Shenzhen GTI Technology Co., Ltd

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EMC TEST REPORT

FCC ID.....:	**2ACBCQ6**
Product name.....:	**Android touchscreen all in one pc**
Trademark .....:	BOCT
Model no.....:	**A1、A2、A3、A4、A5、A6、A7、A8、A9、A10、B1、B2、B3、B4、B5、B6、B7、B8、B9、B10、K1、K2、K3、K4、K5、K6、K7、K8、K9、K10、G1、G2、G3、G4、G5、G6、G7、G8、G9、G10、Q1、Q2、Q3、Q4、Q5、Q6、Q7、Q8、Q9、Q10**
Test Standards .....:	**FCC Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz**
Applicant .....:	**ShenZhen BOCT Technology Co., Ltd.**
Address of applicant.....:	5-6/F, 3rd Building, Hedong Hangcheng Industrial Area, Xixiang Street,Bao'an District,Shenzhen，Guangdong,China
Date of Receipt .....:	April 02, 2014
Date of Test Date.....:	April 22, 2014 to April 27, 2014
Data of issue. .....:	April 28, 2014

Test result.....:	Pass

Testing Engineer : Mart Xiong
(Mart Xiong)

Reviewed By: : Tony Wang
(Tony Wang)

Approved Signatory : Walter Chen
(Walter Chen)

Table of Contents

Page

1. TEST SUMMARY

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

ANSI C63.10: American National Standard for Testing Unlicensed Wireless Devices

KDB558074 D01 V03: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

Test Results:

FCC PART 15 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(1)(i)	20dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.247(b)	Pseudorandom Frequency Hopping Sequence	PASS
FCC Part 15.247(a)(1)(iii)	Number of hopping frequency& Time of Occupancy	PASS
FCC Part 15.247(a)(1)	Frequency Separation	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge Compliance of RF Emission	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

Remark: The measurement uncertainty is not included in the test result.

1.1 TEST FACILITY

1.1.1 Address of the test laboratory

Shenzhen GTI Technology Co., Ltd

1F, 2 Block, Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong, China

1.1.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 9783A

The 3m alternate test site of DTT Services Co.,Ltd.EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Aug, 2011.

FCC-Registration No.: 214666

DTT Services Co.,Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 214666, Sep 19, 2011

1.1.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-40 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emissio 1~25GHz	5.16 dB	(1)
Occupied Bandwidth	---------	(1)

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Name of EUT	**Android touchscreen all in one pc**
Model Number	**Q6**
Adding Model(s):	**A1、A2、A3、A4、A5、A6、A7、A8、A9、A10、B1、B2、B3、B4、B5、B6、B7、B8、B9、B10、K1、K2、K3、K4、K5、K6、K7、K8、K9、K10、G1、G2、G3、G4、G5、G6、G7、G8、G9、G10、Q1、Q2、Q3、Q4、Q5、Q7、Q8、Q9、Q10**
Model Difference	All the models are simillar except for model name,the model **Q6** is selected by test
Antenna Type	Internal
WLAN FCC Operation frequency	IEEE 802.11b:2412-2462MHz IEEE 802.119:2412-2462MHz IEEE 802.11n HT20:2412-2462MHz IEEE 802.11n HT40:2422-2452MHz
BT Operation frequency	2402MHz-2480MHz
WLAN FCC Modulation Type	IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)
BT Modulation Type	GFSK,8DPSK,π/4DQPSK(BT v2.1+EDR)
Hardware version	PA1336 VER:1.2
Software version	Q6_V200_20140321
Android version	Andriod 4.4.2
WLAN	Supported 802.11b/802.11g/802.11n
Bluetooth	Supported BT v2.1+EDR

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.2 DESCRIPTION OF TEST MODES

The EUT has been tested under typical operating condition. There are EDR (Enhanced Data Rate) and BDR

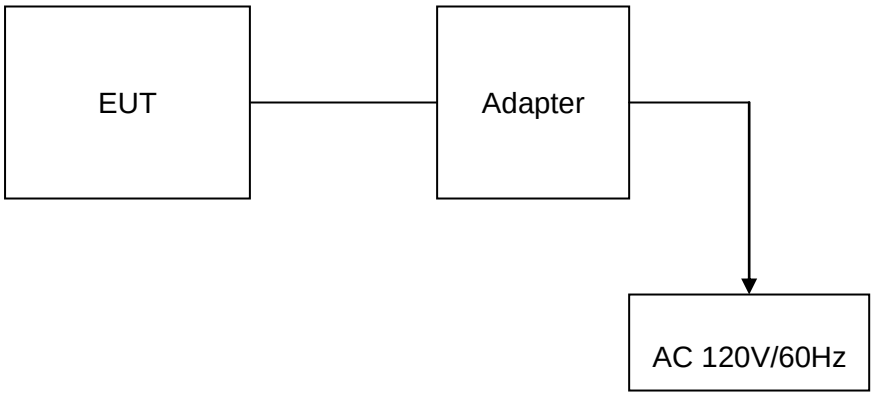
(Basic Data Rate)mode.The Applicant provides communication tools software to control the EUT for staying in

continous transmitting and receiving mode for testing. There are 79 channels of EUT, and the test carried out

at the lowest channel, middle channel and highest channel .

Channel	Frequency(MHz)	Channel	Frequency(MHz)
00	**2402**	40	2442
01	2403	41	2443
02	2404	42	2444
03	2405	43	2445
04	2406	44	2446
05	2407	45	2447
06	2408	46	2448
07	2409	47	2449
08	2410	48	2450
09	2411	49	2451
10	2412	50	2452
11	2413	51	2453
12	2414	52	2454
13	2415	53	2455
14	2416	54	2456
15	2417	55	2457
16	2418	56	2458
17	2419	57	2459
18	2420	58	2460
19	2421	59	2461
20	2422	60	2462
21	2423	61	2463
22	2424	62	2464
23	2425	63	2465
24	2426	64	2466
25	2427	65	2467
26	2428	66	2468
27	2429	67	2469
28	2430	68	2470
29	2431	69	2471
30	2432	70	2472
31	2433	71	2473
32	2434	72	2474
33	2435	73	2475
34	2436	74	2476
35	2437	75	2477
36	2438	76	2478
37	2439	77	2479
38	2440	**78**	**2480**
39	**2441**		

2.3 DESCRIPTION OF TEST SETUP



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

Adapter:

Model: ADS-40SG-19-3 19040G
Input: 100-240V～50/60Hz 1.0A max
Output: OUTPUT: 19V DC 2.1A
Power Cable: 120cm
◇ Shielded ◆ Unshielded

2.5 MEASUREMENT INSTRUMENTS LIST

Maximum Peak Output Power / Power Spectral Density / 6dB Bandwidth / Band Edge Compliance of RF Emission / Spurious RF Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4391.40	Oct 25,2014
2	Climate Chamber	ESPEC	EL-10KA	05107008	Oct 25,2014

CONDUCTED EMISSION					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 26, 2014
2	LISN	R&S	ENV216	101113	Dec. 26, 2014
3	EMI Test Receiver	R&S	ESCI	100920	Dec. 26, 2014

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100658	Dec 26, 2014
2	High pass filter	Compliance Direction systems	BSU-6	34202	Oct 25,2014
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec 27, 2014
4	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Dec 27, 2014
5	Loop Antenna	LAPLAC INSTRUMENTS LTD	RF300	9138	Nov 15,2014
6	Spectrum Analyzer	HP	8563E	02052	Dec 27, 2014
7	Horn Antenna	Schwarzbeck	BBHA 9120D	648	Dec 27, 2014
8	Pre-Amplifier	HP	8447D	1937A03050	Dec 26, 2014
9	Pre-Amplifier	EMCI	EMC051835	980075	Dec 27, 2014
10	Antenna Mast	UC	UC3000	N/A	N/A
11	Turn Table	UC	UC3000	N/A	N/A

3. TEST CONDITIONS AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

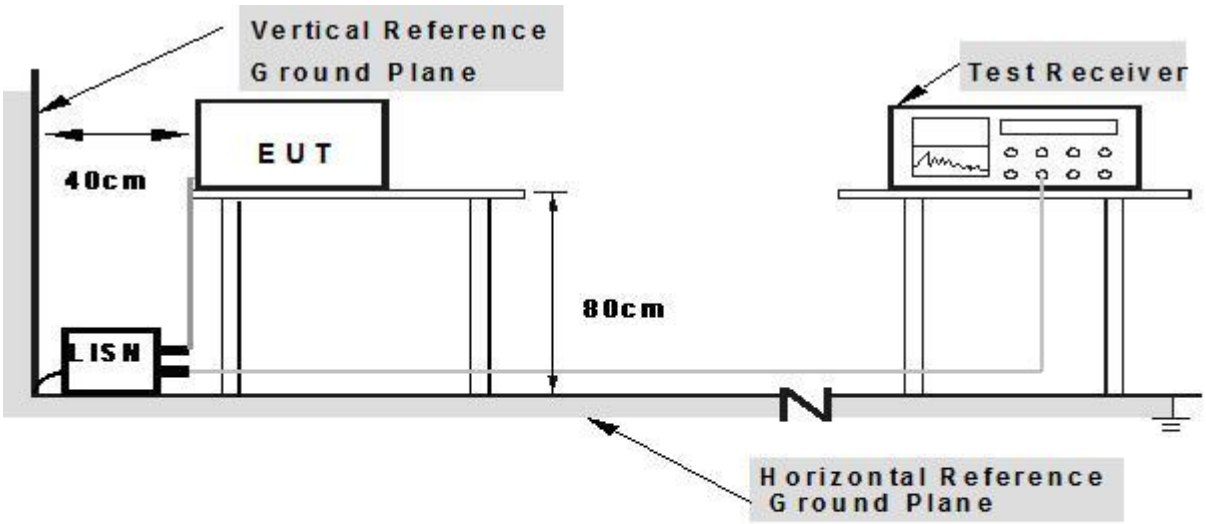
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



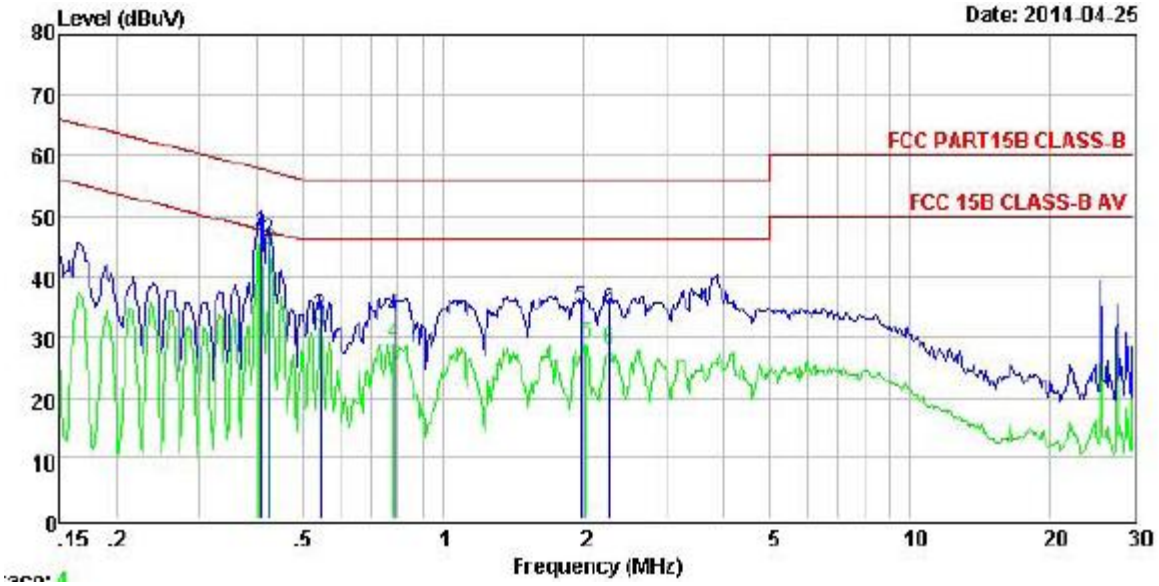
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing. We tested all idle mode, recorded worst case at Mode3.

3.1.5 TEST RESULTS

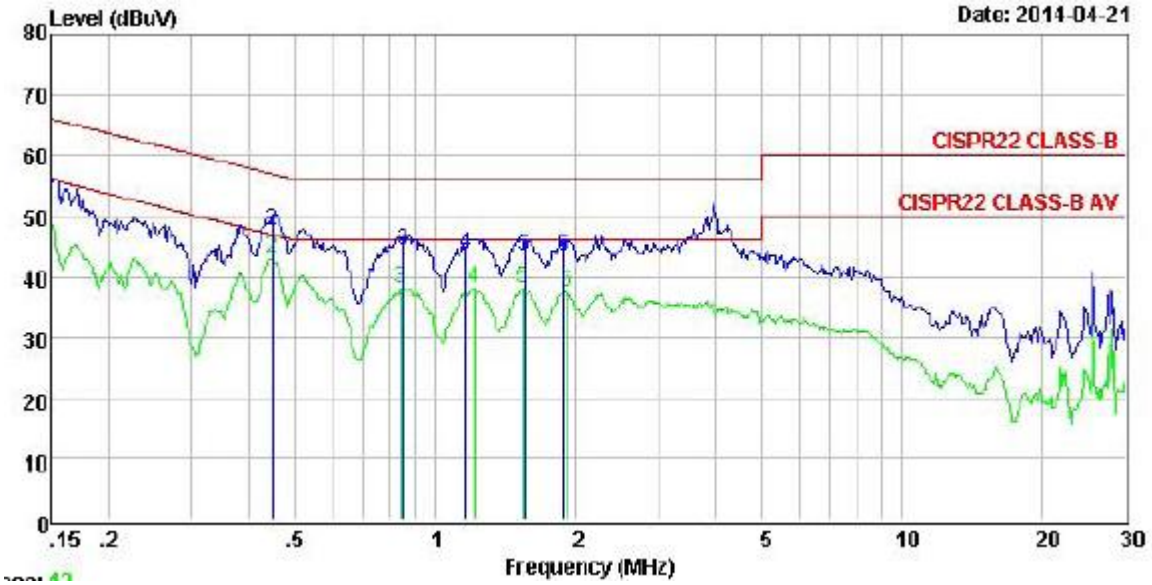
EUT:	Android touchscreen all in one pc	Model Name. :	Q6
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Date :	2014-04-25
Test Mode:	BlueTooth	Phase :	L
Test Voltage :	DC 19V from adapter with AC 120V/60Hz		



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.41	37.41	9.88	47.29	57.73	-10.44	9.82	0.06	QP
2	0.42	35.82	9.88	45.70	57.42	-11.72	9.82	0.06	QP
3	0.54	23.33	9.92	33.25	56.00	-22.75	9.81	0.11	QP
4	0.78	23.38	10.02	33.40	56.00	-22.60	9.81	0.21	QP
5	1.97	24.31	10.39	34.70	56.00	-21.30	9.84	0.55	QP
6	2.26	24.07	10.42	34.49	56.00	-21.51	9.84	0.58	QP

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.40	35.43	9.87	45.30	47.81	-2.51	9.82	0.05	Average
2	0.43	34.50	9.88	44.38	47.33	-2.95	9.82	0.06	Average
3	0.55	21.65	9.92	31.57	46.00	-14.43	9.81	0.11	Average
4	0.78	18.82	10.02	28.84	46.00	-17.16	9.81	0.21	Average
5	2.01	18.33	10.40	28.73	46.00	-17.27	9.84	0.56	Average
6	2.26	17.50	10.42	27.92	46.00	-18.08	9.84	0.58	Average

EUT:	Android touchscreen all in one pc	Model Name. :	Q6
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Date :	2014-04-25
Test Mode:	BlueTooth	Phase :	N
Test Voltage :	DC 19V from adapter with AC 120V/60Hz		



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.18	38.93	9.84	48.77	64.50	-15.73	9.79	0.05	QP
2	0.25	33.24	9.84	43.08	61.69	-18.61	9.80	0.04	QP
3	0.30	34.65	9.87	44.52	60.24	-15.72	9.80	0.07	QP
4	0.49	33.21	9.90	43.11	56.19	-13.08	9.81	0.09	QP
5	3.99	28.71	10.56	39.27	56.00	-16.73	9.86	0.70	QP
6	7.25	24.43	10.62	35.05	60.00	-24.95	9.89	0.73	QP

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.19	29.75	9.85	39.60	54.20	-14.60	9.80	0.05	Average
2	0.25	26.58	9.84	36.42	51.64	-15.22	9.80	0.04	Average
3	0.30	26.45	9.87	36.32	50.15	-13.83	9.80	0.07	Average
4	0.49	25.51	9.91	35.42	46.10	-10.68	9.81	0.10	Average
5	3.94	19.53	10.55	30.08	46.00	-15.92	9.85	0.70	Average
6	7.37	17.72	10.62	28.34	50.00	-21.66	9.89	0.73	Average

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	300	20log(2400/F(kHz))+80	2400/F(kHz)
0.49-1.705	30	20log(24000/F(kHz))+40	24000/F(kHz)
1.705-30	30	20log(30)+40	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

3.2.2 LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	Distance (Meters)	PEAK (dBμV/m)	AV (dBμV/m)
Above 1000	3	74.0	54.0

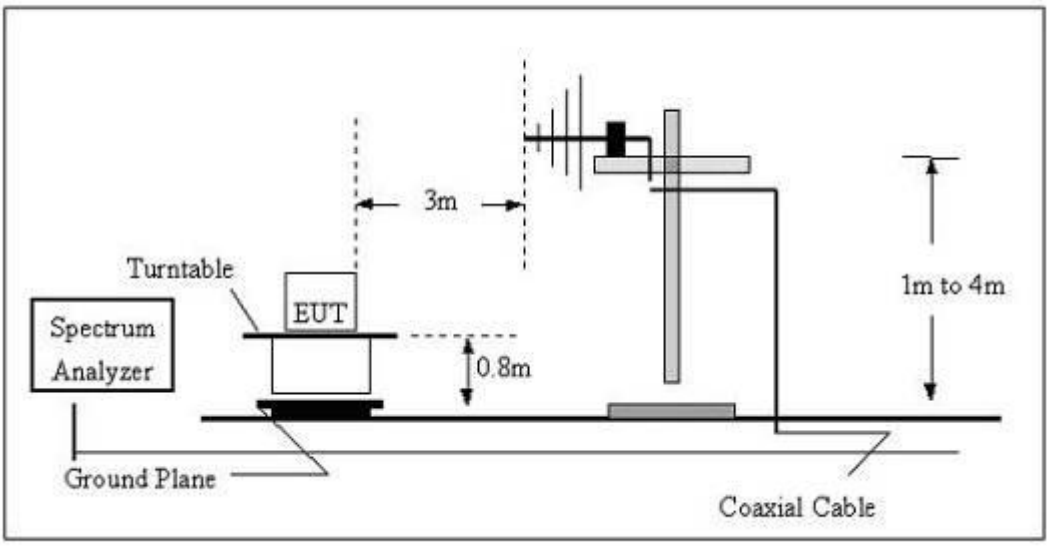
Notes:

(1) The tighter limit applies at the band edges.
(2) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.4 TEST SETUP

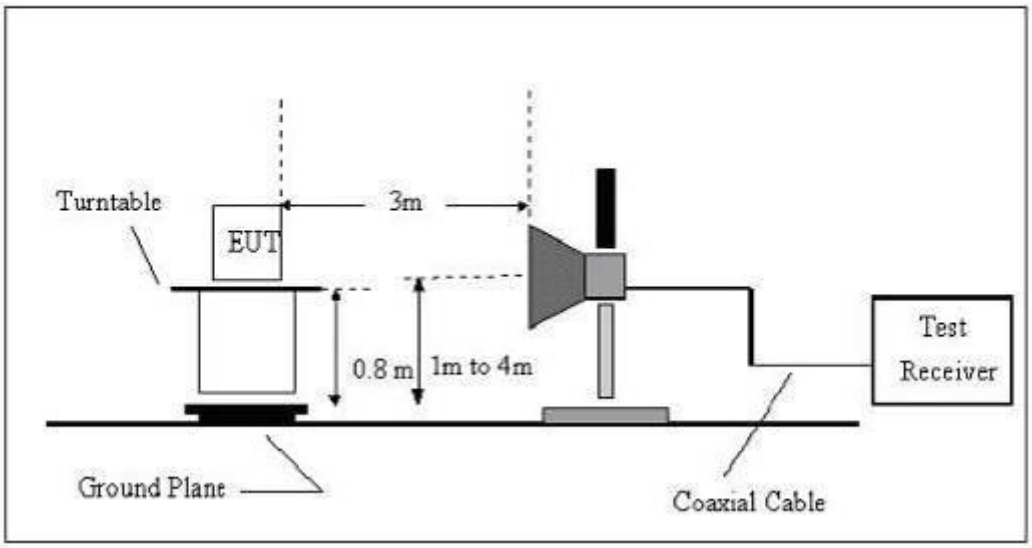
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Above 1GHz

(B) Radiated Emission Test Set-UP Frequency Over 1 GHz

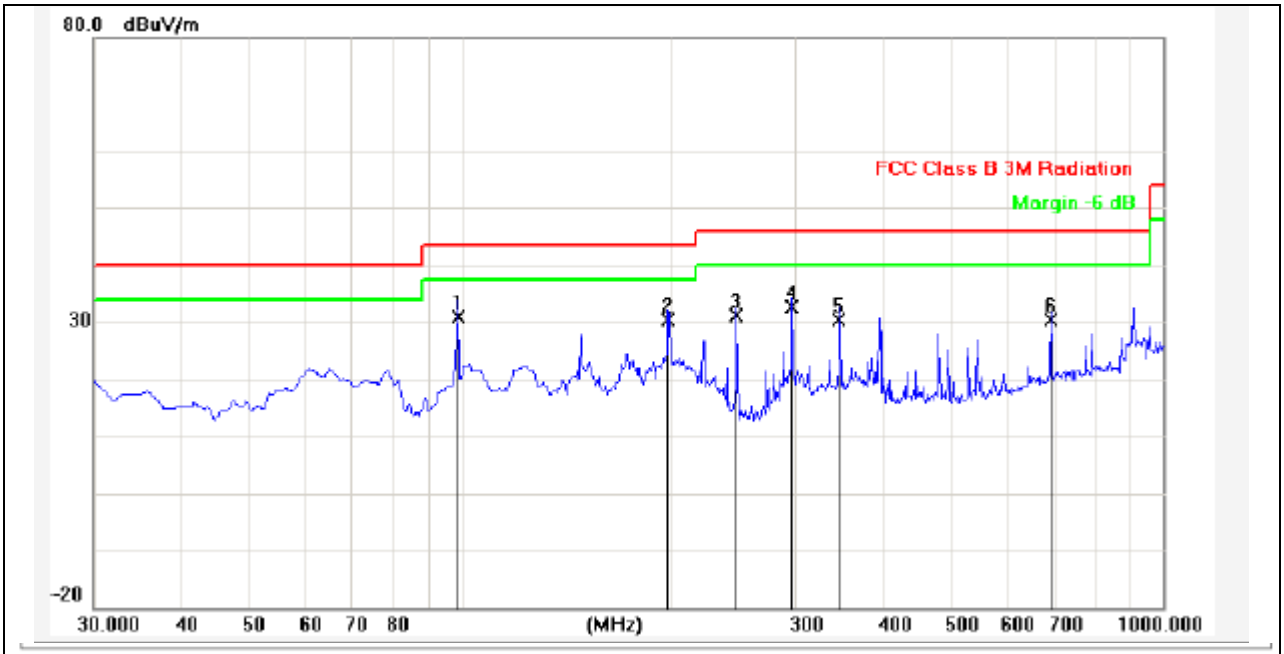


3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing. We tested all idle mode, recorded worst case at Mode3.

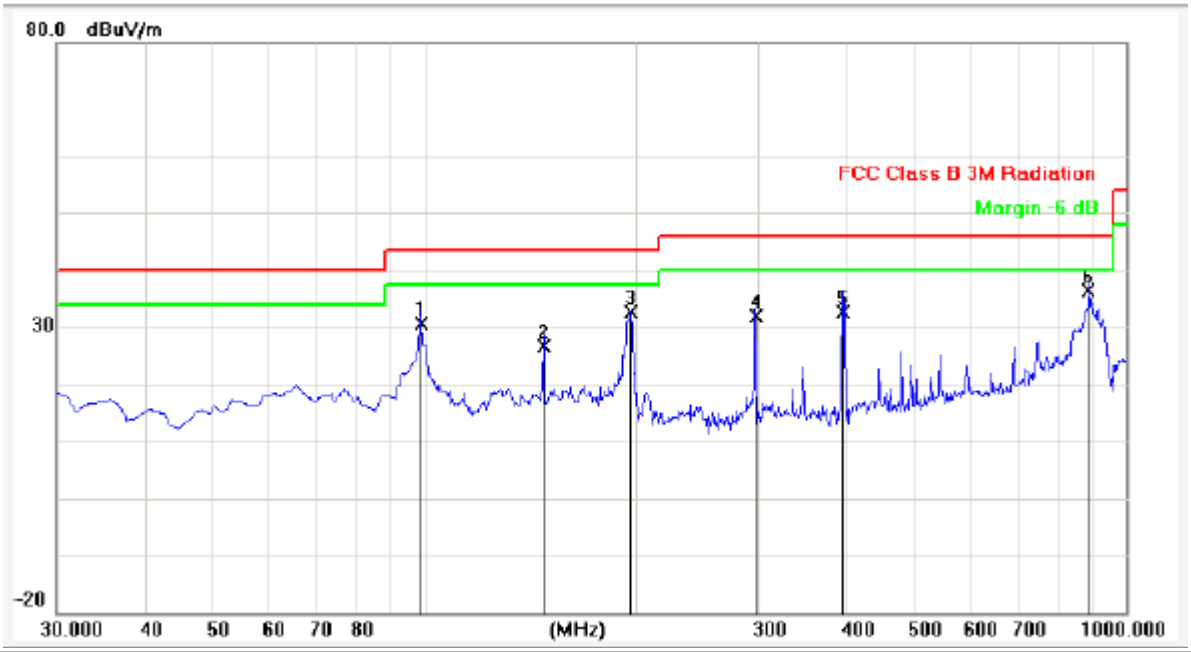
3.2.6 TEST RESULTS (30-1000MHz)

EUT:	Android touchscreen all in one pc	Model Name. :	Q6
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Date :	2014-04-25
Test Mode :	BlueTooth	Polarization :	Horizontal
Test Power :	DC 19V from adapter with AC 120V/60Hz		



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ( )	P/F	Remark
1	99.1795	-19.45	50.30	30.85	43.50	-12.65	QP			P	
2	197.8100	-18.11	48.40	30.29	43.50	-13.21	QP			P	
3	247.2800	-17.59	48.80	31.21	46.00	-14.79	QP			P	
4	296.7500	-17.26	49.80	32.54	46.00	-13.46	QP			P	
5	346.2200	-15.34	45.70	30.36	46.00	-15.64	QP			P	
6	693.4800	-9.34	39.80	30.46	46.00	-15.54	QP			P	

EUT:	Android touchscreen all in one pc	Model Name. :	Q6
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Date :	2014-04-25
Test Mode :	BlueTooth	Polarization :	Vertical
Test Power :	DC 19V from adapter with AC 120V/60Hz		



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ( )	P/F	Remark
1	98.8700	-19.47	50.00	30.53	43.50	-12.97	QP			P	
2	148.3400	-19.72	46.30	26.58	43.50	-16.92	QP			P	
3	197.8100	-18.11	50.80	32.69	43.50	-10.81	QP			P	
4	297.7200	-17.26	49.20	31.94	46.00	-14.06	QP			P	
5	395.6899	-13.31	46.00	32.69	46.00	-13.31	QP			P	
6	887.4800	-6.75	43.10	36.35	46.00	-9.65	QP			P	

3.2.7 TEST RESULTS(1GHz-25GHz)

Low Channel @ Channel 00 @ 2402 MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4804.00	64.66	PK	74.00	9.34	1.00 H	216	62.58	31.58	7.00	36.5	2.08
2	4804.00	45.75	AV	54.00	8.25	1.00 H	216	43.67	31.58	7.00	36.5	2.08
3	7206.00	49.90	PK	74.00	24.1	1.00 H	207	39.24	37.06	8.90	35.3	10.66

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4804.00	64.41	PK	74.00	9.59	1.00 V	221	62.33	31.58	7.00	36.5	2.08
2	4804.00	45.27	AV	54.00	8.73	1.00 V	221	43.19	31.58	7.00	36.5	2.08
3	7206.00	49.62	PK	74.00	24.38	1.00 V	140	38.96	37.06	8.90	35.3	10.66

Middle Channel @ Channel 39 @ 2441 MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4882.00	63.69	PK	74.00	10.31	1.00 H	19	61.55	31.04	7.60	36.5	2.14
2	4882.00	47.48	AV	54.00	6.52	1.00 H	19	45.34	31.04	7.60	36.5	2.14
3	7323.00	51.95	PK	74.00	22.05	1.00 H	254	40.81	37.84	8.60	35.3	11.14

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4882.00	62.59	PK	74.00	11.41	1.00 V	261	60.45	31.04	7.60	36.5	2.14
2	4882.00	47.66	AV	54.00	6.34	1.00 V	261	45.52	31.04	7.60	36.5	2.14
3	7323.00	52.06	PK	74.00	21.94	1.00 V	150	40.92	37.84	8.60	35.3	11.14

High Channel @ Channel 78 @ 2480 MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4960.00	64.41	PK	74.00	9.59	1.00 H	260	61.98	31.63	7.00	36.2	2.43
2	4960.00	45.55	AV	54.00	8.45	1.00 H	260	43.12	31.63	7.00	36.2	2.43
3	7340.00	51.95	PK	74.00	22.05	1.00 H	113	40.35	38.40	8.50	35.3	11.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	4960.00	63.98	PK	74.00	10.02	1.00 V	201	61.55	31.63	7.00	-36.2	2.43
2	4960.00	46.66	AV	54.00	7.34	1.00 V	201	44.23	31.63	7.00	-36.2	2.43
3	7340.00	52.70	PK	74.00	21.30	1.00 V	78	41.1	38.40	8.50	-35.3	11.60

REMARKS: 1. Emission level (dBuV/m) =Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier
3. The other emission levels were very low against the limit.
4. Margin value = Limit value- Emission level.
5. The average measurement was not performed when the peak measured data under the limit of average detection.

3.2.8 TEST RESULTS(9kHz-30MHz)

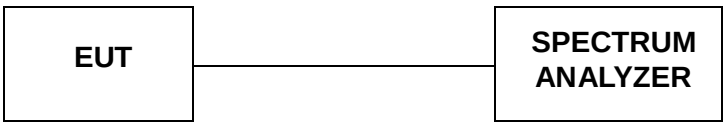
Frequency (MHz)	Corrected Reading (dBuV/m) @3m	Limit (dBuV/m)@3m	Margin (dB)	Detector	Result
12.00	42.08	69.54	27.46	QP	PASS
24.00	40.17	69.54	29.37	QP	PASS

3.3 Maximum Peak Output Power

3.3.1 Limit
The Maximum Peak Output Power Measurement is 30dBm.

3.3.2 Test Procedure
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum.

3.3.3 Test Configuration



3.3.4 Test Results

GFSK Test Mode

A. Test Verdict

Note:1:We test DH1,DH3.DH5 Mode and recorded the worst Data at the DH1 Mode,
2:.The test results including the cable lose.

Channel	Frequency (MHz)	Measured Output Peak Power (dBm)	Measured Output Average Power (dBm)	Limits (dBm)	Verdict
00	2402	10.02	**8.55**	30	PASS
39	2441	10.11	**8.90**	30	PASS
78	2480	10.25	**8.90**	30	PASS

8DPSK Test Mode

A. Test Verdict

Note:1:We test DH1,DH3.DH5 Mode and recorded the worst Data at the DH1 Mode,
2:.The test results including the cable lose.

Channel	Frequency (MHz)	Measured Output Peak Power (dBm)	Measured Output Average Power (dBm)	Limits (dBm)	Verdict
00	2402	10.42	**7.95**	30	PASS
39	2441	10.31	**8.29**	30	PASS
78	2480	10.33	**8.21**	30	PASS

π/4DQPSKTest Mode

A. Test Verdict

Note:1:We test DH1,DH3.DH5 Mode and recorded the worst Data at the DH1 Mode,
2:.The test results including the cable lose.

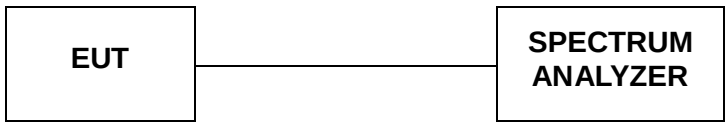
Channel	Frequency (MHz)	Measured Output Peak Power (dBm)	Measured Output Average Power (dBm)	Limits (dBm)	Verdict
00	2402	10.50	**7.85**	30	PASS
39	2441	11.01	**8.19**	30	PASS
78	2480	10.92	**8.28**	30	PASS

3.4 20dB Bandwidth

3.4.1 Limit
For frequency hopping systems operating in the 2400MHz-2483.5MHz no limit for 20dB bandwith.

3.4.2 Test Procedure
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=30 KHz and VBW=100KHz.
The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

3.4.3 Test Configuration



3.4.4 Test Results

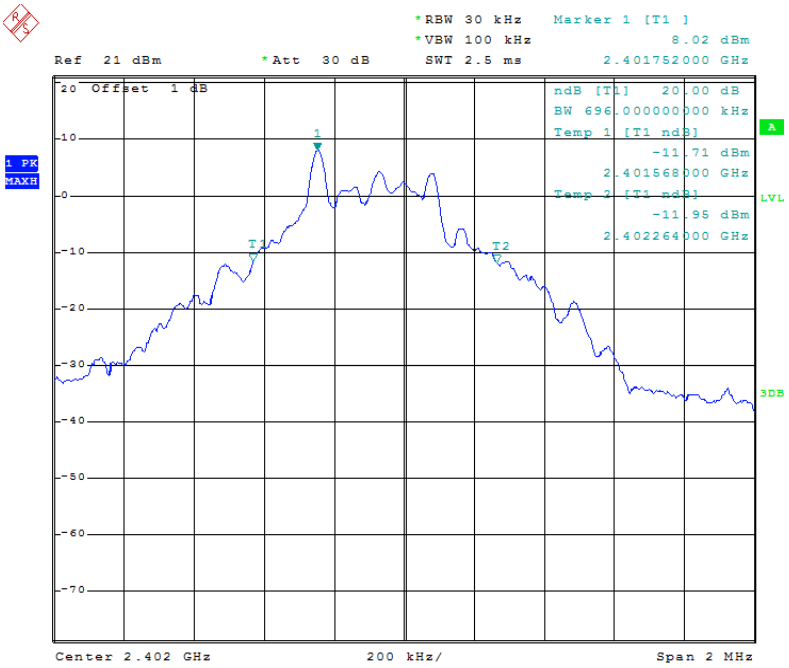
GFSK Test Mode

A. Test Verdict

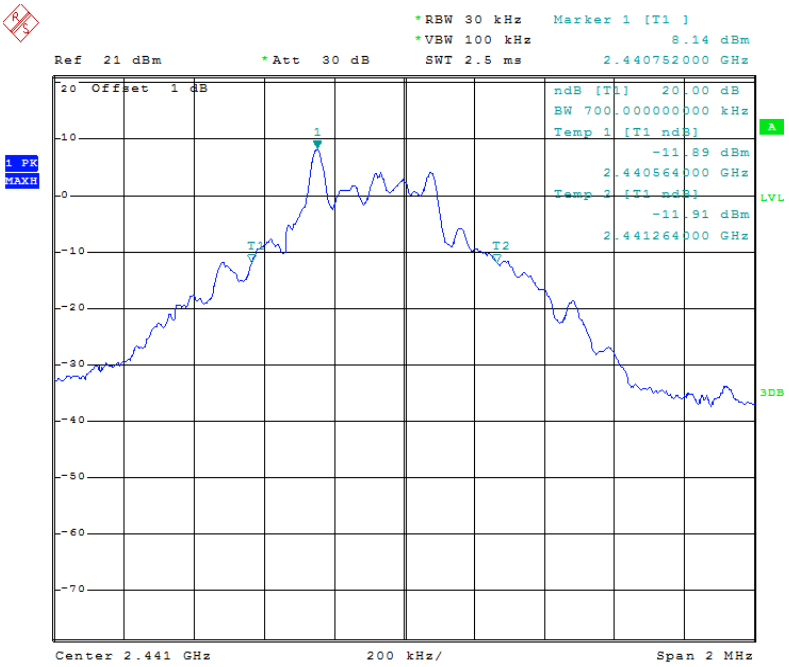
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot	Limits (MHz)	Verdict
00	2402	0.696	Plot 3.4.1 A	/	PASS
39	2441	0.700	Plot 3.4.1 B	/	PASS
78	2480	0.692	Plot 3.4.1 C	/	PASS

Note: 1.The test results including the cable lose.
2.We test DH1,DH3,DH5 Mode and recorded the worst Data at the DH1 Mode.

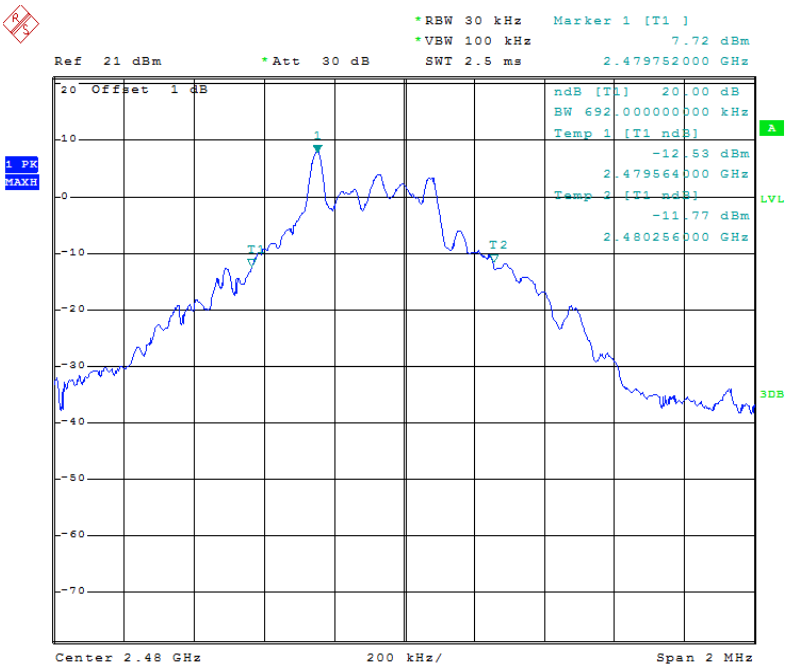
B. Test Plots



(Plot 3.4.1 A: Channel 00: 2402MHz @ GFSK)



(Plot 3.4.1 B: Channel 39: 2441MHz @ GFSK)



(Plot 3.4.1 C: Channel 78: 2480MHz @ GFSK)

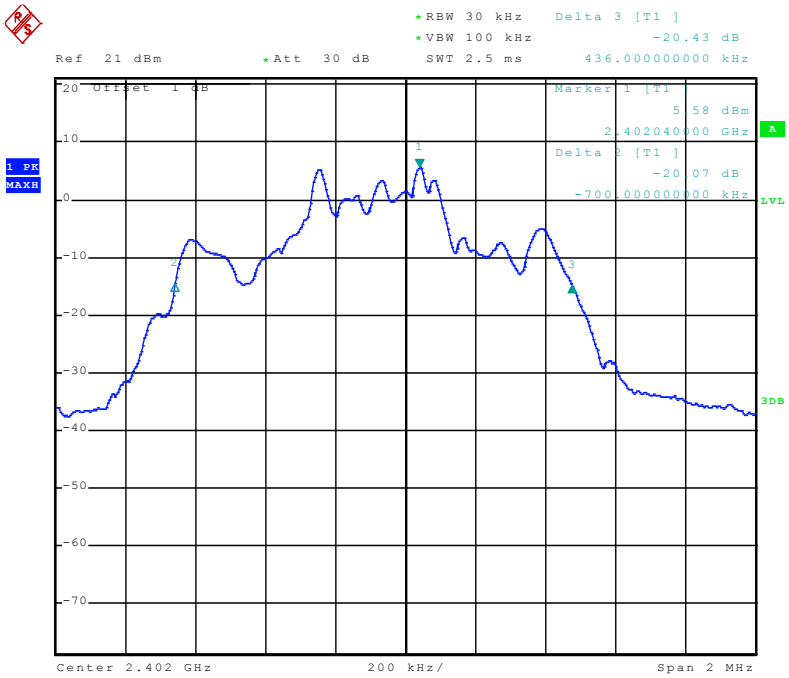
8DPSK Test Mode

A. Test Verdict

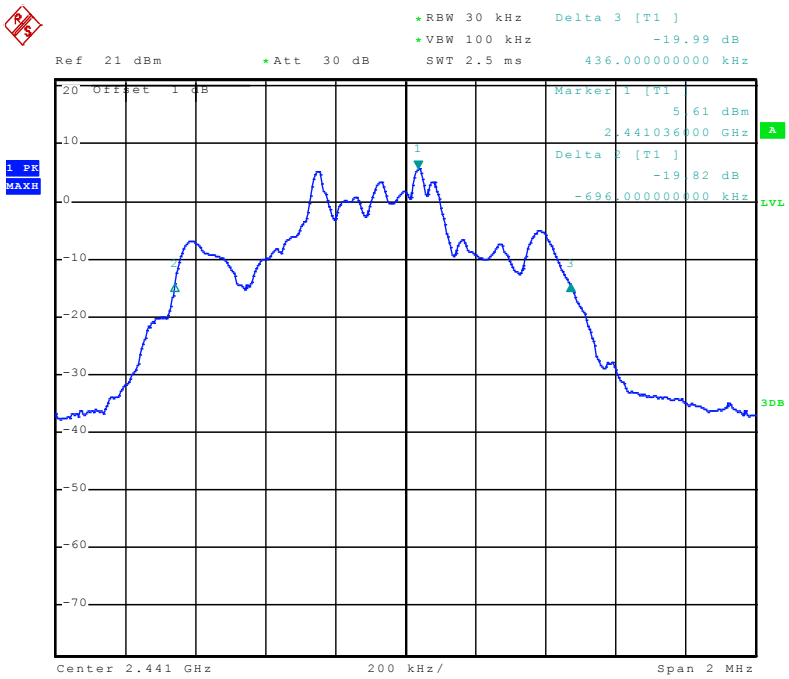
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot	Limits (MHz)	Verdict
00	2402	1.136	Plot 3.4.2 A	/	PASS
39	2441	1.142	Plot 3.4.2 B	/	PASS
78	2480	1.128	Plot 3.4.2 C	/	PASS

Note: 1.The test results including the cable lose.
2.We test DH1,DH3,DH5 Mode and recorded the worst Data at the DH1 Mode.

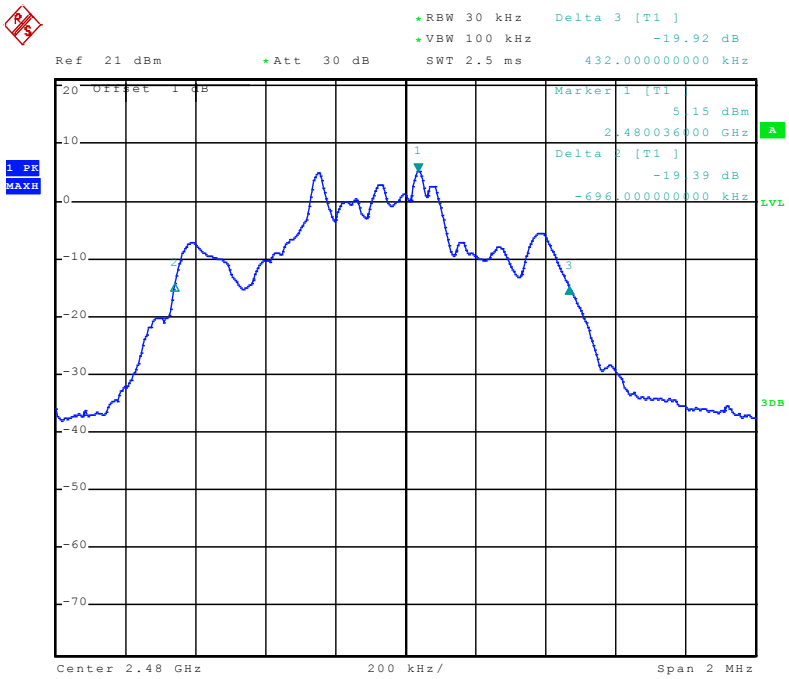
B. Test Plots



(Plot 3.4.2 A: Channel 00: 2402MHz @ 8DPSK)



(Plot 3.4.2 B: Channel 39: 2441MHz @ 8DPSK)



(Plot 3.4.2 C: Channel 78: 2480MHz @ 8DPSK)

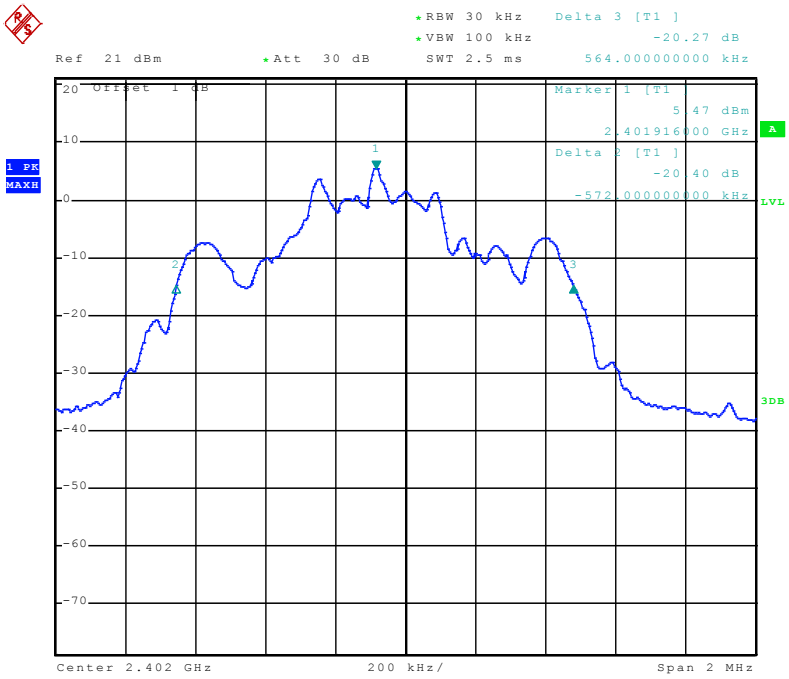
π/4DQPSKTest Mode

A. Test Verdict

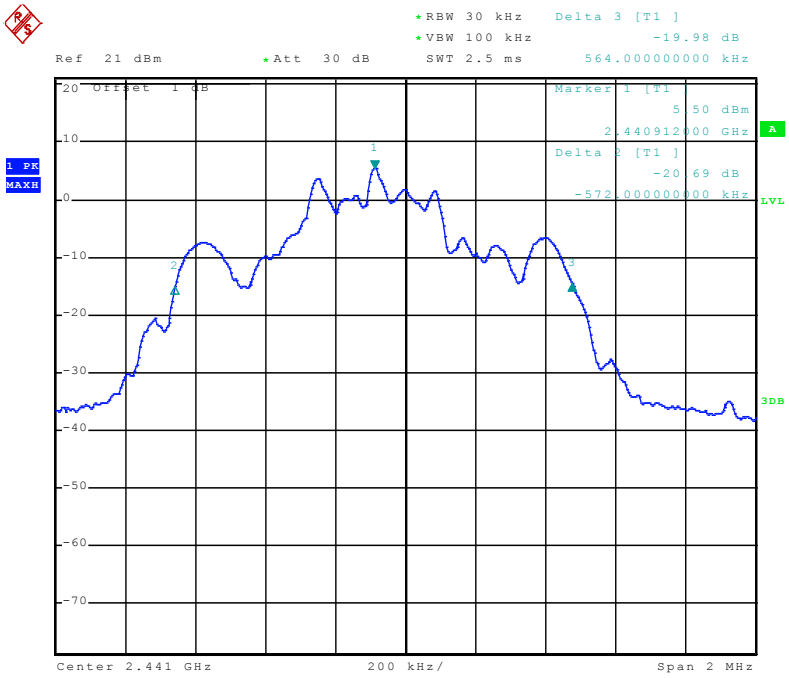
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Refer to Plot	Limits (MHz)	Verdict
00	2402	1.136	Plot 3.4.3 A	/	PASS
39	2441	1.136	Plot 3.4.3 B	/	PASS
78	2480	1.128	Plot 3.4.3 C	/	PASS

Note: 1.The test results including the cable lose.
2.We test DH1,DH3,DH5 Mode and recorded the worst Data at the DH1 Mode.

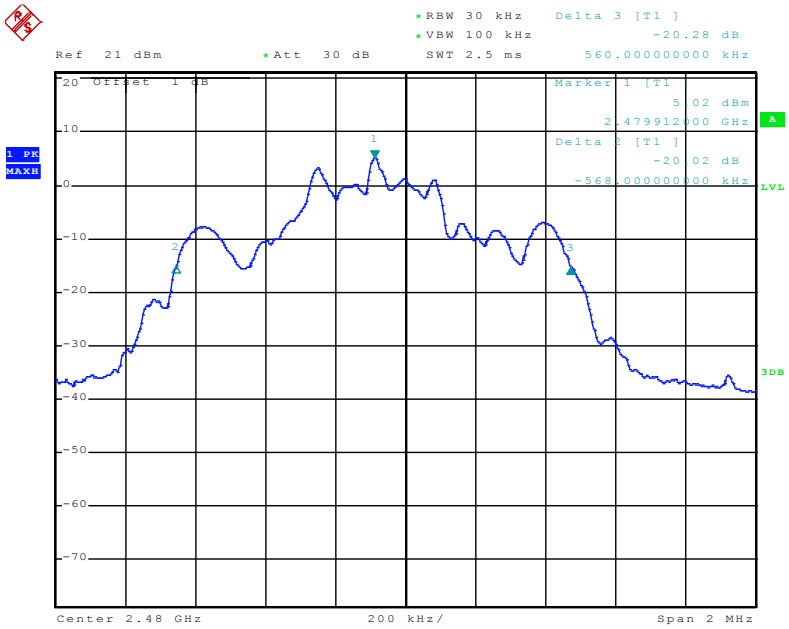
B. Test Plots



(Plot 3.4.3 A: Channel 00: 2402MHz @ π/4DQPSK)



(Plot 3.4.3 B: Channel 39: 2441MHz @π/4DQPSK)



(Plot 3.4.3 C: Channel 78: 2480MHz @π/4DQPSK)

3.5 Band Edge

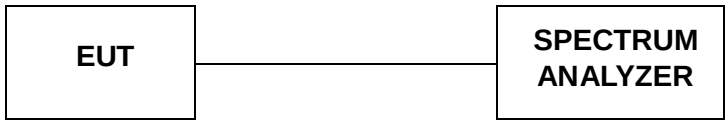
3.5.1 Limit

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)).

3.5.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

3.5.3 Test Configuration



3.5.4 Test Results

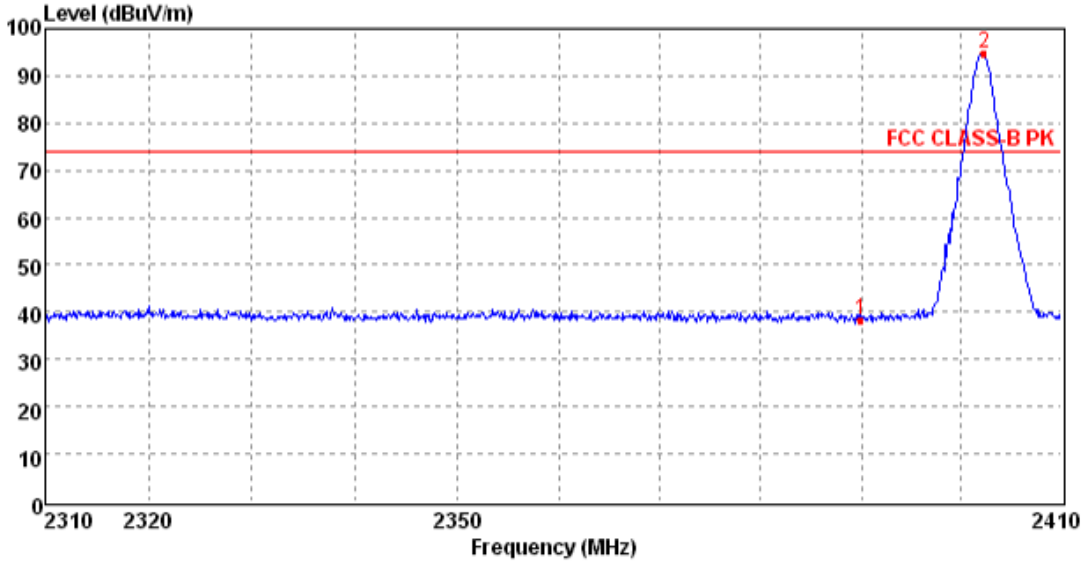
Remark: we measured all conditions(DH1,DH3,DH5) and recorded worst case at DH1

For Radiated Bandedge Measurement

Remark: we tested radiated bandedge at both hopping and no-hopping modes,recorded worst case at no-hopping mode

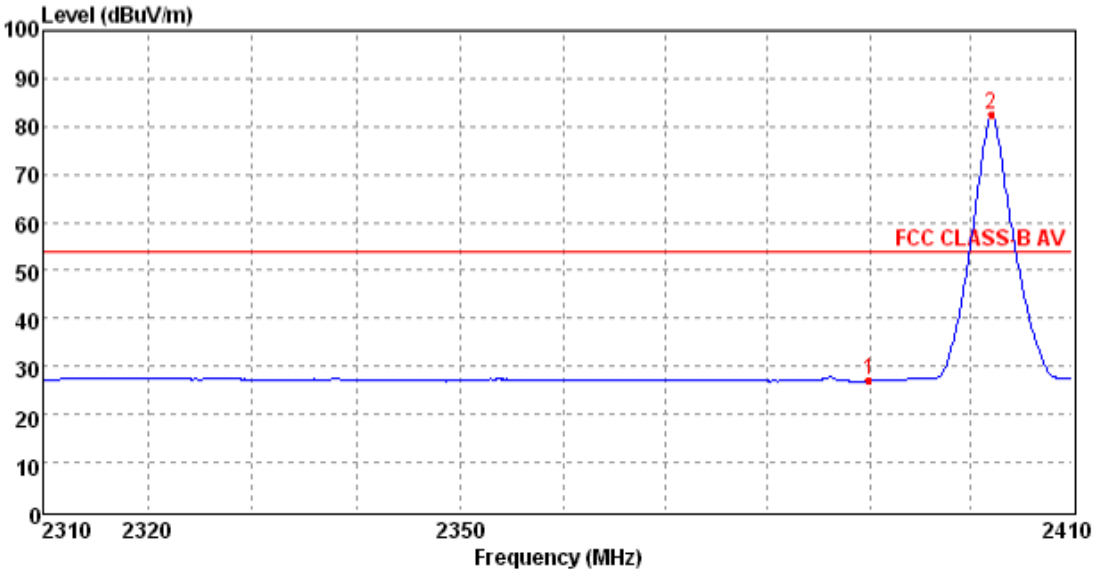
GFSK Test Mode

Data: 33



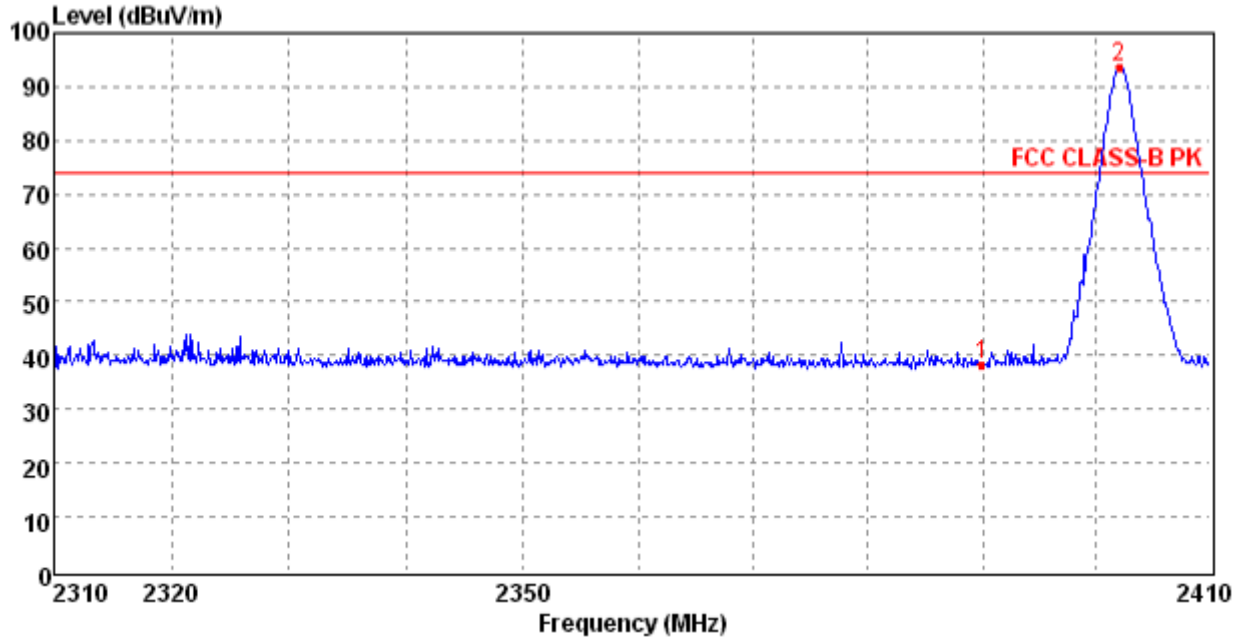
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	38.35	3.32	27.49	36.12	43.63	74.00	35.65	Hor	Peak
2	**2402.25**	**94.75**	**3.32**	**27.49**	**36.12**	**100.06**	**74.00**	**-20.75**	**Hor**	**Peak**

Data: 34



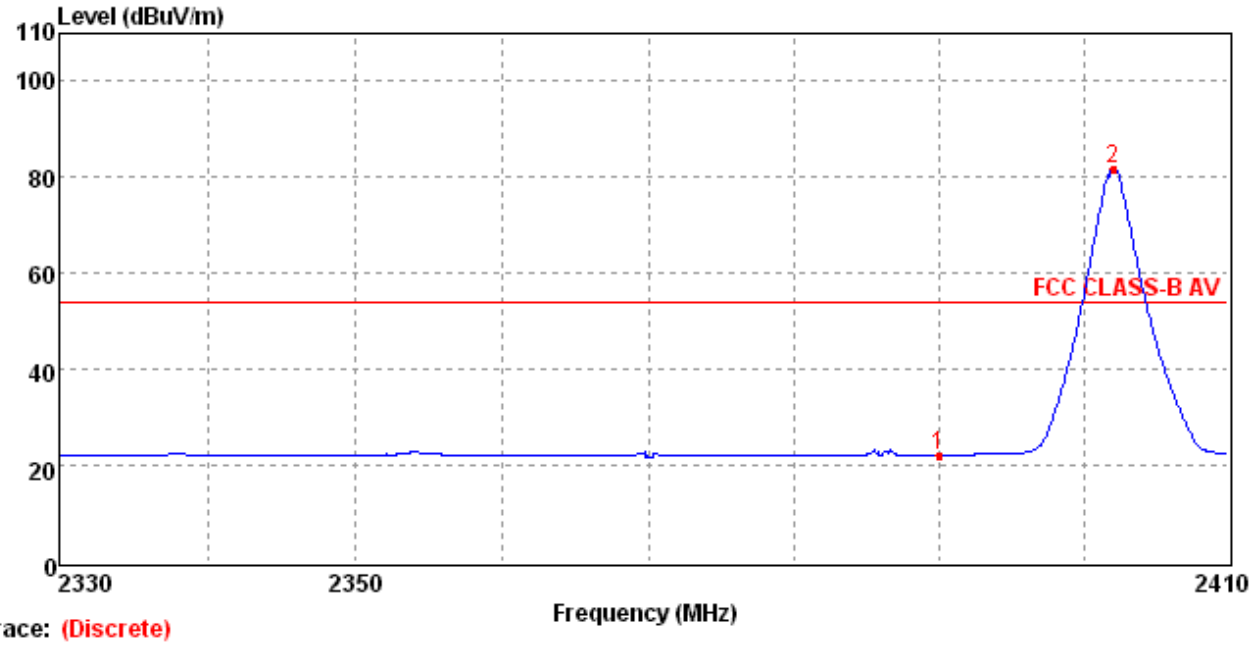
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	26.98	3.32	27.49	36.12	32.26	54.00	27.02	Hor	Average
2	**2402.25**	**82.54**	**3.32**	**27.49**	**36.12**	**87.85**	**54.00**	**-28.54**	**Hor**	Average

Data: 31



Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	38.17	3.32	27.49	36.12	43.45	74.00	35.83	Ver	Peak
2	**2402.25**	**93.59**	**3.32**	**27.49**	**36.12**	**98.90**	**74.00**	**-19.59**	**Ver**	**Peak**

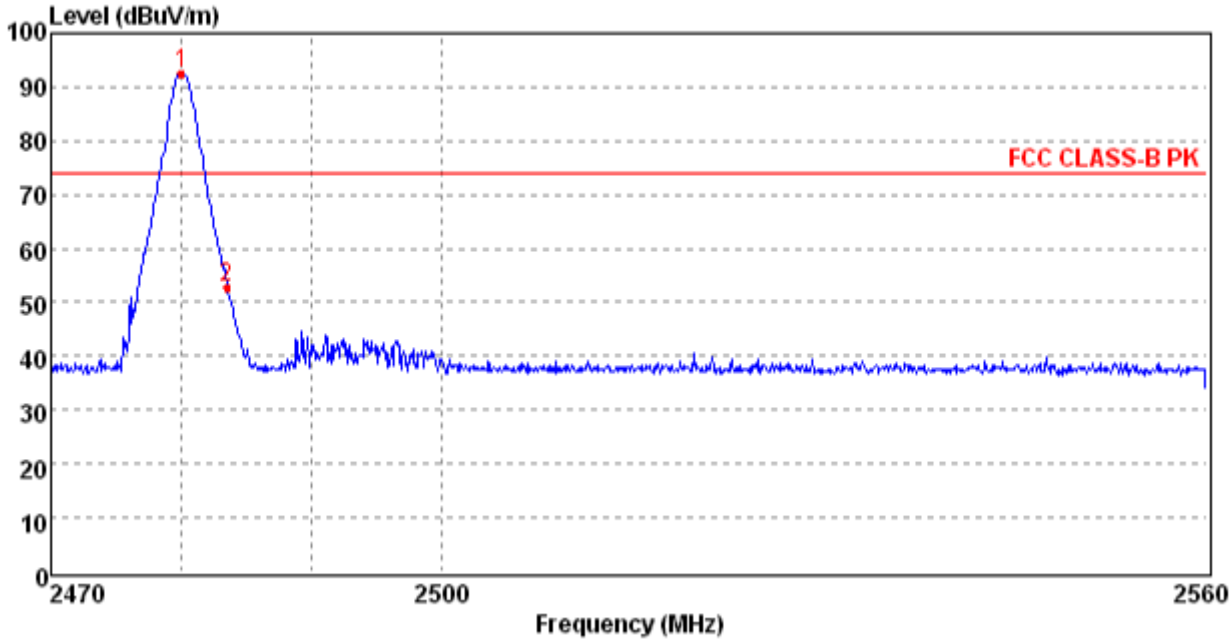
Data: 27



Trace: (Discrete)

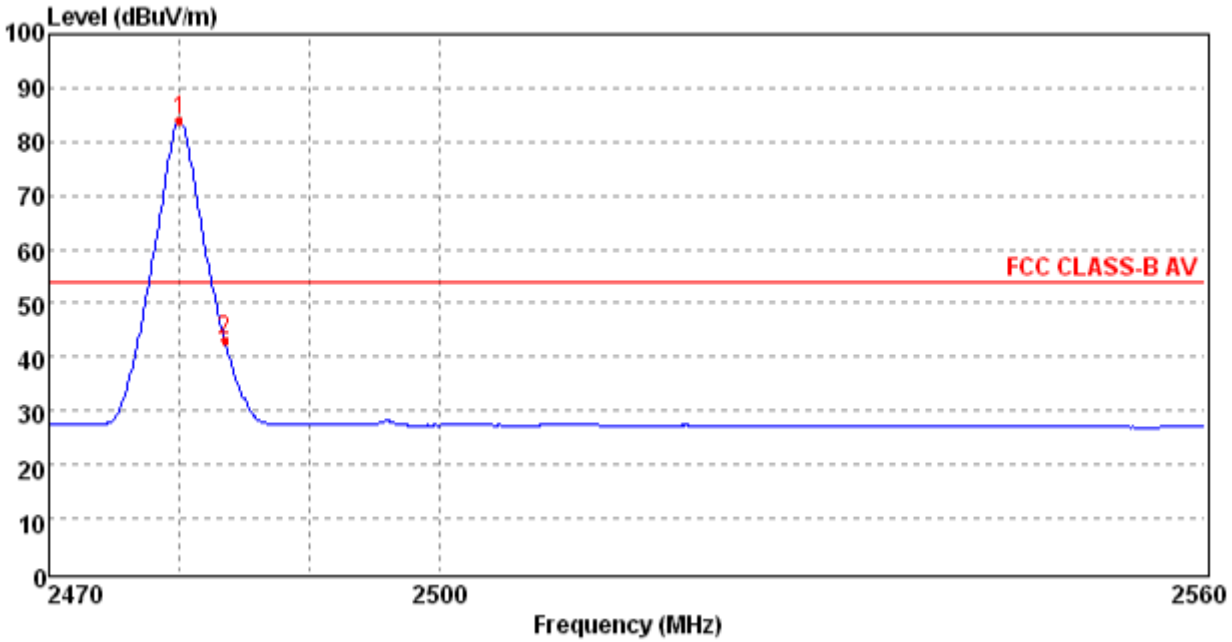
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	22.03	3.32	27.49	36.12	27.34	54.00	31.97	Ver	Average
2	**2402.25**	**81.89**	**3.32**	**27.49**	**36.12**	**87.20**	**54.00**	**-27.89**	**Ver**	Average

Data: 45



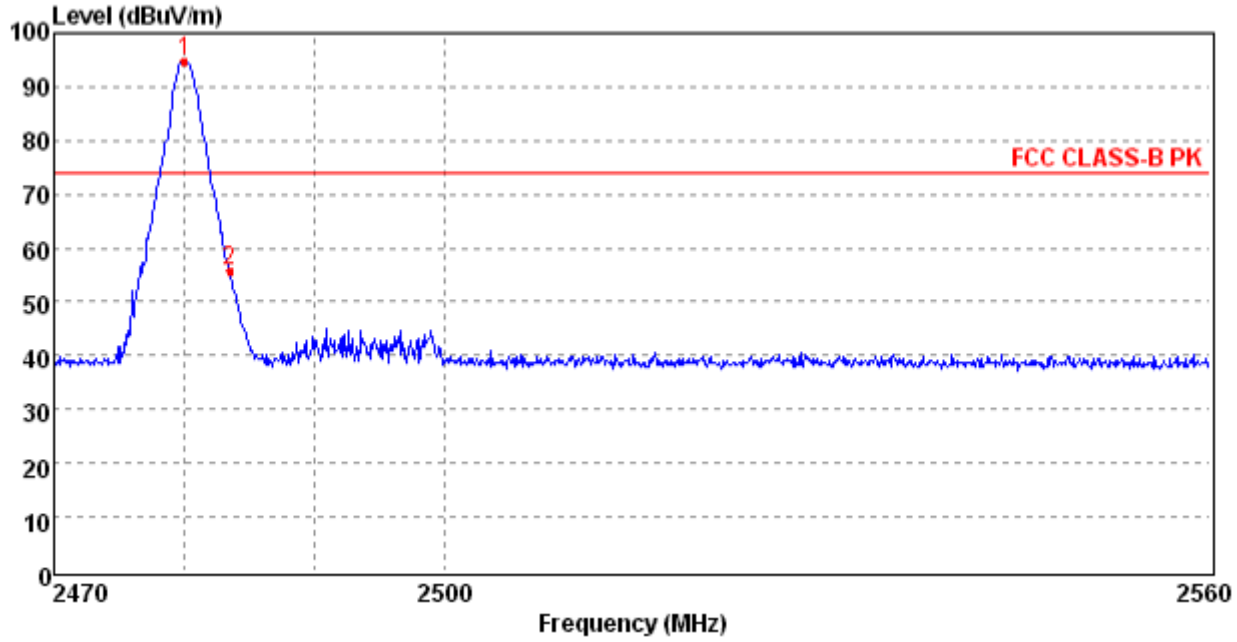
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Mark
1	**2480.01**	**92.38**	**3.88**	**27.45**	**36.55**	**97.60**	**74.00**	**-18.38**	**Hor**	**1**
2	2483.50	52.92	3.88	27.45	36.55	58.14	74.00	21.08	Hor	2

Data: 44



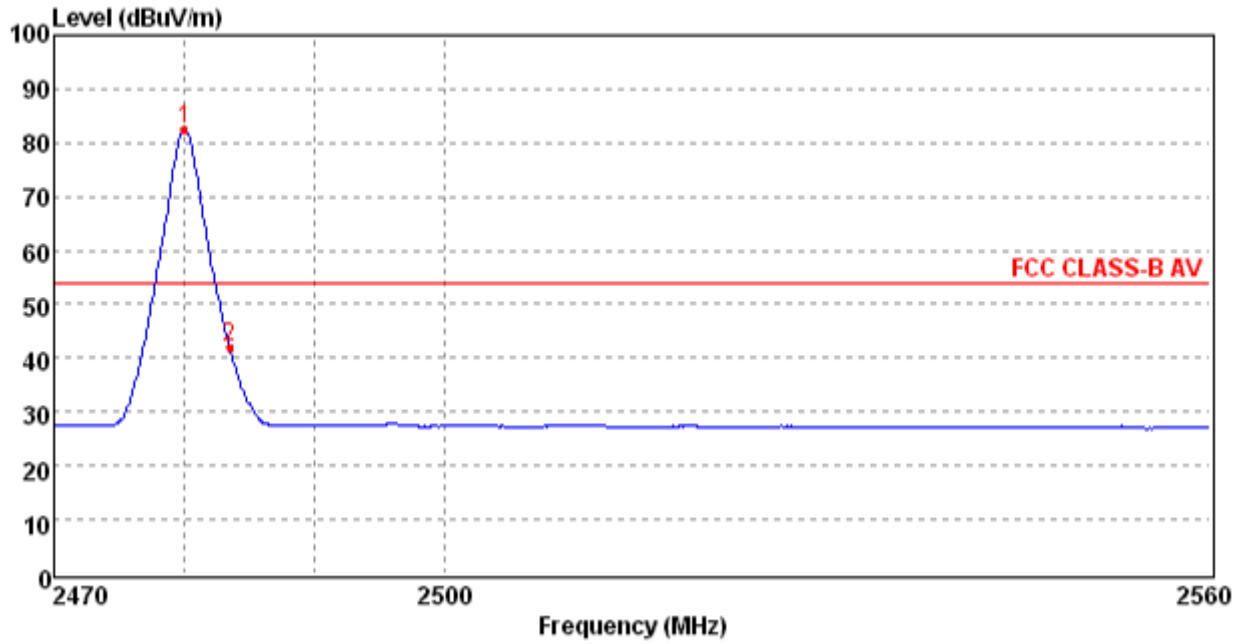
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Mark
1	**2480.07**	**83.97**	**3.88**	**27.45**	**36.55**	**89.19**	**54.00**	**-29.97**	**Ver**	**1**
2	2483.50	43.17	3.88	27.45	36.55	48.39	54.00	10.83	Ver	2

Data: 43



Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	**2479.89**	**94.78**	**3.88**	**27.45**	**36.55**	**100.00**	**74.00**	**-20.78**	**Ver**	**Average**
2	2483.50	55.58	3.88	27.45	36.55	60.80	74.00	18.42	Ver	Average

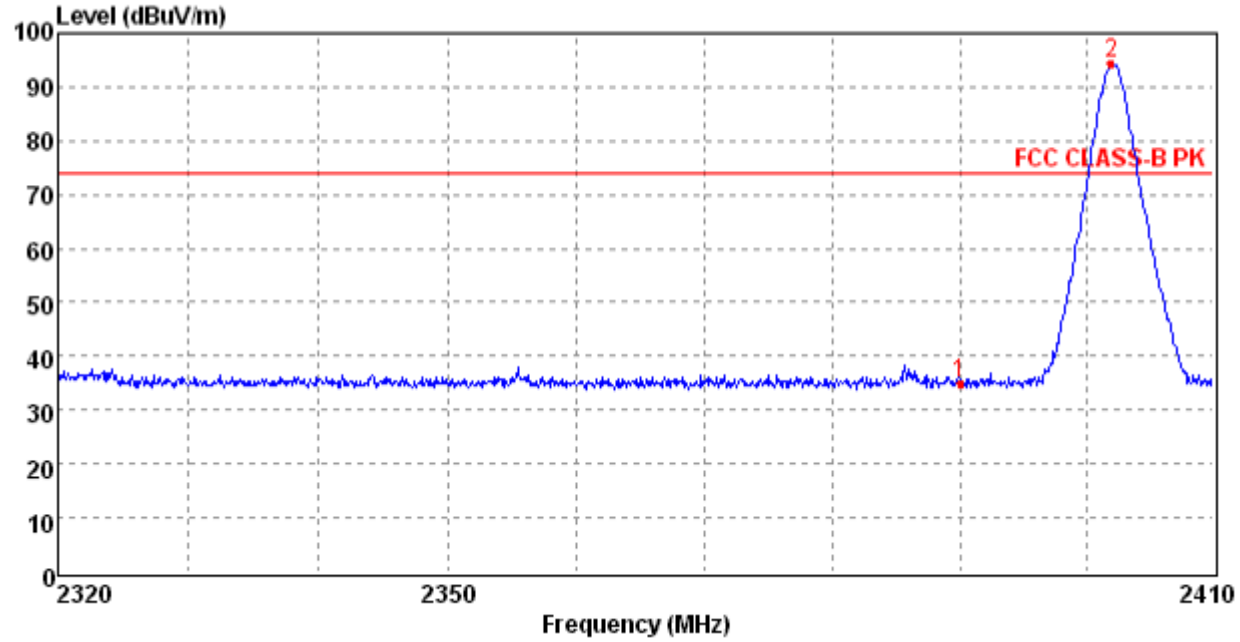
Data: 46



Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	**2479.89**	**82.58**	**3.88**	**27.45**	**36.55**	**87.80**	**54.00**	**-28.58**	**Ver**	**Average**
2	2483.50	41.96	3.88	27.45	36.55	47.18	54.00	12.04	Ver	Average

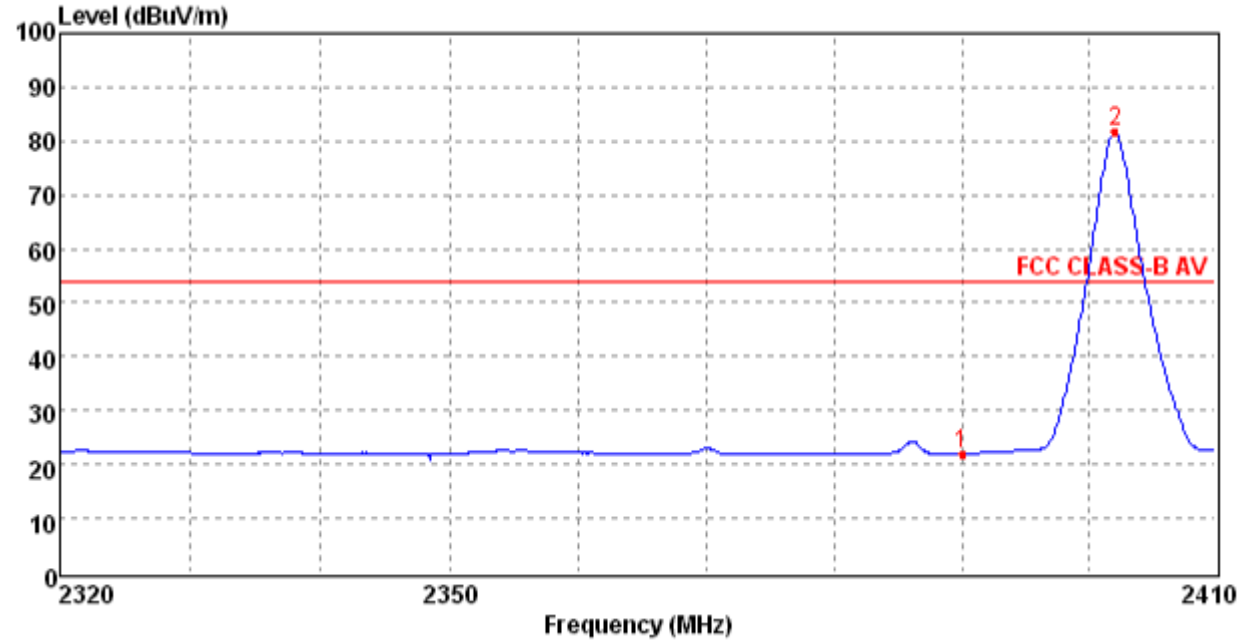
8DPSK Test Mode

Data: 38



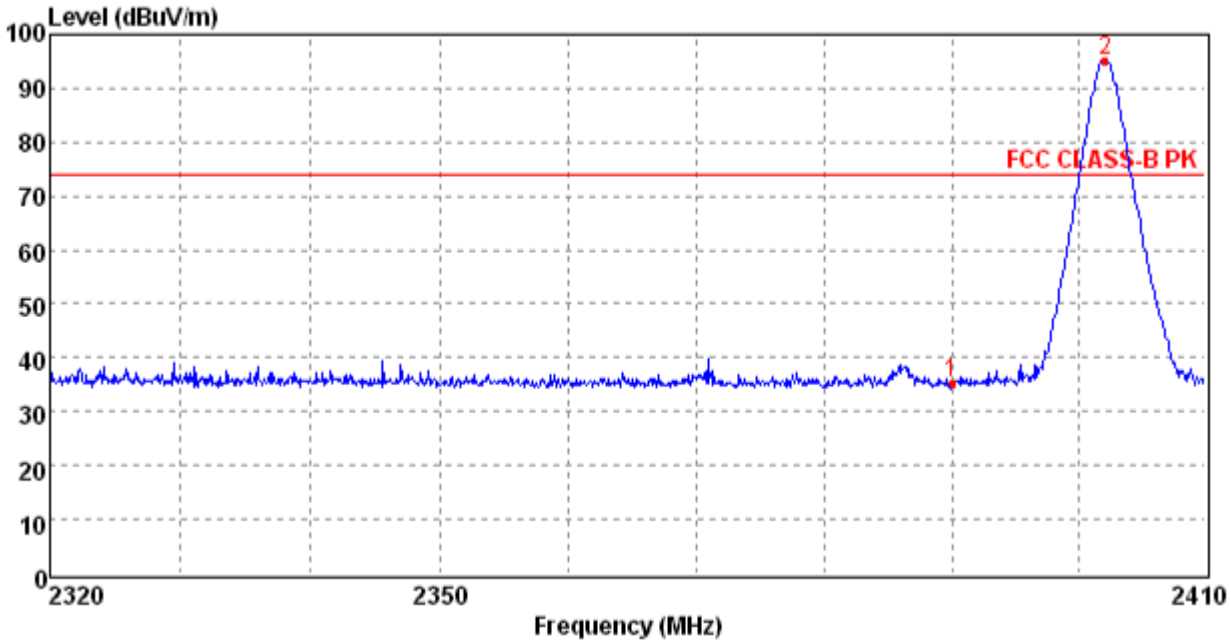
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	35.03	3.32	27.49	36.12	40.31	74.00	38.97	Hor	Peak
2	**2402.15**	**94.30**	**3.32**	**27.49**	**36.12**	**99.61**	**74.00**	**-20.30**	**Hor**	**Peak**

Data: 39



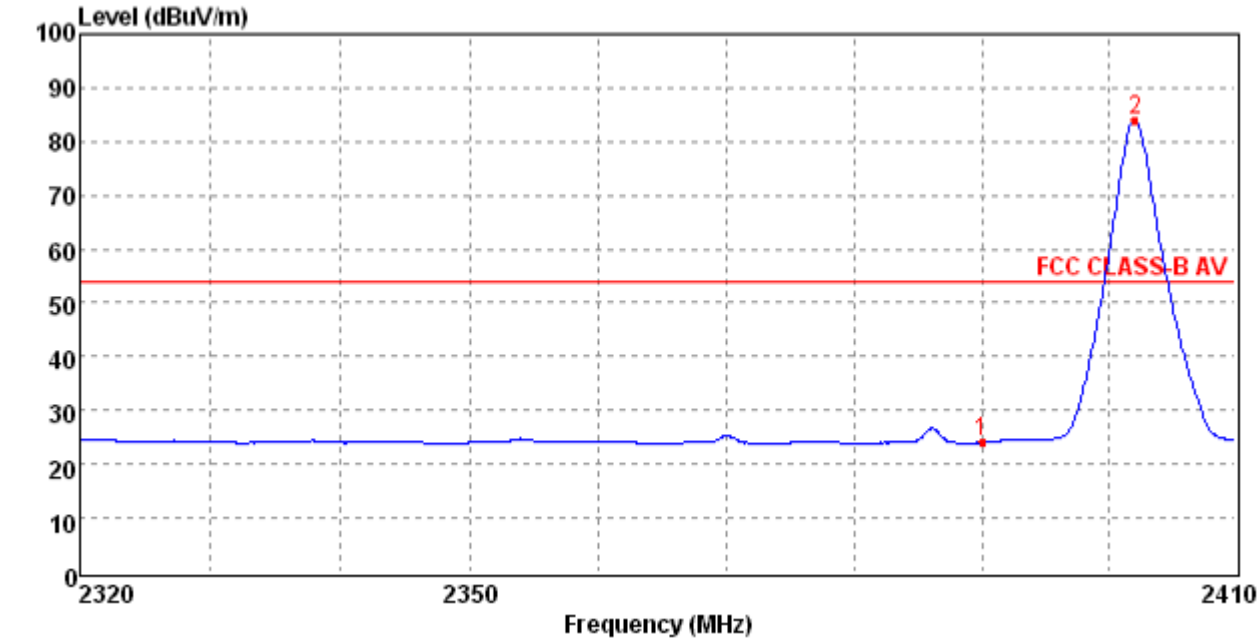
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	21.96	3.32	27.49	36.12	27.24	54.00	32.04	Hor	Average
2	**2402.15**	**81.69**	**3.32**	**27.49**	**36.12**	**87.00**	**54.00**	**-27.69**	**Hor**	Average

Data: 40



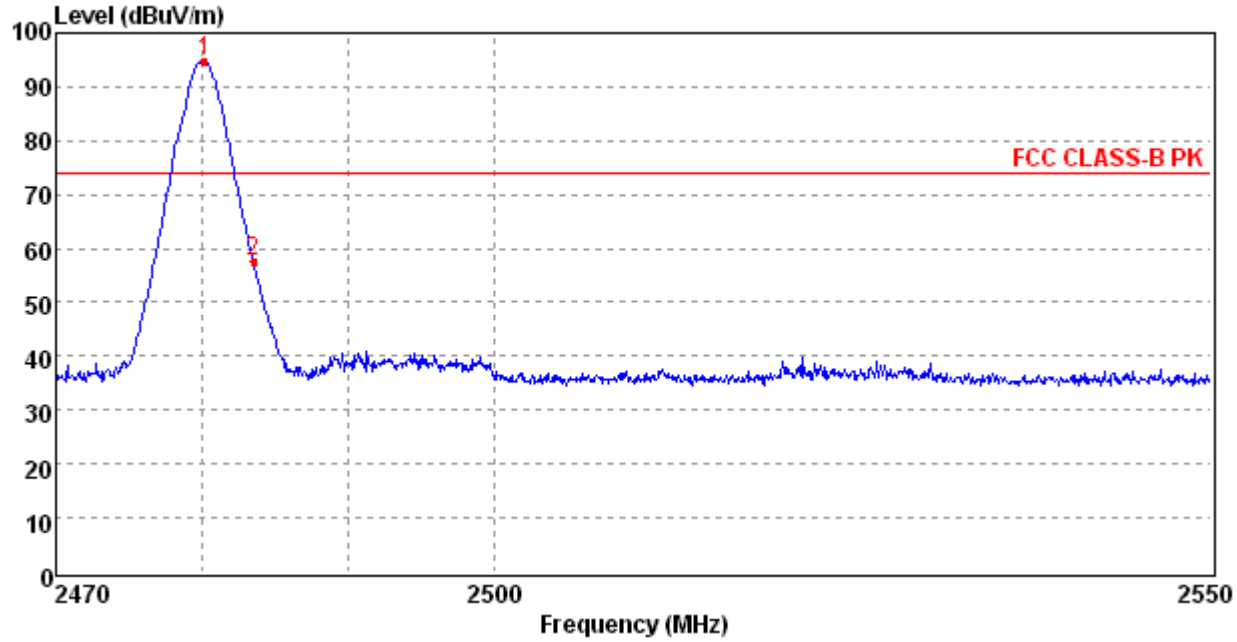
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	35.38	3.32	27.49	36.12	40.66	74.00	38.62	Ver	Peak
2	**2402.05**	**95.13**	**3.32**	**27.49**	**36.12**	**100.44**	**74.00**	**-21.13**	**Ver**	**Peak**

Data: 41



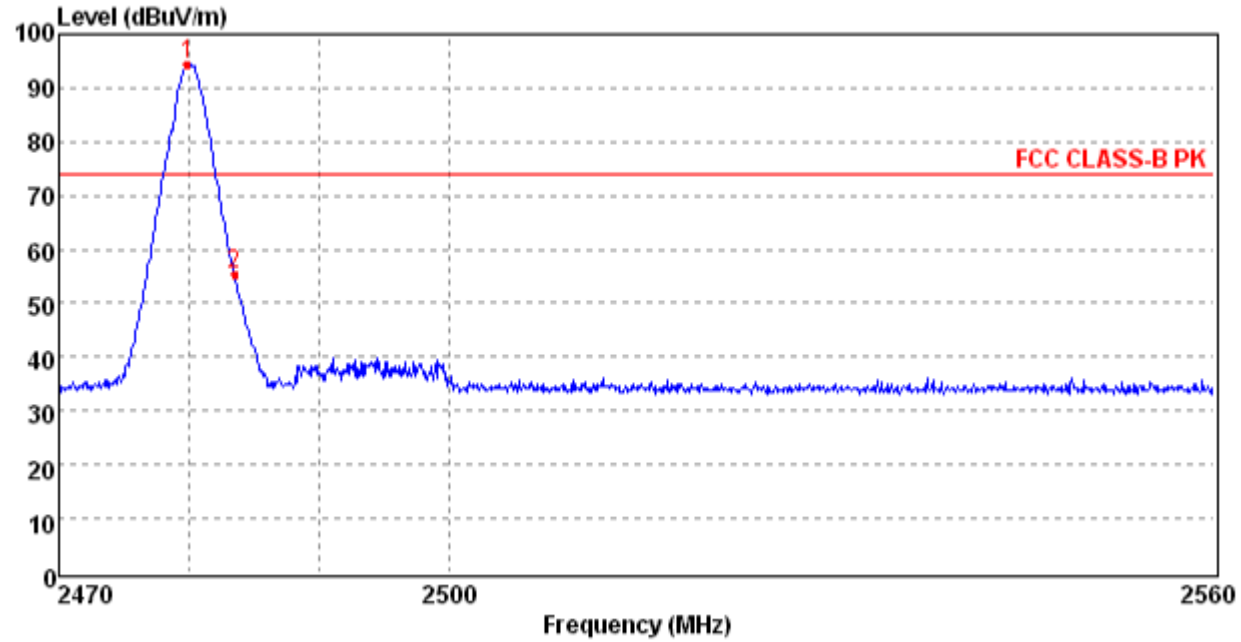
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	24.02	3.32	27.49	36.12	29.30	54.00	29.98	Ver	Average
2	**2402.15**	**84.17**	**3.32**	**27.49**	**36.12**	**89.48**	**54.00**	**-30.17**	**Ver**	Average

Data: 227



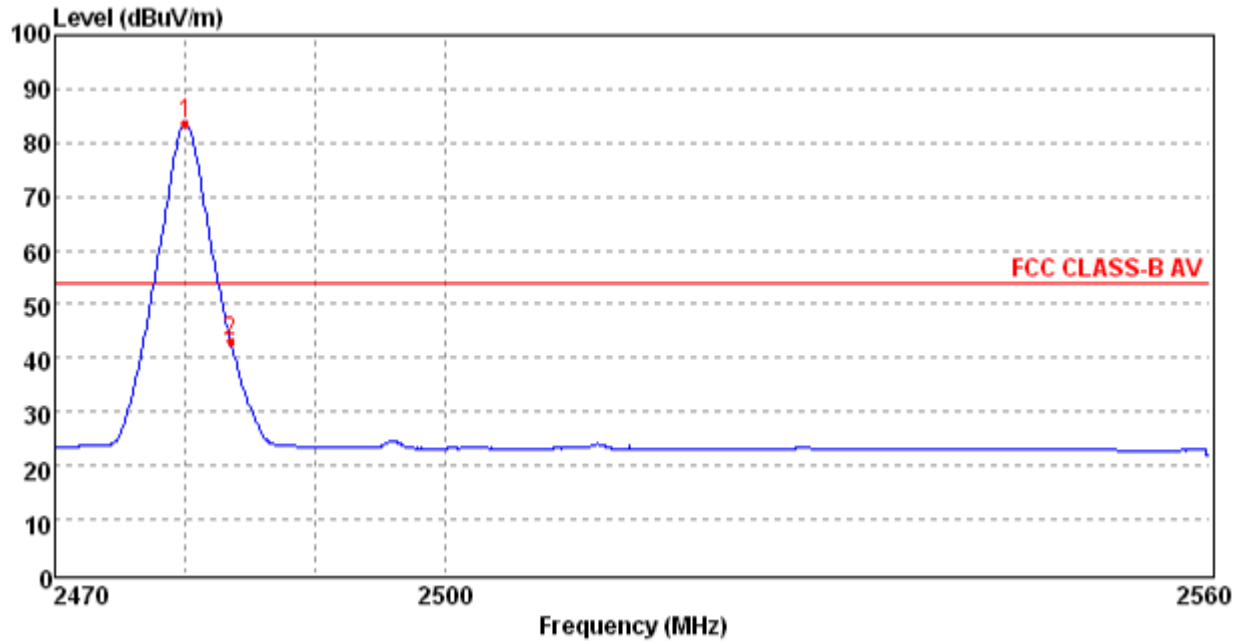
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	**2480.04**	**94.66**	**3.88**	**27.45**	**36.55**	**99.88**	**74.00**	**-20.66**	**Hor**	**Peak**
2	2483.50	57.47	3.88	27.45	36.55	62.69	74.00	16.53	Hor	Peak

Data: 28



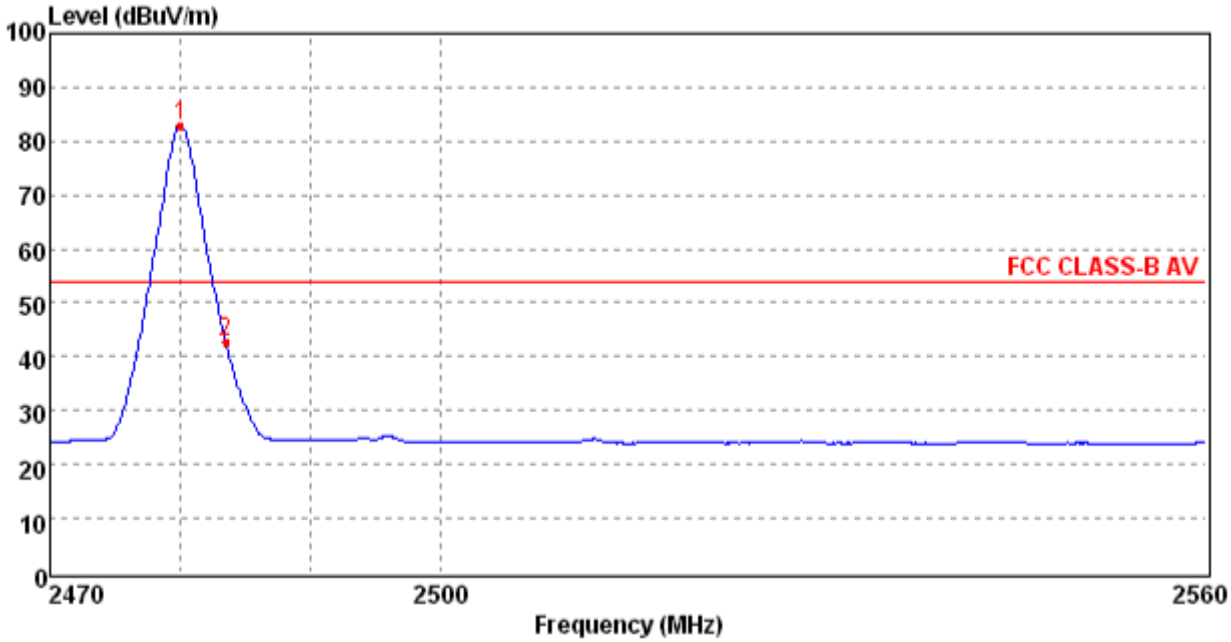
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	**2749.92**	**94.35**	**3.88**	**27.45**	**36.55**	**99.57**	**54.00**	**-20.35**	**Hor**	**Average**
2	2483.50	55.27	3.88	27.45	36.55	60.49	54.00	18.73	Hor	Average

Data: 29



Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	**2480.04**	**83.63**	**3.88**	**27.45**	**36.55**	**88.85**	**74.00**	**-29.63**	**Ver**	**Peak**
2	2483.50	43.27	3.88	27.45	36.55	48.49	74.00	10.73	Ver	Peak

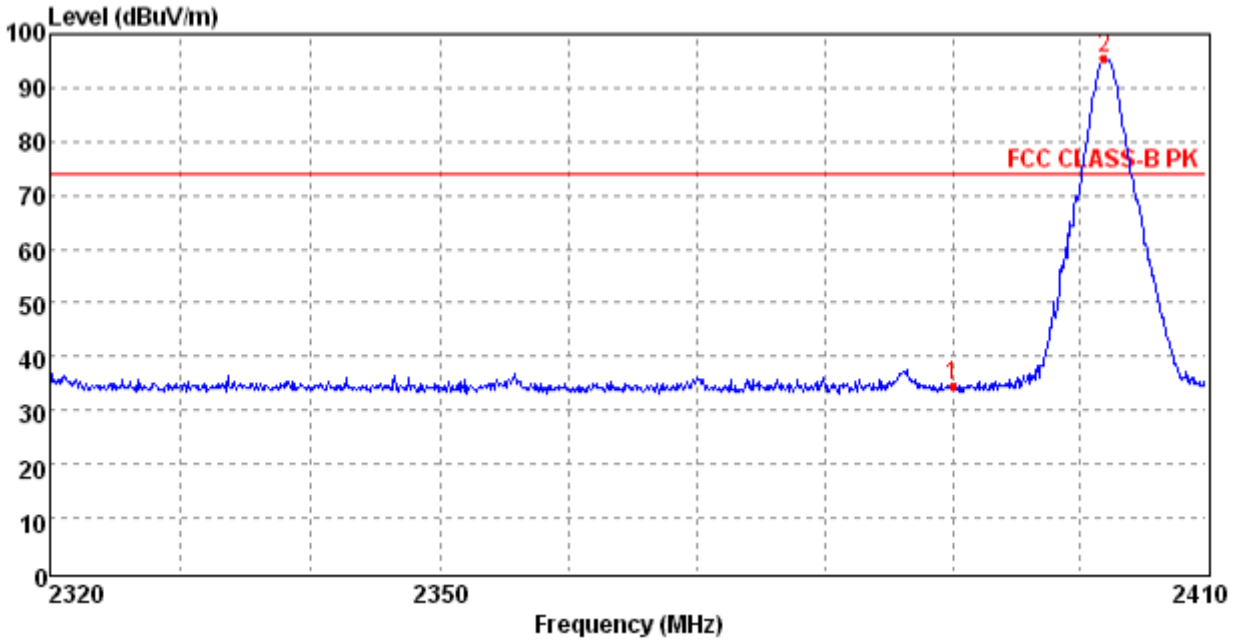
Data: 27



Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	**2480.07**	**82.97**	**3.88**	**27.45**	**36.55**	**88.19**	**54.00**	**-28.97**	**Ver**	**Average**
2	2483.50	42.78	3.88	27.45	36.55	48.00	54.00	11.22	Ver	Average

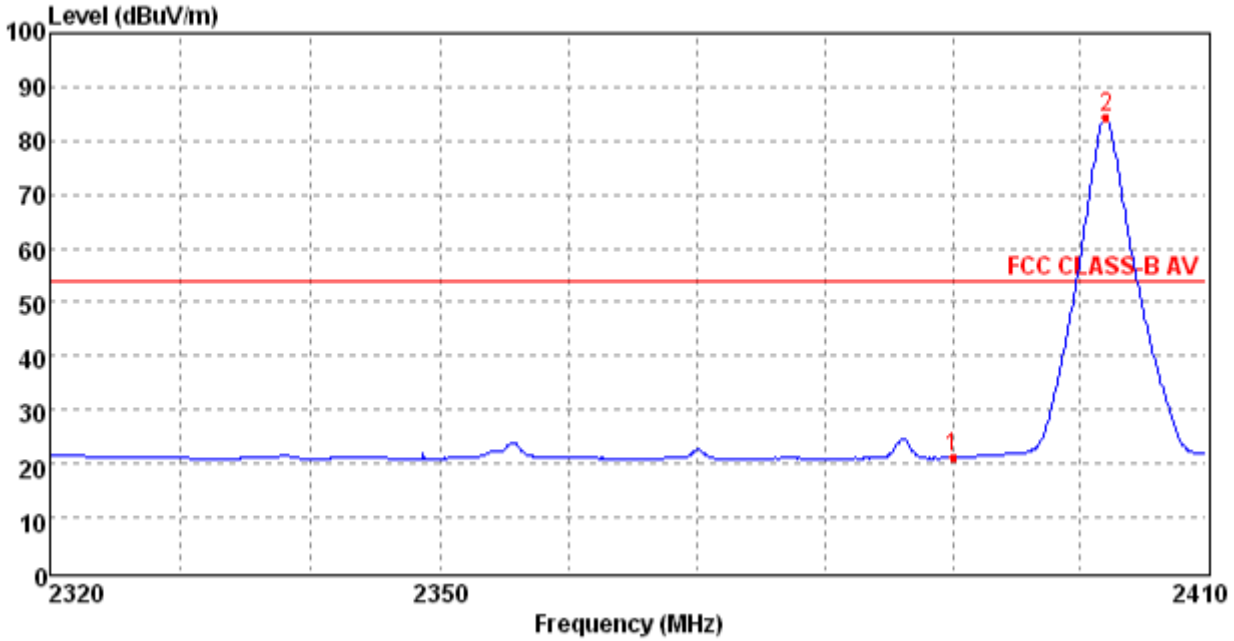
π/4DQPSK Test Mode

Data: 30



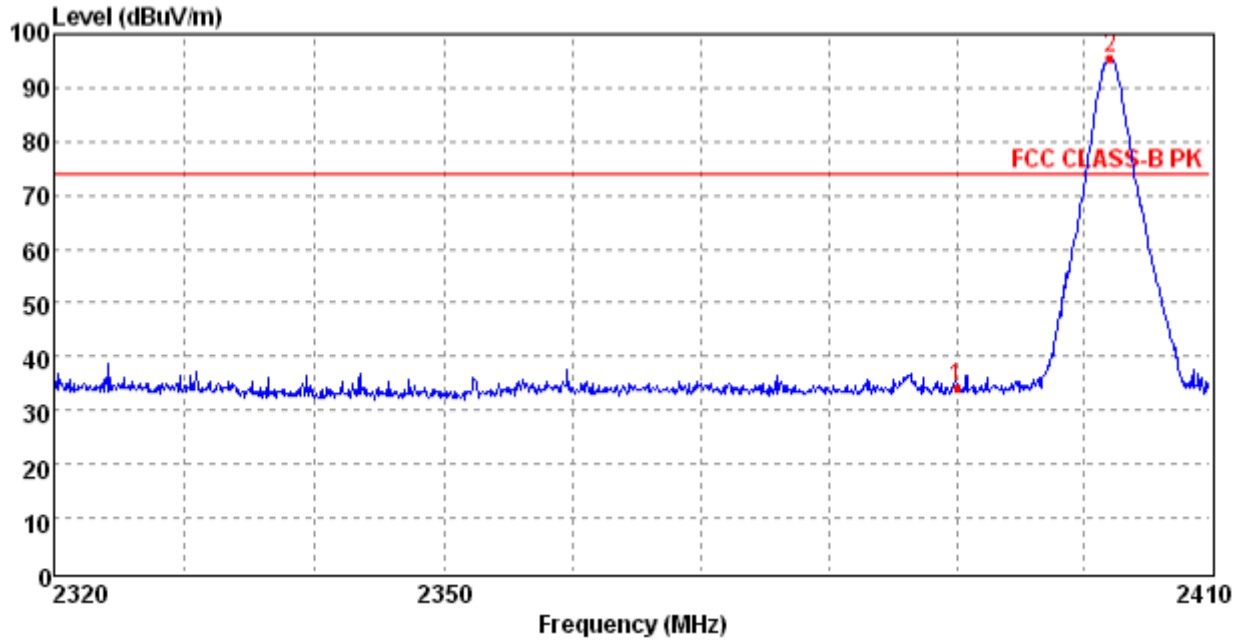
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	34.63	3.32	27.49	36.12	39.91	74.00	39.37	Hor	Peak
2	**2402.05**	**95.39**	**3.32**	**27.49**	**36.12**	**100.70**	**74.00**	**-21.39**	**Hor**	**Peak**

Data: 31



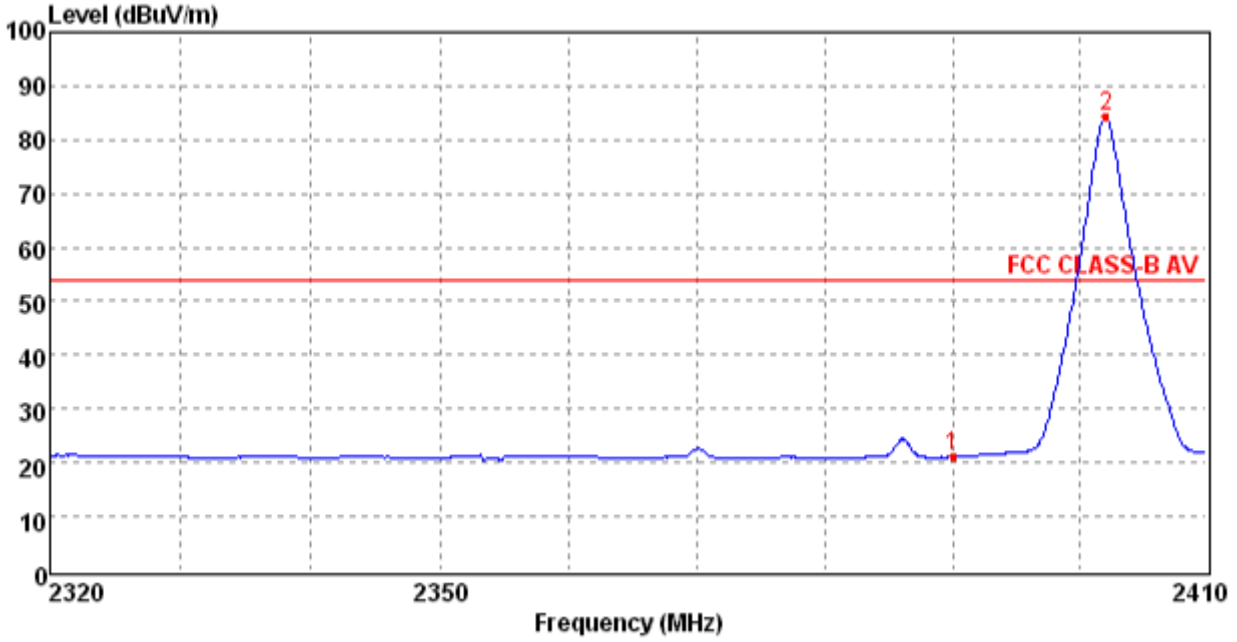
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	21.12	3.32	27.49	36.12	26.40	54.00	32.88	Hor	Average
2	**2402.25**	**84.32**	**3.32**	**27.49**	**36.12**	**89.63**	**54.00**	**-30.32**	**Hor**	Average

Data: 32



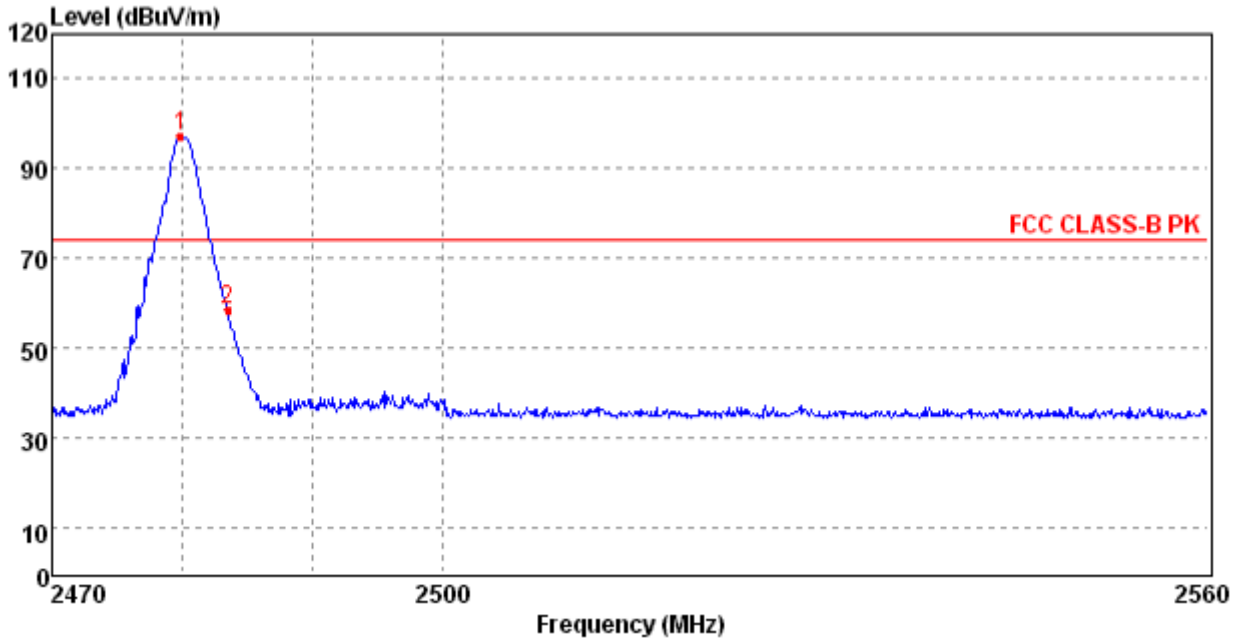
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	34.02	3.32	27.49	36.12	39.30	74.00	39.98	Ver	Peak
2	**2402.15**	**95.50**	**3.32**	**27.49**	**36.12**	**100.81**	**74.00**	**-21.50**	**Ver**	**Peak**

Data: 33



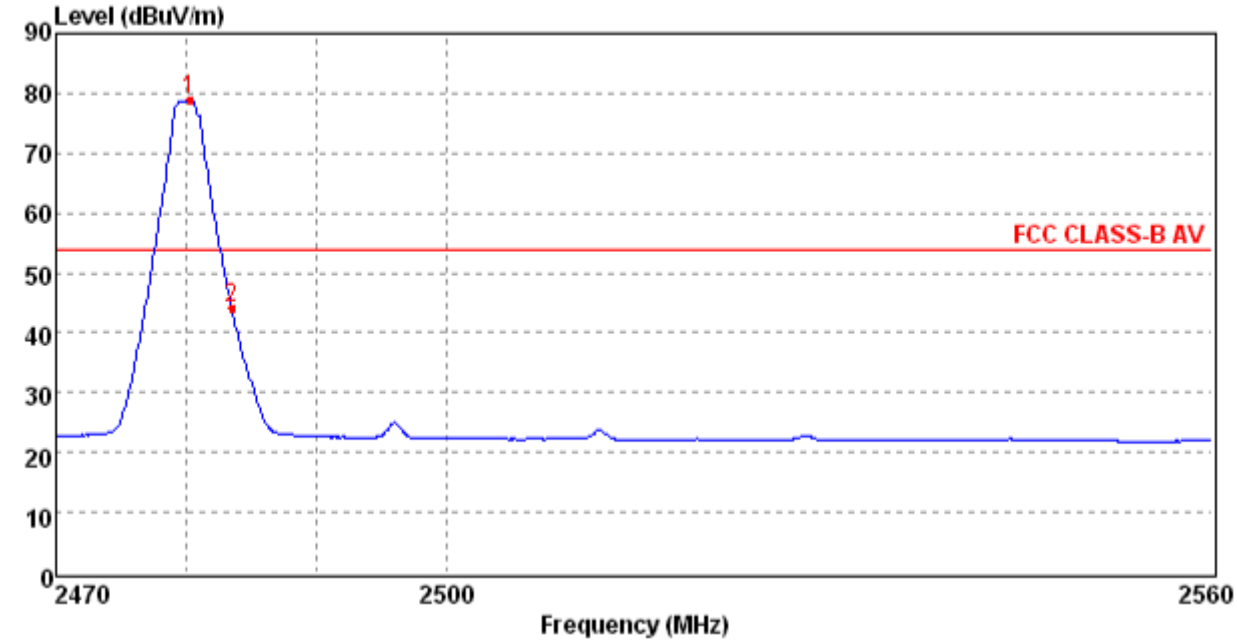
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	2390.00	21.04	3.32	27.49	36.12	26.32	54.00	32.96	Ver	Average
2	**2402.25**	**84.23**	**3.32**	**27.49**	**36.12**	**89.54**	**54.00**	**-30.23**	**Ver**	Average

Data: 20



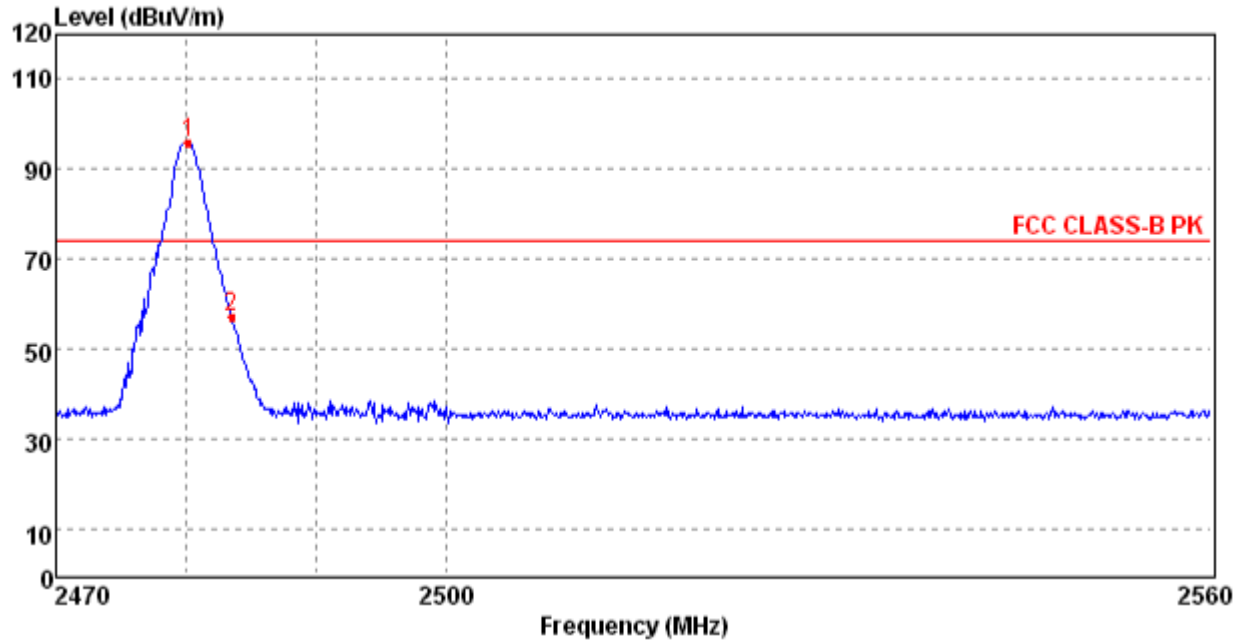
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	**2479.80**	**97.15**	**3.88**	**27.45**	**36.55**	**102.37**	**74.00**	**-23.15**	**Hor**	**Peak**
2	2483.50	58.25	3.88	27.45	36.55	63.47	74.00	15.75	Hor	Peak

Data: 21



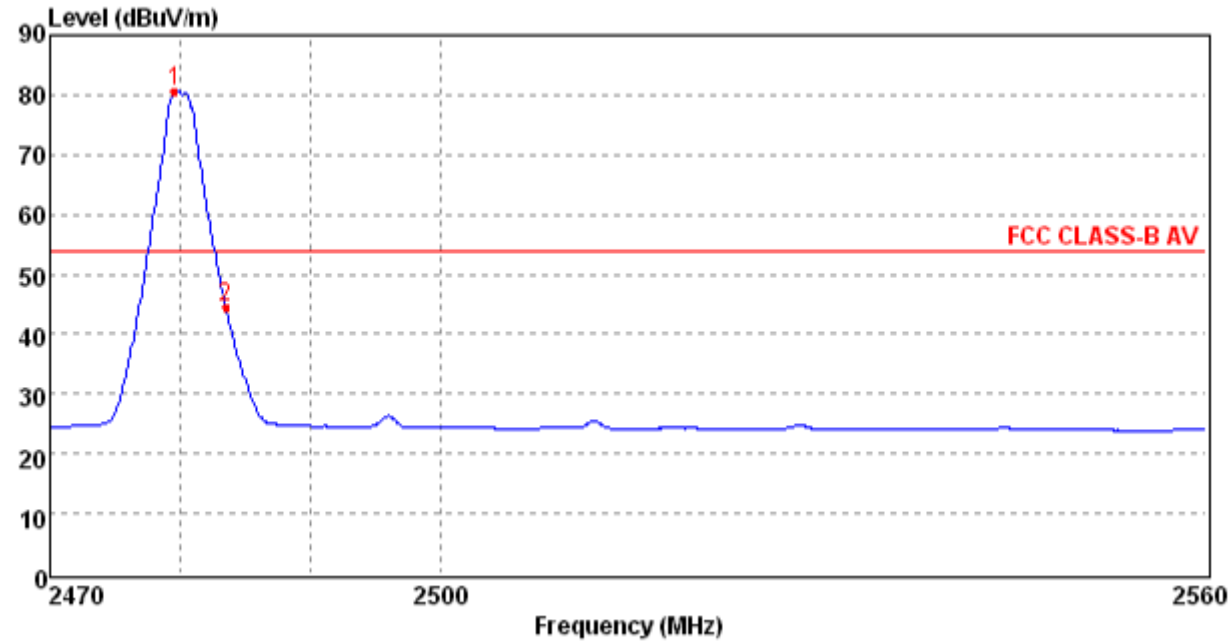
Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	**2480.13**	**79.07**	**3.88**	**27.45**	**36.55**	**84.29**	**54.00**	**-25.07**	**Hor**	**Average**
2	2483.50	44.15	3.88	27.45	36.55	49.37	54.00	9.85	Hor	Average

Data: 18



Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	**2480.07**	**95.81**	**3.88**	**27.45**	**36.55**	**101.03**	**74.00**	**-21.81**	**Ver**	**Peak**
2	2483.50	57.26	3.88	27.45	36.55	62.48	74.00	16.74	Ver	Peak

Data: 19



Mark	Frequency (MHz)	Level (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Reading Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization	Detector
1	**2480.22**	**80.76**	**3.88**	**27.45**	**36.55**	**85.98**	**54.00**	**-26.76**	**Ver**	**Average**
2	2483.50	44.56	3.88	27.45	36.55	49.78	54.00	9.44	Ver	Average

For Conducted Bandedge Measurement

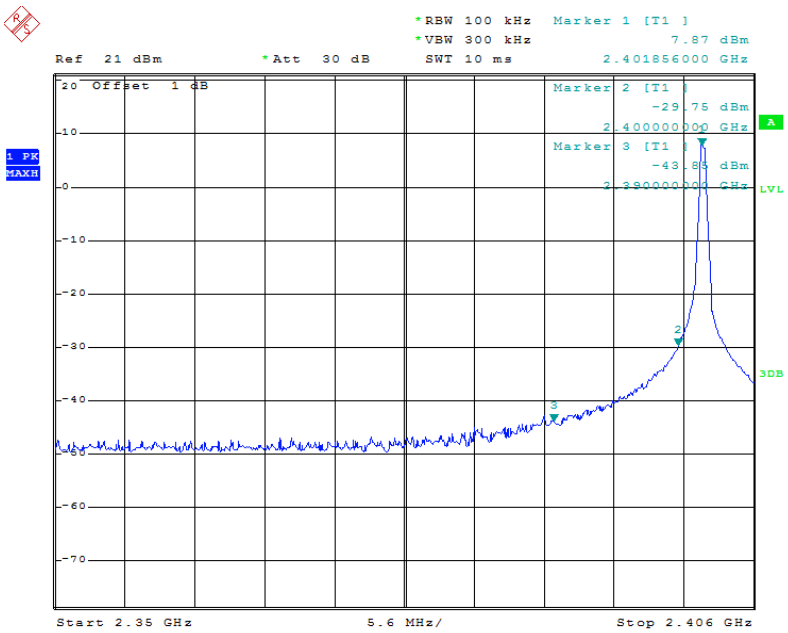
GFSK Test Mode

A. Test Verdict

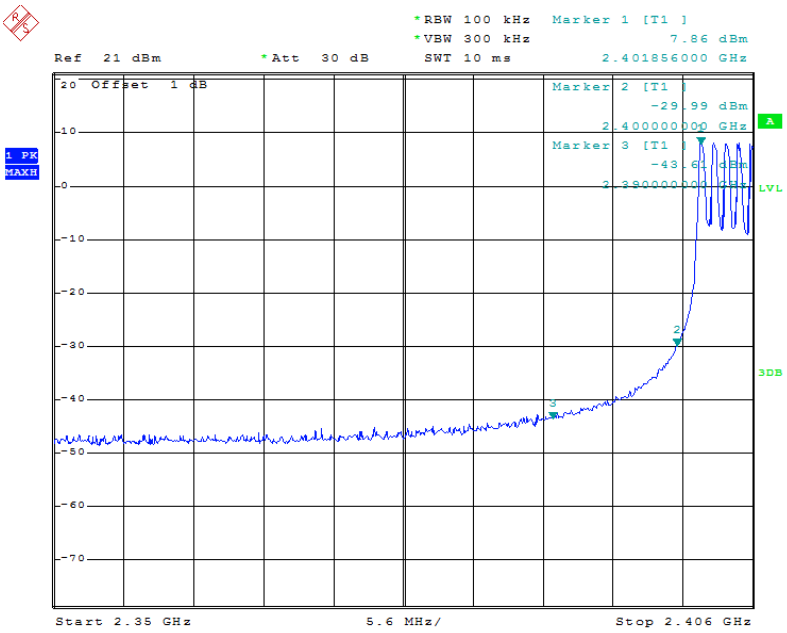
Note: We test DH1,DH3 and DH5 Mode and recorded the worst Data at the DH1 Mode.

Frequency (MHz)	Delta Peak to Band emission (dBc)	Hoping Mode	Detector	Limit (dBc)	Refer to Plot	Verdict
2400.00	-37.62	OFF	Peak	-20	Plot 3.5.2.1 A	PASS
2400.00	-37.85	ON	Peak	-20	Plot 3.5.2.1 B	PASS
2483.50	-44.16	OFF	Peak	-20	Plot 3.5.2.1 C	PASS
2483.50	-44.34	ON	Peak	-20	Plot 3.5.2.1 D	PASS

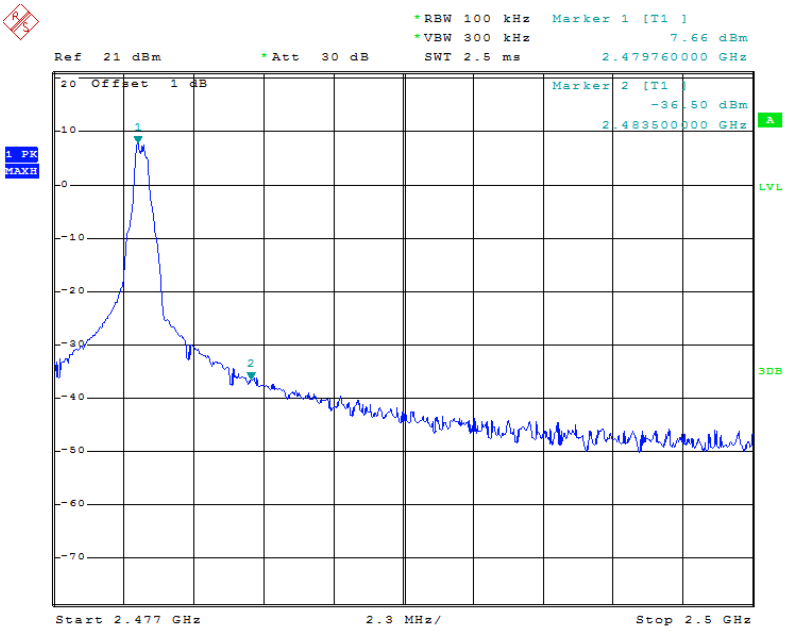
B. Test Plots



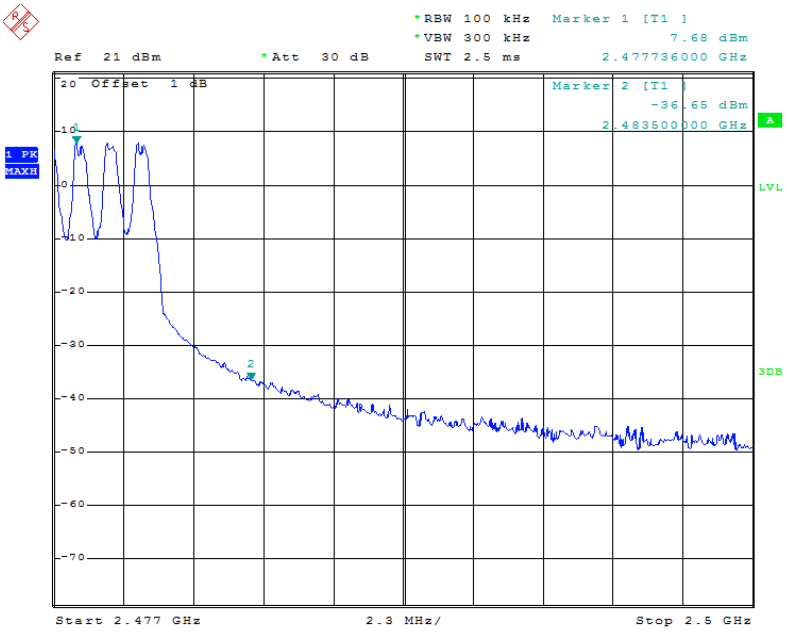
(Plot 3.5.2.1 A: Channel 00: 2402MHz @ GFSK)



(Plot 3.5.2.1 B: Hopping Mode @ GFSK)



(Plot 3.5.2.1 C: Channel 78: 2480MHz @ GFSK)



(Plot 3.5.2.1 D: Hopping Mode @ GFSK)

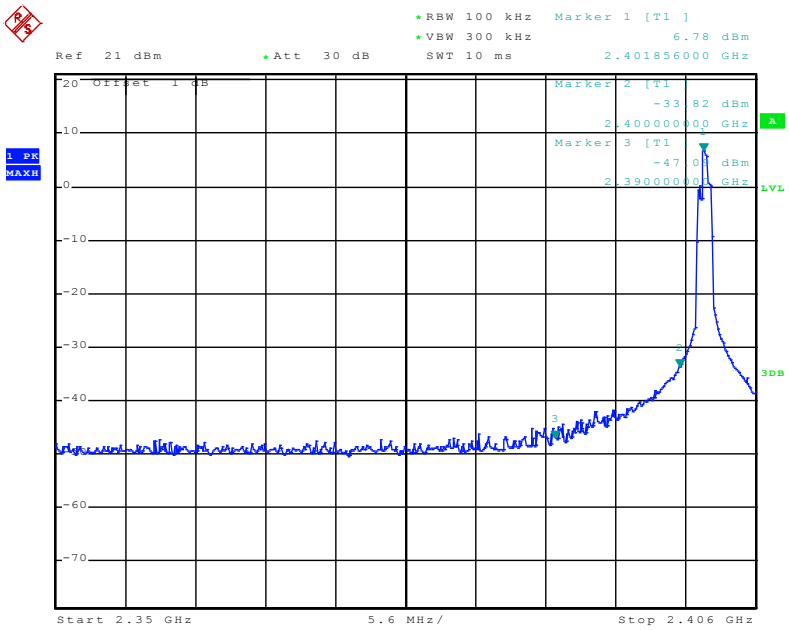
8DPSK Test Mode

A. Test Verdict

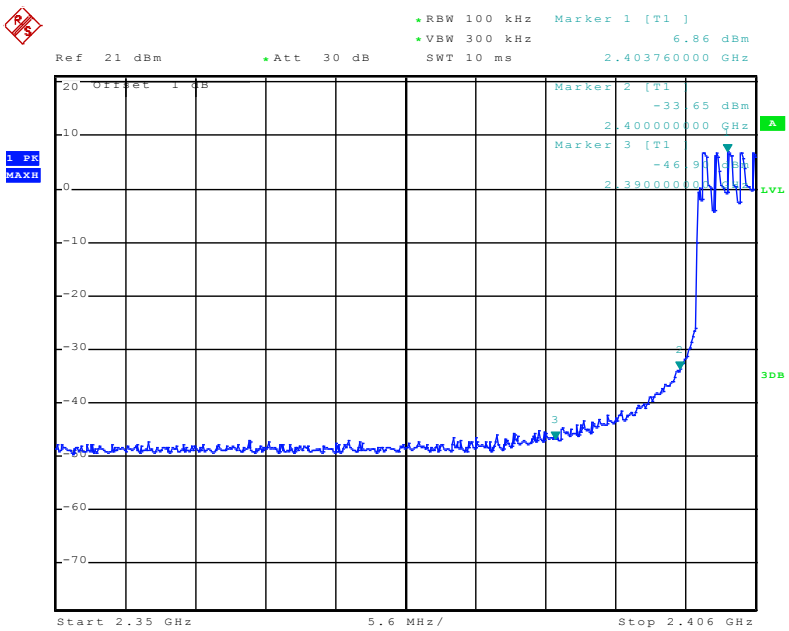
Note: We test DH1,DH3 and DH5 Mode and recorded the worst Data at the DH1 Mode.

Frequency (MHz)	Delta Peak to Band emission (dBc)	Hoping Mode	Detector	Limit (dBc)	Refer to Plot	Verdict
2400.00	-40.60	OFF	Peak	-20	Plot 3.5.2.2 A	PASS
2400.00	-40.51	ON	Peak	-20	Plot 3.5.2.2 B	PASS
2483.50	-44.79	OFF	Peak	-20	Plot 3.5.2.2 C	PASS
2483.50	-44.71	ON	Peak	-20	Plot 3.5.2.2 D	PASS

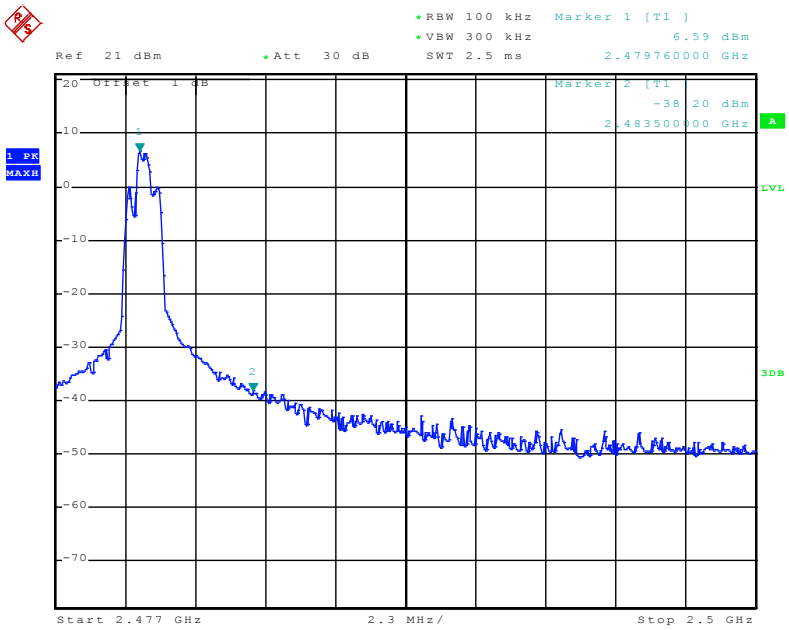
B. Test Plots



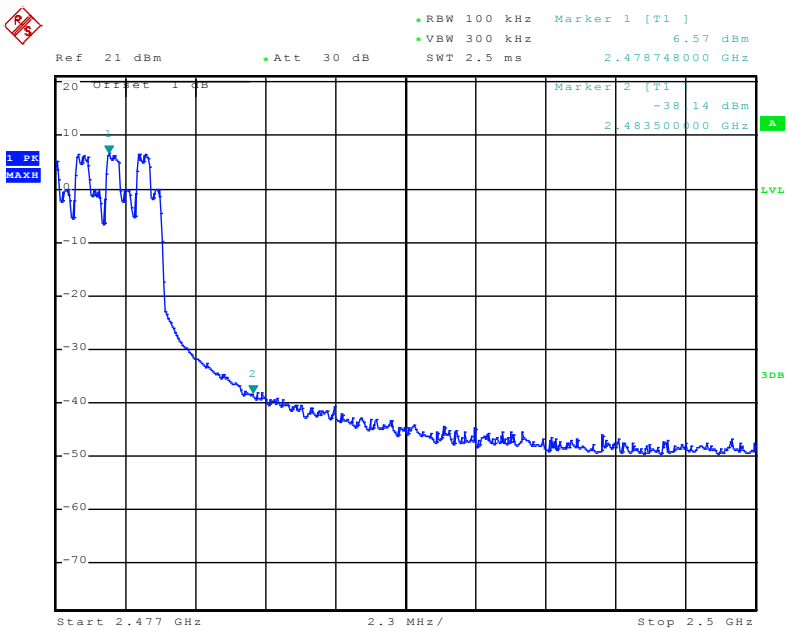
(Plot 3.5.2.2 A: Channel 00: 2402MHz @ 8DPSK)



(Plot 3.5.2.2 B: Hopping Mode @ 8DPSK)



(Plot 3.5.2.2 C: Channel 78: 2480MHz @ 8DPSK)



(Plot 3.5.2.2 D: Hopping Mode @ 8DPSK)

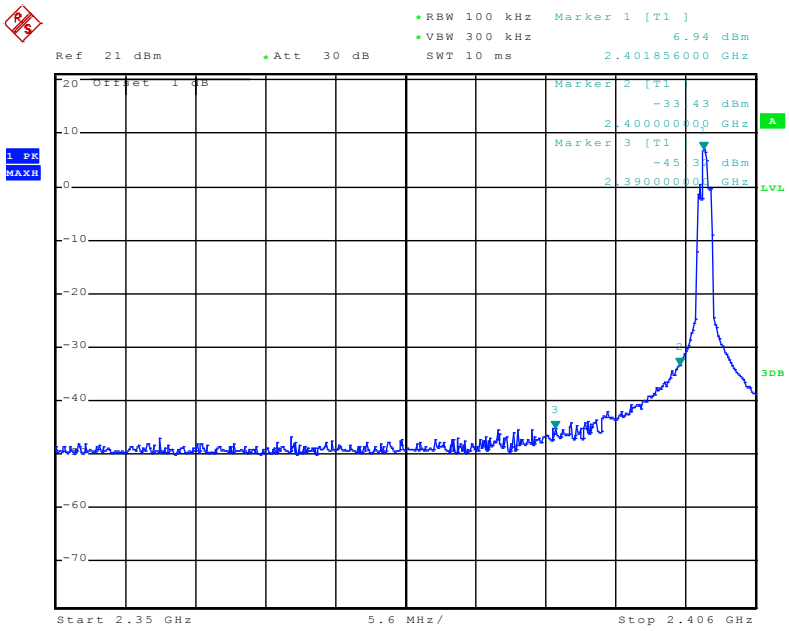
π/4DQPSK Test Mode

A. Test Verdict

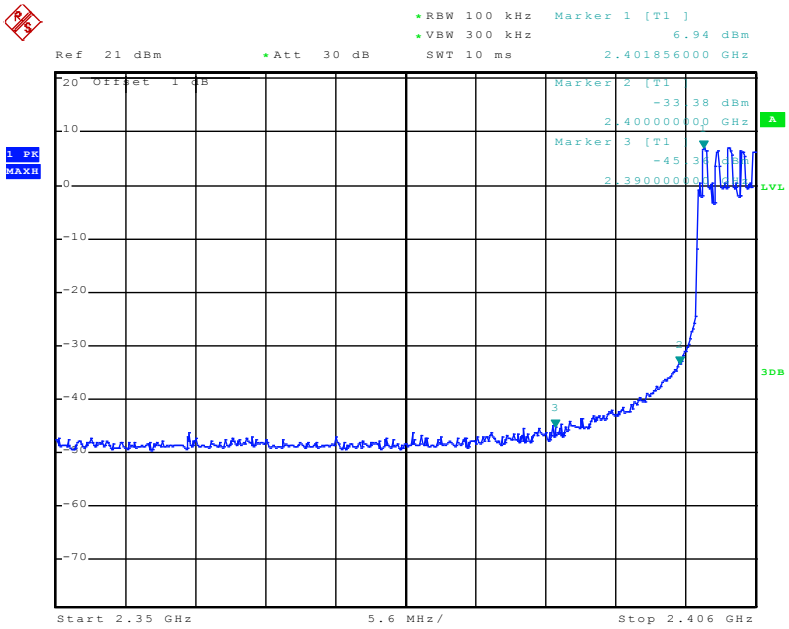
Note: We test DH1,DH3 and DH5 Mode and recorded the worst Data at the DH1 Mode.

Frequency (MHz)	Delta Peak to Band emission (dBc)	Hoping Mode	Detector	Limit (dBc)	Refer to Plot	Verdict
2400.00	-40.37	OFF	Peak	-20	Plot 3.5.2.3 A	PASS
2400.00	-40.32	ON	Peak	-20	Plot 3.5.2.3 B	PASS
2483.50	-45.88	OFF	Peak	-20	Plot 3.5.2.3 C	PASS
2483.50	-44.37	ON	Peak	-20	Plot 3.5.2.3 D	PASS

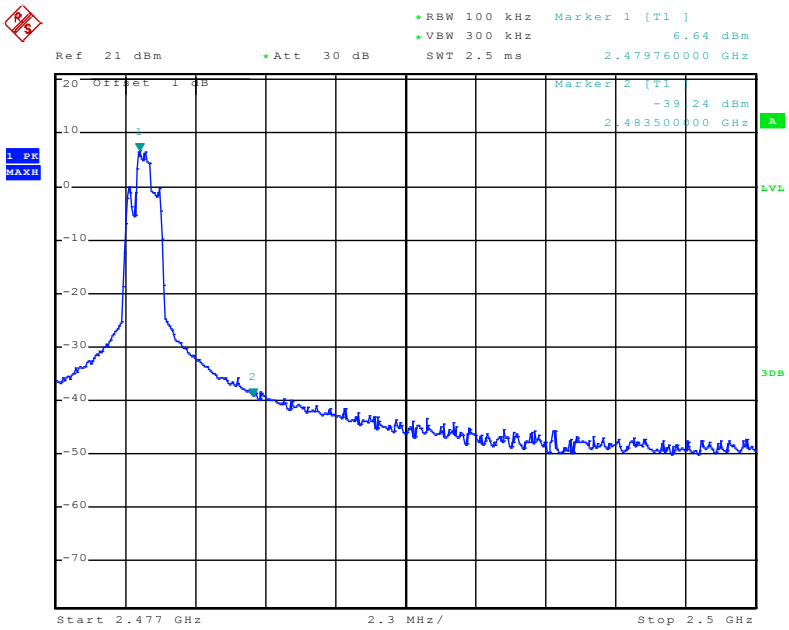
B. Test Plots



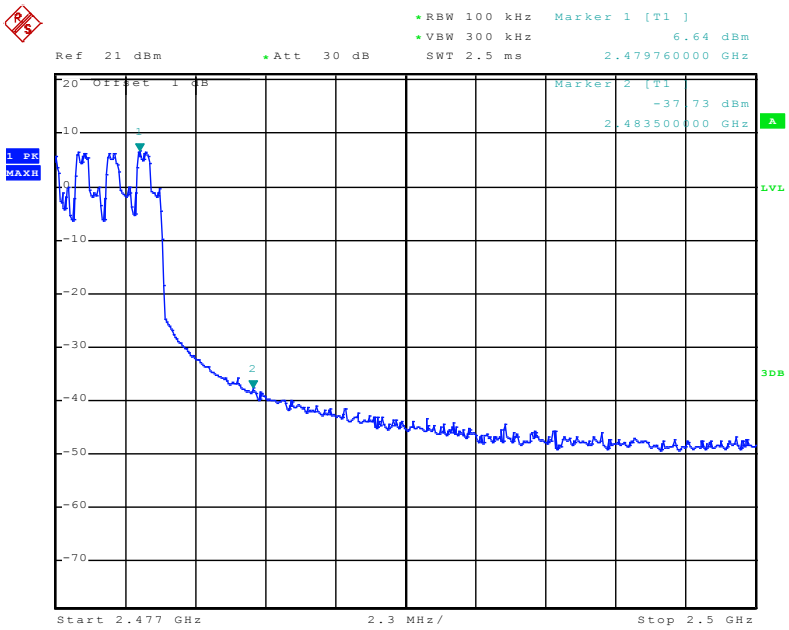
(Plot 3.5.2.3 A: Channel 00: 2402MHz @ π/4DQPSK)



(Plot 3.5.2.3 B: Hopping Mode @π/4DQPSK)



(Plot 3.5.2.3 C: Channel 78: 2480MHz @ π/4DQPSK)



(Plot 3.5.2.3 D: Hopping Mode @π/4DQPSK)

3.6 Frequency Separation

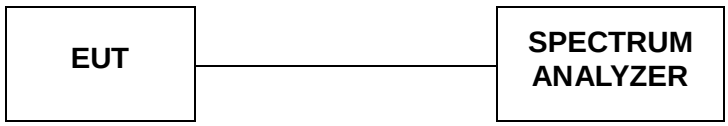
3.6.1 Limit

According to 15.247(a)(1),frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25KHz or the 2/3*20dB bandwidth of the hopping channel, whichever is greater.

3.6.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=30 KHz and VBW=100KHz.

3.6.3 Test Configuration



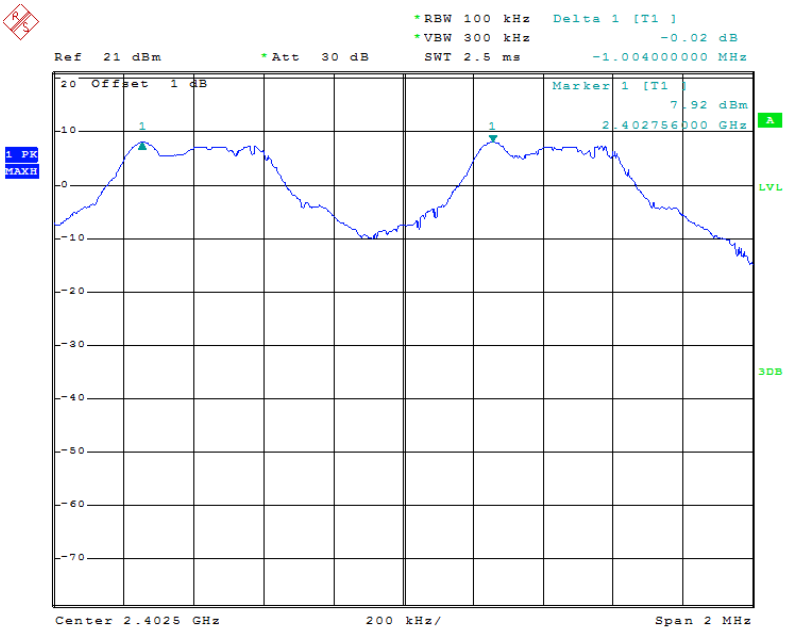
3.6.4 Test Results

GFSK Test Mode

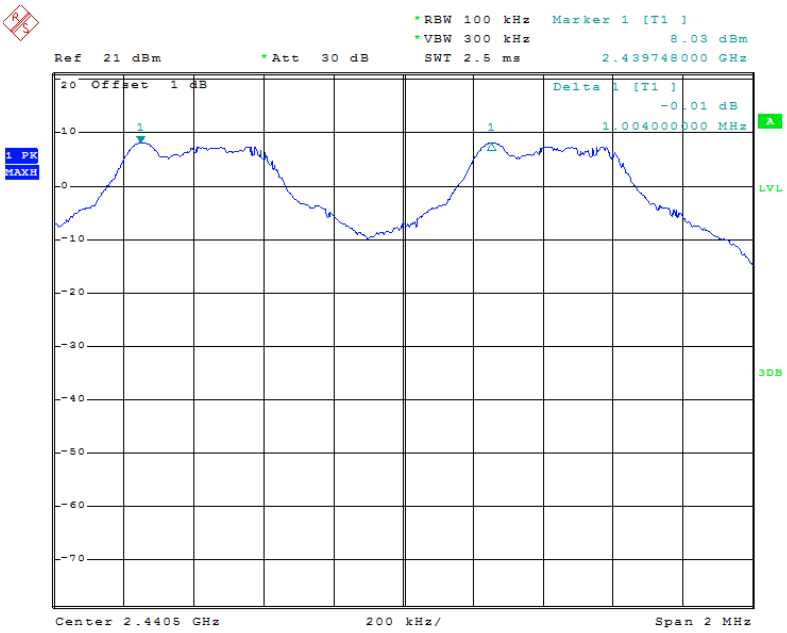
A. Test Verdict

Channel	Frequency (MHz)	Channel Separation (MHz)	Refer to Plot	Limits (KHz)	Verdict
00	2402	1.004	Plot 3.6.1 A	0.464	PASS
01	2403				
38	2440	1.004	Plot 3.6.1 B	0.467	PASS
39	2441				
77	2479	1.004	Plot 3.6.1 C	0.461	PASS
78	2480				

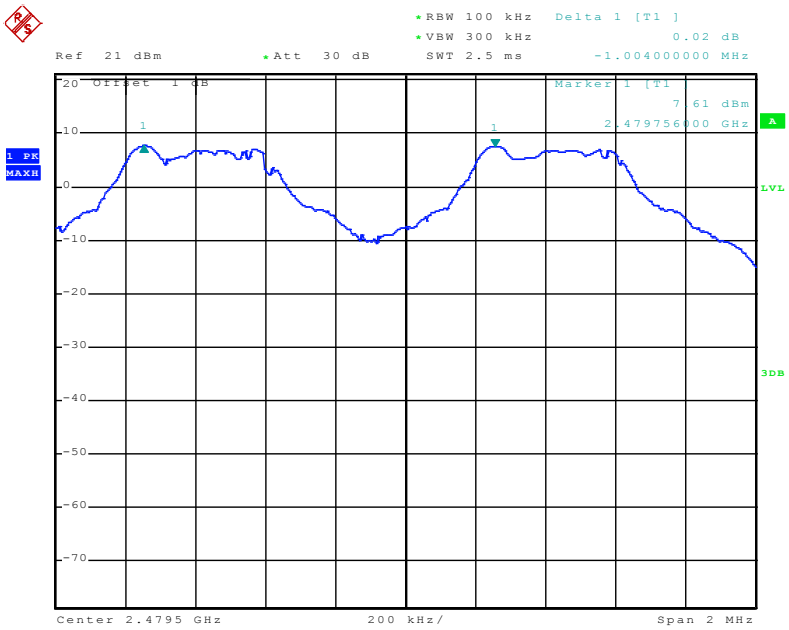
B. Test Plots



(Plot 3.6.1 A: Channel 00: 2402MHz @ GFSK)



(Plot 3.6.1 B: Channel 39: 2441MHz @ GFSK)



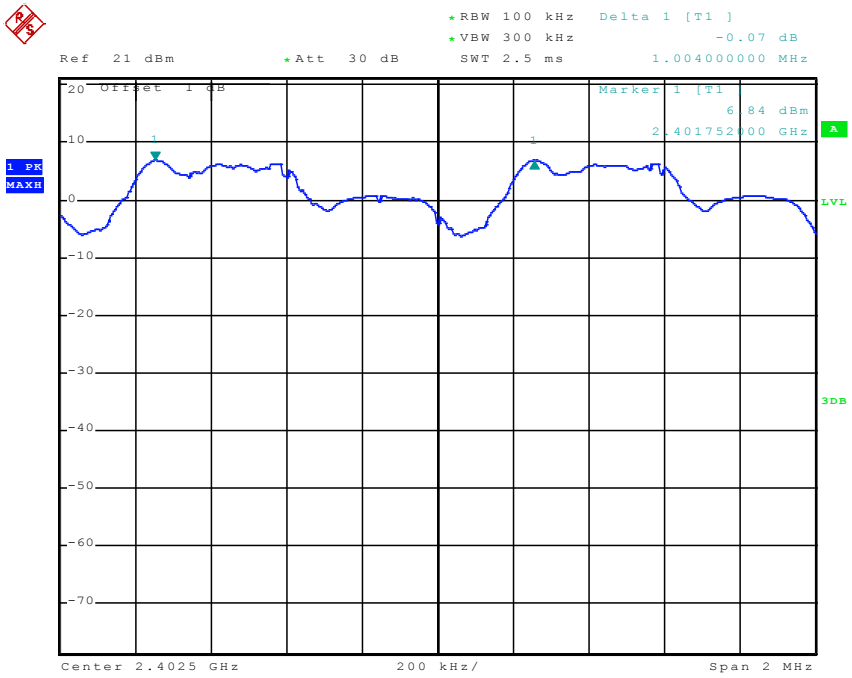
(Plot 3.6.1 C: Channel 78: 2480MHz @ GFSK)

8DPSK Test Mode

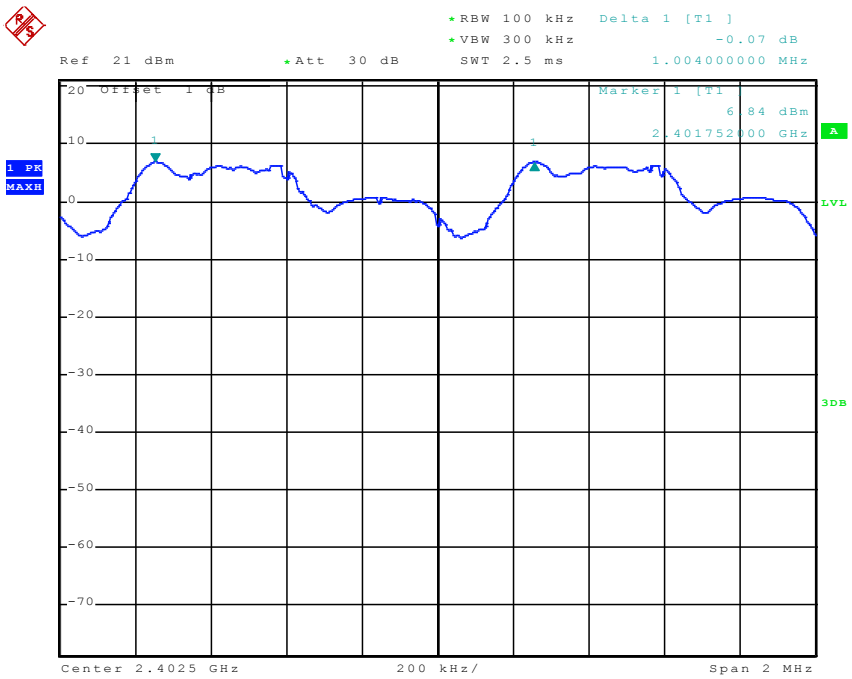
A. Test Verdict

Channel	Frequency (MHz)	Channel Separation (MHz)	Refer to Plot	Limits (KHz)	Verdict
00	2402	1.004	Plot 3.6.2 A	0.757	PASS
01	2403				
38	2440	1.004	Plot 3.6.2 B	0.761	PASS
39	2441				
77	2479	1.004	Plot 3.6.2 C	0.752	PASS
78	2480				

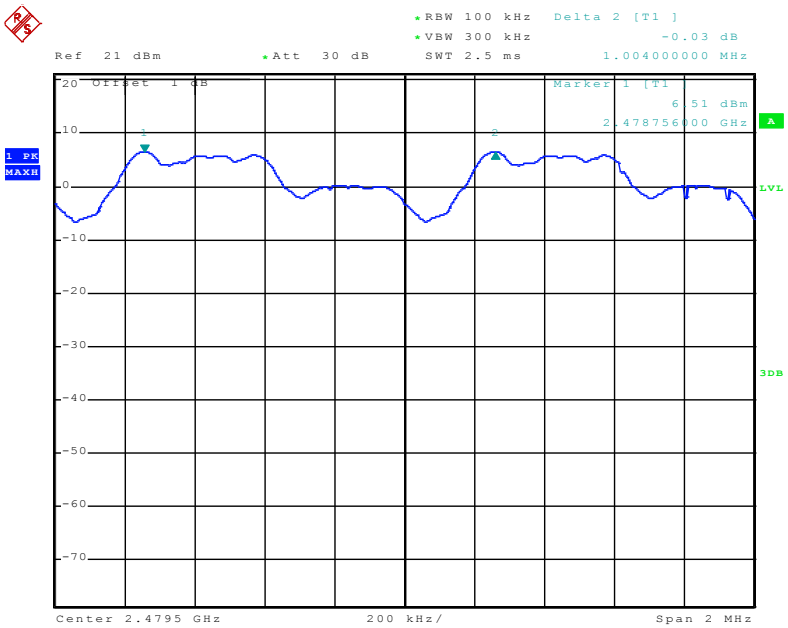
B. Test Plots



(Plot 3.6.2 A: Channel 00: 2402MHz @ 8DPSK)



(Plot 3.6.2 B: Channel 39: 2441MHz @ 8DPSK)



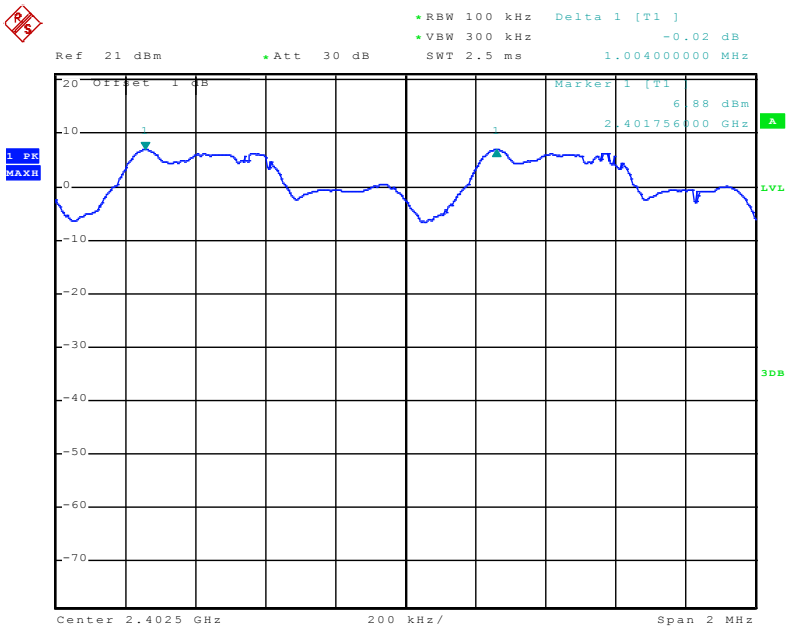
(Plot 3.6.2 C: Channel 78: 2480MHz @ 8DPSK)

4.6.3 π/4DQPSK Test Mode

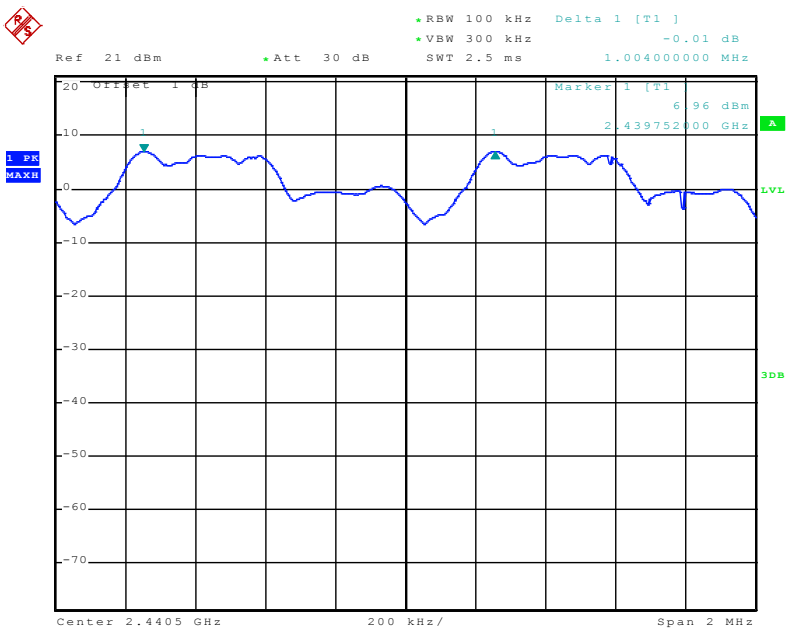
A. Test Verdict

Channel	Frequency (MHz)	Channel Separation (MHz)	Refer to Plot	Limits (KHz)	Verdict
00	2402	1.004	Plot 3.6.3 A	0.757	PASS
01	2403				
38	2440	1.004	Plot 3.6.3 B	0.757	PASS
39	2441				
77	2479	1.004	Plot 3.6.3 C	0.752	PASS
78	2480				

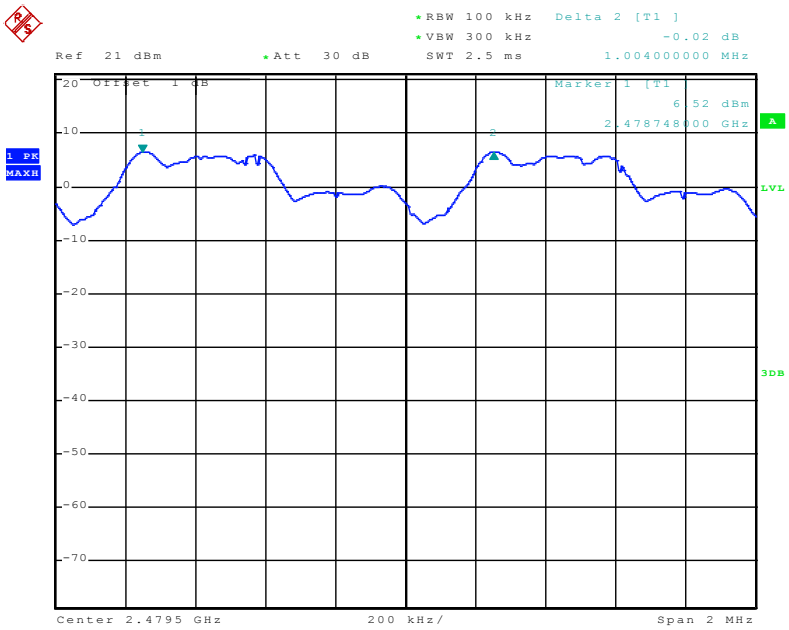
B. Test Plots



(Plot 3.6.3 A: Channel 00: 2402MHz @ π/4DQPSK)



(Plot 3.6.3 B: Channel 39: 2441MHz @ π/4DQPSK)



(Plot 3.6.3 C: Channel 78: 2480MHz @ π/4DQPSK)

3.7 Number of hopping frequency

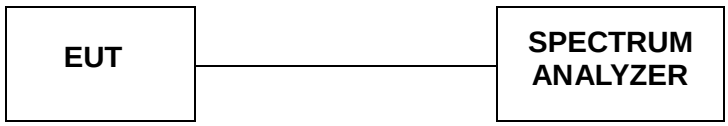
3.7.1 Limit

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

3.7.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator.Set spectrum analyzer start 2400MHz to 2483.5MHz with RBW=30 KHz and VBW=100KHz.

3.7.3 Test Configuration



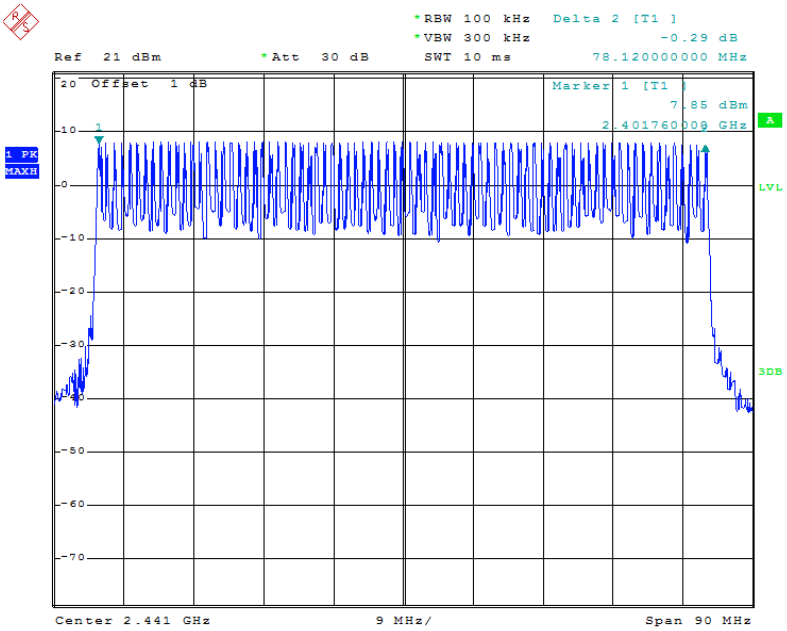
3.7.4 Test Results

GFSK Test Mode

A. Test Verdict

Hopping Channel Frequency Range (MHz)	Number of Hopping Channel	Refer to Plot	Limit	Verdict
2400-2483.5	79	Plot 3.7.1 A	≥15	PASS

B. Test Plots



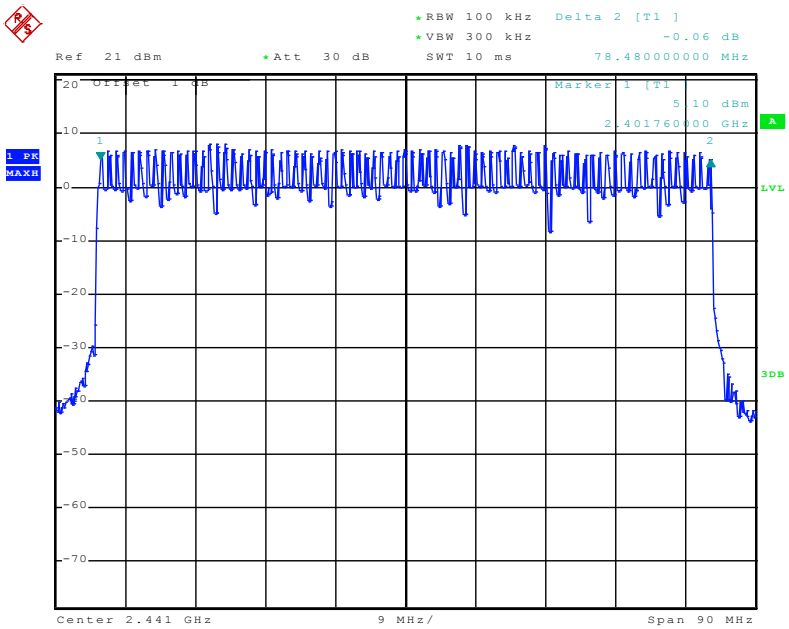
(Plot 3.7.1 A: @ GFSK)

8DPSKTest Mode

A. Test Verdict

Hopping Channel Frequency Range (MHz)	Number of Hopping Channel	Refer to Plot	Limit	Verdict
2400-2483.5	79	Plot 3.7.2 A	≥15	PASS

B. Test Plots



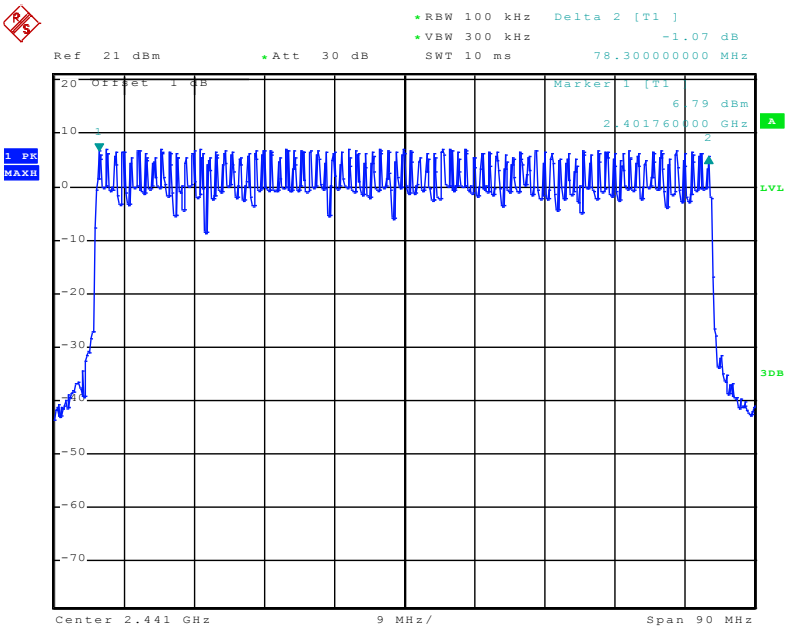
(Plot 3.7.2 A: @ 8DPSK)

π/4DQPSKTest Mode

A. Test Verdict

Hopping Channel Frequency Range (MHz)	Number of Hopping Channel	Refer to Plot	Limit	Verdict
2400-2483.5	79	Plot 3.7.3 A	≥15	PASS

B. Test Plots



(Plot 3.7.3 A: @ π/4DQPSK)

3.8 Time Of Occupancy(Dwell Time)

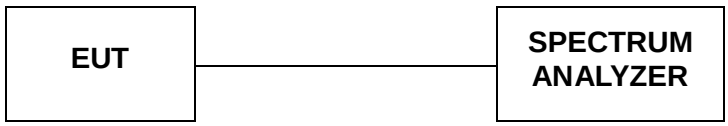
3.8.1 Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a pe-riod of 0.4 seconds multiplied by the number of hopping channels employed.

3.8.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. Set center frequency of spectrum analyzer=operating frequency with RBW=1MHz and VBW=3MHz,Span=0Hz.

3.8.3 Test Configuration



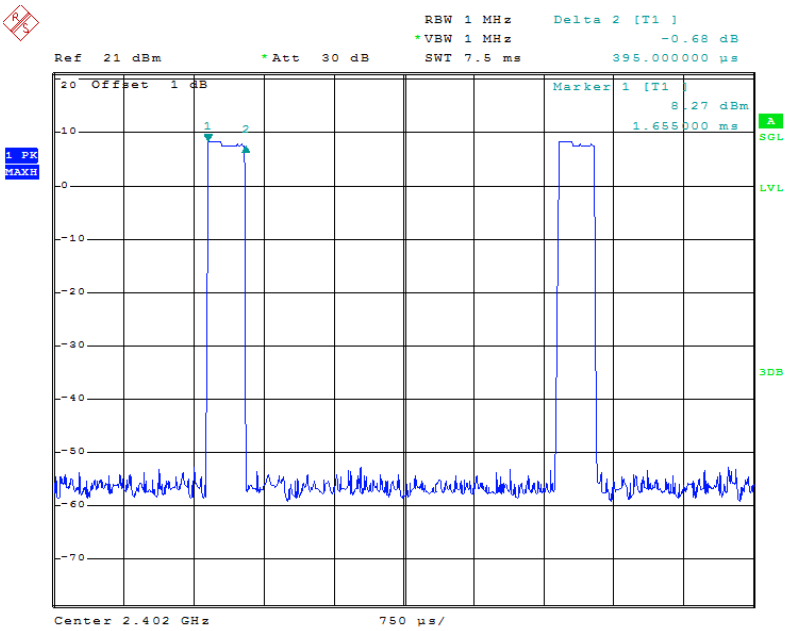
3.8.4 Test Results

GFSK Test Mode

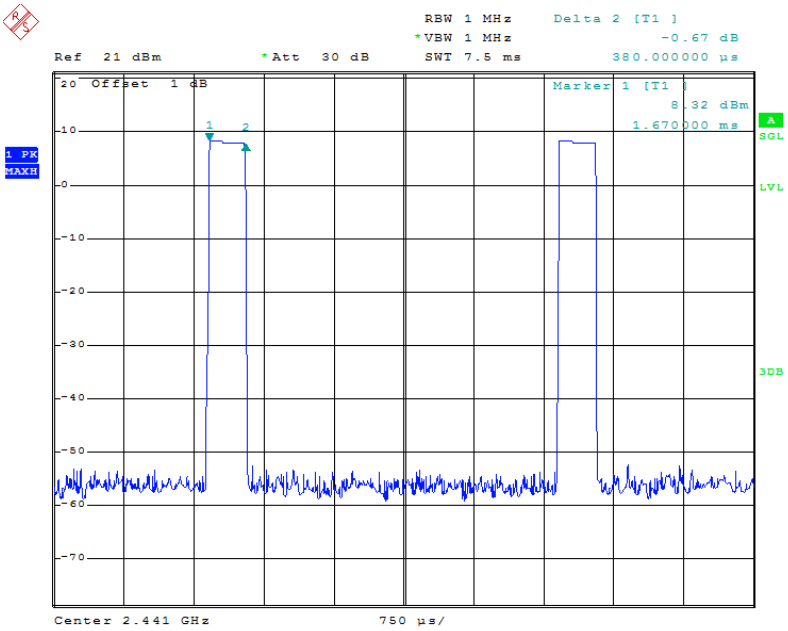
A. Test Verdict

Mode	Frequency (MHz)	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Refer to Plot	Verdict
DH 1	2402	0.395	0.1264	0.4	Plot 3.8.1 A1	PASS
	2441	0.380	0.1216	0.4	Plot 3.8.1 A2	PASS
	2480	0.380	0.1216	0.4	Plot 3.8.1 A3	PASS
	Note: Dwell time=Pulse time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second					
DH 3	2402	1.650	0.2640	0.4	Plot 3.8.1 B1	PASS
	2441	1.650	0.2640	0.4	Plot 3.8.1 B2	PASS
	2480	1.650	0.2640	0.4	Plot 3.8.1 B3	PASS
	Note: Dwell time=Pulse time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second					
DH 5	2402	2.220	0.2368	0.4	Plot 3.8.1 C1	PASS
	2441	2.220	0.2368	0.4	Plot 3.8.1 C2	PASS
	2480	2.220	0.2368	0.4	Plot 3.8.1 C3	PASS
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second					

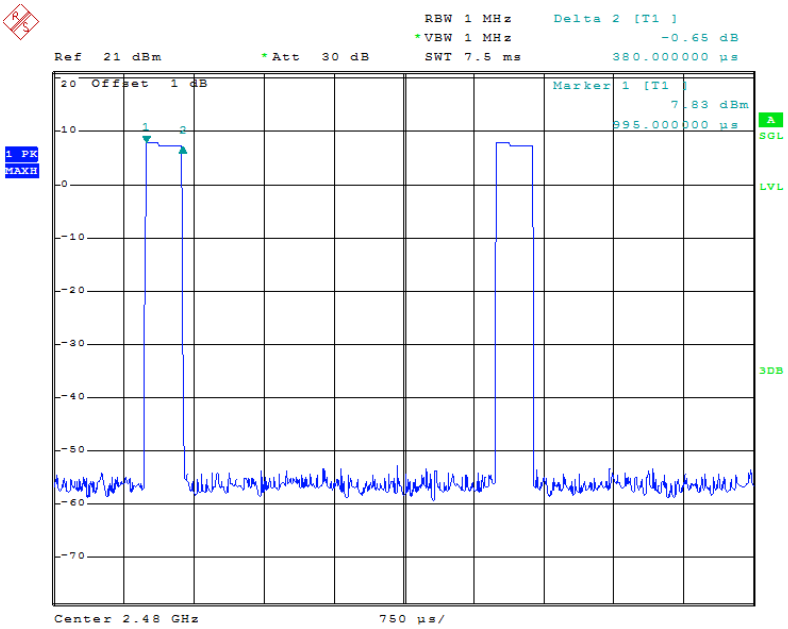
B. Test Plots



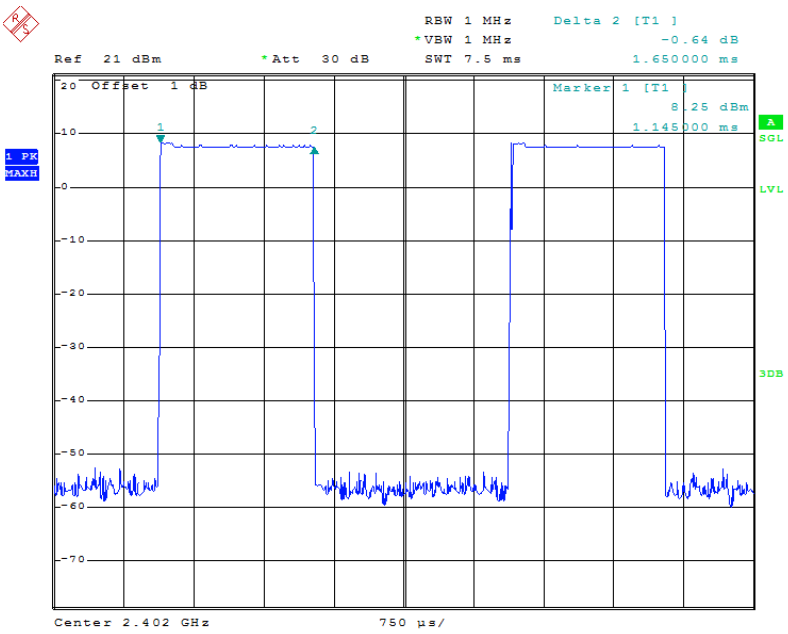
(Plot 3.8.1.A1: Channel 00: 2402MHz @ GFSK @ DH1)



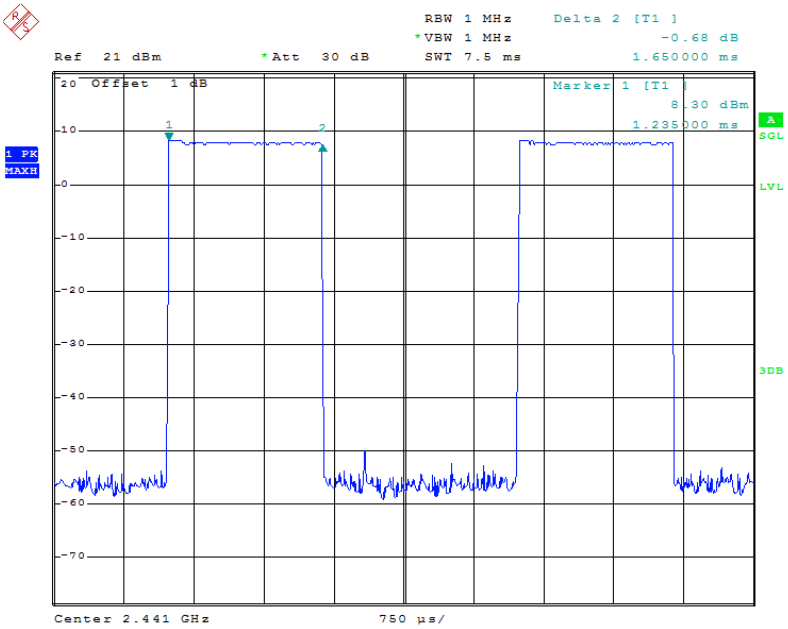
(Plot 3.8.1.A2: Channel 39: 2441MHz @ GFSK @ DH1)



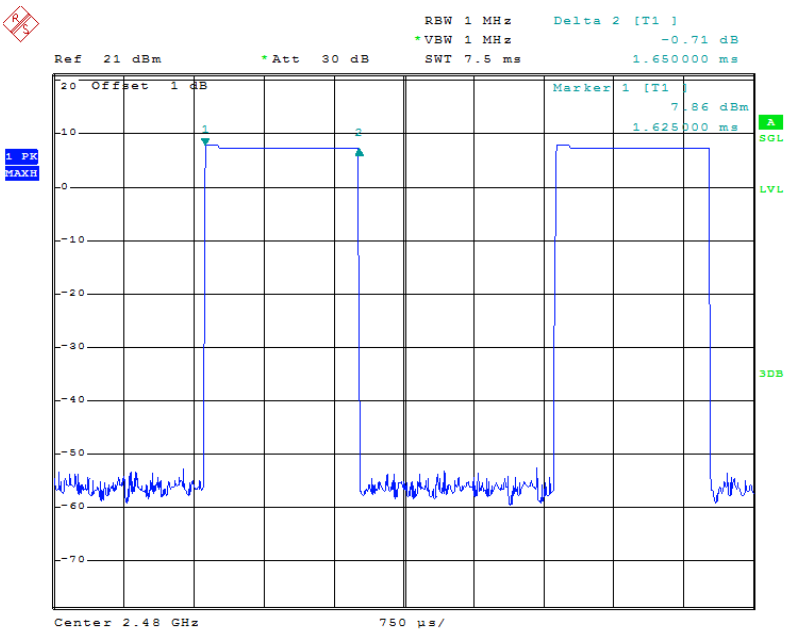
(Plot 3.8.1.A3: Channel 78: 2480MHz @ GFSK @ DH1)



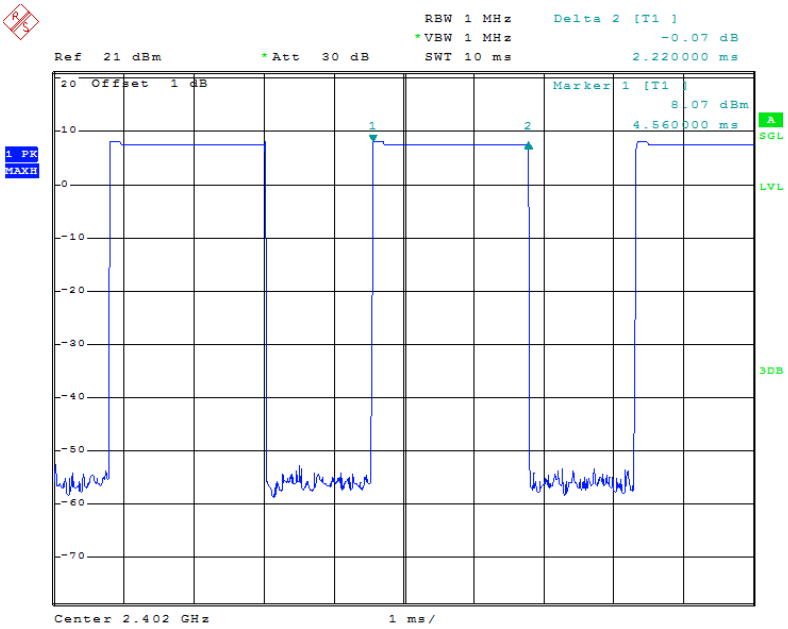
(Plot 3.8.1.B1: Channel 00: 2402MHz @ GFSK @ DH3)



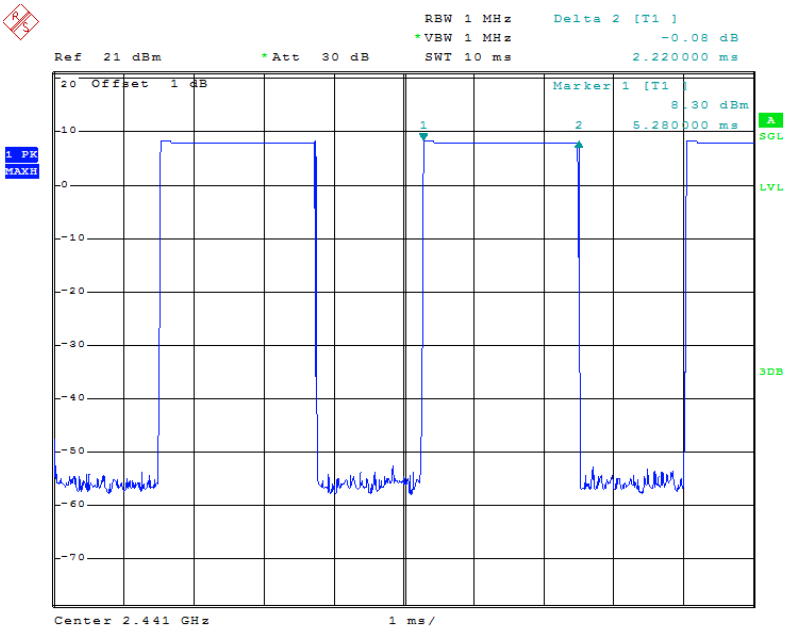
(Plot 3.8.1.B2: Channel 39: 2441MHz @ GFSK @ DH3)



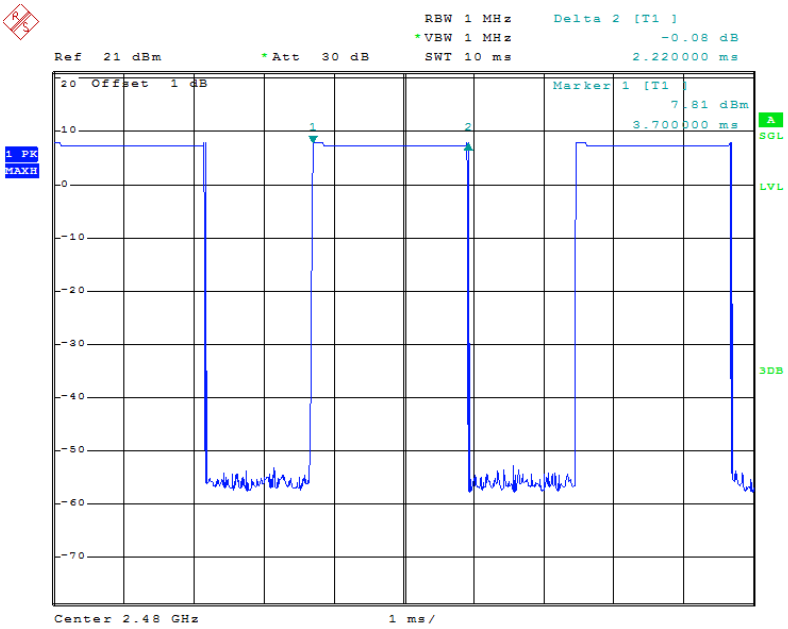
(Plot 3.8.1.B3: Channel 78: 2480MHz @ GFSK @ DH3)



(Plot 3.8.1.C1: Channel 00: 2402MHz @ GFSK @ DH5)



(Plot 3.8.1.C2: Channel 39: 2441MHz @ GFSK @ DH5)



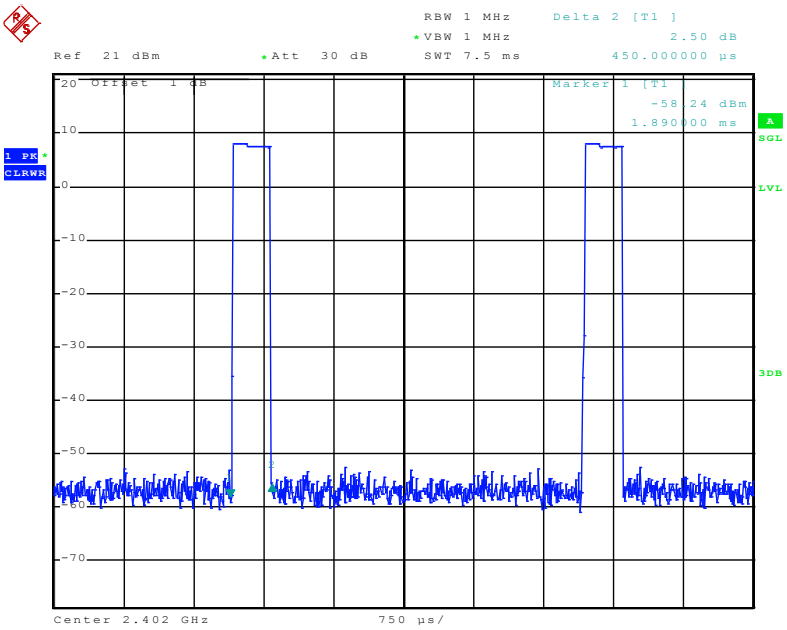
(Plot 3.8.1.C3: Channel 78: 2480MHz @ GFSK @ DH5)

8DPSK Test Mode

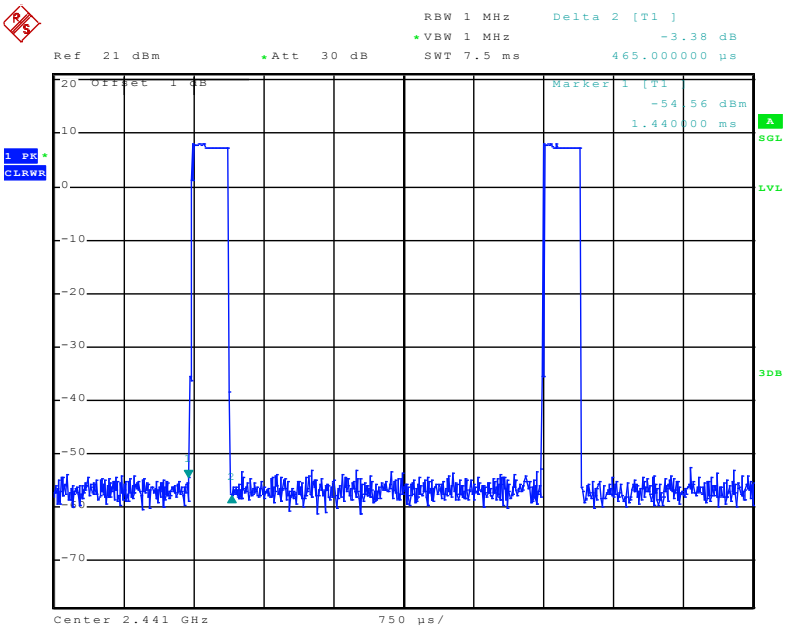
A. Test Verdict

Mode	Frequency (MHz)	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Refer to Plot	Verdict
DH 1	2402	0.450	0.1440	0.4	Plot 3.8.2 A1	PASS
	2441	0.465	0.1488	0.4	Plot 3.8.2 A2	PASS
	2480	0.450	0.1440	0.4	Plot 3.8.2 A3	PASS
	Note: Dwell time=Pulse time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second					
DH 3	2402	1.695	0.2712	0.4	Plot 3.8.2 B1	PASS
	2441	1.710	0.2736	0.4	Plot 3.8.2 B2	PASS
	2480	1.710	0.2736	0.4	Plot 3.8.2 B3	PASS
	Note: Dwell time=Pulse time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second					
DH 5	2402	2.275	0.2427	0.4	Plot 3.8.2 C1	PASS
	2441	2.275	0.2427	0.4	Plot 3.8.2 C2	PASS
	2480	2.295	0.2448	0.4	Plot 3.8.2 C3	PASS
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second					

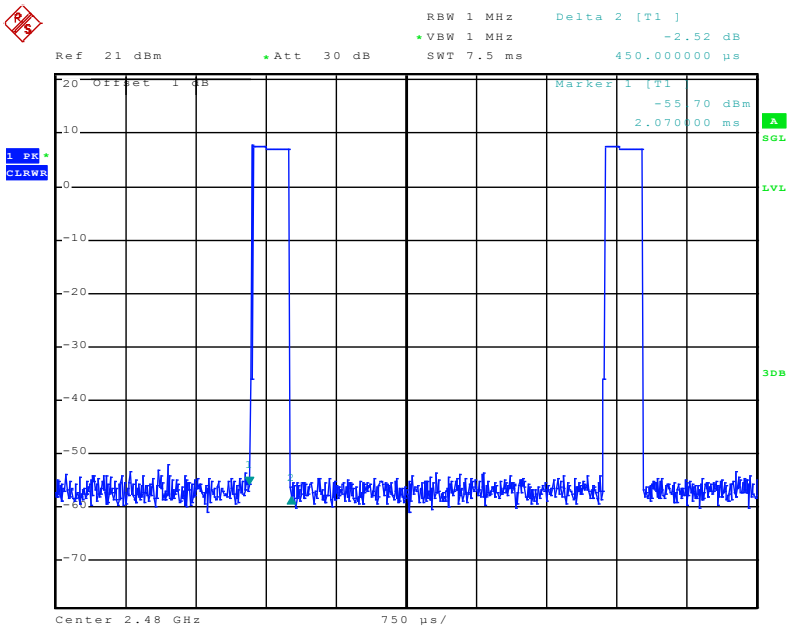
B. Test Plots



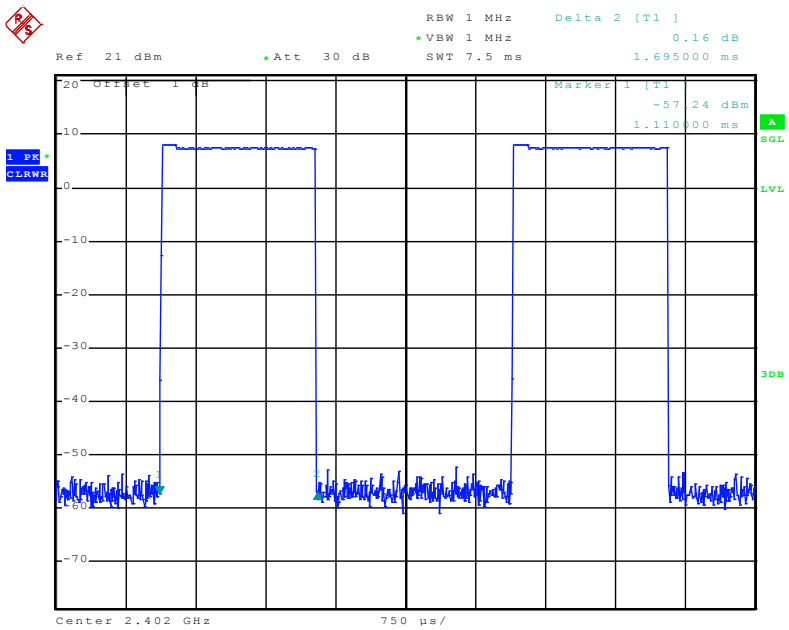
(Plot 3.8.2.A1: Channel 00: 2402MHz @ 8DPSK @ DH1)



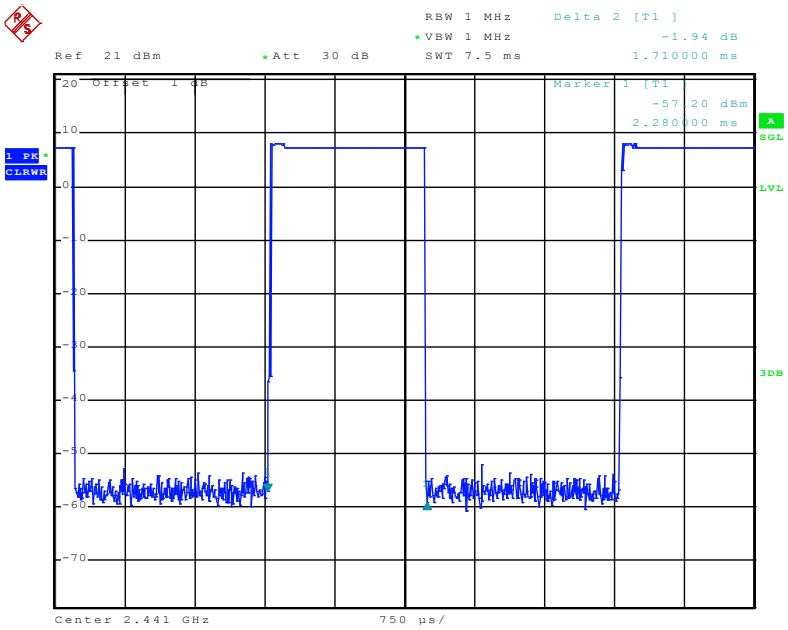
(Plot 3.8.2.A2: Channel 39: 2441MHz @ 8DPSK @ DH1)



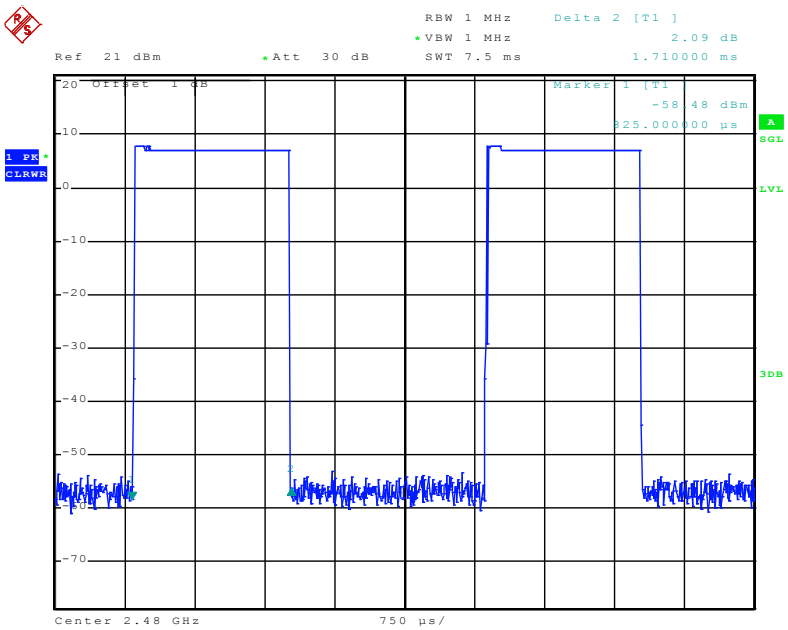
(Plot 3.8.2.A3: Channel 78: 2480MHz @ 8DPSK @ DH1)



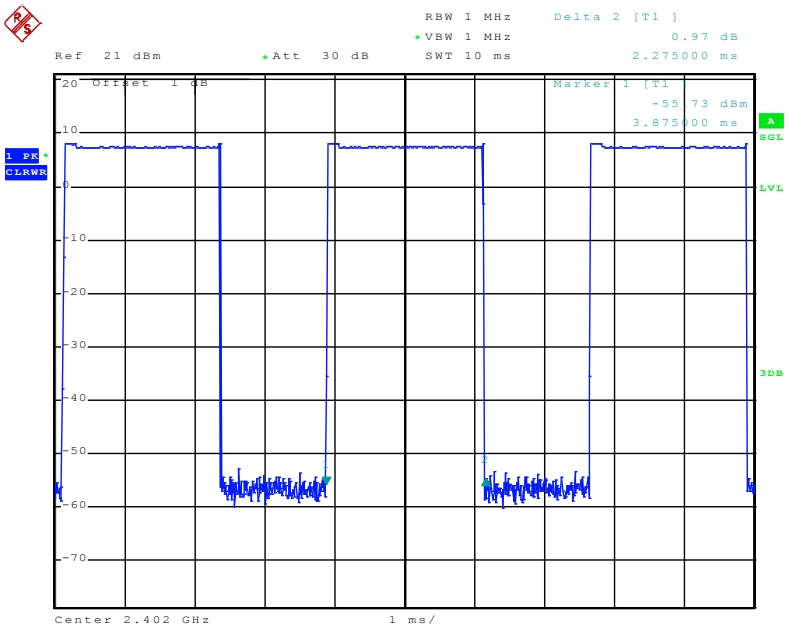
(Plot 3.8.2.B1: Channel 00: 2402MHz @ 8DPSK @ DH3)



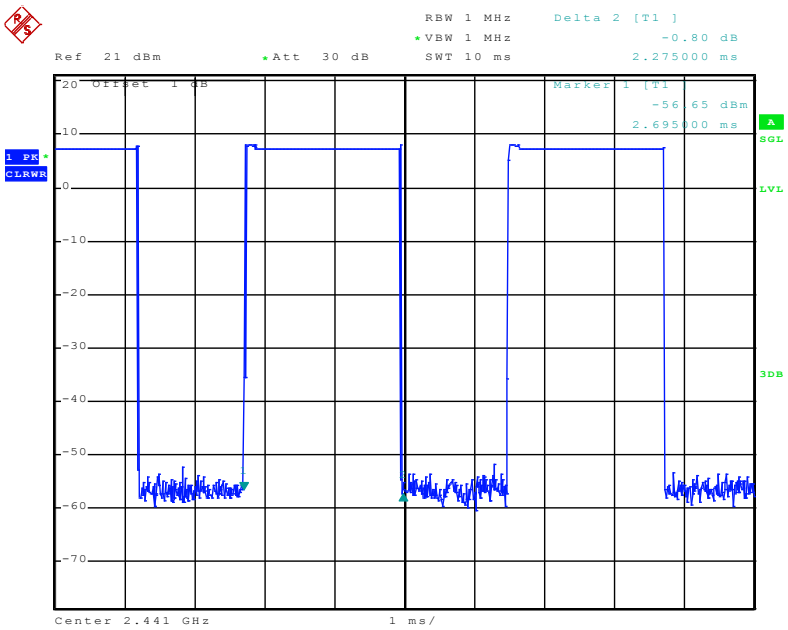
(Plot 3.8.2.B2: Channel 39: 2441MHz @ 8DPSK @ DH3)



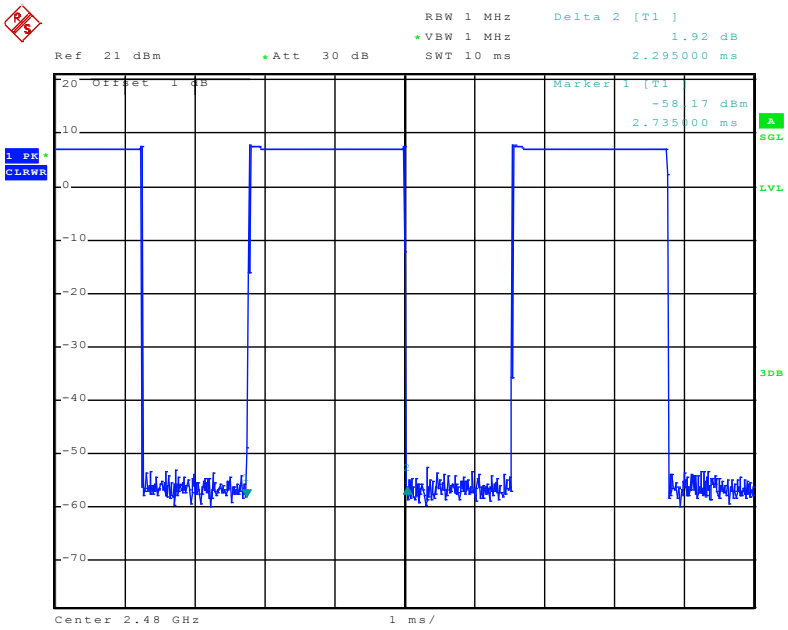
(Plot 3.8.2.B3: Channel 78: 2480MHz @ 8DPSK @ DH3)



(Plot 3.8.2.C1: Channel 00: 2402MHz @ 8DPSK @ DH5)



(Plot 3.8.2.C2: Channel 39: 2441MHz @ 8DPSK @ DH5)



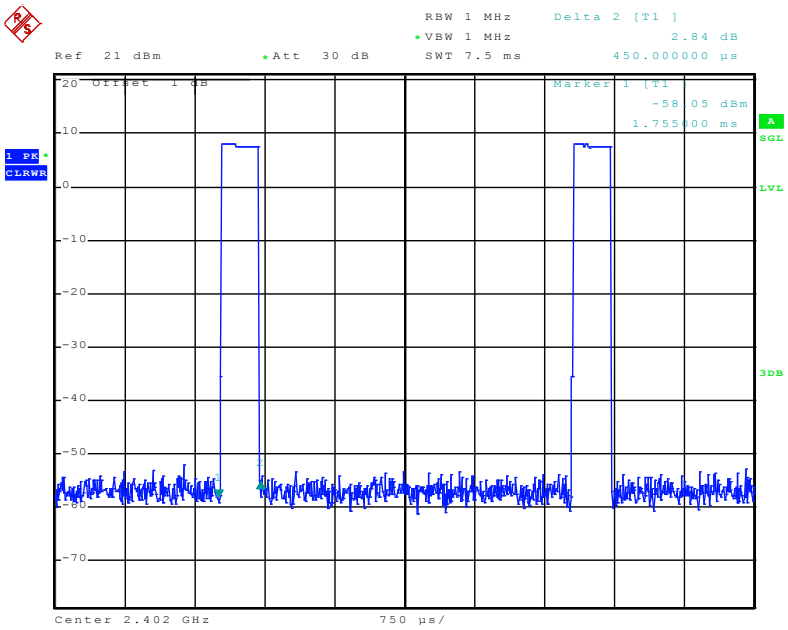
(Plot 3.8.2.C3: Channel 78: 2480MHz @ 8DPSK @ DH5)

π/4DQPSK Test Mode

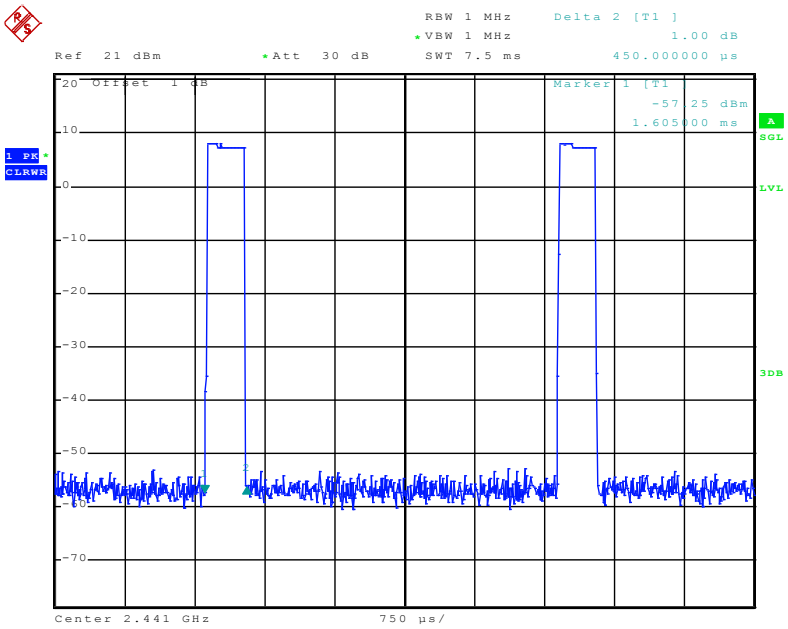
A. Test Verdict

Mode	Frequency (MHz)	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Refer to Plot	Verdict
DH 1	2402	0.450	0.1440	0.4	Plot 3.8.3 A1	PASS
	2441	0.450	0.1440	0.4	Plot 3.8.3 A2	PASS
	2480	0.450	0.1440	0.4	Plot 3.8.3 A3	PASS
	Note: Dwell time=Pulse time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second					
DH 3	2402	1.710	0.2736	0.4	Plot 3.8.3 B1	PASS
	2441	1.710	0.2736	0.4	Plot 3.8.3 B2	PASS
	2480	1.695	0.2712	0.4	Plot 3.8.3 B3	PASS
	Note: Dwell time=Pulse time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second					
DH 5	2402	2.275	0.2427	0.4	Plot 3.8.3 C1	PASS
	2441	2.275	0.2427	0.4	Plot 3.8.3 C2	PASS
	2480	2.275	0.2427	0.4	Plot 3.8.3 C3	PASS
	Note: Dwell time=Pulse Time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second					

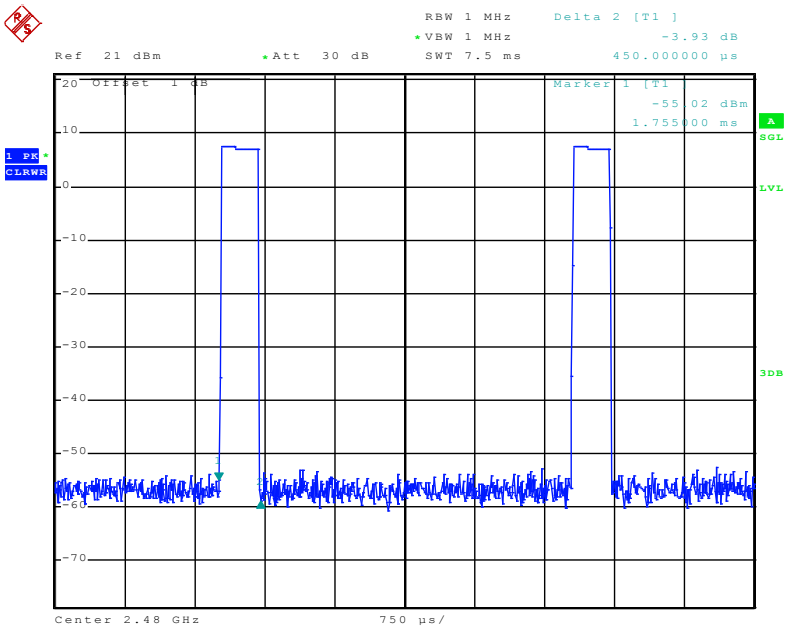
B. Test Plots



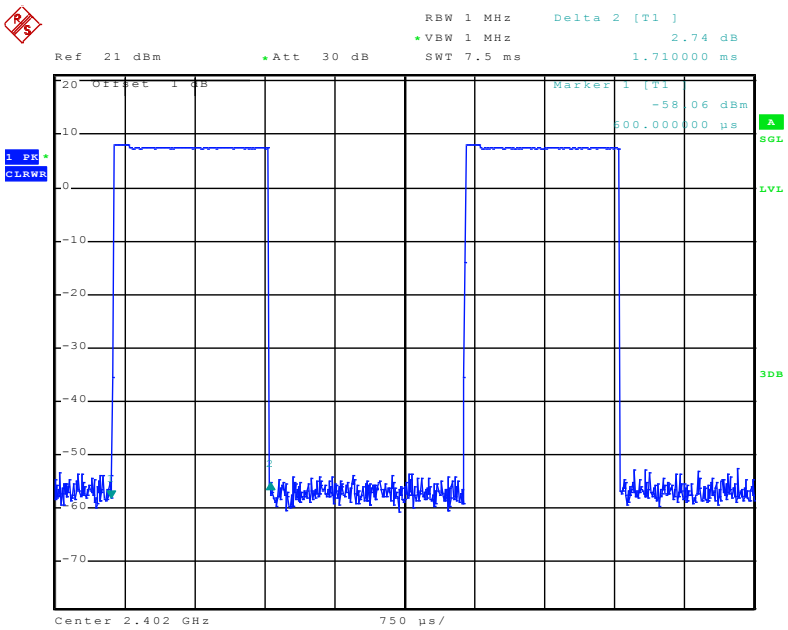
(Plot 3.8.3.A1: Channel 00: 2402MHz @ π/4DQPSK @ DH1)



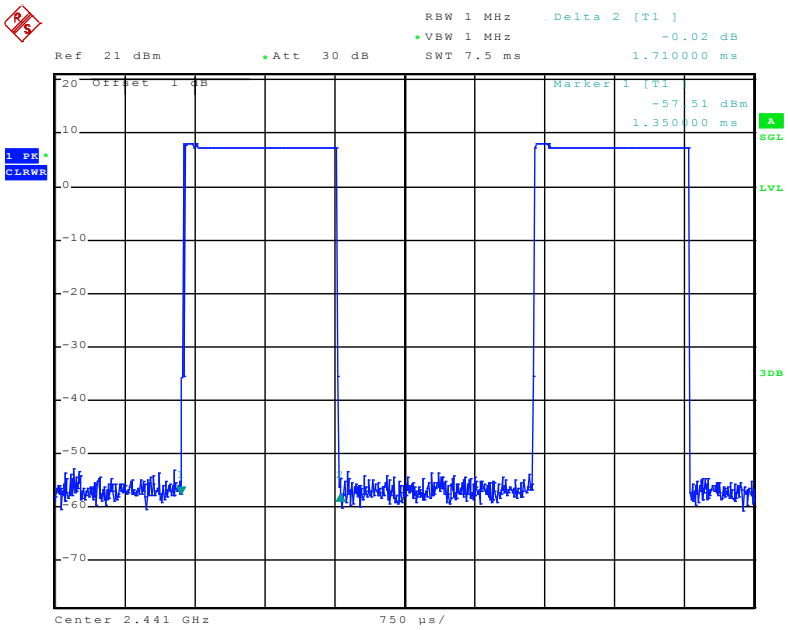
(Plot 3.8.3.A2: Channel 39: 2441MHz @ π/4DQPSK @ DH1)



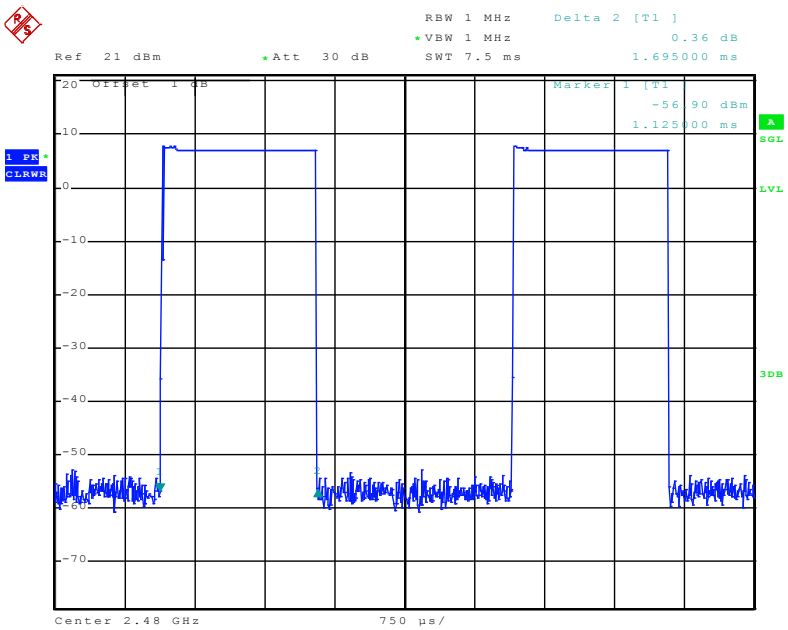
(Plot 3.8.3.A3: Channel 78: 2480MHz @ π/4DQPSK @ DH1)



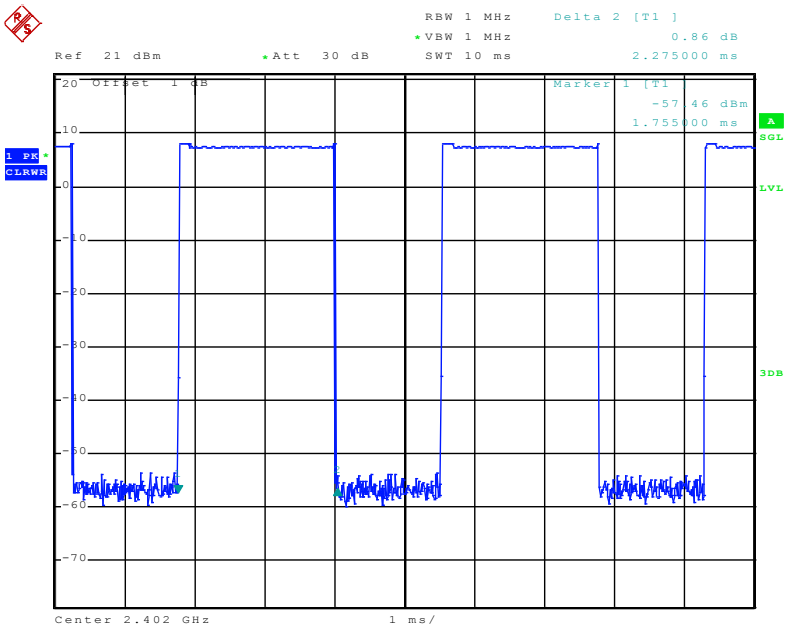
(Plot 3.8.3.B1: Channel 00: 2402MHz @ π/4DQPSK @ DH3)



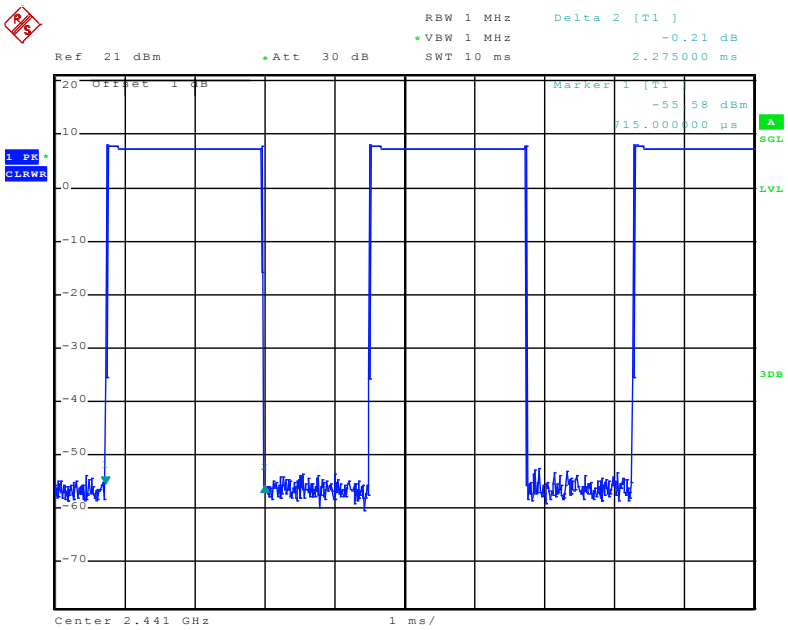
(Plot 3.8.3.B2: Channel 39: 2441MHz @ π/4DQPSK @ DH3)



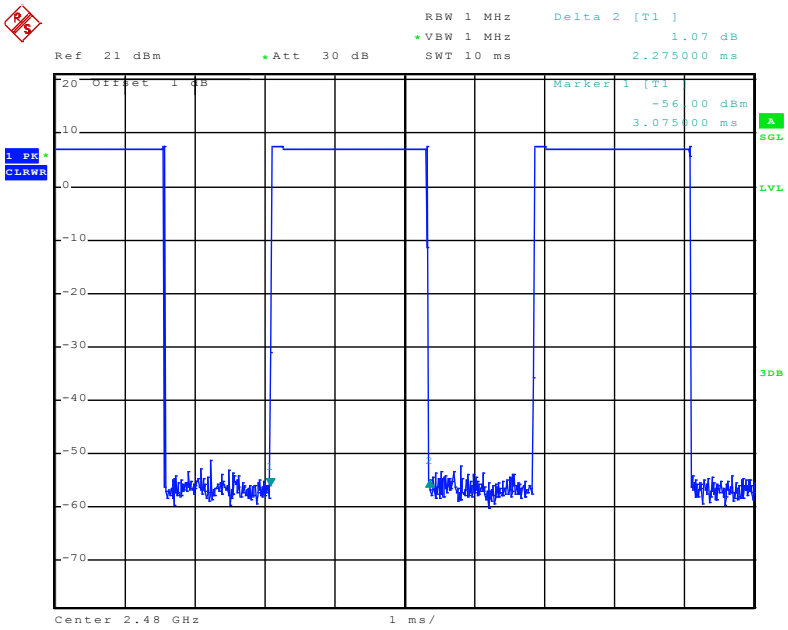
(Plot 3.8.3.B3: Channel 78: 2480MHz @ π/4DQPSK @ DH3)



(Plot 3.8.3.C1: Channel 00: 2402MHz @ π/4DQPSK @ DH5)



(Plot 3.8.3.C2: Channel 39: 2441MHz @ π/4DQPSK @ DH5)



(Plot 3.8.3.C3: Channel 78: 2480MHz @ π/4DQPSK @ DH5)

3.9Spurious RF Conducted Emission

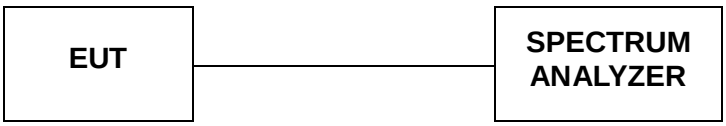
3.9.1 Limit

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

3.9.2 Test Procedure

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2009 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBM= 300KHz to measure the peak field strength , and measurement frequeny range from 30MHz to 26.5GHz.

3.9.3 Test Configuration



3.9.4 Test Results

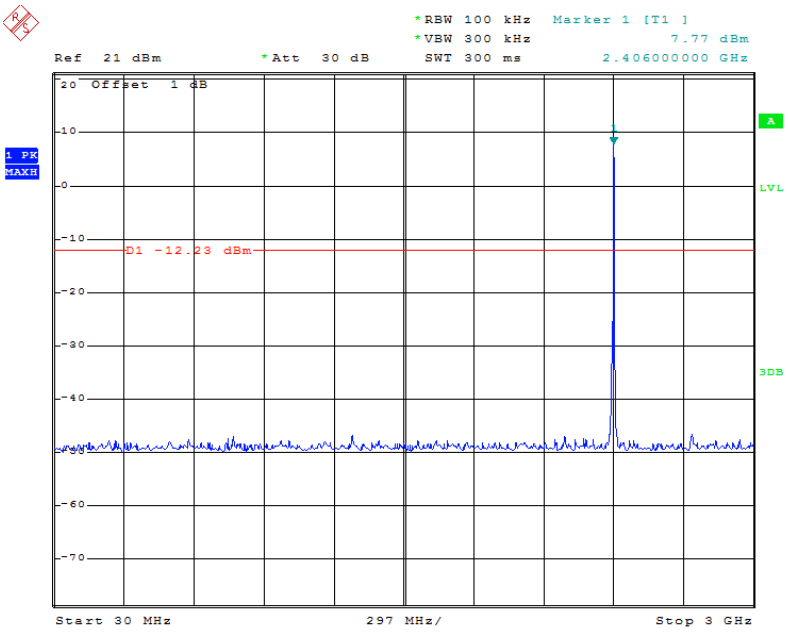
GFSK Test Mode

A. Test Verdict

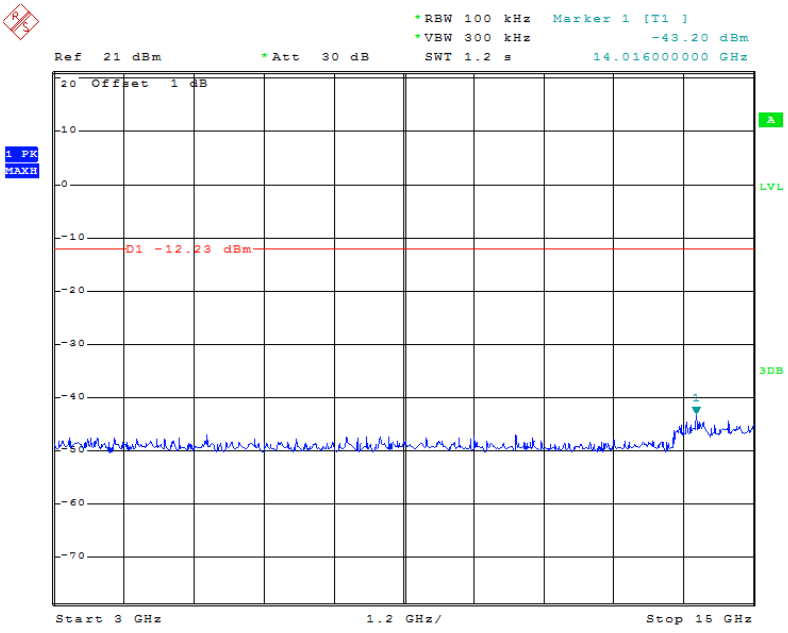
Channel	Frequency (MHz)	Frequency Range (MHz)	Refer to Plot	Limit (dBc)	Verdict
00	2402	30-3000	Plot 3.9.1 A1	-20	PASS
		3000-15000	Plot 3.9.1 A2	-20	PASS
		15000-26000	Plot 3.9.1 A3	-20	PASS
39	2441	30-3000	Plot 3.9.1 B1	-20	PASS
		3000-15000	Plot 3.9.1 B2	-20	PASS
		15000-26000	Plot 3.9.1 B3	-20	PASS
78	2480	30-3000	Plot 3.9.1 C1	-20	PASS
		3000-15000	Plot 3.9.1 C2	-20	PASS
		15000-26000	Plot 3.9.1 C3	-20	PASS

Note: 1. The test results including the cable lose.

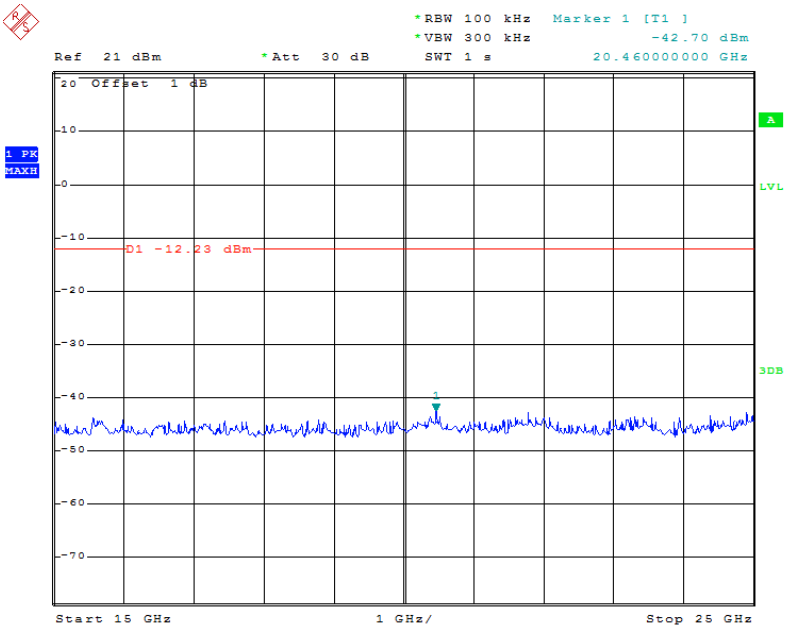
B. Test Plots



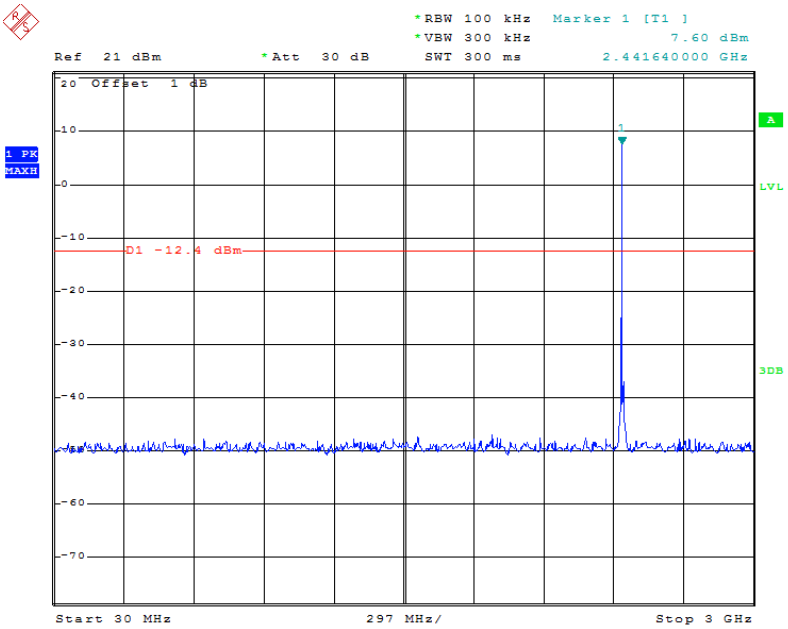
(Plot 3.9.1.A1: Channel 00: 2402MHz @ GFSK)



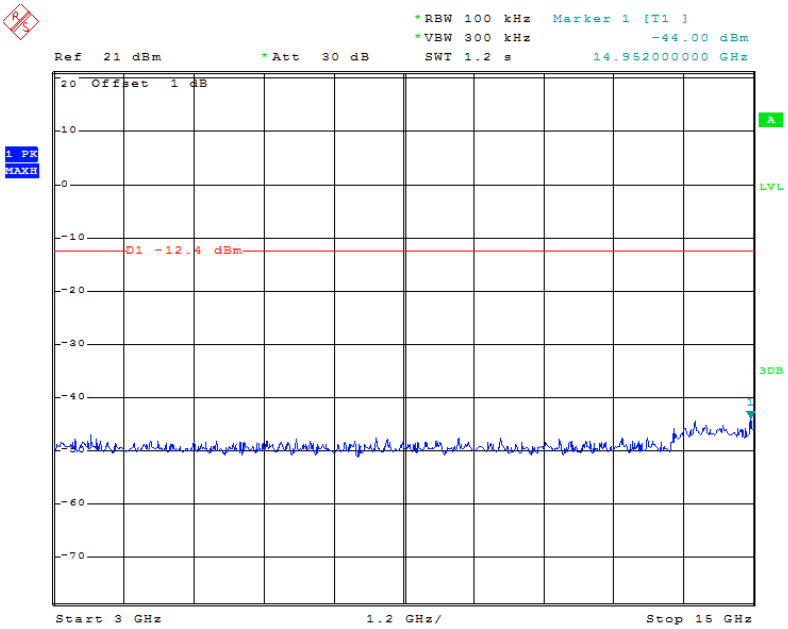
(Plot 3.9.1.A2: Channel 00: 2402MHz @ GFSK)



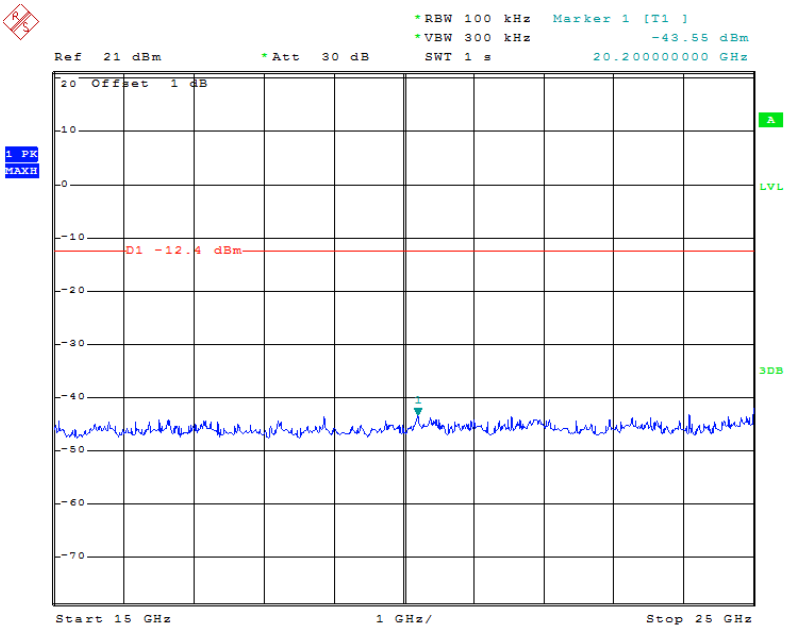
(Plot 3.9.1.A3: Channel 00: 2402MHz @ GFSK)



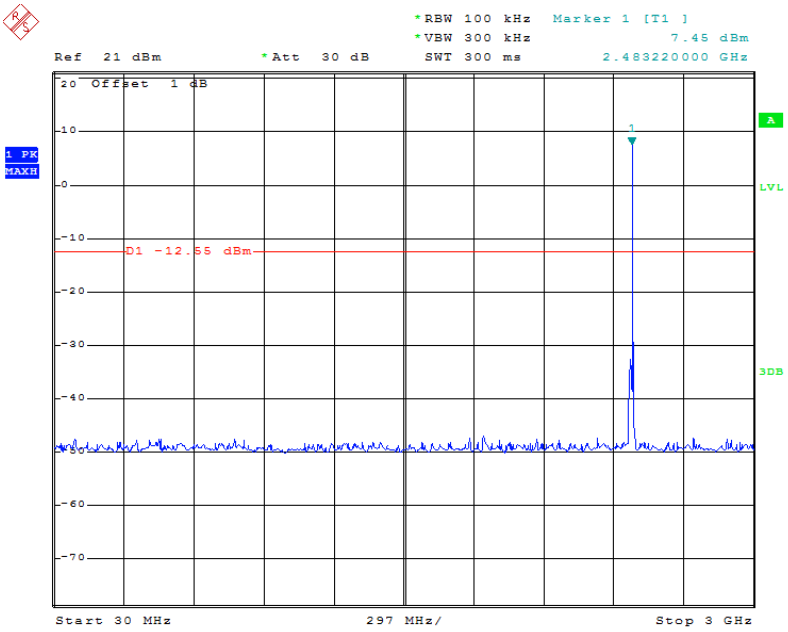
(Plot 3.9.1.B1: Channel 39: 2441MHz @ GFSK)



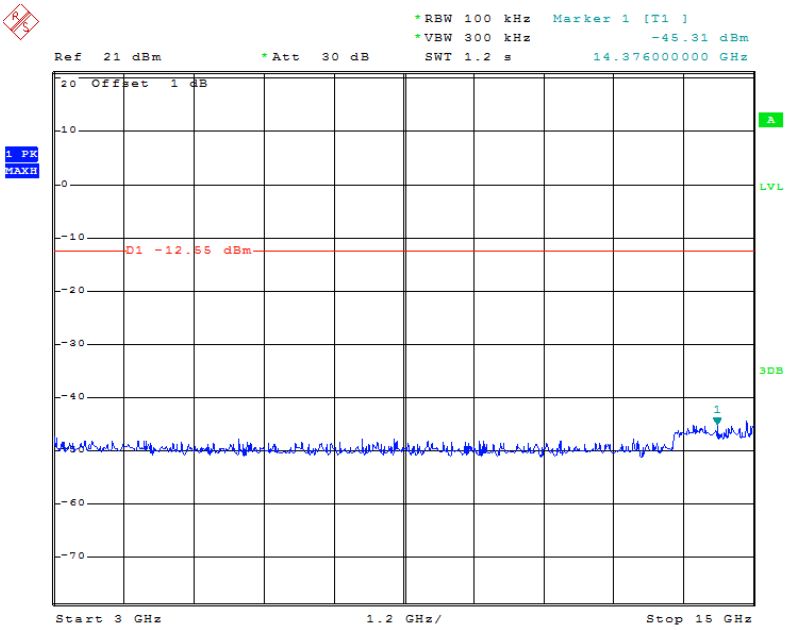
(Plot 3.9.1.B2: Channel 39: 2441MHz @ GFSK)



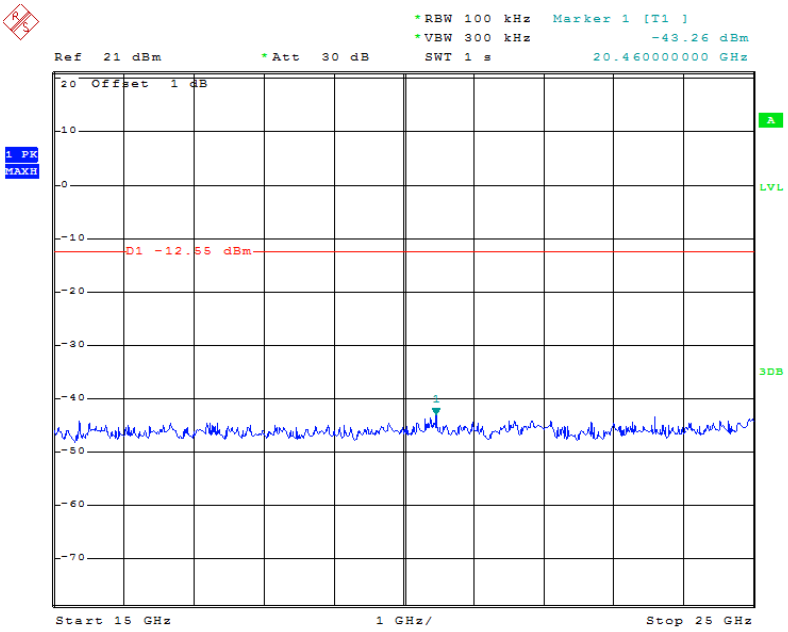
(Plot 3.9.1.B3: Channel 39: 2441MHz @ GFSK)



(Plot 3.9.1.C1: Channel 78: 2480MHz @ GFSK)



(Plot 3.9.1.C2: Channel 78: 2480MHz @ GFSK)



(Plot 3.9.1.C3: Channel 78: 2480MHz @ GFSK)

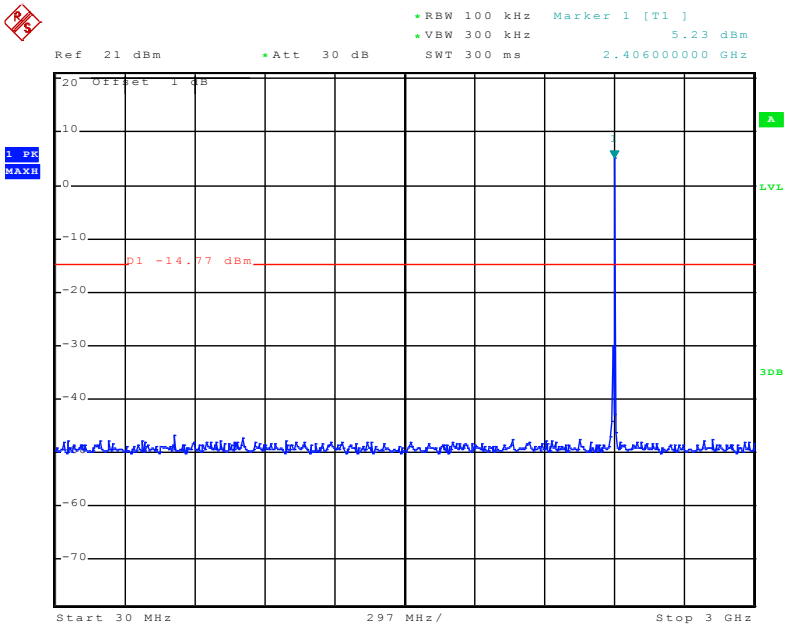
8DPSK Test Mode

A. Test Verdict

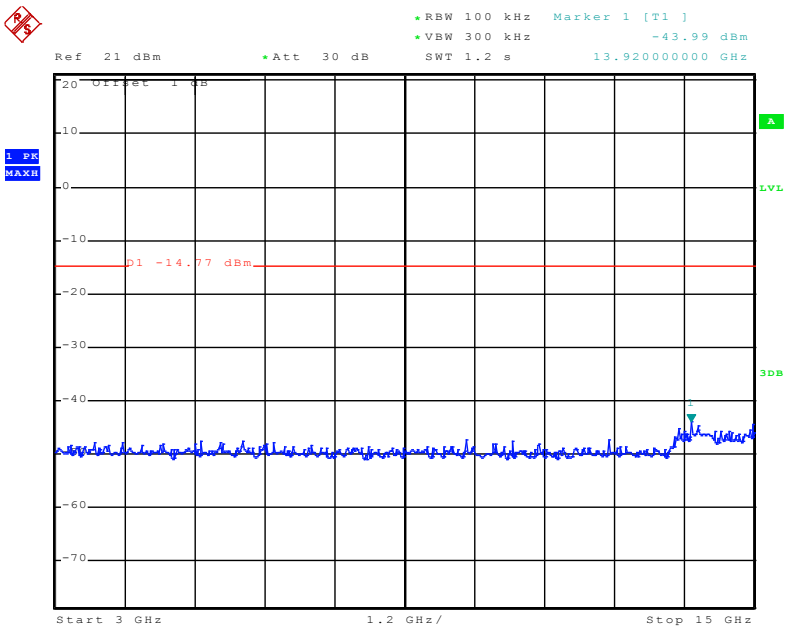
Channel	Frequency (MHz)	Frequency Range (MHz)	Refer to Plot	Limit (dBc)	Verdict
00	2402	30-3000	Plot 3.9.2 A1	-20	PASS
		3000-15000	Plot 3.9.2 A2	-20	PASS
		15000-26000	Plot 3.9.2 A3	-20	PASS
39	2441	30-3000	Plot 3.9.2 B1	-20	PASS
		3000-15000	Plot 3.9.2 B2	-20	PASS
		15000-26000	Plot 3.9.2 B3	-20	PASS
78	2480	30-3000	Plot 3.9.2 C1	-20	PASS
		3000-15000	Plot 3.9.2 C2	-20	PASS
		15000-26000	Plot 3.9.2 C3	-20	PASS

Note: 1. The test results including the cable lose.

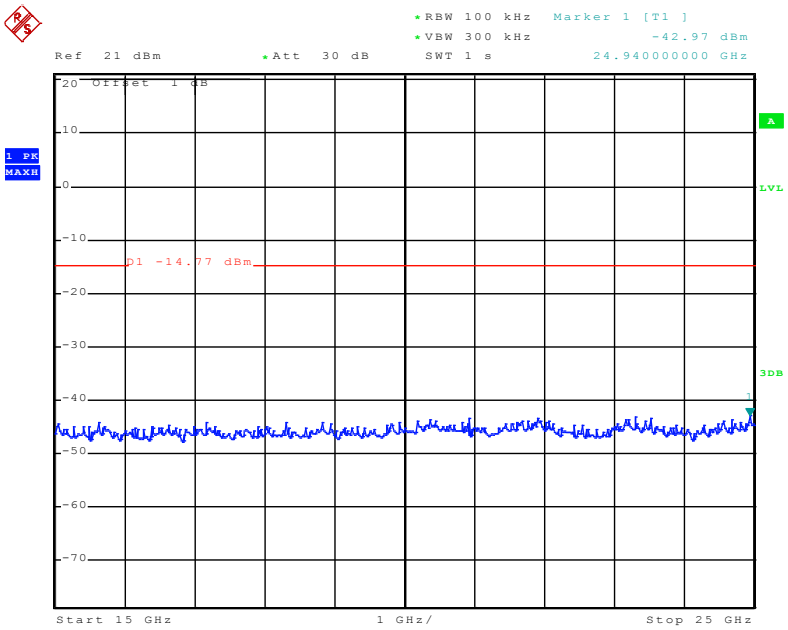
B. Test Plots



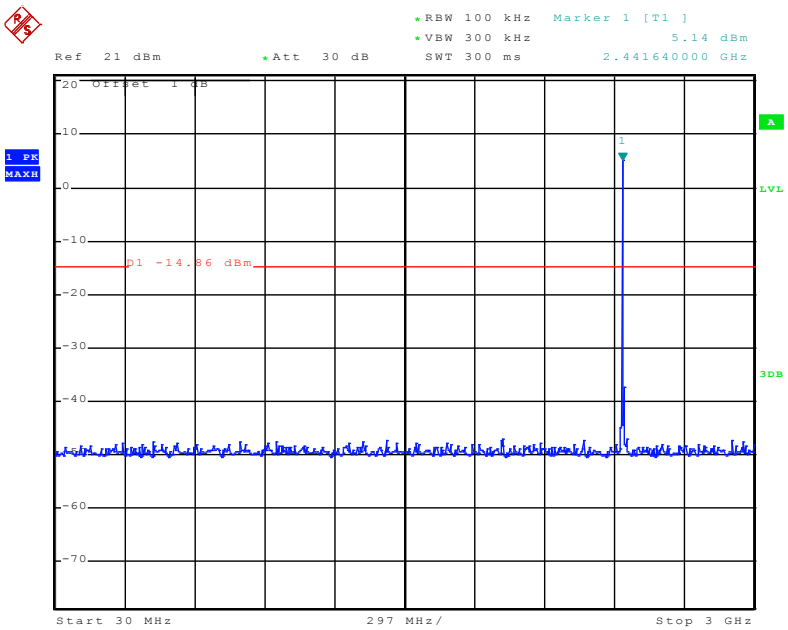
(Plot 3.9.2.A1: Channel 00: 2402MHz @ 8DPSK)



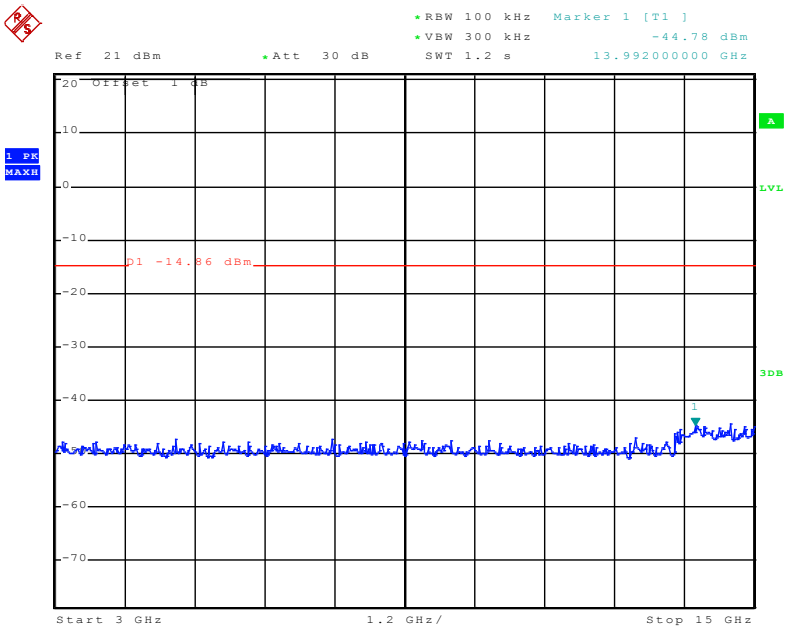
(Plot 3.9.2.A2: Channel 00: 2402MHz @ 8DPSK)



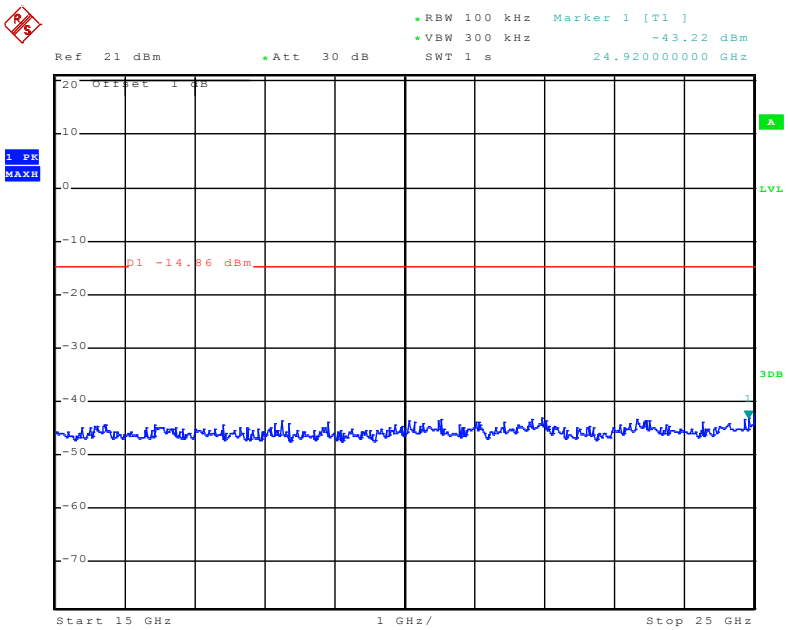
(Plot 3.9.2.A3: Channel 00: 2402MHz @ 8DPSK)



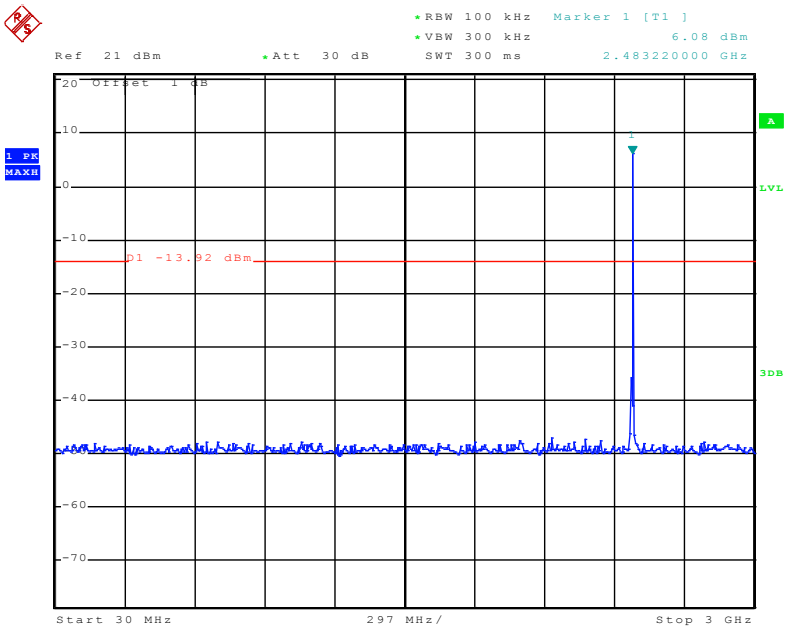
(Plot 3.9.2.B1: Channel 39: 2441MHz @ 8DPSK)



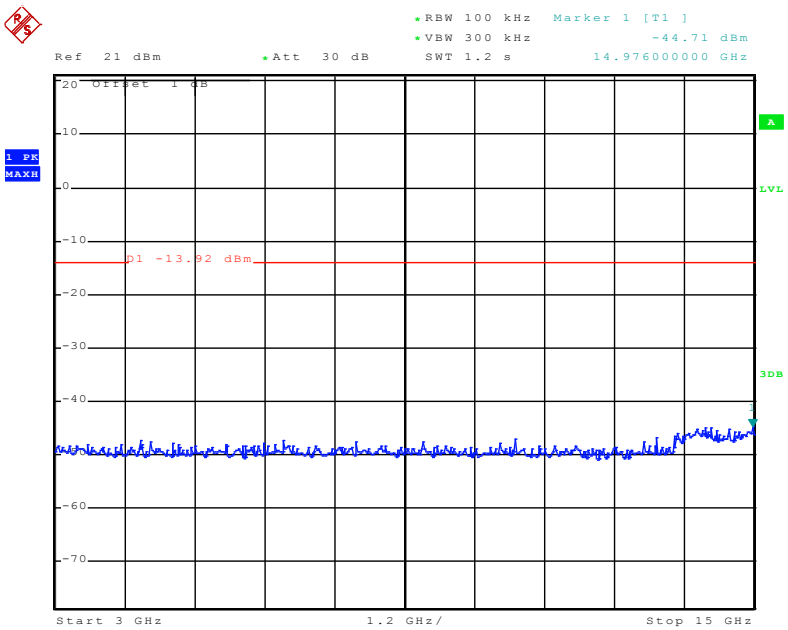
(Plot 3.9.2.B2: Channel 39: 2441MHz @ 8DPSK)



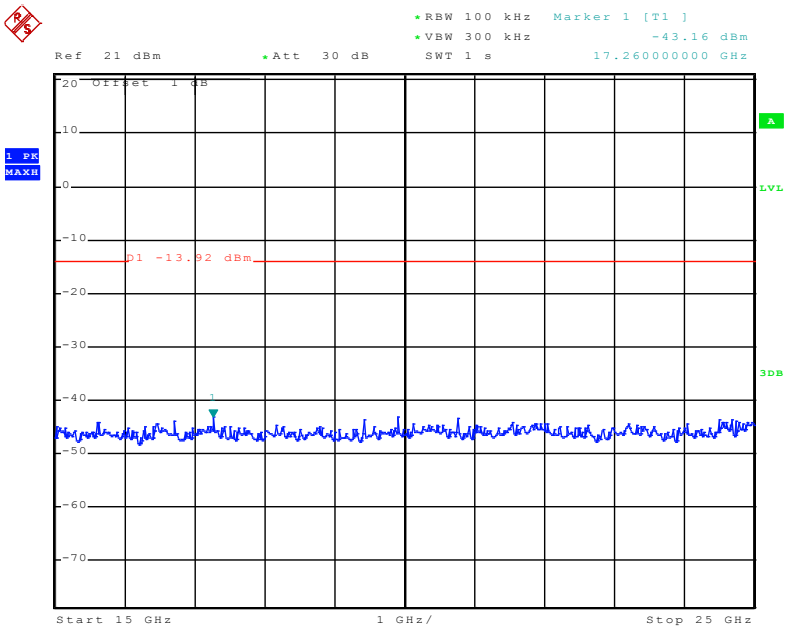
(Plot 3.9.2.B3: Channel 39: 2441MHz @ 8DPSK)



(Plot 3.9.2.C1: Channel 78: 2480MHz @ 8DPSK)



(Plot 3.9.2.C2: Channel 78: 2480MHz @ 8DPSK)



(Plot 3.9.2.C3: Channel 78: 2480MHz @ 8DPSK)

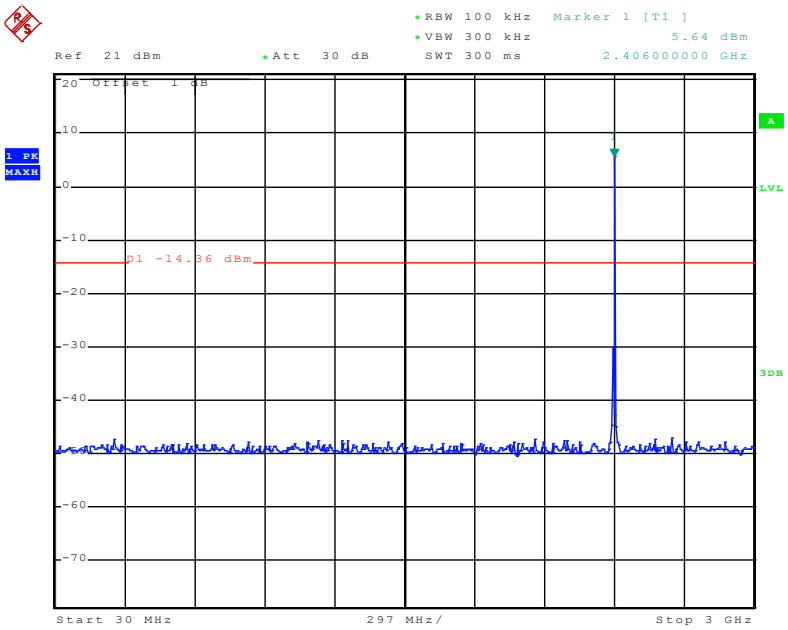
π/4DQPSK Test Mode

A. Test Verdict

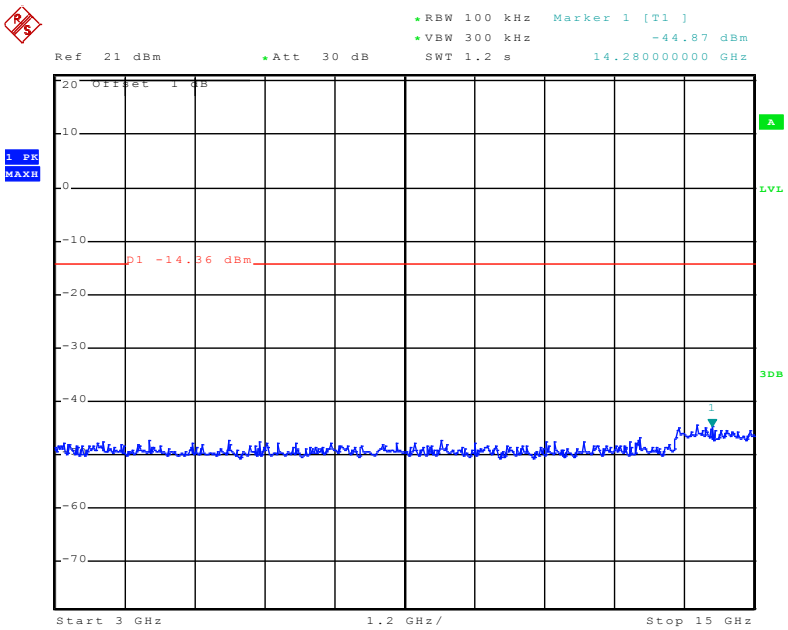
Channel	Frequency (MHz)	Frequency Range (MHz)	Refer to Plot	Limit (dBc)	Verdict
00	2402	30-3000	Plot 3.9.3 A1	-20	PASS
		3000-15000	Plot 3.9.3 A2	-20	PASS
		15000-26000	Plot 3.9.3 A3	-20	PASS
39	2441	30-3000	Plot 3.9.3 B1	-20	PASS
		3000-15000	Plot 3.9.3 B2	-20	PASS
		15000-26000	Plot 3.9.3 B3	-20	PASS
78	2480	30-3000	Plot 3.9.3 C1	-20	PASS
		3000-15000	Plot 3.9.3 C2	-20	PASS
		15000-26000	Plot 3.9.3 C3	-20	PASS

Note: 1. The test results including the cable lose.

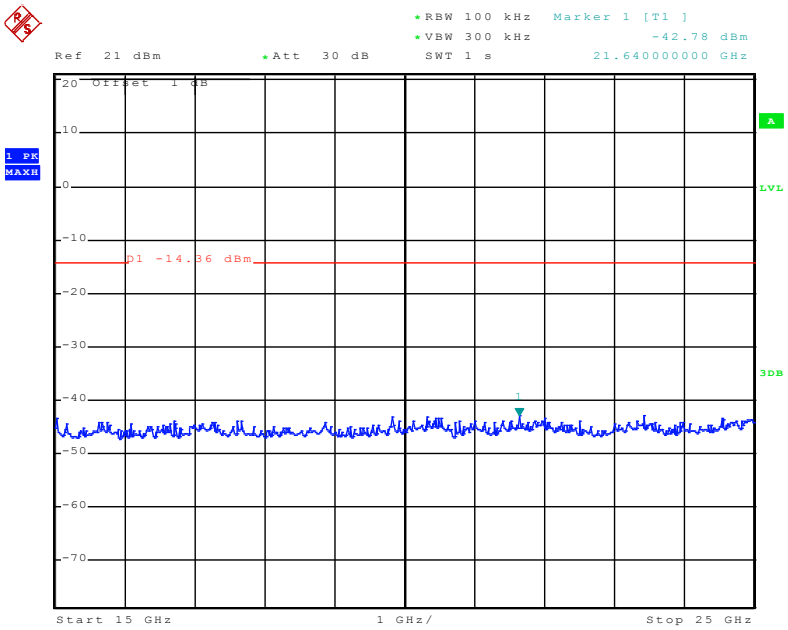
B. Test Plots



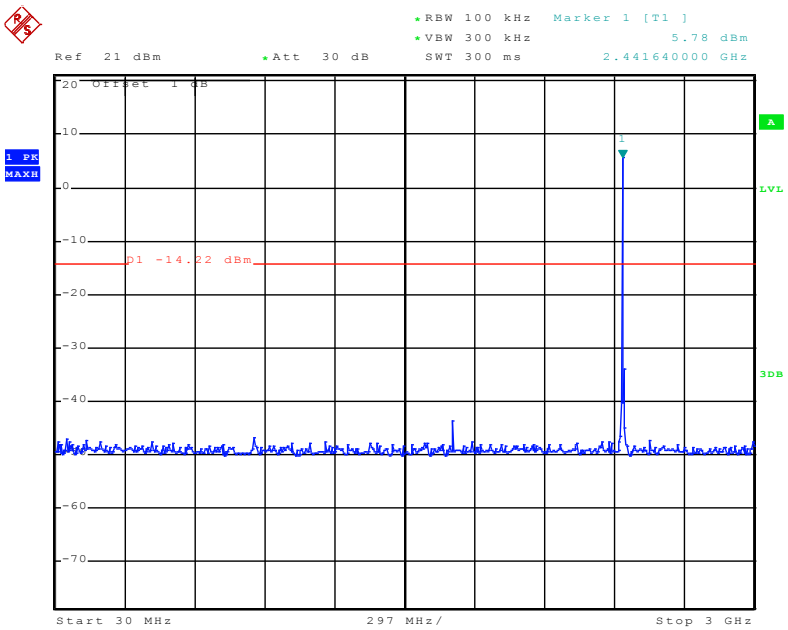
(Plot 3.9.3.A1: Channel 00: 2402MHz @ π/4DQPSK)



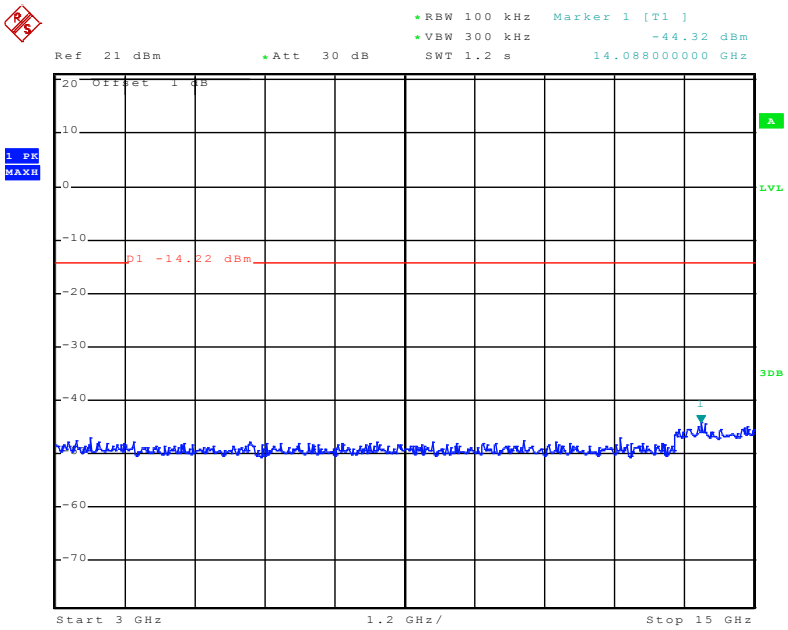
(Plot 3.9.3.A2: Channel 00: 2402MHz @ π/4DQPSK)



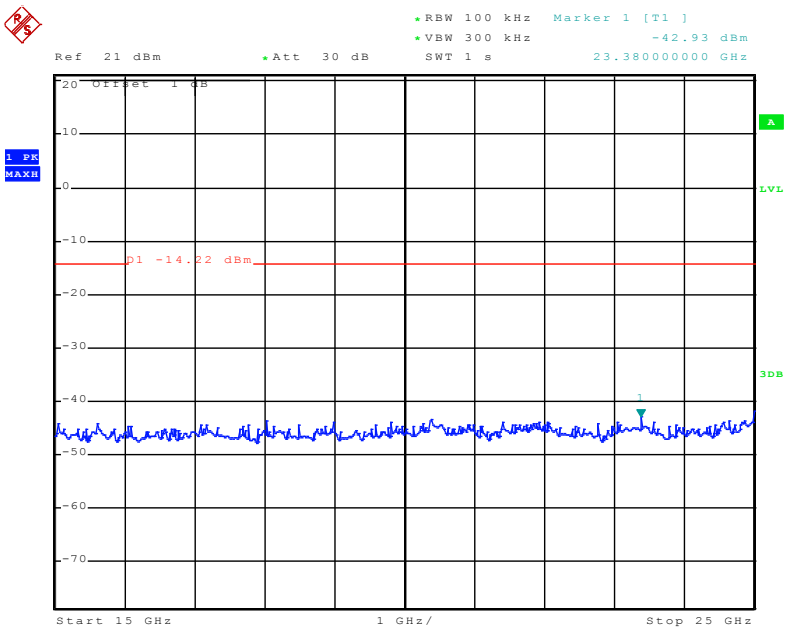
(Plot 3.9.3.A3: Channel 00: 2402MHz @ π/4DQPSK)



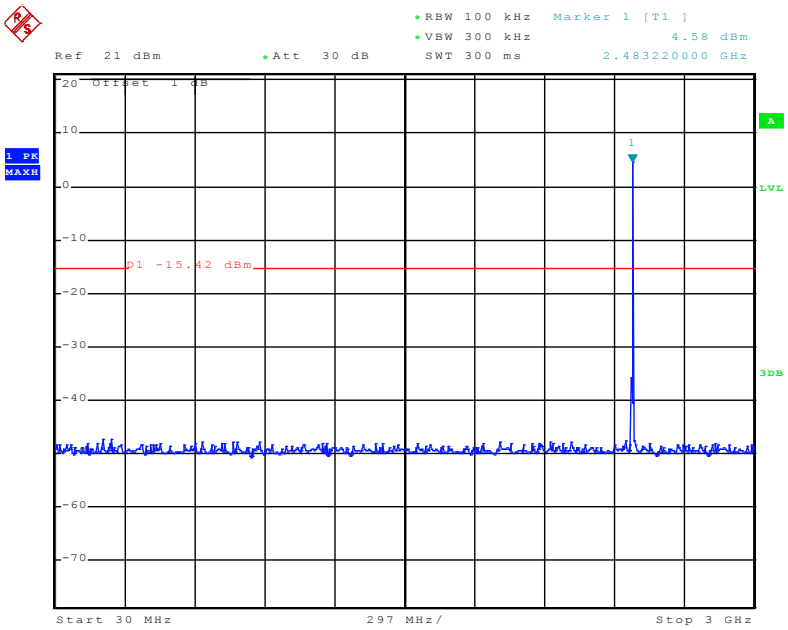
(Plot 3.9.3.B1: Channel 39: 2441MHz @ π/4DQPSK)



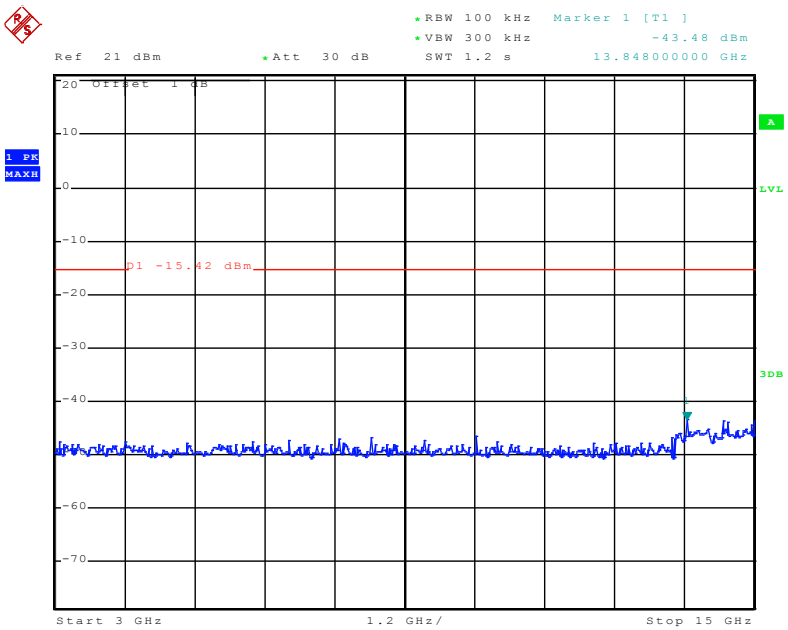
(Plot 3.9.3.B2: Channel 39: 2441MHz @ π/4DQPSK)



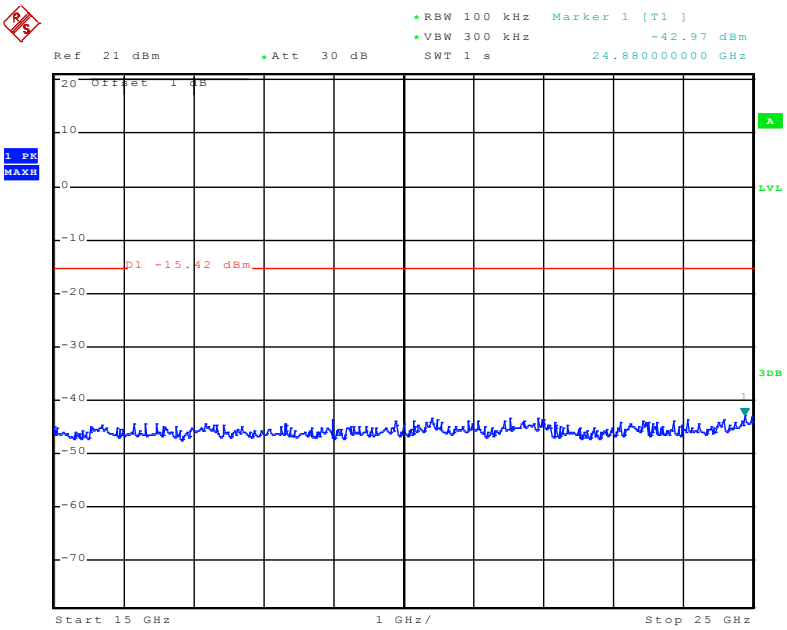
(Plot 3.9.3.B3: Channel 39: 2441MHz @ π/4DQPSK)



(Plot 3.9.3.C1: Channel 78: 2480MHz @ π/4DQPSK)



(Plot 3.9.3.C2: Channel 78: 2480MHz @ π/4DQPSK)



(Plot 3.9.3.C3: Channel 78: 2480MHz @ π/4DQPSK)

3.10 Pseudorandom Frequency Hopping Sequence

TEST APPLICABLE

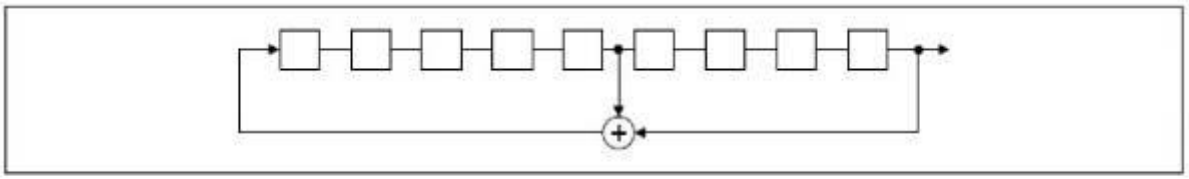
For 47 CFR Part 15C section 15.247 (a)(1) requirement:

Frequency hopping systems shall have hopping channel carrier fre-quencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hop-ping channel, whichever is greater. Al-ternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier fre-quencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to chan-nel frequencies that are selected at the system hopping rate from a pseudo ran-domly ordered list of hopping fre-quencies. Each frequency must be used equally on the average by each trans-mitter. The system receivers shall have input bandwidths that match the hop-ping channel bandwidths of their cor-responding transmitters and shall shift frequencies in synchronization with the transmitted signals.

EUT Pseudorandom Frequency Hopping Sequence Requirement

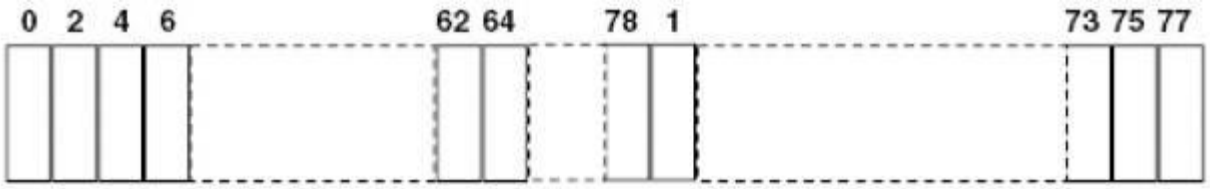
The pseudorandom frequency hopping sequence may be generated in a nice-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage.And the result is fed back to the input of the frist stage.The sequence begins with the frist one of 9 consecutive ones,for example:the shift register is initialized with nine ones.

- Number of shift register stages:9
- Length of pseudo-random sequence:29-1=511 bits
- Longest sequence of zeros:8(non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An explame of pseudorandom frequency hopping sequence as follows:



Each frequency used equally one the average by each transmitter.
The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitter and shift frequencies in synchronization with the transmitted signals.

3.11 Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

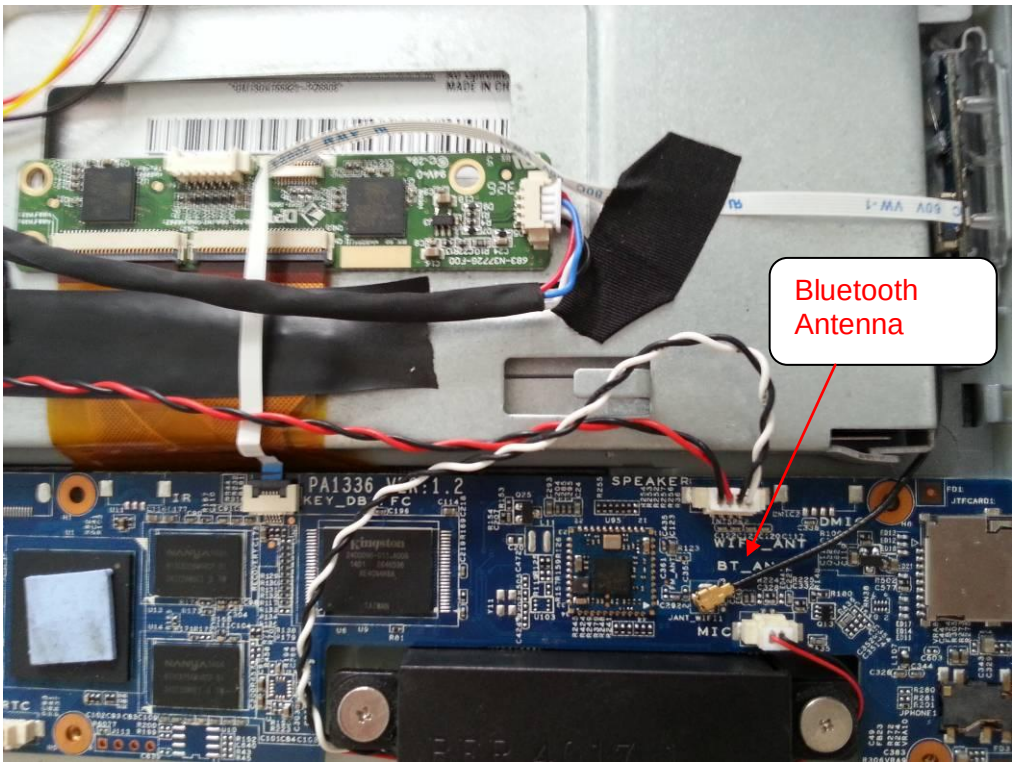
And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

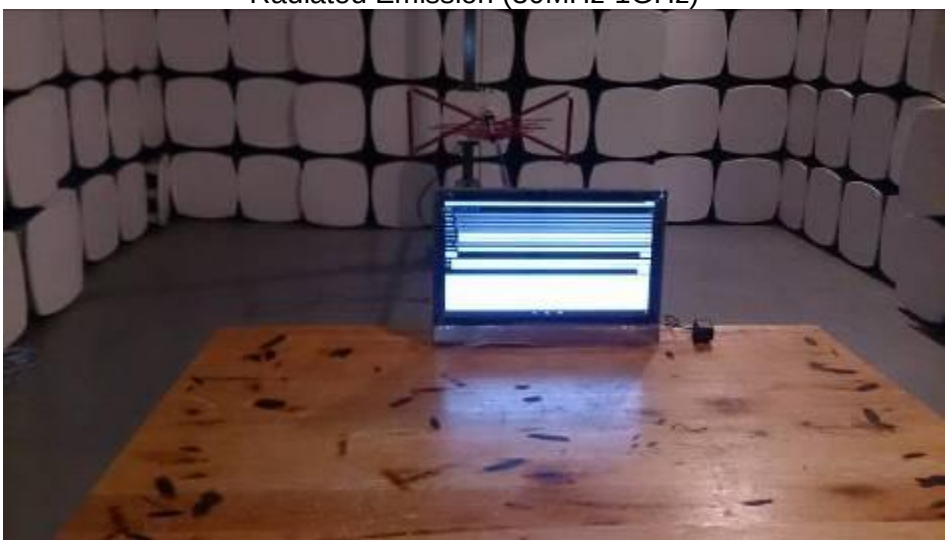
Antenna Connected Construction

The WLAN and Bluetooth Share same antenna and the maximum antenna gain of Bluetooth uesed was 2.3dBi.

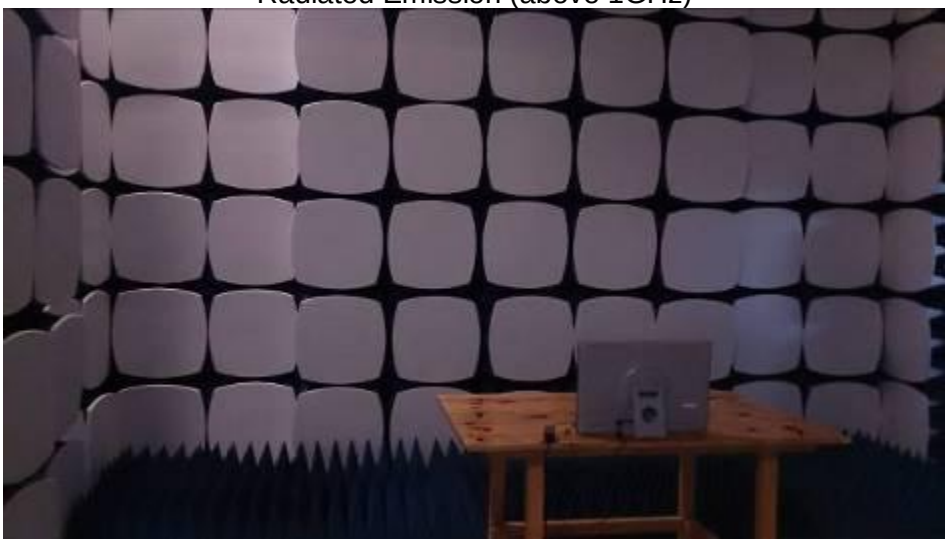


4. EUT TEST PHOTO

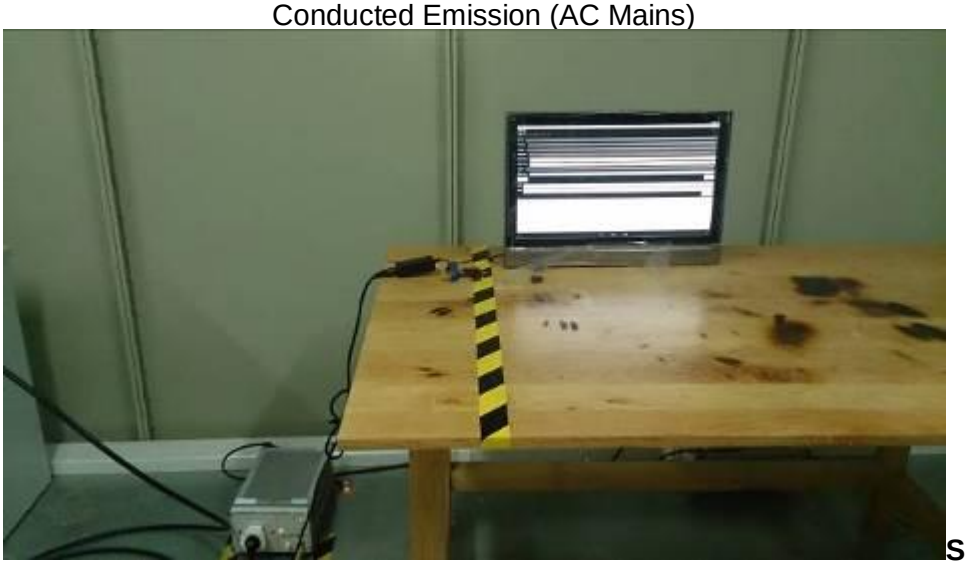
Radiated Emission (30MHz-1GHz)



Radiated Emission (above 1GHz)



Conducted Emission (AC Mains)

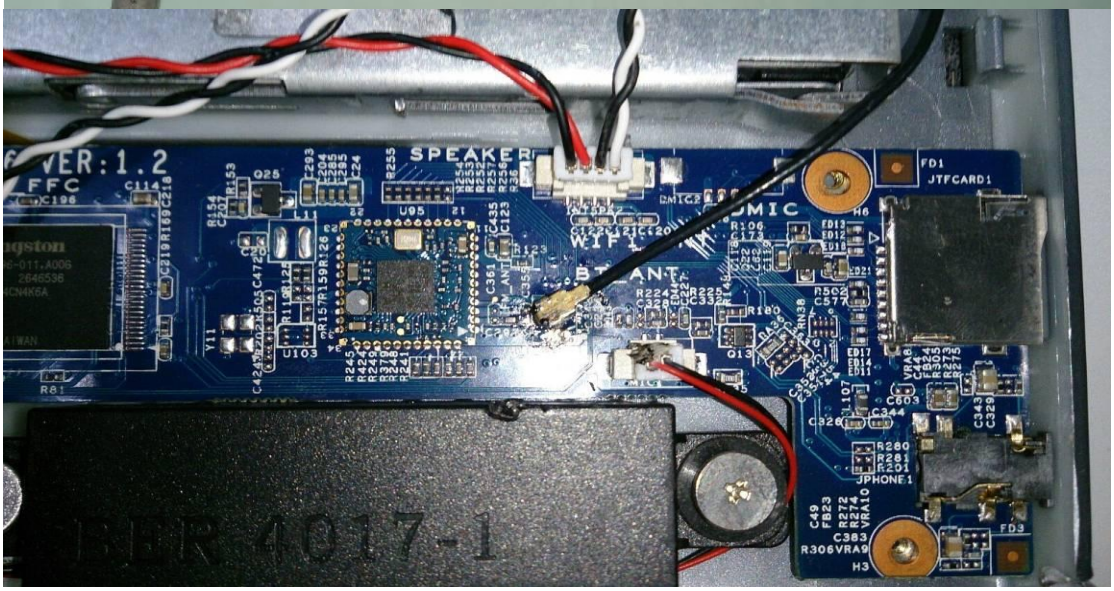


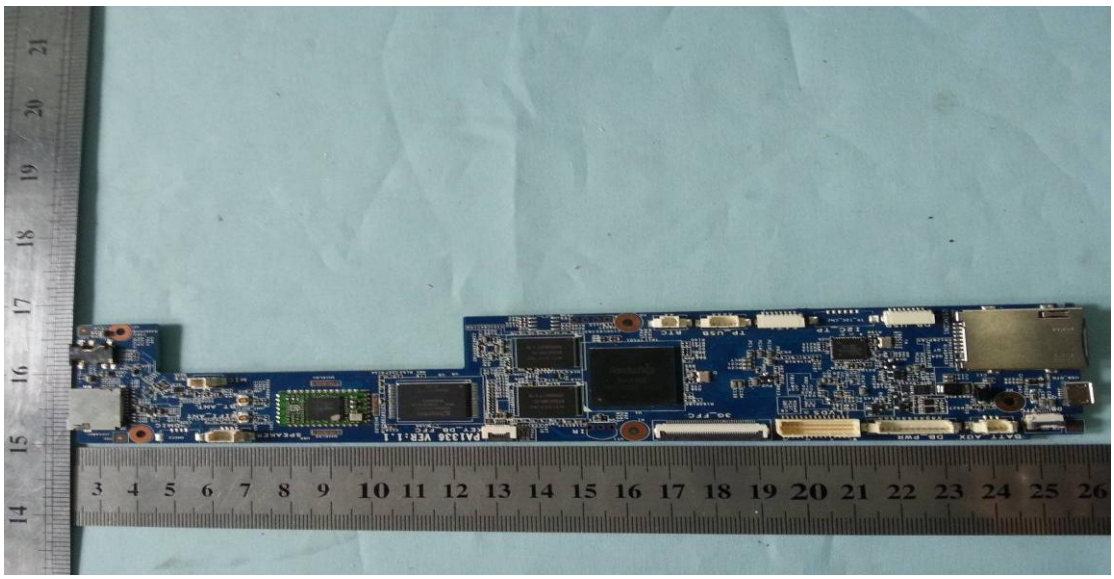
S

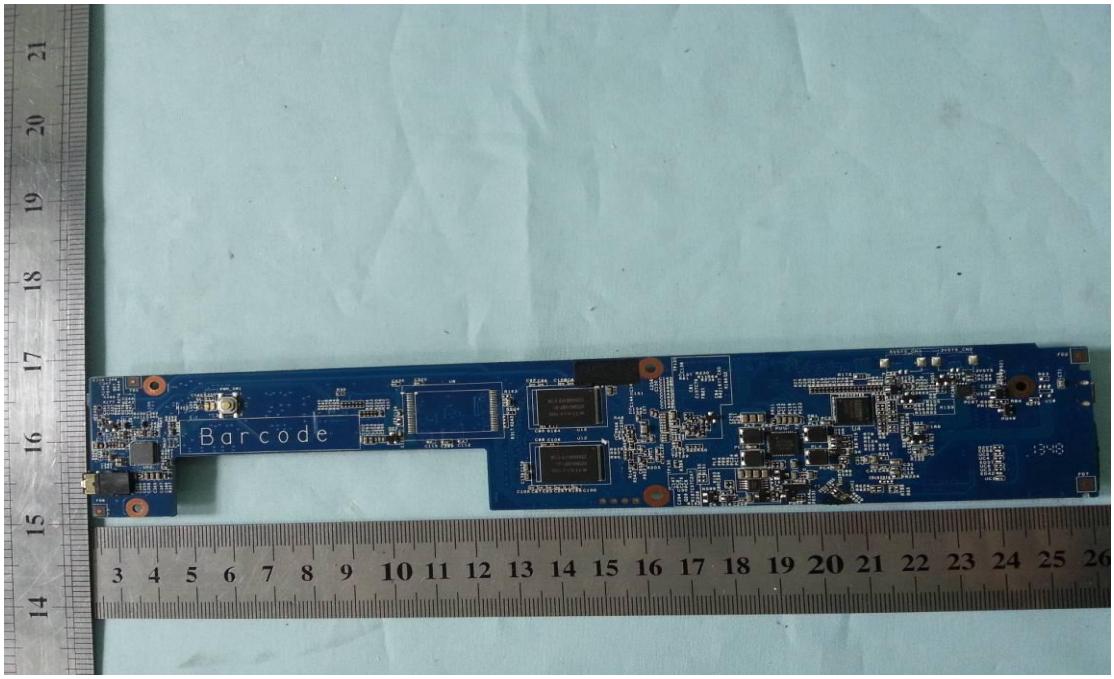
5 APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

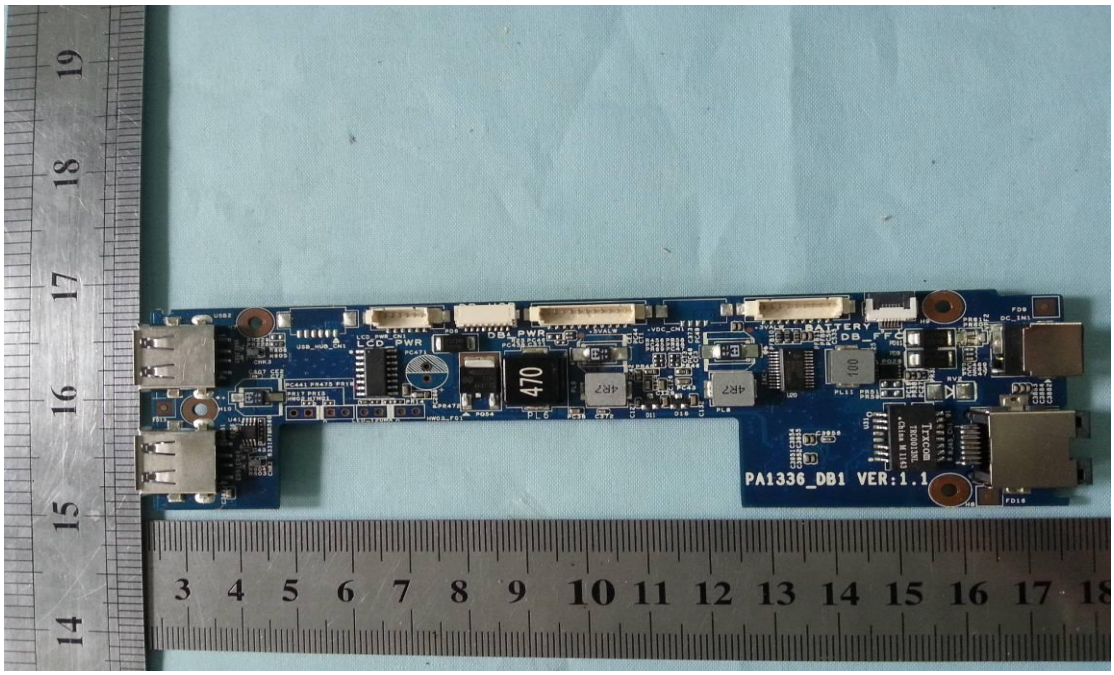
External photos of EUT

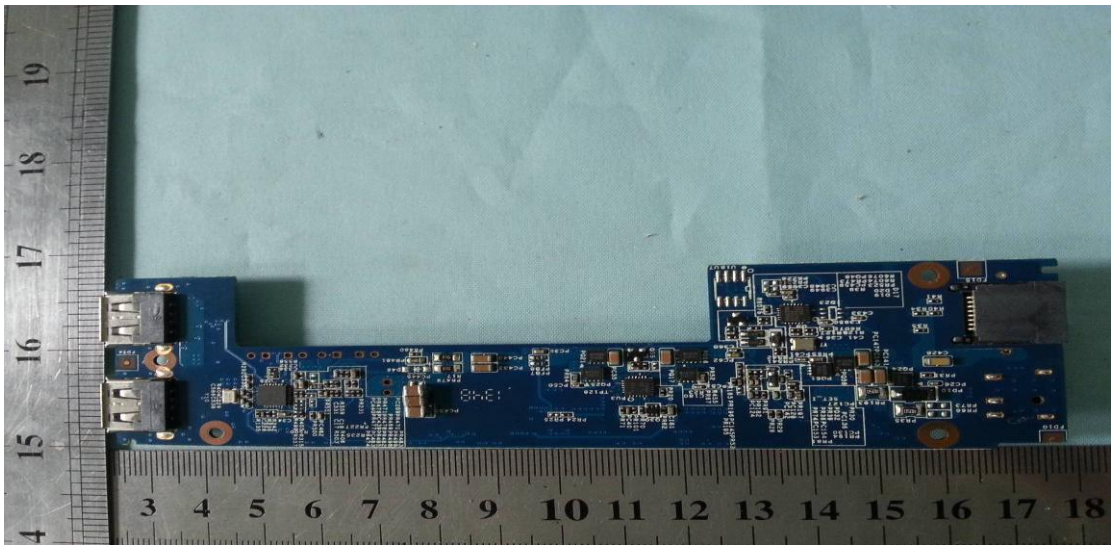
Internal photos of EUT

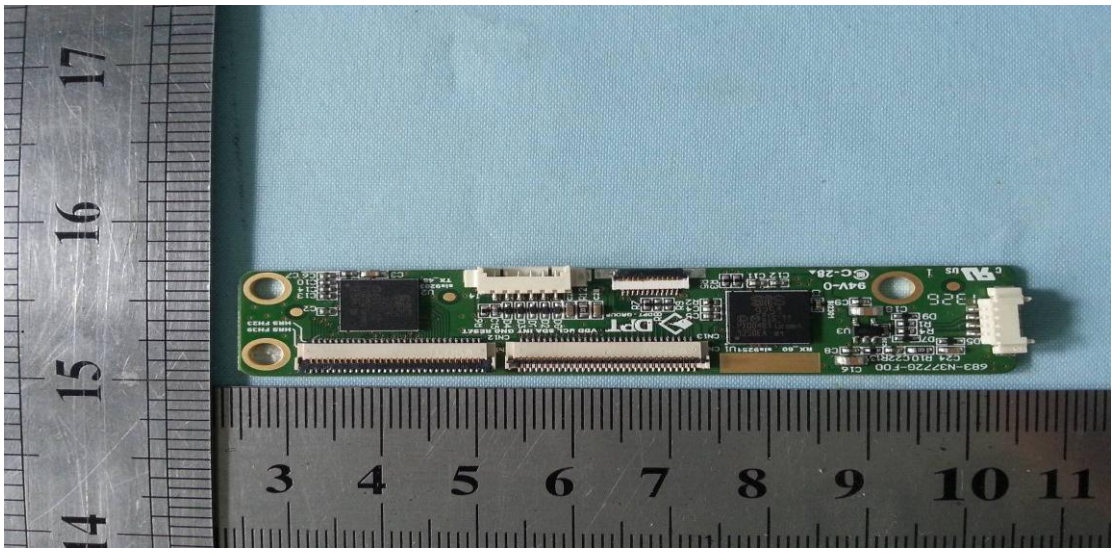


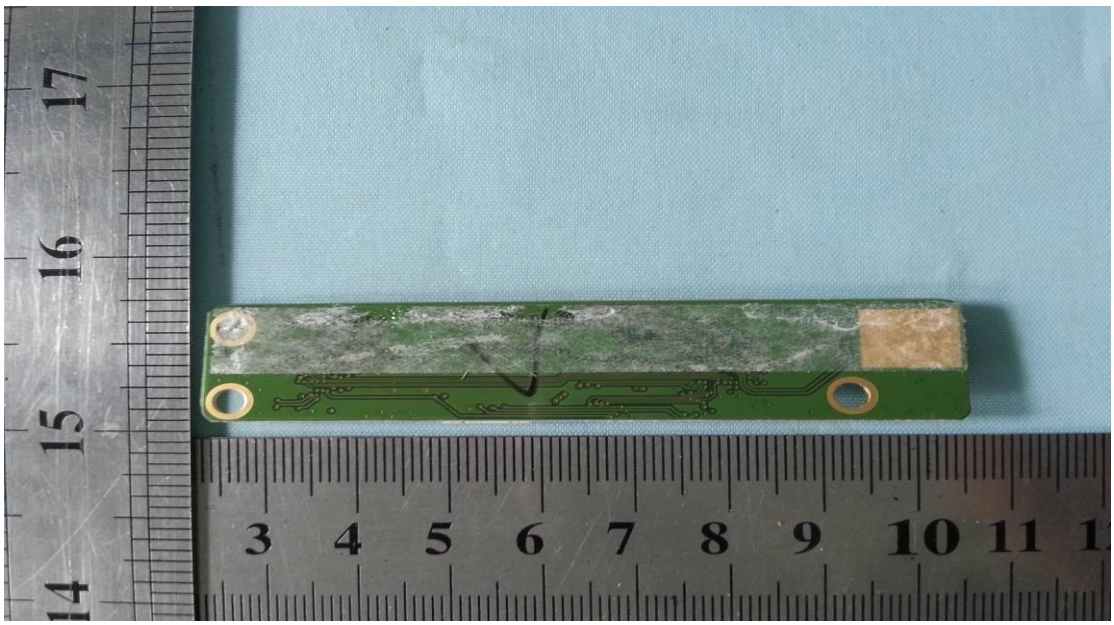


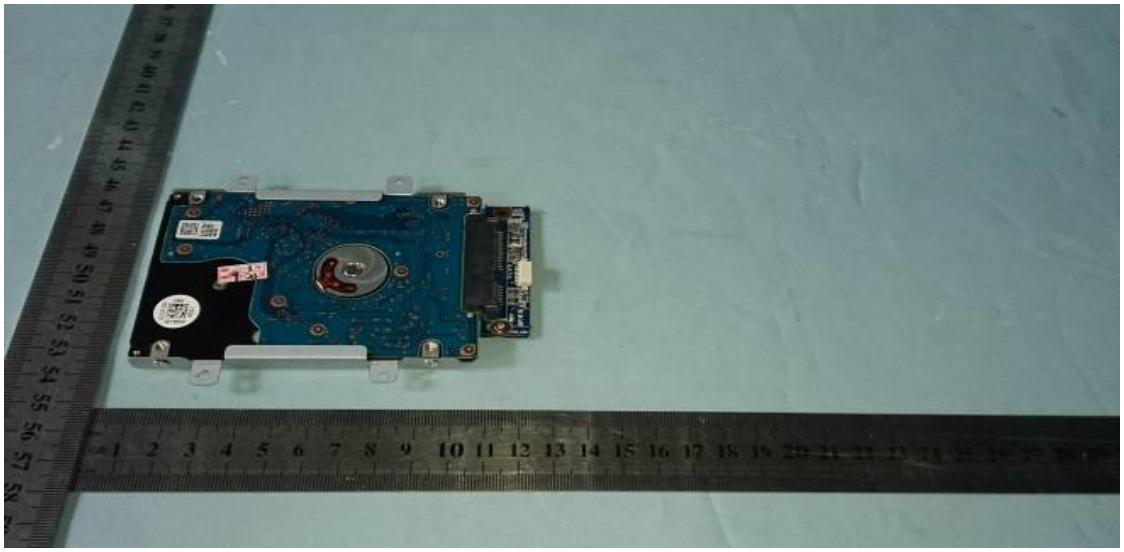

Barcode


PA1336_DB1 VER:1.1









**************************THE END**************************