ETSI TS 103 192-2 V1.1.1 (2018-09)



Intelligent Transport Systems (ITS); Testing; Interoperability test specifications for ITS V2X use cases; Part 2: Test Suite Structure and Test Purposes (TSS & TP) Reference DTS/ITS-47

Keywords

interoperability, ITS, testing, TSS&TP

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 2 of a multi-part deliverable covering C-ITS test specification for automated interoperability testing as identified below:

- Part 1: "Test requirements and Interoperability Feature Statement (IFS) pro forma";
- Part 2: "Test Suite Structure and Test Purposes (TSS & TP)";
- Part 3: "Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".

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1 Scope

The present document provides parts of the Test Suite Structure and Test Purposes (TSS & TP) for ITS Interoperability scenarios. The objective of the present document is to provide a basis for automated interoperability testing.

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.

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

[1]	IEEE 802.11 TM -2012: "IEEE Standard for Information technology - Telecommunications and information exchange between systems Local and metropolitan area networks - Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".
[2]	ETSI EN 302 636-4-1: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to- multipoint communications; Sub-part 1: Media-Independent Functionality".
[3]	ETSI EN 302 637-2: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service".
[4]	ETSI EN 302 637-3: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service".
[5]	ETSI EN 302 663 (V1.2.1): "Intelligent Transport Systems (ITS); Access layer specification for Intelligent Transport Systems operating in the 5 GHz frequency band".

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.

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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.

- [i.1] ETSI EG 202 798: "Intelligent Transport Systems (ITS); Testing; Framework for conformance and interoperability testing".
- [i.2] ETSI TR 103 193: "Intelligent Transport Systems (ITS); Testing; Interoperability test specifications for ITS V2X use cases; Architecture of ITS Interoperability Validation Framework".

3 Definitions and abbreviations

3.1 Definitions

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

host vehicle: vehicle equipped with an OBU

3.2 Abbreviations

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

ATS	Abstract Test Suite
BO	Inopportune test events for Behaviour tests
BTP	Basic Transport Protocol
BV	Valid test events for Behaviour tests
CA	Cooperative Awareness
CAM	Cooperative Awareness Message
CBF	Contention Based Forwarding
CCH	Control Channel
CF	Configuration
CRW	Collision Risk Warning
DAD	Duplicate Address Detection
DEN	Decentralized Environmental Notification
DENM	Decentralized Environmental Notification Message
EUT	Equipment Under Test
GBC	Geographically-Scoped Broadcast
GMC	Geo-broadcast Message Caching
GN	GeoNetworking
GPS	Global Positioning System
HMI	Human Machine Interface
IFS	Interoperability Feature Statement
IoT	Internet of Things
ISO	International Organization for Standardization
ITS	Intelligent Transport Systems
ITS-S	11S Station
ITS-S	115 Station
NOTE: Can be	e either RSU or OBU.
NOTE: Can be	e either RSU or OBU.
NOTE: Can be	e either RSU or OBU.
ITS-S NOTE: Can be LL MAC	e either RSU or OBU. Link Layer Media Access Control
ITS-S NOTE: Can be LL MAC MFW	e either RSU or OBU. Link Layer Media Access Control Message Forwarding
ITS-S NOTE: Can be LL MAC MFW NBD	e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection
ITS-S NOTE: Can be LL MAC MFW NBD OBU	e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO	e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY NICC	e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS	e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL DWG	e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL RHS DOU	 ITS Station e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit Road Hazard Signals
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL RHS RSU	ITS Station e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit Road Hazard Signals Road Side Unit
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL RHS RSU RWW	e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit Road Hazard Signals Road Side Unit Road Works Warning configuration
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL RHS RSU RWW SCF	e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit Road Hazard Signals Road Side Unit Road Works Warning configuration Store Carry & Forward
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL RHS RSU RWW SCF SHB	 ITS Station e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit Road Hazard Signals Road Side Unit Road Works Warning configuration Store Carry & Forward Single Hop Broadcast
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL RHS RSU RWW SCF SHB SVW	ITS Station e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit Road Hazard Signals Road Side Unit Road Works Warning configuration Store Carry & Forward Single Hop Broadcast Stationary Vehicle Warning
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL RHS RSU RWW SCF SHB SVW TD	ITS Station e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit Road Hazard Signals Road Side Unit Road Works Warning configuration Store Carry & Forward Single Hop Broadcast Stationary Vehicle Warning Test Description
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL RHS RSU RWW SCF SHB SVW TD TI	ITS Station e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit Road Hazard Signals Road Side Unit Road Works Warning configuration Store Carry & Forward Single Hop Broadcast Stationary Vehicle Warning Test Description Timer tests
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL RHS RSU RWW SCF SHB SVW TD TI TI TP	ITS Station e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit Road Hazard Signals Road Side Unit Road Works Warning configuration Store Carry & Forward Single Hop Broadcast Stationary Vehicle Warning Test Description Timer tests Test Purposes
ITS-S NOTE: Can be LL MAC MFW NBD OBU PCO PHY PICS RHL RHS RSU RWW SCF SHB SVW TD TI TI TP TSS	ITS Station e either RSU or OBU. Link Layer Media Access Control Message Forwarding Neighbours Detection On Board Unit Point of Communication Observable PHYsical layer Protocol Implementation Conformance Statement Remaining Hop Limit Road Hazard Signals Road Side Unit Road Works Warning configuration Store Carry & Forward Single Hop Broadcast Stationary Vehicle Warning Test Description Timer tests Test Purposes Test Suite Structure

4 Conventions

4.1 Interoperability test process

4.1.1 Introduction

The goal of interoperability test is to check that devices resulting from protocol implementations are able to work together and provide the functionalities provided by the protocols. As necessary, one message may be checked during a test, when a successful functional verification may result from an incorrect behaviour for instance.

A test session can engage one or more EUT. A EUT can be an ITS-S equipment such as a vehicle or a road-side unit or a Central ITS-S. All EUTs are provided by different vendors.

Each EUT provides one or more PCOs according to its role (e.g. vehicle, traffic light, road side unit, etc.). A PCO can be used either to monitor the communication traffic at this interface or to inject protocol messages as stimuli or both.

In order to execute the test, any EUT is connected to two types of network:

- The ITS G5 network for communication between EUTs as defined in [1].
- The configuration network used for communication between EUTs and the Test System as defined in [i.2].

5 Test configuration

5.1 Areas definitions

The clauses below describes the different radio configurations required to execute the AUTO_IOT tests.

Different areas are considered for these tests, e.g.:

- The Geonetworking area which is the ITS G5 radio curvature area.
- The Relevance area which is an area defined for each protocol message such as DENM.

NOTE: The default configuration is the configuration to use when no specific configuration is indicated.

5.2 Common rules

5.2.0 General

All the tests require usage of common rules.

5.2.1 Radio rules definitions

All messages defined in the present document shall be sent on the channel type G5-CCH with the channel number 180, see ETSI EN 302 663 [5].

On-link: EUTs are in radio range and have exchanged CAMs and built a neighbour table.

Off-link: EUTs are outside radio range.

NOTE: It is applicable only for real-time testing mode.

5.2.2 GPS rules definitions

All messages indicating fixed or relative GPS coordinates shall contain well-formatted data, this include the altitude and confident data.

5.2.3 Conformance checks rules definitions

The following basic conformance checks apply for all interoperability tests:

- CAM protocol:
 - ItsPduHeader check
 - Mandatory protocol IEs
- DENM protocol:
 - ItsPduHeader check
 - Mandatory protocol IEs
- BTP protocol:
 - BTP-A/BTP-B type
 - Destination port
- Geonetworking protocol:
 - GN address
 - Position vector content
 - Hop limit decreasing
 - Mandatory protocol IEs

5.3 Triggered messages

Triggered messages are used to indicate:

- 1) An action to be executed on the EUT (from the Test System to the EUT)
- 2) Or to confirm the execution of an action (from the EUT to the Test System)
- 3) Or to indicate an event at the HMI level (from the EUT to the Test System)
- 4) Or to indicates any unsolicited message (from the EUT to the Test System)

In case of real time execution, the vendor shall implement the different triggering interface [i.2].

NOTE: In case of post-mortem execution, these message are not sent.

5.4 Test configuration overview

5.4.0 General

The clauses below describe the different radio configurations required to execute the AUTO_IOT tests.

5.4.1 CF-01: Verify complete forwarding message scenario

There are two independent geonetworking areas defined:

- 1) EUT1 is the source
- 2) EUT2 is closer to TARGET_GEOAREA than EUT3
- 3) EUT4 is in the destination area (TARGET_GEOAREA)
- 4) EUT1, EUT2 and EUT3 are on-link
- 5) EUT2, EUT3 and EUT4 are on-link
- 6) EUT1 and EUT4 are off-link



Figure 1: DEN message forward

5.4.2 CF-02: Road Works Warning configuration

- 1) EUT1 and EUT2 are on-link.
- 2) EUT1 and EUT2 are located in the same Geonetworking area.
- 3) EUT1 acts as a RSU.
- 4) EUT2 acts as a vehicle.
- 5) EUT2 is moving from Start position to End position.



Figure 2: Road Works Warning configuration

5.4.3 CF-03: CA messages

- 1) EUT1, EUT2 and EUT3 are on-link.
- 2) EUT1, EUT2 and EUT3 are located in the same Geonetworking area.
- 3) EUT1, EUT2 and EUT3 act as vehicle.
- 4) EUT1, EUT2 and EUT3 are moving.

5.4.4 CF-04: Intersection Collision Warning configuration

- 1) EUT1 and EUT2 are on-link.
- 2) EUT1 and EUT2 are located in the same Geonetworking area.
- 3) EUT1 (vehicle) in moving from Start1 position to End1 position.
- 4) EUT2 (vehicle) in moving from Start2 position to End2 position.
- 5) Positions POS0 and POS1 are located at the same distance from the intersection.
- 6) EUT1 respectively EUT2 shall pass the position POS0 respectively POS1 at the same time.



Figure 3: Road Works Warning configuration

6 Test Suite Structure (TSS)

6.1 Structure of tests

Table 1 shows the AUTO_IOT Test Suite Structure (TSS) including its subgroups defined for conformance testing.

Table 1: TSS for AUTO_IOT

Root	Group	Sub-group	Category
AUTO_IOT	DENM protocol	Forwarding	Valid and Inopportune
		Road Works Warning	Valid and Inopportune
		Road Hazard Signal	Valid and Inopportune
		Stationary Vehicle Warning	Valid and Inopportune
		Geo-broadcast message caching	Valid and Inopportune
	CAM protocol	Neighbours detection	Valid and Inopportune
		Collision Risk Warning	Valid and Inopportune
	GN protocol	Duplicate Address Detection	Valid and Inopportune

The test suite is structured as a tree with the root defined as AUTO_IOT. The tree is of rank 3 with the first rank a Group, the second a sub-group and the third a category. The third rank is the standard ISO conformance test categories.

6.2 Test groups

6.2.0 General

The test suite has a total of three levels. The first level is the root. The second level separates the root into various functional areas. The third level is the standard ISO conformance test categories.

6.2.1 Root

The root identifies AUTO_IOT Abstract Test Suite.

6.2.2 Test group

This level identifies the major ITS protocol referred by the test.

6.2.3 Test sub-group

This level identifies the sub categories of each Group.

6.2.4 Categories

This level contains the standard ISO conformance test categories: behaviour for valid, invalid, inopportune events and timers.

7 Test Description (TD)

7.1 Introduction

7.1.1 TD definition conventions

The TDs are defined by the rules shown in Table 2.

Table 2: TD definition rules

TD Id The TD ID is a unique identifier. It shall be specified according to the TD naming conventions					
	defined in clause 6.1.				
Test scenario	Short description of test purpose objective according to the requirements from the base				
	standard.				
Reference The reference indicates the sub-clauses of the reference standard specifications in which the					
conformance requirement is expressed.					
Config Id	The configuration required to execute the test				
PICS Selection	Reference to the PICS statement involved for selection of the TD. Contains a Boolean				
	expression.				
Pre-test conditions					
The pre-conditions defines in which initial state the EUT has to be to apply the actual TD. In the corresponding Test					
Case, when the execution of the initial condition does not succeed, it leads to the assignment of an Inconclusive					
verdict.					

Test sequence					
Fest Sequence: Step Type Description			Description		
	Steps	Stimuli or	Stop deparintion		
	numbers	Verify action			
	Pseudocode				
Definition of the events, which are parts of the TD scenario, and the EUT are expected to perform in order to conform to					
the base specification. In the corresponding Test Case, Pass or Fail verdicts can be assigned there.					
Comments Possible additional comments such as specific preamble or postamble.					
(optional)					
Notes	Addition	al notes such a	as implementation notes/remarks.		
(optional)					

7.1.2 TD Identifier naming conventions

The identifier of the TD is built according to Table 3.

Table 3: T	D naming	convention
------------	----------	------------

Identifier:	TD_ <root>_<gr>_<x>_<nn></nn></x></gr></root>		
	<root> = root</root>	AUTO_IOT	ITS interoperability testing
	<gr> = group</gr>	CAM	CAM messages testing
		DENM	DENM message testing
	<sgr> = sub-group</sgr>	MFW	Message forwarding
		RWW	Road Works Warning
		RHS	Road Hazard Signal
		SVW	Stationary Vehicle Warning
		GMC	Geo-broadcast message caching
		NBD	Neighbours detection
		CRW	Collision risk Warning
		DAD	Duplicate Address Detection
	<x> = type of testing</x>	BV	Valid Behaviour tests
		BO	Invalid Syntax or Behaviour Tests
		TI	Timer tests
	<nn> = sequential number</nn>		01 to 99

7.1.3 Rules for the behaviour description

The description of the TD is built according to ETSI EG 202 798 [i.1].

In the TD the following wordings are used:

- "The EUT is requested to send": an upper layer requests the geonetworking layer to send a packet
- "The EUT generates": for internal events generation, i.e. Beacon packets
- "The EUT sends": a message such as CA or DEN message was sent by the EUT
- "The EUT receives": for packets coming from the network and given by the lower layer
- "The EUT already indicates": an upper layer indication is sent indicating some driver display information
- "The EUT still indicates": an upper layer indication was previously sent, and the same upper layer indication is sent
- "The EUT stops indicating": an upper layer indication is sent, not indicating some driver display information

7.2 Test purposes

7.2.1 Introduction

The legend below applies for all figures of this clause.

GREEDY EUT in configured to use Greedy algorithm	
CBF EUT in configured to use CBF algorithm	
SIMPLE EUT in configured to use SIMPLE algorithm	
Contention timer started (CBF algorithm only)	
Contention timer stopped (CBF algorithm only)	
Message discarded (duplicated or message outside of the	e area)

7.2.2 DEN message - Forwarding



Figure 4: GREEDY/GREEDY/GREEDY forwarding

TD Id	TD_AUT	TD_AUTO_IOT_DENM_MFW_BV_01			
Test scenario	Verify co	Verify complete forwarding message scenario (GREEDY, GREEDY, GREEDY) - See Figure 4			
Reference	ETSI EN	302 636-4-1	[2], annex D & clause E.2		
Config Id	CF-01				
PICS Selection					
			Pre-test conditions		
 itsGnNonAre 	aForward	ingAlgorithm o	f EUT1 (source) set to GREEDY		
 itsGnNonAre 	aForward	ingAlgorithm o	f EUT2 (forwarder) set to GREEDY		
 itsGnNonAre 	aForward	ingAlgorithm o	f EUT3 (neighbour) set to GREEDY		
 itsGnNonAre 	aForward	ingAlgorithm o	f EUT4 is SIMPLE		
			Test sequence		
Test Sequence:	Step	Туре	Description		
	1	stimulus	EUT1 (source) is requested to send a DEN message		
	2	verify	EUT1 (source) sends the GeoBroadcast packet containing DEN		
			message to LL address of EUT2 (forwarder)		
	3	verify	EUT2 (forwarder) receives the GeoBroadcast packet containing DEN		
			message		
	4	verify	EUT3 (neighbour) does not receive the GeoBroadcast packet, since it is		
			addressed to the EUT2 (forwarder) LL address		
	5	verify	EUT2 (forwarder) sends the GeoBroadcast packet containing DEN		
			message to LL address of EUT4		
	6	verify	EUT4 indicates that the DEN message has been received		
	7	verify	EUT4 broadcasts the GeoBroadcast packet containing DEN		
	8	verify	EUT2 (forwarder) and EUT3 (neighbour) receive the broadcasted		
			GeoBroadcast packet and discard the packet		

Pseudocode
with {
itsGnNonAreaForwardingAlgorithm of FUT1 set to GREEDY
itsGnNonAreaForwardingAlgorithm of EUT2 set to GREEDY
itsGnNonAreaForwardingAlgorithm of EUT2 set to GREEDY
itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE
j ensure that (
when f
ELITI is requested to send DEN message
anopsulated in a GRC packat
containing Racio Hoador
containing Date Header
indicating KTL lield
containing Destination Area
f then (
ELITI sends a GBC packet
containing Data Field
containing Dectingtion Area
containing Payload
containing Lapload
onconsulated in a LL nacket
containing a dectination MAC address
indicating the ELIT2 address
/ / when (
ELIT2 receives the GBC packet from ELIT1
Lorz receives the GDO packet non Lorr
then {
FLIT2 sends a GBC packet
containing Basic Header
containing RHL field
indicating value decreased by 1
containing DestinationArea
indicating the TARGET GEOAREA
containing Payload
containing the DEN message
encapsulated in a LL packet
containing a destination MAC address
indicating the EUT4 address
and EUT3 does not receive the GBC packet from EUT1
}
when {
EUT4 receives the GBC packet from EUT2
containing Basic Header
containing RHL field
indicating value decreased by 1
containing DestinationArea
indicating the TARGET_GEOAREA
containing Payload
containing the DEN message
) then (
ELITA provides the DEN measure to upper lovers
end El 174 gende a CRC pagingt
contribute and a GBC packet
containing Dasic Ficadel
indicating value decreased by 1
containing DestinationArea
indicating the TARGET GEOADEA
containing the DEN message
encapsulated in a LL packet
containing a destination MAC address

indicating broadcast address	
}	
when {	
EUT2 receives the GBC packet from EUT4	
}	
then {	
EUT2 discards the GBC packet	
}	
when {	
EUT3 receives the GBC packet from EUT4	
}	
then {	
EUT3 discards the GBC packet	
}	
}	





TD Id	TD Id TD_AUTO_IOT_DENM_MFW_BV_02				
Test scenario	Verify complete forwarding message scenario (GREEDY, GREEDY, CBF) - See Figure 5				
Reference	ETSI EN 302 636-4-1 [2], annex D & clause E.2				
Config Id	CF-01		••		
PICS Selection					
			Pre-test conditions		
 itsGnNonAre 	eaForward	ingAlgorithm (of EUT1 (source) set to GREEDY		
 itsGnNonAre 	eaForward	ingAlgorithm of	of EUT2 (forwarder) set to GREEDY		
 itsGnNonAre 	eaForward	ingAlgorithm (of EUT3 (neighbour) set to CBF		
 itsGnNonAre 	eaForward	ingAlgorithm	of EUT4 is SIMPLE		
			Test sequence		
Test Sequence:	Step	Туре	Description		
	1	stimulus	EUT1 (source) is requested to send a DEN message		
	2	verify	EUT1 (source) sends the GeoBroadcast packet containing DEN		
			message to LL address of EUT2 (forwarder)		
	3	verify	EUT2 (forwarder) receives the GeoBroadcast packet containing DEN		
			message		
	4	verify	EUT3 (neighbour) does not receive the GeoBroadcast packet, since it is		
			addressed to the EUT2 (forwarder) LL address		
	5	verify	EUT2 (forwarder) sends the GeoBroadcast packet containing DEN		
		.,	message to LL address of EU14		
	6	verify	EUT4 indicates that the DEN message has been received		
	7	verify	EUT4 broadcasts the GeoBroadcast packet containing DEN		
	8	verify	EUT2 (forwarder) and EUT3 (neighbour) receive the broadcasted		
GeoBroadcast packet and discard the packet					
Pseudocode					
With {					
itsGnNonAreaFor	waruingAl		TI SELIU GREEDT		
itsGnNonAreaFor	wardingAl	Johunin of EU	12 Set to CRE		
ISOTIVOTATEARO WATUINGAIGOTITITI OFEOTO SELLO COR					

itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE ensure that { when { EUT1 is requested to send DEN message encapsulated in a GBC packet containing Basic Header containing RHL field indicating a value > 1 containing DestinationArea indicating the TARGET_GEOAREA } then { EUT1 sends a GBC packet containing Basic Header containing RHL field containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message encapsulated in a LL packet containing a destination MAC address indicating the EUT2 address when { EUT2 receives the GBC packet from EUT1 } then { EUT2 sends a GBC packet containing Basic Header containing RHL field indicating value decreased by 1 containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message encapsulated in a LL packet containing a destination MAC address indicating the EUT4 address and EUT3 does not receive the GBC packet from EUT1 } when { EUT4 receives the GBC packet from EUT2 containing Basic Header containing RHL field indicating value decreased by 1 containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message } , then { EUT4 provides the DEN message to upper layers and EUT4 sends a GBC packet containing Basic Header containing RHL field indicating value decreased by 1 containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message encapsulated in a LL packet containing a destination MAC address indicating broadcast address } when { EUT2 receives the GBC packet from EUT4

```
then {
   EUT2 discards the GBC packet
}
when {
   EUT3 receives the GBC packet from EUT4
}
then {
   EUT3 discards the GBC packet
}
```



Figure 6: GREEDY/CBF/GREEDY forwarding

TD ld	TD_AU1	TD_AUTO_IOT_DENM_MFW_BV_03 (GREEDY, CBF, GREEDY) - See Figure 6			
Test scenario	Verify co	Verify complete forwarding message scenario			
Reference	nce ETSI EN 302 636-4-1 [2], annex D & clause E.2				
Config Id	CF-01				
PICS Selection					
			Pre-test conditions		
 itsGnNonA 	reaForward	lingAlgorithm	of EUT1 (source) set to GREEDY		
 itsGnNonA 	AreaForward	lingAlgorithm	of EUT2 (forwarder) set to CBF		
 itsGnNonA 	AreaForward	lingAlgorithm	of EUT3 (neighbour) set to GREEDY		
 itsGnNonA 	reaForward	lingAlgorithm	of EUT4 is SIMPLE		
			Test sequence		
Test Sequence:	Step	Туре	Description		
	1	stimulus	EUT1 (source) is requested to send a DEN message		
	2	verify	EUT1 (source) sends the GeoBroadcast packet containing DEN		
			message to LL address of EUT2 (forwarder)		
	3	verify	EUT2 (forwarder) receives the GeoBroadcast packet containing DEN		
			message		
	4	verify	EUT2 (forwarder) sends the GeoBroadcast packet containing DEN		
			message to broadcast LL address		
	5	verify	EUT4 receives the GeoBroadcast packet containing DEN message from		
	-	.,	EUT2 (forwarder)		
	6	verity	EUT4 indicates that the DEN message has been received from EUT2		
	1	verity	EUT3 (neighbour) receives the GeoBroadcast packet containing DEN		
	0		message from EUT2 (forwarder)		
	8	verity	EUT3 (neighbour) sends the GeoBroadcast packet containing DEN		
	0	vorify	ITTESSAGE TO LL ADDIESS OF EUT4		
	9	verny	EUT4 discards the Geobroadcast packet containing DEN message from		
	10	vorify	EUT3 (neighbour)		
	10	verny	message from FLIT3 (neighbour)		
	11	verify	FUT4 broadcasts the GeoBroadcast packet containing DEN		
	12	verify	EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast		
		, comy	packet containing DEN message from EUT4		

Pseudocode
with {
itsGnNonAreaForwardingAlgorithm of EUT1 set to GREEDY
itsGnNonAreaForwardingAlgorithm of EUT2 set to CBF
itsGnNonAreaForwardingAlgorithm of EUT3 set to GREEDY
itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE
}
ensure that {
when {
EUT1 is requested to send DEN message
encapsulated in a GBC packet
containing Basic Header
indianting RHL field
indicating a value > 1
indicating the TARGET GEOAREA
then {
EUT1 sends a GBC packet
containing Basic Header
containing RHL field
containing DestinationArea
indicating the TARGET_GEOAREA
containing Payload
containing the DEN message
encapsulated in a LL packet
containing a destination MAC address
Indicating the EU12 address
} when (
ELIT2 receives the CBC packet from ELIT1
}
then {
EUT2 sends a GBC packet
containing Basic Header
containing RHL field
indicating value decreased by 1
containing DestinationArea
Indicating the TARGET_GEOAREA
containing Payload
containing the DEN message
encapsulated in a LL packet
indicating broadcast address
}
when {
EUT1 receives the GBC packet from EUT2
}
then {
EUT1 discards the GBC packet
when {
EUT4 receives the GBC packet from EUT2
containing Basic Header
indicating value decreased by 1
containing DestinationArea
indicating the TARGET GEOAREA
containing Payload
containing the DEN message
}
then {
EUT4 provides the DEN message to upper layers
and EUT4 sends a GBC packet
containing Basic Header
containing RHL tield
Indicating value decreased by 1
containing DestinationArea

indicating the TARGET_GEOAREA	
containing Payload	
containing the DEN message	
encapsulated in a LL packet	
containing a destination MAC address	
indicating broadcast address	
indicating broadcast address	
}	
wnen {	
EU13 received the GBC packet from EU12	
containing Basic Header	
containing RHL field	
indicating value decreased by 1	
containing DestinationArea	
indicating the TARGET_GEOAREA	
containing Payload	
containing the DEN message	
}	
then {	
FLIT3 sends a GBC nacket	
containing Basic Header	
containing Bacio Headel	
indicating value decreased by 1	
containing Destination Area	
indicating the TAPCET CEOAPEA	
containing the DEN message	
encapsulated in a LL packet	
containing a destination MAC address	
indicating the EUT4 address	
}	
when {	
EUT4 receives the GBC packet from EUT3	
}	
then {	
EUT4 discards the GBC packet (duplicated)	
}	
when {	
EUT3 receives the GBC packet from EUT4	
}	
then {	
EUT3 discards the GBC packet	
, when {	
ELIT2 receives the GBC nacket from ELIT4	
J then∫	
FLIT2 discards the CBC packet	
lorz discards the Obo packet	
j	



Figure 7: GREEDY/CBF/CBF forwarding

Test scenario Verify complete forwarding message scenario (GREEDY, CBF, CBF) - See Figure 7 Reference ETSI EN 302 636-4-1 [2], annex D & clause E.2 Config Id CF-01 PICS Selection Pre-test conditions itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF Test Sequence: Step Type	TD Id	TD_AU1	TD_AUTO_IOT_DENM_MFW_BV_04				
Reference ETSI EN 302 636-41 [2], annex D & clause E.2 Config Id CF-01 PICS Selection Pre-test conditions • itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY • itsGnNonAreaForwardingAlgorithm of EUT3 (ineighbour) set to CBF • itsGnNonAreaForwardingAlgorithm of EUT3 (ineighbour) set to CBF • itsGnNonAreaForwardingAlgorithm of EUT1 (source) is requested to send a DEN message Its Step Type Description Test Sequence: Step Type Description 1 stimulus EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) 2 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message to verify 3 verify EUT4 (receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 9 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 <	Test scenario	Verify co	Verify complete forwarding message scenario (GREEDY, CBF, CBF) - See Figure 7				
Config Id CF-01 PICS Selection Pre-test conditions • itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY • • itsGnNonAreaForwardingAlgorithm of EUT3 (reighbour) set to CBF • • itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF • • itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF • • itsGnNonAreaForwardingAlgorithm of EUT1 (source) is requested to send a DEN message • Test Sequence: Step Type Description 2 verify EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message to receives the GeoBroadcast packet containing DEN message to CL address 5 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message from EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT4 indicates that the DEN message has been received from EUT2 9 verify EUT4 indicates that the GeoBroa	Reference	ETSI EN	ETSI EN 302 636-4-1 [2], annex D & clause E.2				
PICS Selection Pre-test conditions • itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY • itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to CBF • itsGnNonAreaForwardingAlgorithm of EUT4 (sineighbour) set to CBF • itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE Test sequence 1 stimulus EUT1 (source) is requested to send a DEN message 2 verify EUT1 (source) so the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) 3 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message to broadcast LL address 4 verify EUT4 (forwarder) receives the GeoBroadcast packet containing DEN message to broadcast LL address 5 verify EUT4 receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT4 receives that the DEN message has been received from EUT2 7 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 9 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify	Config Id	CF-01	CF-01				
Pre-test conditions • itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY • itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF • itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF • itsGnNonAreaForwardingAlgorithm of EUT1 (source) is requested to send a DEN message 2 verify 2 verify 2 verify 3 verify 4 verify 4 verify 5 verify 6 verify 6 verify 7 verify 8 verify 7 verify 6 verify 9 verify 8 verify 9 verify 10 verify 11 verify 12<(forwarder) 8 verify 9 verify 10 verify 11 verify 12 (forwarder) 10 verify 11 verify 12 (fo	PICS Selection						
itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF itsGnNonAreaForwardingAlgorithm of EUT1 (source) is requested to send DEN message Test Sequence: Step Type Description 1 stimulus EUT1 (source) is requested to send DEN message 2 verify EUT1 (source) is requested to send DEN message 2 verify EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) 3 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message to LL address 5 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message to roadcast LL address 5 verify EUT4 receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT4 indicates that the DEN message has been received from EUT2 7 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN to EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm o				Pre-test conditions			
 itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 is SIMPLE Test Sequence: Step Type Description 2 verify EUT1 (source) is requested to send a DEN message 2 verify EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) 3 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message 4 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message 4 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message 5 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message form EUT2 (forwarder) 6 verify EUT4 receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT1 (source) discards the GeoBroadcast packet due to negative progress 9 verify EUT4 rocaves the UT2 (forwarder) 10 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing	 itsGnNonAre 	eaForward	ingAlgorithm	of EUT1 (source) set to GREEDY			
itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE Test Sequence: Step Type Description 1 stimulus EUT1 (source) is requested to send a DEN message 2 verify EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) 3 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message 4 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message to broadcast LL address 5 verify EUT4 receives the GeoBroadcast packet containing DEN message to broadcast LL address 5 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT1 (forwarder) and EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 11 verify EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to GREEDY itsGnNon	 itsGnNonAre 	eaForward	ingAlgorithm	of EUT2 (forwarder) set to CBF			
itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE Test Sequence: Step Type Type Description 1 stimulus EUT1 (source) is requested to send a DEN message 2 verify EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) 3 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message to broadcast LL address 4 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message to broadcast LL address 5 verify EUT4 receives the GeoBroadcast packet containing DEN message to LPT4 receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT3 (nource) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT3 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT4 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message to EUT4 (forwarder) 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN tesnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE ensure that { when { EUT1 is requested to send DEN message encapsulated in a GBC packet containing RHL field indicating a value > 1	 itsGnNonAre 	eaForward	ingAlgorithm	of EUT3 (neighbour) set to CBF			
Test Sequence: Step Type Description 1 stimulus EUT1 (source) is requested to send a DEN message 2 verify EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) 3 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message 4 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message to broadcast L address 5 verify EUT2 (forwarder) 6 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 11 verify EUT1 (source) and EUT2 (forwarder) 10 verify EUT1 (source) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) and EUT3	 itsGnNonAre 	eaForward	ingAlgorithm	of EUT4 is SIMPLE			
Step Type Description 1 stimulus EUT1 (source) is requested to send a DEN message 2 2 verify EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) 3 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message to broadcast packet containing DEN message to broadcast LL address 4 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message to broadcast LL address 5 verify EUT4 receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT4 Pseudocode with { itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT2 (forwarde				Test sequence			
1 stimulus EUT1 (source) is requested to send a DEN message 2 verify EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) 3 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message to broadcast LL address 5 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message to broadcast LL address 5 verify EUT4 receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 7 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 (forwarder) 10 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 (forwarder) <tr< th=""><th>Test Sequence:</th><th>Step</th><th>Туре</th><th>Description</th></tr<>	Test Sequence:	Step	Туре	Description			
2 verify EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder) 3 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message to broadcast LL address 4 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message to broadcast LL address 5 verify EUT4 indicates that the DEN message has been received from EUT2 6 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 9 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) It verify 11 verify EUT2 (forwarder) 10 verify EUT2 (forwarder) Verify EUT4 broadcasts the GeoBroadcast pa		1	stimulus	EUT1 (source) is requested to send a DEN message			
3 verify EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message 4 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message to broadcast LL address 5 verify EUT4 receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT4 indicates that the DEN message has been received from EUT2 7 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 9 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 Verify EUT4 broadcasts the GeoBroadcast packet containing DEN message from EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 Verify EUT4 broadcasts the GeoBroadcast packet containing DEN message from EUT4 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4		2	verify	EUT1 (source) sends the GeoBroadcast packet containing DEN message to LL address of EUT2 (forwarder)			
4 verify EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message to broadcast LL address 5 verify EUT4 receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT4 indicates that the DEN message has been received from EUT2 7 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 9 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT2 (forwarder) 11 verify EUT2 (forwarder) 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 Pseudocode with { itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to CBF itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE EUT11 is requested to send DEN message encapsulated in a GBC packet containing Basic Header containing Basic Header containing DestinationArea indicating a value > 1 containing DestinationArea indicating the TARGET_GEOAREA		3	verify	EUT2 (forwarder) receives the GeoBroadcast packet containing DEN message			
5 verify EUT4 receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 6 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 7 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 9 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT4 broadcasts the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT4 broadcasts the GeoBroadcast packet containing DEN message from EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 Pseudocode with { itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE encapsulated in a GBC packet containing Basic Header containing Basic Header containing RHL field indicating a value > 1		4	verify	EUT2 (forwarder) sends the GeoBroadcast packet containing DEN message to broadcast LL address			
6 verify EUT4 indicates that the DEN message has been received from EUT2 7 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT3 (neighbour) discards the GeoBroadcast packet due to negative progress 9 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN with { itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE } ensure that { when { EUT1 is requested to send DEN message encapsulated in a GBC packet containing RHL field indicating a value > 1 containing NetLifield indicating a value > 1 containing DestinationArea indicating the TARGET_GEOAREA		5	verify	EUT4 receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder)			
7 verify EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 8 verify EUT1 (neighbour) discards the GeoBroadcast packet due to negative progress 9 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT4 broadcasts the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 Pseudocode with { with { tisGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE ensure that { when { EUT1 is requested to send DEN message encapsulated in a GBC packet containing RHL field indicating a value > 1		6	verify	EUT4 indicates that the DEN message has been received from EUT2			
8 verify EUT3 (neighbour) discards the GeoBroadcast packet due to negative progress 9 verify EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder) 10 verify EUT4 broadcasts the GeoBroadcast packet containing DEN 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN with { itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE } ensure that { when { EUT1 is requested to send DEN message encapsulated in a GBC packet containing Basic Header containing DestinationArea indicating a value > 1 containing DestinationArea indicating the TARGET_GEOAREA		7	verify	EUT3 (neighbour) receives the GeoBroadcast packet containing DEN message from EUT2 (forwarder)			
9 verify message from EUT2 (forwarder) 10 verify EUT4 broadcasts the GeoBroadcast packet containing DEN 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 Pseudocode with { itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE } ensure that { when { EUT1 is requested to send DEN message encapsulated in a GBC packet containing Basic Header containing RHL field indicating a value > 1 containing DestinationArea indicating the TARGET_GEOAREA		8	verify	EUT3 (neighbour) discards the GeoBroadcast packet due to negative progress			
10 verify EUT4 broadcasts the GeoBroadcast packet containing DEN 11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 Pseudocode with { itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE } ensure that { when { EUT1 is requested to send DEN message encapsulated in a GBC packet containing Basic Header containing RHL field indicating a value > 1 containing DestinationArea indicating the TARGET_GEOAREA Next		9	verify	EUT1 (source) discards the GeoBroadcast packet containing DEN message from EUT2 (forwarder)			
11 verify EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast packet containing DEN message from EUT4 Pseudocode with { itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE } ensure that { when { EUT1 is requested to send DEN message encapsulated in a GBC packet containing Basic Header containing RHL field indicating a value > 1 containing DestinationArea indicating the TARGET_GEOAREA indicating the TARGET_GEOAREA		10	verify	EUT4 broadcasts the GeoBroadcast packet containing DEN			
implementation implementation implementation implementa		11	verify	EUT2 (forwarder) and EUT3 (neighbour) discard the GeoBroadcast			
Pseudocode with { itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE ensure that { when { EUT1 is requested to send DEN message encapsulated in a GBC packet containing Basic Header containing RHL field indicating a value > 1 containing DestinationArea indicating the TARGET_GEOAREA		packet containing DEN message from EUT4					
<pre>with { itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to CBF itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE } ensure that { when { EUT1 is requested to send DEN message encapsulated in a GBC packet containing Basic Header containing RHL field indicating a value > 1 containing DestinationArea indicating the TARGET_GEOAREA </pre>	Pseudocode						

then {

EUT1 sends a GBC packet containing Basic Header containing RHL field containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message encapsulated in a LL packet containing a destination MAC address indicating the EUT2 address } when { EUT2 receives the GBC packet from EUT1 } then { EUT2 sends a GBC packet containing Basic Header containing RHL field indicating value decreased by 1 containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message encapsulated in a LL packet containing a destination MAC address indicating broadcast address } when { EUT3 receives the GBC packet from EUT2 } then { EUT3 discards the GeoBroadcast packet due to negative progress } when { EUT1 receives the GBC packet from EUT2 then { EUT1 discards the GBC packet } when { EUT4 receives the GBC packet from EUT2 containing Basic Header containing RHL field indicating value decreased by 1 containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message } then { EUT4 provides the DEN message to upper layers and EUT4 sends a GBC packet containing Basic Header containing RHL field indicating value decreased by 1 containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message encapsulated in a LL packet containing a destination MAC address indicating broadcast address } when { EUT3 received the GBC packet from EUT2 containing Basic Header

containing RHL field

indicating value decreased by 1
containing DestinationArea
indicating the TARGET GEOAREA
containing Payload
contraining the DEN message
containing the DEN message
}
then {
EUT3 does not send the GBC packet from EUT2 (timer)
}
when {
ELIT3 receives the GBC packet from ELIT4
j then (
El TO disconde de ODO poster
EU13 discards the GBC packet
}
when {
EUT2 receives the GBC packet from EUT4
}
then {
FILT2 discards the GBC packet
I



Figure 8: CBF/GREEDY/GREEDY forwarding

TD Id	TD_AUTO_IOT_DENM_MFW_BV_05					
Test scenario	Test scenario Verify complete forwarding message scenario (CBF, GREEDY, GREEDY) - See Figure 8					
Reference	Reference ETSI EN 302 636-4-1 [2], annex D & clause E.2					
Config Id	CF-01					
PICS Selection						
Pre-test conditions						
 itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to CBF 						
 itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to GREEDY 						
 itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY 						
 itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE 						

			Test sequence		
Test Sequence:	Step	Type	Description		
	1	stimulus	FLIT1 (source) is requested to send a DEN message		
	2	Vorify	ELIT1 (course) conde the CooRreadeast packet containing DEN		
	2	venity	EUTI (Source) serius the Geoploadcast packet containing DEN		
		l			
	3	verify	EUT2 (forwarder) receives the GeoBroadcast packet containing DEN		
			message		
	4	verifv	EUT3 (neighbour) receives the GeoBroadcast packet		
	5	verify	FUT2 (forwarder) sends the GeoBroadcast packet containing DEN		
	0	verny	message to LL address of EUTA		
	<u> </u>		FLIT2 (neighbour) conde the Cooperadeast peaket containing DEN		
	6	verify	EUT3 (neighbour) sends the GeoBroadcast packet containing DEN		
			message to LL address of EUT4		
	7	verify	EUT4 indicates that the DEN message has been received		
	8	verify	EUT4 broadcasts the GeoBroadcast packet containing DEN		
	9	Vorify	ELITA discards the GeoBroadcast packet sent by ELIT3 (neighbour)		
	9	verity	EUT4 discalus the Geobloadcast packet sent by EUT3 (heighbour)		
	10	verity	EU12 (forwarder) and EU13 (neighbour) receive the broadcasted		
			GeoBroadcast packet and discard the packet		
			Pseudocode		
itsGnNonAreaFor itsGnNonAreaFor } ensure that { when { EUT1 is requ encapsula	ested to s	gorithm of EU gorithm of EU end DEN me 3C packet	T3 (neighbour) set to GREEDY T4 is SIMPLE		
contair	ning Basic	Header			
cor	ntaining RH	IL field			
	indicating	a value > 1			
contair	nina Destin				
contail	ing Destin				
, ind	icating the	TARGET_GE	UAREA		
}					
then {					
EUT1 sends	a GBC pac	ket			
containing	Basic Hea	ader			
contairing					
Contair		eiu			
containing	Destinatio	nArea			
indicat	ing the TAI	RGET_GEOA	IREA		
containing	Payload				
contair	ning the DE	N message			
encansula	ted in a LI	nacket			
encapsula		inction MAC	addroop		
Contain	ing a dest		aduress		
ind	icating bro	adcast addres	SS		
}					
when {					
EUT2 receive	s the GBC	backet from	EUT1		
}		1			
then {					
EUT2 condo		kot			
EUT2 serius					
containing	Basic Hea	ader			
contair	ning RHL fi	eld			
indicating value decreased by 1					
containing DestinationArea					
indicating the TARGET GEOAREA					
containing Payload					
oontoir	containing rayidau				
containing the DEN message					
encapsulated in a LL packet					
containing a destination MAC address					
indicating the EUT4 address					
}					
when {					
FLIT3 receive	s the CRC	nacket from	FUT1		
		Packet HUIII			
} 					
tnen {					
EUT3 sends	a GBC pac	ket			
containing	a destinat	ion MAC add	ress		

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```
indicating the EUT4 address
      containing GBC packet
          containing Basic Header
             containing RHL field
                indicating value decreased by 1
          containing DestinationArea
             indicating the TARGET_GEOAREA
          containing Payload
             containing the DEN message
}
when {
   EUT4 receives the GBC packet from EUT2
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
}
then {
   EUT4 provides the DEN message to upper layers
   and EUT4 sends a GBC packet
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
      encapsulated in a LL packet
          containing a destination MAC address
             indicating broadcast address
}
when {
   EUT4 receives the GBC packet from EUT3
1
then {
   EUT4 discards the GBC packet (duplicated)
}
when {
   EUT2 receives the GBC packet from EUT4
then {
   EUT2 discards the GBC packet
when {
   EUT3 receives the GBC packet from EUT4
}
then {
   EUT3 discards the GBC packet
}
```



Figure 9: CBF/GREEDY/CBF forwarding

TD Id TD_AUTO_IOT_DENM_MFW_BV_06							
Test scenario	Verify complete forwarding message scenario (CBF, GREEDY, CBF) - See Figure 9						
Reference	ETSI EN 302 636-4-1 [2], annex D & clause E.2						
Config Id CF-01							
PICS Selection	PICS Selection						
			Pre-test conditions				
 itsGnNonArea 	aForwardi	ngAlgorithm	of EUT1 (source) set to CBF				
 itsGnNonArea 	aForwardi	ngAlgorithm of	of EUT2 (forwarder) set to GREEDY				
 itsGnNonArea 	Forwardi	ngAlgorithm (of EUT3 (neighbour) set to CBF				
 itsGnNonArea 	Forwardi	ngAlgorithm (of EUT4 is SIMPLE				
		5 5	Test sequence				
Test Sequence:	Step	Type	Description				
	1	stimulus	EUT1 (source) is requested to send a DEN message				
	2	verify	EUT1 (source) sends the GeoBroadcast packet containing DEN				
	_		message to LL broadcast address				
	3	verifv	EUT2 (forwarder) receives the GeoBroadcast packet containing DEN				
	-		message				
	4	verifv	EUT3 (neighbour) receive the GeoBroadcast packet				
	5	verify	EUT2 (forwarder) sends the GeoBroadcast packet containing DEN				
	•		message to LL address of EUT4				
	6	verifv	EUT3 (neighbour) does not send the GeoBroadcast packet due to timer				
	-		expirv				
	7	verifv	EUT4 indicates that the DEN message has been received				
	8	verify	EUT4 broadcasts the GeoBroadcast packet containing DEN				
	9	verify	EUT2 (forwarder) and EUT3 (neighbour) receive the broadcasted				
	-		GeoBroadcast packet and discard the packet				
Pseudocode							
with {							
itsGnNonAreaForw	ardingAlg	orithm of EU	T1 (source) set to CBF				
itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to GREEDY							
itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to CBF							
itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE							
}							
ensure that {							
when {							
EUT1 is requested to send DEN message							
encapsulated in a GBC packet							
containing Basic Header							
containing RHL field							
indicating a value > 1							
containing DestinationArea							
indicating the TARGET_GEOAREA							
}							
then {							
EUTI sends a GBC packet							
containing E	Basic Hea	der					
containir	ng RHL fie	eld					
containing D	Destination	nArea					
Indicating the TARGET_GEOAREA							

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containing Payload containing the DEN message encapsulated in a LL packet containing a destination MAC address indicating broadcast address } when { EUT2 receives the GBC packet from EUT1 } then { EUT2 sends a GBC packet containing Basic Header containing RHL field indicating value decreased by 1 containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message encapsulated in a LL packet containing a destination MAC address indicating the EUT4 address } when { EUT3 receives the GBC packet from EUT1 } then { EUT3 does not send the GeoBroadcast packet due to timer expiry } when { EUT4 receives the GBC packet from EUT2 containing Basic Header containing RHL field indicating value decreased by 1 containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message } , then { EUT4 provides the DEN message to upper layers and EUT4 sends a GBC packet containing Basic Header containing RHL field indicating value decreased by 1 containing DestinationArea indicating the TARGET_GEOAREA containing Payload containing the DEN message encapsulated in a LL packet containing a destination MAC address indicating broadcast address when { } EUT2 receives the GBC packet from EUT4 } then { EUT2 discards the GBC packet when { EUT3 receives the GBC packet from EUT4 3 then { EUT3 discards the GBC packet

}



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Figure 10: CBF/CBF/GREEDY forwarding

TD Id	TD_AUTO_IOT_DENM_MFW_BV_07				
Test scenario	Verify complete forwarding message scenario (CBF, CBF, GREEDY) - See Figure 10				
Reference	ETSI EN 302 636-4-1 [2], annex D & clause E.2				
Config Id CF-01					
PICS Selection					
			Pre-test conditions		
 itsGnNonArea 	aForwardi	ingAlgorithm	of EUT1 (source) set to CBF		
 itsGnNonArea 	aForwardi	ingAlgorithm (of EUT2 (neighbour) set to CBF		
 itsGnNonArea 	aForwardi	ingAlgorithm	of EUT3 (forwarder) set to GREEDY		
 itsGnNonArea 	aForwardi	ingAlgorithm	of EUT4 is SIMPLE		
			Test sequence		
Test Sequence:	Step	Туре	Description		
	1	stimulus	EUT1 (source) is requested to send a DEN message		
	2	verify	EUT1 (source) sends the GeoBroadcast packet containing DEN		
			message to LL broadcast address		
	3	verify	EUT2 (neighbour) receives the GeoBroadcast packet containing DEN		
-		.,	message		
	4	verity	EU12 (neighbour) does not send the GeoBroadcast packet due to timer		
-	F	vorify	ELIT2 (forwarder) receive the CooPresident peaket		
-	6	verify	EUT3 (forwarder) receive the GeoBroadcast packet		
	0	verny	message to LL address of ELITA		
-	7	verify	FLIT4 indicates that the DEN message has been received		
-	8	verify	EUT4 broadcasts the GeoBroadcast packet containing DEN		
	9	verify	EUT2 (neighbour) and EUT3 (forwarder) receive the broadcasted		
	-	- 5	GeoBroadcast packet and discard the packet		
Pseudocode					
with {					
itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to CBF					
itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to CBF					
itsGnNonAreaForwardingAlgorithm of EUT3 (neighbour) set to GREEDY					
itsGnNonAreaForwardingAlgorithm of EUT4 is SIMPLE					
}					
ensure that {					
when {					
EUTI Is requested to send DEN Message					
containing Basic Header					
containing Busic Header					
indicating a value > 1					
containing DestinationArea					
indicating the TARGET_GEOAREA					
}					
then {					
EUT1 sends a	EUT1 sends a GBC packet				
containing E	Basic Hea	der			
containi	ng RHL fie	eld			
containing DestinationArea					

```
indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
      encapsulated in a LL packet
          containing a destination MAC address
             indicating broadcast address
}
when {
   EUT2 receives the GBC packet from EUT1
}
then {
   EUT2 does not send the GBC packet from EUT2 due to timer expiry
}
when {
   EUT3 receives the GBC packet from EUT1
}
,
then {
   EUT3 sends a GBC packet
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
      encapsulated in a LL packet
         containing a destination MAC address
             indicating the EUT4 address
}
when {
   EUT4 receives the GBC packet from EUT3
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
}
then {
   EUT4 provides the DEN message to upper layers
   and EUT4 sends a GBC packet
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
      encapsulated in a LL packet
          containing a destination MAC address
             indicating broadcast address
   when {
}
   EUT2 receives the GBC packet from EUT4
}
then {
   EUT2 discards the GBC packet
when {
   EUT3 receives the GBC packet from EUT4
then {
   EUT3 discards the GBC packet
}
```



Figure 11: CBF/CBF/CBF forwarding

TD Id	TD AUT	O IOT DEN	M MEW BV 08			
Test scenario	Verify co	Verify complete forwarding message scenario (CBF, CBF, CBF) - See Figure 11				
Reference	ETSI EN	ETSI EN 302 636-4-1 [2], annex D & clause E.2				
Config Id	CF-01	CF-01				
PICS Selection	0. 0.					
			Pre-test conditions			
 itsGnNonAre 	aForward	ingAlgorithm	of FUT1 (source) set to CBF			
 itsGnNonAre 	aForward	ngAlgorithm (of EUT2 (forwarder) set to CBE			
 itsGnNonAre 	aForwardi	ingAlgorithm (of EUT3 (neighbour) set to CBE			
 itsGnNonAre 	aForwardi	ingAlgorithm	of EUT4 is SIMPLE			
		ing, agonainn s	Test sequence			
Test Sequence:	Step	Type	Description			
	1	stimulus	EUT1 (source) is requested to send a DEN message			
	2	verify	EUT1 (source) sends the GeoBroadcast packet containing DEN			
			message to LL broadcast address			
	3	verify	EUT2 (forwarder) receives the GeoBroadcast packet containing DEN			
			message			
	4	verify	EUT3 (neighbour) receive the GeoBroadcast packet			
	5		EUT3 (neighbour) does not send the GBC packet from EUT2 due to			
			timer expiry			
	6	verify	EUT2 (forwarder) sends the GeoBroadcast packet containing DEN			
		,	message to LL broadcast address			
	7	verify	EUT4 indicates that the DEN message has been received			
	9	verify	EUT4 broadcasts the GeoBroadcast packet containing DEN			
	8	verify	EUT2 (forwarder) and EUT3 (neighbour) receive the broadcasted			
	GeoBroadcast packet and discard the packet					
			Pseudocode			
with {						
itsGnNonAreaForwardingAlgorithm of EUT1 (source) set to CBF						
itsGnNonAreaForwardingAlgorithm of EUT2 (forwarder) set to CBF						
itsGnNonAreaForv	wardingAlg	porithm of EU	T3 (neighbour) set to CBF			
itsGnNonAreaForv	wardingAlg	porithm of EU	T4 is SIMPLE			
}						
ensure that {						
when {						
EUT1 is reque	ested to se	end DEN mes	ssage			
encapsulated in a GBC packet						
containing Basic Header						
containing KHL field						
Indicating a value > 1						
containing DestinationArea						
} then (
	CBC noo	kot				
EUTT Sends a GBU packet						
containing	ing RHI fi	ald				
containing RHL field						

```
containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
      encapsulated in a LL packet
          containing a destination MAC address
             indicating broadcast address
}
when {
   EUT2 receives the GBC packet from EUT1
then {
   EUT2 sends a GBC packet
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
      encapsulated in a LL packet
          containing a destination MAC address
             indicating the EUT4 address
when {
   EUT3 receives the GBC packet from EUT1
}
then {
   EUT3 does not send the GBC packet from EUT2 due to timer expiry
}
when {
   EUT4 receives the GBC packet from EUT3
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
         containing the DEN message
}
then {
   EUT4 provides the DEN message to upper layers
   and EUT4 sends a GBC packet
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
      encapsulated in a LL packet
         containing a destination MAC address
             indicating broadcast address
}
   when {
   EUT2 receives the GBC packet from EUT4
then {
   EUT2 discards the GBC packet
3
when {
   EUT3 receives the GBC packet from EUT4
then {
   EUT3 discards the GBC packet
}
```

7.2.3 DEN message - Road Works Warning

TD ld	TD_AU1	O_IOT_DEN	M_RWW_BV_01				
Test objective	Verify co	Verify complete Road Works Warning scenario					
Reference	ETSI EN	ETSI EN 302 637-3 [4]					
Config Id	CF-02	CF-02					
PICS Selection							
	Pre-test conditions						
 EUT1 (RSU) 	EUT1 (RSU) sends RWW DENMs D1, D2 and D3						
 EUT2 (vehic 	EUT2 (vehicle) is outside the relevance area						
 EUT2 (vehic 	le) is movi	ng from Start	position to End position				
 EUT2 (vehic 	le) receive	s RWW DENI	Ms D1, D2 and D3				
Test Sequence:	Step	Туре	Description	HMI			
	1	stimulus	EUT2 (vehicle) enters the EUT1 (RSU) relevance	e area			
	2	verify	EUT2 (vehicle) indicates the speed limit	30			
	3	stimulus	EUT2 (vehicle) passes POS1				
	4	verify	EUT2 (vehicle) indicates the closed lane information				
	5	stimulus	EUT2 (vehicle) passes POS2				
	6	verify	EUT2 (vehicle) the closed lane information before POS2				
	7	stimulus	EUT2 (vehicle) passes POS3				
	8	verify	EUT2 (vehicle) the closed lane information				
	9	stimulus	EUT2 (vehicle) passes POS4				
	10	verify	EUT2 (vehicle) no more closed lane information and end of speed limitation				

Pseudocode
with { EUT1 having sent Road Work Warning DEN messages D1
containing a 'speedLimit'
indicating the value 30
containing a 'drivingLaneStatus'
indicating the value '0001'B
containing a 'trafficFlowRule'
and EUT1 having sent a DEN message D2
containing a 'speedl imit'
indicating the value 30
containing a 'drivingLaneStatus'
indicating the value '0011'B
containing a 'trafficFlowRule'
indicating the value 'pass I oRight'
containing a 'speed imit'
indicating the value 30
containing a 'drivingLaneStatus'
indicating the value '0101'B
containing a 'trafficFlowRule'
indicating the value 'passToLeft'
land EDT2 having received the DEN messages DT, D2 and D3
I lensure that {
when {
EUT2 reaches the position POS0
then {
EOTZ arready indicates the speed inflit information
when {
EUT2 (vehicle) reaches the position POS1
}
then {
EU12 still indicates the speed limit information
and EUT2 already indicates the hardshoulder opened
}
when {
EUT2 reaches the position POS2
then {
and FLIT2 already indicates the two most outer lanes closed
and EUT2 already indicates the hardshoulder opened
}
when {
EUT2 reaches the position POS3
} then {
FUT2 still indicates the speed limit information
and EUT2 already indicates the most right lane closed
and EUT2 already indicates the hardshoulder closed
}
when {
EUTZ reaches the position POS4
then {
EUT2 stops indicating the speed limit information
and EUT2 stops indicating the lanes status
}
<u>}</u>

7.2.4 DEN message - Road Hazard Signals

TD Id	TD_AUT	O_IOT_DEN	M_RHS_BV_01		
Test objective	Verify co	Verify complete Road hazard Signals scenario			
Reference	ETSI EN	ETSI EN 302 637-3 [4]			
Config Id	CF-02	CF-02			
PICS Selection					
			Pre-test conditions		
 EUT1 (RSU)) sends R⊦	IS DENMs D1			
 EUT2 (vehic 	le) is outsi	de the relevar	nce area		
 EUT2 (vehic 	le) is movi	ng from Start	position to End position		
EUT2 (vehic	le) receive	s RHS DENM	<u>s D1</u>		
Test Sequence:	Step	Туре	Description	HMI	
	1	stimulus	EUT2 (vehicle) enters the EUT1 (RSU) relevance	ce area	
	2	verify	EUT2 (vehicle) indicates the Road Hazard	A	
			Signal information		
			Pseudocode		
with {					
EUT1 having ser	nt a DEN m	nessage D1			
containing a m	nanagemer	nt			
containing	eventPosit	tion			
indicati	ng POS1				
containing	relevancel	Distance			
indicati	ng lessTha	an100m			
containing	relevance	TrafficDirectio	n		
indicati	indicating allTrafficDirections				
containing situ	lation				
containing	eventlype				
contain	ing cause				
indi	cating a va	alid CAUSE_C	ODE (Table 4)		
containing subCauseCode					
Indicating a valid SUB_CAUSE_CODE (Table 5)					
) angura that (
when J					
FUT2 reaches the position POS0					
}					
then {					
EUT2 already indicates the Road Hazard Signal information					
}					
}					
then { EUT2 already indicates the Road Hazard Signal information } }					

Table 4: Possible DENM cause values (ETSI EN 302 637-3 [4], Table 10)

Test description variants	Cause values
VA_01	1
VA_02	2
VA_03	6
VA_04	9
VA_05	10
VA_06	11

Test description variants	Sub-cause values
VA_01	0
VA_02	1
VA_03	2
VA_04	3
VA_05	4
VA_06	5
VA_07	6
VA_08	7

Table 5: Possible DENM sub-cause values (ETSI EN 302 637-3 [4], Table 10)

7.2.5 DEN message - Stationary Vehicle Warning

TD Id	TD_AUT	O_IOT_DENM	M_SVW_BV_01		
Test objective	Verify co	/erify complete Stationary Vehicle Warning scenario			
Reference	ETSI EN	TSI EN 302 637-3 [4]			
Config Id	CF-02	CF-02			
PICS Selection					
			Pre-test conditions		
 EUT2 (vehic 	le) is outsi	de the relevan	ce area		
 EUT2 (vehic 	le) is movi	ng from Start	position to End position		
 EUT1 (RSU) 	sends RH	IS DENMs D1			
 EUT2 (vehic 	le) receive	s RHS DENM	s D1		
Test Sequence:	Step	Туре	Description	HMI	
	1	stimulus	EUT2 (vehicle) enters the EUT1 (RSU) relevance	e area	
	2	verify	EUT2 (vehicle) indicates the stationary vehicle	▲	
			information		
			Pseudocode		
with {					
EUTI naving sen		iessage D1			
containing a r	anagemer	tion			
indicati		lion			
containing	rolovancol	Distance			
indicati	ng lessTha	an100m			
containing	relevance	TrafficDirection	n		
indicati	ng allTraffi	cDirections			
containing situ	containing situation				
containing	eventType)			
contain	ing cause(Code			
indi	cating a va	alid CAUSE_C	ODE (Table 4)		
contain	containing subCauseCode				
indicating a valid SUB_CAUSE_CODE (Table 5)					
}					
ensure that {					
when {					
EU12 (vehicle) reaches the position POS0					
} +b == {					
(nen {					
	LOTZ (venicle) aready indicates the Stationary venicle warning information				
}	J.				



Figure 12: Geo-broadcast message caching scenario

TD Id	TD Id TD AUTO IOT DENM GMC BV 01				
Test scenario	Verify co	Verify complete Geo-broadcast message caching scenario - See Figure 12			
Reference	ETSI EN	ETSI EN 302 636-4-1 [2], clause 9.3.11, annex D & clause E.2			
Config Id	CF-01 with EUT4 off-link				
PICS Selection	PICS Selection				
			Pre-test conditions		
EUT2 and E	UT4 are of	ff-link			
 itsGnNonAr 	eaForward	ingAlgorithm	of EUT1 (source) set to GREEDY		
 itsGnNonAr 	eaForward	ingAlgorithm	of EUT2 (forwarder) set to GREEDY		
 itsGnNonAre 	eaForward	ingAlgorithm	of EUT4 is SIMPLE		
		0 0	Test sequence		
Test Sequence:	Step	Туре	Description		
	1	stimulus	EUT1 (source) is requested to send a DEN message		
	2	verify	EUT1 (source) sends the GeoBroadcast packet containing DEN		
			message to LL address of EUT2 (forwarder)		
	3	verify	EUT2 (forwarder) receives the GeoBroadcast packet containing DEN		
			message		
	4	verify	EUT2 (forwarder) buffers the GeoBroadcast packet due to no next hop		
	5	stimulus	EUT2 (forwarder) and EUT4 become on-link		
	6	verify	EUT2 (forwarder) sends the GeoBroadcast packet containing DEN		
		-	message to LL address of EUT4		
	7	verify	EUT4 indicates that the DEN message has been received		
	8	verify	EUT4 broadcasts the GeoBroadcast packet containing DEN		
	9	verify	EUT2 (forwarder) receives the broadcasted GeoBroadcast packet and		
discards the packet					
			Pseudocode		
with {					
EUT2 and EUT4	being off-lir	ne			
itsGnNonAreaFor	wardingAl	gorithm of EU	T1 set to GREEDY		
itsGnNonAreaFor	wardingAl	gorithm of EU	T2 set to GREEDY		
itsGnNonAreaFor	wardingAl	gorithm of EU	T4 is SIMPLE		
}					
ensure that {					
when {					
EUI1 is requ	EUT1 is requested to send DEN message				
encapsulated in a GBC packet					
containing Basic Header					
Containing KIL lielu					
indicating the value 1					
indicating the value in containing Destination Area					
indicating bestinationAlea					
containing Pavload					
containing the DEN message					
containing a validityDuration					
	indicating the value 3 600 seconds				

then {

EUT1 sends a GBC packet

```
containing Basic Header
          containing RHL field
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
      encapsulated in a LL packet
          containing a destination MAC address
             indicating the EUT2 address
}
when {
   EUT2 receives the GBC packet from EUT1
}
then {
   EUT2 buffers the GBC packet from EUT1
when {
   EUT2 and EUT4 become on-link
}
then {
   EUT2 sends the buffered GBC packet
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
      encapsulated in a LL packet
          containing a destination MAC address
             indicating the EUT4 address
}
when {
   EUT4 receives the GBC packet from EUT2
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
          indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
}
,
then {
   EUT4 provides the DEN message to upper layers
   and EUT4 sends a GBC packet
      containing Basic Header
          containing RHL field
             indicating value decreased by 1
      containing DestinationArea
         indicating the TARGET_GEOAREA
      containing Payload
          containing the DEN message
      encapsulated in a LL packet
          containing a destination MAC address
             indicating broadcast address
}
when {
   EUT2 receives the GBC packet from EUT4
then {
   EUT2 discards the GBC packet
```

TD Id	TD_AUT	O_IOT_CAM	_NBD_BV_01		
Test scenario	Verify co	mplete neight	bours detection scenario based on CA messages and/or beacons		
Reference	ETSI EN	302 637-2 [3]		
Config Id	CF-03		4		
PICS Selection	01 00				
			Pro-tost conditions		
• EUI1, EUI2	and EUT.	3 send CA/bea	acon messages		
			Test sequence		
Test Sequence:	Step	Туре	Description		
	1	stimulus	EUT1 sends a CA message		
	2	verify	EUT2 receives the SHB packet containing CA message		
	3	verify	EUT2 indicates that the CA message has been received		
	4	verify	EUT3 receives the SHB packet containing CA message		
	5	verify	EUT3 indicates that the CA message has been received		
	6	stimulus	ELIT2 sends a CA message		
	7	vorify	EUT2 solids a OV message		
-	0	verify	ELITI indicates that the CA measure has been received		
-	0	verity	EUT 1 indicates that the CA message has been received		
	9	verify	EUT3 receives the SHB packet containing CA message		
	10	verity	EUT3 indicates that the CA message has been received		
	11	stimulus	EUT3 sends a CA message		
	12	verify	EUT1 receives the SHB packet containing CA message		
	13	verify	EUT1 indicates that the CA message has been received		
	14	verify	EUT2 receives the SHB packet containing CA message		
	15	verify	EUT2 indicates that the CA message has been received		
			Pseudocode		
EUT1, EUT2 and EUT3 being on-link sensure that { when { EUT1 sends CA messages containing cam containing basicContainer containing referencePosition indicating POSITION_1 } then { EUT2 indicates EUT1 as neighbour EUT3 indicates EUT1 as neighbour } when { EUT2 sends CA messages containing cam containing cam containing camParameters containing basicContainer containing referencePosition indicating POSITION_2 } then {					
EUT1 indicates EUT3 indicates } when { EUT3 sends C containing c containing contain containin contain containi	s EUT2 a: s EUT2 a: A messag am ng camPa aining bas ontaining indicati	s neighbour s neighbour ges arameters sicContainer referencePos ng POSITION s neighbour	ition I_3		

7.2.7 CA message - Neighbours detection

}

7.2.8 CA message - Collision Risk Warning

TD ld	DID AUTO IOT CAM CRW BV 01				
Test scenario	Verify co	Verify complete longitudinal collision risk scenario based on CA messages			
Reference	ETSÍ EN	ETSI EN 302 637-2 [3]			
Config Id	CF-02	CF-02			
PICS Selection		<u>····</u>			
			Pre-test conditions		
 EUT1 (vehic 	cle) sends (CA messages.	, C1		
EUT1 (vehic	EUT1 (vehicle) is moving slowly between positions POS1 and POS2				
EUT2 (vehic	le) sends (CA messages,	, C2		
EUT2 (vehic	le) is movi	ng from Start	position to End position		
			Test sequence		
Test Sequence:	Step	Туре	Description		
Test Sequence:	Step	Туре	Description	HMI	
	1	verify	EUT1 (vehicle) receives CA messages C2		
	2	verify	EUT2 (vehicle) receives CA messages C1		
	3	stimulus	Distance between EUT1 (vehicle) and EUT2 (ve	ehicle) becomes less	
			than the pre-defined security distance		
	4	verify	EUT1 (vehicle) indicates the forward collision	^	
			risk		
				Forward collision	
	5	verify	EUT2 (vehicle) indicates the forward collision		
risk l					
Forward collision					
Pseudocode					
with {					
EUI1 having mo	ved slowly	between posi	itions POS1 and POS2		
and EUTZ naving	j movea m	om Start posit	ion to End position		
} ensure that {					
when {					
distance between FLIT1 and FLIT2 becomes less than the pre-defined security distance					
}					
then {					
EUT1 indicates the forward collision risk					
and EUT2 indicates the forward collision risk					
}					
}					

TD Id	TD_AUTO_IOT_CAM_CRW_BV_02			
Test scenario	Verify complete intersection collision risk scenario based on CA messages			
Reference	ETSI EN 302 637-2 [3]			
Config Id	CF-04			
PICS Selection				
	Pre-test conditions			
 EUT1 (vehicle 	e) sends CA messages, C1			
 EUT1 (vehicle) is moving from Start1 position to End1 position 				
EUT2 (vehicle) sends CA messages, C2				
EUT2 (vehicle) is moving from Start2 position to End2 position				

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Test sequence					
Test Sequence:	Step	Туре	Description	HMI	
	1	verify	EUT1 (vehicle) receives CA messages C2		
	2	verify	EUT2 (vehicle) receives CA messages C1		
	3	stimulus	EUT1 (vehicle) and EUT2 (vehicle) approach sir	multaneously POS3	
	4	verify	EUT1 (vehicle) indicates the lateral collision risk		
				Lateral collision	
	5	verify	EUT2 (vehicle) indicates the lateral collision risk		
				Lateral collision	
			Pseudocode		
<pre>with { EUT1 having moved from Start1 position to End1 position and EUT2 having moved from Start2 position to End2 position }</pre>					
ensure that {					
When {		ah cimultanaa	ucly POS3		
EUTT and EUTZ approach simultaneously POSS					
∫ then∫					
FLIT1 indicates the lateral collision risk					
and FLIT2 indicates the lateral collision risk					
}					

7.2.9 GN message - Duplicate address detection

TD Id	TD_AUT	TD_AUTO_IOT_GN_DAD_BV_01			
Test scenario	Verify co	Verify complete resolution of duplicate address conflict scenario based on GN messages			
Reference	ETSI EN	ETSI EN 302 636-4-1 [2], clause 9.2.1.5			
Config Id	CF-01				
PICS Selection					
Pre-test conditions					
 EUT1 (vehicle) and EUT2 (vehicle) are configured with the same GN address 					
EUT1 (vehicle) and EUT2 (vehicle) are off-link					
Test sequence					
Test Sequence:	Step	Туре	Description		
	1	stimulus	EUT1 (vehicle) and EUT2 (vehicle) become on-link		
	2	verify	EUT1 (vehicle) changes its GN address		
	3	verify	EUT2 (vehicle) changes its GN address		
Pseudocode					
<pre>with { EUT1 and EUT2 being configured with the same GN address and EUT1 and EUT2 being off-link ensure that { when { EUT1 and EUT2 become on-link } then { EUT1 changes its GN address and EUT2 changes its GN address and EUT2 changes its GN address and EUT2 changes its GN address vhen { EUT1 sends CA messages containing cam containing camParameters containing basicContainer containing referencePosition } then { EUT2 indicates EUT1 as neighbour } } }</pre>					

}
when {
 EUT2 sends CA messages
 containing cam
 containing camParameters
 containing basicContainer
 containing referencePosition
}
then {
 EUT1 indicates EUT2 as neighbour
}

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• IEEE 802.11pTM-2010: "IEEE Standard for Information technology - Local and metropolitan area networks -Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 6: Wireless Access in Vehicular Environments".

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• ETSI TS 103 097: "Intelligent Transport Systems (ITS); Security; Security header and certificate formats".

History

Document history				
V1.1.1	September 2018	Publication		

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