
GS7 - Electromagnetic Compatibility Standard

1 Scope

This Generic Standard details the minimum Electromagnetic Compatibility (EMC) requirements for the supply of any item of equipment or System containing electrical or electronic components (“**Electrical Goods**”) to BT. Such supply may be stand alone, or as part of a System, or maintenance of electrical or electronic goods already owned by BT. This Generic Standard applies to BT’s EMC requirements for goods to be used in the United Kingdom and the European Union. EMC requirements outside of these areas need to be compliant with the laws applicable to the region where the supplies are being provided.

This Generic Standard does not apply to software or firmware provided that such software or firmware does not change the EMC characteristics of the Electrical Goods. In such event the Electrical Goods will need to be rechecked for compliance with this Generic Standard.

Within this Generic Standard a ‘System’ is defined as a combination of several items of equipment, finished products, and/or components combined, designed and/or put together by a supplier and intended to be physically installed and operated together. For the avoidance of doubt, the individual items may be supplied by different suppliers. A System must comply with the requirements of this Generic Standard as a single entity and not just the individual items used to construct it.

2 Contractual Requirements

- 2.1 The supplier must immediately report to BT any serious breaches of this Generic Standard. BT will work collaboratively with the supplier to implement remedial actions. However, BT will also take action, which may include terminating its contract with the supplier, if the supplier is unwilling to make any appropriate changes requested by BT.
- 2.2 When requested by BT, the supplier will provide information to support their compliance to this Generic Standard and will warrant the accuracy and completeness of any information relating to the subject matter of this Generic Standard provided to BT prior to entry into their contract with BT. If any aspect of such information no longer remains true in any material respect during the term of their contract, the supplier will promptly submit to BT a written update to such information so that it remains true in all material respects.

3 Electromagnetic Compatibility Requirements

	Applicable to	Requirement
3.1	All	<p>Electrical Goods without any radio functions will be compliant with the EU Electromagnetic Compatibility Directive (2014/30/EC).</p> <p>Electrical Goods with radio functionality will be compliant with Article 3.1(b) of the EU Radio Equipment Directive (2014/53/EU).</p> <p>Where requested, the supplier will confirm in writing which of the above directives is applicable to the Electrical Goods being supplied.</p>
3.2	All	<p>Electrical Goods will be fully compliant with all applicable Harmonised EMC Standards as currently listed in the EU Official Journal for the relevant directive.</p> <p>For Electrical Goods intended to be located in customer’s premises or street furniture, they will comply with emission requirements applicable for a residential environment (typically Class B emission limits). If Harmonised EMC Standards have only been applied in part, please respond as non-compliant and respond to requirement 3.3 below.</p> <p>NOTE: EU Official Journal lists can be found at: EMC: http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/electromagnetic-compatibility/ Residential Environment (RE): https://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/rtte_en</p>
3.3	All	<p>Where compliance with requirement 3.1 is not based on the full application of all applicable Harmonised EMC Standards then the manufacturer will have a positive statement or EU type examination certificate from an appropriate Notified Body attesting that the essential requirements of the relevant directive have been met.</p> <p>NOTE: This approach is detailed in Annex III of the directives</p> <p>If you are compliant with requirement 3.2 above there is no need to respond to this requirement.</p>
3.4	All	<p>Electrical Goods intended to be part of the BT network infrastructure and installed or operated in an operational BT building (including street cabinets) will be compliant with the enhanced immunity requirements given in Annex A of this Generic Standard.</p> <p>Note 1 : These requirements are higher than those required for CE marking.</p> <p>Note 2 : The requirement is not applicable to telephone or other service provider equipment located on the customer's premises.</p> <p>Note 3: The requirements will be met when cabinet doors or shelf covers are open or removed, as would be the case during maintenance procedures.</p>

GS7 - Electromagnetic Compatibility Standard

3.5	Fixed Installations	Installers of "Fixed Installations" will ensure the installation complies with the requirements EU Directive on EMC (2014/30/EC) and a technical document detailing the "good engineering practices" used as referred to in point 2 of Annex I of the relevant directive will be made available to BT.
3.6	Maintenance / repairs	<p>Maintenance or repairs to existing equipment or installations will not have any significant detrimental impact on the EMC performance.</p> <p>Only spare parts approved by the original equipment manufacturer should be used.</p> <p>Spare parts from other sources will not be used unless either:</p> <p>a) they are subsequently approved by the original equipment manufacturer or installer; or</p> <p>b) the supplier or installer ensures that the original Electrical Goods when fitted with the part(s) comply with the requirements given in 3.1 to 3.5 above.</p>

4 Further Information and Documentation

	Applicable to	Requirement
5.1	All	The supplier will inform BT if the Electrical Goods require a dedicated earth connection separate from that in a normal power supply connection in order to ensure EMC compliance.
5.2	All	The supplier will inform BT if the Electrical Goods require any additional external filters to ensure EMC (for example, power filter / conditioner or clip-on ferrite filters) that are not already permanently part of the Electrical Goods to ensure EMC compliance.
5.3	All	<p>The supplier will inform BT if the EMC compliance of the Electrical Goods requires the use of any screened/shielded cabling (additional to any intra-equipment cabling that is supplied).</p> <p>Note: Typically the access network and cabling within customer's properties is installed using unscreened twisted pair cables.</p>
5.4	All	EU directives define certain economic operator roles: the manufacturer, the authorised representative, the importer and the distributor. If requested, the supplier will identify which role applies to the parties in respect of the Electrical Goods supplied.
5.5	All	<p>The supplier will make the following documents available to BT on request:</p> <ol style="list-style-type: none"> 1. EU Declaration of Conformity; 2. Positive statement from Notified Body (if applicable); 3. EMC technical documentation and test reports; and 4. Technical documentation detailing the compliance of a 'fixed installation' (if applicable)

Annex A - EMC Immunity Requirements for Equipment with Respect to interference from Mobile Devices

A.1 Overview

BT requires that all Electrical Goods are immune to the threats posed by mobile devices when used in close proximity to the Electrical Goods. The Electrical Goods will be immune when cabinet doors or shelf covers are removed, as would be the case during maintenance procedures.

In addition to the minimum requirements specified by Harmonised EMC Standards, BT also requires that all telecommunication network equipment meets the following minimum requirements.

A.2 Methodology and Requirements

Radiated immunity testing will be carried out using the methodology given in EN61000-4-3 (latest version) at the frequencies and test levels given in Table 1 below. The signal source will be a generator capable of simulating the radio technology and modulation type. If a suitable test simulator is not available, then a signal generator may be used if it is capable of emulating the radio technology. For example, the carrier of GSM should be pulsed at a rate of 217 Hz with a 12.5% duty cycle (on for 576us repeated every 4.6ms). The methodology used must be included in the technical report sent to BT.

The test levels given in Table 1 are the CW levels prior to the addition of the access method and modulation. The field uniformity of the calibrated volume will be within the range 0 to +6 dB with respect to these values.

All testing will be carried out with the cabinet/rack doors open and all shelf covers removed.

Table 1: Test Requirements by Mobile Type

Technology	Frequency Range of Test [MHz]	Test Level [V/m]	Max. Step Size [kHz]	Access Method / Modulation	Comments
LTE	832 - 862	20	500	OFDM	
GSM	880 - 915	50	200	TDMA/GMSK	If necessary, this can be simulated with pulse modulation of 217Hz and 12.5% duty cycle
GSM and LTE	1710 – 1785	35	200	TDMA/GMSK	If necessary, this can be simulated with pulse modulation of 217Hz and 12.5% duty cycle
DECT	1880 – 1900	20	1000	TDMA/GFSK	If necessary, this can be simulated with pulse modulation of 100Hz and 4% duty cycle

GS7 - Electromagnetic Compatibility Standard

PCS1900	1850 – 1910	35	200	TDMA	Only required if the Electrical Goods are to be installed in North America
UMTS TDD	1900 - 1920	50	2000	OFDM	
UMTS	1920 – 1980	50	2000	WCDMA/QPSK	
2.4 GHz LAN	2400 - 2480	12	2000	DSSS/PBCC	This is considered sufficient to also cover the threat from Bluetooth devices
LTE	2500 - 2570	20	1000	OFDM	
TDD-LTE	2570 - 2615	20	1000	OFDM	
TDD-LTE	3400 - 3700	20	1000	OFDM	
5 GHz LAN	5150 – 5350	12	2000	OFDM	

During the application of the test signals, the Electrical Goods will be fully monitored for any disruption including: functional failures, equipment errors, data errors, loss of synchronisation and lock-up. The Electrical Goods will continue to function as intended during the application of the tests without any form of malfunction, self-recovery or manual intervention. Acoustic noise within analogue circuits is permitted.

Notes:

During testing, the minimum test distance may be reduced to 0.5m between the antenna and the Electrical Goods, provided the uniformity requirements of the test area can be satisfied. Care will be taken to ensure that the entirety of the Electrical Goods surface is exposed to the field, which may require several positions of the test antenna / test area.

Later versions of the test method can be used when published. If agreed with BT in writing, an alternative test method may also be used if the results can be correlated to the above requirements.

A.3 Abbreviations

CW	Carrier Wave
DSSS	Direct Sequence Spread Spectrum
GFSK	Gaussian Frequency Shift Keying
GMSK	Gaussian Minimum Shift Keying
GSM	Global System for Mobile Communications
OFDM	Orthogonal Frequency Division Multiplex
PBCC	Packet Binary Convolution Coding
QPSK	Quadrature Phase Shift Keying
TDMA	Time Division Multiple Access
UMTS	Universal Mobile Telecommunications System
WCDMA	Wideband Code Division Multiple Access