TEST REPORT

FCC ID: 2ADW7-MDS

Applicant : ShenZhen SumWard Electronics Co.,LTD
Address : 1st Factory,Hasee industrial park, Beier road, Bantian, Shenzhen

Equipment Under Test (EUT):

Name	:	Bluetooth earphone
Model	:	MDS-800X, MDS-7XXX, MDS-8XXX, MDS-9XXX

In Accordance with: FCC PART 15, SUBPART C : 2014 (Section 15.247)

Report No	:	A1841094 07
Date of Test	:	January 07- January 07, 2015
Date of Issue	:	January 08, 2015
Tset Result	:	PASS

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

Authorized Signature

(Mark Zhu)
General Manager

The manufacture should ensure that all the products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Alpha Product Testing Laboratory Or test done by Alpha Product Testing Laboratory Approvals in connection with, distribution or use of the product described in this report must be approved by Alpha Product Testing Laboratory Approvals in writing.

Contents

1. General Information

1.1. Description of Device (EUT)

EUT	:	Bluetooth earphone
Model No.	:	MDS-800X, MDS-7XXX, MDS-8XXX, MDS-9XXX
DIFF.	:	Only different in Model No, the other the same. The test model: MDS-800X.
Trade mark	:	莫迪·家族 MODY·FAMILY
Power supply	:	DC 3.7V from lithium battery.
Adapter	:	NIL
Radio Technology	:	Bluetooth 3.0+EDR
Operation frequency	:	2402-2480MHz
Modulation	:	GFSK, π /4 DQPSK,8- DPSK
Antenna Type	:	PCB Antenna, max gain 2.8dBi for BT.
Applicant	:	ShenZhen SumWard Electronics Co.,LTD
Address	:	1st Factory,Hasee industrial park, Beier road, Bantian, Shenzhen
Applicant	:	ShenZhen SumWard Electronics Co.,LTD
Address	:	1st Factory,Hasee industrial park, Beier road, Bantian, Shenzhen

1.2. Accessories of device (EUT)

Accessories 1	:	N/A
Type	:	N/A

1.3. Test Lab information

Alpha Product Testing Laboratory
Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road,
Bao'an, Shenzhen, China

August 11, 2014 File on Federal Communication Commission
Registration Number: 203110

July 18, 2014 Certificated by IC
Registration Number: 12135A

2. Summary of test

2.1. Summary of test result

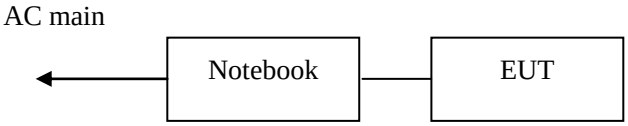
Description of Test Item	Standard	Results
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1) ANSI C63.4 :2003	PASS
Bandwidth	FCC Part 15: 15.215 ANSI C63.4 :2003	PASS
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1) ANSI C63.4 :2003	PASS
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2003	PASS
Dwell Time	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2003	PASS
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.4 :2003	PASS
Band Edge Compliance	FCC Part 15: 15.247(d) ANSI C63.4 :2003	PASS
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.4 :2003	PASS
Antenna requirement	FCC Part 15: 15.203	PASS
Note: Test with the test procedure Airoha.AB1100FamilyLabTestTool.		

2.2. Assistant equipment used for test

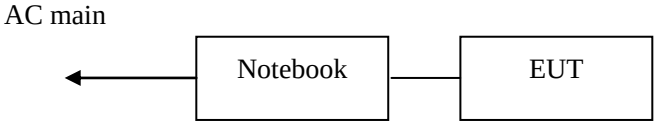
Description	:	Test PC, Notebook
Manufacturer	:	Dell
Model No.	:	D430
Input	:	AC100-230V, 50/60Hz

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 adb.exe software before test.



2, For Power Line Conducted Emissions Test: EUT was connected to notebook by 1m USB line



2.4. Test mode

Test methodology: Test had been referenced to the DA 00-705
The test software "CSR.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)
π /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℃
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℃	
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	2015.01.19	1Year
Spectrum analyzer	Agilent	E4407B	MY49510055	2015.01.19	1Year
Receiver	R&S	ESCI	101165	2015.01.19	1Year
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2016.01.21	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2016.01.21	2Year
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170 D(1432)	2016.01.21	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2015.01.19	1Year
Cable	Resenberger	SUCOFLEX 104	MY6562/4	2015.01.19	1Year
Cable	Resenberger	SUCOFLEX 104	309972/4	2015.01.19	1Year
Cable	Resenberger	SUCOFLEX 104	329112/4	2015.01.19	1Year
Power Meter	Anritsu	ML2487A	6K00001491	2015.01.19	1Year
Power sensor	Anritsu	ML2491A	32516	2015.01.19	1Year
Pre-amplifier	SCHWARZBECK	BBV9743	9743-019	2015.01.19	1Year
Pre-amplifier	Quietek	AP-180C	CHM-0602012	2015.01.19	1Year
Test Receiver	Rohde & Schwarz	ESCI	101165	2015.01.19	1 Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2015.01.19	1 Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2015.01.19	1 Year

3. Maximum Peak Output power

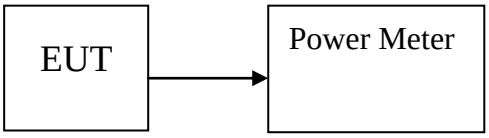
3.1. Limit

Please refer section15.247.
For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W

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: Bluetooth earphone M/N: MDS-800X					
Test date: 2015-01-07		Test site: RF site Tested by: Peter			
Mode	Freq (MHz)	PK Output Power (dBm)	PK Output Power (mW)	Limit (dBm)	Result
GFSK	2402	-1.53	0.70	21.00	Pass
	2441	-1.57	0.70	21.00	Pass
	2480	-1.43	0.72	21.00	Pass
π /4 DQPSK,	2402	-2.09	0.62	21.00	Pass
	2441	-2.13	0.61	21.00	Pass
	2480	-2.22	0.60	21.00	Pass
8- DPSK	2402	-2.54	0.56	21.00	Pass
	2441	-2.56	0.55	21.00	Pass
	2480	-2.68	0.54	21.00	Pass
Conclusion: PASS					

4. Bandwidth

4.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.2. Test Procedure

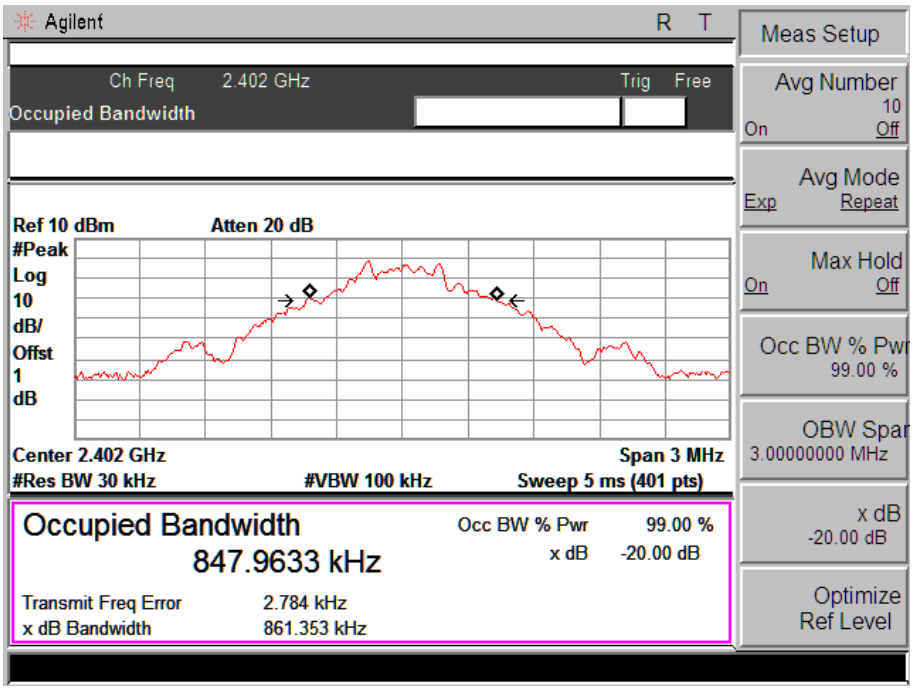
The transmitter output was coupled to a spectrum analyzer via a antenna. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

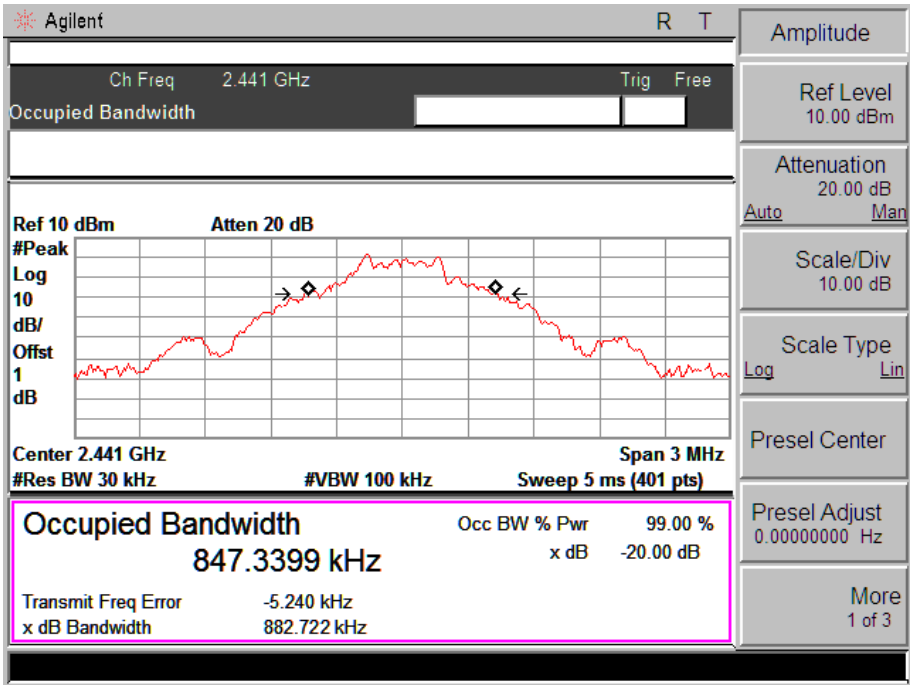
4.3. Test Result

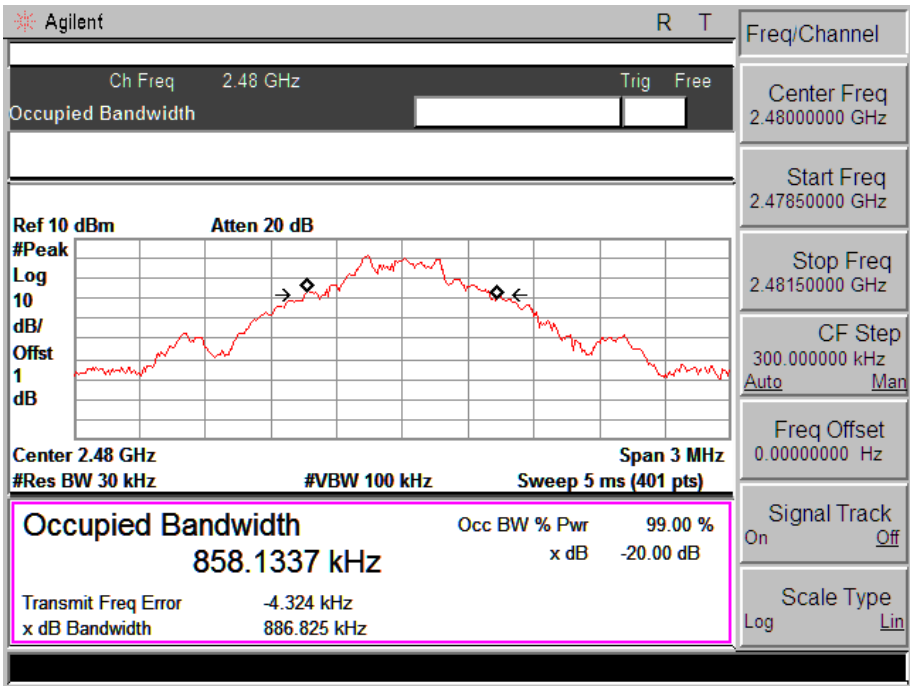
EUT: Bluetooth earphone M/N: MDS-800X				
Test date: 2015-01-07	Test site: RF site Tested by: Peter			
Mode	Freq (MHz)	20dB Bandwidth (MHz)	Limit (kHz)	Conclusion
GFSK	2402	0.861	/	PASS
	2441	0.883	/	PASS
	2480	0.887	/	PASS
π /4 DQPSK	2402	1.225	/	PASS
	2441	1.224	/	PASS
	2480	1.232	/	PASS
8- DPSK	2402	1.241	/	PASS
	2441	1.227	/	PASS
	2480	1.252	/	PASS

Orginal Test data For 20dB bandwidth

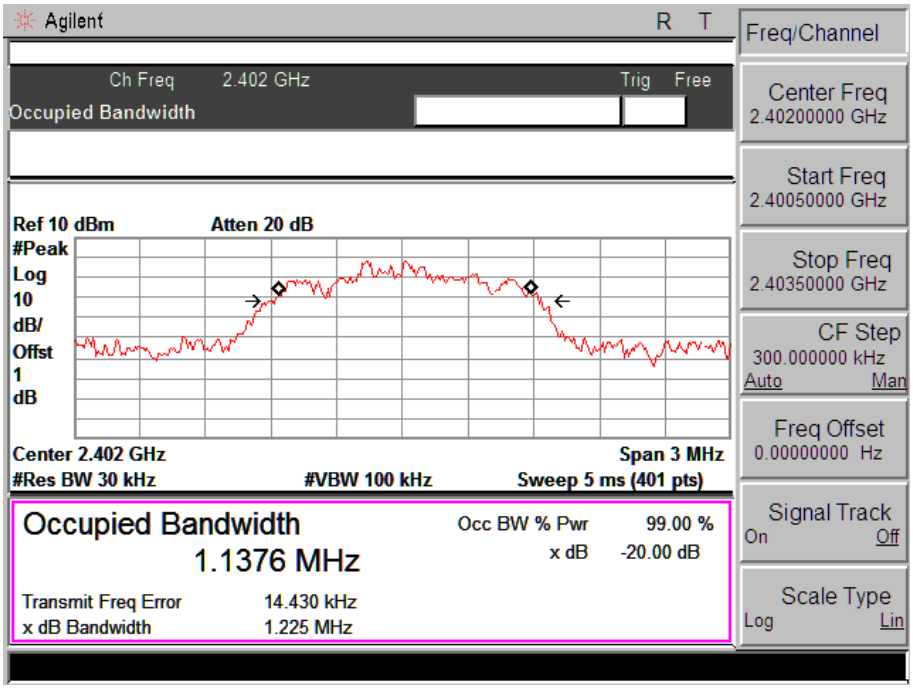
GFSK:

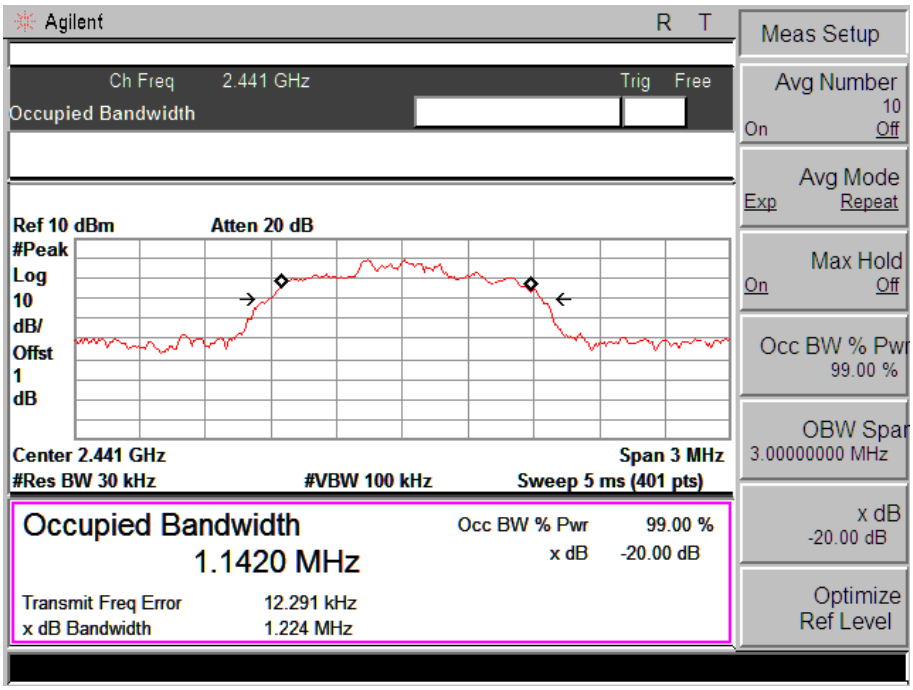


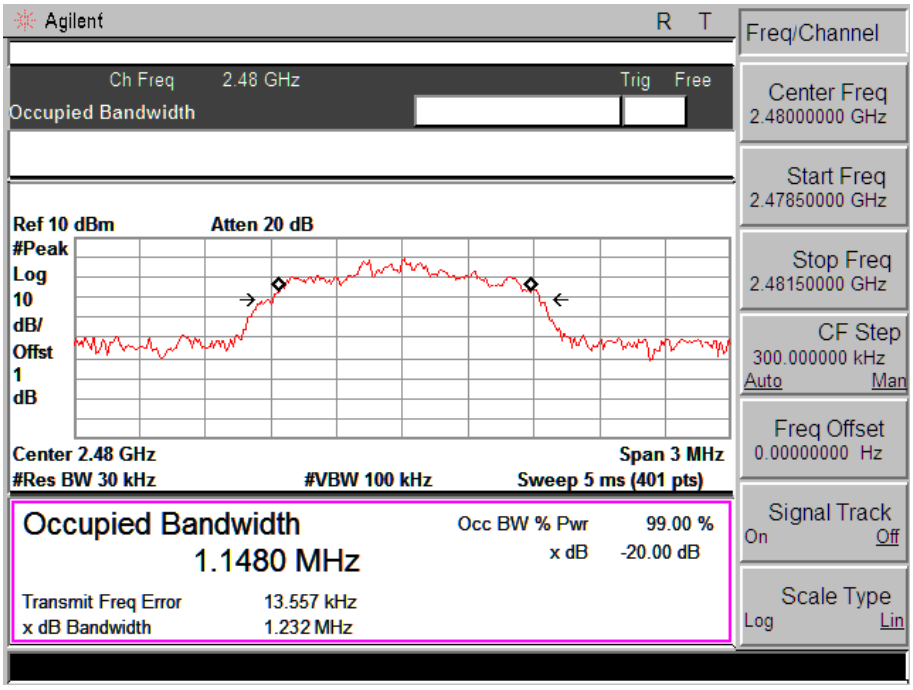



Agilent
R T
Ch Freq 2.48 GHz
Trig Free
Occupied Bandwidth
Ref 10 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
1
dB
Center 2.48 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
858.1337 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error -4.324 kHz
x dB Bandwidth 886.825 kHz
Freq/Channel
Center Freq
2.48000000 GHz
Start Freq
2.47850000 GHz
Stop Freq
2.48150000 GHz
CF Step
300.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

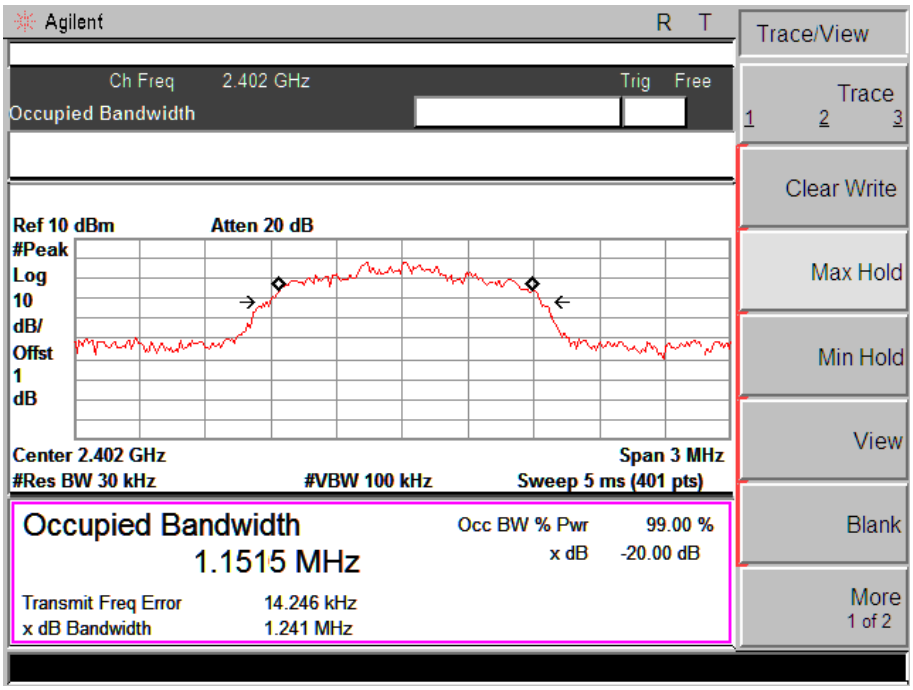
π /4 DQPSK:

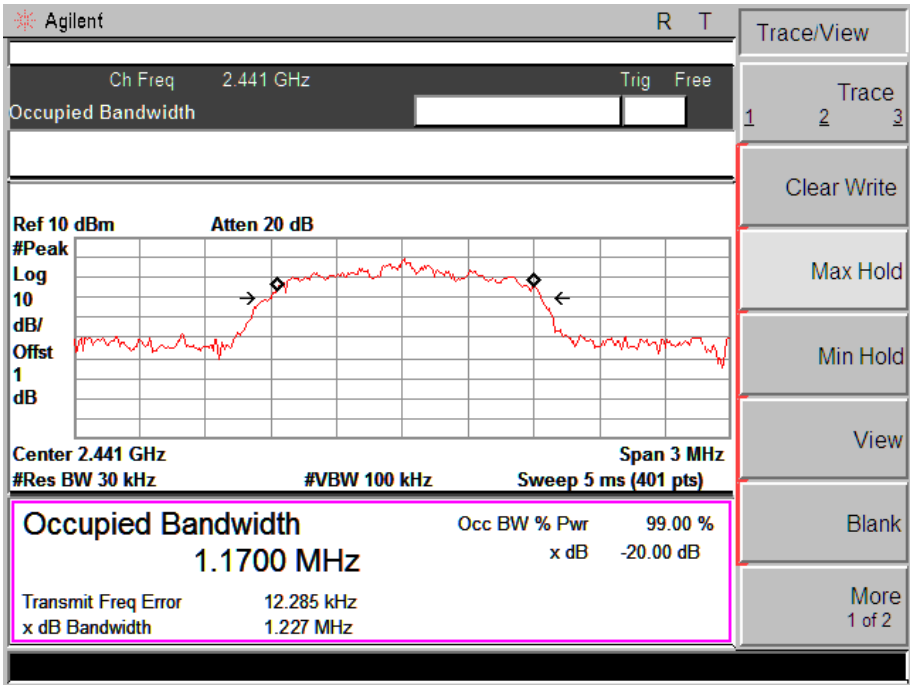

Agilent
R T
Ch Freq 2.402 GHz
Trig Free
Occupied Bandwidth
Ref 10 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
1
dB
Center 2.402 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
1.1376 MHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 14.430 kHz
x dB Bandwidth 1.225 MHz
Freq/Channel
Center Freq
2.40200000 GHz
Start Freq
2.40050000 GHz
Stop Freq
2.40350000 GHz
CF Step
300.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

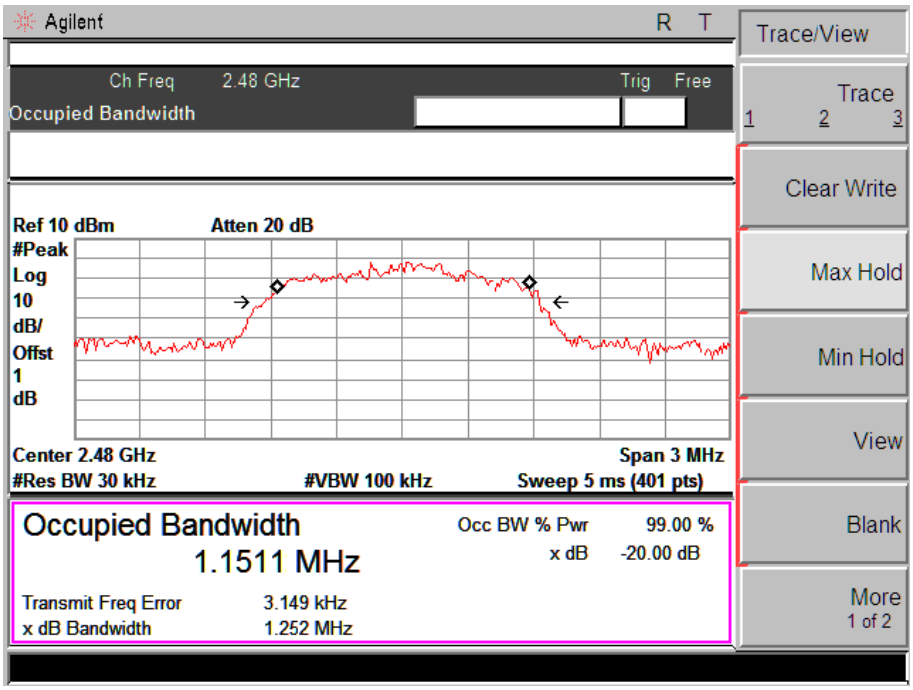

Agilent
R T
Ch Freq 2.441 GHz
Trig Free
Occupied Bandwidth
Ref 10 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
1
dB
Center 2.441 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
1.1420 MHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 12.291 kHz
x dB Bandwidth 1.224 MHz
Meas Setup
Avg Number
10
On Off
Avg Mode
Exp Repeat
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
3.00000000 MHz
x dB
-20.00 dB
Optimize
Ref Level


Agilent
R T
Ch Freq 2.48 GHz
Trig Free
Occupied Bandwidth
Ref 10 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
1
dB
Center 2.48 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
1.1480 MHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 13.557 kHz
x dB Bandwidth 1.232 MHz
Freq/Channel
Center Freq
2.48000000 GHz
Start Freq
2.47850000 GHz
Stop Freq
2.48150000 GHz
CF Step
300.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

8- DPSK


Agilent
R T
Trace/View
Ch Freq 2.402 GHz
Trig Free
Occupied Bandwidth
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Ref 10 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
1
dB
Center 2.402 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
1.1515 MHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 14.246 kHz
x dB Bandwidth 1.241 MHz


Agilent
R T
Trace/View
Ch Freq 2.441 GHz
Trig Free
Occupied Bandwidth
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Ref 10 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
1
dB
Center 2.441 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
1.1700 MHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 12.285 kHz
x dB Bandwidth 1.227 MHz


Agilent
R T
Ch Freq 2.48 GHz
Trig Free
Occupied Bandwidth
Ref 10 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
1
dB
Center 2.48 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
1.1511 MHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 3.149 kHz
x dB Bandwidth 1.252 MHz
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

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

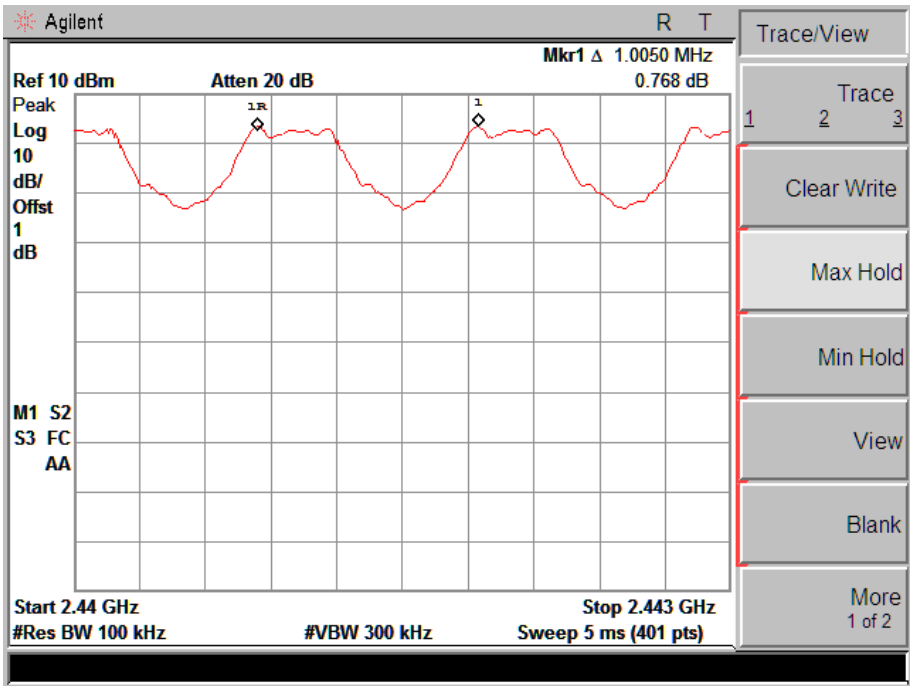
The transmitter output was coupled to a spectrum analyzer via a antenna. The carrier frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW.

5.3. Test Result

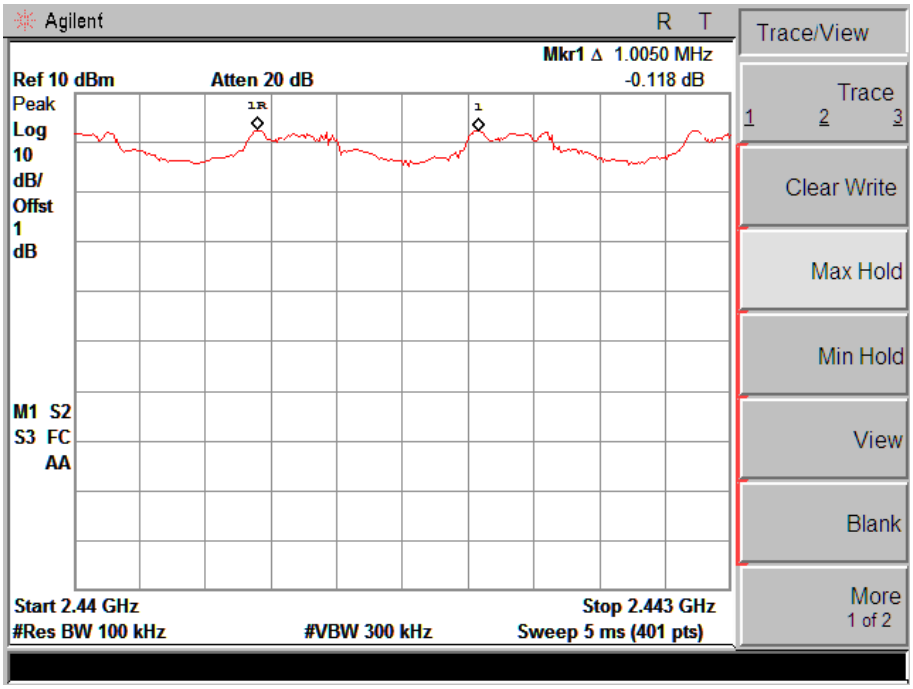
EUT: Bluetooth earphone M/N: MDS-800X				
Test date: 2015-01-07		Test site: RF site	Tested by: Simple	
Mode/Channel	Channel separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz) 2/3 20dB bandwidth	Conclusion
GFSK	1.005	0.883	0.59	PASS
π /4 DQPSK	1.005	1.224	0.82	PASS
8- DPSK	1.005	1.227	0.82	PASS

Orginal test data for channel separation

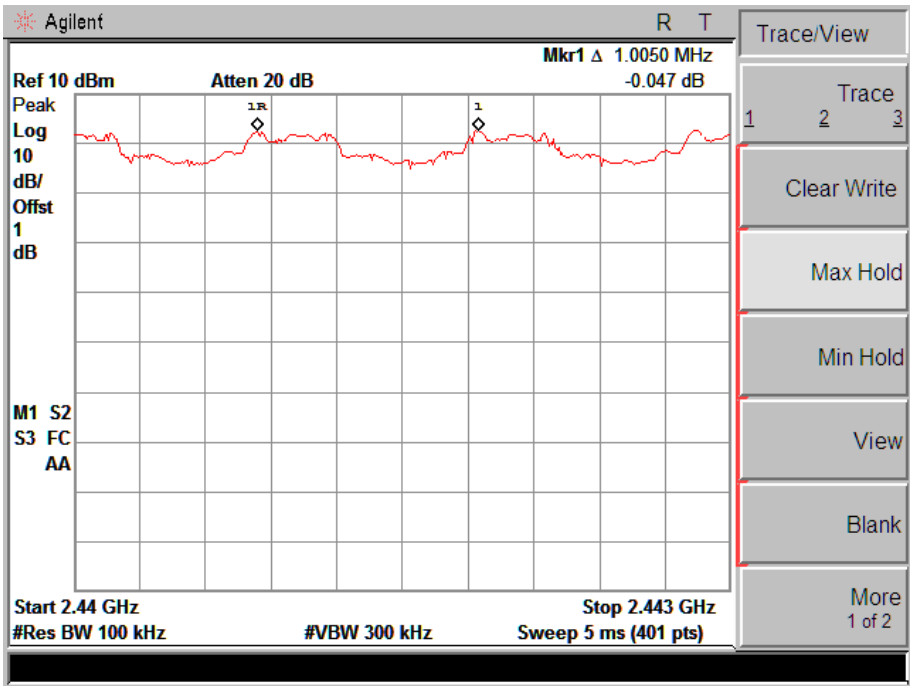
GFSK



π/4 DQPSK



8- DPSK


Agilent
R T
Mkr1 Δ 1.0050 MHz
-0.047 dB
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
Offst
1
dB
1R
1
M1 S2
S3 FC
AA
Start 2.44 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.443 GHz
Sweep 5 ms (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

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

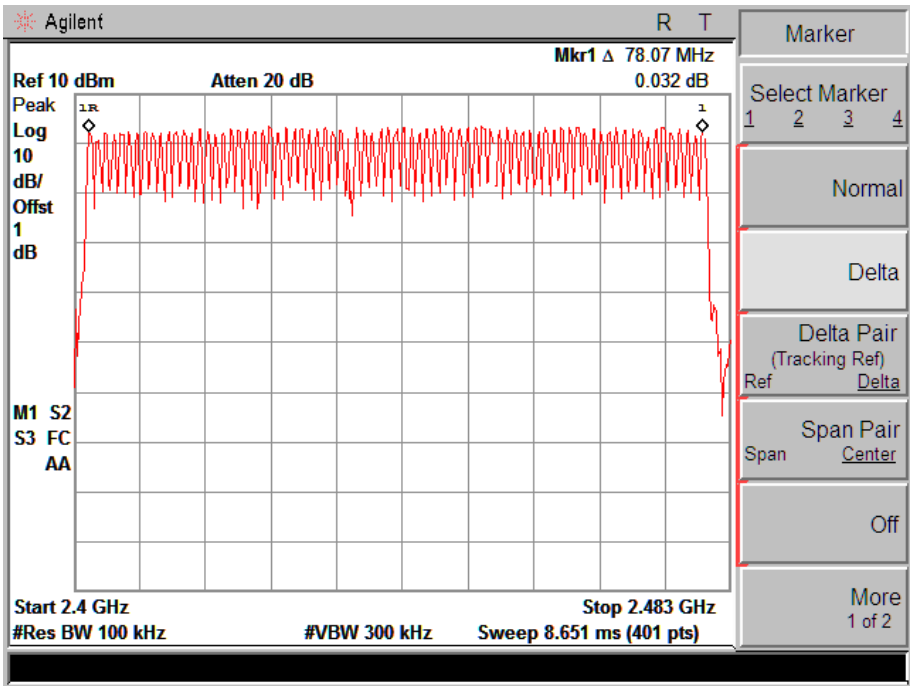
The transmitter output was coupled to a spectrum analyzer via a antenna. The number of hopping channel was measured by spectrum analyzer with 100kHz RBW and 300KHz VBW.

6.3. Test Result

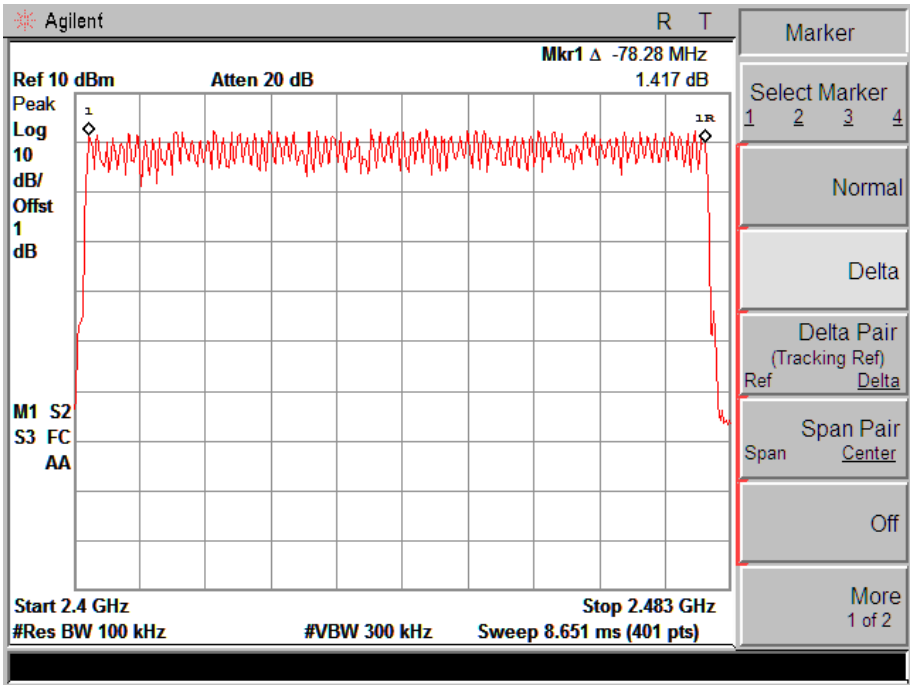
EUT: Bluetooth earphone M/N: MDS-800X			
Test date: 2015-01-07	Test site: RF site	Tested by: Peter	
Mode	Number of hopping channel	Limit	Conclusion
GFSK	79	>15	PASS
π /4 DQPSK	79	>15	PASS
8- DPSK	79	>15	PASS

Original test data for hopping channel number

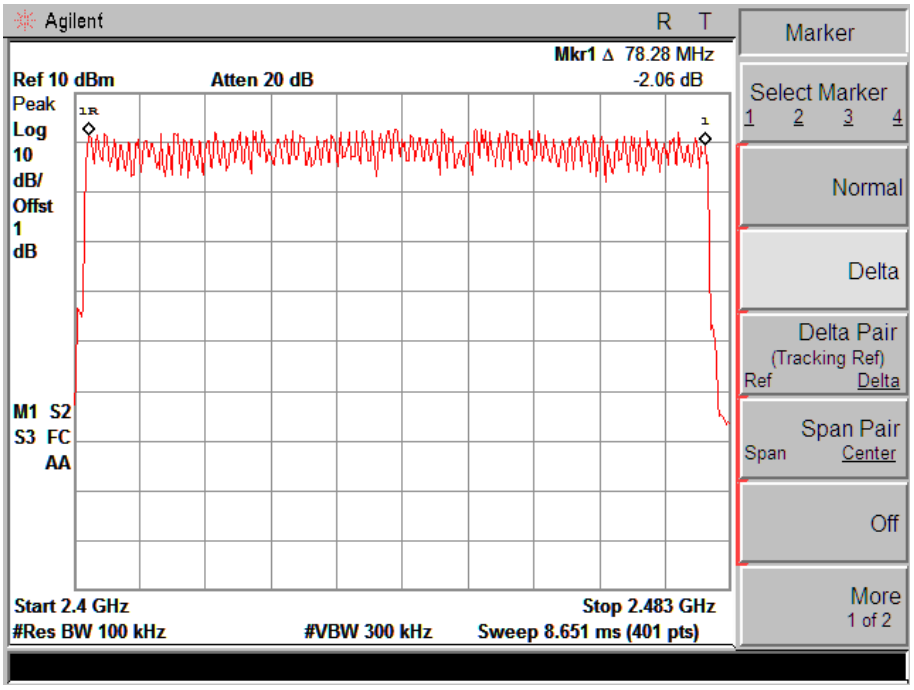
GFSK



π /4 DQPSK



8- DQPSK


Agilent
R T
Mkr1 Δ 78.28 MHz
-2.06 dB
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
Offst
1
dB
1R
1
M1 S2
S3 FC
AA
Start 2.4 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.483 GHz
Sweep 8.651 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

7. Dwell Time

7.1. Test limit

Please refer section15.247

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 sec- onds multiplied by the number of hopping channel employed.

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

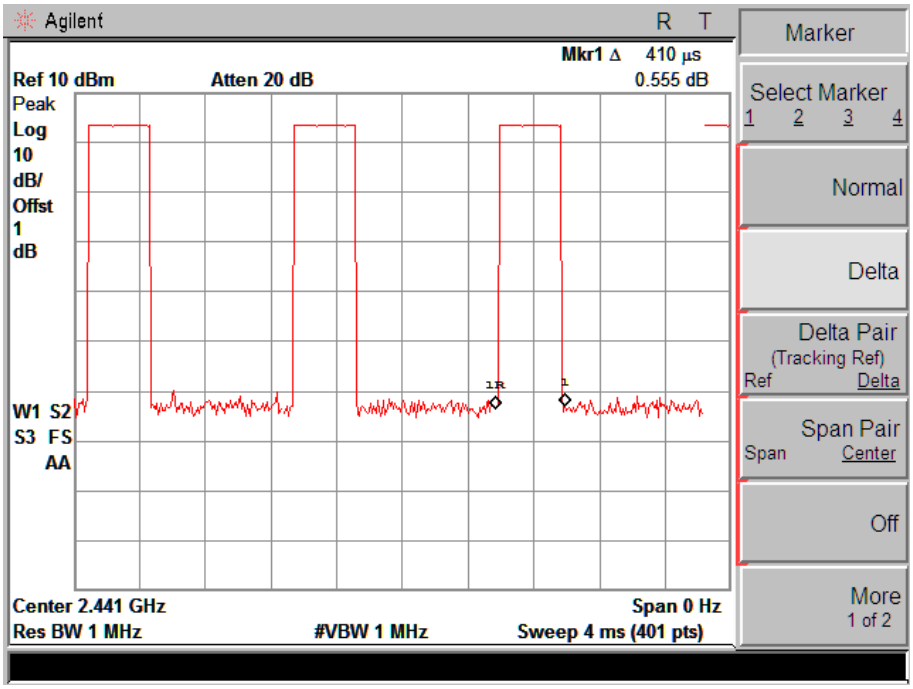
PASS.

Detailed information please see the following page.

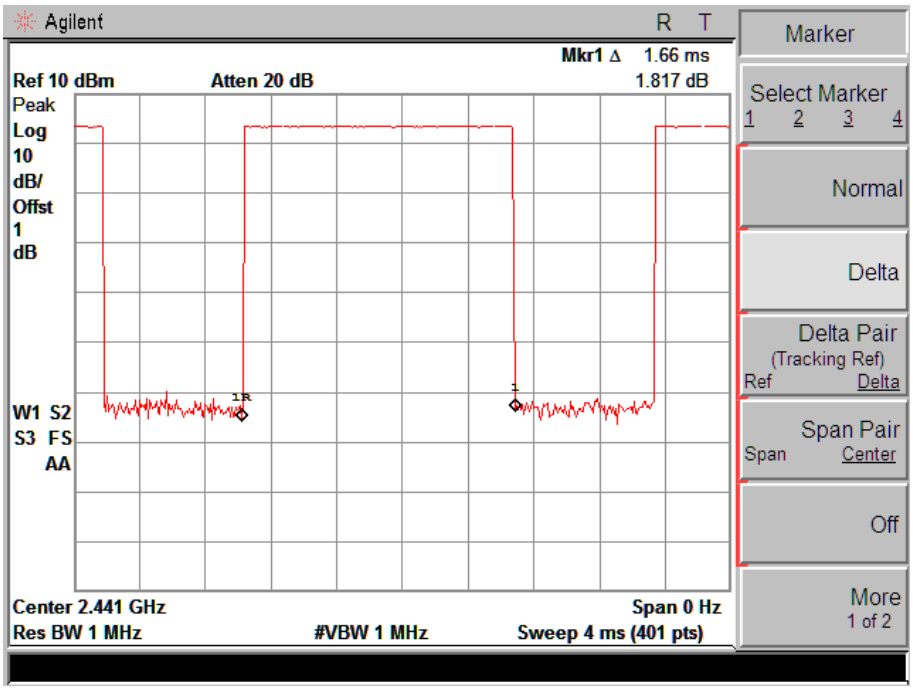
EUT: Bluetooth earphone M/N: MDS-800X						
Test date: 2015-01-07		Test site: RF site		Tested by: Peter		
Mode	Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Conclusion
GFSK	DH1	2441	0.41	0.262	<0.4	PASS
	DH3	2441	1.66	0.354	<0.4	PASS
	DH5	2441	2.94	0.376	<0.4	PASS
π /4 DQPSK	DH1	2441	0.41	0.262	<0.4	PASS
	DH3	2441	1.67	0.356	<0.4	PASS
	DH5	2441	2.94	0.376	<0.4	PASS
8-DQPSK	DH1	2441	0.4	0.256	<0.4	PASS
	DH3	2441	1.66	0.354	<0.4	PASS
	DH5	2441	2.95	0.378	<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

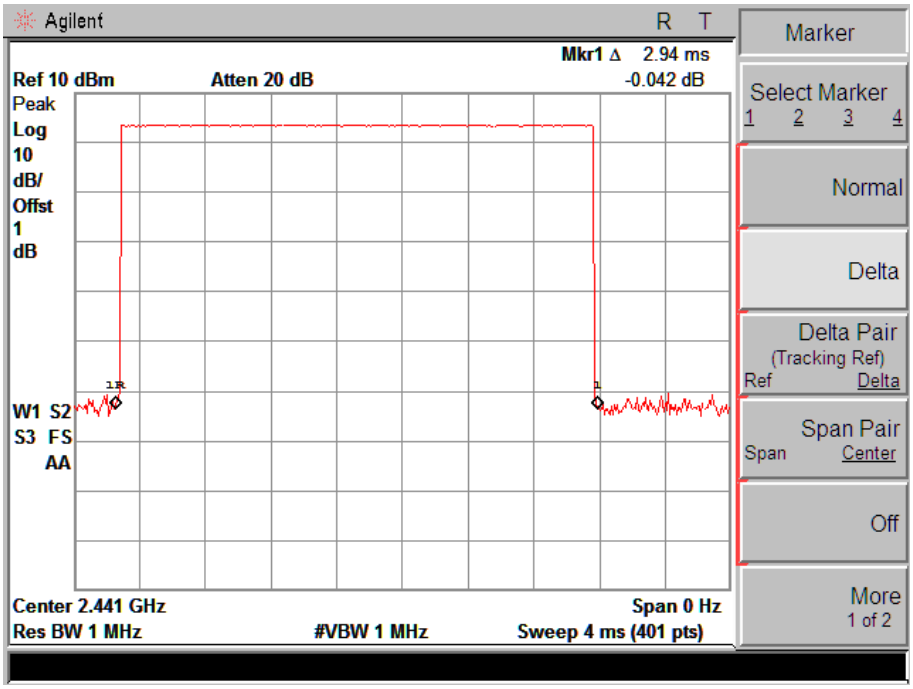
DH1:



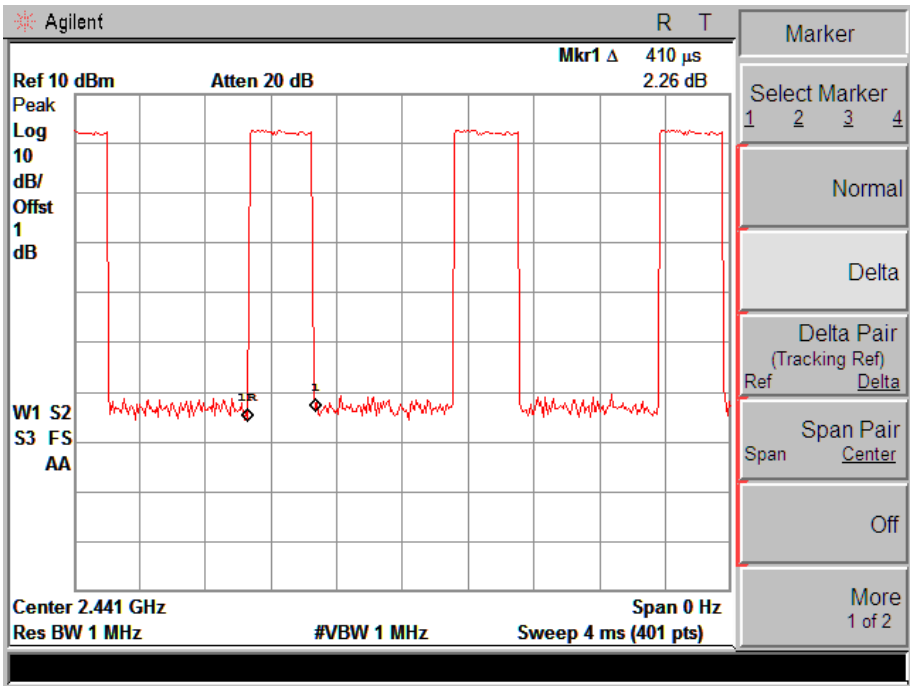
DH3:


Agilent
R T
Mkr1 Δ 1.66 ms
Ref 10 dBm
Atten 20 dB
1.817 dB
Peak
Log
10
dB/
Offst
1
dB
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 1 MHz
#VBW 1 MHz
Span 0 Hz
Sweep 4 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

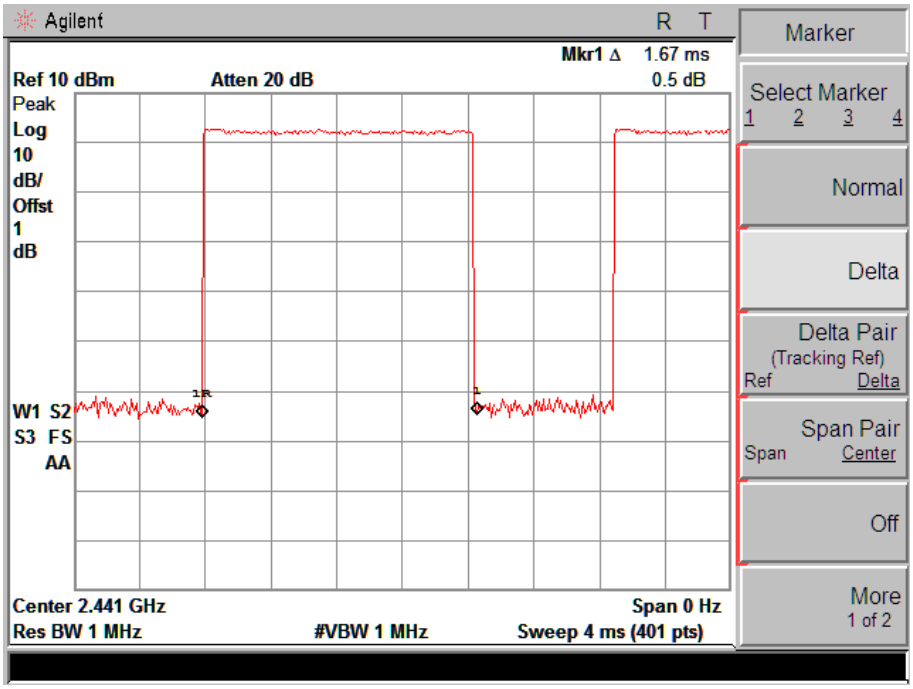
DH5


Agilent
R T
Mkr1 Δ 2.94 ms
Ref 10 dBm
Atten 20 dB
-0.042 dB
Peak
Log
10
dB/
Offst
1
dB
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 1 MHz
#VBW 1 MHz
Span 0 Hz
Sweep 4 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

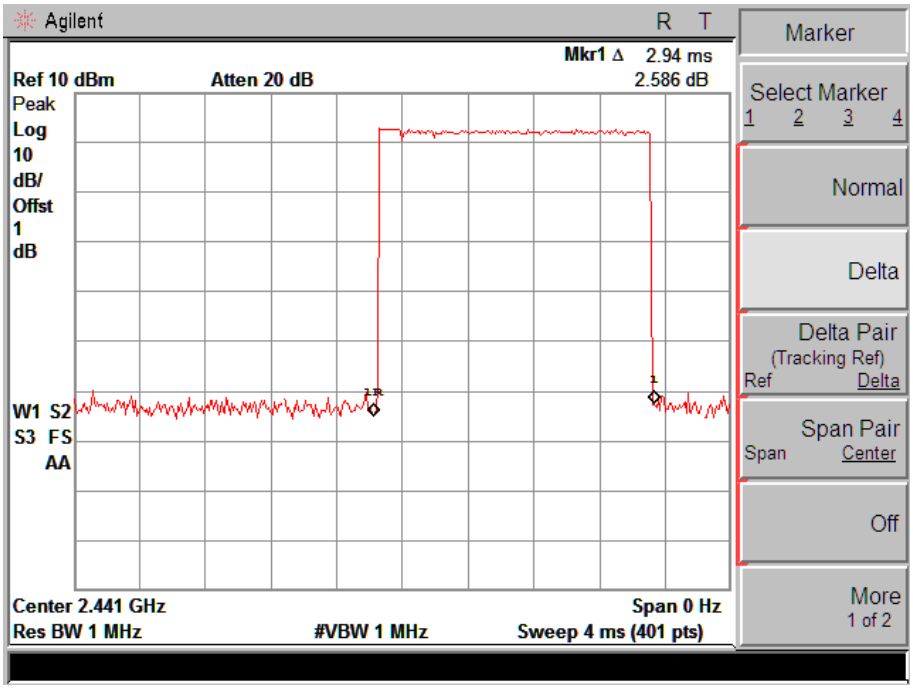
π /4 DQPSK
DH1



DH3

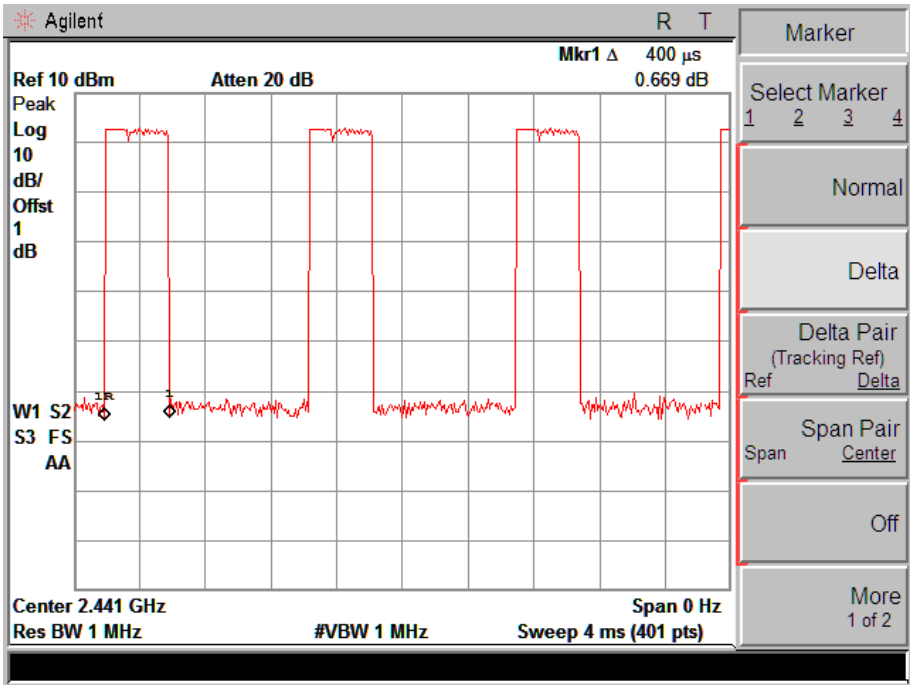


DH5

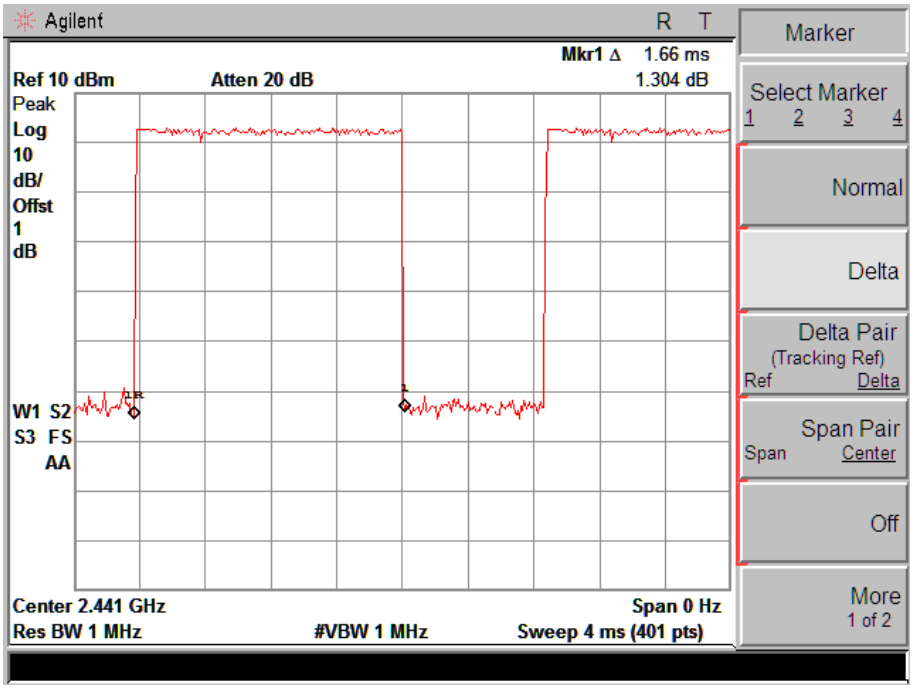


8- DQPSK

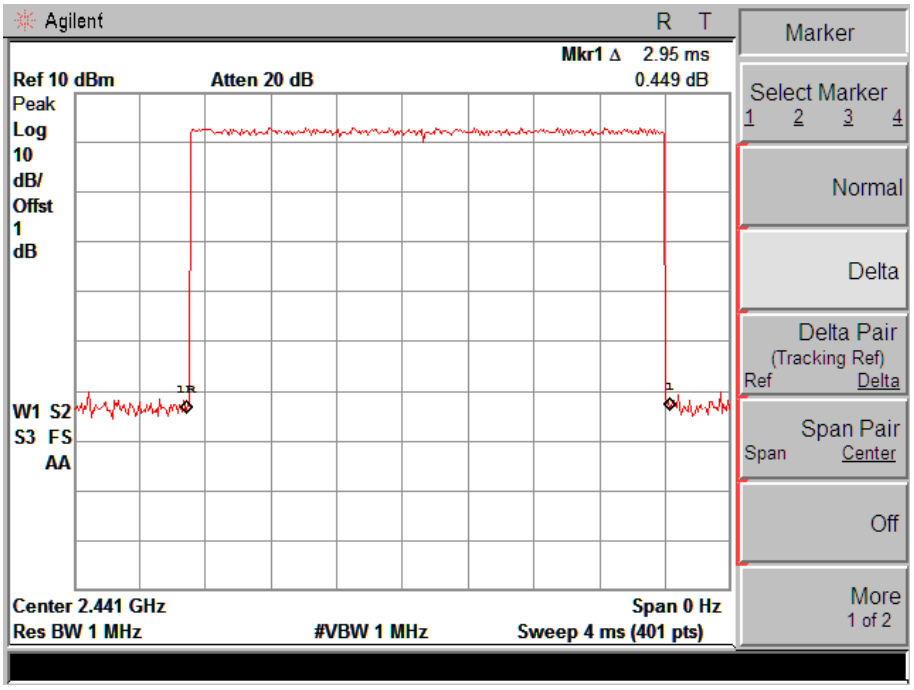
DH1



DH3


Agilent
R T
Mkr1 Δ 1.66 ms
1.304 dB
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
Offst
1
dB
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 1 MHz
#VBW 1 MHz
Span 0 Hz
Sweep 4 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

DH5


Agilent
R T
Mkr1 Δ 2.95 ms
0.449 dB
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
Offst
1
dB
W1 S2
S3 FS
AA
Center 2.441 GHz
Res BW 1 MHz
#VBW 1 MHz
Span 0 Hz
Sweep 4 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

8. Radiated emissions

8.1. Limit

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.

15.205 Restricted frequency band

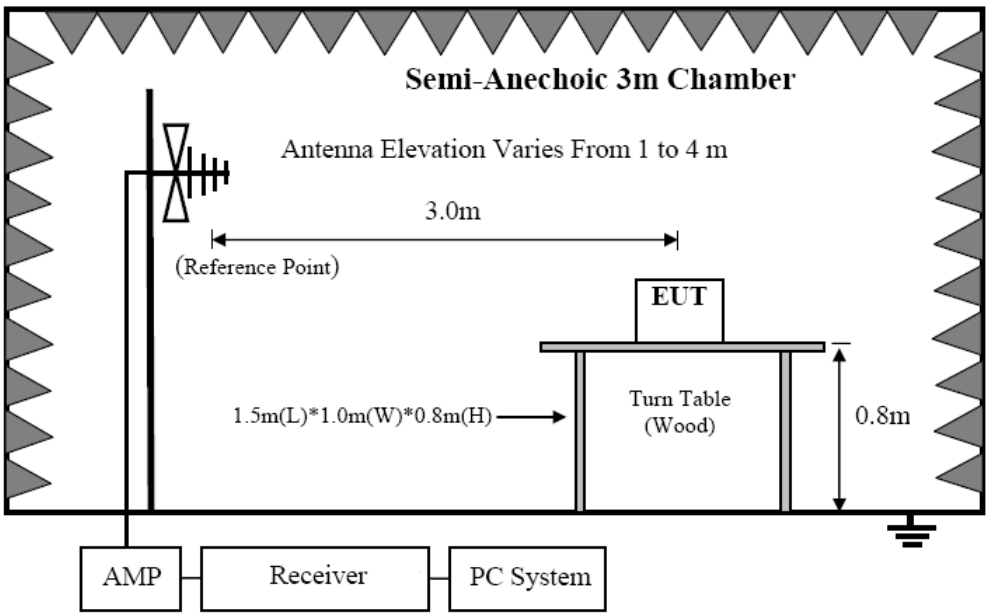
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 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])

15.209 Limit

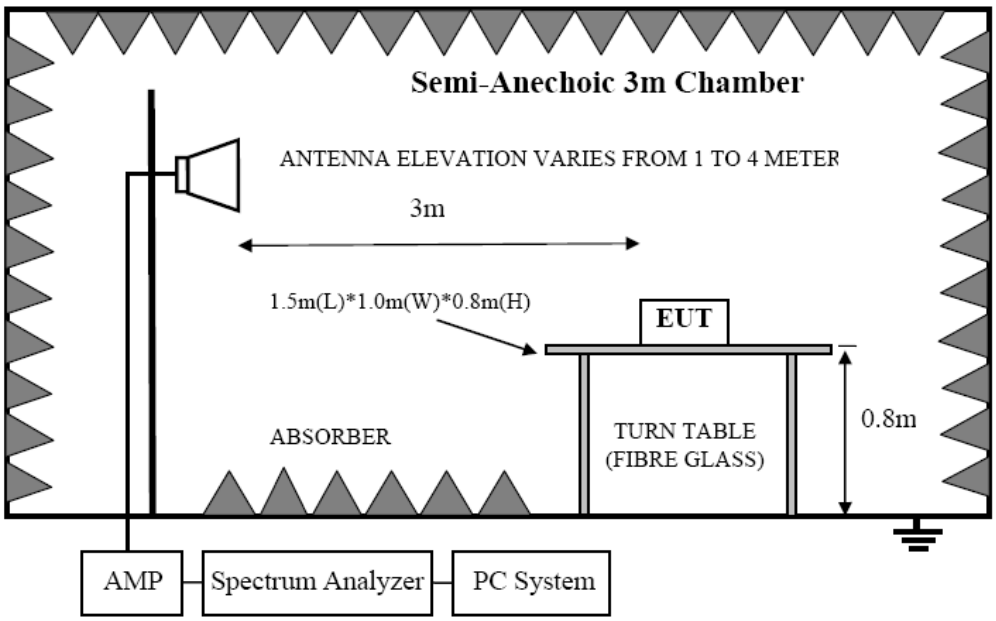
FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

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 2003 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.

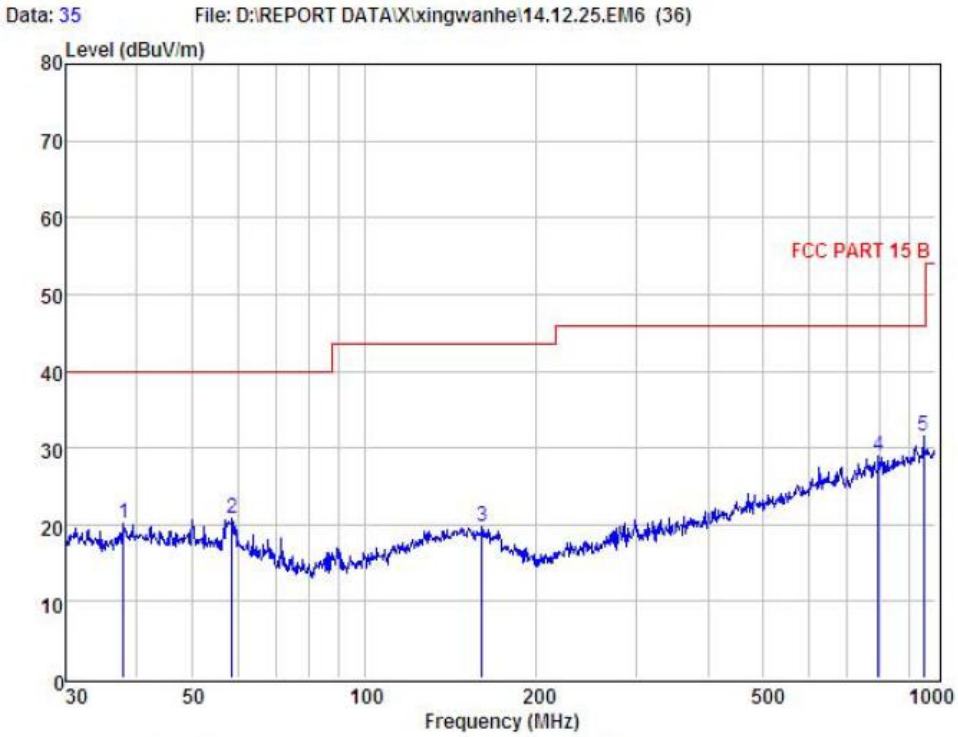
8.4. Test Result

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



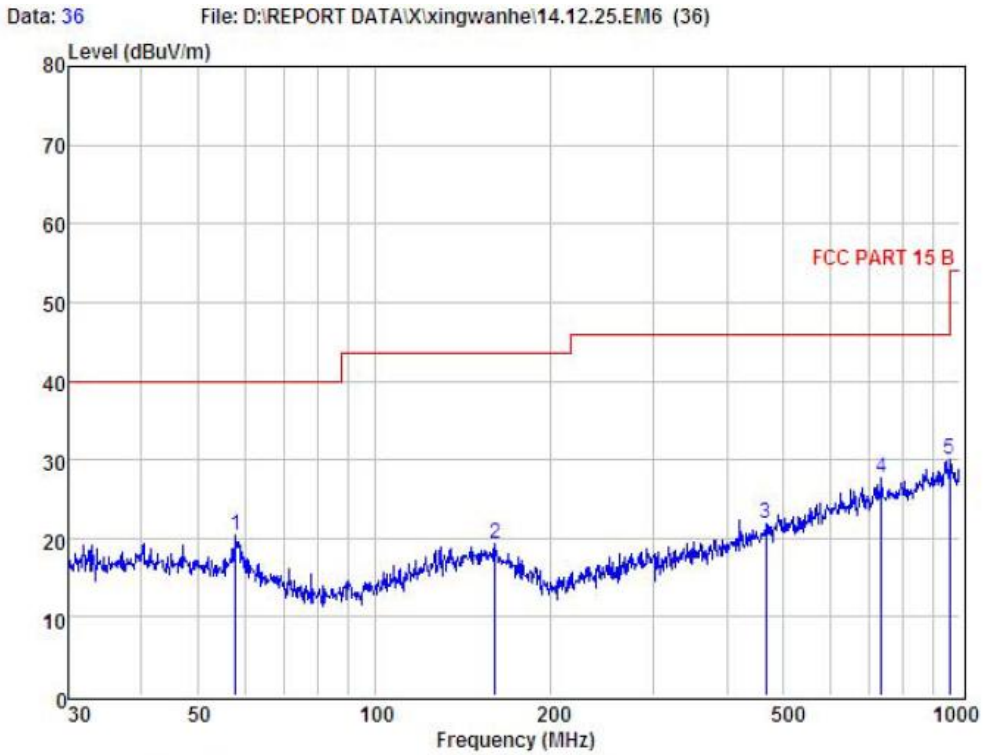
Condition : FCC PART 15 B 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode :
Power : DC 5V With PC AC 120V/60Hz
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	37.94	39.22	13.73	32.86	0.08	20.17	40.00	-19.83	
2	58.61	40.55	12.75	32.73	0.23	20.80	40.00	-19.20	
3	160.91	37.99	14.14	32.81	0.46	19.78	43.50	-23.72	
4	793.40	38.84	20.66	31.92	1.35	28.93	46.00	-17.07	
5	952.09	39.08	22.15	31.78	1.99	31.44	46.00	-14.56	

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

Remark1: All modes have been tested, and only worst data of GFSK mode, Channel 2402MHz was listed in this report.

Remark2: Test for all x, y, z axes is performed and only the worst case of y axes was recorded in the test report.



Condition : FCC PART 15 B 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode :
Power : DC 5V With PC AC 120V/60Hz
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	58.00	39.86	12.91	32.73	0.23	20.27	40.00	-19.73	
2	160.91	37.55	14.14	32.81	0.46	19.34	43.50	-24.16	
3	465.60	36.87	16.11	31.93	0.88	21.93	46.00	-24.07	
4	734.49	38.17	20.09	31.84	1.30	27.72	46.00	-18.28	
5	958.79	37.76	22.16	31.79	1.97	30.10	46.00	-15.90	

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

Remark1: All modes have been tested, and only worst data of GFSK mode, Channel 2402MHz was listed in this report.

Remark2: Test for all x, y, z axes is performed and only the worst case of y axes was recorded in the test report.

1GHz—25GHz Radiated emissison 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: GFSK Tx CH1 2402MHz									
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	4804	45.5	33.95	10.18	34.26	55.37	74	18.63	PK
2	4804	34.88	33.95	10.18	34.26	44.75	54	9.25	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	41.23	33.95	10.18	34.26	51.1	74	22.9	PK
2	4804	33.56	33.95	10.18	34.26	43.43	54	10.57	AV
3	7206	/							
4	9608	/							
5	12010	/							
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 emissison 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: GFSK Tx CH40 2441MHz									
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	4882	41.98	33.93	10.2	34.29	51.82	74	22.18	PK
2	4882	31.83	33.93	10.2	34.29	41.67	54	12.33	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	41.87	33.93	10.2	34.29	51.71	74	22.29	PK
2	4882	32.38	33.93	10.2	34.29	42.22	54	11.78	AV
3	7323	/							
4	9764	/							
5	12205	/							

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 emissison 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: 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	42.44	33.98	10.22	34.25	52.39	74	21.61	PK
2	4960	31.02	33.98	10.22	34.25	40.97	54	13.03	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	41.99	33.98	10.22	34.25	51.94	74	22.06	PK
2	4960	31.62	33.98	10.22	34.25	41.57	54	12.43	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 emissison 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: π/4 DQPSK Tx CH1 2402MHz									
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	4804	42.44	33.95	10.18	34.26	52.31	74	21.69	PK
2	4804	32.99	33.95	10.18	34.26	42.86	54	11.14	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	42.5	33.95	10.18	34.26	52.37	74	21.63	PK
2	4804	32.36	33.95	10.18	34.26	42.23	54	11.77	AV
3	7206	/							
4	9608	/							
5	12010	/							

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 emissison 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: π /4 DQPSK Tx CH40 2441MHz									
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	4882	42.44	33.93	10.2	34.29	52.28	74	21.72	PK
2	4882	31.89	33.93	10.2	34.29	41.73	54	12.27	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	42.22	33.93	10.2	34.29	52.06	74	21.94	PK
2	4882	31.79	33.93	10.2	34.29	41.63	54	12.37	AV
3	7323	/							
4	9764	/							
5	12205	/							
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 emissison 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: π /4 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	42.61	33.98	10.22	34.25	52.56	74	21.44	PK
2	4960	32.09	33.98	10.22	34.25	42.04	54	11.96	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	42.86	33.98	10.22	34.25	52.81	74	21.19	PK
2	4960	32.01	33.98	10.22	34.25	41.96	54	12.04	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 emissison 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 CH1 2402MHz									
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	4804	43.07	33.95	10.18	34.26	52.94	74	21.06	PK
2	4804	32.16	33.95	10.18	34.26	42.03	54	11.97	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	42.53	33.95	10.18	34.26	52.4	74	21.6	PK
2	4804	32.17	33.95	10.18	34.26	42.04	54	11.96	AV
3	7206	/							
4	9608	/							
5	12010	/							

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 emissison 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(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	42.33	33.93	10.2	34.29	52.17	74	21.83	PK
2	4882	31.8	33.93	10.2	34.29	41.64	54	12.36	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	42.43	33.93	10.2	34.29	52.27	74	21.73	PK
2	4882	32.63	33.93	10.2	34.29	42.47	54	11.53	AV
3	7323	/							
4	9764	/							
5	12205	/							
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 emissison 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 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	42.65	33.98	10.22	34.25	52.6	74	21.4	PK
2	4960	32.31	33.98	10.22	34.25	42.26	54	11.74	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	42.75	33.98	10.22	34.25	52.7	74	21.3	PK
2	4960	32.41	33.98	10.22	34.25	42.36	54	11.64	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

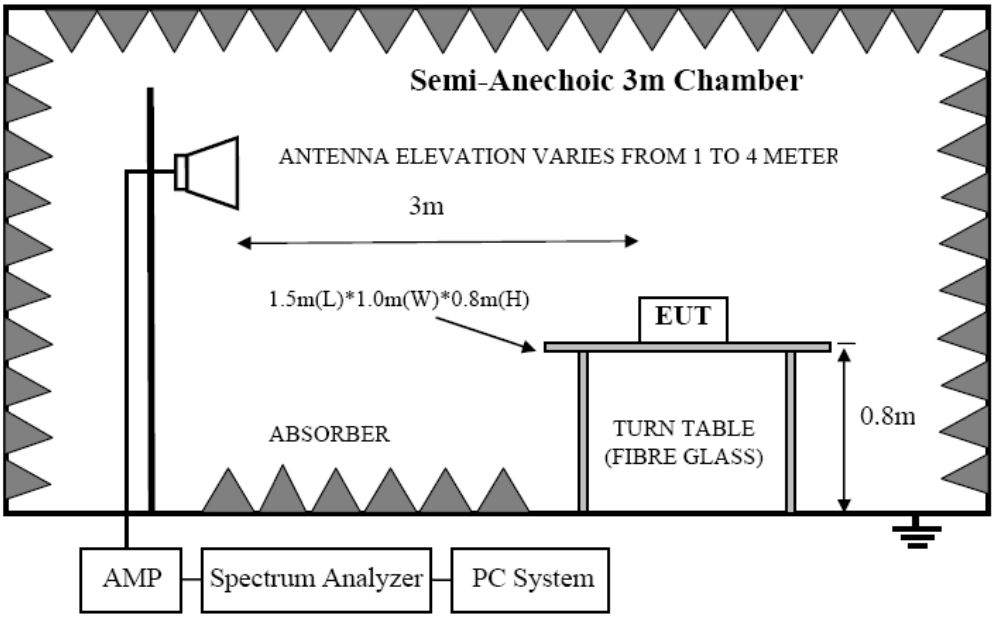
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK

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 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 and 5725MHz to 5850MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

9.3. Test Procedure

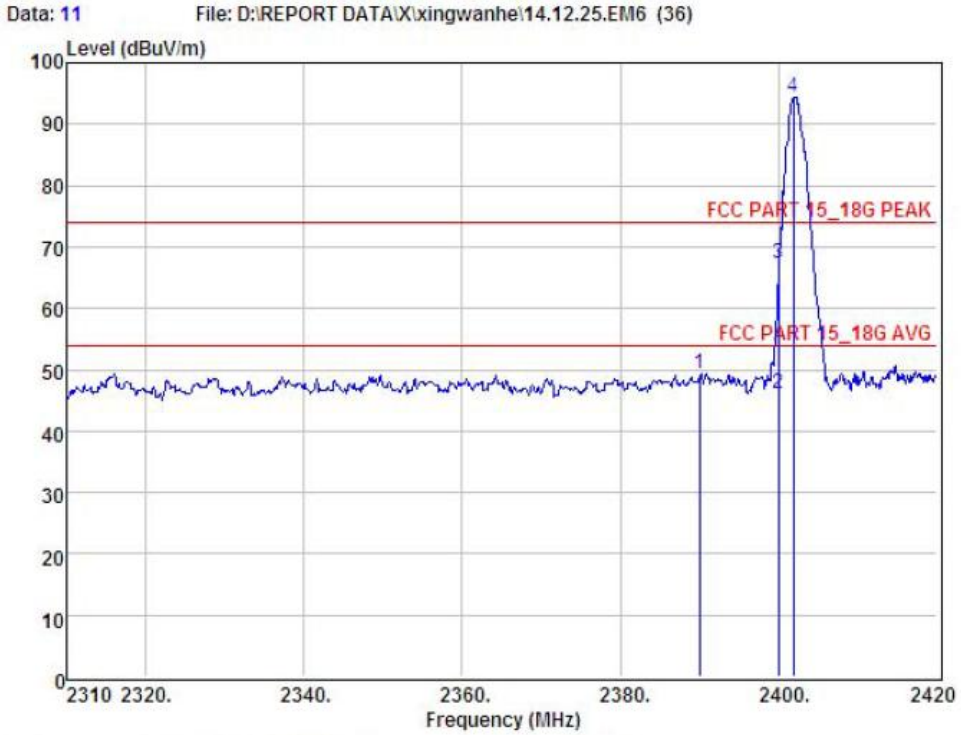
Same with clause 6.3 except change investigated frequency range from 2310MHz to 2415MHz, 2475MHz to 2500MHz.

9.4. Test Result

NOTE : The Band Edge is showed the maximum power data of all mode(GFSK, Π/4 DQPSK, 8-DPSK)

PASS. (See below detailed test data)

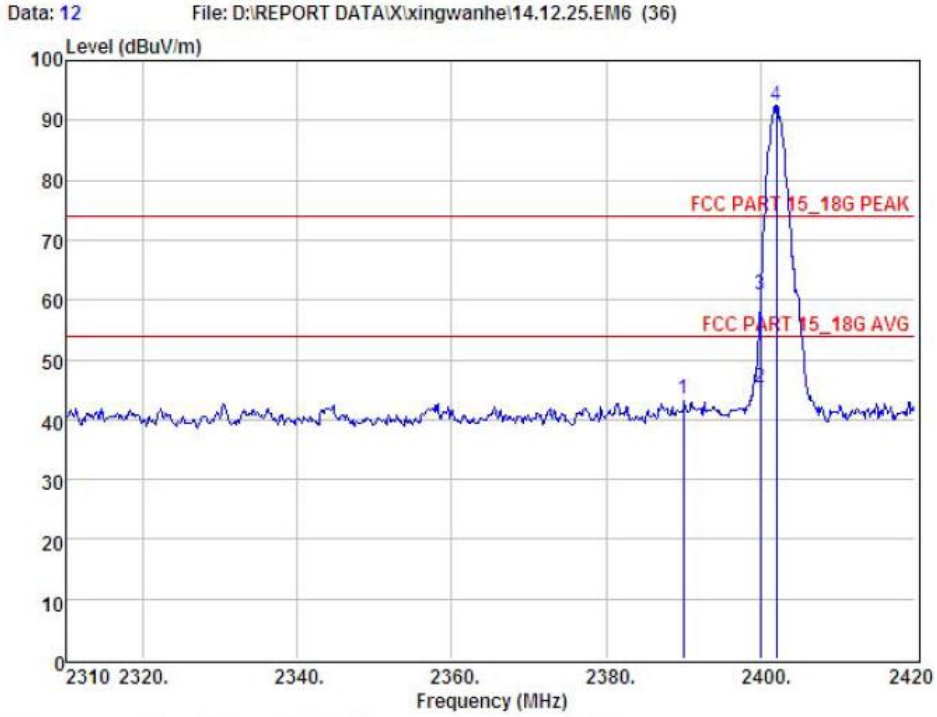
GFSK
CH LOW :



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : GFSK-TX 2402
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	52.87	27.62	34.97	3.92	49.44	74.00	-24.56	Peak
2	2400.00	49.43	27.62	34.97	3.94	46.02	54.00	-7.98	Average
3	2400.00	70.83	27.62	34.97	3.94	67.42	74.00	-6.58	Peak
4	2401.85	97.86	27.62	34.97	3.94	94.45	74.00	20.45	Peak

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

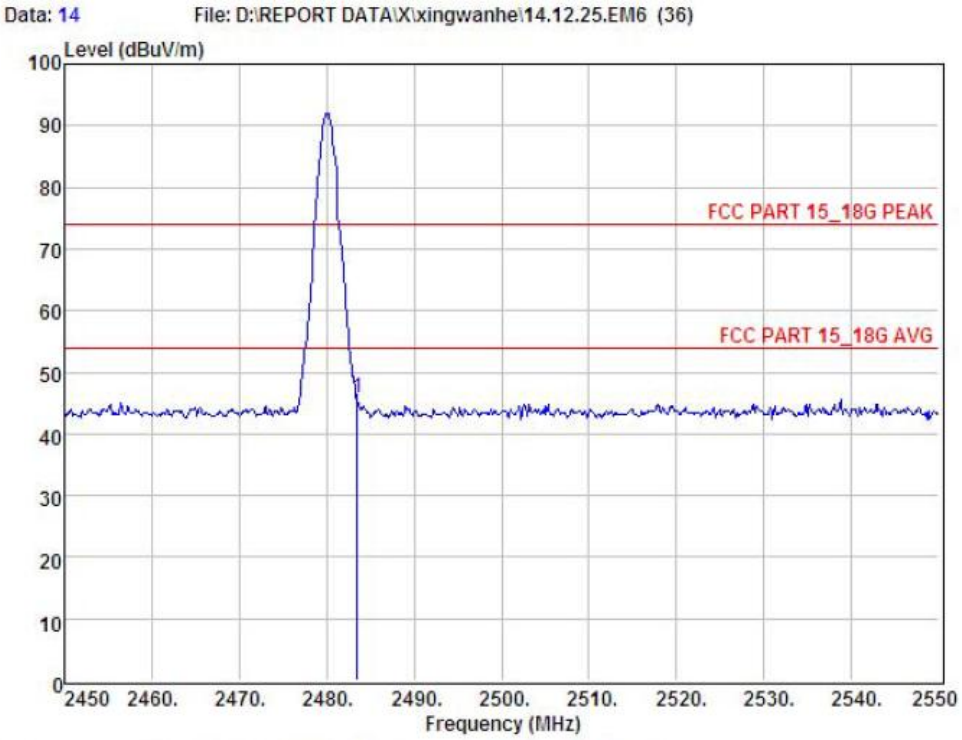


Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : GFSK-TX 2402
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	46.75	27.62	34.97	3.92	43.32	74.00	-30.68	Peak
2	2400.00	48.72	27.62	34.97	3.94	45.31	54.00	-8.69	Average
3	2400.00	64.16	27.62	34.97	3.94	60.75	74.00	-13.25	Peak
4	2402.07	95.80	27.62	34.97	3.94	92.39	74.00	18.39	Peak

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

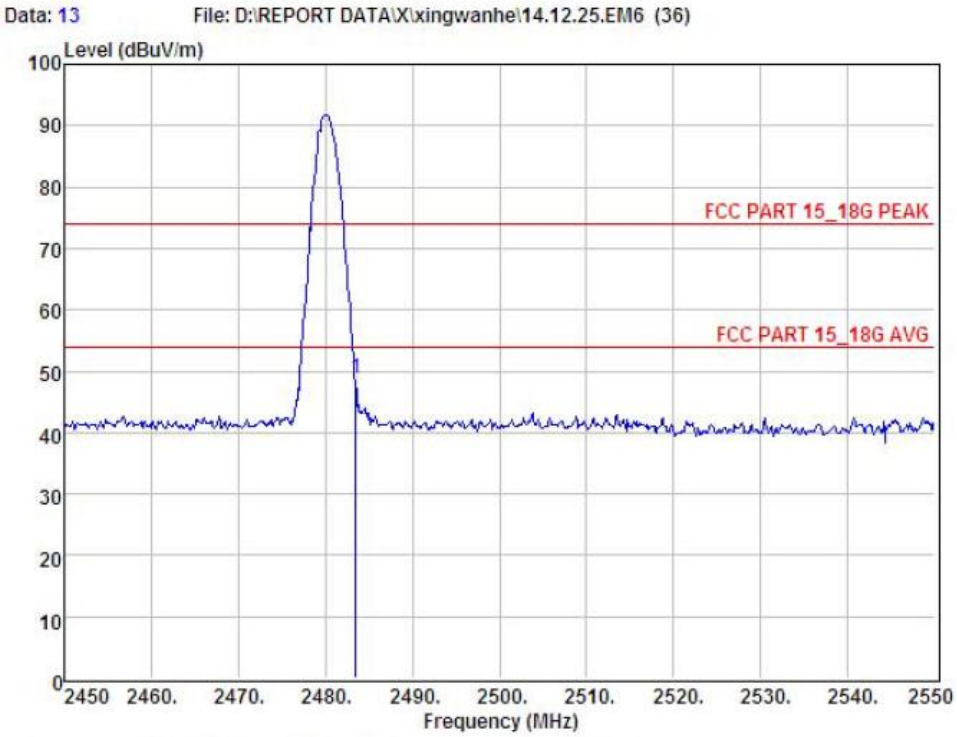
CH High :



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : GFSK-TX 2480
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	49.31	27.59	34.97	4.00	45.93	74.00	-28.07	Peak

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



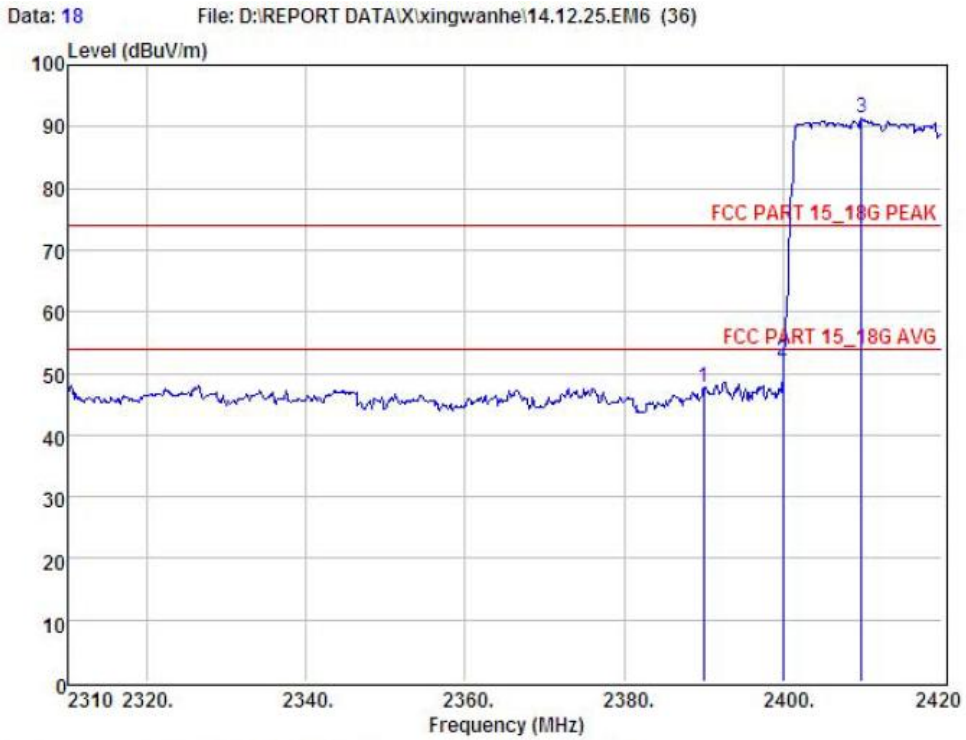
Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : GFSK-TX 2480
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	52.25	27.59	34.97	4.00	48.87	74.00	-25.13	Peak

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

Hopping

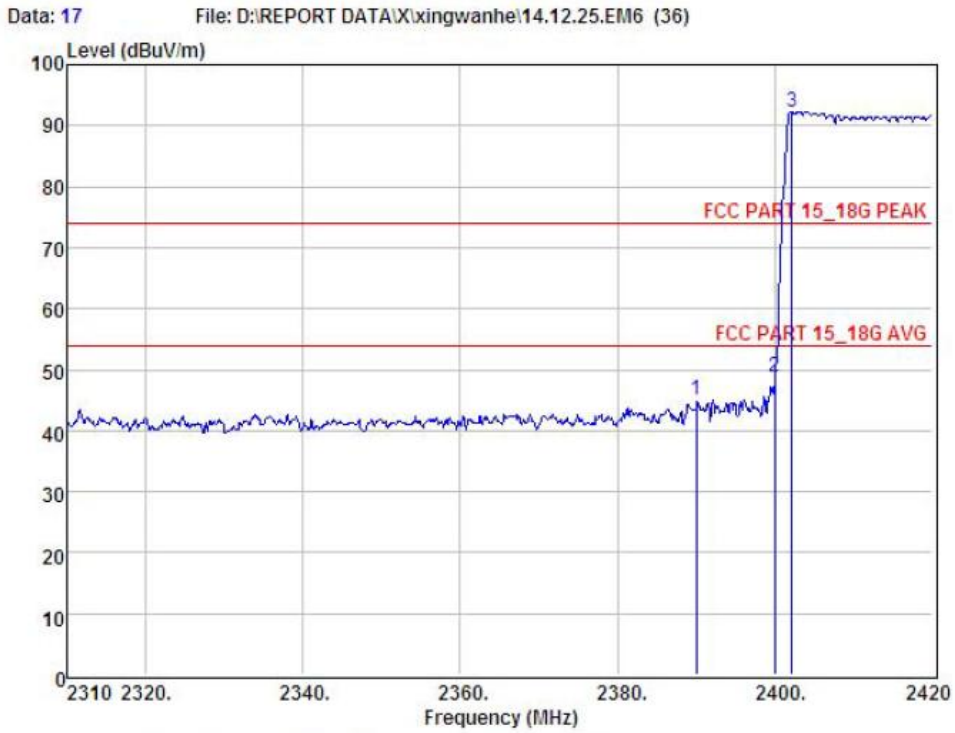
Low



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : GFSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	51.17	27.62	34.97	3.92	47.74	74.00	-26.26	Peak
2	2400.00	55.48	27.62	34.97	3.94	52.07	74.00	-21.93	Peak
3	2409.88	94.71	27.61	34.97	3.94	91.29	74.00	17.29	Peak

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

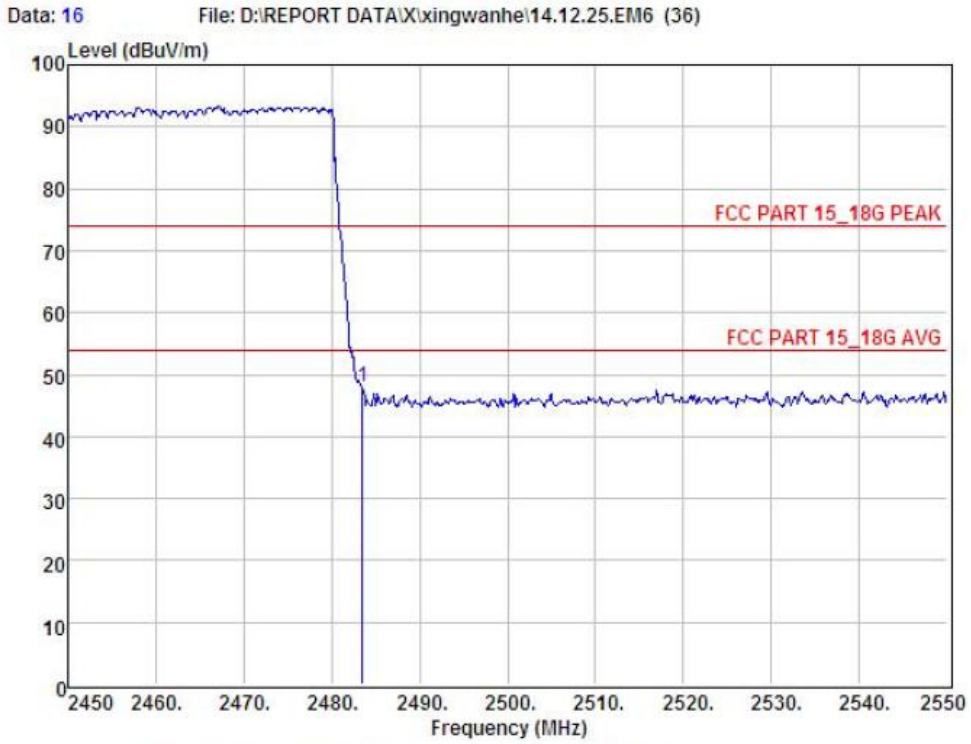


Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : GFSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	48.57	27.62	34.97	3.92	45.14	74.00	-28.86	Peak
2	2400.00	52.23	27.62	34.97	3.94	48.82	74.00	-25.18	Peak
3	2402.18	95.73	27.62	34.97	3.94	92.32	74.00	18.32	Peak

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

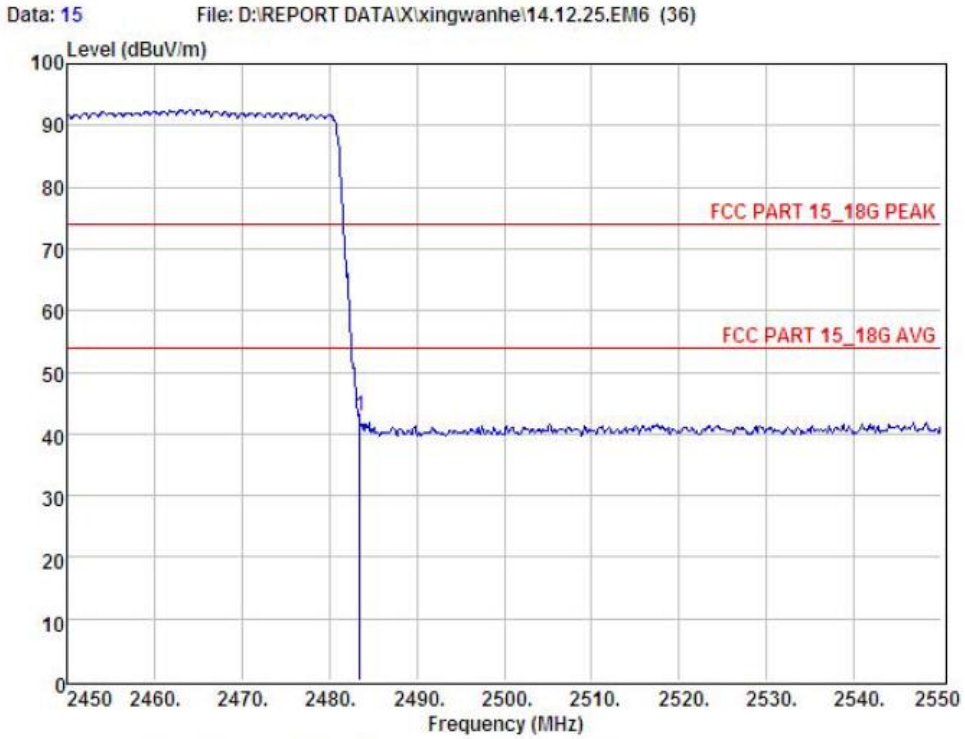
High



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : GFSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	51.25	27.59	34.97	4.00	47.87	74.00	-26.13	Peak

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



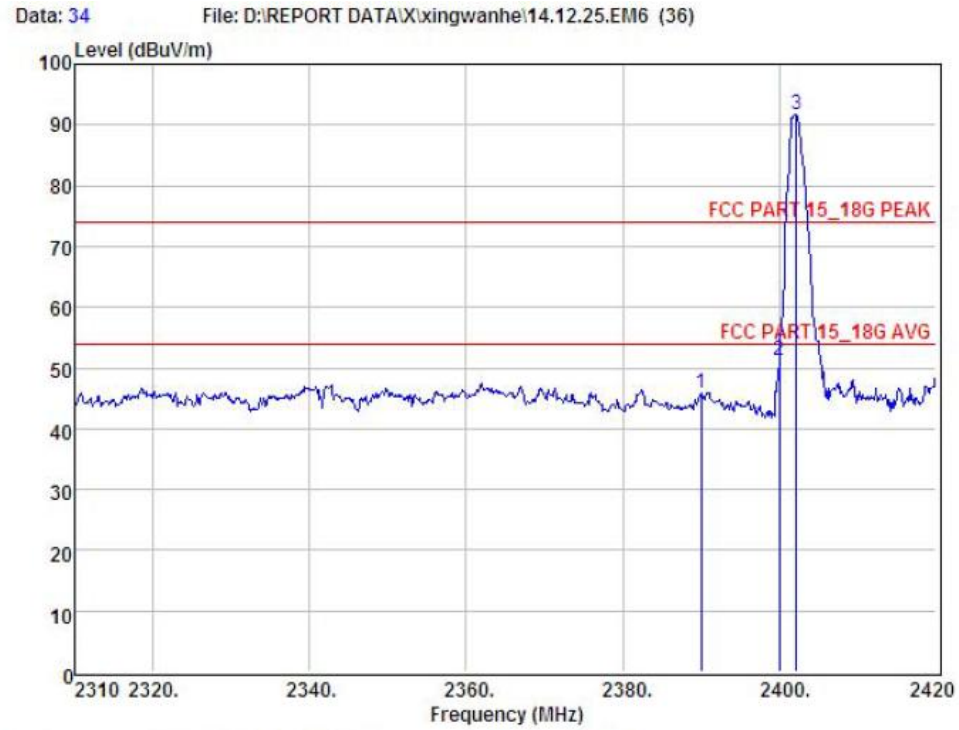
Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : GFSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	46.31	27.59	34.97	4.00	42.93	74.00	-31.07	Peak

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

π /4 DQPSK

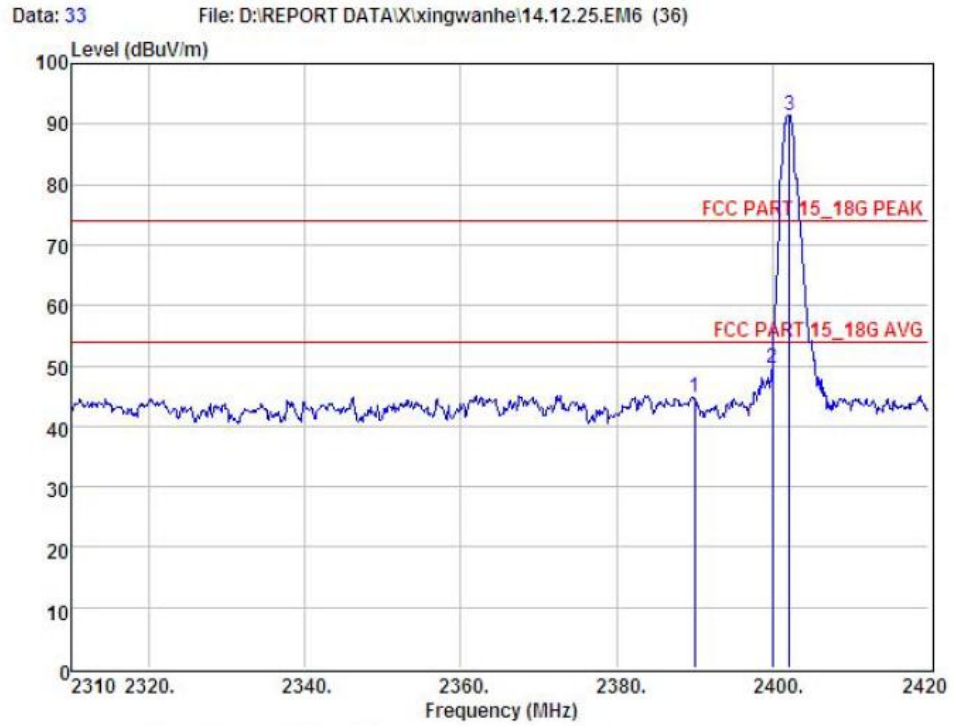
Low



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : pi/4 DQPSK-2402
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	49.35	27.62	34.97	3.92	45.92	74.00	-28.08	Peak
2	2400.00	54.56	27.62	34.97	3.94	51.15	74.00	-22.85	Peak
3	2402.18	95.05	27.62	34.97	3.94	91.64	74.00	17.64	Peak

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

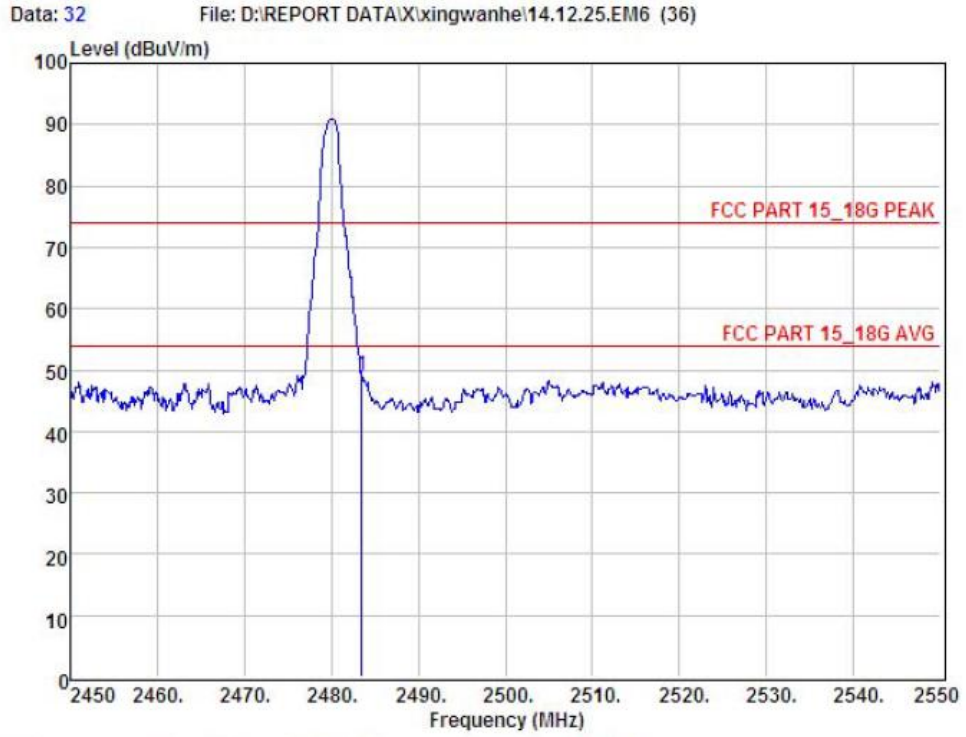


Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : pi/4 DQPSK-2402
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	48.17	27.62	34.97	3.92	44.74	74.00	-29.26	Peak
2	2400.00	52.96	27.62	34.97	3.94	49.55	74.00	-24.45	Peak
3	2402.18	94.83	27.62	34.97	3.94	91.42	74.00	17.42	Peak

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

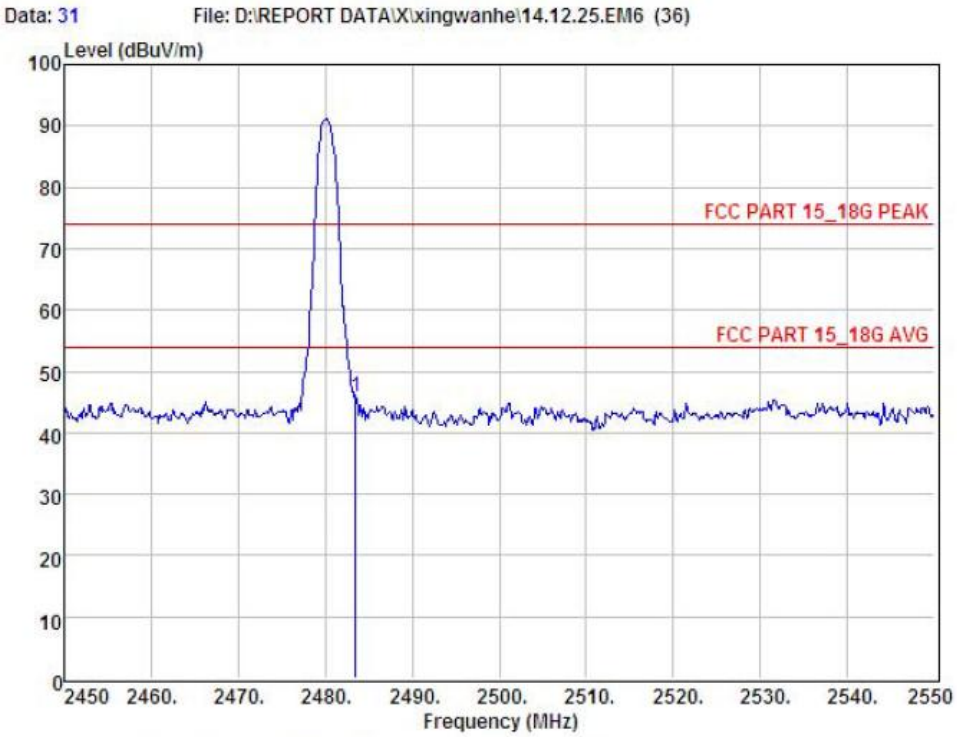
High



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : pi/4 DQPSK-2480
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	52.53	27.59	34.97	4.00	49.15	74.00	-24.85	Peak

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



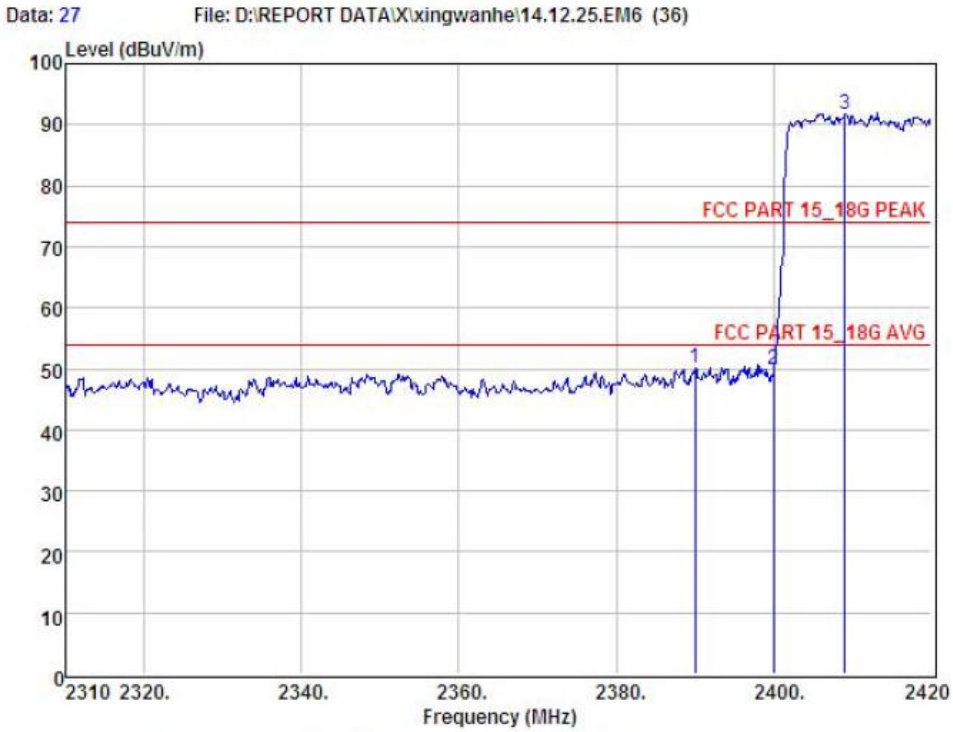
Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : pi/4 DQPSK-2480
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	49.14	27.59	34.97	4.00	45.76	74.00	-28.24	Peak

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

Hopping

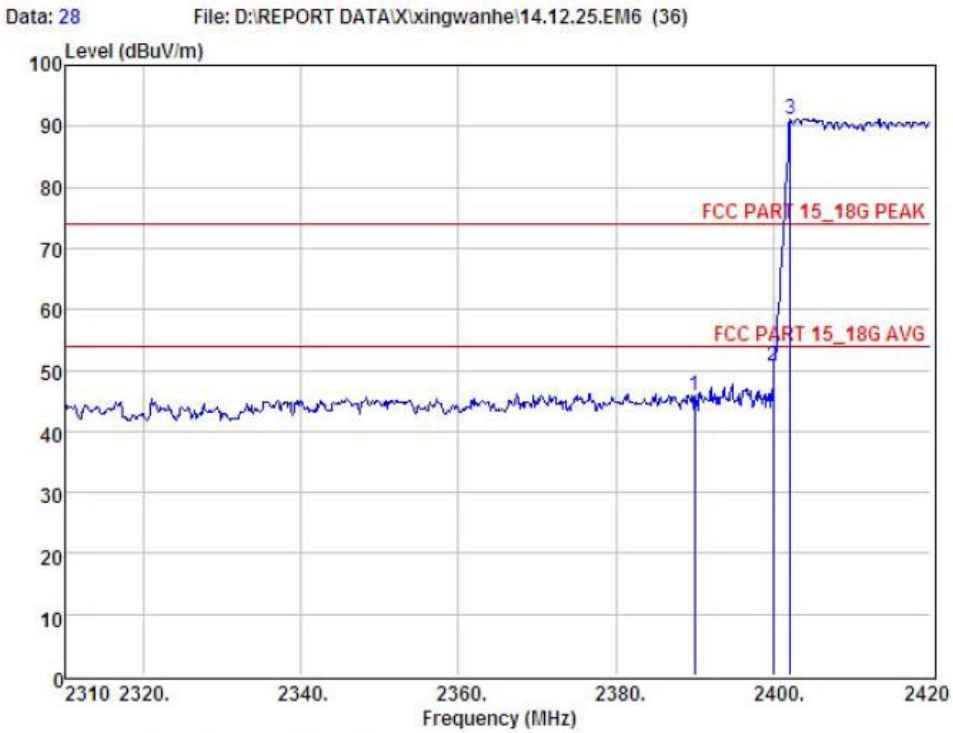
Low



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : pi/4 DQPSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	53.67	27.62	34.97	3.92	50.24	74.00	-23.76	Peak
2	2400.00	53.24	27.62	34.97	3.94	49.83	74.00	-24.17	Peak
3	2409.00	95.24	27.61	34.97	3.94	91.82	74.00	17.82	Peak

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

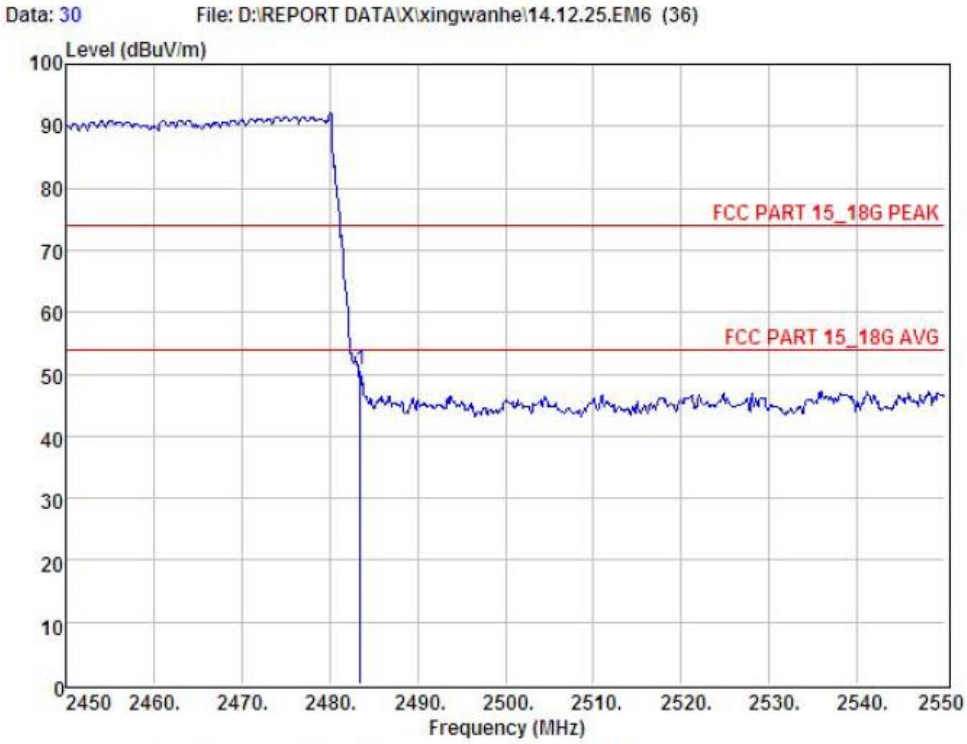


Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : pi/4 DQPSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	49.19	27.62	34.97	3.92	45.76	74.00	-28.24	Peak
2	2400.00	54.18	27.62	34.97	3.94	50.77	74.00	-23.23	Peak
3	2402.18	94.70	27.62	34.97	3.94	91.29	74.00	17.29	Peak

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

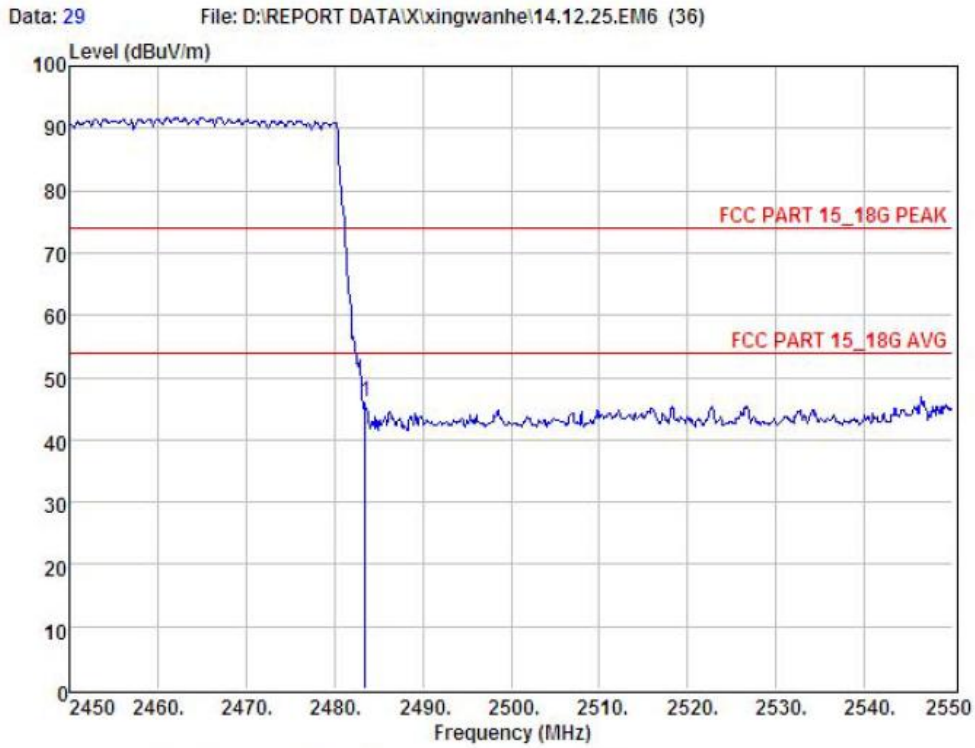
High



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : pi/4 DQPSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	54.13	27.59	34.97	4.00	50.75	74.00	-23.25	Peak

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



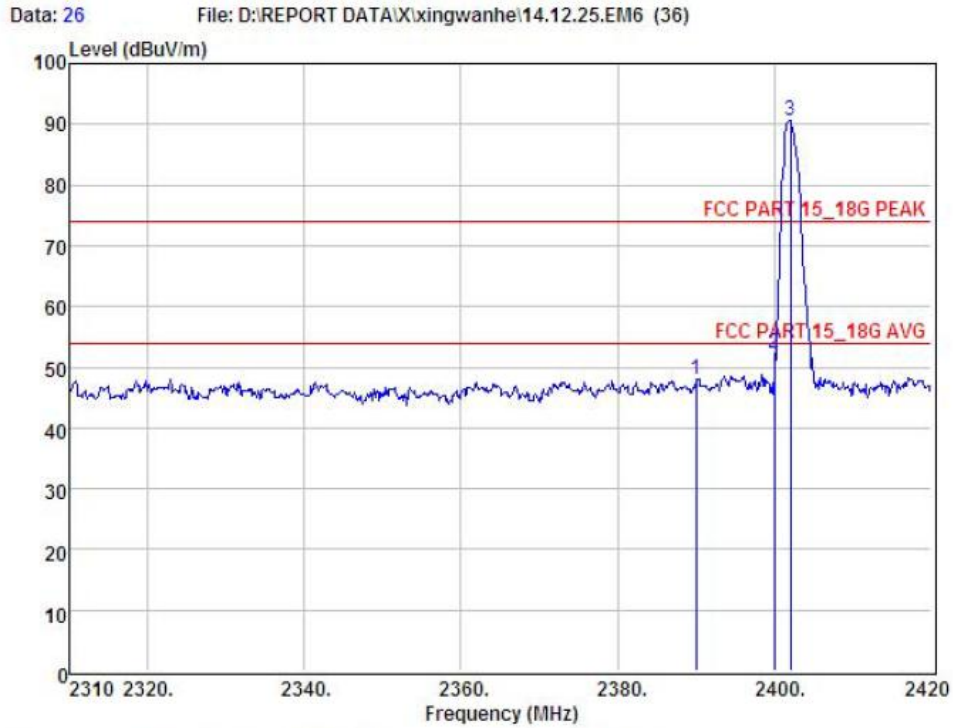
Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : pi/4 DQPSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	49.63	27.59	34.97	4.00	46.25	74.00	-27.75	Peak

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

8- DQPSK

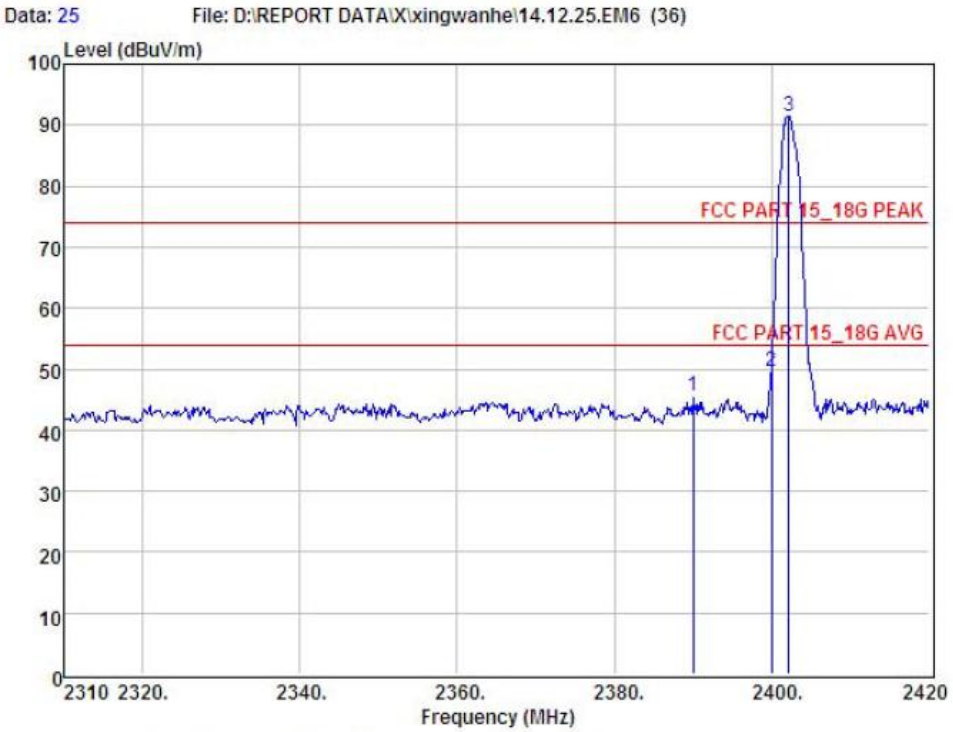
Low



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : 8-DPSK-TX 2402
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	51.38	27.62	34.97	3.92	47.95	74.00	-26.05	Peak
2	2400.00	55.70	27.62	34.97	3.94	52.29	74.00	-21.71	Peak
3	2402.07	94.05	27.62	34.97	3.94	90.64	74.00	16.64	Peak

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

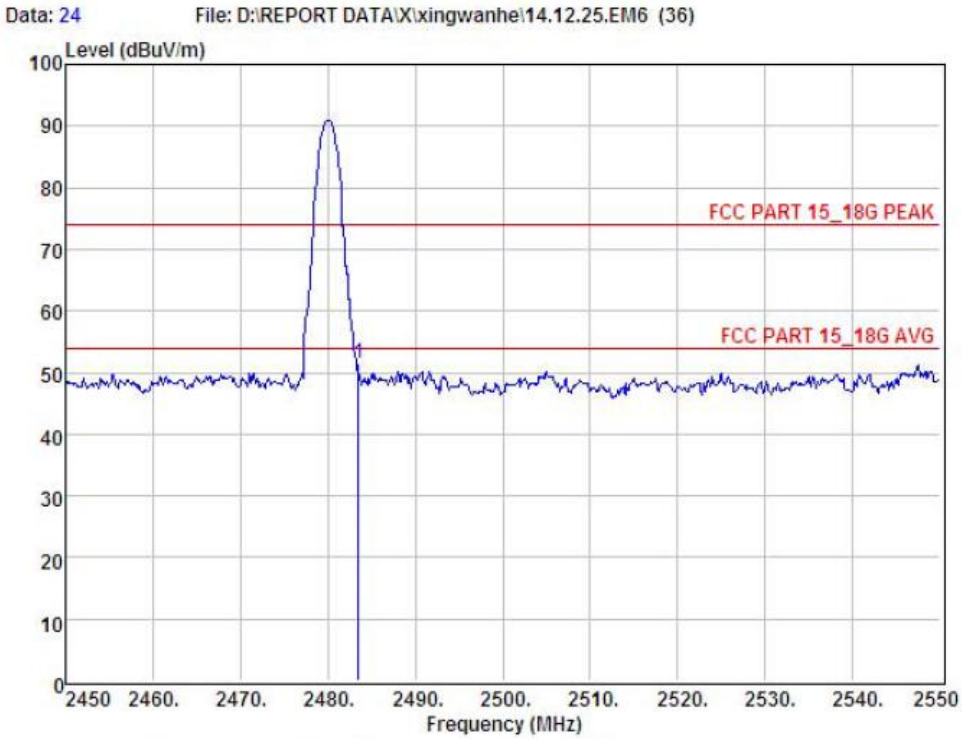


Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : 8-DPSK-TX 2402
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	48.96	27.62	34.97	3.92	45.53	74.00	-28.47	Peak
2	2400.00	52.93	27.62	34.97	3.94	49.52	74.00	-24.48	Peak
3	2402.18	94.83	27.62	34.97	3.94	91.42	74.00	17.42	Peak

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

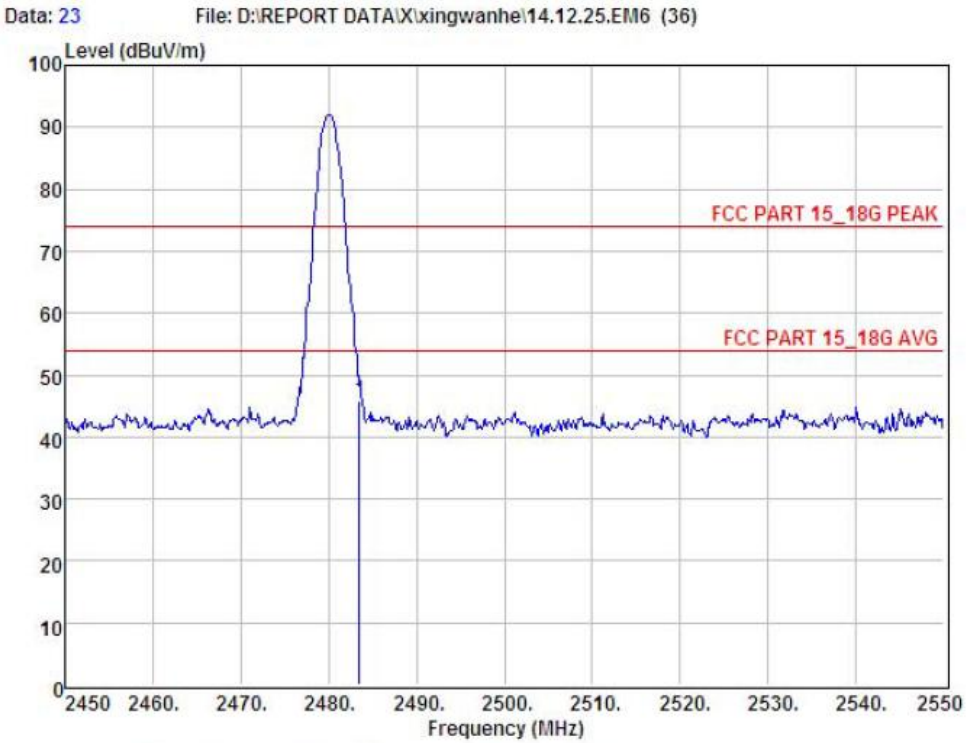
High



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : 8-DPSK-TX 2480
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	54.73	27.59	34.97	4.00	51.35	74.00	-22.65	Peak

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



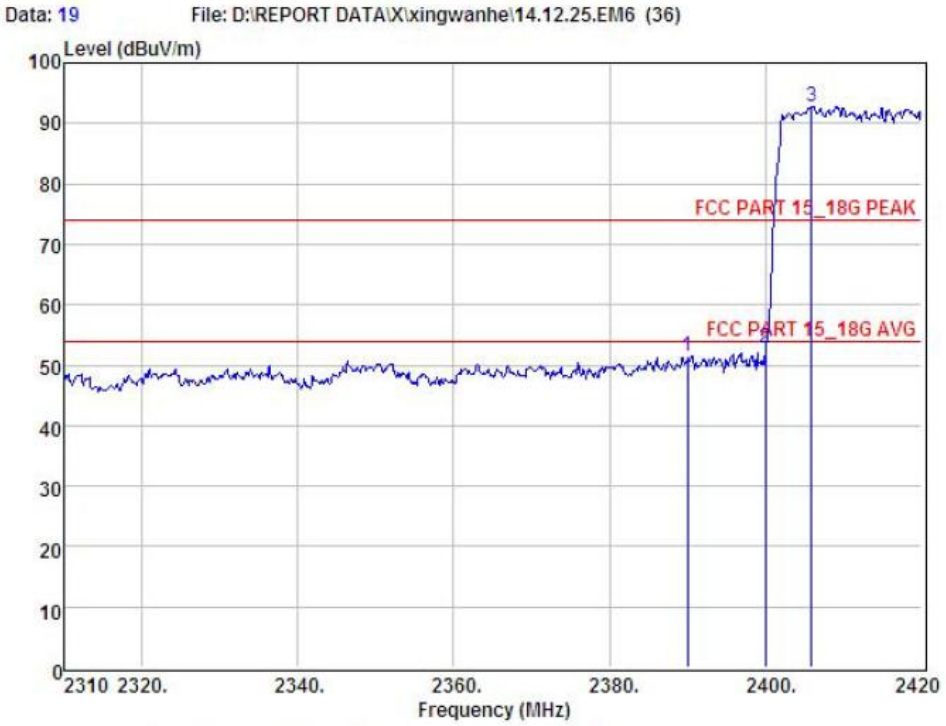
Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : 8-DPSK-TX 2480
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	49.22	27.59	34.97	4.00	45.84	74.00	-28.16	Peak

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

Hopping

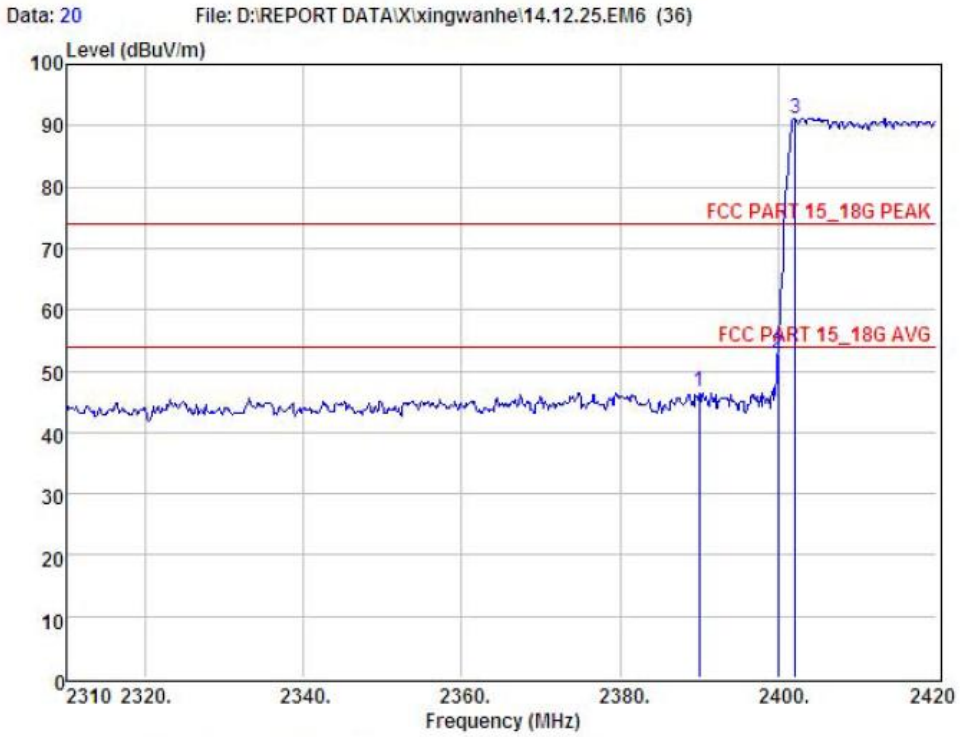
Low



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : 8-DPSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	54.79	27.62	34.97	3.92	51.36	74.00	-22.64	Peak
2	2400.00	56.27	27.62	34.97	3.94	52.86	74.00	-21.14	Peak
3	2405.92	96.23	27.61	34.97	3.94	92.81	74.00	18.81	Peak

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

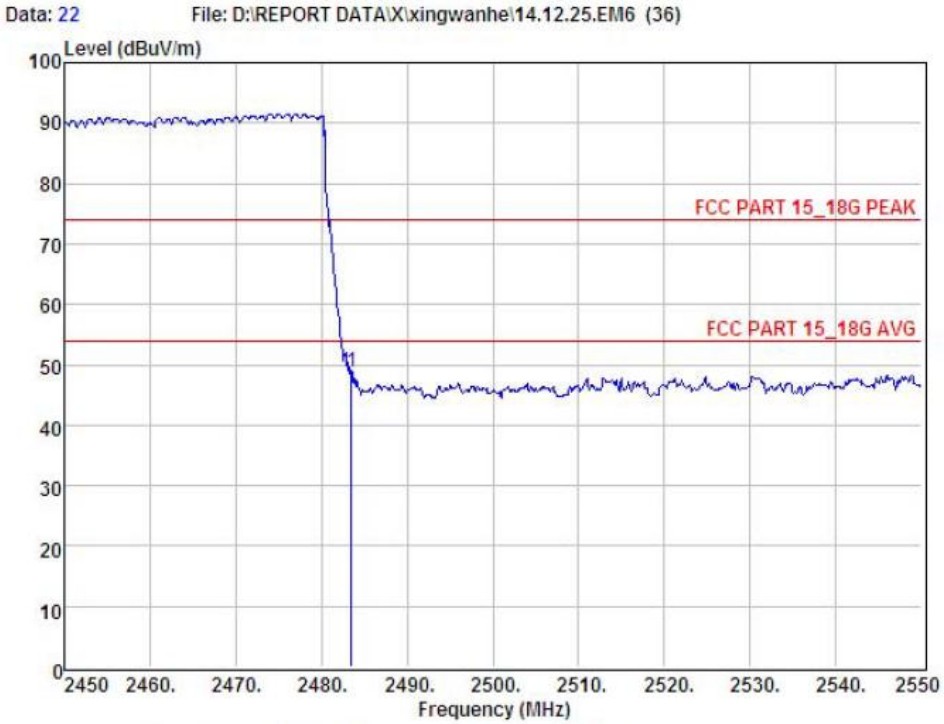


Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : 8-DPSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	50.08	27.62	34.97	3.92	46.65	74.00	-27.35	Peak
2	2400.00	56.27	27.62	34.97	3.94	52.86	74.00	-21.14	Peak
3	2402.18	94.70	27.62	34.97	3.94	91.29	74.00	17.29	Peak

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

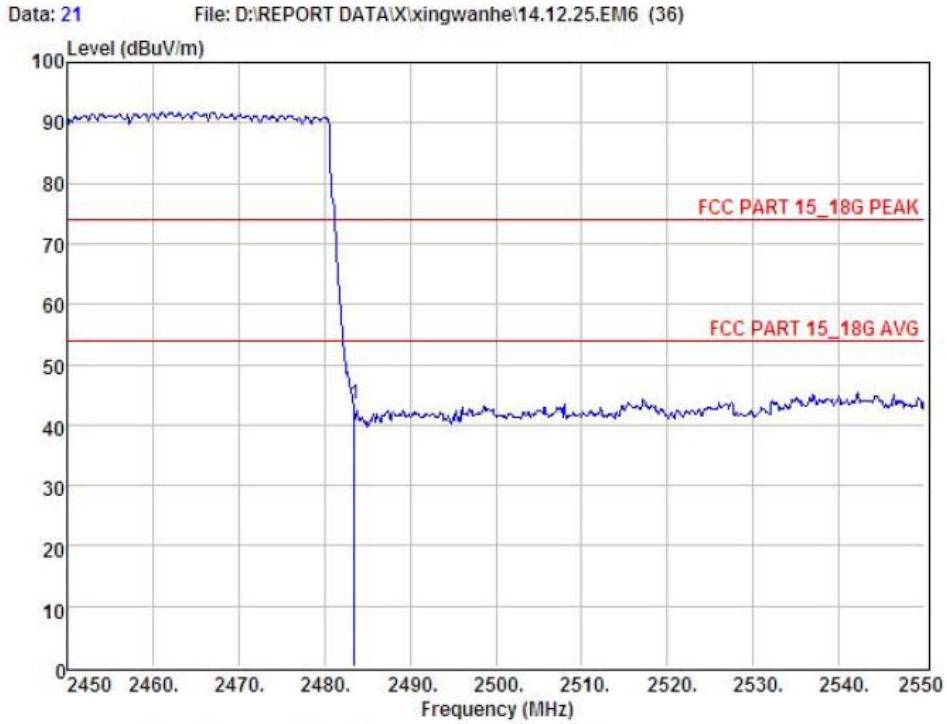
High



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No : MDS-800X
Test Mode : 8-DPSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	52.06	27.59	34.97	4.00	48.68	74.00	-25.32	Peak

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



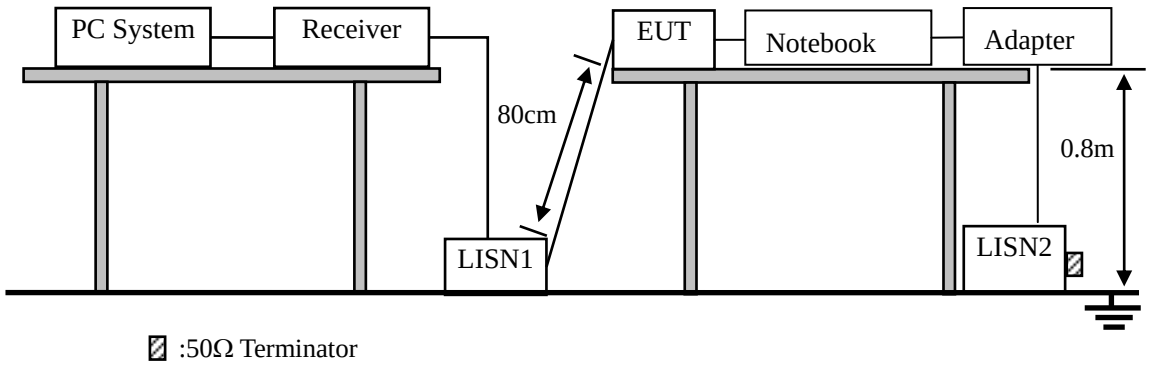
Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL
EUT :
Model No : MDS-800X
Test Mode : 8-DPSK-TX Hopping
Power :
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	46.76	27.59	34.97	4.00	43.38	74.00	-30.62	Peak

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

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

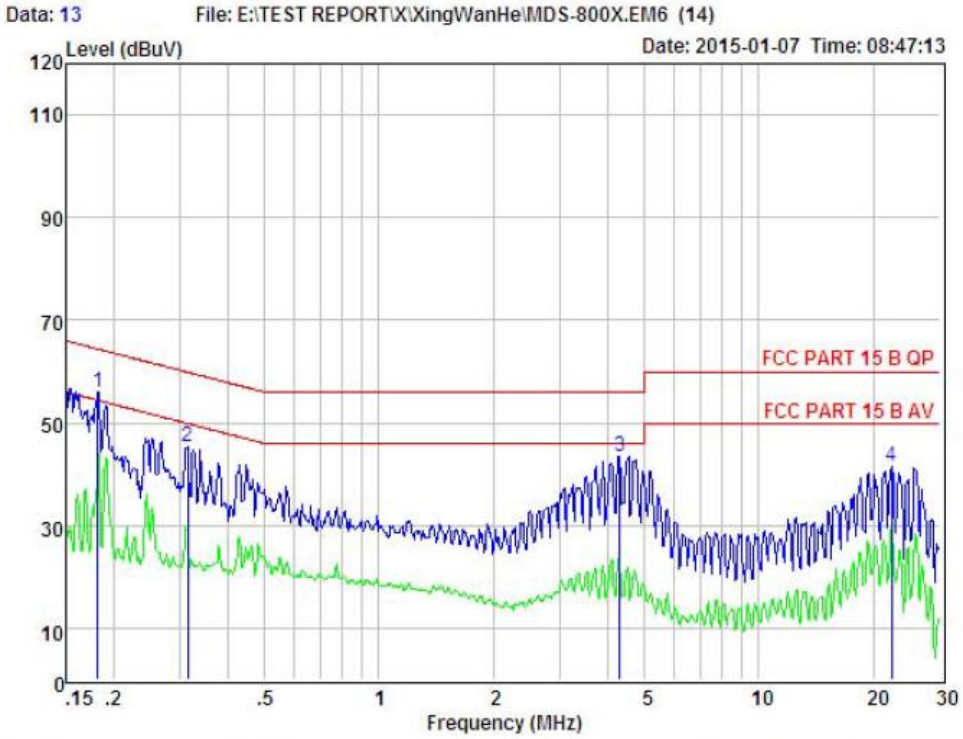
Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

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 notebook 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 2003 on conducted Emission test.
(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

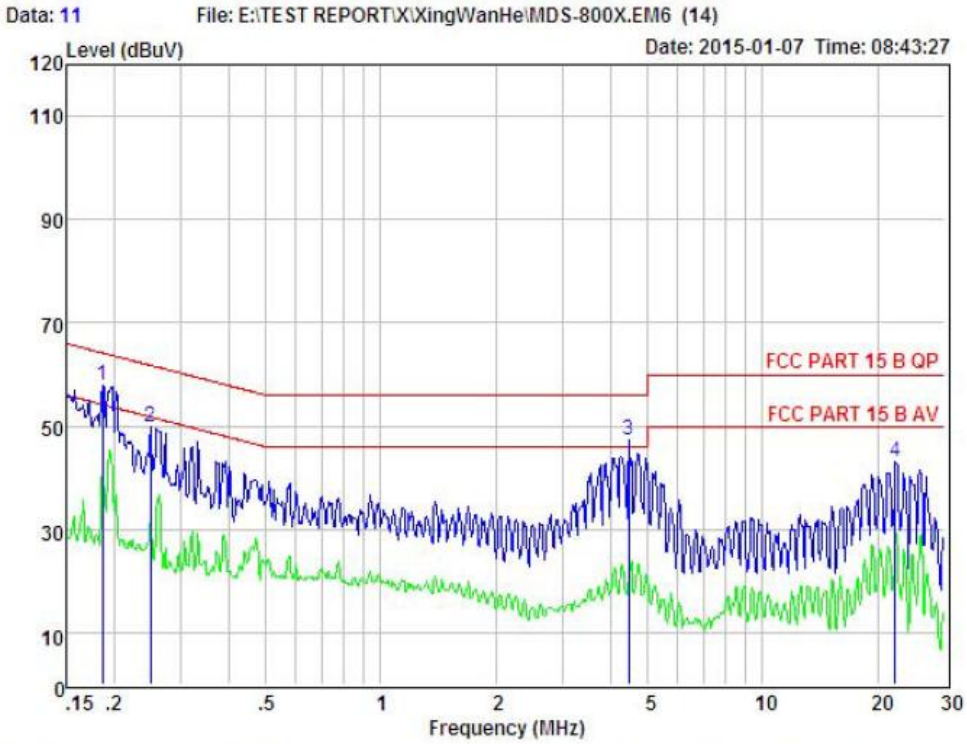
PASS. (See below detailed test data)



Condition : FCC PART 15 B QP POL: LINE Temp:20.1 ℃ Hum:45 %
EUT :
Model No : MDS-800X
Test Mode : Charging And Link Mode
Power : DC 5V From PC With AC 120V/60Hz
Test Engineer:
Remark :

Item	Freq	Read	LISN Factor	Preamp Factor	Cable Lose	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.182	46.16	0.03	-9.72	0.10	56.01	64.42	-8.41	Peak
2	0.313	35.43	0.03	-9.72	0.10	45.28	59.88	-14.60	Peak
3	4.315	33.66	0.09	-9.68	0.12	43.55	56.00	-12.45	Peak
4	22.416	31.31	0.40	-9.54	0.41	41.66	60.00	-18.34	Peak

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



Condition : FCC PART 15 B QP POL: NEUTRAL Temp:20.1 ℃ Hum:45 %
EUT :
Model No : MDS-800X
Test Mode : Charging And Link Mode
Power : DC 5V From PC With AC 120V/60Hz
Test Engineer:
Remark :

Item	Freq	Read	LISN Factor	Preamp Factor	Cable Lose	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.186	48.17	0.03	-9.72	0.10	58.02	64.20	-6.18	Peak
2	0.249	40.09	0.03	-9.72	0.10	49.94	61.78	-11.84	Peak
3	4.454	37.33	0.09	-9.68	0.12	47.22	56.00	-8.78	Peak
4	22.298	32.79	0.40	-9.54	0.40	43.13	60.00	-16.87	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 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.

11.2. Result

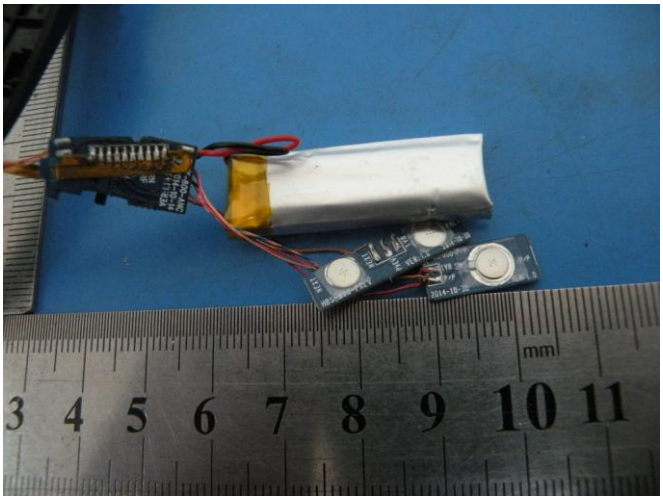
The antennas used for this product are PCB Antenna for Bluetooth, no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 2.8dBi for Bluetooth.

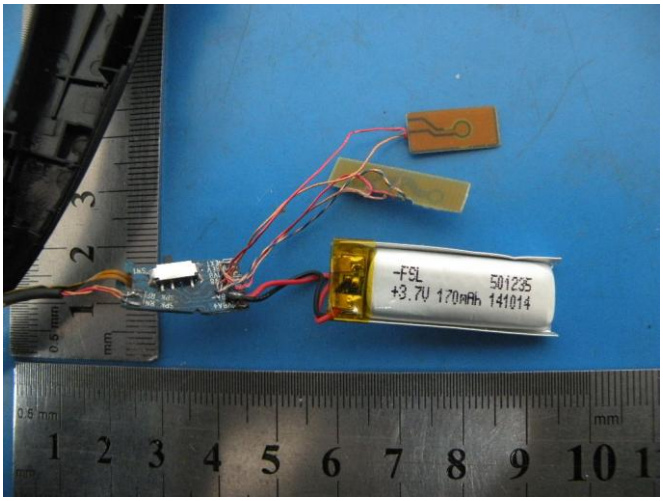
12. Test setup photo

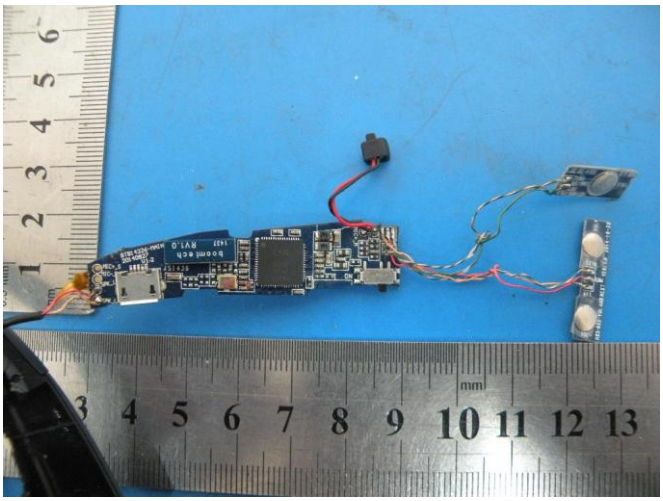
12.1. Photos of Radiated emission

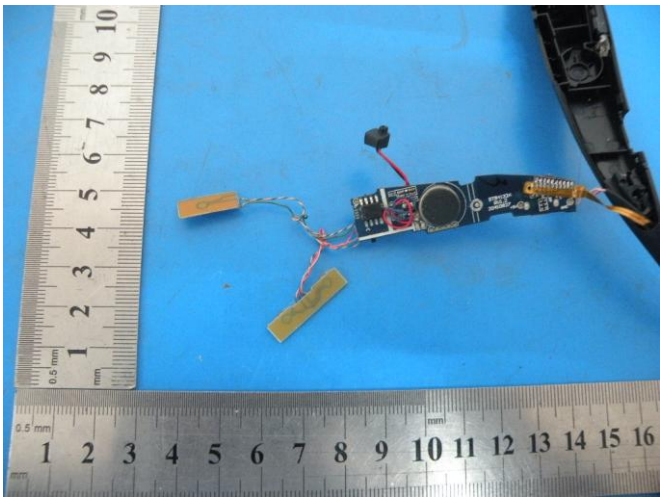
12.2.Photos of Conducted Emission test

13. Photos of EUT


mm
3 4 5 6 7 8 9 10 11


FSL
501235
+3.7V 170mAh 141014
mm


mm



------THE END OF REPORT-------