FCC TEST REPORT

Product Name:	Mobile Phone
Trade Mark:	MI
Model No.:	M1803E7SH
Report Number:	180117025EMC-1
Test Standards:	FCC 47 CFR Part 15 Subpart B
Test Result:	PASS
Date of Issue:	February 24, 2018

Prepared for:

Xiaomi Communications Co., Ltd.
The Rainbow City of China Resources, NO.68,Qinghe Middle Street,
Haidian District, Beijing, China

Prepared by:

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Jim Long
Assistant Manager

UnionTrust Laboratories * Certified *

Version

Version No.	Date	Description
V1.0	February 24, 2018	Original

CONTENTS

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Xiaomi Communications Co., Ltd.
Address of Applicant:	The Rainbow City of China Resources, NO.68,Qinghe Middle Street, Haidian District, Beijing, China
Manufacturer:	Xiaomi Communications Co., Ltd.
Address of Manufacturer:	The Rainbow City of China Resources, NO.68,Qinghe Middle Street, Haidian District, Beijing, China

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Mobile Phone
Model No.:	M1803E7SH
Add. Model No.:	N/A
Trade Mark:	MI
DUT Stage:	Identical Prototype
Power Supply:	100-240V~50/60 Hz 0.35A or/and 3.85 Vdc
Classification of digital devices:	Class B
Highest Internal Frequency:	1.8 GHz
Memory:	3+32G,4+64G,6+64G
Software Version:	MIUI9
Hardware Version:	P2.2
Sample Received Date:	January 18, 2018
Sample Tested Date:	January 18, 2018 to January 26, 2018

1.2.2 Description of Accessories

Adapter(1)	
Trade Mark:	XIAOEZ
Model No.:	MDY-08-EZ
Input:	100-240V~50/60 Hz 0.35A
Output:	5V ⎓ 2A
AC Cable:	N/A
DC Cable:	N/A
Manufacturer:	Dongguan Aohai Power Technology Co., Ltd.

Adapter(2)	
Trade Mark:	XIAOMI
Model No.:	MDY-08-EZ
Input:	100-240V~50/60 Hz 0.35A
Output:	5V ⎓ 2A
AC Cable:	N/A
DC Cable:	N/A
Manufacturer:	Jiangsu Chenyang Electron Co., Ltd.

Battery	
Trade Mark:	MI
Model No.:	BN45
Battery Type:	Lithium-ion Polymer Rechargeable Battery
Rated Voltage:	3.85 Vdc
Limited Charge Voltage:	4.4 Vdc
Rated Capacity:	3900 mAh
Manufacturer:	Sunwoda Electronic Co., Ltd.

Cable(1)	
Trade Mark:	MI
Model No.:	KLC-2639-1
Description:	USB Micro-B Plug Cable
Cable Type:	Shielded without ferrite
Length:	0.8 Meter

Cable(2)	
Trade Mark:	MI
Model No.:	OUS231XI0026
Description:	USB Micro-B Plug Cable
Cable Type:	Shielded without ferrite
Length:	0.8 Meter

1.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
Notebook	Lenovo	E450	SL10G10780	UnionTrust
Wireless AP	SiZong	WN1200A3	WS1505000003	UnionTrust
mouse	DELL	MS111	CN-011D3V-738	UnionTrust

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
Earphone	MI	JNEJ01JY	Unshielded (130cm)	UnionTrust

1.4 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

1.5 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

IC-Registration No.: 21600-1
The 3m Semi-anechoic chamber of Shenzhen UnionTrust Quality and Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 21600-1.

A2LA-Lab Certificate No.: 4312.01
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC Accredited Lab.
Designation Number: CN1194
Test Firm Registration Number: 259480

1.6 DEVIATION FROM STANDARDS

None.

1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.9 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9KHz-150KHz	±3.8 dB
2	Conducted emission 150KHz-30MHz	±3.4 dB
3	Radiated emission 9KHz-30MHz	±4.9 dB
4	Radiated emission 30MHz-1GHz	±4.7 dB
5	Radiated emission 1GHz-18GHz	±5.1 dB
6	Radiated emission 18GHz-26GHz	±5.2 dB
7	Radiated emission 26GHz-40GHz	±5.2 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart B Test Cases			
Test Item	**Test Requirement**	**Test Method**	**Result**
Conducted Emission	FCC 47 CFR Part 15.107	ANSI C63.4-2014	PASS
Radiated Emission	FCC 47 CFR Part 15.109	ANSI C63.4-2014	PASS
Note: 1) N/A: In this whole report not application.			

3. EQUIPMENT LIST

Radiated Emission Test Equipment List (3M Chamber)						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☑	3M Chamber & Accessory Equipment	ETS-LINDGREN	3M	N/A	Dec. 20, 2015	Dec. 19, 2018
☑	Receiver	R&S	ESIB26	100114	Dec. 10, 2017	Dec. 10, 2018
☑	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Dec. 17, 2017	Dec. 17, 2018
☑	Preamplifier	HP	8447F	2805A02960	Dec. 10, 2017	Dec. 10, 2018
☑	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201874	Dec. 17, 2017	Dec. 17, 2018
☑	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☑	Test Software	Audix	e3	Software Version: 9.160323		

Conducted Emission Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☑	Receiver	R&S	ESR7	1316.3003K07 -101181-K3	Dec. 10, 2017	Dec. 10, 2018
☑	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	Dec. 10, 2017	Dec. 10, 2018
☑	LISN	R&S	ESH2-Z5	860014/024	Dec. 10, 2017	Dec. 10, 2018
☑	Test Software	Audix	e3	Software Version: 9.160323		

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage	Relative Humidity (%)
NT/NV	+15 to +35	120V~60 and/or 3.85Vdc	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

4.1.2 Record of Normal Environment

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)	Tested by
Conducted Emission	22.1	44	99.98	Tony Kang
Radiated Emission	21.5	58	100.0	Andy

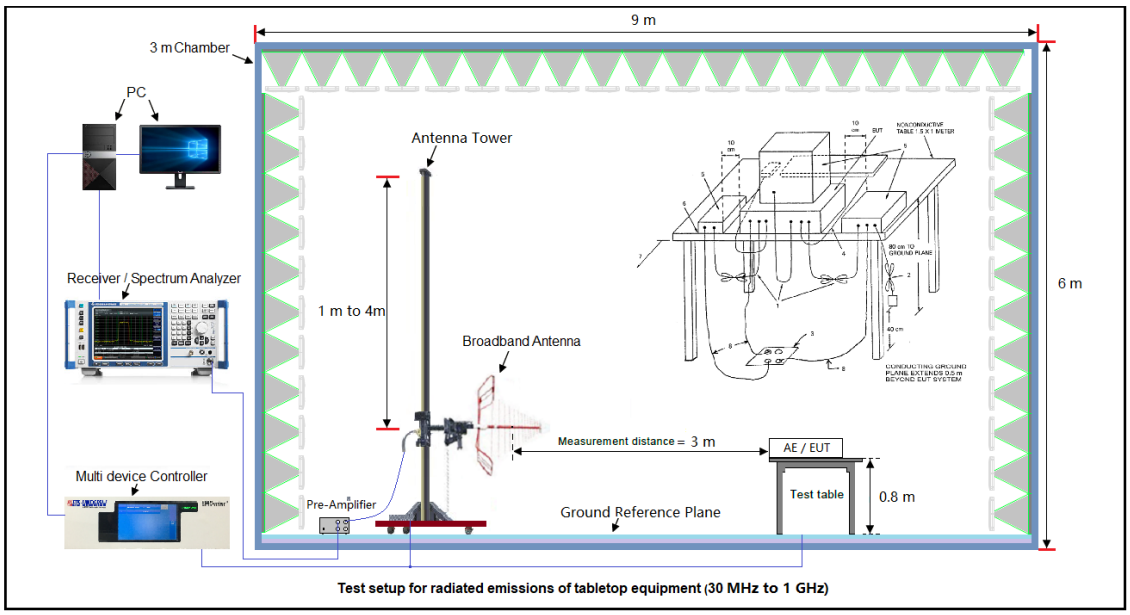
4.2 TEST MODES

Test Item	EMI Test Modes
Radiated Emission	Mode 1: Flight Mode + MP4 playing + SIM 1 Mode 2: GSM 850 Idle + Camera (Front) + USB Cable1 (Charging from Adapter1) + SIM 1 Mode 3: WCDMA B2 idle + Camera (Back) + USB Cable2 (Charging from Adapter2) + SIM 2 Mode 4: LTE B4 Idle + USB Cable1 (Charging from Adapter1) + FM (With Earphone) + SIM 1 **Mode 5: LTE B7 idle + USB Cable1 (data transfer with notebook) + SIM 1** **Mode 6: LTE B38 idle + USB Cable2 (data transfer with notebook) + SIM 2**
Conducted Emission	Mode 1: Flight Mode + MP4 playing + USB Cable2 (Charging from Adapter2 120 Vac) + SIM 1 Mode 2: GSM 850 Idle + Camera (Front) + USB Cable1 (Charging from Adapter1 120 Vac) + SIM 1 **Mode 3: WCDMA B2 idle + Camera (Back) + USB Cable2 (Charging from Adapter2) + SIM 2** Mode 4: LTE B4 Idle + USB Cable1 (Charging from Adapter1) + FM (With Earphone) + SIM 1 Mode 5: LTE B7 idle + USB Cable1 (data transfer with notebook) + SIM 1 Mode 6: LTE B38 idle + USB Cable2 (data transfer with notebook) + SIM 2

4.3 TEST SETUP

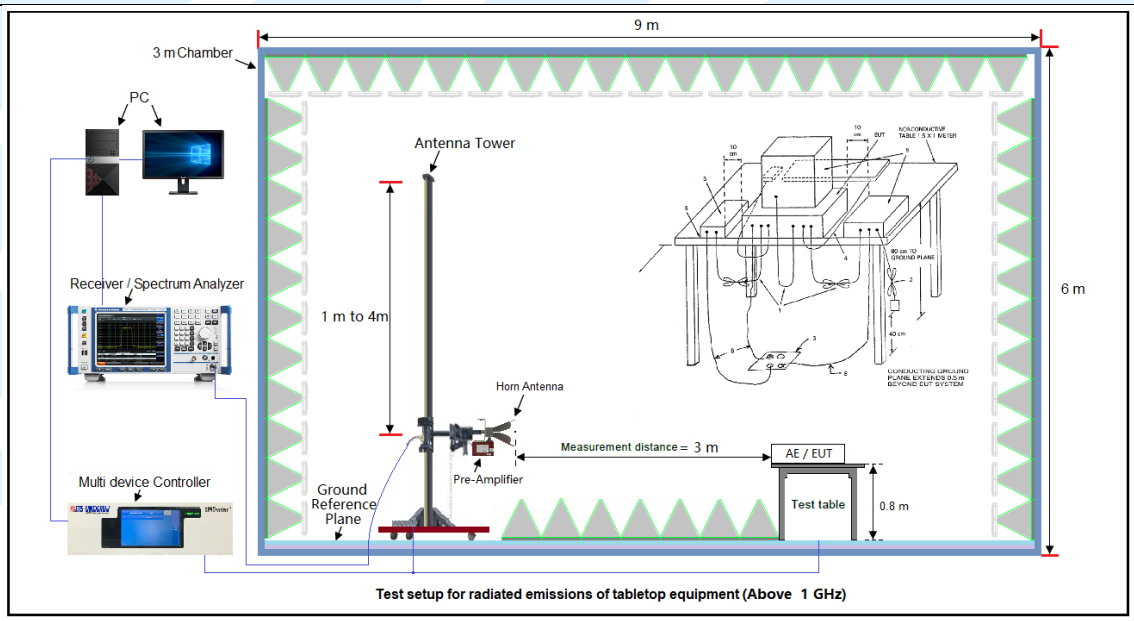
4.3.1 For Radiated Emissions test setup

Figure 1. 30MHz to 1GHz



Test setup for radiated emissions of tabletop equipment (30 MHz to 1 GHz)

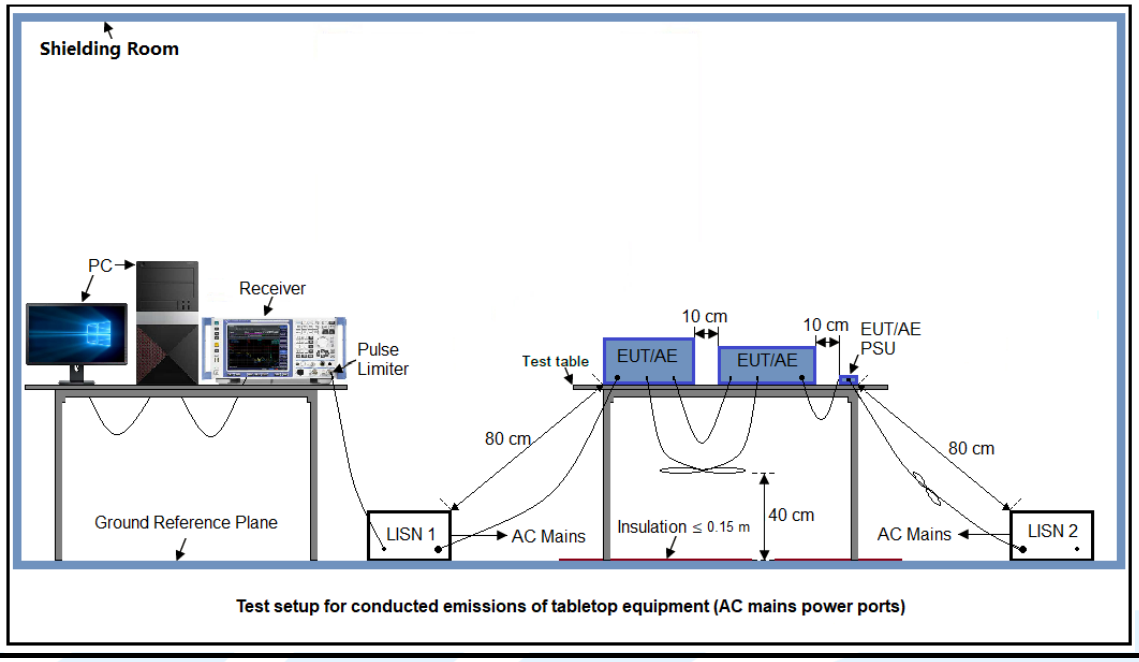
Figure 2. Above 1GHz



Test setup for radiated emissions of tabletop equipment (Above 1 GHz)

4.3.2 For Conducted Emissions test setup

Figure 3. Conducted Emissions setup



Test setup for conducted emissions of tabletop equipment (AC mains power ports)

4.4 SYSTEM TEST CONFIGURATION

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the fifth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

5. REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part15 Subpart B	Unintentional Radiators
2	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

6. EMC REQUIREMENTS SPECIFICATION

6.1 RADIATED EMISSION

Test Requirement: FCC 47 CFR Part 15.109

Test Method: ANSI C63.4-2014

Receiver Setup:

Frequency: (f) (MHz)	Detector type	Measurement receiver bandwidth	
		RBW	VBW
30 ≤ f ≤ 1 000	Quasi Peak	120 kHz	300 kHz
f ≥1000	Peak	1 MHz	3 MHz
	Average	1 MHz	3 MHz

Measured frequency range

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705-108	1000.
108-500	2000.
500-1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

Limits:

Limits for Class B devices

Frequency (MHz)	limits at 3m (dBμV/m)		
	QP Detector	PK Detector	AV Detector
30-88	40.0	--	--
88-216	43.5	--	--
216-960	46.0	--	--
960 to 1000	54.0	--	--
Above 1000	--	74.0	54.0

Remark:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (μV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Test Setup: Refer to section 4.3.1 for details.

Test Procedures:

1. From 30 MHz to 1GHz test procedure as below:

1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

3) For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

2. Above 1GHz test procedure as below:

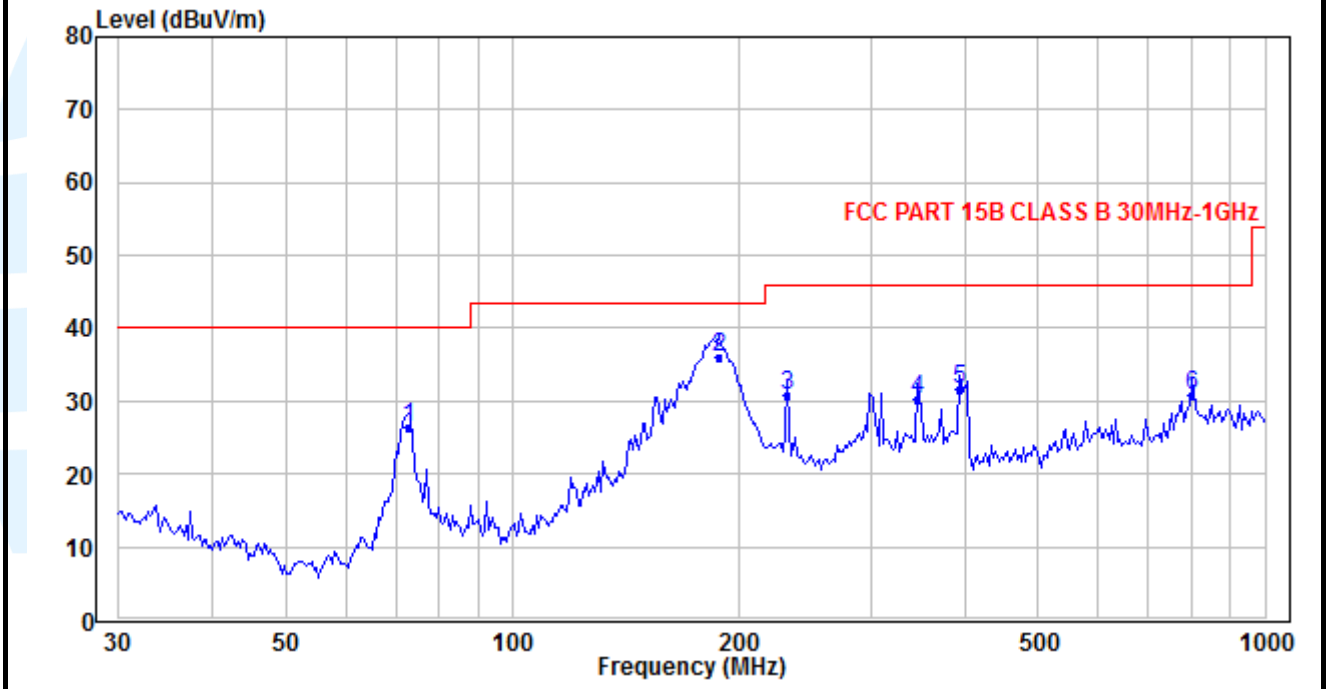
1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
3) For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

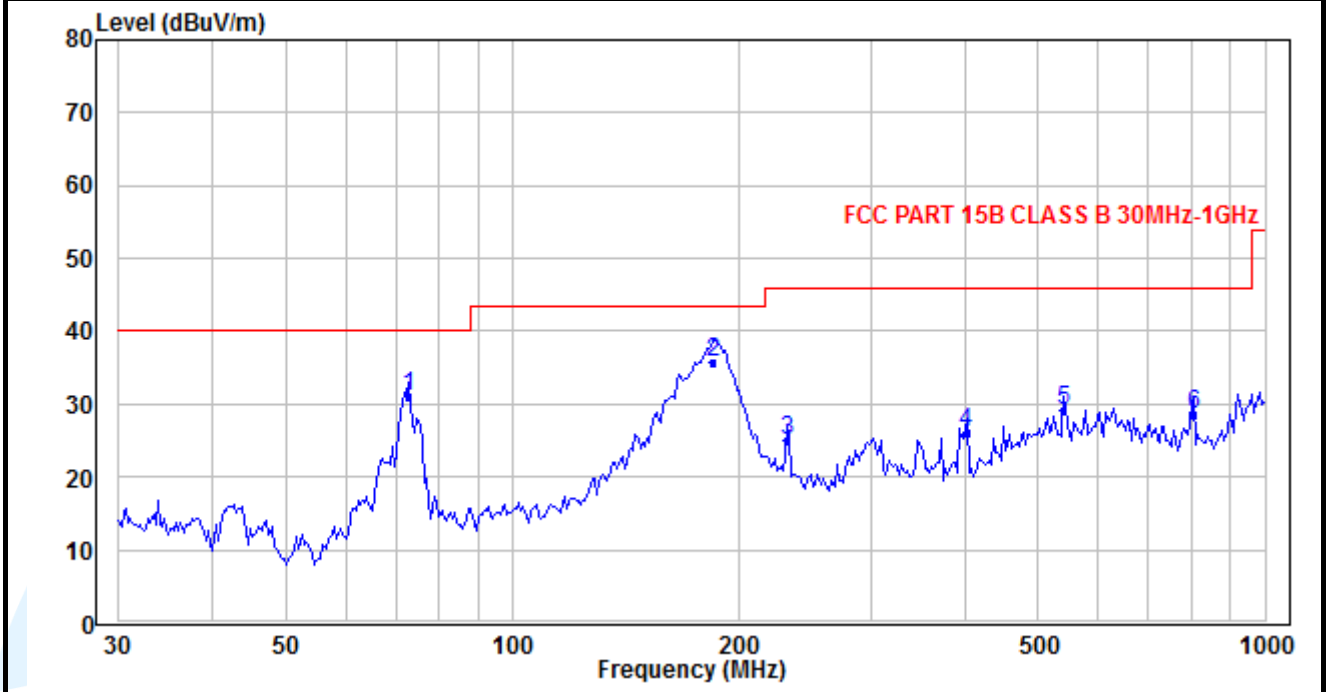
The worst measurement data as follows:

Below 1GHz(Quasi Peak):
Mode 6
Horizontal



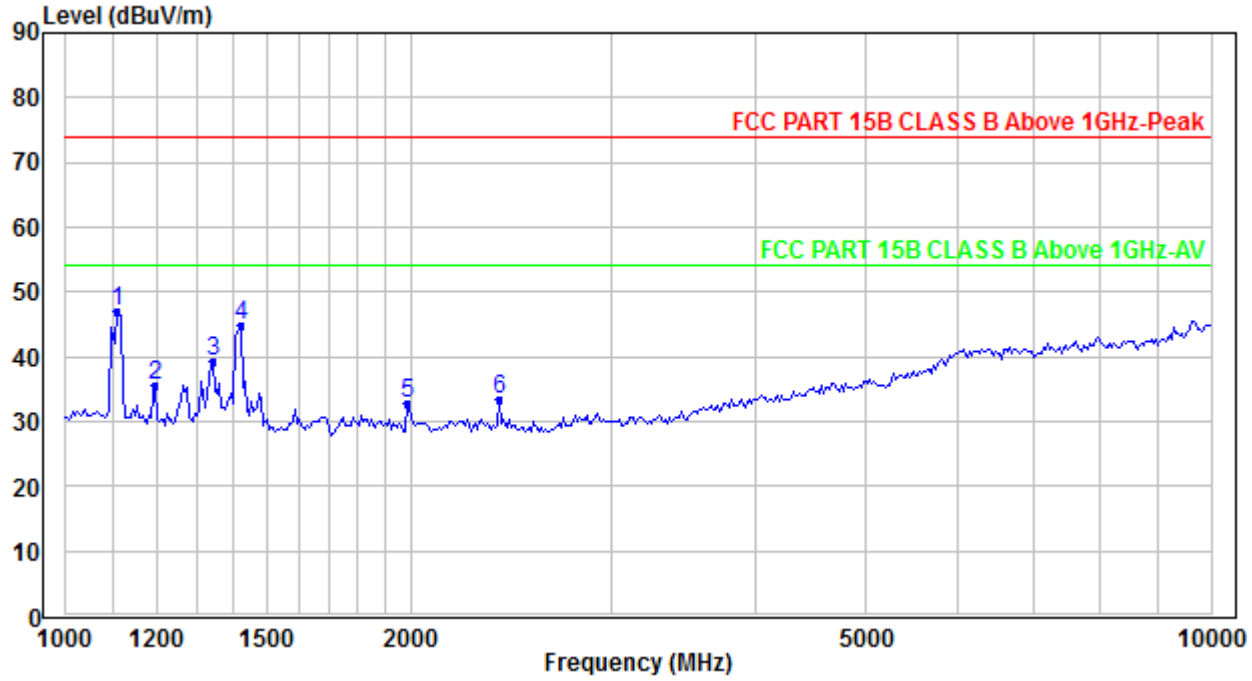
No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Rem ark
1	72.720	46.14	-19.75	26.39	40.00	-13.61	QP
2	187.783	52.07	-15.95	36.12	43.50	-7.38	QP
3	231.853	44.51	-13.78	30.73	46.00	-15.27	QP
4	346.074	40.22	-9.84	30.38	46.00	-15.62	QP
5	392.738	40.11	-8.57	31.54	46.00	-14.46	QP
6	798.620	32.34	-1.43	30.91	46.00	-15.09	QP

Vertical



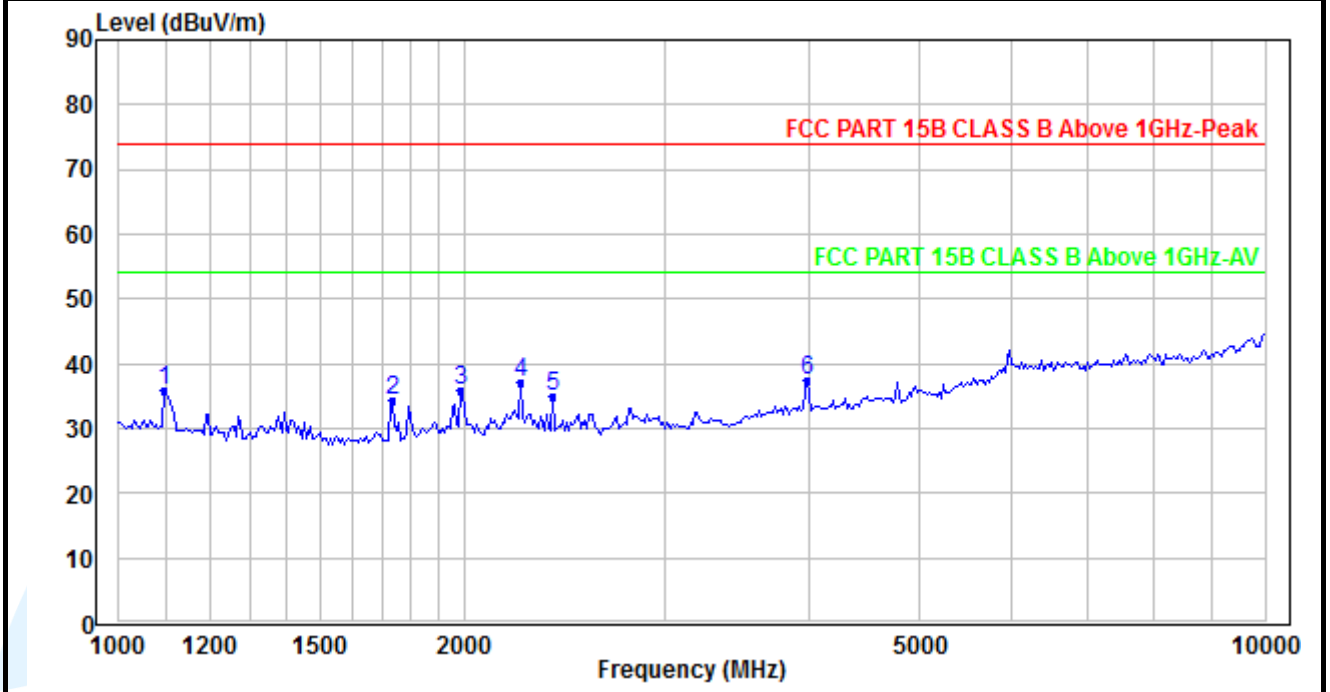
No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Rem ark
1	72.720	50.74	-19.63	31.11	40.00	-8.89	QP
2	185.163	52.14	-16.39	35.75	43.50	-7.75	QP
3	231.853	38.45	-13.52	24.93	46.00	-21.07	QP
4	401.105	34.81	-8.73	26.08	46.00	-19.92	QP
5	538.811	35.11	-5.92	29.19	46.00	-16.81	QP
6	804.252	30.84	-2.18	28.66	46.00	-17.34	QP

Above 1GHz(Peak & Average)
Mode5
Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Rem ark
1	1106.849	60.69	-13.75	46.94	74.00	-27.06	Peak
2	1197.171	49.03	-13.47	35.56	74.00	-38.44	Peak
3	1343.558	52.66	-13.25	39.41	74.00	-34.59	Peak
4	1420.053	58.05	-13.22	44.83	74.00	-29.17	Peak
5	1988.828	42.87	-9.93	32.94	74.00	-41.06	Peak
6*	2391.980	42.50	-9.00	33.50	74.00	-40.50	Peak

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Rem ark
1	1096.681	50.44	-14.41	36.03	74.00	-37.97	Peak
2	1731.717	46.67	-12.42	34.25	74.00	-39.75	Peak
3	1988.828	46.94	-10.96	35.98	74.00	-38.02	Peak
4	2242.340	47.48	-10.31	37.17	74.00	-36.83	Peak
5	2391.980	44.68	-9.79	34.89	74.00	-39.11	Peak
6	3992.109	42.87	-5.34	37.53	74.00	-36.47	Peak

Remark:

1. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.
2. For above 10 GHz radiated emission, the amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

6.2 CONDUCTED EMISSION

Test Requirement: FCC 47 CFR Part 15.107

Test Method: ANSI C63.4-2014

Limits:

Limits for Class B devices

Frequency range (MHz)	Limits (dB(μV))	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

Remark:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

Test Setup: Refer to section 4.3.2 for details.

Test Procedures:

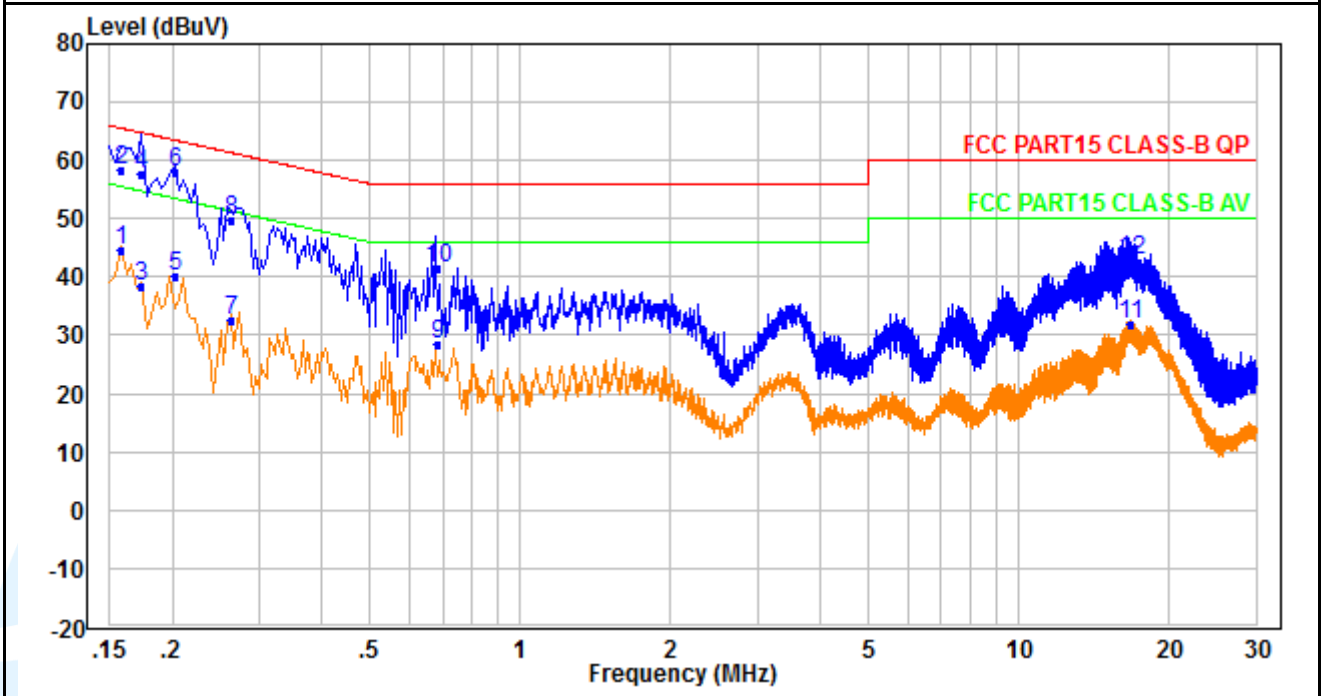
1) The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
2) The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
3) For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

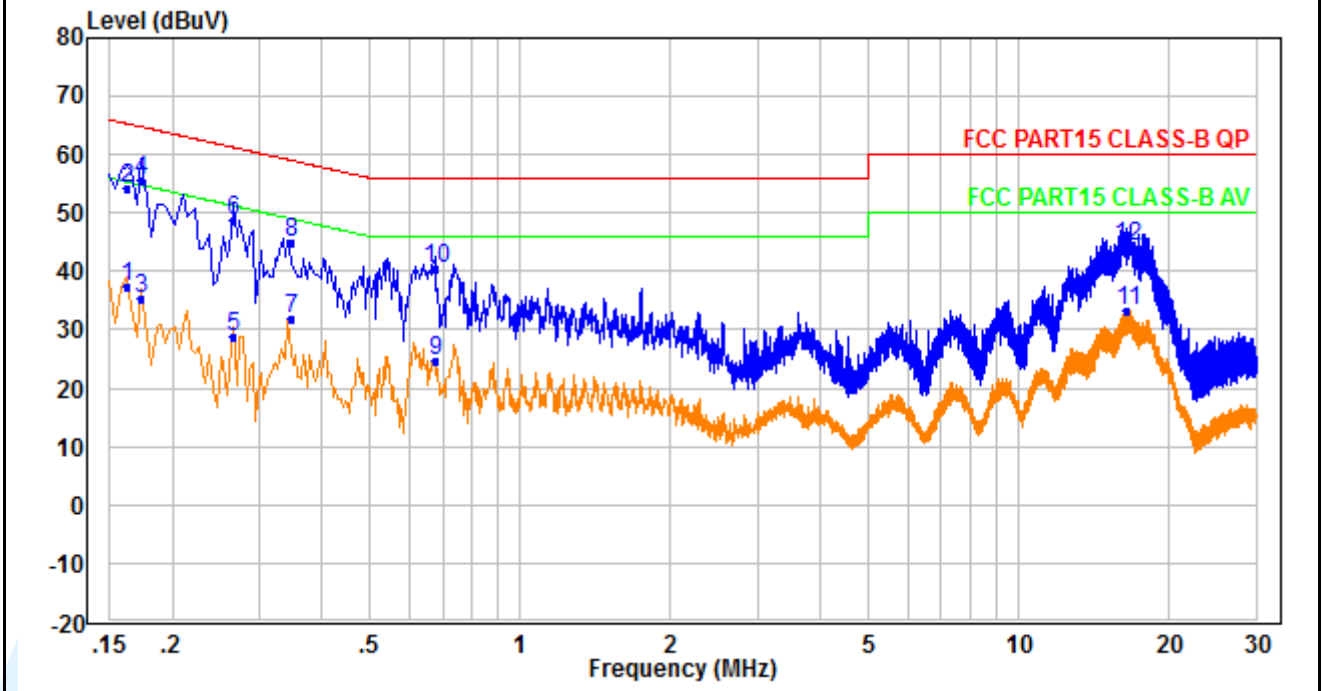
The worst measurement data as follows:
Quasi Peak and Average:
Mode 3

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.158	34.30	10.20	44.50	55.60	-11.10	Average
2	0.158	48.30	10.20	58.50	65.60	-7.10	QP
3	0.174	28.30	10.20	38.50	54.80	-16.30	Average
4	0.174	47.30	10.20	57.50	64.80	-7.30	QP
5	0.202	29.90	10.20	40.10	53.50	-13.40	Average
6	0.202	47.90	10.20	58.10	63.50	-5.40	QP
7	0.262	22.40	10.20	32.60	51.40	-18.80	Average
8	0.262	39.40	10.20	49.60	61.40	-11.80	QP
9	0.682	18.20	10.20	28.40	46.00	-17.60	Average
10	0.682	31.20	10.20	41.40	56.00	-14.60	QP
11	16.749	19.80	12.20	32.00	50.00	-18.00	Average
12	16.749	30.80	12.20	43.00	60.00	-17.00	QP

Neutral Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.162	27.30	10.20	37.50	55.40	-17.90	Average
2	0.162	44.00	10.20	54.20	65.40	-11.20	QP
3	0.174	25.30	10.20	35.50	54.80	-19.30	Average
4	0.174	45.30	10.20	55.50	64.80	-9.30	QP
5	0.266	18.40	10.30	28.70	51.20	-22.50	Average
6	0.266	38.40	10.30	48.70	61.20	-12.50	QP
7	0.346	21.50	10.30	31.80	49.10	-17.30	Average
8	0.346	34.50	10.30	44.80	59.10	-14.30	QP
9	0.674	14.10	10.40	24.50	46.00	-21.50	Average
10	0.674	30.10	10.40	40.50	56.00	-15.50	QP
11	16.569	21.00	12.30	33.30	50.00	-16.70	Average
12	16.569	32.00	12.30	44.30	60.00	-15.70	QP

Remark: An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

********** End of Report **********
