Contents

1. Scope ........................................................................................................................................... 16
2. References ................................................................................................................................... 16
2.1 Normative references .................................................................................................................. 16
2.2 Informative references ................................................................................................................ 17
3. Definition of terms, symbols, abbreviations and coding conventions ........................................... 17
3.1 Terms ........................................................................................................................................ 17
3.2 Symbols .................................................................................................................................... 17
3.3 Abbreviations ............................................................................................................................. 18
3.4 Coding conventions ..................................................................................................................... 19
3.5 Applicability ............................................................................................................................... 19
3.5.1 Applicability of the present document .................................................................................... 19
3.5.2 Applicability of the individual test cases ............................................................................... 19
3.5.3 Applicability to terminal equipment ........................................................................................ 19
3.6 Definitions ................................................................................................................................. 19
3.6.1 Format of table of the table of optional features ................................................................. 19
3.6.2 Format of the applicability table ........................................................................................... 20
3.6.3 Status and Notations ............................................................................................................. 20
3.7 Table of optional features ........................................................................................................ 21
3.8 Applicability table ...................................................................................................................... 22
4. Physical characteristic tests ........................................................................................................... 27
4.1 Contact pressure ........................................................................................................................ 27
4.1.1 Definition and applicability .................................................................................................... 27
4.1.2 Conformance requirement ..................................................................................................... 27
4.1.2.0 Description ........................................................................................................................ 27
4.1.2.1 Reference .......................................................................................................................... 27
4.1.3 Test purpose .......................................................................................................................... 27
4.1.4 Method of test ......................................................................................................................... 27
4.1.4.1 Initial conditions ............................................................................................................... 27
4.1.4.2 Procedure .......................................................................................................................... 27
4.1.5 Acceptance criteria ................................................................................................................ 27
4.2 Curvature of the contacting elements ......................................................................................... 27
4.2.1 Definition and applicability .................................................................................................. 27
4.2.2 Conformance requirement .................................................................................................... 28
4.2.2.0 Description ........................................................................................................................ 28
4.2.2.1 Reference .......................................................................................................................... 28
4.2.3 Test purpose .......................................................................................................................... 28
4.2.4 Method of test ........................................................................................................................ 28
4.2.4.1 Initial conditions ............................................................................................................... 28
4.2.4.2 Procedure .......................................................................................................................... 28
4.2.5 Acceptance criteria ................................................................................................................ 28
5. Electrical characteristic tests ......................................................................................................... 28
5.1 Test of the power transition phases ............................................................................................ 28
5.1.1 Phase preceding Terminal power on ...................................................................................... 28
5.1.1.1 Definition and applicability ............................................................................................... 28
5.1.1.2 Conformance requirement .................................................................................................. 28
5.1.1.3 Reference .......................................................................................................................... 28
5.1.1.4 Test purpose ....................................................................................................................... 29
5.1.1.5 Method of test ..................................................................................................................... 29
5.1.1.5.1 Initial condition .............................................................................................................. 29

ETSI
5.1.2.1 Phase during UICC power on: 3 V - 5 V ................................................................. 29
  5.1.2.1.1 Definition and applicability ............................................................................... 29
  5.1.2.1.2 Conformance requirement ................................................................................. 29
  5.1.2.1.2.1 Reference .................................................................................................. 29
  5.1.2.1.2.3 Test purpose .......................................................................................... 30
  5.1.2.1.2.4 Method of test ......................................................................................... 30
  5.1.2.1.2.5 Acceptance criteria .................................................................................. 30
  5.1.2.2 Phase during UICC power on: 1,8 V - 3 V ......................................................... 30
  5.1.2.2.1 Definition and applicability ............................................................................... 30
  5.1.2.2.2 Conformance requirement ................................................................................. 30
  5.1.2.2.2.1 Reference ................................................................................................. 30
  5.1.2.2.2.3 Test purpose .......................................................................................... 30
  5.1.2.2.2.4 Method of test ......................................................................................... 31
  5.1.2.2.2.5 Acceptance criteria .................................................................................. 31

5.1.3 Phase during Terminal power off ............................................................................. 31
  5.1.3.1 Phase during Terminal power off: 3 V - 5 V ......................................................... 31
    5.1.3.1.1 Definition and applicability ............................................................................... 31
    5.1.3.1.2 Conformance requirement ................................................................................. 31
    5.1.3.1.2.1 Reference ................................................................................................. 31
    5.1.3.1.2.3 Test purpose .......................................................................................... 32
    5.1.3.1.2.4 Method of test ......................................................................................... 32
    5.1.3.1.2.5 Acceptance criteria .................................................................................. 32
    5.1.3.2 Phase during Terminal power off: 1,8 V - 3 V ..................................................... 32
    5.1.3.2.1 Definition and applicability ............................................................................... 32
    5.1.3.2.2 Conformance requirement ................................................................................. 32
    5.1.3.2.2.1 Reference ................................................................................................. 32
    5.1.3.2.2.3 Test purpose .......................................................................................... 33
    5.1.3.2.2.4 Method of test ......................................................................................... 33
    5.1.3.2.2.5 Acceptance criteria .................................................................................. 33

5.1.4 Warm reset timing ................................................................................................. 33
    5.1.4.1 Definition and applicability ............................................................................... 33
    5.1.4.2 Conformance requirement ................................................................................. 33
    5.1.4.2.1 Reference ................................................................................................. 33
    5.1.4.3 Test purpose .................................................................................................. 34
    5.1.4.4 Method of test ................................................................................................. 34
    5.1.4.4.1 Initial conditions ......................................................................................... 34
    5.1.4.4.2 Procedure .................................................................................................. 34
    5.1.4.5 Acceptance criteria .......................................................................................... 34

5.1.5 Recognition of voltage classes accepted by the UICC and voltage switching .................. 34
    5.1.5.1 Reaction of Terminals supporting voltage classes A and B on recognition of UICCs accepting voltage classes A and B ........................................................... 34
      5.1.5.1.1 Definition and applicability ........................................................................ 34
      5.1.5.1.2 Conformance requirement ......................................................................... 34
      5.1.5.1.2.1 Reference .......................................................................................... 34
      5.1.5.1.3 Test purpose .......................................................................................... 35
      5.1.5.1.4 Method of test ......................................................................................... 35
      5.1.5.1.5 Acceptance criteria .................................................................................. 35
    5.1.5.2 Reaction of Terminals supporting voltage classes A and B on recognition of UICCs accepting voltage classes B and C ........................................................... 35
      5.1.5.2.1 Definition and applicability ........................................................................ 35
      5.1.5.2.2 Conformance requirement ......................................................................... 36
      5.1.5.2.2.1 Reference .......................................................................................... 36
      5.1.5.2.3 Test purpose .......................................................................................... 36
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.2.4.2</td>
<td>Conformance requirement</td>
</tr>
<tr>
<td>5.2.2.4.3</td>
<td>Reference</td>
</tr>
<tr>
<td>5.2.2.4.4</td>
<td>Test purpose</td>
</tr>
<tr>
<td>5.2.2.4.5</td>
<td>Method of test</td>
</tr>
<tr>
<td>5.2.2.4.6</td>
<td>Acceptance criteria</td>
</tr>
<tr>
<td>5.2.3</td>
<td>Electrical tests on contact C2 (Reset - RST)</td>
</tr>
<tr>
<td>5.2.3.1</td>
<td>Electrical tests on contact C2: 3 V - 5 V</td>
</tr>
<tr>
<td>5.2.3.1.1</td>
<td>Definition and applicability</td>
</tr>
<tr>
<td>5.2.3.1.2</td>
<td>Conformance requirement</td>
</tr>
<tr>
<td>5.2.3.1.3</td>
<td>Reference</td>
</tr>
<tr>
<td>5.2.3.1.4</td>
<td>Test purpose</td>
</tr>
<tr>
<td>5.2.3.1.5</td>
<td>Method of test</td>
</tr>
<tr>
<td>5.2.3.1.6</td>
<td>Acceptance criteria</td>
</tr>
<tr>
<td>5.2.3.2</td>
<td>Electrical tests on contact C2: 1.8 V - 3 V</td>
</tr>
<tr>
<td>5.2.3.2.1</td>
<td>Definition and applicability</td>
</tr>
<tr>
<td>5.2.3.2.2</td>
<td>Conformance requirement</td>
</tr>
<tr>
<td>5.2.3.2.3</td>
<td>Reference</td>
</tr>
<tr>
<td>5.2.3.2.4</td>
<td>Test purpose</td>
</tr>
<tr>
<td>5.2.3.2.5</td>
<td>Method of test</td>
</tr>
<tr>
<td>5.2.3.2.6</td>
<td>Acceptance criteria</td>
</tr>
<tr>
<td>5.2.4</td>
<td>Electrical tests on contact C3 (Clock - CLK)</td>
</tr>
<tr>
<td>5.2.4.1</td>
<td>Electrical tests on contact C3: 3 V - 5 V</td>
</tr>
<tr>
<td>5.2.4.1.1</td>
<td>Definition and applicability</td>
</tr>
<tr>
<td>5.2.4.1.2</td>
<td>Conformance requirement</td>
</tr>
<tr>
<td>5.2.4.1.3</td>
<td>Reference</td>
</tr>
<tr>
<td>5.2.4.1.4</td>
<td>Test purpose</td>
</tr>
<tr>
<td>5.2.4.1.5</td>
<td>Method of test</td>
</tr>
<tr>
<td>5.2.4.1.6</td>
<td>Acceptance criteria</td>
</tr>
<tr>
<td>5.2.4.2</td>
<td>Electrical tests on contact C3: 1.8 V - 3 V</td>
</tr>
<tr>
<td>5.2.4.2.1</td>
<td>Definition and applicability</td>
</tr>
<tr>
<td>5.2.4.2.2</td>
<td>Conformance requirement</td>
</tr>
<tr>
<td>5.2.4.2.3</td>
<td>Reference</td>
</tr>
<tr>
<td>5.2.4.2.4</td>
<td>Test purpose</td>
</tr>
<tr>
<td>5.2.4.2.5</td>
<td>Method of test</td>
</tr>
<tr>
<td>5.2.4.2.6</td>
<td>Acceptance criteria</td>
</tr>
<tr>
<td>5.2.5</td>
<td>Electrical tests on contact C7 (Input/Output - I/O)</td>
</tr>
<tr>
<td>5.2.5.1</td>
<td>Electrical tests on contact C7, Test 1: 3 V - 5 V</td>
</tr>
<tr>
<td>5.2.5.1.1</td>
<td>Definition and applicability</td>
</tr>
<tr>
<td>5.2.5.1.2</td>
<td>Conformance requirement</td>
</tr>
<tr>
<td>5.2.5.1.3</td>
<td>Reference</td>
</tr>
<tr>
<td>5.2.5.1.4</td>
<td>Test purpose</td>
</tr>
<tr>
<td>5.2.5.1.5</td>
<td>Method of test</td>
</tr>
<tr>
<td>5.2.5.1.6</td>
<td>Acceptance criteria</td>
</tr>
<tr>
<td>5.2.5.2</td>
<td>Electrical tests on contact C7, Test 2: 3 V - 5 V</td>
</tr>
<tr>
<td>5.2.5.2.1</td>
<td>Definition and applicability</td>
</tr>
<tr>
<td>5.2.5.2.2</td>
<td>Conformance requirement</td>
</tr>
<tr>
<td>5.2.5.2.3</td>
<td>Reference</td>
</tr>
<tr>
<td>5.2.5.2.4</td>
<td>Test purpose</td>
</tr>
<tr>
<td>5.2.5.2.5</td>
<td>Method of test</td>
</tr>
<tr>
<td>5.2.5.2.6</td>
<td>Acceptance criteria</td>
</tr>
<tr>
<td>5.2.5.3</td>
<td>Electrical tests on contact C7, Test 1: 1.8 V - 3 V</td>
</tr>
<tr>
<td>5.2.5.3.1</td>
<td>Definition and applicability</td>
</tr>
<tr>
<td>5.2.5.3.2</td>
<td>Conformance requirement</td>
</tr>
<tr>
<td>5.2.5.3.3</td>
<td>Reference</td>
</tr>
<tr>
<td>5.2.5.3.4</td>
<td>Test purpose</td>
</tr>
<tr>
<td>5.2.5.3.5</td>
<td>Method of test</td>
</tr>
<tr>
<td>5.2.5.3.6</td>
<td>Acceptance criteria</td>
</tr>
<tr>
<td>5.2.5.4</td>
<td>Electrical tests on contact C7, Test 2: 1.8 V - 3 V</td>
</tr>
<tr>
<td>5.2.5.4.1</td>
<td>Definition and applicability</td>
</tr>
<tr>
<td>5.2.5.4.2</td>
<td>Conformance requirement</td>
</tr>
<tr>
<td>5.2.5.4.3</td>
<td>Reference</td>
</tr>
<tr>
<td>5.2.5.4.4</td>
<td>Test purpose</td>
</tr>
</tbody>
</table>
7.3.4.4 Method of test ........................................................................................................ 87
7.3.4.3 Test purpose .......................................................................................................... 87
7.3.4.2.1 Reference ........................................................................................................... 87
7.3.4.2 Conformance requirement ........................................................................................ 86
7.3.4.1 Definition and applicability ..................................................................................... 86
7.3.3.3 Test purpose .......................................................................................................... 85
7.3.3.2.1 Reference ........................................................................................................... 85
7.3.3.2 Conformance requirement ........................................................................................ 85
7.3.3.1 Definition and applicability ..................................................................................... 84
7.3.2.2 Conformance requirement ........................................................................................ 83
7.3.2.1 Definition and applicability ..................................................................................... 83
7.3.2 Block Timing ............................................................................................................ 83
7.3.1.4.1 Initial conditions .................................................................................................. 82
7.3.1.4 Method of test ........................................................................................................ 82
7.3.1.3 Test purpose .......................................................................................................... 82
7.3.1.2.1 Reference ........................................................................................................... 82
7.3.1.2 Conformance requirement ........................................................................................ 82
7.3.1 Character Waiting Time .............................................................................................. 82
7.3.1.1 Definition and applicability ..................................................................................... 82
7.3.1.0 Description ............................................................................................................. 82
7.3.1 Error detection ........................................................................................................... 81
7.3.1 Error correction .......................................................................................................... 81
7.2.7.5 Acceptance criteria ................................................................................................ 81
7.2.7.4.2 Procedure ........................................................................................................... 81
7.2.7.4.1 Initial conditions .................................................................................................. 81
7.2.7.4 Method of test ........................................................................................................ 81
7.2.7.3 Test purpose .......................................................................................................... 81
7.2.7.2.1 Reference ........................................................................................................... 81
7.2.7.2 Conformance requirement ........................................................................................ 81
7.2.7.1 Definition and applicability ..................................................................................... 81
7.2.7.0 Description ............................................................................................................. 81
7.2.7 Error detection ........................................................................................................... 81
7.2.7 Error correction .......................................................................................................... 81
7.2.6.5 Acceptance criteria ................................................................................................ 81
7.2.6.4.1 Initial conditions .................................................................................................. 81
7.2.6.4 Method of test ........................................................................................................ 81
7.2.6.3 Test purpose .......................................................................................................... 81
7.2.6.2 Conformance requirement ....................................................................................... 81
7.2.6.1 Definition and applicability ..................................................................................... 81
7.2.6 Acceptance criteria ...................................................................................................... 80
7.2.5.5 Acceptance criteria ................................................................................................ 80
7.2.5.4.1 Initial conditions .................................................................................................. 80
7.2.5.4 Method of test ........................................................................................................ 80
7.2.5.3 Test purpose .......................................................................................................... 80
7.2.5.2.1 Reference ........................................................................................................... 80
7.2.5.2 Conformance requirement ....................................................................................... 80
7.2.5.1 Definition and applicability ..................................................................................... 80
7.2.5 Error detection ........................................................................................................... 80
7.2.5 Error correction .......................................................................................................... 80
7.2.4.5 Acceptance criteria ................................................................................................ 80
7.2.4.4 Method of test ........................................................................................................ 80
7.2.4.3 Test purpose .......................................................................................................... 80
7.2.4.2 Conformance requirement ....................................................................................... 80
7.2.4.1 Initial conditions ..................................................................................................... 80
7.2.4 Conformance requirement .......................................................................................... 80
7.2.3.5 Acceptance criteria ................................................................................................ 80
7.2.3.4 Method of test ........................................................................................................ 79
7.2.3.3 Test purpose .......................................................................................................... 79
7.2.3.2.1 Reference ........................................................................................................... 79
7.2.3.2 Conformance requirement ....................................................................................... 79
7.2.3.1 Definition and applicability ..................................................................................... 79
7.2.3 Character Waiting Time extension ............................................................................... 79
7.2.2.5 Acceptance criteria ................................................................................................ 79
7.2.2.4 Procedure ............................................................................................................. 79
7.2.2.3 Method of test ........................................................................................................ 79
7.2.2.2.1 Reference ........................................................................................................... 79
7.2.2.2 Conformance requirement ....................................................................................... 79
7.2.2.1 Definition and applicability ..................................................................................... 79
7.2.2.0 Description ............................................................................................................. 79
7.2.2 Error detection ........................................................................................................... 78
7.2.2 Error correction .......................................................................................................... 78
7.2.1.5 Acceptance criteria ................................................................................................ 78
7.2.1.4 Procedure ............................................................................................................. 78
7.2.1.3 Method of test ........................................................................................................ 78
7.2.1.2.1 Reference ........................................................................................................... 78
7.2.1.2 Conformance requirement ....................................................................................... 78
7.2.1.1 Definition and applicability ..................................................................................... 78
7.2.1 Character Waiting Time .............................................................................................. 78
7.2.1 Error detection ........................................................................................................... 78
7.2.1 Error correction .......................................................................................................... 78
7.2 Acceptance criteria ......................................................................................................... 78
7.1 Procedure ..................................................................................................................... 78
7.1 Method of test ............................................................................................................... 78
7 Release 17 9 ETSI TS 102 230-1 V17.0.0 (2023-08)
7.3.10.5 Acceptance criteria ........................................................................................................ 95
7.3.11 Chaining - Abortion ........................................................................................................... 95
7.3.11.1 Definition and applicability ............................................................................................ 95
7.3.11.2 Conformance requirement ........................................................................................... 95
7.3.11.2.0 Description ........................................................................................................... 95
7.3.11.2.1 Reference ........................................................................................................... 95
7.3.11.3 Test purpose ............................................................................................................. 95
7.3.11.4 Method of test ............................................................................................................ 95
7.3.11.4.1 Initial conditions .................................................................................................. 95
7.3.11.4.2 Procedure .......................................................................................................... 96
7.3.11.5 Acceptance criteria ..................................................................................................... 96
7.3.12 Block repetition and resynchronization ........................................................................ 96
7.3.12.1 Definition and applicability ........................................................................................ 96
7.3.12.2 Conformance requirement ......................................................................................... 97
7.3.12.2.0 Description .......................................................................................................... 97
7.3.12.2.1 Reference .......................................................................................................... 97
7.3.12.3 Test purpose ............................................................................................................. 97
7.3.12.4 Method of test ........................................................................................................... 97
7.3.12.4.1 Initial conditions .................................................................................................. 97
7.3.12.4.2 Procedure .......................................................................................................... 97
7.3.12.5 Acceptance criteria ................................................................................................... 98
7.3.13 UICC is unresponsive .................................................................................................... 98
7.3.13.1 Definition and applicability ....................................................................................... 98
7.3.13.2 Conformance requirement ........................................................................................ 98
7.3.13.2.0 Description .......................................................................................................... 98
7.3.13.2.1 Reference .......................................................................................................... 98
7.3.13.3 Test purpose ............................................................................................................. 98
7.3.13.4 Method of test ........................................................................................................... 98
7.3.13.4.1 Initial conditions .................................................................................................. 98
7.3.13.4.2 Procedure .......................................................................................................... 99
7.3.13.5 Acceptance criteria ................................................................................................... 99

8 Application dependent procedures .................................................................................. 99
8.1 UICC presence detection ................................................................................................. 99
8.1.1 Definition and applicability ......................................................................................... 99
8.1.2 Conformance requirement ........................................................................................... 100
8.1.2.0 Description ............................................................................................................. 100
8.1.2.1 Reference .............................................................................................................. 100
8.1.3 Test purpose ................................................................................................................ 100
8.1.4 Method of test ............................................................................................................. 100
8.1.4.1 Initial conditions ..................................................................................................... 100
8.1.4.2 Procedure ............................................................................................................. 100
8.1.5 Acceptance criteria ...................................................................................................... 100

9 Commands .......................................................................................................................... 101
9.1 TERMINAL CAPABILITY ................................................................................................. 101
9.1.1 Additional interfaces support ...................................................................................... 101
9.1.1.1 Definition and applicability .................................................................................... 101
9.1.1.2 Conformance requirement ...................................................................................... 101
9.1.1.2.0 Description .......................................................................................................... 101
9.1.1.2.1 Reference .......................................................................................................... 101
9.1.1.3 Test purpose ............................................................................................................ 101
9.1.1.4 Method of test ........................................................................................................... 101
9.1.1.4.1 Initial conditions .................................................................................................. 101
9.1.1.4.2 Procedure .......................................................................................................... 101
9.1.1.5 Acceptance criteria ................................................................................................... 102
9.2 SUSPEND UICC ............................................................................................................... 102
9.2.1 Support of the SUSPEND UICC command ................................................................. 102
9.2.1.1 SUSPEND UICC - Nominal Condition ................................................................. 102
9.2.1.1.1 Definition and applicability ............................................................................... 102
9.2.1.1.2 Conformance requirement ............................................................................... 102
9.2.1.1.3 Test purpose ..................................................................................................... 102

ETSI
10. Application independent features .................................................................................................................. 115

10.1 Logical secure element Interfaces .............................................................................................................. 115

10.1.0 General test execution information .......................................................................................................... 115

10.1.1 Identification of Multiplexing mechanism .................................................................................................. 115

10.1.2 Identification of LSIs .................................................................................................................................. 115

10.1.3 Selection of an LSI ...................................................................................................................................... 115

10.1.3.1 Selection of an LSI in T=0 using MANAGE LSI (select LSI) ................................................................. 115

10.1.3.2 Selection of an LSI in T=1 using MANAGE LSI (select LSI) ................................................................. 115

10.1.3.3 Selection of an LSI in T=1 using the NAD byte ..................................................................................... 115

10.1.3.3.1 Definition and applicability .............................................................................................................. 115

10.1.3.3.2 Conformance requirement ................................................................................................................ 115

10.1.3.3.3 Selection of an LSI in T=1 using the NAD byte ................................................................................ 115

10.1.3.3.4 Method of test .................................................................................................................................. 115

10.1.3.3.5 Acceptance criteria ......................................................................................................................... 115

10.1.3.4 SUSPEND UICC - Nominal Condition - Events .................................................................................. 115

10.1.3.4.1 Definition and applicability .............................................................................................................. 115

10.1.3.4.2 Conformance requirement ................................................................................................................ 115

10.1.3.4.3 Test purpose .................................................................................................................................... 115

10.1.3.4.4 Method of test .................................................................................................................................. 115

10.1.3.4.5 Acceptance criteria ......................................................................................................................... 115

10.1.3.5 SUSPEND UICC - Suspension not supported by the UICC ................................................................. 116

10.1.3.5.1 Definition and applicability .............................................................................................................. 116

10.1.3.5.2 Conformance requirement ................................................................................................................ 116

10.1.3.5.3 Test purpose .................................................................................................................................... 116

10.1.3.5.4 Method of test .................................................................................................................................. 116

10.1.3.5.5 Acceptance criteria ......................................................................................................................... 116

10.1.4 SUSPEND UICC - Rejection of the UICC suspension with status word '6985' ........................................ 116

10.1.4.1 Definition and applicability .............................................................................................................. 116

10.1.4.2 Conformance requirement ................................................................................................................ 116

10.1.4.3 Test purpose .................................................................................................................................... 116

10.1.4.4 Method of test .................................................................................................................................. 116

10.1.4.5 Acceptance criteria ......................................................................................................................... 116

10.1.5 SUSPEND UICC - Rejection of the UICC suspension with status word '9864' ....................................... 116

10.1.5.1 Definition and applicability .............................................................................................................. 116

10.1.5.2 Conformance requirement ................................................................................................................ 116

10.1.5.3 Test purpose .................................................................................................................................... 116

10.1.5.4 Method of test .................................................................................................................................. 116

10.1.5.5 Acceptance criteria ......................................................................................................................... 116

10.1.6 SUSPEND UICC - Rejection of the UICC resume with status word '6982' ............................................. 117

10.1.6.1 Definition and applicability .............................................................................................................. 117

10.1.6.2 Conformance requirement ................................................................................................................ 117

10.1.6.3 Test purpose .................................................................................................................................... 117

10.1.6.4 Method of test .................................................................................................................................. 117

10.1.6.5 Acceptance criteria ......................................................................................................................... 117

10.1.7 SUSPEND UICC - Rejection of the UICC resume with status word '6982' - Events .............................. 117

10.1.7.1 Definition and applicability .............................................................................................................. 117

10.1.7.2 Conformance requirement ................................................................................................................ 117

10.1.7.3 Test purpose .................................................................................................................................... 117

10.1.7.4 Method of test .................................................................................................................................. 117

10.1.7.5 Acceptance criteria ......................................................................................................................... 117

10.1.8 SUSPEND UICC - Rejection of the UICC resume with status word '6985' ............................................. 118

10.1.8.1 Definition and applicability .............................................................................................................. 118

10.1.8.2 Conformance requirement ................................................................................................................ 118

10.1.8.3 Test purpose .................................................................................................................................... 118

10.1.8.4 Method of test .................................................................................................................................. 118

10.1.8.5 Acceptance criteria ......................................................................................................................... 118

10.1.9 SUSPEND UICC - Rejection of the UICC resume with status word '6985' - Events .............................. 119

10.1.9.1 Definition and applicability .............................................................................................................. 119

10.1.9.2 Conformance requirement ................................................................................................................ 119

10.1.9.3 Test purpose .................................................................................................................................... 119

10.1.9.4 Method of test .................................................................................................................................. 119

10.1.9.5 Acceptance criteria ......................................................................................................................... 119
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1.3.3.2.1 Description</td>
<td>115</td>
</tr>
<tr>
<td>10.1.3.3.2.2 Reference</td>
<td>116</td>
</tr>
<tr>
<td>10.1.3.3.3 Test purpose</td>
<td>116</td>
</tr>
<tr>
<td>10.1.3.3.4 Method of test</td>
<td>116</td>
</tr>
<tr>
<td>10.1.3.3.4.1 Initial conditions</td>
<td>116</td>
</tr>
<tr>
<td>10.1.3.3.4.2 Procedure</td>
<td>116</td>
</tr>
<tr>
<td>10.1.3.3.5 Acceptance criteria</td>
<td>116</td>
</tr>
<tr>
<td>Annex A (normative): UICC simulator functional requirement</td>
<td>117</td>
</tr>
<tr>
<td>A.1 General</td>
<td>117</td>
</tr>
<tr>
<td>A.2 Contacts C1, C3, C7</td>
<td>117</td>
</tr>
<tr>
<td>A.2.1 Default measurement/setting uncertainties</td>
<td>117</td>
</tr>
<tr>
<td>A.2.2 Contact C1</td>
<td>117</td>
</tr>
<tr>
<td>A.2.3 Contact C7</td>
<td>118</td>
</tr>
<tr>
<td>A.2.4 Contact C3</td>
<td>118</td>
</tr>
<tr>
<td>A.3 Definition of timing</td>
<td>118</td>
</tr>
<tr>
<td>Annex B (informative): Change history</td>
<td>119</td>
</tr>
<tr>
<td>Annex C (informative): Core specification version information</td>
<td>121</td>
</tr>
<tr>
<td>History</td>
<td>122</td>
</tr>
</tbody>
</table>
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Foreword

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    Version x.y.z

where:

x  the first digit:

1  presented to TC SET for information;
2  presented to TC SET for approval;
3  or greater indicates TC SET approved document under change control.

y  the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z  the third digit is incremented when editorial only changes have been incorporated in the document.

The present document is part 1 of a multi-part deliverable covering the UICC-Terminal interface; Physical, electrical and logical test specification, as identified below:

Part 1: "Terminal features";
Part 2: "UICC features".
Modal verbs terminology

In the present document "shall", "shall not", "should", "should not", "may", "need not", "will", "will not", "can" and "cannot" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"must" and "must not" are NOT allowed in ETSI deliverables except when used in direct citation.

Introduction

The present document defines the interface tests for the Terminal/UICC interface.

The aim of the present document is to ensure interoperability between an UICC and a Terminal independently of the respective manufacturer, card issuer or operator.

Application specific tests for applications residing on an UICC are specified in ETSI TS 131 121 [4].
1 Scope

The present document specifies the interface test for the Terminal/UICC.

The present document specifies the tests of:

- physical characteristics of the UICC;
- the electrical interface between the UICC and the Terminal;
- the initial communication establishment and the transport protocols;
- the application independent procedures.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- In the case of a reference to a TC SET document, a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 102 221: "Smart Cards; UICC-Terminal interface; Physical and logical characteristics".
[3] ETSI TS 121 111: "Universal Mobile Telecommunications System (UMTS); LTE; USIM and IC card requirements (3GPP TS 21.111)".
[4] ETSI TS 131 121: "Universal Mobile Telecommunications System (UMTS); LTE; UICC-terminal interface; Universal Subscriber Identity Module (USIM) application test specification (3GPP TS 31.121)".
[6] ETSI TS 102 613: "Smart Cards; UICC - Contactless Front-end (CLF) Interface; Physical and data link layer characteristics".
[7] ETSI TS 102 223: "Smart Cards; Card Application Toolkit (CAT)".
2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- In the case of a reference to a TC SET document, a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

Not applicable.

3 Definition of terms, symbols, abbreviations and coding conventions

3.1 Terms

For the purposes of the present document, the following terms apply:

- **access conditions**: set of security attributes associated with a file
- **data object**: information coded as TLV objects, i.e. consisting of a Tag, a Length and a Value part
- **Dedicated File (DF)**: file containing access conditions and, optionally, Elementary Files (EFs) or other Dedicated Files (DFs)
- **directory**: general term for MF, DF and ADF
- **Elementary File (EF)**: file containing access conditions and data and no other files
- **file**: directory or an organized set of bytes or records in the UICC
- **file identifier**: 2 bytes which address a file in the UICC
- **Master File (MF)**: unique mandatory file containing access conditions and optionally DFs and/or EFs
- **plug-in UICC**: second format of UICC
- **soft power off**: Terminal ends operation in a graceful way (i.e. without abruptly removing the battery/power)
- **SWP interface**: UICC-CLF interface according to ETSI TS 102 613 [6]

3.2 Symbols

For the purposes of the present document, the following symbols apply:

- \( f \): frequency
- \( F_i \): Clock rate conversion factor
- \( I \): Current
- \( I_{cc} \): Current at supply voltage
- \( L_c \): Length of Command data sent by the application layer in a case 3 or 4 Command
- \( L_e \): Maximum length of data Expected by the application layer in response to a case 2 or 4 Command
- \( L_{uicc} \): Exact Length of data available in the UICC to be returned in response to the case 2 or 4 Command received by the UICC
- \( I_F \): fall time
3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

- **ACK** - ACKnowledge
- **ADF** - Application Dedicated File
- **AID** - Application IDentifier
- **ATR** - Answer To Reset
- **BGT** - Block Guard Time
- **BWI** - Block Waiting Integer
- **BWT** - Block Waiting Time
- **CLF** - ContactLess Frontend
- **CLK** - CLock
- **CWI** - Character Waiting Integer
- **CWT** - Character Waiting Time
- **DF** - Dedicated File
- **EDC** - Error Detection Code byte
- **EF** - Elementary File
- **etu** - elementary time unit
- **FCP** - File Control Parameters
- **GND** - GrouND
- **GSM** - Global System for Mobile communications
- **I/O** - Input/Output
- **IBlock** - Information-Block
- **ID** - IDentifier
- **IEC** - International Electrotechnical Commission
- **IFSC** - Information Field Size for the UICC
- **IFSD** - Information Field Size for the Terminal
- **INS** - INStruction
- **ISO** - International Organization for Standardization
- **LEN** - LENgth
- **LSB** - Least Significant Bit
- **LSE** - Logical Secure Element
- **LSI** - Logical Secure element Interface
- **MF** - Master File
- **MSB** - Most Significant Bit
- **N/A** - Not Applicable
- **NAD** - Node ADdress byte
- **PCB** - Protocol Control Byte
- **PIN** - Personal Identification Number
- **PPS** - Protocol and Parameter Selection
- **R-Block** - Receive-ready Block
- **RFU** - Reserved for Future Use
- **RST** - Reset
- **S-Block** - Supervisory-Block
- **SFI** - Short (elementary) File Identifier
- **SWP** - Single Wire Protocol
- **TBD** - To Be Defined
- **TE** - Terminal Equipment
- **TLV** - Tag Length Value
- **UE** - User Equipment
- **USIM** - Universal Subscriber Identity Module
- **VCC** - Power supply input
- **WI** - Waiting time Integer
- **WTX** - Waiting Time eXtension
- **WWT** - Work Waiting Time
3.4 Coding conventions

For the purposes of the present document, the following coding conventions apply.

All lengths are presented in bytes, unless otherwise stated. Each byte is represented by bits b8 to b1, where b8 is the Most Significant Bit (MSB) and b1 is the Least Significant Bit (LSB). In each representation, the leftmost bit is the MSB.

In the UICC, all bytes specified as RFU is to be set to '00' and all bits specified as RFU are to be set to 0. If the GSM and/or USIM application exists on a UICC or is built on a generic telecommunications card, then other values may apply for the non-GSM or non-USIM applications. The values will be defined in the appropriate specifications for such cards and applications. These bytes and bits are not to be interpreted by a Terminal in a GSM or 3G session.

The coding of all data objects in the present document is according to ETSI TS 102 221. All data objects are BER-TLV except if otherwise defined.

3.5 Applicability

3.5.1 Applicability of the present document

This present test specification applies to terminal equipment that supports UICC according to ETSI TS 102 221.

3.5.2 Applicability of the individual test cases

Table A.1 lists the optional features for which the supplier of the implementation states the support.

3.5.3 Applicability to terminal equipment

The applicability to terminal equipment specified in table B.1 of the present document applies, unless otherwise specified.

3.6 Definitions

3.6.1 Format of table of the table of optional features

The columns in table A.1 have the following meaning:

<table>
<thead>
<tr>
<th>Column</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option:</td>
<td>The optional feature supported or not by the implementation.</td>
</tr>
<tr>
<td>Status:</td>
<td>See clause 3.6.3 'Status and Notations'.</td>
</tr>
<tr>
<td>Support:</td>
<td>The support columns are to be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7, are used for the support column in table A.1:</td>
</tr>
<tr>
<td></td>
<td>Y or y supported by the implementation.</td>
</tr>
<tr>
<td></td>
<td>N or n not supported by the implementation.</td>
</tr>
<tr>
<td></td>
<td>N/A, n/a or - no answer required (allowed only if the status is N/A, directly or after evaluation of a conditional status).</td>
</tr>
<tr>
<td>Mnemonic:</td>
<td>The mnemonic column contains mnemonic identifiers for each item.</td>
</tr>
</tbody>
</table>
3.6.2 Format of the applicability table

The applicability of every test in table B.1 is formally expressed by the use of Boolean expression defined in the following clause.

The columns in table B.1 have the following meaning:

<table>
<thead>
<tr>
<th>Column</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case:</td>
<td>The “Test case” column gives a reference to the test case number(s) detailed in the present document and required to validate the implementation of the corresponding item in the &quot;Description&quot; column.</td>
</tr>
<tr>
<td>Description:</td>
<td>In the “Description” column a short non-exhaustive description of the requirement is found.</td>
</tr>
<tr>
<td>Release:</td>
<td>The “Release” column gives the Release applicable and onwards, for the item in the &quot;Description&quot; column.</td>
</tr>
<tr>
<td>Rel x TE:</td>
<td>For a given Release, the corresponding &quot;Rel X Terminal&quot; column lists the tests required for a Terminal to be declared compliant to this Release.</td>
</tr>
<tr>
<td>Support:</td>
<td>The &quot;Support&quot; column is blank in the proforma, and is to be completed by the manufacturer in respect of each particular requirement to indicate the choices, which have been made in the implementation.</td>
</tr>
</tbody>
</table>

3.6.3 Status and Notations

The "Release X Terminal" columns show the status of the entries as follows:

The following notations, defined in ISO/IEC 9646-7 [5], are used for the status column:

- **M** mandatory - the capability is required to be supported.
- **O** optional - the capability may be supported or not.
- **N/A** not applicable - in the given context, it is impossible to use the capability.
- **X** prohibited (excluded) - there is a requirement not to use this capability in the given context.
- **O.i** qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer which identifies an unique group of related optional items and the logic of their selection which is defined immediately following the table.
- **Ci** conditional - the requirement on the capability ("M", "O", "X" or "N/A") depends on the support of other optional or conditional items. "i" is an integer identifying an unique conditional status expression which is defined immediately following the table. For nested conditional expressions, the syntax "IF ... THEN (IF ... THEN ... ELSE...) ELSE..." is to be used to avoid ambiguities.

References to items

For each possible item answer (answer in the support column) there exists a unique reference, used, for example, in the conditional expressions. It is defined as the table identifier, followed by a solidus character "/", followed by the item number in the table. If there is more than one support column in a table, the columns are to be discriminated by letters (a, b, etc.), respectively.

**EXAMPLE:** A.1/4 is the reference to the answer of item 4 in table A.1.
### 3.7 Table of optional features

**Table A.1: Options**

<table>
<thead>
<tr>
<th>Item</th>
<th>Option</th>
<th>Status</th>
<th>Support</th>
<th>Mnemonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Void</td>
<td>O</td>
<td>Void</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Void</td>
<td>O</td>
<td>Void</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Class A</td>
<td>O</td>
<td>O_CLASS_A</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Class B</td>
<td>O</td>
<td>O_CLASS_B</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Class C</td>
<td>O</td>
<td>O_CLASS_C</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Compliant to ETSI TS 121 111 [3]</td>
<td>O</td>
<td>O_COMP_121_111</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Low impedance buffer</td>
<td>O</td>
<td>O_LIB</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SWP interface</td>
<td>O</td>
<td>O_SWP</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Support of SUSPEND UICC</td>
<td>O</td>
<td>O_SUSPEND_UICC</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Terminal supports keypad</td>
<td>C001</td>
<td>O_NO_TYPE_NK</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Terminal supports T=1 NAD selection</td>
<td>O</td>
<td>O_LSI_T1_NAD</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Terminal supports LSIs</td>
<td>O</td>
<td>O_LSI</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>LSI configuration is pre-agreed</td>
<td>O</td>
<td>O_LSI_CONFIG_PRE_AGREED</td>
<td></td>
</tr>
</tbody>
</table>

C001 If feature is implemented according to Rel-8 or later then O, else M.

NOTE: The DUT manufacturer shall provide sufficient information for how to cause the terminal to suspend the UICC and to resume the UICC. This could be active (e.g. a user action) or automatic (e.g. a timeout), and could involve suitable configuration of the Terminal.
### 3.8 Applicability table

#### Table B.1a: Applicability of tests (Rel-99 to Rel-11)

<table>
<thead>
<tr>
<th>Test case</th>
<th>Description</th>
<th>Release</th>
<th>R99</th>
<th>Rel-4</th>
<th>Rel-5</th>
<th>Rel-6</th>
<th>Rel-7</th>
<th>Rel-8</th>
<th>Rel-9</th>
<th>Rel-10</th>
<th>Rel-11</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Contact pressure</td>
<td>R99</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>4.2</td>
<td>Curvature of the contacting elements</td>
<td>R99</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>5.1.1</td>
<td>Phase preceding Terminal power on</td>
<td>R99</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>5.1.2.1</td>
<td>Phase during UICC power on: 3 V - 5 V</td>
<td>R99</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
</tr>
<tr>
<td>5.1.2.2</td>
<td>Phase during UICC power on: 1.8 V - 3 V</td>
<td>R99</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
</tr>
<tr>
<td>5.1.3.1</td>
<td>Phase during Terminal power off: 3 V - 5 V</td>
<td>R99</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
</tr>
<tr>
<td>5.1.3.2</td>
<td>Phase during Terminal power off: 1.8 V - 3 V</td>
<td>R99</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
</tr>
<tr>
<td>5.1.4</td>
<td>Warm reset timing</td>
<td>R99</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>5.1.5.1</td>
<td>Reaction of Terminals supporting voltage classes A and B on recognition of UICCs accepting voltage classes A and B</td>
<td>R99</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
</tr>
<tr>
<td>5.1.5.2</td>
<td>Reaction of Terminals supporting voltage classes A and B on recognition of UICCs accepting voltage classes B and C</td>
<td>R99</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
<td>C001</td>
</tr>
<tr>
<td>5.1.5.3</td>
<td>Reaction of Terminals supporting voltage classes B and C on recognition of UICCs accepting voltage classes A and B</td>
<td>R99</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
</tr>
<tr>
<td>5.1.5.4</td>
<td>Reaction of Terminals supporting voltage classes B and C on recognition of UICCs accepting voltage classes B and C</td>
<td>R99</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
<td>C002</td>
</tr>
<tr>
<td>5.1.5.6.1</td>
<td>Reaction of Terminals receiving no ATR, 3 V - 5 V</td>
<td>R99</td>
<td>C001</td>
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<td>Electrical tests on contact C7, Test 1: 3 V - 5 V</td>
<td>R99</td>
<td>C001</td>
<td>C009</td>
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<td>5.2.5.2</td>
<td>Electrical tests on contact C7, Test 2: 3 V - 5 V</td>
<td>R99</td>
<td>C001</td>
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<td>5.2.5.3</td>
<td>Electrical tests on contact C7, Test 1: 1.8 V - 3 V</td>
<td>R99</td>
<td>C002</td>
<td>C010</td>
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<td>5.2.5.4</td>
<td>Electrical tests on contact C7, Test 2: 1.8 V - 3 V</td>
<td>R99</td>
<td>C002</td>
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<td>6.1.1</td>
<td>ATR characters</td>
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<td>ATR indicating the support of LSIs</td>
<td>Rel-17</td>
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<td>6.2</td>
<td>Clock stop mode with UICC accepting voltage classes B and C</td>
<td>R99</td>
<td>C003</td>
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<td>6.3</td>
<td>Clock stop mode with UICC accepting voltage classes A and B</td>
<td>R99</td>
<td>C004</td>
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<td>6.5</td>
<td>Speed enhancement</td>
<td>R99</td>
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<td>7.1.1</td>
<td>Bit/character duration during the transmission from the Terminal to the UICC</td>
<td>R99</td>
<td>M</td>
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<td>7.1.2</td>
<td>Bit/character duration during the transmission from the UICC to the Terminal</td>
<td>R99</td>
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<td>7.2.1</td>
<td>Timing</td>
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<td>7.2.2</td>
<td>Command processing, ACK, NACK, NULL procedure bytes</td>
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<td>7.2.3</td>
<td>Case 2 command, use of procedure bytes ‘61xx’ and ‘6Cxx’</td>
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<td>7.2.4</td>
<td>Case 4 command, use of procedure bytes ‘61xx’</td>
<td>R99</td>
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<td>7.2.5</td>
<td>Command processing, warning and error status bytes</td>
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<td>7.2.7</td>
<td>Error detection</td>
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<td>Character Waiting Time</td>
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<td>Block Timing</td>
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<td>Test case</td>
<td>Description</td>
<td>Release</td>
<td>Rel-12 TE</td>
<td>Rel-13 TE</td>
<td>Rel-14 TE</td>
<td>Rel-15 TE</td>
<td>Rel-16 TE</td>
<td>Rel-17 TE</td>
<td>Support</td>
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<td>7.3.4</td>
<td>Chaining - Respect of IFSC by Terminal</td>
<td>R99</td>
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<td>7.3.5</td>
<td>Chaining - IFSD management</td>
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<td>7.3.6</td>
<td>I-Block error correction</td>
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<td>I-Block error detection</td>
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<td>7.3.8</td>
<td>R-Block error handling in non-chaining mode</td>
<td>R99</td>
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<td>7.3.9</td>
<td>R-Block error handling in chaining mode</td>
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<td>7.3.10</td>
<td>Successive errors in both directions</td>
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<td>7.3.11</td>
<td>Chaining - Abortion</td>
<td>R99</td>
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<td>7.3.12</td>
<td>Block repetition and resynchronization</td>
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<td>7.3.13</td>
<td>UICC is unresponsive</td>
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<td>UICC presence detection</td>
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<td>9.1.1</td>
<td>TERMINAL CAPABILITY - Additional interfaces support</td>
<td>Rel-7</td>
<td>C008</td>
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<td>9.2.1.1</td>
<td>SUSPEND UICC - Nominal Condition</td>
<td>Rel-14</td>
<td>N/A</td>
<td>N/A</td>
<td>C011</td>
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<td>9.2.1.2</td>
<td>SUSPEND UICC - Nominal Condition - Events</td>
<td>Rel-14</td>
<td>N/A</td>
<td>N/A</td>
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<td>9.2.1.3</td>
<td>SUSPEND UICC - Suspension not supported by the UICC</td>
<td>Rel-14</td>
<td>N/A</td>
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<td>9.2.1.4</td>
<td>SUSPEND UICC - Rejection of the UICC suspension with status word '6985'</td>
<td>Rel-14</td>
<td>N/A</td>
<td>N/A</td>
<td>C011</td>
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<td>9.2.1.5</td>
<td>SUSPEND UICC - Rejection of the UICC suspension with status word '9684'</td>
<td>Rel-14</td>
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<td>9.2.1.6</td>
<td>SUSPEND UICC - Rejection of the UICC resume with status word '6982'</td>
<td>Rel-14</td>
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<td>9.2.1.7</td>
<td>SUSPEND UICC - Rejection of the UICC resume with status word '6982' - Events</td>
<td>Rel-14</td>
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<td>9.2.1.8</td>
<td>SUSPEND UICC - Rejection of the UICC resume with status word '6985'</td>
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<td>N/A</td>
<td>C012</td>
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<td>9.2.1.9</td>
<td>SUSPEND UICC - Rejection of the UICC resume with status word '6985' - Events</td>
<td>Rel-14</td>
<td>N/A</td>
<td>N/A</td>
<td>C012</td>
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<td>10.1.3.3</td>
<td>Selection of an LSI in T=1 using the NAD byte</td>
<td>Rel-17</td>
<td>N/A</td>
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<td>N/A</td>
<td>N/A</td>
<td>C014</td>
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<tr>
<td>C001</td>
<td>IF (O_CLASS_A AND O_CLASS_B AND NOT O_COMP_121_111) THEN M ELSE N/A.</td>
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<tr>
<td>C002</td>
<td>IF (O_CLASS_B AND O_CLASS_C) THEN M ELSE N/A.</td>
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<tr>
<td>C003</td>
<td>IF O_CLASS_C THEN M ELSE N/A.</td>
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<tr>
<td>C004</td>
<td>IF O_CLASS_B THEN M ELSE N/A.</td>
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<td>C005</td>
<td>Void.</td>
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<tr>
<td>C006</td>
<td>Void.</td>
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<td>C007</td>
<td>IF O_LIB THEN M ELSE N/A.</td>
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<tr>
<td>C008</td>
<td>IF O_SWP THEN M ELSE N/A.</td>
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<tr>
<td>C009</td>
<td>IF ((O_CLASS_B AND NOT O_CLASS_A AND NOT O_CLASS_C) OR (O_CLASS_A AND O_CLASS_B AND NOT O_COMP_121_111)) THEN M ELSE N/A.</td>
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<td>C010</td>
<td>IF (O_CLASS_C AND NOT O_CLASS_A AND NOT O_CLASS_B) OR (O_CLASS_B AND O_CLASS_C)) THEN M ELSE N/A.</td>
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<tr>
<td>C011</td>
<td>IF (O_SUSPEND_UICC AND NOT O_SWP) THEN M ELSE N/A.</td>
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<tr>
<td>C012</td>
<td>IF (O_SUSPEND_UICC AND NOT O_SWP AND O_NO_TYPE_NK) THEN M ELSE N/A.</td>
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<tr>
<td>C013</td>
<td>IF O_LSI THEN M ELSE N/A.</td>
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<tr>
<td>C014</td>
<td>IF (O_LSI_T1_NAD AND O_LSI) THEN M ELSE N/A.</td>
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</table>
4 Physical characteristic tests

4.1 Contact pressure

4.1.1 Definition and applicability
The contact pressure shall be large enough to ensure reliable and continuous contact (e.g. to overcome oxidization and to prevent interruption caused by vibration).
For applicability of this test case see clause 3.8.

4.1.2 Conformance requirement

4.1.2.0 Description
Under no circumstances shall the contact force exceed 0,5 N per contact.

4.1.2.1 Reference
ETSI TS 102 221 [1], clause 4.5.4.

4.1.3 Test purpose
To verify that the contact pressure of each contacting element is not greater than 0,5 N when each of the following types of card is used:

1) Unembossed.
2) Embossed on the contact side.

NOTE: Only type 1) applies to the plug-in UICC.

4.1.4 Method of test

4.1.4.1 Initial conditions
The Terminal manufacturers shall provide, if possible, a separate card reader (mechanical components) to allow measurements.

4.1.4.2 Procedure
The pressure of each contacting element is measured.

4.1.5 Acceptance criteria
The contact force shall not exceed 0.5 N per contact.

4.2 Curvature of the contacting elements

4.2.1 Definition and applicability
The contact pressure shall be large enough to ensure reliable and continuous contact (e.g. to overcome oxidization and to prevent interruption caused by vibration).
For applicability of this test case see clause 3.8.

4.2.2 Conformance requirement

4.2.2.0 Description

The radius of any curvature of the contacting elements shall be greater than or equal to 0.8 mm over the contact area.

4.2.2.1 Reference

ETSI TS 102 221 [1], clause 4.5.4.

4.2.3 Test purpose

To verify that the radius of curvature of the contacting elements is greater than or equal to 0.8 mm over the contact area.

4.2.4 Method of test

4.2.4.1 Initial conditions

The Terminal manufacturers shall provide, if possible, a separate card reader (mechanical components) to allow measurements.

4.2.4.2 Procedure

The radius of curvature of the contacting elements is measured on both axes.

4.2.5 Acceptance criteria

The radius of any curvature of the contacting elements shall be greater than or equal to 0.8 mm over the contact area.

5 Electrical characteristic tests

5.1 Test of the power transition phases

5.1.1 Phase preceding Terminal power on

5.1.1.1 Definition and applicability

When the mobile equipment is switched off, the contacts of the UICC-Terminal interface remain in an inactive state in order to prevent any damage to the UICC.

For applicability of this test case see clause 3.8.

5.1.1.2 Conformance requirement

The residual voltage across the contacts of the UICC-Terminal interface (C1, C2, C3, C7) shall not exceed ±0.4 V referenced to GND.

5.1.1.3 Reference

ETSI TS 102 221 [1], clause 4.4.3.
5.1.1.4 Test purpose
To verify that the residual voltage across the contacts of the UICC-Terminal interface (C1, C2, C3, C7) is not greater than ±0.4 V referenced to GND.

5.1.1.5 Method of test

5.1.1.5.1 Initial condition
The terminal shall be connected to an UICC simulator.
The contact C1 (VCC) of the UICC-Terminal interface shall be loaded with an impedance of 10 kΩ.
The other contacts (C2, C3, C7) shall be loaded with an impedance of 50 kΩ.

5.1.1.5.2 Procedure
The residual voltage on each contact shall be measured.

5.1.1.6 Acceptance criteria
The residual voltage on each contact shall not exceed ±0.4 V referenced to GND.

5.1.2 Phase during UICC power on

5.1.2.1 Phase during UICC power on: 3 V - 5 V

5.1.2.1.1 Definition and applicability
When the user equipment is switched on or when the UICC-Terminal interface is being activated after supply voltage switching, the contacts shall be activated in a defined sequence in order to prevent any damage to the UICC.

A Terminal supporting voltage classes A and B may switch from 3 V to 5 V after it has analysed the ATR and identified the UICC voltage class by deactivating the UICC and activating it at the new supply voltage.

For applicability of this test case see clause 3.8.

5.1.2.1.2 Conformance requirement

5.1.2.1.2.0 Description
<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
</table>
| RQ_1 | When the UE is soft powered on, the contacts of the UICC-Terminal interface shall be activated to 3 V mode in the following order:  
• VCC at state H and stable;  
• CLK stable;  
• RST at state L for at least 400 clock cycles after the clock signal is applied to CLK;  
• I/O in reception mode (state H) within 200 clock cycles after the clock signal is applied to CLK. |
| RQ_2 | For a Terminal supporting voltage classes A and B: When the UICC-Terminal interface is being activated after the 3 V/5 V switching the contacts shall be activated to 5 V mode in the order given in RQ_1. |

5.1.2.1.2.1 Reference
ETSI TS 102 221 [1], clause 4.5.2.1.

5.1.2.1.3 Test purpose
To verify that the contacts of the UICC-Terminal interface are activated in the correct order, as described in the conformance requirement.
5.1.2.1.4 Method of test

5.1.2.1.4.1 Initial condition
The Terminal shall be connected to an UICC-Terminal simulator.

5.1.2.1.4.2 Procedure
To test RQ_1, the UE shall be soft powered on.

For a Terminal supporting voltage classes A and B: To test RQ_2, the Terminal shall be caused to switch the voltage on the UICC-Terminal interface.

The verification of the activation procedure shall be started with the first contact leaving the inactive state. The UICC-Terminal interface shall be monitored until it is fully activated.

5.1.2.1.5 Acceptance criteria
The contacts of the UICC-Terminal interface shall be activated in the correct order, as described in the conformance requirement.

5.1.2.2 Phase during UICC power on: 1,8 V - 3 V

5.1.2.2.1 Definition and applicability
When the user equipment is switched on or when the UICC-Terminal interface is being activated after supply voltage switching, the contacts shall be activated in a defined sequence in order to prevent any damage to the UICC.

A Terminal supporting voltage classes B and C may switch from 1,8 V to 3 V after it has analysed the ATR and identified the UICC voltage class by deactivating the UICC and activating it at the new supply voltage.

For applicability of this test case see clause 3.8.

5.1.2.2.2 Conformance requirement

5.1.2.2.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>When the UE is soft powered on, the contacts of the UICC-Terminal interface shall be activated to 1,8 V mode in the following order:</td>
</tr>
<tr>
<td></td>
<td>• VCC at state H and stable;</td>
</tr>
<tr>
<td></td>
<td>• CLK stable;</td>
</tr>
<tr>
<td></td>
<td>• RST at state L for at least 400 clock cycles after the clock signal is applied to CLK;</td>
</tr>
<tr>
<td></td>
<td>• I/O in reception mode (state H) within 200 clock cycles after the clock signal is applied to CLK.</td>
</tr>
<tr>
<td>RQ_2</td>
<td>For a Terminal supporting voltage classes B and C: When the UICC-Terminal interface is being activated after the 1,8 V/3 V switching the contacts shall be activated to 3 V mode in the order given in RQ_1.</td>
</tr>
</tbody>
</table>

5.1.2.2.2.1 Reference
ETSI TS 102 221 [1], clause 4.5.2.1.

5.1.2.2.3 Test purpose
To verify that the contacts of the UICC-Terminal interface are activated in the correct order, as described in the conformance requirement.
5.1.2.2.4 Method of test

5.1.2.2.4.1 Initial condition
The Terminal shall be connected to an UICC-Terminal simulator.

5.1.2.2.4.2 Procedure
To test RQ_1, the UE shall be soft powered on.

For a Terminal supporting voltage classes B and C: To test RQ_2, the Terminal shall be caused to switch the voltage on the UICC-Terminal interface.

The verification of the activation procedure shall be started with the first contact leaving the inactive state. The UICC-Terminal interface shall be monitored until it is fully activated.

5.1.2.2.5 Acceptance criteria
The contacts of the UICC-Terminal interface shall be activated in the correct order, as described in the conformance requirement.

5.1.3 Phase during Terminal power off

5.1.3.1 Phase during Terminal power off: 3 V - 5 V

5.1.3.1.1 Definition and applicability
When the user equipment is soft powered off or when the UICC-Terminal interface is being deactivated for 3 V/5 V switching, the contacts shall be deactivated in a defined sequence in order to prevent any damage to the UICC.

NOTE: If during UE operation the UICC is physically removed it is impractical to ensure correct sequencing of deactivation and the possible damage to the UICC cannot be safeguarded by a type approval test. Furthermore, in this situation the integrity of the UICC data is not guaranteed.

For applicability of this test case see clause 3.8.

5.1.3.1.2 Conformance requirement

5.1.3.1.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>Depending on the state of the clock at the time of deactivation, the contacts of the UICC-Terminal shall be deactivated in one of two ways. If the clock is running, the contacts of the UICC-Terminal interface shall be deactivated in the following order:</td>
</tr>
<tr>
<td></td>
<td>- RST at low level;</td>
</tr>
<tr>
<td></td>
<td>- Clock stopped at low level;</td>
</tr>
<tr>
<td></td>
<td>- I/O at status A;</td>
</tr>
<tr>
<td></td>
<td>- VCC inactive.</td>
</tr>
<tr>
<td></td>
<td>If the clock is stopped and is not restarted, the Terminal is allowed to deactivate all the contacts in any order, provided that all signals reach low level before Vcc leaves high level.</td>
</tr>
<tr>
<td>RQ_2</td>
<td>For a Terminal supporting voltage classes A and B: When the UICC-Terminal interface is deactivated for 3 V/5 V switching, the contacts shall be deactivated as given in RQ_1.</td>
</tr>
</tbody>
</table>

5.1.3.1.2.1 Reference
ETSI TS 102 221 [1], clause 4.5.2.1.
5.1.3.1.3 Test purpose

To verify that, depending on the state of the clock (running or stopped), the contacts of the UICC-Terminal interface become deactivated in the correct order, as given in the conformance requirement.

5.1.3.1.4 Method of test

5.1.3.1.4.1 Initial condition

The Terminal shall be connected to an UICC simulator.

The UICC characteristics of the directories (see ETSI TS 102 221 [1], clause 11.1.1.4.6.1) shall indicate that clock stop is allowed.

5.1.3.1.4.2 Procedure

To test RQ_1, the UE shall be soft powered off.

For a Terminal supporting voltage classes A and B: To test RQ_2, the Terminal shall be caused to switch the voltage on the UICC-Terminal interface.

The UICC-Terminal interface shall be monitored until it is fully deactivated.

5.1.3.1.5 Acceptance criteria

The contacts of the UICC-Terminal interface shall be deactivated in the correct order, as given in the conformance requirements.

5.1.3.2 Phase during Terminal power off: 1,8 V - 3 V

5.1.3.2.1 Definition and applicability

When the user equipment is soft powered off or when the UICC-Terminal interface is being deactivated for 1,8 V/3 V switching, the contacts shall be deactivated in a defined sequence in order to prevent any damage to the UICC.

NOTE: If during UE operation the UICC is physically removed it is impractical to ensure correct sequencing of deactivation and the possible damage to the UICC cannot be safeguarded by a type approval test. Furthermore, in this situation the integrity of the UICC data is not guaranteed.

For applicability of this test case see clause 3.8.

5.1.3.2.2 Conformance requirement

5.1.3.2.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>Depending on the state of the clock at the time of deactivation, the contacts of the UICC-Terminal shall be deactivated in one of two ways. If the clock is running, the contacts of the UICC-Terminal interface shall be deactivated in the following order: - RST at low level; - Clock stopped at low level; - I/O at status A; - VCC inactive. If the clock is stopped and is not restarted, the Terminal is allowed to deactivate all the contacts in any order, provided that all signals reach low level before VCC leaves high level.</td>
</tr>
<tr>
<td>RQ_2</td>
<td>For a Terminal supporting voltage classes B and C: When the UICC-Terminal interface is deactivated for 1,8 V/3 V switching, the contacts shall be deactivated as given in RQ_1.</td>
</tr>
</tbody>
</table>
5.1.3.2.2.3 Test purpose
To verify that, depending on the state of the clock (running or stopped), the contacts of the UICC-Terminal interface become deactivated in the correct order, as given in the conformance requirement.

5.1.3.2.4 Method of test

5.1.3.2.4.1 Initial condition
The Terminal shall be connected to an UICC simulator.

The UICC characteristics of the directories (see ETSI TS 102 221 [1], clause 11.1.1.4.6.1) shall indicate that clock stop is allowed.

5.1.3.2.4.2 Procedure
To test RQ_1, the UE shall be soft powered off.

For a Terminal supporting voltage classes B and C: To test RQ_2, the Terminal shall be caused to switch the voltage on the UICC-Terminal interface.

The UICC-Terminal interface shall be monitored until it is fully deactivated.

5.1.3.2.5 Acceptance criteria
The contacts of the UICC-Terminal interface shall be deactivated in the correct order, as given in the conformance requirements.

5.1.4 Warm reset timing

5.1.4.1 Definition and applicability
The warm reset is performed according to clause 5.3.3 of ISO/IEC 7816-3 [2] and the UICC shall enter either the negotiable or the specific mode.

For applicability of this test case see clause 3.8.

5.1.4.2 Conformance requirement

5.1.4.2.0 Description
1) V_{CC} at state H and stable.
2) CLK stable.
3) RST at state H.
4) RST at state L for 400 clock cycles.
5) RST at state H for at least 400 clock cycles.
6) RST at state H for 40 000 clock cycles before deactivation if no answer is received.
5.1.4.2.1 Reference
ETSI TS 102 221 [1], clause 6.6.
ISO/IEC 7816-3 [2], clause 5.3.3.

5.1.4.3 Test purpose
To verify that the contacts of the UICC-Terminal interface are activated in the correct order, as described in the conformance requirement.

5.1.4.4 Method of test

5.1.4.4.1 Initial conditions
The Terminal shall be connected to the UICC simulator.

5.1.4.4.2 Procedure
a) The Terminal shall be made to initiate a warm reset (TBD).

b) The UICC simulator shall send a valid ATR:

b-1) 400 clock cycles after RST is set to state H.

b-2) 39 990 clock cycles after RST is set to state H. The contacts of the UICC-Terminal interface shall be monitored during the warm reset sequence.

5.1.4.5 Acceptance criteria
The Terminal shall perform a warm reset as described in the conformance requirement.
In steps b-1) and b-2) the Terminal shall read the answer to the warm reset and work with the UICC.

5.1.5 Recognition of voltage classes accepted by the UICC and voltage switching

5.1.5.1 Reaction of Terminals supporting voltage classes A and B on recognition of UICCs accepting voltage classes A and B

5.1.5.1.1 Definition and applicability
When a Terminal supporting voltage classes A and B detects a UICC accepting voltage classes A and B during the ATR analysis the Terminal may either switch to 5 V operation or stay in 3 V operation.
For applicability of this test case see clause 3.8.

5.1.5.1.2 Conformance requirement

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>A Terminal supporting voltage classes A and B shall initially activate the UICC with 3 V (i.e. the first activation of a card session).</td>
</tr>
<tr>
<td>RQ_2</td>
<td>The Terminal shall analyse the ATR and identify the voltage class supported by the UICC.</td>
</tr>
<tr>
<td>RQ_3</td>
<td>If a Terminal supporting voltage classes A and B identifies a UICC accepting voltage classes A and B the Terminal may switch to 5 V operation. Switching from 3 V to 5 V shall only be performed by deactivating the UICC and activating it with 5 V supply voltage immediately after the analysis of the ATR without issuing any commands.</td>
</tr>
</tbody>
</table>
5.1.5.1.3 Test purpose

1) To verify that a Terminal supporting voltage classes A and B initially activates the UICC with 3 V.
2) To verify that a Terminal supporting voltage classes A and B correctly identifies the voltage class.
3) To verify that a Terminal supporting voltage classes A and B deactivates the UICC-Terminal interface immediately after the analysis of the ATR without issuing any command and activates it with 5 V supply voltage or proceeds with the 3 V operation during the whole card session without switching to 5 V supply voltage.

5.1.5.1.4 Method of test

5.1.5.1.4.1 Initial condition

The Terminal shall be connected to an UICC simulator simulating a UICC accepting voltage classes A and B with nominal test conditions (see clause 5.2.1). All elementary files shall be coded as default.

The Terminal shall be powered on.

5.1.5.1.4.2 Procedure

The UICC simulator shall send an ATR indicating a UICC accepting voltage classes A and B.

The UICC-Terminal interface shall be monitored for at least 1 minute until the UE is switched off.

5.1.5.1.5 Acceptance criteria

1) RQ_1 is met if the initial activation of the UICC-Terminal interface is performed with 3 V supply voltage.
2) RQ_2 is implicitly verified if RQ_3 is met.
3) RQ_3 is met if the Terminal reacts in one of the following ways:
   a) The Terminal deactivates the UICC-Terminal interface immediately after the receipt of the ATR from the UICC and activates it with 5 V supply voltage.
   b) The Terminal proceeds with the card session without switching to another supply voltage.

5.1.5.2 Reaction of Terminals supporting voltage classes A and B on recognition of UICCs accepting voltage classes B and C

5.1.5.2.1 Definition and applicability

When a Terminal supporting voltage classes A and B detects a UICC accepting voltage classes B and C during the ATR analysis the Terminal shall stay in 3 V operation.

For applicability of this test case see clause 3.8.
5.1.5.2.2 Conformance requirement

5.1.5.2.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>A Terminal supporting voltage classes A and B shall initially activate the UICC with 3 V (i.e. the first activation of a card session).</td>
</tr>
<tr>
<td>RQ_2</td>
<td>The Terminal shall analyse the ATR and identify the voltage class supported by the UICC.</td>
</tr>
<tr>
<td>RQ_3</td>
<td>If a Terminal supporting voltage classes A and B identifies a UICC accepting voltage classes B and C during the ATR analysis the Terminal shall stay in 3 V operation.</td>
</tr>
</tbody>
</table>

5.1.5.2.2.1 Reference

ETSI TS 102 221 [1], clause 6.2.

5.1.5.2.3 Test purpose

1) To verify that a Terminal supporting voltage classes A and B initially activates the UICC with 3 V.
2) To verify that a Terminal supporting voltage classes A and B correctly identifies the voltage class.
3) To verify that a Terminal supporting voltage classes A and B stays in 3 V operation during the whole card session.

5.1.5.2.4 Method of test

5.1.5.2.4.1 Initial condition

The Terminal shall be connected to an UICC simulator simulating a UICC accepting voltage classes B and C with nominal test conditions (see clause 5.2.1). All elementary files shall be coded as default.

The Terminal shall be powered on.

5.1.5.2.4.2 Procedure

The UICC simulator shall send an ATR indicating a UICC accepting voltage classes B and C.

The UICC-Terminal interface shall be monitored for at least 1 minute until the UE is switched off.

5.1.5.2.5 Acceptance criteria

1) RQ_1 is met if the initial activation of the UICC-Terminal interface is performed with 3 V supply voltage.
2) RQ_2 is implicitly verified if RQ_3 is met.
3) RQ_3 is met if the Terminal reacts in the following way:
   - The Terminal proceeds with the card session without switching to another supply voltage.

5.1.5.3 Reaction of Terminals supporting voltage classes B and C on recognition of UICCs accepting voltage classes B and C

5.1.5.3.1 Definition and applicability

When a Terminal supporting voltage classes B and C detects a UICC accepting voltage classes B and C during the ATR analysis the Terminal may either switch to 3 V operation or stay in 1,8 V operation.

For applicability of this test case see clause 3.8.
5.1.5.3.2 Conformance requirement

5.1.5.3.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>A Terminal supporting voltage classes B and C shall initially activate the UICC with 1.8 V (i.e. the first activation of a card session).</td>
</tr>
<tr>
<td>RQ_2</td>
<td>The Terminal shall analyse the ATR and identify the voltage class supported by the UICC.</td>
</tr>
<tr>
<td>RQ_3</td>
<td>If a Terminal supporting voltage classes B and C identifies a UICC accepting voltage classes B and C during the ATR analysis the Terminal may switch to 3 V operation. Switching from 1.8 V to 3 V shall only be performed by deactivating the UICC and activating it with 3 V supply voltage immediately after the analysis of the ATR without issuing any commands.</td>
</tr>
</tbody>
</table>

5.1.5.3.2.1 Reference

ETSI TS 102 221 [1], clause 6.2.

5.1.5.3.3 Test purpose

1) To verify that a Terminal supporting voltage classes B and C initially activates the UICC with 1.8 V.
2) To verify that a Terminal supporting voltage classes B and C correctly identifies the voltage class.
3) To verify that a Terminal supporting voltage classes B and C deactivates the UICC-Terminal interface immediately after the analysis of the ATR without issuing any command and activates it with 3 V supply voltage or proceeds with the 1,8 V operation during the whole card session without switching to 3 V supply voltage.

5.1.5.3.4 Method of test

5.1.5.3.4.1 Initial condition

The Terminal shall be connected to an UICC simulator simulating a UICC accepting voltage classes B and C with nominal test conditions (see clause 5.2.1). All elementary files are coded as default.

The Terminal shall be powered on.

5.1.5.3.4.2 Procedure

The UICC simulator shall send the ATR indicating a UICC accepting voltage classes B and C.

The UICC-Terminal interface shall be monitored for at least 1 minute until the UE is switched off.

5.1.5.3.5 Acceptance criteria

1) RQ_1 is met if the initial activation of the UICC-Terminal interface is performed with 1,8 V supply voltage.
2) RQ_2 is implicitly verified if RQ_3 is met.
3) RQ_3 is met if the Terminal reacts in one of the following ways:
   a) The Terminal deactivates the UICC-Terminal interface immediately after the analysis of the ATR from the UICC and activates it with 3 V supply voltage.
   b) The Terminal proceeds with the card session without switching to another supply voltage.
5.1.5.4 Reaction of Terminals supporting voltage classes B and C on recognition of UICCs accepting voltage classes A and B

5.1.5.4.1 Definition and applicability

When a Terminal supporting voltage classes B and C detects a UICC accepting voltage classes A and B during the ATR analysis the Terminal shall switch to 3 V operation.

For applicability of this test case see clause 3.8.

5.1.5.4.2 Conformance requirement

5.1.5.4.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>A Terminal supporting voltage classes B and C shall initially activate the UICC with 1.8 V (i.e. the first activation of a card session).</td>
</tr>
<tr>
<td>RQ_2</td>
<td>The Terminal shall analyse the ATR and identify the voltage class supported by the UICC.</td>
</tr>
<tr>
<td>RQ_3</td>
<td>If a Terminal supporting voltage classes B and C identifies a UICC accepting voltage classes A and B, the Terminal shall switch to 3 V operation. Switching from 1,8 V to 3 V shall only be performed by deactivating the UICC and activating it with 3 V supply voltage immediately after the analysis of the ATR without issuing any commands.</td>
</tr>
</tbody>
</table>

5.1.5.4.2.1 Reference

ETSI TS 102 221 [1], clause 6.2.

5.1.5.4.3 Test purpose

1) To verify that a Terminal supporting voltage classes B and C initially activates the UICC with 1.8 V.

2) To verify that a Terminal supporting voltage classes B and C correctly identifies the voltage class.

3) To verify that a Terminal supporting voltage classes B and C deactivates the UICC-Terminal interface immediately after the recognition of a UICC accepting voltage classes A and B (in order to switch the supply voltage).

4) To verify that a Terminal supporting voltage classes B and C activates the UICC with 3 V.

5.1.5.4.4 Method of test

5.1.5.4.4.1 Initial condition

The Terminal shall be connected to an UICC simulator simulating a UICC accepting voltage classes A and B with nominal test conditions (see clause 5.2.1). All elementary files are coded as default.

The Terminal shall be powered on.

5.1.5.4.4.2 Procedure

The UICC simulator shall send the ATR indicating a UICC accepting voltage classes A and B.

The UICC-Terminal interface shall be monitored for at least 1 minute until the UE is switched off.

5.1.5.4.5 Acceptance criteria

1) RQ_1 is met if the initial activation of the UICC-Terminal interface is performed with 1,8 V supply voltage.

2) RQ_2 is implicitly verified if RQ_3 is met.
3) RQ.3 is met if the Terminal reacts in the following way:
   - The Terminal deactivates the UICC-Terminal interface immediately after the analysis of the ATR from the UICC and activates it with 3 V supply voltage. The Terminal proceeds with the card session.

5.1.5.5 Void

5.1.5.6 Reaction of Terminals receiving no ATR

5.1.5.6.1 Reaction of Terminals receiving no ATR: 3 V - 5 V

5.1.5.6.1.1 Definition and applicability
A Terminal supporting 3 V - 5 V shall initially activate the UICC with 3V. If no ATR is received, the UICC-Terminal interface shall be deactivated and activated with 5 V.

For applicability of this test case see clause 3.8.

5.1.5.6.1.2 Conformance requirement
If a Terminal does not receive an ATR, the Terminal shall deactivate the UICC-Terminal interface and repeat the activation with the next higher voltage class.

5.1.5.6.1.3 Reference
ETSI TS 102 221 [1], see clause 6.2.

5.1.5.6.1.4 Test purpose
To verify that a Terminal deactivates the UICC-Terminal interface and repeats the activation with the next higher voltage class in case that the Terminal cannot receive an ATR.

5.1.5.6.1.5 Method of test

5.1.5.6.1.5.1 Initial condition
The Terminal shall be connected to an UICC simulator. All elementary files shall be coded as default. The Terminal shall be powered on.

5.1.5.6.1.5.2 Procedure
The UICC simulator shall send no ATR.

5.1.5.6.1.6 Acceptance criteria
If no ATR is received by the Terminal, the Terminal shall wait at least 40 000 clock cycles before deactivating the UICC-Terminal interface. The Terminal shall then repeat the activation procedure with the next higher voltage class.

5.1.5.6.2 Reaction of Terminals receiving no ATR: 1,8 V - 3 V

5.1.5.6.2.1 Definition and applicability
A Terminal supporting 1,8 V - 3 V shall initially activate the UICC with 1,8 V. If no ATR is received, the UICC-Terminal interface shall be deactivated and activated with 3 V.

For applicability of this test case see clause 3.8.
5.1.5.6.2.2 Conformance requirement

If a Terminal does not receive an ATR, the Terminal shall deactivate the UICC-Terminal interface and repeat the activation with the next higher voltage class.

5.1.5.6.2.3 Reference

ETSI TS 102 221 [1], see clause 6.2.

5.1.5.6.2.4 Test purpose

To verify that a Terminal deactivates the UICC-Terminal interface and repeats the activation with the next higher voltage class in case that the Terminal cannot receive an ATR.

5.1.5.6.2.5 Method of test

5.1.5.6.2.5.1 Initial condition

The Terminal shall be connected to an UICC simulator. All elementary files shall be coded as default. The Terminal shall be powered on.

5.1.5.6.2.5.2 Procedure

The UICC simulator shall send no ATR.

5.1.5.6.2.6 Acceptance criteria

If no ATR is received by the Terminal, the Terminal shall wait at least 40,000 clock cycles before deactivating the UICC-Terminal interface. The Terminal shall then repeat the activation procedure with the next higher voltage class.

5.1.5.7 FFS

5.1.5.8 FFS

5.1.5.9 Reaction of Terminals not supporting any voltage class indicated in the ATR

5.1.5.9.1 Definition and applicability

If a Terminal is not supporting any of the voltage classes indicated in the ATR send from the UICC, it shall not send any APDU in response and may deactivate the UICC.

For applicability of this test case see clause 3.8.

5.1.5.9.2 Conformance requirement

5.1.5.9.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>If an ATR is received at the first applied voltage class, the contents of the ATR shall be analysed by the Terminal.</td>
</tr>
<tr>
<td>RQ_2</td>
<td>If the Terminal does not support any of the voltage classes indicated in the ATR, the Terminal shall not send any APDU to the UICC.</td>
</tr>
<tr>
<td>RQ_3</td>
<td>The Terminal may deactivate the UICC at any time.</td>
</tr>
</tbody>
</table>

NOTE: According to ISO/IEC 7816-3 [2], clause 8.1 a format character shall be sent within $WT = 9\,600$ etu. It can be assumed that the terminal is not sending an APDU if none is sent within this timeframe.
5.1.5.9.2.1 Reference
ETSI TS 102 221 [1], clause 6.2.

5.1.5.9.3 Test purpose
To verify that a Terminal does not send APDUs to a UICC providing an ATR indicating only voltage classes not supported by the Terminal.

5.1.5.9.4 Method of test

5.1.5.9.4.1 Initial condition
The Terminal shall be connected to an UICC simulator. All elementary files shall be coded as default. The Terminal shall be powered on.

5.1.5.9.4.2 Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Description</th>
<th>RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UICC &gt; T</td>
<td>Send an ATR indicating support of at least one voltage class (TAi, i &gt; 2), where none of the voltage classes indicated are supported by the Terminal.</td>
<td>RQ_1</td>
</tr>
<tr>
<td>2</td>
<td>T &gt; UICC</td>
<td>The Terminal shall not send any APDU</td>
<td>RQ_2</td>
</tr>
<tr>
<td>3</td>
<td>User</td>
<td>Deactivate the Terminal</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>T</td>
<td>The Terminal may deactivate the UICC at any time after receiving the ATR indication a voltage class not supported by the Terminal in step 1)</td>
<td>RQ_3</td>
</tr>
</tbody>
</table>

5.1.5.9.5 Acceptance criteria
1) If the Terminal is not sending any APDU for at least 5 seconds, it is assumed that it has analysed the ATR (RQ_1) and handles compliant to RQ_2.
2) The deactivation of the UICC by the Terminal (RQ_3) is optional.

5.2 Electrical tests on each Terminal contact

5.2.1 Nominal test conditions
If a terminal implemented in accordance to a release up to release 11 is being tested, tables 5.1, 5.2a and 5.3a give the electrical conditions that shall be applied by the UICC simulator to all contacts during a test if not stated otherwise.

If a terminal implemented in accordance to a release from release 12 upwards is being tested, tables 5.1, 5.2b and 5.3b give the electrical conditions that shall be applied by the UICC simulator to all contacts during a test if not stated otherwise.

<table>
<thead>
<tr>
<th>Contacts</th>
<th>Low level</th>
<th>High level</th>
<th>Max. capacitive load</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 (VCC)</td>
<td>---</td>
<td>I = 10 mA</td>
<td></td>
</tr>
<tr>
<td>C2 (RST)</td>
<td>I = -200 μA</td>
<td>I = +20 μA</td>
<td>30 pF</td>
</tr>
<tr>
<td>C3 (CLK)</td>
<td>I = -200 μA</td>
<td>I = +20 μA</td>
<td>30 pF</td>
</tr>
<tr>
<td>C5 (GND)</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>C7 (I/O)</td>
<td>Terminal input</td>
<td>I = +1 mA</td>
<td>I = +20 μA</td>
</tr>
<tr>
<td></td>
<td>Terminal output</td>
<td>I = -1 mA</td>
<td>I = +20 μA</td>
</tr>
</tbody>
</table>
### Table 5.2a: Nominal test conditions for the 3 V UICC-Terminal interface up to release 11

<table>
<thead>
<tr>
<th>Contacts</th>
<th>Low level</th>
<th>High level</th>
<th>Max. capacitive load</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 (VCC)</td>
<td>---</td>
<td>I = 7.5 mA</td>
<td></td>
</tr>
<tr>
<td>C2 (RST)</td>
<td>I = -200 µA</td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
<tr>
<td>C3 (CLK)</td>
<td>I = -20 µA</td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
<tr>
<td>C5 (GND)</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>C7 (I/O)</td>
<td>Terminal input</td>
<td>I = +1 mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Terminal output</td>
<td>I = -1 mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
</tbody>
</table>

### Table 5.2b: Nominal test conditions for the 3 V UICC-Terminal interface (release 12 and higher)

<table>
<thead>
<tr>
<th>Contacts</th>
<th>Low level</th>
<th>High level</th>
<th>Max. capacitive load</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 (VCC)</td>
<td>---</td>
<td>I = 10 mA</td>
<td></td>
</tr>
<tr>
<td>C2 (RST)</td>
<td>I = -200 µA</td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
<tr>
<td>C3 (CLK)</td>
<td>I = -20 µA</td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
<tr>
<td>C5 (GND)</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>C7 (I/O)</td>
<td>Terminal input</td>
<td>I = +1 mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Terminal output</td>
<td>I = -1 mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
</tbody>
</table>

### Table 5.3a: Nominal test conditions for the 1.8 V UICC-Terminal interface up to release 11

<table>
<thead>
<tr>
<th>Contacts</th>
<th>Low level</th>
<th>High level</th>
<th>Max. capacitive load</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 (VCC)</td>
<td>---</td>
<td>I = 5 mA</td>
<td></td>
</tr>
<tr>
<td>C2 (RST)</td>
<td>I = -200 µA</td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
<tr>
<td>C3 (CLK)</td>
<td>I = -20 µA</td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
<tr>
<td>C5 (GND)</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>C7 (I/O)</td>
<td>Terminal input</td>
<td>I = +1 mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Terminal output</td>
<td>I = -1 mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
</tbody>
</table>

### Table 5.3b: Nominal test conditions for the 1.8 V UICC-Terminal interface (release 12 and higher)

<table>
<thead>
<tr>
<th>Contacts</th>
<th>Low level</th>
<th>High level</th>
<th>Max. capacitive load</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 (VCC)</td>
<td>---</td>
<td>I = 10 mA</td>
<td></td>
</tr>
<tr>
<td>C2 (RST)</td>
<td>I = -200 µA</td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
<tr>
<td>C3 (CLK)</td>
<td>I = -20 µA</td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
<tr>
<td>C5 (GND)</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>C7 (I/O)</td>
<td>Terminal input</td>
<td>I = +1 mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Terminal output</td>
<td>I = -1 mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I = +20 µA</td>
<td>30 pF</td>
</tr>
</tbody>
</table>

**NOTE 1:** Measurements of contacts voltage levels can be done at any time since the beginning of activation of the UICC and the end of deactivation of the UICC (ISO/IEC 7816-3 [2], clause 5.1).

**NOTE 2:** The reference point of all measurements is the contact C5 (Ground).

**NOTE 3:** Currents flowing into the UICC are considered positive.
5.2.2 Electrical tests on contact C1 (Card power supply - \(V_{CC}\))

5.2.2.1 Electrical tests on contact C1, Test 1: 3 V - 5 V

5.2.2.1.1 Definition and applicability

When the user equipment is activated, the supply voltage on the UICC-Terminal interface shall remain in the specified range in order to ensure correct operation and to prevent any damage to the UICC.

For applicability of this test case see clause 3.8.

5.2.2.1.2 Conformance requirement

<table>
<thead>
<tr>
<th>RQ</th>
<th>REL</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>REL</td>
<td>The voltage on contact C1 of the UICC-Terminal interface shall be (5 \text{ V} \pm 10%) for (I_{CC}) up to 10 mA when the Terminal is in 5 V operation mode.</td>
</tr>
<tr>
<td>RQ_2a</td>
<td>Up to Rel-11</td>
<td>The voltage on contact C1 of the UICC-Terminal interface shall be (3 \text{ V} \pm 10%) for (I_{CC}) up to 7.5 mA when the Terminal is in 3 V operation mode.</td>
</tr>
<tr>
<td>RQ_2b</td>
<td>Rel-12 upwards</td>
<td>The voltage on contact C1 of the UICC-Terminal interface shall be (3 \text{ V} \pm 10%) for (I_{CC}) up to 10 mA when the Terminal is in 3 V operation mode.</td>
</tr>
</tbody>
</table>

5.2.2.1.3 Reference

1) ETSI TS 102 221 [1], clause 5.1.
2) ETSI TS 102 221 [1], clause 5.2.

5.2.2.1.4 Test purpose

To verify that the Terminal keeps the voltage on contact C1 of the UICC-Terminal interface within the ranges specified in the conformance requirements.

5.2.2.1.5 Method of test

5.2.2.1.5.1 Initial condition

The Terminal shall be connected to an UICC simulator.

The UE shall be activated.

The remaining contacts of the UICC-Terminal interface shall be in nominal test conditions:

- For an interface operated in class A see clause 5.2.1, Table 5.1 of the present document.
- For an interface as defined for releases up to 11, operated in class B see clause 5.2.1, Table 5.2a of the present document.
- For an interface as defined for Release 12 and upwards, operated in class B see clause 5.2.1, Table 5.2b of the present document.

5.2.2.1.5.2 Test Procedure

The voltage of contact C1 (\(V_{CC}\)) of the UICC-Terminal interface shall be measured.

5.2.2.1.6 Acceptance criteria

The voltage on contact C1 of the UICC-Terminal interface shall be within the ranges specified in the conformance requirements.
5.2.2.2  Electrical tests on contact C1, Test 2: 3 V - 5 V

5.2.2.2.1  Definition and applicability

When the user equipment is activated, the supply voltage on the UICC-Terminal interface shall be able to counteract spikes in the current consumption of the UICC up to the limits given in the conformance requirement, ensuring that the supply voltage stays in the specified range.

For applicability of this test case see clause 3.8.

5.2.2.2.2  Conformance requirement

1) The voltage on contact C1 of the UICC-Terminal interface shall be 5 V ± 10 % for spikes in the current consumption with a maximum charge of 40 n. As with no more than 400 ns duration and an amplitude of at most 200 mA when the Terminal is in 5 V operation mode.

2) The voltage on contact C1 of the UICC-Terminal interface shall be 3 V ± 10 % for spikes in the current consumption with a maximum charge of 12 n. As with no more than 400 ns duration and an amplitude of at most 60 mA when the Terminal is in 3 V operation mode.

NOTE: For compatibility reasons a maximum spike duration of 400 ns is kept also for terminals implemented in accordance to ETSI TS 102 221 [1] - Release 12 and upwards.

5.2.2.2.3  Reference

1) ETSI TS 102 221 [1], clause 5.1.

2) ETSI TS 102 221 [1], clause 5.2.

5.2.2.2.4  Test purpose

To verify that the Terminal keeps the voltage on contact C1 of the UICC-Terminal interface within the specified range for the conditions given in the UICC-Terminal conformance requirement.

5.2.2.2.5  Method of test

5.2.2.2.5.1  Initial condition

The Terminal shall be connected to an UICC simulator.

The UE shall be activated.

The remaining contacts of the interface shall held in nominal test condition (see clause 5.2.1).

5.2.2.2.5.2  Procedure

In order to test the requirements 1), the voltage on contact C1 of the UICC-Terminal interface shall be monitored and the following current spikes shall be applied:

1) Continuous spikes:
   - current amplitude 20 mA;
   - current offset 0 mA;
   - duration 100 ns;
   - pause 100 ns.

2) Continuous spikes:
   - current 20 mA;
3) Continuous spikes:
- current amplitude 15 mA;
- current offset 5 mA;
- (i.e. maximum amplitude = 5 mA + 15 mA = 20 mA);
- duration 150 ns;
- pause 300 ns.

4) Random spikes:
- current amplitude 200 mA;
- current offset 0 mA;
- duration 200 ns;
- pause between 0.1 ms and 500 ms, randomly varied.

5) Random spikes:
- current amplitude 100 mA;
- current offset 0 mA;
- duration 400 ns;
- pause between 0.1 ms and 500 ms, randomly varied.

6) Random spikes:
- current amplitude 195 mA;
- current offset 5 mA;
- (i.e. maximum amplitude = 5 mA + 195 mA = 200 mA);
- Duration 200 ns;
- Pause between 0.1 ms and 500 ms, randomly varied.

In order to test the requirements 2), the voltage on contact C1 of the UICC-Terminal interface shall be monitored and the following current spikes shall be applied:

1) Continuous spikes:
- current amplitude 12 mA;
- current offset 0 mA;
- duration 100 ns;
- pause 100 ns.

2) Continuous spikes:
- current 12 mA;
- current offset 0 mA;
3) Continuous spikes:
   - duration 400 ns;
   - pause 400 ns.

4) Random spikes:
   - current amplitude 60 mA;
   - current offset 0 mA;
   - duration 200 ns;
   - pause between 0,1 ms and 500 ms, randomly varied.

5) Random spikes:
   - current amplitude 30 mA;
   - current offset 0 mA;
   - duration 400 ns;
   - pause between 0,1 ms and 500 ms, randomly varied.

6) Random spikes:
   - current amplitude 57 mA;
   - current offset 3 mA;
   - (i.e. maximum amplitude = 3 mA + 57 mA = 60 mA);
   - duration 200 ns;
   - pause between 0,1 ms and 500 ms, randomly varied.

The specified spike durations shall be measured at 50 % of the spike amplitude.

5.2.2.2.6 Acceptance criteria

The voltage on contact C1 of the UICC-Terminal interface shall be within the ranges specified in the conformance requirements.

5.2.2.3 Electrical tests on contact C1, Test 1: 1,8 V - 3 V

5.2.2.3.1 Definition and applicability

When the user equipment is activated, the supply voltage on the UICC-Terminal interface shall remain in the specified range in order to ensure correct operation and to prevent any damage to the UICC.

For applicability of this test case see clause 3.8.
5.2.2.3.2 Conformance requirement

<table>
<thead>
<tr>
<th>RQ</th>
<th>REL</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1a</td>
<td>Up to Rel-11</td>
<td>The voltage on contact C1 of the UICC-Terminal interface shall be 3 V ± 10% for ICC up to 7.5 mA when the Terminal is in 3 V operation mode.</td>
</tr>
<tr>
<td>RQ_1b</td>
<td>Rel-12 upwards</td>
<td>The voltage on contact C1 of the UICC-Terminal interface shall be 3 V ± 10% for ICC up to 10 mA when the Terminal is in 3 V operation mode.</td>
</tr>
<tr>
<td>RQ_2a</td>
<td>Up to Rel 11</td>
<td>The voltage on contact C1 of the UICC-Terminal interface shall be 1.8 V ± 10% for ICC up to 5 mA when the Terminal is in 1.8 V operation mode.</td>
</tr>
<tr>
<td>RQ_2b</td>
<td>Rel-12 upwards</td>
<td>The voltage on contact C1 of the UICC-Terminal interface shall be 1.8 V ± 10% for ICC up to 10 mA when the Terminal is in 1.8 V operation mode.</td>
</tr>
</tbody>
</table>

5.2.2.3.3 Reference

1) ETSI TS 102 221 [1], clause 5.2.
2) ETSI TS 102 221 [1], clause 5.3.

5.2.2.3.4 Test purpose
To verify that the Terminal keeps the voltage on contact C1 of the UICC-Terminal interface within the ranges specified in the conformance requirements.

5.2.2.3.5 Method of test

5.2.2.3.5.1 Initial condition
The Terminal shall be connected to an UICC simulator.

The UE shall be activated.

The remaining contacts of the UICC-Terminal interface shall be in nominal test conditions:

- For an interface as defined for releases up to 11, operated in class B see clause 5.2.1, Table 5.2a of the present document.
- For an interface as defined for Release 12 and upwards, operated in class B see clause 5.2.1, Table 5.2b of the present document.
- For an interface as defined for releases up to 11, operated in class C see clause 5.2.1, Table 5.3a of the present document.
- For an interface as defined for Release 12 and upwards, operated in class C see clause 5.2.1, Table 5.3b of the present document.

5.2.2.3.5.2 Test Procedure
The voltage of contact C1 (Vcc) of the UICC-Terminal interface shall be measured.

5.2.2.3.6 Acceptance criteria
The voltage on contact C1 of the UICC-Terminal interface shall be within the ranges specified in the conformance requirements.

5.2.2.4 Electrical tests on contact C1, Test 2: 1.8 V - 3 V

5.2.2.4.1 Definition and applicability
When the user equipment is activated, the supply voltage on the UICC-Terminal interface shall be able to counteract spikes in the current consumption of the UICC up to the limits given in the conformance requirement, ensuring that the supply voltage stays in the specified range.
For applicability of this test case see clause 3.8.

5.2.2.4.2 Conformance requirement

1) The voltage on contact C1 of the UICC-Terminal interface shall be 3 V ± 10 % for spikes in the current consumption with a maximum charge of 12 n. As with no more than 400 ns duration and an amplitude of at most 60 mA when the Terminal is in 3 V operation mode.

2) The voltage on contact C1 of the UICC-Terminal interface shall be 1.8 V ± 10 % for spikes in the current consumption with a maximum charge of 12 n. As with no more than 400 ns duration and an amplitude of at most 60 mA when the Terminal is in 1.8 V operation mode.

NOTE: For compatibility reasons a maximum spike duration of 400 ns is kept also for terminals implemented in accordance to ETSI TS 102 221 [1] - Release 12 and upwards.

5.2.2.4.3 Reference

1) ETSI TS 102 221 [1], clause 5.2.

2) ETSI TS 102 221 [1], clause 5.3.

5.2.2.4.4 Test purpose

To verify that the Terminal keeps the voltage on contact C1 of the UICC-Terminal interface within the specified range for the conditions given in the UICC-Terminal conformance requirement.

5.2.2.4.5 Method of test

5.2.2.4.5.1 Initial condition

The Terminal shall be connected to an UICC simulator.

The UE shall be activated.

The remaining contacts of the interface shall held in nominal test condition (see clause 5.2.1).

5.2.2.4.5.2 Procedure

In order to test the requirements 1) and 2), the voltage on contact C1 of the UICC-Terminal interface shall be monitored and the following current spikes shall be applied:

1) Continuous spikes:
   - current amplitude 12 mA;
   - current offset 0 mA;
   - duration 100 ns;
   - pause 100 ns.

2) Continuous spikes:
   - current 12 mA;
   - current offset 0 mA;
   - duration 400 ns;
   - pause 400 ns.
3) Continuous spikes:
   - current amplitude 9 mA;
   - current offset 3 mA;
   - (i.e. maximum amplitude = 3 mA + 9 mA = 12 mA);
   - duration 150 ns;
   - pause 300 ns.

4) Random spikes:
   - current amplitude 60 mA;
   - current offset 0 mA;
   - duration 200 ns;
   - pause between 0.1 ms and 500 ms, randomly varied.

5) Random spikes:
   - current amplitude 30 mA;
   - current offset 0 mA;
   - duration 400 ns;
   - pause between 0.1 ms and 500 ms, randomly varied.

6) Random spikes:
   - current amplitude 57 mA;
   - current offset 3 mA;
   - (i.e. maximum amplitude = 3 mA + 57 mA = 60 mA);
   - duration 200 ns;
   - pause between 0.1 ms and 500 ms, randomly varied.

The specified spike durations shall be measured at 50 % of the spike amplitude.

5.2.2.4.6 Acceptance criteria

The voltage on contact C1 of the UICC-Terminal interface shall be within the ranges specified in the conformance requirements.

5.2.3 Electrical tests on contact C2 (Reset - RST)

5.2.3.1 Electrical tests on contact C2: 3 V - 5 V

5.2.3.1.1 Definition and applicability

When the user equipment is activated, the voltage on contact C2 of the UICC-Terminal interface shall remain in the specified range in order to ensure correct operation and to prevent any damage to the UICC.

For applicability of this test case see clause 3.8.
5.2.3.1.2 Conformance requirement

1) The voltage on contact C2 (RST) of the UICC-Terminal interface shall be between -0.3 V and +0.6 V for a current of -200 μA in low state and between V_{CC} -0.7 V and V_{CC} + 0.3 V for a current of +20 μA in high state when the Terminal is in 5 V operation mode.

2) The voltage on contact C2 (RST) of the UICC-Terminal interface shall be between -0.3 V and 0.2 × V_{CC} for a current of -200 μA in low state and between 0.8 × V_{CC} and V_{CC} + 0.3 V for a current of +20 μA in high state when the Terminal is in 3 V operation mode.

5.2.3.1.3 Reference

1) ETSI TS 102 221 [1], clause 5.1.

2) ETSI TS 102 221 [1], clause 5.2.

5.2.3.1.4 Test purpose

To verify that the Terminal keeps the voltage on contact C2 (RST) of the UICC-Terminal interface within the specified range, as given in the conformance requirement.

5.2.3.1.5 Method of test

5.2.3.1.5.1 Initial condition

The Terminal shall be connected to an UICC simulator.

The UE shall be activated.

The remaining contacts of the UICC-Terminal interface shall be held in nominal test conditions (see clause 5.2.1).

5.2.3.1.5.2 Procedure

The voltage on contact C2 (RST) of the UICC-Terminal interface shall be measured.

5.2.3.1.6 Acceptance criteria

The voltage on contact C2 (RST) of the UICC-Terminal interface shall be within the range specified in the conformance requirement.

5.2.3.2 Electrical tests on contact C2: 1,8 V - 3 V

5.2.3.2.1 Definition and applicability

When the user equipment is activated, the voltage on contact C2 of the UICC-Terminal interface shall remain in the specified range in order to ensure correct operation and to prevent any damage to the UICC.

For applicability of this test case see clause 3.8.

5.2.3.2.2 Conformance requirement

1) The voltage on contact C2 (RST) of the UICC-Terminal interface shall be between -0.3 V and 0.2 × V_{CC} for a current of -200 μA in low state and between 0.8 × V_{CC} and V_{CC} + 0.3 V for a current of +20 μA in high state when the Terminal is in 3 V operation mode.

2) The voltage on contact C2 (RST) of the UICC-Terminal interface shall be between -0.3 V and 0.2 × V_{CC} for a current of -200 μA in low state and between 0.8 × V_{CC} and V_{CC} + 0.3 V for a current of +20 μA in high state when the Terminal is in 1,8 V operation mode.
5.2.3.2.3 Reference
   1) ETSI TS 102 221 [1], clause 5.2.
   2) ETSI TS 102 221 [1], clause 5.3.

5.2.3.2.4 Test purpose
To verify that the Terminal keeps the voltage on contact C2 (RST) of the UICC-Terminal interface within the specified range, as given in the conformance requirement.

5.2.3.2.5 Method of test

5.2.3.2.5.1 Initial condition
The Terminal shall be connected to an UICC simulator.
The UE shall be activated.
The remaining contacts of the UICC-Terminal interface shall be held in nominal test conditions (see clause 5.2.1).

5.2.3.2.5.2 Procedure
The voltage on contact C2 (RST) of the UICC-Terminal interface shall be measured.

5.2.3.2.6 Acceptance criteria
The voltage on contact C2 (RST) of the UICC-Terminal interface shall be within the range specified in the conformance requirement.

5.2.4 Electrical tests on contact C3 (Clock - CLK)

5.2.4.1 Electrical tests on contact C3: 3 V - 5 V

5.2.4.1.1 Definition and applicability
When the user equipment is activated, the voltage, the rise/fall time of the signal, the clock cycle ratio and the frequency on contact C3 of the UICC - Terminal interface shall remain in the specified range in order to ensure correct operation and to prevent any damage to the UICC.

For applicability of this test case see clause 3.8.

5.2.4.1.2 Conformance requirement
   1) The voltage on contact C3 (CLK) of the UICC - Terminal interface shall be between -0,3 V and +0,5 V for a current of -200 μA in low state and between 0,7 × Vcc and Vcc + 0,3 V for a current of +20 μA in high state when the Terminal is in 5 V operation mode.
   2) The rise and the fall time of the clock signal shall not exceed 9 % of the clock period with a maximum of 0,5 μs when the Terminal is in 5 V operation mode.
   3) The cycle ratio of the clock signal shall be between 40 % and 60 % of the period, in steady state when the Terminal is in 5 V operation mode.
   4) The frequency of the clock signal shall be between 1 MHz and 5 MHz when the Terminal is in 5 V operation mode.
   5) The voltage on contact C3 (CLK) of the UICC - Terminal interface shall be between -0,3 V and 0,2 × Vcc for a current of -20 μA in low state and between 0,7 × Vcc and Vcc + 0,3 V for a current of +20 μA in high state when the Terminal is in 3 V operation mode.
6) The rise and the fall time of the clock signal shall not exceed 50 ns when the Terminal is in 3 V operation mode.

7) The cycle ratio of the clock signal shall be between 40 % and 60 % of the period, in steady state when the Terminal is in 3 V operation mode.

8) The frequency of the clock signal shall be between 1 MHz and 5 MHz when the Terminal is in 3 V operation mode.

5.2.4.1.3 Reference

1 - 4) ETSI TS 102 221 [1], clause 5.1.

5 - 8) ETSI TS 102 221 [1], clause 5.2.

5.2.4.1.4 Test purpose

To verify that the Terminal keeps the voltage, the rise and fall time, the cycle ratio and the frequency on contact C3 (CLK) of the UICC - Terminal interface within the ranges specified in the conformance requirements.

5.2.4.1.5 Method of test

5.2.4.1.5.1 Initial condition

The Terminal shall be connected to an UICC simulator.

The UE shall be activated.

The remaining contacts of the UICC-Terminal interface shall be held in nominal test conditions (see clause 5.2.1).

5.2.4.1.5.2 Procedure

The voltage, the rise/fall time, the clock cycle ratio and the frequency on contact C3 (CLK) of the UICC-Terminal interface shall be measured.

5.2.4.1.6 Acceptance criteria

The voltage, the rise and fall time, the cycle ratio and the frequency on contact C3 (CLK) of the UICC-Terminal interface shall be within the ranges specified in the conformance requirements.

5.2.4.2 Electrical tests on contact C3: 1,8 V - 3 V

5.2.4.2.1 Definition and applicability

When the user equipment is activated, the voltage, the rise/fall time of the signal, the clock cycle ratio and the frequency on contact C3 of the UICC - Terminal interface shall remain in the specified range in order to ensure correct operation and to prevent any damage to the UICC.

For applicability of this test case see clause 3.8.

5.2.4.2.2 Conformance requirement

1) The voltage on contact C3 (CLK) of the UICC - Terminal interface shall be between -0,3 V and 0,2 × VCC for a current of -20 μA in low state and between 0,7 × VCC and VCC + 0,3 V for a current of +20 μA in high state when the Terminal is in 3 V operation mode.

2) The rise and the fall time of the clock signal shall not exceed 50 ns when the Terminal is in 3 V operation mode.

3) The cycle ratio of the clock signal shall be between 40 % and 60 % of the period, in steady state when the Terminal is in 3 V operation mode.
4) The frequency of the clock signal shall be between 1 MHz and 5 MHz when the Terminal is in 3 V operation mode.

5) The voltage on contact C3 (CLK) of the UICC-Terminal interface shall be between -0.3 V and 0.2 × VCC for a current of -20 μA in low state and between 0.7 × VCC and VCC + 0.3 V for a current of +20 μA in high state when the Terminal is in 1.8 V operation mode.

6) The rise and the fall time of the clock signal shall not exceed 50 ns when the Terminal is in 1.8 V operation mode.

7) The cycle ratio of the clock signal shall be between 40 % and 60 % of the period, in steady state when the Terminal is in 1.8 V operation mode.

8) The frequency of the clock signal shall be between 1 MHz and 5 MHz when the Terminal is in 1.8 V operation mode.

5.2.4.2.3 Reference
1 - 4) ETSI TS 102 221 [1], clause 5.2.
5 - 8) ETSI TS 102 221 [1], clause 5.3.

5.2.4.2.4 Test purpose
To verify that the Terminal keeps the voltage, the rise and fall time, the cycle ratio and the frequency on contact C3 (CLK) of the UICC - Terminal interface within the ranges specified in the conformance requirements.

5.2.4.2.5 Method of test
5.2.4.2.5.1 Initial condition
The Terminal shall be connected to an UICC simulator.
The UE shall be activated.
The remaining contacts of the UICC-Terminal interface shall be held in nominal test conditions (see clause 5.2.1).

5.2.4.2.5.2 Procedure
The voltage, the rise/fall time, the clock cycle ratio and the frequency on contact C3 (CLK) of the UICC-Terminal interface shall be measured.

5.2.4.2.6 Acceptance criteria
The voltage, the rise and fall time, the cycle ratio and the frequency on contact C3 (CLK) of the UICC-Terminal interface shall be within the ranges specified in the conformance requirements.

5.2.5 Electrical tests on contact C7 (Input/Output - I/O)
5.2.5.1 Electrical tests on contact C7, Test 1: 3 V - 5 V
5.2.5.1.1 Definition and applicability
When the user equipment is activated, the Terminal shall keep the voltage, the current and the rise/fall time of the signal on contact C7 of the UICC-Terminal interface within the specified range in order to ensure correct operation and to prevent any damage to the UICC.

For applicability of this test case see clause 3.8.
5.2.5.1.2 Conformance requirement

1) Terminal receiving state A (low state):
   - With an imposed voltage of 0 V the current flowing out of the Terminal shall not exceed 1 mA when the Terminal is in 5 V operation mode.

2) Terminal transmitting state A (low state):
   - The voltage shall be between -0,3 V and 0,15 × V_{CC} when a current of 1 mA flowing into the Terminal is applied when the Terminal is in 5 V operation mode.

3) Terminal transmitting or receiving state Z (high state):
   - The voltage shall be between +3,8 V (V_{OH})/0,7 × V_{CC} (V_{IH}) respectively and V_{CC} + 0,3 V when a current of 20 μA flowing out of the Terminal is applied when the Terminal is in 5 V operation mode.

4) The rise time and the fall time of the I/O signal shall not exceed 1 μs when the Terminal is in 5 V operation mode.

5) Terminal receiving state A (low state):
   - With an imposed voltage of 0 V the current flowing out of the Terminal shall not exceed 1 mA when the Terminal is in 3 V operation mode.

6) Terminal transmitting state A (low state):
   - The voltage shall be between -0,3 V and 0,2 × V_{CC} when a current of 1 mA flowing into the Terminal is applied when the Terminal is in 3 V operation mode.

7) Terminal transmitting or receiving state Z (high state):
   - The voltage shall be between 0,7 × V_{CC} and V_{CC} + 0,3 V when a current of 20 μA flowing out of the Terminal is applied when the Terminal is in 3 V operation mode.

8) The rise time and the fall time of the I/O signal shall not exceed 1 μs when the Terminal is in 3 V operation mode.

5.2.5.1.3 Reference

1 - 4) ETSI TS 102 221 [1], clause 5.1.

5 - 8) ETSI TS 102 221 [1], clause 5.2.

5.2.5.1.4 Test purpose

To verify that the Terminal keeps the voltage, the current and the rise and fall times of the signal on contact C7 (I/O) of the UICC-Terminal interface within the ranges specified in the conformance requirements.

5.2.5.1.5 Method of test

5.2.5.1.5.1 Initial condition

The Terminal shall be connected to an UICC simulator.

The UE shall be activated.

The remaining contacts of the UICC-Terminal interface shall be held in nominal test conditions (see clause 5.2.1).

5.2.5.1.5.2 Procedure

The voltage, the current and the rise/fall time on contact C7 (I/O) of the UICC-Terminal interface shall be measured.
5.2.5.1.6 Acceptance criteria
The voltage, the current and the rise and fall times of the signal on contact C7 (I/O) of the UICC-Terminal interface shall be within the ranges specified in the conformance requirements.

5.2.5.2 Electrical tests on contact C7, Test 2: 3 V - 5 V

5.2.5.2.1 Definition and applicability
When the user equipment is activated, the Terminal shall keep the voltage, the current and the rise/fall time of the signal on contact C7 of the UICC-Terminal interface within the specified range in order to ensure correct operation and to prevent any damage to the UICC.

For applicability of this test case see clause 3.8.

5.2.5.2.2 Conformance requirement

1) Terminal receiving state A (low state):
   - With an imposed voltage of 0 V the current flowing out of the Terminal shall not exceed 1 mA when the Terminal is in 5 V operation mode.

2) Terminal transmitting state A (low state):
   - The voltage shall be between \(-0.3\) V and \(0.15 \times V_{CC}\) when a current of 1 mA flowing into the Terminal is applied when the Terminal is in 5 V operation mode.

3) Terminal transmitting or receiving state Z (high state):
   - The voltage shall be between \(+3.8\) V \((V_OH)/0.7 \times V_{CC}\) \((V_IH)\) respectively and \(V_{CC} + 0.3\) V when a current of \(20 \mu A\) flowing out of the Terminal is applied when the Terminal is in 5 V operation mode.

4) The rise time and the fall time of the I/O signal shall not exceed 100 ns when the Terminal is in 5 V operation mode.

5) Terminal receiving state A (low state):
   - With an imposed voltage of 0 V the current flowing out of the Terminal shall not exceed 1 mA when the Terminal is in 3 V operation mode.

6) Terminal transmitting state A (low state):
   - The voltage shall be between \(-0.3\) V and \(0.2 \times V_{CC}\) when a current of 1 mA flowing into the Terminal is applied when the Terminal is in 3 V operation mode.

7) Terminal transmitting or receiving state Z (high state):
   - The voltage shall be between \(0.7 \times V_{CC}\) and \(V_{CC} + 0.3\) V when a current of \(20 \mu A\) flowing out of the Terminal is applied when the Terminal is in 3 V operation mode.

8) When the low impedance buffer is selected, the rise time and the fall time of the I/O signal shall not exceed 100 ns when the Terminal is in 3 V operation mode.

5.2.5.2.3 Reference

1 - 4) ETSI TS 102 221 [1], clause 5.1.

5 - 8) ETSI TS 102 221 [1], clause 5.2.
5.2.5.2.4 Test purpose
To verify that the Terminal supporting low impedance buffer keeps the voltage, the current and the rise and fall times of the signal on contact C7 (I/O) of the UICC-Terminal interface within the ranges specified in the conformance requirements.

5.2.5.2.5 Method of test
5.2.5.2.5.1 Initial condition
The Terminal shall be connected to a UICC simulator.
The UE shall be activated.
The remaining contacts of the UICC-Terminal interface shall be held in nominal test conditions (see clause 5.2.1).
An ATR indicating the support of the low impedance buffer shall have been received and the PPS procedure selecting the low impedance buffer shall have been successfully completed.

5.2.5.2.5.2 Procedure
The voltage, the current and the rise/fall time on contact C7 (I/O) of the UICC-Terminal interface shall be measured.

5.2.5.2.6 Acceptance criteria
The voltage, the current and the rise and fall times of the signal on contact C7 (I/O) of the UICC-Terminal interface shall be within the ranges specified in the conformance requirements.

5.2.5.3 Electrical tests on contact C7, Test 1: 1,8 V - 3 V
5.2.5.3.1 Definition and applicability
When the user equipment is activated, the Terminal shall keep the voltage, the current and the rise/fall time of the signal on contact C7 of the UICC-Terminal interface within the specified range in order to ensure correct operation and to prevent any damage to the UICC.
For applicability of this test case see clause 3.8.

5.2.5.3.2 Conformance requirement
1) Terminal receiving state A (low state):
   - With an imposed voltage of 0 V the current flowing out of the Terminal shall not exceed 1 mA when the Terminal is in 3 V operation mode.
2) Terminal transmitting state A (low state):
   - The voltage shall be between -0,3 V and 0,2 × VCC when a current of 1 mA flowing into the Terminal is applied when the Terminal is in 3 V operation mode.
3) Terminal transmitting or receiving state Z (high state):
   - The voltage shall be between 0,7 × VCC and VCC + 0,3 V when a current of 20 μA flowing out of the Terminal is applied when the Terminal is in 3 V operation mode.
4) The rise time and the fall time of the I/O signal shall not exceed 1 μs when the Terminal is in 3 V operation mode.
5) Terminal receiving state A (low state):
   - With an imposed voltage of 0 V the current flowing out of the Terminal shall not exceed 1 mA when the Terminal is in 1,8 V operation mode.
6) Terminal transmitting state A (low state):
   - The voltage shall be between -0.3 V and 0.2 × VCC when a current of 1 mA flowing into the Terminal is applied when the Terminal is in 1.8 V operation mode.

7) Terminal transmitting or receiving state Z (high state):
   - The voltage shall be between 0.7 × VCC and VCC + 0.3 V when a current of 20 μA flowing out of the Terminal is applied when the Terminal is in 1.8 V operation mode.

8) The rise time and the fall time of the I/O signal shall not exceed 1 μs when the Terminal is in 1.8 V operation mode.

5.2.5.3.3 Reference
1 - 4) ETSI TS 102 221 [1], clause 5.2.
5 - 8) ETSI TS 102 221 [1], clause 5.3.

5.2.5.3.4 Test purpose
To verify that the Terminal keeps the voltage, the current and the rise and fall times of the signal on contact C7 (I/O) of the UICC-Terminal interface within the ranges specified in the conformance requirements.

5.2.5.3.5 Method of test
5.2.5.3.5.1 Initial condition
The Terminal shall be connected to an UICC simulator.
The UE shall be activated.
The remaining contacts of the UICC-Terminal interface shall be held in nominal test conditions (see clause 5.2.1).

5.2.5.3.5.2 Procedure
The voltage, the current and the rise/fall time on contact C7 (I/O) of the UICC-Terminal interface shall be measured.

5.2.5.3.6 Acceptance criteria
The voltage, the current and the rise and fall times of the signal on contact C7 (I/O) of the UICC-Terminal interface shall be within the ranges specified in the conformance requirements.

5.2.5.4 Electrical tests on contact C7, Test 2: 1.8 V - 3 V
5.2.5.4.1 Definition and applicability
When the user equipment is activated, the Terminal shall keep the voltage, the current and the rise/fall time of the signal on contact C7 of the UICC-Terminal interface within the specified range in order to ensure correct operation and to prevent any damage to the UICC.
For applicability of this test case see clause 3.8.

5.2.5.4.2 Conformance requirement
1) Terminal receiving state A (low state):
   - With an imposed voltage of 0 V the current flowing out of the Terminal shall not exceed 1 mA when the Terminal is in 3 V operation mode.
2) Terminal transmitting state A (low state):
   - The voltage shall be between -0.3 V and 0.2 × VCC when a current of 1 mA flowing into the Terminal is applied when the Terminal is in 3 V operation mode.

3) Terminal transmitting or receiving state Z (high state):
   - The voltage shall be between 0.7 × VCC and VCC + 0.3 V when a current of 20 μA flowing out of the Terminal is applied when the Terminal is in 3 V operation mode.

4) The rise time and the fall time of the I/O signal shall not exceed 100 ns when the Terminal is in 3 V operation mode.

5) Terminal receiving state A (low state):
   - With an imposed voltage of 0 V the current flowing out of the Terminal shall not exceed 1 mA when the Terminal is in 1.8 V operation mode.

6) Terminal transmitting state A (low state):
   - The voltage shall be between -0.3 V and 0.2 × VCC when a current of 1 mA flowing into the Terminal is applied when the Terminal is in 1.8 V operation mode.

7) Terminal transmitting or receiving state Z (high state):
   - The voltage shall be between 0.7 × VCC and VCC + 0.3 V when a current of 20 μA flowing out of the Terminal is applied when the Terminal is in 1.8 V operation mode.

8) When the low impedance buffer is selected, the rise time and the fall time of the I/O signal shall not exceed 100 ns when the Terminal is in 1.8 V operation mode.

5.2.5.4.3 Reference
1 - 4) ETSI TS 102 221 [1], clause 5.2.
5 - 8) ETSI TS 102 221 [1], clause 5.3.

5.2.5.4.4 Test purpose
To verify that the Terminal supporting low impedance buffer keeps the voltage, the current and the rise and fall times of the signal on contact C7 (I/O) of the UICC-Terminal interface within the ranges specified in the conformance requirements.

5.2.5.4.5 Method of test

5.2.5.4.5.1 Initial condition
The Terminal shall be connected to a UICC simulator.
The UE shall be activated.
The remaining contacts of the UICC-Terminal interface shall be held in nominal test conditions (see clause 5.2.1).
An ATR indicating the support of the low impedance buffer shall have been received and the PPS procedure selecting the low impedance buffer shall have been successfully completed.

5.2.5.4.5.2 Procedure
The voltage, the current and the rise/fall time on contact C7 (I/O) of the UICC-Terminal interface shall be measured.

5.2.5.4.6 Acceptance criteria
The voltage, the current and the rise and fall times of the signal on contact C7 (I/O) of the UICC-Terminal interface shall be within the ranges specified in the conformance requirements.
6 Initial communication tests

6.1 ATR

6.1.1 ATR characters

6.1.1.1 Definition and applicability

The ATR is the first string of bytes sent from the UICC to the Terminal after a reset has been performed.

The historical bytes indicate to the external world how to use the card.

Both protocols T=0 and T=1 are mandatory for the Terminal. The protocol starts after either the answer to reset or a successful PPS exchange.

For applicability of this test case see clause 3.8.

6.1.1.2 Conformance requirement

6.1.1.2.0 Description

1) The Terminal shall adopt the data encoding convention and initial etu time defined in the initial character TS of the ATR.

2) The Terminal shall be able to receive interface characters for transmission protocols other than T=0 and T=1, historical bytes and a check byte, even if only T=0 and T=1 are used by the Terminal.

6.1.1.2.1 Reference

ETSI TS 102 221 [1], clauses 6.3 and 7.

6.1.1.3 Test purpose

1) To verify that the Terminal adopts the data encoding convention and initial etu time defined in the initial character TS of the ATR.

2) To verify that the Terminal accepts interface characters for transmission protocols (T=0 and T=1), historical bytes and a check byte.

6.1.1.4 Method of test

6.1.1.4.1 Initial conditions

The Terminal shall be connected to the UICC (or UICC simulator).

6.1.1.4.2 Procedure

a) The Terminal shall be powered on.

b) The UICC (or UICC simulator) shall send an ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor FI=1 (F=372)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baud rate adjustment factor DI=1 (D=1)</td>
</tr>
<tr>
<td>Character</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present Protocol T=0 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA3</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) 1,8 V technology UICC</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>SELECT by AID supported EFDIR present</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

- The Terminal shall be made to send further commands to the UICC (or UICC simulator) (e.g. by entering the PIN).
- The Terminal is switched off and on.
- The UICC (or UICC simulator) shall send an ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3F'</td>
<td>Indicates inverse convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor FI=1 (F=372) Baud rate adjustment factor DI=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present Protocol T=0 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA3</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) 1,8 V technology UICC</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>SELECT by AID supported EFDIR present</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

- The Terminal shall be made to send further commands to the UICC (or UICC simulator) (e.g. by entering the PIN).
- The Terminal is switched off and on.
- The UICC (or UICC simulator) shall send an ATR as follows:
<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD2</td>
<td>'B1'</td>
<td>TA3, TB3 and TD3 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TA3</td>
<td>'FE'</td>
<td>IFSC is 254 bytes long</td>
</tr>
<tr>
<td>TB3</td>
<td>'00'</td>
<td>Block Waiting Integer=0 Character Waiting Integer=0</td>
</tr>
<tr>
<td>TD3</td>
<td>'1F'</td>
<td>Only TA4 is present Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA4</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) 1.8 V technology UICC</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported EFDIR present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'ED'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

i) The Terminal shall be made to send further commands to the UICC (or UICC simulator) (e.g. by entering the PIN).

j) The Terminal is switched off and on.

k) The UICC (or UICC simulator) shall send an ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1, and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor F=F=372 Baud rate adjustment factor D=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'91'</td>
<td>TA2 and TD2 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TA2</td>
<td>'81'</td>
<td>Protocol T=1 used in specific mode Parameters indicated by the interface bytes, and card is not able to change mode</td>
</tr>
<tr>
<td>TD2</td>
<td>'B1'</td>
<td>TA3, TB3 and TD3 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TA3</td>
<td>'FE'</td>
<td>IFSC is 254 bytes long</td>
</tr>
<tr>
<td>TB3</td>
<td>'00'</td>
<td>Block Waiting Integer=0 Character Waiting Integer=0</td>
</tr>
<tr>
<td>TD3</td>
<td>'0F'</td>
<td>Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA4</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) 1.8 V technology UICC</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported EFDIR present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'7D'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

l) The Terminal shall be made to send further commands to the UICC (or UICC simulator) (e.g. by entering the PIN).

m) The Terminal is switched off and on.

n) The UICC (or UICC simulator) shall send an ATR as follows:
### Character Table

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3F'</td>
<td>Indicates inverse convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1, and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor FI=1 (F=372) Baud rate adjustment factor DI=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'91'</td>
<td>TA2 and TD2 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TA2</td>
<td>'81'</td>
<td>Protocol T=1 used in specific mode Parameters indicated by the interface bytes, and card is not able to change mode</td>
</tr>
<tr>
<td>TD2</td>
<td>'B1'</td>
<td>TA3, TB3 and TD3 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TA3</td>
<td>'FE'</td>
<td>IFSC is 254 bytes long</td>
</tr>
<tr>
<td>TB3</td>
<td>'00'</td>
<td>Block Waiting Integer=0 Character Waiting Integer=0</td>
</tr>
<tr>
<td>TD3</td>
<td>'0F'</td>
<td>Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA4</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) 1.8 V technology UICC</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported EF_DIR present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'7D'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

#### 6.1.1.5 Acceptance criteria

In step c), the Terminal shall start a T=0 session in direct convention and work with the UICC (or UICC simulator).

In steps f) and i), the Terminal shall start a T=0 session in inverse convention and work with the UICC (or UICC simulator).

In step l), the Terminal shall start a T=1 session in direct convention and work with the UICC (or UICC simulator).

In step o), the Terminal shall start a T=1 session in inverse convention and work with the UICC (or UICC simulator).

#### 6.1.2 ATR indicating the support of LSIs

##### 6.1.2.1 Definition and applicability

If LSIs are supported by the UICC this is indicated in the first global interface byte (TBi (i > 2)) of the ATR. The coding of the first TBi (i > 2) after T = 15 is defined in ETSI TS 102 221 [1].

Terminal and UICC shall agree on using LSIs as follows:

- The UICC indicates support for LSIs in the ATR.
- If indicated by the UICC, the terminal shall indicate in PPS2 if LSIs shall be used for the card session.
- If LSIs are used for the card session, LSI 0 is selected after the PPS.

For applicability of this test case see clause 3.8.
6.1.2.2 Conformance requirement

6.1.2.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>The Terminal shall be capable to interpret global interface bytes from an ATR.</td>
</tr>
<tr>
<td>RQ_2</td>
<td>After receiving an ATR indicating the support of LSIs, the Terminal shall indicate in PPS1 the transmission protocol shall be used for the card session.</td>
</tr>
<tr>
<td>RQ_3</td>
<td>After receiving an ATR indicating the support of LSIs, the Terminal shall indicate in PPS2 if LSIs shall be used for the card session.</td>
</tr>
<tr>
<td>RQ_4</td>
<td>The Terminal shall select LSI 0 after the PPS if LSIs are used for the card session.</td>
</tr>
</tbody>
</table>

6.1.2.2.1 Reference

ETSI TS 102 221 [1], clauses 6.3.3, 6.4, and 7.5.

6.1.2.3 Test purpose

1) To verify that the Terminal recognizes that LSIs shall be used from the ATR.
2) To verify that the Terminal indicates the usage of LSIs in PPS2.
3) To verify that the Terminal correctly uses LSIs and selects LSI 0.

6.1.2.4 Method of test

6.1.2.4.1 Initial conditions

The Terminal shall be connected to the UICC (or UICC simulator).

ATR-LSI1 (direct convention, T=0, T=15, eUICC and LSIs supported):

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor FI=1 (F=372) Baud rate adjustment factor DI=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 is present Protocol T=0 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'3F'</td>
<td>TA3 and TB3 are present Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA3</td>
<td>'4E'</td>
<td>Clock stop supported (low electrical state) UICC accepting voltage classes B, C and D</td>
</tr>
<tr>
<td>TB3</td>
<td>'83'</td>
<td>eUICC as defined in GSMA SGP.22 [8] supported LSIs supported</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported EF_DIR present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'09'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>
**ATR-LSI2 (direct convention, T=0, T=1, T=15, eUICC and LSIs supported):**

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor FI=1 (F=372) Baud rate adjustment factor DI=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 is present Protocol T=0 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'B1'</td>
<td>TA3, TB3 and TD3 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TA3</td>
<td>'FE'</td>
<td>IFSC is 254 bytes long Block Waiting Integer=2 Character Waiting Integer=1</td>
</tr>
<tr>
<td>TB3</td>
<td>'21'</td>
<td>IFSC is 254 bytes long Block Waiting Integer=2 Character Waiting Integer=1</td>
</tr>
<tr>
<td>TD3</td>
<td>'3F'</td>
<td>TA4 and TB4 are present Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA4</td>
<td>'4E'</td>
<td>Clock stop supported (low electrical state) UICC accepting voltage classes B, C and D</td>
</tr>
<tr>
<td>TB4</td>
<td>'83'</td>
<td>eUICC as defined in GSMA SGP.22 [8] supported LSIs supported</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported EFDIR present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding_byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'67'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

**ATR-LSI3 (direct convention, T=1, T=15, eUICC and LSIs supported):**

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1, and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor FI=1 (F=372) Baud rate adjustment factor DI=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'91'</td>
<td>TA2 and TD2 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TA2</td>
<td>'81'</td>
<td>Protocol T=1 used in specific mode Parameters indicated by the interface bytes, and card is not able to change mode</td>
</tr>
<tr>
<td>TD2</td>
<td>'B1'</td>
<td>TA3, TB3 and TD3 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TA3</td>
<td>'FE'</td>
<td>IFSC is 254 bytes long Block Waiting Integer=2 Character Waiting Integer=1</td>
</tr>
<tr>
<td>TB3</td>
<td>'21'</td>
<td>Block Waiting Integer=2 Character Waiting Integer=1</td>
</tr>
<tr>
<td>TD3</td>
<td>'3F'</td>
<td>TA4 and TB4 are present Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA4</td>
<td>'4E'</td>
<td>Clock stop supported (low electrical state) UICC accepting voltage classes B, C and D</td>
</tr>
<tr>
<td>TB4</td>
<td>'83'</td>
<td>eUICC as defined in GSMA SGP.22 [8] supported LSIs supported</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported EFDIR present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding_BYTE</td>
</tr>
</tbody>
</table>
### 6.1.2.4.2 Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Direction</th>
<th>Description</th>
<th>RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>TT</td>
<td>Repeat steps 1) to 6) for all ATRs defined in the initial conditions</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>User/UE</td>
<td>Activate the UICC-Terminal interface</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>UICC &gt; T</td>
<td>Send an ATR as defined in the initial conditions</td>
<td>RQ_1</td>
</tr>
<tr>
<td>3</td>
<td>T &gt; UICC</td>
<td>Send PPS1 with communication speed settings and PPS2 indicating the support of LSIs (see note)</td>
<td>RQ_2, RQ_3</td>
</tr>
<tr>
<td>4</td>
<td>UICC &gt; T</td>
<td>Send a PPS response confirming the Terminal's PPS request</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>T &gt; UICC</td>
<td>Ensure that a valid APDU is sent to LSI 0 (e.g. by selecting MF)</td>
<td>RQ_4</td>
</tr>
<tr>
<td>6</td>
<td>User/UE</td>
<td>Deactivate the UICC-Terminal interface</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** In addition to the support of LSIs, the global interface bytes indicates the support of eUICC-related functions. The Terminal may confirm that in PPS2 too.

### 6.1.2.5 Acceptance criteria

1) During step 3) the Terminal shall select one of the protocols indicated in the ATR by indicating the protocol in PPS1 (RQ_2).

2) During step 3) the Terminal shall confirm the support of LSIs, indicating the LSI support in the PPS2 the (RQ_3).

3) During step 5) the Terminal shall correctly operate using the selected protocol with (F/D) = (372/1) on LSI 0 (RQ_4).

### 6.2 Clock stop mode with UICC accepting voltage classes B and C

#### 6.2.1 Definition and applicability

The Terminal shall be able to receive interface characters, historical bytes and a check byte, even if only T=0 and T=1 are used by the Terminal.

T=15 global interface parameters shall be returned by the UICC.

The UICC shall support the clock stop procedure. The clock stop mode is indicated in TA_i (i > 2) in T=15 in the ATR.

For applicability of this test case see clause 3.8.
6.2.2 Conformance requirement

6.2.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>If the UICC supports any other operating conditions even together with class A, clock stop mode shall be supported and the indication shall be set accordingly. The terminal shall follow this indication independently of operating conditions indicated by the card.</td>
</tr>
<tr>
<td>RQ_2</td>
<td>The Terminal shall wait at least 1 860 clock cycles after having received the last character, including the guard time (2 etu), of the response before it switches off the clock.</td>
</tr>
<tr>
<td>RQ_3</td>
<td>The Terminal shall wait at least 744 clock cycles before it sends the first command after having started the clock.</td>
</tr>
</tbody>
</table>

6.2.2.1 Reference

ETSI TS 102 221 [1], clauses 6.6 and 11.1.1.4.6.1.
ISO/IEC 7816-3 [2], clauses 6.3.2 and 8.3.

6.2.3 Test purpose

1) To verify that the clock is only switched off as indicated in the ATR first global interface byte and file characteristics (byte 1 of the directory characteristics).

2) To verify that the timing of the clock switching is as specified.

6.2.4 Method of test

6.2.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator. PIN shall be enabled.

6.2.4.2 Procedure

a) The Terminal shall be powered on and the UICC simulator shall send an ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor F1=1 (F=372)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baud rate adjustment factor D1=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protocol T=0 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA3</td>
<td>'C6'</td>
<td>Clock stop supported (no preferred state)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UICC accepting voltage classes B and C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EFDIR present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'22'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>
and be used with bits set as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor Fl = 1 (F = 372)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baud rate adjustment factor Di = 1 (D = 1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protocol T=0 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA3</td>
<td>'86'</td>
<td>Clock stop supported (high electrical state)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UICC accepting voltage classes B and C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EFDuw present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'62'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

and be used with bits set as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor Fl = 1 (F = 372)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baud rate adjustment factor Di = 1 (D = 1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protocol T=0 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA3</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UICC accepting voltage classes B and C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EFDuw present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
</tbody>
</table>

d) When the Terminal is in mode PIN check, 10 seconds shall elapse before the PIN shall be entered.
e) The Terminal shall be powered off and on. The UICC simulator shall send an ATR as follows:
<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'A2'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

and be used with bits set as follows:

<table>
<thead>
<tr>
<th>b8</th>
<th>b7</th>
<th>b6</th>
<th>b5</th>
<th>b4</th>
<th>b3</th>
<th>b2</th>
<th>b1</th>
<th><strong>Meaning</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>Voltage classes BC and clock stop mode supported.  Low level preferred.</td>
</tr>
</tbody>
</table>

f) When the Terminal is in mode PIN check, 10 seconds shall elapse before the PIN shall be entered.

### 6.2.5 Acceptance criteria

1) During step b), the Terminal shall switch off the clock at either high or low level.

2) During step d), the Terminal shall switch off the clock at high level.

3) During step f), the Terminal shall switch off the clock at low level.

4) During steps b), d) and f), the Terminal shall not switch off the clock until at least 1 860 clock cycles after having received the last character of the response including the minimum guard time (2 etu).

5) During steps b), d) and f), the Terminal shall wait at least 744 clock cycles before it sends the first command after having restarted the clock.

**NOTE:** The Terminal will operate at either 1.8 V or 3 V and use the supply voltage procedure if it does not support the first value.

### 6.3 Clock stop mode with UICC accepting voltage classes A and B

#### 6.3.1 Definition and applicability

The Terminal shall be able to receive interface characters, historical bytes and a check byte, even if only T=0 and T=1 are used by the Terminal.

T=15 global interface parameters shall be returned by the UICC.

The UICC shall support the clock stop procedure. The clock stop mode is indicated in TA<sub>i</sub> (i > 2) in T=15 in the ATR.

For applicability of this test case see clause 3.8.

#### 6.3.2 Conformance requirement

#### 6.3.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>If the UICC supports any other operating conditions even together with class A, clock stop mode shall be supported and the indication shall be set accordingly. The terminal shall follow this indication independently of operating conditions indicated by the card.</td>
</tr>
<tr>
<td>RQ_2</td>
<td>The Terminal shall wait at least 1 860 clock cycles after having received the last character, including the guard time (2 etu), of the response before it switches off the clock.</td>
</tr>
<tr>
<td>RQ_3</td>
<td>The Terminal shall wait at least 744 clock cycles before it sends the first command after having started the clock.</td>
</tr>
</tbody>
</table>
6.3.2.1 Reference

ETSI TS 102 221 [1], clauses 6.6 and 11.1.1.4.6.1.
ISO/IEC 7816-3 [2], clauses 6.3.2 and 8.3.

6.3.3 Test purpose

1) To verify that the clock is only switched off as indicated in the ATR first global interface byte and file characteristics (byte 1 of the directory characteristics).

2) To verify that the timing of the clock switching is as specified.

6.3.4 Method of test

6.3.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator. PIN shall be enabled.

6.3.4.2 Procedure

a) The Terminal shall be powered on and the UICC simulator shall send an ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor F1=1 (F=372)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baud rate adjustment factor D1=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protocol T=0 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA3</td>
<td>'C3'</td>
<td>Clock stop supported (no preferred state)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UICC accepting voltage classes A and B</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EFon present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'27'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

and be used with bits set as follows:

<table>
<thead>
<tr>
<th>b8</th>
<th>b7</th>
<th>b6</th>
<th>b5</th>
<th>B4</th>
<th>b3</th>
<th>b2</th>
<th>b1</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>Voltage classes AB and clock stop mode supported. No preferred level.</td>
</tr>
</tbody>
</table>

b) When the Terminal is in mode PIN check, 10 seconds shall elapse before the PIN shall be entered.

c) The Terminal shall be powered off and on. The UICC simulator shall send an ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 bytes of historical bytes</td>
</tr>
<tr>
<td>Character</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor $F_l=1$ ($F=372$) Baud rate adjustment factor $D_l=1$ ($D=1$)</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present Protocol $T=0$ supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present Global interface bytes following ($T=15$)</td>
</tr>
<tr>
<td>TA3</td>
<td>'83'</td>
<td>Clock stop supported (high electrical state) UICC accepting voltage classes A and B</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported $E_{FDIR}$ present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>$SFI$ supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended $L_c$ and $L_e$ No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'67'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

and be used with bits set as follows:

<table>
<thead>
<tr>
<th>b8 b7 b6 b5 b4 b3 b2 b1</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 0 1 1 1 0 0 1</td>
<td>Voltage classes AB and clock stop mode supported. High level preferred.</td>
</tr>
</tbody>
</table>

d) When the Terminal is in mode PIN check, 10 seconds shall elapse before the PIN shall be entered.

e) The Terminal shall be powered off and on. The UICC simulator shall send an ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor $F_l=1$ ($F=372$) Baud rate adjustment factor $D_l=1$ ($D=1$)</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present Protocol $T=0$ supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present Global interface bytes following ($T=15$)</td>
</tr>
<tr>
<td>TA3</td>
<td>'43'</td>
<td>Clock stop supported (low electrical state) UICC accepting voltage classes A and B</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported $E_{FDIR}$ present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>$SFI$ supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended $L_c$ and $L_e$ No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'A7'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

and be used with bits set as follows:

<table>
<thead>
<tr>
<th>b8 b7 b6 b5 b4 b3 b2 b1</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 0 1 1 1 0 0 1</td>
<td>Voltage classes AB and clock stop mode supported. Low level preferred.</td>
</tr>
</tbody>
</table>

f) When the Terminal is in mode PIN check, 10 seconds shall elapse before the PIN shall be entered.
6.3.5 Acceptance criteria

1) During step b), the Terminal shall switch off the clock at either high or low level.
2) During step d), the Terminal shall switch off the clock at high level.
3) During step f), the Terminal shall switch off the clock at low level.
4) During steps b), d) and f), the Terminal shall operate at 3 V and not switch off the clock until at least 1 860 clock cycles after having received the last character of the response including the minimum guard time (2 etu).
5) During steps b), d) and f), the Terminal shall wait at least 744 clock cycles before it sends the first command after having restarted the clock.

6.4 Void

6.5 Speed enhancement

6.5.1 Definition and applicability

The Terminal shall at least support speed enhancement using \((F,D) = (512,8)\) and \((512,16)\) in addition to the default values \((372,1)\).

For applicability of this test case see clause 3.8.

6.5.2 Conformance requirement

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>The Terminal, shall support (F = 512) and (D = 8).</td>
</tr>
<tr>
<td>RQ_2</td>
<td>The Terminal, shall support (F = 512) and (D = 16).</td>
</tr>
</tbody>
</table>

6.5.3 Test purpose

To verify that the Terminal supports the transmission parameters \(F = 512\) and \(D = 8\) as well as \(F = 512\) and \(D = 16\).

6.5.4 Method of test

6.5.4.1 Initial conditions

The Terminal is connected to the UICC simulator.

6.5.4.2 Procedure

a) The Terminal is powered on.

b) The UICC simulator sends an ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1, TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'94'</td>
<td>(F=512, D=8)</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present (T=0)</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present Global interface bytes following</td>
</tr>
<tr>
<td>Character</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>TA3</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) UICC accepting class B and class C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>SELECT by AID supported EFDIR present</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'26'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

**Character**

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1, TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'95'</td>
<td>F=512, D=16</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present T=0</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present Global interface bytes following</td>
</tr>
<tr>
<td>TA3</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) UICC accepting class B and class C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>SELECT by AID supported EFDIR present</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'26'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

**Acceptance criteria**

After receipt of the PPS Request, the UICC simulator answers with the PPS Response "FF 10 94 7B" using a work waiting time of 9 600 etu (initial waiting time).

The UICC simulator transmits with enhanced speed (F = 512, D = 8).

The Terminal is switched off and on. The UICC simulator sends an ATR as follows:

After receipt of the PPS Request, the UICC simulator answers with the PPS Response "FF 10 95 7B" using a work waiting time of 9 600 etu (initial waiting time).

The UICC simulator transmits with enhanced speed (F = 512, D = 16).

### 6.5.5 Acceptance criteria

After step b) the Terminal shall send to the UICC simulator the PPS Request "FF 10 94 7B" (RQ_1).

After step c) the Terminal shall work with the UICC simulator (RQ_1).

After step e) the Terminal shall send to the UICC simulator the PPS Request "FF 10 95 7B" (RQ_2).

After step f) the Terminal shall work with the UICC simulator (RQ_2).
7 Transmission protocol tests

7.1 Character transmission

7.1.1 Bit/character duration during the transmission from the Terminal to the UICC

7.1.1.1 Definition and applicability

A character consists of 10 consecutive bits:

- 1 start bit in state L;
- 8 bits, which comprise the data byte;
- 1 even parity checking bit.

For applicability of this test case see clause 3.8.

7.1.1.2 Conformance requirement

7.1.1.2.0 Description

The bit/character duration and the delay between two consecutive characters (between start leading edges) sent by the Terminal shall be in the range specified.

7.1.1.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.1.

7.1.1.3 Test purpose

To verify the timing during the transmission from the Terminal to the UICC.

7.1.1.4 Method of test

7.1.1.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

7.1.1.4.2 Procedure

A number of characters are transmitted from the Terminal to the UICC simulator. The UICC simulator shall measure the bit/character duration and the delay between two consecutive characters for all characters transmitted by the Terminal.

7.1.1.5 Acceptance criteria

The timing shall be in the specified range.
7.1.2 Bit/character duration during the transmission from the UICC to the Terminal

7.1.2.1 Definition and applicability

A character consists of 10 consecutive bits:

- 1 start bit in state L;
- 8 bits, which comprise the data byte;
- 1 even parity checking bit.

For applicability of this test case see clause 3.8.

7.1.2.2 Conformance requirement

7.1.2.2.0 Description

The bit/character duration and the delay between two consecutive characters (between start leading edges) sent by the Terminal shall be in the range specified.

7.1.2.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.1.

7.1.2.3 Test purpose

To verify the timing during the transmission from the UICC to the Terminal.

7.1.2.4 Method of test

7.1.2.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

7.1.2.4.2 Procedure

The UICC simulator shall send responses with the maximum and minimum bit/character duration specified in ETSI TS 102 221 [1].

7.1.2.5 Acceptance criteria

The Terminal shall accept the response and act accordingly.

7.2 T=0 protocol

7.2.1 Timing

7.2.1.1 Definition and applicability

The minimum interval between the leading edge of the start bits of two consecutive characters shall be at least 12 etu. The Work Waiting Time (WWT) is the maximum interval between the start leading edge of any character sent by the UICC and the start leading edge of the previous character sent by either by the UICC or the terminal.

The value of the WWT shall not exceed 960 × WI × Fi/ f. WI is an integer received in the specific interface byte TC2. The clock rate conversion factor, Fi, may be indicated in TA1.
For applicability of this test case see clause 3.8.

7.2.1.2 Conformance requirement

7.2.1.2.0 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>If TA1 is absent the Terminal shall use the default value Fi = 372</td>
</tr>
<tr>
<td>RQ_2</td>
<td>If no TC2 is available the Terminal shall use the default value of WI (10).</td>
</tr>
<tr>
<td>RQ_3</td>
<td>The Terminal shall accept characters sent by the UICC with the Work Waiting Time within the specified range.</td>
</tr>
<tr>
<td>RQ_4</td>
<td>The Terminal shall use the speed defined in TA1</td>
</tr>
<tr>
<td>RQ_5</td>
<td>The Terminal shall deactivate the Terminal-UICC interface if WWT is exceeded</td>
</tr>
</tbody>
</table>

7.2.1.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.2.1.

7.2.1.3 Test purpose

1) To verify the correct evaluation of the characters TA1 and TC2 indicated in the ATR.
2) To verify that the Terminal accepts the minimum and maximum Work Waiting Time during the transmission from the UICC to the Terminal.
3) To verify that the Terminal deactivates the UICC if WWT is exceeded.

7.2.1.4 Method of test

7.2.1.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

7.2.1.4.2 Procedure

a) Upon reception of a reset the UICC simulator shall transmit the ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct or inverse convention</td>
</tr>
<tr>
<td>T0</td>
<td>'87'</td>
<td>TD1 only is present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TD1</td>
<td>'80'</td>
<td>TD2 only is present</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present Global interface bytes following</td>
</tr>
<tr>
<td>TA3</td>
<td>'4E'</td>
<td>Clock stop supported (low electrical state) UICC accepting class B and class C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported Eforr present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'A3'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>
b) Upon reception of a reset the UICC simulator shall transmit the ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct or inverse convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1 and TD1 are present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor F1 = 1 (F = 372)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baud rate adjustment factor D1 = 1 (D = 1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'C0'</td>
<td>TC2 and TD2 are present</td>
</tr>
<tr>
<td>TC2</td>
<td>'01'</td>
<td>WI = 1 meaning WWT = 960 × (Fi/f) × 1</td>
</tr>
<tr>
<td>TD2</td>
<td>'1F'</td>
<td>TA3 only is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Global interface bytes following</td>
</tr>
<tr>
<td>TA3</td>
<td>'4E'</td>
<td>Clock stop supported (low electrical state)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UICC accepting class B and class C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EFDIR present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'E3'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

c-1) The UICC simulator shall transmit with a WWT of 12 etu.

c-2) The UICC simulator shall transmit with the specified WWT (960 × (Fi/f) × WI).

c-3) The UICC simulator shall not transmit i.e. WWT exceeded.

7.2.1.5 Acceptance criteria

In step a), the Terminal shall work with the UICC simulator using the default values of TA1 and TC2.

In steps c-1) and c-2) the Terminal shall work with the UICC simulator.

In step c-3) the Terminal shall initiate a deactivation of the UICC within 960 etu following the excess of WWT.

7.2.2 Command processing, ACK, NACK, NULL procedure bytes

7.2.2.1 Definition and applicability

Procedure bytes are used to keep up the communication between the terminal and the UICC. They shall not be transmitted to the Application Layer.

The status bytes SW1 SW2 form an end sequence indicating the status of the UICC at the end of a command.

For applicability of this test case see clause 3.8.

7.2.2.2 Conformance requirement

7.2.2.2.0 Description

The Terminal shall correctly use the different modes of data transmission.

7.2.2.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.2.3.

ISO/IEC 7816-3 [2], clause 8.3.
7.2.2.3 Test purpose
To verify that the Terminal correctly uses the different modes of data transmission.

7.2.2.4 Method of test

7.2.2.4.1 Initial conditions
The Terminal shall be connected to the UICC simulator, and powered on.

T=0 ATR shall have been received and eventual PPS procedure successfully completed.

7.2.2.4.2 Procedure
  a) The Terminal shall be made to initiate a VERIFY PIN command with 8 bytes of data.
  b) The UICC simulator shall answer the first 5 bytes with ACK=INS complemented.
  c1) The UICC simulator shall answer the next data byte with NULL (NULL="60"). This byte is sent between 0.8 and 1.0 x Work Waiting Time after the previous procedure byte.
  c2) The UICC simulator shall send a second NULL (NULL="60"). This byte is sent between 0.8 and 1.0 x Work Waiting Time after the previous procedure byte.
  c3) The UICC simulator shall send a third NULL (NULL="60"). This byte is sent between 0.8 and 1.0 x Work Waiting Time after the previous procedure byte.
  d) The UICC simulator shall then send ACK=INS. This byte is sent between 0.8 and 1.0 x Work Waiting Time after the previous procedure byte.
  e) The UICC simulator shall answer the transmission of the rest of the data with NULL.
  f) The UICC simulator shall then send SW1 and SW2, indicating correct execution of the command ("90" and "00" for SW1 and SW2 respectively). These bytes are sent when the elapsed time since step d) is greater than the Work Waiting Time.

7.2.2.5 Acceptance criteria
The command shall be executed correctly.

7.2.3 Case 2 command, use of procedure bytes '61xx' and '6Cxx'

7.2.3.1 Definition and applicability
Procedure bytes '61XX' and '6CXX' are returned by the UICC to control exchanges between the Transport Layer of the Terminal and the UICC, and should never be returned to the Application Layer of the Terminal. Command processing in the UICC is not complete if it has returned procedure bytes '61XX' or '6CXX'.

For applicability of this test case see clause 3.8.

7.2.3.2 Conformance requirement

7.2.3.2.0 Description
The UICC returns procedure bytes '61xx' and '6Cxx' to the Transport Layer of the Terminal to indicate to it the manner in which it should retrieve the data requested by the command currently being processed. These procedure bytes are only used when processing case 2 and 4 commands using T=0.
7.2.3.2.1 Reference
ETSI TS 102 221 [1], clause 7.3.1.1.5.
ISO/IEC 7816-3 [2], clause 8.3.

7.2.3.3 Test purpose
To verify that the Terminal correctly handles the procedure bytes ‘61XX’ and ‘6CXX’ when processing a case 2 command.

7.2.3.4 Method of test

7.2.3.4.1 Initial conditions
The Terminal shall be connected to the UICC simulator, and powered on.
T=0 ATR shall have been received and eventual PPS procedure successfully completed.

7.2.3.4.2 Procedure
a) The Terminal shall be made to initiate a case 2 command with Le > Luicc (ex: READ RECORD command).
b) The UICC simulator shall send ‘6CLuicc’ procedure bytes.
c) Following receipt of the command, the UICC simulator shall send ‘61xx’ procedure bytes.
d) Following receipt of the command, the UICC simulator shall send corresponding data + ‘61yy’ procedure bytes.
e) Following receipt of the command, the UICC simulator shall then send the rest of the data and SW1 and SW2, indicating correct execution of the command (“90” and “00” for SW1 and SW2 respectively).

7.2.3.5 Acceptance criteria
After step b) the Terminal shall send the previous command with Le = ‘Luicc’.
After step c) the Terminal shall send a GET RESPONSE command with Le = ‘xx’.
After step f) the Terminal shall send a GET RESPONSE command with Le = ‘yy’.

7.2.4 Case 4 command, use of procedure bytes ‘61xx’

7.2.4.1 Definition and applicability
Procedure bytes ‘61XX’ and ‘6CXX’ are returned by the UICC to control exchanges between the Transport Layer of the Terminal and the UICC, and should never be returned to the Application Layer of the Terminal. Command processing in the UICC is not complete if it has returned procedure bytes ‘61XX’ or ‘6CXX’.

For applicability of this test case see clause 3.8.

7.2.4.2 Conformance requirement

7.2.4.2.0 Description
The UICC returns procedure bytes ‘61xx’ and ‘6Cxx’ to the Transport Layer of the Terminal to indicate to it the manner in which it should retrieve the data requested by the command currently being processed. These procedure bytes are only used when processing case 2 and 4 commands using T=0.
7.2.4.2.1 Reference
ETSI TS 102 221 [1], clause 7.3.1.1.5.
ISO/IEC 7816-3 [2], clause 8.3.

7.2.4.3 Test purpose
To verify that the Terminal correctly handles the procedure bytes ‘61XX’ when processing a case 4 command.

7.2.4.4 Method of test

7.2.4.4.1 Initial conditions
The Terminal shall be connected to the UICC simulator, and powered on.
T=0 ATR shall have been received and eventual PPS procedure successfully completed.

7.2.4.4.2 Procedure
a) The Terminal shall be made to initiate a case 4 command with Le > Luicc (ex: SELECT command).
b) The UICC simulator shall answer the command header with INS and send ‘61xx’ procedure bytes following reception of data.
c) Following receipt of the command, the UICC simulator shall send corresponding data + ‘61yy’ procedure bytes.
d) Following receipt of the command, the UICC simulator shall then send the rest of the data and SW1 and SW2, indicating correct execution of the command (“90” and “00” for SW1 and SW2 respectively).

7.2.4.5 Acceptance criteria
After step b) the Terminal shall send a GET RESPONSE command with Le = ‘xx’.
After step c) the Terminal shall send a GET RESPONSE command with Le = ‘yy’.

7.2.5 Command processing, warning and error status bytes

7.2.5.1 Definition and applicability
The status bytes SW1 SW2 form an end sequence indicating the status of the UICC at the end of a command.
For applicability of this test case see clause 3.8.

7.2.5.2 Conformance requirement

7.2.5.2.0 Description
In the case of an error, the UICC may return status indicating error or warning conditions instead of the ‘61xx’ or ‘6Cxx’ response.

7.2.5.2.1 Reference
ETSI TS 102 221 [1], clauses 7.2.2.3 and 10.2.1.

7.2.5.3 Test purpose
To verify that the Terminal correctly handles status bytes different than ‘9000’.
7.2.5.4 Method of test

7.2.5.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

T=0 ATR shall have been received and eventual PPS procedure successfully completed.

7.2.5.4.2 Procedure

a) Warning:

a-1) The Terminal shall be made to initiate a case 4 command except for SEARCH RECORD (ex: SELECT command).

a-2) The UICC simulator shall send warning status bytes ('62xx' '63xx' or '9xxx').

a-3) Following receipt of the command, the UICC simulator shall then send the rest of the data and SW1 and SW2, indicating correct execution of the command ('90' and '00' for SW1 and SW2 respectively).

b) Error:

b-1) The Terminal shall be made to initiate a case 4 command (ex: SELECT command).

b-2) The UICC simulator shall send error status bytes ('6xxx' except '6Cxx', '61xx', '62xx' and '63xx').

7.2.5.5 Acceptance criteria

After step a-2) the Terminal shall send a GET RESPONSE command with Le = '00'.

After step b-2) the Terminal shall discontinue processing of the command.

7.2.6 Error correction

7.2.6.1 Definition and applicability

If the UICC as receiver detects a parity error within 11 etu ± 0.2 etu starting from the leading edge of the start bit, in a character just received, it shall set I/O to state L to indicate the error to the Terminal.

For applicability of this test case see clause 3.8.

7.2.6.2 Conformance requirement

7.2.6.2.0 Description

The error detection and correction procedure is mandatory for T=0 protocol except for the Terminal during the ATR-procedure.

7.2.6.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.2.4.

7.2.6.3 Test purpose

To verify the error handling during the transmission from the Terminal to the UICC.
7.2.6.4 Method of test

7.2.6.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

7.2.6.4.2 Procedure

The UICC simulator shall transmit an error signal in response to a received character by setting the I/O line to state L for a maximum of 2 etu and a minimum of 1 etu, 10.5 etu ± 0.2 etu after the leading edge of the start bit of the received character.

7.2.6.5 Acceptance criteria

The Terminal shall repeat the disputed character after a minimum delay of 2 etu.

7.2.7 Error detection

7.2.7.1 Definition and applicability

If the Terminal as receiver detects a parity error within 11 ± 0.2 etu starting from the leading edge of the start bit, in a character just received, it shall set I/O to state L to indicate the error to the UICC.

For applicability of this test case see clause 3.8.

7.2.7.2 Conformance requirement

7.2.7.2.0 Description

The error detection and correction procedure is mandatory for T=0 protocol except for the Terminal during the ATR-procedure.

7.2.7.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.2.4.

7.2.7.3 Test purpose

To verify the error handling during the transmission from the UICC to the Terminal.

7.2.7.4 Method of test

7.2.7.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

7.2.7.4.2 Procedure

The UICC simulator shall send a response with a parity error and check that the terminals correctly handles it.

7.2.7.5 Acceptance criteria

The Terminal shall detect the parity error by setting the I/O line to state L for a maximum of 2 etu and a minimum of 1 etu, 10.5 etu ± 0.2 etu after the leading edge of the start bit of the erroneous character and correctly evaluate the character when repeated by the UICC simulator.
7.3 T=1 protocol

7.3.1 Character Waiting Time

7.3.1.1 Definition and applicability
CWT is defined as the maximum delay between the leading edges of two consecutive characters in the block.
For applicability of this test case see clause 3.8.

7.3.1.2 Conformance requirement

7.3.1.2.0 Description
CWI is used to calculate CWT and shall be in the range from 0 to 5. The value is set in bits b4 to b1 in TB3. The value of CWT may be calculated from the following equation: \( CWT = (11 + 2^{CWI}) \) etu.

7.3.1.2.1 Reference
ETSI TS 102 221 [1], clause 7.2.3.1.
ISO/IEC 7816-3 [2], clause 11.4.3.

7.3.1.3 Test purpose
To verify that the Terminal respects the CWT indicated by the UICC.

7.3.1.4 Method of test

7.3.1.4.1 Initial conditions
The Terminal shall be connected to the UICC simulator, and powered on.

7.3.1.4.2 Procedure
a) Upon reception of a reset the UICC simulator shall transmit the ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1, and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor F1=1 (F=372) Baud rate adjustment factor D1=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'81'</td>
<td>Only TD2 is present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'A1'</td>
<td>TB3 and TD3 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TB3</td>
<td>'05'</td>
<td>Block Waiting Integer=0 Character Waiting Integer=5 indicating CWT=43 etu</td>
</tr>
<tr>
<td>TD3</td>
<td>'1F'</td>
<td>Only TA4 is present Global interface bytes following (T=15)</td>
</tr>
<tr>
<td>TA4</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) UICC accepting voltage classes B and C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported EFon present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>Character</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'07'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

b) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring reception of an I-Block.

b-1) The UICC simulator shall send the I-Block (data + '9000' indicating correct execution of the command) using CWT=11 etu.

b-2) The UICC simulator shall send the I-Block (data + '9000' indicating correct execution of the command) using CWT=43 etu.

7.3.1.5 Acceptance criteria

In step b.1) and b.2) the Terminal shall acknowledge the error free I-Block.

7.3.2 Block Timing

7.3.2.1 Definition and applicability

BWT is defined as the maximum delay between the leading edge of the last character of the block received by the card and the leading edge of the first character of the next block sent by the card.

BGT is defined as the minimum delay between the leading edge of two consecutive characters sent in opposite directions. The value of BGT shall be 22 etu.

For applicability of this test case see clause 3.8.

7.3.2.2 Conformance requirement

7.3.2.2.0 Description

BWI is used to calculate BWT and shall be in the range from 0 to 4. The value is set in bits b5 to b8 in TB3. The value of BWT may be calculated from the following equation: $BWT = 11 + (2^{BWI} \times 960 \times 372/f)$ etu.

The delay between the last character of a block received by the UICC and the first character of the next block sent from the UICC shall be in the interval: $BGT < \text{delay} < BWT$.

7.3.2.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.3.

ISO/IEC 7816-3 [2], clause 11.4.3.

7.3.2.3 Test purpose

To verify that the Terminal respects the BGT and BWT indicated by the UICC in the ATR and detects time-out.

7.3.2.4 Method of test

7.3.2.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.
7.3.2.4.2 Procedure

a) Upon reception of a reset the UICC simulator shall transmit the ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1, and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor FI=1 (F=372) Baud rate adjustment factor DI=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'81'</td>
<td>Only TD2 is present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'A1'</td>
<td>TB3 and TD3 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TB3</td>
<td>'31'</td>
<td>Block Waiting Integer=3 indicating BWT = 11 + (8 × 960 × 372/f) etu Character Waiting Integer=1 indicating CWT=13 etu</td>
</tr>
<tr>
<td>TD3</td>
<td>'1F'</td>
<td>Only TA4 is present Global interface bytes following</td>
</tr>
<tr>
<td>TA4</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) UICC accepting voltage classes B and C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported EFDIR present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'33'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

b) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring reception of chained I-Blocks.

c) The UICC simulator shall measure the delay between the last character of each block sent by the UICC and the first character of each following block sent by the Terminal.

d) BWT:

d-1) The UICC simulator shall send the I-Blocks using BGT = 22 etu.

d-2) The UICC simulator shall send each I-Block using BWT = 11 + (2^{BW1} × 960 × 372/f) etu.

BWT excess:

d-3) The UICC simulator shall not send an I-Block.

7.3.2.5 Acceptance criteria

In step c) the Terminal shall use a BGT of at least 22 etus.

In steps d-1) and d-2) the Terminal shall acknowledge reception of the I-Blocks without error.

In step d-3) the Terminal shall detect a time-out and send an R-Block requesting retransmission of the last block.

7.3.3 Block Waiting Time extension

7.3.3.1 Definition and applicability

WTX is a parameter used to ask for more time to process a command.

Supervisory blocks, S-block, are used to send control information.
S-blocks are always used in pairs. A S(request) is always followed by a S(response) block:

- S(WTX request), a request for an extension of the waiting time.
- S(WTX response), an acknowledge of the extension of the waiting time.

For applicability of this test case see clause 3.8.

### 7.3.3.2 Conformance requirement

#### 7.3.3.2.0 Description

The UICC might need more than BWT to process the previously received block, a S(WTX request) is sent by the UICC. The terminal shall acknowledge with a S(WTX response).

When an S(... request) has been sent and either a BWT time-out occurs (with the terminal) or the received response is not a S(... response), the S(... request) shall be resent.

#### 7.3.3.2.1 Reference

ETS I TS 102 221 [1], clause 7.2.3.1.

ISO/IEC 7816-3 [2], clauses 11.3.2.2, 11.3.3, 11.6.1 and 11.6.2.3, scenarios 2, 14 and 15.

### 7.3.3.3 Test purpose

1. To verify that the Terminal respects the WTX procedure and applies the extended BWT.
2. To verify that the Terminal handles the different types of errors in S(... request).

### 7.3.3.4 Method of test

#### 7.3.3.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

#### 7.3.3.4.2 Procedure

a) Upon reception of a reset the UICC simulator shall transmit the ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1, and TD1 are present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor Fl=1 (F=372)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baud rate adjustment factor Di=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'81'</td>
<td>Only TD2 is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'A1'</td>
<td>TB3 and TD3 are present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TB3</td>
<td>'21'</td>
<td>Block Waiting Integer = 2 indicating BWT = 11 + (4 × 960 × 372/f) etu</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Character Waiting Integer = 1 indicating CWT = 13 etu</td>
</tr>
<tr>
<td>TD3</td>
<td>'1F'</td>
<td>Only TA4 is present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Global interface bytes following</td>
</tr>
<tr>
<td>TA4</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UICC accepting voltage classes B and C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EF_DIR present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>Character</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Lc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'23'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

b) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring exchange of I-Blocks.

c-1) Error free S(WTX request):

   c-1-1) Following receipt of the I-block, the UICC simulator shall send a S(WTX request) without error (BWT multiplied by 2).

   c-1-2) The UICC simulator shall use the extended BWT when receiving the S(WTX response), then complete the command (data + '9000' indicating correct execution of the command).

c-2) Error in S(WTX request):

   c-2-1) Following receipt of the I-block, the UICC simulator shall send a S(WTX request) and generate the following errors:

      - Parity error.
      - NAD ≠ '00'.
      - S(WTX response) instead of S(WTX request).
      - Other S(... response) instead of S(WTX request).
      - LEN error.

   c-2-2) Following reception of the block sent by the Terminal (correct or with error assumed) the UICC simulator shall retransmit the S(WTX request) without error.

   c-2-3) The UICC simulator shall use the extended BWT when receiving the S(WTX response), then complete the command (data + '9000' indicating correct execution of the command).

7.3.3.5 Acceptance criteria

After steps c-1-1) and c-2-2) the Terminal shall send a S(WTX response).

After step c-2-1) the Terminal shall send an R-Block requesting retransmission of the last block.

7.3.4 Chaining - Respect of IFSC by Terminal

7.3.4.1 Definition and applicability

Chaining allows the terminal or the UICC to transfer information, which is longer than IFSC or IFSD. If information longer than IFSC or IFSD is transferred, the information should be divided into pieces, each has a length ≤ IFSC or IFSD. Each piece should be sent in an I-block using the chaining function.

The IFSC defines the maximum length of the information field of blocks that can be received by the UICC.

For applicability of this test case see clause 3.8.

7.3.4.2 Conformance requirement

7.3.4.2.0 Description

The default value of the IFSC is 32 bytes. Another value may be indicated in TA3 of the ATR.
When the terminal is the sender, all I-blocks of a chain shall have LEN = IFSC bytes except for the last, which could have a value in the range of 0 to IFSC.

When a receiver receives a more-data I-block, a R(N(R)) shall be sent. N(R) = N(S) of the expected I-block. At least one chained block should follow.

7.3.4.2.1 Reference

ETSI TS 102 221 [1], clauses 7.2.3.1.1 and 7.2.3.5.

ISO/IEC 7816-3 [2], clause11.4.2, 11.6.2.2, 11.6.2.3, 11.6.3.1, scenarios 5 and 6.

7.3.4.3 Test purpose

To verify that the Terminal respects the Information Field Size of the UICC in chaining mode.

7.3.4.4 Method of test

7.3.4.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

7.3.4.4.2 Procedure

a) No TA3:

a-1) Upon reception of a reset the UICC simulator shall transmit the ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1, and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor F=1 (F=372) Baud rate adjustment factor D=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'81'</td>
<td>Only TD2 is present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'A1'</td>
<td>TB3 and TD3 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TB3</td>
<td>'00'</td>
<td>Block Waiting Integer=0 Character Waiting Integer=0</td>
</tr>
<tr>
<td>TD3</td>
<td>'1F'</td>
<td>Only TA4 is present Global interface bytes following</td>
</tr>
<tr>
<td>TA4</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) UICC accepting voltage classes B and C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by Aid supported EFhid present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'02'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

a-2) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring sending of chained I-Blocks.

a-3) Following receipt of the command, the UICC simulator shall evaluate the length and acknowledge reception of the received I-Blocks without error.
b) TA3='FE':

b-1) Upon reception of a reset the UICC simulator shall transmit the ATR as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>'3B'</td>
<td>Indicates direct convention</td>
</tr>
<tr>
<td>T0</td>
<td>'97'</td>
<td>TA1, and TD1 are present 7 bytes of historical bytes</td>
</tr>
<tr>
<td>TA1</td>
<td>'11'</td>
<td>Clock rate conversion factor Fi=1 (F=372) Baud rate adjustment factor Di=1 (D=1)</td>
</tr>
<tr>
<td>TD1</td>
<td>'81'</td>
<td>Only TD2 is present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TD2</td>
<td>'B1'</td>
<td>TA3, TB3 and TD3 are present Protocol T=1 supported by UICC</td>
</tr>
<tr>
<td>TA3</td>
<td>'FE'</td>
<td>IFSC is 254 bytes long</td>
</tr>
<tr>
<td>TB3</td>
<td>'00'</td>
<td>Block Waiting Integer=0 Character Waiting Integer=0</td>
</tr>
<tr>
<td>TD3</td>
<td>'1F'</td>
<td>Only TA4 is present Global interface bytes following</td>
</tr>
<tr>
<td>TA4</td>
<td>'46'</td>
<td>Clock stop supported (low electrical state) UICC accepting voltage classes B and C</td>
</tr>
<tr>
<td>T1</td>
<td>'80'</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>'31'</td>
<td>Card data services</td>
</tr>
<tr>
<td>T3</td>
<td>'A0'</td>
<td>SELECT by AID supported EFdir present</td>
</tr>
<tr>
<td>T4</td>
<td>'73'</td>
<td>Card capabilities</td>
</tr>
<tr>
<td>T5</td>
<td>'BE'</td>
<td>SFI supported</td>
</tr>
<tr>
<td>T6</td>
<td>'21'</td>
<td>Data Coding Byte</td>
</tr>
<tr>
<td>T7</td>
<td>'00'</td>
<td>No extended Lc and Le No Logical channels supported</td>
</tr>
<tr>
<td>TCK</td>
<td>'EC'</td>
<td>Check byte</td>
</tr>
</tbody>
</table>

b-2) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring sending of chained I-Blocks.

b-3) Following receipt of the command, the UICC simulator shall evaluate the length and acknowledge reception of the received I-Blocks without error.

7.3.4.5 Acceptance criteria

In step a-2) the Terminal shall send the chained I-Blocks, except the last one, using the default value of IFSC, i.e. 32 bytes long information field.

In step b-2) the Terminal shall send the chained I-Blocks, except the last one, using the specified value of IFSC, i.e. 254 bytes long information field.

7.3.5 Chaining - IFSD management

7.3.5.1 Definition and applicability

Chaining allows the Terminal or the UICC to transfer information, which is longer than IFSC or IFSD. If information longer than IFSC or IFSD is transferred, the information should be divided into pieces, each has a length ≤ IFSC or IFSD. Each piece should be sent in an I-block using the chaining function.

When a receiver receives a more-data I-block, a R(N(R)) shall be sent. N(R) = N(S) of the expected I-block. At least one chained block should follow.

The IFSD defines the maximum length of the information field of blocks that the terminal can receive.

The default value of the IFSD is 32 bytes and may be adjusted during the card session. The maximum value of the IFSD is 254 bytes.

For applicability of this test case see clause 3.8.
7.3.5.2 Conformance requirement

7.3.5.2.0 Description

When the UICC is the sender, all I-blocks of a chain shall have LEN ≤ IFSD bytes per block.

7.3.5.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.3.

7.3.5.3 Test purpose

To verify that the Terminal correctly handles the Information Field Size in chaining mode.

7.3.5.4 Method of test

7.3.5.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

ATR shall have been received and eventual PPS procedure successfully completed.

7.3.5.4.2 Procedure

a) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring reception of chained I-Blocks.

b) The UICC simulator shall send an I-Block with LEN > IFSD.

c) Following correct receipt of the next block the UICC simulator shall send the rest of I-Blocks (data + '9000' indicating correct execution of the command).

7.3.5.5 Acceptance criteria

In step b), the Terminal shall detect the incorrect LEN and send an R-Block requesting retransmission of the last block.

In step c) the Terminal shall acknowledge reception of the I-Blocks without error by sending R-Blocks with N(R)=sequence number of expected I-Block.

7.3.6 I-Block error correction

7.3.6.1 Definition and applicability

Information blocks are used to transfer command and response APDUs.

The I-blocks are denoted as follows: I(N(S), M) where:

- N(S) is the send-sequence number of the block.
- M is the more-data bit used in the chaining function.

For applicability of this test case see clause 3.8.

7.3.6.2 Conformance requirement

7.3.6.2.0 Description

When an I-block has been sent and a BWT time-out occurs or an invalid block has been received (with the terminal), an R-block is sent, which requests with its N(R) for the expected I-block with N(S)=N(R).
7.3.6.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.3.4.

ISO/IEC 7816-3 [2], clause 9.7.3, scenario 8.

7.3.6.3 Test purpose

To verify that the Terminal sends an I-Block again when notified incorrect reception by the UICC (R-Block meaning error).

7.3.6.4 Method of test

7.3.6.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

ATR shall have been received and eventual PPS procedure successfully completed.

7.3.6.4.2 Procedure

a) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring sending of chained I-Blocks.

b) The UICC simulator shall assume each transmitted I-Block, including the last non-chained one, is invalid by sending an R-Block requesting retransmission.

7.3.6.5 Acceptance criteria

In step b), the Terminal shall resend each disputed I-Block.

7.3.7 I-Block error detection

7.3.7.1 Definition and applicability

Information blocks are used to transfer command and response APDUs.

The I-blocks are denoted as follows: I(N(S), M) where:

- N(S) is the send-sequence number of the block.
- M is the more-data bit used in the chaining function.

For applicability of this test case see clause 3.8.

7.3.7.2 Conformance requirement

7.3.7.2.0 Description

When an I-block has been sent and a BWT time-out occurs or an invalid block has been received (with the terminal), an R-block is sent, which requests with its N(R) for the expected I-block with N(S)=N(R).

7.3.7.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.3.4.

7.3.7.3 Test purpose
To verify that the Terminal correctly handles the different types of invalid I-Blocks.

7.3.7.4 Method of test
7.3.7.4.1 Initial conditions
The Terminal shall be connected to the UICC simulator, and powered on.
ATR shall have been received and eventual PPS procedure successfully completed.

7.3.7.4.2 Procedure
a) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring reception of I-Blocks.
b) The UICC simulator shall send I-Blocks and generate the following errors:
   - Parity error.
   - NAD ≠ '00'.
   - PCB with wrong sequence number.
   - PCB of an R-Block.
   - PCB of an S-Block.
   - LEN error (= 'FF').
   - EDC error.
c) Following correct reception of the block sent by the Terminal, the UICC simulator shall retransmit the I-Block without error and complete the command (data + '9000' indicating correct execution of the command).

NOTE: Test can be achieved either by generating the errors in one session using chained blocks or through separate tests generating one error.

7.3.7.5 Acceptance criteria
In step b), the Terminal shall detect the invalid block and send an R-Block requesting retransmission of the last block (N(R)=sequence number of last I-Block).
In step c) the Terminal shall acknowledge reception of the I-Block without error.

7.3.8 R-Block error handling in non-chaining mode
7.3.8.1 Definition and applicability
Receive-ready blocks, R-blocks, are used to transfer acknowledgements.
The R-blocks are denoted as follows: R(N(R)), where:
   - N(R) is the number of the expected I-block.
For applicability of this test case see clause 3.8.
7.3.8.2 Conformance requirement

7.3.8.2.0 Description

When an R-block was sent and an invalid block is received or BWT time-out, the R-block will be resent.

7.3.8.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.3.4.


7.3.8.3 Test purpose

To verify that the Terminal handles the different types of invalid R-Blocks and correctly recovers while sending non-chained data.

7.3.8.4 Method of test

7.3.8.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

ATR shall have been received and eventual PPS procedure successfully completed.

7.3.8.4.2 Procedure

a) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring sending of a non-chained I-Block.

b) The UICC simulator shall assume the received block is invalid by sending an R-Block and generate the following errors:
   - Parity error.
   - NAD ≠ '00'.
   - PCB with wrong sequence number.
   - PCB with b6=1.
   - PCB of an S-Block.
   - LEN error.
   - EDC error.

c) Following correct reception of the block sent by the Terminal, the UICC simulator shall retransmit the R-Block without error.

7.3.8.5 Acceptance criteria

In step b) the Terminal shall detect the invalid block and send an R-Block requesting retransmission of the last block (N(R)=sequence number of invalid R-Block).

After step c), the Terminal shall resend the first I-Block.
7.3.9 R-Block error handling in chaining mode

7.3.9.1 Definition and applicability

Receive-ready blocks, R-blocks, are used to transfer acknowledgements.

The R-blocks are denoted as follows: \( R(N(R)) \), where:

- \( N(R) \) is the number of the expected I-block.

For applicability of this test case see clause 3.8.

7.3.9.2 Conformance requirement

7.3.9.2.0 Description

When an R-block was sent and an invalid block is received or BWT time-out, the R-block will be resent.

7.3.9.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.3.4.


7.3.9.3 Test purpose

To verify that the Terminal handles the different types of invalid R-Blocks and correctly recovers while sending chained data.

7.3.9.4 Method of test

7.3.9.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

ATR shall have been received and eventual PPS procedure successfully completed.

7.3.9.4.2 Procedure

a) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring sending of chained I-Blocks.

b) The UICC simulator shall send an invalid R-Block and generate the following errors:

- Parity error.
- NAD ≠ '00'.
- PCB with \( b_6 = 1 \).
- PCB of an S-Block.
- LEN error.
- EDC error.

c) Following correct reception of the block sent by the Terminal, the UICC simulator shall retransmit the R-Block without error.
7.3.9.5 Acceptance criteria
In step b) the Terminal shall detect the invalid block and send an R-Block requesting retransmission of the last block (N(R)=sequence number of invalid R-Block).
After step c), the Terminal shall send the rest of chained data (I-Block).

7.3.10 Successive errors in both directions

7.3.10.1 Definition and applicability
Receive-ready blocks, R-blocks, are used to transfer acknowledgements.
The R-blocks are denoted as follows: R(N(R)), where:
• N(R) is the number of the expected I-block.
For applicability of this test case see clause 3.8.

7.3.10.2 Conformance requirement
7.3.10.2.0 Description
When an R-block was sent and an invalid block is received or BWT time-out, the R-block will be resent.

7.3.10.2.1 Reference
ETSI TS 102 221 [1], clause 7.2.3.4.

7.3.10.3 Test purpose
To verify that the Terminal properly recovers after receiving and being notified errors successively.

7.3.10.4 Method of test
7.3.10.4.1 Initial conditions
The Terminal shall be connected to the UICC simulator, and powered on.
ATR shall have been received and eventual PPS procedure successfully completed.

7.3.10.4.2 Procedure
a) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring reception of I-Blocks.
b) The UICC simulator shall send an invalid I-Block.
c) Following correct reception of the block sent by the Terminal, the UICC simulator shall assume the received block is invalid by sending an R-Block, also invalid.
d) Following correct reception of the block sent by the Terminal:
  d-1) No error:
    d-1-1) The UICC simulator shall retransmit the I-Block without error and complete the command (data + '9000' indicating correct execution of the command).
d-2) Error assumed:
  
d-2-1) The UICC simulator shall assume the received block is invalid by sending an R-Block requesting retransmission (N(R)= correct sequence number of step c)).
  
d-2-2) Following correct reception of the block sent by the Terminal, the UICC simulator shall complete the command (data + '9000' indicating correct execution of the command).

7.3.10.5 Acceptance criteria

After step b) and c), the Terminal shall detect the invalid block and send an R-Block requesting retransmission of the last block (N(R)=sequence number of invalid I-Block).

After step d-2-1), the Terminal shall resend the previous R-Block with N(R)=sequence number of invalid I-Block.

After step d-1) and d-2-2), the Terminal shall acknowledge the error free I-Block(s).

7.3.11 Chaining - Abortion

7.3.11.1 Definition and applicability

Supervisory blocks, S-block, are used to send control information.

S-blocks are always used in pairs. A S(request) is always followed by a S(response) block:
  
  • S(ABORT request), a request to abort the chain function.
  
  • S(ABORT response), an acknowledge of the abortion of the chain function.

For applicability of this test case see clause 3.8.

7.3.11.2 Conformance requirement

7.3.11.2.0 Description

When an S(… request) has been sent and either a BWT time-out occurs (with the terminal) or the received response is not a S(… response), the S(… request) shall be resent. But if an S(… response) has been sent and either an invalid block is received or a BWT time-out occurs (with the terminal), an R-block shall be sent.

7.3.11.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.3.4.

ISO/IEC 7816-3 [2], clause 9.7.3, scenarios 26 and 27.

7.3.11.3 Test purpose

To verify that the Terminal correctly handles the abortion procedure in chaining mode.

7.3.11.4 Method of test

7.3.11.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

ATR shall have been received and eventual PPS procedure successfully completed.
7.3.11.4.2 Procedure

a) Terminal sends chained data:
   a-1) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring sending of chained I-Blocks.
   a-2) The UICC simulator shall acknowledge receipt of the first chained I-Block by sending an R-Block without error.
   a-3) Following receipt of the second I-Block, the UICC simulator shall send an S(ABORT request).
   a-4) The UICC simulator shall acknowledge receipt of the response and give back the Terminal the right to send (R-Block without error) and complete the next command.

b) UICC sends chained data:
   b-1) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring reception of chained I-Blocks.
   b-2) The UICC simulator shall transmit the first chained I-Block without error.
   b-3) Following correct reception of the block sent by the Terminal, the UICC simulator shall send an S(ABORT request).
   b-4) The UICC simulator shall acknowledge receipt of the response without error.
   b-5) The UICC simulator shall restart and complete the command (data + ‘9000’ indicating correct execution of the command).

7.3.11.5 Acceptance criteria

After steps a-3) and b-3), the Terminal shall send an S(ABORT response).

In step b-5) the Terminal shall acknowledge reception of the I-Blocks without error by sending R-Blocks with N(R)=sequence number of expected I-Block.

7.3.12 Block repetition and resynchronization

7.3.12.1 Definition and applicability

Resynchronization of the protocol may be attempted at three consecutive levels. If one level is unsuccessful, then the next level is tried:

- For the terminal, the three levels are:
  - Retransmission of blocks.
  - Use of S(RESYNCH request).
  - Card reset or deactivation.

Supervisory blocks, S-block, are used to send control information.

S-blocks are always used in pairs. A S(request) is always followed by a S(response) block:

- S(RESYNCH request), a request of a resynchronization.
- S(RESYNCH response), an acknowledge of the resynchronization.

For applicability of this test case see clause 3.8.
7.3.12.2 Conformance requirement

7.3.12.2.0 Description

When an S(… request) has been sent and either a BWT time-out occurs (with the terminal) or the received response is not a S(… response), the S(… request) shall be resent. But if an S(… response) has been sent and either an invalid block is received or a BWT time-out occurs (with the terminal), an R-block shall be sent.

If the terminal fails to receive an error-free block during a card-session, a maximum of two further attempts is allowed before a S(RESYNCH request) is sent.

7.3.12.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.3.4.
ISO/IEC 7816-3 [2], clause 9.7.3, scenarios 29, 30, 31, 32 and 34.

7.3.12.3 Test purpose

1) To verify that the Terminal resynchronizes the UICC if block repetition is unsuccessful.
2) To verify that the Terminal correctly handles an invalid response to an S(... request).

7.3.12.4 Method of test

7.3.12.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

ATR shall have been received and eventual PPS procedure successfully completed.

7.3.12.4.2 Procedure

a) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring sending of an I-Block.

b) Following receipt of the first I-Block, the UICC simulator shall send an erroneous block or be unresponsive.

c) Following correct reception of the block sent by the Terminal, the UICC simulator shall send two more erroneous blocks or remain unresponsive two more times:

   c-1) No error:
       c-1-1) Following correct reception of the block (S(RESYNCH request)) sent by the Terminal, the UICC simulator shall send a S(RESYNCH response), then complete the next command without error.

c-2) Error assumed:

   c-2-1) Following correct reception of the block (S(RESYNCH request)) sent by the Terminal, the UICC simulator shall send a S(RESYNCH response) and generate the following errors:

      - Parity error.
      - NAD ≠ '00'.
      - LEN error (≠ '01').
      - S(RESYNCH request) instead of S(RESYNCH response).
      - Other S(... response).
      - EDC error.
c-2-2) Following correct reception of the block (S(RESYNCH request)) sent by the Terminal, the UICC simulator shall send a S(RESYNCH response), then complete the next command without error.

### 7.3.12.5 Acceptance criteria

After step b), the Terminal shall send an R-Block requesting retransmission.

In step c), the Terminal shall send the same R-Block as in b) two more times, then initiate an S(RESYNCH request).

After step c-2-1), the Terminal shall resend an S(RESYNCH request).

### 7.3.13 UICC is unresponsive

#### 7.3.13.1 Definition and applicability

Resynchronization of the protocol may be attempted at three consecutive levels. If one level is unsuccessful, then the next level is tried:

- For the terminal, the three levels are:
  - Retransmission of blocks.
  - Use of S(RESYNCH request).
  - Card reset or deactivation.

For applicability of this test case see clause 3.8.

#### 7.3.13.2 Conformance requirement

##### 7.3.13.2.0 Description

After an ATR due to a Warm reset or successful PPS procedure, the communication between the terminal and the UICC can be initiated. But if the terminal fails to receive an error-free block, in the beginning of the protocol, a maximum of two more successive attempts to receive the block is allowed before resetting or a deactivation of the card takes place.

If the terminal fails to receive an error-free block during a card-session, a maximum of two further attempts is allowed before a S(RESYNCH request) is sent.

##### 7.3.13.2.1 Reference

ETSI TS 102 221 [1], clause 7.2.3.4.

ISO/IEC 7816-3 [2], clause 9.7.3, scenarios 33 and 35.

#### 7.3.13.3 Test purpose

To verify that the Terminal correctly resets or deactivates the UICC at the start of the protocol and during the protocol if resynchronization is unsuccessful.

#### 7.3.13.4 Method of test

##### 7.3.13.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, and powered on.

ATR shall have been received and eventual PPS procedure successfully completed.
7.3.13.4.2 Procedure

a) At the start of the protocol:
   a-1) Following receipt of the first block, the UICC simulator shall be unresponsive.
   a-2) Following correct reception of the block sent by the Terminal, the UICC simulator shall remain unresponsive two more times.

b) During the protocol:
   b-1) Following receipt of the first block by the UICC simulator, the Terminal shall be made to initiate a command requiring sending of an I-Block.
   b-2) Following receipt of the first I-Block, the UICC simulator shall be unresponsive.
   b-3) Following correct reception of the block sent by the Terminal, the UICC simulator shall remain unresponsive two more times.
   b-4) Following correct reception of the block (S(RESYNCH request)) sent by the Terminal, the UICC simulator shall remain unresponsive three more times.

7.3.13.5 Acceptance criteria

After step a-1), the Terminal shall:

- Send an R-Block if the first block it sent was an I-Block.
- Repeat the S-Block if the first block it sent was an S-Block.

In step a-2), the Terminal shall send the same block as in a-1) two more times, then reset or deactivate the UICC.

After step b-2), the Terminal shall send an R-Block with N(R)=sequence number of previous I-Block.

In step b-3), the Terminal shall send the same R-Block as in b-2) two more times, then initiate an S(RESYNCH request).

In step b-4), the Terminal shall resend S(RESYNCH request) two more times, then reset or deactivate the UICC.

8 Application dependent procedures

8.1 UICC presence detection

8.1.1 Definition and applicability

To ensure that the UICC has not been removed during a card session, the Terminal sends, at frequent intervals, a STATUS command during each voice call.

This procedure shall be used in addition to a mechanical or other device used to detect the removal of a UICC.
8.1.2 Conformance requirement

8.1.2.0 Description

A STATUS command shall be issued within all 30 seconds periods of inactivity on the UICC-Terminal interface during a voice call. Inactivity in this case is defined as starting at the end of the last communication or the last issued STATUS command. If no response data is received to this STATUS command, then the voice call shall be terminated as soon as possible but at least within 5 seconds after the STATUS command has been sent. If the DF indicated in response to a STATUS command is not the same as that which was indicated in the previous response, or accessed by the previous command, then the voice call shall be terminated as soon as possible but at least within 5 seconds after the response data has been received.

8.1.2.1 Reference

ETSI TS 102 221 [1], clause 14.5.2.

8.1.3 Test purpose

To verify that:

1) There are no periods of inactivity on the UICC-Terminal interface greater than 30 seconds during a call.

2) The Terminal terminates a voice call within 5 seconds at the latest after having received an invalid response to the STATUS command.

8.1.4 Method of test

8.1.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator.

All elementary files shall be coded as default.

8.1.4.2 Procedure

a) A call shall be set up using the generic voice call setup.

b) The UICC simulator shall monitor the time of periods of inactivity on the UICC-Terminal interface.

c) After 3 minutes, the voice call shall be cleared.

d) A call shall be set up using the generic voice call setup.

e) After one minute after the call was successfully set up, the UICC simulator shall respond to a STATUS command with the response data of the MF.

8.1.5 Acceptance criteria

1) During step b), the time of periods of inactivity on the UICC-Terminal interface shall not be longer than 30 seconds.

2) After step e), the Terminal shall terminate the voice call within 5 seconds at the latest after having received the wrong response to the STATUS command.
9  Commands

9.1  TERMINAL CAPABILITY

9.1.1  Additional interfaces support

9.1.1.1  Definition and applicability

Terminals supporting an interface in addition to the interface defined in ETSI TS 102 221 [1] shall indicate it to the UICC by issuing the TERMINAL CAPABILITY command with an additional interface support TLV object during a new card session before the first application selection.

For applicability of this test case see clause 3.8.

9.1.1.2  Conformance requirement

9.1.1.2.1  Description

Terminals supporting an interface in addition to the interface defined in the present document and present in the list below (e.g. the UICC-CLF interface as defined in ETSI TS 102 613 [6]) shall indicate it to the UICC by issuing the TERMINAL CAPABILITY command with an additional interface support TLV object during a new card session before the first application selection. The terminal supporting the SWP interface shall send a TLV object with tag '82' to indicate the support of the SWP interface before the first application selection.

The TERMINAL CAPABILITY command shall not be issued by the terminal if the Terminal capability mechanism is not indicated inside the supported system command field.

9.1.1.2.2  Reference

ETSI TS 102 221 [1], clauses 11.1.19.2.3 and 11.1.19.1.

9.1.1.3  Test purpose

To verify that the terminal which supports the SWP interface sends a TERMINAL CAPABILITY command indicating the interface supported before the first application selection.

9.1.1.4  Method of test

9.1.1.4.1  Initial conditions

The UICC simulator shall support the SWP interface.

The Terminal shall be connected to the UICC simulator.

The UICC simulator shall indicate support of the TERMINAL CAPABILITY command in the FCP for the MF.

9.1.1.4.2  Procedure

a)  Power on the Terminal.

b)  The UICC simulator shall send an ATR with a global interface byte tBi (i > 2) indicating the support of the SWP interface.

c)  The terminal shall retrieve the FCP of the MF of the UICC using a SELECT command or a STATUS command.

d)  The terminal sends a TERMINAL CAPABILITY command.
9.1.1.5 Acceptance criteria
In step d), the Terminal shall send TERMINAL CAPABILITY command indicating support of the SWP interface.

NOTE: Other commands may be sent by the terminal before the TERMINAL CAPABILITY command.

The terminal may send other TERMINAL CAPABILITY commands which do not include an Additional interfaces support TLV; such TERMINAL CAPABILITY commands shall be ignored for the purposes of this test case.

The terminal shall send the TERMINAL CAPABILITY command before the first application selection.

9.2 SUSPEND UICC

9.2.1 Support of the SUSPEND UICC command

9.2.1.1 SUSPEND UICC - Nominal Condition

9.2.1.1.1 Definition and applicability
A Terminal supporting the SUSPEND UICC command shall be capable of suspending and resuming the UICC as defined in ETSI TS 102 221 [1] if operated with a UICC indicating the support of the SUSPEND UICC command.

For applicability of the test case see clause 3.8.

9.2.1.1.2 Conformance requirement

9.2.1.1.2.1 Description
The Terminal can run a UICC suspension by issuing the SUSPEND UICC command.

Upon reception of the response indicating successful execution of the SUSPEND UICC command, the terminal shall deactivate the contacts of the UICC, storing the 8 byte Resume token sent by the UICC.

Within the maximum time duration for the suspension given by the UICC the Terminal resumes the UICC-Terminal interface. The Terminal performs the initial communication establishment procedures to allow the UICC to resume in the exact same condition it was in before the power supply was removed.

9.2.1.1.2.2 Reference
ETSI TS 102 221 [1], clauses 11.1.22 and 14.5.6.

9.2.1.1.3 Test purpose
1) To verify that the Terminal is issuing the SUSPEND UICC command correctly.
2) To verify that the Terminal is deactivating the contacts of the UICC-Terminal interface in the correct order (as defined in clause 5.1.3) after receiving the confirmation for the UICC suspension.
3) To verify that the Terminal is reactivating the UICC-Terminal interface within the maximum time frame negotiated with the UICC.
4) To verify that the Terminal is performing the initial communication establishment procedures as defined in ETSI TS 102 221 [1], clause 6:
   a) During establishment of the initial communication the Terminal is not issuing commands other than:
      - SELECT with P1 ≠ '04';
      - READ BINARY;
9.2.1.1.4 Method of test

9.2.1.1.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, where the UICC simulator indicates support of the SUSPEND UICC command in EFUMPC.

The UICC simulator shall indicate support of the TERMINAL CAPABILITY command in the FCP for the MF.

The PIN to verify the user at the NAA is disabled.

The Terminal shall be activated.

The test tool shall record any TERMINAL CAPABILITY command sent by the terminal.

The Terminal has selected an NAA present on the UICC. Any technology specific conditions for the Terminal to use the SUSPEND UICC command are met.

9.2.1.1.4.2 Procedure

a) The UICC simulator shall send the proactive command TIMER MANAGEMENT to start a timer for 24 hours.

b) The Terminal shall be made to suspend the UICC. Any conditions (for example: waiting for a timeout or suitable configuration of the Terminal) which would normally be required for the Terminal to suspend the UICC shall be satisfied (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7).

c) After reception of a SUSPEND UICC command with P1 = 'Suspend the UICC' the UICC simulator returns an 8 byte Resume token and the minimum time duration proposed by the terminal as the time duration for which it can be suspended.

d) The Terminal shall deactivate the UICC-Terminal interface.

e) The Terminal shall be made to resume the UICC (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7).

f) The Terminal shall activate the UICC-Terminal interface after the suspension.

g) The Terminal is performing the communication establishment procedures.

h) After reception of a SUSPEND UICC command with P1 = 'Resume the UICC' the UICC simulator shall restore the previous status and return '9000' (indicating correct execution of the command).

i) The UICC simulator shall send the proactive command TIMER MANAGEMENT to get the current value of the Timer.
NOTE: The maximum value (24 hours) for the timer set in the proactive command TIMER MANAGEMENT is used to ensure that the timer is still running after the resume. It is not intended that the test execution will last 24 hours.

9.2.1.1.5 Acceptance criteria

1) In step d) the Terminal shall deactivate the UICC-Terminal interface as defined in ETSI TS 102 221 [1], clause 4.5.2.

2) After step d) the Terminal shall keep the inactive contacts within the voltage range defined in ETSI TS 102 221 [1], clause 4.5.3.

3) In step e) the Terminal is activating the UICC-Terminal interface as defined in ETSI TS 102 221 [1], clause 4.5.2 within the time frame negotiated to be the time duration for the suspension in step c).

4) After step f), the terminal shall not re-select the network application.

5) During step g) The Terminal is successfully establishing the communication as defined in ETSI TS 102 221 [1] clause 6. Where the Terminal shall not issue commands other than:
   - SELECT with P1 ≠ '04'.
   - READ BINARY.
   - READ RECORD.
   - TERMINAL CAPABILITY:
     ▪ Where the TERMINAL CAPABILITY, if sent, shall be identical to the one sent in the Initial conditions.

6) After step i) the Terminal shall send a TERMINAL RESPONSE providing the current value of the timer started before the resume. The timer value returned shall be 24 hours minus the test execution time elapsed after ending the proactive command TIMER MANAGEMENT ± 1 minute.

9.2.1.2 SUSPEND UICC - Nominal Condition - Events

9.2.1.2.1 Definition and applicability

A Terminal supporting the SUSPEND UICC command shall be capable of suspending and resuming the UICC as defined in ETSI TS 102 221 [1] if operated with a UICC indicating the support of the SUSPEND UICC command.

For applicability of the test case see clause 3.8.

9.2.1.2.2 Conformance requirement

9.2.1.2.2.1 Description

The Terminal can run a UICC suspension by issuing the SUSPEND UICC command.

Upon reception of the response indicating successful execution of the SUSPEND UICC command, the terminal shall deactivate the contacts of the UICC, storing the 8 byte Resume token sent by the UICC.

Within the maximum time duration for the suspension given by the UICC the Terminal resumes the UICC-Terminal interface. The Terminal performs the initial communication establishment procedures to allow the UICC to resume in the exact same condition it was in before the power supply was removed.

9.2.1.2.2.2 Reference

ETSI TS 102 221 [1], clauses 11.1.22 and 14.5.6.
9.2.1.2.3 Test purpose

1) To verify that the Terminal is issuing the SUSPEND UICC command correctly.

2) To verify that the Terminal is deactivating the contacts of the UICC-Terminal interface in the correct order (as defined in clause 5.1.3) after receiving the confirmation for the UICC suspension.

3) To verify that the Terminal is reactivating the UICC-Terminal interface within the maximum time frame negotiated with the UICC

4) To verify that the Terminal is performing the initial communication establishment procedures as defined in ETSI TS 102 221 [1], clause 6:
   - During establishment of the initial communication the Terminal is not issuing commands other than:
     - SELECT with P1 ≠ '04';
     - READ BINARY;
     - READ RECORD;
     - TERMINAL CAPABILITY;
     before a SUSPEND UICC command with P1 = 'Resume the UICC' and the Resume token is sent.

5) To verify that the Terminal is sending the 8-byte Resume token provided by the UICC when it was suspended.

6) To verify that the Terminal is maintaining the logical status of the UICC as before the suspension and is resuming the UICC for the events for which it had previously registered:
   a) The Terminal shall not ask for a PIN verification for applications already verified.
   b) A Terminal supporting the SETUP EVENT LIST command shall provide information to the UICC as defined in ETSI TS 102 223 [7] at occurrence of a listed event.

9.2.1.2.4 Method of test

9.2.1.2.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, where the UICC simulator indicates support of the SUSPEND UICC command in EF\textsubscript{UMPC}.

The UICC simulator shall indicate support of the TERMINAL CAPABILITY command in the FCP for the MF.

The PIN to verify the user at the NAA is enabled.

The Terminal shall be activated.

The Terminal has selected an NAA present on the UICC. Any technology specific conditions for the Terminal to use the SUSPEND UICC command are met.

9.2.1.2.4.2 Procedure

a) When the Terminal is in mode PIN check, the valid PIN shall be entered.

b) The UICC simulator shall send the proactive command SETUP EVENT LIST for the event: User activity.

c) The Terminal shall be made to suspend the UICC. Any conditions (for example: waiting for a timeout or suitable configuration of the Terminal) which would normally be required for the Terminal to suspend the UICC shall be satisfied (see note related to O\textsubscript{ SUSPEND\_UICC} of table A.1 in clause 3.7).

d) After reception of a SUSPEND UICC command with P1 = 'Suspend the UICC' the UICC simulator returns an 8 byte Resume token and the minimum time duration proposed by the terminal as the time duration for which it can be suspended.

e) The Terminal shall deactivate the UICC-Terminal interface.
f) The Terminal shall be made to resume the UICC (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7).

NOTE: No user activity should be performed before step j).

g) The Terminal shall activate the UICC-Terminal interface after the suspension.

h) The Terminal is performing the communication establishment procedures.

i) After reception of a SUSPEND UICC command with P1 = 'Resume the UICC' the UICC simulator shall restore the previous status and return '9000' (indicating correct execution of the command).

j) When there is a period of inactivity on the UICC-Terminal interface longer than 20 seconds, the user shall press any key.

9.2.1.2.5 Acceptance criteria

1) In step e) the Terminal shall deactivate the UICC-Terminal interface as defined in ETSI TS 102 221 [1], clause 4.5.2.

2) After step e) the Terminal shall keep the inactive contacts within the voltage range defined in ETSI TS 102 221 [1], clause 4.5.3.

3) In step f) the Terminal is activating the UICC-Terminal interface as defined in ETSI TS 102 221 [1], clause 4.5.2 within the time frame negotiated to be the time duration for the suspension in step c).

4) After step g), the terminal shall not re-select the network application and shall not ask the user to verify the PIN.

5) During step h) The Terminal is successfully establishing the communication as defined in ETSI TS 102 221 [1] clause 6. Where the Terminal shall not issue commands other than:
   - SELECT with P1 ≠ '04'.
   - READ BINARY.
   - READ RECORD.
   - TERMINAL CAPABILITY.

6) After step i) and before step j) the Terminal shall not sent an ENVELOPE for the User activity event to the UICC simulator.

7) After step j) the Terminal shall send an ENVELOPE for the User activity event to the UICC simulator.

9.2.1.3 SUSPEND UICC - Suspension not supported by the UICC

9.2.1.3.1 Definition and applicability

A Terminal supporting the SUSPEND UICC command shall not cause the UICC suspension if the UICC is not indicating the support in EF_{UMPC}.

For applicability of the test case see clause 3.8.

9.2.1.3.2 Conformance requirement

9.2.1.3.2.1 Description

The Terminal does not issue the command if the UICC suspension mechanism is not indicated as supported by the UICC in the UICC Maximum Power Consumption file (EF_{UMPC}).
9.2.1.3.2.2 Reference
ETSI TS 102 221 [1], clause 11.1.22.

9.2.1.3.3 Test purpose
To verify that the Terminal is not issuing a SUSPEND UICC command if the support is not indicated in EF\textsubscript{UMPC}.

9.2.1.3.4 Method of test

9.2.1.3.4.1 Initial conditions
The Terminal shall be connected to the UICC simulator, where the UICC simulator shall not indicate support of the SUSPEND UICC command in EF\textsubscript{UMPC}.
The PIN to verify the user at the NAA is disabled.
The Terminal shall be activated.
The Terminal has selected an NAA present on the UICC.
Any technology specific conditions for the Terminal to use the SUSPEND UICC command are met.

9.2.1.3.4.2 Procedure
a) The UICC simulator shall monitor the activity on the UICC-Terminal interface.
b) After the conditions which would normally cause the Terminal to suspend the UICC are met, wait for 3 minutes.

9.2.1.3.5 Acceptance criteria
During step b) the Terminal shall not issue the SUSPEND UICC command or deactivate the UICC-Terminal interface.

9.2.1.4 SUSPEND UICC - Rejection of the UICC suspension with status word '6985'

9.2.1.4.1 Definition and applicability
A Terminal shall not deactivate the contacts of the UICC if the UICC has send status word '6985' in response to a SUSPEND UICC command with coding P1 = 'Suspend the UICC'.
For applicability of the test case see clause 3.8.

9.2.1.4.2 Conformance requirement

9.2.1.4.2.1 Description
The UICC can reject the SUSPEND UICC command with status word '6985' during an active proactive UICC session, or if there is any open BIP channel, or if a secure channel is in use, or due to internal reasons.

9.2.1.4.2.2 Reference
ETSI TS 102 221 [1], clause 11.1.22.

9.2.1.4.3 Test purpose
To verify that the Terminal is not deactivating the UICC-Terminal interface after receiving status word '6985' in response to a SUSPEND UICC command with coding P1 = 'Suspend the UICC'.
9.2.1.4.4 Method of test

9.2.1.4.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, where the UICC simulator indicates support of the SUSPEND UICC command in EF\_UMPC.

The UICC simulator shall indicate support of the TERMINAL CAPABILITY command in the FCP for the MF.

The PIN to verify the user at the NAA is disabled.

The Terminal shall be activated.

The Terminal has selected an NAA present on the UICC.

Any technology specific conditions for the Terminal to use the SUSPEND UICC command are met.

9.2.1.4.4.2 Procedure

a) The Terminal shall be made to suspend the UICC. Any conditions (for example: waiting for a timeout or suitable configuration of the Terminal) which would normally be required for the Terminal to suspend the UICC shall be satisfied (see note related to O\_SUSPEND\_UICC of table A.1 in clause 3.7).

b) After reception of a SUSPEND UICC command with P1 = 'Suspend the UICC' the UICC simulator sends status word '6985' in response.

c) Wait for 3 minutes.

9.2.1.4.5 Acceptance criteria

In step c) the Terminal shall not deactivate the UICC-Terminal interface.

9.2.1.5 SUSPEND UICC - Rejection of the UICC suspension with status word '9864'

9.2.1.5.1 Definition and applicability

A Terminal shall not deactivate the contacts of the UICC if the UICC has send status word '9864' in response to a SUSPEND UICC command.

For applicability of the test case see clause 3.8.

9.2.1.5.2 Conformance requirement

9.2.1.5.2.1 Description

The UICC can reject the SUSPEND UICC command with status word '9864' in response to a SUSPEND UICC command where the minimum duration requested by the terminal is too large to be accepted.

9.2.1.5.2.2 Reference

ETSI TS 102 221 [1], clause 11.1.22.

9.2.1.5.3 Test purpose

To verify that the Terminal is not deactivating the UICC-Terminal interface after receiving status word '9864' in response to a SUSPEND UICC command.
9.2.1.5.4 Method of test

9.2.1.5.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, where the UICC simulator indicates support of the SUSPEND UICC command in EF\textsubscript{UMPC}.

The UICC simulator shall indicate support of the TERMINAL CAPABILITY command in the FCP for the MF.

The PIN to verify the user at the NAA is disabled.

The Terminal shall be activated.

The Terminal has selected an NAA present on the UICC.

Any technology specific conditions for the Terminal to use the SUSPEND UICC command are met.

9.2.1.5.4.2 Procedure

a) The Terminal shall be made to suspend the UICC. Any conditions (for example: waiting for a timeout or suitable configuration of the Terminal) which would normally be required for the Terminal to suspend the UICC shall be satisfied (see note related to O\textsubscript{SUSPEND UICC} of table A.1 in clause 3.7).

b) After reception of a SUSPEND UICC command with P1 = 'Suspend the UICC' the UICC simulator sends the status word '9864' in response.

c) Wait for 3 minutes.

9.2.1.5.5 Acceptance criteria

In step c) the Terminal shall not deactivate the UICC-Terminal interface.

9.2.1.6 SUSPEND UICC - Rejection of the UICC resume with status word '6982'

9.2.1.6.1 Definition and applicability

A Terminal shall not try to restore the logical status as before the suspension or to resume the UICC for the events for which it had previously registered if the UICC sent status word '6982' in response to a SUSPEND UICC command with P1 = 'Resume the UICC'.

For applicability of the test case see clause 3.8.

9.2.1.6.2 Conformance requirement

9.2.1.6.2.1 Description

The UICC compares the Resume token passed by the Terminal with the token stored in its non-volatile memory. If the Resume token passed by the Terminal does not match the token stored the UICC will return status word '6982'.

9.2.1.6.2.2 Reference

ETSI TS 102 221 [1], clause 11.1.22.

9.2.1.6.3 Test purpose

To verify that the Terminal is not resuming the UICC for the file system state and for the events for which it had previously registered if the resume is rejected by the UICC.
9.2.1.6.4 Method of test

9.2.1.6.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, where the UICC simulator indicates support of the SUSPEND UICC command in EFUMPC.

The UICC simulator shall indicate support of the TERMINAL CAPABILITY command in the FCP for the MF.

The PIN to verify the user at the NAA is disabled.

The Terminal shall be activated.

The Terminal has selected an NAA present on the UICC.

Any technology specific conditions for the Terminal to use the SUSPEND UICC command are met.

9.2.1.6.4.2 Procedure

a) The UICC simulator shall send the proactive command TIMER MANAGEMENT to start a timer for 24 hours.

b) The Terminal shall be made to suspend the UICC. Any conditions (for example: waiting for a timeout or suitable configuration of the Terminal) which would normally be required for the Terminal to suspend the UICC shall be satisfied (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7).

c) After reception of a SUSPEND UICC command with P1 = 'Suspend the UICC' the UICC simulator returns an 8 byte Resume token and the minimum time duration proposed by the terminal as the time duration for which it can be suspended.

d) The Terminal shall deactivate the UICC-Terminal interface.

e) The Terminal shall be made to resume the UICC (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7)

f) The Terminal shall activate the UICC-Terminal interface.

g) The Terminal is performing the communication establishment procedures.

h) After reception of a SUSPEND UICC command with P1 = 'Resume the UICC' the UICC simulator sends status word '6982' in return.

i) The Terminal shall send TERMINAL PROFILE.

j) The Terminal shall select a network application present on the UICC.

k) The UICC simulator shall send the proactive command TIMER MANAGEMENT to get the current value of the Timer.

NOTE: The maximum value (24 hours) for the timer set in the proactive command TIMER MANAGEMENT is used to ensure that the timer is still running after the resume. It is not intended that the test execution will last 24 hours.

9.2.1.6.5 Acceptance criteria

1) After step k) the Terminal shall send a TERMINAL RESPONSE providing the message:

- 'Action in contradiction with the current timer state'.
9.2.1.7 SUSPEND UICC - Rejection of the UICC resume with status word '6982' - Events

9.2.1.7.1 Definition and applicability

A Terminal shall not try to restore the logical status as before the suspension or to resume the UICC for the events for which it had previously registered if the UICC sent status word '6982' in response to a SUSPEND UICC command with P1 = 'Resume the UICC'.

For applicability of the test case see clause 3.8.

9.2.1.7.2 Conformance requirement

9.2.1.7.2.1 Description

The UICC compares the Resume token passed by the Terminal with the token stored in its non-volatile memory. If the Resume token passed by the Terminal does not match the token stored the UICC will return status word '6982'.

9.2.1.7.2.2 Reference

ETSI TS 102 221 [1], clause 11.1.22.

9.2.1.7.3 Test purpose

To verify that the Terminal is not resuming the UICC for the file system state and for the events for which it had previously registered if the resume is rejected by the UICC.

9.2.1.7.4 Method of test

9.2.1.7.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, where the UICC simulator indicates support of the SUSPEND UICC command in EFUMPC.

The UICC simulator shall indicate support of the TERMINAL CAPABILITY command in the FCP for the MF.

The Terminal supports a keypad and the PIN to verify the user at the NAA is enabled.

The Terminal shall be activated.

The Terminal has selected an NAA present on the UICC.

Any technology specific conditions for the Terminal to use the SUSPEND UICC command are met.

9.2.1.7.4.2 Procedure

a) When the Terminal is in mode PIN check, the valid PIN shall be entered.

b) The UICC simulator shall send the proactive command SETUP EVENT LIST for the event: User activity.

c) The Terminal shall be made to suspend the UICC. Any conditions (for example: waiting for a timeout or suitable configuration of the Terminal) which would normally be required for the Terminal to suspend the UICC shall be satisfied (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7).

d) After reception of a SUSPEND UICC command with P1 = 'Suspend the UICC' the UICC simulator returns an 8 byte Resume token and the minimum time duration proposed by the terminal as the time duration for which it can be suspended.

e) The Terminal shall deactivate the UICC-Terminal interface.
f) The Terminal shall be made to resume the UICC (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7).

NOTE: No user activity should be performed before step k).

g) The Terminal shall activate the UICC-Terminal interface.

h) The Terminal is performing the communication establishment procedures.

i) After reception of a SUSPEND UICC command with P1 = 'Resume the UICC' the UICC simulator sends status word '6982' in return.

j) The Terminal shall send TERMINAL PROFILE.

k) The Terminal shall select a network application present on the UICC.

l) When the Terminal is in mode PIN check, the valid PIN shall be entered.

m) Wait for at least 2 minutes.

9.2.1.7.5 Acceptance criteria

1) During step m) the Terminal shall not send an ENVELOPE for the User activity event to the UICC simulator.

9.2.1.8 SUSPEND UICC - Rejection of the UICC resume with status word '6985'

9.2.1.8.1 Definition and applicability

A Terminal shall not try to restore the logical status as before the suspension or to resume the UICC for the events for which it had previously registered if the UICC sent status word '6985' in response to a SUSPEND UICC command with P1 = 'Resume the UICC'.

For applicability of the test case see clause 3.8.

9.2.1.8.2 Conformance requirement

9.2.1.8.2.1 Description

The UICC rejects the RESUME UICC command if it does not have a valid status to resume. To indicate the rejection the UICC will return status word '6985'.

9.2.1.8.2.2 Reference

ETSI TS 102 221 [1], clause 11.1.22.

9.2.1.8.3 Test purpose

To verify that the Terminal is not resuming the UICC for the file system state and for the events for which it had previously registered if the resume is rejected by the UICC.

9.2.1.8.4 Method of test

9.2.1.8.4.1 Initial conditions

The Terminal shall be connected to the UICC simulator, where the UICC simulator indicates support of the SUSPEND UICC command in EF_U MPC.

The UICC simulator shall indicate support of the TERMINAL CAPABILITY command in the FCP for the MF.

The PIN is disabled.
The Terminal shall be activated.

The Terminal has selected an NAA present on the UICC.

Any technology specific conditions for the Terminal to use the SUSPEND UICC command are met.

9.2.1.8.4.2 Procedure

a) The UICC simulator shall send the proactive command TIMER MANAGEMENT to start a timer for 24 hours.

b) The Terminal shall be made to suspend the UICC. Any conditions (for example: waiting for a timeout or suitable configuration of the Terminal) which would normally be required for the Terminal to suspend the UICC shall be satisfied (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7).

c) After reception of a SUSPEND UICC command with P1 = 'Suspend the UICC' the UICC simulator returns an 8 byte Resume token and the minimum time duration proposed by the terminal as the time duration for which it can be suspended.

d) The Terminal shall deactivate the UICC-Terminal interface.

e) The Terminal shall be made to resume the UICC (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7).

f) The Terminal shall activate the UICC-Terminal interface.

g) The Terminal is performing the communication establishment procedures.

h) After reception of a SUSPEND UICC command with P1 = 'Resume the UICC' the UICC simulator sends status word '6985' in return.

i) The Terminal shall send TERMINAL PROFILE.

j) The Terminal shall select a network application present on the UICC.

k) The UICC simulator shall send the proactive command TIMER MANAGEMENT to get the current value of the Timer.

NOTE: The maximum value (24 hours) for the timer set in the proactive command TIMER MANAGEMENT is used to ensure that the timer is still running after the resume. It is not intended that the test execution will last 24 hours.

9.2.1.8.5 Acceptance criteria

1) After step k) the Terminal shall send a TERMINAL RESPONSE providing the message: 'Action in contradiction with the current timer state'.

9.2.1.9 SUSPEND UICC - Rejection of the UICC resume with status word '6985' - Events

9.2.1.9.1 Definition and applicability

A Terminal shall not try to restore the logical status as before the suspension or to resume the UICC for the events for which it had previously registered if the UICC sent status word '6985' in response to a SUSPEND UICC command with P1 = 'Resume the UICC'.

For applicability of the test case see clause 3.8.

9.2.1.9.2 Conformance requirement

9.2.1.9.2.1 Description

The UICC rejects the RESUME UICC command if it does not have a valid status to resume. To indicate the rejection the UICC will return status word '6985'.
Reference
ETSI TS 102 221 [1], clause 11.1.22.

Test purpose
To verify that the Terminal is not resuming the UICC for the file system state and for the events for which it had previously registered if the resume is rejected by the UICC.

Method of test

Initial conditions

The Terminal shall be connected to the UICC simulator, where the UICC simulator indicates support of the SUSPEND UICC command in EFUMPC.

The UICC simulator shall indicate support of the TERMINAL CAPABILITY command in the FCP for the MF.

The Terminal supports a keypad and the PIN to verify the user at the NAA is enabled.

The Terminal shall be activated.

The Terminal has selected an NAA present on the UICC.

Any technology specific conditions for the Terminal to use the SUSPEND UICC command are met.

Procedure

a) When the Terminal is in mode PIN check, the valid PIN shall be entered.

b) The UICC simulator shall send the proactive command SETUP EVENT LIST for the event: User activity.

c) The Terminal shall be made to suspend the UICC. Any conditions (for example: waiting for a timeout or suitable configuration of the Terminal) which would normally be required for the Terminal to suspend the UICC shall be satisfied (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7).

d) After reception of a SUSPEND UICC command with P1 = 'Suspend the UICC' the UICC simulator returns an 8 byte Resume token and the minimum time duration proposed by the terminal as the time duration for which it can be suspended.

e) The Terminal shall deactivate the UICC-Terminal interface.

f) The Terminal shall be made to resume the UICC (see note related to O_SUSPEND_UICC of table A.1 in clause 3.7).

NOTE: No user activity should be performed before step k).

g) The Terminal shall activate the UICC-Terminal interface.

h) The Terminal is performing the communication establishment procedures.

i) After reception of a SUSPEND UICC command with P1 = 'Resume the UICC' the UICC simulator sends status word '6985' in return.

j) The Terminal shall send TERMINAL PROFILE.

k) The Terminal shall select a network application present on the UICC.

l) When the Terminal is in mode PIN check, the valid PIN shall be entered.

m) Wait for at least 2 minutes.

Acceptance criteria

1) During step m) the Terminal shall not send an ENVELOPE for the User activity event to the UICC simulator.
10 Application independent features

10.1 Logical secure element Interfaces

10.1.0 General test execution information

The following statements are applicable to all procedure clauses contained within clause 10.1:

- Some other specifications which reference ETSI TS 102 221 [1] may add additional TLVs to the command data or response data of MANAGE LSI (configure LSIs). Therefore, if the terminal is implemented according to such a specification then, unless otherwise specified:
  - Additional TLVs may be present in the command data of MANAGE LSI (configure LSIs), after the '80' and (if present) '81' TLVs.
  - The test tool shall add suitable additional TLVs to the response data of MANAGE LSI (configure LSIs), after the '80' and (if present) '81' TLVs.

10.1.1 Identification of Multiplexing mechanism

FFS

10.1.2 Identification of LSIs

FFS

10.1.3 Selection of an LSI

10.1.3.1 Selection of an LSI in T=0 using MANAGE LSI (select LSI)

FFS

10.1.3.2 Selection of an LSI in T=1 using MANAGE LSI (select LSI)

FFS

10.1.3.3 Selection of an LSI in T=1 using the NAD byte

10.1.3.3.1 Definition and applicability

If the T=1 protocol and multiple LSIs are supported, the terminal and the UICC can agree to use the NAD byte to indicate the LSI. The LSIs are identified by the combination of SAD and DAD values.

For applicability of this test case see clause 3.8.

10.1.3.3.2 Conformance requirement

10.1.3.3.2.1 Description

<table>
<thead>
<tr>
<th>RQ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ_1</td>
<td>The Terminal shall correctly discover the T=1 protocol and the Multiple LSIs support from the ATR</td>
</tr>
<tr>
<td>RQ_2</td>
<td>The Terminal shall correctly define the protocol and the number of LSIs to use and send the expected PPS1 and PPS2 values</td>
</tr>
<tr>
<td>RQ_3</td>
<td>The Terminal shall be capable to indicate an LSI by the NAD byte used</td>
</tr>
<tr>
<td>RQ_4</td>
<td>The Terminal shall be capable to identify an LSI by the NAD byte used</td>
</tr>
<tr>
<td>RQ_5</td>
<td>The Terminal shall be capable to select different LSI by changing the NAD byte</td>
</tr>
</tbody>
</table>
10.1.3.3.2.2 Reference
ETSI TS 102 221 [1], clauses 6.3.3, 6.4, 7.2.3.2.1.1 and 7.5.

10.1.3.3.3 Test purpose
To verify that the Terminal correctly uses the different NAD bytes for the LSI selection.

10.1.3.3.4 Method of test
10.1.3.3.4.1 Initial conditions
The Terminal shall be connected to the UICC (or UICC simulator).
The UICC (or UICC simulator) shall be configured with at least 2 LSIs and corresponding LSEs capable to respond to a SELECT MF command.

Expected MANAGE LSI (configure LSIs) command to be sent from a Terminal supporting T=1 and LSI selection by NAD byte:

<table>
<thead>
<tr>
<th>CLA</th>
<th>INS</th>
<th>P1</th>
<th>P2</th>
<th>Lc</th>
<th>Data</th>
<th>Le</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>7C</td>
<td>04</td>
<td>00</td>
<td>YY</td>
<td>80 01 XX 81 01 01</td>
<td>00</td>
</tr>
</tbody>
</table>

Where 'XX' is the highest LSI proposed by the Terminal in the range '01' to '1F'.

10.1.3.3.4.2 Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power on the UICC-Terminal interface</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Send ATR-LSI2 (as defined in clause 6.1.2.4.1 of the present document)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PPS request including transmission protocol selected and the PPS2 indicating the support of LSIs</td>
<td>RQ_1</td>
</tr>
<tr>
<td>4</td>
<td>PPS response confirming the Terminal's PPS request</td>
<td>RQ_3</td>
</tr>
</tbody>
</table>

Condition: If O_LSI_CONFIG_PRE_AGREED = TRUE, skip steps 5) and 6)

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Send expected MANAGE LSI (configure LSIs) command containing command data as specified in the initial condition clause.</td>
<td>RQ_2</td>
</tr>
<tr>
<td>6</td>
<td>Return status condition SW1 = '90', SW2 = '00' Send response data confirming the support of LSIs and the selection via NAD byte by the UICC (data = '80 01 01 81 01 01')</td>
<td>RQ_4</td>
</tr>
<tr>
<td>7</td>
<td>Send an I-Block with a C-APDU (e.g. SELECT MF command) addressing LSI 0 with NAD '00'</td>
<td>RQ_3</td>
</tr>
<tr>
<td>8</td>
<td>Return I-Block with SW1 = '90', SW2 = '00' to LSI 0 with NAD '00'</td>
<td>RQ_4</td>
</tr>
<tr>
<td>9</td>
<td>Initiate a switch to LSI 1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Send an I-Block with a C-APDU (e.g. SELECT MF command) addressing LSI 1 with NAD '10'</td>
<td>RQ_3</td>
</tr>
<tr>
<td>11</td>
<td>Return I-Block with SW1 = '90', SW2 = '00' to LSI 1 with NAD '01'</td>
<td>RQ_4</td>
</tr>
</tbody>
</table>

10.1.3.3.5 Acceptance criteria
The Terminal supporting T=1 and the LSI selection via NAD byte shall be capable to execute the procedure defined in clause 10.1.3.3.4 correctly.
Annex A (normative):
UICC simulator functional requirement

A.1 General
The UICC simulator shall implement the functions of an UICC as described in ETSI TS 102 221 [1].

A.2 Contacts C1, C3, C7

A.2.1 Default measurement/setting uncertainties
Unless stated otherwise below, the following uncertainties apply:

- Voltage measurement uncertainty: < ±50 mV
- Time measurement uncertainty: < ±100 ns

A.2.2 Contact C1
Continuous Spikes:

- Voltage measurement uncertainty: < ±100 mV
- Current Load Amplitude: 0 mA to 20 mA
- Adjustable Step Size: 1 mA
- Uncertainty: < ±1 mA
- Additional Current Offset: 0 mA to 5 mA
  - Adjustable Step Size: 1 mA
  - Uncertainty: < ±1 mA
- Pulse Width: 100 ns to 500 ns
  - Adjustable Step Size: 50 ns
  - Uncertainty: < ±25 ns
  - Rise and Fall Time: ≤ 50 ns
- Pause Width: 100 ns to 500 ns
  - Adjustable Step Size: 50 ns
  - Uncertainty: < ±25 ns

Random Spikes:

- Voltage measurement uncertainty: < ±100 mV
- Current Load Amplitude: 50 mA to 200 mA
- Adjustable Step Size: 1 mA
- Uncertainty: < ±1 mA
Additional Current Offset: 0 mA to 5 mA
Adjustable Step Size: 1 mA
Uncertainty: < ±0,1 mA
Pulse Width: 100 ns to 500 ns
Adjustable Step Size: 50 ns
Uncertainty: < ±25 ns
Rise and Fall Time: ≤ 50 ns
Pause Width: 0,1 ms to 500 ms, randomly varied
Adjustable Step Size: 0,1 ms
Uncertainty: < ±0,1 ms

A.2.3 Contact C7
The Elementary Time Unit (etu) used in the clauses below refer to the nominal bit duration on the I/O line, as defined in ISO/IEC 7816-3 [2]:

Voltage setting uncertainty: < ±25 mV
Rise and fall Time setting uncertainty: < ±100 ns
Jitter measurement uncertainty: < ±5 × 10^{-3} etu
Jitter setting uncertainty: < ±5 × 10^{-3} etu

A.2.4 Contact C3

Frequency measurement uncertainty: < ±0,5 %
Voltage Measurement uncertainty: < ±50 mV
Rise and fall time measurement uncertainty: < ±5 ns
Duty cycle:

Measurement range: 35 % to 65 %
Measurement uncertainty: < ±2,5 %

A.3 Definition of timing
It shall be possible to define all timings relative to the clock. The UICC simulator shall be able to calculate and to use the absolute values automatically, even if the Terminal changes the frequency during the communication.
Annex B (informative):
Change history

The table below indicates all change requests that have been incorporated into the present document since it was created by TC SET (formerly TC SCP).

<table>
<thead>
<tr>
<th>Date</th>
<th>Meeting</th>
<th>Doc</th>
<th>CR</th>
<th>Rev</th>
<th>Cat</th>
<th>Subject/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-06</td>
<td>SCP-06</td>
<td>SCP-010156</td>
<td></td>
<td></td>
<td></td>
<td>TSG-T #11 agreed to transfer the contents of the test specification, 3GPP TS 31.120 to EP SCP. V1.0.0 is submitted to EP SCP for approval. It contains only editorial changes compared to 3GPP TS 31.120 V3.0.0.</td>
</tr>
<tr>
<td>2001-06</td>
<td>SCP-06</td>
<td>SCP-010194</td>
<td></td>
<td></td>
<td></td>
<td>Undoing a change regarding the coding conventions in clause 3.4.</td>
</tr>
<tr>
<td>2001-06</td>
<td>SCP-06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EP SCP agreed that V1.0.1 was ready to be put under change control. As a result, V3.0.0 was created.</td>
</tr>
<tr>
<td>2001-07</td>
<td>SCP-06</td>
<td>SCP-010193</td>
<td>001</td>
<td>B</td>
<td></td>
<td>Alignment with Rel-4 version of core specification (UICC current consumption values for 3V and 1,8V).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SCP-010200</td>
<td>002</td>
<td>F</td>
<td></td>
<td>Correction of ATR examples regarding DCB and T4</td>
</tr>
<tr>
<td>2002-03</td>
<td>SCP-09</td>
<td>SCP-020052</td>
<td>003</td>
<td>F</td>
<td></td>
<td>Correction of Errors in UICC type recognition</td>
</tr>
<tr>
<td>2003-01</td>
<td>SCP-12</td>
<td>SCP-030013</td>
<td>005</td>
<td>F</td>
<td></td>
<td>Correction of clause numbering of ACK, NACK, NULL procedure bytes and correction of CHV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SCP-030062</td>
<td>006</td>
<td>D</td>
<td></td>
<td>Remove UICC as an abbreviation to align with 3GPP TR 21.905</td>
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<tr>
<td>2003-09</td>
<td>SCP-14</td>
<td>SCP-030288</td>
<td>007</td>
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<td>Upgrade to Rel-5 version of the specification</td>
</tr>
<tr>
<td>2004-05</td>
<td>SCP-17</td>
<td>SCP-040284</td>
<td>010</td>
<td>A</td>
<td></td>
<td>Removal of test 6.4 and modification of the numbering order of electrical tests in clause 5.2</td>
</tr>
<tr>
<td>2004-09</td>
<td>SCP-18</td>
<td>SCP-040376</td>
<td>015</td>
<td>A</td>
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<td>Removal of transmit for WWT exceeded in test 7.2.1</td>
</tr>
<tr>
<td>2004-11</td>
<td>SCP-19</td>
<td>SCP-040489</td>
<td>020</td>
<td>A</td>
<td></td>
<td>Non-specific Referencing</td>
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<tr>
<td></td>
<td></td>
<td>SCP-040492</td>
<td>023</td>
<td>A</td>
<td></td>
<td>Modification of test 7.3.2 Block Timing</td>
</tr>
<tr>
<td>2005-06</td>
<td>SCP-21</td>
<td>SCP-050129</td>
<td>026</td>
<td>F</td>
<td></td>
<td>Correction of test case 7.3.9</td>
</tr>
<tr>
<td>2005-09</td>
<td>SCP-22</td>
<td>SCP-050131</td>
<td>029</td>
<td>F</td>
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<td>Correction of test case 7.3.11</td>
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<td></td>
<td></td>
<td>SCP-050186</td>
<td>032</td>
<td>F</td>
<td></td>
<td>Correction of references to ISO/IEC 7816-3</td>
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<tr>
<td></td>
<td></td>
<td>SCP-050297</td>
<td>035</td>
<td>A</td>
<td></td>
<td>Change of internal references</td>
</tr>
<tr>
<td>2006-03</td>
<td>SCP-25</td>
<td>SCP-060160</td>
<td>038</td>
<td>A</td>
<td></td>
<td>Removal of test case 5.1.5.5</td>
</tr>
<tr>
<td>2007-01</td>
<td>SCP-29</td>
<td>SCP-070062</td>
<td>041</td>
<td>A</td>
<td></td>
<td>Essential correction of &quot;Chaining - IFSD management&quot; test case</td>
</tr>
<tr>
<td>2007-10</td>
<td>SCP-33</td>
<td>SCP-070446</td>
<td>049</td>
<td>F</td>
<td></td>
<td>CR to ETSI TS 102 230, Rel-5: Adding an applicability table to generate a base for a combined Rel-5 to Rel-7 test specification. Note: incorrect CR number renumbered from 42 to 49</td>
</tr>
<tr>
<td>2008-07</td>
<td>SCP-38</td>
<td>SCP-080337</td>
<td>047</td>
<td>A</td>
<td></td>
<td>CR 102 230 Rel-5 Essential correction of ATR coding</td>
</tr>
<tr>
<td>2008-10</td>
<td>SCP-39</td>
<td>SCP-080414</td>
<td>050</td>
<td>F</td>
<td></td>
<td>Correction of cl. 5.2 chapter numbering</td>
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<td>2009-04</td>
<td>SCP-41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Upgrade of the specification to Rel-7</td>
</tr>
<tr>
<td>2009-04</td>
<td>SCP-41</td>
<td>SCP-090180</td>
<td>053</td>
<td>B</td>
<td></td>
<td>Addition of a test case: analysing rise- and fall-time when a low impedance buffer is selected.</td>
</tr>
<tr>
<td>2010-03</td>
<td>SCP-44</td>
<td>SCP(10)0065</td>
<td>055</td>
<td>F</td>
<td></td>
<td>Creation of REL 8 of ETSI TS 102 230</td>
</tr>
<tr>
<td>2013-03</td>
<td>SCP-45</td>
<td>SCP(10)0116</td>
<td>059</td>
<td>F</td>
<td></td>
<td>Correction of maximum allowed rise/fall time on contact C7 in test 5.2.5.2</td>
</tr>
<tr>
<td>2013-03</td>
<td>SCP-58</td>
<td>SCP(13)000016</td>
<td>061</td>
<td>F</td>
<td></td>
<td>Enhancement of TC 7.2.2 with regards to NULL procedure byte</td>
</tr>
<tr>
<td>2013-03</td>
<td>SCP-57</td>
<td>SCP(12)000229</td>
<td>060</td>
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<td>Creation of ETSI TS 102 230 REL-9</td>
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<td>2014-02</td>
<td>SCP-62</td>
<td>SCP(14)000099</td>
<td>063</td>
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Annex C (informative):
Core specification version information

Unless otherwise specified, the versions of ETSI TS 102 221 [1] which have been taken into consideration for the present document are as follows.

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## History

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