

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Guide to the demonstration of conformity for
after market Electric/electronic Sub-Assemblies (ESAs)
to the motor vehicle EMC Directive 2004/104/EC**



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650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

Introduction

The present document sets out guidelines to the demonstration of conformity for after market radio communications equipment and its associated ancillary equipment to the vehicle EMC Directive 2004/104/EC [i.3]. In respect of the directive, this type of equipment is known as an Electrical/electronic Sub-Assembly (ESA).

The clause numbers referenced in the text of present document relate directly to the clause numbers used in Directive 2004/104/EC [i.3] unless otherwise stated.

The motor vehicle EMC Directive 2004/104/EC [i.3], contains in its annexes all the technical requirements necessary to demonstrate conformance which allows the ESA to be placed on the market. There are two categories of after market equipment (ESAs) covered by the directive as follows:

- a) After market equipment intended for installation in a motor vehicle, and which are not related to immunity related functions of the motor vehicle. As a general rule ESAs which are not related to an immunity related function of the motor vehicle, are connected directly to the vehicles dc supply, and are not involved/related with any of the vehicle functions described in annex I, clause 2.1.12 of the Directive 2004/104/EC [i.3].
- b) After market equipment intended for installation in a motor vehicle, and which is related to immunity related functions of the motor vehicle, as set out in annex I, clause 2.1.12, are subject to full type approval requirements of the Directive 2004/104/EC [i.3].

The present document sets out guidance to the demonstration of conformity for ESAs in a) and b) described above, but will need to be used together with the Directive 2004/104/EC [i.3].

The motor vehicle EMC Directive now recognizes conformity according to the procedures of the EMC Directive 2004/108/EC [i.2] and the R&TTE Directive 1999/5/EC [i.1], CE marking for after market ESAs described in a) above, but additionally requires that the limits of the clauses referenced in annex I, clause 3.2.9, of the Directive 2004/104/EC [i.3], are fulfilled.

The EMC standard for radio equipment EN 301 489-1 [i.4] has been amended to include all these additional requirements.

It is important to take into account the "exceptions" to the directive, set out in annex I, clause 8 of the Directive 2004/104/EC [i.3].

1 Scope

The present document provides guidance in the demonstration of conformance to the motor vehicle EMC Directive 2004/104/EC [i.3] for after market radio communications equipment and its associated ancillary equipment intended to be installed in motor vehicles.

The present document covers the following ESAs:

- equipment that is not related to immunity-related functions of the motor vehicle;
- equipment which is related to immunity-related functions of the motor vehicle (annex I, clause 2.1.12 of the Directive 2004/104/EC [i.3]).

The purpose of the present document is:

- to provide guidance with the testing of ESAs for conformance evaluation;
- to provide guidance for conformance evaluation.

The clause numbers referenced in the present document relate directly to the clause numbers used in Directive 2004/104/EC [i.3] unless otherwise stated.

2 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 reference document (including any amendments) applies.

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

2.1 Normative references

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

Not applicable.

2.2 Informative references

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] | Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive). |
| [i.2] | Council Directive 2004/108/EC of 31 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive). |
| [i.3] | Commission Directive 2004/104/EC (formally 95/54/EEC) of 14 October 2004, adapting to technical progress Council Directive 72/245/EEC relating to radio interference (electromagnetic compatibility) of vehicles and amending Directive 70/156/EEC on the approximation of laws of the Member States relating to the type approval of motor vehicles and their trailers as amended by 2005/83/EC. |

- [i.4] ETSI EN 301 489-1 (V1.8.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements".
- [i.5] Commission Directive 2009/19 of 12 March 2009 amending, for the purposes of its adaptation to technical progress, Council Directive 72/245/EEC relating to the radio interference (electromagnetic compatibility) of vehicles.

3 Definitions and abbreviations

3.1 Definitions

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

Electrical/electronic Sub-Assembly (ESA): electrical and/or electronic device(s) or set(s) of devices intended to be part of the vehicle, together with any associated electrical connections and wiring, which perform one or more specialized functions

NOTE: See annex I, clause 2.1.8 of Directive 2004/104/EC [i.3].

immunity related functions of the motor vehicle: are those involved or related to immunity related functions

EXAMPLE 1: functions related to the direct control of the vehicle:

- by degradation or change in engine, gear, break, suspension, active steering, speed limitation devices, for example;
- by affecting drivers position, e.g. seat or steering wheel positioning;
- by affecting drivers visibility, e.g. dipped beam, windscreen wiper.

EXAMPLE 2: functions related to the driver, passenger and other road-user protection:

- e.g. airbag and safety restrain systems.

EXAMPLE 3: functions which, when disturbed, cause confusion to the driver and other road users:

- optical disturbances: incorrect operation of e.g. direction indicators, stop lamps, end outline marker lamps, rear position lamps, lightbars for emergency systems, wrong information from warning indicators, lamps or displays related to functions in examples 1 and 2 which might be observed in the direct view of the driver;
- acoustical disturbances: incorrect operation of anti-theft alarm, horn, for example.

EXAMPLE 4: functions related to the vehicle data bus functionality:

- by blocking data transmission on vehicle data-bus systems, which are used to transmit data, required to ensure the correct functioning of other immunity-related functions.

EXAMPLE 5: functions which when disturbed, affect vehicle statutory data: e.g. tachograph, odometer.

NOTE: See annex I, clause 2.1.12 of Directive 2004/104/EC [i.3].

non immunity related functions of the motor vehicle: are those not involved or related to immunity related functions

NOTE: Described in annex I, clause 2.1.12 of Directive 2004/104/EC [i.3].

3.2 Abbreviations

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

EC	European Community
EMC	ElectroMagnetic Compatibility
ESA	Electrical/electronic Sub-Assembly
OJ	Official Journal of the European Commission
R&TTE	Radio and/or Telecommunications Terminal Equipment

4 Conformance/Type Approval requirements for aftermarket ESAs

4.1 General

The motor vehicle EMC Directive 2004/104/EC [i.3] is made up in the following way.

The directive itself covers the legal aspects and transposition date, and also includes the amendments which affect the other directives involved. Attached to the directive are 10 annexes, which sets out the details that need to be followed to demonstrate conformance/type approval to the directive by ESAs.

The annexes of the Directive 2004/104/EC [i.3] cover the following:

- annex I sets out the overall requirements;
- annex II A through to III C covers information relating to the type approval process; and
- annex IV through to X, the methods of measurement used for each of the requirements set out in annex I, clause 6.

It is important to take into account the following general clauses in annex I of the Directive 2004/104/EC [i.3]:

- annex I, clause 2, **Definitions**, as they define all the basic terms used in the conformance requirements;
- annex I, clause 8, **Exceptions**, which sets out the exceptions in respect of conformity to the directive;
- annex I, Appendix 1, Lists the **standards** referred to in the directive.

The technical requirements necessary to demonstrate conformance/type approval to the Directive 2004/104/EC [i.3] for ESAs are set out in clauses 4.2 and 4.4 of the present document and the actions necessary and documentation involved to achieve conformity/type approval, including equipment marking are set out in clauses 4.3 and 4.5 of the present document.

4.2 ESAs not related to an immunity related function of the motor vehicle

This type of ESA is not related to the immunity related functions of the motor vehicle as described in annex I, clause 2.1.12 of the Directive 2004/104/EC [i.3].

Annex I, clause 3.2.9 of the Directive 2004/104/EC [i.3], sets out the requirements for this type of equipment, summarized as follows.

The motor vehicle EMC Directive 2004/104/EC [i.3] now recognizes conformity according to the procedures of the EMC Directive 2004/108/EC [i.2] and the R&TTE Directive 1999/5/EC [i.1]. CE marking is accepted for after market equipment (ESAs) not related to an immunity related function of the motor vehicle (annex I, clause 2.1.12 of the Directive 2004/104/EC [i.3]), but additionally requires that the limits defined in clauses 6.5, 6.6, 6.8 and 6.9 of annex I of the Directive 2004/104/EC [i.3] are fulfilled.

As a general rule ESAs which are not related to an immunity related function of the motor vehicle, are connected directly to the vehicles dc supply, and are not involved/related with any of the vehicle functions as described in annex I, clause 2.1.12 of the Directive 2004/104/EC [i.3].

The EMC standard EN 301 489-1 [i.4] has been amended and include the above additional requirements, which are set out in the normative annex D of EN 301 489-1 [i.4], and can be used to demonstrate conformance to the directive, without additional testing, as stated in annex I, clause 3.2.9 of the Directive 2004/104/EC [i.3].

It is important to note that the requirements of annex I, clause 6.6 of the Directive 2004/104/EC [i.3], are exempt for radio equipment as set out in clause 8.7. These emissions are covered in the ETSI product standards published in the EC, Official Journal (OJ), under article 3.2 of the R&TTE Directive [i.1].

4.3 Actions necessary to demonstrate conformance for ESAs not related to an immunity related function of the motor vehicle

With the Commission Directive 2009/19/EC [i.5] the requirement to obtain an attestation by a Technical Service according to Directive 2004/104/EC [i.3] annex I, clause 3.2.9 has been abolished and the requirement has been deleted from that directive accordingly. This deletion is effective as of 2nd of October 2009. As of that date manufacturer of after market ESA not related to immunity related functions is no more committed to consult a Technical Service anymore before issuing a Declaration of Conformity.

4.4 ESAs related to an immunity related function of the motor vehicle

This type of ESA is related to the immunity related functions of the motor vehicle as described in annex I, clause 2.1.12 and is subject to the type approval requirements of the Directive 2004/104/EC [i.3]. Annex I, clause 3.2 of the Directive 2004/104/EC [i.3], sets out the type approval requirements.

This type of ESA is required to fulfil the appropriate technical specifications set out in annex I, clause 6 of the Directive 2004/104/EC [i.3].

A model of the information document involved is given in annex II B of the Directive 2004/104/EC [i.3].

4.5 Actions necessary to obtain type approval for ESAs related to an immunity related function of the motor vehicle

Type approval: For this type of equipment the type approval process in accordance with the appropriate clauses of annex I, clause 4.2.2 of the Directive 2004/104/EC [i.3].

The documentation described in annex I, clauses 3.2.3 and 3.2.4 of the Directive 2004/104/EC [i.3], should be provided.

Marking: ESAs type approved are marked with an EC type approval mark in accordance with annex I, clause 5 of the Directive 2004/104/EC [i.3]. An example of the "e" mark is shown in annex I, appendix 8 of the Directive 2004/104/EC [i.3].

Any amendments to type approval of an ESA is covered in annex I, clause 4.3 of the Directive 2004/104/EC [i.3].

History

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