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Technical Report

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Using the EN 301 489 series of EMC standards**

Reference

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Foreword

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

Introduction

The EN 301 489 series [i.2] of EMC standards have been produced by ETSI to enable manufacturers of radio products to be able to use the harmonised standards route to demonstrate compliance with article 3.1(b) of the Directive 1999/5/EC [i.1] (R&TTE Directive). The present document is designed to assist the manufacturer to apply these standards in a consistent manner and also understand the various changes between the different versions of each individual part of the EN 301 489 series [i.2].

The present document should reduce the number of revisions to the EN 301 489 series [i.2] of harmonised standards where these revisions are simply to add new examples of equipment covered into the annex A of the individual parts.

1 Scope

The present document is intended to provide guidance on the use the EN 301 489 series [i.2] of harmonised EMC standards produced by ETSI ERM.

Specifically this guidance covers selection of which part that is to be selected for use in conjunction with EN 301 489-1 [i.2] to provide the necessary requirements to enable the user to demonstrate compliance with article 3.1(b) of the Directive 1999/5/EC [i.1] (R&TTE Directive). The aim of this is to increase consistency of application.

In addition the present document also details the differences between the individual versions of each part of the EN 301 489 series [i.2] to assist the reader in reaching a decision on the impact of the different versions on their particular product.

In the interest of maintaining the document as up to date as possible the present document starts with those versions of the EN 301 489 series [i.2] cited in the Official Journal of the European Union (OJEU) on the 29th December 2010.

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.

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

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

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] ETSI EN 301 489 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".
- [i.3] Commission Directive 2004/104/EC of 14 October 2004 adapting to technical progress Council Directive 72/245/EEC relating to the radio interference (electromagnetic compatibility) of vehicles and amending Directive 70/156/EEC on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers.
- [i.4] CENELEC EN 55022: "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurements".
- [i.5] ETSI EN 300 676: "ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service using amplitude modulation".

- [i.6] ETSI TS 125 104: "Universal Mobile Telecommunications System (UMTS); Base Station (BS) radio transmission and reception (FDD) (3GPP TS 25.104)".
- [i.7] ETSI TS 125 105: "Universal Mobile Telecommunications System (UMTS); Base Station (BS) radio transmission and reception (TDD) (3GPP TS 25.105)".
- [i.8] ETSI TS 125 106: "Universal Mobile Telecommunications System (UMTS); UTRA repeater radio transmission and reception (3GPP TS 25.106)".
- [i.9] ETSI TS 136 104: "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception (3GPP TS 36.104)".
- [i.10] ETSI TS 136 141: "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing (3GPP TS 36.141)".
- [i.11] ETSI TS 136 106: "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); FDD repeater radio transmission and reception (3GPP TS 36.106)".
- [i.12] ETSI TS 136 143: "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); FDD repeater conformance testing (3GPP TS 36.143)".
- [i.13] ETSI TS 125 101: "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) radio transmission and reception (FDD) (3GPP TS 25.101)".
- [i.14] ETSI TS 125 102: "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) radio transmission and reception (TDD) (3GPP TS 25.102)".
- [i.15] ETSI TS 136 101: "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception (3GPP TS 36.101)".
- [i.16] ETSI EN 301 839-1 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 402 MHz to 405 MHz for Ultra Low Power Active Medical Implants and Accessories; Part 1: Technical characteristics, including electromagnetic compatibility requirements, and test methods".
- [i.17] ETSI EN 301 839-2 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 402 MHz to 405 MHz for Ultra Low Power Active Medical Implants and Accessories; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".
- [i.18] ERC Recommendation 70-03: "Relating to the use of Short Range Devices (SRD)".
- [i.19] ETSI EN 302 537-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ultra Low Power Medical Data Service Systems operating in the frequency range 401 MHz to 402 MHz and 405 MHz to 406 MHz; Part 1: Technical characteristics and test methods".
- [i.20] ETSI EN 302 537-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Ultra Low Power Medical Data Service Systems operating in the frequency range 401 MHz to 402 MHz and 405 MHz to 406 MHz; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".
- [i.21] ETSI EN 302 195-1 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 9 kHz to 315 kHz for Ultra Low Power Active Medical Implants (ULP-AMI) and accessories; Part 1: Technical characteristics and test methods".
- [i.22] ETSI EN 302 195-2 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 9 kHz to 315 kHz for Ultra Low Power Active Medical Implants (ULP-AMI) and accessories; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".
- [i.23] CENELEC EN 62684: "Interoperability specifications of common external power supply (EPS) for use with data-enabled mobile telephones".

- [i.24] CENELEC EN 61000-3-11: "Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection".
- [i.25] CENELEC EN 61000-3-12: "Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase".
- [i.26] CENELEC EN 61000-4-11: "Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests".
- [i.27] CENELEC EN 55024: "Information technology equipment - Immunity characteristics - Limits and methods of measurement".
- [i.28] ETSI EN 305 550-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 40 GHz to 246 GHz frequency range; Part 1: Technical characteristics and test methods".
- [i.29] M/455 EN Standardisation mandate to CEN, CENELEC and ETSI on a common Charging Capability for Mobile Telephones.
- [i.30] ETSI EN 300 422-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement".
- [i.31] ETSI EN 301 357-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Cordless audio devices in the range 25 MHz to 2 000 MHz; Part 1: Technical characteristics and test methods".
- [i.32] ETSI EN 300 454-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Wide band audio links; Part 1: Technical characteristics and test methods".
- [i.33] CENELEC EN 61000-6-1: "Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments".
- [i.34] ETSI EN 302 567: "Broadband Radio Access Networks (BRAN); 60 GHz Multiple-Gigabit WAS/RLAN Systems; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".
- [i.35] Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC.
- [i.36] ETSI EN 301 559: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Low Power Active Medical Implants (LP-AMI) operating in the frequency range 2 483,5 MHz to 2 500 MHz".

3 Abbreviations

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

AC	Alternating Current
AM	Amplitude Modulation
BS	Base Station
BSS	Base Station System
CB	Citizens Band
CCMF	Centralised Control and Monitoring Functions
CDMA	Code Division Multiple Access
CPE	Customer Premises Equipment
DCS	Digital Cellular System
DECT	Digital Enhanced Cordless Telecommunications
DSB	Double Side Band
EC	European Commission

EDGE	Enhanced Data for GSM Evolution
EMC	Electromagnetic Compatibility
EMCD	EMC Directive
EPS	External Power Supply
ERP	Effective Radiated Power
ESA	Electrical/Electronic Sub-Assembly
EST	Earth Station on Trains
EU	European Union
EUT	Equipment Under Test
E-UTRA	Evolved Universal Terrestrial Radio Access
FDD	Frequency Division Duplex
FS	Fixed Service
FSS	Fixed Satellite Service
GFSK	Gaussian Frequency Shift Key
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
IEM	In Ear Monitor
ISM	Industrial, Scientific and Medical
LAN	Local Area Network
LMSS	Land Mobile Satellite Service
LNB	Low Noise Block
MEDS	Medical Data Service
MES	Mobile Earth Station
MSS	Mobile Satellite Service
NCF	Network Control Facilities
NMT	Nordic Mobile Telephone
OJEU	Official Journal of the European Union
PABX	Private Automatic Branch Exchange
PCN	Personal Communications Network
PMR	Private Mobile Radio
RBS	Random Binary Sequence
RF	Radio Frequency
ROMES	Receive Only Mobile Earth Station
RTMS	Radio Telephone Mobile System (Italy)
SMS	Short Message Service
SNG	Satellite News Gathering
SRD	Short Range Device
TACS	Total Access Communication System
TDD	Time Division Duplex
TES	Transportable Earth Station
TETRA	TErrestrial TRunked RAdio
TTE	Telecommunications Terminal Equipment
TTED	Telecommunications Terminal Equipment Directive
UE	User Equipment
UMTS	Universal Mobile Telecommunication System
UTRA	Universal Terrestrial Radio Access
UWB	Ultra WideBand
VDL	Very High Frequency Digital Link
VHF	Very High Frequency

4 Overview of the EN 301 489 series

The EN 301 489 series [i.2] of EMC standards was developed to replace the previous range of EMC standards by bringing together all of the requirements into one standard, EN 301 489-1 [i.2]. However, recognising that radio systems contain differences in intentional operating frequencies and may require different test set-ups and diagnostics owing to the use of different modulation schemes etc., part 2 onwards were produced to contain the individual differences that were present in the different technologies covered by this series. Over time the number of extra parts has exploded to the situation that we have today. One of the consequences of the increasing number of extra parts is the risk of an inconsistent approach to the selection of which part is to be used alongside part 1 for a given type of product.

The way the EN 301 489 [i.2] series was designed to be used is that EN 301 489-1 [i.2] is used either on its own or in conjunction with the appropriate part from 2 onwards. As the part 2 onwards contains deltas to the requirements within EN 301 489-1 [i.2] both standards should be quoted in any test documentation, and subsequent declaration of conformity, as the full test suite for any given product can only be realised by using the combination of both parts; e.g. a test report for a WiFi device would refer to EN 301 489-1 [i.2] and EN 301 489-17 [i.2].

Guidance on the applicability of each of the sub-parts was originally intended to be covered by the examples in annex A of each of the sub-parts. However, with the rapid evolution of technology this approach has increasingly meant that every time a new technology or product is required to be included in annex A, a revision of a harmonised standard would take place. As revising harmonised standards is both time consuming in its actual process and the consequence of a revision is felt by all manufacturers whether they benefit or not from the revision in terms of cost of changing compliance documentation. Although annex A was always intended to contain only examples and thus be indicative rather than normative, this has not always been the way these standards have been viewed.

5 Individual parts of the EN 301 489 series

The following clauses provide detail on each of the individual parts of the EN 301 489 series [i.2].

It should be noted that some of the sub-parts in the EN 301 489 series [i.2] contain undated references. In these cases and in line with the ETSI Technical Working Procedures, the latest published version of the referenced document applies.

NOTE: All future revisions of the EN 301 489 series [i.2] will contain dated references only.

5.1 EN 301 489-1 Common technical requirements

As previously mentioned EN 301 489-1 [i.2] contains all the technical requirement, limits and test methods required to demonstrate compliance with article 3.1(b) of the Directive 1999/5/EC [i.1] (R&TTE Directive) and/or the essential requirement of the Directive 2004/108/EC [i.35] contained in article 5 of this Directive.

It is possible to use EN 301 489-1 [i.2] on its own without the use of an additional part where none of the additional parts apply to the radio system under assessment. However, where a product specific part is available, this should be used with EN 301 489-1 [i.2].

5.1.1 EN 301 489-1 V1.6.1

This version has a cessation of presumption of conformity of 1 October 2011.

Compared with the previous version 1.5.1, this version contained a new annex B detailing the Technical requirements for aftermarket equipment (ESAs), which are not related to immunity related functions of the vehicle, necessary to demonstrate conformance to the motor vehicle EMC Directive 2004/104/EC [i.3].

5.1.2 EN 301 489-1 V1.7.1

This version was never published by ETSI or cited in the OJEU. The reason for this was that during its formal approval phase, errors were discovered in the document that, when corrected, resulted in version 1.8.1 being produced.

5.1.3 EN 301 489-1 V1.8.1

This should be viewed as the follow on from version 1.6.1 owing to the situation surrounding V1.7.1 described in clause 5.1.2.

This version has a cessation of presumption of conformity of 30 June 2013.

This version increased the upper range limit of the radiated emissions testing on ancillary equipment from 1 GHz to 6 GHz in line with the 2006 version of EN 55022 [i.4].

In addition to the increased range of radiated emissions testing, the upper range limit for the Radio frequency electromagnetic field testing was increased from 2,0 GHz to 2,7 GHz. This increase was in recognition of the large increase in devices containing 2,4 GHz transmitters, such as WiFi and Bluetooth.

For high current equipment, i.e. input current of greater than 16 Amperes per phase, additional requirements were introduced for harmonic current emissions (AC mains input port) according to EN 61000-3-12 [i.25] and voltage fluctuations and flicker (AC mains input port) according to EN 61000-3-11 [i.24].

The requirements for voltage dips and interruptions, test method according to EN 61000-4-11 [i.26] were revised with test levels defined in the generic immunity standard EN 61000-6-1 [i.33] as follows:

- voltage dip: 0 % residual voltage for 0,5 cycle;
- voltage dip: 0 % residual voltage for 1 cycle;
- voltage dip: 70 % residual voltage for 25 cycles (at 50 Hz);
- voltage interruption: 0 % residual voltage for 250 cycles (at 50 Hz).

Also in this version a new annex C was added providing guidance on the use of EMC standards when testing both combined radio and non-radio equipment and multi-radio equipment.

5.1.4 EN 301 489-1 V1.9.2

This version contains the development of the concept of multi-standard radio and how they are to be assessed for EMC compliance.

There are no changes to any of the technical requirements defined in version 1.8.1, thus meaning in many cases a test report showing compliance to EN 301 489-1 [i.2] V1.8.1 is also able to show compliance to EN 301 489-1 [i.2] V1.9.2.

It should be noted that this version is also cited under the EMC Directive 2004/108/EC [i.35].

5.2 EN 301 489-2 Specific conditions for radio paging equipment

This part of the EN 301 489 series [i.2] is intended to cover all paging equipment whether it be base station transmitting equipment or user terminal. It is also intended to cover all forms of paging regardless of the modulation and data schemes employed.

5.2.1 EN 301 489-2 V1.3.1

Version 1.3.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.3 EN 301 489-3 Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz

This part of the EN 301 489 series [i.2] is intended to cover all generic short range devices operating over the frequency range of 9 KHz to 246 GHz that are not covered by another part of the EN 301 489 series [i.2].

This part is also applicable to all types of RFID equipment irrespective of operating frequency.

5.3.1 EN 301 489-3 V1.4.1

This version covers short range devices falling in the frequency range 9 kHz to 40 GHz and is the only version currently cited in the OJEU.

This version has a cessation of presumption of conformity of 31 May 2015.

5.3.2 EN 301 489-3 V1.5.1

This version was never published owing to issues detected during the formal approval process.

5.3.3 EN 301 489-3 V1.6.1

This version extends the frequency range from 40 GHz to 246 GHz. This was to support those products covered by EN 305 550-1 [i.28].

In addition the radiated immunity test frequency range for all short range devices was extended from 2 GHz to 2,7 GHz.

5.4 EN 301 489-4 Specific conditions for fixed radio links and ancillary equipment

This part of the EN 301 489 series [i.2] is intended to cover all fixed link equipment whether it is operating in a point to point or point to multipoint configuration. Although annex A does separate out equipment into different frequency bands, the standard itself is designed to be used for all frequency bands where this type of equipment may be deployed regardless as to whether the band is listed in annex A or not.

5.4.1 EN 301 489-4 V1.3.1

This version has a cessation of presumption of conformity of 31 January 2011.

5.4.2 EN 301 489-4 V1.4.1

In this version the scope of the standard was revised to cover WiMAX™ base station equipment regardless of the frequency of operation.

Unfortunately this version also contained an error that was only discovered at a later date and subsequently corrected in version 2.1.1.

This version has a cessation of presumption of conformity of 31 August 2014.

5.4.3 EN 301 489-4 V2.1.1

This version effectively reverts the standard back to version 1.3.1. This is done by removing the WiMAX™ base station coverage which is now covered by part 50.

This version also corrects the error in version 1.4.1 where the enclosure radiated emissions requirements were removed from the standard during the addition of the WiMAX™ equipment owing to a difference in the split of specifying requirements between traditional fixed link equipment and the more cellular technology based WiMAX™ base stations.

With this revision fixed link equipment compliant with version 1.3.1 will also be compliant with version 2.1.1.

5.5 EN 301 489-5 Specific conditions for Private land Mobile Radio (PMR) and ancillary equipment (speech and non-speech)

This part of the EN 301 489 series [i.2] is intended to cover all private land mobile radio equipment regardless of its modulation scheme. The exception to this is TETRA equipment which uses EN 301 489-18 [i.2].

5.5.1 EN 301 489-5 V1.3.1

Version 1.3.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.6 EN 301 489-6 Specific conditions for Digital Enhanced Cordless Telecommunications (DECT) equipment

This part of the EN 301 489 series [i.2] is intended to cover all DECT equipment. This includes domestic handsets and base stations, cordless PABX base stations and public access base stations.

5.6.1 EN 301 489-6 V1.3.1

Version 1.3.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.7 EN 301 489-7 Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)

This part of the EN 301 489 series [i.2] is intended to cover all GSM user terminal equipment regardless of the frequency of operation and the services and applications supported by an individual terminal.

It should also be noted that GSM 1800 equipment was originally known as DCS 1800.

This part was originally intended to cover GSM handsets operating in either voice call or SMS transmission. This part should also be used when assessing the impact of enhanced data services such as GPRS and EDGE.

5.7.1 EN 301 489-7 V1.3.1

Version 1.3.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.8 EN 301 489-8 Specific conditions for GSM base stations

This part of the EN 301 489 series [i.2] is intended to cover all GSM base station, repeaters and ancillary RF amplifiers equipment regardless of their operating frequency.

This part was originally intended to cover GSM base stations operating in either voice call or SMS transmission. This part should also be used when assessing the impact of enhanced data services such as GPRS and EDGE.

This part is superseded by EN 301 489-50 [i.2].

5.8.1 EN 301 489-8 V1.2.1

Version 1.2.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.9 EN 301 489-9 Specific conditions for wireless microphones, similar Radio Frequency (RF) audio link equipment, cordless audio and in-ear monitoring devices

This part of the EN 301 489 series [i.2] is intended to cover both analogue and digital equipment in the 30 MHz to 3 000 MHz range, it includes:

- All Radio Microphone equipment
- Hearing Aids
- Assistive listening Devices
- In Ear Monitors(IEM)
- Band II micro transmitters

- Tour Guide Systems
- Cordless Audio
- Audio links (up to 25 W)

Applicable harmonized radio standards are EN 300 422-1 [i.30], EN 301 357-1 [i.31] and EN 300 454-1 [i.32].

Equipment may be body worn, hand held, in vehicle or stand alone. However, it should be noted that equipment employing infra red transmission are outside of the scope of EN 301 489-9 [i.2].

5.9.1 EN 301 489-9 V1.4.1

Version 1.4.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.10 EN 301 489-10 Specific conditions for first (CT1 and CT1+) and second generation cordless telephone (CT2) equipment

This part of the EN 301 489 series [i.2] is intended to cover all analogue cordless telephone equipment regardless of operating frequency used. This covers both domestic handsets and base stations as well cordless PABX base stations. It should also be noted that in some countries some of these analogue systems were known as CT0. However these also fall within the scope of this part of the EN 301 489 series [i.2].

This part also covers all CT2 equipment including domestic handsets and base stations, cordless PABX base stations, public access base stations and stand-alone handsets.

5.10.1 EN 301 489-10 V1.3.1

Version 1.3.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.11 EN 301 489-11 Specific conditions for terrestrial sound broadcasting service transmitters

This part of the EN 301 489 series [i.2] is intended to cover all sound broadcasting transmitters, employing either analogue or digital forms of modulation regardless of their frequency of operation.

5.11.1 EN 301 489-11 V1.3.1

Version 1.3.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.12 EN 301 489-12 Specific conditions for Very Small Aperture Terminal, Satellite Interactive Earth Stations operated in the frequency ranges between 4 GHz and 30 GHz in the Fixed Satellite Service (FSS)

This part of the EN 301 489 series [i.2] applies to the following satellite Earth Stations:

Transmit only and Transmit and receive Ku band VSATs operating as part of a satellite network (e.g. star, meshed or point to point) used for the distribution and/or exchange of information between users, operating in the exclusive part of the Ku-band allocated to the Fixed Satellite Services (FSS), 14,00 GHz to 14,25 GHz (Earth-Space), 12,50 GHz to 12,75 GHz (Space-Earth), and/or in the shared parts of the Ku-band, allocated to the FSS and Fixed Services (FS), 14,25 GHz to 14,50 GHz (Earth-Space) and/or 10,70 GHz to 11,70 GHz (Space-Earth). In such a network a Centralized Control and Monitoring Functions (CCMF) is responsible for the monitoring and control of VSATs.

Receive-only Ku band VSATs operating as part of a satellite network (e.g. star, meshed or point to point) used for the distribution of information, operating in the exclusive space-to-earth part of the Ku-band allocated to the Fixed Satellite Service (FSS), 12,50 GHz to 12,75 GHz (Space-Earth), and/or in the shared parts of the Ku-band, allocated to the FSS and Fixed Service (FS), 10,70 GHz to 11,70 GHz (Space-Earth).

Transmit only and Transmit and receive C band VSATs operating as part of a satellite network (e.g. star, meshed or point to point) used for the distribution and/or exchange of information between users, operating in the exclusive part of the C-band allocated to the Fixed Services (FS) and to the Fixed Satellite Services (FSS), 5,850 GHz to 6,425 GHz (Earth-Space), 3,625 GHz to 4,200 GHz (Space-Earth). In such a network a Centralized Control and Monitoring Function (CCMF) is responsible for the monitoring and control of VSATs.

Receive-only C band VSATs operating as part of a satellite network (e.g. star, meshed or point to point) used for the distribution of information, operating in the exclusive part of the C-band allocated to the Fixed Services (FS) and to the Fixed Satellite Services (FSS) 3,625 GHz to 4,200 GHz (Space-Earth).

NOTE 1: The above VSATs comprise both the "outdoor unit", usually composed of the antenna subsystem and associated power amplifier and Low Noise Block (LNB), and the "indoor unit" composed of the remaining part of the communication chain, including the cable between these two units.

Satellite News Gathering (SNG) Ku band Transportable Earth Stations (TESs) which can be either an unforeseen or pre-planned activity. The SNG TES is capable of transmitting television signals and associated audio or programme audio only towards a satellite positioned on the geostationary orbit, operating in the exclusive part of the Ku-band allocated to the Fixed Satellite Services (FSS), 12,75 GHz to 13,25 GHz (Earth - Space), 13,75 GHz to 14,50 GHz (Earth-Space), 10,70 GHz to 11,70 GHz (Space-Earth), and/or 12,50 GHz to 12,75 GHz (Space-Earth). Frequencies could be selected from through the entire frequency range or be restricted to a range completely enclosed within those bands. These bands are partly shared between FSS and Fixed Service (FS). The modulation method may be either analogue or digital. Such transmissions are point-to-point or point-to-multipoint but not for general broadcast reception. A Transportable Earth Station (TES) is an earth station that can be relocated at any time to a different fixed operating location but is not intended to operate during the relocation period. The TES can be either vehicle mounted or packed for transportation. The TESs considered in the present document are those designed to operate whilst stationary. This earth station should include a capability to receive from the satellite for antenna pointing purposes and to monitor its own transmission where the satellite transmission beam permits. The receive equipment could also be used in the process of the two-way communication to control and co-ordinate operation. These SNG TESs comprise both the antenna sub-system and the associated transmit and receive sub-systems.

Satellite Interactive Terminals (SITs), with reception in frequency ranges from 10,70 GHz to 11,70 GHz and from 12,50 GHz to 12,75 GHz as well as the Broadcast Satellite Service (BSS) frequency range from 11,70 GHz to 12,50 GHz, whilst transmission is in the frequency band 29,5 GHz to 30,0 GHz. These SITs are used for reception of audio-visual signals as well as data and for providing a return channel for interactive services via satellite. In such a network a Network Control Facility (NCF) is responsible for the monitoring and control of the transmit functions of the SITs.

Satellite User Terminals (SUTs) that receive in the frequency band 19,70 GHz to 20,20 GHz and/or transmit in the frequency bands 27,5 GHz to 29,5 GHz or 29,5 GHz to 30,0 GHz. In such a network a Network Control Facility (NCF) is responsible for the monitoring and control of the transmit functions of the SITs.

NOTE 2: The equipment considered in the above comprises both the outdoor unit, usually composed of the antenna subsystem and associated upconverter, power amplifier and Low Noise Block (LNB) downconverter, and the indoor unit, usually composed of receive and transmit logic as well as the modulator, including the cable between these two units.

Satellite Earth Station on Trains (EST) used mainly for transmission and reception of data signals, with the following characteristics:

- The EST is comprised of all the equipment, electrical and mechanical, from the antenna itself to the interface with other communications equipment on a train (usually referred to as the terrestrial interface).
- The EST transmits on single carrier in the frequency range 14,00 GHz to 14,25 GHz, which is a portion of a band allocated to the Fixed Satellite Services (FSS) (Earth to space).
- The EST receives in one or more frequencies within the range from 10,70 GHz to 12,75 GHz in bands allocated to the Fixed Satellite Services (FSS) (space to Earth) or the Broadcast Satellite Service (BSS) (space to-Earth), depending on the ITU Region where the EST is located.

- The EST operates in a railway environment and, therefore, may be subject to occasional disturbances and interruptions in the satellite link.
- The EST is operating as part of a satellite network (e.g. star, mesh or point to point) used for the distribution and/or exchange of information.

5.12.1 EN 301 489-12 V2.2.2

Version 2.2.2 is the latest version of this part and is the only version currently listed in the OJEU.

5.13 EN 301 489-13 Specific conditions for Citizens' Band (CB) radio and ancillary equipment (speech and non-speech)

This part of the EN 301 489 series [i.2] is intended to cover all CB equipment regardless of the operating frequency of the equipment and modulation schemes employed.

5.13.1 EN 301 489 V1.2.1

Version 1.2.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.14 EN 301 489-14 Specific conditions for analogue and digital terrestrial TV broadcasting service transmitters

This part of the EN 301 489 series [i.2] is intended to cover all terrestrial television broadcasting transmitters, employing either analogue or digital forms of modulation regardless of their frequency of operation.

5.14.1 EN 301 489-14 V1.2.1

Version 1.2.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.15 EN 301 489-15 Specific conditions for commercially available amateur radio equipment

This part of the EN 301 489 series [i.2] is intended to cover all commercially available amateur radio equipment regardless of the operating frequency and modulation schemes employed.

5.15.1 EN 301 489-15 V1.2.1

Version 1.2.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.16 EN 301 489-16 Specific conditions for analogue cellular radio communications equipment, mobile and portable

This part of the EN 301 489 series [i.2] is intended to cover all analogue cellular user terminal equipment regardless of the frequency of operation and modulation schemes employed. This means that EN 301 489-16 [i.2] is applicable to TACS, NMT, RC-2000, C-450 and RTMS products.

5.16.1 EN 301 489-16 V1.2.1

Version 1.2.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.17 EN 301 489-17 Specific conditions for Broadband Data Transmission Systems

This part of the EN 301 489 series [i.2] was originally developed to cover wireless LAN equipment operating in the 2,45 GHz and 5 GHz bands. This was then expanded to cover other wireless broadband systems such as HomeRF and Bluetooth that also operated in the 2,45 GHz band. Equipment covered includes both access point (base station) and client devices including transceivers embedded within other devices such as personal computers.

5.17.1 EN 301 489-17 V1.3.2

This version was created to include the addition of broadband data transmission systems operating in the 5,8 GHz band and has a cessation of presumption of conformity of 1 October 2011.

5.17.2 EN 301 489-17 V2.1.1

This version was created to include the addition of WiMAX™ CPE equipment regardless of the frequency of operation or whether or not this user equipment is fixed, nomadic or mobile. It should be noted that equipment containing an embedded WiMAX™ transceiver such as a pc would also be covered by this part when assessing that functionality.

Also with this version the title of part 17 was simplified to give a clearer description of the type of equipment covered.

No technical changes were made in comparison to version 1.3.1, thus meaning a test report to version 1.3.2 is also able to show compliance to the requirements of version 2.1.1.

This version has a cessation of presumption of conformity of 31 May 2014.

5.17.3 EN 301 489-17 V2.2.1

This version was created to add 60 GHz Multiple-Gigabit WAS/RLAN Systems as described by EN 302 567 [i.34]. In addition clarification of the types of WiMAX™ CPE equipment covered by this part of the EN 301 489 series [i.2] was improved by the addition of references to more recent standards.

No technical changes were made in comparison to version 2.1.1, thus meaning a test report to version 2.1.1 or version 1.3.2 is also able to show compliance to the requirements of version 2.2.1.

5.18 EN 301 489-18 Specific conditions for Terrestrial Trunked Radio (TETRA) equipment

This part of the EN 301 489 series [i.2] is intended to cover all TETRA equipment whether it be base station transmitting equipment, repeater or user terminal.

5.18.1 EN 301 489-18 V1.3.1

Version 1.3.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.19 EN 301 489-19 Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications

This part of the EN 301 489 series [i.2] applies to ROMES which operate in the Land Mobile Satellite Service (LMSS) space to earth bands at 1 525 MHz to 1 544 MHz and 1 555 MHz to 1 559 MHz. These ROMES operate as part of a satellite system providing one way data communications.

5.19.1 EN 301 489-19 V1.2.1

Version 1.2.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.20 EN 301 489-20 Specific conditions for Mobile Earth Stations (MES) used in the Mobile Satellite Services (MSS)

This part of the EN 301 489 series [i.2] applies to Mobile Earth Stations (MESs), with both transmit and receive capabilities for operation in a Satellite Personal Communication Network (S-PCN).

MES equipment may be handheld, portable or vehicle mounted. Unless otherwise stated, EN 301 489-20 [i.2] only applies to the MES component of a multi-mode terminal.

The Mobile Satellite Service (MSS) frequency bands within which the MESs operate are:

- MESs transmit 1 610 MHz to 1 626,5 MHz
- MESs receive 1 613,8 MHz to 1 626,5 MHz and 2 483,5 MHz to 2 500 MHz

5.20.1 EN 301 489-20 V1.2.1

Version 1.2.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.21 EN 301 489-21

This part of the EN 301 489 series [i.2] is currently unused.

5.22 EN 301 489-22 Specific conditions for ground based VHF aeronautical mobile and fixed radio equipment

This part of the EN 301 489 series [i.2] applies to ground base station, ground mobile and hand held/portable aeronautical VHF radio communications and associated ancillary equipment, as defined in EN 300 676 [i.5].

Ground based aeronautical VHF radio communications equipment within the scope of this part is characterized by the following operating conditions:

- a) operating in the frequency range 118 MHz to 136,975 MHz, at 8,33 kHz or 25 kHz channel spacing;
- b) using DSB AM, GFSK or D8PSK modulation; and comprises ground base station, mobile, and hand held/portable applications.

This part also covers EMC requirements for VDL Mode 2 and VDL Mode 4 ground base station radio equipment.

5.22.1 EN 301 489-22 V1.3.1

Version 1.3.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.23 EN 301 489-23 Specific conditions for IMT-2000 CDMA, Direct Spread (UTRA and E-UTRA) Base Station (BS) radio, repeater and ancillary equipment

This part of the EN 301 489 series [i.2] applies to 3rd Generation Partnership Project (UTRA) base station and repeater equipment intended for use in UTRA networks. In addition it also applies to base station and repeater equipment for Evolved Universal Terrestrial Radio Access (E-UTRA) networks.

Definitions for UTRA base station equipment within the scope of this part are found in the following functional radio specifications:

- TS 125 104 [i.6];
- TS 125 105 [i.7];
- TS 125 106 [i.8].

Definitions for E-UTRA base station equipment within the scope of this part are found in the following functional radio specifications:

- base stations of E-UTRA meeting the requirements of TS 136 104 [i.9], with conformance demonstrated by compliance to TS 136 141 [i.10];
- repeaters of E-UTRA meeting the requirements of TS 136 106 [i.11], with conformance demonstrated by compliance to TS 136 143 [i.12].

This part is superseded by EN 301 489-50 [i.2].

5.23.1 EN 301 489-23 V1.3.1

This version was created to improve the definition of the exclusion bands for use with different TDD and FDD transmission option that may be supported.

This version has a cessation of presumption of conformity of 30 June 2012.

5.23.2 EN 301 489-23 V1.4.1

This version included provision for E-UTRA base station and repeater equipment.

This version has a cessation of presumption of conformity of 31 August 2013.

5.23.3 EN 301 489-23 V1.5.1

This version was produced to correct an error in version 1.4.1 which causes difficulties in applying the performance criteria for UTRA RBS (WCDMA).

5.24 EN 301 489-24 Specific conditions for IMT-2000 CDMA Direct Spread (UTRA and E-UTRA) for Mobile and portable (UE) radio and ancillary equipment

This part of the EN 301 489 series [i.2] applies to the 3rd Generation Partnership Project UTRA and E-UTRA digital cellular mobile and portable radio equipment. Definitions for mobile and portable radio and associated ancillary equipment within the scope of this part are found in the following functional radio specifications:

- TS 125 101 [i.13]
- TS 125 102 [i.14]
- TS 136 101 [i.15]

5.24.1 EN 301 489-24 V1.4.1

This version was created to improve the definition of the exclusion bands for use with different TDD and FDD transmission option that may be supported.

This version has a cessation of presumption of conformity of 31 July 2012.

5.24.2 EN 301 489-24 V1.5.1

This version included provision for E-UTRA user equipment.

5.25 EN 301 489-25 Specific conditions for CDMA 1x spread spectrum Mobile Stations and ancillary equipment

This part of the EN 301 489 series [i.2] is intended to cover all CDMA 1x spread spectrum mobile stations and related ancillary equipment, regardless of which band class the equipment operates in.

5.25.1 EN 301 489-25 V2.3.2

Version 2.3.2 is the latest version of this part and is the only version currently listed in the OJEU.

5.26 EN 301 489-26 Specific conditions for CDMA 1x spread spectrum Base Stations, repeaters and ancillary equipment

This part of the EN 301 489 series [i.2] is intended to cover all CDMA 1x spread spectrum base stations, repeaters and related ancillary equipment, regardless of which band class the equipment operates in.

This part is superseded by EN 301 489-50 [i.2].

5.26.1 EN 310 489-26 V2.3.2

Version 2.3.2 is the latest version of this part and is the only version currently listed in the OJEU.

5.27 EN 301 489-27 Specific conditions for Ultra Low Power Active Medical Implants (ULP-AMI) and related peripheral devices (ULP-AMI-P)

The part of the EN 301 489 series [i.2] applies to ULP-AMI and ULP-AMI-P devices with RF power levels ranging up to 25 μ W ERP and intended for operation in the frequency range 402 MHz to 405 MHz in accordance with the provisions of annex 12, band (a), to CEPT/ERC/REC 70-03 [i.18]. Definitions of such ULP-AMI and ULP-AMI-P radio equipment are found in the following functional radio standards:

- EN 301 839-1 [i.16]
- EN 301 839-2 [i.17]

5.27.1 EN 301 489-27 V1.1.1

Version 1.1.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.28 EN 301 489-28 Specific conditions for wireless digital video links

This part of the EN 301 489 series [i.2] applies to wireless digital video link equipment. Such equipment is categorized as follows to further aid the EMC assessment of various individual pieces of equipment.

The categories of equipment covered, are as follows:

- Category 1: This category of equipment is typically used by Broadcasters and Programme makers that require the highest video contribution quality and or minimum processing delay times to allow both real time inserts into programmes and easy accurate editing. This category of equipment normally operate on licensed frequencies e.g. 2,5 GHz, 3,5 GHz, 5 GHz, 7 GHz and 12 GHz bands.
- Category 2: This category of equipment is typically used by Professional and Business users and has quality requirements similar to category 1, but the users are less concerned with delay issues, that affect the broadcaster and can therefore operate within a reduced spectrum mask, than category 1 equipment.
- Category 3: This category of equipment is typically used by civil and industrial users, emergency services, Automobile Associations, and the utilities etc who need good quality available from digital based systems and who operate on licensed frequencies.
- Category 4: This category of equipment is typically used in Industrial applications (e.g. industrial security), operating either in ISM bands or on frequencies specifically allocated for the purpose.
- Category 5: This category of equipment is typically used by consumers, hobbyists and amateur users. Its 5 MHz mask can be subdivided into $2 \times 2,5$ for two way visual communication and is primarily intended for indoor use.

5.28.1 EN 301 489-28 V1.1.1

Version 1.1.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.29 EN 301 489-29 Specific conditions for Medical Data Service Devices (MEDS) operating in the 401 MHz to 402 MHz and 405 MHz to 406 MHz bands

This part of the EN 301 489 series [i.2] is intended to cover ULP-AMI, ULP-AMD, ULP-BWD, ULP-AMD-P and ULP-AMI-P devices with RF power levels ranging up to 25 μ W ERP and intended for operation in the frequency range 401 MHz to 402 MHz and 405 MHz to 406 MHz in accordance with the provisions of annex 12, band b) and band c), to ERC Recommendation 70-03 [i.18]. Definitions of such ULP-AMI, ULP-AMD, ULP-BWD, ULP-AMD-P and ULP-AMI-P radio devices are found in the following functional radio standards:

- EN 302 537-1 [i.19]
- EN 302 537-2 [i.20]

5.29.1 EN 301 489-29 V1.1.1

Version 1.1.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.30 EN 301 489-30

This part of the EN 301 489 series [i.2] is currently unused.

5.31 EN 301 489-31 Specific conditions for equipment in the 9 kHz to 315 kHz band for Ultra Low Power Active Medical Implants (ULP-AMI) and related peripheral devices (ULP-AMI-P)

This part of the EN 301 489 series [i.2] applies to ULP-AMI and ULP-AMI-P with field strength levels ranging up to 30 dB μ A/m at 10 meters and intended for operation in the frequency range 9 kHz to 315 kHz in accordance with the provisions of annex 12, band (b), to ERC Recommendation 70-03 [i.18]. Applications include but are not limited to pacemakers, defibrillators, nerve stimulators, insulin pumps, etc. Definitions pertaining to this radio equipment are found in the following functional radio standards:

- EN 302 195-1 [i.21]
- EN 302 195-2 [i.22]

5.31.1 EN 301 489-31 V1.1.1

Version 1.1.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.32 EN 301 489-32 Specific conditions for Ground and Wall Probing Radar applications

This part of the EN 301 489 series [i.2] is intended to cover all ground and wall probing radar equipment.

5.32.1 EN 301 489-32 V1.1.1

Version 1.1.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.33 EN 301 489-33 Specific conditions for Ultra Wide Band (UWB) communications devices

This part of the EN 301 489 series [i.2] is intended to cover impulse, modified impulse and RF carrier based UWB communication technologies.

The part of the EN 301 489 series [i.2] applies to fixed (indoor only), mobile or portable applications, e.g.:

- stand-alone radio equipment with or without its own control provisions;
- plug-in radio devices intended for use with, or within, a variety of host systems, e.g. personal computers, hand-held terminals, etc.;
- plug-in radio devices intended for use within combined equipment, e.g. cable modems, set-top boxes, access points, etc.;
- combined equipment or a combination of a plug-in radio device and a specific type of host equipment;
- equipment for use in road and rail vehicles.

5.33.1 EN 301 489-33 V1.1.1

Version 1.1.1 is the latest version of this part and is the only version currently listed in the OJEU.

5.34 EN 301 489-34 Specific conditions for External Power Supply (EPS) for mobile phones

This part of the EN 301 489 series [i.2] is intended to cover the requirements for the common external power supply (EPS) for use with data-enabled mobile telephones as described in EN 62684 [i.23] and M/455 [i.29]. Interoperability for products within the scope of this part is covered by EN 62684 [i.23]. An EPS not intended to support EN 62684 [i.23] should meet the EMC requirements of EN 55022 [i.4], EN 55024 [i.27], EN 301 489-1 [i.2].

The EPS supplied for test (EUT) should be identified by the supplier as intended to support M/455 [i.29] regarding Harmonisation of a Charging Capability for Mobile Phones.

Prior to EU Mandate M/455 [i.29] and the associated MoU of Manufacturers (given in M/455 [i.29]) EMC assessment was achieved by one of the following options:

- External Power Supply (used as Charger/Power Adaptor for mobile phones):
 - Under R&TTED using EN 301 489-1 [i.2] and a combination of parts 7, 17 and 24 (and/or other applicable standards in this series).
 - Under EMCD using EN 55022 [i.4] & EN 55024 [i.27].
- Mobile Phone:
 - Under R&TTED using EN 301 489-1 [i.2] and a combination of -7, -17, -24.

EMC Compliance Assessment post EU Mandate M/455 [i.29] may be achieved by one of the following options:

- Products which do not comply with the EN 62684 [i.23] and M/455 [i.29]:
 - As prior to the EN 62684 [i.23].
- External Power Supply intended to comply with the EN 62684 [i.23]:
 - R&TTED or EMCD using EN 301 489-1 [i.2] and EN 301 489-34 [i.2].
- Mobile Phone intended to comply with the M/455 [i.29] MoU:
 - R&TTED using EN 301 489-1 [i.2] and a combination of -7, -17, -24 (and/or other applicable standards in this series). This is the same as for a Mobile phone NOT intended to comply with the M/455 [i.29] MoU.

NOTE 1: A Mobile Phone intended to comply with the M/455 [i.29] MoU should be interoperable with an EPS meeting EN 62684 [i.23].

NOTE 2: Meeting the MoU agreement is a voluntary commitment.

This part of the EN 301 489 series [i.2] is also cited under Directive 2004/108/EC [i.35].

5.34.1 EN 301 489-34 V1.1.1

Version 1.1.1 is the initial version of this part listed in the OJEU.

This version has a cessation of presumption of conformity of 28 February 2014.

5.34.2 EN 301 489-34 V1.2.1

This version was never published owing to issues detected during the formal approval process.

5.34.3 EN 301 489-34 V1.3.1

This version modifies the following test requirements:

- 80 mV peak to peak test requirement for continuous phenomena in clause 6.1 of version 1.1.1 has been removed.

Clauses were also re-numbered to maintain alignment with EN 301 489-1 [i.2].

This version has a cessation of presumption of conformity of 28 February 2015.

5.34.4 EN 301 489-34 V1.4.1

This version modifies the following test requirements:

- The RF field immunity and conducted immunity levels in sub clause 9.2 were changed from 10V/m and 10Vrms to 3V/m and 3Vrms respectively across the full test range except for the relevant uplink frequencies.

5.35 EN 301 489-35 Specific requirements for Low Power Active Medical Implants (LP-AMI) operating in the 2 483,5 MHz to 2 500 MHz bands

This part of the EN 301 489 series [i.2] is for Low Power Active Medical Implants (LP-AMI) and associated Peripherals (LP-AMI-P) operating in the band 2 483,5 MHz to 2 500 MHz. The applicable product standard is EN 301 559 [i.36]: this differs from the similar application in the 400 MHz range by virtue of offering greater bandwidth.

5.35.1 EN 301 489-35 V1.1.1

This version has completed the resolution process and is now on national vote, expected to be completed by end of October 2013.

5.36 EN 301 489-50 Specific conditions for Cellular Communication Base Station (BS), repeater and ancillary equipment

This part is intended to replace parts 8, 23, 26 and the clause of part 4 dealing with WiMAX™ base stations. The intention is to bring together all digital cellular technology base station and repeater EMC requirements into a single part of the EN 301 489 series [i.2].

5.36.1 EN 301 489-50 V1.2.1

This is the first edition of this part to be completed.

Version 1.2.1 is the only version currently listed in the OJEU.

History

Document history		
V1.1.1	March 2012	Publication
V1.2.1	January 2014	Publication