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FCC REPORT

Report Reference No.....:	**TRE 1708006002** R/C…….: 60103
FCC ID.....:	**QISEG8247H**
Applicant's name.....:	Huawei Technologies Co.,Ltd.
Address .....:	Administration Building, Huawei Base, Bantian, Longgang District, Shenzhen 518129, Guangdong, China
Manufacturer.....:	Huawei Technologies Co.,Ltd.
Address.....:	Administration Building, Huawei Base, Bantian, Longgang District, Shenzhen 518129, Guangdong, China
Test item description.....:	GPON Terminal
Trade Mark .....:	HUAWEI
Model/Type reference.....:	EchoLife HG8247H, EchoLife EG8247H
Standard .....:	47 CFR Part 15 Subpart B
Date of receipt of test sample……..:	Jun.12, 2017
Date of testing……..:	Jun. 20, 2017 - Jun. 21, 2017
Date of issue……...:	Jun. 26, 2017
Result..... ……..:	**Pass**

Compiled by (position+printed name+signature) .....:	File administrators Shayne Zhu	Shayne Zhu
Supervised by (position+printed name+signature) .....:	Project Engineer Lion Cai	Lion Cai
Approved by (position+printed name+signature) .....:	Manager Hans Hu	Hans Hu
Testing Laboratory Name .....:	**Shenzhen Huatongwei International Inspection Co., Ltd.**	
Address .....:	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China	

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Change History		
Issue	Date	Reason for change
1.0	2017.06.26	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Name ..... :	GPON Terminal
FCC ID ..... :	QISEG8247H
Trade Name……..:	HUAWEI
Brand Name……:	HUAWEI
Hardware Version ..... :	HG8247XGA
Software Version ..... :	V300
Ancillary Equipment ..... …:	AC Adapter 1
	Model No.: HW-120200U7W
	Rated Input: 100-240V, 50/60Hz ,0.8A
	Rated Output: 12V⎓2.0A

Note1:The EUT is a GPON Terminal, it supports the following operating frequency band:
WIFI 2.4G;

Note 2:For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart B 2017	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	15.107	Conducted Emission	PASS
2	15.109	Radiated Emission	PASS

NOTE:

(1) The EUT has been tested according to 47 CFR Part 15 Subpart B,Class B.The test procedure is according to ANSI C63.4:2014.

1.3 Facilities and Accreditations

1.3.1 Facilities

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories

(identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

FCC-Registration No.: 317478

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

1.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15°C - 35°C
Relative Humidity (%):	25% -75%
Atmospheric Pressure (kPa):	86kPa-106kPa

1.3.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission:	Uc = 3.6 dB (k=2)
Uncertainty of Radiated Emission:	Uc = 4.5 dB (k=2)

2. TEST CONDITIONS SETTING

2.1 Test Peripherals

The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Support Equipment:

Description	Brand name	Model	Serial No.	FCCID
Notebook	ThinkPad	E430C	A131101550	N/A
Mouse	Logitech	M100r	25011051	DOC

Support Cable：

Description	Shield Type	Ferrite Core	Length
USB Cable	shielding	Yes	1.2m
RJ45 Cable	shielding	No	2m
PC Power adapter Cable	Un- shielding	No	1.2m
Mouse Cable	Un- shielding	No	1m

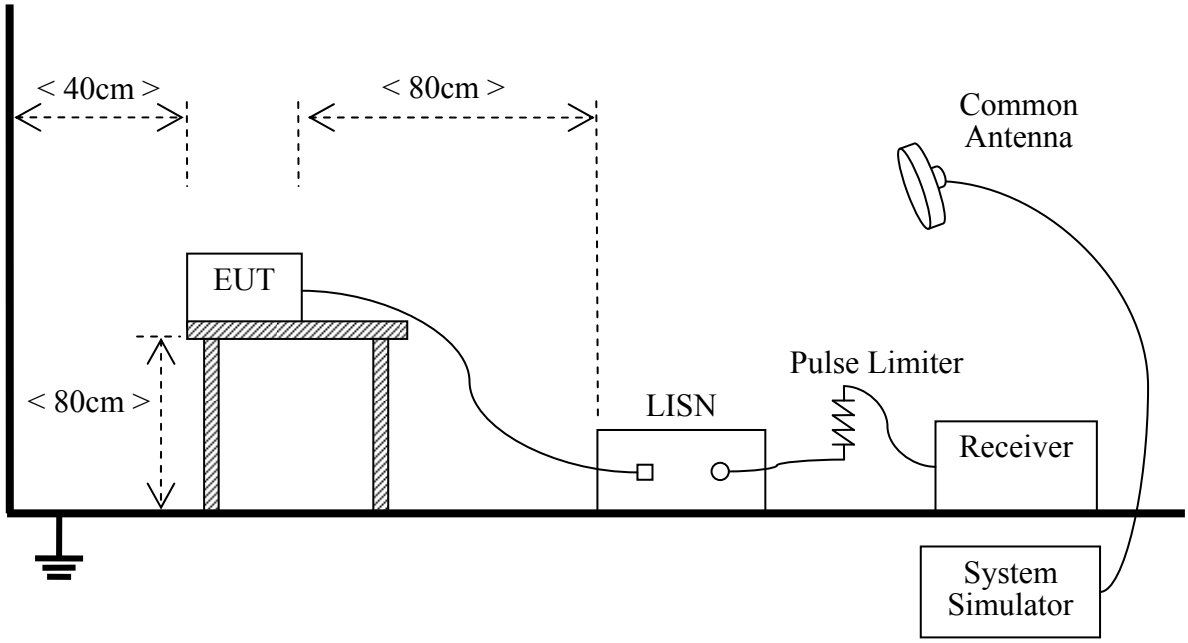
2.2 Test Mode

The EUT configuration of the emission tests is EUT + PC+Mouse+ Adapter.

2.3 Test Setup and Equipments List

2.3.1 Conducted Emission

A. Test Setup:



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. The Common Antenna is used for the call between the EUT and the System Simulator (SS). A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

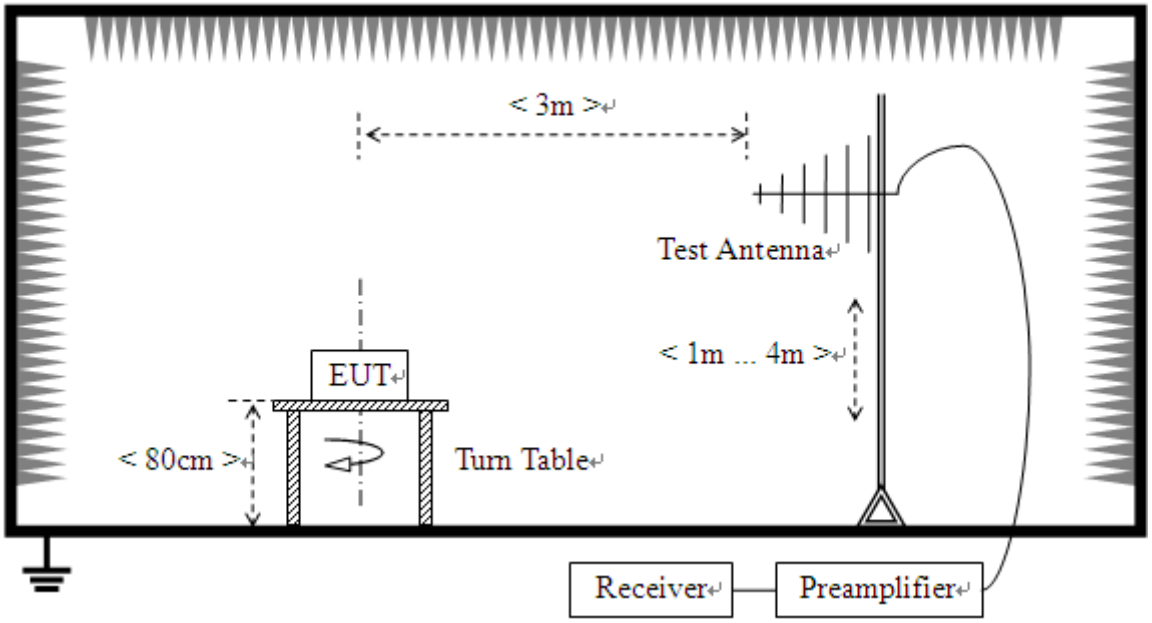
B. Equipments List:

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	EMI Test Receiver	R&S	ESCI	100106	2017/06/2	2018/06/1
2	Artificial Mains	R&S	ESH2-Z5	100028	2017/06/2	2018/06/1
3	Pulse Limiter	R&S	ESHSZ2	100044	2017/06/2	2018/06/1
4	EMI Test Software	R&S	ES-K1	N/A	N/A	N/A

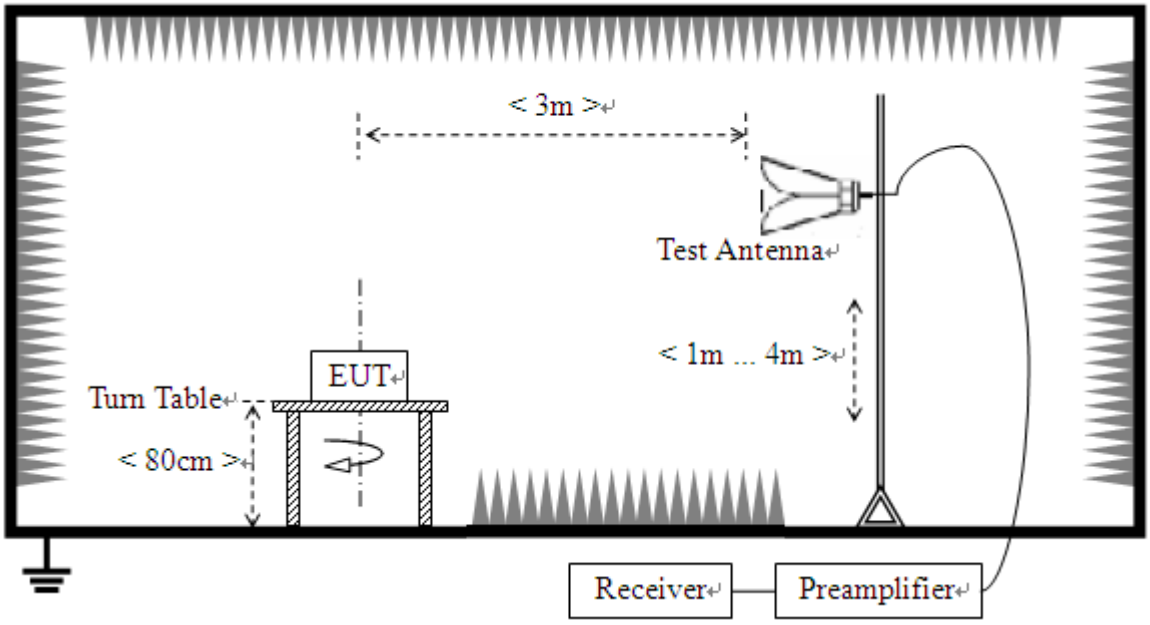
2.3.2 Radiated Emission

A. Test Setup:

1) For radiated emissions from 30MHz to1GHz



2) For radiated emissions above 1GHz



B. Test Procedure

The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

1) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

C. Equipments List:

Radiated Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	ULTRA-BROADBAND ANTENNA	ShwarzBeck	VULB9163	538	2017/06/2	2018/06/1
2	EMI TEST RECEIVER	R&S	ESI 26	100009	2017/06/2	2018/06/1
3	EMI TEST Software	Audix	E3	N/A	N/A	N/A
4	TURNTABLE	MATURO	TT2.0	N/A	N/A	N/A
5	ANTENNA MAST	MATURO	TAM-4.0-P	N/A	N/A	N/A
6	EMI TEST Software	R&S	ESK1	N/A	N/A	N/A
7	ULTRA-BROADBAND ANTENNA	R&S	HL562	100015	2017/06/2	2018/06/1
8	Amplifer	Sonoma	310N	E009-13	2017/06/2	2018/06/1
9	JS amplifer	R&S	JS4-00101800-28-5A	F201504	2017/06/2	2018/06/1
10	TURNTABLE	ETS	2088	2149	N/A	N/A
11	ANTENNA MAST	ETS	2075	2346	N/A	N/A
12	HORN ANTENNA	R&S	HF906	100039	2017/06/2	2018/06/1

3. 47 CFR PART 15B REQUIREMENTS

3.1 Conducted Emission

3.1.1 Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

a) The limit subjects to the Class B digital device.

b) The lower limit shall apply at the band edges.

c) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.1.2 Test Description

See section 2.3.1 of this report.

3.1.3 Test Result

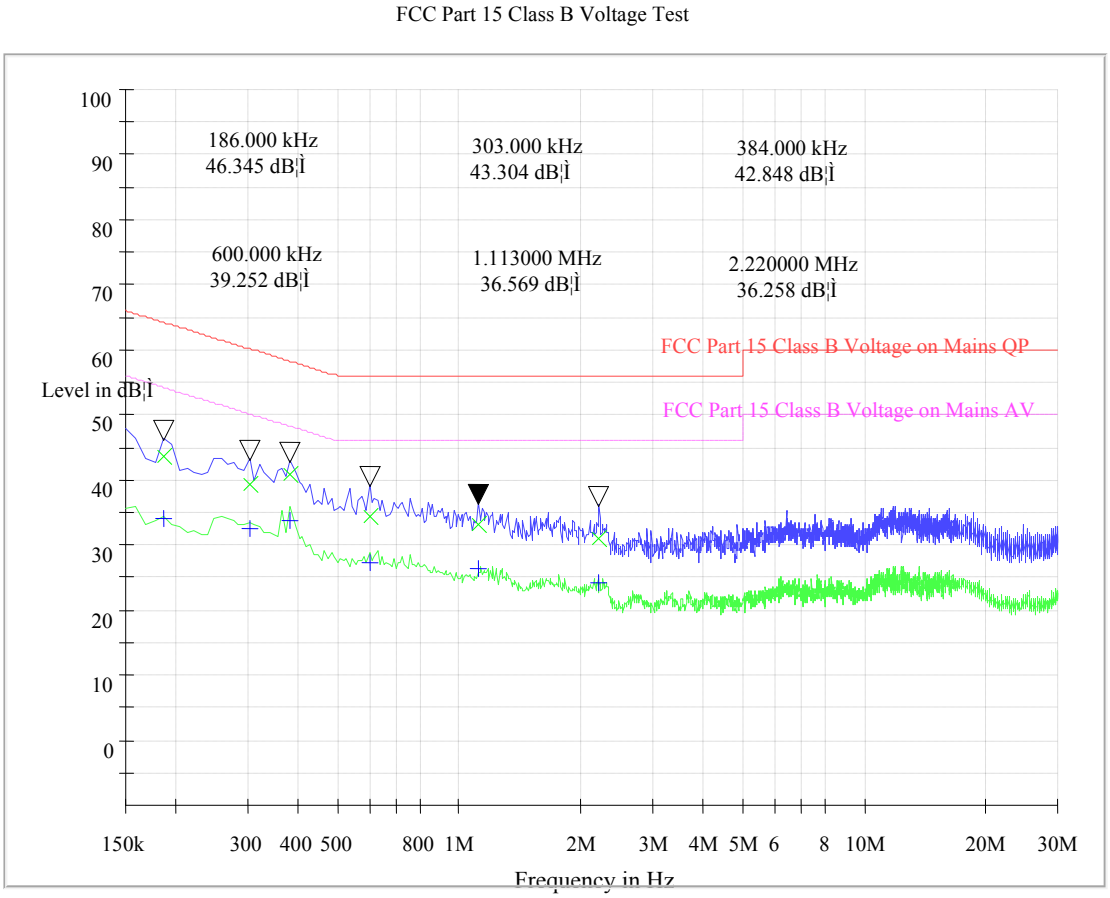
The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

Note:

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a Nominal 120V AC,50/60Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

Test voltage and frequency (120V AC,60Hz)

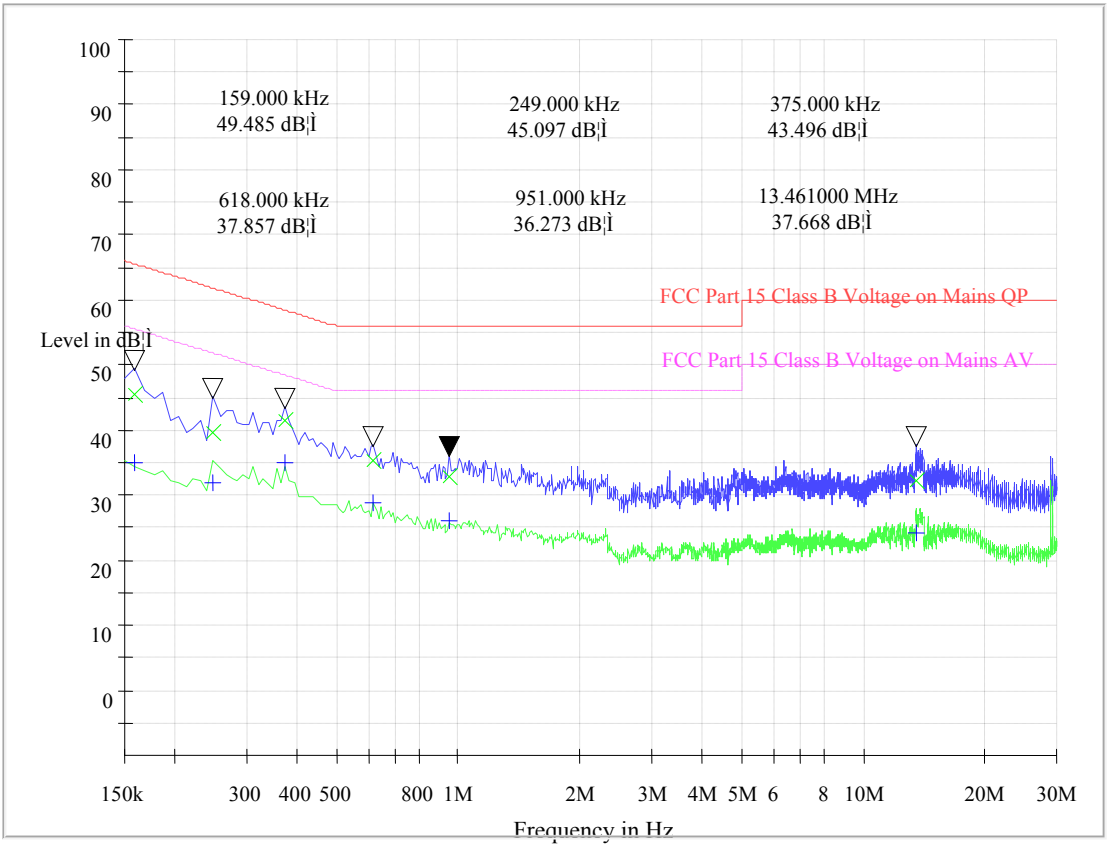
A. Test Plot and Suspicious Points:



(Plot A: L Phase)

Conducted Disturbance at Mains Terminals							
L Test Data							
QP				AV			
Frequency (MHz)	Limits (dBµV)	Measurement Value (dBµV)	Margin (dB)	Frequency (MHz)	Limits (dBµV)	Measurement Value (dBµV)	Margin (dB)
0.18600	64.20	43.60	20.61	0.18600	54.20	34.10	20.10
0.30300	60.20	39.19	20.97	0.30300	50.20	32.40	17.80
0.38400	58.20	40.74	17.45	0.38400	48.20	33.66	14.54
0.600000	56.00	34.26	21.74	0.60000	46.00	27.43	18.57
1.113000	56.00	33.10	22.90	1.11300	46.00	26.31	19.69
2.220000	56.00	31.13	24.87	2.22000	46.00	24.25	21.75

FCC Part 15 Class B Voltage Test



Conducted Disturbance at Mains Terminals							
N Test Data							
QP				AV			
Frequency (MHz)	Limits (dBµV)	Measurement Value (dBµV)	Margin (dB)	Frequency (MHz)	Limits (dBµV)	Measurement Value (dBµV)	Margin (dB)
0.159000	65.50	45.36	20.16	0.159000	56.50	36.50	12.70
0.249000	61.80	39.66	22.13	0.249000	51.80	33.00	13.00
0.375000	58.40	41.43	16.96	0.375000	48.4	33.12	12.88
0.618000	56.00	35.31	20.69	0.618000	46.00	28.80	17.20
0.951000	56.00	32.89	23.11	0.951000	46.00	26.02	19.98
13.46100	60.00	32.12	27.88	13.46100	50.00	24.10	25.90

(Plot B: N Phase)

Test Result: PASS

3.2 Radiated Emission

3.2.1 Requirement

According to FCC section 15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Field Strength		Field Strength Limitation at 3m Measurement Dist	
	μV/m	Dist	(uV/m)	(dBuV/m)
0.009 - 0.490	2400/F(kHz)	300m	10000* 2400/F(kHz)	20log 2400/F(kHz) + 80
0.490 - 1.705	2400/F(kHz)	30m	100* 2400/F(kHz)	20log 2400/F(kHz) + 40
1.705 - 30.00	30	30m	100*30	20log 30 + 40
30.0 - 88.0	100	3m	100	20log 100
88.0 - 216.0	150	3m	150	20log 150
216.0 - 960.0	200	3m	200	20log 200
Above 960.0	500	3m	500	20log 500

a) As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

b) Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

c) For below 1G :QP detector RBW 120kHz ,VBW 300kHz.

d) For Above 1G: PK detector RBW 1MHz,VBW 3MHz for PK value ;AV detector RBW 1MHz, VBW 10Hz for AV value.

Note:

1) The tighter limit shall apply at the boundary between two frequency range.
2) Limitation expressed in dBuV/m is calculated by 20log Emission Level(uV/m).
3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $Ld1 = Ld2 * (d2/d1)^{2.}$
   Example:
   F.S Limit at 30m distance is 30uV/m, then F.S Limitation at 3m distance is adjusted as
   $Ld1 = L1 = 30uV/m * (10)^2 = 100 * 30uV/m.$

3.2.2 Test Description

See section 2.3.2 of this report.

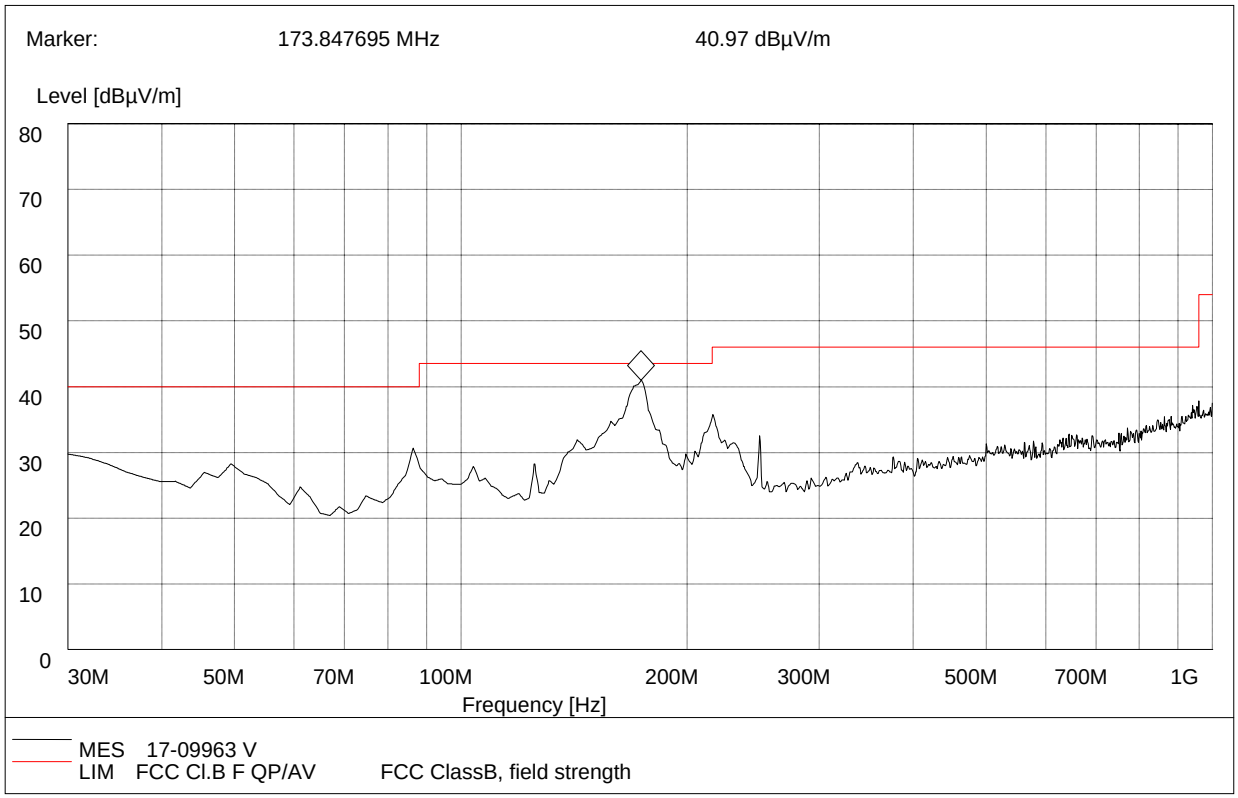
3.2.3 Test Result

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

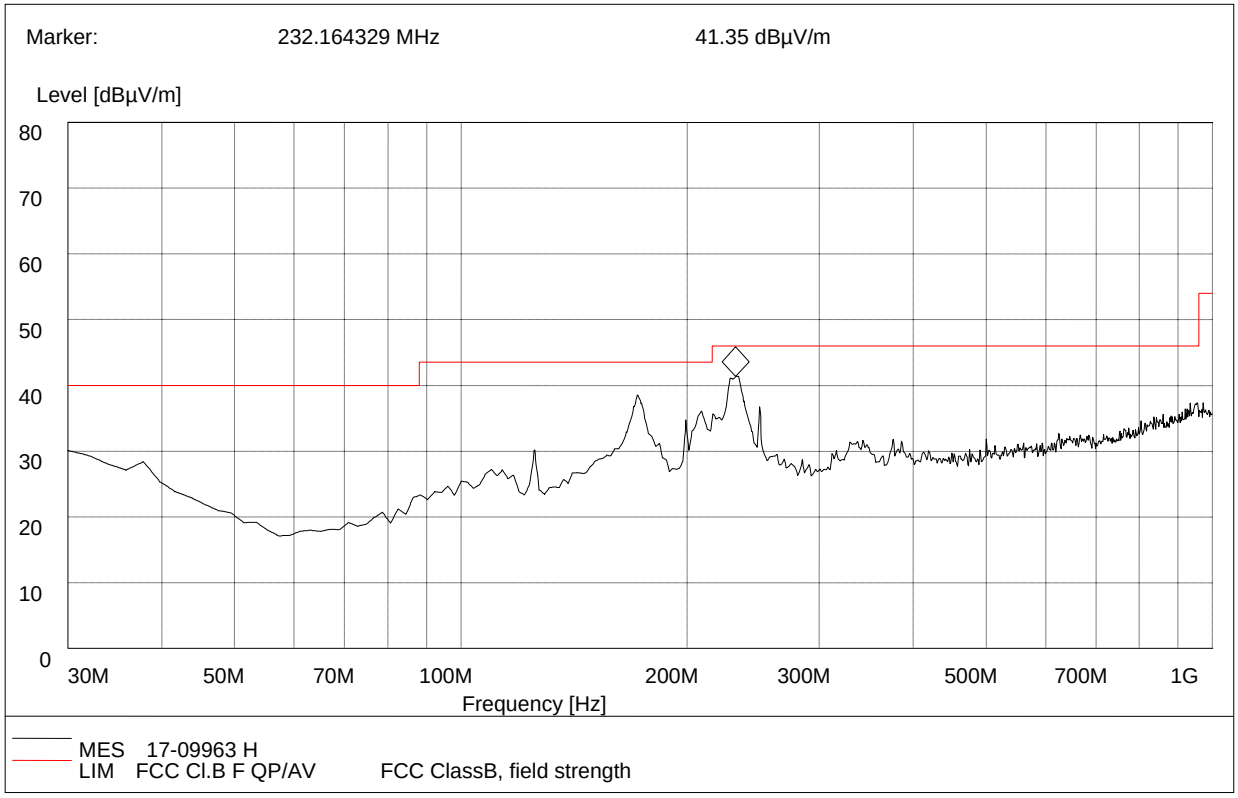
Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

B. Test Plots and Suspicious Points:



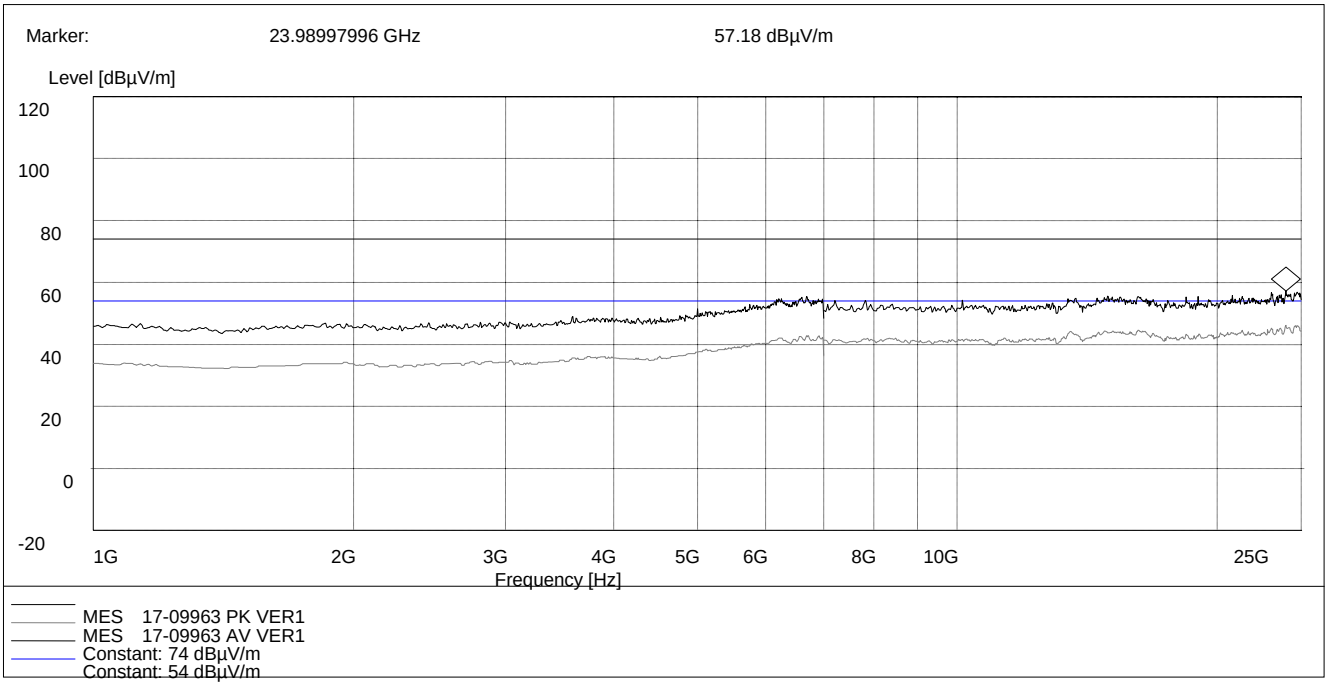
(Plot C: Test Antenna Vertical 30M - 1G)

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dBµV/m)	Margin (dB)	Antenna	Verdict
87.63	28.64	120.000	150.00	40.00	12.94	Vertical	Pass
159.63	33.09	120.000	150.00	43.50	14.62	Vertical	Pass
174.58	37.89	120.000	300.00	43.50	15.52	Vertical	Pass
217.50	34.15	120.000	200.00	46.00	11.85	Vertical	Pass
231.49	28.81	120.000	250.00	46.00	17.19	Vertical	Pass
250.03	31.97	120.000	150.00	46.00	14.03	Vertical	Pass

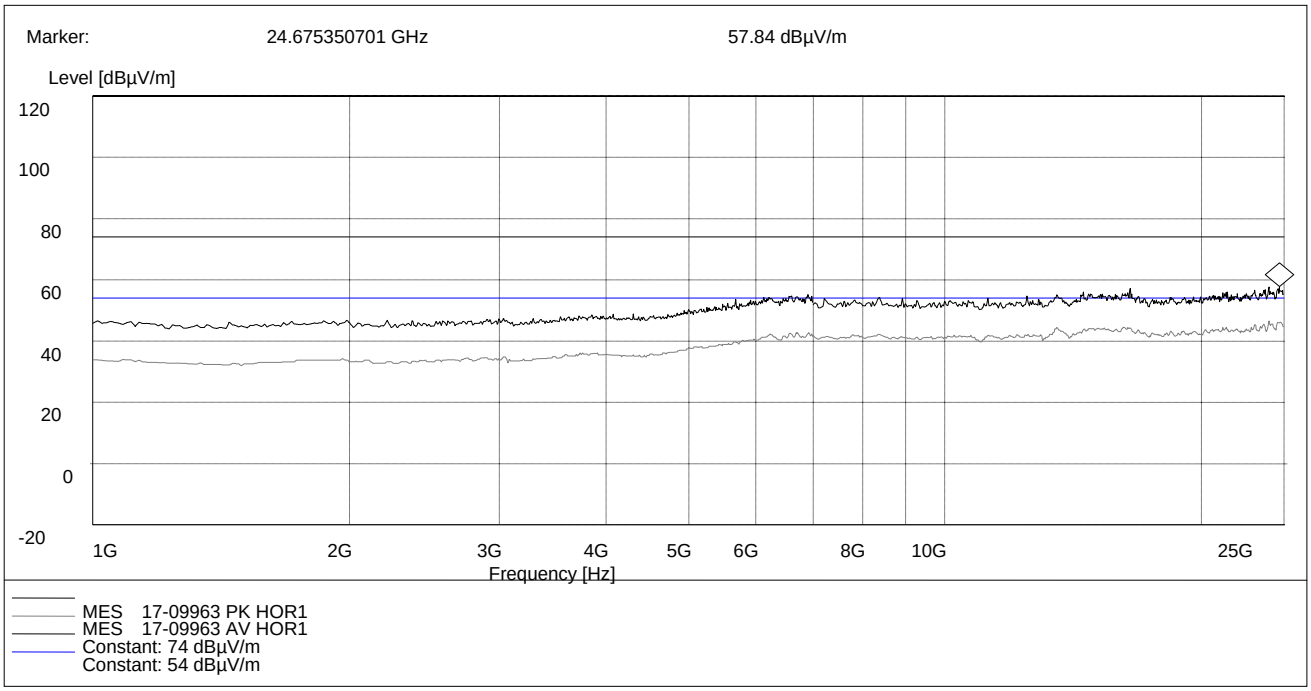


(Plot D: Test Antenna Horizontal 30M - 1G)

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dBµV/m)	Margin (dB)	Antenna	Verdict
125.15	30.31	120.000	200.00	43.50	13.19	Horizonta	Pass
172.40	37.16	120.000	150.00	43.50	6.34	Horizonta	Pass
200.01	33.86	120.000	250.00	43.50	9.64	Horizonta	Pass
209.69	34.81	120.000	150.00	43.50	8.69	Horizonta	Pass
233.69	39.64	120.000	100.00	46.00	6.36	Horizonta	Pass
250.01	35.96	120.000	300.00	46.00	10.04	Horizonta	Pass



(Plot E: Test Antenna Horizontal 1G – 25G)



(Plot F: Test Antenna Vertical 1G – 25G)

Test Result: PASS