FCC TEST REPORT(Bluetooth)

for

PEAG, LLC dba JLab Audio

Speaker

Model Number : JLab Block Party

FCC ID: 2AHYVBLOCKPARTY

Prepared for	:	PEAG, LLC dba JLab Audio
Address	:	3402 Piazza DOro Way, Suite 230 Oceanside, CA 92056, United States
Prepared by	:	Keyway Testing Technology Co., Ltd.
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Report No.	:	16KWE124792F
Date of Test	:	Dec. 1~8, 2016
Date of Report	:	Dec. 9, 2016

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Keyway Testing Technology Co., Ltd.

Applicant: **Address:**	PEAG, LLC dba JLab Audio 3402 Piazza DOro Way, Suite 230 Oceanside, CA 92056, United States		
Manufacturer: **Address:**	Musilab Electronic Co., Ltd No.5 Huanwei Street,Fugang,Qingxi Town, Dongguan,Guandong,China		
E.U.T:	Speaker		
Model Number:	JLab Block Party		
Trade Name:	JLab	Serial No.:	------
Date of Receipt:	Nov. 30, 2016	**Date of Test:**	Dec. 1~8, 2016
Test Specification:	FCC Part 15, Subpart C Section 15.247: 2016 ANSI C63.10:2013 KDB558074 D01 DTS Meas Guidance v03r05		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied. **Issue Date: Dec. 9, 2016**		

Tested by:	Reviewed by:	Approved by:
Keven Wu / Engineer	Mark Li / Supervisor	Andy Gao / Supervisor

Other Aspects:

None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

1.TEST SUMMARY

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Emissions	15.205(a) 15.209 15.247(d)	PASS
6dB&99% Bandwidth	15.247(a)(2)	PASS
Power density	15.247(e)	PASS
Maximum Peak Output Power	15.247(b)(3)	PASS
Emissions from out of band	15.247(d)	PASS
Antenna Requirement	15.203	PASS

2.GENERAL PRODUCT INFROMATION

2.1. Product Function

Refer to Technical Construction From and User Manual.

2.2. Description of Device (EUT)

Product Name:	Speaker
Model No.:	JLab Block Party
Operation Frequency:	BT: 2402MHz~2480MHz
Channel numbers:	BT: 40 Channels
Modulation technology:	BT: GFSK
Antenna Type:	PCB antenna
Antenna gain:	1.0dBi
Power supply:	DC 11.1V 2200mA (Battery) or DC 14.5V from adapter
Adapter:	Manufacturer: Blue Iron Holdings Limited Model No: BI36-145240-I Input: AC 100-240V~50/60Hz 1.2A Output: DC 14.5V 2.4A DC Line:Unshielded, Undetachable 1.2m

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

2.3. Independent Operation Modes

The basic operation modes are:

2.3.1. EUT work BT mode, and Test Mode as below:

Final Test Mode	Description
Mode 1	CH00
Mode 2	CH19
Mode 3	CH39
Mode 4	Link Mode

Remark: According to ANSI C63.10 standards, the test results are both the “worst case” and “worst setup”

2.4. TEST SITES

2.4.1. Test Facilities

Lab Qualifications : Certificated by Industry Canada
Registration No.: 9868A
Date of registration: December 8, 2011

Certificated by FCC, USA
Registration No.: 370994
Date of registration: February 21, 2012

Certificated by CNAS China
Registration No.: CNAS L5783
Date of registration: August 8, 2012

2.5. List of Test and Measurement Instruments

2.5.1. For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 27,16	Apr. 27,17
Artificial Mains Network	Rohde&Schwarz	ENV216	101315	Apr. 27,16	Apr. 27,17
Artificial Mains Network (AUX)	Rohde&Schwarz	ENV216	101314	Apr. 27,16	Apr. 27,17
RF Cable	FUJIKURA	3D-2W	944 Cable	Apr. 27,16	Apr. 27,17

2.5.2. For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 27,16	Apr. 27,17
System Simulator	Agilent	E5515C	GB43130245	Apr. 27,16	Apr. 27,17
Power Splitter	Weinschel	1506A	NW425	Apr. 27,16	Apr. 27,17
Bilog Antenna	ETS-LINDGREEN	3142D	135452	Apr. 27,16	Apr. 27,17
Spectrum Analyzer	Agilent	E4411B	MY4511304	Apr. 27,16	Apr. 27,17
Spectrum Analyzer	R&S	FSV40	132.1.3008K39 -100967	Apr. 27,16	Apr. 27,17
3m Semi-anechoic Chamber	ETS-LINDGREEN	966	KW01	Apr. 27,16	Apr. 27,17
Signal Amplifier	SONOMA	310	187016	Apr. 27,16	Apr. 27,17
Signal Amplifier	Agilent	8449B	3008A00251	Apr. 27,16	Apr. 27,17
RF Cable	IMRO	IMRO-400	966 Cable 1#	N/A	N/A
MULTI-DEVICE Controller	ETS-LINDGREEN	2090	126913	N/A	N/A
Horn Antenna	DAZE	ZN30701	11003	Apr. 27,16	Apr. 27,17
Horn Antenna	SCHWARZBECK	BBHA9170	9170-068	Apr. 27,16	Apr. 27,17
Spectrum Analyzer	Agilent	8593E	3911A04271	Apr. 27,16	Apr. 27,17
Spectrum Analyzer	Agilent	E4408B	MY44211125	Apr. 27,16	Apr. 27,17
Signal Amplifier	DAZE	ZN3380C	11001	Apr. 27,16	Apr. 27,17
High Pass filter	Micro	HPM50111	324216	Apr. 27,16	Apr. 27,17
Filter	COM-MW	ZBSF-C836.5-25-X	KW032	Apr. 27,16	Apr. 27,17
Filter	COM-MW	ZBSF-C1747.5-75-X2	KW035	Apr. 27,16	Apr. 27,17
Filter	COM-MW	ZBSF-C1880-60-X2	KW037	Apr. 27,16	Apr. 27,17
DC Power Supply	LongWei	PS-305D	010964729	Apr. 27,16	Apr. 27,17
Constant temperature and humidity box	GF	GTH-800-40-1P	MAA9906-005	Apr. 27,16	Apr. 27,17
Splitter	Agilent	11636B	0025164	Apr. 27,16	Apr. 27,17
Loop Antenna	ARA	PLA-1030/B	1029	Apr. 22,16	Apr. 22,17
Power Meter	Anritsu	ML2495A	1204003	Apr. 24,16	Apr. 24,17
Power Sensor	Anritsu	MA2411B	1126150	Apr. 24,16	Apr. 24,17

3. TEST SET-UP AND OPERATION MODES

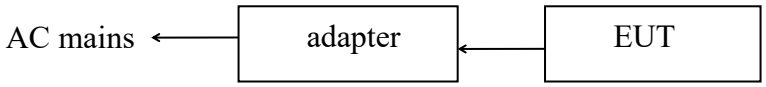
3.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators

Conducted Emission:



Radiated Emission:

3.3. Test Operation Mode and Test Software

Final Test Mode	Description
Mode 1	CH00
Mode 2	CH19
Mode 3	CH39
Mode 4	Link Mode
Test Software	Bluetooth MP Tool

3.4. Special Accessories and Auxiliary Equipment

N/A.

3.5. Countermeasures to Achieve EMC Compliance

N/A.

4. EMISSION TEST RESULTS

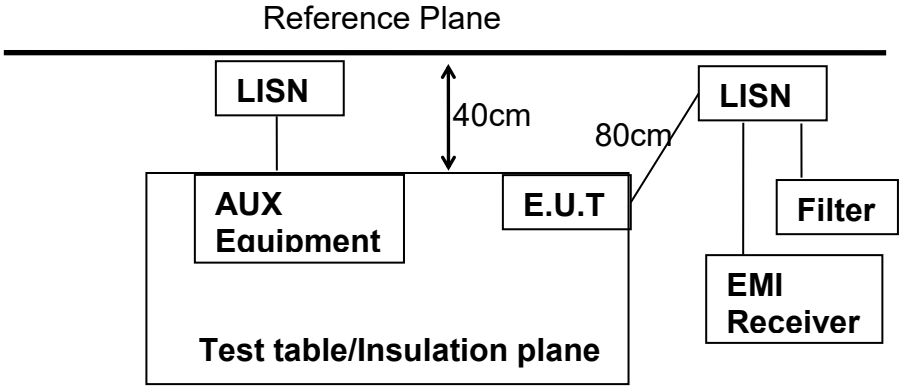
4.1. Conducted Emission at the Mains Terminals Test

4.1.1. Limit 15.207 limits

Frequency	Limit (dBuV)	
MHz	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50
NOTE: 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 MHz to 0,50 MHz.		

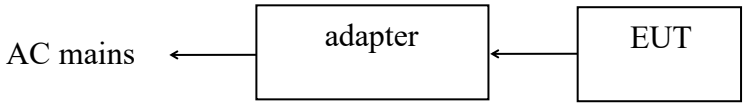
4.1.2. Test Setup

1.The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 0.8 m, the excess was folded back and forth parallel to the cable at the center so as to from a bundle no longer than 0.4 m.
2.The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.
3.The frequency range from 150 kHz to 30 MHz was investigated.
4.The bandwidth of the test receiver was set at 9 kHz.
5.Pretest for all mode, The test data of the worst case condition(s) was reported on the following page.

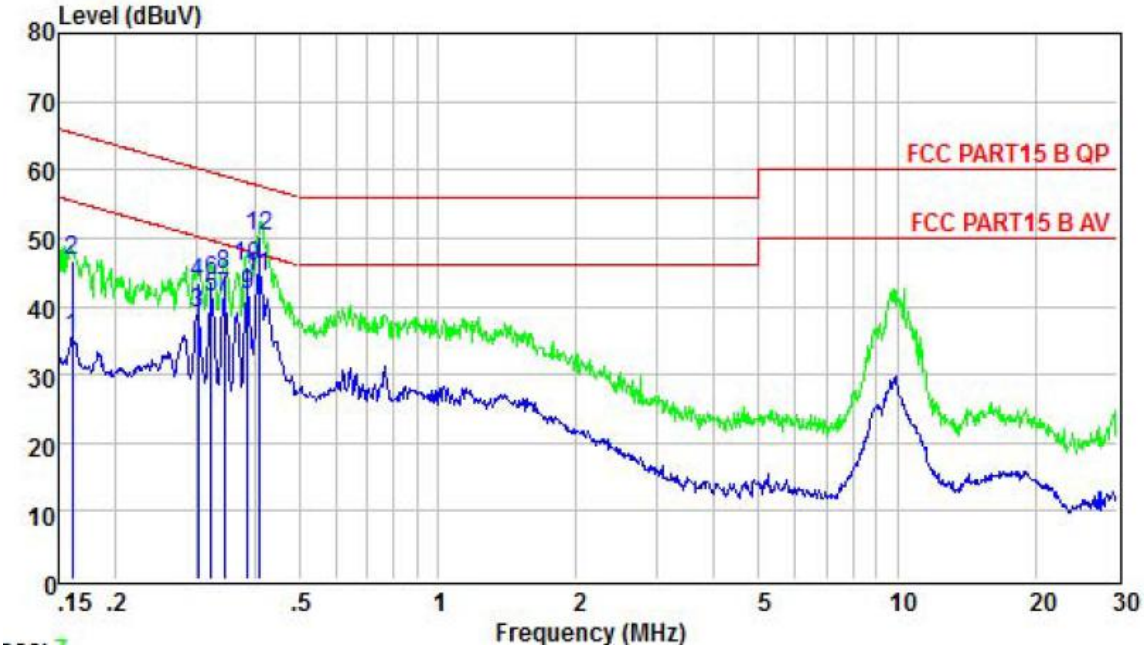


Remark: E.U.T. :Equipment Under Test
LISN: Line Impedance Stabilization Network
Test table height: 0.8m.

Test block

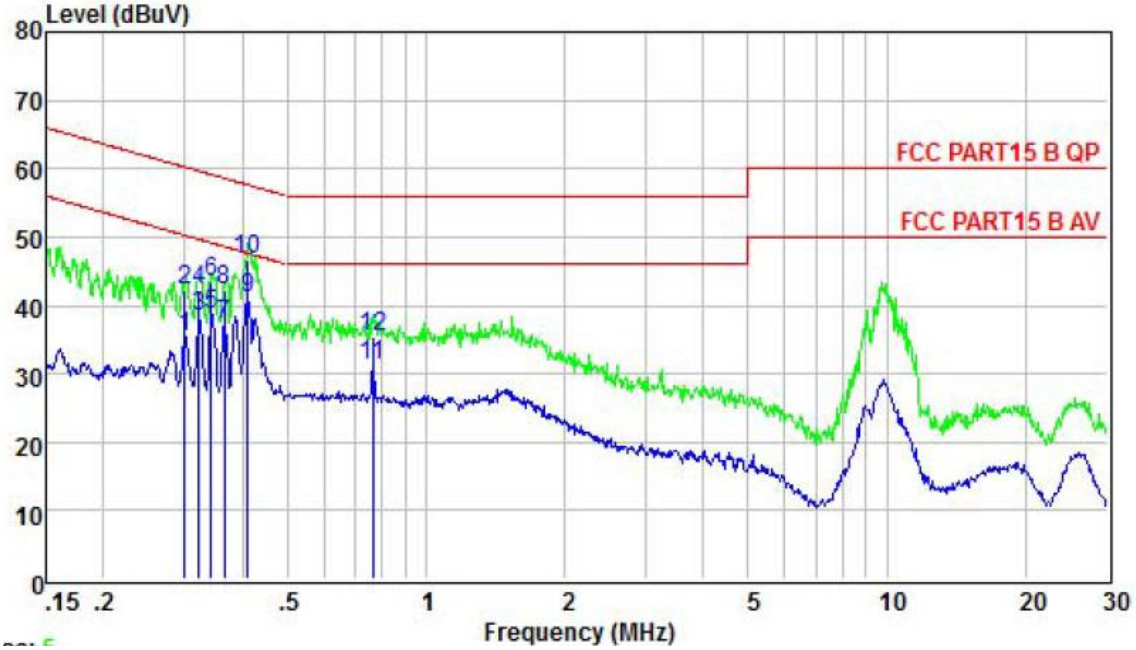


EUT：	Speaker	Model Name ：	JLab Block Party
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 14.5V from Adapter AC 120V/60Hz	Test Mode：	Mode 4



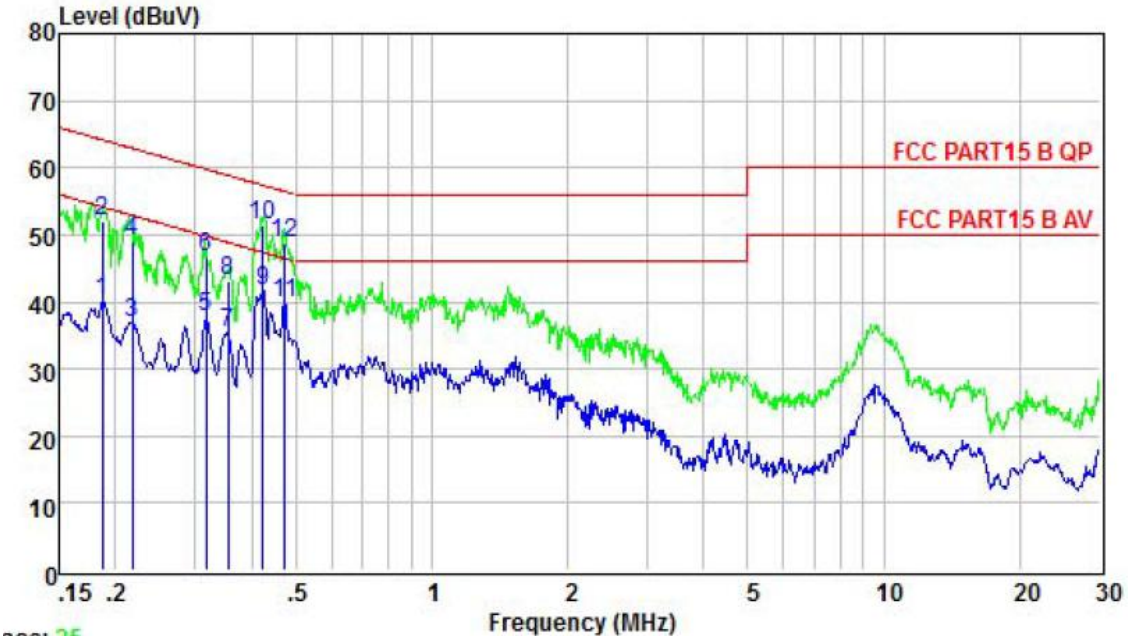
	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.161	35.40	55.43	-20.03	Average
2	0.161	46.57	65.43	-18.86	QP
3	0.302	39.06	50.19	-11.13	Average
4	0.302	43.29	60.19	-16.90	QP
5	0.322	41.36	49.66	-8.30	Average
6	0.322	43.59	59.66	-16.07	QP
7	0.345	41.41	49.09	-7.68	Average
8	0.345	44.51	59.09	-14.58	QP
9	0.387	41.72	48.12	-6.40	Average
10	0.387	45.69	58.12	-12.43	QP
11	0.408	44.38	47.68	-3.30	Average
12	0.408	50.13	57.68	-7.55	QP

EUT：	Speaker	Model Name ：	JLab Block Party
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 14.5V from Adapter AC 120V/60Hz	Test Mode：	Mode 4



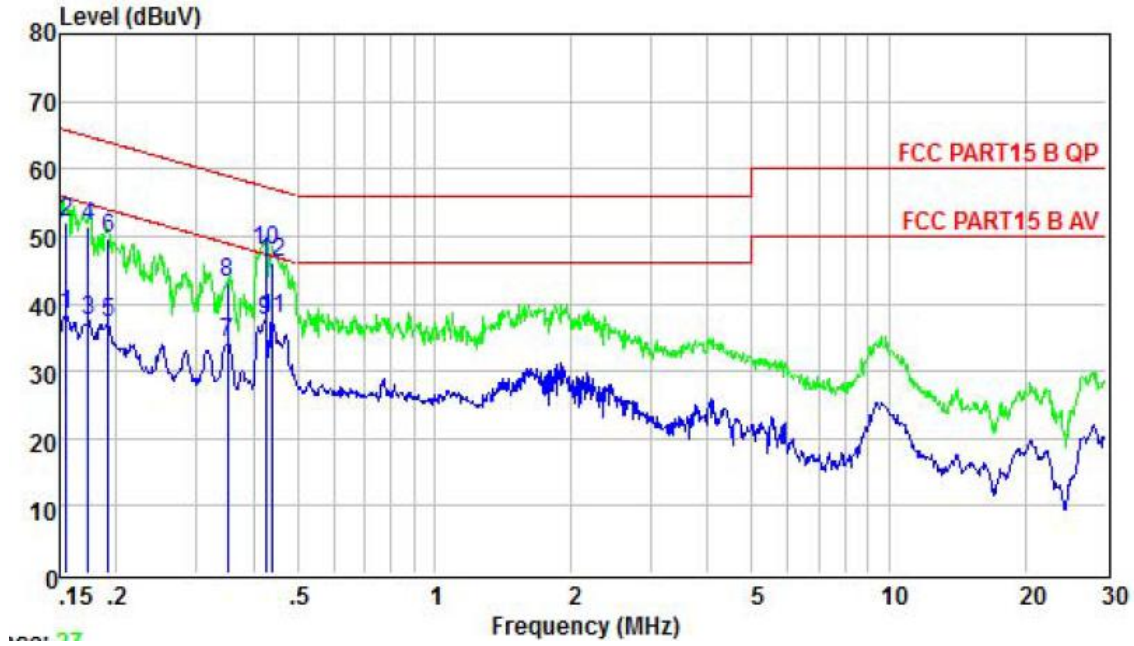
	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.300	35.41	50.24	-14.83	Average
2	0.300	42.18	60.24	-18.06	QP
3	0.322	38.35	49.66	-11.31	Average
4	0.322	42.17	59.66	-17.49	QP
5	0.343	38.76	49.13	-10.37	Average
6	0.343	43.56	59.13	-15.57	QP
7	0.365	37.26	48.61	-11.35	Average
8	0.365	42.35	58.61	-16.26	QP
9	0.410	41.14	47.64	-6.50	Average
10	0.410	46.69	57.64	-10.95	QP
11	0.767	31.33	46.00	-14.67	Average
12	0.767	35.26	56.00	-20.74	QP

EUT：	Speaker	Model Name ：	JLab Block Party
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 14.5V from Adapter AC 240V/60Hz	Test Mode：	Mode 4



	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.187	40.10	54.15	-14.05	Average
2	0.187	52.16	64.15	-11.99	QP
3	0.217	37.02	52.92	-15.90	Average
4	0.217	48.96	62.92	-13.96	QP
5	0.317	37.67	49.80	-12.13	Average
6	0.317	46.63	59.80	-13.17	QP
7	0.354	35.38	48.87	-13.49	Average
8	0.354	43.26	58.87	-15.61	QP
9	0.424	41.78	47.37	-5.59	Average
10	0.424	51.36	57.37	-6.01	QP
11	0.474	39.95	46.45	-6.50	Average
12	0.474	48.63	56.45	-7.82	QP

EUT：	Speaker	Model Name ：	JLab Block Party
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 14.5V from Adapter AC 240V/60Hz	Test Mode：	Mode 4



	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.155	38.39	55.74	-17.35	Average
2	0.155	52.16	65.74	-13.58	QP
3	0.173	37.60	54.81	-17.21	Average
4	0.173	51.48	64.81	-13.33	QP
5	0.191	37.17	53.98	-16.81	Average
6	0.191	49.63	63.98	-14.35	QP
7	0.350	34.19	48.96	-14.77	Average
8	0.350	43.16	58.96	-15.80	QP
9	0.426	37.59	47.33	-9.74	Average
10	0.426	47.83	57.33	-9.50	QP
11	0.442	37.79	47.02	-9.23	Average
12	0.442	46.13	57.02	-10.89	QP

4.2. Radiated Emission Test

4.2.1. Limit 15.209 limits

Frequency MHZ	Distance Meters	Filed Strengths Limit	
		μV/m	dB(μV)/m
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0
Above 1000	3	74.0dB(μV)/m(Peak) 54.0dB(μV)/m(Average)	

4.2.2. Restricted bands of operation

MHz	MHz	MHz	GHz
0.009-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	
All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209,all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.			

4.2.3. Test setup

The EUT was placed on a turn table which was 0.8 m(above 1GHz, the table was 1.5m) above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz, Both PK and AV measure, PK detector is used.

The frequency range from 30MHz to 10^{th} harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

Notes: 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading-Preamp Factor.

2. Measurement Uncertainty: ±3.2 dB at a level of confidence of 95%.

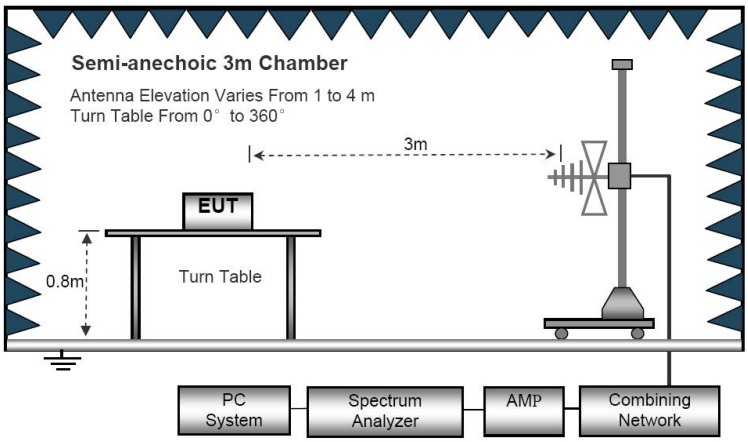
3. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

4. For emissions below 1GHz, pretest for all mode, The test data of the worst case condition(s) was reported on the following pages.

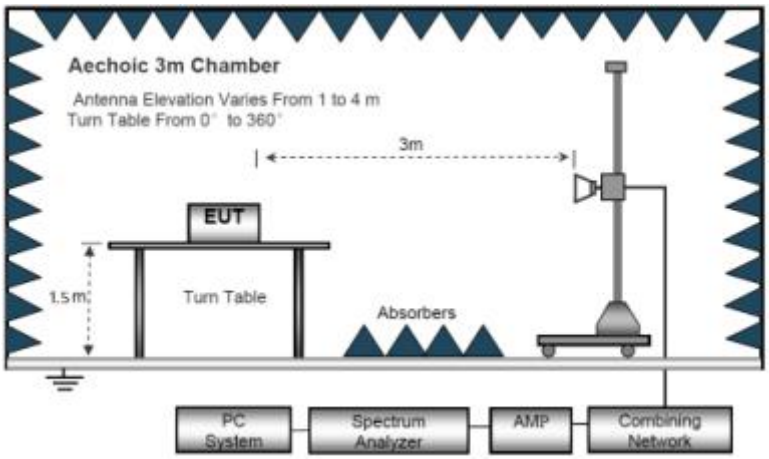
5. For Both PK and AV value above 1GHz, PK detector is used.

6. EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report (Z orientation).

Radiated Emission Test-Up Frequency 30MHz- 1GHz



Above 1GHz



Below 30MHz

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	P
--	--	--	--	P

Note:

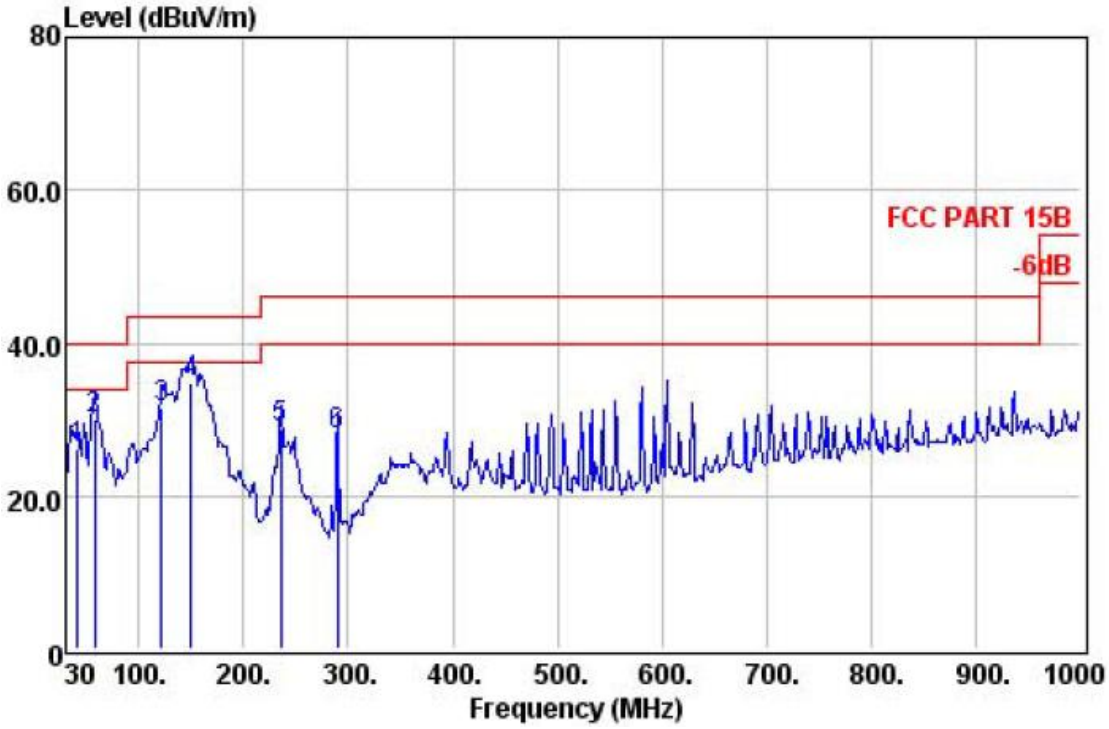
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

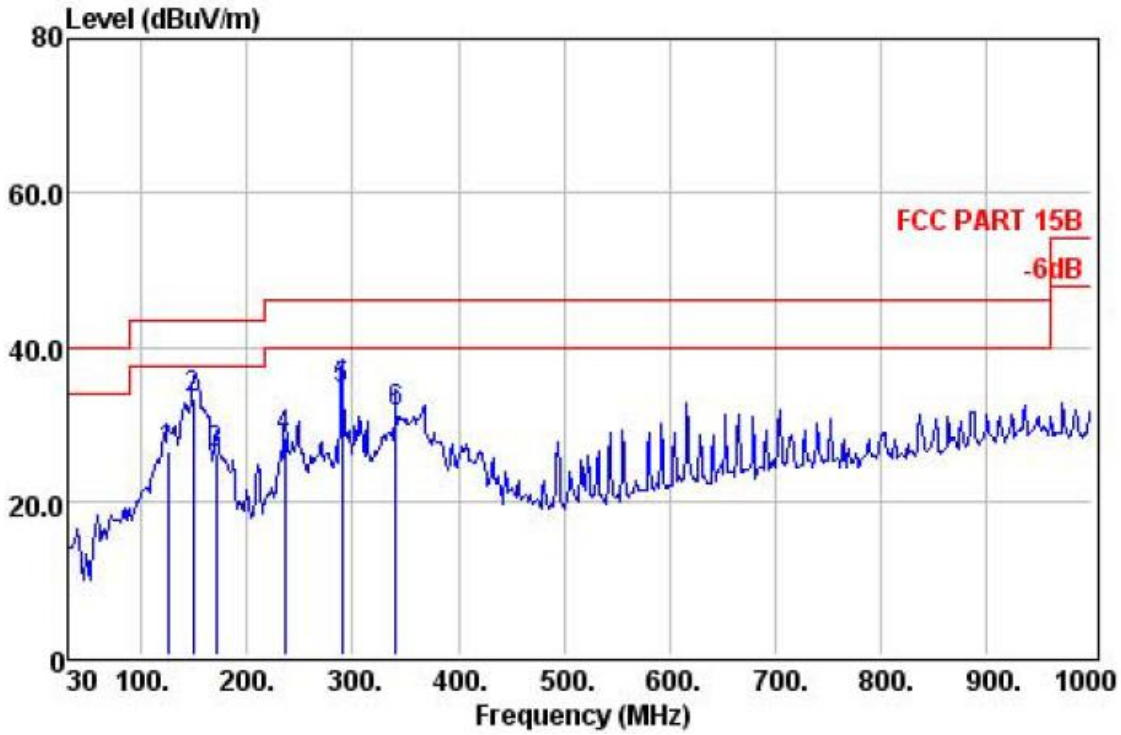
Below 1GHz			
EUT：	Speaker	Model Name ：	JLab Block Party
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010hPa	Test Mode：	Mode 1-GFSK
Test Voltage ：	DC 11.1V from Battery		

Vertical



	Freq	Preamp Factor	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dBuV/m	dBuV/m	dB	
1	41.64	31.38	44.87	0.56	26.28	40.00	-13.72	QP
2	57.16	31.36	53.06	0.75	30.18	40.00	-9.82	QP
3	122.15	31.23	53.13	1.12	31.48	43.50	-12.02	QP
4	150.28	31.25	55.80	1.22	34.78	43.50	-8.72	QP
5	235.64	30.94	45.78	1.61	28.95	46.00	-17.05	QP
6	289.96	30.93	43.65	1.87	28.07	46.00	-17.93	QP

Horizontal



	Freq	Preamp Factor	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dBuV/m	dBuV/m	dB	
1	125.06	31.22	48.30	1.12	26.60	43.50	-16.90	QP
2	148.34	31.24	54.51	1.22	33.39	43.50	-10.11	QP
3	170.65	31.19	45.87	1.30	26.10	43.50	-17.40	QP
4	235.64	30.94	45.17	1.61	28.34	46.00	-17.66	QP
5	289.96	30.93	50.05	1.87	34.47	46.00	-11.53	QP
6	340.40	30.71	44.98	2.10	31.49	46.00	-14.51	QP

NOTE:Absolute Level= Reading Level+antenna Factor+cable loss - Preamp factor,
Over Limit= Absolute Level – Limit;
Mode 1 is the worst mode. Only worst case is presented in the report .

Above 1GHz			
EUT：	Speaker	Model Name ：	JLab Block Party
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010hPa	Test Mode：	1Mbps
Test Voltage ：	DC 11.1V from Battery		

Frequency	Meter Reading	Antenna Factor	Cable loss	Preamp factor	Emission Level	Limits	Margin	Detector Type	Comment
(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
TX-2402									
4804	29.91	32.94	11.94	27.49	47.30	54	-6.70	Average	Vertical
4804	39.68	32.94	11.94	27.49	57.07	74	-16.93	peak	Vertical
7206	30.09	25.28	18.04	27.94	45.47	54	-8.53	Average	Vertical
7206	41.73	25.28	18.04	27.94	57.11	74	-16.89	peak	Vertical
4804	29.89	32.94	11.94	27.49	47.28	54	-6.72	Average	Horizontal
4804	40.32	32.94	11.94	27.49	57.71	74	-16.29	peak	Horizontal
7206	29.79	25.28	18.04	27.94	45.17	54	-8.83	Average	Horizontal
7206	41.62	25.28	18.04	27.94	57.00	74	-17.00	peak	Horizontal
TX-2440									
4880	29.90	32.11	12.15	27.53	46.63	54	-7.37	Average	Vertical
4880	39.87	32.11	12.15	27.53	56.60	74	-17.40	peak	Vertical
7320	30.69	24.33	18.09	27.96	45.15	54	-8.85	Average	Vertical
7320	41.71	24.33	18.09	27.96	56.17	74	-17.83	peak	Vertical
4880	30.64	32.11	12.15	27.53	47.37	54	-6.63	Average	Horizontal
4880	40.59	32.11	12.15	27.53	57.32	74	-16.68	peak	Horizontal
7320	29.48	24.33	18.09	27.96	43.94	54	-10.06	Average	Horizontal
7320	39.83	24.33	18.09	27.96	54.29	74	-19.71	peak	Horizontal
TX-2480									
4960	30.12	31.32	12.31	27.58	46.17	54	-7.83	Average	Vertical
4960	40.85	31.32	12.31	27.58	56.90	74	-17.10	peak	Vertical
7440	30.11	24.38	18.16	27.99	44.66	54	-9.34	Average	Vertical
7440	40.32	24.38	18.16	27.99	54.87	74	-19.13	peak	Vertical
4960	29.72	31.32	12.31	27.58	45.77	54	-8.23	Average	Horizontal
4960	40.68	31.32	12.31	27.58	56.73	74	-17.27	peak	Horizontal
7440	30.24	24.38	18.16	27.99	44.79	54	-9.21	Average	Horizontal
7440	40.52	24.38	18.16	27.99	55.07	74	-18.93	peak	Horizontal

NOTE:1.Absolute Level= ReadingLevel+antenna Factor+cable loss-preamp factor.

2.Over Limit= Absolute Level – Limit.

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

4.EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report (Z orientation)

5. BAND EDGE COMPLIANCE TEST

5.1. Limits

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 30dB below the fundamental emissions, or comply with 15.209 limits.

5.2. Test setup

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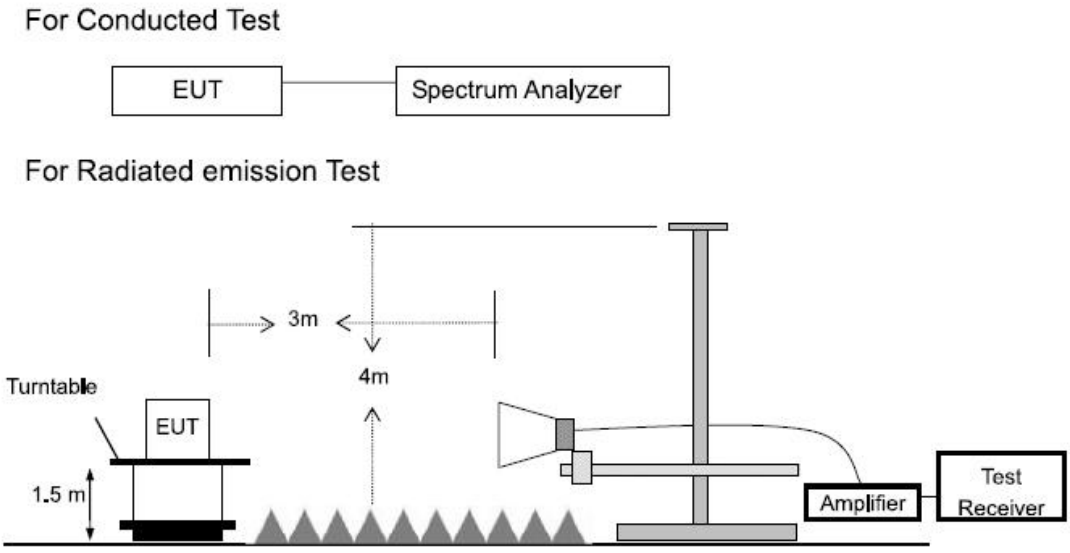


5.3. TEST Procedure

For Conducted Test		
1.	The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100KHz. The video bandwidth is set to 300KHz.	
2.	The spectrum from 30MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.	
EMI Test receiver	Setting	
Attenuation	Auto	
RBW	100KHz	
VBW	300KHz	
Detector	Peak	
trace	Max hold	
For Radiated emission Test		
1.	The EUT was placed on a styrofoam table which is 1.5m above ground plane.	
2.	The measurement procedure at the ban edges was simplified by perfroming the measurement in just one plot. Both, the in-band-emission and the unwanted emission were be encompassed by the span. After trace stabilization, the maxium peak was be determined by a peak detector and the value was marked by an appropriate limit line. The second limit line, which is 20dB below the first, marks the limits for the emissions in the unrestricted band next to the band edge.	
3.	The measurements were perfromed at the lower end of the 2.4GHz band.	
4.	Use the following spectrum analyzer settings	
EMI Test receiver	Setting	
Attenuation	Auto	Auto
RBW	1MHz	1MHz
VBW	3MHz	10Hz
Detector	Peak	Average
trace	Max hold	Max hold

For radiated test as follows:

Polar (H/V)	Frequency	Meter Reading	Antenna Factor	Cable loss	Preamp factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Vertical	2390	36.46	30.44	8.94	26.32	49.52	74	-24.48	Peak
Horizontal	2390	36.72	30.44	8.94	26.32	49.78	74	-24.22	Peak
Vertical	2483.5	36.57	30.05	9.07	26.34	49.35	74	-24.65	Peak
Horizontal	2483.5	37.83	30.05	9.07	26.34	50.61	74	-23.39	Peak

NOTE: 1.Absolute Level= Reading Level+antenna Factor+cable loss-preamp factor,

Over Limit= Absolute Level – Limit;

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

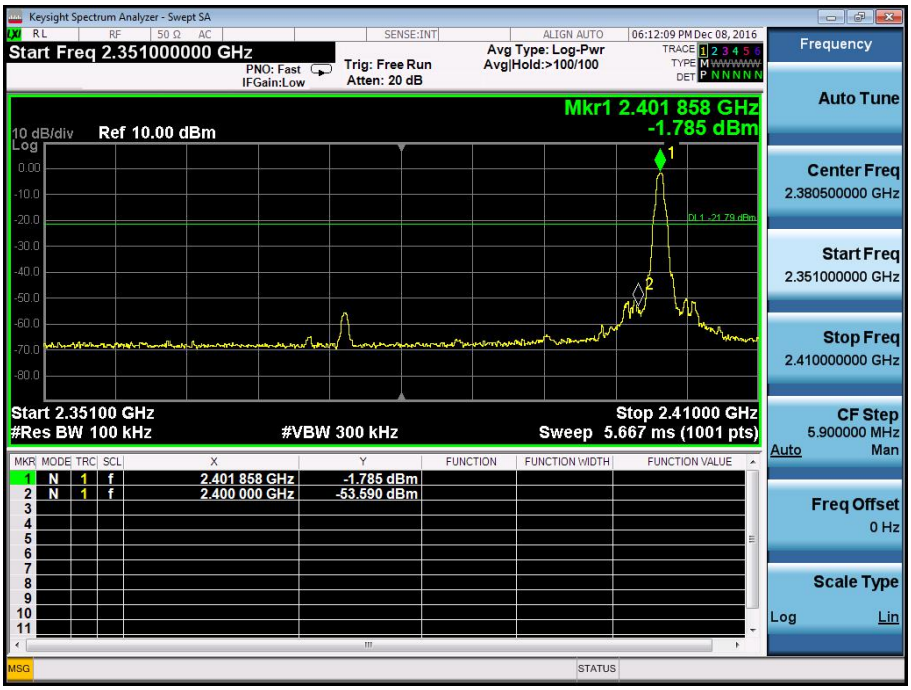
3.If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

4.Mode 1 is the worst mode. Only worst case is presented in the report .

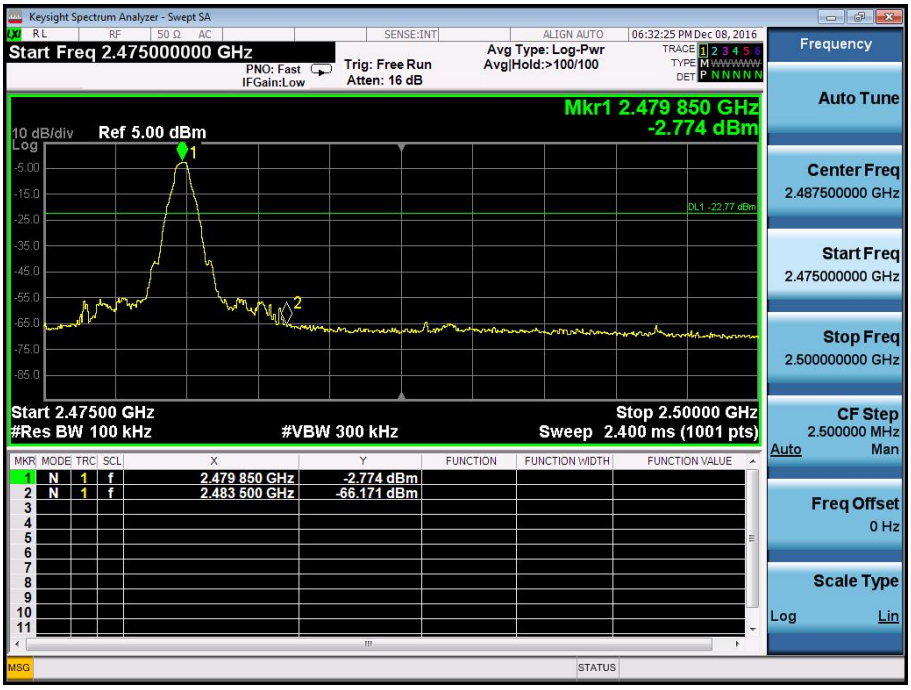
conduction band-edge

Frequency Band	Delta Peak to band emission (dBc)	＞Limit (dBc)	Result
Left-band	51.81	20	Pass
Right-band	63.40	20	Pass

Left Side



Right Side



6. 6DB OCCUPY BANDWIDTH

6.1. Limits

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

6.2. TEST PROCEDURE

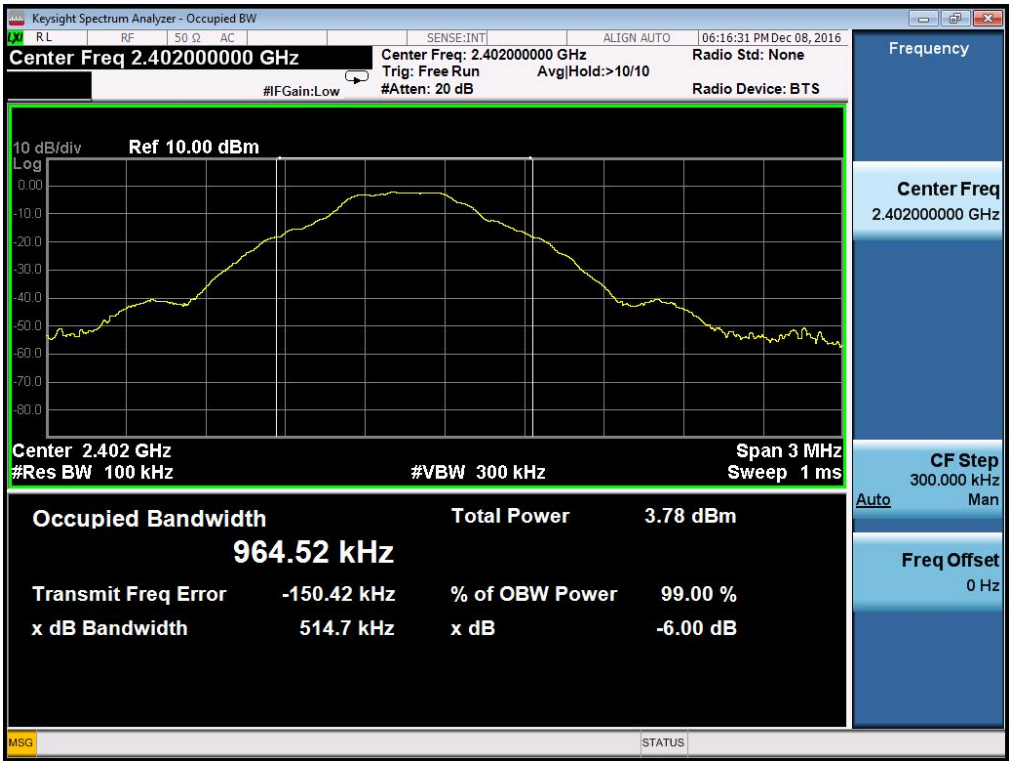
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated
with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test data:

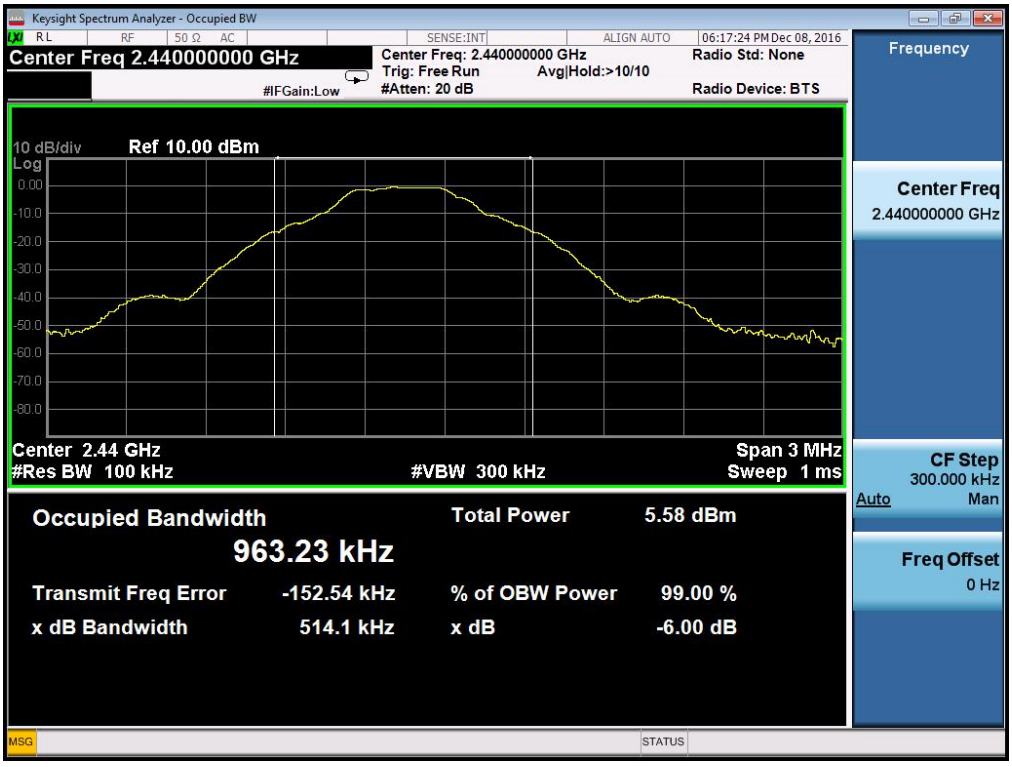
Channel Frequency (MHz)	6dB Bandwidth (MHz)	Limit (KHz)	Result
2402	0.515	500	Pass
2440	0.514	500	Pass
2480	0.513	500	Pass

Test plot as follows:

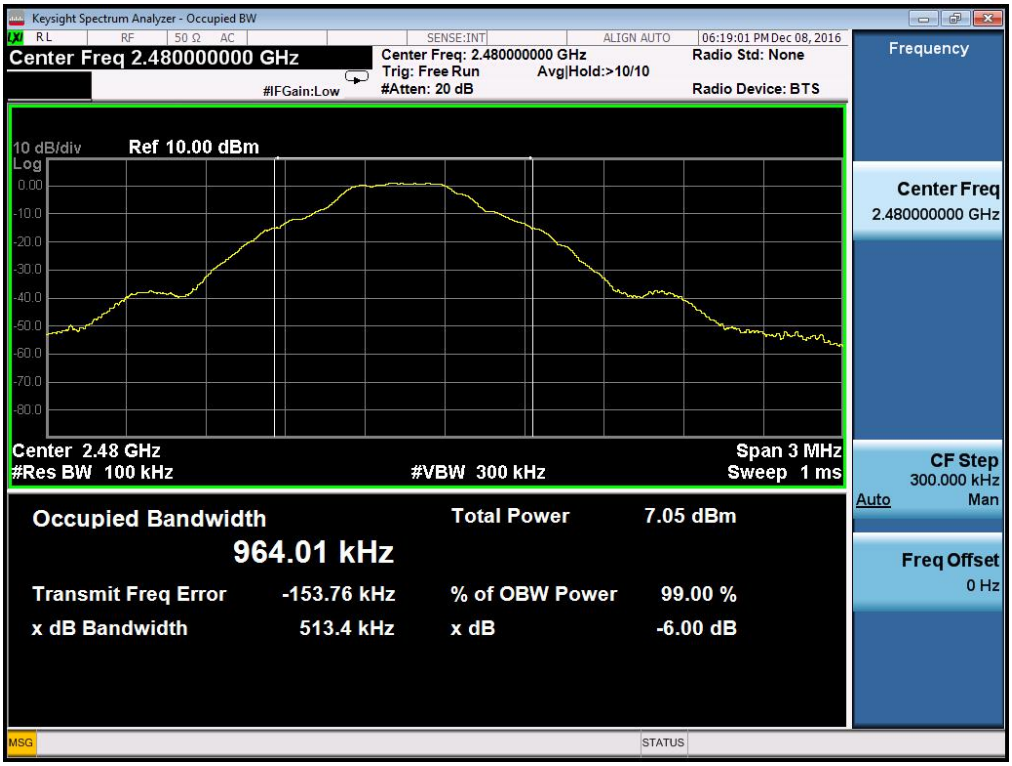
2402MHz



2440 MHz



2480 MHz


Keysight Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
06:19:01 PM Dec 08, 2016
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
964.01 kHz
Total Power
7.05 dBm
Transmit Freq Error
-153.76 kHz
% of OBW Power
99.00 %
x dB Bandwidth
513.4 kHz
x dB
-6.00 dB
Freq Offset
0 Hz
MSG
STATUS

7. OUTPUT POWER TEST

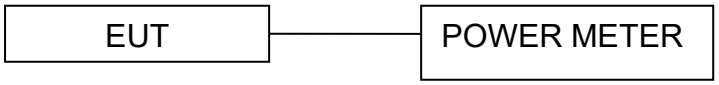
7.1. Limits

For systems using digital modulation in the 2400~2483.5MHz, The out put Power shall not exceed 1W (30dBm)

7.2. Test setup

1. The Transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the power value.
3. Repeat above procedures on all channels needed to be tested.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.



7.3. Test result

Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
2402	1.846	30
2440	2.213	30
2480	2.725	30

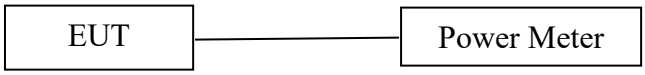
8. POWER SPECTRAL DENSITY TEST

8.1. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

8.2. Test setup

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 RBW
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

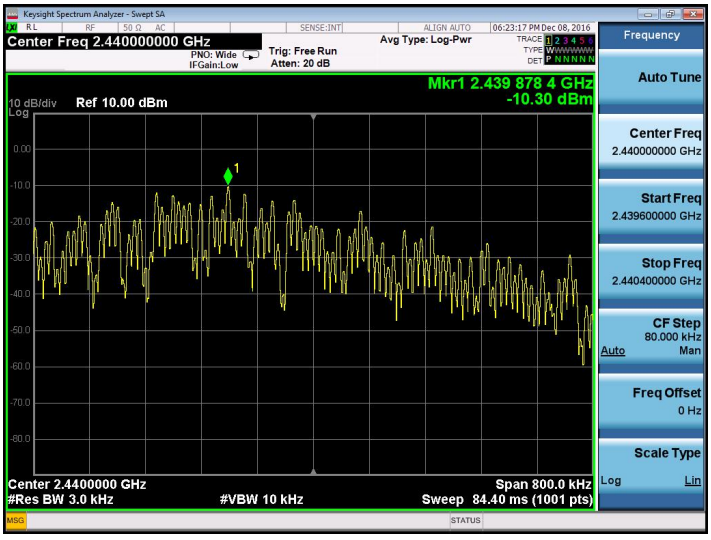


8.3. Test result

Channel Frequency (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2402	-12.17	8	Pass
2440	-10.30	8	Pass
2480	-8.82	8	Pass

TX CH00

TX CH 19



TX CH39

9. ANTENNA REQUIREMENTS

9.1. Limits

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

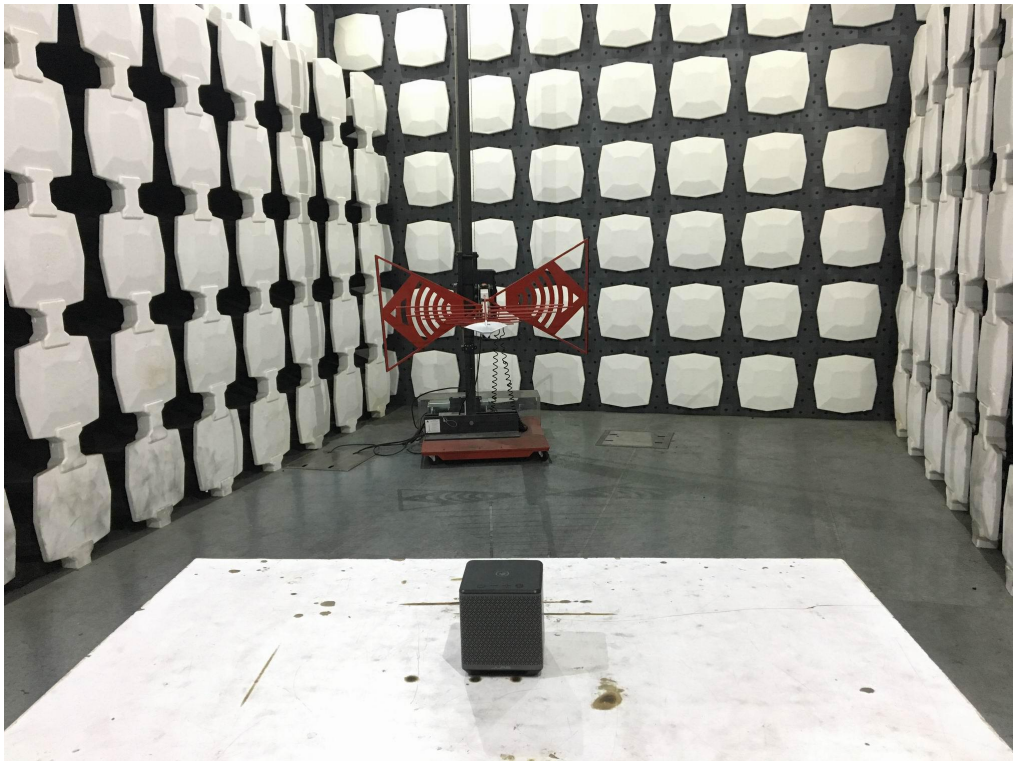
9.2. Result

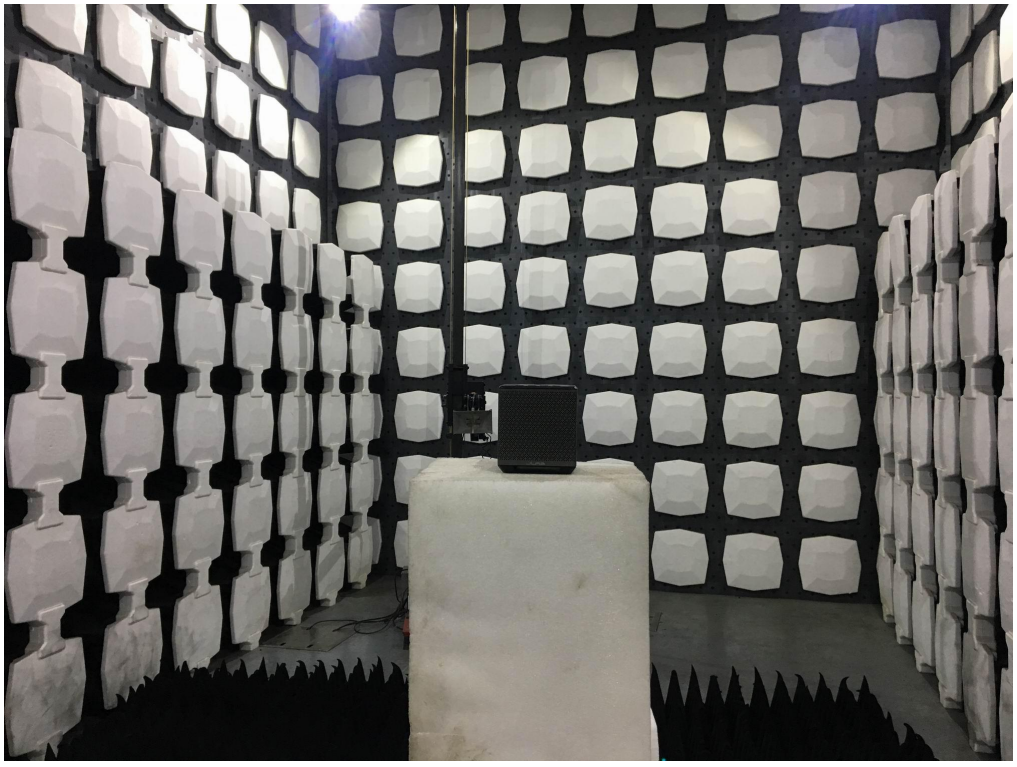
The antennas used for this product is PCB antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 1.0dBi.

10.PHOTOGRAPHS OF TEST SET-UP

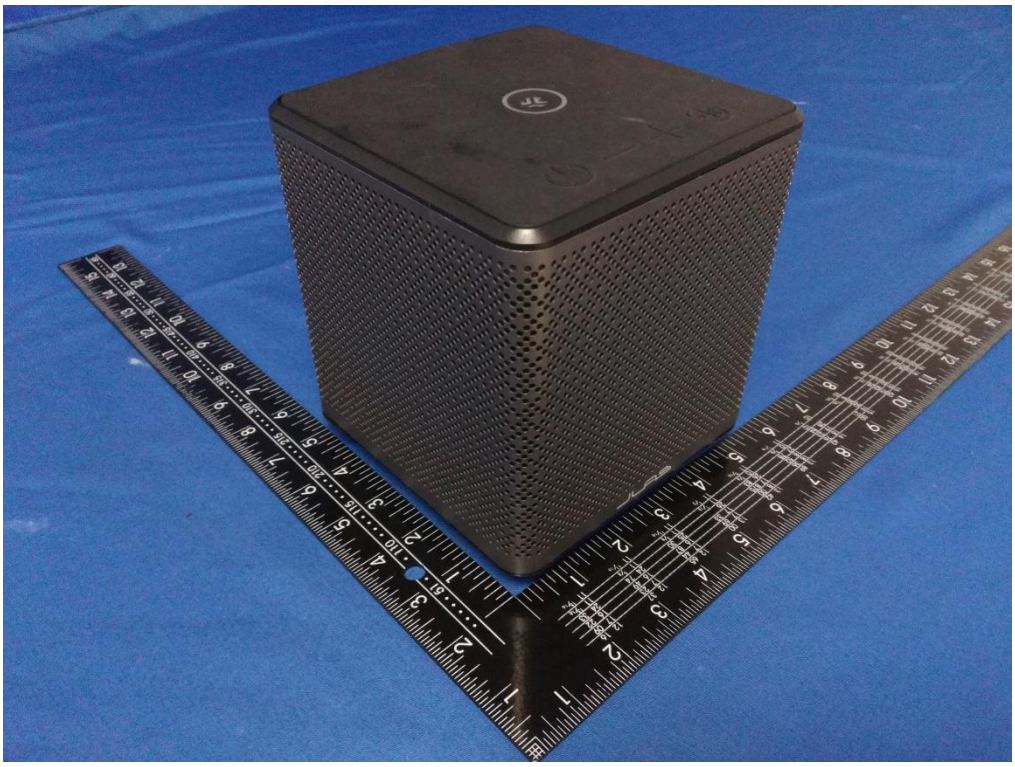
Conducted Emission

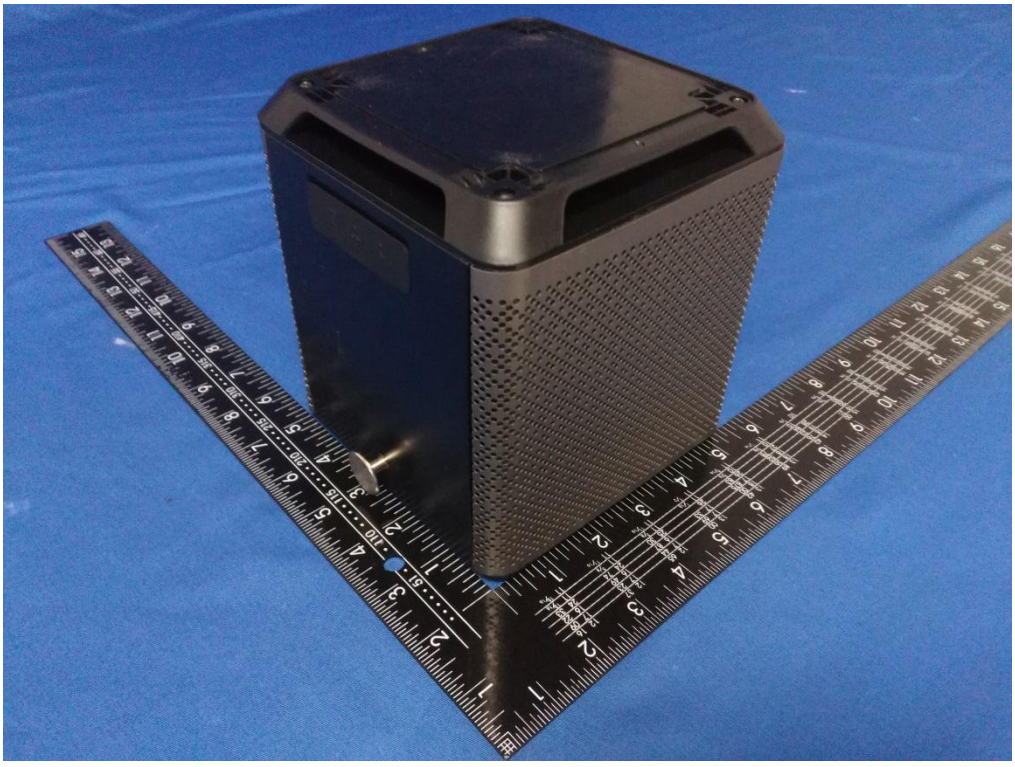
Radiated Emission Test





11. PHOTOGRAPHS OF THE EUT





*** the end of report ***