



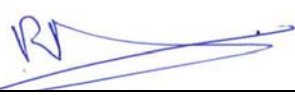
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Report Reference ID:	158708-1TRFWL
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Test specifications:	<b>Title 47-Telecommunication</b>  Chapter I - Federal Communications Commission Subchapter A - General Part 15 - Radio Frequency Devices Subpart B - Unintentional Radiators  – <b>§15.107 – Conducted limits</b> – <b>§15.109 – Radiated emission limits</b>
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Applicant:	Xmark Corporation 309 Legget Drive Ottawa, ON, Canada K2K 3A3
Apparatus:	International Patient Security Receiver
Model:	IPSR
FCC ID	ISEIPSR

Testing laboratory:	Nemko Canada Inc. 303 River Road Ottawa, ON, Canada K1V 1H2  Telephone: (613) 737-9680 Facsimile: (613) 737-9691
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	Name and title	Date
Tested by:	David Duchesne, Wireless/EMC Specialist	October 27, 2010
Reviewed by:	 Richard Brazeau, Laboratory Manager	October 27, 2010



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## Section 1: Report summary

### 1.1 Test specifications

#### Title 47-Telecommunication

Chapter I - Federal Communications Commission Subchapter A - General  
Part 15 - Radio Frequency Devices  
Subpart B - Unintentional Radiators

- **§15.107 – Conducted limits**
- **§15.109 – Radiated emission limits**

### 1.2 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested. See “Summary of test results” for full details.

### 1.3 Exclusions

None

### 1.4 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued

### 1.5 Test location

303 River Road, R.R. 5, Ottawa, Ontario, Canada, K1V 1H2

### 1.6 Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada’s ISO/IEC 17025 accreditation.

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## Section 2: Summary of test results

### 2.1 FCC 47 CFR Part 15, Subpart B – Tests result summary

Part	Test description	Verdict
§15.109(a)	Radiated emissions limits	Pass
§15.107(a)	Conducted limits	Pass
Notes: None		

## Section 3: Equipment under test (EUT) details

### 3.1 Product details

<b>Product</b>	Product name:	International Patient Security Receiver
	Model number:	816A1001
	Serial number:	0001
<b>Description:</b>	The Patient Security Receiver is a dual antenna Low IF receiver that allows for the monitoring of infants that wear an RF ID tag in a hospital. The receiver then sends messages to a pc (head end) via twisted pair (Lonworks network).	

### 3.2 Sample information

Receipt date:	October 14, 2010
Nemko sample number:	Item # 1

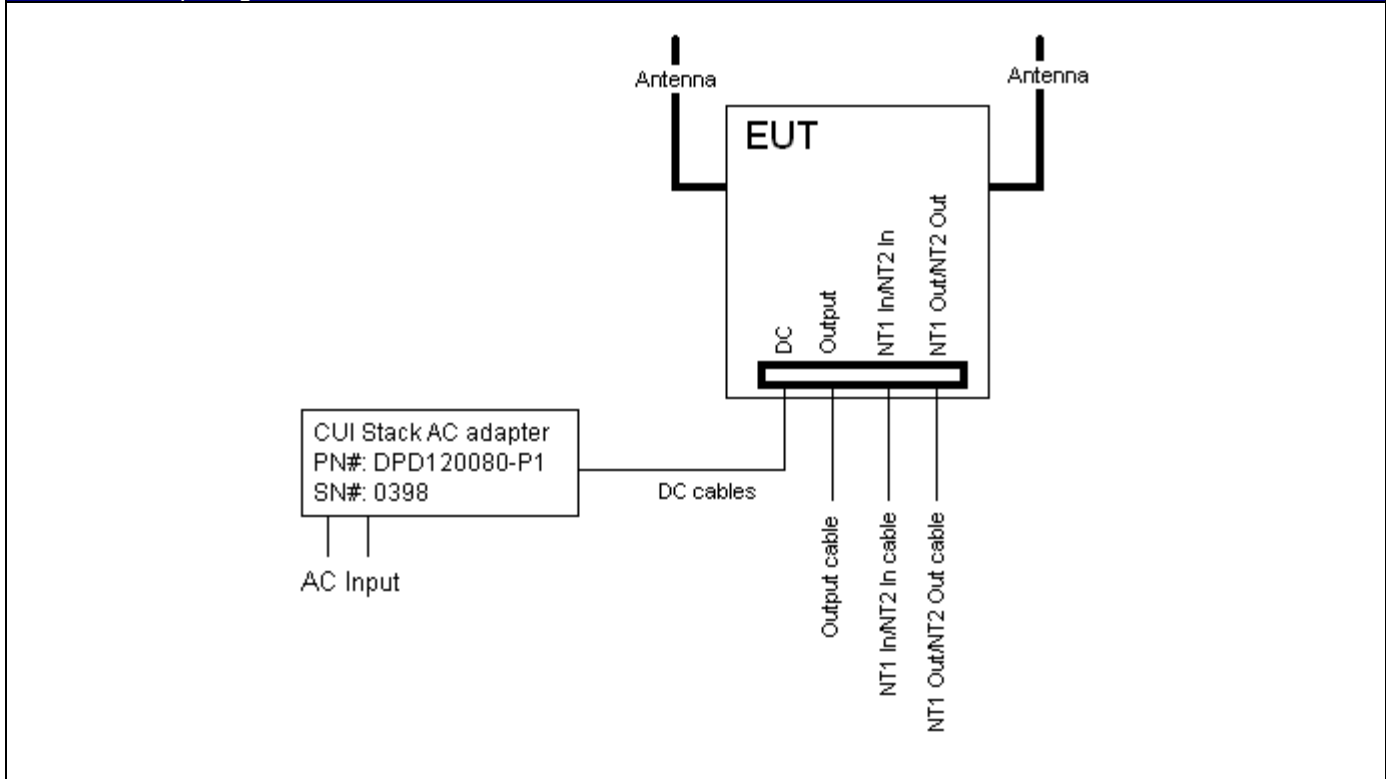
### 3.3 EUT technical specifications

Operating band:	433.5 - 434.5 MHz
Operating frequency:	Receive Freq: 434.17 MHz
Antenna type:	Permanent fixed antenna
Power source:	10 – 30 VDC

### 3.4 Operation of the EUT during testing

The EUT was in receiving mode.

3.5 EUT setup diagram



## Section 4: Engineering considerations

### 4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

### 4.2 Technical judgment

None

### 4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory test procedures.

## Section 5: Test conditions

### 5.1 Normal temperature, humidity and air pressure test conditions

Temperature: 15–30 °C  
 Relative humidity: 20–75 %  
 Air pressure: 86–106 kPa

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

### 5.2 Power supply range:

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages  $\pm 5\%$ , for which the equipment was designed.



Section 6: Measurement uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95 % and can be found in Nemko Canada document MU-003.



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**Section 7:** Testing equipment

**Product:** International Patient Security Receiver

**Specification:** FCC 15 Subpart B

## Section 7: Test equipment

### 7.1 Test equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Mar. 09/11
International power supply	California Inst.	30011	FA001021	—	COU
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	Jan. 14/11
Bilog antenna	Sunol	JB3	FA002108	1 year	Jan. 18/11
Horn antenna #2	Emco	3115	FA000825	1 year	Jan. 18/11
50 coax cable	Huber + Suhner	NONE	FA002013	1 year	Sept. 01/11
50 coax cable	Huber + Suhner	NONE	FA002074	1 year	July 13/11
1–18 GHz amplifier	JCA	JCA118-503	FA002091	1 year	Sept. 23/11
LISN	Rohde & Schwarz	ENV216	FA002023	1 year	Sept. 15/11

Note: N/A = not applicable, NCR = no cal required, COU = cal on use

## Section 8: Testing data

### 8.1 Clause 15.109 Radiated emission limits (a)

- (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Table 1 - Spurious emission limits for receivers

Frequency (MHz)	Quasi-Peak field strength		Measurement distance (m)
	( $\mu\text{V/m}$ )	( $\mu\text{V/m}$ )	
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
Above 960	500	54.0	3

Notes:

- In the emission table above, the tighter limit applies at the band edges.
- For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

### Special notes

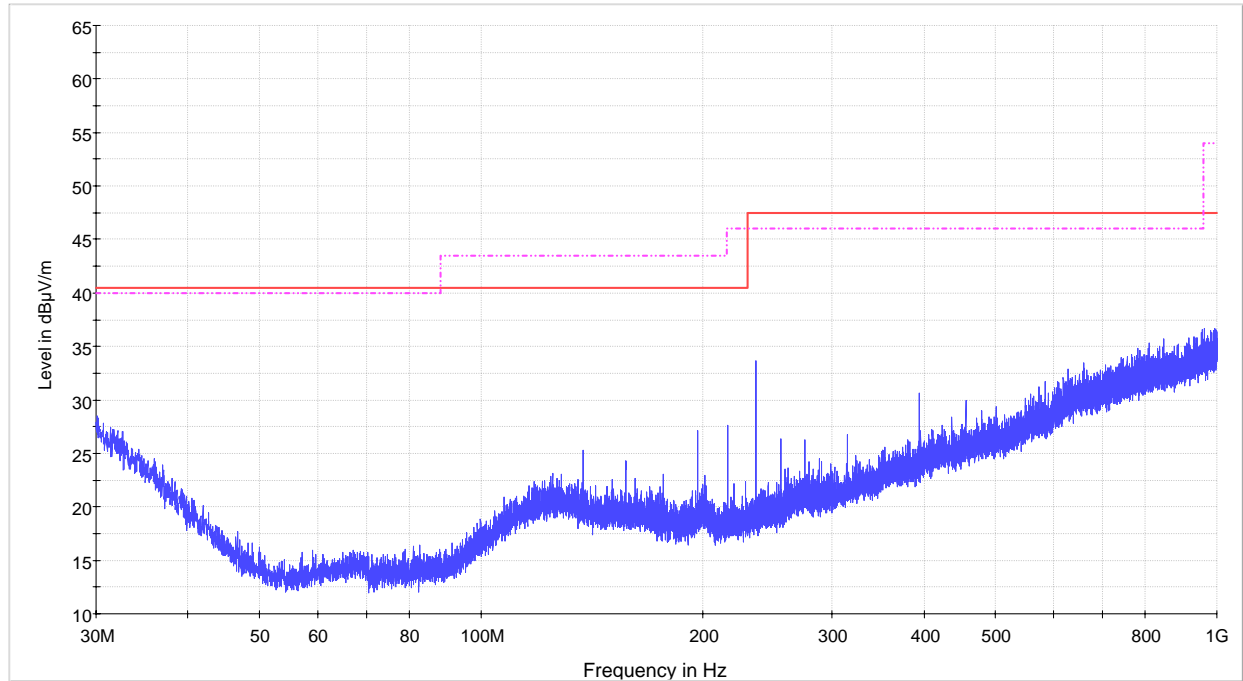
The spectrum was searched from 30 MHz to the 10<sup>th</sup> harmonics.

<b>Section 8: Testing data</b>		<b>Product:</b> International Patient Security Receiver	
<b>Test name:</b> Clause 15.109 Radiated emission limits (a)			
<b>Test date:</b> October 17, 2010		<b>Test engineer:</b> David Duchesne	
		<b>Verdict:</b> Pass	
<b>Specification:</b> FCC 15 Subpart B			

## Test data

Test facility	Measuring distance (m)	Antenna height variation (m)	Turn table position (°)
3 m Semi anechoic chamber	3	1–4	0–360

## Spectral plots



Vertical and Horizontal (Receiver portion only)

- Preview Peak Detector
- CISPR22 Class B 3m Limit
- FCC Part 15 Class B 3m Limit

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators) for determination of compliance. Limits have been adjusted to reflect 3 m requirements.

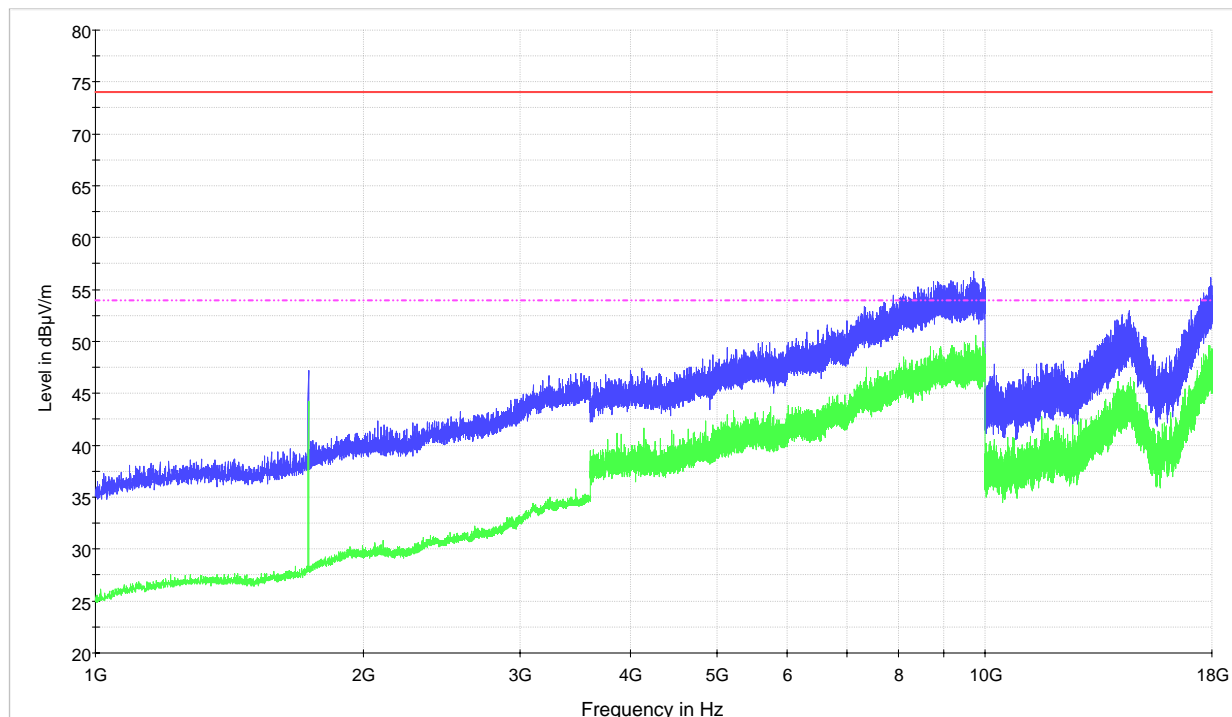
A preview measurement was generated with receiver in continuous scan or sweep mode while the EUT was rotated and antenna adjusted to maximize radiated emission. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

## Receiver/Spectrum analyzer settings

Preview measurements	Final measurement
Receiver: 120 kHz RBW, Peak detector, max hold	Receiver: 120 kHz RBW, Quasi-peak detector
Measurement time 100ms	

## Test data, continued

### Spectral plots, continued



Vertical and Horizontal (Receiver only - sample 3)

- Preview Peak Detector
- Preview Average Detector
- FCC Part 15 Class B 3m Peak Limit
- FCC Part 15 Class B 3m Average Limit

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators) for determination of compliance. Limits have been adjusted to reflect 3 m requirements.

A preview measurement was generated with receiver in continuous scan or sweep mode while the EUT was rotated and antenna adjusted to maximize radiated emission. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

### Receiver/Spectrum analyzer settings

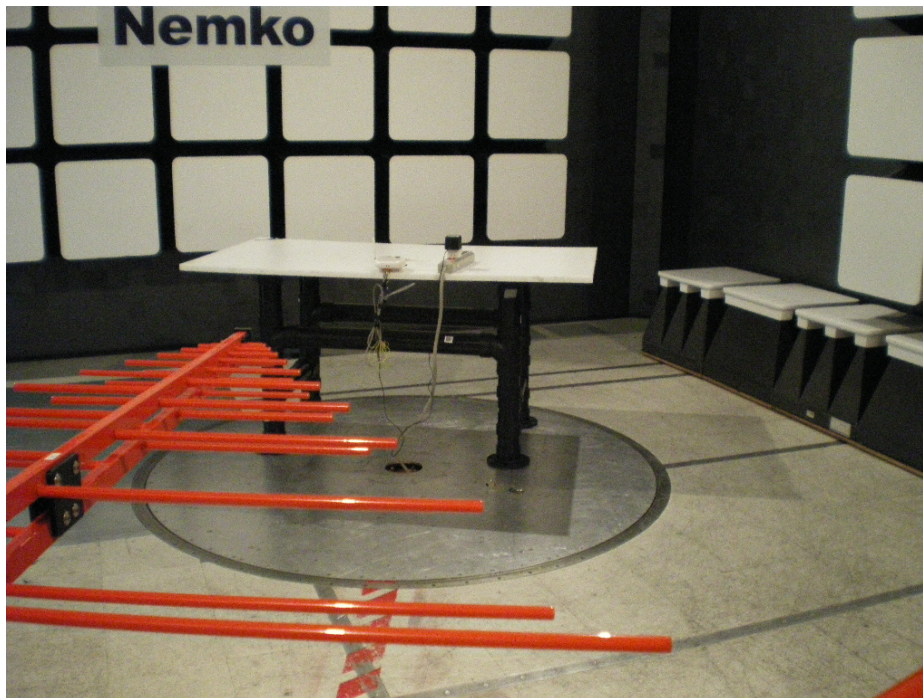
Preview measurements

Spectrum analyzer: 1 MHz RBW, Peak and Average detector, max hold

Measurement time 100ms

## Test data, continued

### Setup photos



## 8.2 Clause 15.107 Conducted limits (a)

### § 15.107 Conducted limits.

- (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

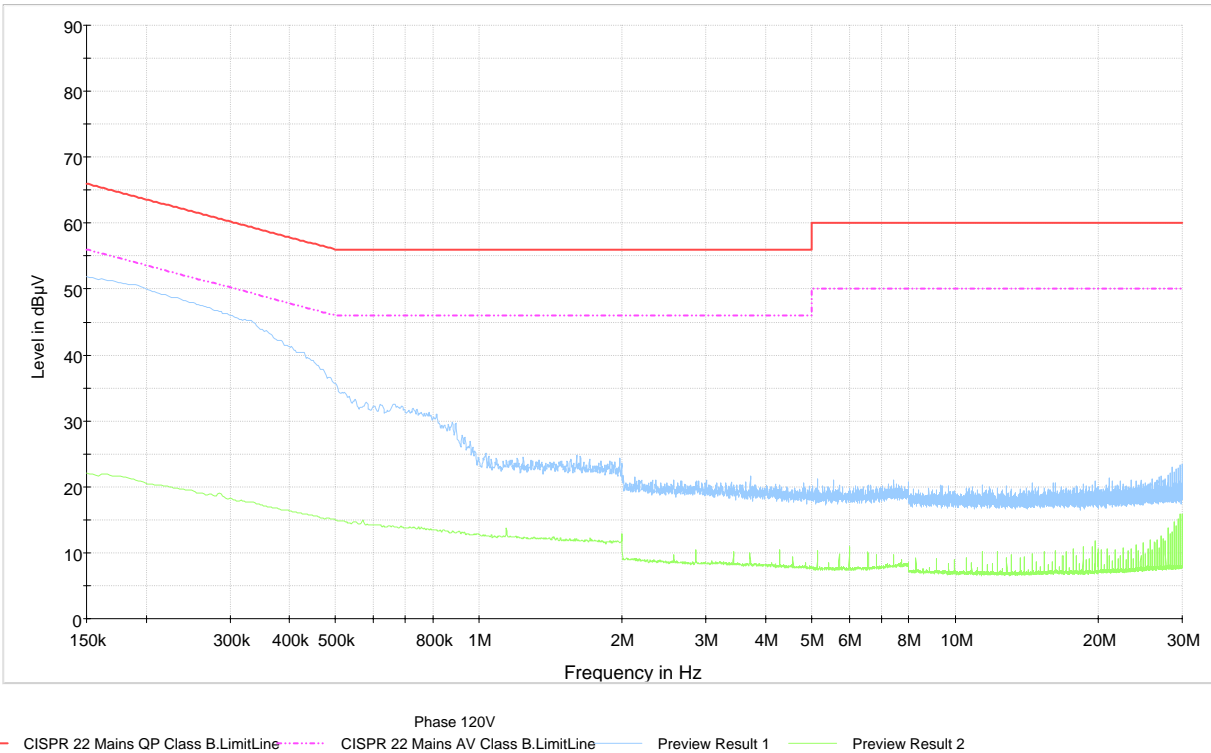
Frequency (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50
*-Decreases with the logarithm of the frequency.		

### Special notes

None

**Test data**

**Spectral plots**



The spectral scan has been corrected with transducer factors (i.e. cable loss, LISN factors, and attenuators) for determination of compliance.

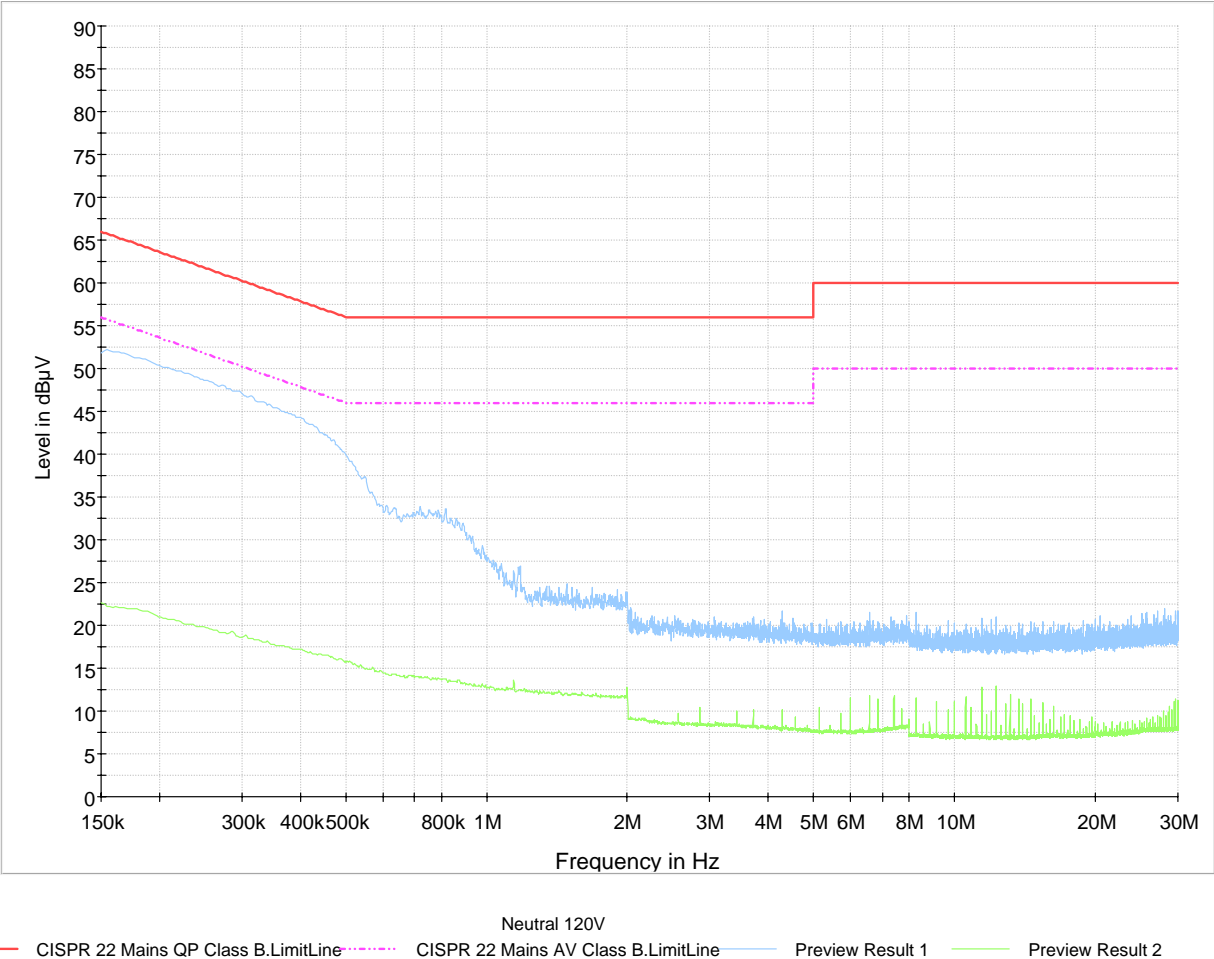
A preview measurement was generated with the receiver in continuous scan mode Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver/Spectrum analyzer settings:	
Preview measurements	Final measurement
Receiver: 9 kHz RBW, Peak and Average detector, max hold	Receiver: 9 kHz RBW, Quasi-peak and Average detector
Measurement time 100 ms	



**Test data, continued**

**Spectral plots, continued**



The spectral scan has been corrected with transducer factors (i.e. cable loss, LISN factors, and attenuators) for determination of compliance.

A preview measurement was generated with the receiver in continuous scan mode Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver/Spectrum analyzer settings:	
Preview measurements	Final measurement
Receiver: 9 kHz RBW, Peak and Average detector, max hold	Receiver: 9 kHz RBW, Quasi-peak and Average detector
Measurement time 100 ms	

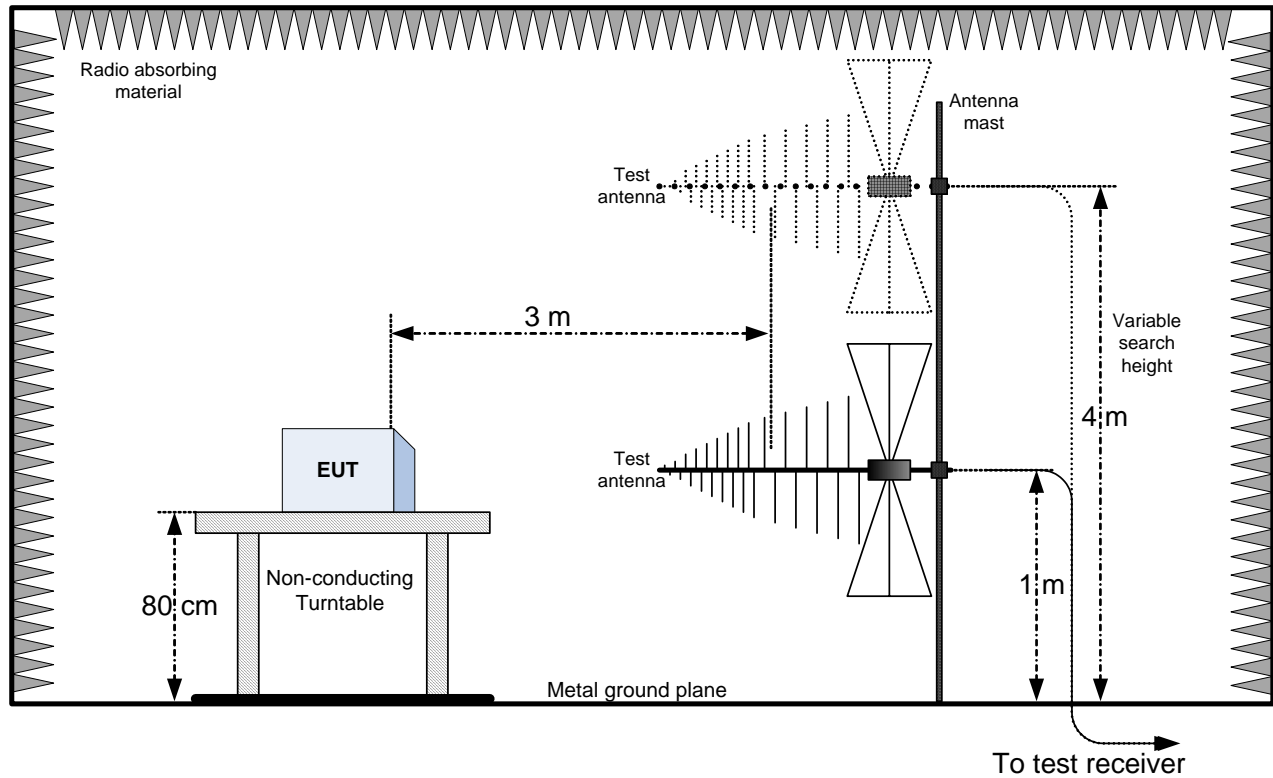
Test data, continued

Setup photos



## Section 9: Block diagrams of test set-ups

### Radiated emissions set-up



### Conducted emissions set-up

