



TEST REPORT

Applicant : InMusic Brands, Inc
Address : 200 Scenic View Drive, Cumberland, RI 02864, U.S.A

Equipment Under Test (EUT):

Name : BT Wireless Speaker
Model : TRANSACTIVE WIRELESS
Trademark : **ALESIS**

Standards : FCC PART 15, SUBPART C : 2014 (Section 15.247)
ANSI C63.4:2014 ; ANSI C63.10:2013

Report No : F15060902
Date of Test : July 02, 2015- July 14, 2015
Date of Issue : July 31, 2015

Tset Result : PASS

In the configuration tested, the EUT complied with the standards specified above
Authorized Signature

Mike Lee



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1. General Information

1.1. Description of Device (EUT)

EUT : BT Wireless Speaker

Model No. : TRANSACTIVE WIRELESS

DIFF : N/A

Trade mark : ALESIS

Power supply : DC 12V from battery or AC100-240V, 50/60Hz

Radio Technology : Bluetooth 3.0 + EDR

Operation frequency : 2402-2480MHz

Modulation : GFSK, $\pi/4$ DQPSK, 8-DPSK

Antenna Type : Integrated PCB antenna, Max. Gain: 2dBi

FCC ID : Y40-LGAC-2

Applicant : InMusic Brands, Inc

Address : 200 Scenic View Drive, Cumberland, RI 02864, U.S.A

manufacture : Dongguan Integrity Electronic Co., Ltd

Address : No.68, Huanghe Road, Fenghuanggang, Tangxia Town, Dongguan City, Guangdong Province, China



1.2. Accessories of device (EUT)

Description : USB Cable
Manufacturer : N/A
Model No. : 0.8m unshielded

1.3. Test Lab information

Report issued by WH Technology Corp.

FCC Designation Number: TW1083

TAF Lab. No.: 2954

Open Site		No.120, Ln. 5, Hudong St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
EMC Test Site	Xizhi Office and Lab	4F., No.27-1, Ln. 169, Kangning St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
Tel.: +886-7729-7707 Fax: +886-2- 8648-1311		



2. Summary of test

2.1. Summary of test result

Description of Test Item	Standard	Results
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1) ANSI C63.4 :2009	PASS
Bandwidth	FCC Part 15: 15.215 ANSI C63.4 :2009	PASS
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1) ANSI C63.4 :2009	PASS
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2009	PASS
Dwell Time	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2009	PASS
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.4 :2009	PASS
Band Edge Compliance	FCC Part 15: 15.247(d) ANSI C63.4 :2009	PASS
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.4 :2009	PASS
Antenna requirement	FCC Part 15: 15.203	PASS

Note: Test with the test software RF Control Kit v1.0.exe.

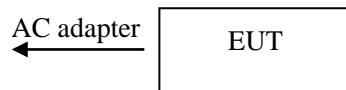
2.2. Assistant equipment used for test

Description	:	Notebook
Manufacturer	:	ACER
Model No.	:	ZQT
Remark: FCC DOC approved		

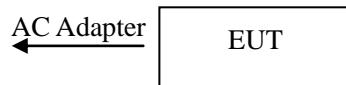


2.3. Block Diagram

1, For radiated emissions test: EUT was placed on a turn table, which is 0.8 meter high above ground. EUT was be set into BT test mode by RF Control Kit v1.0.exe. software before test.



2, For Power Line Conducted Emissions Test: EUT was connected to notebook by 1.5m USB line



2.4. Test mode

The test software “RF Control Kit v1.0.exe.” was used to control EUT work in Continuous TX mode, and select test channel, wireless mode.

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
GFSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
$\pi /4$ DQPSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
8- DPSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480



2.5. Test Conditions

Temperature range	21-25°C
Humidity range	40-75%
Pressure range	86-106kPa

2.6. Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB	Polarize: V
	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	1×10^{-9}	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2°C	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	



2.7. Test Equipment

Equipment	Manufacture	Model No.	Serial No.	Cal. Due day	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2016.01.19	1Year
Spectrum analyzer	Agilent	E4407B	MY49510055	2016.01.19	1Year
Receiver	R&S	ESCI	101165	2016.01.19	1Year
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2017.01.21	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2017.01.21	2Year
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170 D(1432)	2017.01.21	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2016.01.19	1Year
Cable	Resenberger	SUCOFLEX 104	MY6562/4	2016.01.19	1Year
Cable	Resenberger	SUCOFLEX 104	309972/4	2016.01.19	1Year
Cable	Resenberger	SUCOFLEX 104	329112/4	2016.01.19	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2016.01.19	1Year
L.I.S.N.#2	ROHDE&SCHWABE RZ	ENV216	101043	2016.01.19	1 Year
Power Meter	Anritsu	ML2487A	6K00001491	2016.01.19	1Year
Power sensor	Anritsu	ML2491A	32516	2016.01.19	1Year
Pre-amplifier	SCHWARZBECK	BBV9743	9743-019	2016.01.19	1Year
Pre-amplifier	Quietek	AP-180C	CHM-0602012	2016.01.19	1Year



3. Maximum Peak Output power

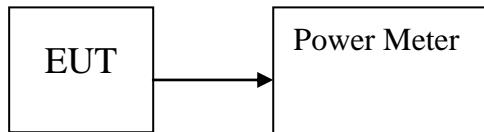
3.1. Limit

Please refer section 15.247.

3.2. Test Procedure

The transmitter output is connected to the RF Power Meter. The RF Power Meter is set to the peak power detection.

3.3. Test Setup



3.4. Test Result

EUT: BT Wireless Speaker		M/N: TRANSACTIVE WIRELESS			
Test date: 2015-07-04		Test site: RF site		Tested by: Store	
Mode	Freq (MHz)	PK Output Power (dBm)	PK Output Power (mW)	Limit (dBm)	Margin (dB)
GFSK	2402	-5.649	0.272	21	26.649
	2441	-5.304	0.295	21	26.304
	2480	-5.051	0.313	21	26.051
$\pi/4$ DQPSK,	2402	-7.247	0.188	21	28.247
	2441	-6.542	0.222	21	27.542
	2480	-6.003	0.251	21	27.003
8- DPSK	2402	-7.165	0.192	21	28.165
	2441	-6.464	0.226	21	27.464
	2480	-5.962	0.253	21	26.962
Conclusion: PASS					



4. Bandwidth

4.1. Limit

Please refer section 15.247.

4.2. Test Procedure

The transmitter output was coupled to a spectrum analyzer via a antenna. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.3. Test Result

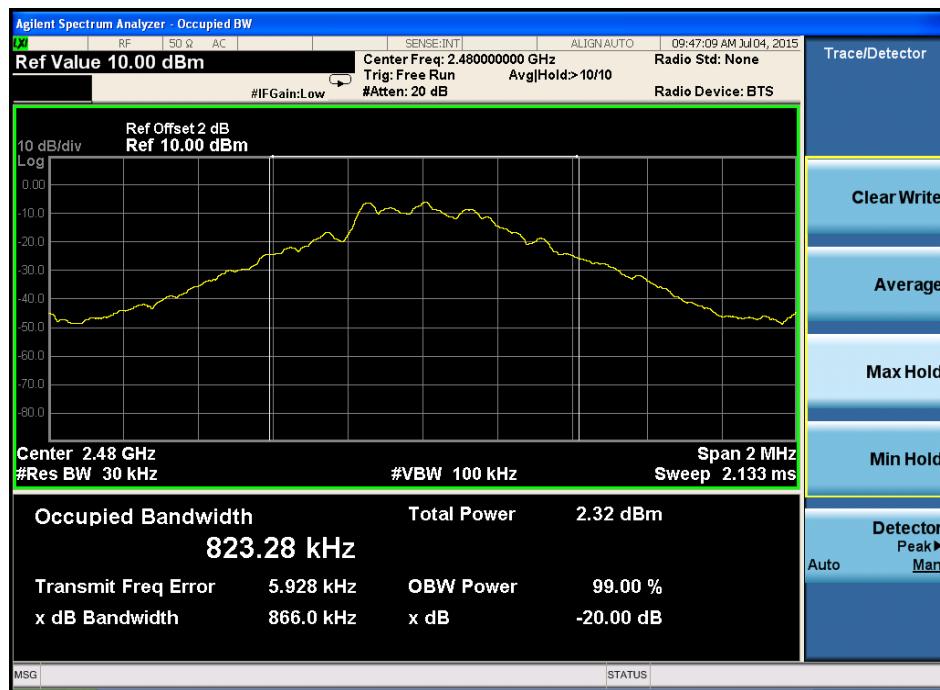
EUT: BT Wireless Speaker		M/N: TRANSACTIVE WIRELESS		
Test date: 2015-07-04		Test site: RF site	Tested by: Store	
Mode	Freq (MHz)	20dB Bandwidth (KHz)	Limit (kHz)	Conclusion
GFSK	2402	866.0	/	PASS
	2441	851.3	/	PASS
	2480	866.0	/	PASS
$\pi/4$ DQPSK	2402	1219	/	PASS
	2441	1223	/	PASS
	2480	1234	/	PASS
8- DPSK	2402	1212	/	PASS
	2441	1211	/	PASS
	2480	1212	/	PASS



Orginal Test data For 20dB bandwidth

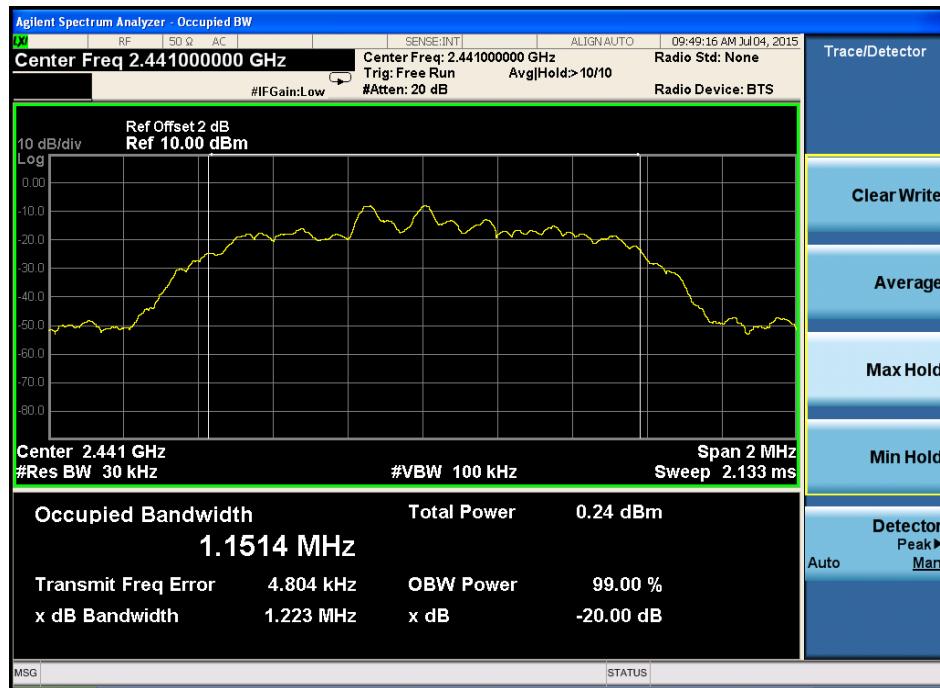
GFSK:





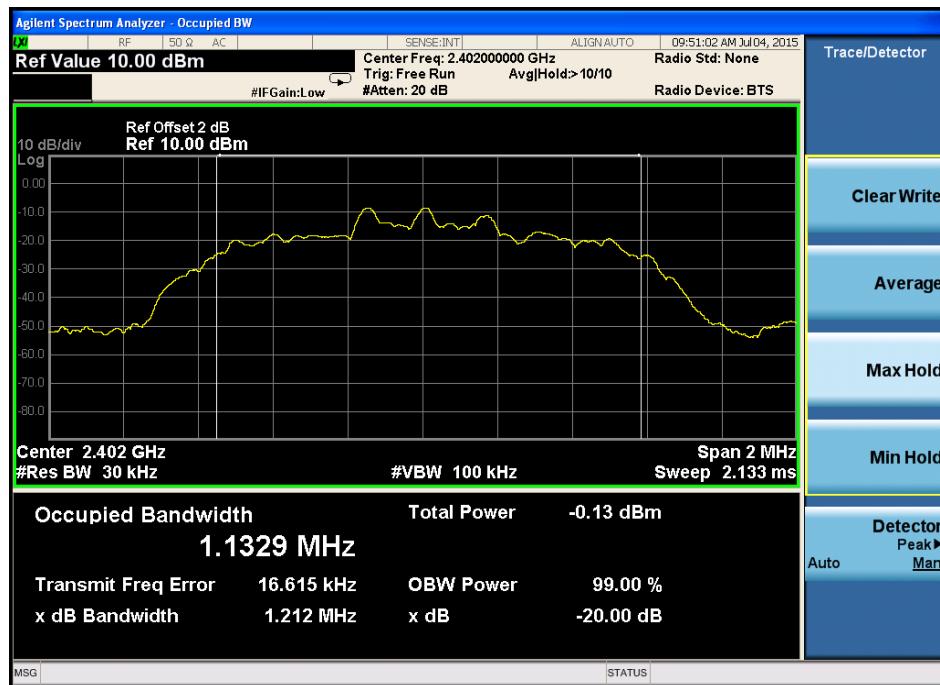
$\pi/4$ DQPSK

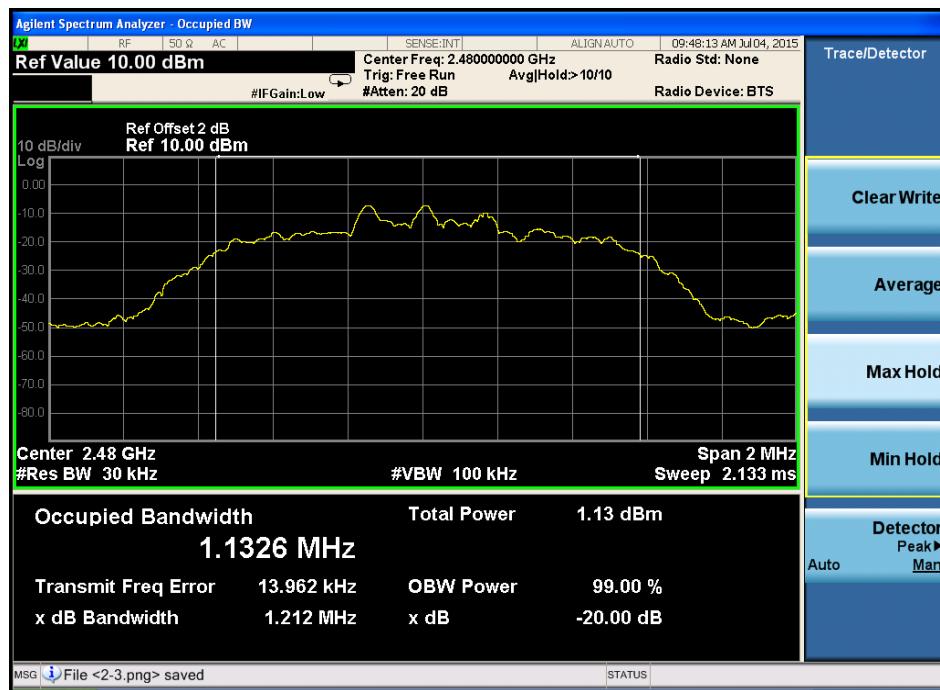






8- DPSK







5. Carrier Frequency Separation

5.1. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW

5.2. Test Procedure

The transmitter output was coupled to a spectrum analyzer via a antenna. The carrier frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW.

5.3. Test Result

EUT: BT Wireless Speaker M/N: TRANSACTIVE WIRELESS				
Test date: 2015-07-04		Test site: RF site	Tested by: Store	
Mode/Channel	Channel separation (KHz)	20dB Bandwidth (KHz)	Limit (KHz) 2/3 20dB bandwidth	Conclusion
GFSK	1002	851.3	567.533	PASS
$\pi/4$ DQPSK	1002	1223.0	815.333	PASS
8- DPSK	1008	1211.0	807.333	PASS



Orginal test data for channel separation

GFSK



$\pi/4$ DQPSK





8- DPSK





6. Number Of Hopping Channel

6.1. Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

6.2. Test Procedure

The transmitter output was coupled to a spectrum analyzer via a antenna. The number of hopping channel was measured by spectrum analyzer with 300kHz RBW and 1MHz VBW.

6.3. Test Result

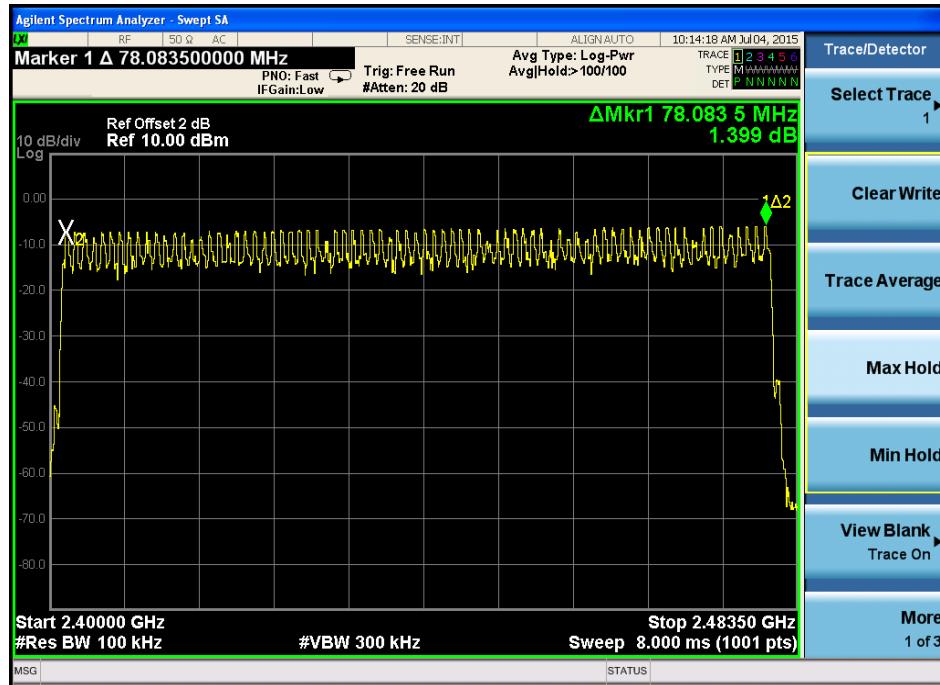
EUT: BT Wireless Speaker M/N: TRANSACTIVE WIRELESS			
Test date: 2015-07-04		Test site: RF site	Tested by: Store
Mode	Number of hopping channel	Limit	Conclusion
GFSK	79	>15	PASS
$\pi/4$ DQPSK	79	>15	PASS
8- DPSK	79	>15	PASS



Original test data for hopping channel number
GFSK

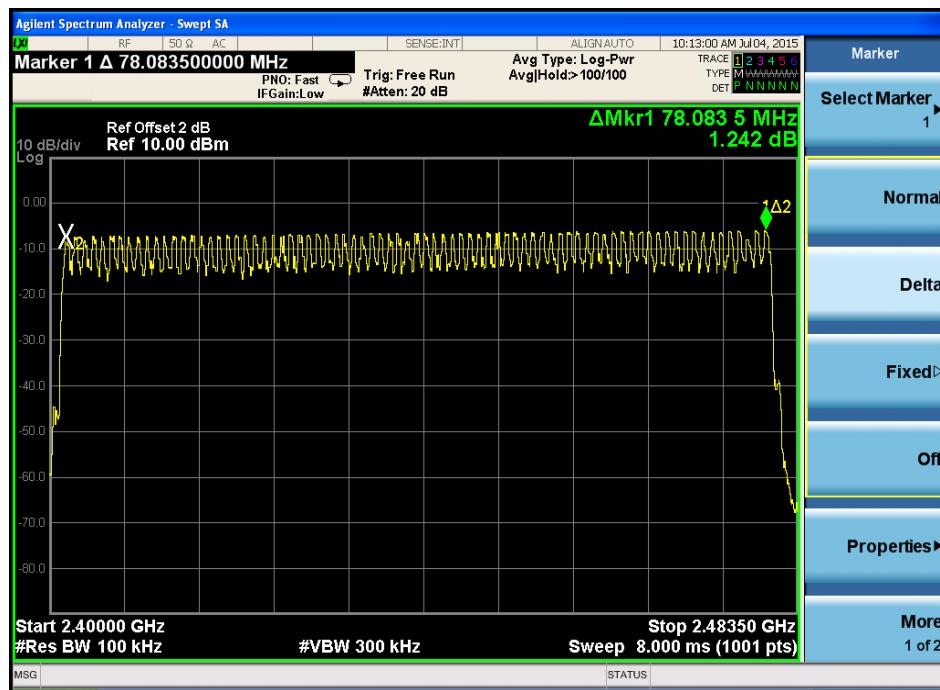


$\pi/4$ DQPSK





8- DPSK





7. Dwell Time

7.1. Test limit

Please refer section 15.247.

7.2. Test Procedure

- 7.2.1. Place the EUT on the table and set it in transmitting mode.
- 7.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 7.2.3. Set center frequency of spectrum analyzer = operating frequency.
- 7.2.4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.
- 7.2.5. Repeat above procedures until all frequency measured were complete.

7.3. Test Results

PASS.

Detailed information please see the following page.



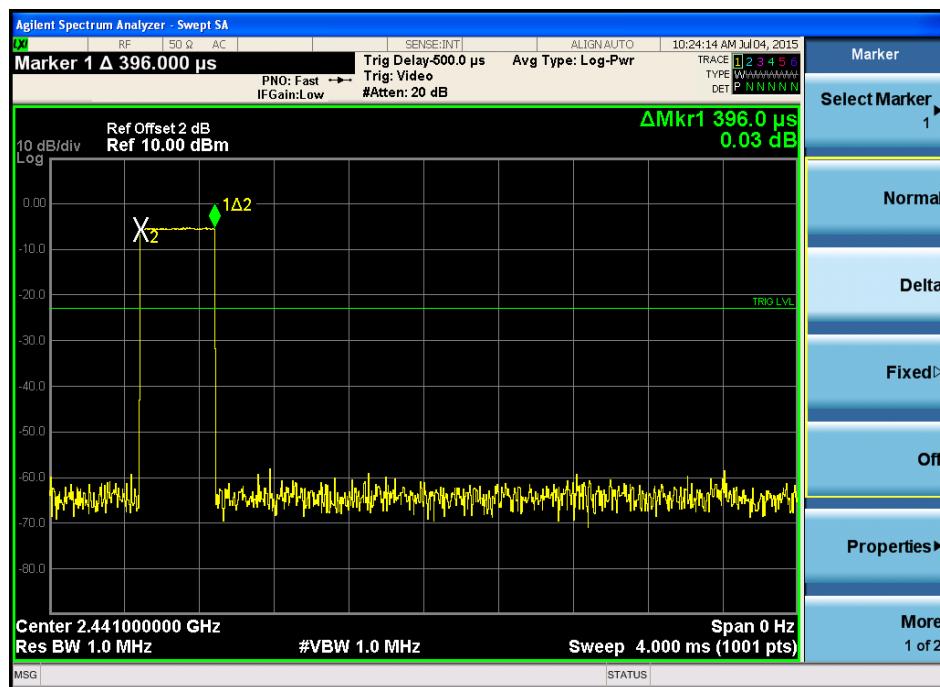
EUT: BT Wireless Speaker M/N: TRANSACTIVE WIRELESS						
Test date: 2015-07-04		Test site: RF site		Tested by: Store		
Mode	Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Conclusion
GFSK	DH1	2441	0.396	0.253	<0.4	PASS
	DH3	2441	1.656	0.353	<0.4	PASS
	DH5	2441	2.904	0.372	<0.4	PASS
$\pi/4$ DQPSK	DH1	2441	0.400	0.256	<0.4	PASS
	DH3	2441	1.656	0.353	<0.4	PASS
	DH5	2441	2.908	0.372	<0.4	PASS
8- DPSK	DH1	2441	0.404	0.259	<0.4	PASS
	DH3	2441	1.656	0.353	<0.4	PASS
	DH5	2441	2.908	0.372	<0.4	PASS

Note: 1 A period time = 0.4 (s) * 79 = 31.6(s)
2 DH1 time slot = Pulse Duration * (1600/(1*79)) * A period time
DH3 time slot = Pulse Duration * (1600/(3*79)) * A period time
DH5 time slot = Pulse Duration * (1600/(5*79)) * A period time

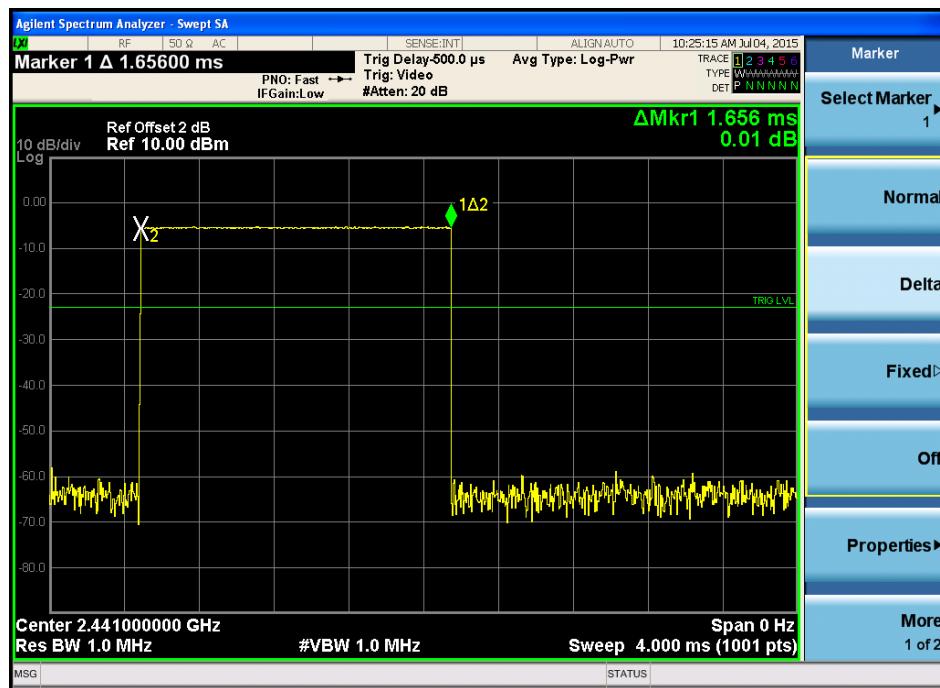


GFSK

DH1:

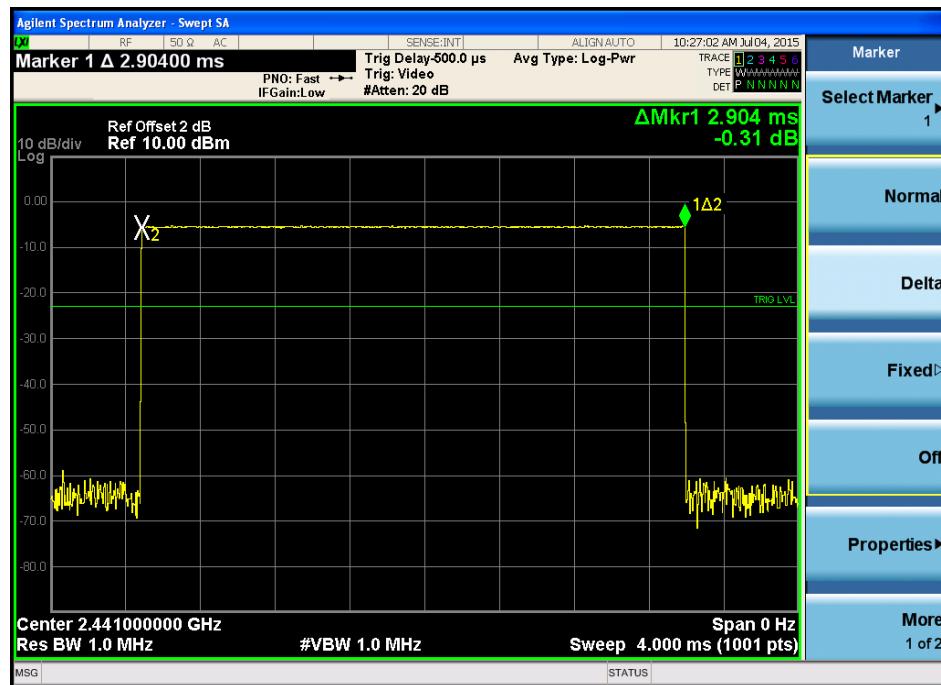


DH3:

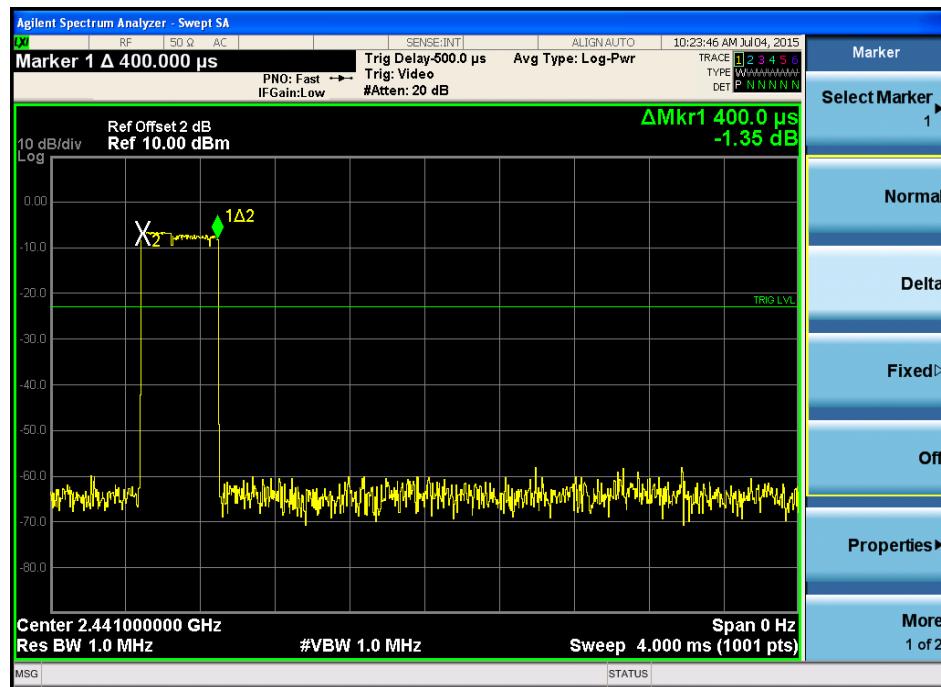




DH5

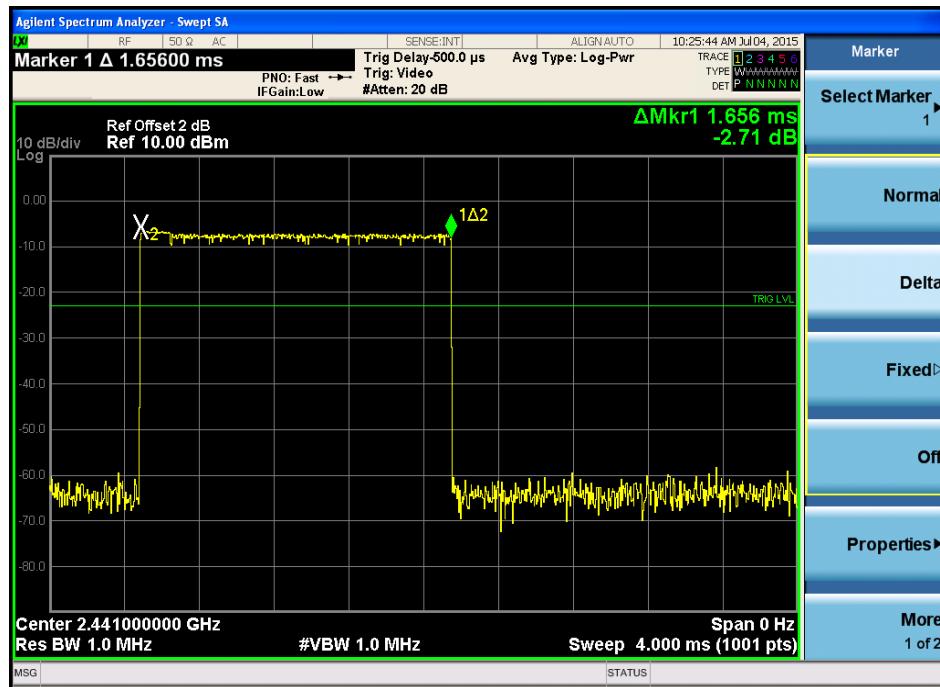


$\pi/4$ DQPSK DH1

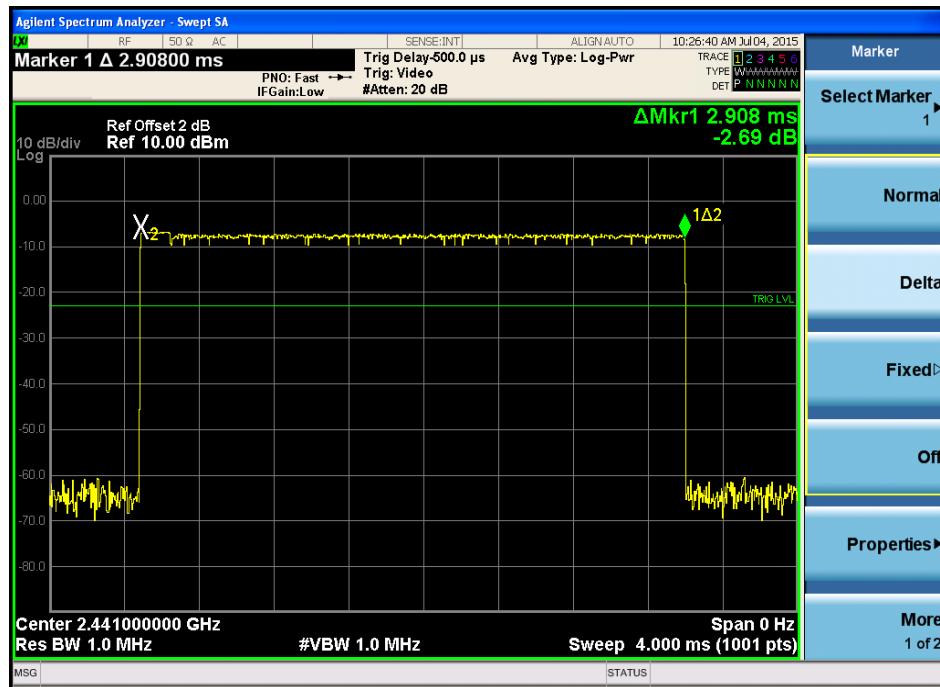




DH3



DH5



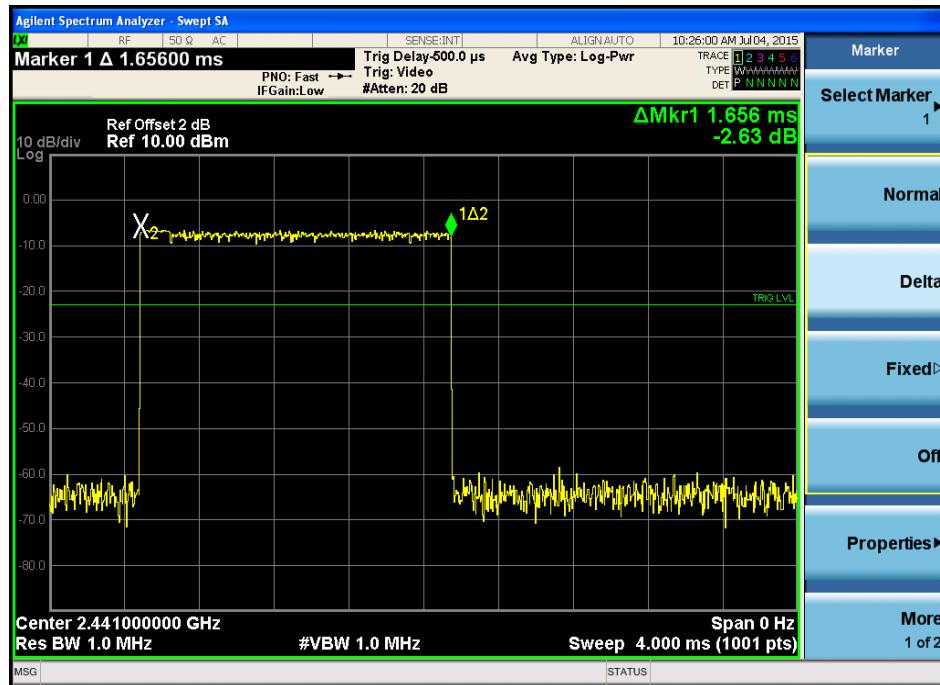
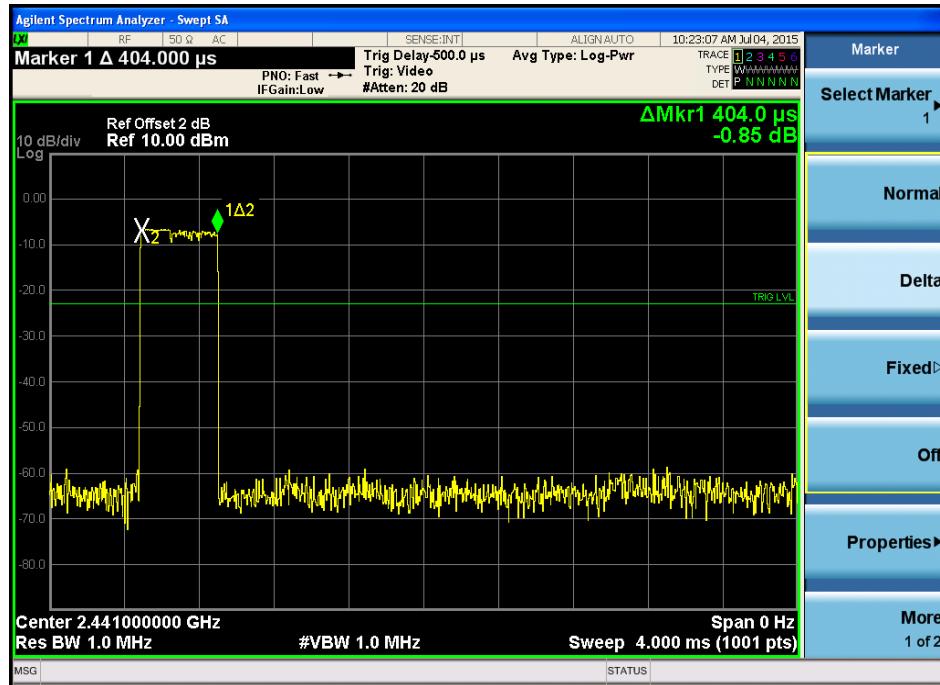


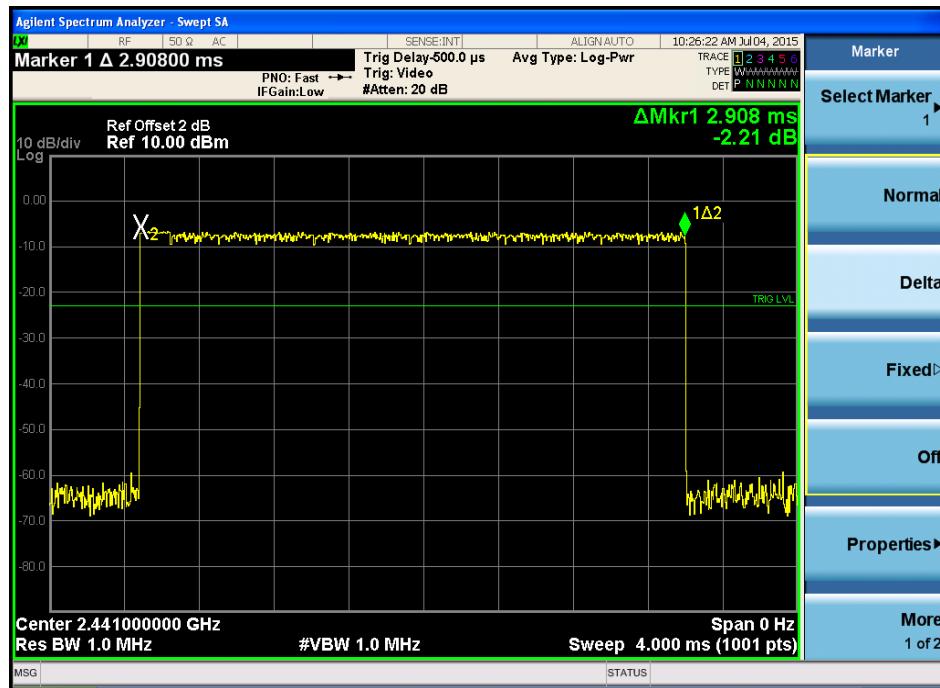
WH Technology Corp.

Date of Issue: Jul. 31, 2015
Report No. :F15060902



8- DPSK:







8. Radiated emissions

8.1. Limit

All the emissions appearing within 15.247 restricted frequency bands shall not exceed the limits shown in 15.247, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.247 limits.

15.247 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 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	(²)

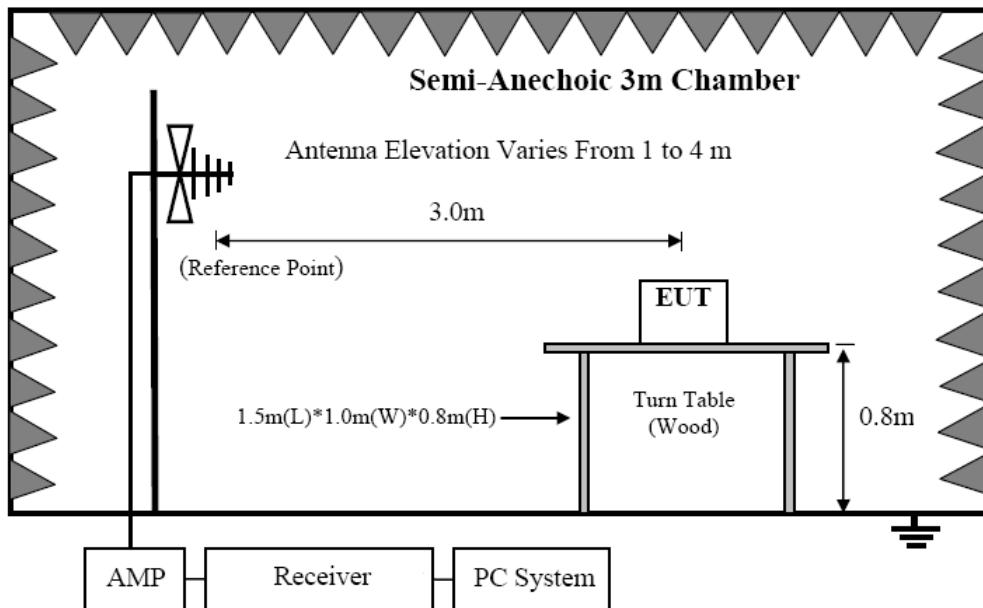
15.247 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		µV/m	dB(µV)/m
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
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	74.0 dB(µV)/m (Peak) 54.0 dB(µV)/m (Average)	

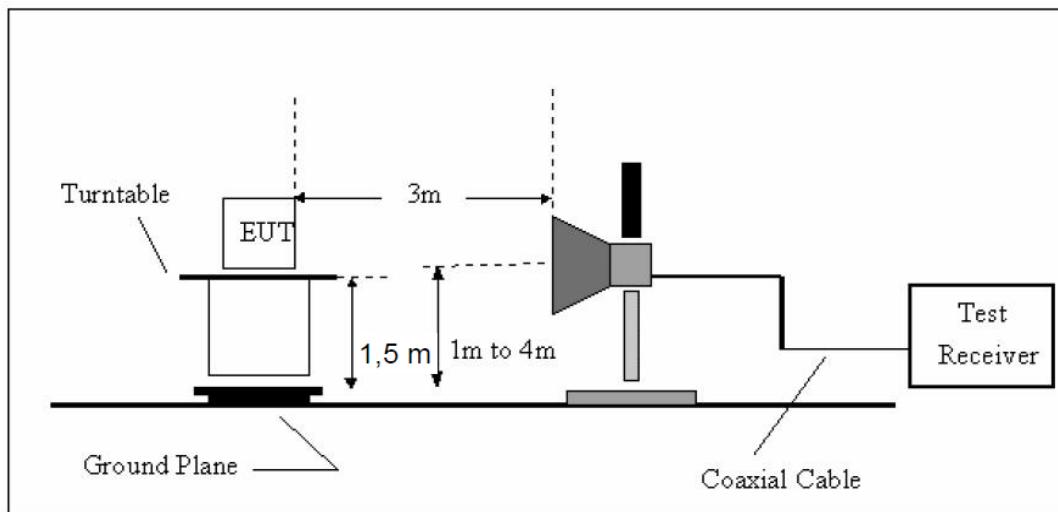


8.2. Block Diagram of Test setup

8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



8.2.2 In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz





Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

8.3. Test Procedure

- (1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
- (2) Setup EUT and simulator as shown in section 1.4 and 6.1
- (3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.
 - (a) Change work frequency or channel of device if practicable.
 - (b) Change modulation type of device if practicable.
 - (c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions
- (4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated
- (5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4 2014 on Radiated Emission test.
- (6) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure.

8.4. Test Result

We have scanned the 10th harmonic from 9KHz to the EUT.
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

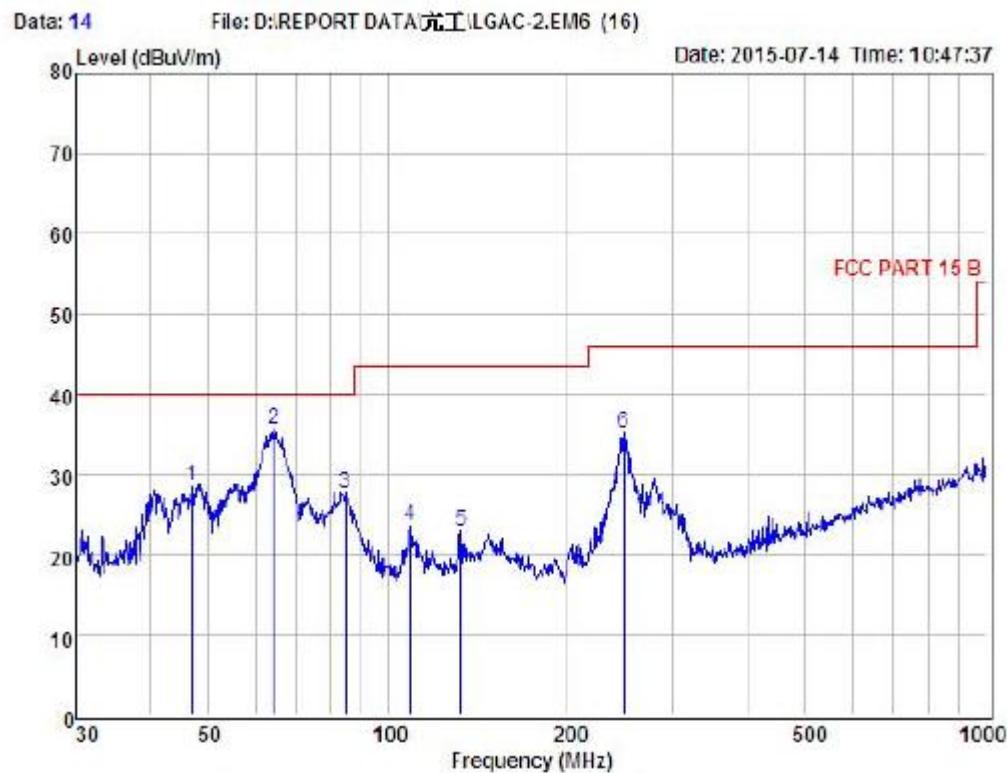
Note: The amplitude of spurious emissions which are attenuated by more than 20dB



below the permissible value has no need to be reported.



From 30MHz to 1000MHz: Conclusion: PASS

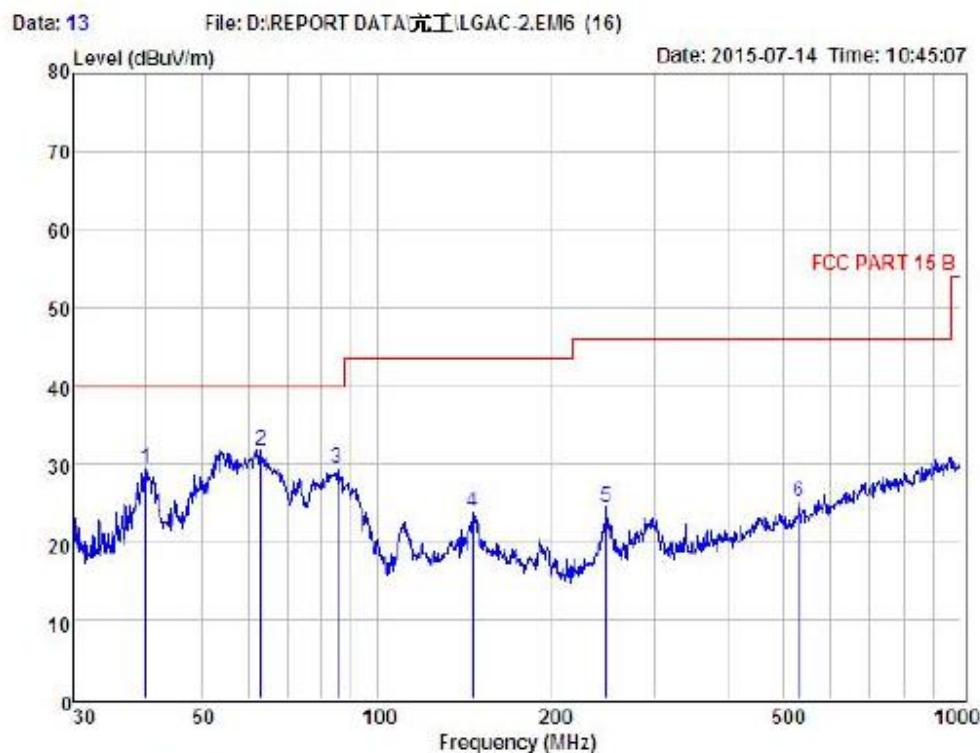


Condition : FCC PART 15 B 3m POL: HORIZONTAL
EUT :

Model No : LGAC-2
Test Mode : Working
Power : AC 120V/60Hz
Test Engineer : Alex
Remark : Bluetooth
Temp : 24.2°C
Hum : 54%

Item	Freq	Read Level	Antenne Factor	Preemp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	46.99	46.65	13.59	31.83	0.08	28.49	40.00	-11.51	Peak
2	64.43	55.05	11.98	31.74	0.24	35.53	40.00	-4.47	Peak
3	84.70	49.62	9.38	31.63	0.26	27.73	40.00	-12.27	Peak
4	109.03	43.48	11.13	31.35	0.41	23.67	43.50	-19.83	Peak
5	132.69	40.66	12.93	31.25	0.53	22.87	43.50	-20.63	Peak
6	248.55	53.89	11.55	30.72	0.44	35.16	46.00	-10.84	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
									Peak
1	39.99	46.93	14.07	31.89	0.17	29.28	40.00	-10.72	Peak
2	63.09	51.30	11.98	31.74	0.21	31.75	40.00	-8.25	Peak
3	85.30	51.21	9.38	31.53	0.29	29.35	40.00	-10.65	Peak
4	145.86	40.71	13.90	31.20	0.44	23.85	43.50	-19.65	Peak
5	247.68	43.08	11.55	30.72	0.58	24.49	46.00	-21.51	Peak
6	531.96	36.46	17.09	29.54	1.11	25.12	46.00	-20.88	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Remark: All modes have been tested, and only worst data of GFSK mode, Channel 2404MHz was listed in this report.





WH Technology Corp.

Date of Issue: Jul. 31, 2015
Report No.: F15060902

1GHz—25GHz Radiated emission Test result									
EUT: BT Wireless Speaker	M/N: TRANSACTIVE WIRELESS								
Power: AC120V/60Hz	Page 39 of 88								
Test date: 2015-07-04	Test site: 3m Chamber	Tested by: Store							
Test mode: GFSK Tx CH79 2480MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960	41.89	33.98	10.22	34.25	51.84	74	22.16	PK
2	4960	30.74	33.98	10.22	34.25	40.69	54	13.31	AV



3	7440	/							
4	9920	/							
5	12400	/							

Antenna Polarity: Horizontal

1	4960	42.43	33.98	10.22	34.25	52.38	74	21.62	PK
2	4960	31.35	33.98	10.22	34.25	41.3	54	12.7	AV
3	7440	/							
4	9920	/							
5	12400	/							

Note:

- 1, Measuring frequency from 1GHz to 25GHz
- 2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
- 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK
- 3, Result = Read level + Antenna factor + cable loss-Amp factor
- 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.





WH Technology Corp.

Date of Issue: Jul. 31, 2015
Report No.: F15060902

1GHz—25GHz Radiated emission Test result									
EUT: BT Wireless Speaker	M/N: TRANSACTIVE WIRELESS								
Power: AC120V/60Hz	Page 43 of 88								
Test date: 2015-07-04	Test site: 3m Chamber	Tested by: Store							
Test mode: π /4 DQPSK	Tx CH79	2480MHz							
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(d B)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960	41.21	33.98	10.22	34.25	51.16	74	22.84	PK
2	4960	32.21	33.98	10.22	34.25	42.16	54	11.84	AV



3	7440	/							
4	9920	/							
5	12400	/							

Antenna Polarity: Horizontal

1	4960	42.73	33.98	10.22	34.25	52.68	74	21.32	PK
2	4960	31.92	33.98	10.22	34.25	41.87	54	12.13	AV
3	7440	/							
4	9920	/							
5	12400	/							

Note:

- 1, Measuring frequency from 1GHz to 25GHz
- 2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
- 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK
- 3, Result = Read level + Antenna factor + cable loss-Amp factor
- 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.





1GHz—25GHz Radiated emission Test result									
EUT: Bluetooth earphone					M/N: MDS-800X				
Power: DC 5.0V From notebook									
Test date: 2015-01-07 Test site: 3m Chamber Tested by: Peter									
Test mode: 8- DQPSK Tx CH40 2441MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(d B)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	41.48	33.93	10.2	34.29	51.32	74	22.68	PK
2	4882	31.51	33.93	10.2	34.29	41.35	54	12.65	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	41.93	33.93	10.2	34.29	51.77	74	22.23	PK
2	4882	32.21	33.93	10.2	34.29	42.05	54	11.95	AV
3	7323	/							
4	9764	/							
5	12205	/							



1GHz—25GHz Radiated emission Test result									
EUT: Bluetooth earphone		M/N: MDS-800X							
Power: DC 5.0V From notebook		Page 47 of 88							
Test date: 2015-01-07		Test site: 3m Chamber		Tested by: Peter					
Test mode: 8- DQPSK		Tx CH79	2480MHz						
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960	41.89	33.98	10.22	34.25	51.84	74	22.16	PK
2	4960	32.39	33.98	10.22	34.25	42.34	54	11.66	AV



3	7440	/							
4	9920	/							
5	12400	/							

Antenna Polarity: Horizontal

1	4960	41.9	33.98	10.22	34.25	51.85	74	22.15	PK
2	4960	32	33.98	10.22	34.25	41.95	54	12.05	AV
3	7440	/							
4	9920	/							
5	12400	/							

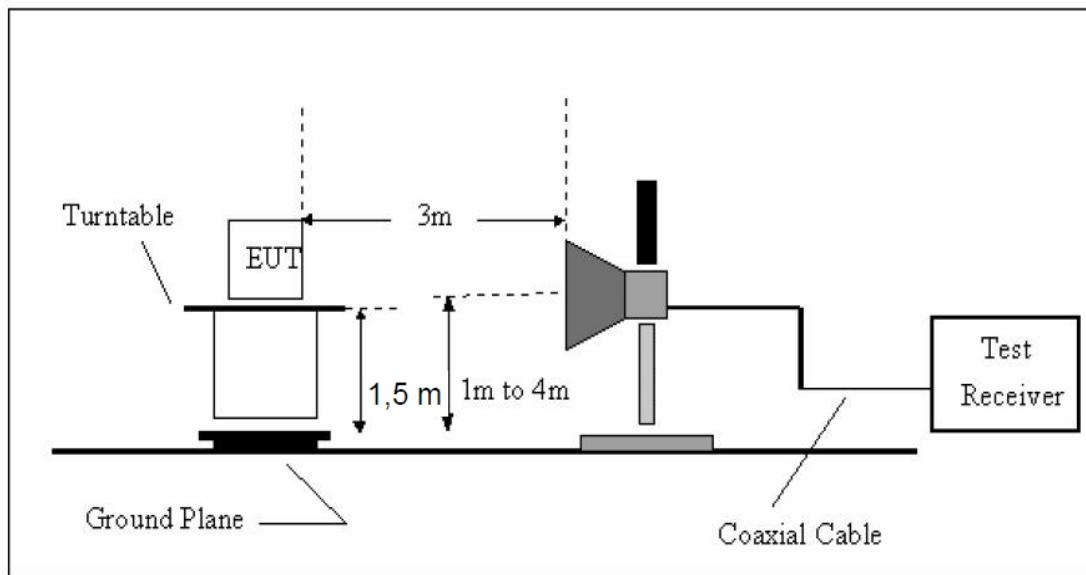
Note:

- 1, Measuring frequency from 1GHz to 25GHz
- 2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
- 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK
- 3, Result = Read level + Antenna factor + cable loss-Amp factor
- 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.



9. Band Edge Compliance

9.1. Block Diagram of Test Setup



9.2. Limit

All the lower and upper band-edges emissions appearing within restricted frequency bands shall not exceed the limits shown in 15.247, all the other emissions outside operation shall be at least 20dB below the fundamental emissions, or comply with 15.247 limits.

9.3. Test Procedure

All restriction band and non- restriction band have been tested , only worse case is reported.

9.4. Test Result

PASS. (See below detailed test data)



WH Technology Corp.

Date of Issue: Jul. 31, 2015
Report No. :F15060902



Radiated Method

GFSK (CH Low)



GFSK (CH High)



GFSK (Hopping Low)



GFSK (Hopping High)



$\pi/4$ DQPSK (CH Low)



Note:

- 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
- 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK
- 3, Result = Read level + Antenna factor + cable loss-Amp factor
- 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.



$\pi/4$ DQPSK (CH High)



$\pi/4$ DQPSK (Hopping Low)



$\pi/4$ DQPSK (Hopping High)



8- DPSK (CH Low)



8- DPSK (CH High)



8- DPSK (Hopping Low)



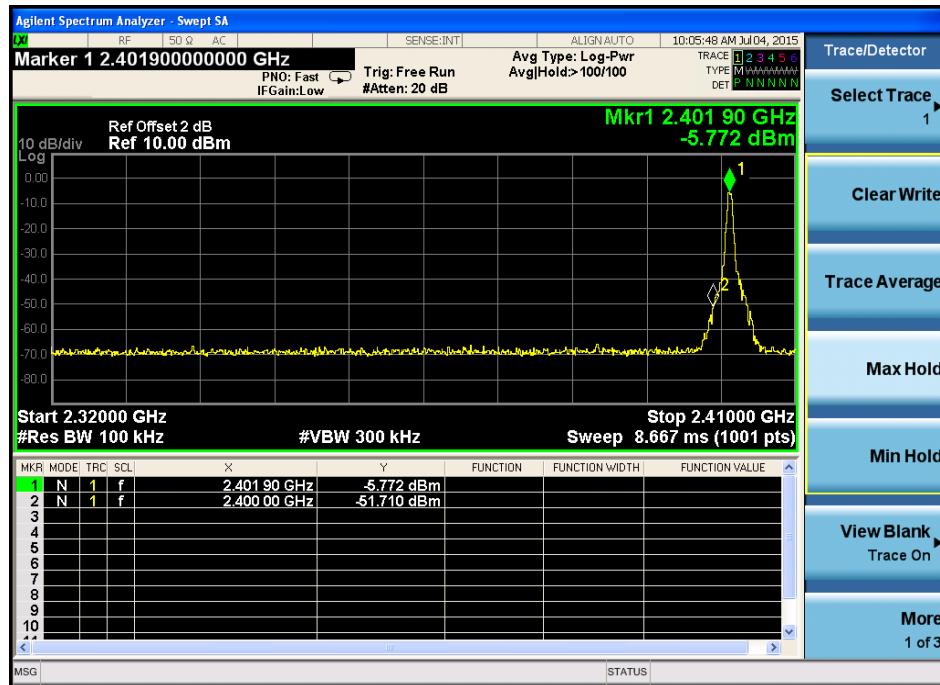
8- DPSK (Hopping High)



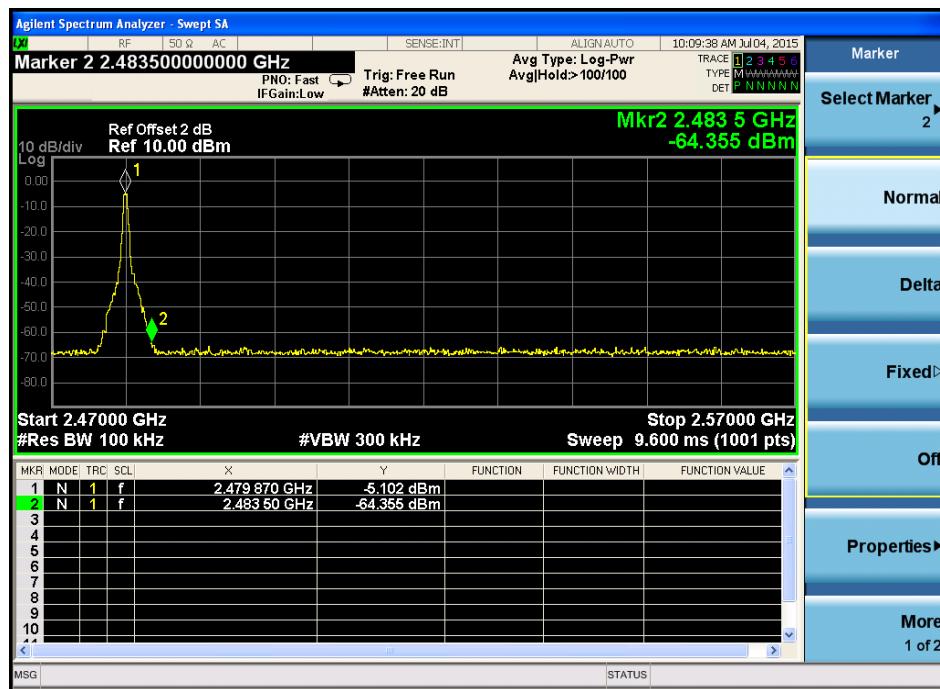
Conducted Method

GFSK

CH LOW :



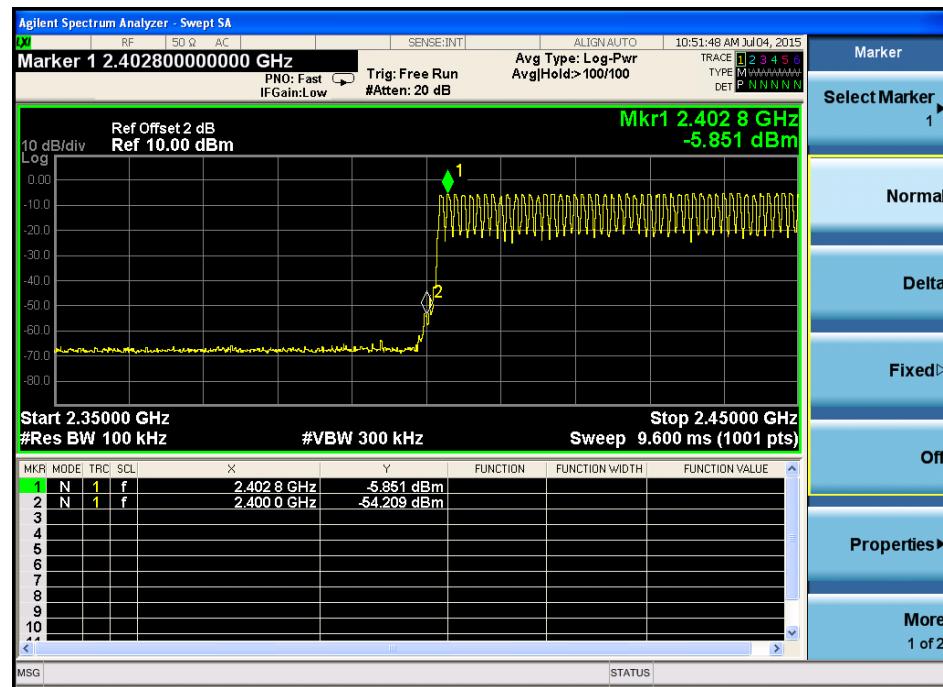
CH High :



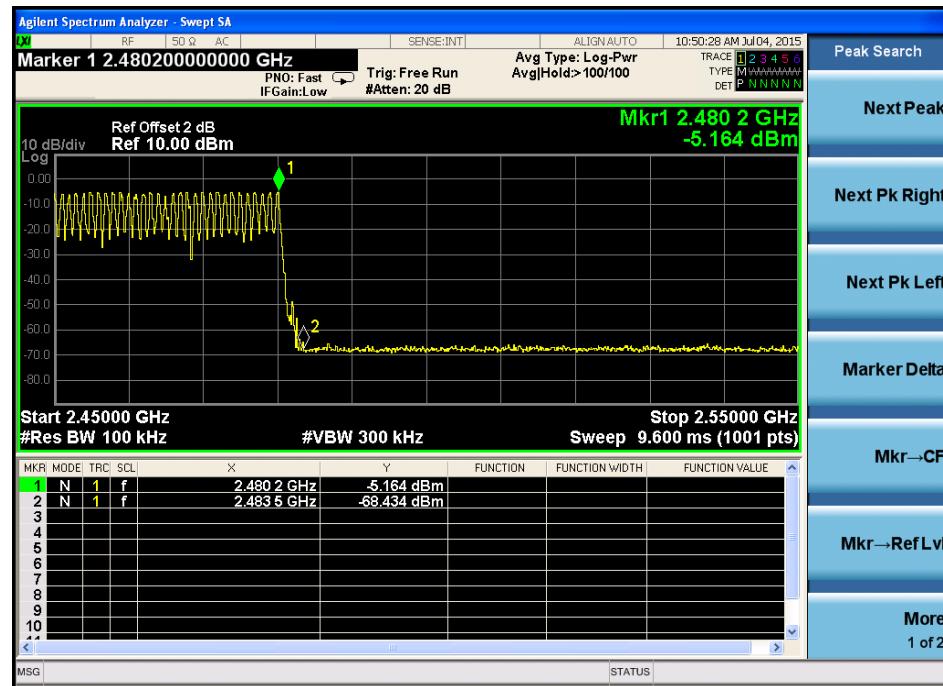


Hopping

Low



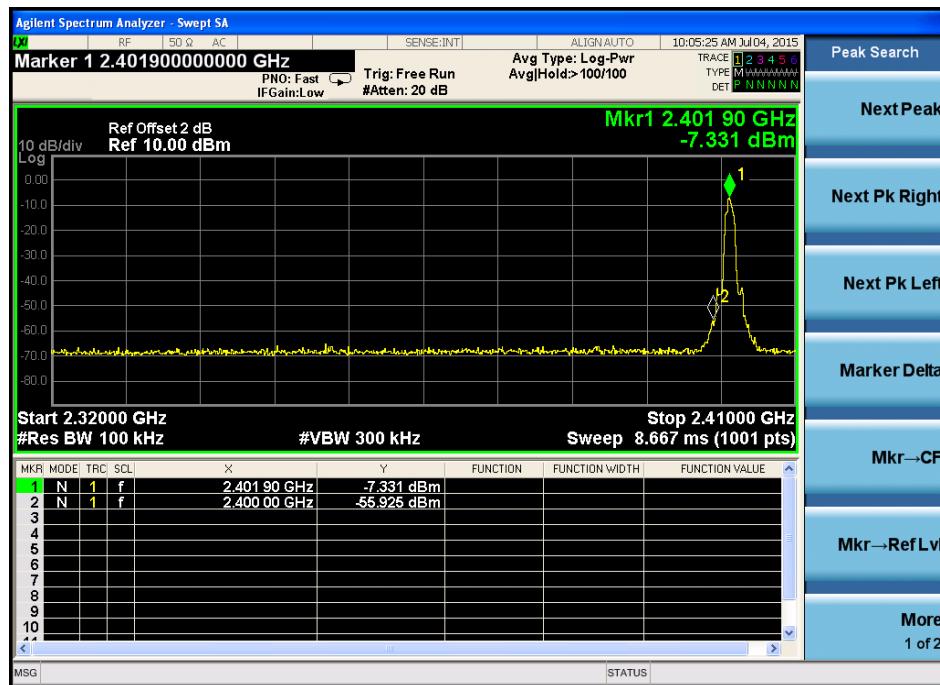
High



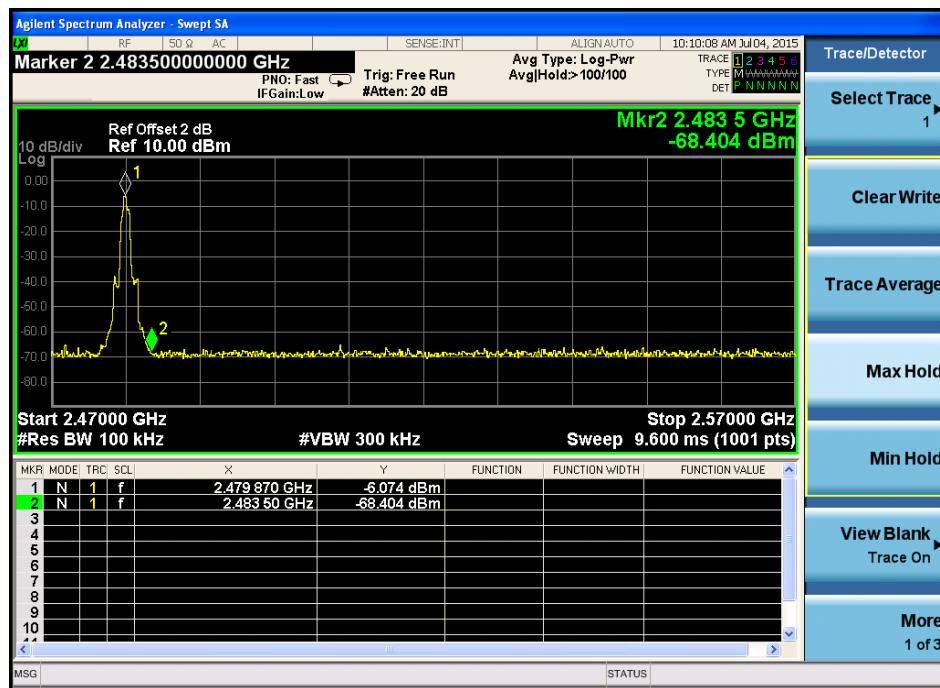


$\pi/4$ DQPSK

Low

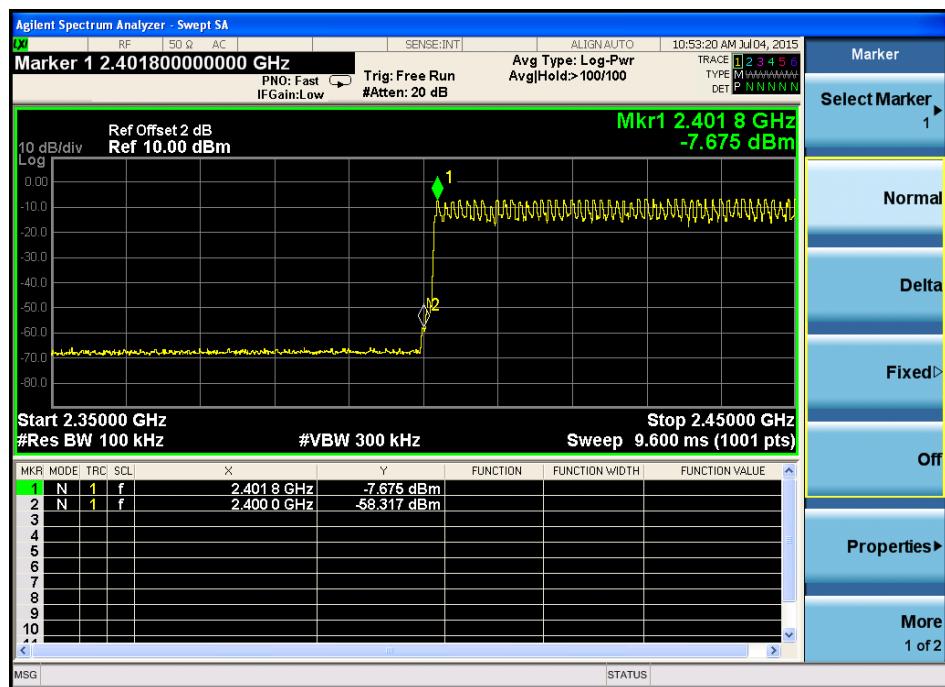


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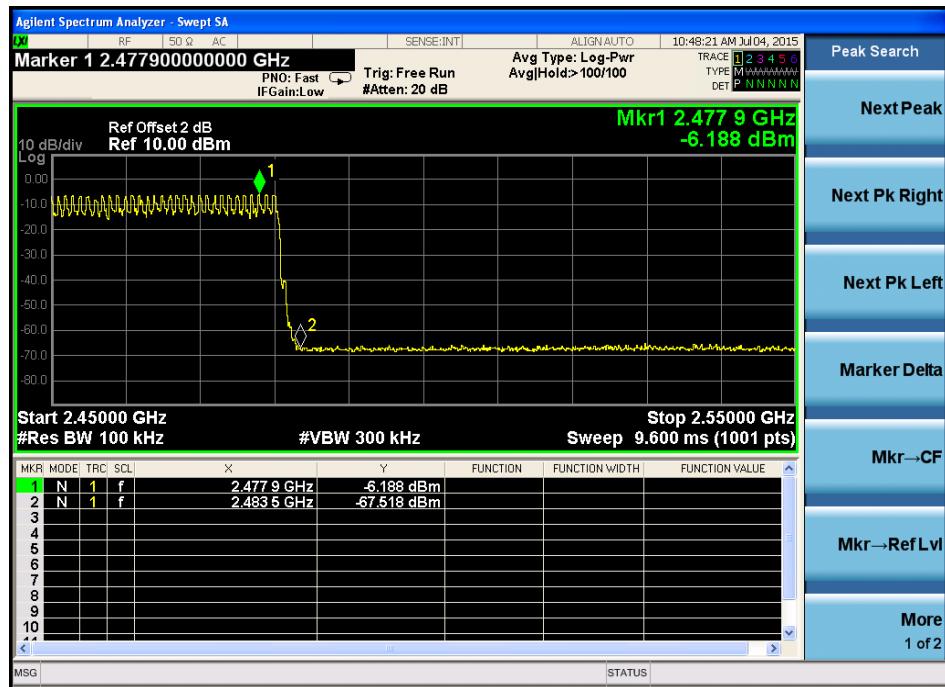




Hopping Low



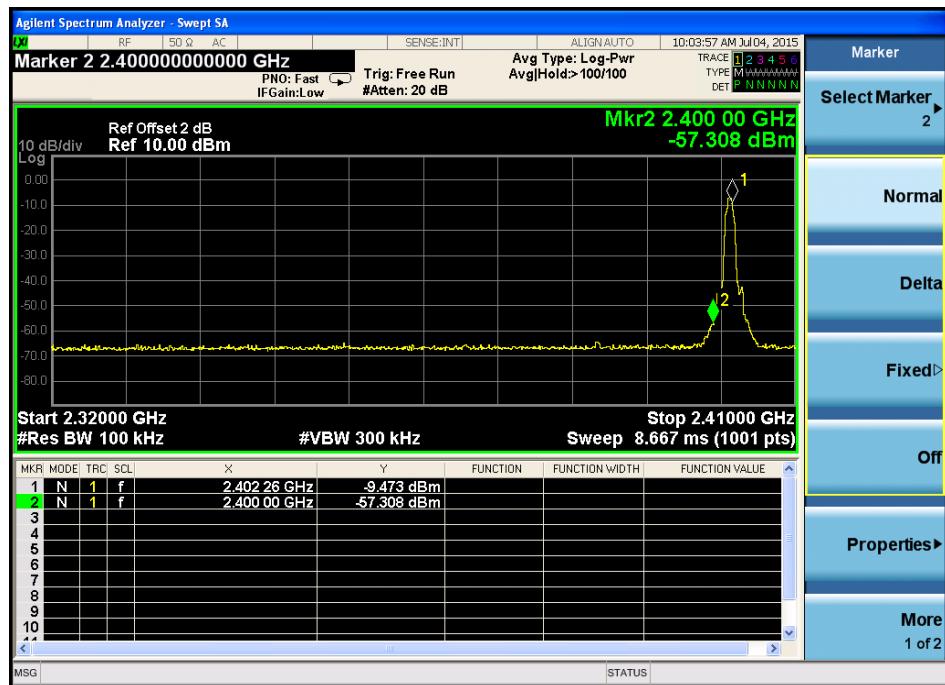
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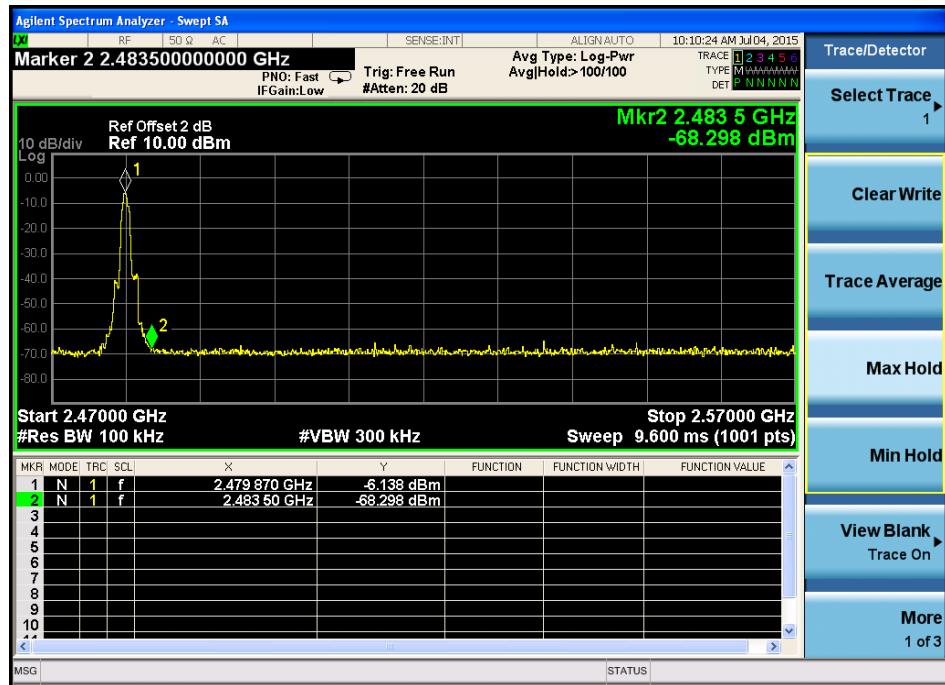


8- DPSK:

Low

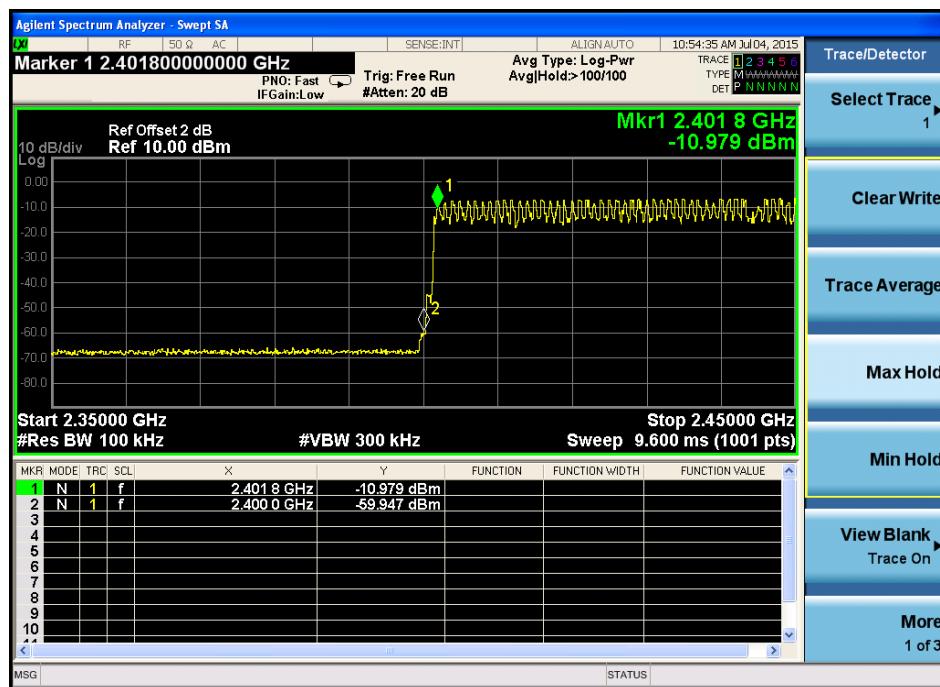


High

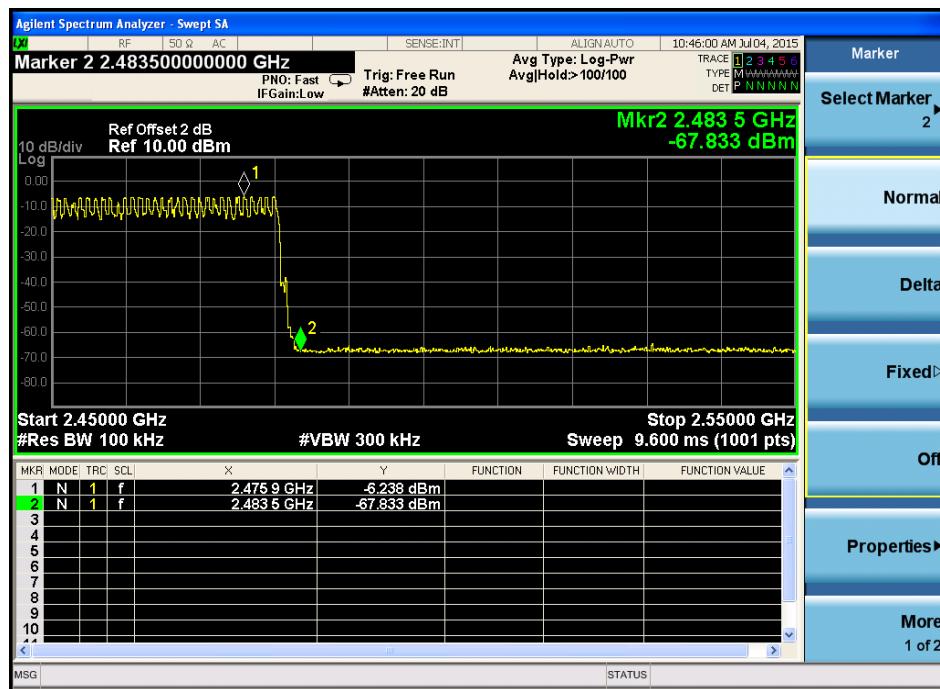




Hopping
Low



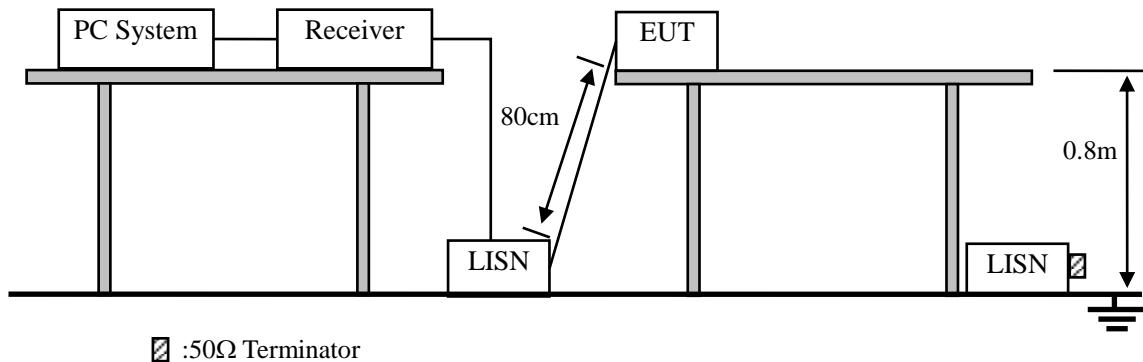
High





10. Power Line Conducted Emissions

10.1. Block Diagram of Test Setup



10.2. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

10.3. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane.
- (2) Setup the EUT and simulator as shown in 10.1
- (3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N2), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4 2014 on conducted Emission test.



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- (4) The bandwidth of test receiver is set at 10KHz.
- (5) The frequency range from 150 KHz to 30MHz is checked.

10.4. Test Result

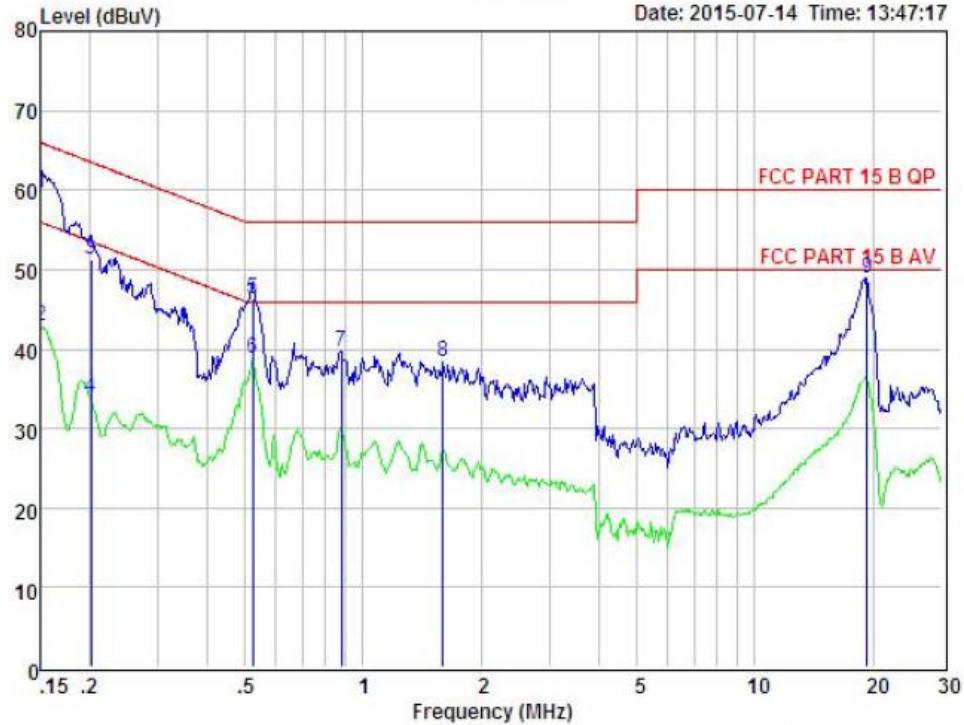
PASS. (See below detailed test data)



Data: 78

File: E:\TEST REPORT\WW\Weixin\拉杆音箱 CE.EM6 (83)

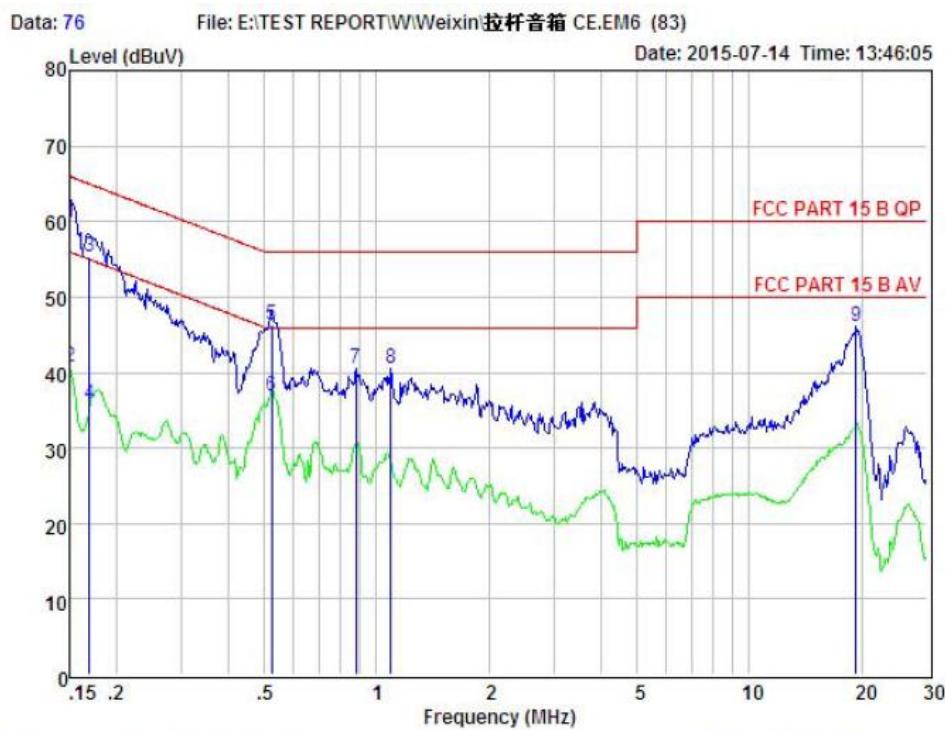
Date: 2015-07-14 Time: 13:47:17



Condition : FCC PART 15 B QP POL: LINE Temp: 24.3°C Hum: 51 %
EUT :
Model No :
Test Mode : BT MODE
Power : AC 120V/60Hz
Test Engineer:
Remark :

Item	Freq	Read	LISN	Preamp	Cable	Level	Limit	Margin	Remark
			Factor	Factor	Loss	dBuV	dBuV	dBuV	
	MHz	dBuV	dB	dB	dB				
1	0.150	49.80	0.03	-9.72	0.10	59.65	66.00	-6.35	QP
2	0.150	33.00	0.03	-9.72	0.10	42.85	56.00	-13.15	Average
3	0.202	41.44	0.03	-9.72	0.10	51.29	63.54	-12.25	QP
4	0.202	24.00	0.03	-9.72	0.10	33.85	53.54	-19.69	Average
5	0.524	36.56	0.03	-9.72	0.10	46.41	56.00	-9.59	QP
6	0.524	29.00	0.03	-9.72	0.10	38.85	46.00	-7.15	Average
7	0.880	29.84	0.04	-9.71	0.10	39.69	56.00	-16.31	Peak
8	1.602	28.43	0.05	-9.71	0.10	38.29	56.00	-17.71	Peak
9	19.326	38.81	0.30	-9.47	0.34	48.92	60.00	-11.08	Peak

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss



Condition : FCC PART 15 B QP POL: NEUTRAL Temp:24.3°C Hum:51 %
EUT :
Model No :
Test Mode : BT MODE
Power : AC 120V/60Hz
Test Engineer:
Remark :

Item	Freq	Read	LISN	Preamp	Cable	Level	Limit		Margin	Remark
							Factor	Factor	Lose	
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	dBuV	
1	0.150	50.06	0.03	-9.72	0.10	59.91	66.00	-6.09		QP
2	0.150	31.00	0.03	-9.72	0.10	40.85	56.00	-15.15		Average
3	0.169	45.57	0.03	-9.72	0.10	55.42	64.99	-9.57		QP
4	0.169	26.00	0.03	-9.72	0.10	35.85	54.99	-19.14		Average
5	0.524	36.43	0.03	-9.72	0.10	46.28	56.00	-9.72		QP
6	0.524	27.00	0.03	-9.72	0.10	36.85	46.00	-9.15		Average
7	0.880	30.73	0.04	-9.71	0.10	40.58	56.00	-15.42		Peak
8	1.094	30.64	0.04	-9.71	0.10	40.49	56.00	-15.51		Peak
9	19.326	35.91	0.30	-9.47	0.34	46.02	60.00	-13.98		Peak

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

Note: If QP Result comply with AV limit, AV Result is deemed to comply with AV limit



11. Antenna Requirements

11.1. Limit

For intentional device, according to 15.247, 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 15.247, 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.

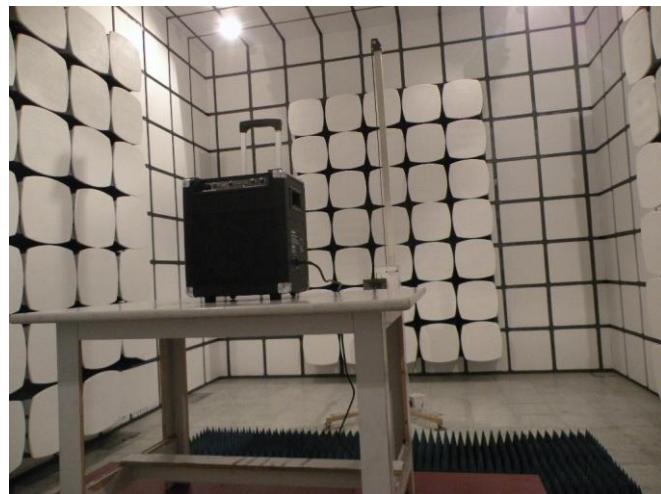
11.2. Result

The antennas used for this product are PCB Antenna for Bluetooth, 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 0dBi .



12. Test setup photo

12.1. Photos of Radiated emission





12.2.Photos of Conducted Emission test





13.Photos of EUT



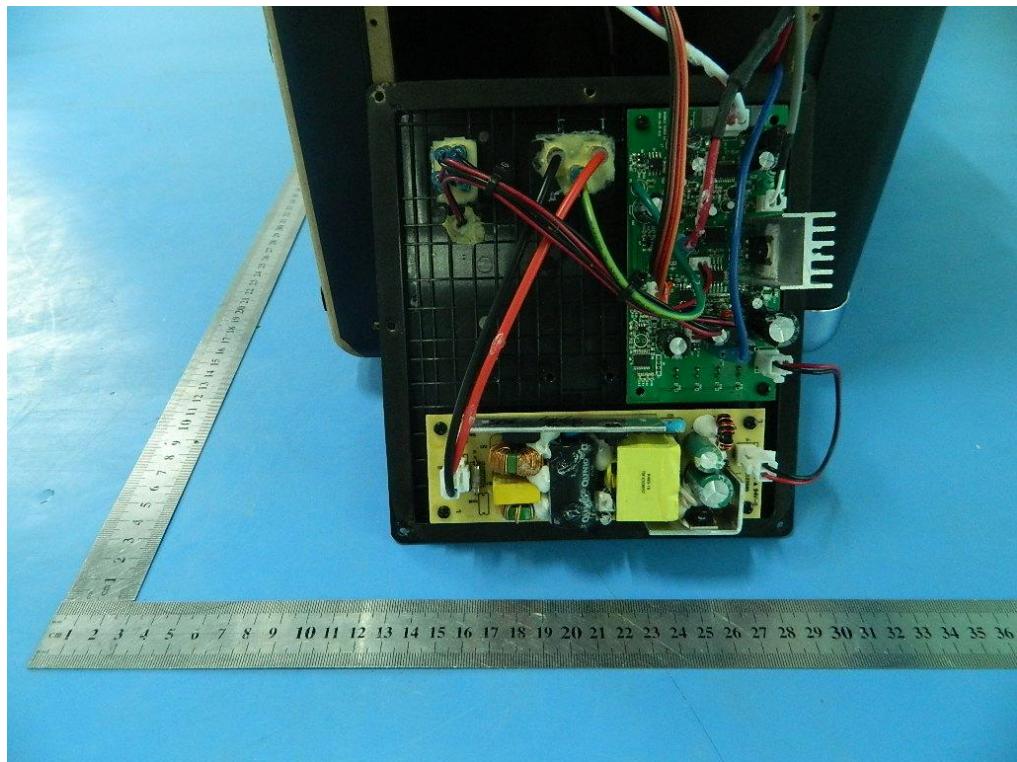


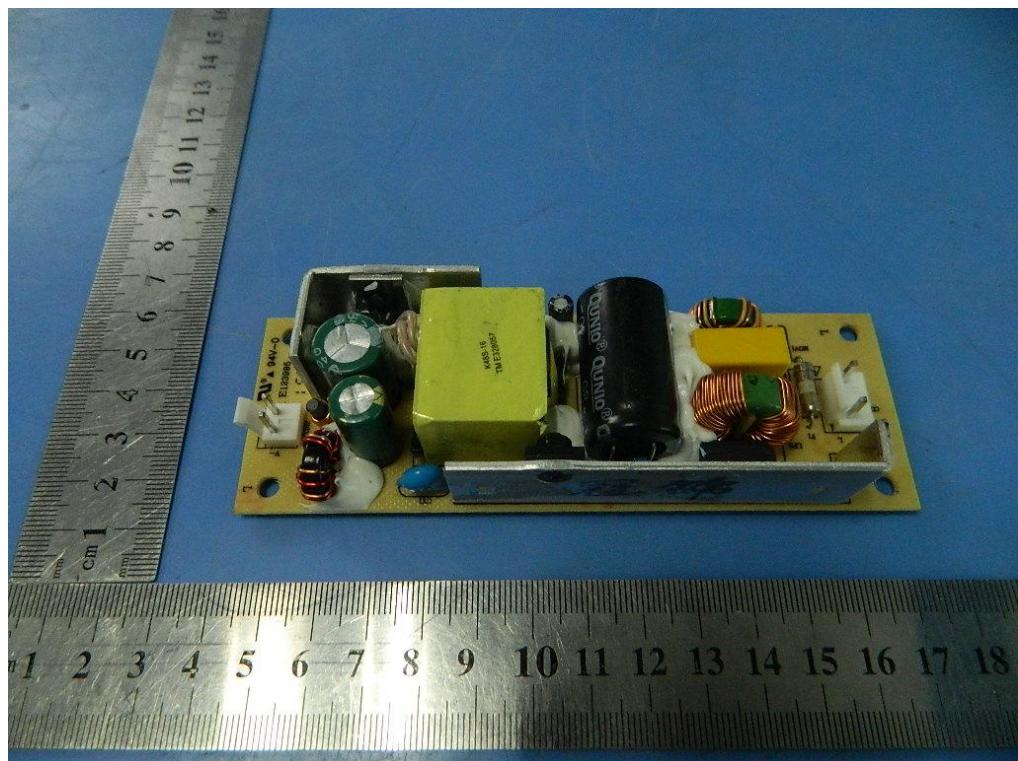


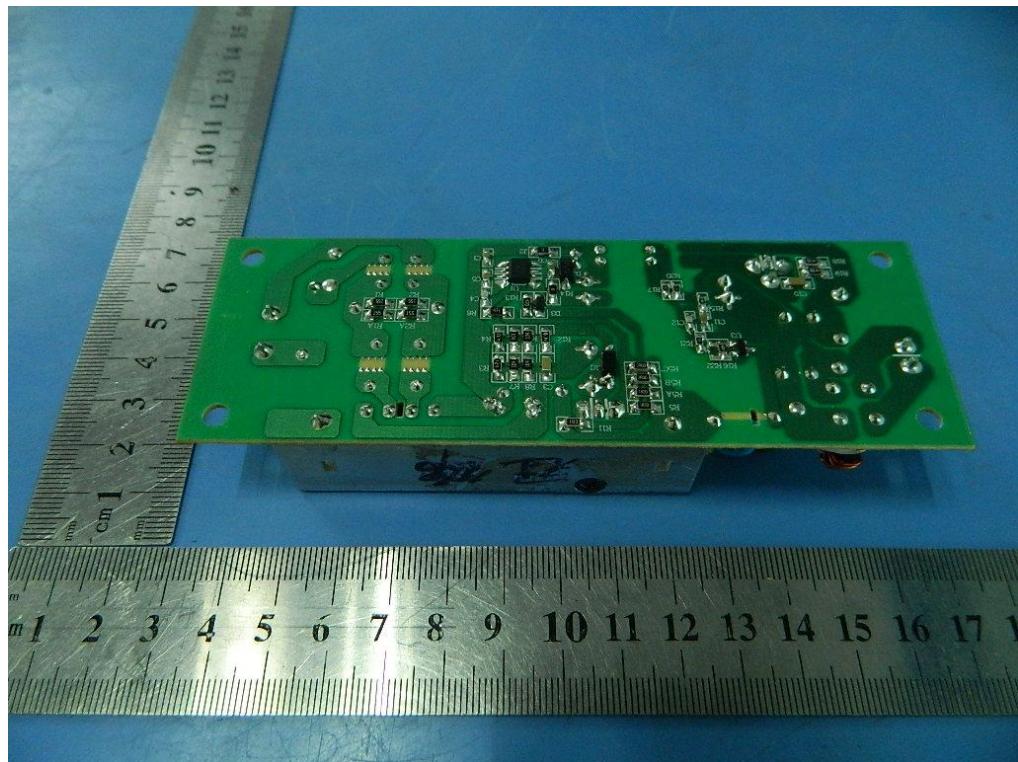


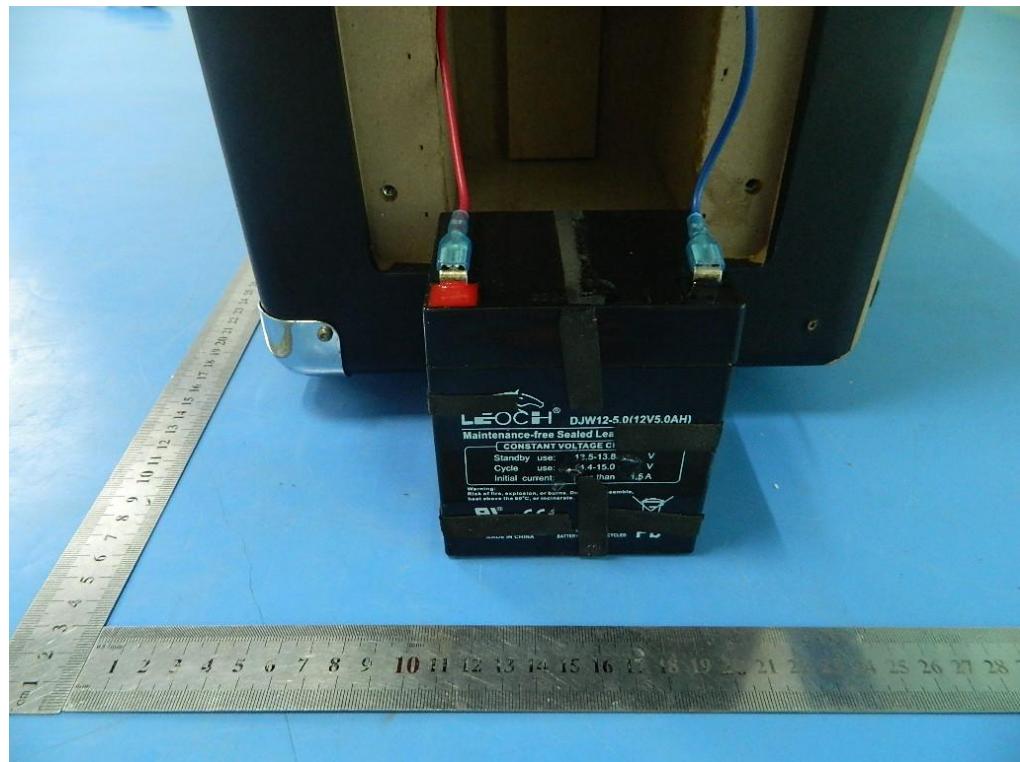


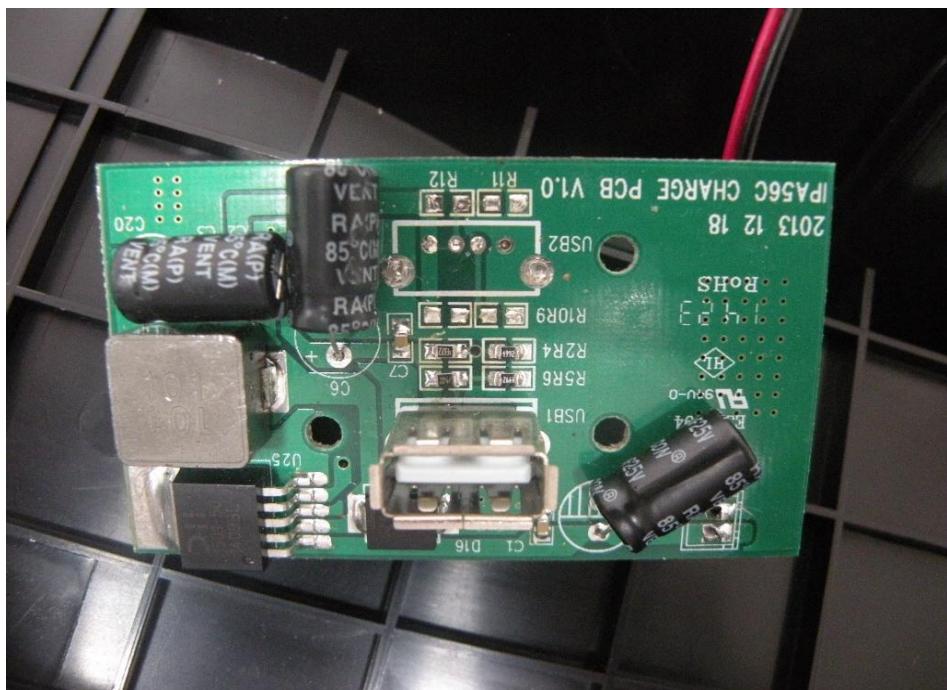
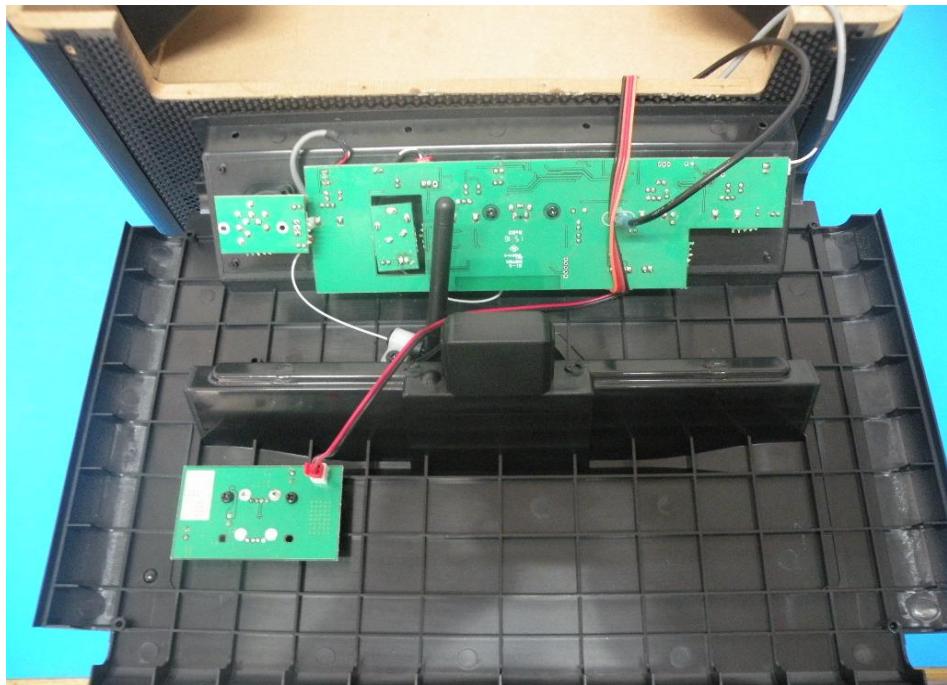


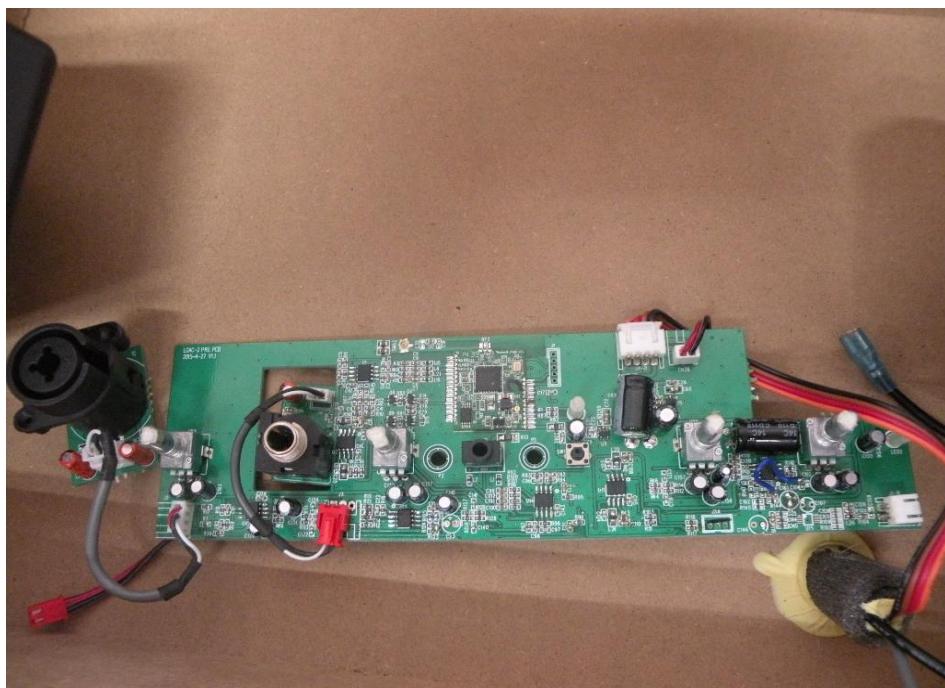
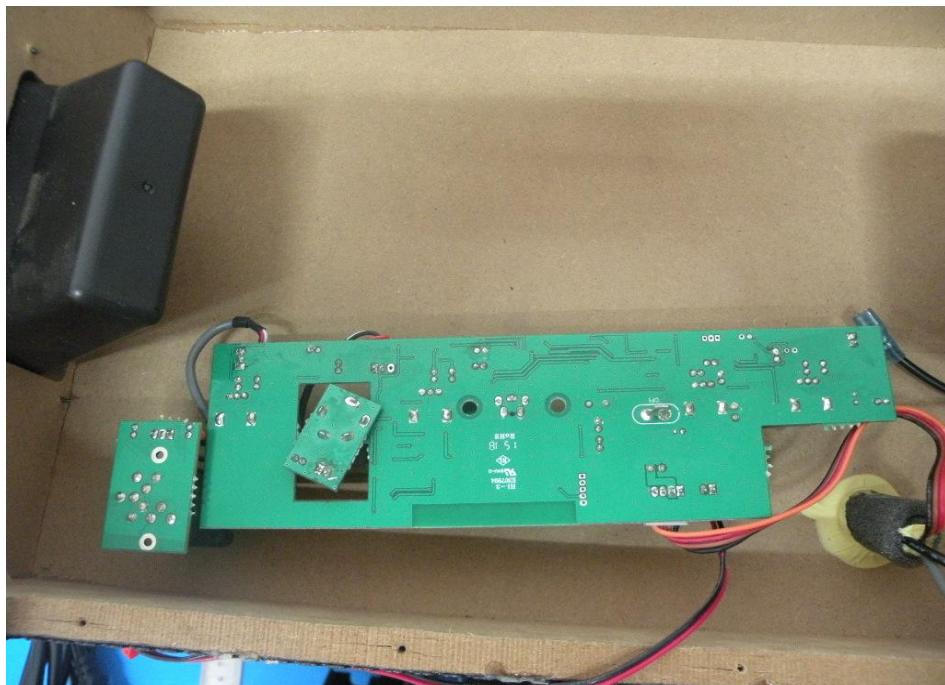












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