



EMC Test Report

Product Name: DC-HSPA+ USB Rotator

Model Number: E3256s-6

Report No: SYBH(Z-EMC)018062012-2

FCC ID: QISE3256S-6

Reliability Laboratory of Huawei Technologies Co., Ltd.

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Notice

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2. 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.
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Applicant: Huawei Technologies Co., Ltd.
Address: Huawei Base, Bantian, Longgang District, Shenzhen
 518129, P.R. China

Date of Receipt Test Item: Jun.08, 2012
Start Date of Test: Jun.10, 2012
End Date of Test: Jun.15, 2012

Test Result: Pass

**Approved By
(Lab Manager)**

2012-06-27
Date

Liuchunlin
Name

Signature

Operator

2012-06-27
Date

Daniel
Name

Signature



TABLE OF CONTENT

1	General Information.....	5
1.1	EUT Description.....	5
1.2	Test Site Information.....	6
1.3	Applied Standards.....	6
2	Summary of Results.....	7
3	System Configuration during EMC Test.....	8
3.1	Test Mode.....	8
3.2	Test System Configuration.....	8
3.3	Associated Equipment Used during Test.....	9
4	Electromagnetic Interference (EMI).....	10
4.1	Radiated Disturbance 30MHz to 18GHz.....	10
4.2	Conducted Disturbance 0.15 MHz to 30MHz.....	12
5	Main Test Instruments.....	13
6	System Measurement Uncertainty.....	13
7	Test Graph and Data.....	14
7.1	Radiated Disturbance.....	14
7.2	Conducted Disturbance.....	16



1 General Information

1.1 EUT Description

EUT Description	
Product Name	DC-HSPA+ USB Rotator
Model Number	E3256s-6
TX Frequency	GSM850:824MHz To 849MHz; GSM1900:1850MHz To 1910MHz; WCDMA BAND II: 1850MHz To 1910MHz WCDMA BAND V: 824MHz To 849MHz;
RX Frequency	GSM850:869MHz To 894MHz; GSM1900:1930MHz To 1990MHz WCDMA BAND II: 1930MHz To 1990MHz WCDMA BAND V: 869MHz To 894MHz;
S/N	M9F01A9260300201
HW Version	CH1E3256SM
SW Version	22.122.00.04.00
EUT Accessory	
Data cable	Data Cable USB A Male to Micro USB, shielded

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



1.2 Test Site Information

Site 1:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	Bantian Longgang District Shenzhen, P.R. China

1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15:2011, Subpart B

2 Summary of Results

Summary of Results				
Test Items	Test Mode	Performance Class & Required Performance Criteria	Result	Site
<u>Radiated Emissions</u> Enclosure Port	Mode2 Mode4	CLASS B	Pass	Site1
<u>Conducted Emissions</u> <input checked="" type="checkbox"/> DC Power Port <input checked="" type="checkbox"/> AC Power Port <input type="checkbox"/> Telecommunication Ports	Mode1 Mode3	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the measurement uncertainty of measurement system. 2, <input checked="" type="checkbox"/> The item has been tested; <input type="checkbox"/> The item has not been tested.				

During the measurement, the environmental conditions complied with the range listed as below.

Item	Required
Ambient temperature	15°C ~ 35°C
Relative humidity	25% ~ 75%
Atmospheric pressure	86kPa ~ 106kPa

3 System Configuration during EMC Test

3.1 Test Mode

Huawei has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was in this test report and defined as:

Test Mode	
Mode 1:	USB Copy(EUT with PC)+ Traffic
Mode 2:	USB Copy(EUT with PC)+Idle
Mode 3:	USB Cable + USB Copy(EUT with PC)+ Traffic
Mode 4:	USB Cable + Copy(EUT with PC)+Idle

Remark: When the EUT have multiple Data cable, need separate test with Data cable. Here only the worst cases are recorded in this report.

USB Copy:

State of EUT when transferred the data between the EUT and PC

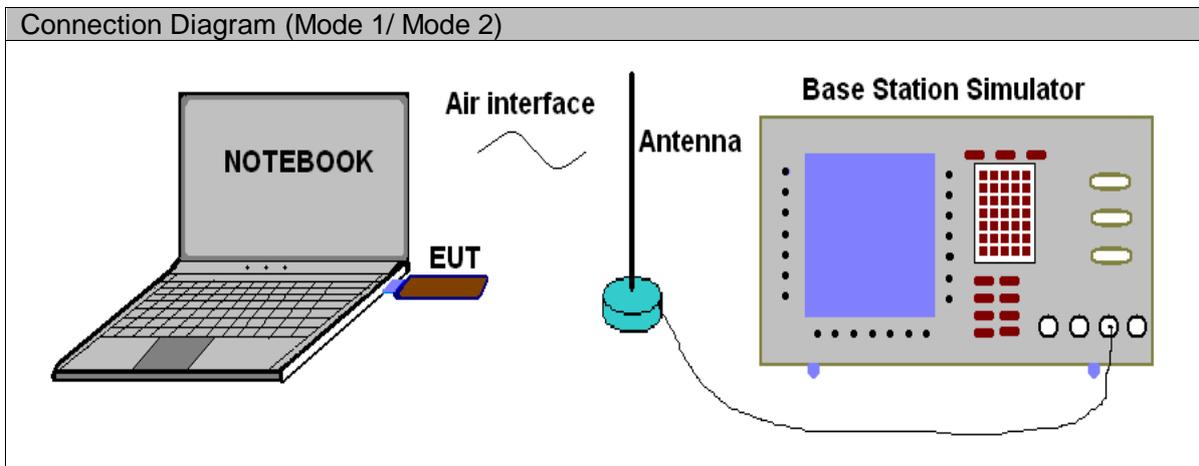
Traffic Mode:

State of EUT when switched on and with Radio Resource Control (RRC) connection established

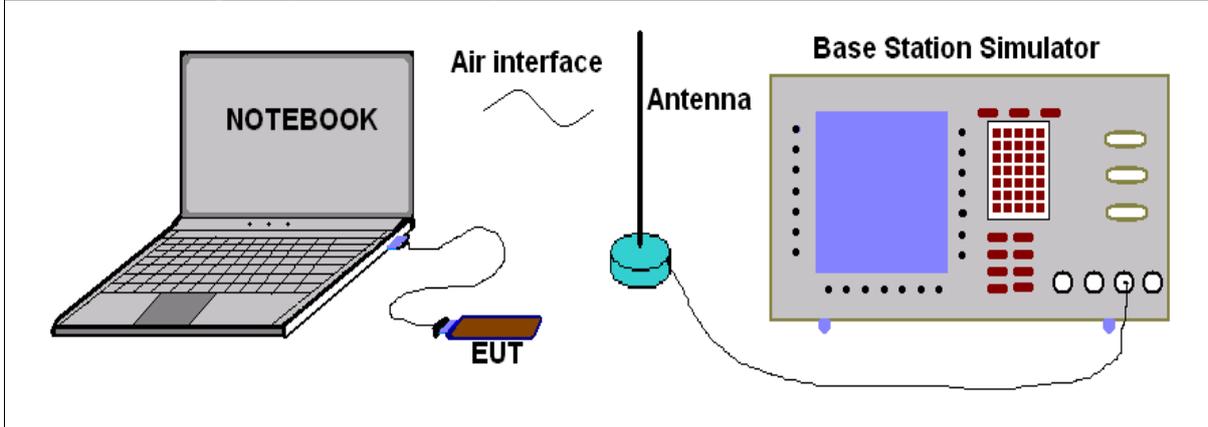
Idle Mode:

State of EUT when switched on but with no Radio Resource Control (RRC) connection

3.2 Test System Configuration



Connection Diagram (Mode 3/ Mode 4)



3.3 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline
Radio Communication Tester	CMU200	R&S	3608105673	2012-11-06
Notebook	X200	ThinkPad	31090403588	N/A

4 Electromagnetic Interference (EMI)

4.1 Radiated Disturbance 30MHz to 18GHz

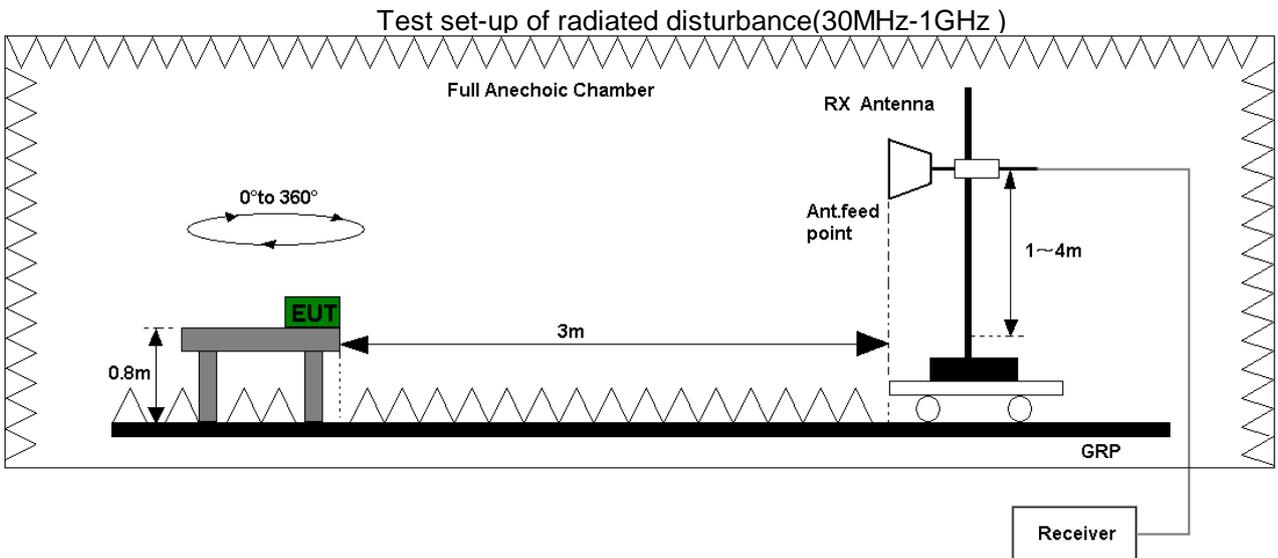
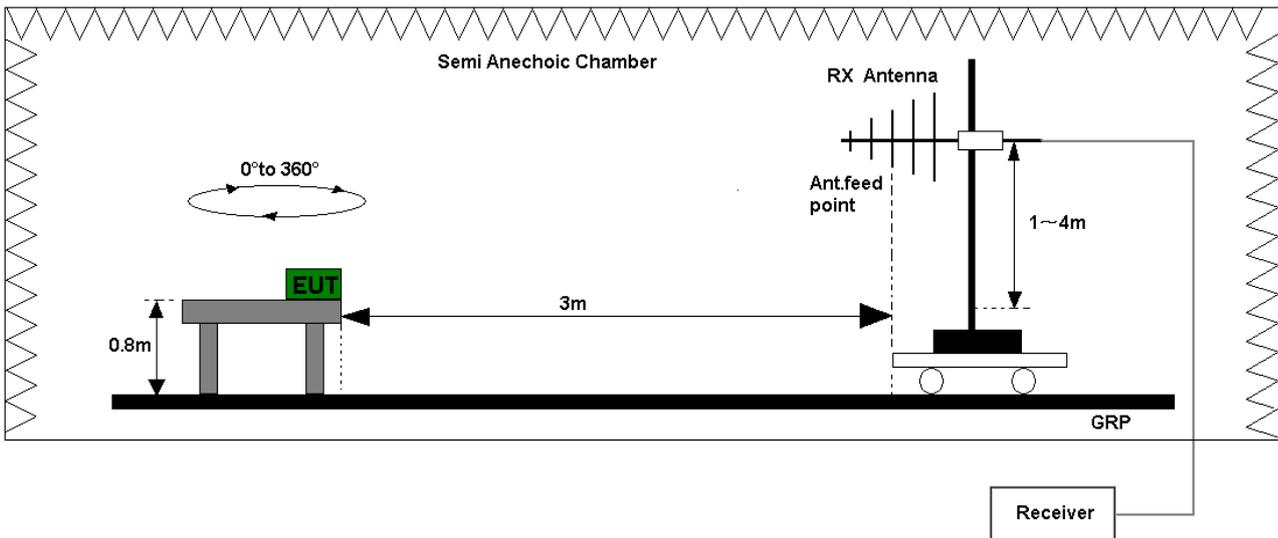
Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4-2009. The test distance was 3m. The set-up and test methods were according to ANSI C63.4-2009.

A preliminary scan and a final scan of the emissions were made from 30 MHz to 18 GHz by using test script of software; the emissions were measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). 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 receiving antenna has two polarizations V and H.

EUT was configured in idle mode and the test performed at worst emission state.

Test setup



Test set-up of radiated disturbance(above 1GHz)



Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.
The test data see section 7.1 of this report.

Test Limits				
Frequency of Emission (MHz)	Radiated Limit			
	Unit(μ V/m)		Unit(dB μ V/m)	
30-88	100		40	
88-216	150		43.5	
216-960	200		46	
Above 960	500		54	
Above 1000	AV	PK	AV	PK
	500	5000	54	74

4.2 Conducted Disturbance 0.15 MHz to 30MHz

Test Procedure

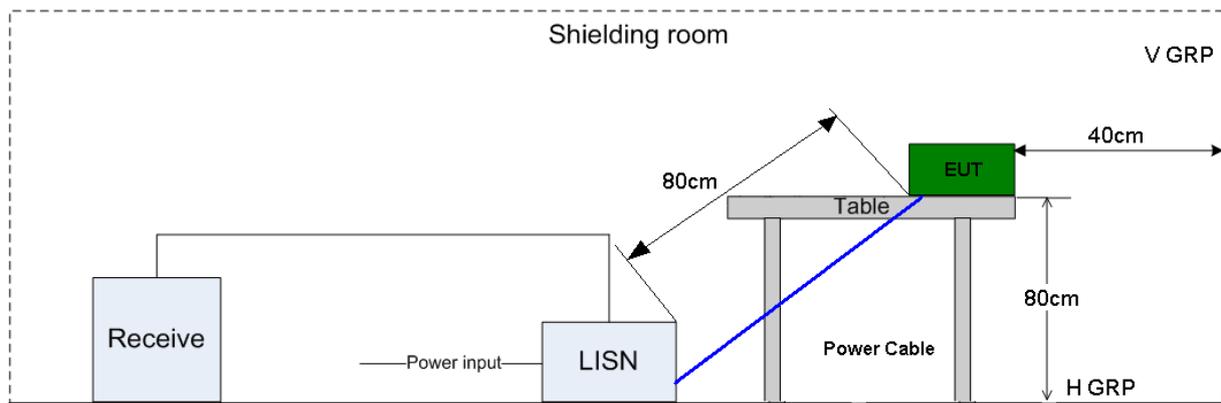
The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm away from LISN. The set-up and test methods were according to ANSI C63.4-2009. Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.

EUT was communicated with the simulator through Air interface, the 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;

The EUT was setup in the shielded chamber and operated under nominal conditions.

Test Setup



Test Set-up of conducted disturbance

Test Results

The EUT has met requirements for Conducted disturbance of power lines.
The test data see section 7.2 of this report.

Test Limit of AC Power Port		
Frequency range	150kHz ~ 30MHz	
Frequency	Voltage limits	
	QP	AV
0.15MHz~0.5MHz	66-56dB μ V	56-46 dB μ V
0.5MHz-5MHz	56dB μ V	46 dB μ V
5MHz~30MHz	60dB μ V	50 dB μ V

5 Main Test Instruments

Main Test Equipments					
Test item	Test Instrument	Model	S/N	Manufacturer	Calibrated Deadline
RE	EMI Test receiver	ESU26	100150	R&S	May.27, 2013
	Broadband Antenna	VULB 9163	9163-941	SCHWARZBECK	Jul.07, 2013
	Horn Antenna	HF906	100683	R&S	May.15, 2013
CE	EMI Test receiver	ESCI	101163	R&S	Mar. 05, 2013
	Artificial Mains Network	ENV216	100382	R&S	Mar.21, 2013
Software Information					
Test Item	Software Name	Manufacturer		Version	
RE	ES-K1	R&S		1.7.1	
CE	EMC32	R&S		V8.52.0	

6 System Measurement Uncertainty

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

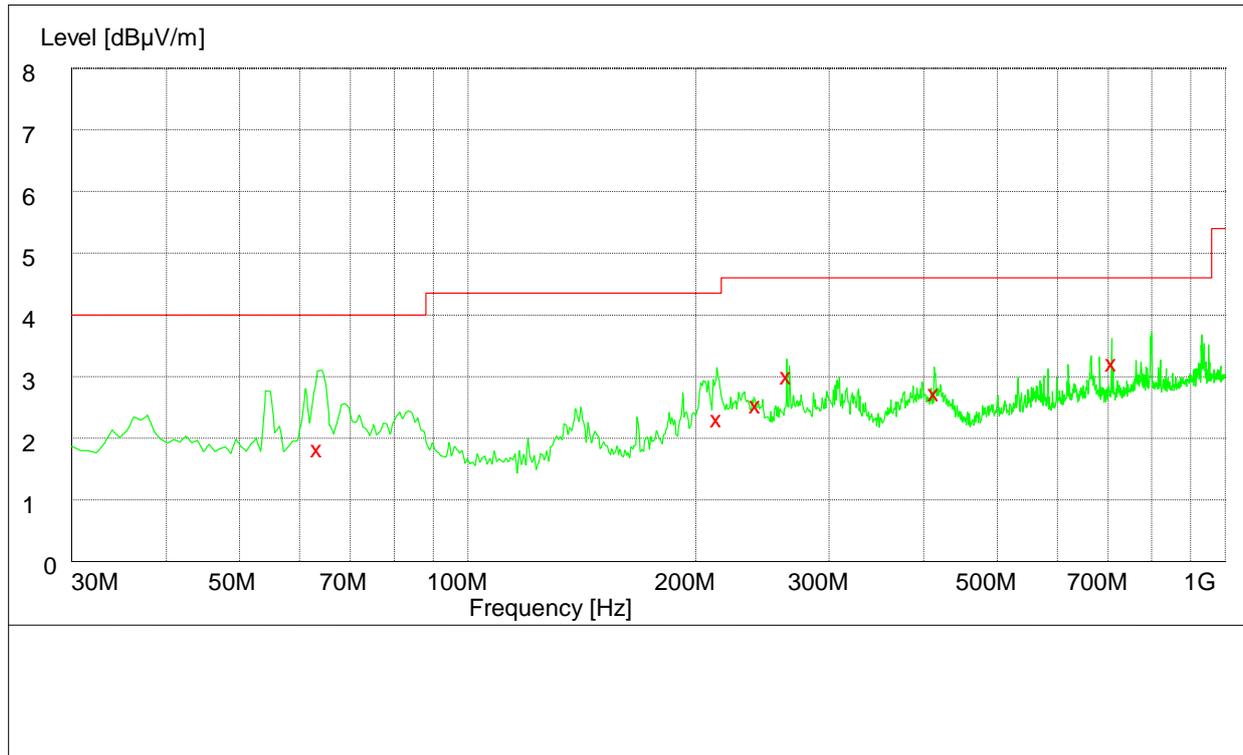
System Measurement Uncertainty		
Items		Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dB μ V/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB μ V/m)	U=5.1dB; k=2
CE	Disturbance Voltage (dB μ V)	U=2.6dB; k=2

7 Test Graph and Data

Only the worst test result was shown in this report.

7.1 Radiated Disturbance

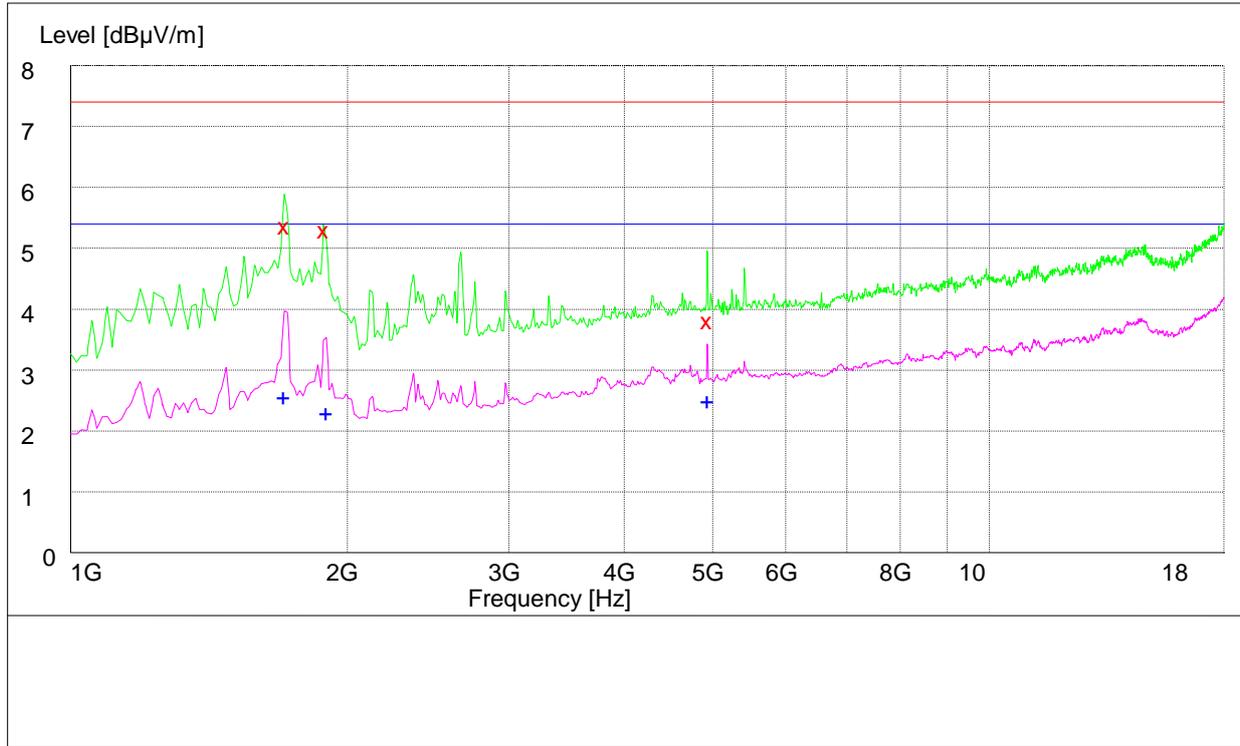
30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
63.300000	18.90	12.2	40.0	21.1	200.0	56.00	HORIZONTAL
213.780000	23.80	12.6	43.5	19.7	151.0	70.00	HORIZONTAL
240.000000	26.10	13.8	46.0	19.9	108.0	304.00	HORIZONTAL
264.000000	30.70	14.2	46.0	15.3	100.0	220.00	HORIZONTAL
412.500000	28.00	17.7	46.0	18.0	123.0	252.00	VERTICAL
708.480000	32.90	22.4	46.0	13.1	100.0	146.00	HORIZONTAL

1GHz~18GHz



MEASUREMENT RESULT: PK Detector

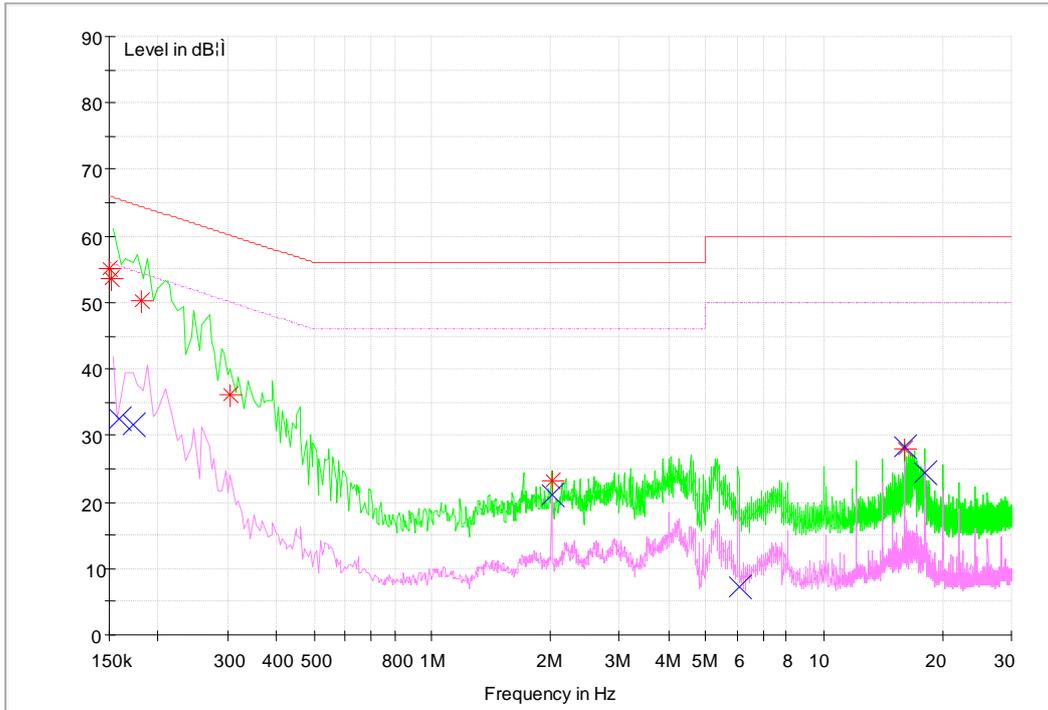
Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1711.200000	54.40	-13.3	74.0	19.6	183.0	121.00	VERTICAL
1888.500000	53.80	-12.2	74.0	20.2	101.0	100.00	VERTICAL
4937.900000	38.80	-2.3	74.0	35.2	112.0	218.00	VERTICAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1705.700000	26.50	-13.3	54.0	27.5	110.0	79.00	VERTICAL
1896.600000	23.80	-12.1	54.0	30.2	100.0	87.00	VERTICAL
4937.400000	25.90	-2.3	54.0	28.1	150.0	177.00	VERTICAL

7.2 Conducted Disturbance

AC Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV	Transducer dB	Limit dBμV	Margin dB	Line	PE
0.150351	55.2	9.7	66.0	10.8	L1	FLO
0.150958	53.7	9.7	65.9	12.2	N	FLO
0.181830	50.3	9.7	64.4	14.1	N	FLO
0.306761	36.0	9.7	60.1	24.1	L1	FLO
2.013356	23.2	9.7	56.0	32.8	N	FLO
16.110536	28.0	10.0	60.0	32.0	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Transducer dB	Limit dBμV	Margin dB	Line	PE
0.158864	32.5	9.7	55.5	23.0	N	FLO
0.172031	31.5	9.7	54.9	23.4	N	FLO
2.012974	21.2	9.7	46.0	24.8	L1	FLO
6.088016	7.1	9.8	50.0	42.9	L1	FLO
16.109411	28.2	10.0	50.0	21.8	L1	FLO
18.121807	24.5	10.1	50.0	25.5	N	FLO



END
