FCC TEST REPORT

FCC ID: 2AJWU-3229BT

Product	:	CAR AUDIO
Model Name	:	RSD-3229BT,RSD-3228BT,RSD-3230BT,RSD-3231BT, M9910
Brand	:	N/A
Report No.	:	PT802620160913E-FC01

Prepared for

MMOTION ELECTRONICS (HK) LIMITED

Room 11, 25/F., Ho King Commercial Centre, 2-16 Fa Yuen Street,

Mongkok, Kowloon, Hong Kong

Prepared by

DongGuan Precise Testing Service Co.,Ltd.

Building D, Baoding Technology Park, Guangming Road 2, Guangming Community

Dongcheng District, Dongguan, Guangdong, China

TEST RESULT CERTIFICATION

Applicant's name	:	MMOTION ELECTRONICS (HK) LIMITED
Address		Room 11, 25/F., Ho King Commercial Centre, 2-16 Fa Yuen Street Mongkok, Kowloon, Hong Kong
Manufacture's name	:	Dongguan Navisonic Electronic Technology Co., Ltd
Address	:	Hongye Industrial Zone 138 North Road Two, Third Floor C, TangXia Town, Dongguan, GuangDong
Product name	:	CAR AUDIO
Model name	:	RSD-3229 BT,RSD-3228 BT,RSD-3230 BT,RSD-3231 BT,M9910
Standards	:	FCC CFR47 Part 15 Section 15.247
Test procedure	:	ANSI C63.10:2013
Test Date	:	Sep. 21, 2016 ~ Sep. 26, 2016
Date of Issue	:	Sep. 26, 2016
Test Result	:	Pass

This device described above has been tested by PTS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable onlyto the tested sample identified in the report.

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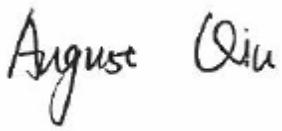
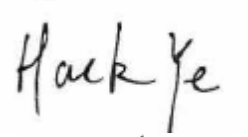
Testing Engineer

August Qiu



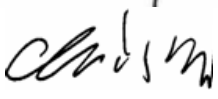
TechnicalManager

Hack Ye



AuthorizedSignatory

Chris Du



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2 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
Conduct Emission	15.207	PASS
20dB Bandwidth	15.247(a)(1)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Frequency Separation	15.247(a)(1)	PASS
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
Dwell time	15.247(a)(1)(iii)	PASS
Antenna Requirement	15.203	PASS
Remark: N/A: Not Applicable		

3 General Information

3.1 General Description of E.U.T.

Product Name	:	CAR AUDIO
Model Name	:	RSD-3229 BT,RSD-3228 BT,RSD-3230 BT,RSD-3231 BT,M9910
Model Description	:	Just the appearance is different
Bluetooth Version	:	BT3.0
Operating frequency	:	For BT(Normal) 2402-2480MHz, 79 channels
Antenna installation:	:	Integrated Antenna
Antenna Gain:	:	0.5dBi
Type of Modulation	:	For BT(Normal) GFSK, Pi/4DQPSK, 8DPSK
Power supply	:	DC3.7V power by battery, DC 5V charging by USB port

3.2 Channel List

BT							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	1	2403	2	2404	3	2405
4	2406	5	2407	6	2408	7	2409
8	2410	9	2411	10	2412	11	2413
12	2414	13	2415	14	2416	15	2417
16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425
24	2426	25	2427	26	2428	27	2429
28	2430	29	2431	30	2432	31	2433
32	2434	33	2435	34	2436	35	2437
36	2438	37	2439	38	2440	39	2441
40	2442	41	2443	42	2444	43	2445
44	2446	45	2447	46	2448	47	2449
48	2450	49	2451	50	2452	51	2453
52	2454	53	2455	54	2456	55	2457
56	2458	57	2459	58	2460	59	2461
60	2462	61	2463	62	2464	63	2465
64	2466	65	2467	66	2468	67	2469
68	2470	69	2471	70	2472	71	2473
72	2474	73	2475	74	2476	75	2477
76	2478	77	2479	78	2480	-	-

3.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectivelyby performing full tests,the worst data were recorded and reported.

Test mode	**Low channel**	**Middle channel**	**High channel**
Transmitting	2402MHz	2441MHz	2480MHz
Hopping	2402-2480MHz		
Tests Carried Out Under FCC part 15.207			
Test Item	Test Mode		
Conduction Emission, 0.15MHz to 30MHz	BT Communication		

3.4 Test Site

Dongguan Precise Testing Service Co., Ltd.

Building D,Baoding Technology Park,Guangming Road2, Dongcheng District, Dongguan, Guangdong, China, Dongguan, 523129
China
FCC Registration Number: 371540
IC Registration Number: 12191A-1

4 Equipment During Test

4.1 Equipments List

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

RF Conducted Test							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMC Analyzer (9k~26.5GHz)	Agilent	E4407B	MY45109572	Aug.04, 2016	Aug.03, 2017	1 year
2	EXA Signal Analyzer	Agilent	N9010A	MY50520207 526B25MPB W7X	Aug.04, 2016	Aug.03, 2017	1 year
3	EMI Test Receiver	R&S	ESCI	101155	July 15, 2016	July 14, 2017	1 year
4	Humidity Chamber	GF	GTH-225-40-1P	IAA061225	July 15, 2016	July 14, 2017	1 year
5	Temporary Antenna Connector	Murrata	MXHS83Q E3000	201938	July 15, 2016	July 14, 2017	1 year
Radiated Emissions							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	Rohde&Schwarz	ESCI	101417	July 15, 2016	July 14, 2017	1 year
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3355	July 15, 2016	July 14, 2017	1 year
3	Amplifier	EM	EM-30180	060538	July 15, 2016	July 14, 2017	1 year
4	Horn Antenna	SCHWARZBECK	BBHA9120 D	9120D-1246	July 15, 2016	July 14, 2017	1 year
5	Horn Antenna	Schwarzbeck	BBHA 9170	9170-0741	July 15, 2016	July 14, 2017	1 year
6	Loop Antenna	SCHWARZBECK	FMZB1516	9130D-1243	July 15, 2016	July 14, 2017	1 year
7	3m Anechoic Chamber	CHENGYU	966	PTC-002	June 6, 2016	June 5, 2017	1 year
8	Coaxial Cable(below 1GHz)	LARGE	CALB1	-	July 15, 2016	July 14, 2017	1 year
9	Coaxial Cable(above 1GHz)	LARGE	CALB2	-	July 15, 2016	July 14, 2017	1 year

4.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
DC Power Supply	AGILENT	E3642A	108472
Stereo	HAVIT	SK533	75231
AC power line(1.0m)	Cold come	JYD-20	C-2201

4.3 Measurement Uncertainty

Parameter	**Uncertainty**
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10^{-6}
Bandwidth	± 1.5 x 10^{-6}
Time	±2%
Duty Cycle	±2%
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB

5 Conducted Emission

Test Requirement:	:	FCC CFR 47 Part 15 Section 15.207
Test Method:	:	ANSI C63.10:2013
Test Result:	:	PASS
Frequency Range:	:	150kHz to 30MHz
Class/Severity:	:	Class B
Limit:	:	66-56 dBμV between 0.15MHz & 0.5MHz
	:	56 dBμV between 0.5MHz & 5MHz
	:	60 dBμV between 5MHz & 30MHz
Detector:	:	Peak for pre-scan(9kHz Resolution Bandwidth)

5.1 E.U.T. Operation

Operating Environment**:**

Temperature:	:	25.5 °C
Humidity:	:	51 % RH
Atmospheric Pressure:	:	101.2kPa
EUT Operation**:**	:	Refer to section 3.3

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.

5.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

5.4 Conducted Emission Test Result

EUT is a car radio system which is normally used in vehicles, Did not need application for this item.

6 Radiated Spurious Emissions

Test Requirement: : FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: : ANSI C63.10:2013

Test Result: : PASS

Measurement Distance: : 3m

Limit: : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

6.1 EUT Operation

Operating Environment :

Temperature: : 23.5 °C

Humidity: : 51.1 % RH

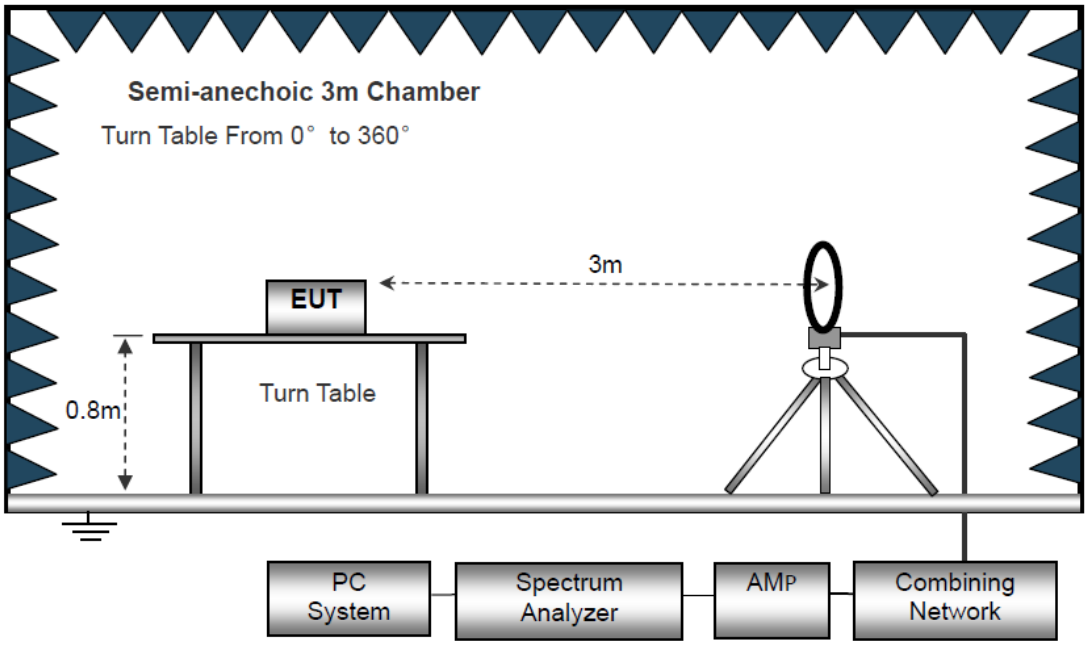
Atmospheric Pressure: : 101.2kPa

EUT Operation : : Refer to section 3.3

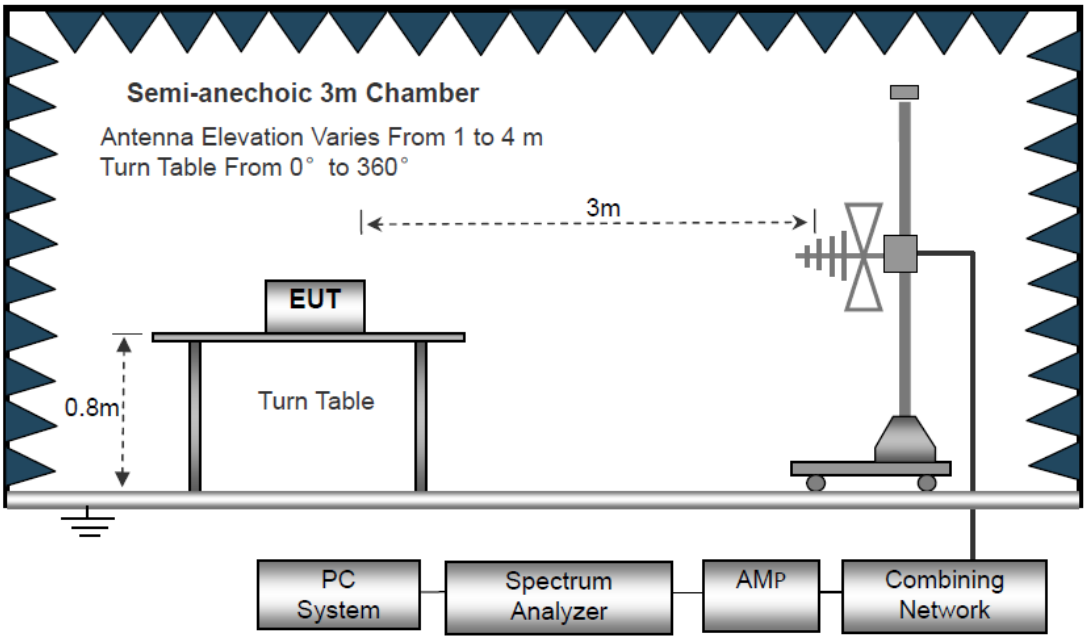
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber testsite

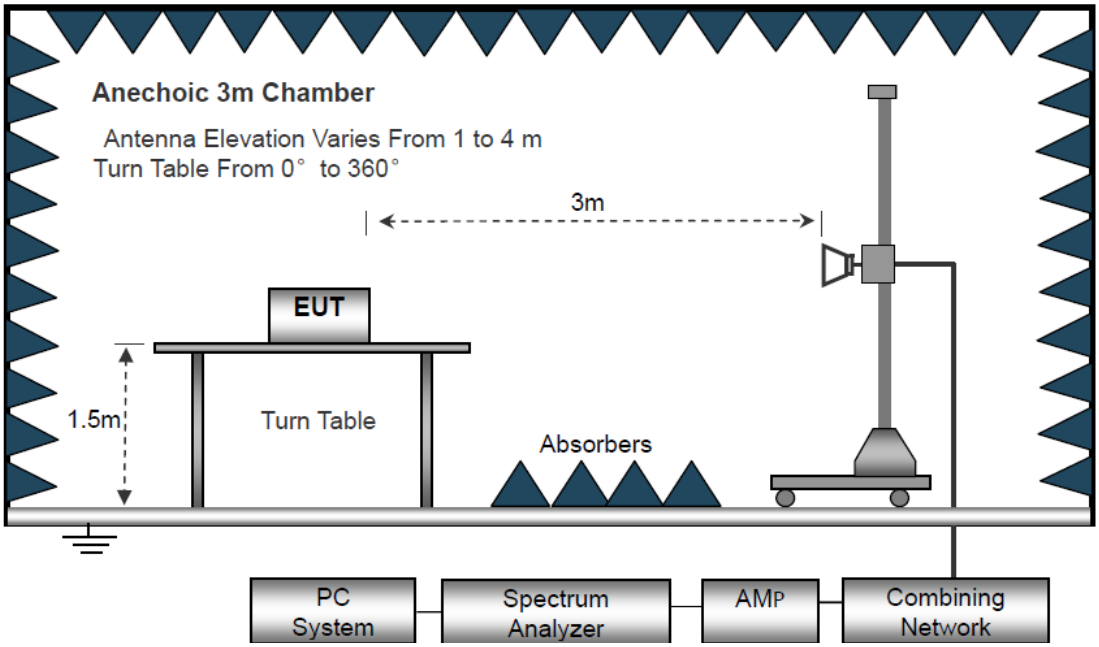
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

Below 30MHz

IF Bandwidth		10kHz
Resolution Bandwidth		10kHz
Video Bandwidth		10kHz

30MHz ~ 1GHz

Detector	:	PK
Resolution Bandwidth	:	100kHz
Video Bandwidth	:	300kHz
Detector	:	QP
Resolution Bandwidth	:	120kHz
Video Bandwidth	:	300kHz

Above 1GHz

Detector	:	PK
Resolution Bandwidth	:	1MHz
Video Bandwidth	:	3MHz
Detector	:	AV
Resolution Bandwidth	:	1MHz
Video Bandwidth	:	10Hz

6.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up tothe tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

6. Repeat above procedures until the measurements for all frequencies are complete.

7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

8. The test above 1GHz must be use the fully anechoic room, and the test below 1GHz use the halfanechoic room

6.5 Summary of Test Results

Test Frequency: Below 30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 18GHz

Remark: All applicable test modes have been tested and only the worst data(GFSK modulation mode) were reported.

Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
GFSK Low Channel						
203.14	43.16	PK	-17.72	25.44	43.50	-18.06
203.14	38.47	PK	-17.72	20.75	43.50	-22.75
4804.00	50.02	PK	-1.06	48.96	74.00	-25.04
4804.00	43.76	Ave	-1.06	42.70	54.00	-11.30
7206.00	50.20	PK	1.33	51.53	74.00	-22.47
7206.00	44.07	Ave	1.33	45.40	54.00	-8.60

Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
GFSK Middle Channel						
203.14	42.21	PK	-17.72	24.49	43.50	-19.01
203.14	38.22	PK	-17.72	20.50	43.50	-23.00
4882.00	50.84	PK	-0.93	49.91	74.00	-24.09
4882.00	44.14	Ave	-0.93	43.21	54.00	-10.79
7323.00	50.20	PK	1.67	51.87	74.00	-22.13
7323.00	45.06	Ave	1.67	46.73	54.00	-7.27

Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
GFSK High Channel						
203.14	41.66	PK	-17.72	23.94	43.50	-19.56
203.14	38.23	PK	-17.72	20.51	43.50	-22.99
4960.00	50.82	PK	-0.87	49.95	74.00	-24.05
4960.00	43.68	Ave	-0.87	42.81	54.00	-11.19
7440.00	49.38	PK	1.84	51.22	74.00	-22.78
7440.00	45.43	Ave	1.84	47.27	54.00	-6.73

Band edge

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
GFSK							
2390	69.07	-12.99	56.08	74	-17.92	peak	Vertical
2390	55.62	-12.99	42.63	54	-11.37	AVG	Vertical
2390	68.78	-12.99	55.79	74	-18.21	peak	Horizontal
2390	54.89	-12.99	41.9	54	-12.1	AVG	Horizontal
2483.5	67.87	-12.78	55.09	74	-18.91	peak	Vertical
2483.5	55.24	-12.78	42.46	54	-11.54	AVG	Vertical
2483.5	68.57	-12.78	55.79	74	-18.21	peak	Horizontal
2483.5	55.78	-12.78	43	54	-11	AVG	Horizontal
π/4-DQPSK							
2390	69.87	-12.99	56.88	74	-17.12	peak	Vertical
2390	56.91	-12.99	43.92	54	-10.08	AVG	Vertical
2390	68.87	-12.99	55.88	74	-18.12	peak	Horizontal
2390	54.34	-12.99	41.35	54	-12.65	AVG	Horizontal
2483.5	68.52	-12.78	55.74	74	-18.26	peak	Vertical
2483.5	54.45	-12.78	41.67	54	-12.33	AVG	Vertical
2483.5	69.67	-12.78	56.89	74	-17.11	peak	Horizontal
2483.5	55.56	-12.78	42.78	54	-11.22	AVG	Horizontal
8DPSK							
2390	69.08	-12.99	56.09	74	-17.91	peak	Vertical
2390	55.98	-12.99	42.99	54	-11.01	AVG	Vertical
2390	68.35	-12.99	55.36	74	-18.64	peak	Horizontal
2390	55.67	-12.99	42.68	54	-11.32	AVG	Horizontal
2483.5	69.56	-12.78	56.78	74	-17.22	peak	Vertical
2483.5	55.45	-12.78	42.67	54	-11.33	AVG	Vertical
2483.5	68.35	-12.78	55.57	74	-18.43	peak	Horizontal
2483.5	55.34	-12.78	42.56	54	-11.44	AVG	Horizontal

Hopping

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
GFSK							
2390	69.07	-12.99	56.08	74	-17.92	peak	Vertical
2390	55.62	-12.99	42.63	54	-11.37	AVG	Vertical
2390	68.78	-12.99	55.79	74	-18.21	peak	Horizontal
2390	54.89	-12.99	41.9	54	-12.1	AVG	Horizontal
2483.5	67.87	-12.78	55.09	74	-18.91	peak	Vertical
2483.5	55.24	-12.78	42.46	54	-11.54	AVG	Vertical
2483.5	68.57	-12.78	55.79	74	-18.21	peak	Horizontal
2483.5	55.78	-12.78	43	54	-11	AVG	Horizontal
π/4-DQPSK							
2390	69.87	-12.99	56.88	74	-17.12	peak	Vertical
2390	56.91	-12.99	43.92	54	-10.08	AVG	Vertical
2390	68.87	-12.99	55.88	74	-18.12	peak	Horizontal
2390	54.34	-12.99	41.35	54	-12.65	AVG	Horizontal
2483.5	68.52	-12.78	55.74	74	-18.26	peak	Vertical
2483.5	54.45	-12.78	41.67	54	-12.33	AVG	Vertical
2483.5	69.67	-12.78	56.89	74	-17.11	peak	Horizontal
2483.5	55.56	-12.78	42.78	54	-11.22	AVG	Horizontal
8DPSK							
2390	69.08	-12.99	56.09	74	-17.91	peak	Vertical
2390	55.98	-12.99	42.99	54	-11.01	AVG	Vertical
2390	68.35	-12.99	55.36	74	-18.64	peak	Horizontal
2390	55.67	-12.99	42.68	54	-11.32	AVG	Horizontal
2483.5	69.56	-12.78	56.78	74	-17.22	peak	Vertical
2483.5	55.45	-12.78	42.67	54	-11.33	AVG	Vertical
2483.5	68.35	-12.78	55.57	74	-18.43	peak	Horizontal
2483.5	55.34	-12.78	42.56	54	-11.44	AVG	Horizontal

Low measurement frequencies is range from 2310 to 2400 MHz, high measurement frequencies is range from 2483.5 to 2500 MHz.
Only show the worst point data of the emissions in the frequency 2310-2400 MHz and 2483.5-2500 MHz.

Test Frequency :Above 18GHz

The measurements were more than 20 dB below the limit and not reported

7 Band Edge Measurement

TestRequirement	:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Test Mode	:	Refer to section 3.3

7.1 Test Procedure

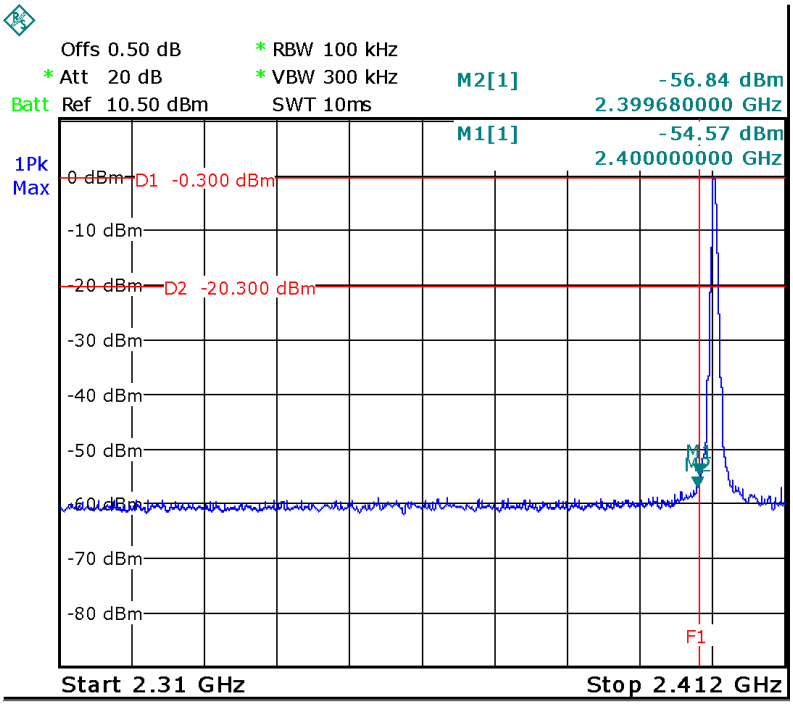
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to thespectrum;

2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto

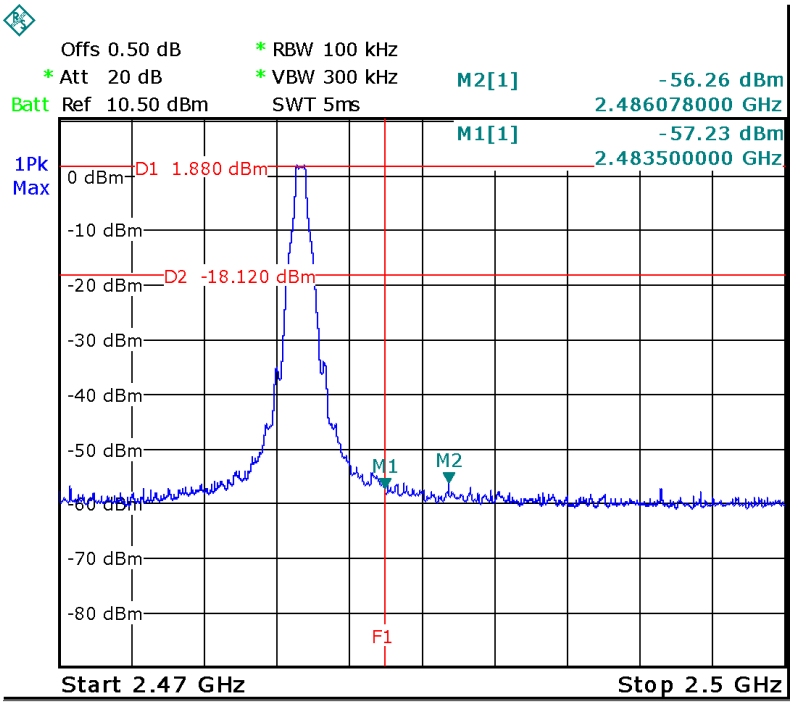
Detector function = peak, Trace = max hold

7.2 Test Result

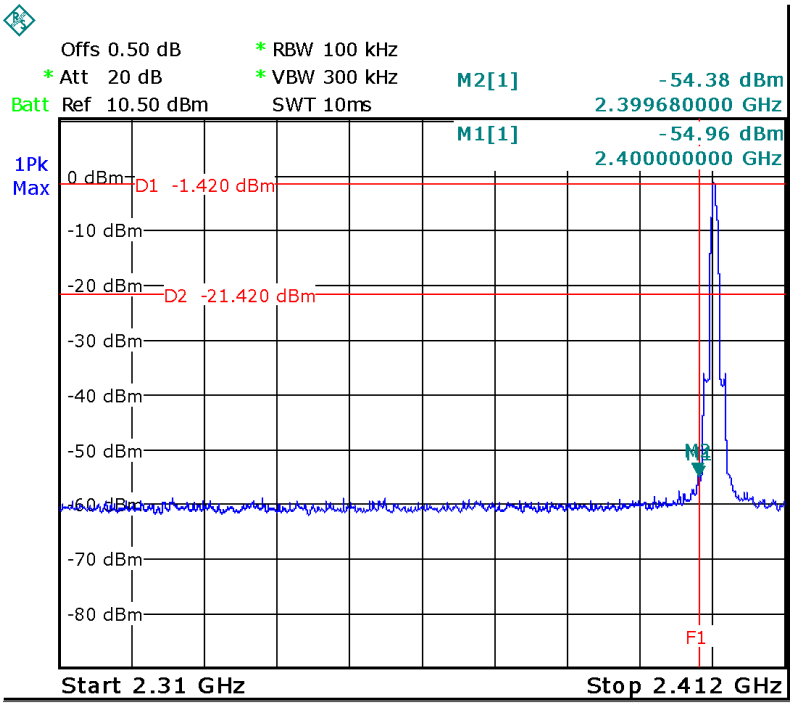
GFSK Band edge-left side



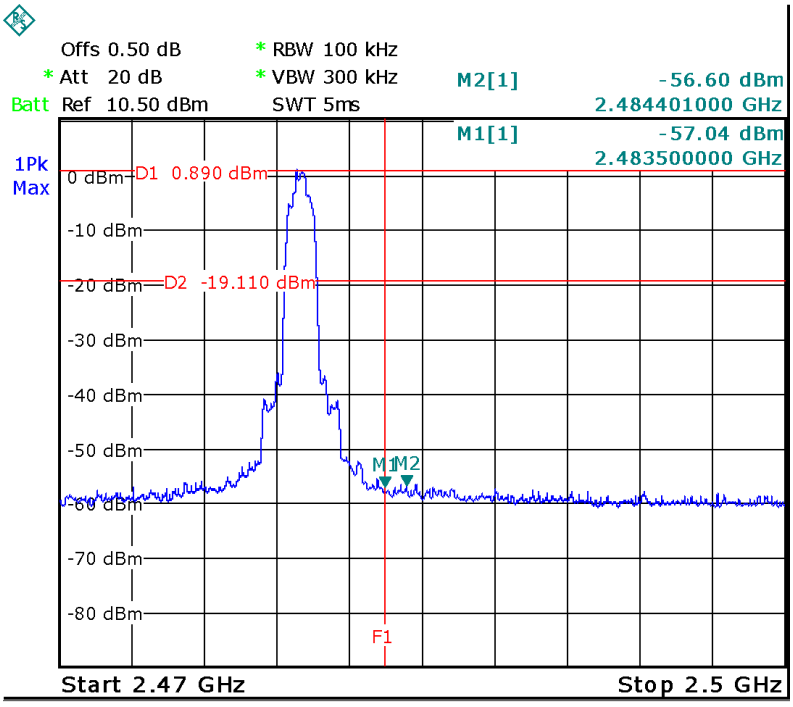
GFSK Band edge-right side



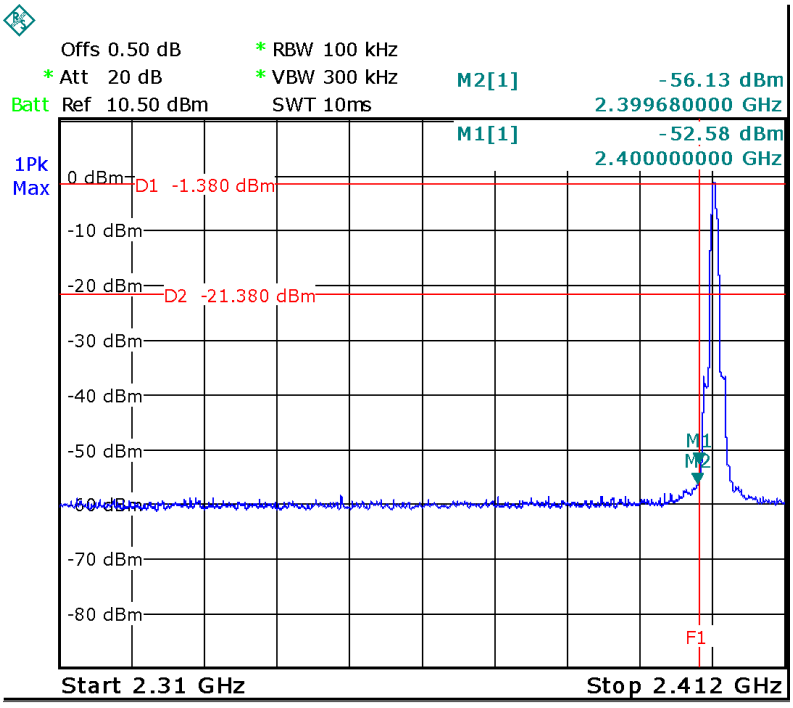
Pi/4 DQPSK Band edge-left side



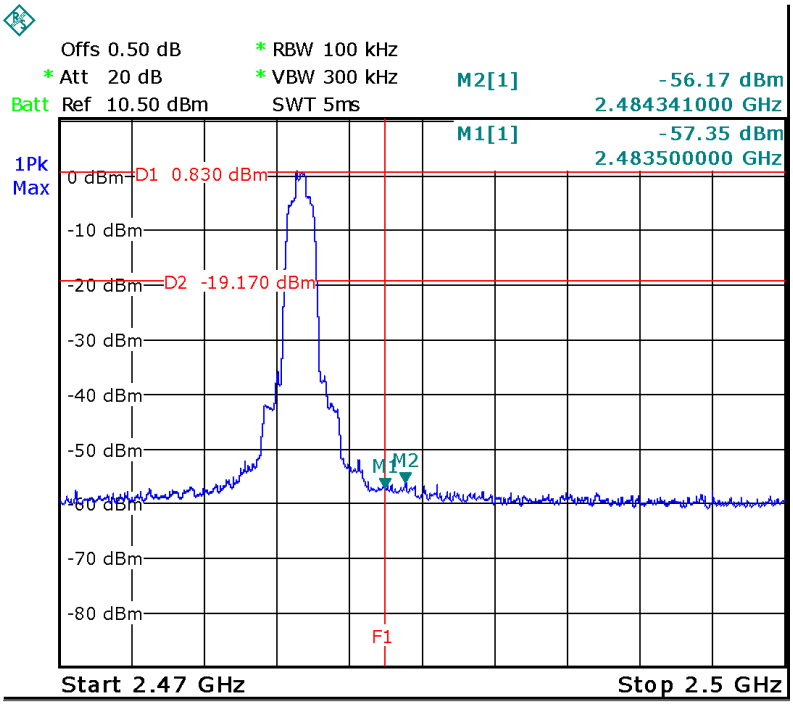
Pi/4 DQPSK Band edge-right side



8DPSK Band edge-left side



8DPSK Band edge-right side



8 20 dB Bandwidth Measurement

TestRequirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Mode	:	Refer to section 3.3

8.1 Test Procedure

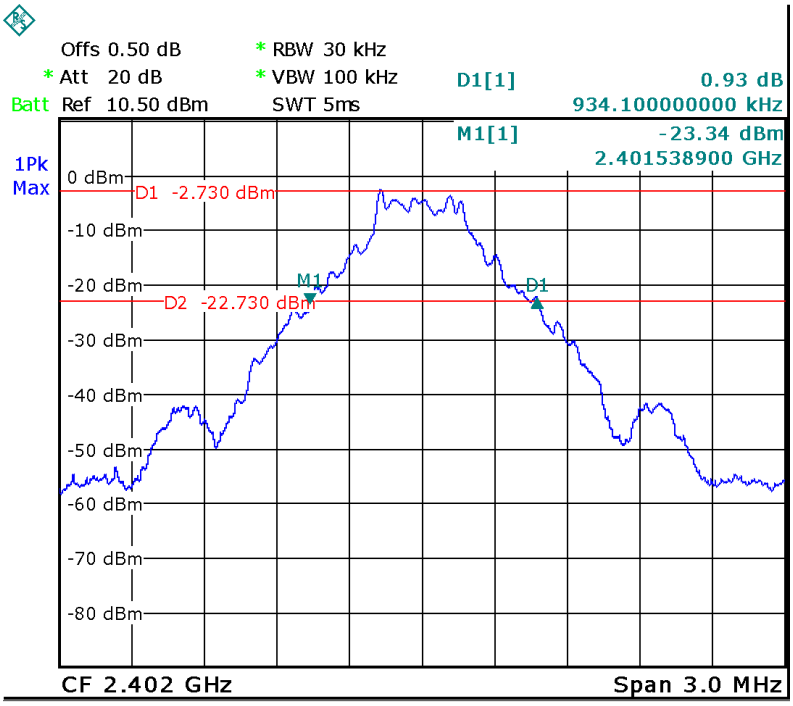
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. Set the spectrum analyzer: RBW = 30kHz, VBW = 100kHz

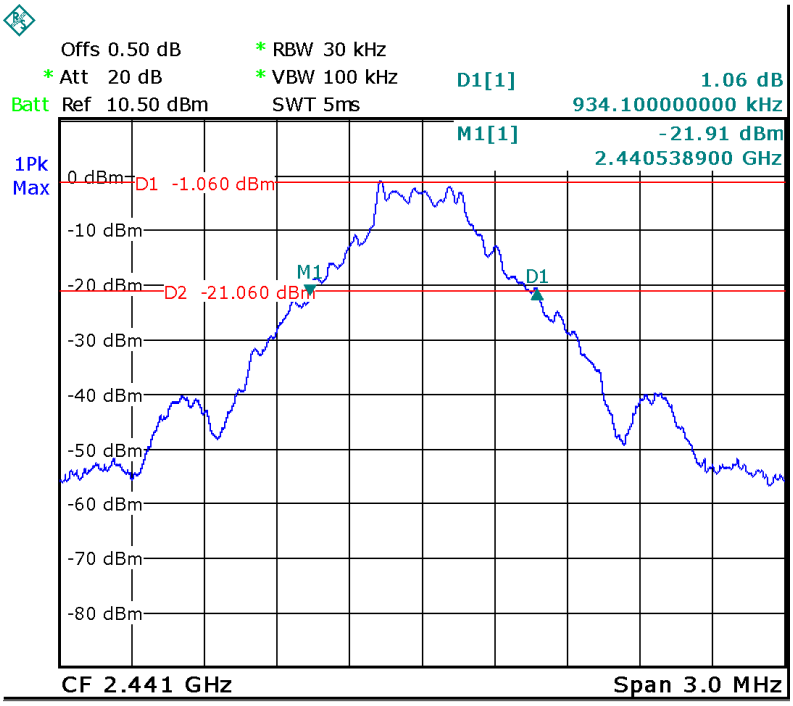
8.2 Test Result

Modulation	Test Channel	Bandwidth(MHz)
GFSK	Low	0.934
GFSK	Middle	0.934
GFSK	High	0.934
Pi/4 DQPSK	Low	1.252
Pi/4 DQPSK	Middle	1.252
Pi/4 DQPSK	High	1.252
8DPSK	Low	1.258
8DPSK	Middle	1.258
8DPSK	High	1.258

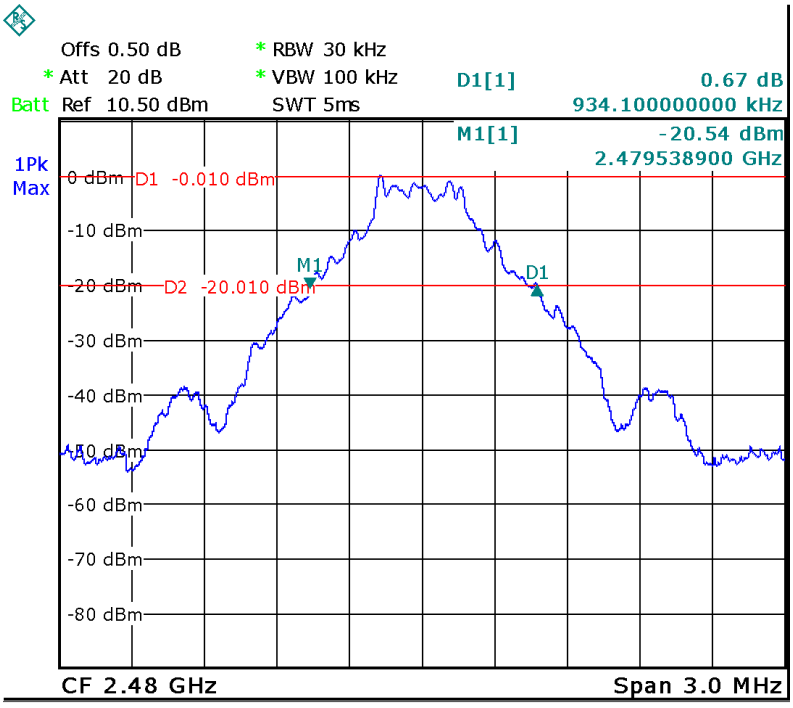
GFSK Low Channel



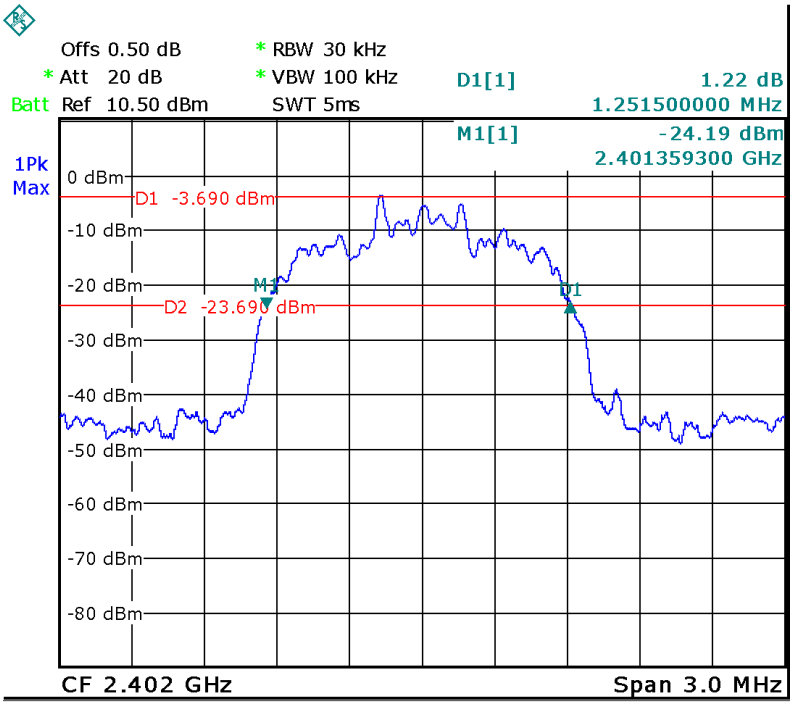
GFSK Middle Channel



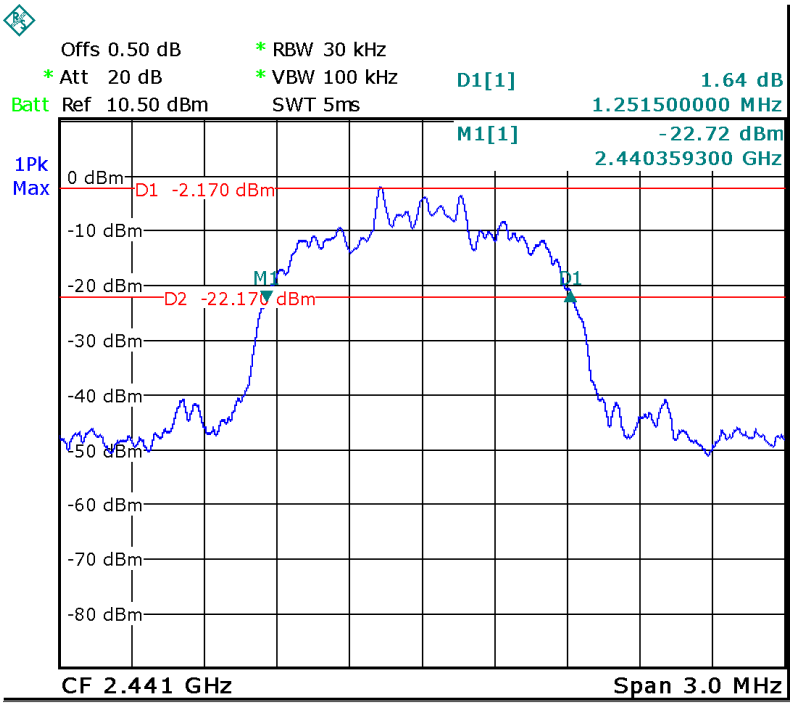
GFSKHigh Channel



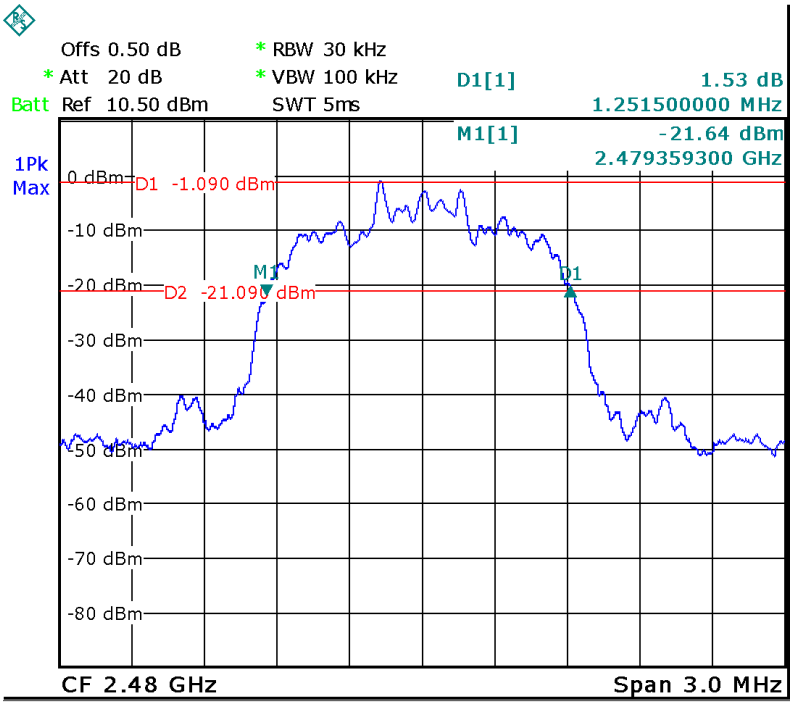
Pi/4DQPSK LowChannel



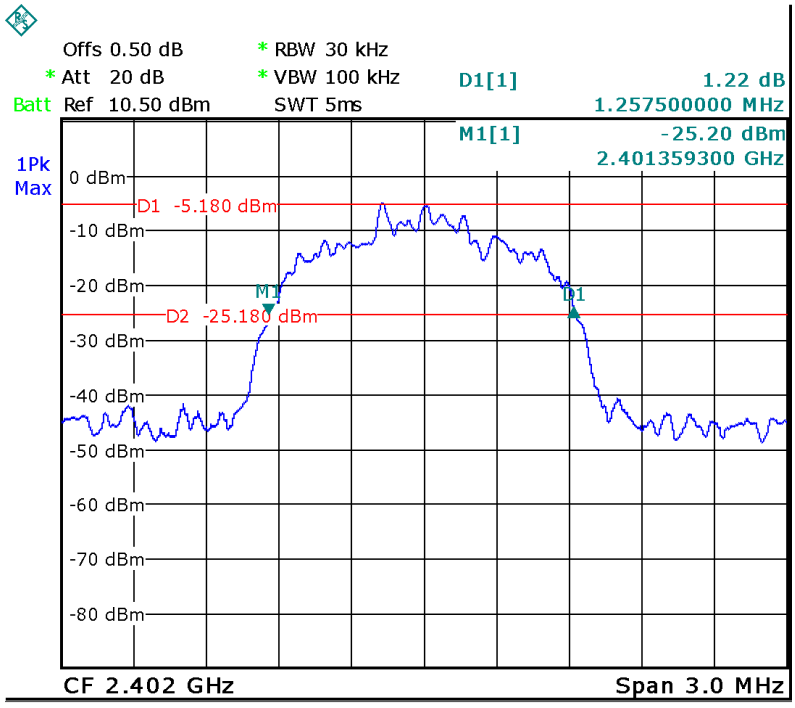
Pi/4DQPSK Middle Channel



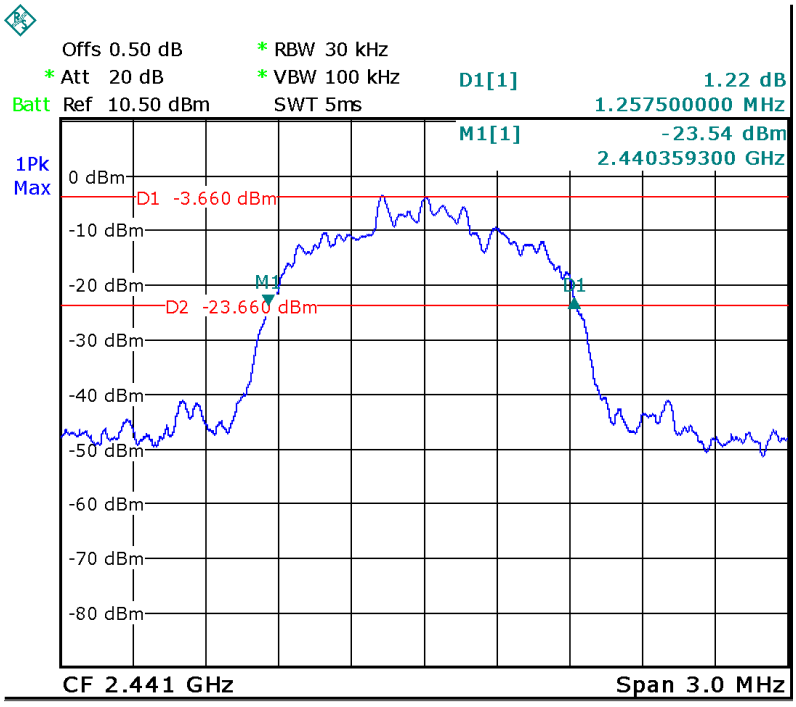
Pi/4DQPSK High Channel



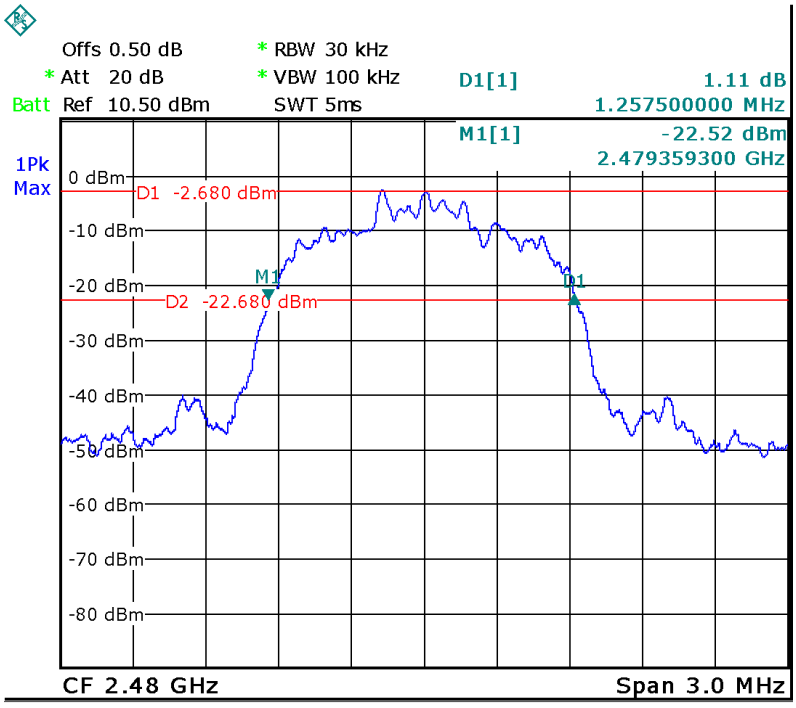
8DPSK Low Channel



8DPSK Middle Channel



8DPSK High Channel



9 Maximum Peak Output Power

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247 (b)(1), 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. Refer to the result “Number of Hopping Frequency” of this document. The 0.125watts (20.97 dBm) limit applies.
Test Mode	:	Refer to section 3.3

9.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

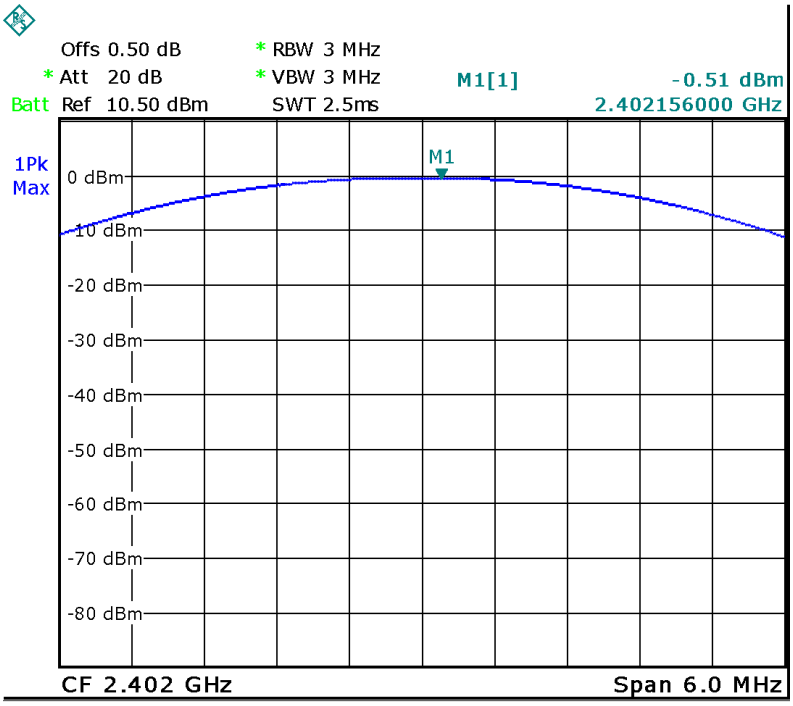
2. Set the spectrum analyser: RBW = 3 MHz. VBW =3 MHz. Sweep = auto; Detector Function = Peak.

3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

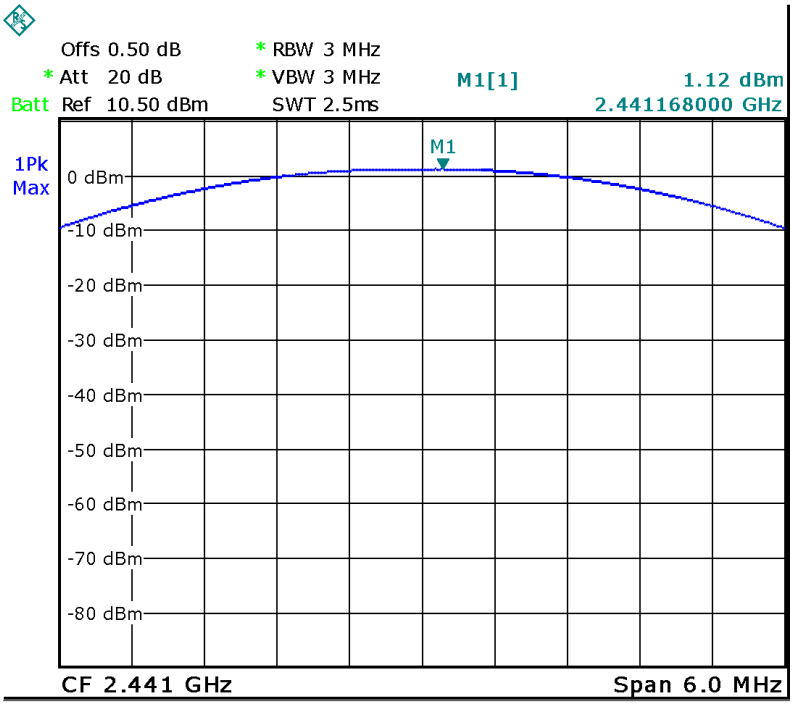
9.2 Test Result

Modulation	Test Channel	Output Power (dBm)	Limit (dBm)
GFSK	Low	-0.51	30
GFSK	Middle	1.12	30
GFSK	High	2.16	30
Pi/4 DQPSK	Low	-0.94	20.97
Pi/4 DQPSK	Middle	0.60	20.97
Pi/4 DQPSK	High	1.67	20.97
8DPSK	Low	-0.57	20.97
8DPSK	Middle	1.05	20.97
8DPSK	High	2.13	20.97

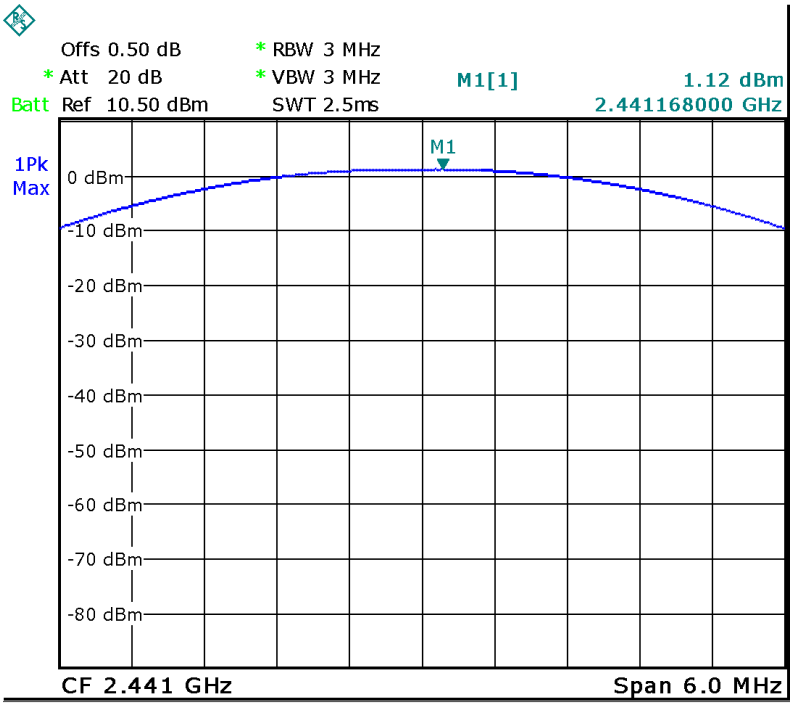
GFSK Low Channel



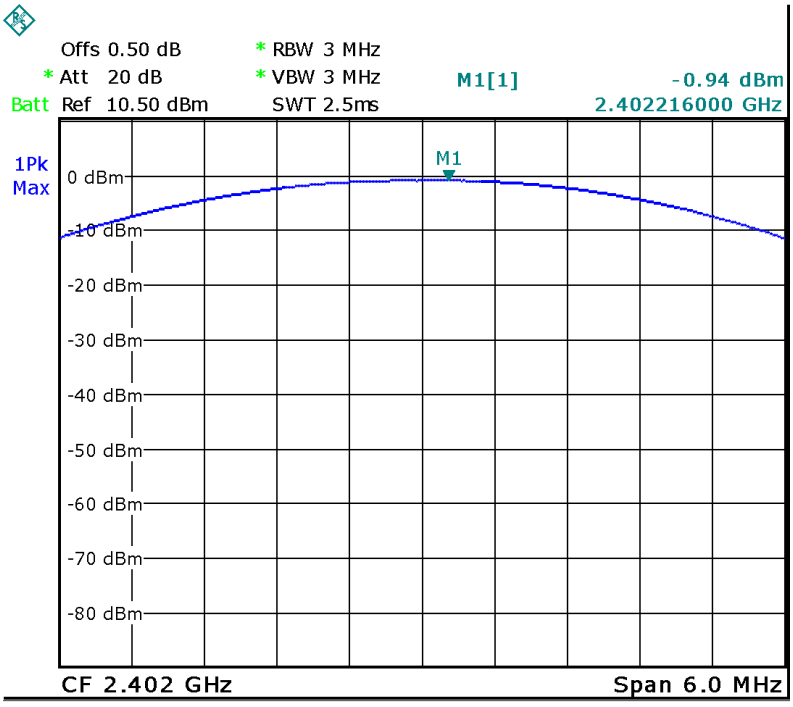
GFSK Middle Channel



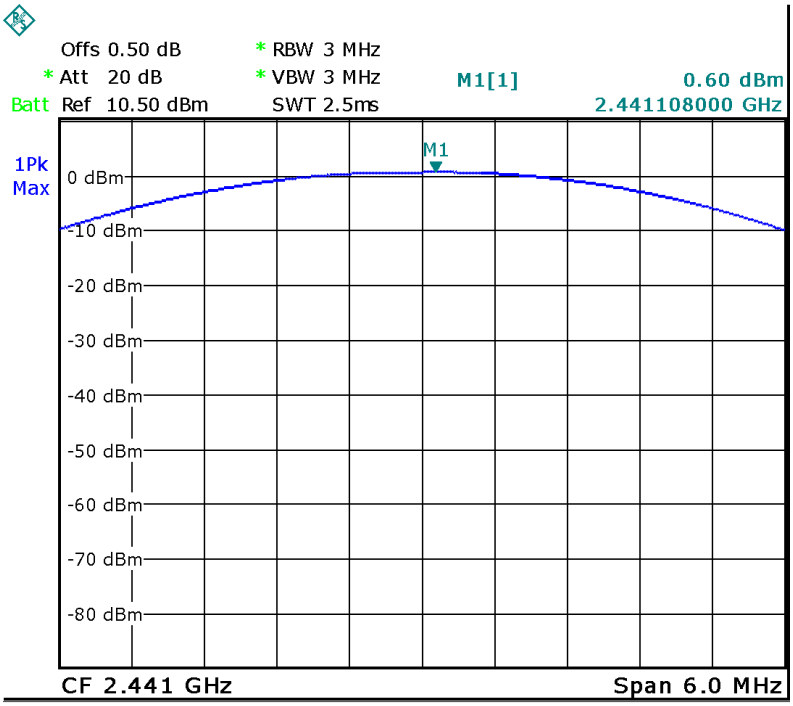
GFSKHigh Channel



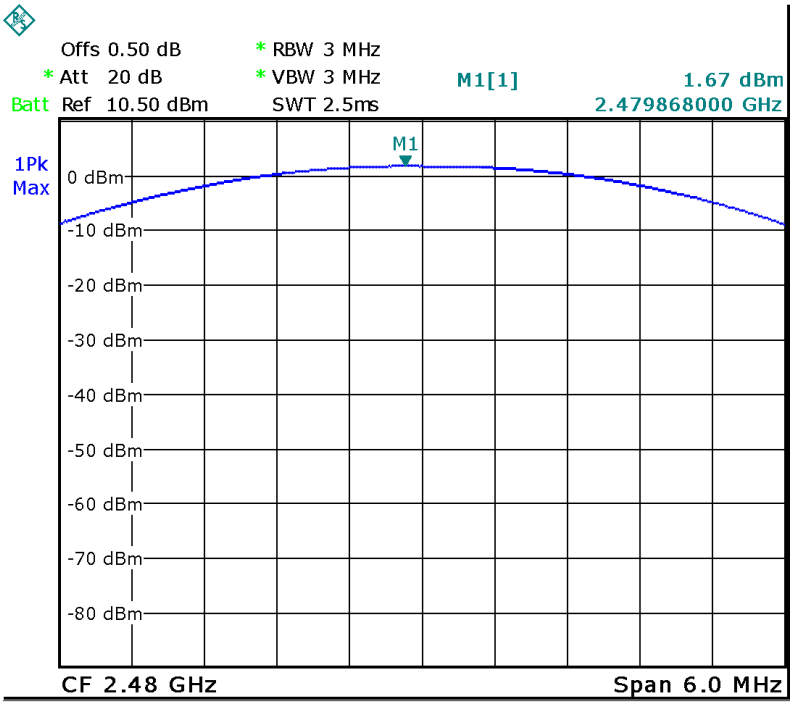
Pi/4DQPSK LowChannel



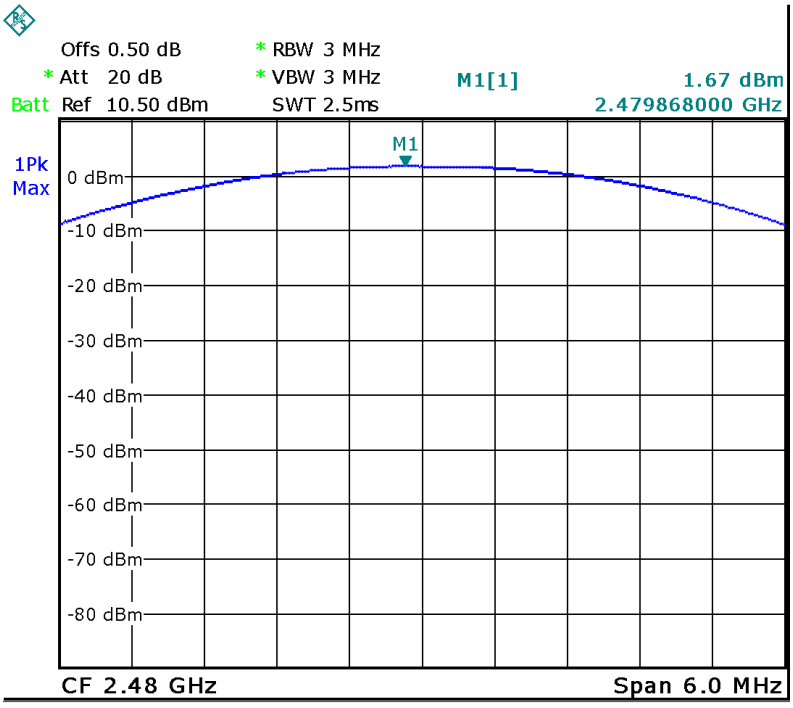
Pi/4DQPSK Middle Channel



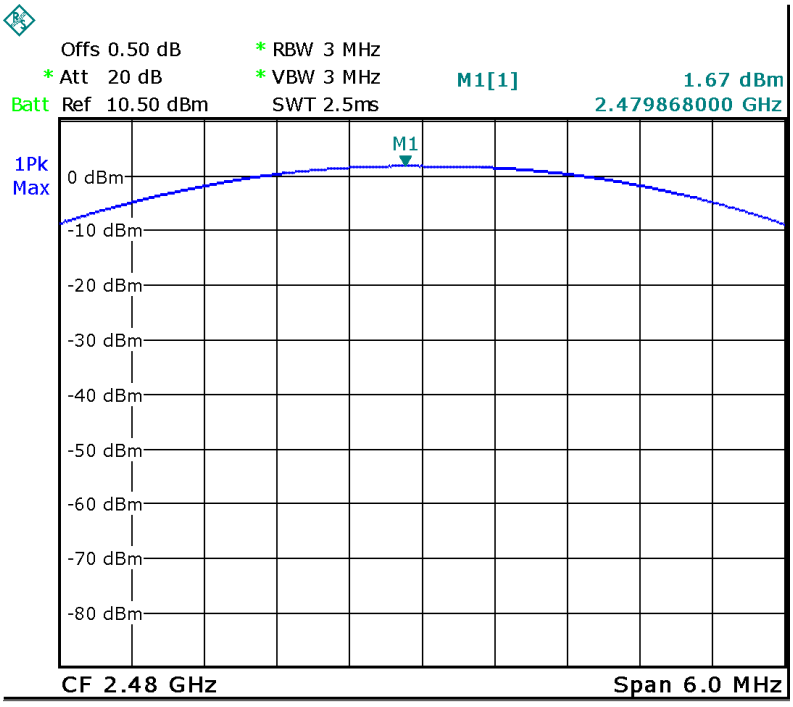
Pi/4DQPSK High Channel



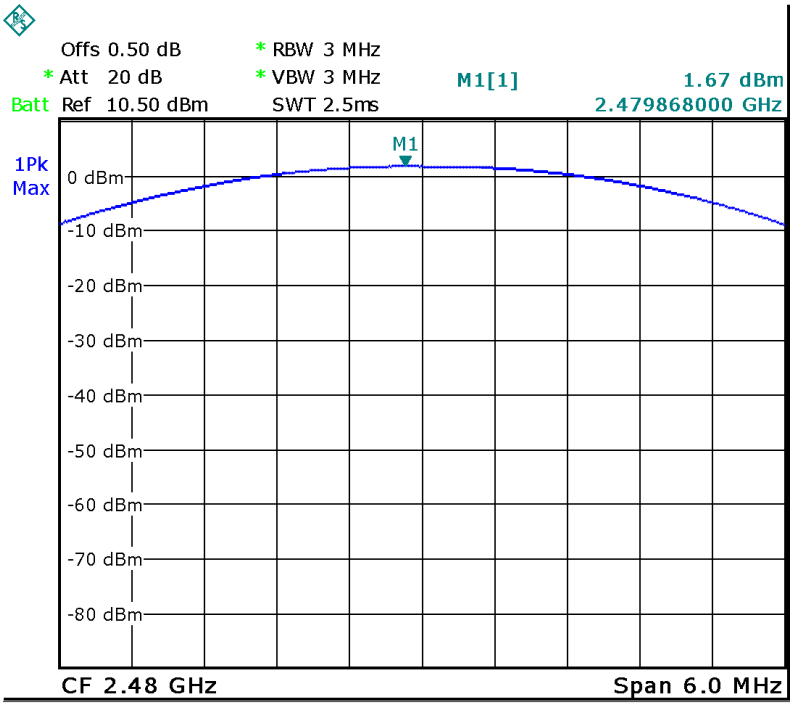
8DPSK Low Channel



8DPSK Middle Channel



8DPSK High Channel



10 Hopping Channel Separation

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247(a)(1) 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 2400-2483.5MHz 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 than125mW.
Test Mode	:	Hopping

10.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna portto the spectrum.

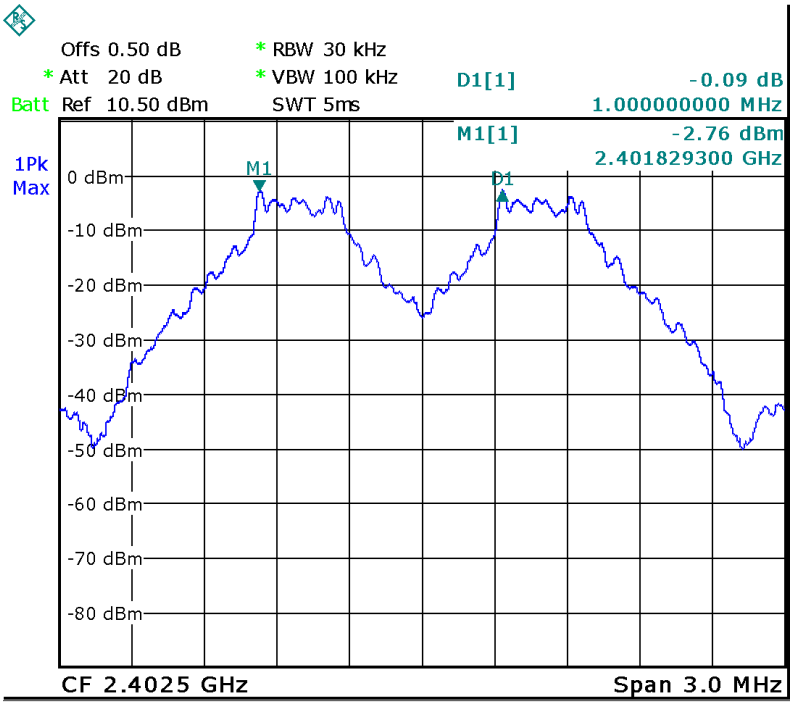
2. Set the spectrum analyzer: RBW = 30KHz. VBW = 100KHz , Span = 3MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

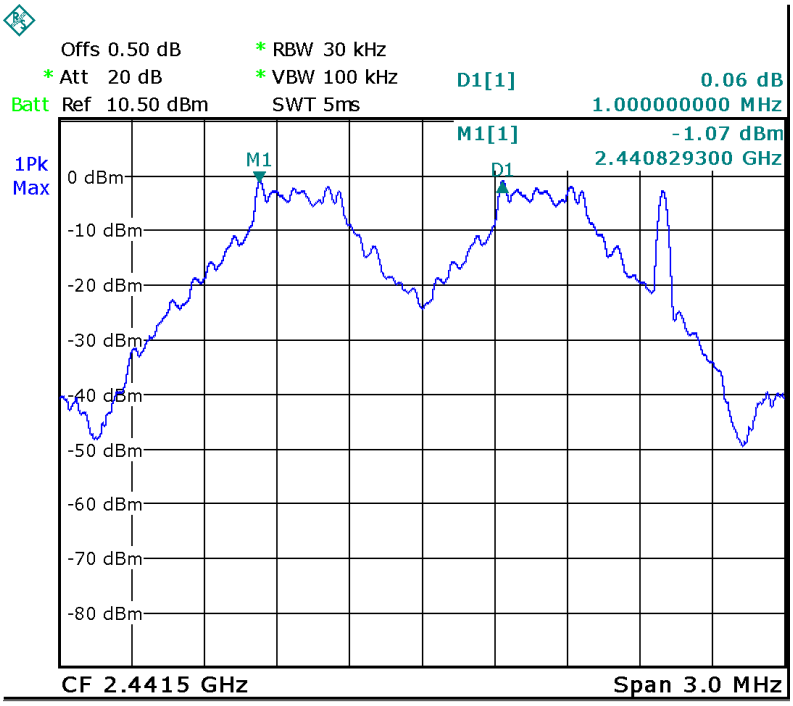
10.2 Test Result

Modulation	Test Channel	Separation (MHz)	Result
GFSK	Low	1.000	PASS
GFSK	Middle	1.000	PASS
GFSK	High	1.000	PASS
Pi/4 DQPSK	Low	1.000	PASS
Pi/4 DQPSK	Middle	1.000	PASS
Pi/4 DQPSK	High	1.000	PASS
8DPSK	Low	1.000	PASS
8DPSK	Middle	1.000	PASS
8DPSK	High	1.000	PASS

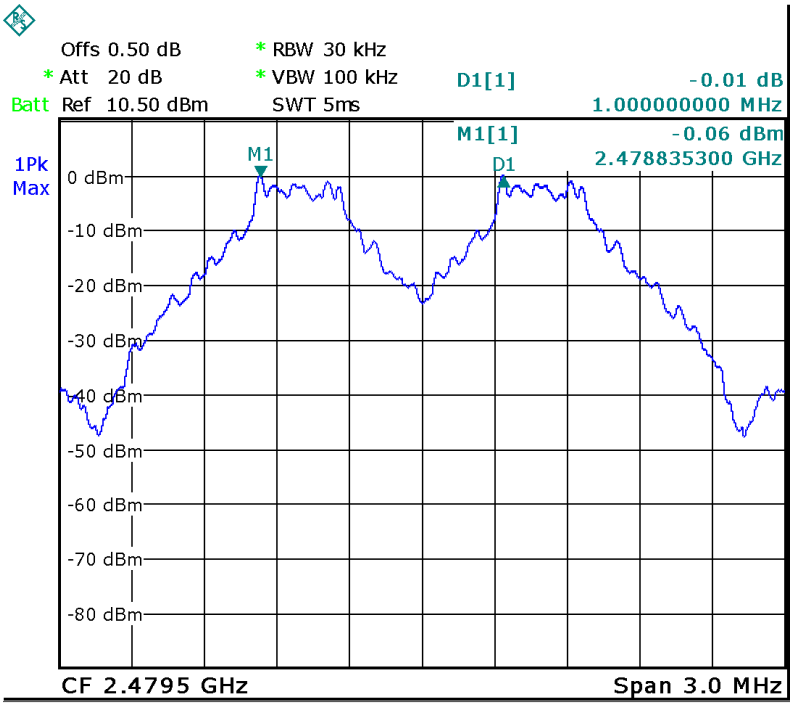
GFSK Low Channel



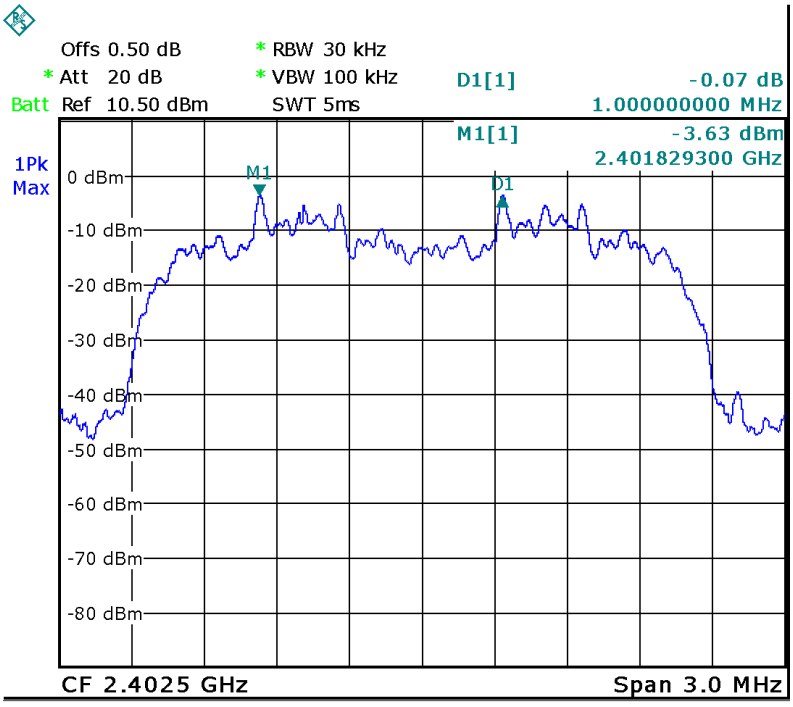
GFSK Middle Channel



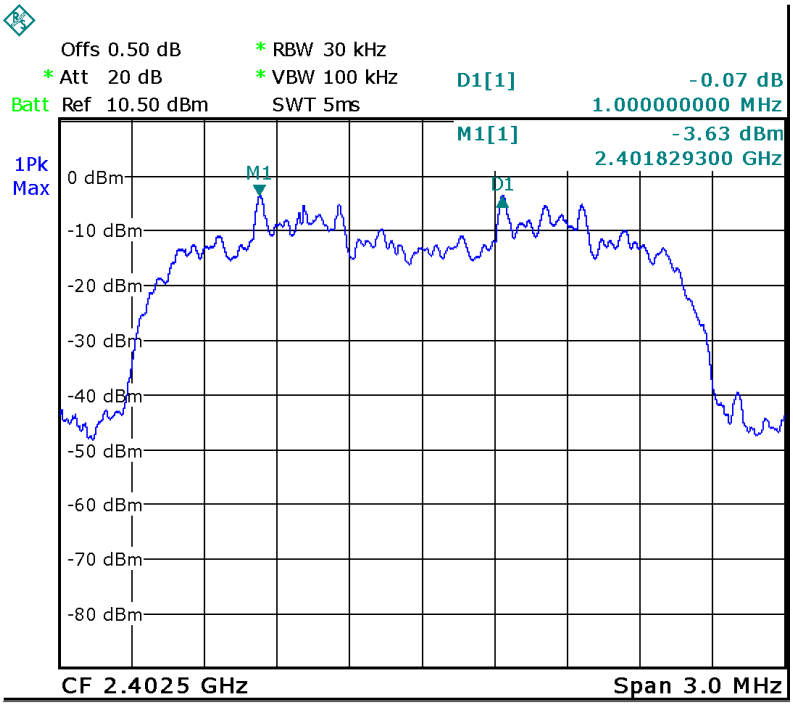
GFSKHigh Channel



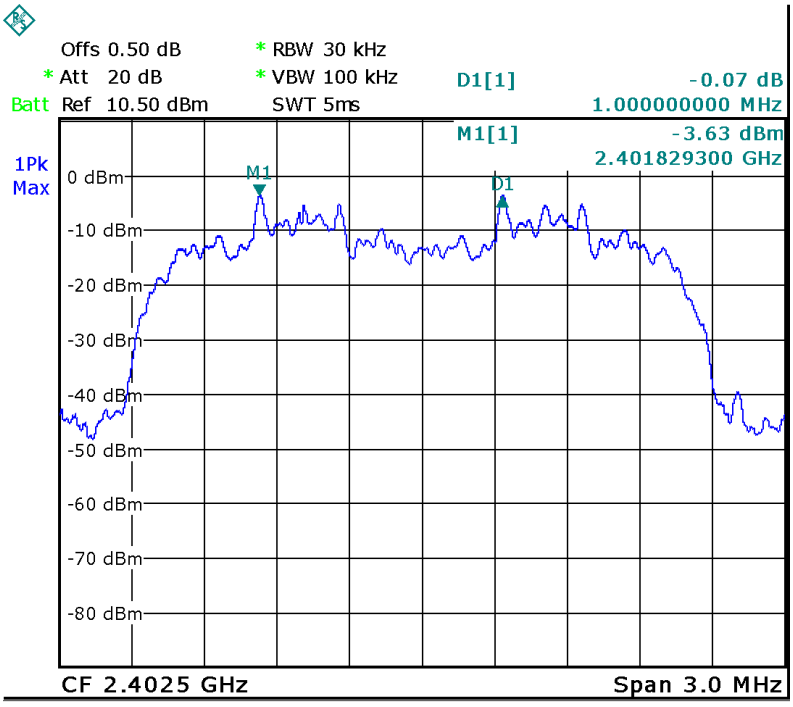
Pi/4DQPSK LowChannel



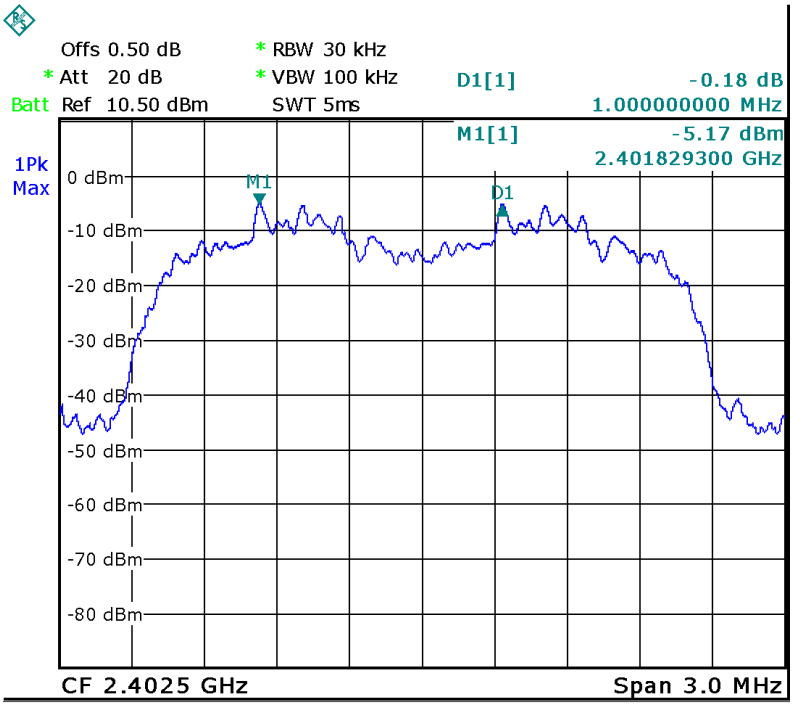
Pi/4DQPSK Middle Channel



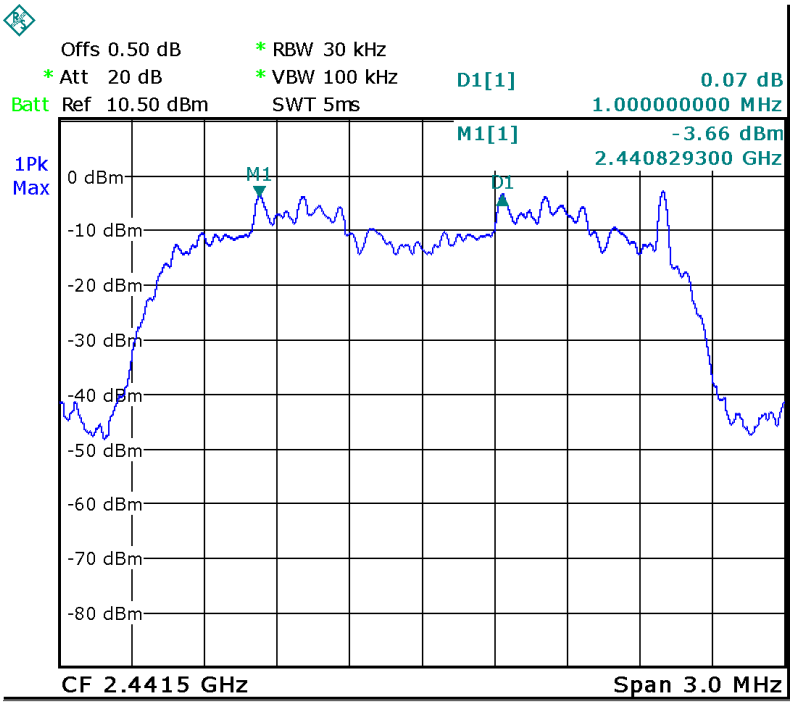
Pi/4DQPSK High Channel



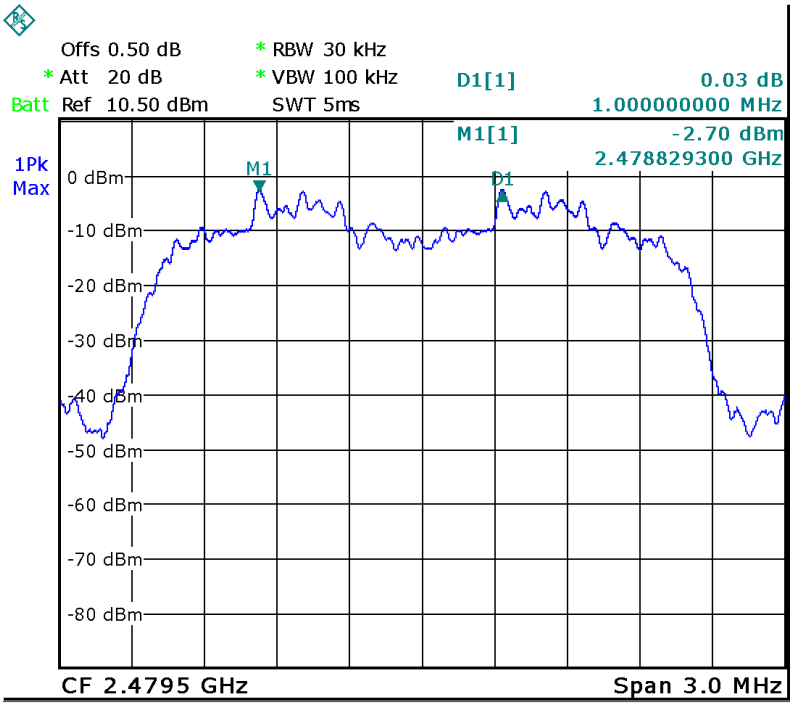
8DPSK Low Channel



8DPSK Middle Channel



8DPSK High Channel



11 Number of Hopping Frequency

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247 (a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Mode	:	Hopping(GFSK)

11.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

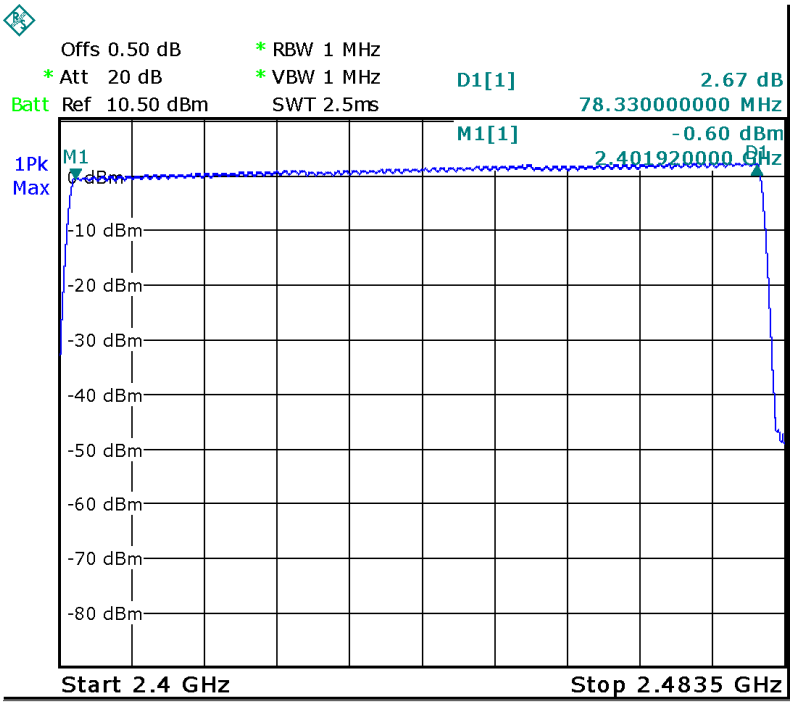
2. Set the spectrum analyzer: RBW = 1MHz. VBW = 1MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.

4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.483GHz. Sweep=auto;

11.2 Test Result

Channel Number	Limit
79	⩾15



12 Dwell Time

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247(a)(1)(iii) Frequency hopping systems inthe 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.
Test Mode	:	Hopping
Remark	:	The worst case(8DPSK,DH5) was recorded

12.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set spectrum analyzer span = 0. Centredon a hopping channel;

3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 and DH1 packet transmitting.

4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

12.2 Test Result

DH5 Packet permit maximum 1600 / 79 / 6 hops per second in each channel (5 time slots RX, 1 time slot TX).

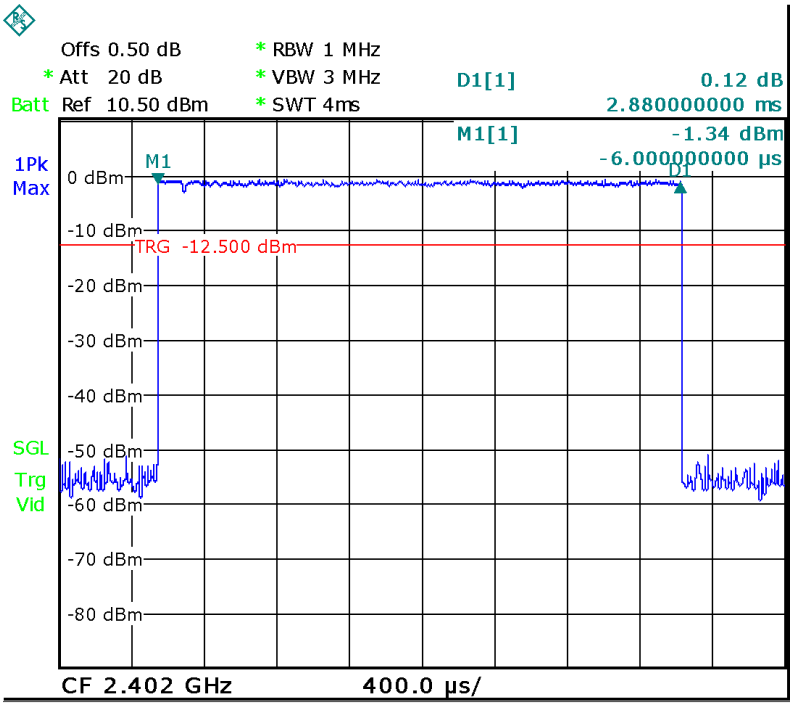
DH3 Packet permit maximum 1600 / 79 / 4 hops per second in each channel (3 time slots RX, 1 time slot TX).

DH1 Packet permit maximum 1600 / 79 /2 hops per second in each channel (1 time slot RX, 1 time slot TX). So,the Dwell Time can be calculated as follows:

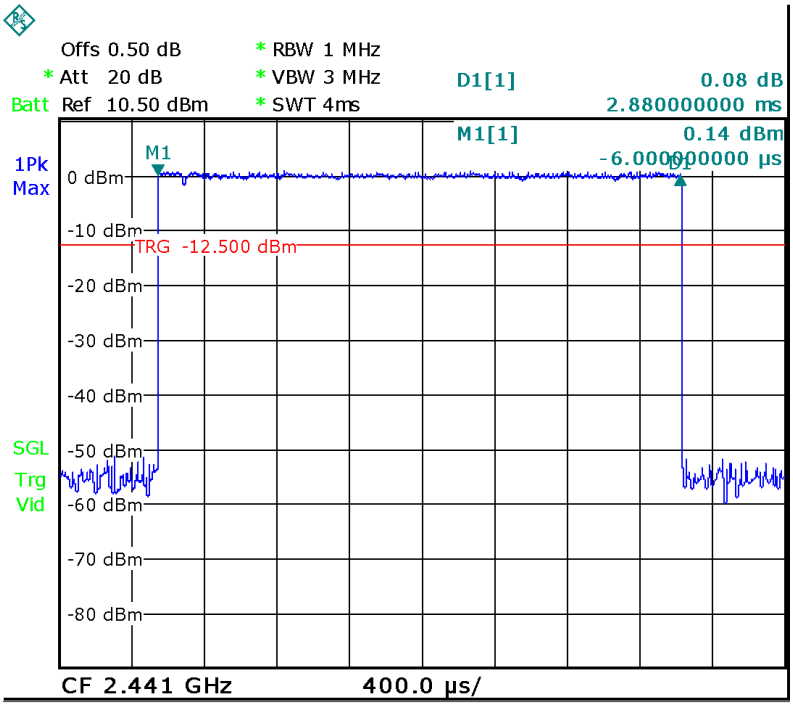
Data Packet	Dwell Time(s)
DH5	1600/79/6*0.4*79*(MkrDelta)/1000
DH3	1600/79/4*0.4*79*(MkrDelta)/1000
DH1	1600/79/2*0.4*79*(MkrDelta)/1000
Remark: Mkr Deltais once pulse time. Only the worst data(DH5) were show as follow.	

Modulation	Data Packet	Channel	pulse time(ms)	Dwell Time(s)	Limits(s)
8DPSK	DH5	Low	2.880	0.307	0.4
		middle	2.880	0.307	0.4
		High	2.880	0.307	0.4

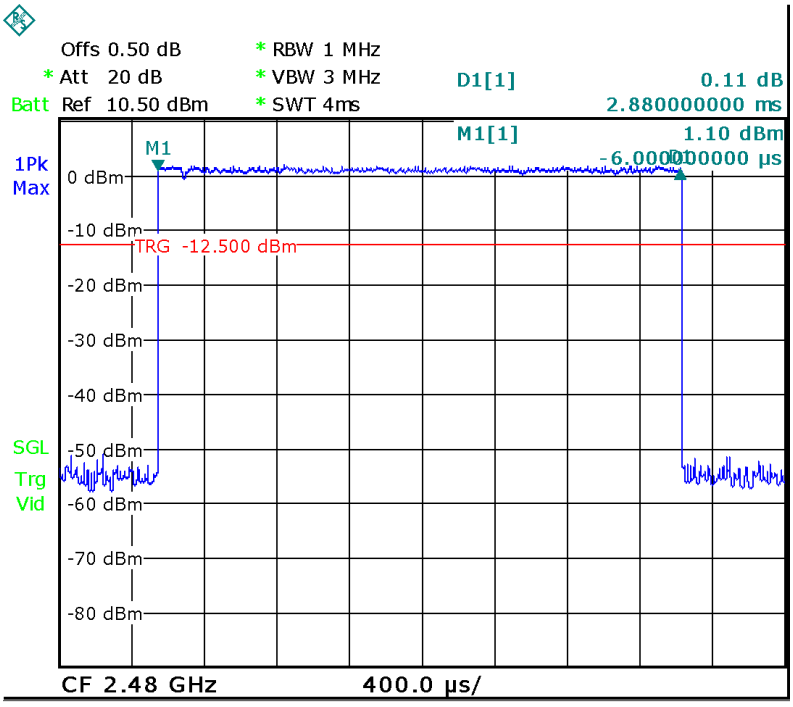
8DPSK Low Channel



8DPSK Middle Channel



8DPSK High Channel

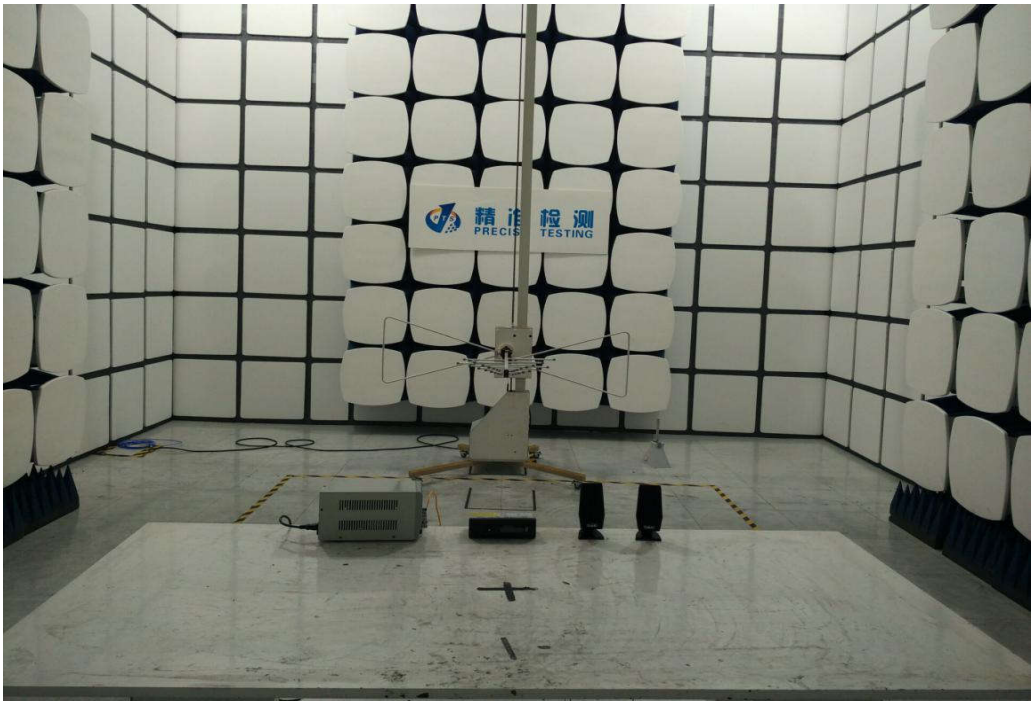


13 Antenna Requirement

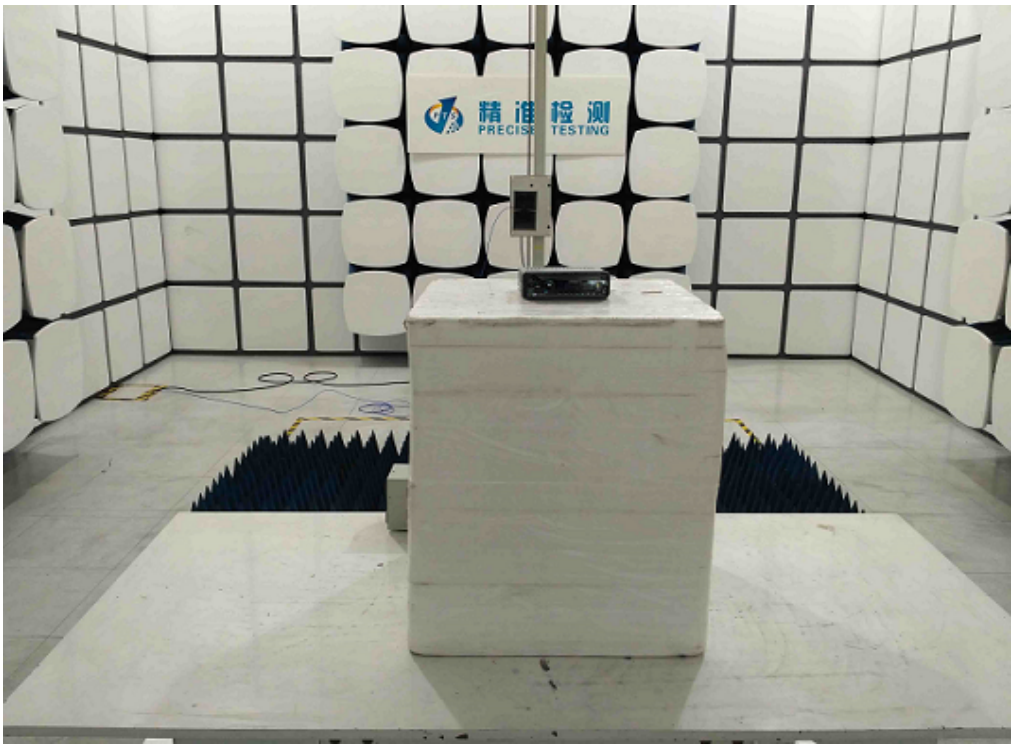
According to the FCC part15.203, a transmitter can only be sold or operated with antennas with which it was approved. This product has anexternal antenna with RP-SMA connector, it meet the requirement of this section.

14 Test Setup

Spurious Emissions
From 30MHz-1000MHz



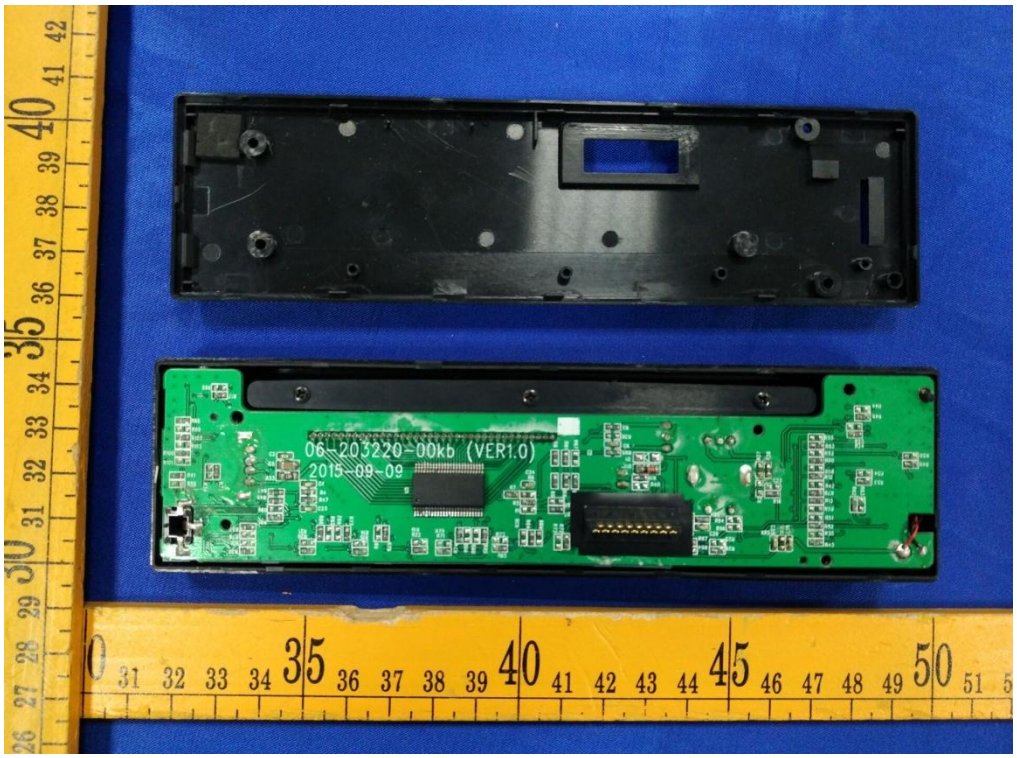
Above 1GHz

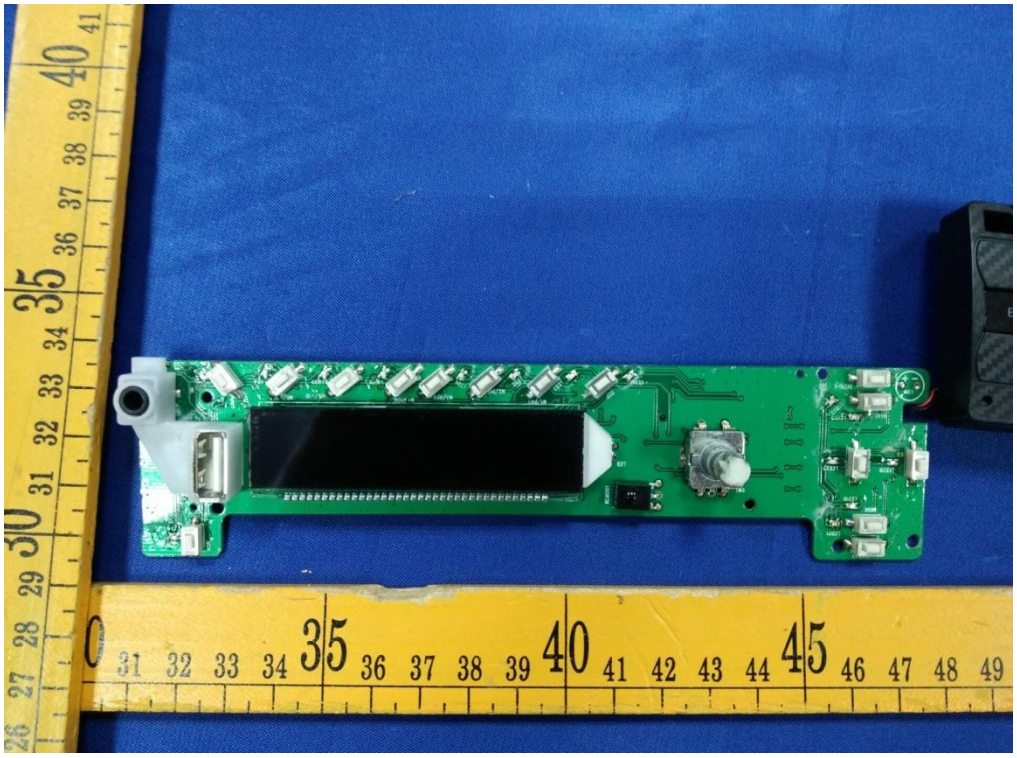


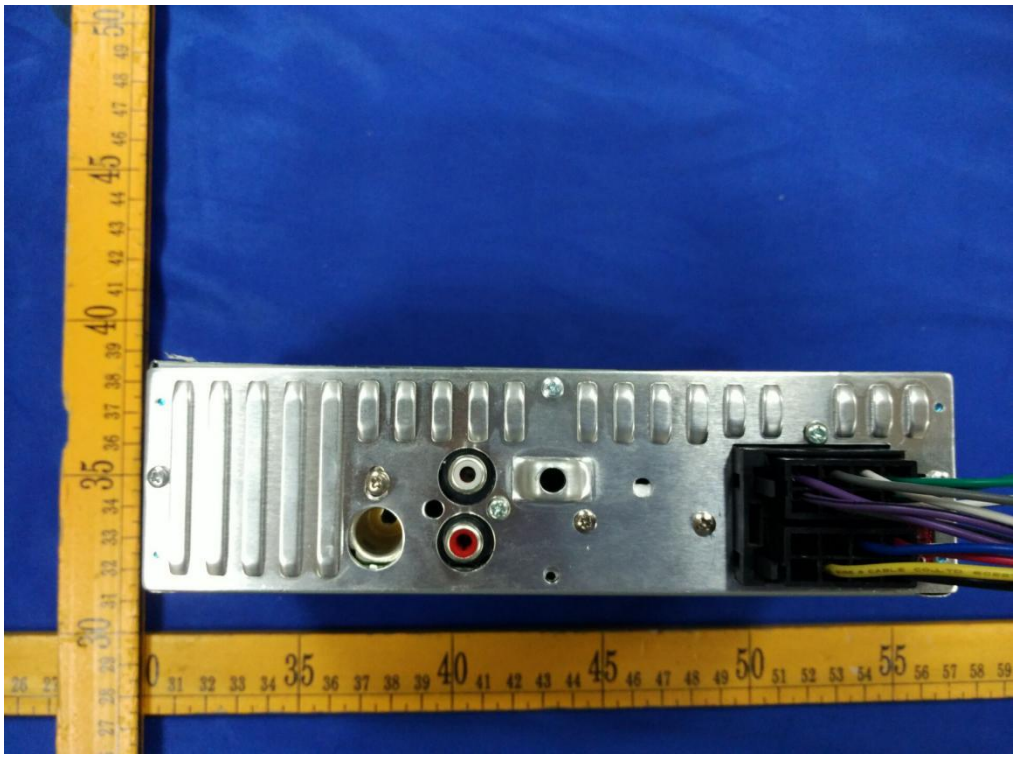
15 EUT Photos

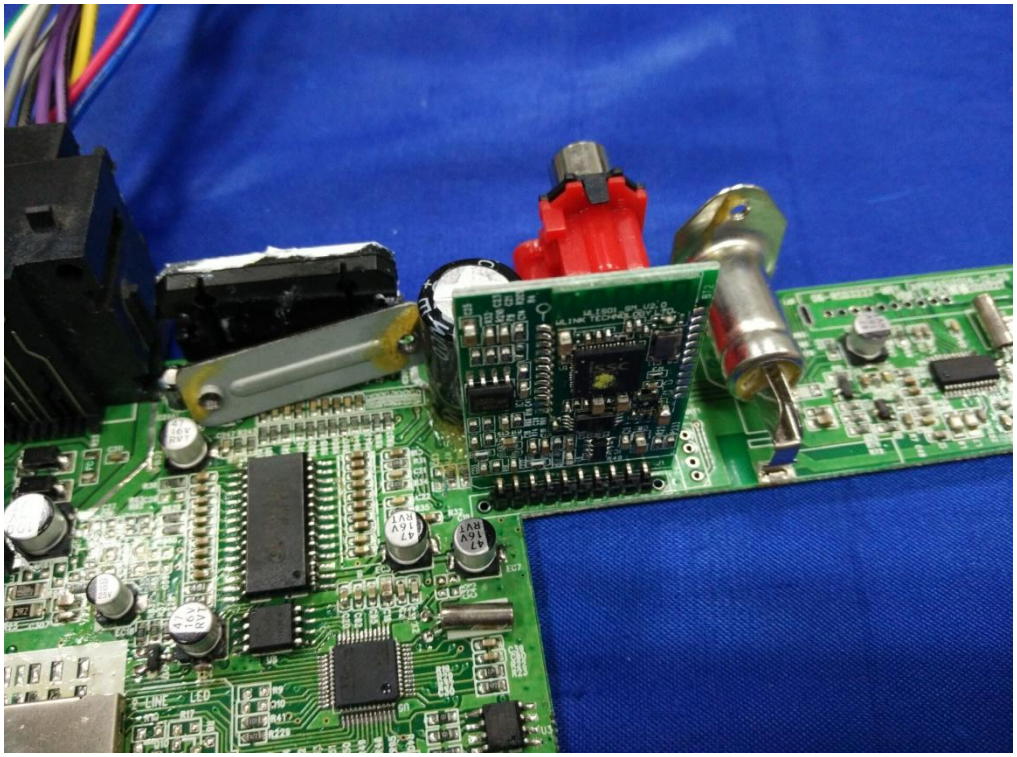
External Photos

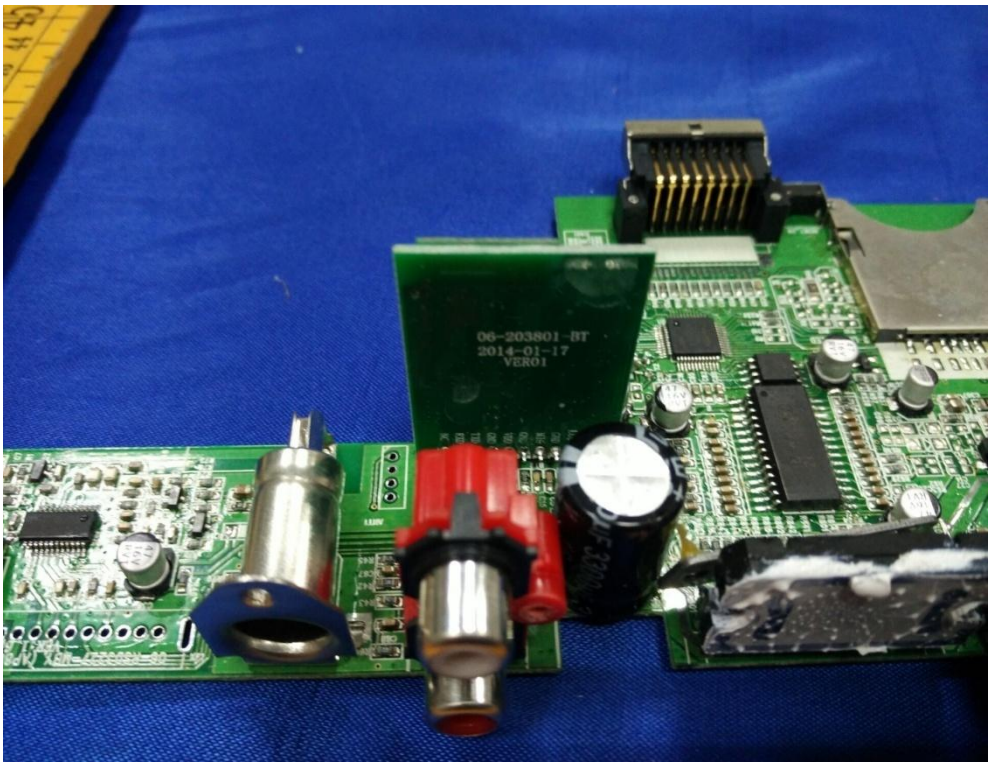

NXR1019BT
AMS
USB
AUX
MON


06-203220-00kb (VER1.0)
2015-09-09

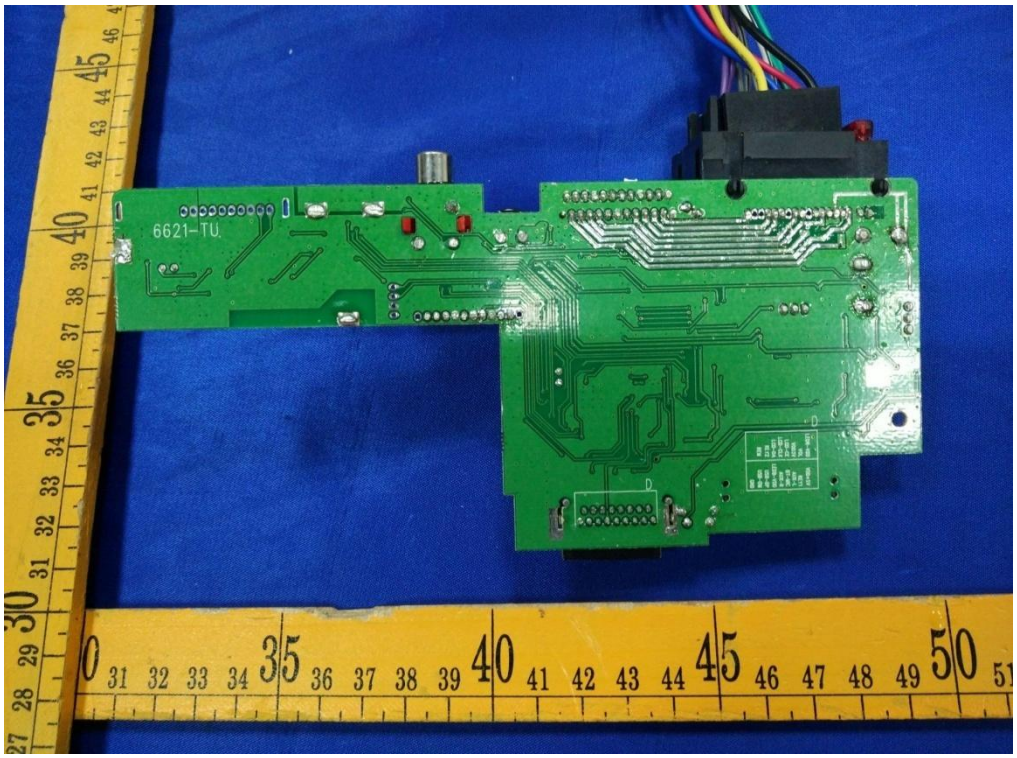


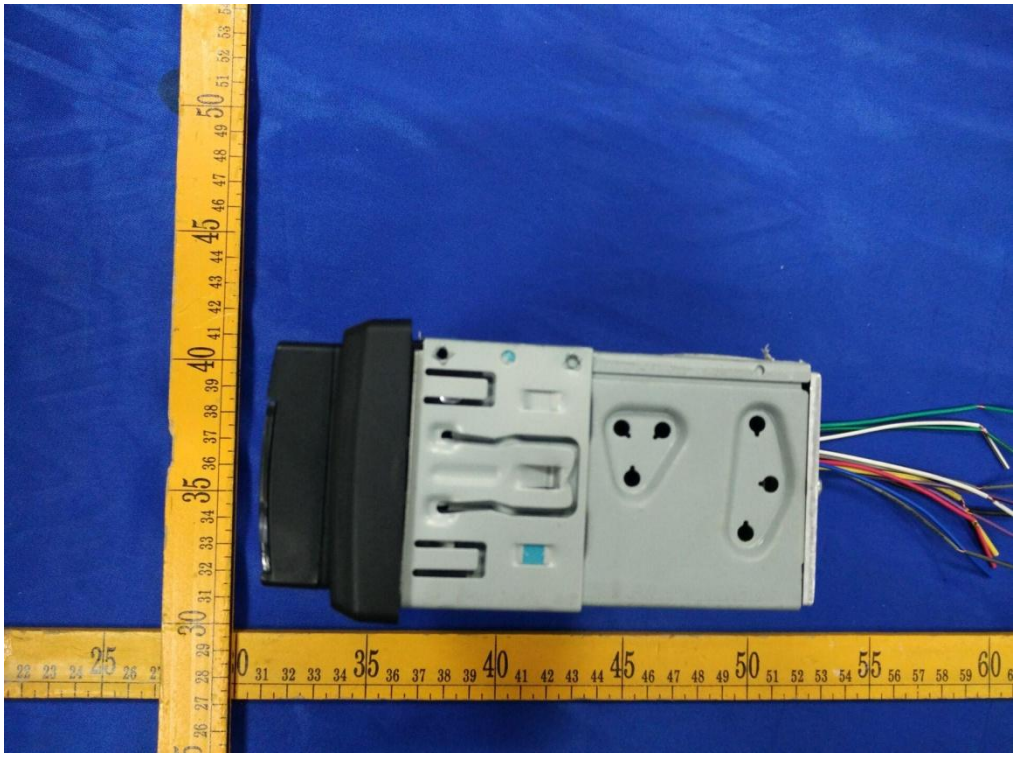





06-203801-BT
2014-01-17
VER01


ETIQUETA DE GARANTÍA
SI ESTA ETIQUETA FUERA DAÑADA, LA REPARACIÓN DE EQUIPO NO PODRÁ SER REALIZADA EN GARANTÍA.
NO WARRANTY CLAIM CAN BE ACCEPTED
IN CASE THIS LABEL IS DAMAGED.
NOBLEX
NXR1019
newsan





********THE END REPORT********