



Report No: SYBH (E) 91032007
FCC ID: QISE870

**FCC TEST REPORT OF
HUAWEI E870 HSDPA EXPRESS
PCI DATACARD**

M/N: E870

Apr. 18, 2007

Reliability Laboratory of Huawei Technologies Co., Ltd.

All Right Reserved

Notice

1.	The laboratory has obtained the accreditation of China National Accreditation Committee for Laboratories (CNAL), and accreditation number: L0310.
2.	The laboratory has obtained the accreditation of THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION (A2LA), and Accreditation Council Certificate Number: 2174.01.
3.	The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
4.	The laboratory also has been listed by the VCCI to perform EMC measurements. The accreditation number is C2583, R2364, and T256.
5.	The test report is invalid if not marked with "exclusive stamp for the test report".
6.	Any copy of the test report is invalid if not re-marked with the "exclusive stamp for the test report".
7.	The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.
8.	The test report is invalid if there is any evidence of erasure and/or falsification.
9.	If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.
10.	Normally, the test report is only responsible for the samples that have undergone the test.
11.	Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the laboratory.



**REPORT ON
DATACARD**

FCC Test of HUAWEI E870 HSDPA EXPRESS PCI

M/N: E870

Report No: SYBH (E) 91032007

REGULATION

FCC CFR47 Part 15: Subpart B;

CONCLUSION

There are 2 items need to be tested, 2 items have been tested. The sample of the model completely meets the requirements

Final Judgement: Pass

General Manager

2007.04.17

Date

Guo Xiaoqi

Name

signature



**Technical Responsibility
For Area of Testing**

2007.04.16

Date

Zhang Xinghai

Name

signature

Handwritten signature of Zhang Xinghai in black ink.

Test Lab Engineer

2007.04.15

Date

Hu Jun

Name

signature

Handwritten signature of Hu Jun in black ink.

Contents

1	<u>Summary</u>	5
2	<u>Product Description</u>	6
2.1	PRODUCTION INFORMATION	6
2.2	MODIFICATION INFORMATION	6
3	<u>Test Site Description</u>	7
3.1	TESTING PERIOD	7
3.2	GENERAL SET UP DESCRIPTION	7
4	SUMMARY OF RESULTS	8
5	<u>Product Description</u>	9
5.1	TECHNICAL CHARACTERISTICS.....	9
5.2	EUT IDENTIFICATION LIST.....	10
6	<u>Main Test Instruments</u>	11
6.1	AUXILIARY EQUIPMENT USED DURING TEST	11
7	<u>EMC Test</u>	13
7.1	CONDUCTED EMISSION AT POWER PORT.....	13
7.2	RADIATED EMISSION OF ENCLOSURE	15
8	<u>System Measurement Uncertainty</u>	17
9	<u>Appendices</u>	18

1 Summary

The table below summarizes the measurements and results for the HUAWEI E870 HSDPA EXPRESS PCI DATACARD. Detailed results and descriptions are shown in the following pages.

Table 1 Summary of results

FCC Measurement Specification	FCC Limits Part(s)	Description	Result
-	15.107	Conducted Emission at Power Port	PASS
-	15.109	Radiated Emission of Enclosure	PASS

2 Product Description

2.1 Production Information

2.1.1 General Description

HUAWEI E870 HSDPA EXPRESS PCI DATACARDE870 is subscriber equipment in the GSM system. The frequency band is 850MHz and 1900MHz. The E870 implements such functions as RF signal receiving / Transmitting, HSDPA/UMTS/EDGE/GPRS/GSM protocol processing and data service etc. Externally it provides EXPRESSCARD interface (to connect to the notebook etc.), USIM card interface and antenna interface. It has an internal antenna and an external antenna as default. E870 uses Qualcomm MSM7200 chipset and Zero-IF technologies.

Huawei D08 PCMCIA to express adapter should work with the Huawei Express card E870, which switches the PC card interface of laptop from PCMCIA to ExpressCard. It can possess the protocol transfer from PCMCIA protocol PC Card Standard 8.1 (December 2002) to ExpressCard protocol ExpressCard Standard Release 1.0, so E870 can also work in the interface of PCMCIA by using it. But we don't recommend that D08 to work with other vendors' express cards.

2.1.2 Support function and Service

The HUAWEI E870 HSDPA EXPRESS PCI DATACARD support the function and service as follows:

Table 2 Service and Test mode List

Service Name	Characteristic	Note
Data	Modulation: GMSK	GPRS/GSM
Data	Modulation: 8PSK	EDGE
Data	Modulation: QPSK	HSDPA/WCDMA

Note: * The specified GPRS test conditions & settings are defined in 3GPP TS51.010 V6.1.0 clause 40 and the EDGE test conditions & settings are defined in 3GPP TS51.010 V6.1.0 clause 50.

2.2 Modification Information

For original equipment, following table is not application.


Table 3 Modification Information

Model Number	Board/Module	Original Version	New Version	Modify Information
Not applicable				

3 Test Site Description

The test site of:

***Huawei Technologies Co. Ltd.
P.O. Box 518129
Huawei base, bantian,
Longgang District, Shenzhen, China***

The test site description has been submitted to  and registration granted under the registration number **97456** on April 20, 2006. The test site has been accredited by



and the accredited number is **2174.01** in Jan of 2006.

3.1 Testing Period

The test have been performed during the period of

Apr. 01, 2007 –Apr. 18, 2007

3.2 General Set up Description

HUAWEI E870 HSDPA EXPRESS PCI DATACARD can support GPRS/EDGE mode and 850M Band. During this measurement, the HUAWEI E870 HSDPA EXPRESS PCI DATA CARD works in UMTS/GPRS/EDGE mode and 850MHz and 1900MHz Band.

4 SUMMARY OF RESULTS

Below shows a brief summary of the results obtained.

EUT Classification: Wireless Terminal			
Test Items	Configuration	Required Performance Criteria	Result
<u>Radiated Emissions</u> Enclosure Port 30MHz – 1000MHz Class B Limits	TM2	N/A	Pass
Conducted Emission Power port 150kHz – 30MHz Class B Limits	TM1	N/A	Pass

* Measurement taken is within the measurement uncertainty of measurement system.

5 Product Description

5.1 Technical Characteristics

5.1.1 Frequency Range

Table 4 Frequency Range

Uplink band:	824 to 849 MHz 1850 to 1910 MHz
Downlink band:	869 to 894 MHz 1930 to 1990 MHz

5.1.2 Channel Spacing / Separation

Table 5 Channel Spacing / Separation

	EDGE/GPRS/GSM	UMTS/HSDPA
Channel spacing	200k Hz	200k Hz
Channel separation:	200k Hz	5M Hz



5.1.3 Environmental Requirements

Table 6 Environmental Requirements

Minimum temperature:	- 10 °C
Maximum temperature:	+ 55 °C
Relative Humidity:	5%-95%RH

5.1.4 Power Source

Table 7 Power Source

DC voltage nominal:	 +3.3V; Supplied by EXPRESSCARD port of notebook
DC voltage range	 +3.0-3.6V
DC current maximal:	750mA

5.2 EUT Identification List

5.2.1 Board Information

Table 8 Board Information

850MHz HUAWEI E870 HSDPA EXPRESS PCI Data Card		
E870		
Board and Module		
Equipment Designation / Description	Serial Number	Remarks
-MAINBOARD	020EHH1074000011	TCPU Ver.B

5.2.2 Adapter Technical Data

No Applicable.

5.2.3 Battery Technical Data

No Applicable.

5.2.4 FCC Identification

Grantee Code: QIS
Product Code: E870
FCC Identification: QISE870

6 Main Test Instruments

Table 9 Main Test Equipments

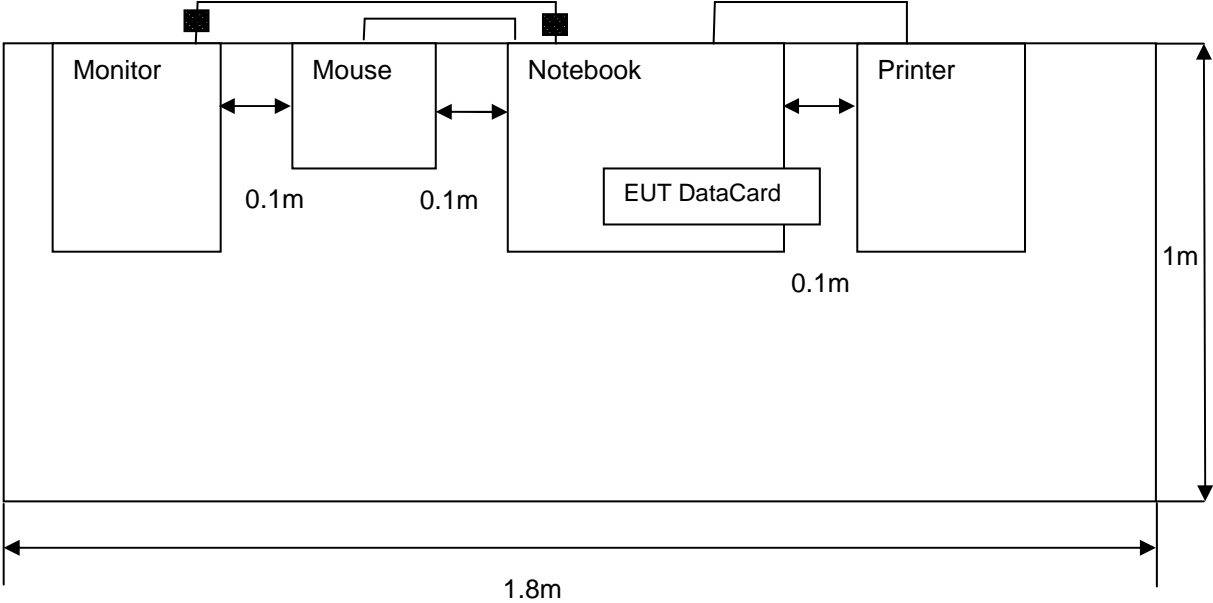
Equipment Description	Manufacturer	Model	Serial Number	Calibrated until (MM.DD.YYYY)
3m Semi Anechoic Chamber	S+M	N/A	N/A	12.24.2007
Test Receiver	R&S	ESMI	829214/011	07.30.2007
Test Receiver	R&S	ESCS30	830245/018	07.30.2007
Pre-Amplifier	Agilent	8447D	2944A10146	07.30.2007
BiLog Antenna	Schaffner	CBL 6112B	2747	08.30.2007
Artificial Mains Network	Schwarzbeck	NNLK8121	8121416	09.29.2007
Universal Radio Communication Tester	R&S	CMU200	108035	07.04.2007

6.1 Auxiliary Equipment Used during Test

Name	Model	Manufacturer	S/N	Cal Date	Cal Interval (month)
Notebook	X40	IBM	99-BNA39	NA	NA
Monitor	6331-02N	IBM	23-HH524	NA	NA
Printer	LaserJet 2015DN	HP	CNCJL03433	NA	NA
Mouse	MO32BO	IBM	003000	NA	NA
Mouse	MO32BO	IBM	003000	NA	NA

Model	Manufacturer	Cable Type
Notebook X40	IBM	NA
Monitor 6331-02N	IBM	1.8m shielding cable
Printer LaserJet 2015DN	HP	1.8m shielding cable

Test Setup Figure



7 EMC Test

7.1 Conducted Emission at Power Port

7.1.1 Test Conditions

Table 10 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Power port
Ambient temperature:	+25°C
Relative humidity:	52 %
Test Configurations:	TM1 : Traffic mode

7.1.2 Test Specifications and Limits

7.1.2.1 Specification

CFR 47 (FCC) part 15.107

7.1.2.2 Supporting Standards

Table 11 Supporting Standards:

ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
------------------	--

7.1.2.3 Limits

Compliance with part 15.107, conducted emission must meet the requirement of following table.

Table 12 Limits

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Note: * Decreases with the logarithm of the frequency.

7.1.3 Test Method and Setup

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.4: 2003.

Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.

The EUT was communicated with the BTS simulator through Air interface, the BTS simulator controls the EUT to transmitter the maximum power which defined in specification of product. The EUT

operated on the typical channel.

Measurement bandwidth (RBW) for 150kHz to 30 MHz: 9 kHz;

Test Set-up

The Mobile Phone was setup in the screened chamber and operated under nominal conditions.

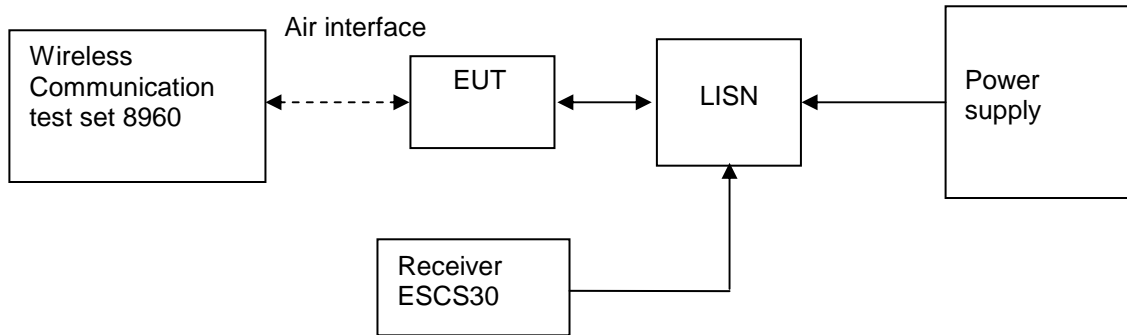


Figure 1. Test Set-up

7.1.4 Measurement Results

Table 13 MEASUREMENT RESULT:QP DECTER

Frequency (MHz)	Level (dBμV)	Transd (dB)	Limit (dBμV)	Margin (dB)	Line	PE
0.168000	54.60	10.8	65	10.4	L3	GND
0.393000	35.70	10.1	58	22.3	L3	GND
2.067000	33.10	10.1	56	22.9	L3	GND
3.961500	44.20	10.1	56	11.8	L3	GND
9.874500	30.60	11.0	60	29.4	L3	GND
14.316000	40.30	11.3	60	19.7	N	GND

Table 14 MEASUREMENT RESULT:AV DECTER

Frequency (MHz)	Level (dBμV)	Transd (dB)	Limit (dBμV)	Margin (dB)	Line	PE
0.168000	44.70	10.8	55	10.3	N	GND
0.388500	33.50	10.1	48	14.5	L3	GND
2.062500	35.00	10.1	46	11.0	L3	GND
3.957000	38.60	10.1	46	7.4	L3	GND
9.087000	28.20	10.7	50	21.8	L3	GND
14.316000	38.20	11.3	50	11.8	N	GND

7.1.5 Conclusion

The equipment **PASSED** the requirement of this clause.
 For the measurement results refer to appendix A.

7.2 Radiated Emission of Enclosure

Notes: The data card was tested with adapter and without adapter, and all meet the requirement of FCC. Here only the worst test result is shown in the appendix which is the card works with the adapter.

7.2.1 Test Conditions

Table 15 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	25 °C
Relative humidity:	52 %
Test Configurations:	TM2: Idle mode

7.2.2 Test Specifications and Limits

7.2.2.1 Specification

CFR 47 (FCC) part 15.109

7.2.2.2 Supporting Standards

Table 16 Supporting Standards:

ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
------------------	--

7.2.2.3 Limits

The Radiated Emission of enclosure of EUT should compliance with the requirement of part 15.109. The limit showed in following table.

Table 17 Limits

Frequency of Emission (MHz)	Radiated Limit	
	Unit($\mu\text{V} / \text{m}$)	Unit($\text{dB}\mu\text{V} / \text{m}$)
30-88	100	40
88-216	150	43.5
216-960	200	46
960-1000	500	54

7.2.3 Test Method and Setup

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 (2003). The test distance was 3m. The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.4. The Radiated Disturbance measurements were made using a Rohde and Schwarz ESMI Test Receiver and control

software ES-K1.

A preliminary scan and a final scan of the emissions were made from 30 MHz to 1GHz by using test script of software; the emissions were measured using a Quasi-Peak Detector. The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°; The receive antenna has two polarizations V and H.

Huawei E870 communicated with the BTS simulator through Air interface. For FCC Part 15B test, unintentional radiators, the E870 operated on the typical channel and the E870 worked in idle mode, transmitter did not work.

Measurement bandwidth: 30 MHz – 1000 MHz: 120 kHz

Test set up

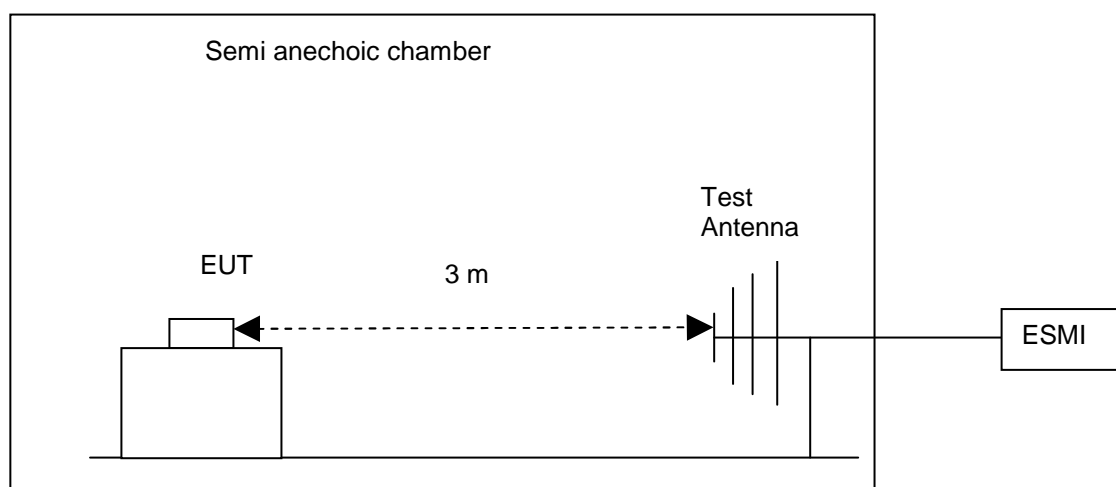


Figure 2. Test set up

7.2.4 Measurement Results

Table 18 MEASUREMENT RESULT: QP DECTER

Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
31.020000	32.10	-4.7	40.0	7.9	109.0	287.00	VERTICAL
50.820000	30.60	-14.3	40.0	9.4	100.0	314.00	VERTICAL
101.340000	31.20	-10.6	43.5	12.3	198.0	176.00	HORIZONTAL
182.820000	38.40	-12.1	43.5	5.1	177.0	230.00	HORIZONTAL
457.680000	32.30	-3.8	46.0	13.7	112.0	354.00	VERTICAL
953.220000	32.40	1.9	46.0	13.6	289.0	178.00	VERTICAL

7.2.5 Conclusion

The equipment **PASSED** the requirement of this clause. For the measurement results refer to appendix B.

8 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Table 19 System Measurement Uncertainty

Items		Extended Uncertainty
Conducted Emission at Power Port	Disturbance Voltage (dB μ V)	U=3.3dB; k=2
Radiated Emission of enclosure at ideal mode	Field strength (dB μ V/m)	U=4.6dB; k=2

9 Appendices

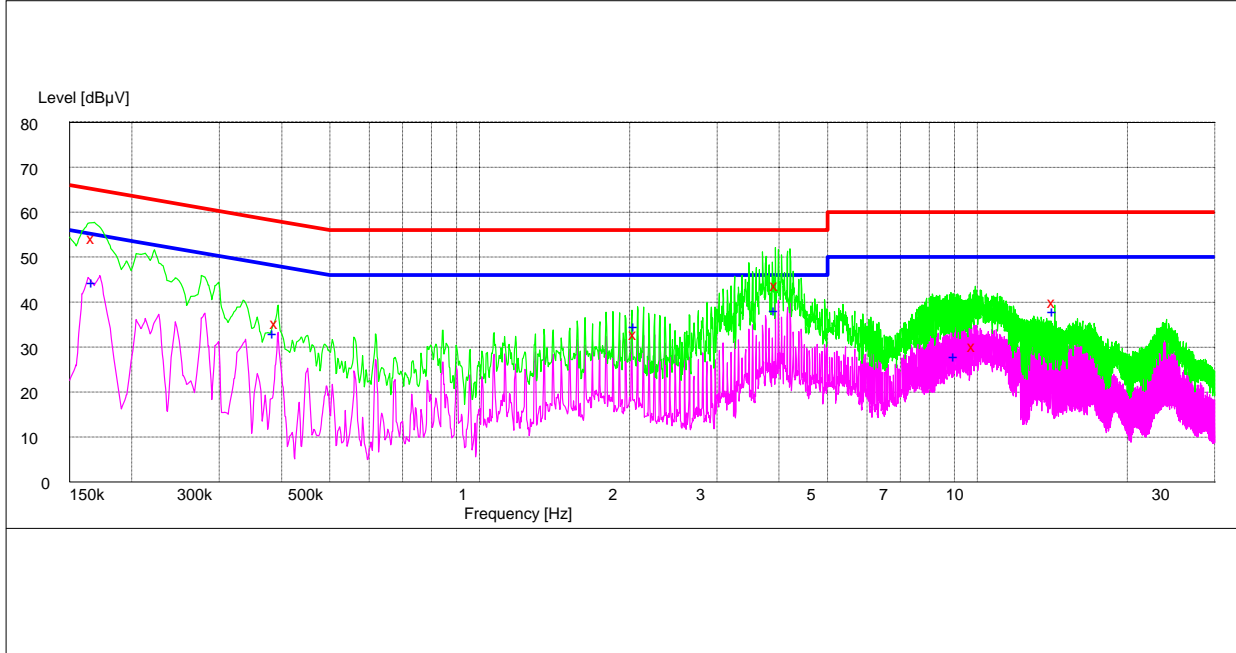
Appendix A	Measurement Results Conducted Emission at Power Port	2 pages
Appendix B	Measurement Results Radiated Emission of Enclosure	3 pages
Appendix C	Photos of Test Setup	2 pages

Appendix A

Conducted Emission at Power Port

According to FCC Part 15.107

TRAFFIC MODE



MEASUREMENT RESULT: QP DECTER

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
0.168000	54.60	10.8	65	10.4	L3	GND
0.393000	35.70	10.1	58	22.3	L3	GND
2.067000	33.10	10.1	56	22.9	L3	GND
3.961500	44.20	10.1	56	11.8	L3	GND
9.874500	30.60	11.0	60	29.4	L3	GND
14.316000	40.30	11.3	60	19.7	N	GND

MEASUREMENT RESULT: AV DECTER

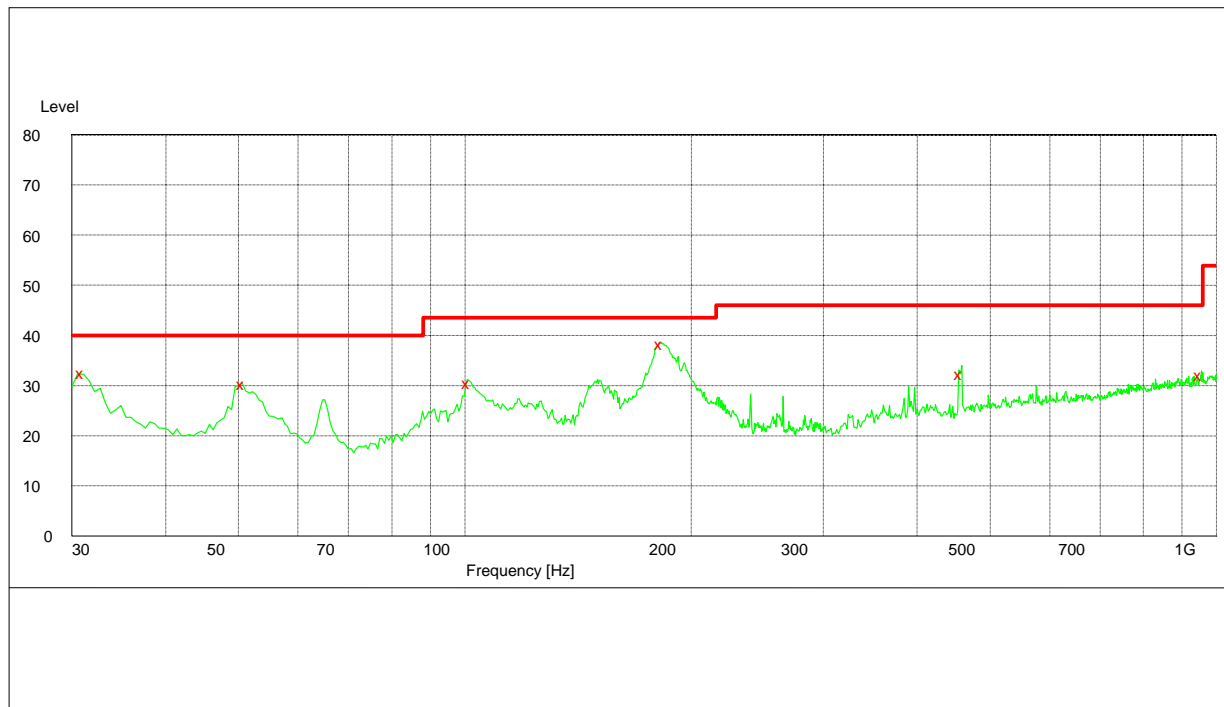
Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
0.168000	44.70	10.8	55	10.3	N	GND
0.388500	33.50	10.1	48	14.5	L3	GND
2.062500	35.00	10.1	46	11.0	L3	GND
3.957000	38.60	10.1	46	7.4	L3	GND
9.087000	28.20	10.7	50	21.8	L3	GND
14.316000	38.20	11.3	50	11.8	N	GND

Appendix B

Radiated Emission of Enclosure

According to FCC Part 15.109

IDLE MODE



MEASUREMENT RESULT: QP DECTER

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
31.020000	32.10	-4.7	40.0	7.9	109.0	287.00	VERTICAL
50.820000	30.60	-14.3	40.0	9.4	100.0	314.00	VERTICAL
101.340000	31.20	-10.6	43.5	12.3	198.0	176.00	HORIZONTAL
182.820000	38.40	-12.1	43.5	5.1	177.0	230.00	HORIZONTAL
457.680000	32.30	-3.8	46.0	13.7	112.0	354.00	VERTICAL
953.220000	32.40	1.9	46.0	13.6	289.0	178.00	VERTICAL