FCC TEST REPORT
FCC ID:2ALS7IQ2525BT

Product	:	PORTABLE BT SPEAKER
Model Name	:	IQ-2525BT, B16, B11, B12, B15, B13, B17, B20, B21, B30, B112, B122, B132, B152, B162, B172, PBX-55
Brand	:	IQ Sound, EARISE,QFX
Report No.	:	PTC-DQ-01170513301-FC01

Prepared for

Dongguan City MeiZhiZun Electronics Technology Co.,Ltd

No. 33, Hehe Road,XiangxiVillage,LiaobuTown,Dongguan ,Guangdong.China

Prepared by

DongGuan Precise Testing Service Co.,Ltd.

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

Dongcheng District, Dongguan, Guangdong, China

1 TEST RESULT CERTIFICATION

Applicant's name	:	Dongguan City MeiZhiZun Electronics Technology Co.,Ltd
Address	:	No. 33, Hehe Road,Xiangxi Village, Liaobu Town, Dongguan, Guangdong, China
Manufacture's name	:	Dongguan City MeiZhiZun Electronics Technology Co.,Ltd
Address	:	No. 33, Hehe Road,Xiangxi Village, Liaobu Town, Dongguan, Guangdong, China
Product name	:	PORTABLE BT SPEAKER
Model name	:	IQ-2525BT, B16, B11, B12, B15, B13, B17, B20, B21, B30, B112, B122, B132, B152, B162, B172, PBX-55
Brand	:	IQ Sound, EARISE,QFX
Standards	:	FCC CFR47 Part 15 Section 15.247
Test procedure	:	ANSI C63.10:2013
Test Date	:	May 24. 2017 ~ June 03. 2017
Date of Issue	:	June 27. 2017
Test Result	:	Pass

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

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Testing Engineer

August Qiu

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
Conducted Spurious emissions	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

2 General Information

2.1 General Description of E.U.T.

Product Name	:	PORTABLE BT SPEAKER
Model Name	:	IQ-2525BT, B16, B11, B12, B15, B13, B17, B20, B21, B30, B112, B122, B132, B152, B162, B172, PBX-55
Model Description		Except for decorative parts in front panels, color of enclosure, are the trade mark and model no. for trading purpose.
Bluetooth Version	:	V2.1+EDR
Operating frequency	:	2402-2480MHz,79channels
Antenna installation:	:	PCB Antenna
Antenna Gain:	:	0dBi
Type of Modulation	:	GFSK, Pi/4DQPSK, 8DPSK
Power supply	:	DC 3.7V, 1200mA by battery Charging voltage DC5V

2.2 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	-	-

2.3 Test Mode

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

During the test, the engineering test program was provide and enabled to make EUT transmit at Low channel/Middle channel/High channel.

During test use new and full voltage battery.

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

2.4 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

3 Equipment During Test

3.1 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	Keysight	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	USB RF power sensor	DARE	RPR3006W	15I00041SN O01	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	Loop Antenna	SCHWARZBECK	FMZB 1519	012	July 15, 2016	July 14, 2017	1 year
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3355	July 15, 2016	July 14, 2017	1 year
4	Amplifier	EM	EM-30180	060538	July 15, 2016	July 14, 2017	1 year
5	Horn Antenna	SCHWARZBECK	BBHA9120D	1246	July 15, 2016	July 14, 2017	1 year
6	Horn Antenna	SCHWARZBECK	BBHA9170D	1412	July 15, 2016	July 14, 2017	1 year
7	Coaxial Cable(below 1GHz)	LARGE	CALB1	-	July 15, 2016	July 14, 2017	1 year
8	Coaxial Cable(above 1GHz)	LARGE	CALB2	-	July 15, 2016	July 14, 2017	1 year

Conducted Emissions

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	R&S	ESCI	101155	July 15, 2016	July 14, 2017	1 year
2	LISN	SCHWARZBECK	NSLK 8128	8128-289	July 15, 2016	July 14, 2017	1 year
3	Cable	LARGE	RF300	-	July 15, 2016	July 14, 2017	1 year

3.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
Adapter	/	NSA12UH-050200 Input: AC 100-240V,50/60Hz, 0.5A Output: DC5V, 2A	/

3.3 Measurement Uncertainty

Parameter	**Uncertainty**
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	$\pm 1 \times 10^{-6}$
Bandwidth	$\pm 1.5 \times 10^{-6}$
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
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

4 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
Detector:	:	Peak for pre-scan(9kHz Resolution Bandwidth)

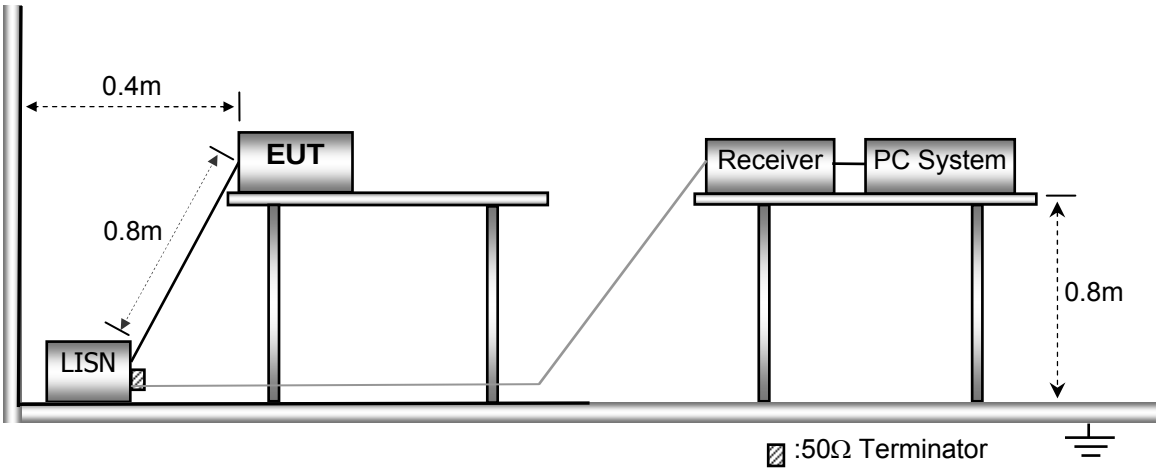
4.1 E.U.T. Operation

Operating Environment :

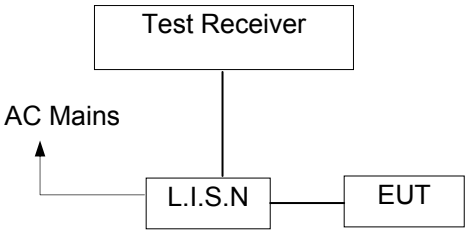
Temperature:	:	25.5 °C
Humidity:	:	51 % RH
Atmospheric Pressure:	:	101.2kPa
EUT Operation :	:	Refer to section 3.3

4.2 EUT Setup

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



4.3 Test SET-UP (Block Diagram of Configuration)



4.4 Measurement Procedure:

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

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

3. Repeat above procedures until all frequency measured was complete.

4.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

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

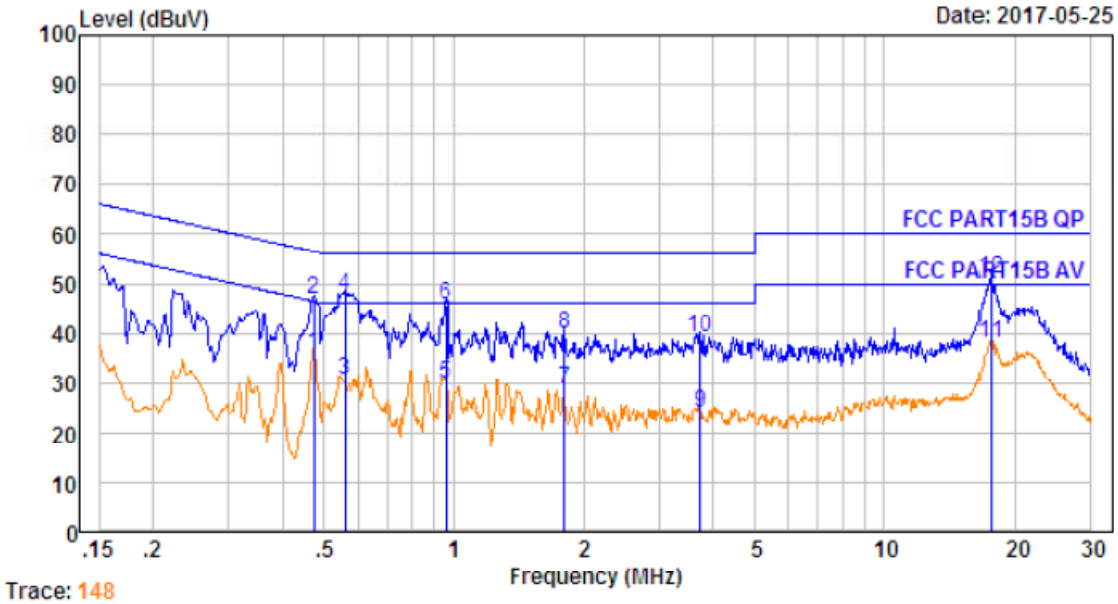
4.6 Measurement Description

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.
Remark: emission level= AMN factor+ Cable Loss +Receiver reading

4.7 Conducted Emission Test Result

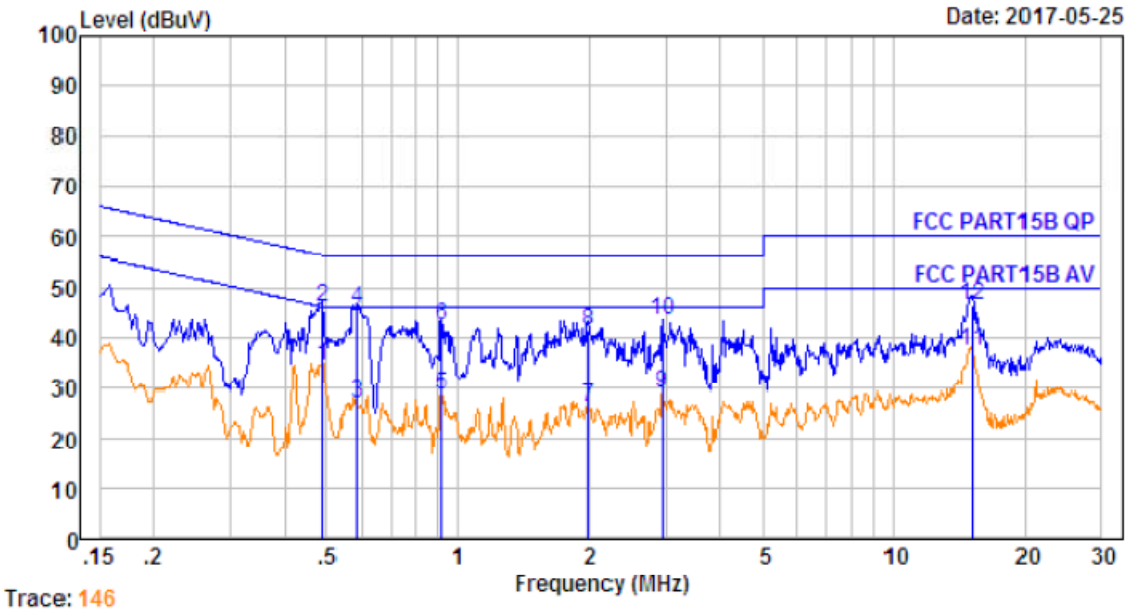
Pass
Please find the following pages.

Live line-120V:



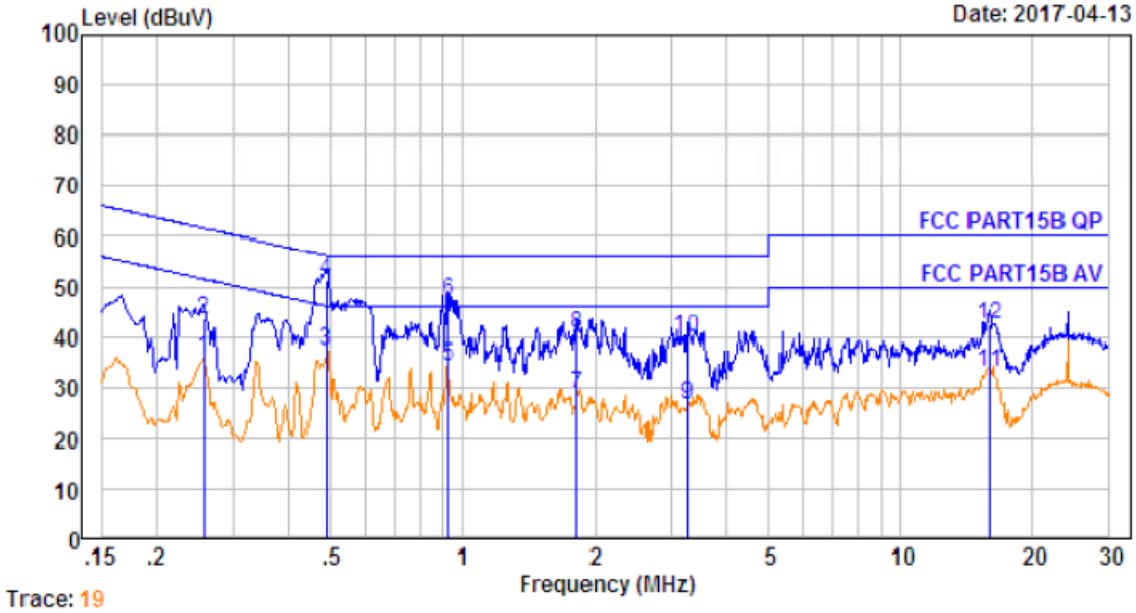
No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.474	10.64	0.60	24.50	35.74	46.45	-10.71	Average
2.	0.474	10.64	0.60	35.50	46.74	56.45	-9.71	QP
3.	0.558	10.65	0.60	19.50	30.75	46.00	-15.25	Average
4.	0.558	10.65	0.60	36.50	47.75	56.00	-8.25	QP
5.	0.958	10.67	0.60	18.56	29.83	46.00	-16.17	Average
6.	0.958	10.67	0.60	34.56	45.83	56.00	-10.17	QP
7.	1.810	10.69	0.60	17.64	28.93	46.00	-17.07	Average
8.	1.810	10.69	0.60	28.64	39.93	56.00	-16.07	QP
9.	3.740	10.72	0.60	12.81	24.13	46.00	-21.87	Average
10.	3.740	10.72	0.60	27.81	39.13	56.00	-16.87	QP
11.	17.568	10.78	0.60	26.54	37.92	50.00	-12.08	Average
12.	17.568	10.78	0.60	39.54	50.92	60.00	-9.08	QP

Neutral line-120V:



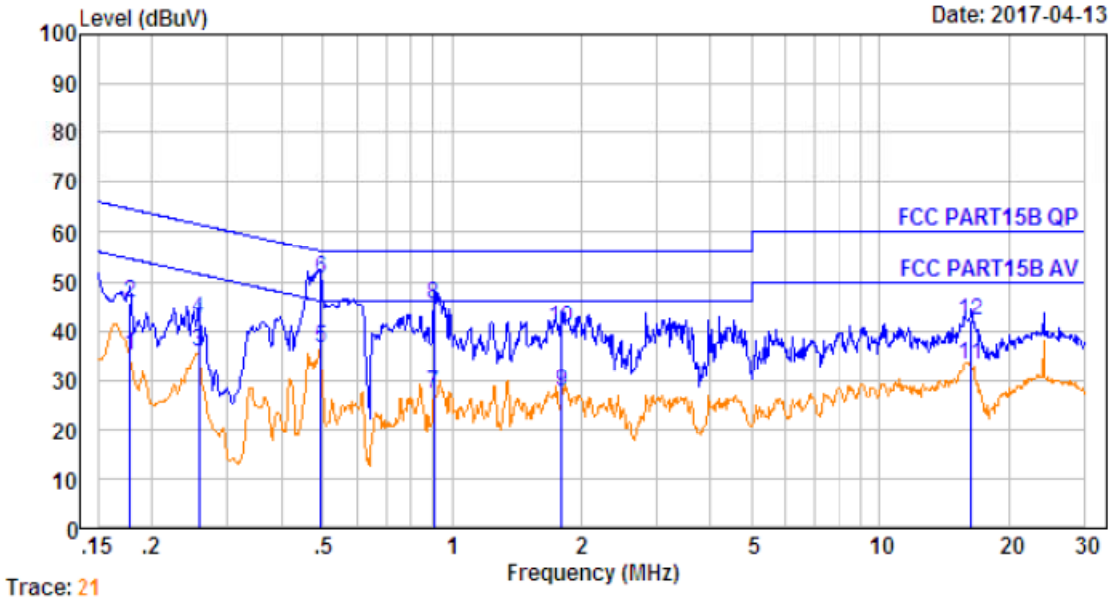
No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.489	10.64	0.60	23.05	34.29	46.19	-11.90	Average
2.	0.489	10.64	0.60	35.05	46.29	56.19	-9.90	QP
3.	0.585	10.66	0.60	15.58	26.84	46.00	-19.16	Average
4.	0.585	10.66	0.60	34.58	45.84	56.00	-10.16	QP
5.	0.918	10.67	0.60	17.11	28.38	46.00	-17.62	Average
6.	0.918	10.67	0.60	31.11	42.38	56.00	-13.62	QP
7.	1.991	10.70	0.60	15.04	26.34	46.00	-19.66	Average
8.	1.991	10.70	0.60	30.04	41.34	56.00	-14.66	QP
9.	2.946	10.71	0.60	17.29	28.60	46.00	-17.40	Average
10.	2.946	10.71	0.60	32.29	43.60	56.00	-12.40	QP
11.	15.226	10.77	0.60	25.96	37.33	50.00	-12.67	Average
12.	15.226	10.77	0.60	34.96	46.33	60.00	-13.67	QP

Live line-240V:



No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level cBuV	Limit dBuV	Over Limit dB	Remark
1.	0.258	10.62	0.60	24.45	35.67	51.51	-15.84	Average
2.	0.258	10.62	0.60	32.45	43.67	61.51	-17.84	QP
3.	0.486	10.64	0.60	26.15	37.39	46.23	-8.84	Average
4.	0.486	10.64	0.60	40.15	51.39	56.23	-4.84	QP
5.	0.928	10.67	0.60	22.98	34.25	46.00	-11.75	Average
6.	0.928	10.67	0.60	35.98	47.25	56.00	-8.75	QP
7.	1.829	10.69	0.60	17.39	28.68	46.00	-17.32	Average
8.	1.829	10.69	0.60	29.39	40.68	56.00	-15.32	QP
9.	3.258	10.72	0.60	15.41	26.73	46.00	-19.27	Average
10.	3.258	10.72	0.60	28.41	39.73	56.00	-16.27	QP
11.	15.970	10.78	0.60	21.97	33.35	50.00	-16.65	Average
12.	15.970	10.78	0.60	30.97	42.35	60.00	-17.65	QP

Neutral line-240V:



No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.178	10.61	0.60	23.73	34.94	54.59	-19.65	Average
2.	0.178	10.61	0.60	34.73	45.94	64.59	-18.65	QP
3.	0.258	10.62	0.60	24.40	35.62	51.51	-15.89	Average
4.	0.258	10.62	0.60	31.40	42.62	61.51	-18.89	QP
5.	0.494	10.64	0.60	25.26	36.50	46.10	-9.60	Average
6.	0.494	10.64	0.60	39.26	50.50	56.10	-5.60	QP
7.	0.904	10.67	0.60	16.10	27.37	46.00	-18.63	Average
8.	0.904	10.67	0.60	34.10	45.37	56.00	-10.63	QP
9.	1.810	10.69	0.60	16.45	27.74	46.00	-18.26	Average
10.	1.810	10.69	0.60	29.45	40.74	56.00	-15.26	QP
11.	16.312	10.78	0.60	21.76	33.14	50.00	-16.86	Average
12.	16.312	10.78	0.60	30.76	42.14	60.00	-17.86	QP

5 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	$20\log^{(500)}$

5.1 EUT Operation

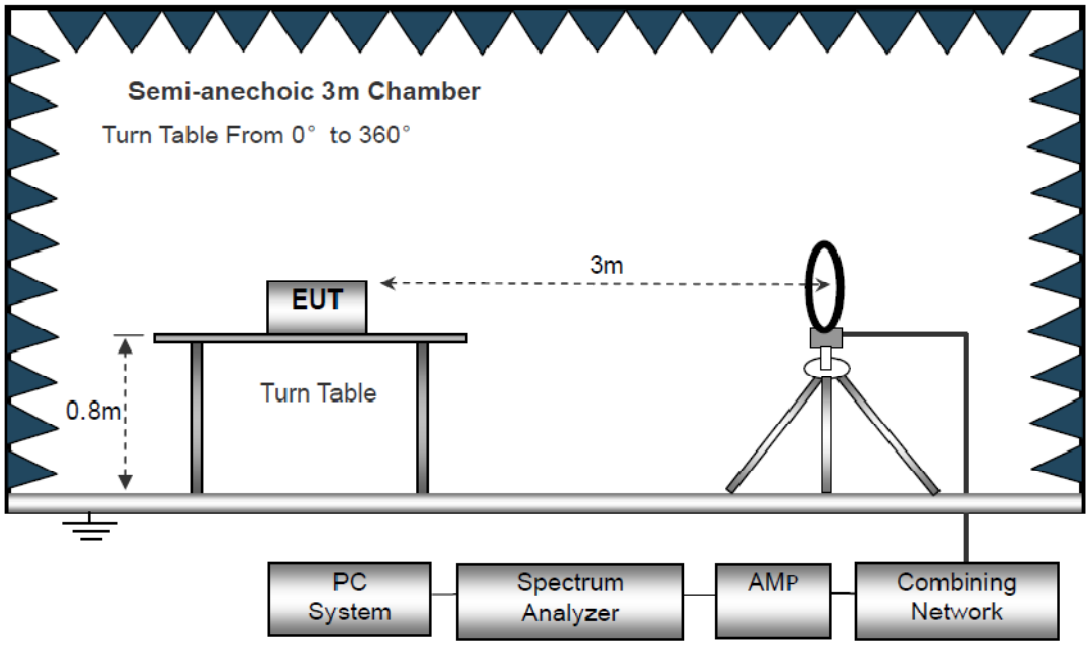
Operating Environment :
Temperature: : 23.5 °C
Humidity: : 51.1 % RH
Atmospheric Pressure: : 101.2kPa

EUT Operation : : Refer to section 3.3

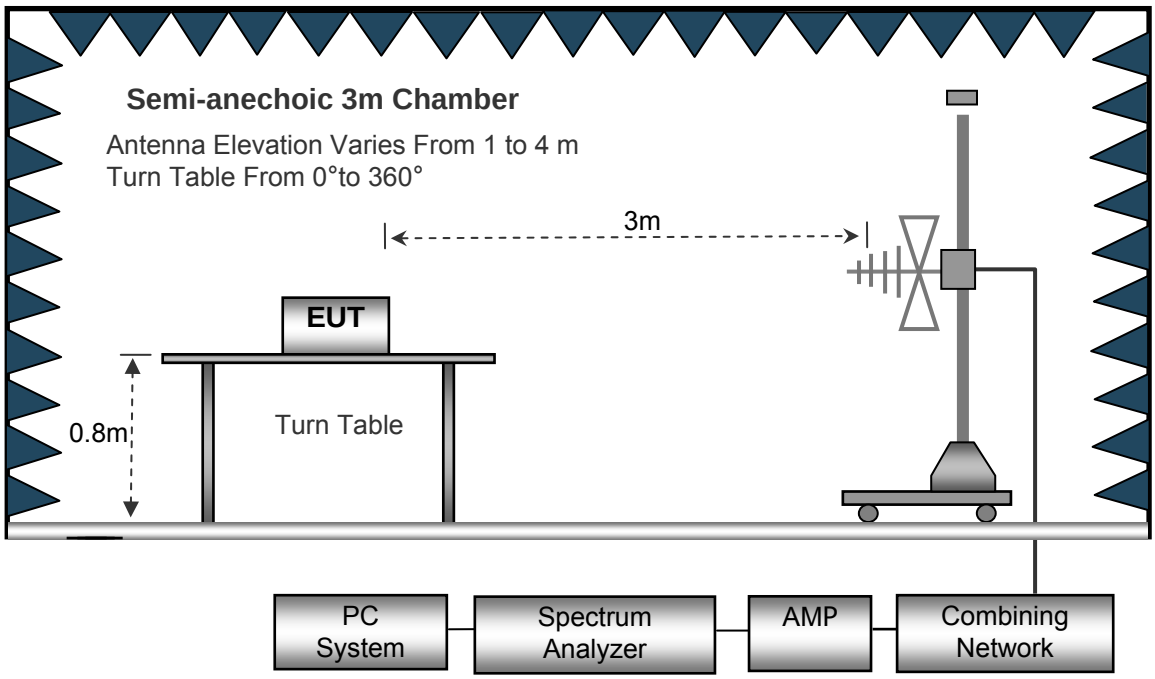
5.2 Test Setup

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

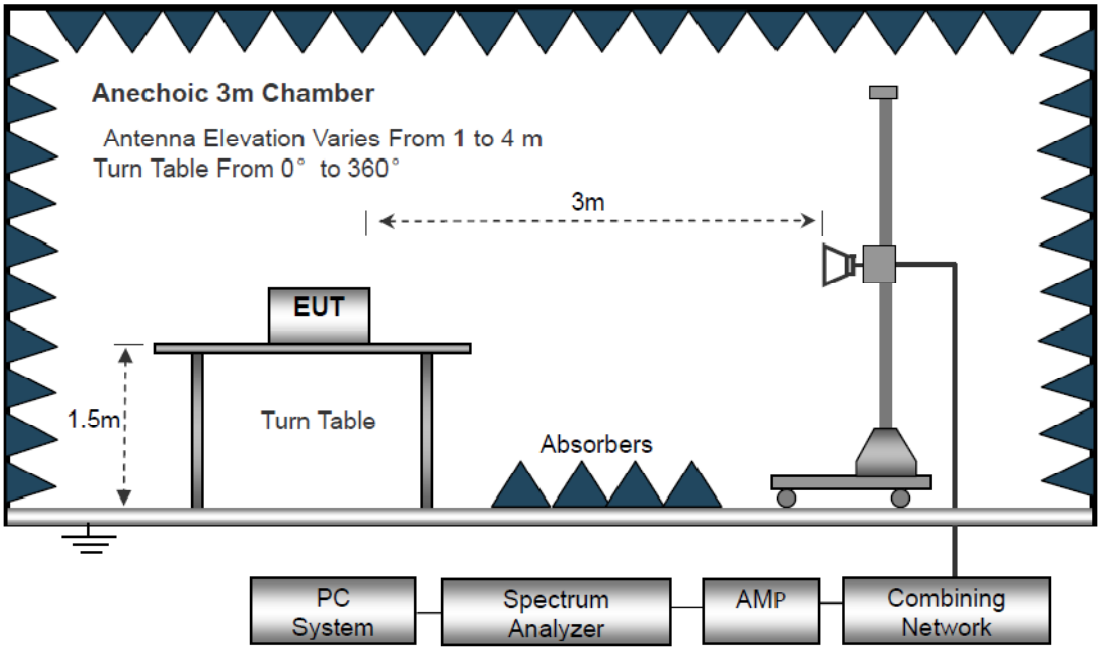
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



5.3 Spectrum Analyzer Setup

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / *10Hz* for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.

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 to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. In the frequency above 1GHz, Place the measurement antenna 3m away from the EUT for each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

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.

5.5 Summary of Test Results

Only show worst data(GFSK/Low CH)

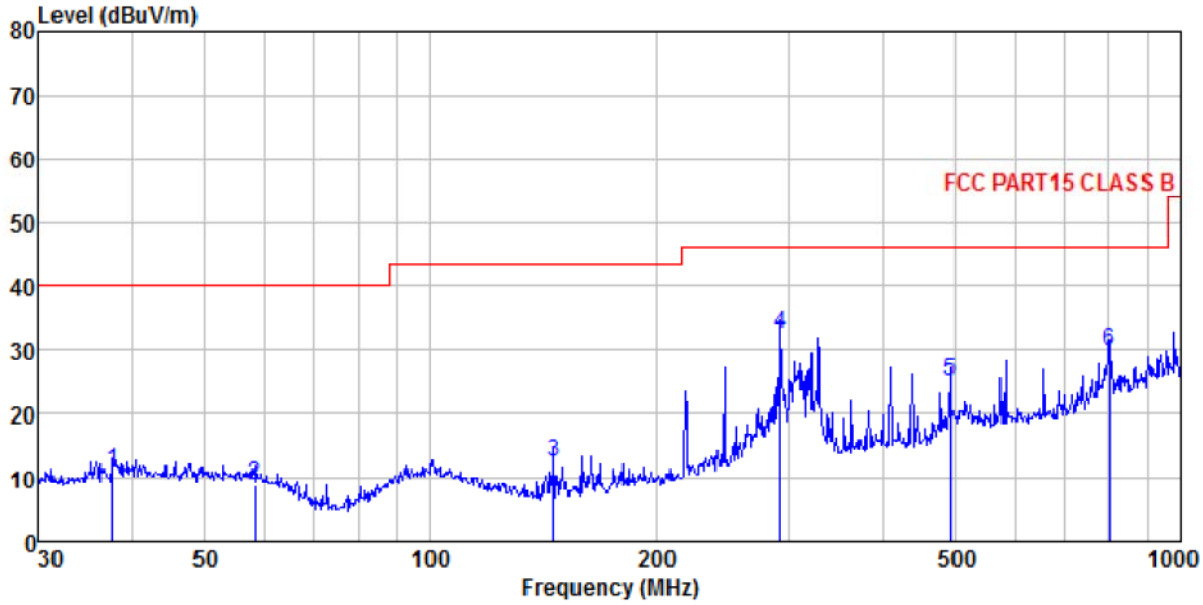
Emission level = Receiver reading + ANT factor + cable loss – Preamp factor

Test Frequency: Below 30MHz

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

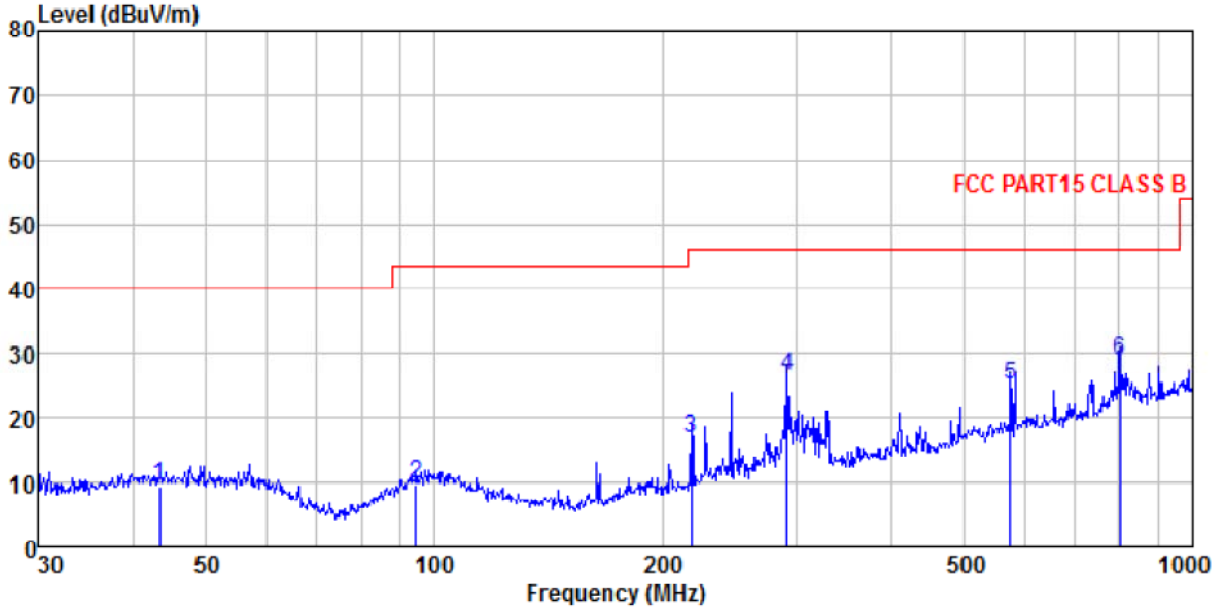
Test Frequency: 30MHz ~ 1GHz

Antenna Polarization: Vertical



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	37.680	25.42	15.01	0.64	30.06	11.01	40.00	-28.99	QP
2	58.203	23.20	14.80	0.84	29.93	8.91	40.00	-31.09	QP
3	145.861	30.06	10.23	1.54	29.43	12.40	43.50	-31.10	QP
4	292.058	45.28	14.89	2.32	29.95	32.54	46.00	-13.46	QP
5	492.469	32.74	18.39	3.27	29.32	25.08	46.00	-20.92	QP
6	801.786	32.40	22.06	4.46	29.20	29.72	46.00	-16.28	QP

Antenna Polarization: Horizontal



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	43.353	23.34	15.56	0.70	30.03	9.57	40.00	-30.43	QP
2	94.428	23.57	14.75	1.15	29.72	9.75	43.50	-33.75	QP
3	218.309	31.14	13.13	1.95	29.38	16.84	46.00	-29.16	QP
4	292.058	39.20	14.89	2.32	29.95	26.46	46.00	-19.54	QP
5	574.626	30.83	20.03	3.63	29.30	25.19	46.00	-20.81	QP
6	801.786	31.66	22.06	4.46	29.20	28.98	46.00	-17.02	QP

Test Frequency: Above 1000MHz~10th Harmonics:

GFSK Low Channel (2402MHz)

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4804	39.46	AV	V	33.67	6.86	32.66	47.33	54	-6.67
4804	39.85	AV	H	33.67	6.86	32.66	47.72	54	-6.28
4804	48.73	PK	V	33.67	6.86	32.66	56.6	74	-17.4
4804	45.97	PK	H	33.67	6.86	32.66	53.84	74	-20.16
17804	24.44	AV	V	45.03	11.21	32.38	48.3	54	-5.7
17804	25.01	AV	H	45.03	11.21	32.38	48.87	54	-5.13
17804	40.68	PK	V	45.03	11.21	32.38	64.54	74	-9.46
17804	42.33	PK	H	45.03	11.21	32.38	66.19	74	-7.81

GFSK Low Channel (2441MHz)

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882	39.38	AV	V	33.71	6.95	32.74	47.3	54	-6.7
4882	39.11	AV	H	33.71	6.95	32.74	47.03	54	-6.97
4882	49.24	PK	V	33.71	6.95	32.74	57.16	74	-16.84
4882	47.56	PK	H	33.71	6.95	32.74	55.48	74	-18.52
17811	25.19	AV	V	45.15	11.18	32.41	49.11	54	-4.89
17811	23.86	AV	H	45.15	11.18	32.41	47.78	54	-6.22
17811	41.12	PK	V	45.15	11.18	32.41	65.04	74	-8.96
17811	41.69	PK	H	45.15	11.18	32.41	65.61	74	-8.39

GFSK High Channel (2480MHz)

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4960	37.98	AV	V	33.90	6.76	32.74	45.9	54	-8.1
4960	38.85	AV	H	33.90	6.76	32.74	46.77	54	-7.23
4960	48.26	PK	V	33.90	6.76	32.74	56.18	74	-17.82
4960	47.63	PK	H	33.90	6.76	32.74	55.55	74	-18.45
17823	24.08	AV	V	45.22	11.35	32.38	48.27	54	-5.73
17823	24.81	AV	H	45.22	11.35	32.38	49	54	-5
17823	42.55	PK	V	45.22	11.35	32.38	66.74	74	-7.26
17823	41.39	PK	H	45.22	11.35	32.38	65.58	74	-8.42

π /4-DQPSK Low Channel (2402MHz)

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4804	39.36	AV	V	33.67	6.86	32.66	47.23	54	-6.77
4804	39.95	AV	H	33.67	6.86	32.66	47.82	54	-6.18
4804	48.77	PK	V	33.67	6.86	32.66	56.64	74	-17.36
4804	45.89	PK	H	33.67	6.86	32.66	53.76	74	-20.24
17804	24.32	AV	V	45.03	11.21	32.38	48.18	54	-5.82
17804	24.31	AV	H	45.03	11.21	32.38	48.17	54	-5.83
17804	40.65	PK	V	45.03	11.21	32.38	64.51	74	-9.49
17804	41.94	PK	H	45.03	11.21	32.38	65.8	74	-8.2

π /4-DQPSK Low Channel (2441MHz)

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882	38.83	AV	V	33.71	6.95	32.74	46.75	54	-7.25
4882	39.07	AV	H	33.71	6.95	32.74	46.99	54	-7.01
4882	48.39	PK	V	33.71	6.95	32.74	56.31	74	-17.69
4882	47.20	PK	H	33.71	6.95	32.74	55.12	74	-18.88
17814	24.64	AV	V	45.15	11.18	32.41	48.56	54	-5.44
17814	22.96	AV	H	45.15	11.18	32.41	46.88	54	-7.12
17814	40.42	PK	V	45.15	11.18	32.41	64.34	74	-9.66
17814	40.98	PK	H	45.15	11.18	32.41	64.9	74	-9.1

π /4-DQPSK High Channel (2480MHz)

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4960	38.45	AV	V	33.90	6.76	32.74	46.37	54	-7.63
4960	38.38	AV	H	33.90	6.76	32.74	46.3	54	-7.7
4960	47.42	PK	V	33.90	6.76	32.74	55.34	74	-18.66
4960	47.53	PK	H	33.90	6.76	32.74	55.45	74	-18.55
17825	23.79	AV	V	45.22	11.35	32.38	47.98	54	-6.02
17825	24.34	AV	H	45.22	11.35	32.38	48.53	54	-5.47
17825	42.86	PK	V	45.22	11.35	32.38	67.05	74	-6.95
17825	40.63	PK	H	45.22	11.35	32.38	64.82	74	-9.18

8DPSK Low Channel (2402MHz)

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4804	39.41	AV	V	33.67	6.86	32.66	47.28	54	-6.72
4804	39.18	AV	H	33.67	6.86	32.66	47.05	54	-6.95
4804	48.17	PK	V	33.67	6.86	32.66	56.04	74	-17.96
4804	46.04	PK	H	33.67	6.86	32.66	53.91	74	-20.09
17800	24.04	AV	V	45.03	11.21	32.38	47.9	54	-6.1
17800	23.54	AV	H	45.03	11.21	32.38	47.4	54	-6.6
17800	40.92	PK	V	45.03	11.21	32.38	64.78	74	-9.22
17800	39.33	PK	H	45.03	11.21	32.38	63.19	74	-10.81

8DPSK Low Channel (2441MHz)

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882	38.78	AV	V	33.71	6.95	32.74	46.7	54	-7.3
4882	38.58	AV	H	33.71	6.95	32.74	46.5	54	-7.5
4882	49.14	PK	V	33.71	6.95	32.74	57.06	74	-16.94
4882	46.53	PK	H	33.71	6.95	32.74	54.45	74	-19.55
17814	24.78	AV	V	45.15	11.18	32.41	48.7	54	-5.3
17814	23.06	AV	H	45.15	11.18	32.41	46.98	54	-7.02
17814	41.63	PK	V	45.15	11.18	32.41	65.55	74	-8.45
17814	41.08	PK	H	45.15	11.18	32.41	65	74	-9

8DPSK High Channel (2480MHz)

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4960	38.42	AV	V	33.90	6.76	32.74	46.34	54	-7.66
4960	37.65	AV	H	33.90	6.76	32.74	45.57	54	-8.43
4960	48.03	PK	V	33.90	6.76	32.74	55.95	74	-18.05
4960	46.62	PK	H	33.90	6.76	32.74	54.54	74	-19.46
17824	23.92	AV	V	45.22	11.35	32.38	48.11	54	-5.89
17824	23.62	AV	H	45.22	11.35	32.38	47.81	54	-6.19
17824	42.03	PK	V	45.22	11.35	32.38	66.22	74	-7.78
17824	41.14	PK	H	45.22	11.35	32.38	65.33	74	-8.67

Note: 1. The testing has been conformed to 10*2480MHz=24800MHz.

2. All other emissions more than 30dB below the limit.

3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Reading + Factor
Margin=Emission Level-Limit

Band edge

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
GFSK							
2399.9	66.16	-12.99	53.17	74	-20.83	PK	Vertical
2399.9	49.38	-12.99	36.39	54	-17.61	AV	Vertical
2399.9	67.32	-12.99	54.33	74	-19.67	PK	Horizontal
2399.9	50.88	-12.99	37.89	54	-16.11	AV	Horizontal
2483.6	65.67	-12.78	52.89	74	-21.11	PK	Vertical
2483.6	49.23	-12.78	36.45	54	-17.55	AV	Vertical
2483.6	66.35	-12.78	53.57	74	-20.43	PK	Horizontal
2483.6	49.79	-12.78	37.01	54	-16.99	AV	Horizontal
π/4-DQPSK							
2399.9	64.27	-12.99	51.28	74	-22.72	PK	Vertical
2399.9	47.32	-12.99	34.23	54	-19.76	AV	Vertical
2399.9	65.19	-12.99	52.20	74	-21.80	PK	Horizontal
2399.9	48.30	-12.99	35.31	54	-18.69	AV	Horizontal
2483.6	63.28	-12.78	50.50	74	-23.50	PK	Vertical
2483.6	46.80	-12.78	34.02	54	-19.98	AV	Vertical
2483.6	65.03	-12.78	52.25	74	-21.50	PK	Horizontal
2483.6	47.93	-12.78	35.15	54	-18.85	AV	Horizontal
8DPSK							
2399.9	64.02	-12.99	51.03	74	-22.97	PK	Vertical
2399.9	47.11	-12.99	34.12	54	-19.88	AV	Vertical
2399.9	64.89	-12.99	51.90	74	-22.10	PK	Horizontal
2399.9	47.92	-12.99	34.93	54	-19.07	AV	Horizontal
2483.6	62.76	-12.78	49.98	74	-24.02	PK	Vertical
2483.6	46.21	-12.78	33.43	54	-20.57	AV	Vertical
2483.6	64.66	-12.78	51.88	74	-22.12	PK	Horizontal
2483.6	47.52	-12.78	34.74	54	-19.26	AV	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.

Hopping

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
GFSK							
2390.0	56.07	-12.99	43.08	74	-30.92	PK	Vertical
2390.0	--	-12.99	--	54	--	AV	Vertical
2390.0	56.49	-12.99	43.50	74	-30.50	PK	Horizontal
2390.0	--	-12.99	--	54	--	AV	Horizontal
2483.5	56.40	-12.78	43.62	74	-30.38	PK	Vertical
2483.5	--	-12.78	--	54	--	AV	Vertical
2483.5	55.87	-12.78	43.09	74	-30.91	PK	Horizontal
2483.5	--	-12.78	--	54	--	AV	Horizontal
π/4-DQPSK							
2390.0	54.76	-12.99	41.77	74	-32.23	PK	Vertical
2390.0	--	-12.99	--	54	--	AV	Vertical
2390.0	55.13	-12.99	42.14	74	-31.86	PK	Horizontal
2390.0	--	-12.99	--	54	--	AV	Horizontal
2483.5	55.21	-12.78	42.43	74	-31.57	PK	Vertical
2483.5	--	-12.78	--	54	--	AV	Vertical
2483.5	55.03	-12.78	42.25	74	-31.75	PK	Horizontal
2483.5	--	-12.78	--	54	--	AV	Horizontal
8DPSK							
2390.0	54.31	-12.99	42.31	74	-32.68	PK	Vertical
2390.0	--	-12.99	--	54	--	AV	Vertical
2390.0	54.96	-12.99	41.97	74	-32.03	PK	Horizontal
2390.0	--	-12.99	--	54	--	AV	Horizontal
2483.5	54.37	-12.78	41.59	74	-32.41	PK	Vertical
2483.5	--	-12.78	--	54	--	AV	Vertical
2483.5	54.83	-12.78	42.05	74	-31.95	PK	Horizontal
2483.5	--	-12.78	--	54	---	AV	Horizontal

Note:
1.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.
2. The AV final emission level is not recorded because the PK final emission level is less than AV limit.

6 Conducted Spurious Emission

Test Requirement	:	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	:	Transmitting & Hopping
Remark	:	The worst case was recorded.

6.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2.

Spectrum Parameter	Setting
Detector	Peak
Start Frequency	30 MHz
Stop Frequency	25GHz(10th carrier harmonic)
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

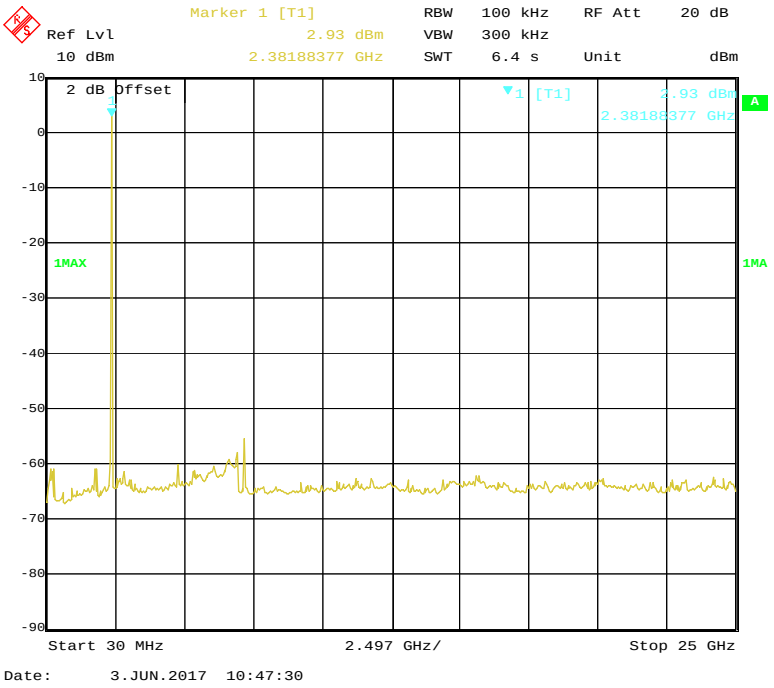
For Band edge

Spectrum Parameter	Setting
Attenuation	Auto
Start/Stop Frequency	Lower Band Edge: 2310 – 2404 MHz Upper Band Edge: 2478 – 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

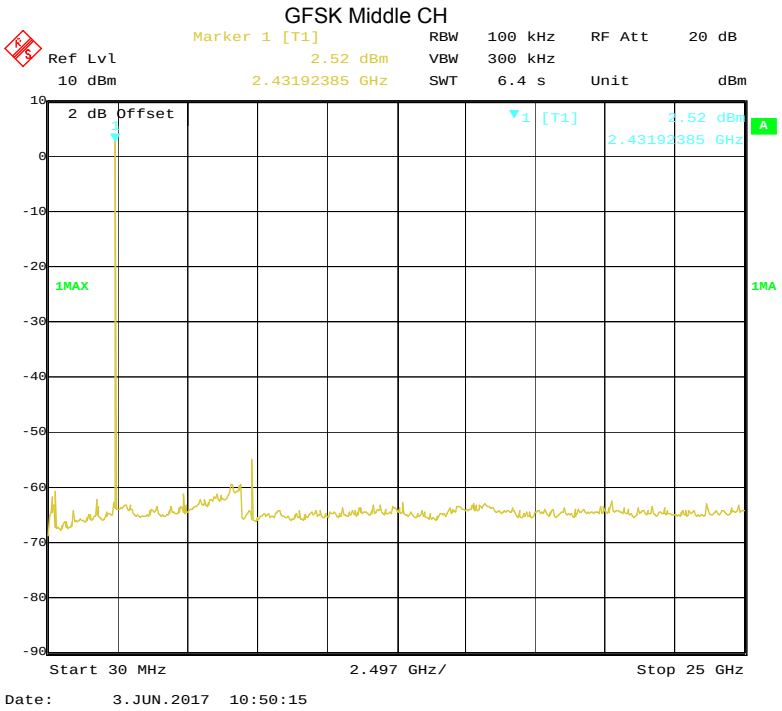
6.2 Test Result

Test Mode ：	GFSK(1Mbps)-00/39/78 CH

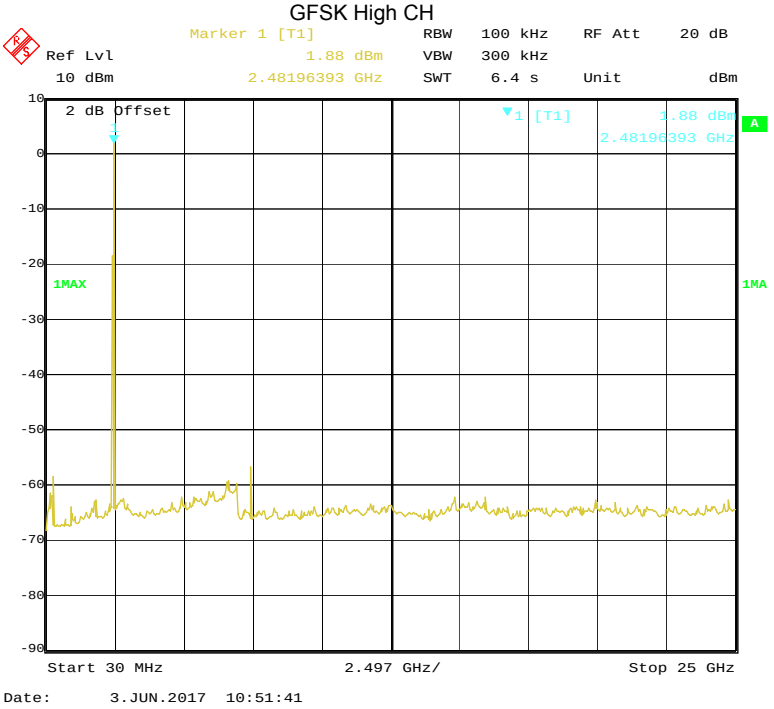
GFSK Low CH



GFSK Middle CH



GFSK High CH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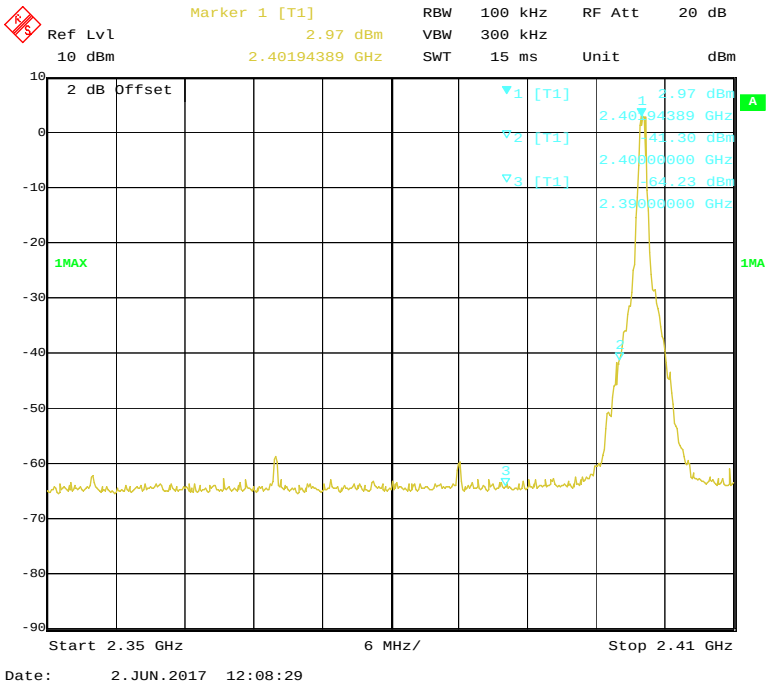
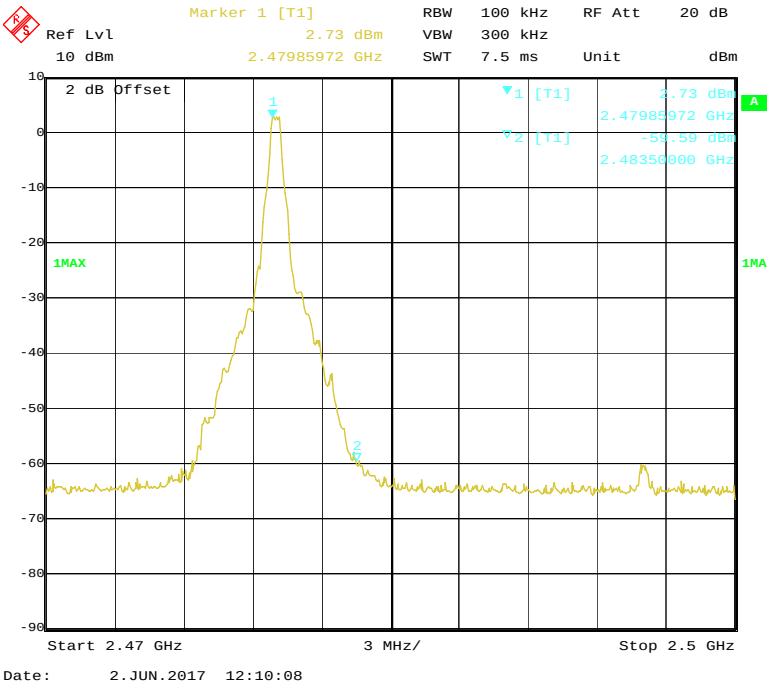
2.48196393 GHz
RBW 100 kHz
VBW 300 kHz
SWT 6.4 s
RF Att 20 dB
Unit dBm
Ref Lvl
10 dBm
2 dB Offset
1 [T1] 1.88 dBm
2.48196393 GHz
A
1MAX
1MA
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Start 30 MHz
2.497 GHz/
Stop 25 GHz
Date: 3.JUN.2017 10:51:41

For Band edge

00 CH

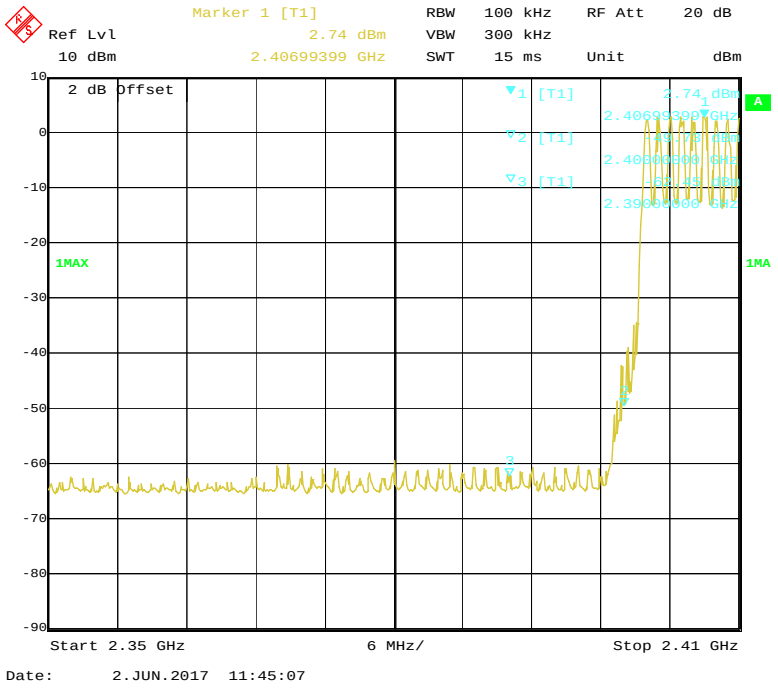


78 CH

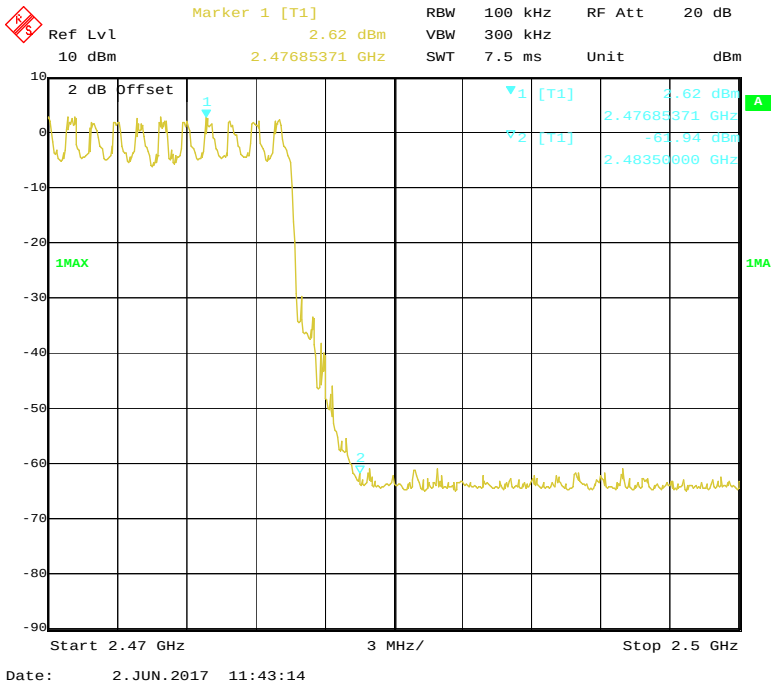


For Hopping Band edge

00 CH

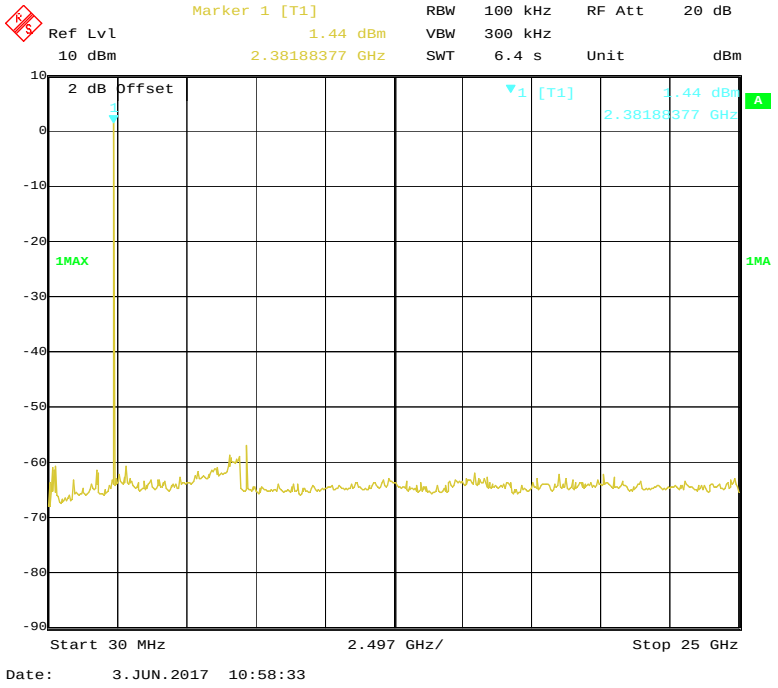


78 CH

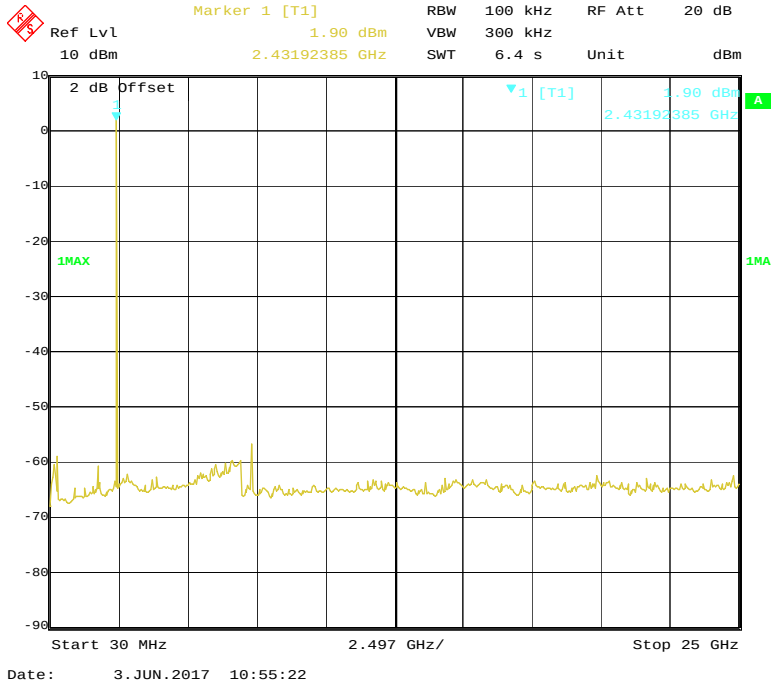


Test Mode ：	π/4-DQPSK(2Mbps) –00/39/78 CH

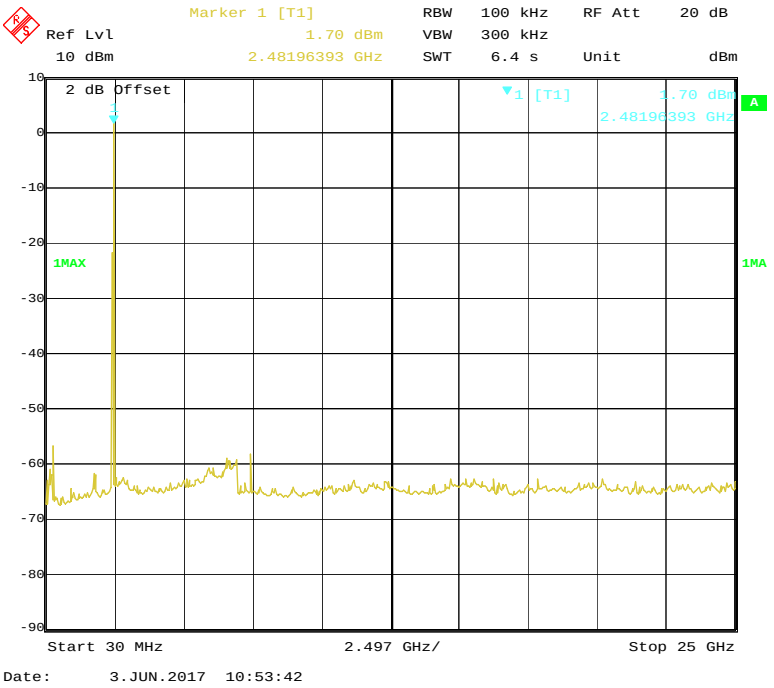
00 CH



39 CH



78 CH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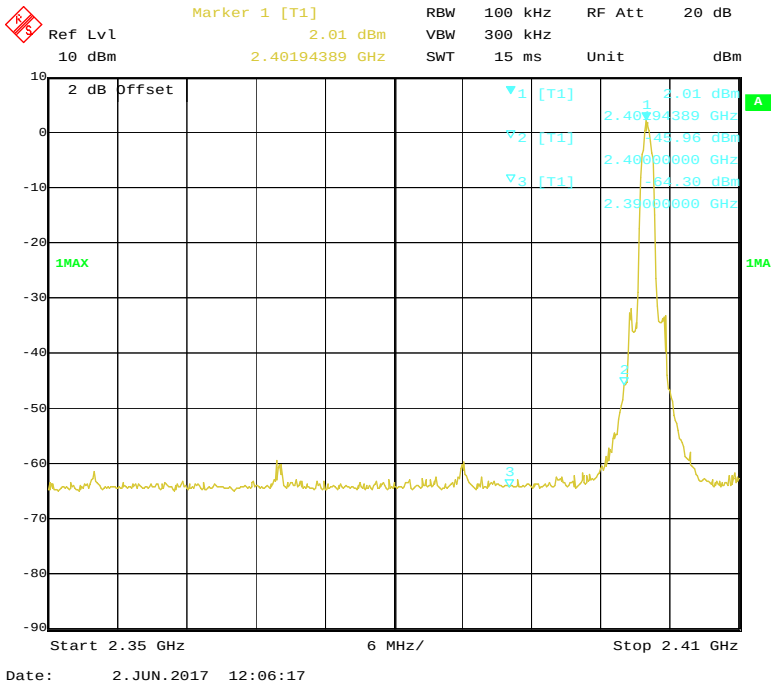
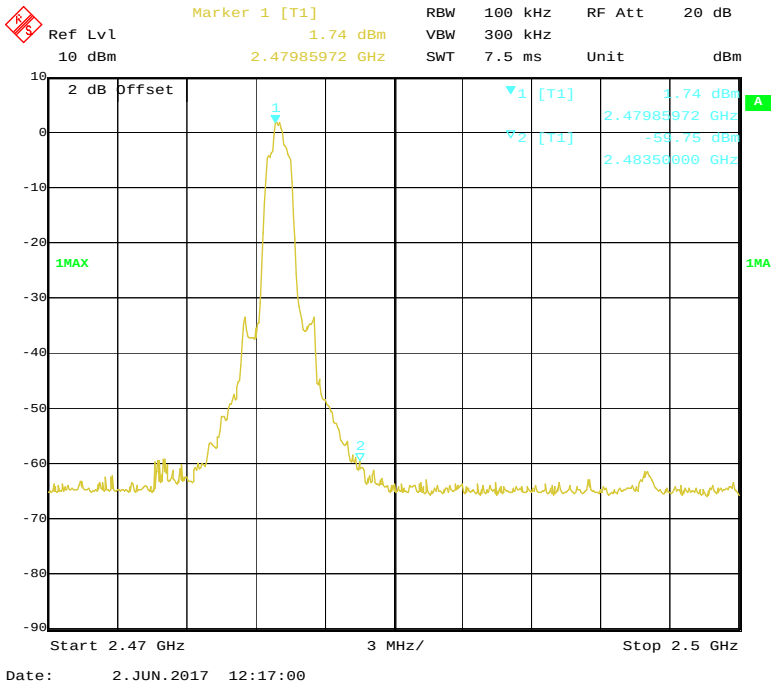
1.70 dBm
2.48196393 GHz
RBW 100 kHz
VBW 300 kHz
SWT 6.4 s
RF Att 20 dB
Unit dBm
Ref Lvl
10 dBm
2 dB Offset
1 [T1]
1.70 dBm
2.48196393 GHz
A
1MAX
1MA
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Start 30 MHz
2.497 GHz/
Stop 25 GHz
Date: 3.JUN.2017 10:53:42

For Band edge

00 CH

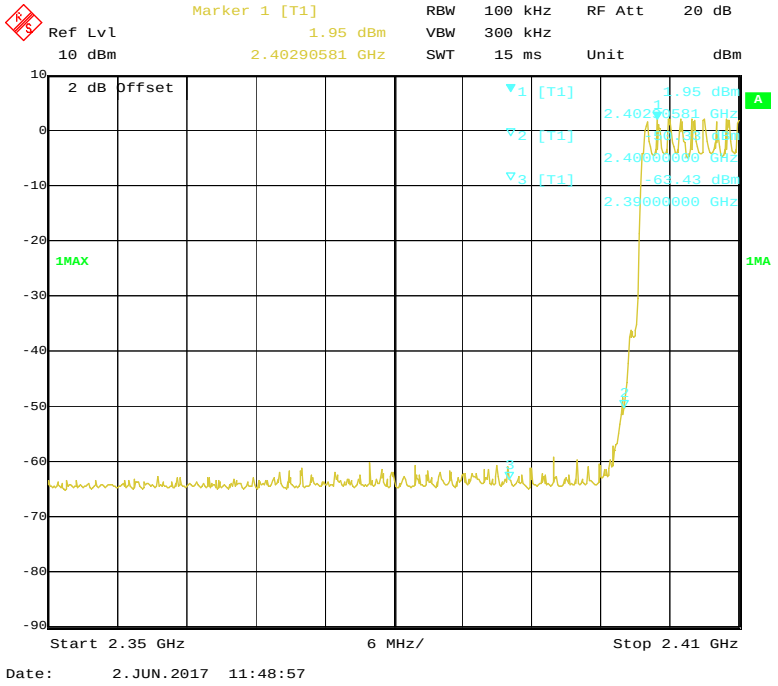


78 CH

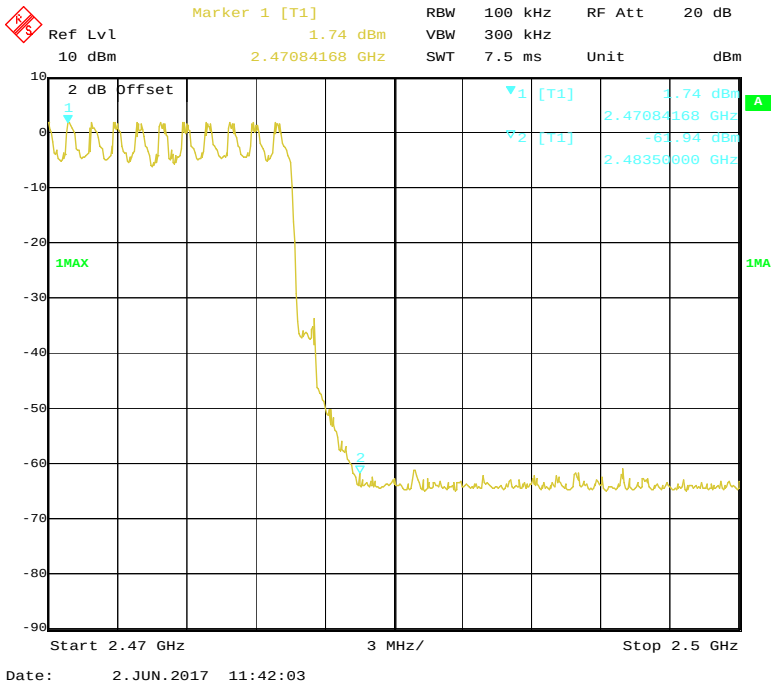


For Hopping Band edge

00 CH

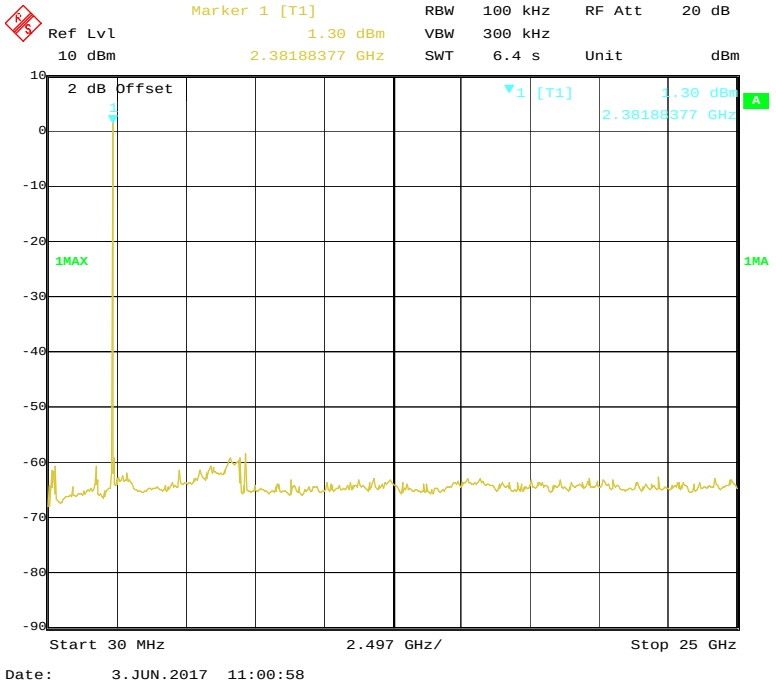


78 CH

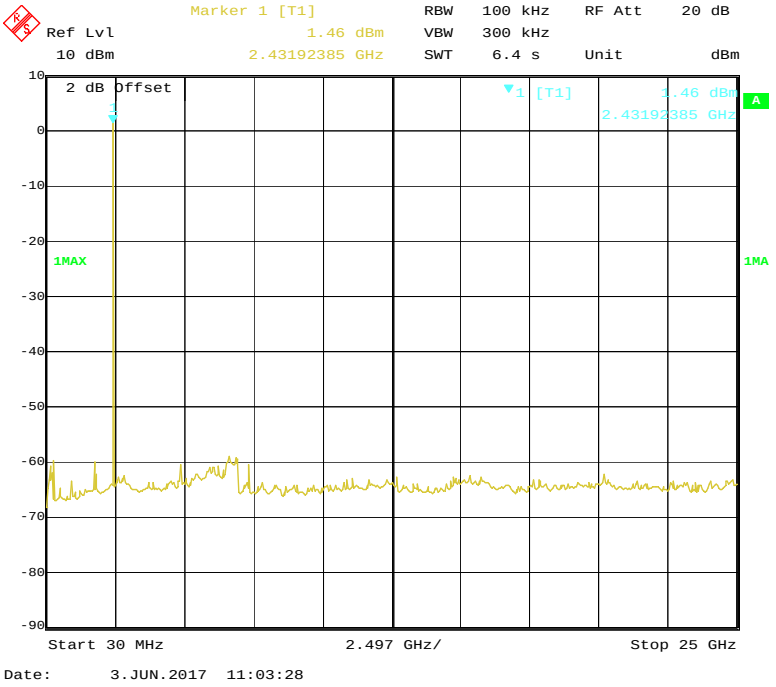


Test Mode ：	8-DPSK(3Mbps)

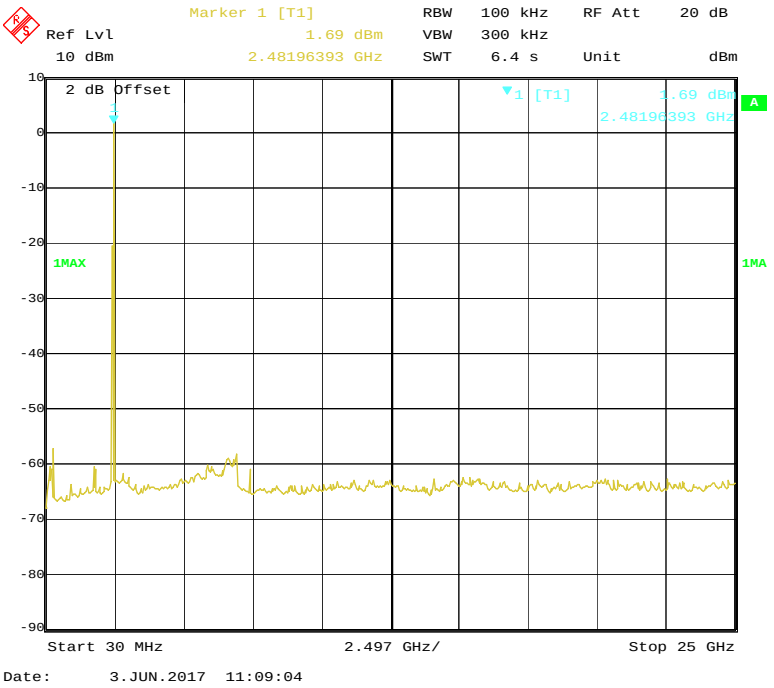
00 CH



39 CH

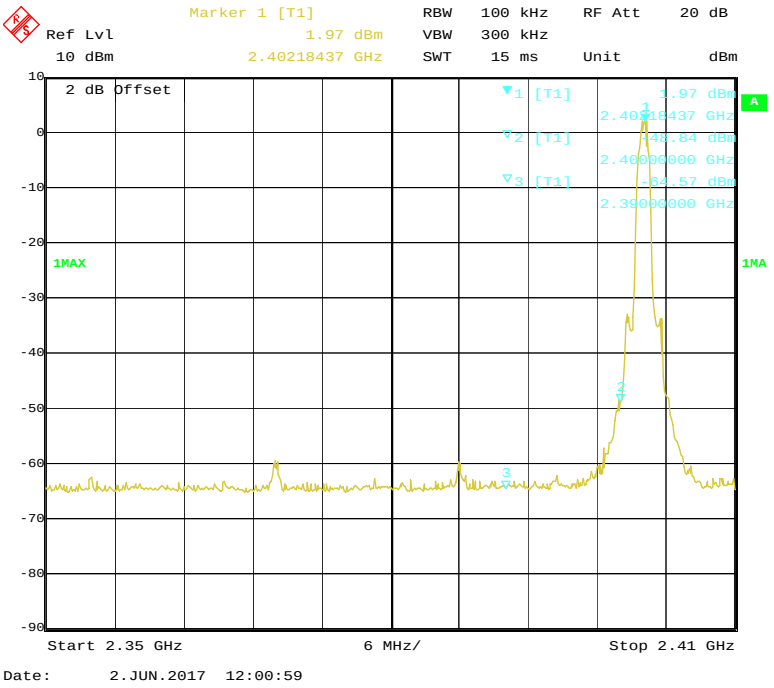


78 CH

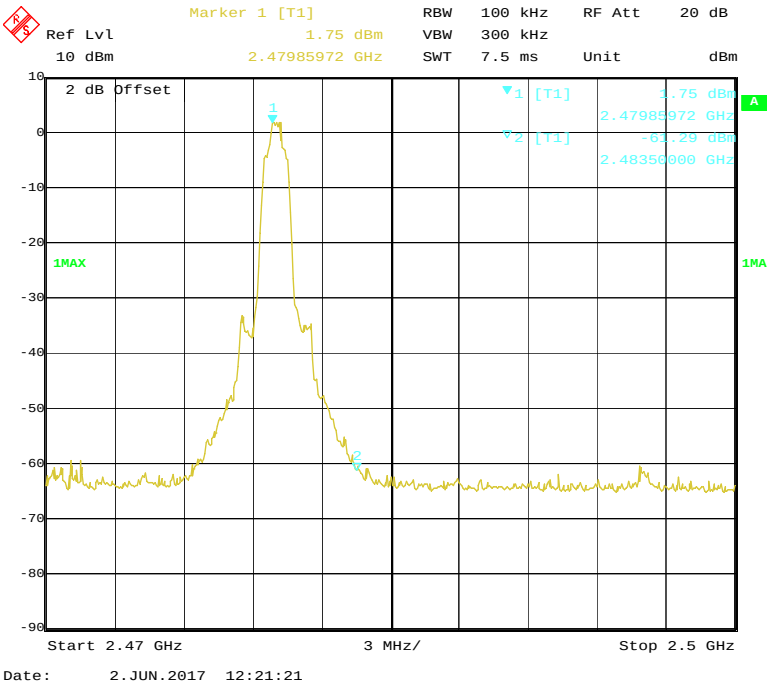

Marker 1 [T1]
1.69 dBm
2.48196393 GHz
RBW 100 kHz
VBW 300 kHz
SWT 6.4 s
RF Att 20 dB
Unit dBm
Ref Lvl
10 dBm
2 dB Offset
1 [T1]
1.69 dBm
2.48196393 GHz
A
1MAX
1MA
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Start 30 MHz
2.497 GHz/
Stop 25 GHz
Date: 3.JUN.2017 11:09:04

For Band edge

00 CH

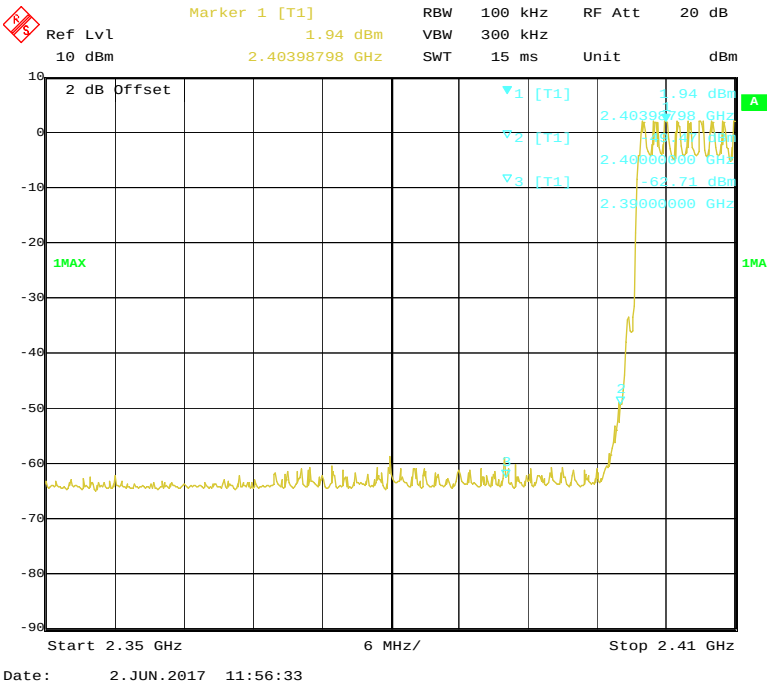


78 CH

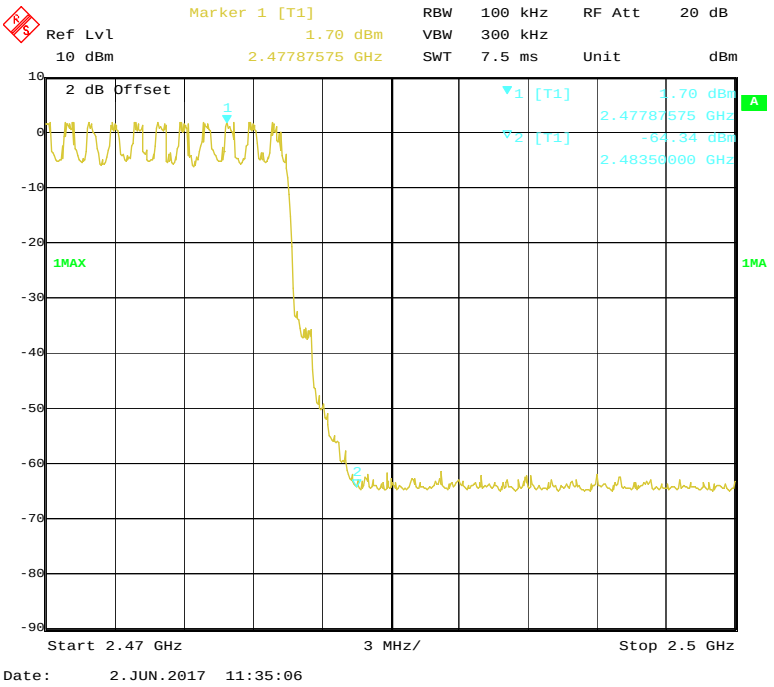


For Hopping Band edge

00 CH



78 CH



7 20 dB Bandwidth Measurement

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

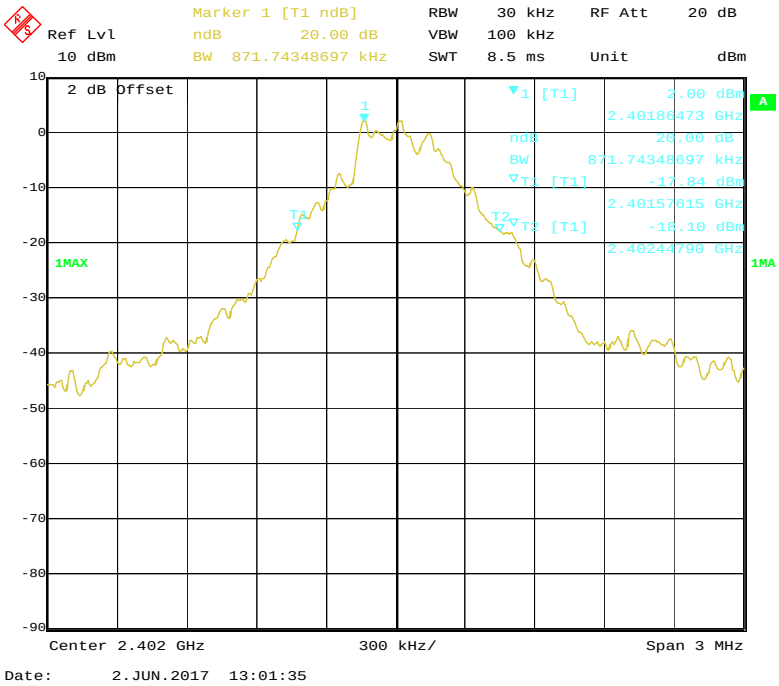
7.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 30kHz, VBW = 100kHz

7.2 Test Result

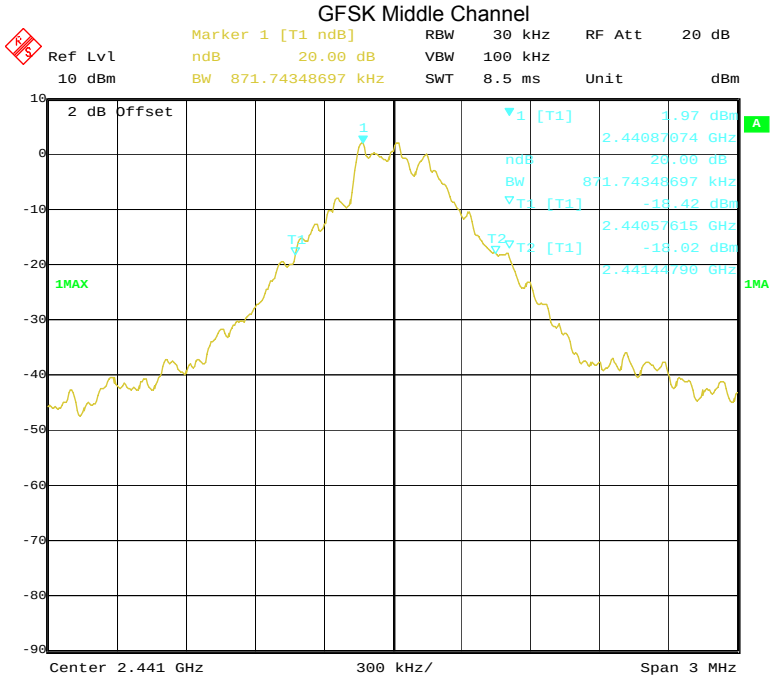
Modulation	Test Channel	Bandwidth(MHz)
GFSK	Low	0.872
GFSK	Middle	0.872
GFSK	High	0.860
Pi/4 DQPSK	Low	1.220
Pi/4 DQPSK	Middle	1.220
Pi/4 DQPSK	High	1.220
8DPSK	Low	1.220
8DPSK	Middle	1.220
8DPSK	High	1.214

GFSK Low Channel



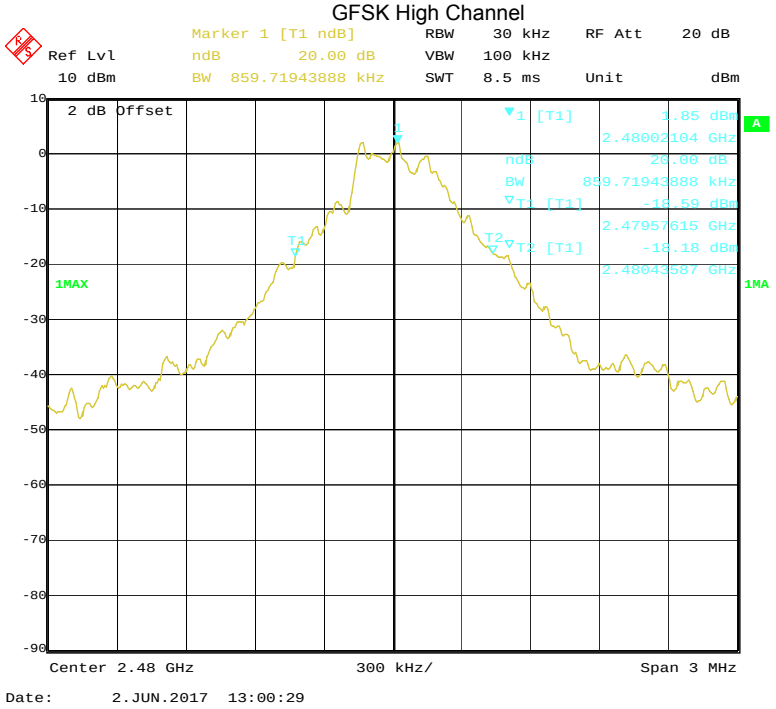
Date: 2.JUN.2017 13:01:35

GFSK Middle Channel

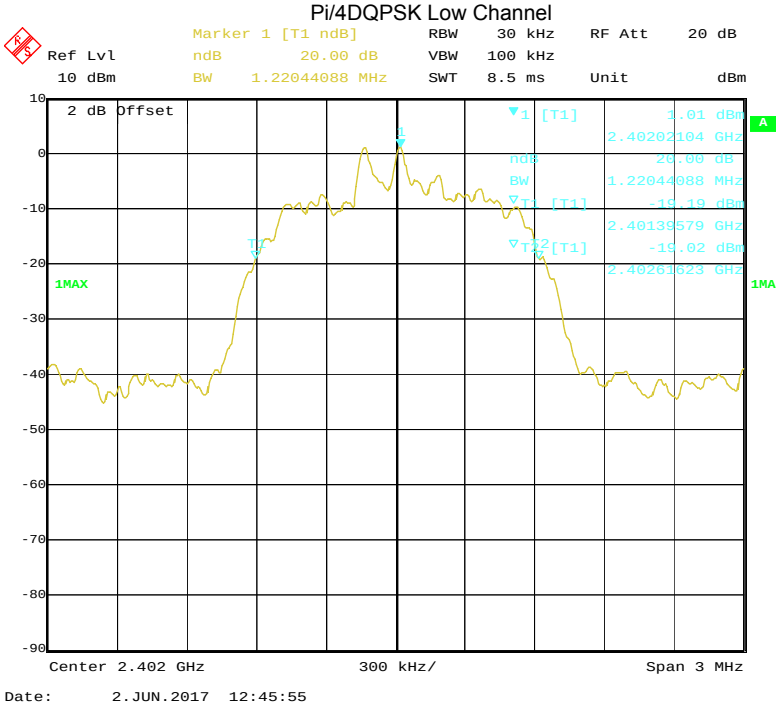


Date: 2.JUN.2017 12:57:27

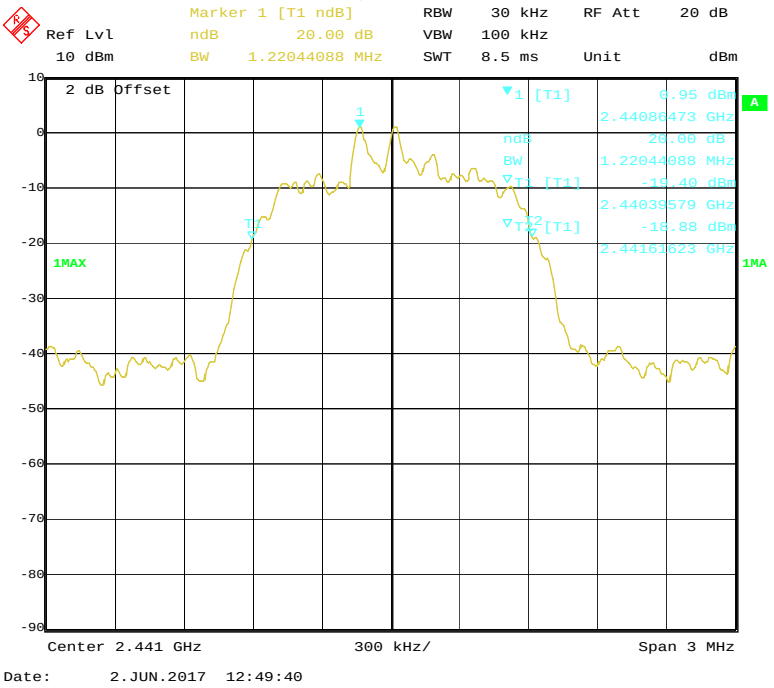
GFSK High Channel



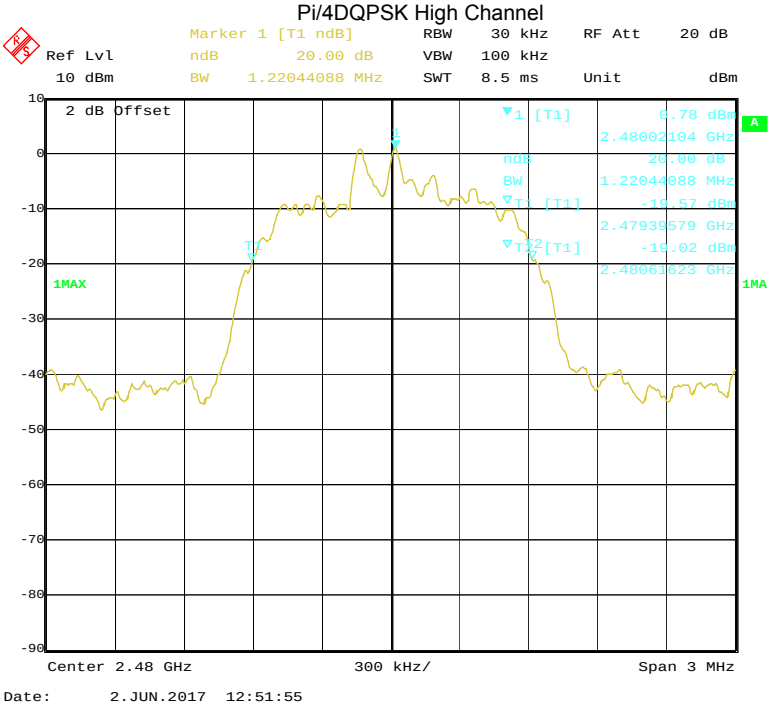
Pi/4DQPSK Low Channel



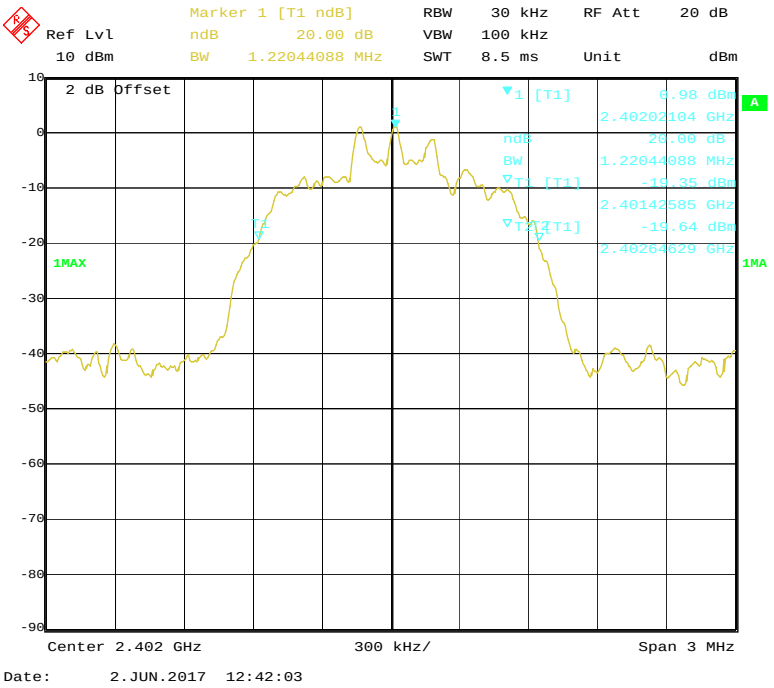
Pi/4DQPSK Middle Channel



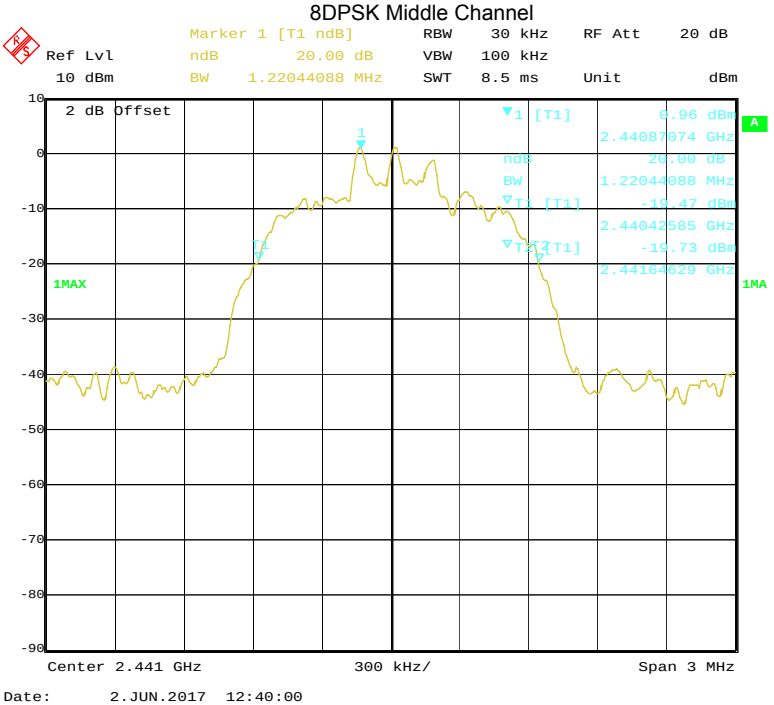
Pi/4DQPSK High Channel



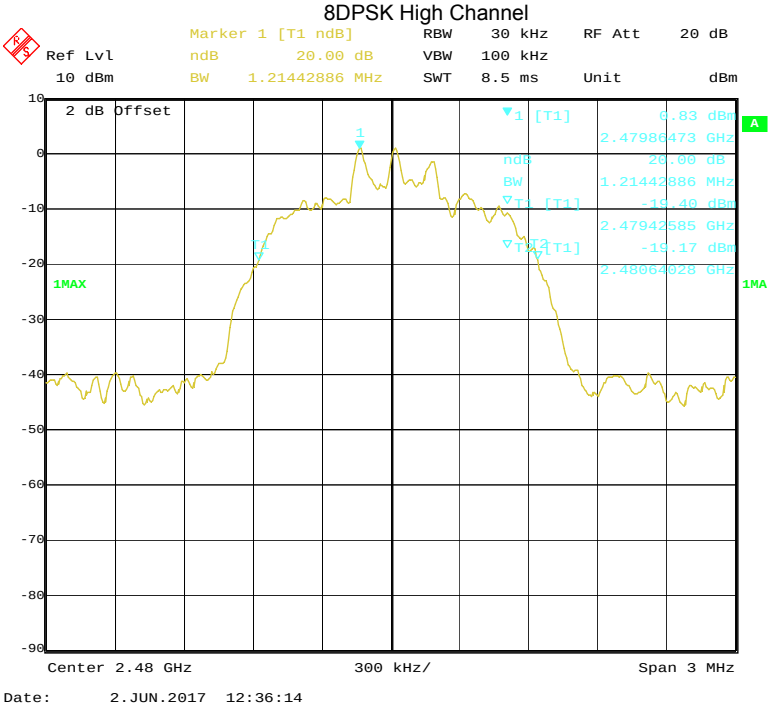
8DPSK Low Channel



8DPSK Middle Channel



8DPSK High Channel



8 Maximum Peak Output Power

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2013

Test Limit : 1 W or 0.125W
if channel separation > 2/3 bandwidth provided the systems operate with an output power no greater than 125 mW(20.97dBm)

Test Mode : Refer to section 3.3

8.1 Test Procedure

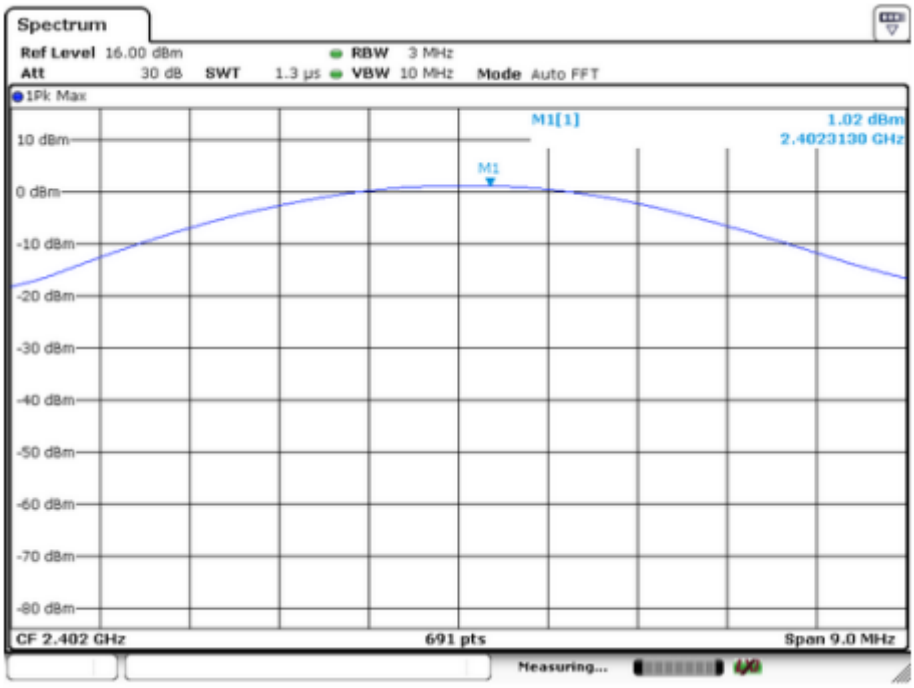
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyser: RBW = 3 MHz. VBW =10 MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

8.2 Test Result

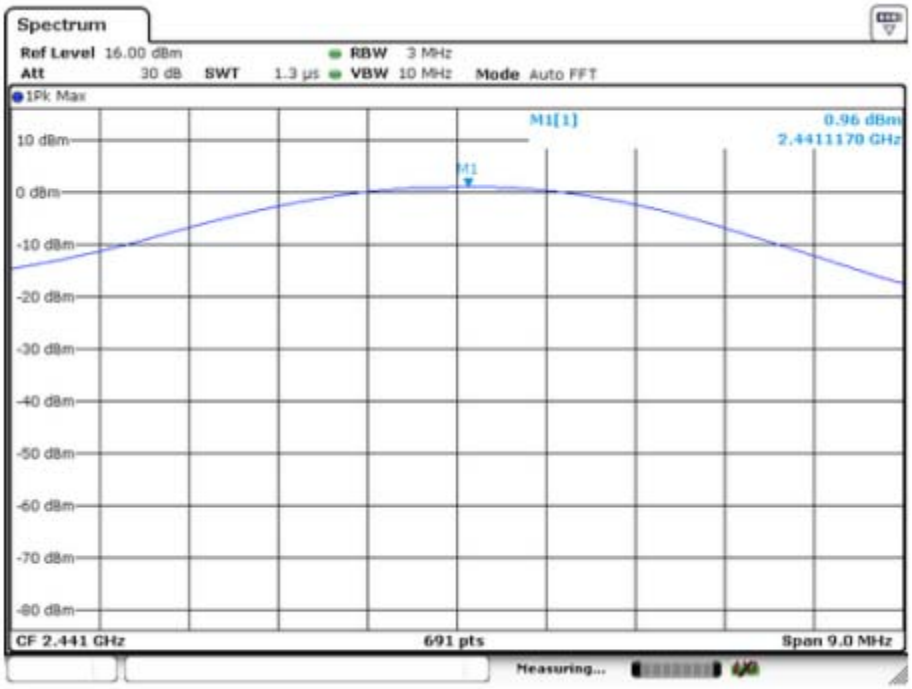
Modulation	Test Channel	Output Power (dBm)	Limit (dBm)
GFSK	Low	1.02	30
GFSK	Middle	0.96	30
GFSK	High	0.84	30
Pi/4 DQPSK	Low	1.07	20.97
Pi/4 DQPSK	Middle	0.99	20.97
Pi/4 DQPSK	High	0.88	20.97
8DPSK	Low	1.07	20.97
8DPSK	Middle	0.97	20.97
8DPSK	High	0.88	20.97

Test Plot:

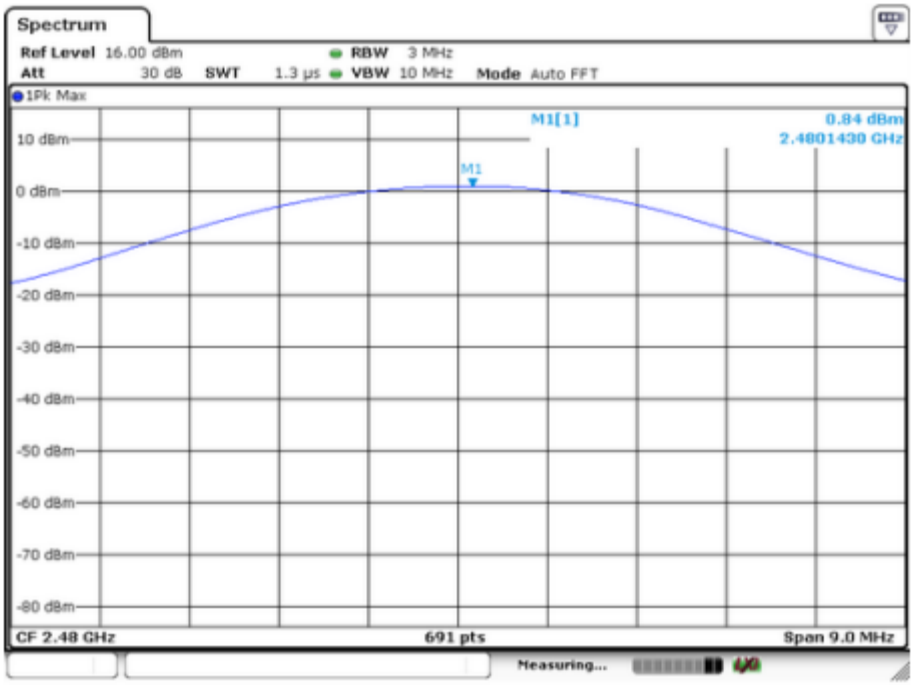
GFSK Low Channel



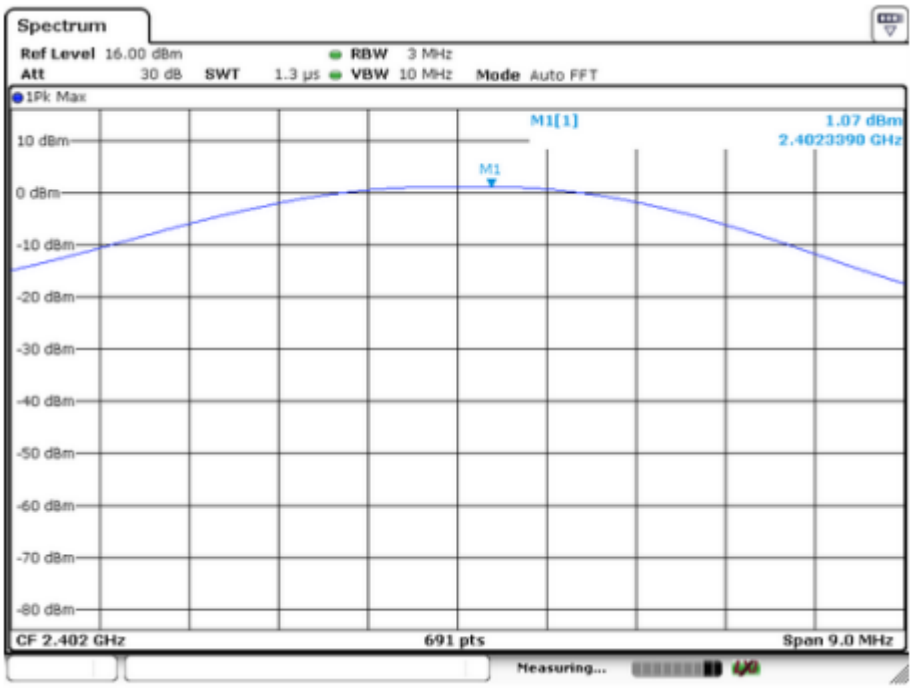
GFSK Middle Channel



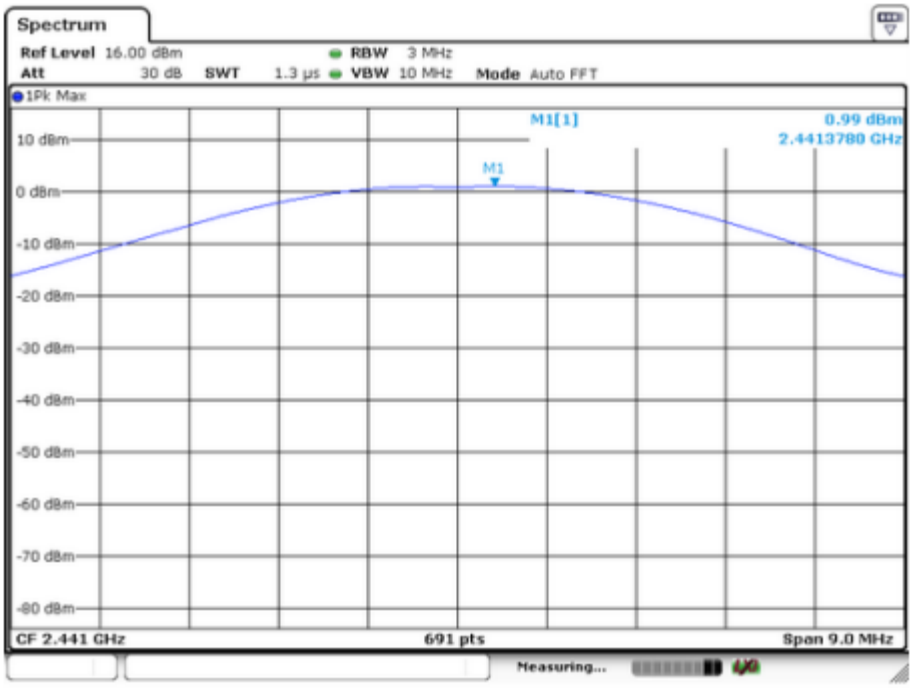
GFSK High Channel



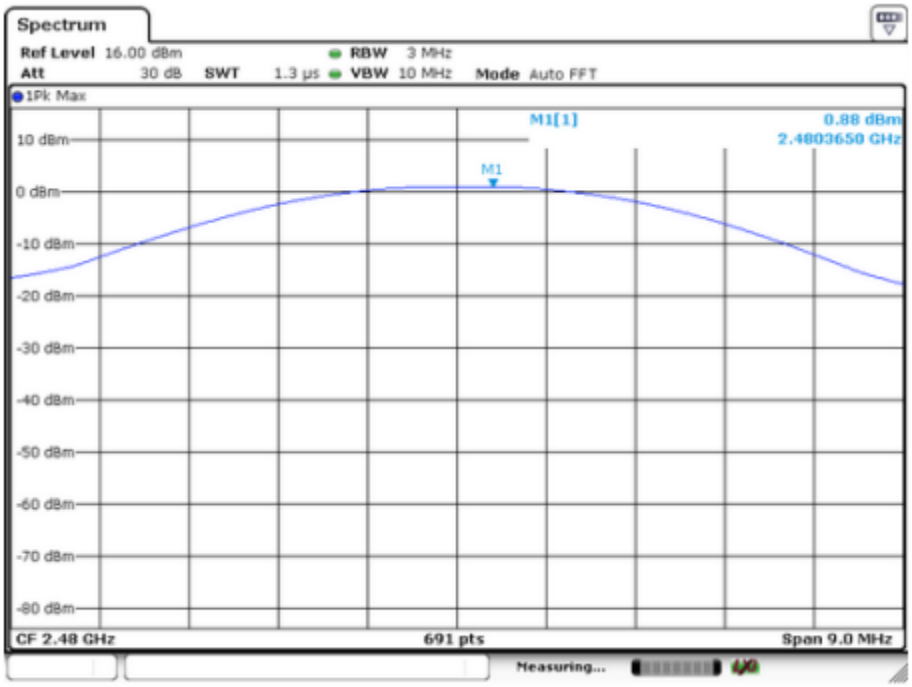
Pi/4DQPSK Low Channel



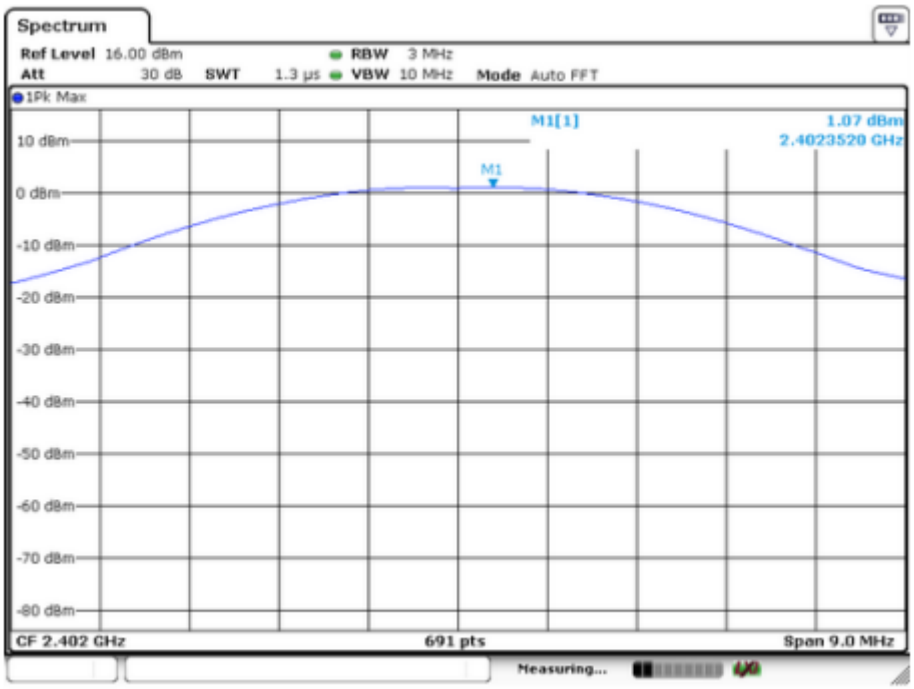
Pi/4DQPSK Middle Channel



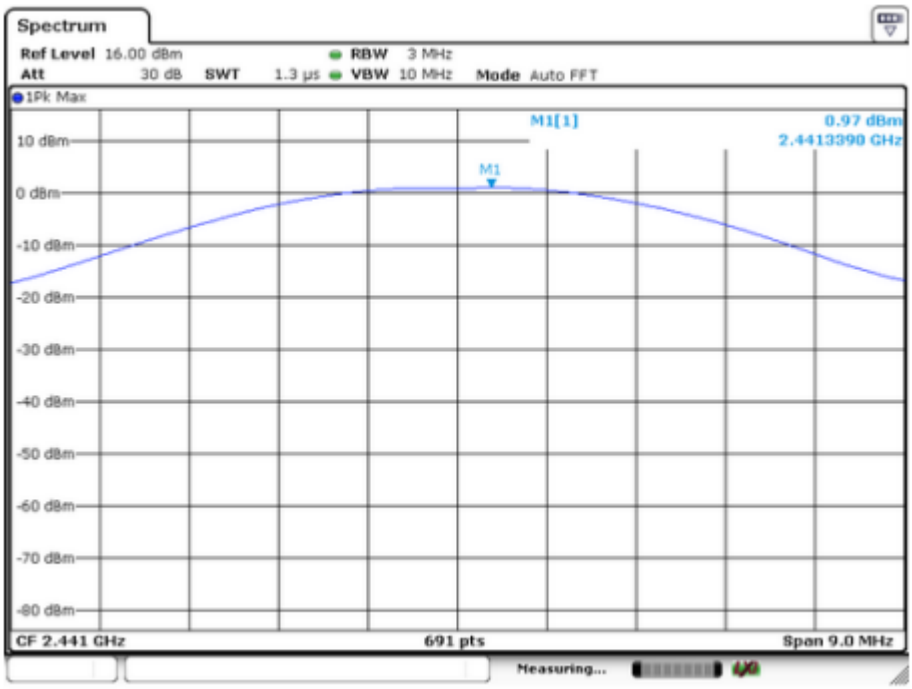
Pi/4DQPSK High Channel



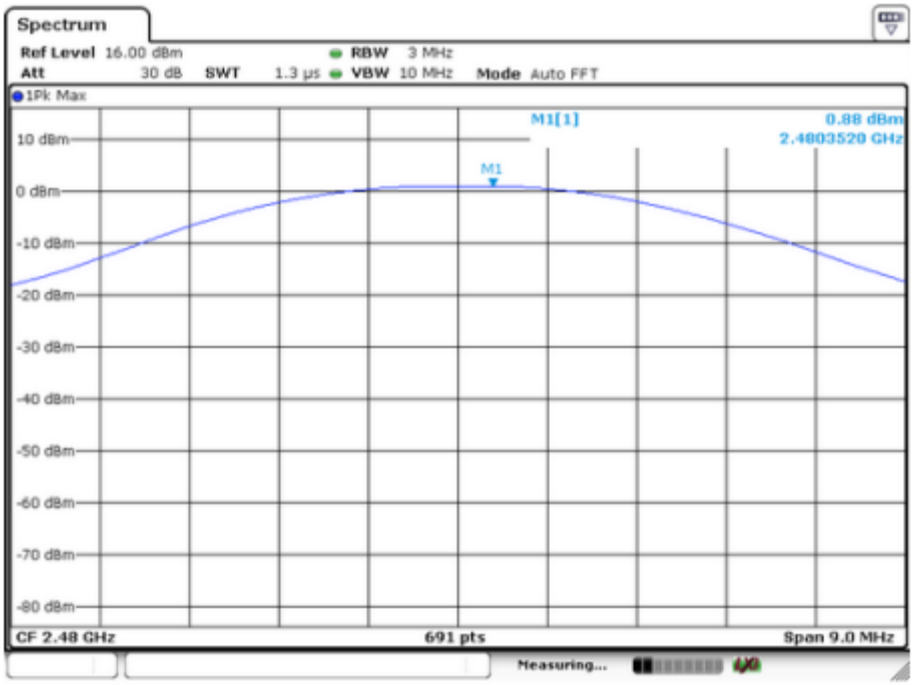
8DPSK Low Channel



8DPSK Middle Channel



8DPSK High Channel



9 Hopping Channel Separation

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2013

Test Limit : 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.

Test Mode : Hopping

9.1 Test Procedure

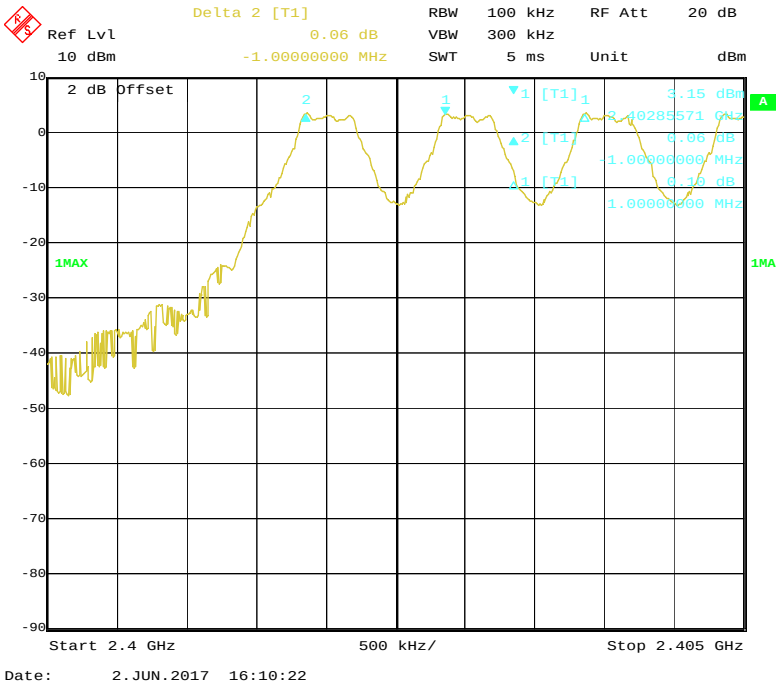
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW = 300KHz , Span = 3MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to 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.

9.2 Test Result

Modulation	Test Channel	Separation (MHz)	Limit (MHz)	Result
GFSK	Low	1.000	0.872	PASS
GFSK	Middle	1.000	0.872	PASS
GFSK	High	1.000	0.860	PASS
Pi/4 DQPSK	Low	1.000	0.813	PASS
Pi/4 DQPSK	Middle	1.000	0.813	PASS
Pi/4 DQPSK	High	1.000	0.813	PASS
8DPSK	Low	1.000	0.813	PASS
8DPSK	Middle	1.000	0.813	PASS
8DPSK	High	1.000	0.809	PASS

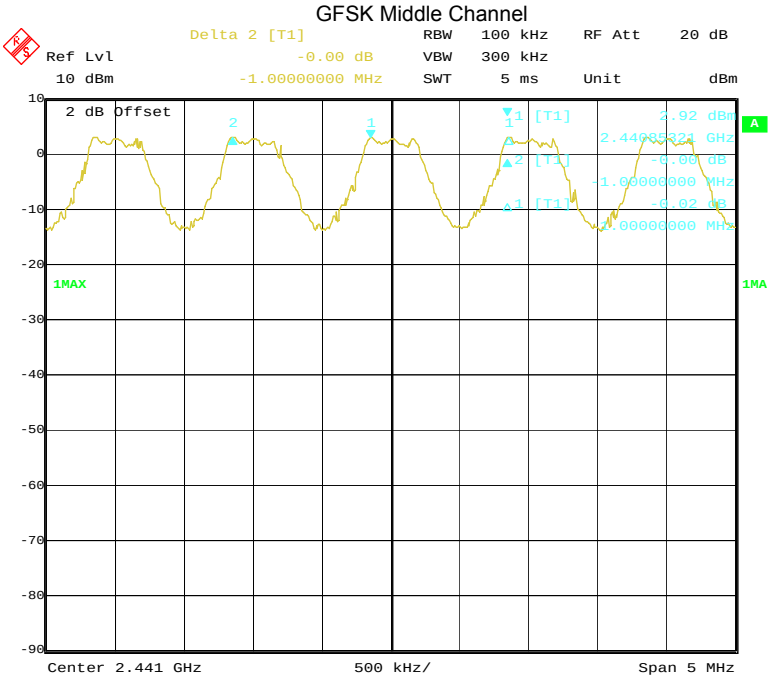
For GFSK: Ch. Separation Limits: >20dB bandwidth
For π/4-DQPSK(2Mbps): Ch. Separation Limits: > two-thirds 20dB bandwidth
For 8-DPSK(3Mbps): Ch. Separation Limits: > two-thirds 20dB bandwidth

GFSK Low Channel



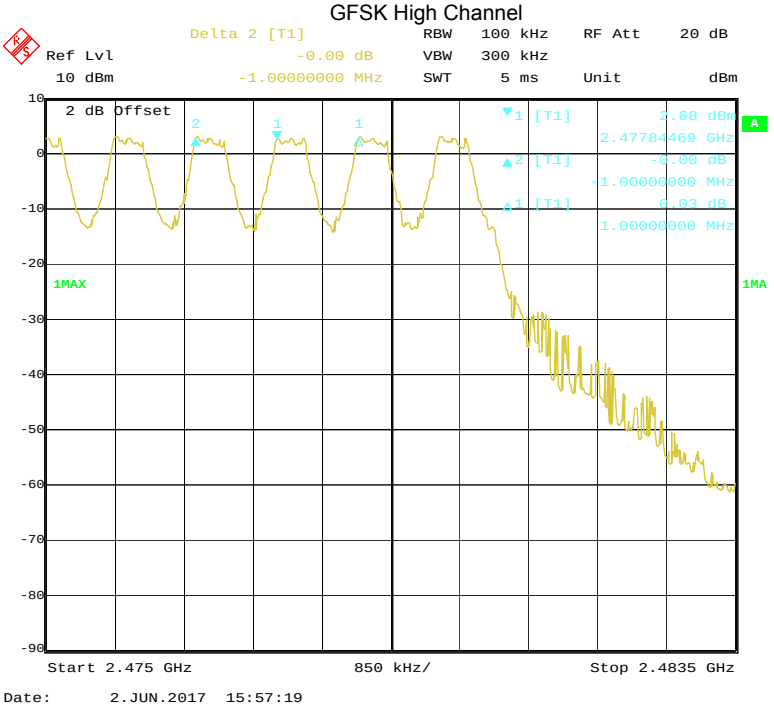
Date: 2.JUN.2017 16:10:22

GFSK Middle Channel



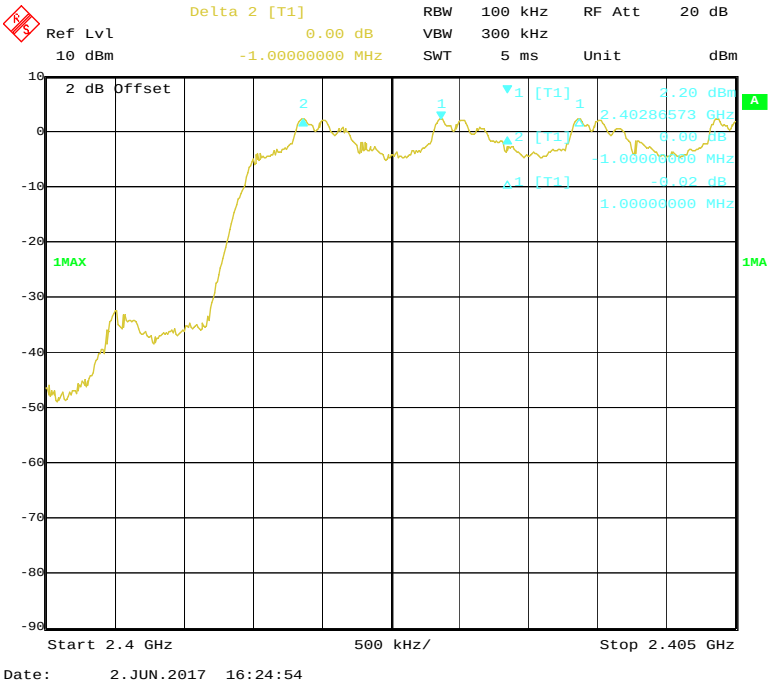
Date: 2.JUN.2017 10:34:10

GFSK High Channel



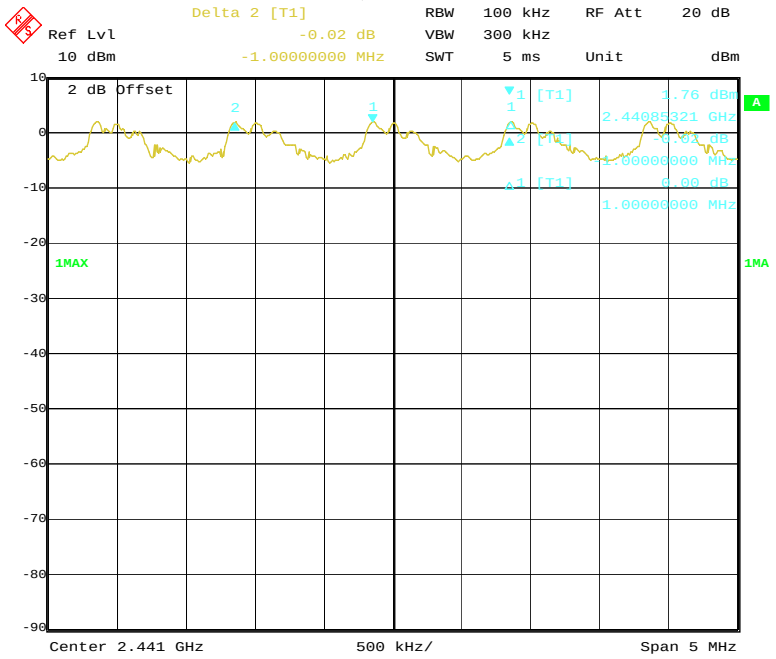
Date: 2.JUN.2017 15:57:19

Pi/4DQPSK Low Channel



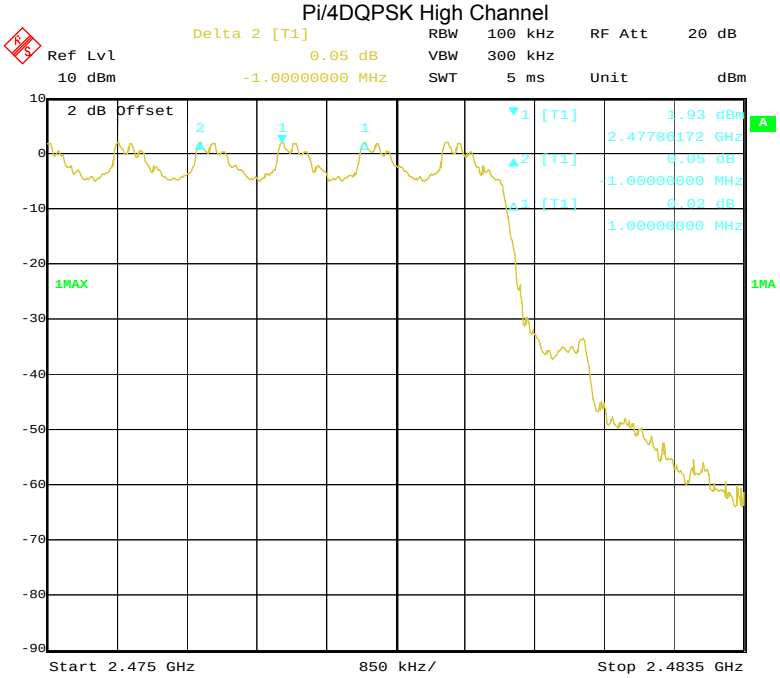
Date: 2.JUN.2017 16:24:54

Pi/4DQPSK Middle Channel



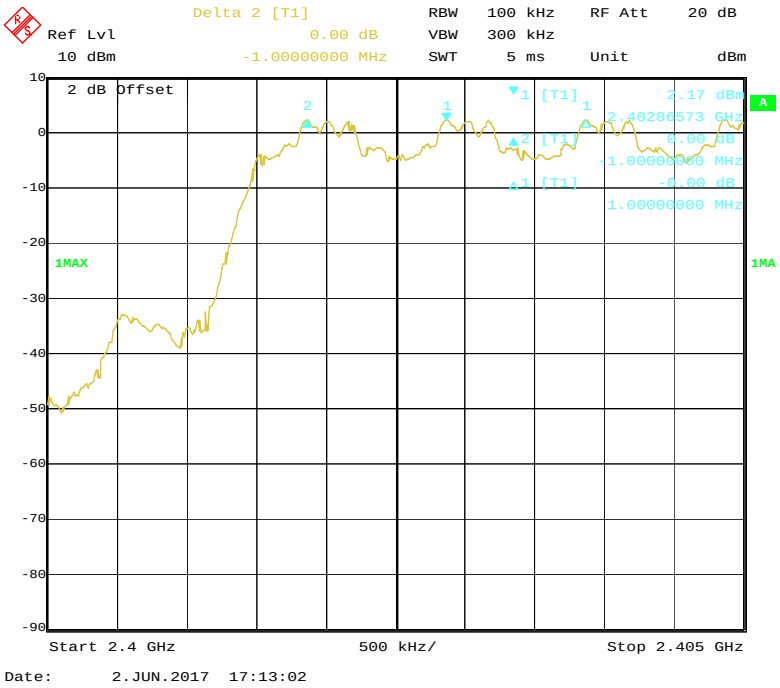
Date: 2.JUN.2017 10:46:37

Pi/4DQPSK High Channel

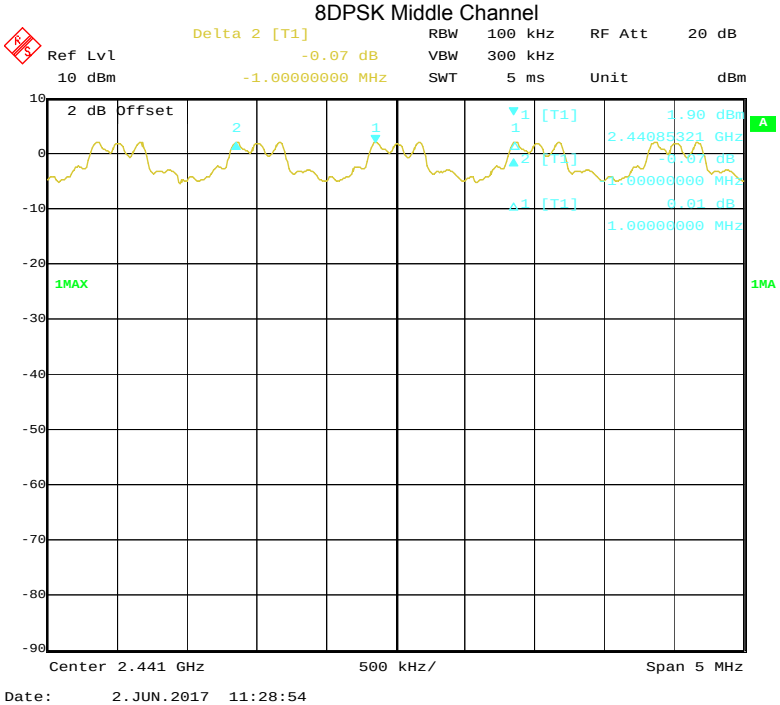


Date: 2.JUN.2017 16:39:49

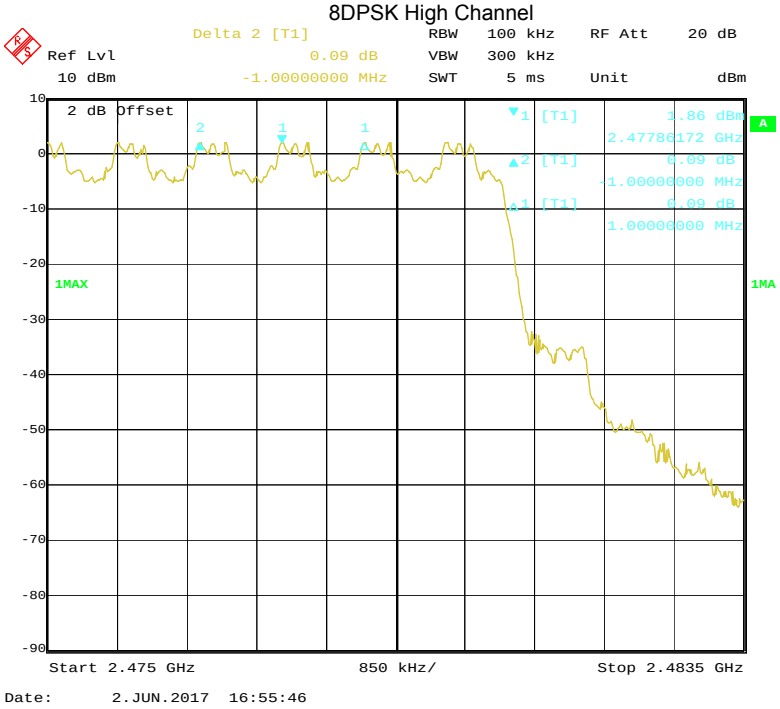
8DPSK Low Channel



8DPSK Middle Channel



8DPSK High Channel



10 Number of Hopping Frequency

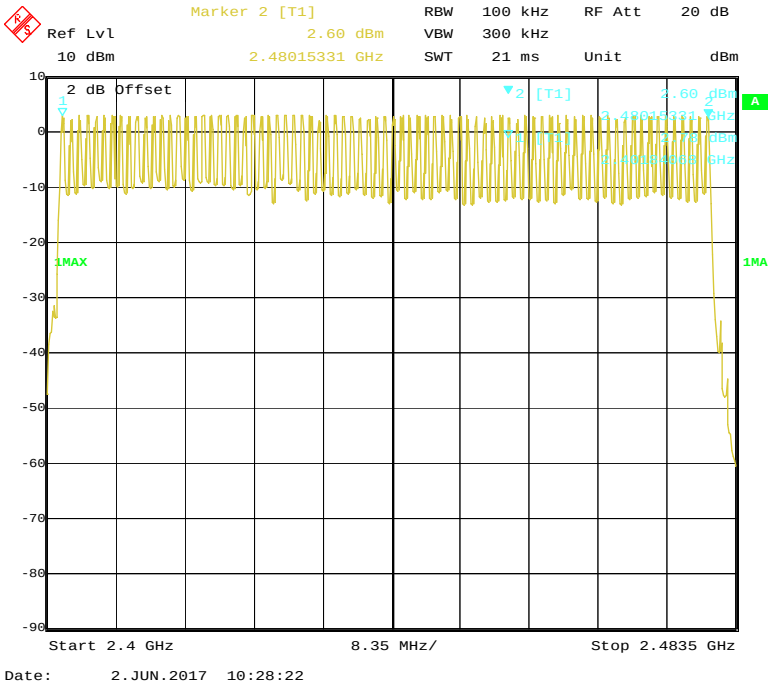
Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247 (a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Mode	:	Hopping(GFSK)

10.1 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 = 100KHz. VBW = 300KHz. 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;

10.2 Test Result

Channel Number	Limit
79	≥15



11 Dwell Time

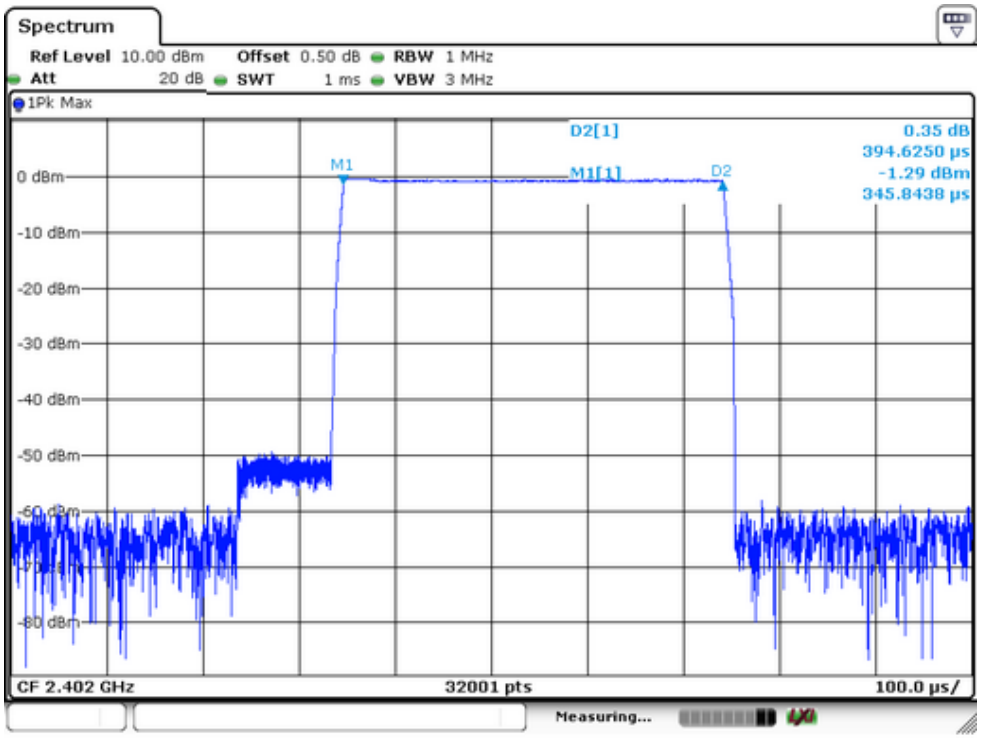
Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within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

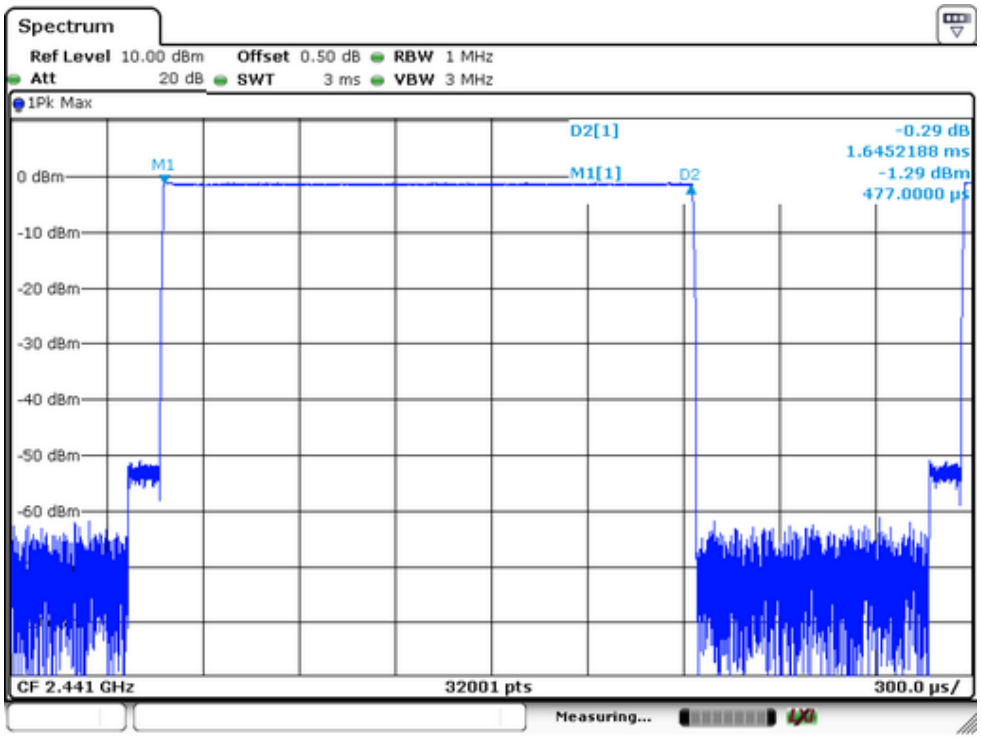
11.1 Test Procedure

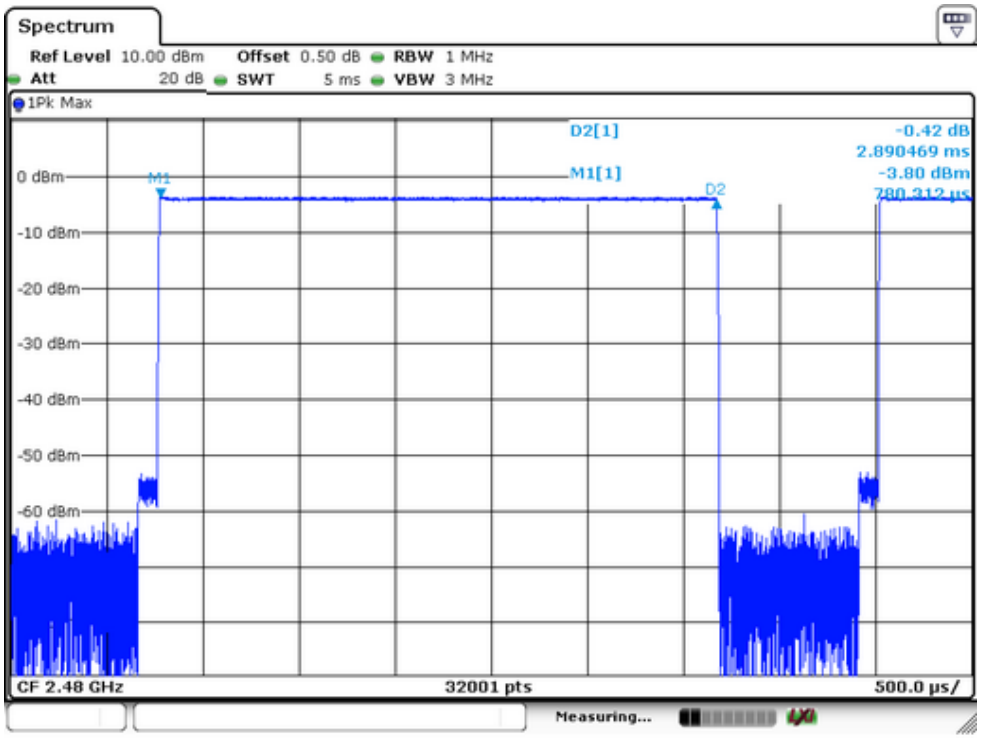
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. Centred on a hopping channel;
3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 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).

11.2 Test Result

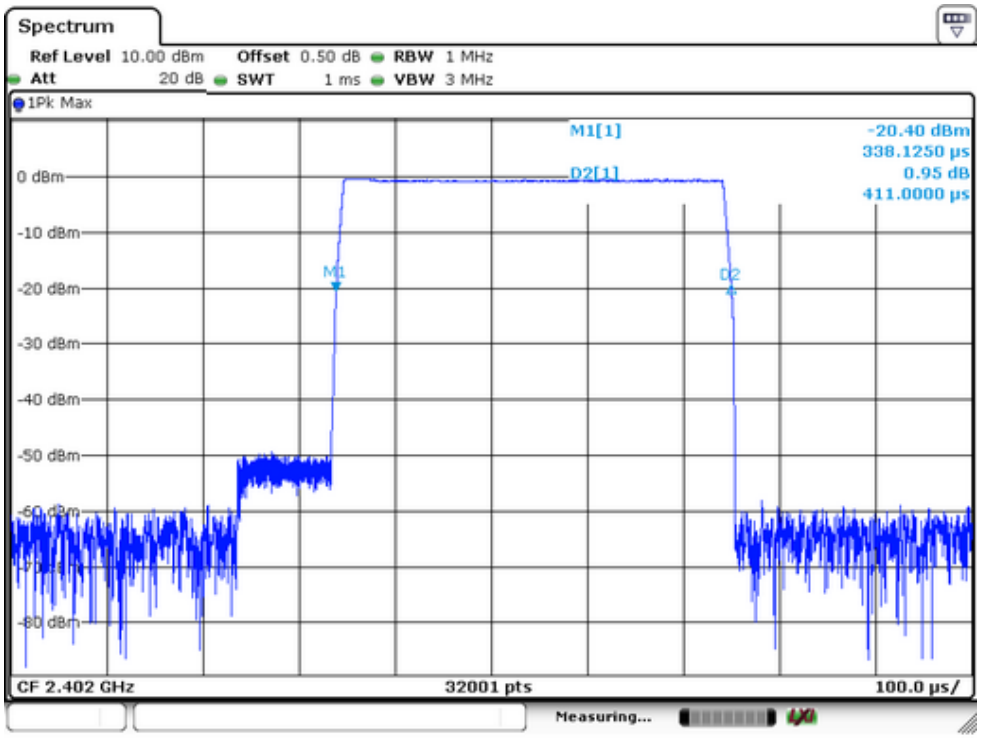
Mode	Number of transmission in a 31.6(79 Hopping*0.4)	Length of transmissions time(msec)	Result (msec)	Limit (msec)
DH1	1600/(2*79) x 31.6 = 320	0.394	126.08	400
DH3	1600/(4*79) x 31.6 =160	1.645	263.20	400
DH5	1600/(6*79) x 31.6 =106.67	2.89	308.27	400

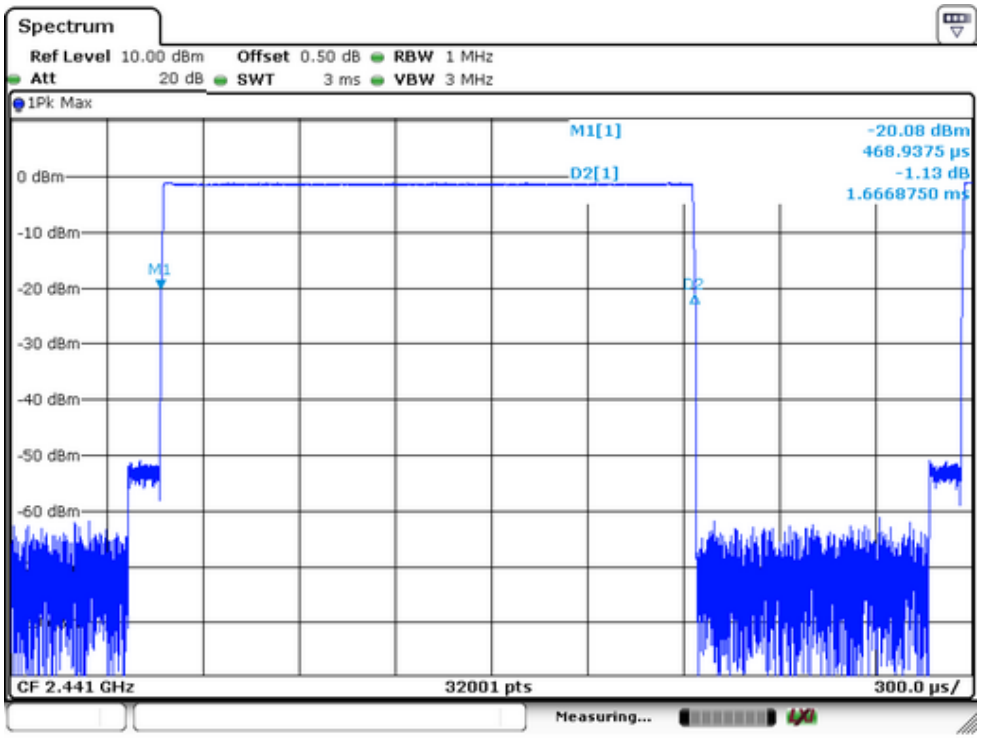


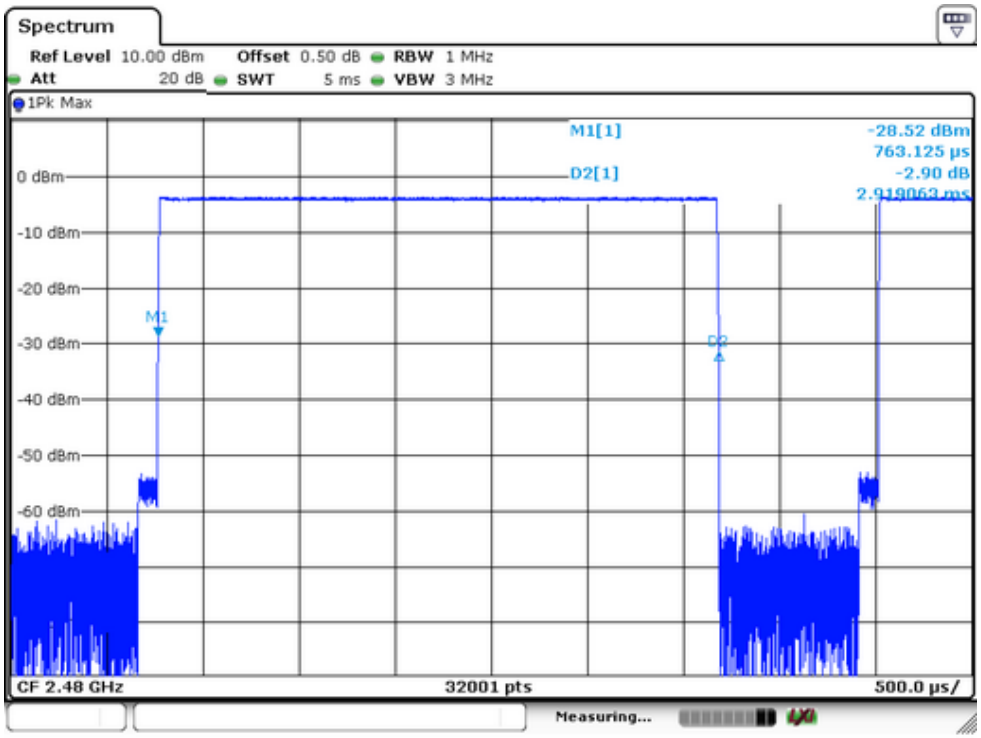

Spectrum
Ref Level 10.00 dBm Offset 0.50 dB RBW 1 MHz
Att 20 dB SWT 3 ms VBW 3 MHz
1Pk Max
D2[1]
-0.29 dB
1.6452188 ms
-1.29 dBm
477.0000 µs
M1
M1[1]
D2
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.441 GHz
32001 pts
300.0 µs/
Measuring...


Spectrum
Ref Level 10.00 dBm Offset 0.50 dB RBW 1 MHz
Att 20 dB SWT 5 ms VBW 3 MHz
1Pk Max
D2[1]
-0.42 dB
2.890469 ms
-3.80 dBm
780.312 µs
M1
M1[1]
D2
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.48 GHz
32001 pts
500.0 µs/
Measuring...

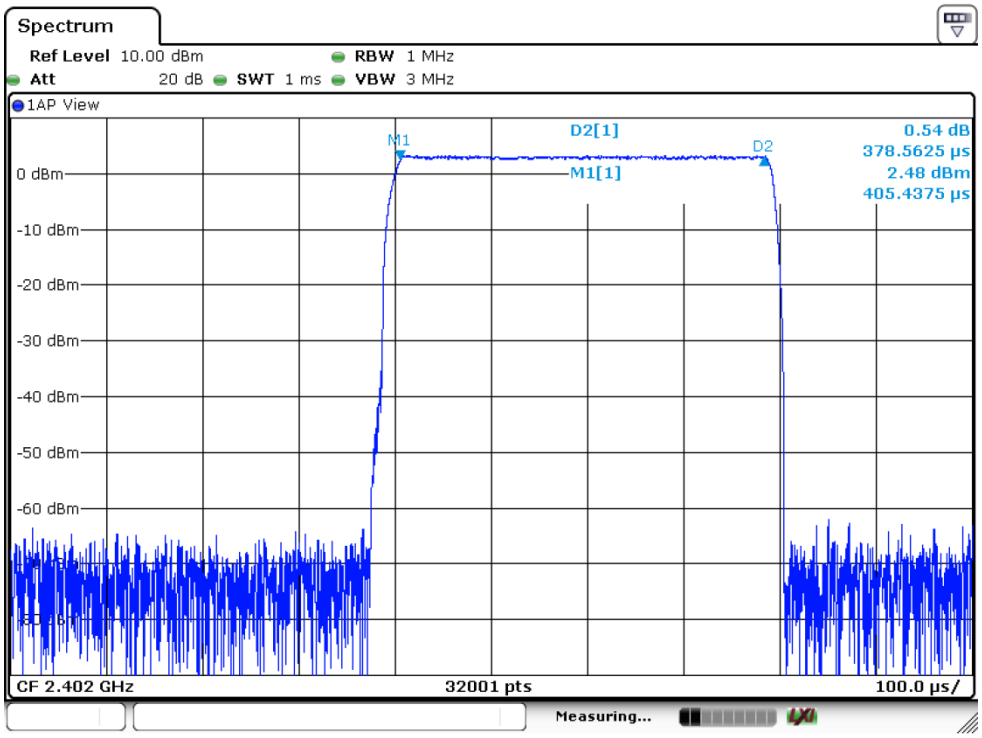
Mode	Number of transmission in a 31.6(79 Hopping*0.4)	Length of transmissions time(msec)	Result (msec)	Limit (msec)
2DH1	1600/(2*79) x 31.6 = 320	0.338	108.16	400
2DH3	1600/(4*79) x 31.6 =160	1.667	266.72	400
2DH5	1600/(6*79) x 31.6 =106.67	2.919	311.37	400

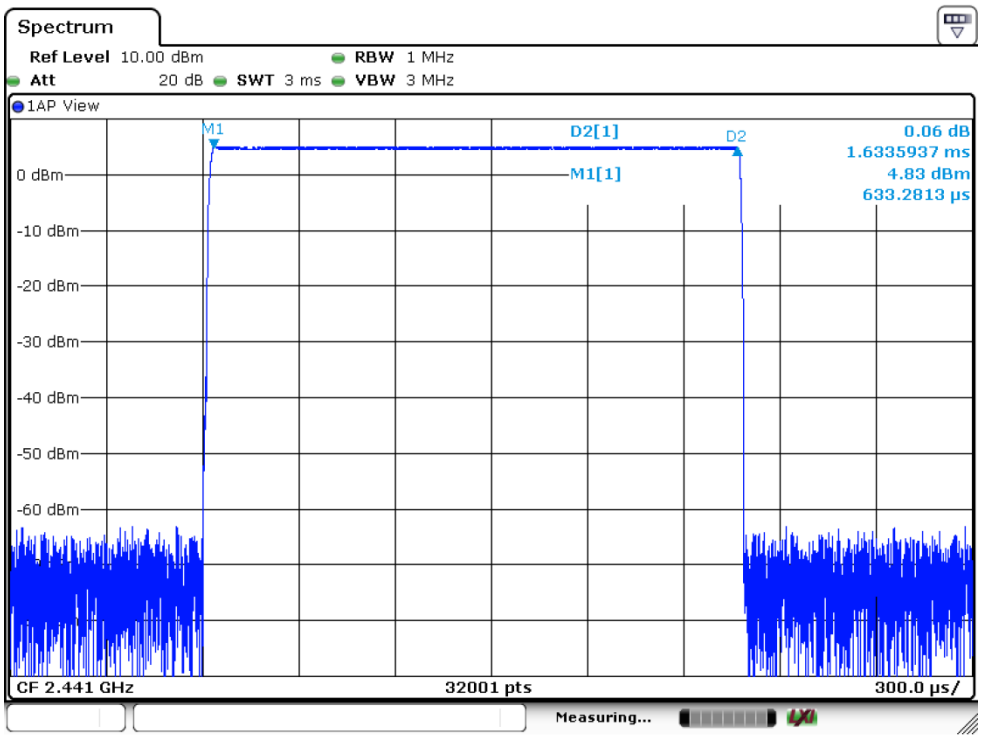


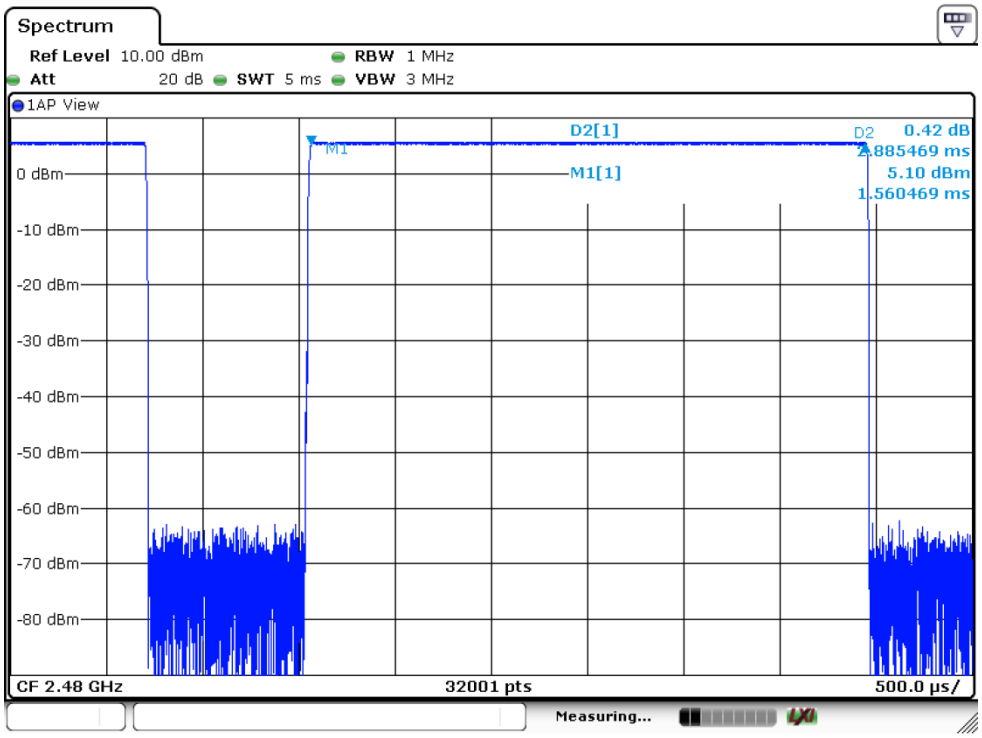

Spectrum
Ref Level 10.00 dBm Offset 0.50 dB RBW 1 MHz
Att 20 dB SWT 3 ms VBW 3 MHz
1Pk Max
M1[1] -20.08 dBm
468.9375 µs
D2[1] -1.13 dB
1.6668750 ms
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
D2
CF 2.441 GHz
32001 pts
300.0 µs/
Measuring...


Spectrum
Ref Level 10.00 dBm Offset 0.50 dB RBW 1 MHz
Att 20 dB SWT 5 ms VBW 3 MHz
1Pk Max
M1[1] -28.52 dBm
763.125 µs
D2[1] -2.90 dB
2.919063 ms
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
D2
CF 2.48 GHz
32001 pts
500.0 µs/
Measuring...

Mode	Number of transmission in a 31.6(79 Hopping*0.4)	Length of transmissions time(msec)	Result (msec)	Limit (msec)
3DH1	1600/(2*79) x 31.6 = 320	0.379	121.28	400
3DH3	1600/(4*79) x 31.6 =160	1.634	261.44	400
3DH5	1600/(6*79) x 31.6 =106.67	2.885	307.74	400




Spectrum
Ref Level 10.00 dBm
RBW 1 MHz
Att 20 dB
SWT 3 ms
VBW 3 MHz
1AP View
M1
D2[1]
D2
0.06 dB
1.6335937 ms
M1[1]
4.83 dBm
633.2813 µs
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.441 GHz
32001 pts
300.0 µs/
Measuring...

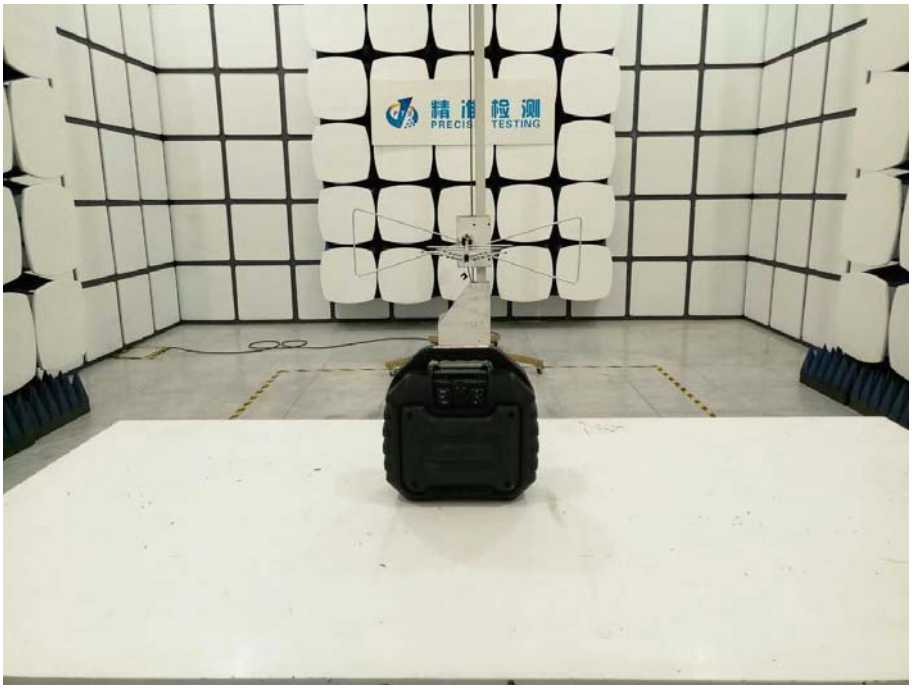

Spectrum
Ref Level 10.00 dBm
RBW 1 MHz
Att 20 dB
SWT 5 ms
VBW 3 MHz
1AP View
D2[1]
M1
D2
0.42 dB
2.885469 ms
M1[1]
5.10 dBm
1.560469 ms
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.48 GHz
32001 pts
500.0 µs/
Measuring...

12 Antenna Requirement

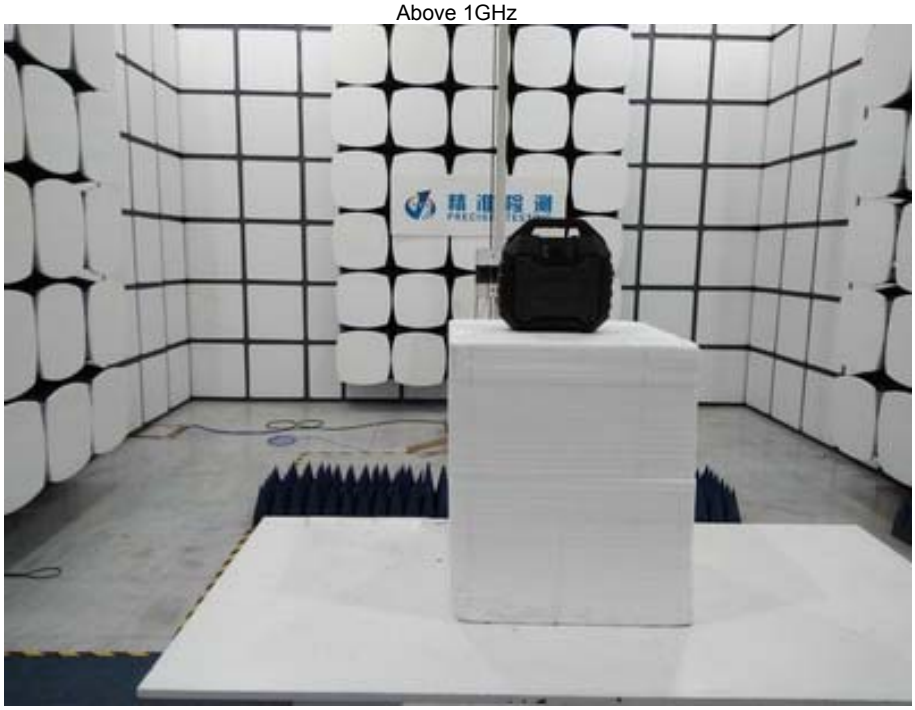
According to the FCC part15.203, a transmitter can only be sold or operated with antennas with which it was approved. This product has a PCB antenna, it meet the requirement of this section.

13 Test Setup

Spurious Emissions
From 30MHz-1000MHz

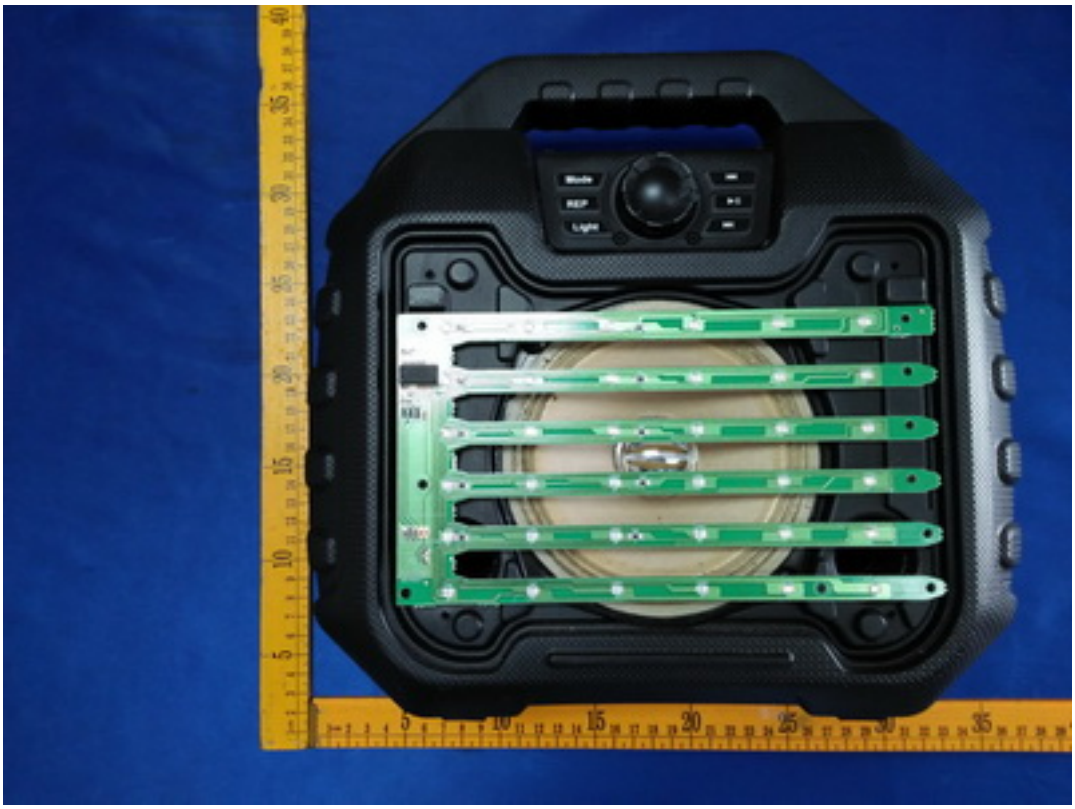


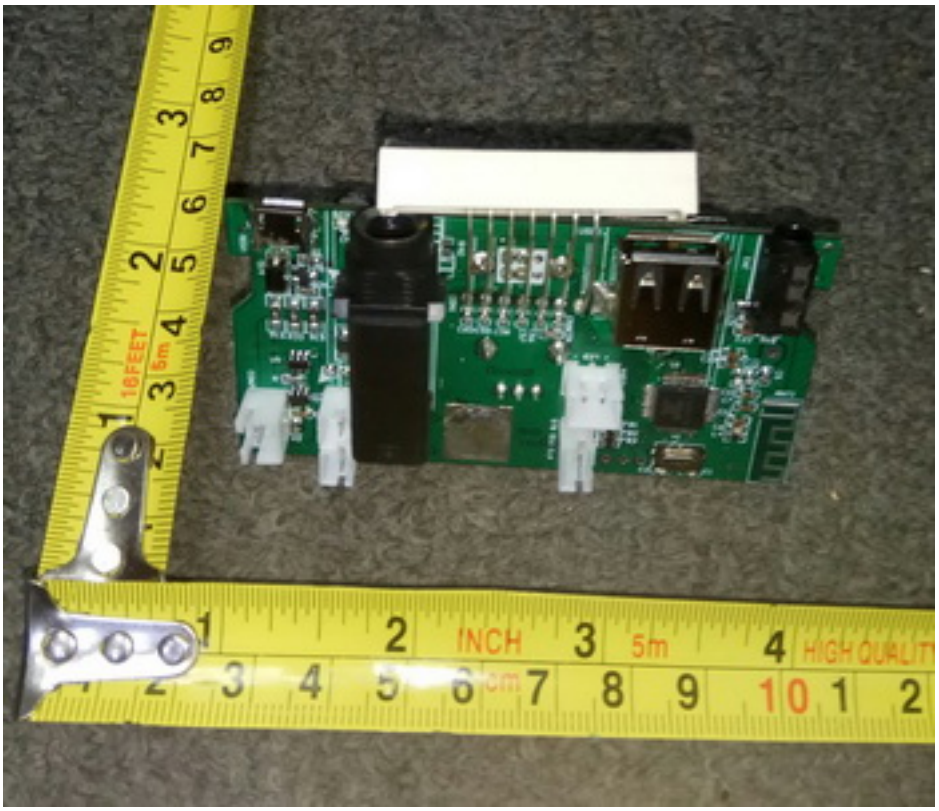
Above 1GHz

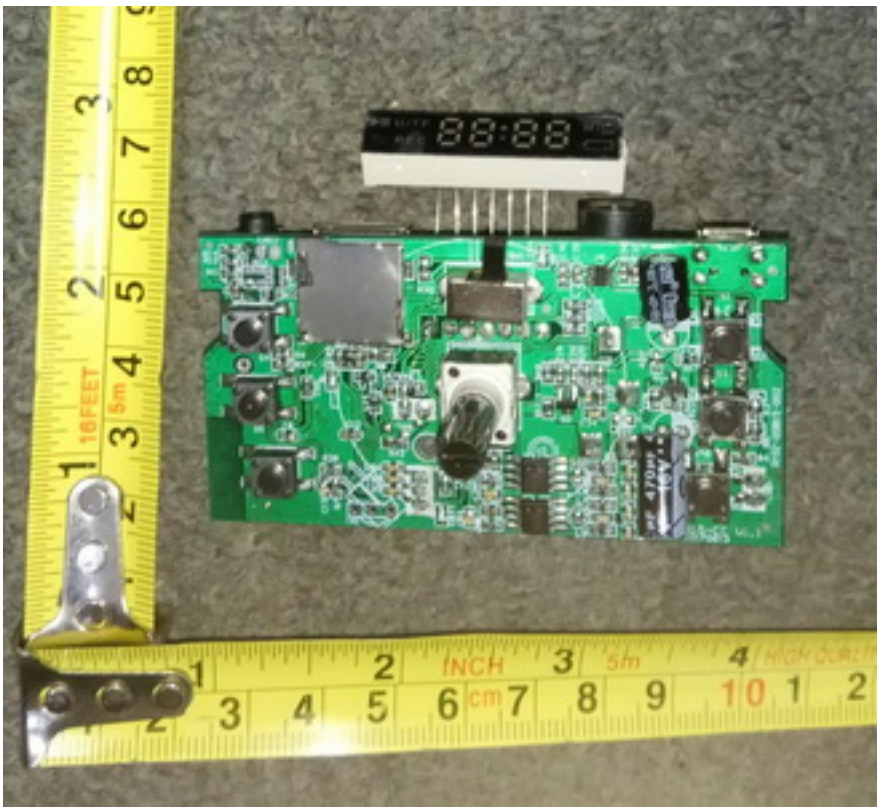


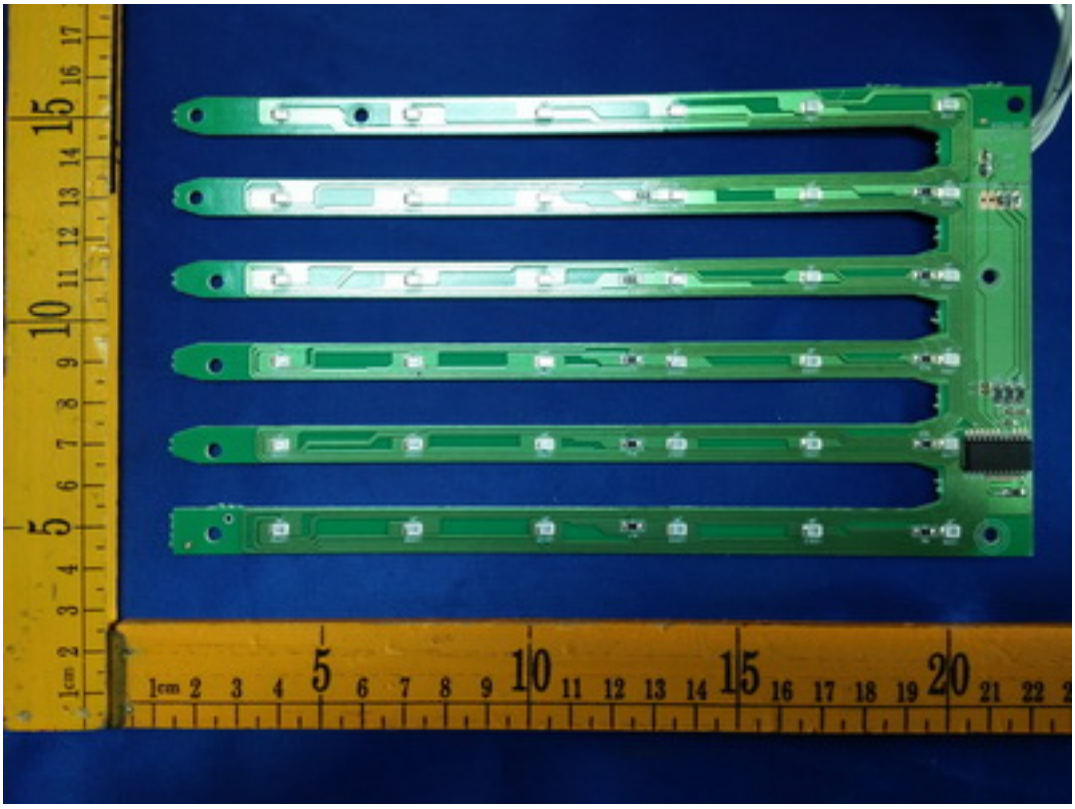
14 EUT PHOTOS

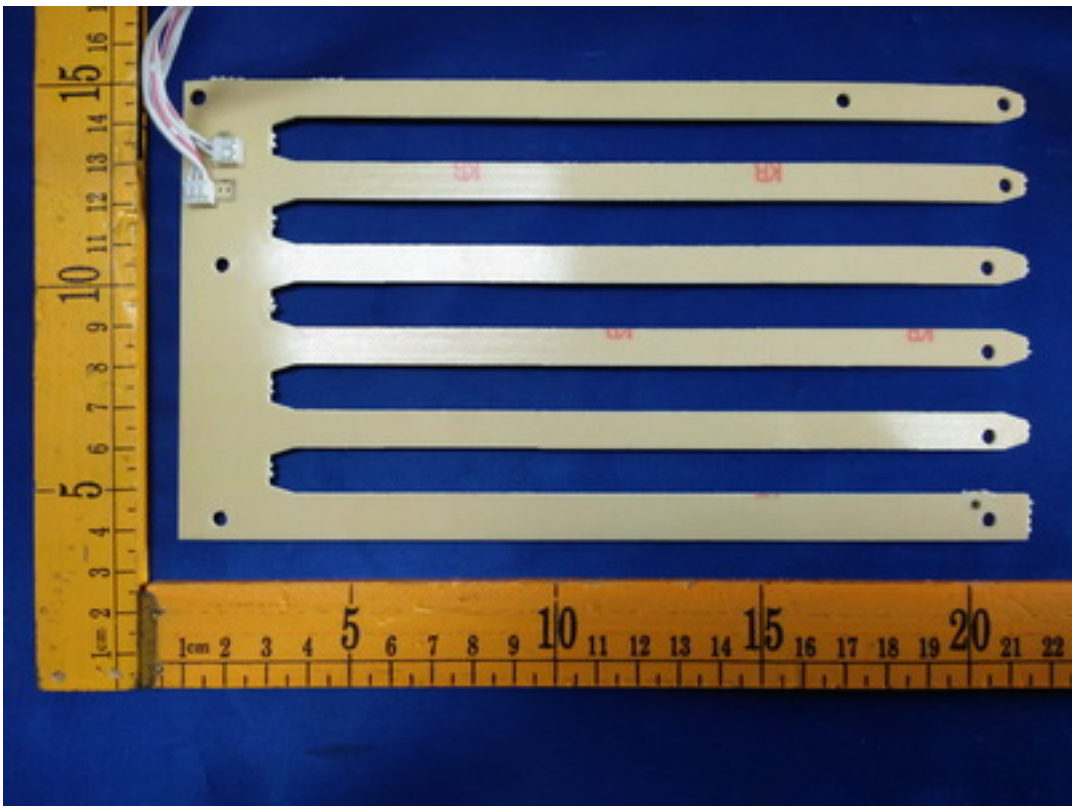
USB
LINE IN
TF
OFF
ON MIC IN
USB 5V




INCH
5m
HIGH QUALITY
cm


INCH
5m
cm





M/N: B11

M/N: B12

M/N: B30

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