EMC Test Report

Product Name: HUAWEI MediaPad T1 8.0 Pro

Model Number: T1-821L, T1-821w

Report No: SYBH(Z-EMC)075082014

FCC ID：QIST1-821L
QIST1-821W

Reliability Laboratory of Huawei Technologies Co., Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

Tel: +86 755 28780808 Fax: +86 755 89652518

Notice

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2. **The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 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 has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.**
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8. **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.**
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Applicant:	Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Date of Receipt Test Item:	Sep.03, 2014
Start Date of Test:	Sep.25, 2014
End Date of Test:	Sep.26, 2014
Test Result:	Pass

Approved By (Lab Manager)	**2014-09-27**	**Liuchunlin**	
	Date	**Name**	**Signature**
Prepared by (Test Engineer)	**2014-09-27**	**Xuchengming**	
	Date	**Name**	**Signature**

Modification Record

No.	Last Report No.	Modification Description
1	NA	First report

TABLE OF CONTENT

1 General Information

1.1 EUT Description

EUT Description	
Product Name	HUAWEI MediaPad T1 8.0 Pro
Model Number	T1-821L, T1-821w
Serials Number	B6F0114830000011
Working Voltage	5Vdc
TX Frequency	Bluetooth:2402MHz To 2480MHz WIFI:2412MHz To 2462MHz WIFI:5150MHz To 5250MHz WIFI:5250MHz To 5350MHz WIFI:5470MHz To 5725MHz WIFI:5725MHz To 5850MHz GSM850:824MHz to 849MHz GSM1900:1850MHz to 1910MHz WCDMA BAND II: 1850MHz to 1910MHz WCDMA BAND IV: 1710MHz to 1755MHz WCDMA BAND V: 824MHz to 849MHz LTE Band 2: 1850MHz to 1910MHz LTE Band 4: 1710MHz to 1755MHz LTE Band 7: 2500MHz to 2570MHz
RX Frequency	Bluetooth:2402MHz To 2480MHz WIFI:2412MHz To 2462MHz WIFI:5150MHz To 5250MHz WIFI:5250MHz To 5350MHz WIFI:5470MHz To 5725MHz WIFI:5725MHz To 5850MHz GPS:1570MHz To 1580MHz GSM850:869MHz to 894MHz GSM1900:1930MHz to 1990MHz WCDMA BAND II: 1930MHz to 1990MHz WCDMA BAND IV: 2110MHz to 2155MHz WCDMA BAND V: 869MHz to 894MHz LTE Band 2: 1930MHz to 1990MHz LTE Band 4: 2110MHz to 2155MHz LTE Band 7: 2620MHz to 2690MHz
HW Version	SH1T1821LM
SW Version	T1-821LV100R001C001B001
EUT Accessory	
Data cable	BRAND: Huawei Technologies Co., Ltd. Data Cable USB Male to Mini USB Male,
Adapter	BRAND: HUAWEI Model: HW-050200U3W Input voltage: 100V-240V ~50-60Hz，0.5A Output voltage: +5V ⎓ 2A S/N: HWHKAAD92600260 S/N: HWBYABDB2504339
Adapter	BRAND: HUAWEI Model: HW-050100U2W

	Input voltage: ~100V-240V 50/60Hz,0.2A Output voltage: 5V ⎓ 1A S/N: HWHKAGDC0803253 S/N: HWBYAAE11500052
Rechargeable Li-ion	BRAND: HUAWEI Battery Model: HB3080G1EBC Rated capacity: 4800 mAh Nominal Voltage: ⎓ +3.8V Charging Voltage: ⎓ +4.35V
Rechargeable Li-ion	BRAND: HUAWEI Battery Model: HB3080G1EBW Rated capacity: 4800 mAh Nominal Voltage: +3.8V Charging Voltage: +4.35V

Remark: The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.

1.2 Differences Description

The differences between T1-821L, T1-821w is :

	T1-821L	T1-821w
PCB	the same	the same
WIFI/BT 2.4G	the same	the same
WIFI 5G	the same	the same
GSM850/1900	support	Not support
WCDMA1900/850/AWS	support	Not support
LTE BAND 2/4/7	support	Not support

The main test model is T1-821L. The following test data is used as T1-821L.

1.3 Test Site Information

Test Site 1:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.4 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15:2013, Subpart B

2 Summary of Results

Summary of Results				
Test Items	**Test Mode**	**Performance Class & Required Performance Criteria**	**Result**	**Site**
Radiated Emissions Enclosure Port	Mode2 Mode3	CLASS B	Pass	Site1
Conducted Emissions ☐DC Power Port ☒AC Power Port ☐Telecommunication Ports	Mode1 Mode2	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the uncertainty of test system. 2, ☒ The item has been tested; ☐ 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

The EUT was configured, installed, arranged and operated in a manner consistent with typical application; the following mode(s) were applied during the compliance test.

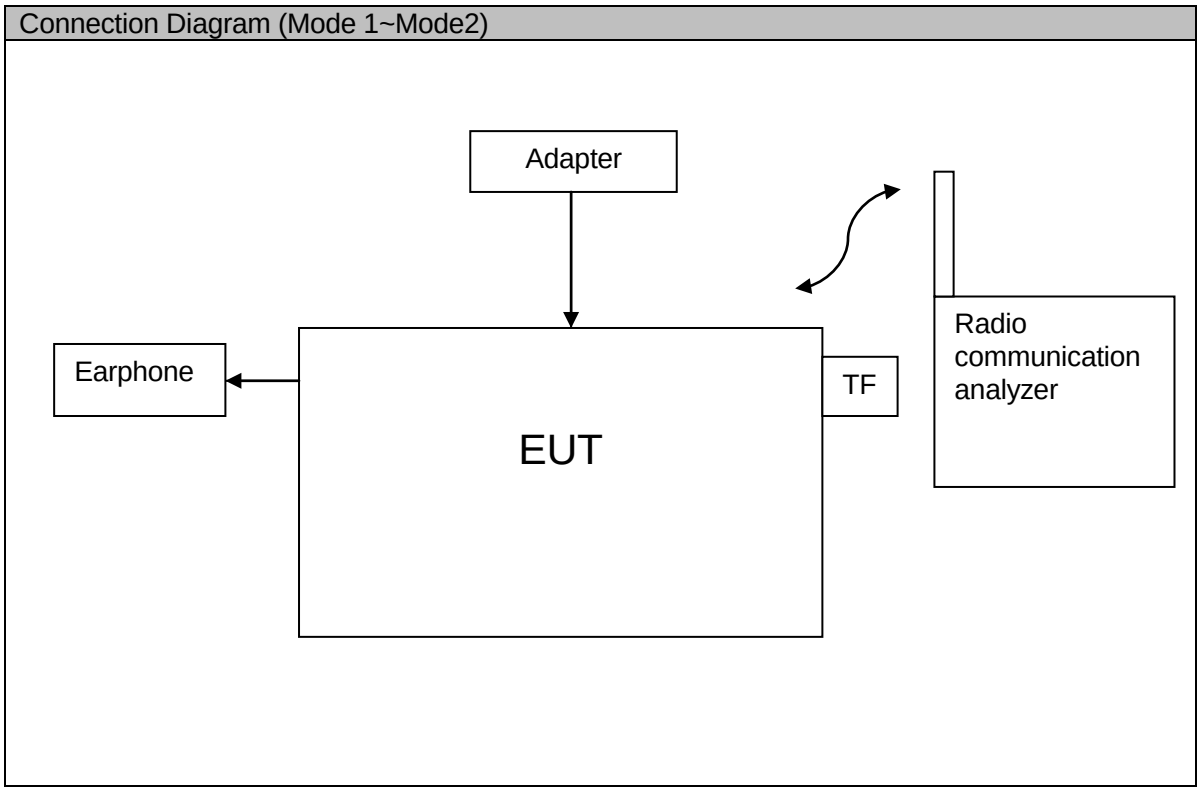
Test Mode	
Mode 1:	Adapter (charge) + TF Card + earphone + Camera on +wireless service traffic mode
Mode 2:	Adapter (charge) + TF Card + earphone + Camera on +wireless service IDLE mode
Mode 3:	PC (Power supply and USB copy) + TF card + earphone + wireless service IDLE mode

Remark: If there is more than one adapter, each one should be applied throughout the compliance test respectively, however, only the worst case will be recorded in this report.
Traffic Mode:
State of EUT when switched on and with Radio Resource Control (RRC) connection established

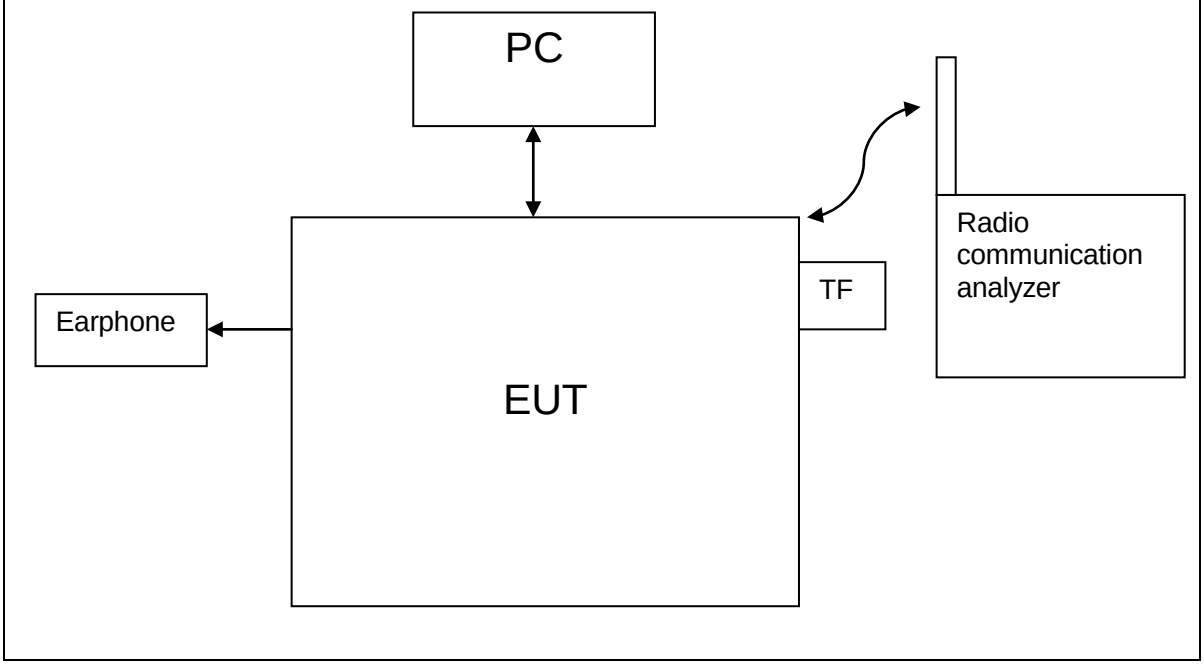
IDLE Mode:
State of EUT when switched on but with no Radio Resource Control (RRC) connection

3.2 Test System Configuration

Connection Diagram (Mode 1~Mode2)



Connection Diagram (Mode 3)



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB	1	<3m	shielded
Earphone	1	<3m	unshielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated dateline	Cal interval (month)
Radio Communication Tester	CMW500	R&S	115624	2015-09-17	12
PC	X200	Lenovo	3108052581	/	/
TF Card	4G	Kingston	1335PW93804	/	/

4 Electromagnetic Interference (EMI)

4.1 Radiated Disturbance 30MHz to 18GHz

4.1.1 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 to18 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.
Measurement bandwidth (RBW) for 30MHz to 1000 MHz: 120 kHz;
Measurement bandwidth (RBW) for 1000MHz to 18000 MHz: 1MHz;
EUT was configured in idle mode and the test performed at worst emission state.

4.1.2 Test setup

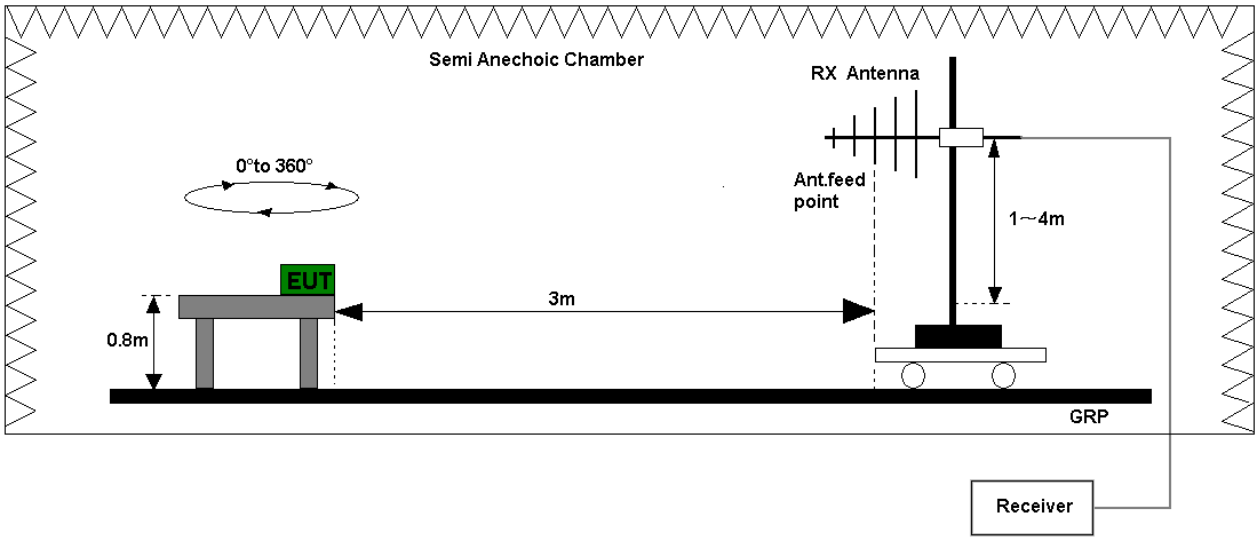


Figure 1.Test set-up of radiated disturbance(30MHz-1GHz)

Figure 2.

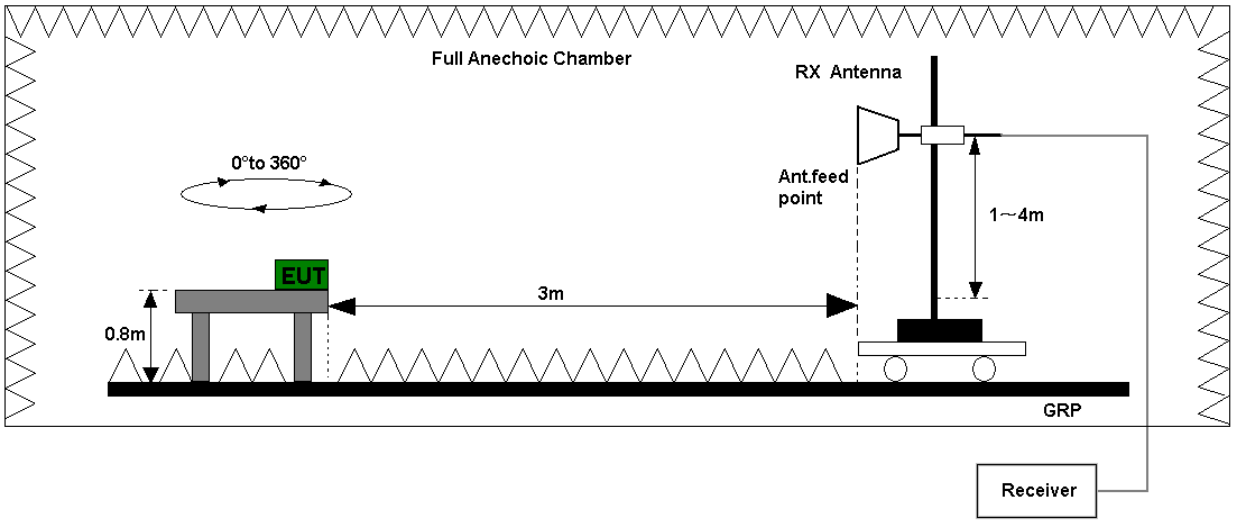


Figure 3.Test set-up of radiated disturbance(above 1GHz)

4.1.3 Test Results

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

Test Limits (Class B)				
Frequency of Emission (MHz)	Radiated Limit			
	Unit(μV/m)		Unit(dBμV/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

4.2.1 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 150 kHz to 30 MHz: 9 kHz;
The EUT was set in the shielded chamber and operated under nominal conditions.

4.2.2 Test Setup

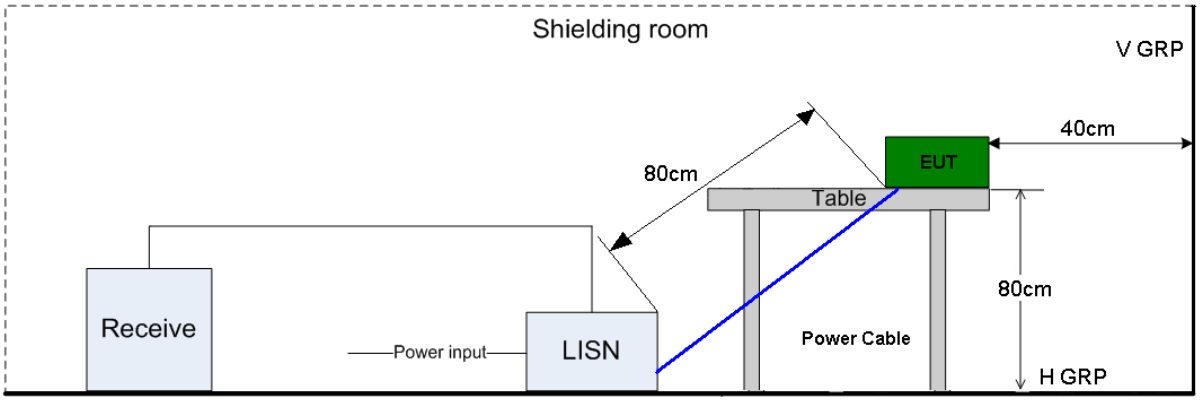


Figure 4. Test Set-up of conducted disturbance

4.2.3 Test Results

The EUT has met requirements for Conducted disturbance of power lines.
Refer to the section 7 .2of this report for test data.

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

5 Main Test Instruments

Main Test Equipments						
Test item	**Test Instrument**	**Model**	**S/N**	**Manufacturer**	**Calibrated Deadline**	**Cal interval**
RE	EMI Test receiver	ESU26	100387	R&S	May 08, 2015	12
	Broadband Antenna	VULB 9163	9163-491	SCHWARZBECK	Feb.01, 2015	24
	Horn Antenna	HF907	10305	R&S	Feb.01,2015	24
CE	EMI Test receiver	ESCI	101163	R&S	Dec.23, 2014	12
	Artificial Mains Network	ENV216	100382	R&S	Dec.23, 2014	12
	Artificial Mains Network	ENV216	101176	R&S	Dec.23, 2014	12

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EMC 32	R&S	V8.40.0
CE	EMC 32	R&S	V8.40.0

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 (dBμV/m)	U=4.2dB; k=2
RE(1GHz-18GHz)	Field strength (dBμV/m)	U=5.3dB; k=2
CE	Disturbance Voltage (dBμV)	U=2.6dB; k=2

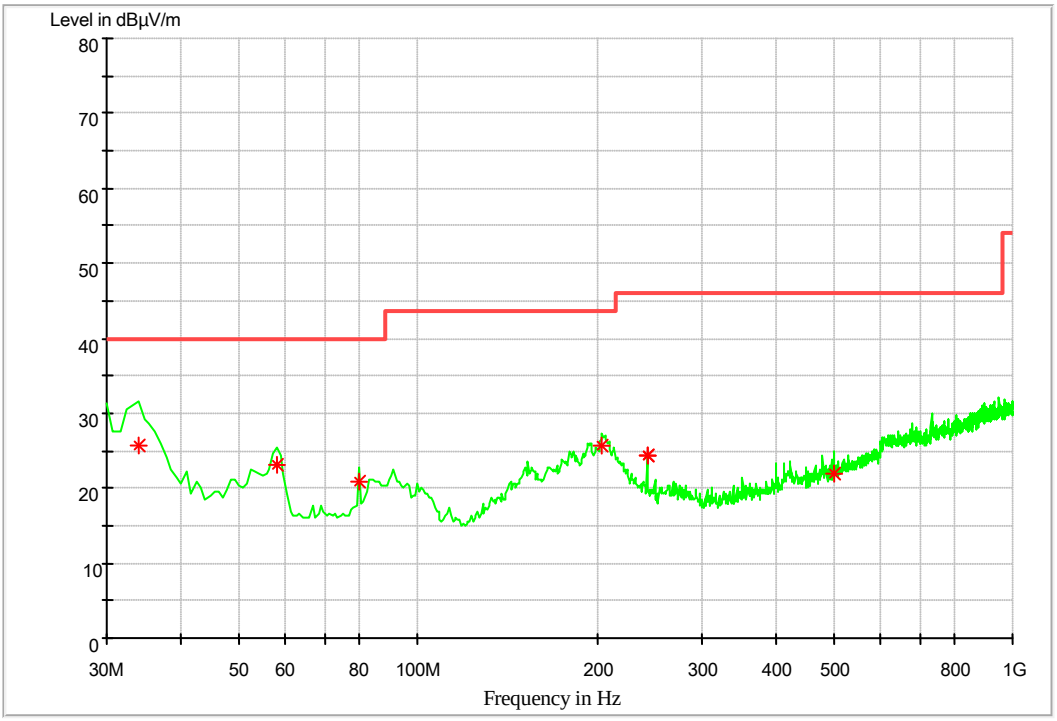
7 Test Data and Graph

Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz

FCC CLASS B RE 30MHz-1GHz



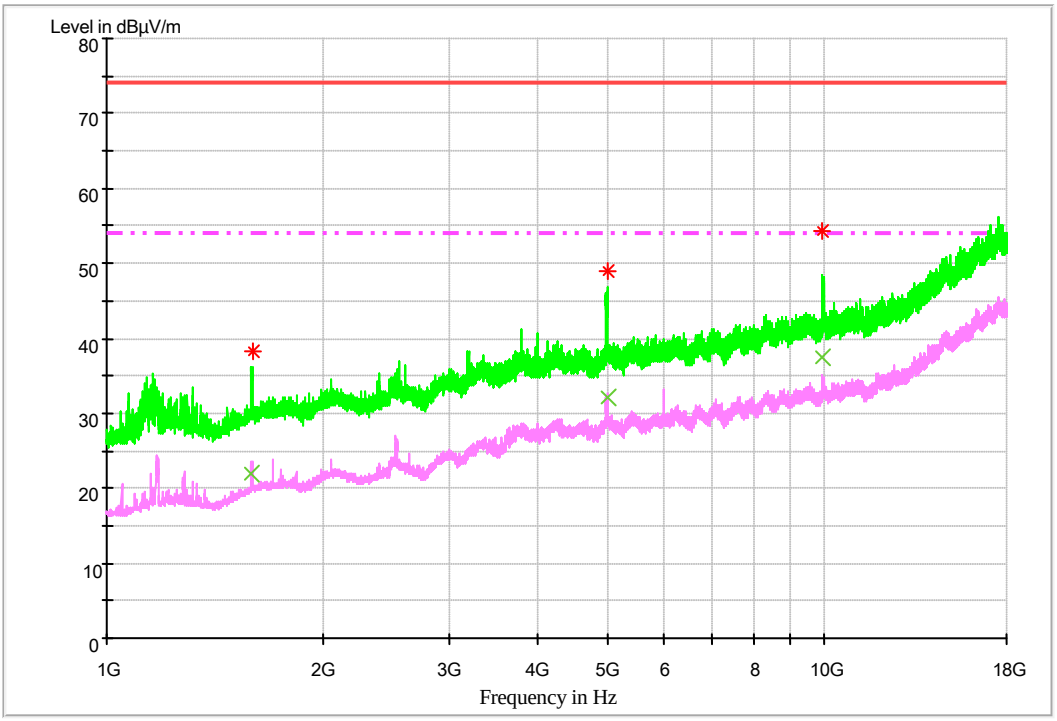
MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
34.354746	26.3	14.0	40.0	13.7	100.0	163.0	VERTICAL
57.037440	23.0	14.9	40.0	17.0	100.0	185.0	VERTICAL
80.123840	20.9	11.2	40.0	19.1	122.0	205.0	VERTICAL
207.872000	25.2	12.1	43.5	17.3	100.0	28.0	VERTICAL
242.162880	24.7	12.9	46.0	18.8	100.0	2.0	VERTICAL
500.435520	21.9	17.0	46.0	24.1	100.0	112.0	HORIZONTAL

Note:
Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.

7.1.2 1GHz~18GHz

FCC CLASS B RE 1GHz-18GHz



MEASUREMENT RESULT: PK Detector

Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
1597.418666	38.4	-11.5	74.0	35.6	100.0	41.0	HORIZONTAL
4992.203334	49.1	0.3	74.0	24.9	100.0	0.0	VERTICAL
9977.815333	54.4	9.3	74.0	19.6	162.0	85.0	VERTICAL

MEASUREMENT RESULT: AV Detector

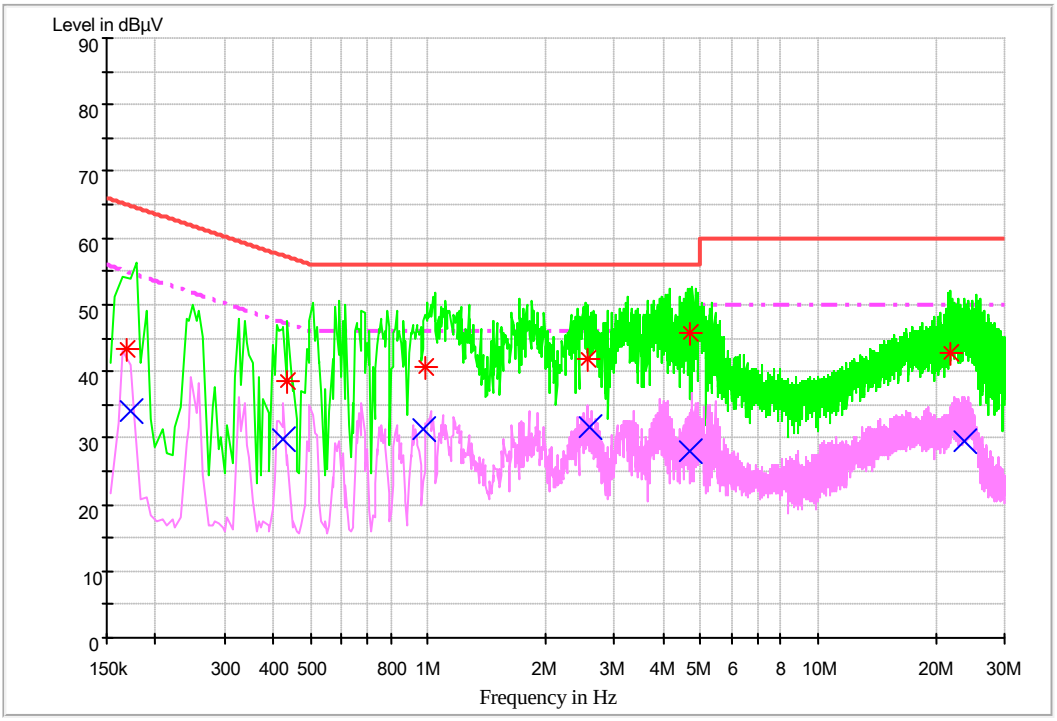
Frequency	Level	Transducer	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
1594.050000	21.9	-11.5	54.0	32.1	100.0	286.0	VERTICAL
4985.750667	32.1	0.4	54.0	21.9	100.0	159.0	VERTICAL
9983.469334	37.4	9.3	54.0	16.6	100.0	92.0	VERTICAL

Note:
Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.

7.2 Conducted Disturbance

7.2.1 AC Port Test Data

CLASS B Voltage with ENV216



MEASUREMENT RESULT: QP Detector

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.168086	43.5	9.7	65.1	21.6	L1	FLO
0.432768	38.5	9.7	57.2	18.7	L1	FLO
0.982864	40.5	9.7	56.0	15.5	L1	FLO
2.548215	41.7	9.7	56.0	14.3	L1	FLO
4.710228	45.7	9.8	56.0	10.3	N	FLO
21.824550	42.9	10.1	60.0	17.1	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.171969	34.0	9.7	54.9	20.9	L1	FLO
0.425928	29.9	9.7	47.3	17.4	L1	FLO
0.974168	31.4	9.7	46.0	14.6	L1	FLO
2.583012	31.6	9.7	46.0	14.4	L1	FLO
4.681282	27.9	9.8	46.0	18.1	L1	FLO
23.561302	29.6	10.2	50.0	20.4	N	FLO

Note:

Level= Reading level+ Transd (cable loss + correction factor)

The reading level is calculated by software which is not shown in the sheet.

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