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APPENDIX H
OF
TEST REPORT T60643_F

TEST SAMPLE TEST PLAN

FCC ID:	TVN-MDR1109
Manufacturer:	MAGELLAN TECHNOLOGY PTY LIMITED
Test Sample:	MDR-1109 Desk Top Reader
Model:	MDR-1109
Serial Number:	100132
Date:	19th July 2006

MDR-1109 DESK TOP READER

09 July 2006

Test Plan

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Revision status

Revision	***Date***	***Description***
1.0	22 June 2006	Initial Release
1.1	9 July 2006	Added version numbers to Standards, corrected references in Table 3

SECTION 1 - INTRODUCTION

1. PURPOSE

The purpose of this document is to describe the requirements for testing Model MDR-1109 against the EMC, radio and safety requirements of Australia, European Union, USA and Canada.

1.1 TEST REQUIREMENTS

1.1.1 Test Standards

Testing is to be performed using the procedures and criteria contained in the following standards:

- Australia
  (a) AS/NZS 4268 : 2003 (Radio)
  (b) AS/NZS CISPR 22 : 2004 (EMC)

- European Union
  (a) EN 300 330-1 : vers 1.3.1, EN 300 330-2 : vers 1.1.1 (Radio)
  (b) EN 301 489-1 : vers 1.5.1, EN 301 489-3 : vers 1.4.1 (EMC)
  (c) EN 50364 : 2001 (EMR)
  (d) EN 60950-1 : 2001 (Safety)

- USA
  (a) FCC Part 2, Part 15 (Radio)
  (b) FCC Part 15 (EMC)
  (c) EMR

- Canada
  (a) RSS-210 : Issue 6 (Radio)
  (b) ICES-03 : Issue 4 (EMC)
  (c) RSS-102 : Issue 2 (EMR)

1.2 PRODUCT DESCRIPTION

The desktop MDR-1109 is an RFID read-write device designed for desktop environments.

The unit consists of a single integral antenna, external power supply, USB and Ethernet ports.

Power is provided from an external 12VDC power supply.

1.2.1 Ports

The following ports are provided on the product:

- Power port
- USB device port
- USB host port
- RJ45 (Ethernet) port

1.3 PRODUCT SPECIFICATIONS

Manufacturer:	Magellan Technology Pty Limited 65 Johnston Street Annandale NSW 2038 Telephone: +61 2 9562 9800 Fax: +61 2 9518 7620
Transmission Frequency:	13.56 MHz
Voltage:	12VDC

Number of Axes:	1
Number of Reply Channels:	2
Command Data Rate	424 kbit/s
Tag Type:	PJM Stack Tag and PJM Item Tag
Dimensions:	146 (L) x 91 (W) x 30 mm (H)
Operating environment:	Indoors

1.4 PRODUCT BUILD LEVEL

The build level of the MDR-1109 under test is as follows:

Model Number:	MDR-1109
Serial Number:	Production Prototype
Part Number:	60-70-003-ASY MLC01 Ver. 1
Microprocessor type:	AT91RM9200
Frequencies:	50 MHz 27.120 MHz 18.432 MHz
Real Time Clock:	32,768 kHz
BOM:	60-70-003-BOM Ver. 1 (Master BOM MDR-1109) 56-10-002-BOM Ver. 5 (BOM Main Circuit Assembly) 60-10-000-BOM Ver. 4 (BOM Antenna MDR-1109)
Main PCB Circuit:	56-10-002-SCH Ver. 4
Main PCB:	56-10-002-ASY Rev 3
Antenna PCB Circuit:	60-10-002-SCH Ver. 1
Antenna PCB:	60-10-000-ASY Ver. 2
Antenna type:	Integral inductive loop antenna
Power Supply:	Cincon type TR36A-12 Input 100 – 240V, 1.0A, 50-60 Hz Output 12VDC, 2.5A
Data Cables:	Ethernet Cable minimum 3 meters in length

1.4.1 Auxiliary Equipment

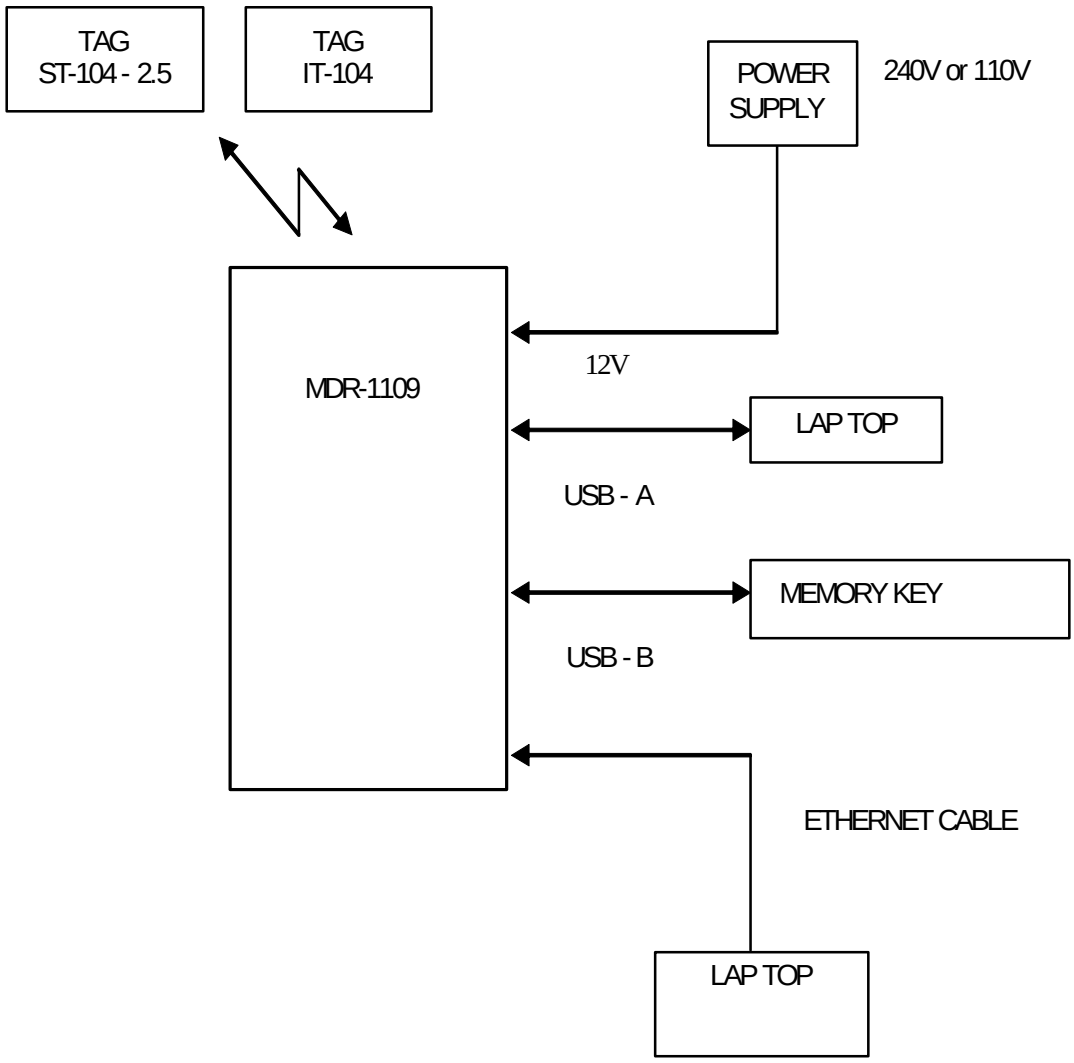
The following auxiliary equipment will be used during testing:

- laptop "Toshiba Tecra 8100"
- laptop “Toshiba TE2000”
- USB Flash drive "ASTONE 256MB 80X"
- USB AtoB cables, shielded type cable, unknown brand, shorter than 3m
- USB AtoA (extension) cables, shielded type cable, unknown brand, shorter than 3m
- 2 test tags, type "TAGSTAR SYSTEMS ST-104-2.5" and "TAGSTAR SYSTEMS IT-104"

1.5 TESTING

1.5.1 EUT Configuration

EUT is to be tested as a tabletop unit with all ports connected as shown below.



1.5.2 EUT Operation

During radiated emissions testing the radio transmitter will not be operational. And during conducted emissions testing, the radio transmitter is operational with a resistive load connected replacing the antenna.

In this mode, the test software will:

Ethernet:
The EUT will be connected via an Ethernet cable to a host PC in the test control area. The host PC will connect to a server application on the EUT that will continuously send the date and time to the host PC.

USB host:
A USB flash drive will be connected to this port via the AtoA extension cable. The test software will periodically (~1 second interval) access this device. A blue flashing light on the USB flash drive will indicate the activity.

USB device:
A host PC will be connected via a USB A-B cable to this port. The host PC will connect to a server application on the EUT that will continuously send the date and time from the EUT to the host PC.

During radio and immunity testing all ports of the MDR-1109 will be connected and operating and unit will be transmitting.

In this mode the test software will:

Ethernet:
The EUT will be connected via an Ethernet cable to a host PC in the test area or in the test control area. The host PC will connect to a server application on the EUT. Approximately twice a second, the host PC communicates with the server application to check the connection state of the USB host, the USB device, and the RFID functionality of the reader. This information will slowly scroll upward on the host PC display and will look like this:
e.g.

```
3792, USB device: online, USB host: online, RFID: online
3793, USB device: online, USB host: online, RFID: online
3794, USB device: online, USB host:offline, RFID:offline
3794, USB device: online, USB host:offline, RFID: online
3795, USB device:offline, USB host: online, RFID: online
3796, USB device:offline, USB host: online, RFID: online
3797, USB device: online, USB host: online, RFID: online
3797, USB device: online, USB host: online, RFID:offline
ERROR - network connection is offline
```

The number on the left is the number of seconds since the device was started, the last error indicates that the Ethernet connection to the EUT has been lost either due to EUT reset or Ethernet connection lost. Whenever there is an error, the host PC will play a short sound to alert the tester that an error has occurred.

USB host:
A USB flash drive will be connected to this port via an extension cable. The EUT test software will monitor this device for unintended disconnection

USB device:
A host PC will be connected via a USB A-B cable to this port. The EUT test software will monitor this device for unintended disconnection

2. AUSTRALIAN REQUIREMENTS

2.1 PRODUCT CLASSIFICATION

The MDR-1109 is classified as a short range radio device.

2.2 TEST CONFIGURATION and OPERATION

The test configuration and operation for MDR-1109 is detailed in Paragraph 1.5.

2.3 TEST REQUIREMENTS

A summary of all test requirements is given in Section 9 of this document.

2.3.1 Radio Testing

The MDR-1109 must satisfy the requirements of AS/NZS 4268 for radio regulations.

Test results can be generated from EU testing.

2.3.2 EMC Testing

The MDR-1109 must satisfy the requirements of AS/NZS CISPR 22 for EMC testing.

Test results can be generated from EU testing.

Class A radiated and conducted emissions are required.

Conducted emission testing of Ethernet cable is not required.

2.3.3 Safety Testing

As the external power supply is already certified for use within Australia, testing is not required.

2.4 PERFORMANCE CRITERIA

The MDR-1109 must meet the Class A limits for radiated and conducted emissions testing.

The MDR-1109 must satisfy the ERP and EIRP requirements for radio regulations.

2.5 TEST REPORTS

Provided MDR-1109 meets the requirements, the following test reports are required (soft copy only):

- AS/NZS 4268
- AS/NZS CISPR 22

Test Reports are not required if the MDR-1109 does not meet the requirements.

3. EUROPEAN UNION RADIO REQUIREMENTS

3.1 PRODUCT CLASSIFICATION

The MDR-1109 is classified as a short range radio device and as such must meet the requirements of the R&TTE Directive.

For the purpose of radio performance assessment the MDR-1109 is classified as follows:

Product Class	Class 1 – Inductive loop coil transmitter with integral antenna
Receiver Classification	Class 3 – Standard reliable SRD communication media eg causing inconvenience to persons which can simply be overcome by other means eg manual.

3.2 TEST CONFIGURATION and OPERATION

The test configuration and operation for MDR-1109 is detailed in Paragraph 1.5.

3.3 TEST REQUIREMENTS

A summary of all test requirements is given in Section 9 of this document.

The MDR-1109 must satisfy the requirements of EN 300 330-1 for radio regulations.

Duty cycle class is Class 4 (>10%) (Refer EN 300 330-1 Clause 7.5)

Radio test suites are given in EN 300 330-2.

3.4 PERFORMANCE CRITERIA

The MDR-1109 must meet the requirements stated in EN 300 330-1.

3.5 TEST REPORTS

Provided MDR-1109 meets the requirements, AN en 300 330 test report is required (soft copy only):

Test Report is not required if the MDR-1109 does not meet the requirements.

4. EUROPEAN UNION EMC REQUIREMENTS

4.1 PRODUCT CLASSIFICATION

The MDR-1109 is classified as a short range radio device and as such must meet the requirements of the R&TTE Directive.

For the purpose of EMC performance assessment the MDR-1109 is classified as follows:

- Equipment for fixed use as per EN 301 489-1 Clause 5.5
- Class 3 - Standard reliable SRD communications media as per EN 301 489-3
- Equipment type I - Transfer of messages (digital or analogue signals) as per EN 301 489-3

4.2 TEST CONFIGURATION and OPERATION

The test configuration and operation for MDR-1109 is detailed in Paragraph 1.5.

4.3 TEST CONDITIONS

4.3.1 General

The MDR-1109 shall be tested under normal test conditions.

4.3.2 Arrangement of Test Signals

The provisions of EN 301 489-1 Clause 4.2 applies to the arrangement of signals.

The transmitter shall be operated at its maximum rated RFoutput power.

As the MDR-1109 has an integral antenna, the wanted RF output signal to establish a communication link shall be delivered from the EUT to an antenna located within the test chamber.

4.3.3 Exclusion Band

Reference EN 301 489-3 Clause 4.3.

The frequency on which the MDR-1109 is intended to operate (13.56 MHz +/- 5MHz), is excluded from conducted and radiated RF immunity tests and from conducted and radiated emission measurements when performed in transmit mode of operation.

4.4 TEST REQUIREMENTS

A summary of all test requirements is given in Section 9 of this document.

The MDR-1109 must satisfy the requirements of EN 301 489-1 and EN 301 489-3 for EMC requirements.

4.5 PERFORMANCE ASSESSMENT

Performance of MDR-1109 is assessed by monitoring (observing) the equipment reaction.

For equipment such as MDR-1109 which does not provide a continuous communications link, the provisions of EN 301 489-1 Clause 5.3 applies.

For MDR-1109 ancillary equipment the provisions of EN 301 489-1 Clause 5.4 applies ie tested in combination.

As per EN 301 489-1 Clause 8.2, radiated emissions test is not applicable for ancillary equipment intended to be measured in combination with the radio equipment. During testing the ancillary equipment of MDR-1109 (USB, Ethernet port) will be operating. For the purpose of radiated emissions testing the requirements of EN 55022 will be applied.

4.6 PERFORMANCE CRITERIA

MDR-1109 is classified as Class 3 – Standard reliable SRD communication media.

The performance criteria for Class 3 equipment in combination with equipment type I during and after immunity tests are:

- Performance criteria A for immunity tests with phenomena of a continuous nature;
- Performance criteria B for immunity tests with phenomena of a transient nature

4.6.1 Performance Table

CLASS 3 SRD EQUIPEMENT		
Criteria	During Test	After test
A and B	May be a loss of function. No unintentional responses	Operate as intended. No degradation of performance Lost functions can be self-recoverable.

4.6.2 Performance Criteria for Continuous Phenomena Applied to Transmitters

For MDR-1109 (equipment type I) the performance criteria A shall apply.

4.6.3 Performance Criteria for Transient Phenomena Applied to Transmitters

For MDR-1109 (equipment type I) the performance criteria B shall apply.

4.6.4 Performance Criteria for Continuous Phenomena Applied to Receivers

For MDR-1109 (equipment type I) the performance criteria A shall apply.

4.6.5 Performance Criteria for Transient Phenomena Applied to Receivers

For MDR-1109 (equipment type I) the performance criteria B shall apply.

4.7 TEST REPORTS

Provided MDR-1109 meets the requirements, an EN 301 489 test report is required (soft copy only):

Test Report is not required if the MDR-1109 does not meet the requirements.

5. EUROPEAN UNION SAFETY REQUIREMENTS

5.1 PRODUCT CLASSIFICATION

The MDR-1109 is classified as a short range radio device and as such must meet the requirements of the R&TTE Directive.

5.2 TEST REQUIREMENTS

A summary of all test requirements is given in Section 9 of this document.

The power supply is not part of the safety testing.

5.3 PERFORMANCE CRITERIA

The MDR-1109 must satisfy the requirements of EN 60950-1 for safety regulations.

5.4 TEST REPORTS

Provided MDR-1109 meets the requirements, an EN 60950-1 test report is required (soft copy only):

Test Report is not required if the MDR-1109 does not meet the requirements.

6. EUROPEAN UNION EMR REQUIREMENTS

6.1 PRODUCT CLASSIFICATION

The MDR-1109 is classified as a short range radio device and as such must meet the requirements of the R&TTE Directive.

6.2 TEST CONFIGURATION and OPERATION

The test configuration and operation for MDR-1109 is detailed in Paragraph 1.5.

6.3 TEST REQUIREMENTS

A summary of all test requirements is given in Section 9 of this document.

6.4 PERFORMANCE CRITERIA

The MDR-1109 must satisfy the requirements of EN 50364 for safety regulations.

6.5 TEST REPORTS

Provided MDR-1109 meets the requirements, an EN 50364 test report is required (soft copy only):

Test Report is not required if the MDR-1109 does not meet the requirements.

7. USA REQUIREMENTS

7.1 PRODUCT CLASSIFICATION

The MDR-1109 is classified as a short range radio device.

7.2 TEST CONFIGURATION and OPERATION

The test configuration and operation for MDR-1109 is detailed in Paragraph 1.5.

7.3 TEST REQUIREMENTS

A summary of all test requirements is given in Section 9 of this document.

7.3.1 Radio Testing

The MDR-1109 must satisfy the requirements of FCC Part 15 for intentional radiators.

7.3.2 EMC Testing

The MDR-1109 must satisfy the requirements of FCC Part 15 for unintentional radiators.

Transmitter will not be operational during testing.

Class A radiated and conducted emissions are required.

7.3.3 EMR Testing

The MDR-1109 must satisfy the SAR requirements of USA.

Test results can be generated from EU testing.

7.3.4 Safety Testing

As the external power supply is already certified for use within USA, testing is not required.

7.4 PERFORMANCE CRITERIA

The MDR-1109 must meet the Class A limits for radiated and conducted emissions testing.

The MDR-1109 must satisfy the requirements for radio regulations.

7.5 TEST REPORTS

Provided MDR-1109 meets the requirements, and FCC Part 15 test report for intentional and unintentional radiators is required (soft copy only).

Test Reports are not required if the MDR-1109 does not meet the requirements.

7.6 CERTIFICATION

FCC certification, via a TCB, is required on completion of testing.

8. CANADIAN REQUIREMENTS

8.1 PRODUCT CLASSIFICATION

The MDR-1109 is classified as a short range radio device.

8.2 TEST CONFIGURATION and OPERATION

The test configuration and operation for MDR-1109 is detailed in Paragraph 1.5.

8.3 TEST REQUIREMENTS

A summary of all test requirements is given in Section 9 of this document.

8.3.1 Radio Testing

The MDR-1109 must satisfy the requirements of RSS-210 for radio requirements.

8.3.2 EMC Testing

The MDR-1109 must satisfy the requirements of CS-03 for EMC requirements.

Transmitter will not be operational during testing.

Class A radiated and conducted emissions are required.

8.3.3 EMR Testing

The MDR-1109 must satisfy the SAR requirements of Canada contained in RSS-102.

Test results can be generated from EU testing.

8.3.4 Safety Testing

As the external power supply is already certified for use within Canada, testing is not required.

8.4 PERFORMANCE CRITERIA

The MDR-1109 must meet the Class A limits for radiated and conducted emissions testing.

The MDR-1109 must satisfy the requirements for radio regulations.

8.5 TEST REPORTS

Provided MDR-1109 meets the requirements, and RSS-210, CS-03 and RSS-102 test report for is required (soft copy only).

Test Reports are not required if the MDR-1109 does not meet the requirements.

8.6 CERTIFICATION

Industry Canada certification, via a TCB, is required on completion of testing.

9. SUMMARY OF TEST REQUIREMENTS

The following Tables provide a summary of all required testing.

TABLE 1 – OVERALL TEST REQUIREMENTS

TESTS	APPLICABILITY				TEST REPORTS	CERTIFICATION
	AUSTRALIA	EU	USA	CANADA		
Radio/emissions (Intentional radiators)	Applicable AS/NZS 4268	Applicable EN 300 330-1 (Refer Table 3 for details)	Applicable FCC Part 15	Applicable RSS 210	AS/NZS 4268 EN 300 330 FCC Pt 15 RSS 210	Required for USA and Canada
EMC Emissions (unintentional radiators)	Applicable AS/NZS CISPR 22 (Refer Table 2 for details)	Applicable EN 301 489-1 EN 55022 (Refer Table 4 for details)	Applicable FCC Part 15 Class A	Applicable CS-03 Class A	AS/NZS CISPR 22 EN 301 489-1 EN 301 489-3 EN 55022 FCC Part 15 CS-03	Not required
EMC Immunity	Not applicable	Applicable EN 301 489-1 (Refer Table 5 for details)	Not applicable	Not applicable	EN 301 489-1 EN 301 489-3	Not required
EMR	Not applicable	Applicable EN 50364	Applicable EN 50364	Applicable RSS 102	EN 50364 RSS 102	Required for USA and Canada
Safety	Not required	Applicable EN 60950-1	Not applicable	Not applicable	EN 60950-1	Not required

TABLE 2 – AUSTRALIAN EMC TEST SUITES

ITEM	DESCRIPTION	APPLICABILITY	REQUIREMENT
1	Radiated emissions	Applicable.	AS/NZS CISPR 22 Class A
2	Conducted emissions – Power line	Applicable.	AS/NZS CISPR 22 Class A
3	Conducted emissions – Ethernet line	Not applicable.	Not required

TABLE 3 – EU RADIO TEST SUITES

ITEM	DESCRIPTION	APPLICABILITY	REQUIREMENT
1	Radiated H-field	Applicable	EN 300 330-2 Cl 4.1.1.1
2	RF Carrier current	Not applicable. Only applies to product Class 3	Not required
3	Radiated E-field	Not applicable. Only applies to product Class 4	Not required
4	Permitted frequency range of the modulation bandwidth	Applicable	EN 300 330-2 Cl 4.1.2
5	Conducted spurious emissions at frequencies below 30 MHz	Not applicable. Only applies to product Class 3	Not required
6	Conducted spurious emissions at frequencies greater than or equal to 30 MHz	Not applicable. Only applies to product Class 3	Not required
7	Radiated spurious emissions at frequencies below 30 MHz	Applicable	EN 300 330-2 Cl 4.1.2.3
8	Radiated spurious emissions at frequencies greater than or equal to 30 MHz	Applicable	EN 300 330-2 Cl 4.1.2.4
9	Duty cycle	Applicable	EN 300 330-2 Cl 4.1.3
10	Adjacent channel selectively – in band	Not applicable. Does not apply to a receiver Class 3 product	Not required
11	Blocking or desensitization	Not applicable. Does not apply to a receiver Class 3 product	Not required
12	Radiated emissions below 30 MHz	Applicable	EN 300 330-2 Cl 4.2.3.1
13	Radiated emissions greater than or equal to 30 MHz	Applicable	EN 300 330-2 Cl 4.2.3.2

TABLE 4 EU EMC EMISSIONS TEST SUITES

TEST	APPLICATION	TEST REQUIREMENT	LIMIT	REFERENCE STANDARDS
Radiated emission	Enclosure of ancillary equipment	Not applicable. Refer Clause 4.5 of this document, Testing to be done IAW EN 55022	Class A	EN 301 489-1 Clause 8.2 EN 55022
Conducted emission	DC power input/output port	Not applicable. Cables are not longer than 3m	Not applicable	Not applicable
Conducted emission	AC mains input/output port	Applicable	Table 6 of EN 301 489-1	EN 301 489-1 Clause 8.4
Harmonic current emissions	AC mains input port	Applicable		EN 301 489-1 Clause 8.5
Voltage fluctuations and flicker	AC mains input port	Applicable		EN 301 489-1 Clause 8.6
Conducted emissions	Telecom port	Applicable		EN 301 489-1 Clause 8.7

TABLE 5 EU EMC IMMUNITY TEST SUITES

TEST	APPLICATION	APPLICABILITY	REQUIREMENTS	PERFORMANCE CRITERIA	REFERENCE STANDARDS
RF Electro. Field (80MHz – 2000MHz)	Enclosure	Applicable.	- Test level 3v/m - Range 80-1000MHz and 1400 to 2000MHz - Increment shall be 10% (Class 3 equipment)	As ancillary equipment tested in connection with transmitter performance criteria for continuous phenomena as detailed in Paragraph 4.6 applies	EN 301 489-1 Clause 9.2 EN 301 489-3 Clause 7.2
Electrostatic discharge	Enclosure	Applicable	- Contact discharge – 4kV - Air discharge – 8kV	As ancillary equipment tested in connection with transmitter performance criteria for transient phenomena as detailed in Paragraph 4.6 applies	EN 301 489-1 Clause 9.3 EN 301 489-3 Clause 7.2
Fast transients common mode	Signal, telecom and control ports DC and AC power ports	Applicable to: - AC power port and - Ethernet cable which can be longer than 3m.	- 0,5kV for Ethernet cable - 1kV for AC power cable	As ancillary equipment tested in connection with transmitter performance criteria for transient phenomena as detailed in Paragraph 4.6 applies	EN 301 489-1 Clause 9.4
RF common mode 0,15 MHz to 80 MHz	Signal, telecom and control ports DC and AC power ports	Applicable to: - AC power port and - Ethernet cable which can be longer than 3m.	- Test level 2 (3v rms) - Range 150kHz-80MHz and - Increment shall be 10% (Class 3 equipment)	As ancillary equipment tested in connection with transmitter performance criteria for continuous phenomena as detailed in Paragraph 4.6 applies	EN 301 489-1 Clause 9.5 EN 301 489-3 Clause 7.2
Transients and surges	DC power input ports	Not applicable	Not applicable	Not applicable	Not applicable

Voltage dips and interruptions	AC mains power input ports	Applicable	- a voltage dip corresponding to a reduction of the supply voltage of 30 % for 10 ms; and - a voltage dip corresponding to a reduction of the supply voltage of 60 % for 100 ms; and - a voltage interruption corresponding to a reduction of the supply voltage of greater than 95 % for 5 000 ms	As per special requirements stated in EN 301 489-3 Clause 7.2.2	EN 301 489-1 Clause 9.7 EN 301 489-3 Clause 7.2
Surges	AC mains power input ports, telecom ports	Applicable to: - AC power port and - Ethernet cable which can be longer than 3m	- 2kV line to gnd (AC port) - 1kV line to line (AC port) - 0,5kV line to gnd (Ethernet)	As ancillary equipment tested in connection with transmitter performance criteria for transient phenomena as detailed in Paragraph 4.6 applies	EN 301 489-1 Clause 9.8