

FCC PART 15C TEST REPORT FOR CERTIFICATION

On Behalf of

Soundlab Technology Company Limited

Soundbar

Model Number: Klipsch Cinema 1200 Sound Bar

FCC ID: 2ATKO-BAR1200

Prepared for:	Soundlab Technology Company Limited
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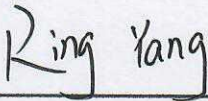
Report Number:	ESTE-R2008141
Date of Test:	Jul. 14~ Aug. 19, 2020
Date of Report:	Aug. 21, 2020

TABLE OF CONTENTS

Description	Page
TEST REPORT VERIFICATION	3
1. GENERAL INFORMATION.....	5
1.1. Description of Device (EUT)	5
1.2. Antenna Information	5
2. SUMMARY OF TEST	6
2.1. Summary of test result.....	6
2.2. Test Facilities.....	7
2.3. Measurement uncertainty	8
2.4. Assistant equipment used for test.....	8
2.5. Block Diagram.....	8
2.6. Test mode	9
2.7. Channel List.....	10
2.8. Power Setting of Test Software.....	10
2.9. Test Equipmen.....	11
3. MAXIMUM PEAK OUTPUT POWER.....	12
3.1. Limit.....	12
3.2. Test Setup	12
3.3. Spectrum Analyzer Setting.....	12
3.4. Test Procedure	12
3.5. Test Result	13
4. 20 DB BANDWIDTH	20
4.1. Limit.....	20
4.2. Test Setup	20
4.3. Spectrum Analyzer Setting.....	20
4.4. Test Procedure	20
4.5. Test Result	21
5. CARRIER FREQUENCY SEPARATION.....	28
5.1. Limit	28
5.2. Test Setup	28
5.3. Spectrum Analyzer Setting.....	28
5.4. Test Procedure	28
5.5. Test Result	29
6. NUMBER OF HOPPING CHANNEL	36
6.1. Limit	36
6.2. Test Setup	36
6.3. Spectrum Analyzer Setting.....	36
6.4. Test Procedure	36
6.5. Test Result	37
7. DWELL TIME.....	40
7.1. Limit	40
7.2. Test Setup	40
7.3. Spectrum Analyzer Setting.....	40
7.4. Test Procedure	40
7.5. Test Result	41

8.	CONDUCTED BAND EDGE	48
8.1.	Limit	48
8.2.	Test Setup	48
8.3.	Spectrum Analyzer Setting	48
8.4.	Test Procedure	48
8.5.	Test Result	49
9.	CONDUCTED SPURIOUS EMISSIONS	53
9.1.	Limit	53
9.2.	Test Setup	53
9.3.	Spectrum Analyzer Setting	53
9.4.	Test Procedure	53
9.5.	Test Result	54
10.	RADIATED SPURIOUS EMISSIONS AND BAND EDGE	57
10.1.	Limit	57
10.2.	Test Setup	58
10.3.	Spectrum Analyzer Setting	59
10.4.	Test Procedure	60
10.5.	Test Result	61
11.	AC POWER LINE CONDUCTED EMISSIONS	73
11.1.	Limit	73
11.2.	Test Setup	73
11.3.	Spectrum Analyzer Setting	73
11.4.	Test Procedure	73
11.5.	Test Result	74
12.	ANTENNA REQUIREMENTS	78
12.1.	Limit	78
12.2.	Test Result	78
13.	TEST SETUP PHOTO	79
14.	EUT PHOTO	81

EST Technology Co., Ltd.

Applicant:	Soundlab Technology Company Limited		
Address:	No.101,202,Building 1, Microlab Industrial Park, No.2 Baozi South Road, Kengzi, Pingshan District, ShenZhen, China		
Manufacturer:	Klipsch Group Inc.		
Address:	3502 Woodview Trace, Indianapolis, IN 46268		
E.U.T:	Soundbar		
Model Number:	Klipsch Cinema 1200 Sound Bar		
Power Supply:	AC 100~240V~ 50/60Hz		
Trade Name:	Klipsch	Serial No.:	-----
Date of Receipt:	Jul. 14, 2020	Date of Test:	Jul. 14~ Aug. 19, 2020
Test Specification:	FCC Part 15 Subpart C (15.247) ANSI C63.10:2013 FCC KDB 558074 D01 15.247 Meas Guidance v05r02		
Test Result:	The device described above is tested by EST Technology Co., Ltd. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd.		
Prepared by:		Reviewed by:	
 Ring Yang / Assistant		 Seven Wang / Engineer	
		Date: Aug 21, 2020 Approved by:  Iceman Hu / Manager	
Other Aspects:			
None.			
<i>Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested</i>			
<i>This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.</i>			

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name	:	Soundbar
Model Number	:	Klipsch Cinema 1200 Sound Bar
Software Version	:	V28
Hardware Version	:	V1.0.
Operation frequency	:	2402MHz~2480MHz
Number of channel	:	79
Max Output Power (PEAK)	:	6.55dBm
Modulation Type	:	BT BDR(1Mbps): GFSK BT EDR(2Mbps): $\pi/4$ -DQPSK BT EDR(3Mbps): 8-DPSK
Sample Type	:	Prototype production

Note:

For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

1.2. Antenna Information

Ant No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Internal	N/A	2.34
2	N/A	N/A	Internal	N/A	2.34
Only one antenna transmission is supported, Simultaneous transmission is not supported.					

2. SUMMARY OF TEST

2.1. Summary of test result

Report Section	Description of Test Item	FCC Standard Section	Results
3	Maximum Peak Output Power	15.247(a)(1)	PASS
4	20dB Bandwidth	15.247(a)(1)	PASS
5	Carrier Frequency Separation	15.247(a)(1)	PASS
6	Number Of Hopping Channel	15.247(a)(1)(iii)	PASS
7	Dwell Time	15.247(a)(1)(iii)	PASS
8	Conducted Band Edge	15.247(d)	PASS
9	Conducted Spurious Emissions	15.247(d)	PASS
10	Radiated Spurious Emissions and Band Edge	15.205 15.209 15.247(d)	PASS
11	AC Power Line Conducted Emissions	15.207	PASS
12	Antenna Requirement	15.203	PASS

Note:

(1) "N/A" denotes test is not applicable in this test report

2.2. Test Facilities

EMC Lab : Certified by CNAS, CHINA
Registration No.: L5288
This Certificate is valid until: November 12, 2023

Certificated by FCC, USA
Designation Number: CN1215
This Certificate is valid until: January 31, 2022

Certificated by A2LA, USA
Registration No.: 4366.01
This Certificate is valid until: January 31, 2022

Certificated by Industry Canada
CAB identifier No.: CN0035
This Certificate is valid until: January 31, 2022

Certificated by VCCI, Japan
Registration No.: C-14103; T-20073; R-13663;
R-20103; G-20097
Date of registration: Apr. 20, 2020
This Certificate is valid until: Apr. 19, 2023

Certificated by TUV Rheinland, Germany
Registration No.: UA 50413872 0001
Date of registration: July 31, 2018

Certificated by Intertek
Registration No.: 2011-RTL-L2-64
Date of registration: November 08, 2018

Name of Firm : EST Technology Co., Ltd.

Site Location : Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

2.3. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	$\pm 3.48\text{dB}$
Uncertainty for spurious emissions test (30MHz-1GHz)	$\pm 4.60\text{ dB(Polarize: H)}$
	$\pm 4.68\text{ dB(Polarize: V)}$
Uncertainty for spurious emissions test (1GHz to 25GHz)	$\pm 4.96\text{dB}$
Uncertainty for radio frequency	7×10^{-8}
Uncertainty for conducted RF Power	0.20dB
Uncertainty for Power density test	0.26dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

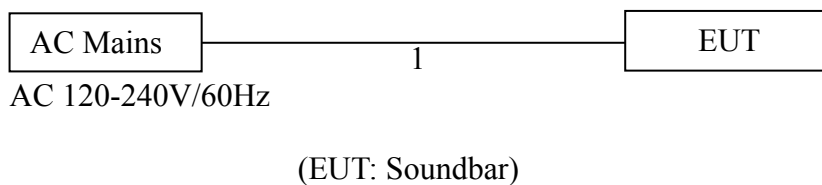
2.4. Assistant equipment used for test

Item	Equipment	Brand	Model Name/Type No.	FCC ID	Series No.
-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.5m	AC Cable

2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was beset into Bluetooth test mode by software before test.



2.6. Test mode

Combining all the rates, modulations, and packet types, the Pre-scans had been carried out. The worst case test mode was selected for the final test as listed below.

Test Item	Modulation Type	Operating Mode	Packet Type	Test Channel
Maximum Peak Output Power	GFSK&8-DPSK	Non Hopping	DH5	Low/Middle/High
20dB Bandwidth	GFSK&8-DPSK	Non Hopping	DH5	Low/Middle/High
Carrier Frequency Separation	GFSK&8-DPSK	Hopping	DH5	Low/Middle/High
Number Of Hopping Channel	GFSK&8-DPSK	Hopping	DH5	All Channel Hopping
Dwell Time	GFSK&8-DPSK	Hopping	DH1/DH3/DH5	Middle(All Channel Hopping)
Conducted Band Edge	GFSK&8-DPSK	Non Hopping	DH5	Low/ High& All Channel Hopping
Conducted Spurious Emissions	GFSK&8-DPSK	Non Hopping	DH5	Low/Middle/High
Radiated Spurious Emissions(Below 1GHz)	GFSK&8-DPSK	Non Hopping	DH5	Low/Middle/High
Radiated Spurious Emissions(Above 1GHz)	GFSK&8-DPSK	Non Hopping	DH5	Low/Middle/High
Radiated Band Edge	GFSK&8-DPSK	Non Hopping	DH5	Low/High
AC Power Line Conducted Emissions	GFSK&8-DPSK	Non Hopping	DH5	Low/Middle/High

Note:

1. In radiated measurement,the EUT had been pre-scan on the positioned of each 3 axis(X,Y,Z), the worst case was found when positioned on **X-plane**.

2.7. Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	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	-	-

2.8. Power Setting of Test Software

Software Name	SecureCRT 5.50		
Frequency(MHz)	2402	2441	2480
GFSK(1Mbps) Setting	Default	Default	Default
8-DPSK(3Mbps) Setting	Default	Default	Default

2.9. Test Equipmen

For conducted emission test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESHS30	EST-E001	LISAI	June 13,20	1 Year
Artificial Mains Network	Rohde & Schwarz	ENV216	EST-E002	LISAI	June 13,20	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	EST-E078	LISAI	June 13,20	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

For radiated emission test(9 kHz-30MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	EST-E047	LISAI	June 13,20	1 Year
Active Loop Antenna	SCHWARZB ECK	FMZB 1519B	EST-E054	LISAI	June 13,20	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
9kHz-30MHz Cable	N/A	EST-001	N/A	N/A	N/A	N/A

For radiated emissions test (30-1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	EST-E047	LISAI	June 13,20	1 Year
Bilog Antenna	Teseq	CBL 6111D	EST-E034	LISAI	June 13,20	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
30-1000MHz Cable	N/A	EST-002	N/A	N/A	N/A	N/A

For radiated emission test(Above 1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna	SCHWARZB ECK	BBHA9120D	EST-E031	LISAI	June 13,20	1 Year
Signal Amplifier	SCHWARZB ECK	BBV9718	EST-E032	LISAI	June 13,20	1 Year
Spectrum Analyzer	Rohde & Schwarz	FSV40	EST-E069	LISAI	June 13,20	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
Above 1GHz Cable	N/A	EST-003	N/A	N/A	N/A	N/A

For connect EUT antenna terminal test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Spectrum Analyzer	Rohde & Schwarz	FSV40	EST-E069	LISAI	June 13,20	1 Year

3. MAXIMUM PEAK OUTPUT POWER

3.1. Limit

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

3.2. Test Setup



3.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	3MHz
VBW	3MHz
Span	7.5MHz
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

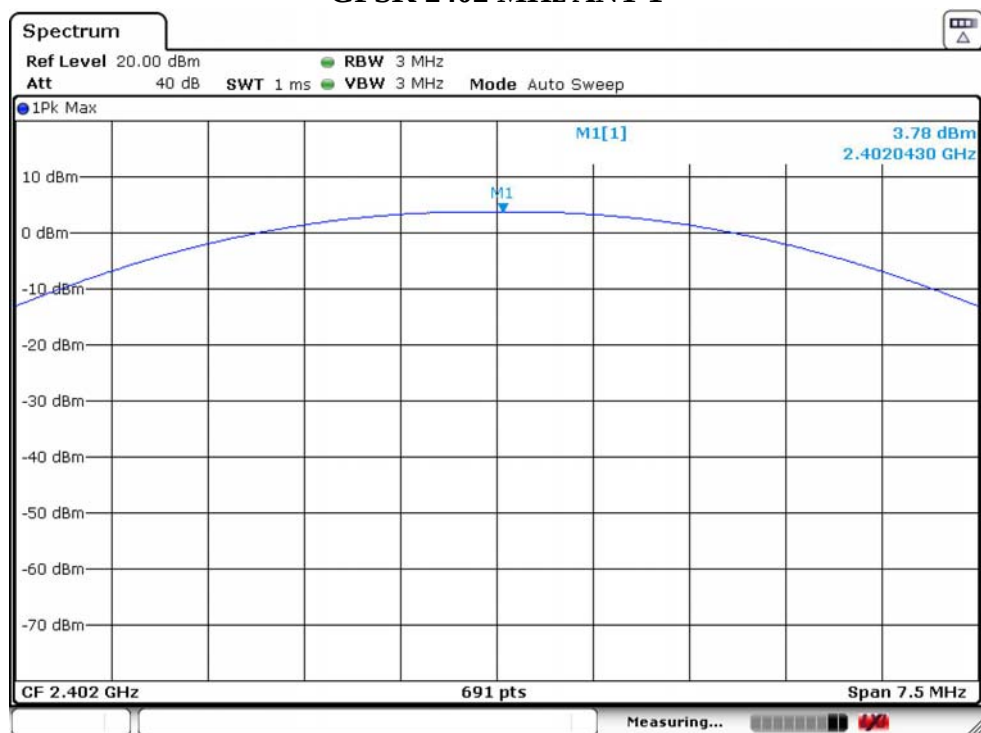
3.4. Test Procedure

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 3.3.
- Set the EUT transmit continuously with maximum output power over fixed single hopping channel.
- Allow trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission.
- Repeat above procedures until all channels and test modes were measured.
- Record the results in the test report.

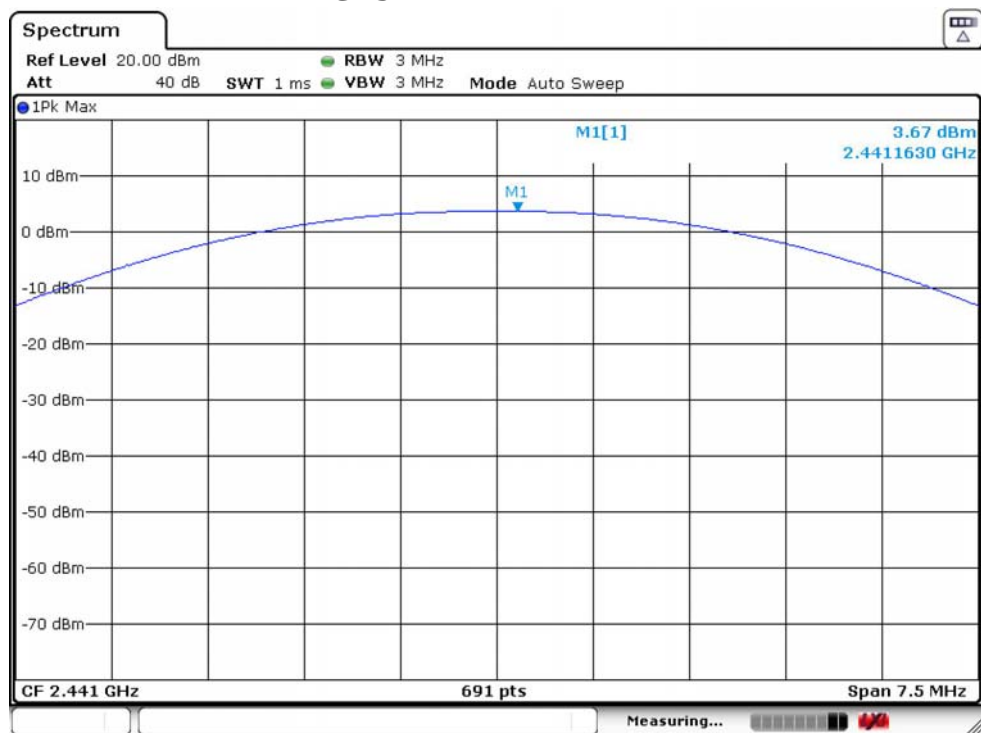
3.5. Test Result

Temperature		23.5℃	Relative Humidity	49%	Test Voltage		120V/60Hz
Antenna	Mode	Freq (MHz)	Peak Output Power		Limit		Result
			dBm	W	dBm	W	
ANT 1	GFSK	2402	3.78	0.0024	20.97	0.1250	PASS
		2441	3.67	0.0023	20.97	0.1250	PASS
		2480	3.49	0.0022	20.97	0.1250	PASS
	8-DPSK	2402	6.55	0.0045	20.97	0.1250	PASS
		2441	6.45	0.0044	20.97	0.1250	PASS
		2480	6.24	0.0042	20.97	0.1250	PASS
ANT 2	GFSK	2402	3.67	0.0023	20.97	0.1250	PASS
		2441	3.52	0.0022	20.97	0.1250	PASS
		2480	3.28	0.0021	20.97	0.1250	PASS
	8-DPSK	2402	6.42	0.0044	20.97	0.1250	PASS
		2441	6.24	0.0042	20.97	0.1250	PASS
		2480	6.01	0.0040	20.97	0.1250	PASS

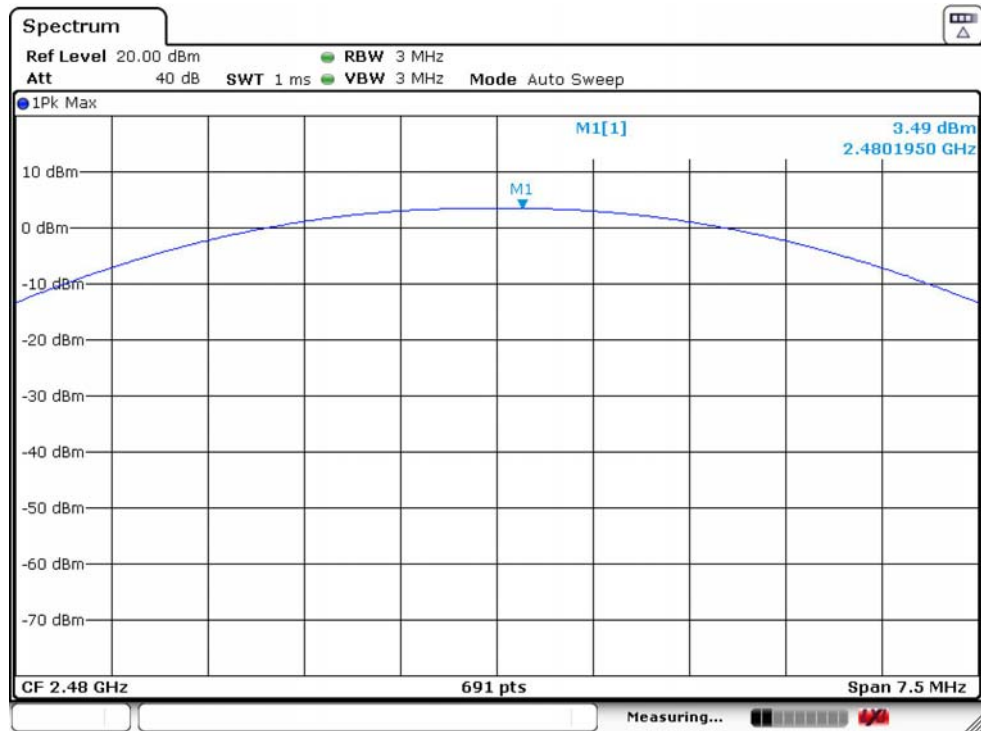
GFSK 2402 MHz ANT 1



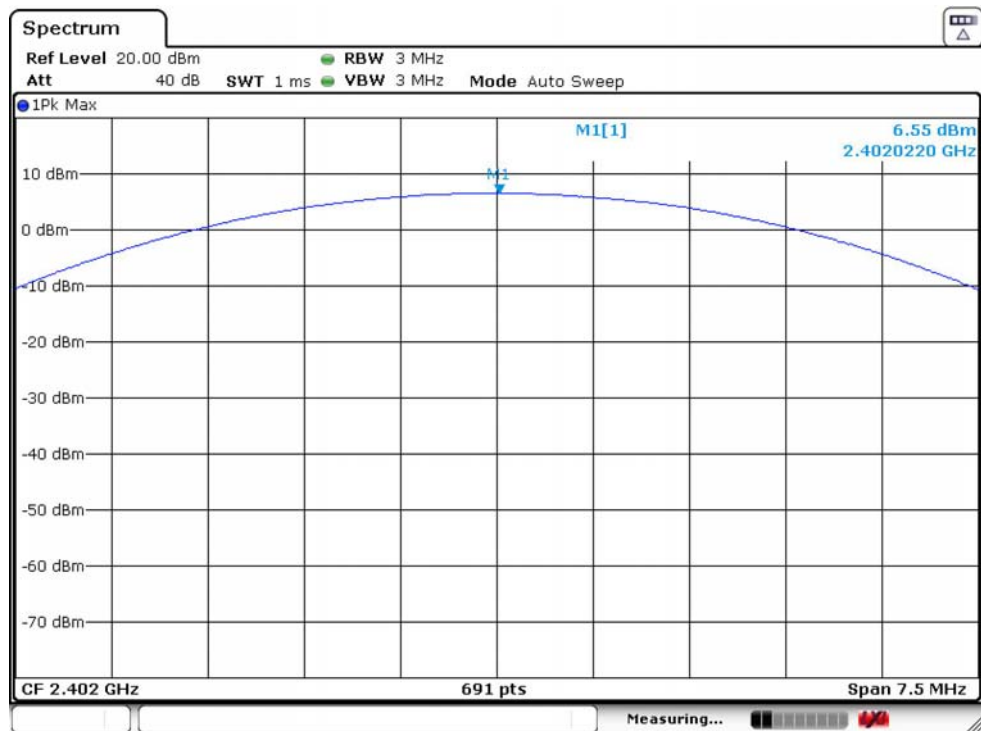
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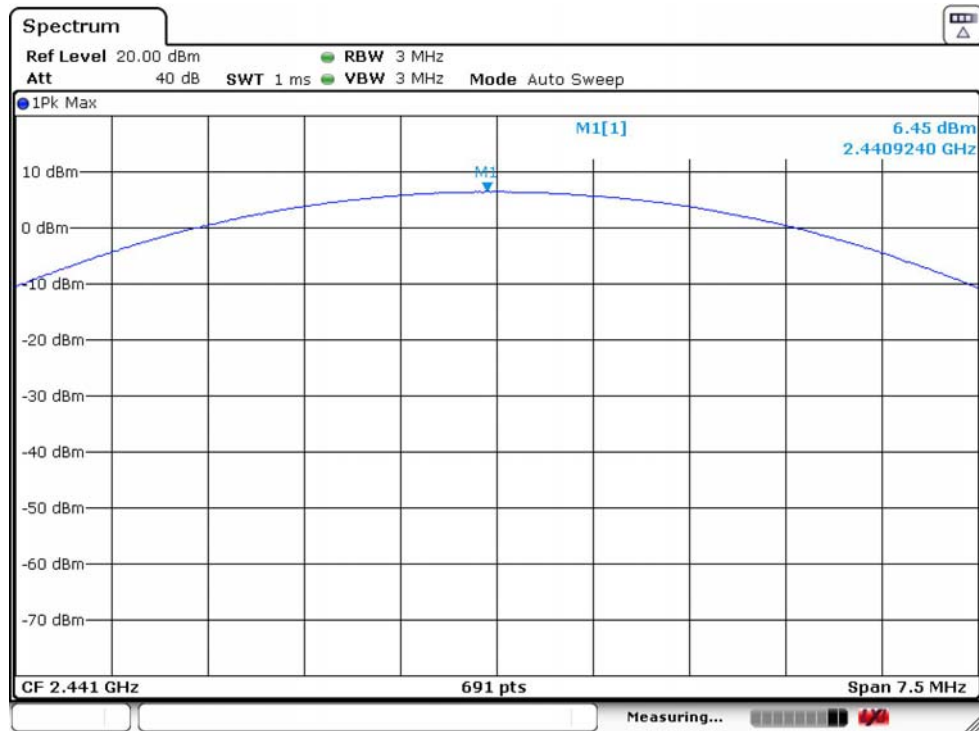
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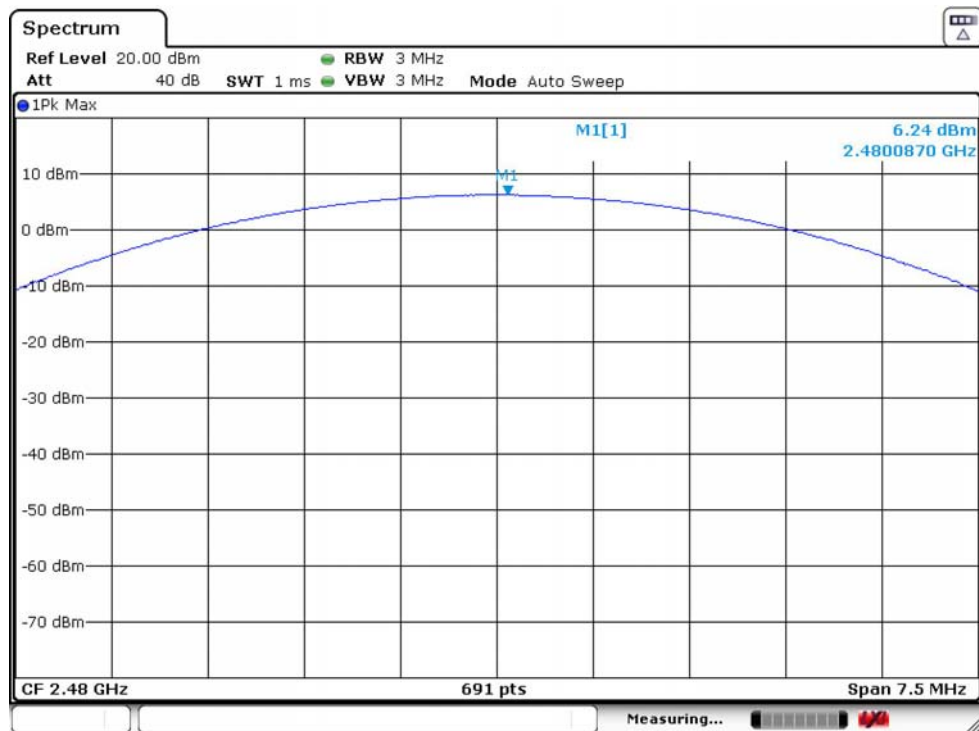
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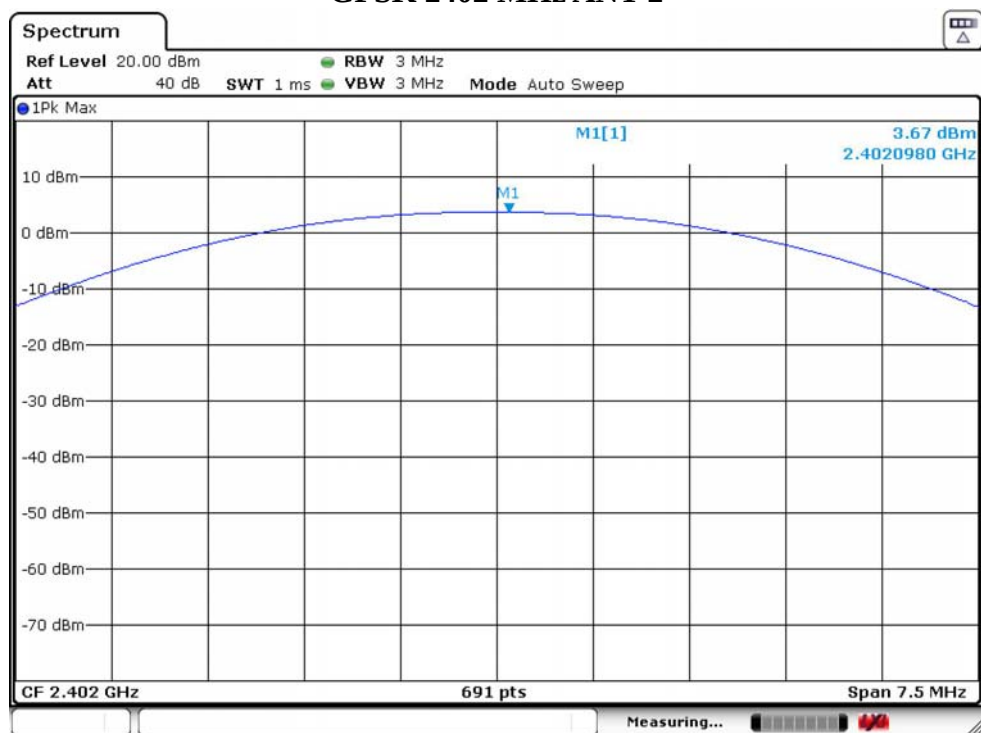
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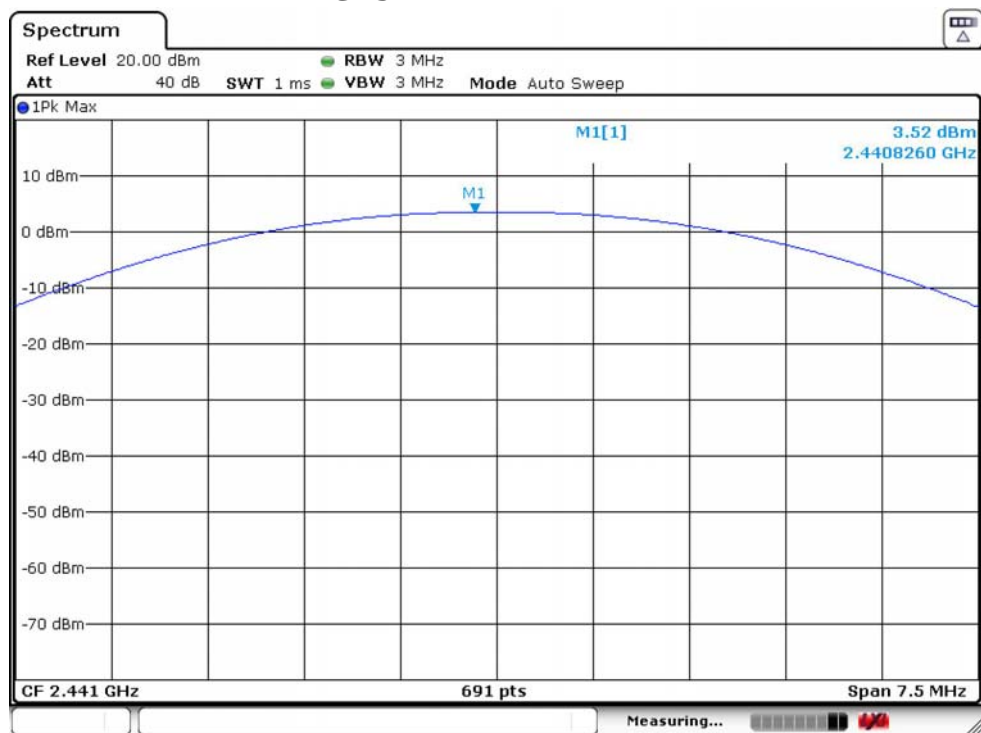
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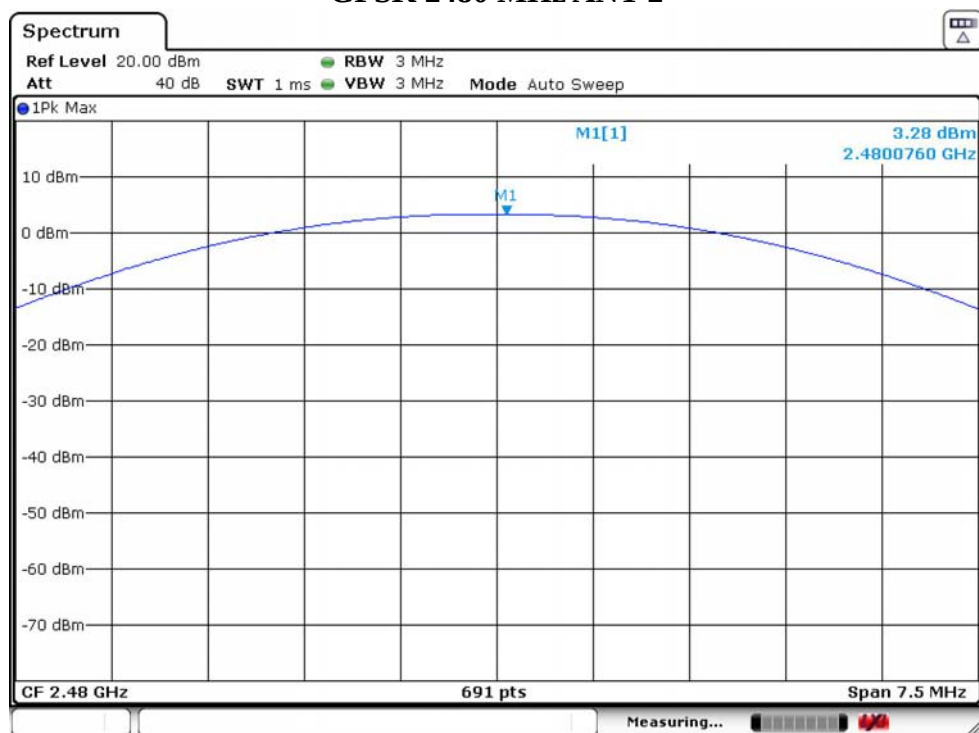
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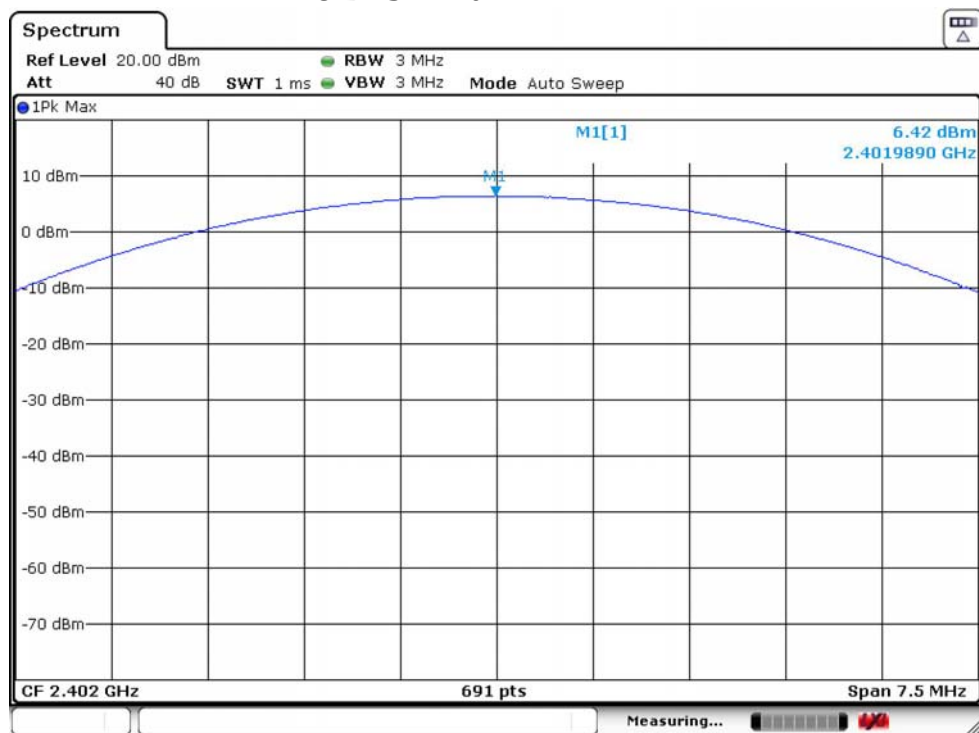
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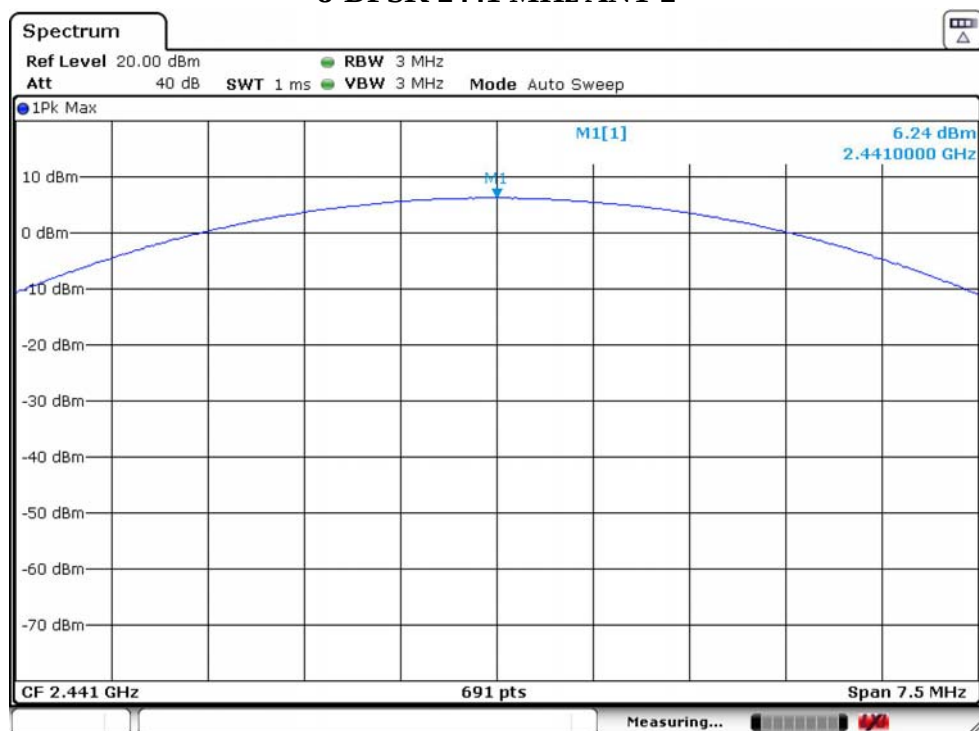
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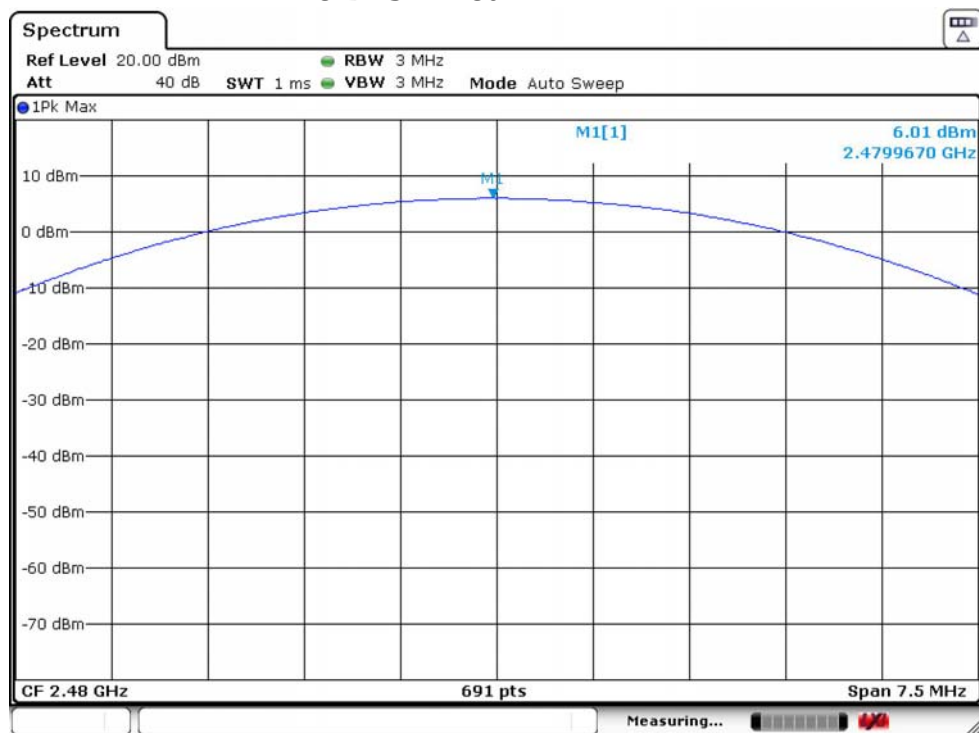
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8-DPSK 2441 MHz ANT 2



8-DPSK 2480 MHz ANT 2

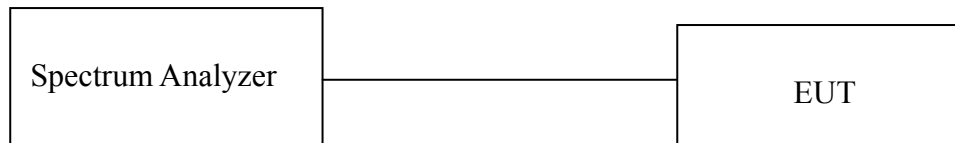


4. 20 DB BANDWIDTH

4.1. Limit

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

4.2. Test Setup



4.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	30KHz
VBW	100KHz
Span	3MHz
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

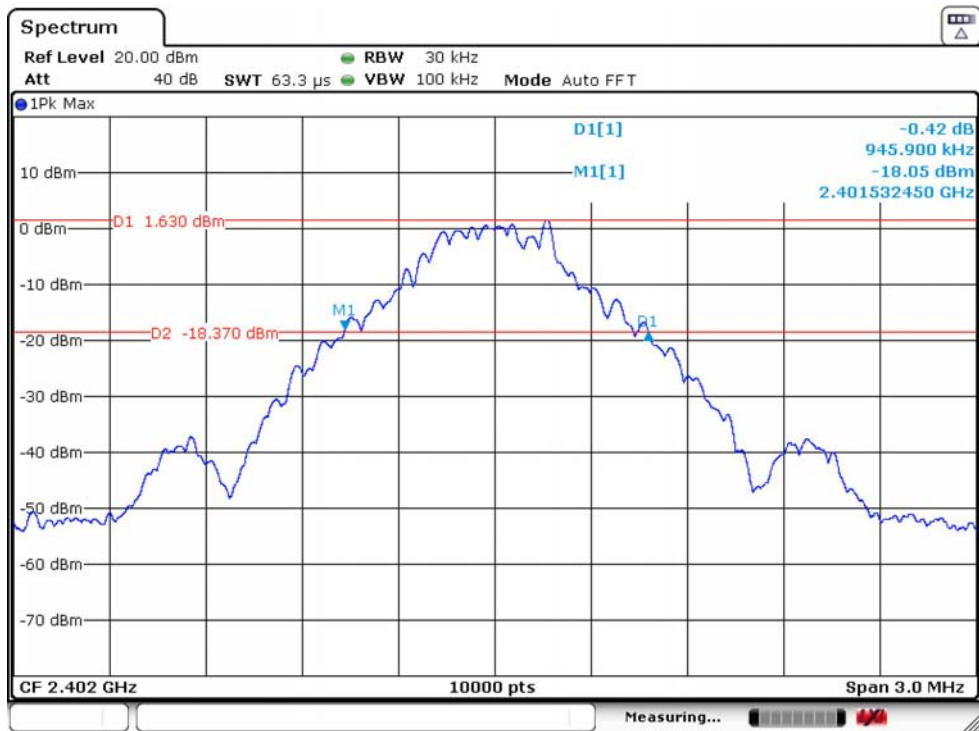
4.4. Test Procedure

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 4.3.
- Set the EUT transmit continuously with maximum output power over fixed single hopping channel.
- Allow trace to stabilize, use the ndB down function to measure 20dB Bandwidth.
- Repeat above procedures until all channels and test modes were measured.
- Record the results in the test report.

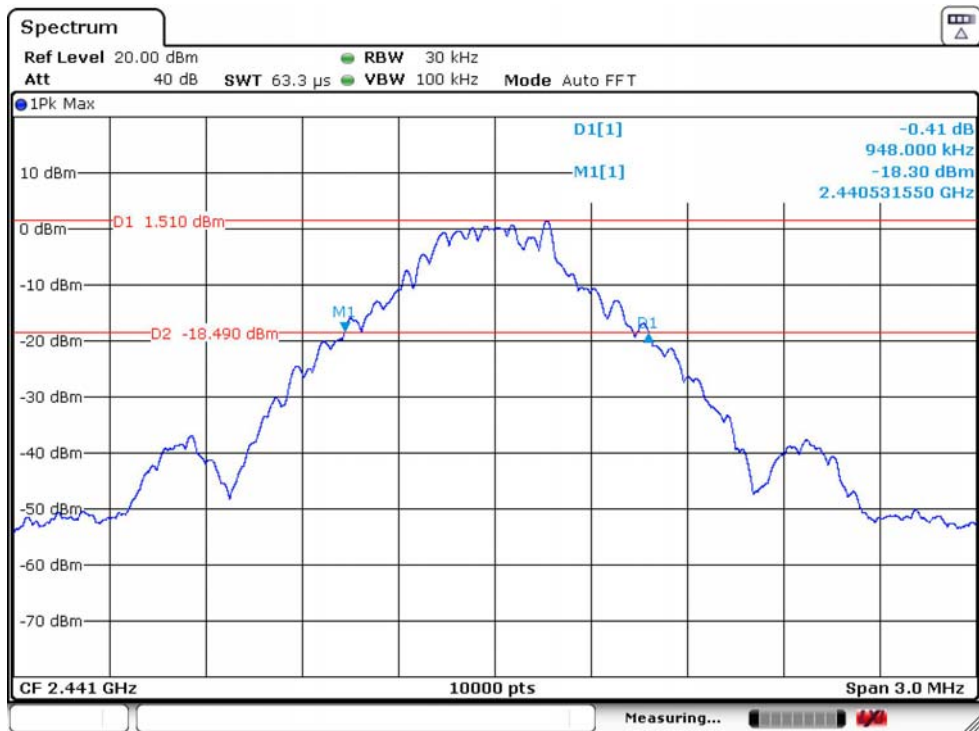
4.5. Test Result

Temperature			27℃	Relative Humidity	54%
Test Voltage			120V/60Hz		
Antenna	Mode	Freq (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Result
ANT 1	GFSK	2402	0.9459	/	PASS
		2441	0.9480	/	PASS
		2480	0.9453	/	PASS
	8-DPSK	2402	1.2855	/	PASS
		2441	1.2834	/	PASS
		2480	1.2852	/	PASS
ANT 2	GFSK	2402	0.9486	/	PASS
		2441	0.9477	/	PASS
		2480	0.9477	/	PASS
	8-DPSK	2402	1.2819	/	PASS
		2441	1.2837	/	PASS
		2480	1.2834	/	PASS

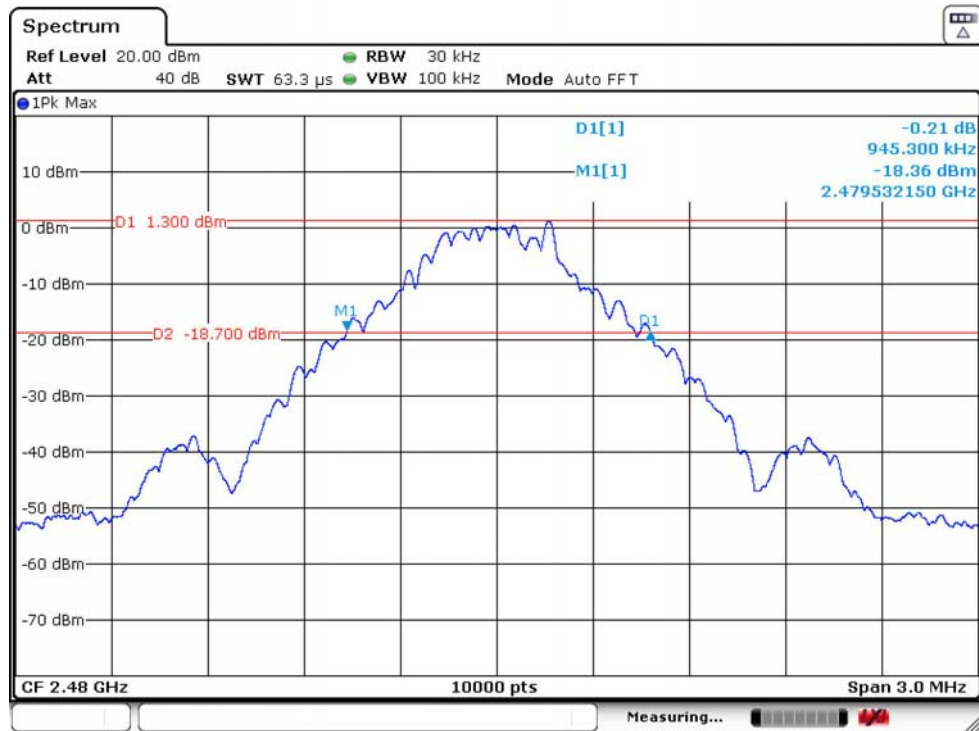
GFSK 2402MHz ANT 1



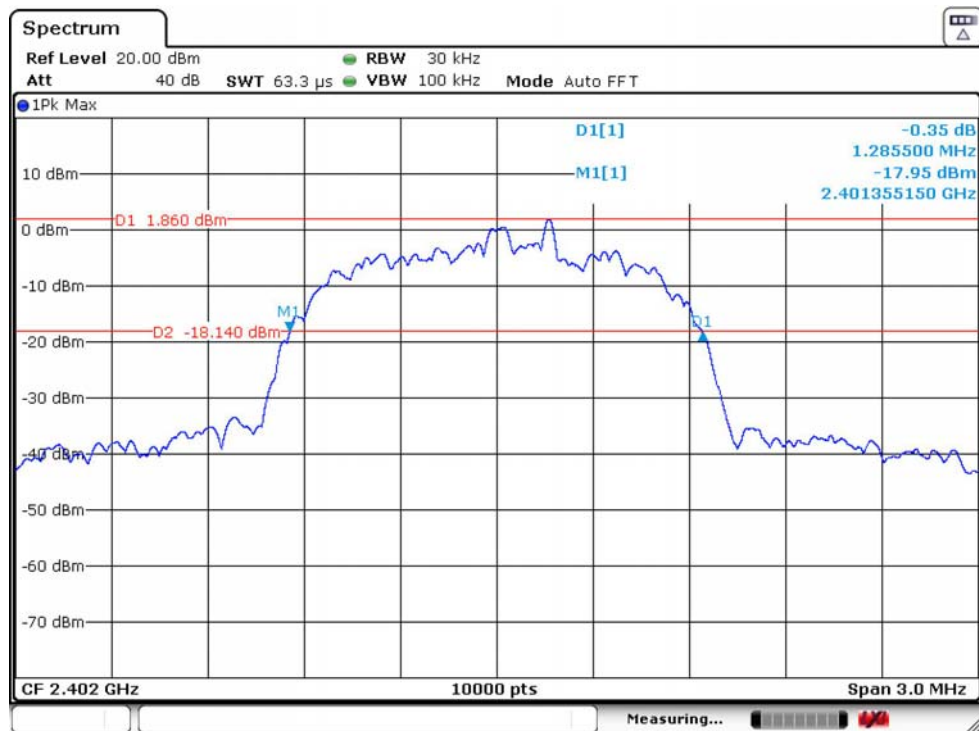
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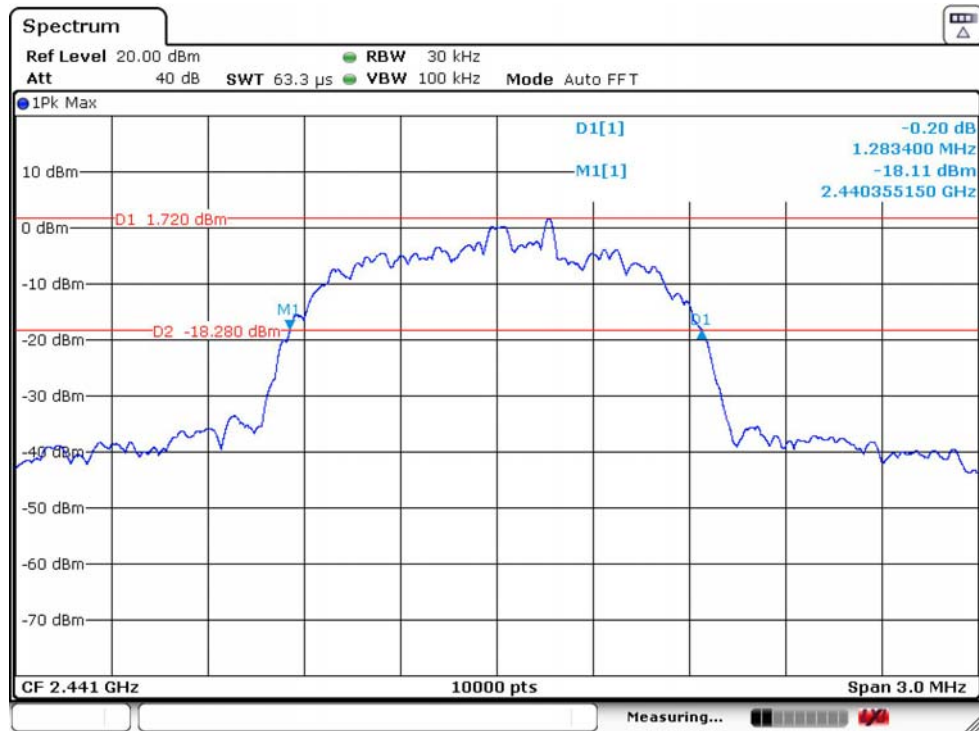
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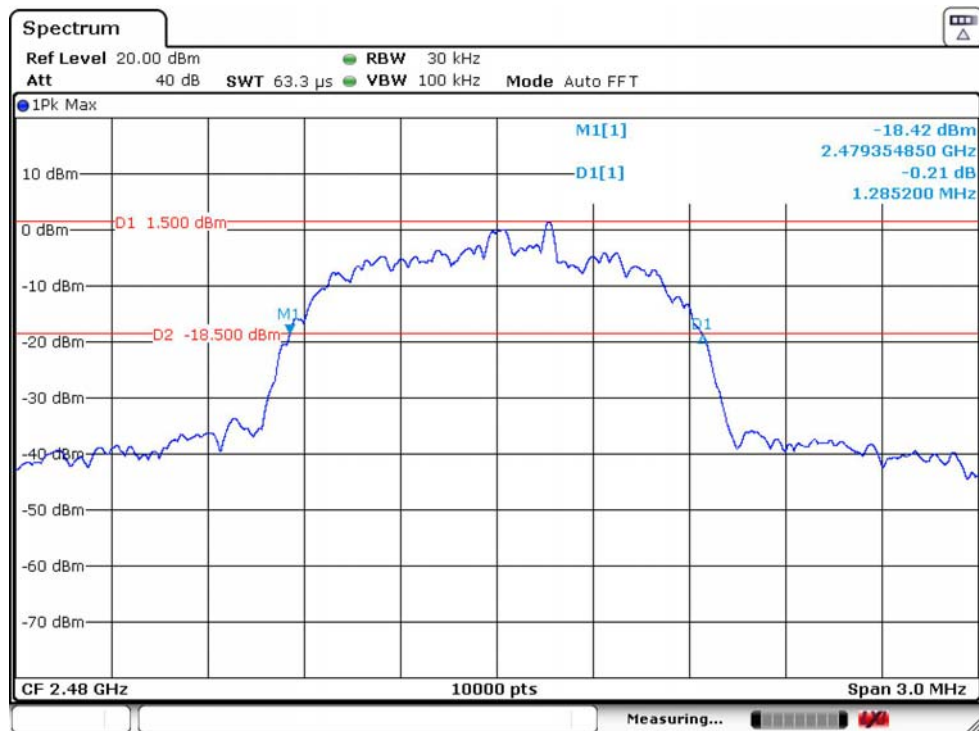
8-DPSK 2402MHz ANT 1



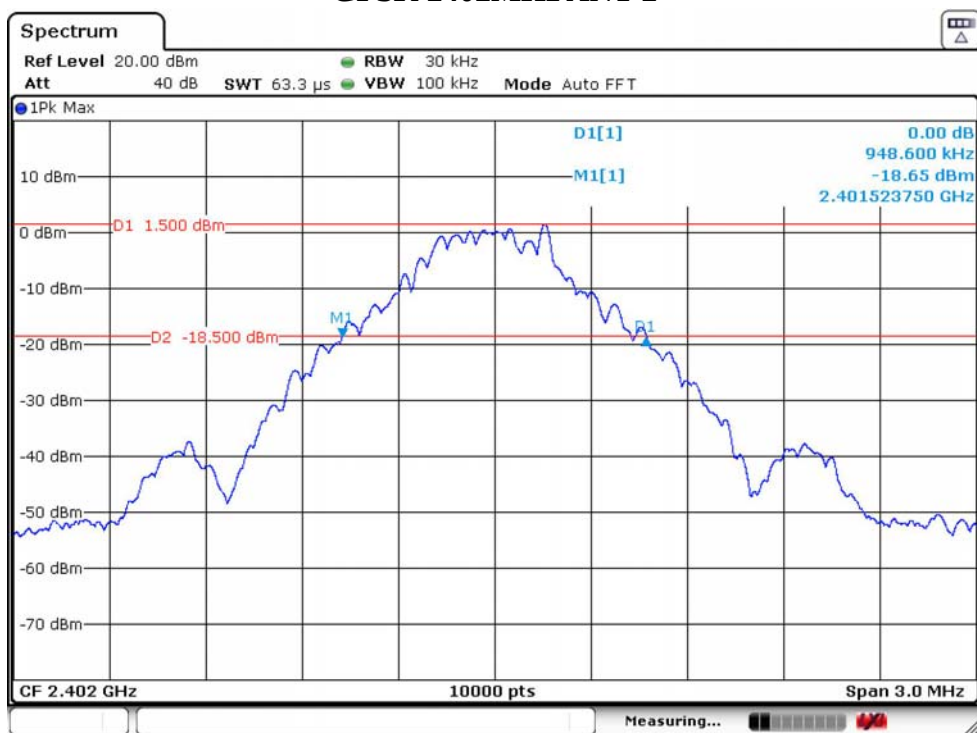
8-DPSK 2441MHz ANT 1



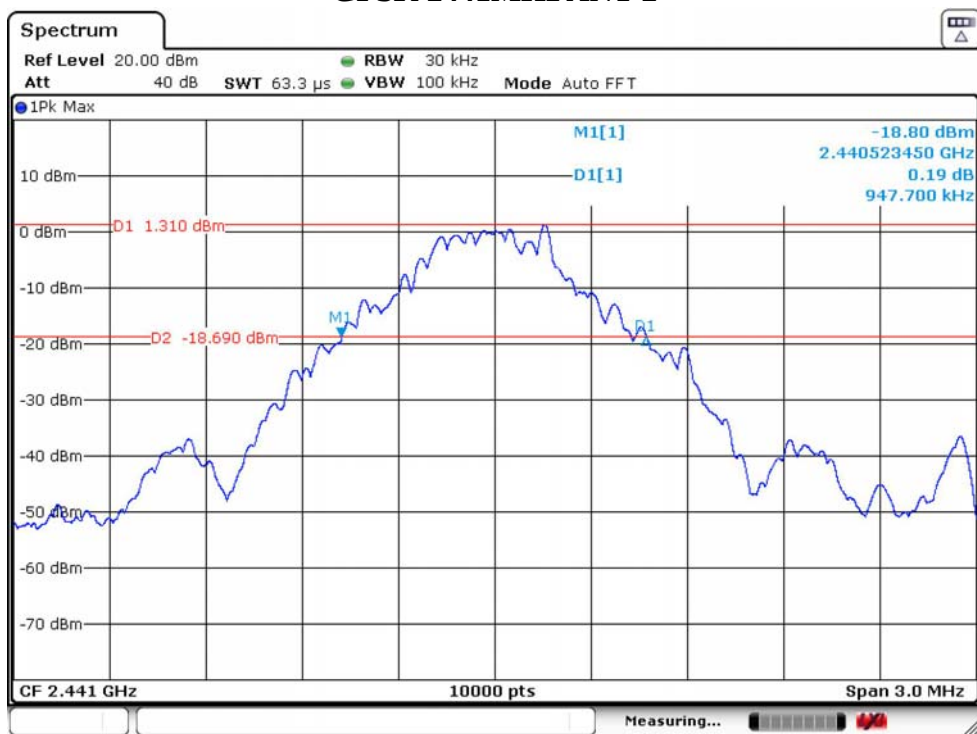
8-DPSK 2480MHz ANT 1



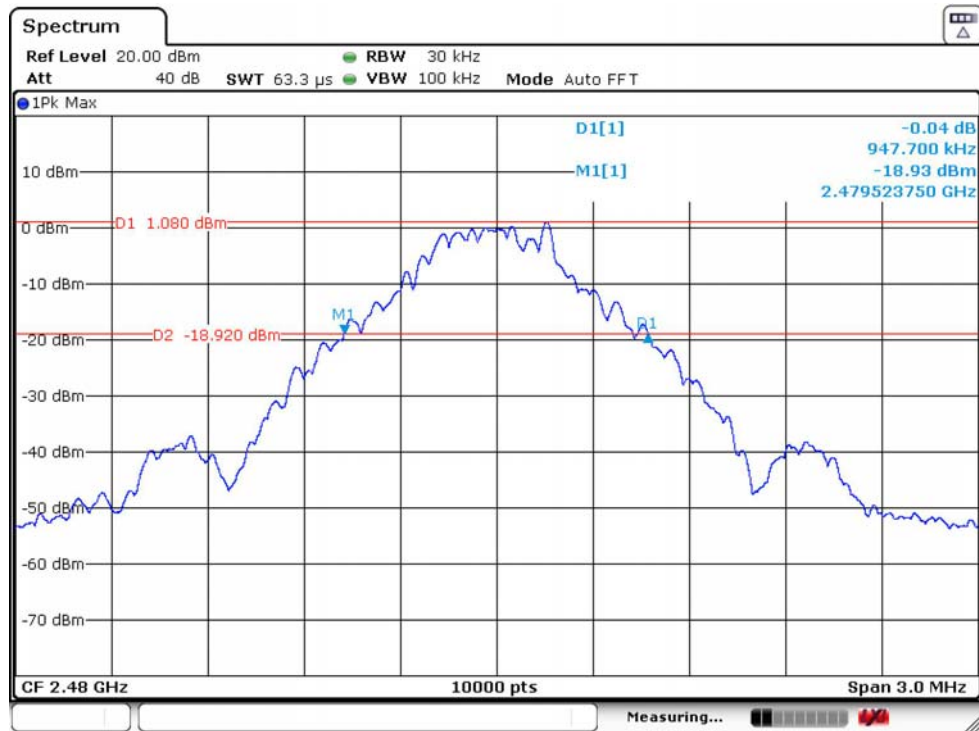
GFSK 2402MHz ANT 2



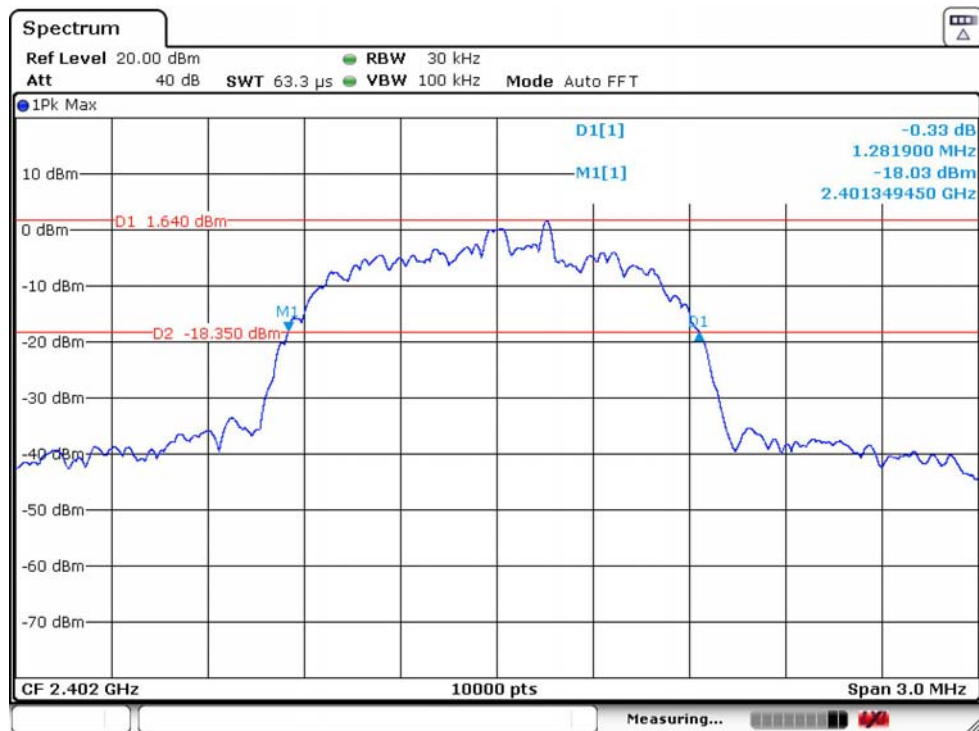
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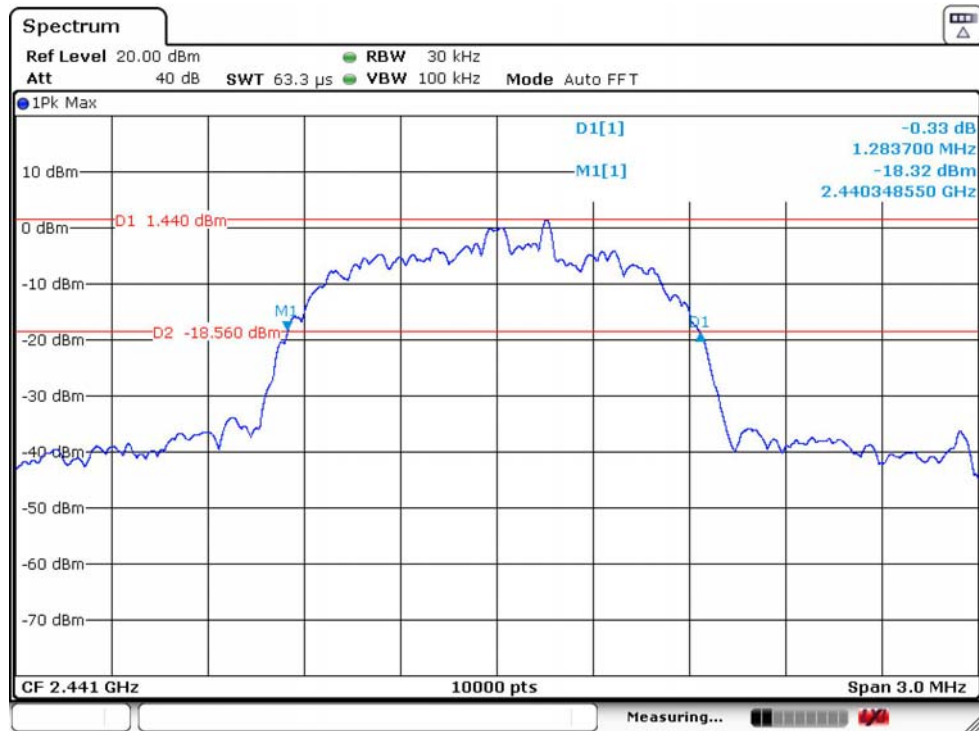
GFSK 2480MHz ANT 2



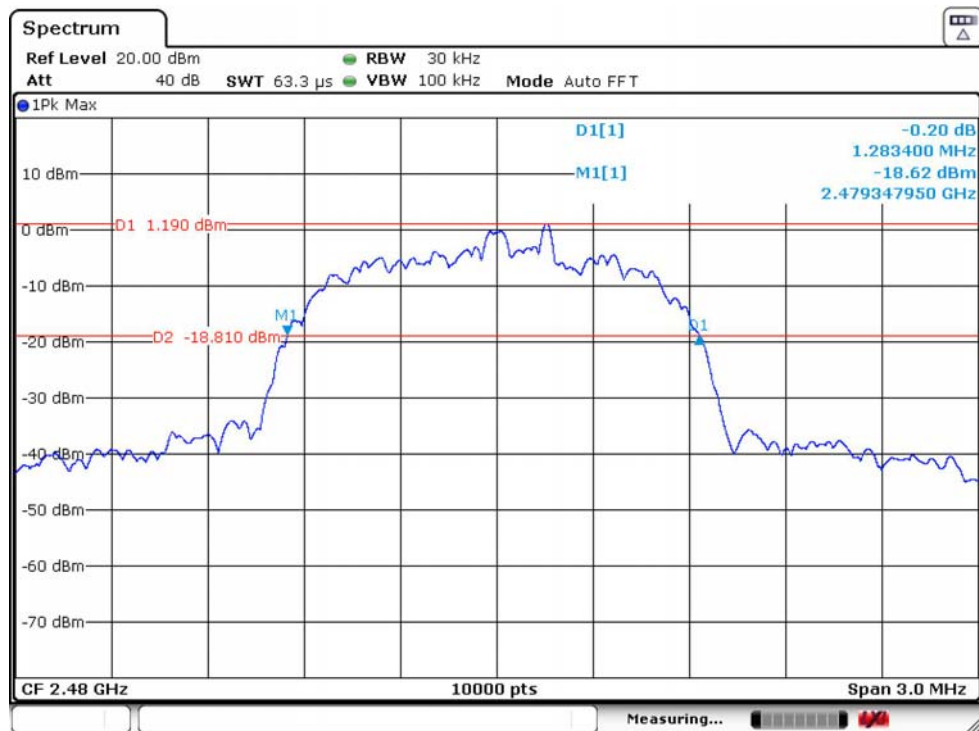
8-DPSK 2402MHz ANT 2



8-DPSK 2441MHz ANT 2



8-DPSK 2480MHz ANT 2

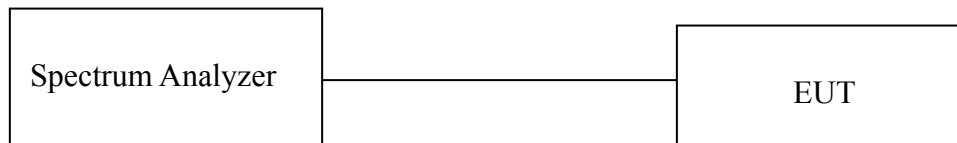


5. CARRIER FREQUENCY SEPARATION

5.1. Limit

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

5.2. Test Setup



5.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	30KHz
VBW	100KHz
Span	3MHz
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

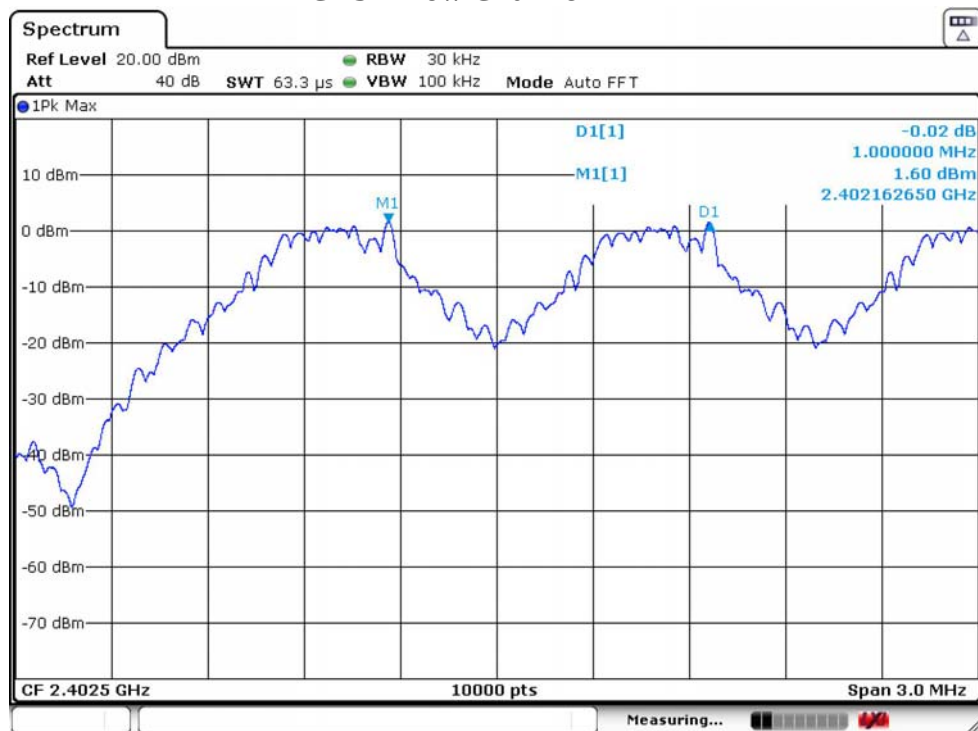
5.4. Test Procedure

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 5.3.
- Set the EUT transmit continuously with maximum output power in all channel hopping mode.
- Allow trace to stabilize, use the marker-delta function to measure channel separation between two adjacent channels.
- Repeat above procedures until all channels and test modes were measured.
- Record the results in the test report.

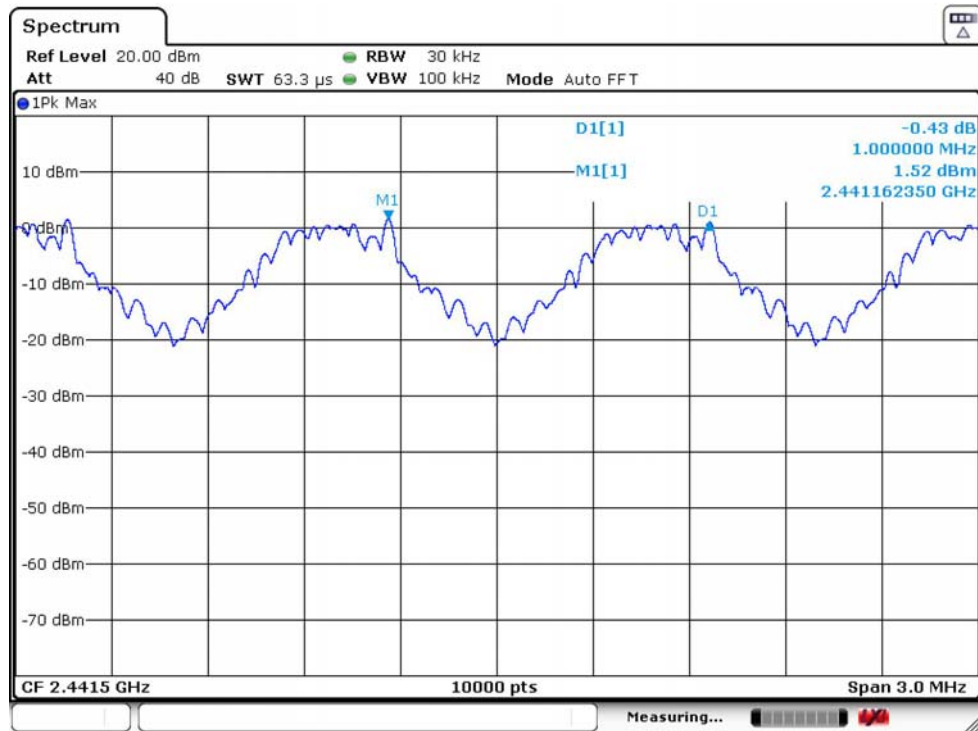
5.5. Test Result

Temperature		27°C	Relative Humidity	54%	Test Voltage	120V/60Hz
Antenna	Mode	Channel	Channel Separation (MHz)	2/3 of 20dB Bandwidth Limit (MHz)		Result
ANT 1	GFSK	Low CH	1.0000	0.6306		PASS
		Mid CH	1.0000	0.6320		PASS
		High CH	1.0000	0.6302		PASS
	8-DPSK	Low CH	1.0000	0.8570		PASS
		Mid CH	1.0000	0.8556		PASS
		High CH	1.0000	0.8568		PASS
ANT 2	GFSK	Low CH	1.0000	0.6324		PASS
		Mid CH	1.0000	0.6318		PASS
		High CH	1.0000	0.6318		PASS
	8-DPSK	Low CH	1.0000	0.8546		PASS
		Mid CH	1.0000	0.8558		PASS
		High CH	1.0000	0.8556		PASS

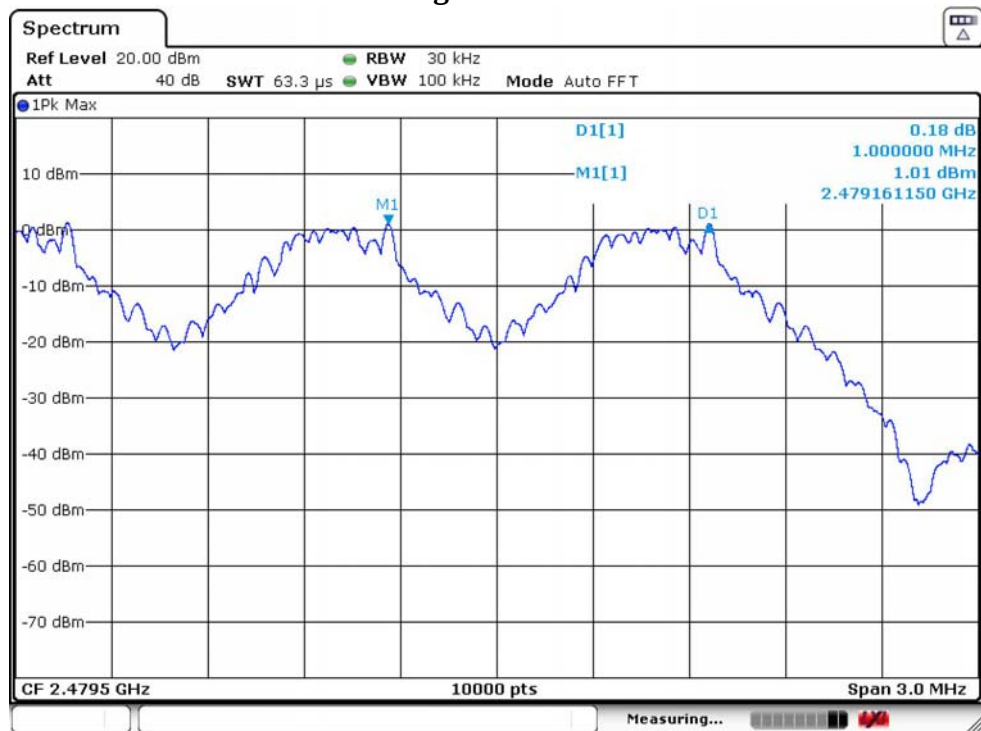
GFSK Low Channel ANT 1



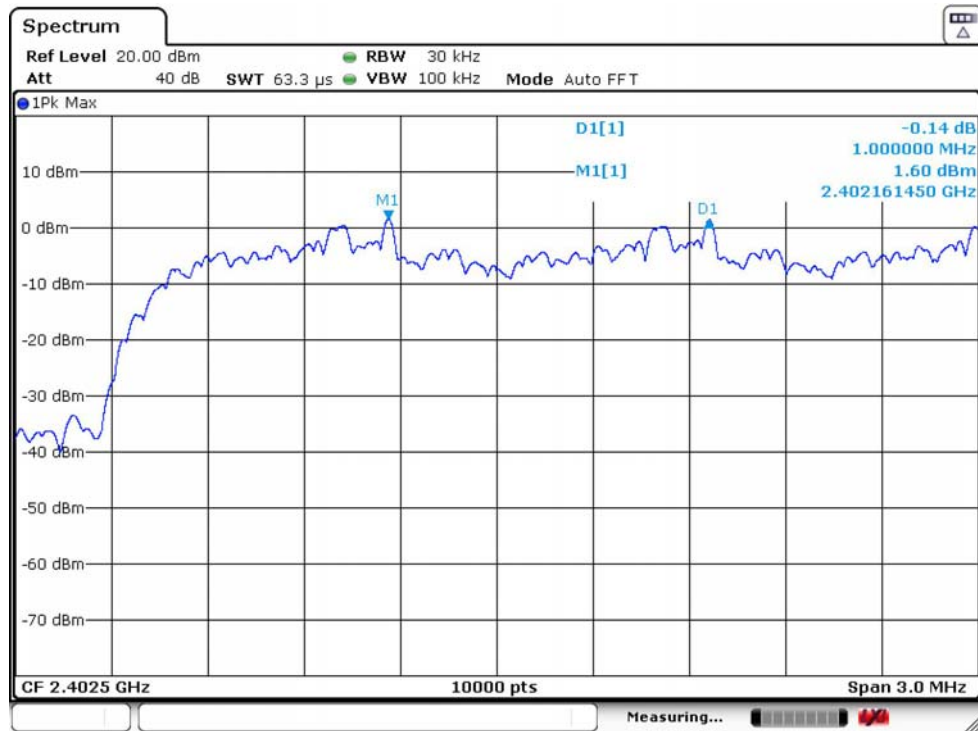
GFSK Mid Channel ANT 1



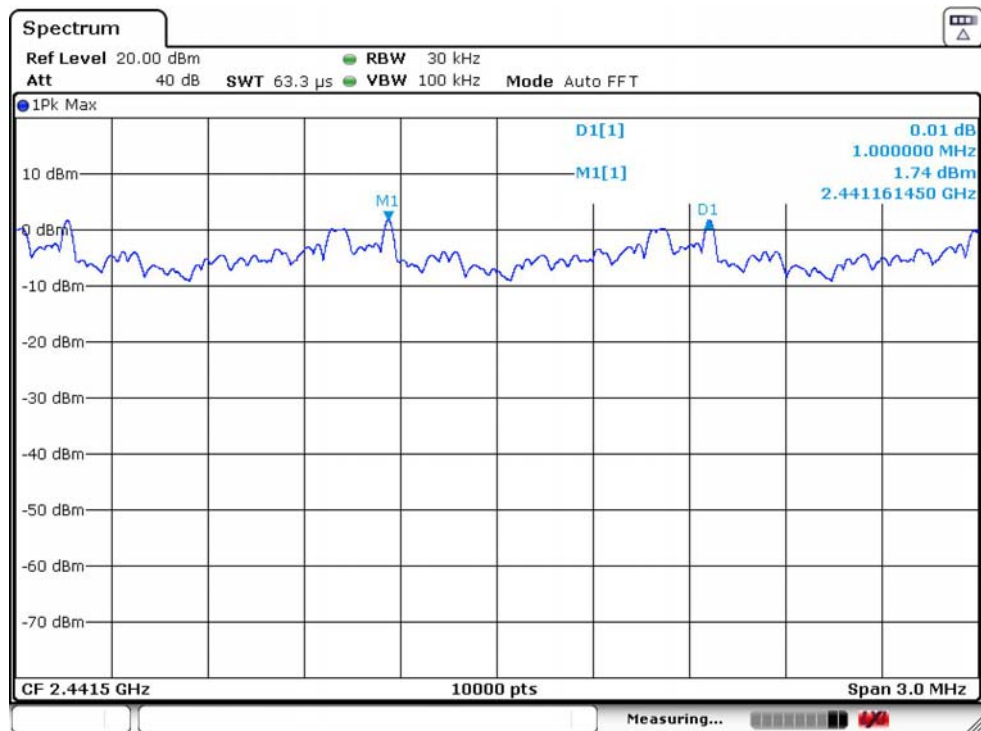
GFSK High Channel ANT 1



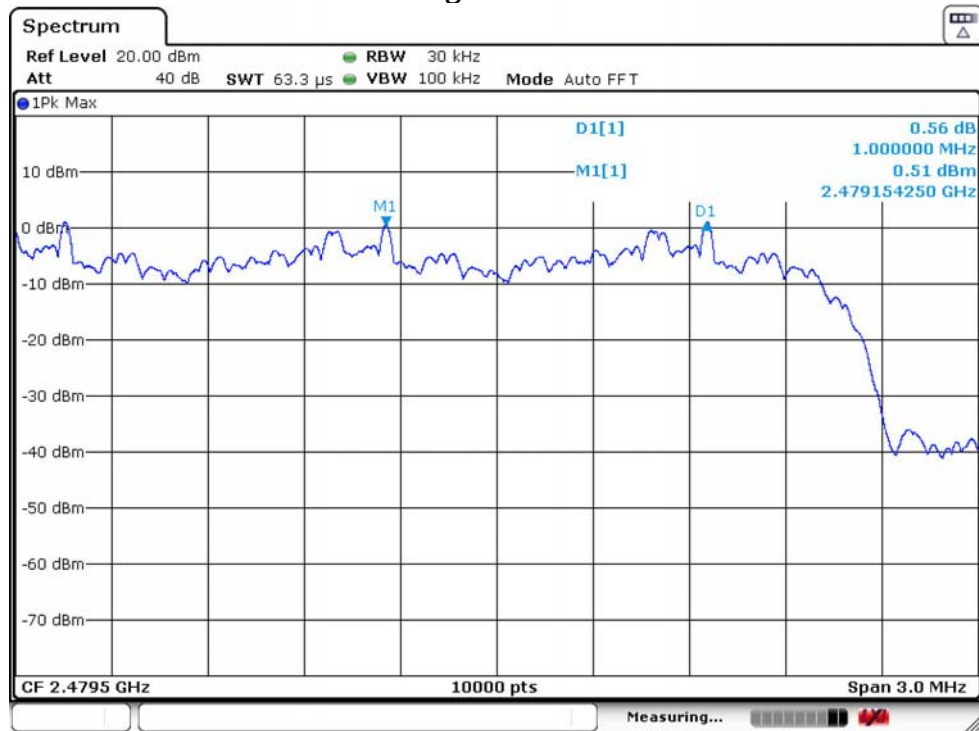
8-DPSK Low Channel ANT 1



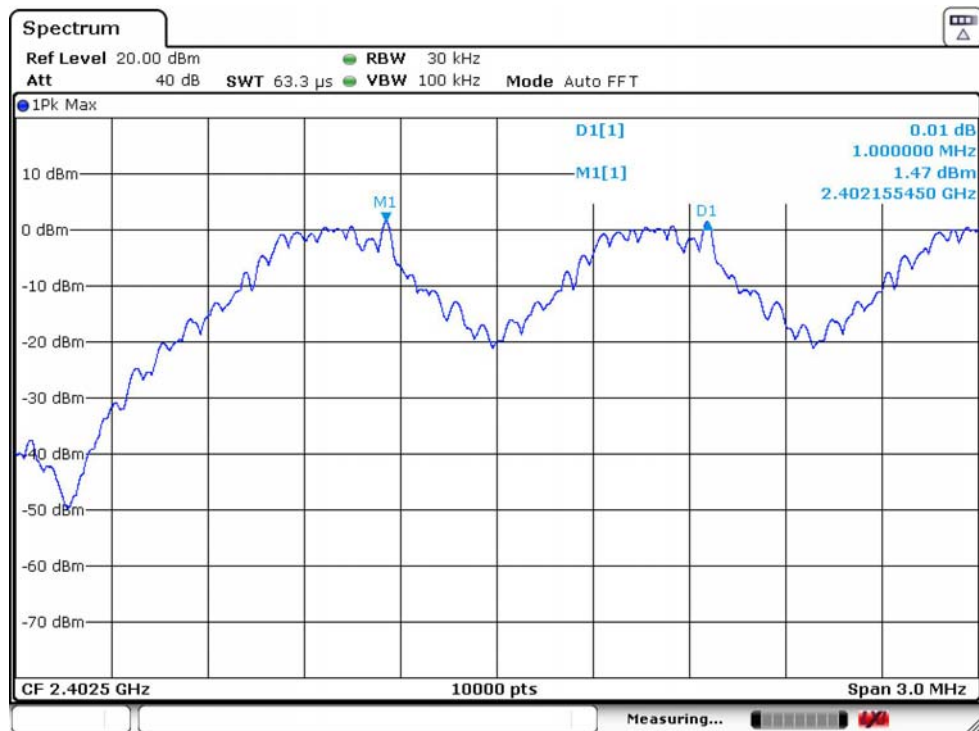
8-DPSK Mid Channel ANT 1



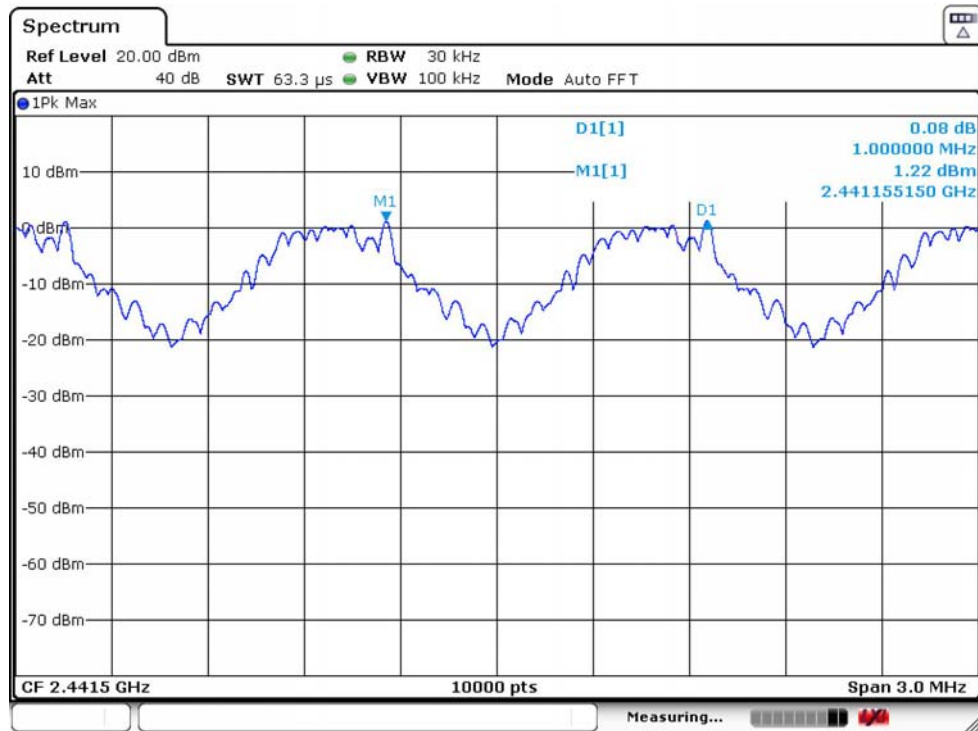
8-DPSK High Channel ANT 1



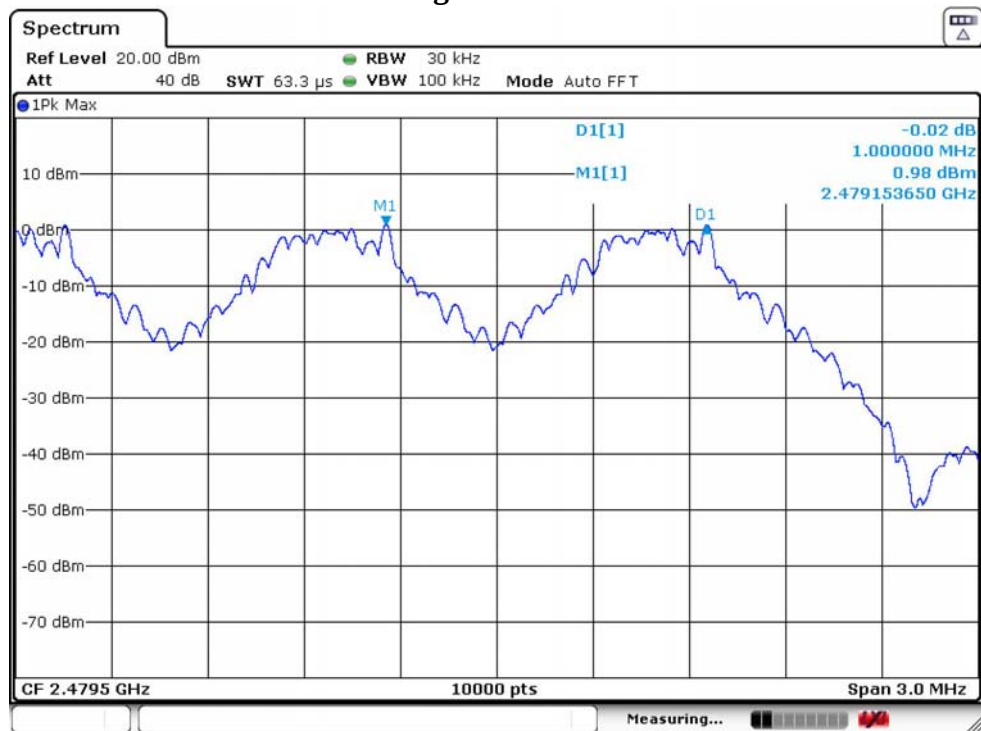
GFSK Low Channel ANT 2



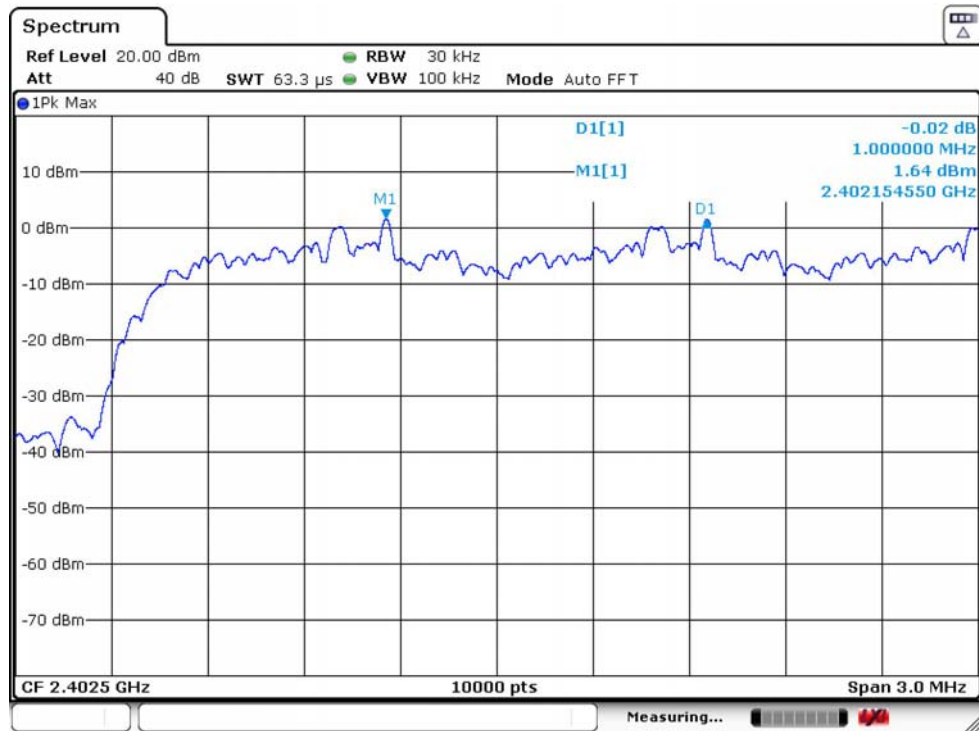
GFSK Mid Channel ANT 2



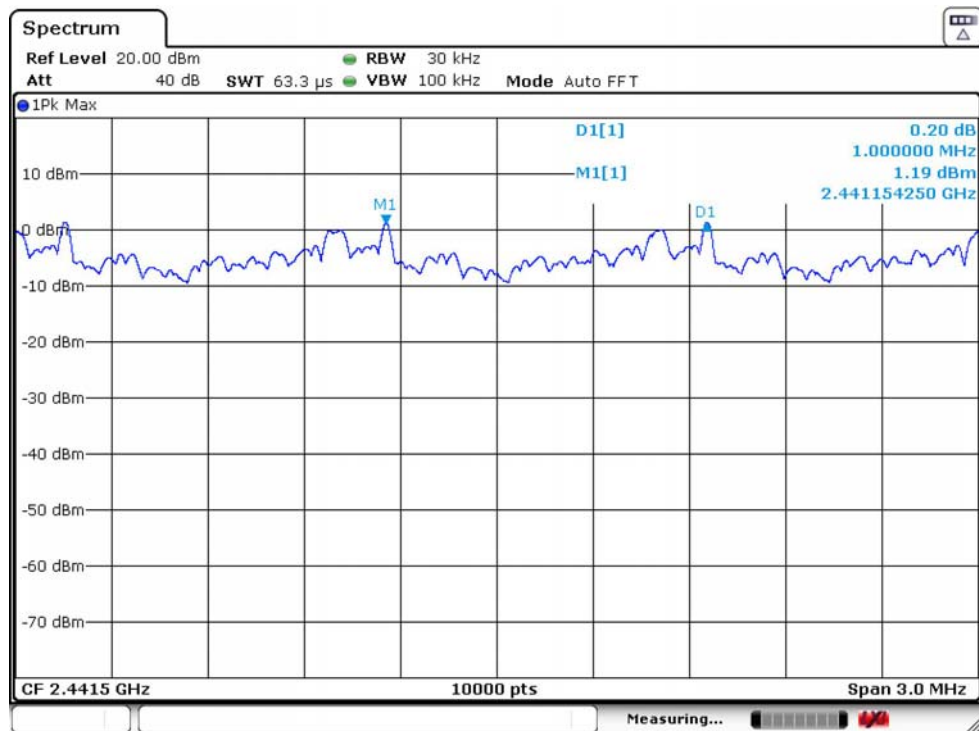
GFSK High Channel ANT 2



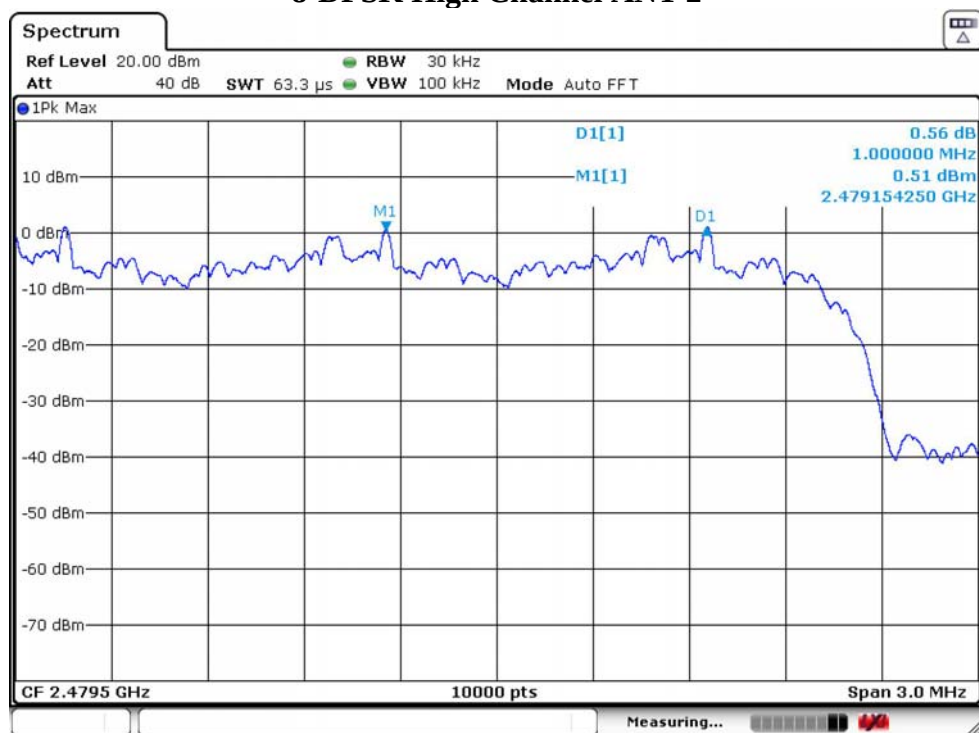
8-DPSK Low Channel ANT 2



8-DPSK Mid Channel ANT 2



8-DPSK High Channel ANT 2

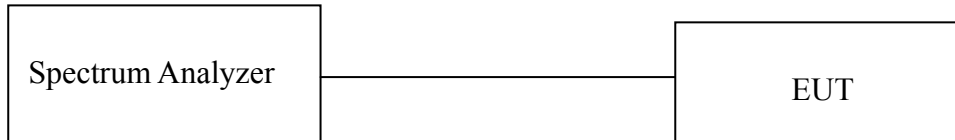


6. NUMBER OF HOPPING CHANNEL

6.1. Limit

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

6.2. Test Setup



6.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	300KHz
VBW	300KHz
Start frequency	2400MHz
Stop frequency	2483.5MHz
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

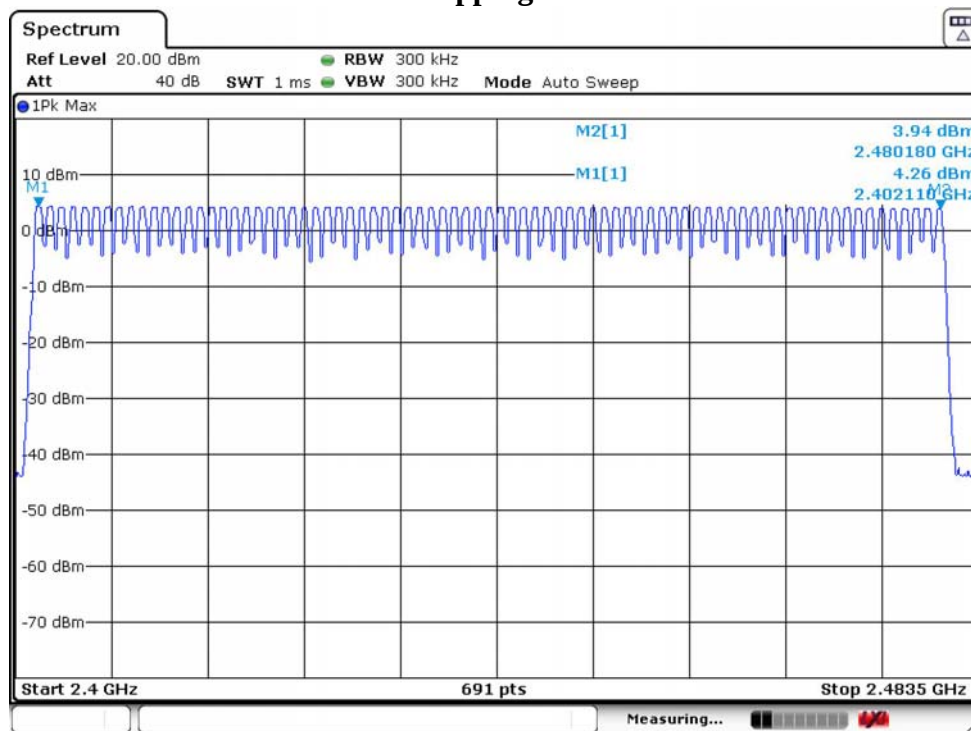
6.4. Test Procedure

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 6.3.
- Set the EUT transmit continuously with maximum output power in all channel hopping mode.
- Allow trace to stabilize, use the marker-peak function to mark the first and last frequency hopping channel.
- Repeat above procedures until all test modes were measured.
- Record the results in the test report.

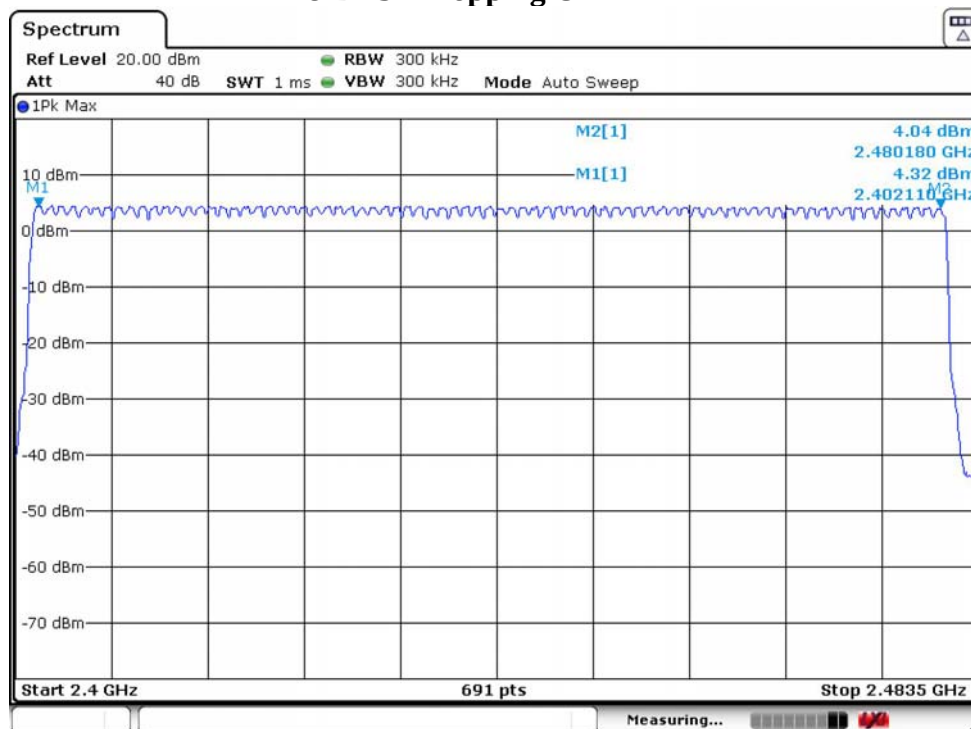
6.5. Test Result

Temperature		27℃	Relative Humidity	54%	Test Voltage	120V/60Hz
Antenna	Mode	Number of Hopping Channel			Limit	Result
ANT 1	GFSK(DH5)	79			≥ 15	PASS
	8-DPSK(DH5)	79			≥ 15	PASS
ANT 2	GFSK(DH5)	79			≥ 15	PASS
	8-DPSK(DH5)	79			≥ 15	PASS

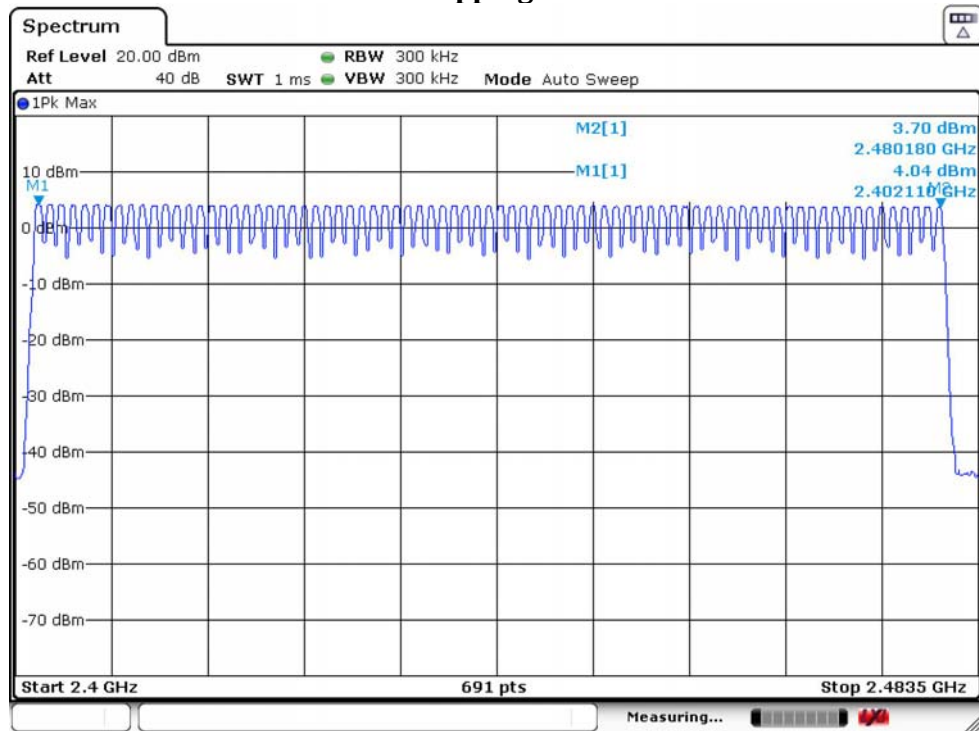
GFSK Hopping On ANT1



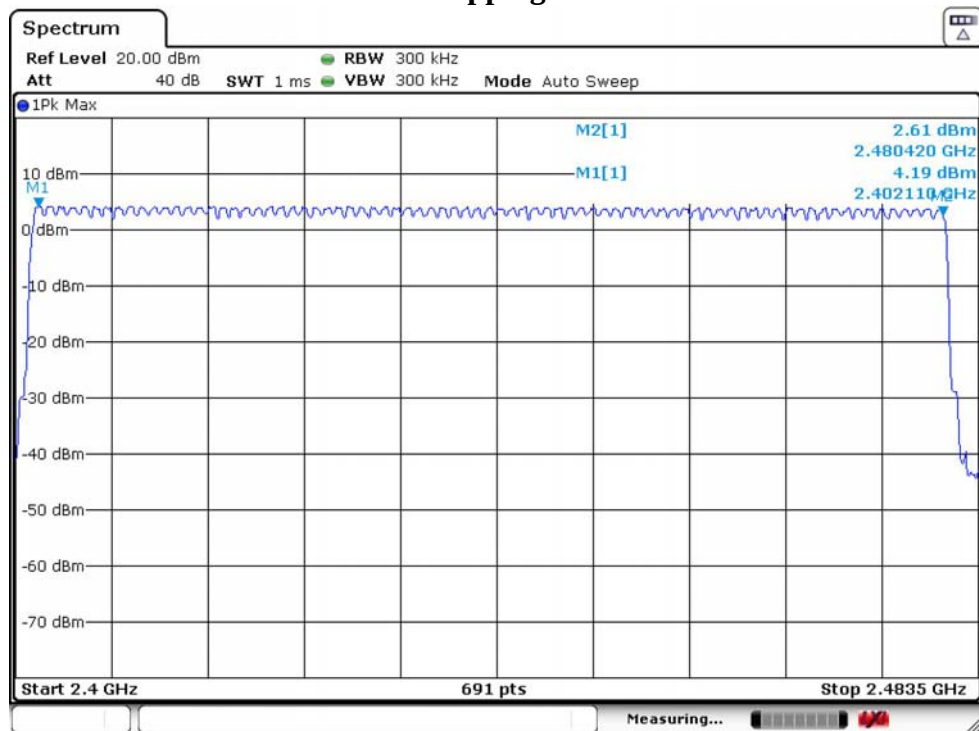
8-DPSK Hopping On ANT1



GFSK Hopping On ANT2



8-DPSK Hopping On ANT2



7. DWELL TIME

7.1. Limit

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.

7.2. Test Setup



7.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	1MHz
VBW	1MHz
Span	Zero
Detector	Peak
Sweep Time	2.5ms(DH1)/10ms(DH3)/20ms(DH5)
Sweep Mode	Single Sweep

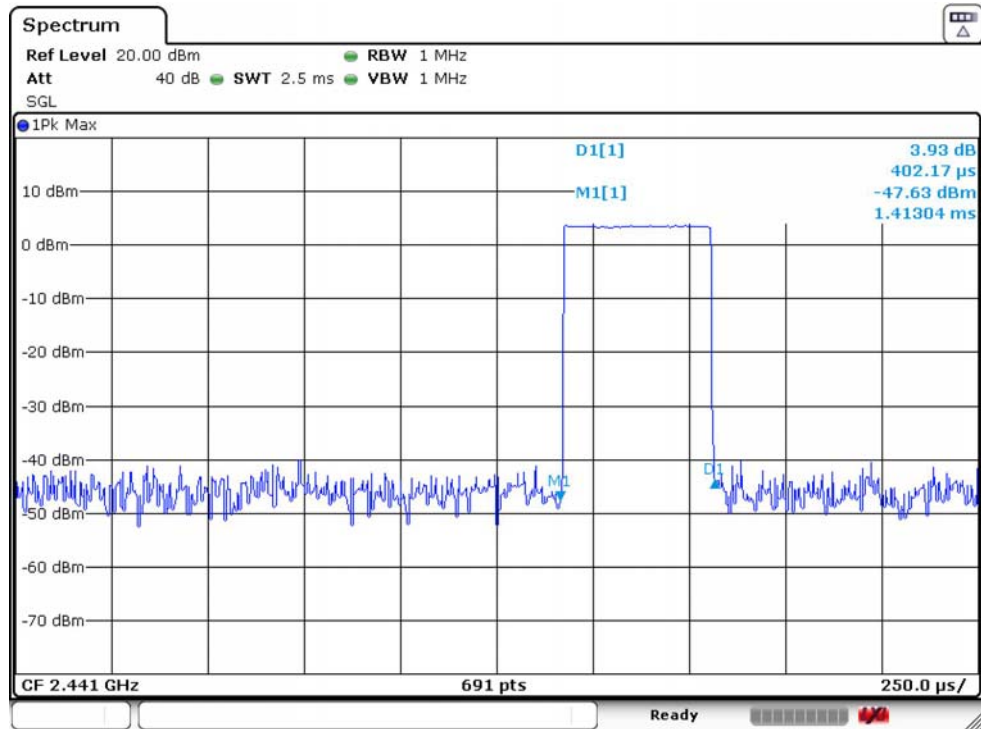
7.4. Test Procedure

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 7.3.
- Set the EUT transmit continuously with maximum output power in all channel hopping mode.
- Allow trace to stabilize, use the marker-delta function to measure single pulse duration.
- Repeat above procedures until all test modes were measured.
- Record the results in the test report.

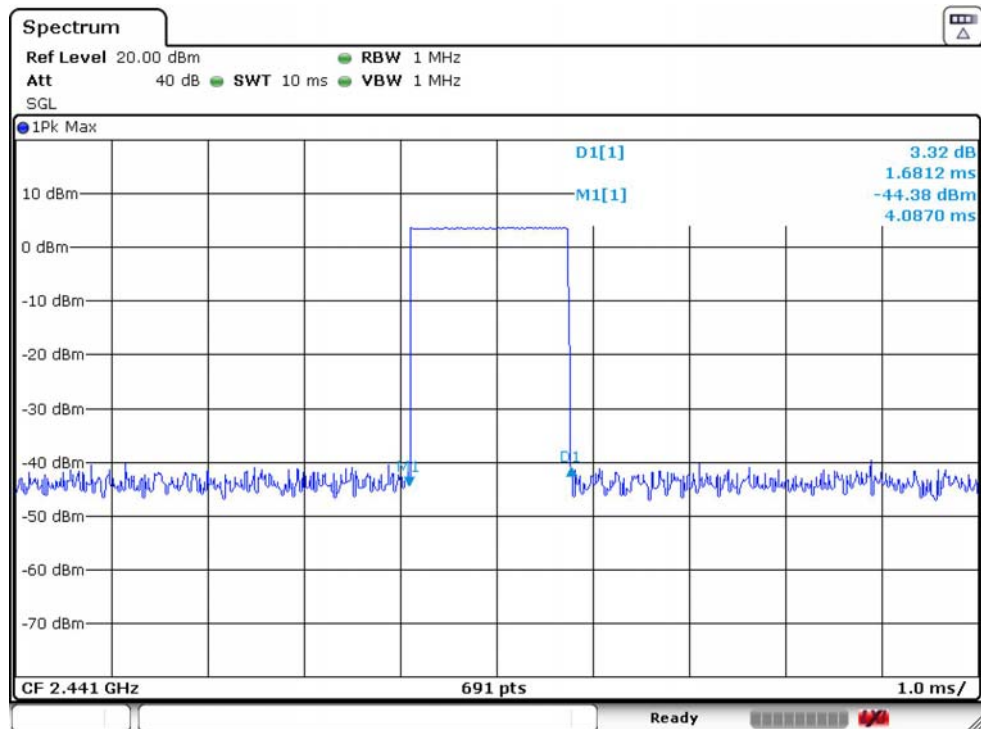
7.5. Test Result

Temperature		23.5℃	Relative Humidity		49%	Test Voltage	120V/60Hz
Antenna	Mode	Freq (MHz)	Hops in Observation Period(hops)	Pulse Duration (ms)	Dwell time (ms)	Limit	Result
ANT 1	GFSK DH1	2441	320	0.4022	128.69	<400ms	PASS
	GFSK DH3	2441	160	1.6812	268.99	<400ms	PASS
	GFSK DH5	2441	106.67	2.9565	315.36	<400ms	PASS
	8-DPSK 3DH1	2441	320	0.4022	128.69	<400ms	PASS
	8-DPSK 3DH3	2441	160	1.6812	268.99	<400ms	PASS
	8-DPSK 3DH5	2441	106.67	2.9565	315.36	<400ms	PASS
ANT 2	GFSK DH1	2441	320	0.4058	129.86	<400ms	PASS
	GFSK DH3	2441	160	1.6812	268.99	<400ms	PASS
	GFSK DH5	2441	106.67	2.9565	315.36	<400ms	PASS
	8-DPSK 3DH1	2441	320	0.4022	128.69	<400ms	PASS
	8-DPSK 3DH3	2441	160	1.6812	268.99	<400ms	PASS
	8-DPSK 3DH5	2441	106.67	2.9565	315.36	<400ms	PASS
1. DH1 Packet permit maximum 1600 hops/s with 2 timeslot in 79 channels (1 timeslot TX, 1 timeslot RX), So the hops in Observation Period($0.4s \times 79 \text{ channel}$)=$(1600/79/2)\text{hops/s} \times 0.4s \times 79=320 \text{ hops}$. 2. DH3 Packet permit maximum 1600 hops/s with 4 timeslot in 79 channels (3 timeslot TX, 1 timeslot RX), So the hops in Observation Period($0.4s \times 79 \text{ channel}$)=$(1600/79/4)\text{hops/s} \times 0.4s \times 79=160 \text{ hops}$. 3. DH5 Packet permit maximum 1600 hops/s with 6 timeslot in 79 channels (5 timeslot TX, 1 timeslot RX), So the hops in Observation Period($0.4s \times 79 \text{ channel}$)=$(1600/79/5)\text{hops/s} \times 0.4s \times 79=106.67 \text{ hops}$. 4. Dwell Time= Hops in Observation Period $\times$ Pulse Duration.							

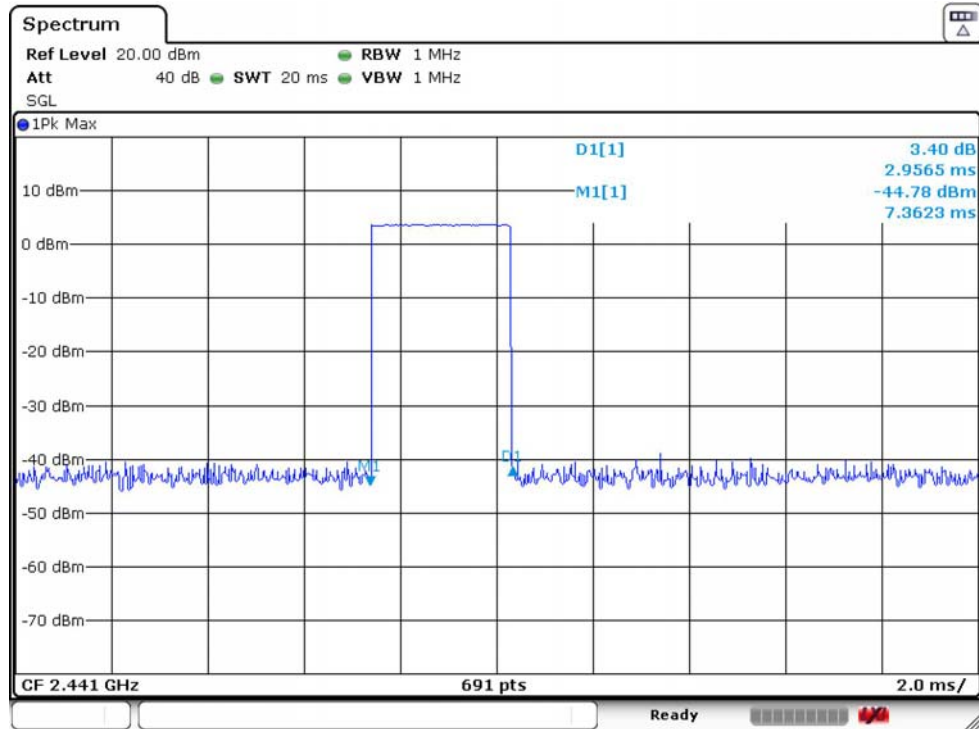
GFSK DH1 ANT1



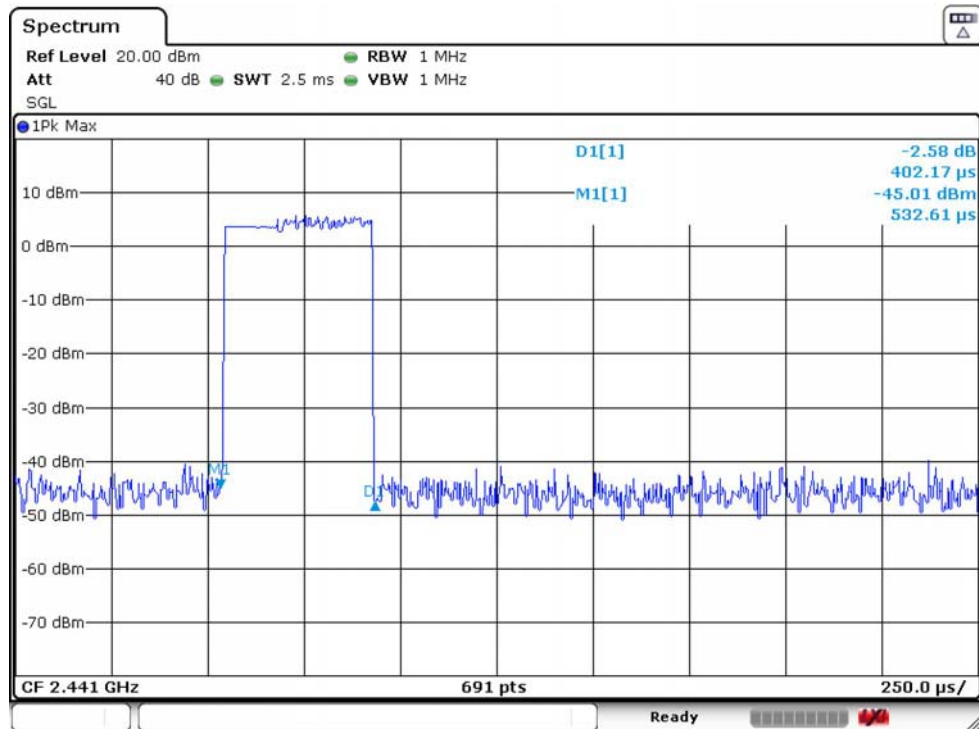
GFSK DH3 ANT1



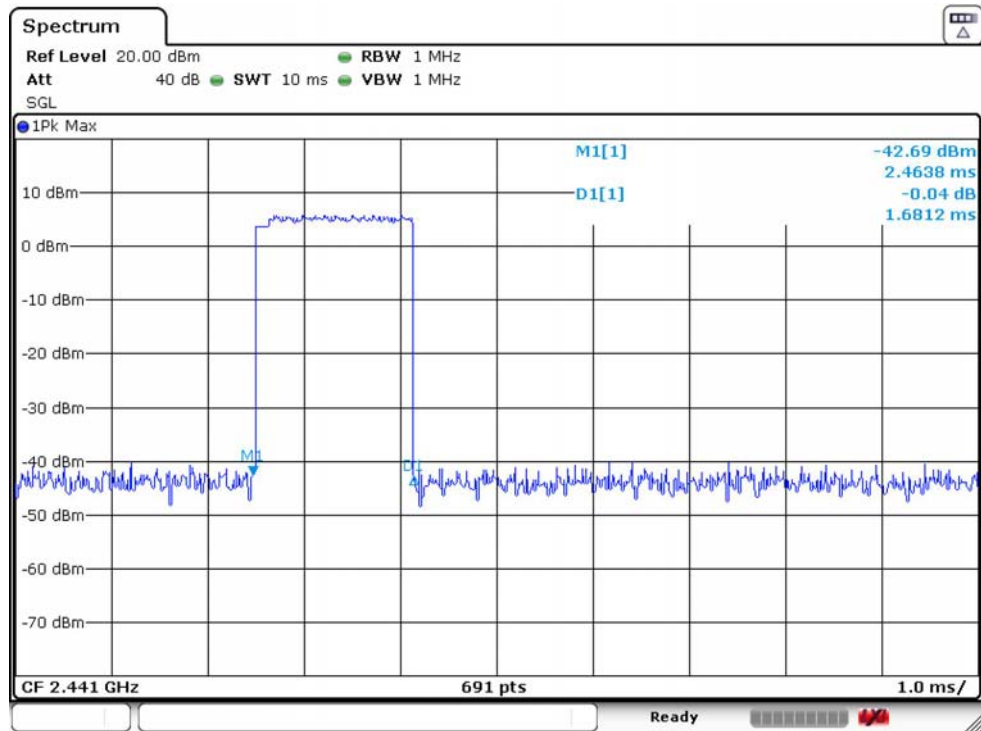
GFSK DH5 ANT1



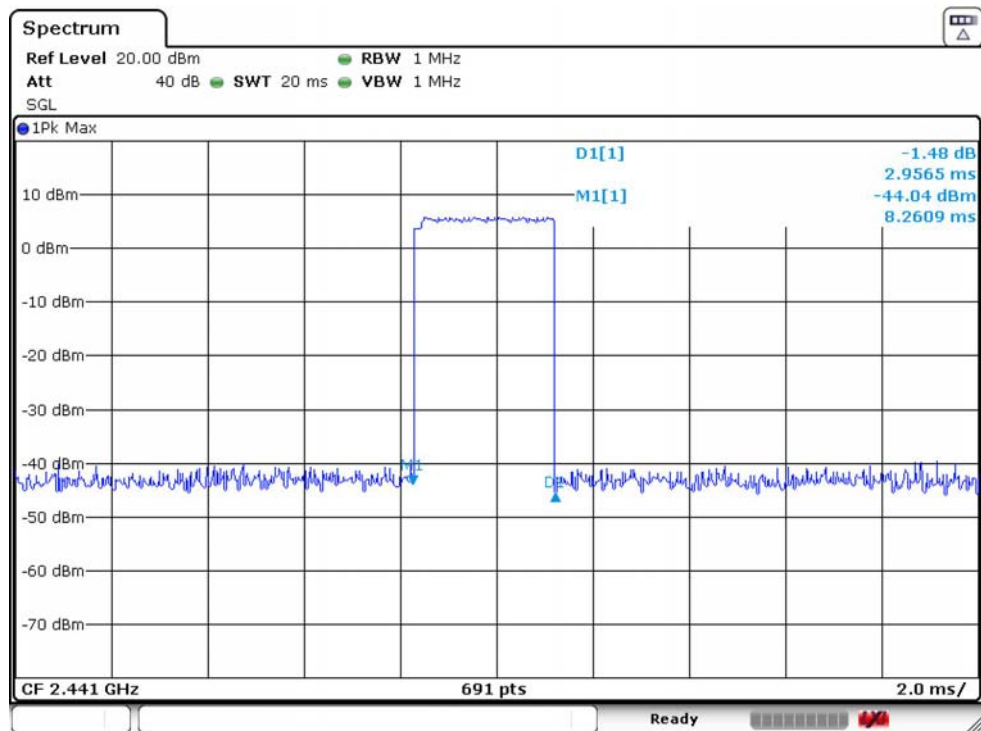
8-DPSK 3DH1 ANT1



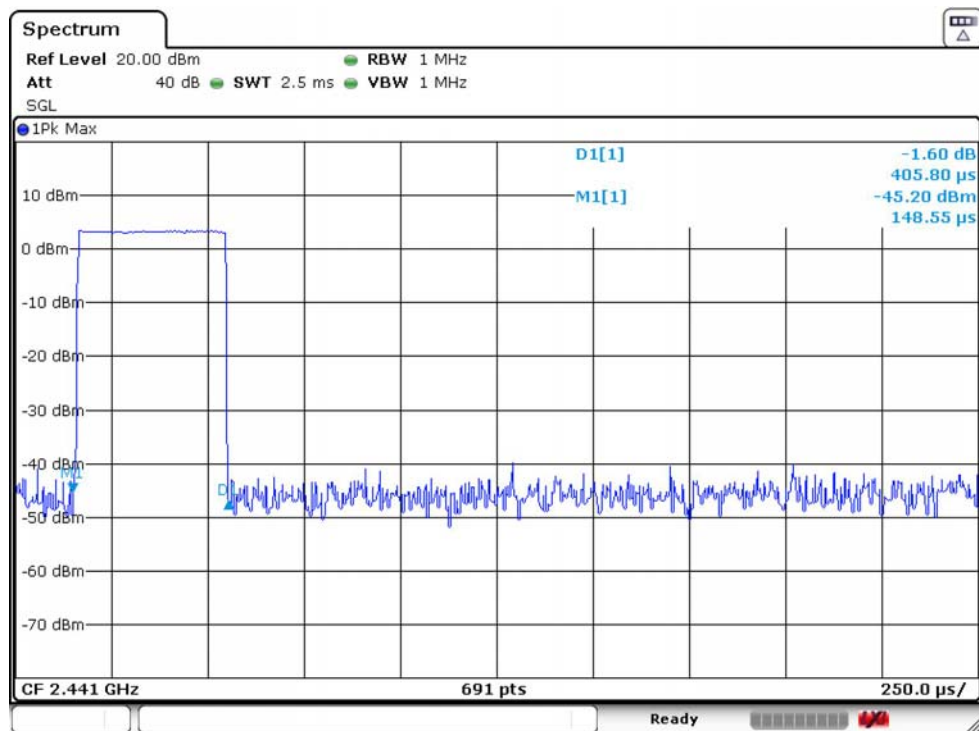
8-DPSK 3DH3 ANT1



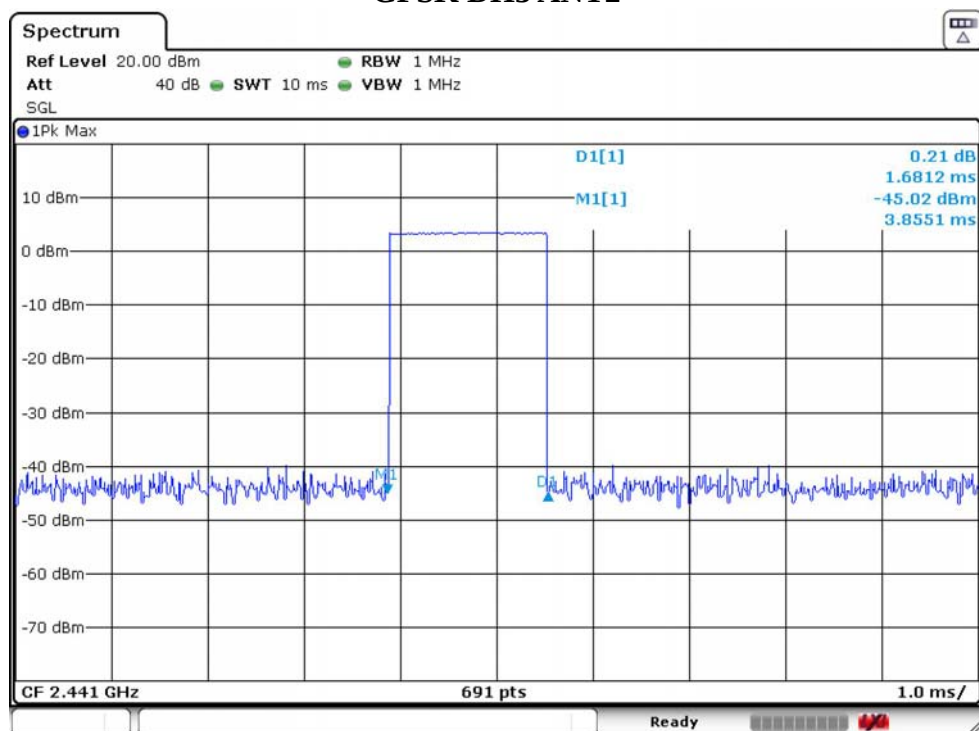
8-DPSK 3DH5 ANT1



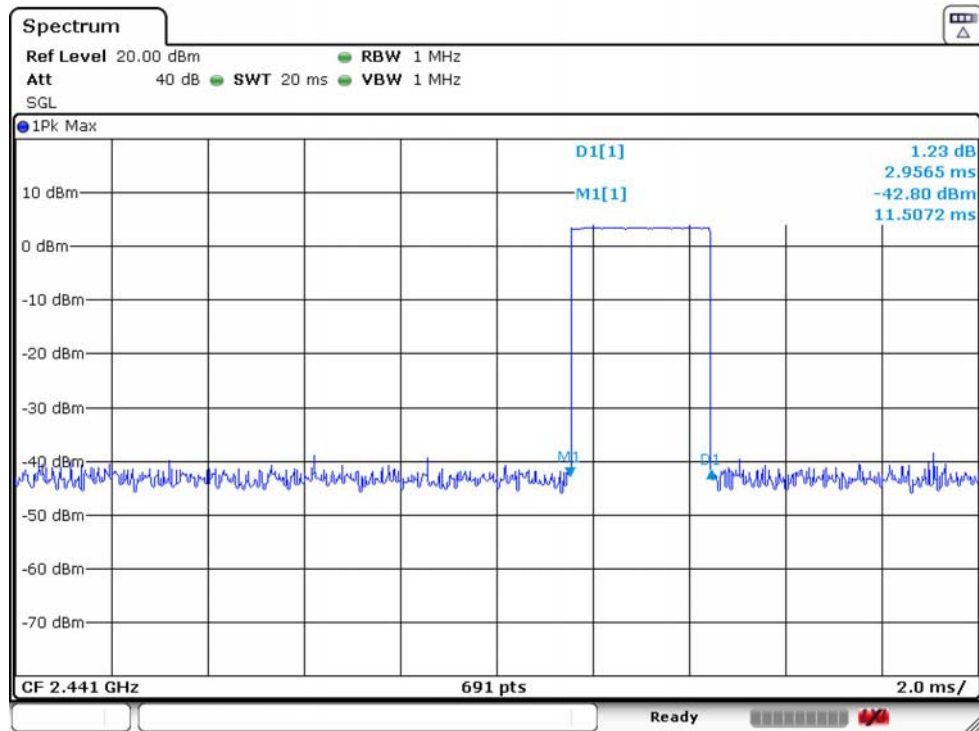
GFSK DH1 ANT2



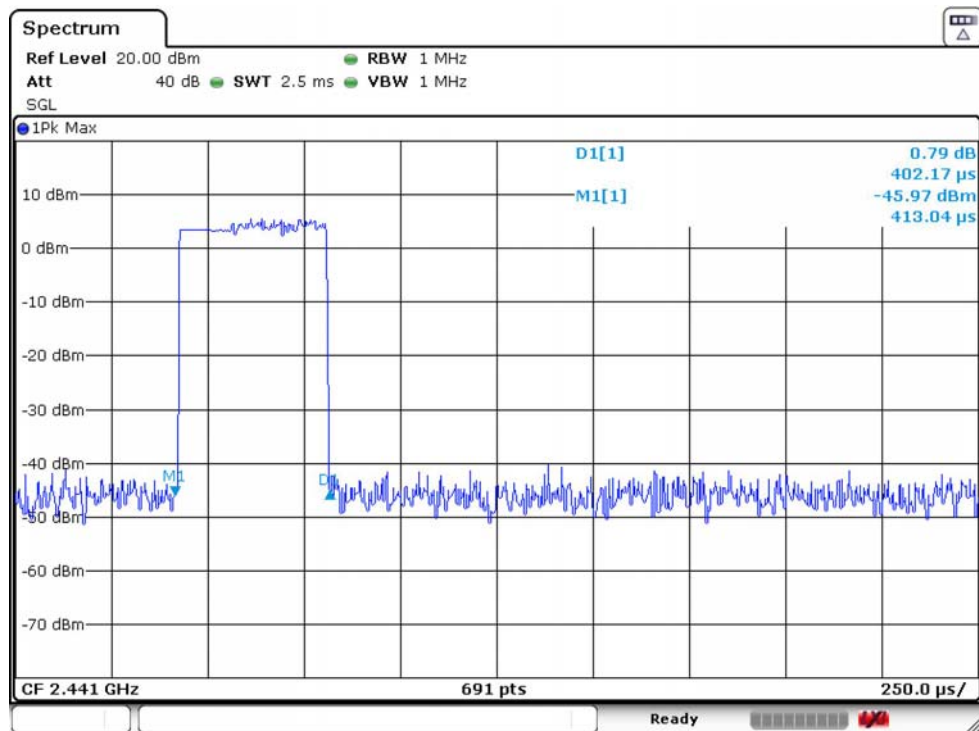
GFSK DH3 ANT2



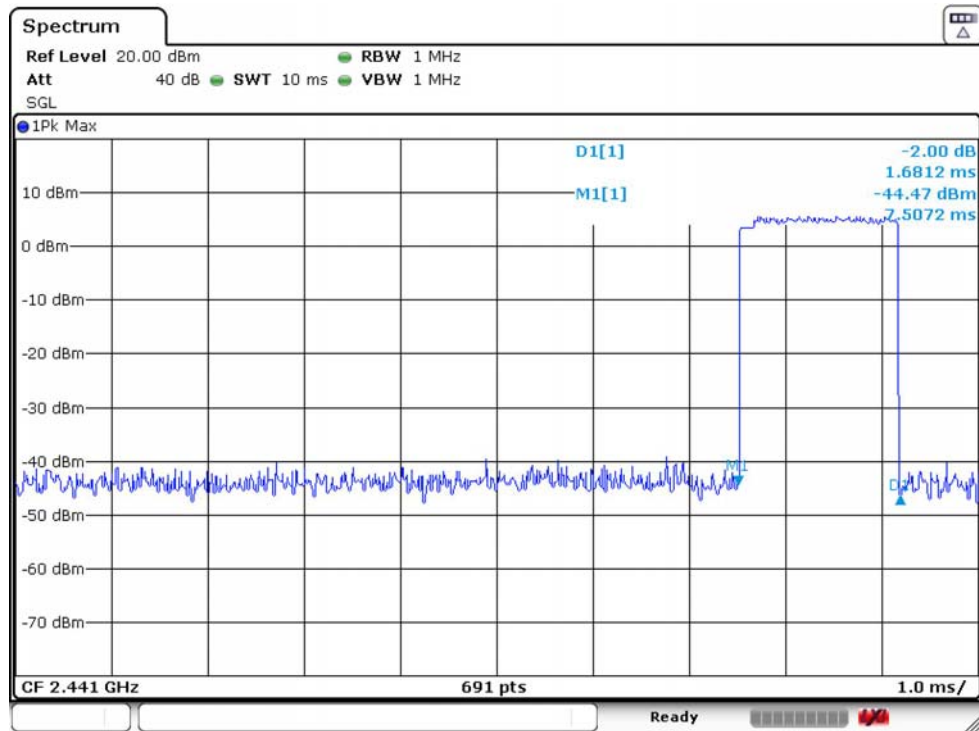
GFSK DH5 ANT2



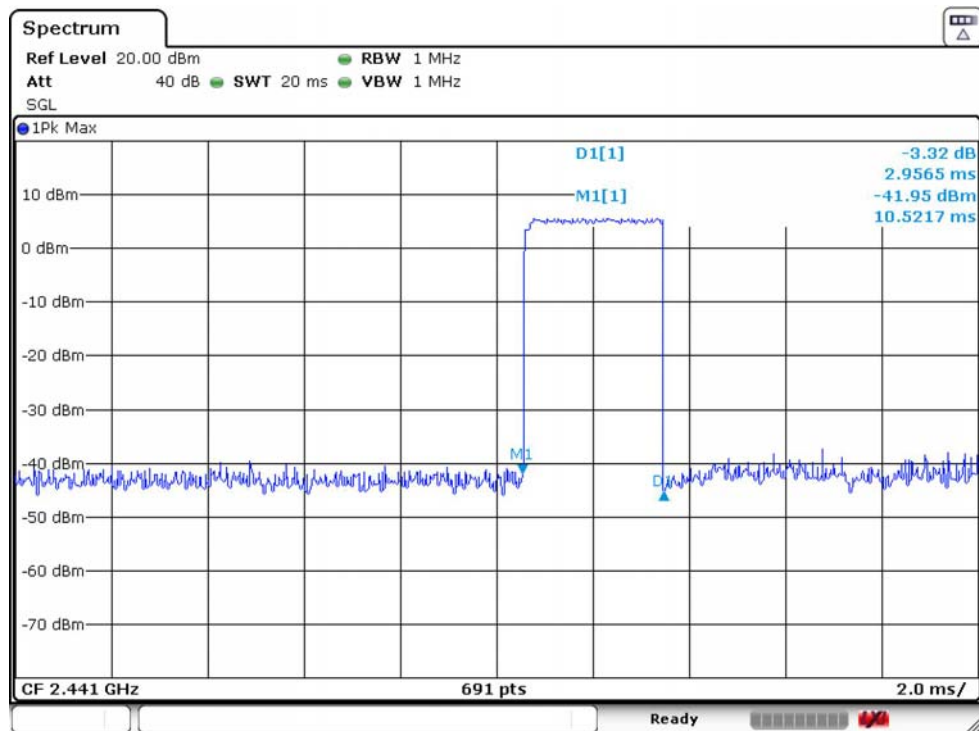
8-DPSK 3DH1 ANT2



8-DPSK 3DH3 ANT2



8-DPSK 3DH5 ANT2

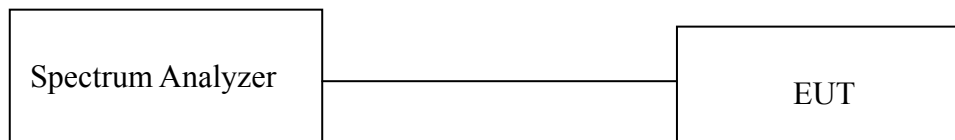


8. CONDUCTED BAND EDGE

8.1. 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)).

8.2. Test Setup



8.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Span	100MHz
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

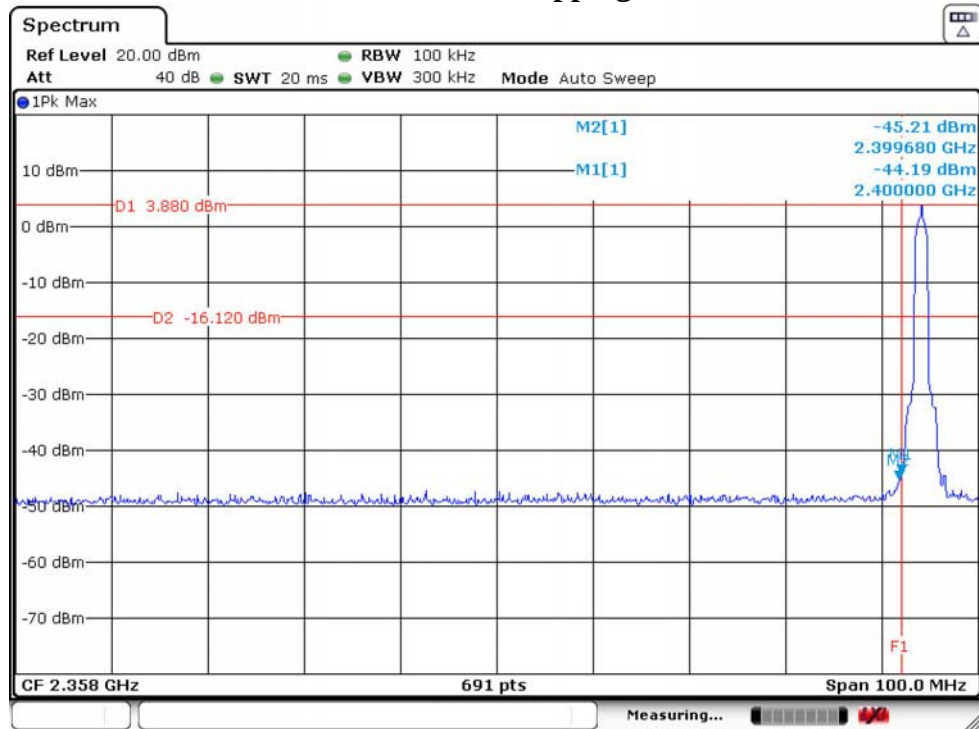
8.4. Test Procedure

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 8.3.
- Set the EUT transmit continuously with maximum output power over fixed single hopping channel.
- Allow trace to stabilize, use the marker function to mark the highest emission level outside the authorized band.
- Repeat above procedures until all channels and test modes were measured (including frequency hopping off and frequency hopping on).
- Record the results in the test report.

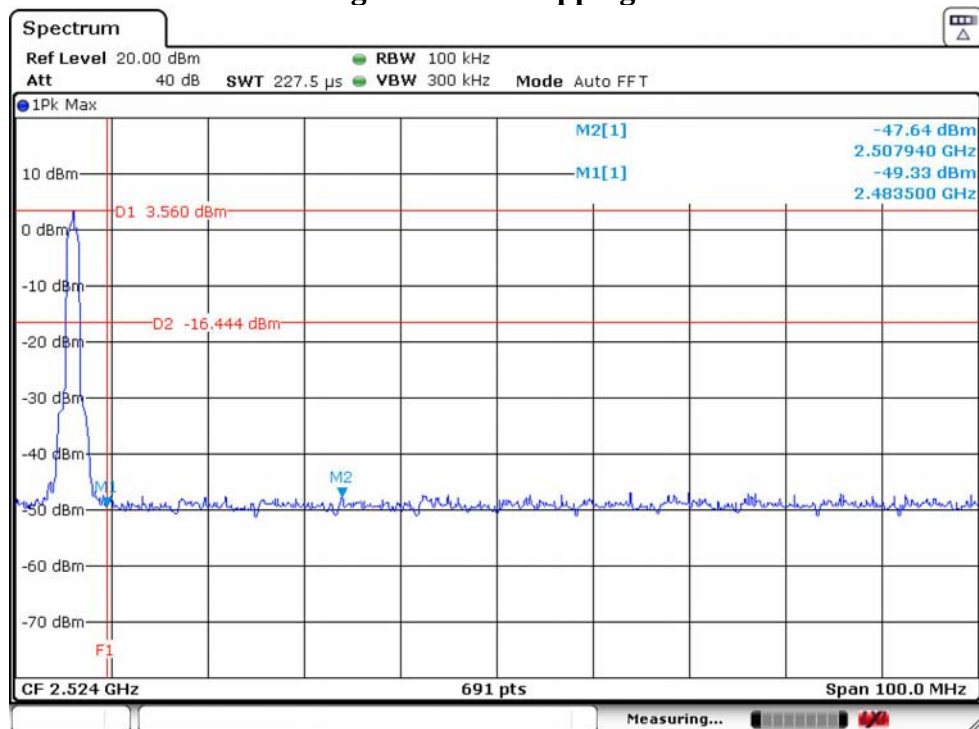
8.5. Test Result

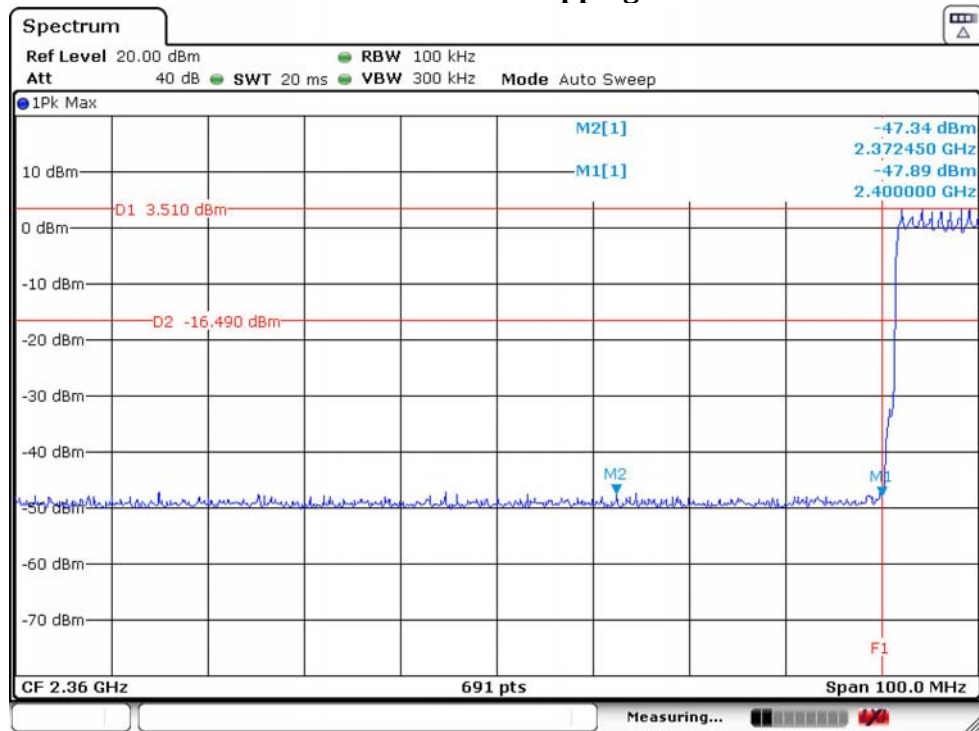
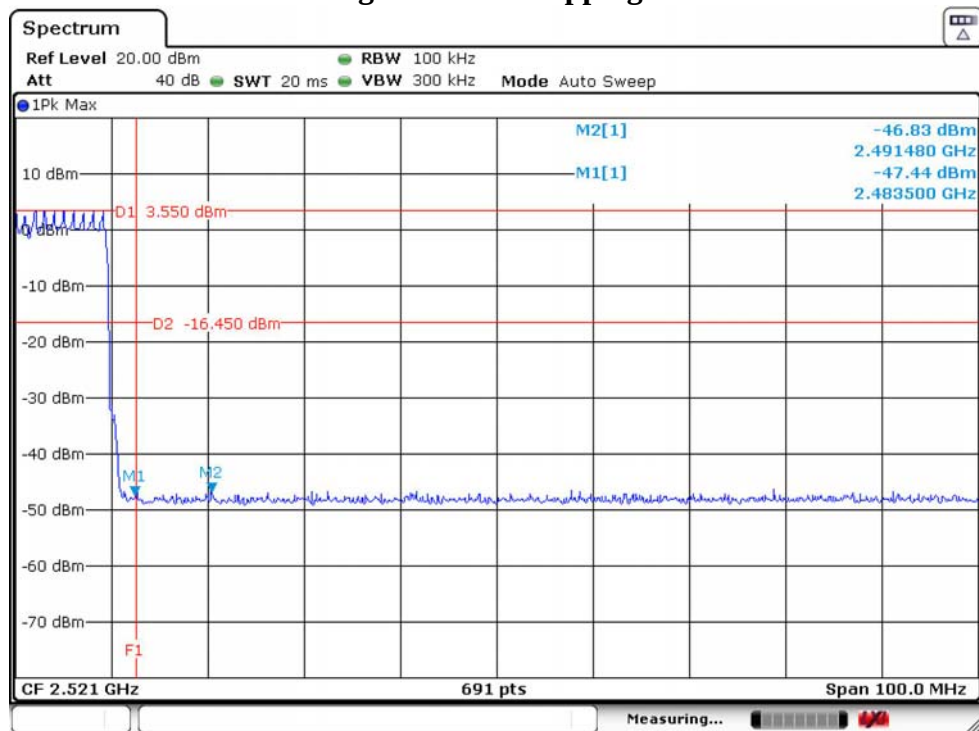
Temperature	27°C	Relative Humidity	54%	Test Voltage	120V/60Hz
Result	PASS				

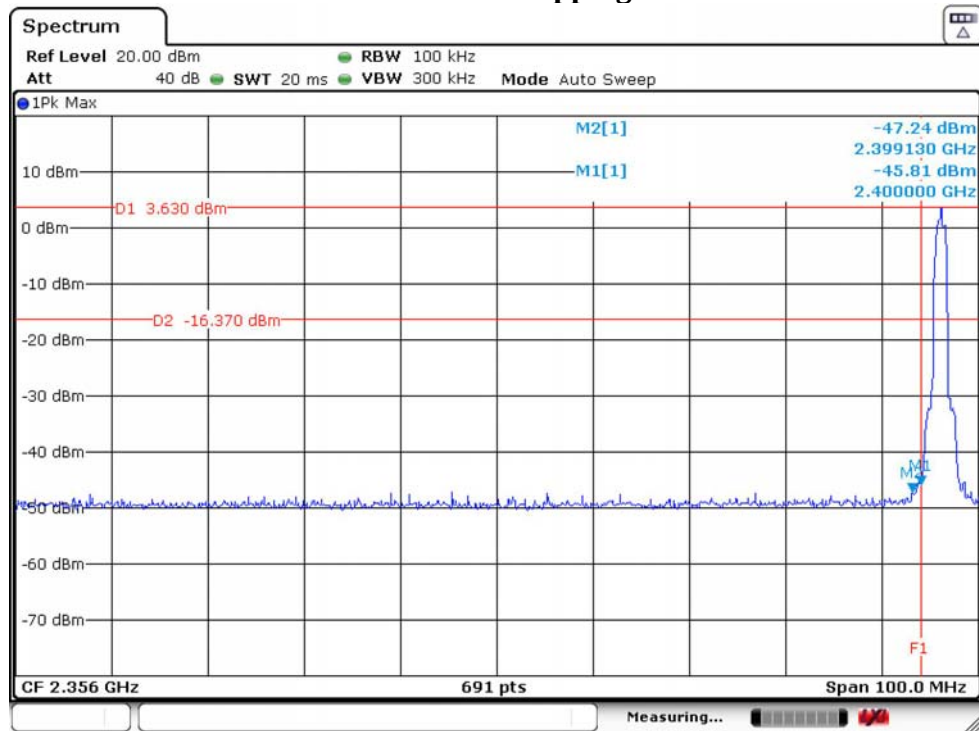
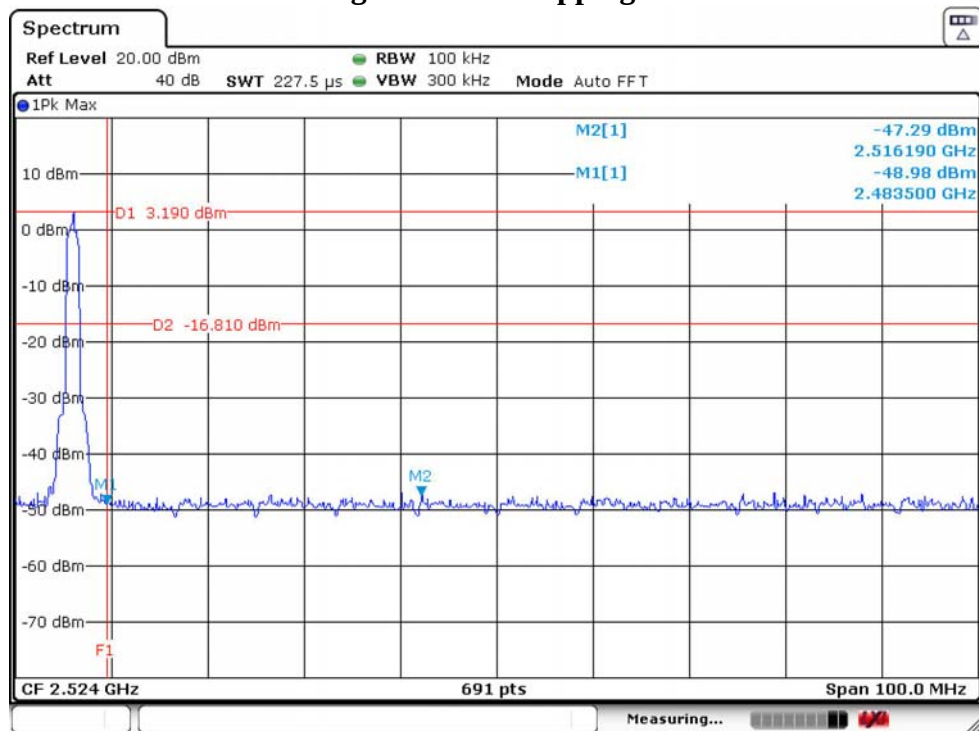
8-DPSK Low Channel Hopping OFF ANT1



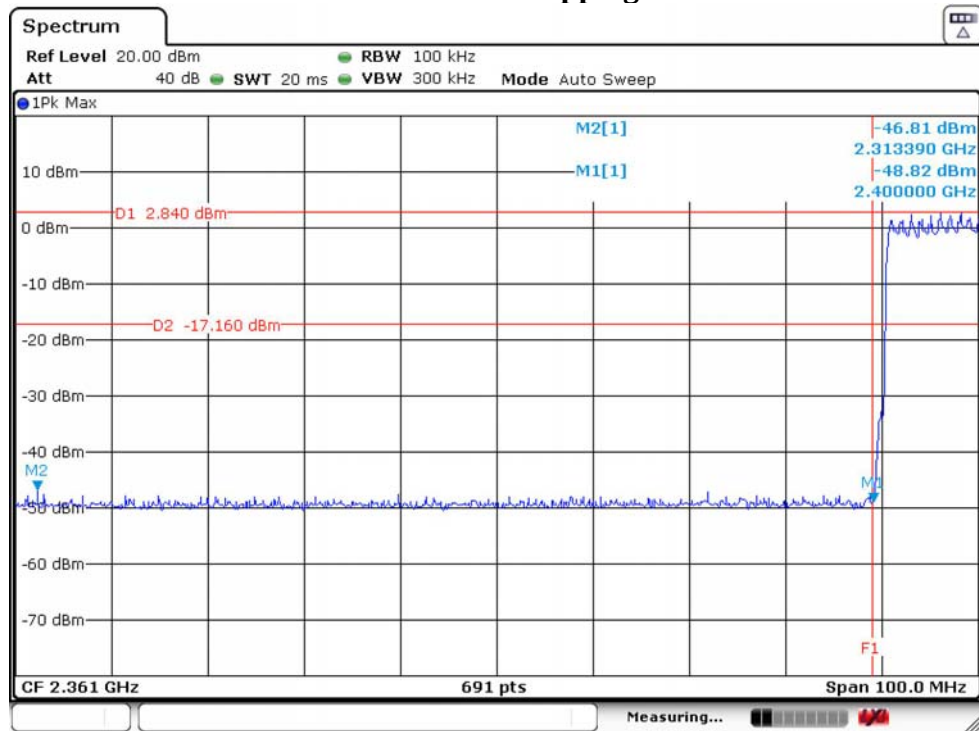
8-DPSK High Channel Hopping OFF ANT1



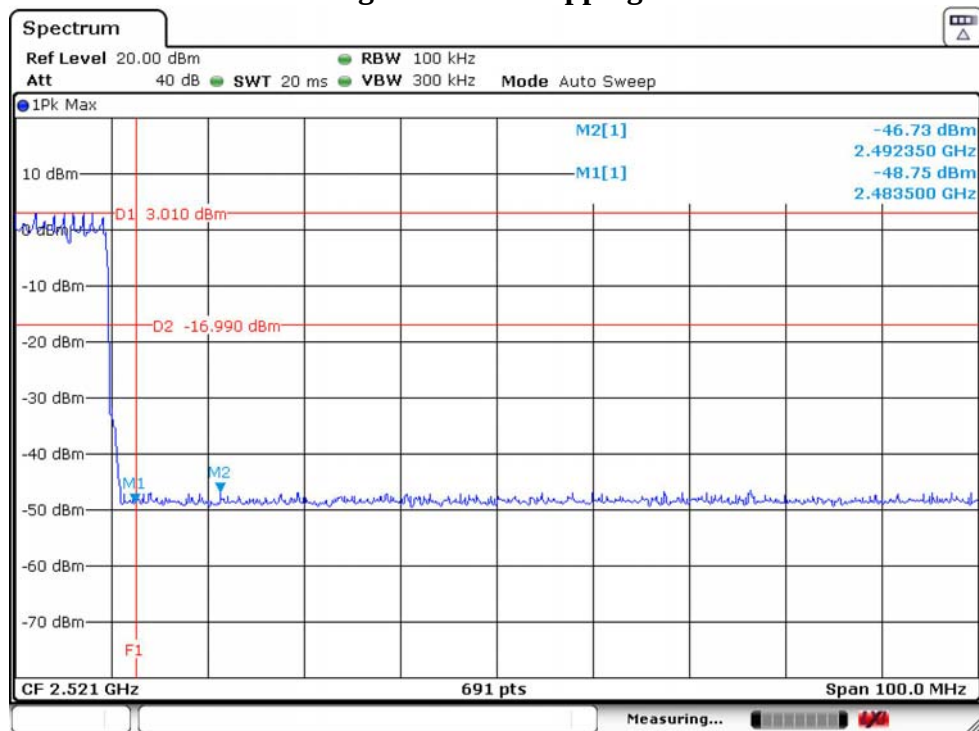
8-DPSK Low Channel Hopping ON ANT1**8-DPSK High Channel Hopping ON ANT1**

8-DPSK Low Channel Hopping OFF ANT2**8-DPSK High Channel Hopping OFF ANT2**

8-DPSK Low Channel Hopping ON ANT2



8-DPSK High Channel Hopping ON ANT2



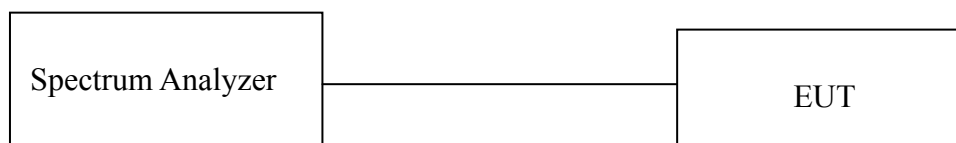
All modulations are all tested ,only worse case is reported

9. CONDUCTED SPURIOUS EMISSIONS

9.1. 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)).

9.2. Test Setup



9.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Start frequency	30MHz
Stop frequency	25GHz
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

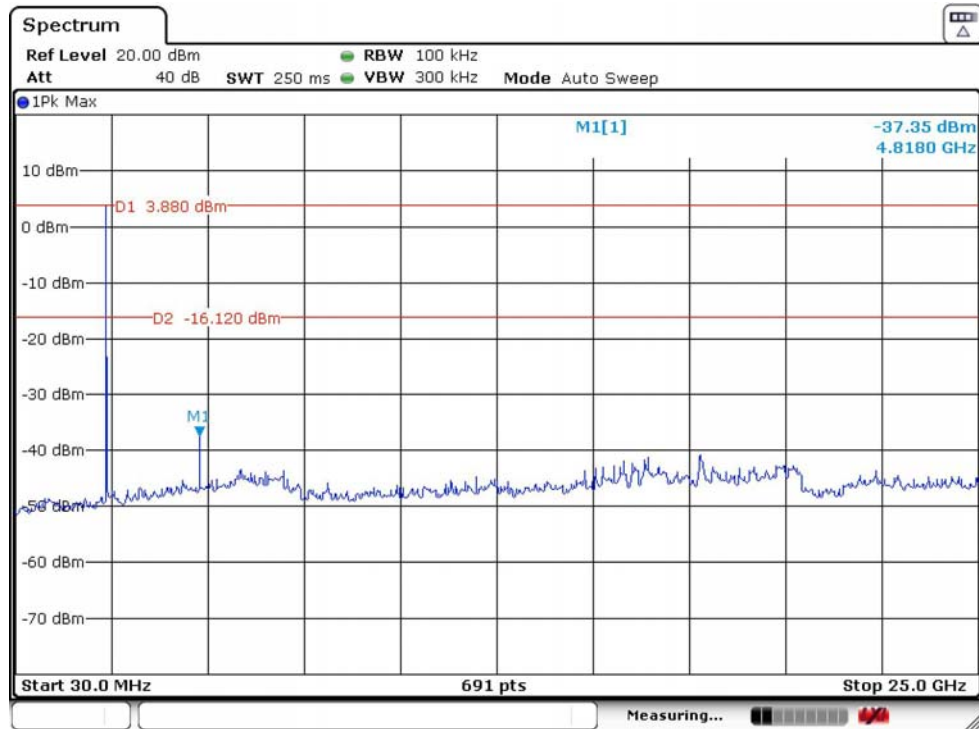
9.4. Test Procedure

- Connect EUT antenna terminal to the spectrum analyzer with RF cable.
- Spectrum analyzer setting parameters in accordance with section 9.3.
- Set the EUT transmit continuously with maximum output power over fixed single hopping channel.
- Allow trace to stabilize, use the marker function to mark the highest emission level outside the authorized band.
- Repeat above procedures until all channels and test modes were measured.
- Record the results in the test report.

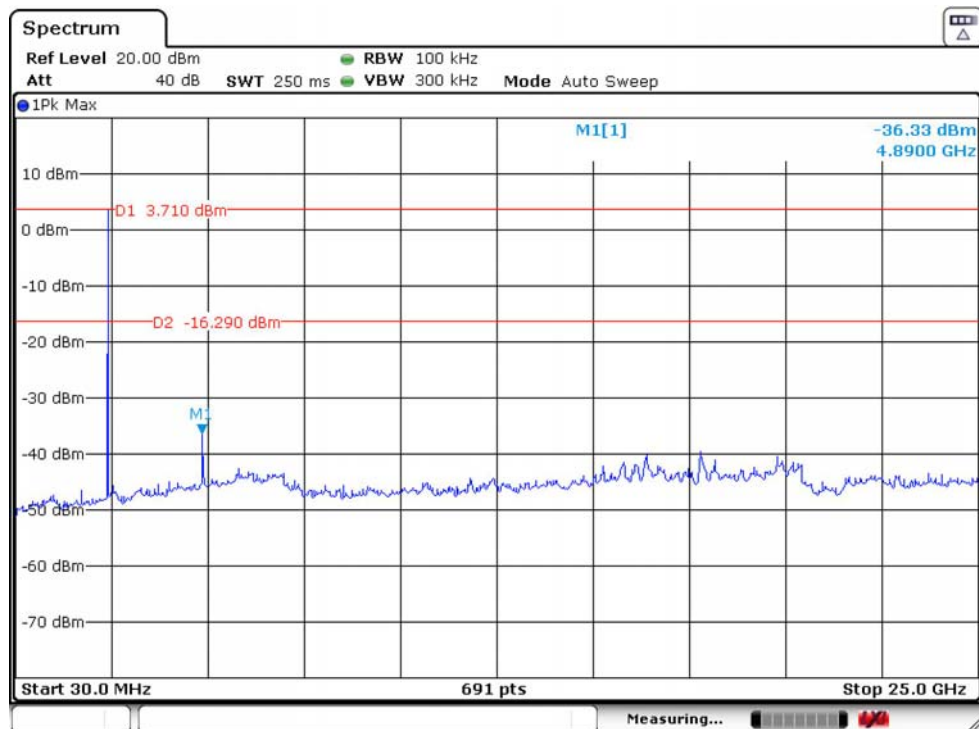
9.5. Test Result

Temperature	27°C	Relative Humidity	54%	Test Voltage	120V/60Hz
Result	PASS				

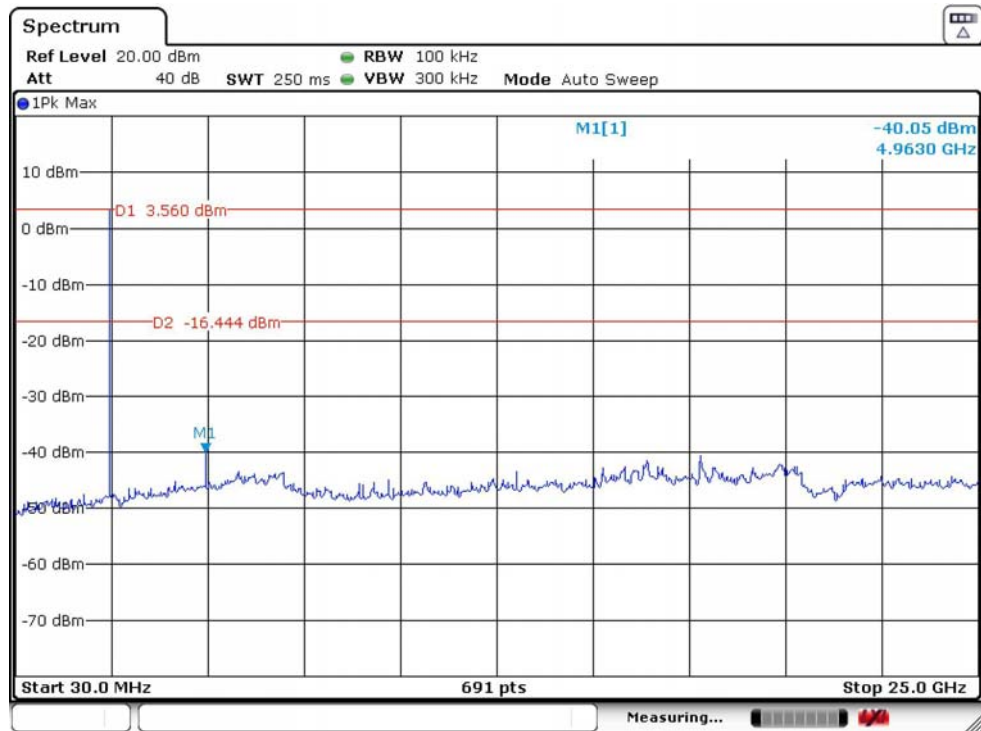
8-DPSK 2402MHz ANT1



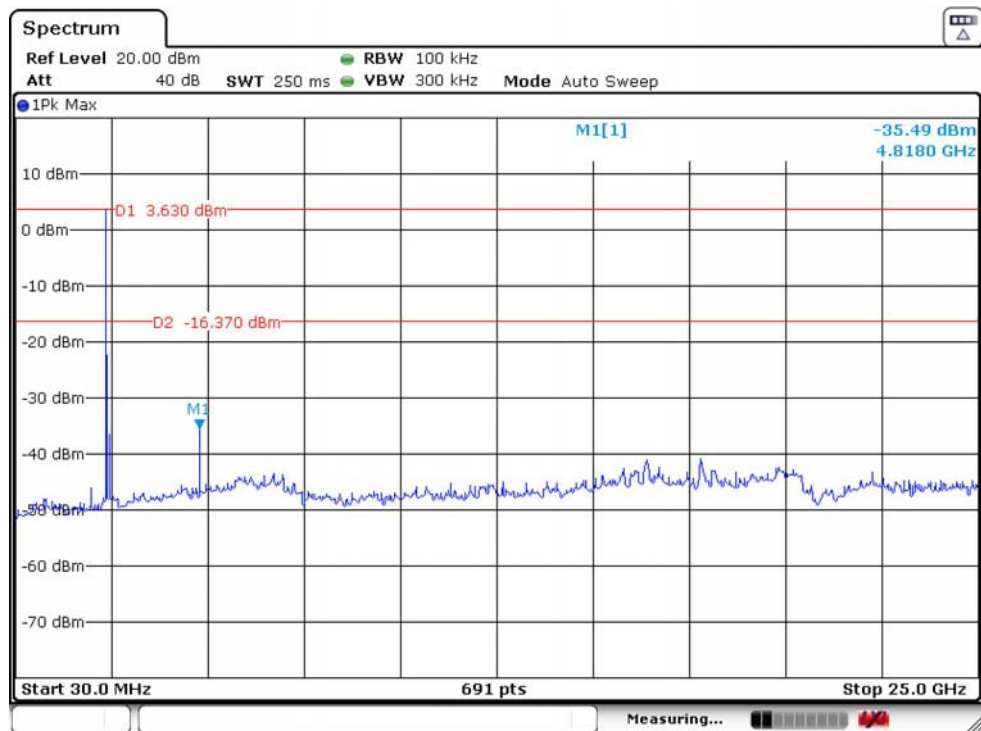
8-DPSK 2441MHz ANT1



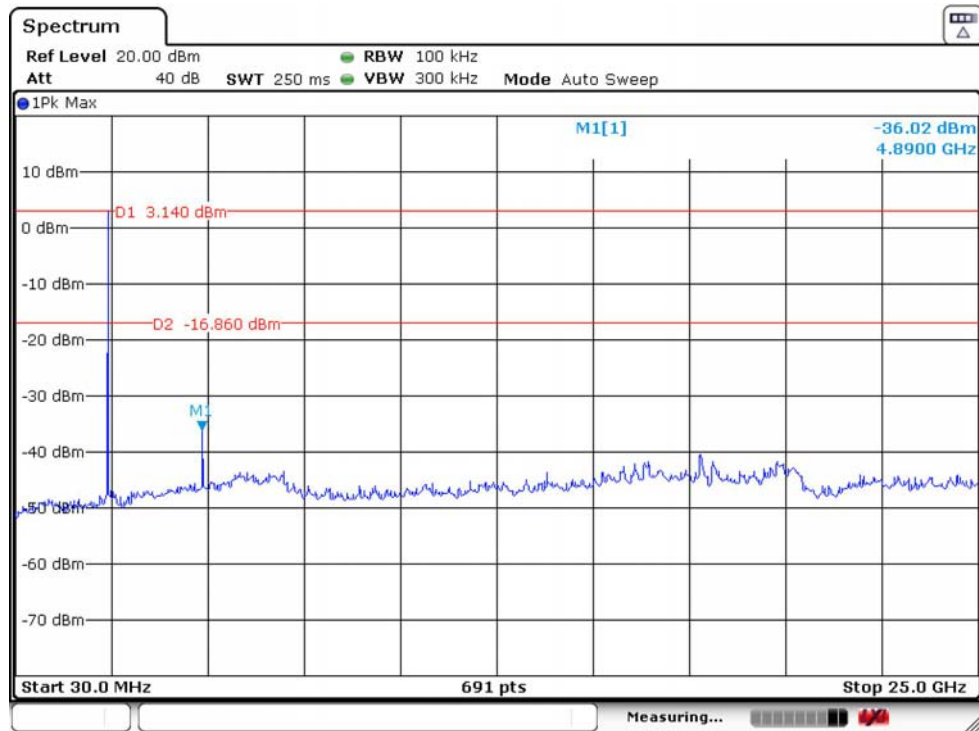
8-DPSK 2480MHz ANT1



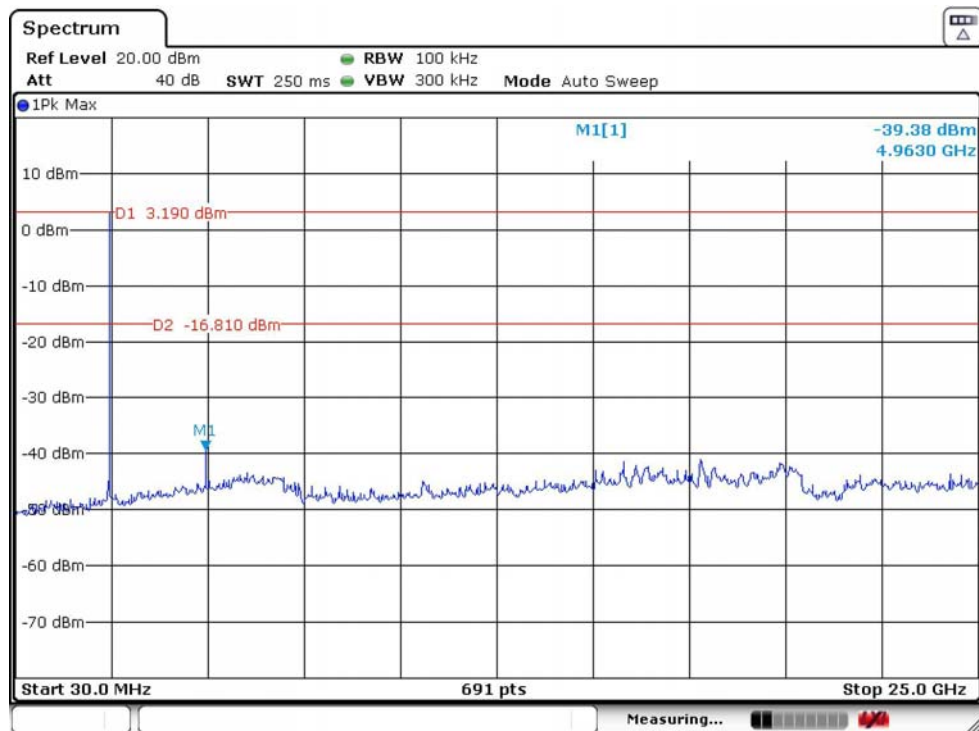
8-DPSK 2402MHz ANT2



8-DPSK 2441MHz ANT2



8-DPSK 2480MHz ANT2



All modulations are all tested ,only worse case is reported