

FCC Part 15 Subpart C Test Report

for FHSS System

Product Name : **GNSS receiver**
Model Name : **i80 WXYZ**

Prepared for:

Shanghai Huace Navigation Technology LTD.
Building C, 599 Gaojing Road, Qingpu District, Shanghai
TEL: 021-51508100-1242
FAX: 021-64851208

Prepared by:

Unilab (Shanghai) Co., Ltd
FCC 2.948 register number is 714465
No.1350, Lianxi Rd. Pudong New District, Shanghai, China
TEL: +86-21-50275125
FAX: +86-21-50275126

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Date of Report : **07-30-2015**
Date of Test : **06-08-2015~07-30-2015**

Notes :

The test results only relate to these samples which have been tested.
Partly using this report will not be admitted unless been allowed by Unilab.
Unilab is only responsible for the complete report with the reported stamp of Unilab.

Applicant: Shanghai Huace Navigation Technology LTD.
Building C,599 Gaojing Road, Qingpu District, Shanghai

Manufacturer: Shanghai Huace Navigation Technology LTD.
Building C,599 Gaojing Road, Qingpu District, Shanghai

Product Name: GNSS receiver

Brand Name:



Model Name: i80 WXYZ

Model Description: See Part1.1 Note.

FCC ID: SY4-A01004

Serial Number: N/A

EUT Voltage: MIN: 8V, NOR:12V, MAX: 36V

Date of Receipt: 03-12-2015

Test Standard: FCC CFR Title 47 Part 15 Subpart C
ANSI C 63.4: 2009
DA 00705

Test Result: PASS

Date of Test 06-08-2015~07-30-2015

Tested by : Jeffrey Wang
(Test Engineer: Jeffrey Wang)

Reviewed by : Forest Cao
(Senior Engineer: Forest Cao)

Approved by : Eva Wang
(Supervisor: Eva Wang)

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1. GENERAL INFORMATION

1.1 EUT DESCRIPTION

Product Name:	GNSS receiver
Model Name:	i80 WXYZ
Hardware Version:	V1.3
Software Version:	V1.1.8
RF Exposure Environment:	Uncontrolled
Bluetooth	
Frequency Range:	2402MHz~2480MHz
Carrier Frequency of Each Channel	2402+N*1MHz(N=0~78)
Type of Modulation:	GFSK, $\pi/4$ -DQPSK, 8-DPSK
Channel Separation:	1MHz
Channel Number:	79
Antenna Type:	Internal
Antenna Peak Gain:	1.0dBi
Component	
AC Adapter:	Input: AC 100-240V 50/60Hz
	Output: DC 12V/2A
The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

NOTE:Model i80 WXYZ, W is variable, it indicated A-Z or 0-9 or blank , X is variable, it indicated A-Z or 0-9 or blank , Y is variable, it indicated A-Z, 0-9 or blank. Z is variable, it indicated A-Z, 0-9 or blank. due to sales purpose in different countries or regions. The internal PCB design are no difference , but only distinct in colours and model names. This test model name is i80.

1.2 COMPLIANCE DESCRIPTION FOR BLUETOOTH TRANSMITTER

This Bluetooth module was built by TI WL1271 chip, it supports Bluetooth v2.1 + Enhanced Data Rate(EDR), it has been tested by a Bluetooth Qualification Lab, it compliance the 15.247 requirements for Bluetooth transmitter, and we confirm the following:

a) Pseudorandom Frequency Hopping Sequence

This system is hopping pseudo-randomly, and its carrier is modulated with the coded information. According to the test plots in section 4 “channel separation” and section 5 “minimum hopping channels”, the frequency of the carrier changes at fixed intervals under the direction of a pseudo-randomly coded sequence, and it has 79 hopping frequencies, for example, the hopping sequence channels can be {20, 12, 28, 04, 52, 44, 60, 36, 76, 05, 13, 68, 29, 37, 45, 21, 69, 73, 77, 65, 22, 28, 30, 20, 46, 58, 62, 42, 78, 13, 15, 76} in one period.

b) Equal Hopping Frequency Use

Each frequency is used equally on the average by each transmitter, from the test result about minimum hopping channels, the each new transmission event begins on the next channel in the hopping sequence after the final channel used in the previous transmission event.

c) System Receiver Input Bandwidth

The receiver input bandwidths that match the hopping channel bandwidths of their corresponding transmitters, and the receiver shifts frequencies in synchronization with the transmitted signals.

1.3 TEST MODE

Unilab has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: GFSK CH0
Mode 2: GFSK CH39
Mode 3: GFSK CH78
Mode 4: 8-DPSK CH0
Mode 5: 8-DPSK CH39
Mode 6: 8-DPSK CH78
Mode 7: $\Pi/4$ -DQPSK CH0
Mode 8: $\Pi/4$ -DQPSK CH39
Mode 9: $\Pi/4$ -DQPSK CH78

Note:

1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. For radiated emission test, every axis (X, Y, Z) was verified, and show the worst result on this report.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application

2.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

2.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.3 of ANSI C63.4: 2009 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.4 of ANSI C63.4: 2009.

2.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

2 Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

2.5 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

After verification, all tests were carried out with the worst case test modes as shown below GFSK(1Mbps) and 8-DPSK(3 Mbps) Channel Low (2402MHz),Mid (2441MHz) and High (2480MHz), these were chosen for full testing.

3. TECHNIACL SUMMARY

3.1 SUMMARY OF STANDARDS AND TEST RESULTS

The EUT have been tested according to the applicable standards as referenced below:

Test Item	FCC	Result
Channel Separation	§15.247 (a)	P
Minimum Hopping Channel	§15.247 (a)	P
Occupied Bandwidth	§15.247 (a)	P
Dwell Time	§15.247 (a)	P
Peak Output Power (Conduction)	§15.247 (b)	P
Spurious Emissions (Conduction)	§15.247 (d)	P
Band edge measurement	§15.247 (d)	P
Spurious Emissions (Radiation)	§15.247 (d) §15.35 (b) §15.209 (a)	P
AC Power Line Conducted Emissions	§15.207 (a)	P

Note: P means pass, F means failure, N/A means not applicable

3.2 TEST UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted disturbance	3.4
Radiated disturbance	4.2

3.3 TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	Serial No.	Cal. Interval	Due Date
Receiver	Agilent	N9038A	MY51210142	1 year	11/11/2015
Wireless Connectivity Test Set	Agilent	N4010A	MY49080305	1 year	10/23/2015
Loop Antenna	Schwarzbeck	FMZB1519	1519-020	1 year	03/25/2016
LISN	R&S	ENV216	100069	2 years	07/27/2016
3m Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	CT-0000336	3 years	11/26/2017
Microwave Preamplifier	EM Electronics	EM30180	3008A02425	1 years	02/27/2016
Power Splitter	Agilent	11667C/ 52401	MY53806148	2 years	02/27/2016
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	3 years	09/19/2016
VHF-UHF-Biconical Antenna	Schwarzbeck	VUBA9117	9117-263	3 years	09/19/2016
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	3 years	09/19/2016
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	3 years	09/19/2016
Horn Antenna(18-40GHz)	ETS	3116	00070497	3 years	07/18/2016.

3.4 SUPPORT EQUIPMENT

Equipment	Manufacturer	Model	Serial No.	Due Date
Signal Generator	Agilent	N4010A	MY50140938	10/23/2015

3.5 TEST FACILITY

All test facilities used to collect the test data are located at Shanghai Institute of Measurement and Testing Technology EMC Lab., Shanghai, China.

The site and apparatus are constructed in conformance with the requirements of ANSI C63.4: 2009, CISPR 16-1-1 and other equivalent standards. The laboratory is compliance with the requirements of the ISO/IEC/E 17025.

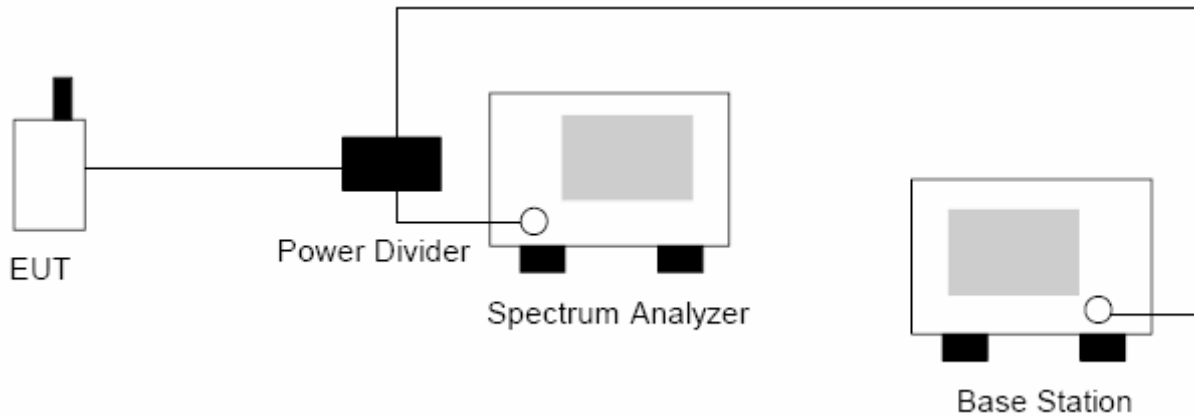
3.6 TEST SETUP CONFIGURATION

The information contained within this report is intended to show verification of compliance of the EUT to the requirements of CFR 47 FCC Part 15.247.

Unilab has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report .

4. CHANNEL SEPARATION

4.1 TEST SETUP



4.2 LIMITS

Limits	≥ 25 kHz or 20 dB bandwidth of hopping channel
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4.3 TEST PROCEDURE

The EUT have its hopping function enabled. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) $\geq 1\%$ of the span

Video (or Average) Bandwidth (VBW) \geq RBW

Sweep = auto

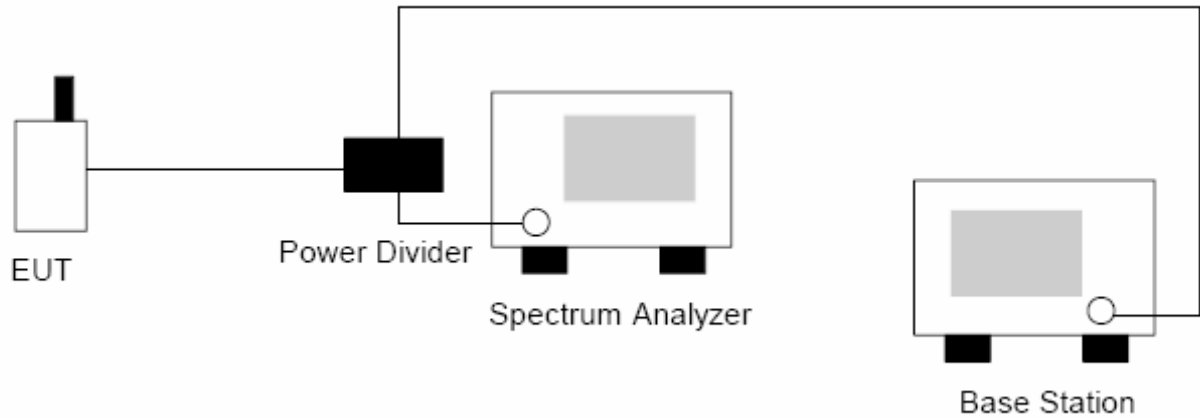
Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

5. MINIMUM HOPPING CHANNELS

5.1 TEST SETUP



5.2 LIMITS

Limits	≥ 15 Channels
--------	--------------------

5.3 TEST PROCEDURE

The EUT have its hopping function enabled.

Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW $\geq 1\%$ of the span

VBW \geq RBW

Sweep = auto

Detector function = peak

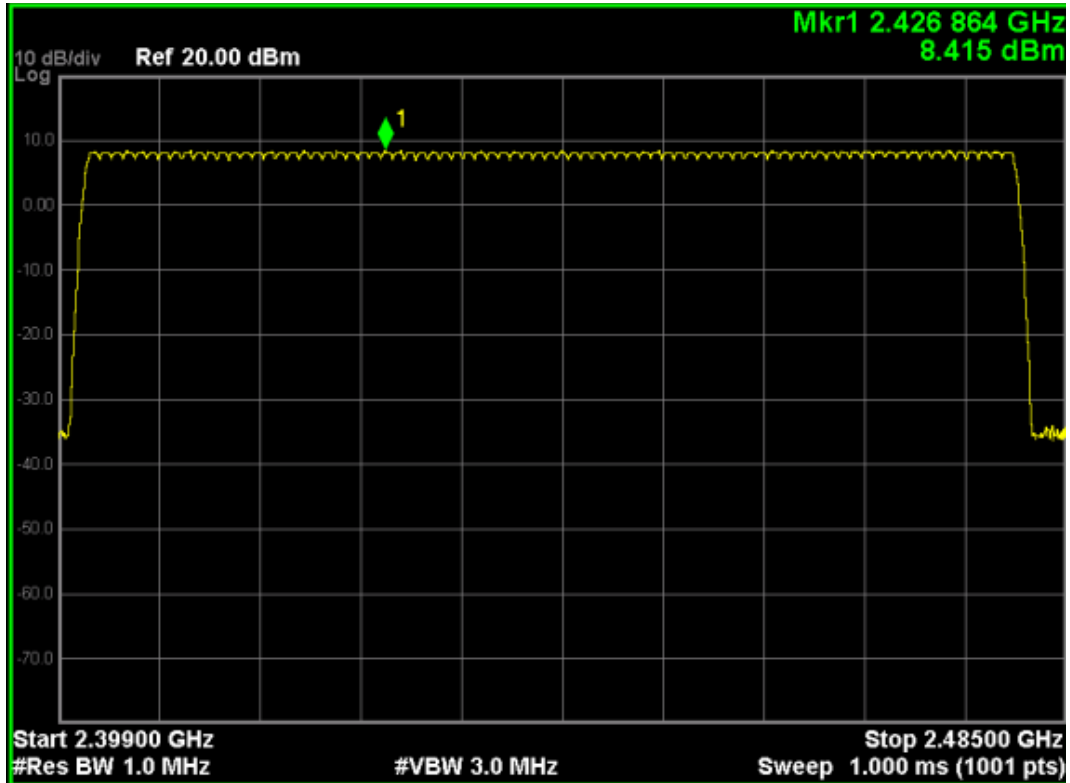
Trace = max hold

Allow the trace to stabilize. It may prove necessary to break the span up to sections, in order to clearly show all of the hopping frequencies.

5.4 TEST RESULT

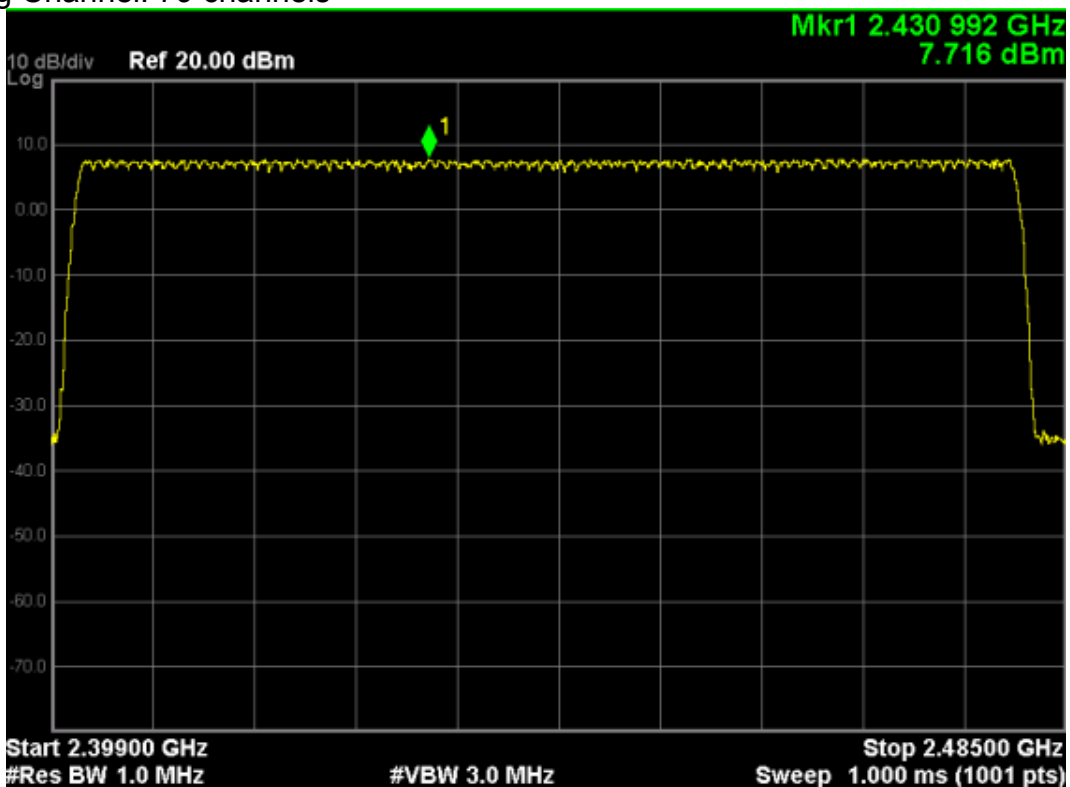
GFSK

Hopping Channel: 79 channels



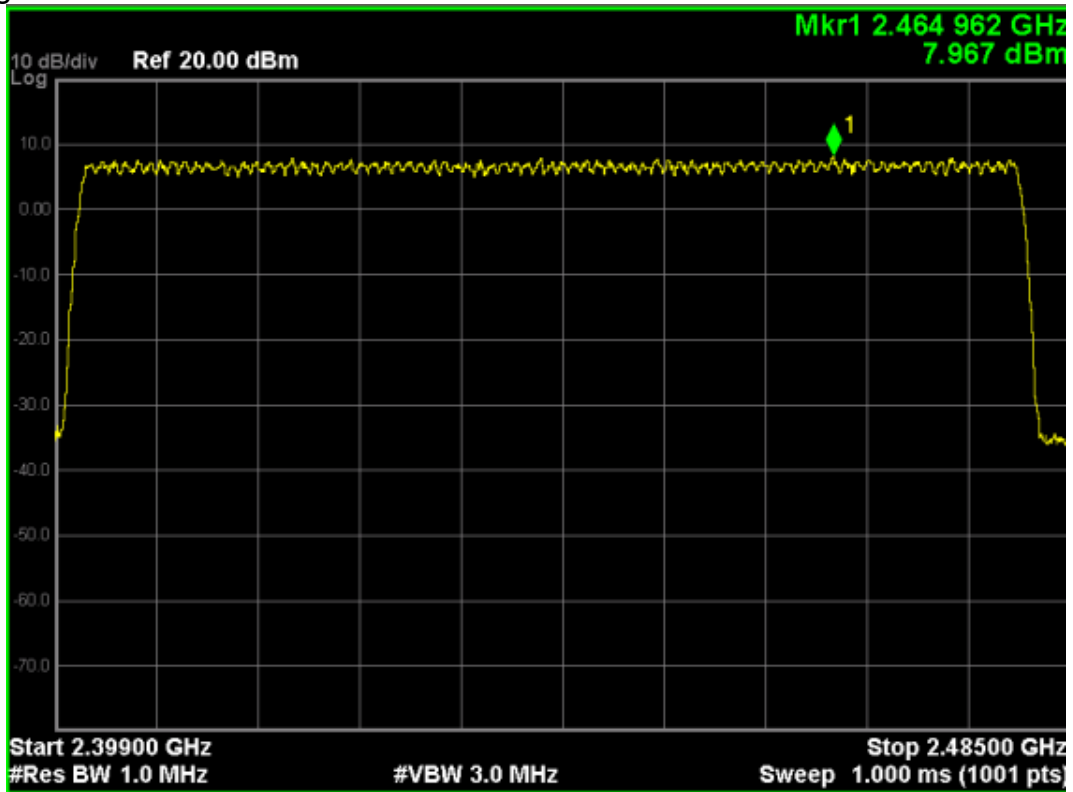
Π/4-DQPSK

Hopping Channel: 79 channels



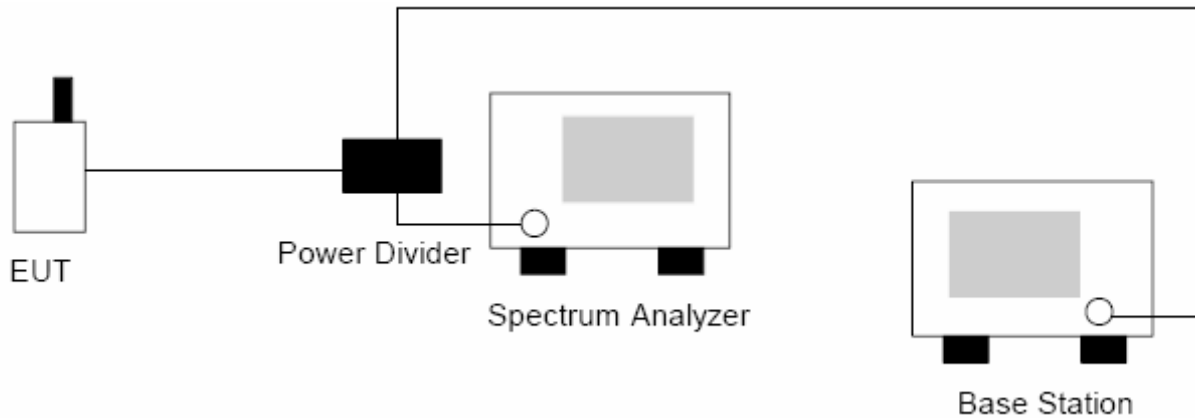
8-DPSK

Hopping Channel: 79 channels



6. OCCUPIED BANDWIDTH

6.1 TEST SETUP



6.2 LIMITS

Limits	≥ 25 kHz or 2 to 3 times the 20 dB bandwidth
--------	---

6.3 TEST PROCEDURE

Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum analyzer. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration.

The measurement will be conducted at three channels.

BT: Low(0), Middle(39) and High (78).

Using occupied BW measurement function of spectrum analyzer and settings are:

XdB = -20dB

RBW =20KHz

VBW \geq RBW

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a channel

Sweep = auto

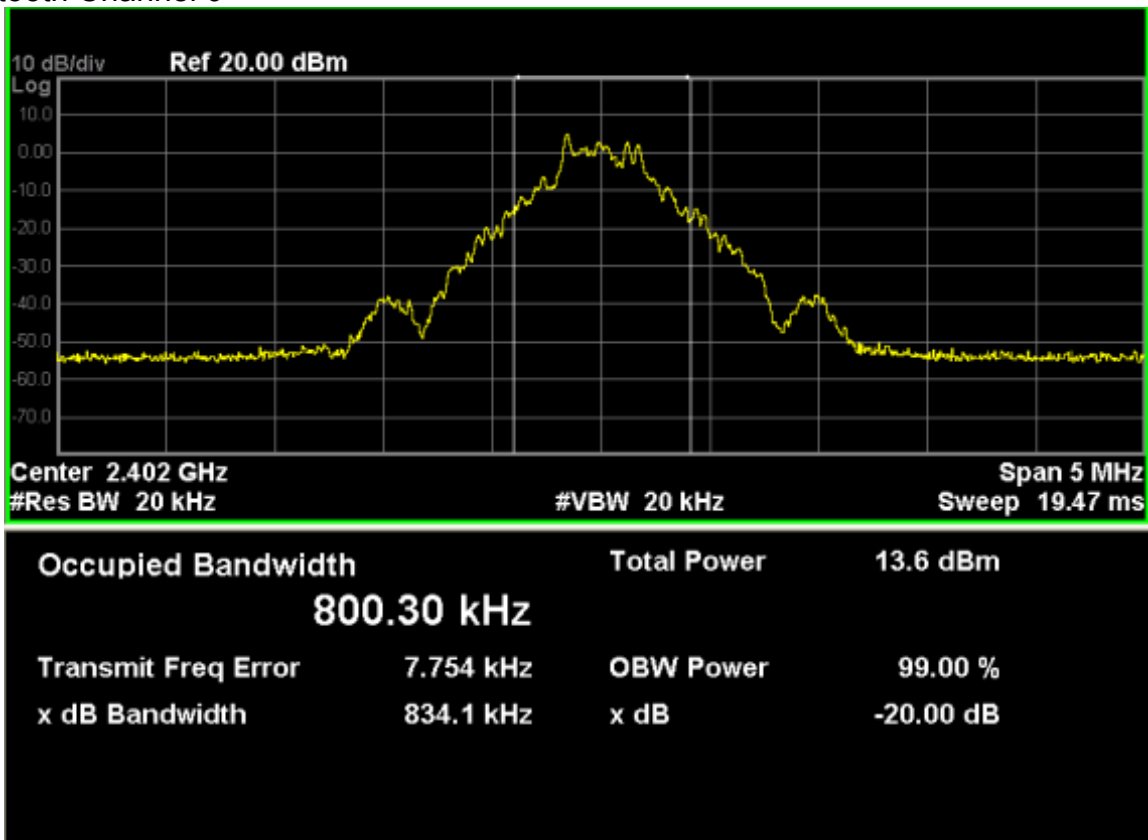
Detector function = peak

Trace = max hold

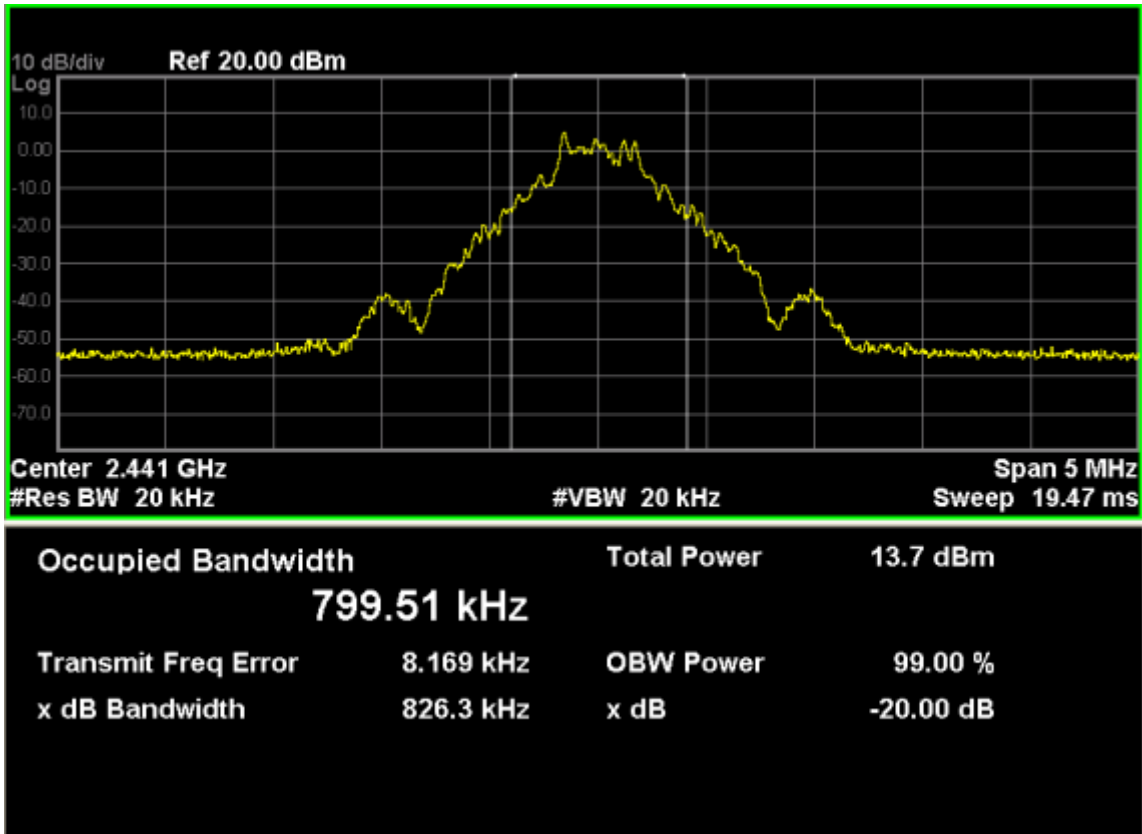
6.4 TEST RESULTS

Channel	20dB bandwidth (kHz)	99% bandwidth (kHz)
GFSK		
BT CH0	834.1	800.30
BT CH39	826.3	799.51
BT CH78	833.8	805.43
Π/4-DQPSK		
BT CH0	1318	1191.3
BT CH39	1318	1191.9
BT CH78	1323	1193.3
8-DPSK		
BT CH0	1286	1195.6
BT CH39	1277	1197.0
BT CH78	1290	1194.6

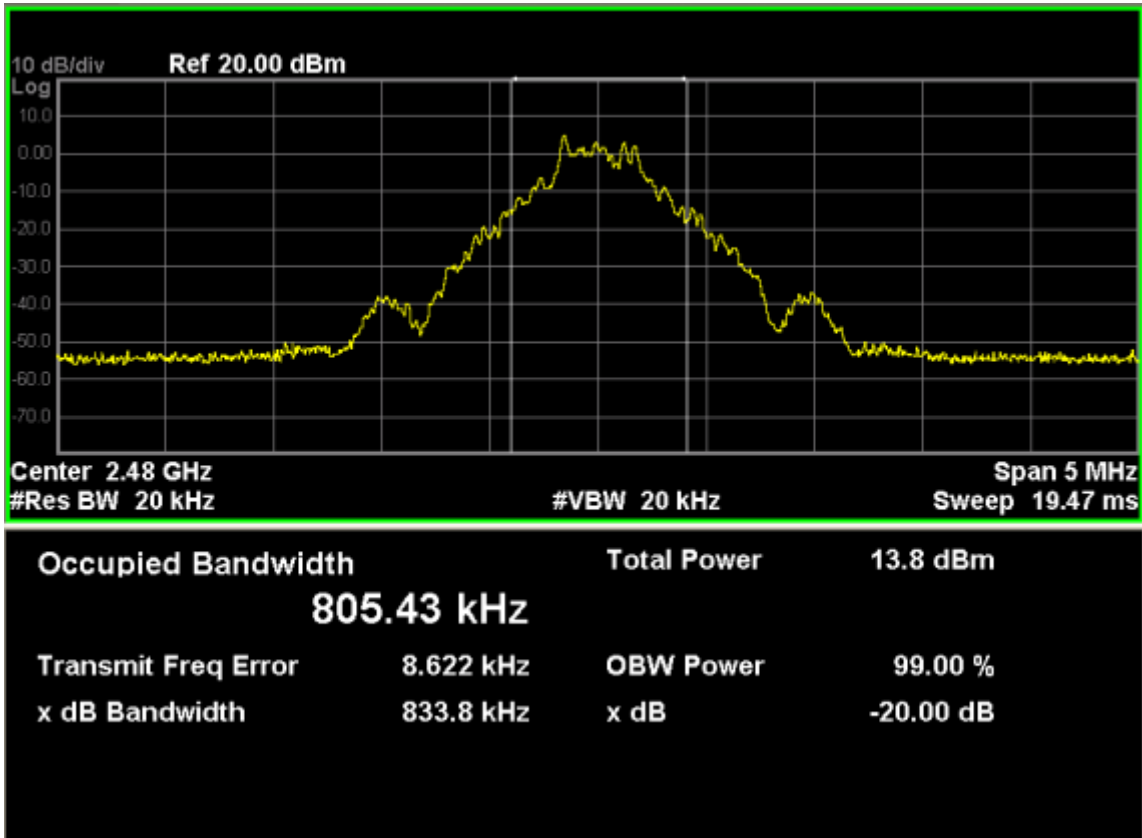
GFSK Bluetooth Channel 0



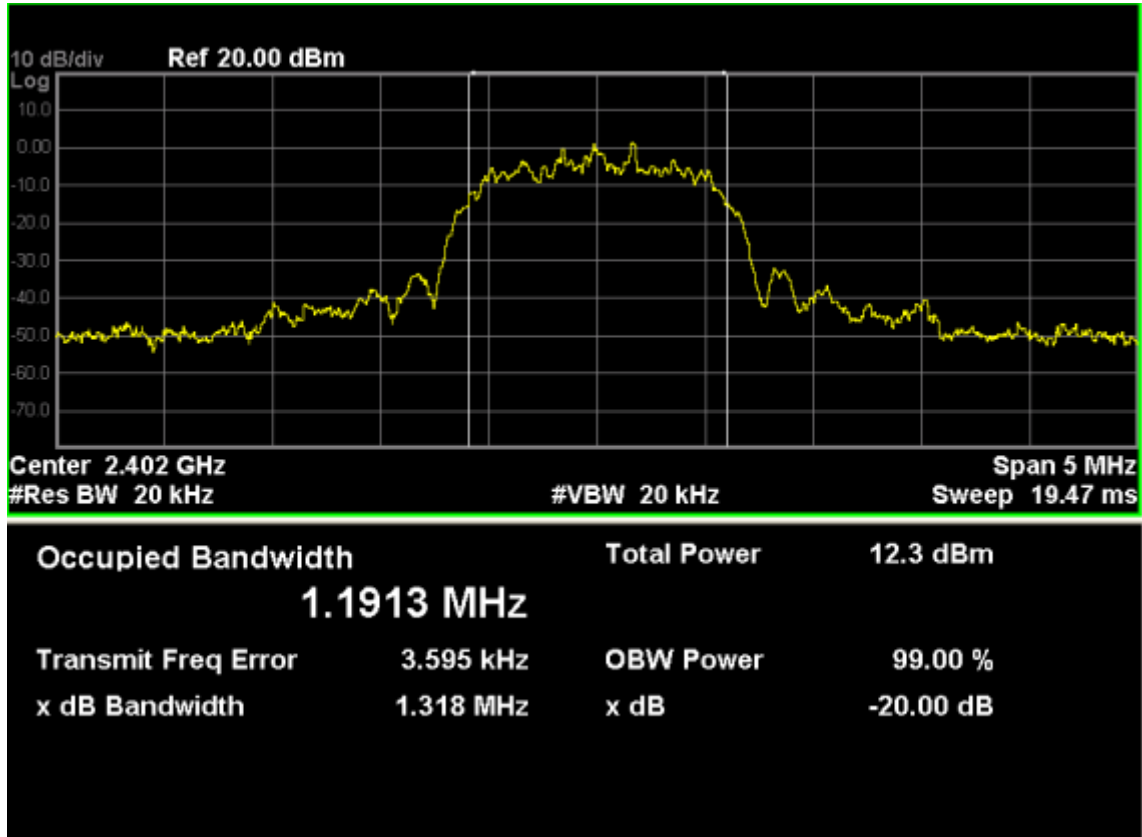
Bluetooth Channel 39



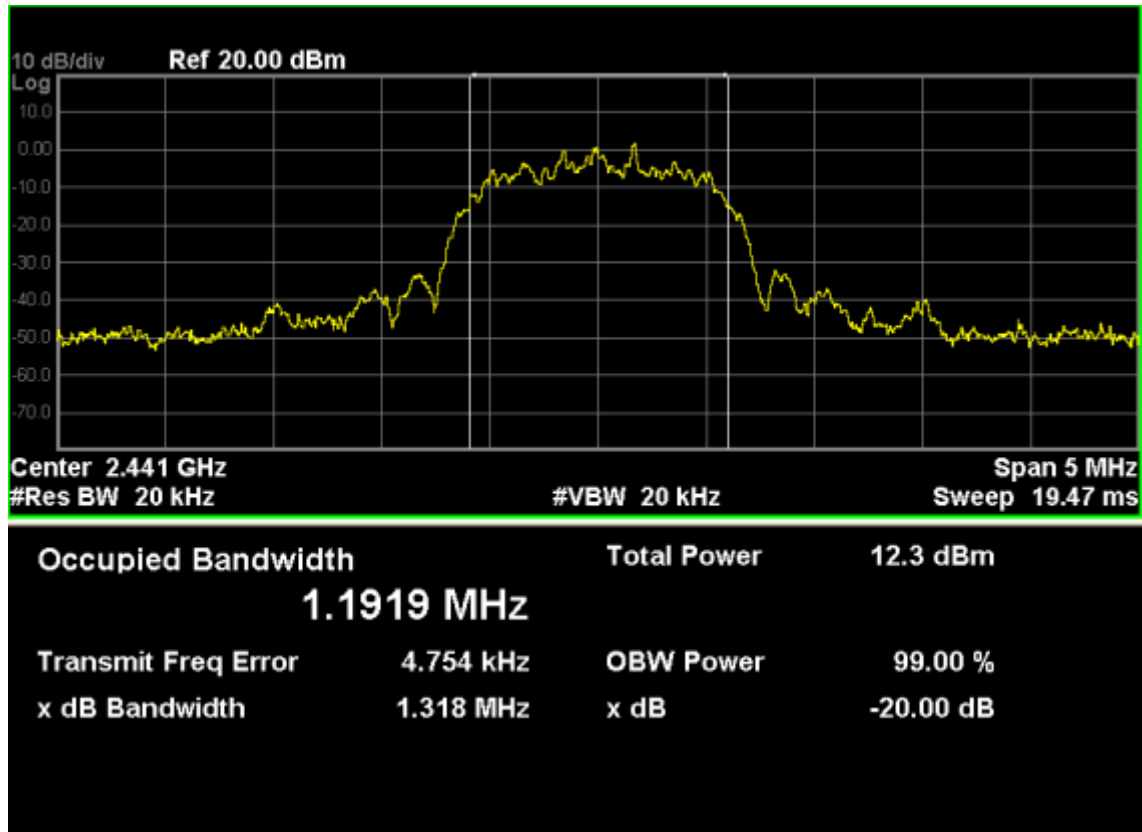
Bluetooth Channel 78



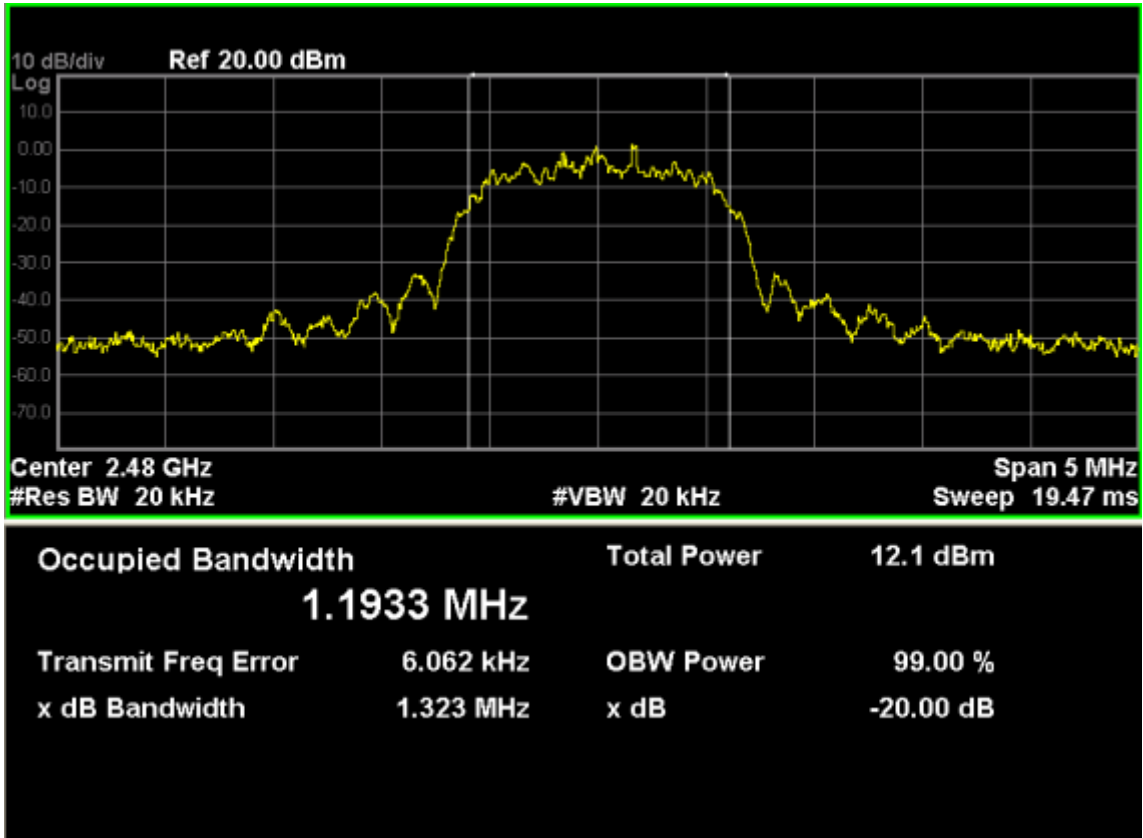
Π/4-DQPSK Bluetooth Channel 0



Bluetooth Channel 39

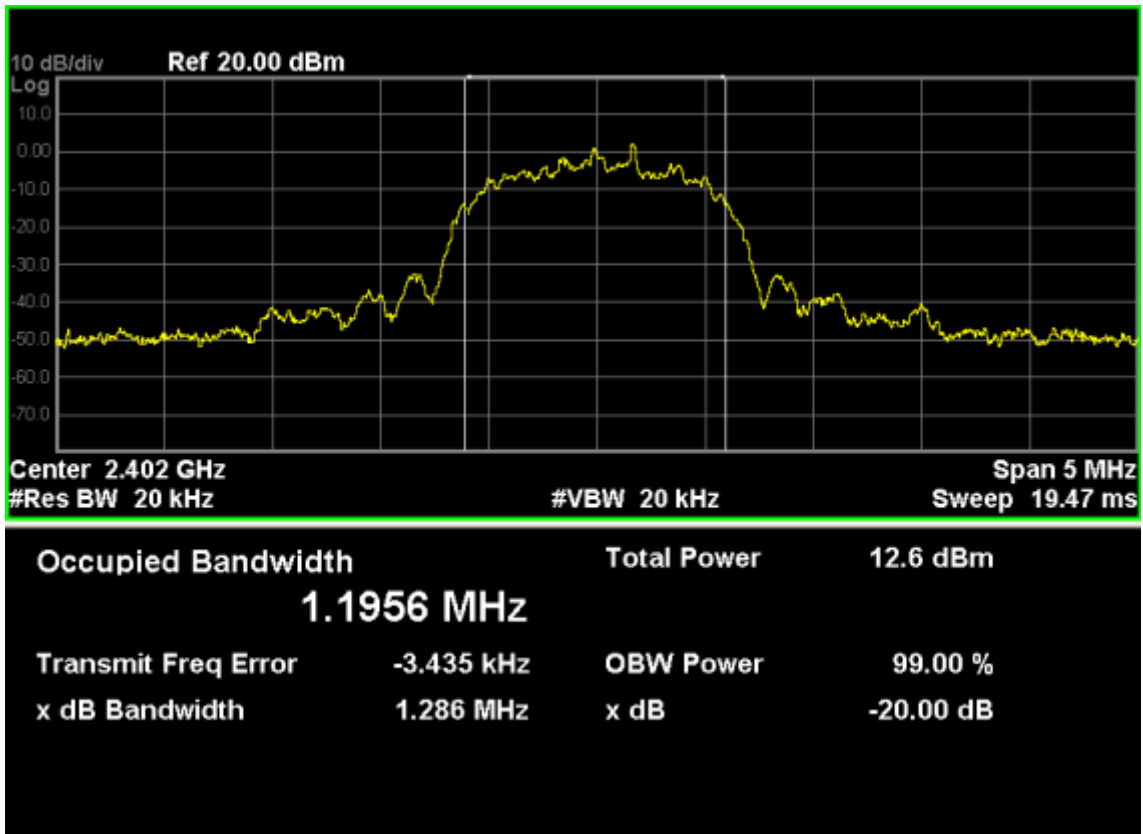


Bluetooth Channel 78

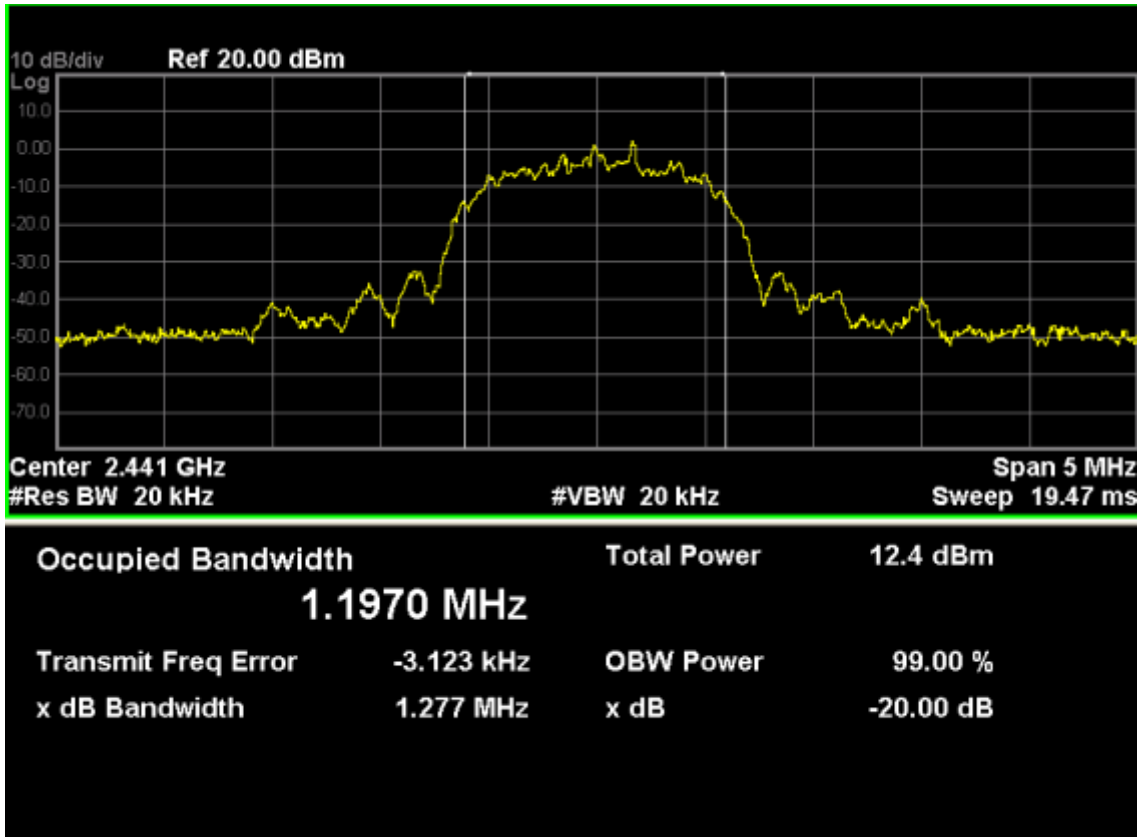


8-DPSK

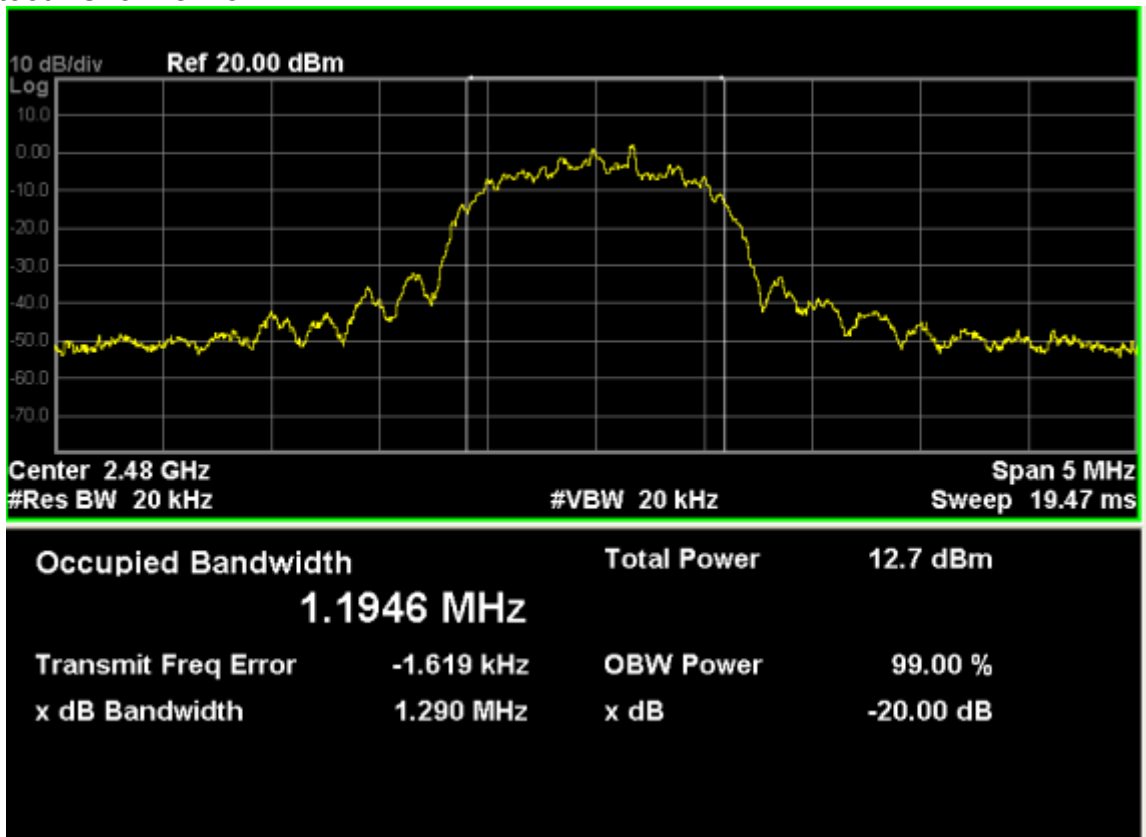
Bluetooth Channel 0



Bluetooth Channel 39

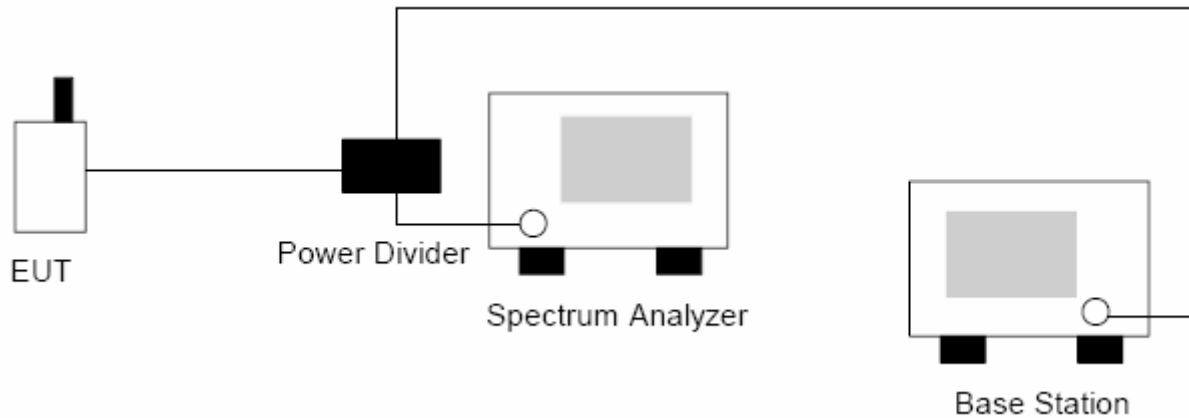


Bluetooth Channel 78



7. DWELL TIME

7.1 TEST SETUP



7.2 LIMITS

Limits	<400.00ms
--------	-----------

7.3 TEST PROCEDURE

The EUT must have its hopping function enabled.

Use the following spectrum analyzer settings:

Span = zero span, centered on a hopping channel

RBW \leq Channel Separation

VBW \geq RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak

Trace = max hold

If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

7.4 TEST RESULTS

GFSK

Packet	N	x(ms)	Calculation formula	Result(T)(ms)
DH1	2	0.386	$T = \frac{1600}{79 \times N} \times x \times (0.4 \times 79) = \frac{1600}{79 \times N} \times x \times 31.6$ DH1, N=2; DH3, N=4; DH5, N=6	123.5
DH3	4	1.620		259.2
DH5	6	2.885		307.7

Π/4-DQPSK

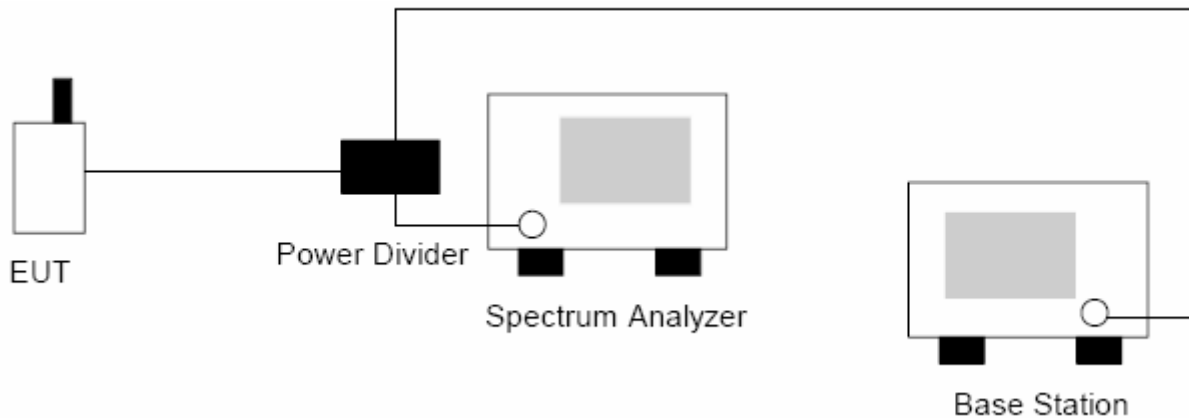
Packet	N	x(ms)	Calculation formula	Result(T)(ms)
DH1	2	0.460	$T = \frac{1600}{79 \times N} \times x \times (0.4 \times 79) = \frac{1600}{79 \times N} \times x \times 31.6$ DH1, N=2; DH3, N=4; DH5, N=6	147.2
DH3	4	1.644		263.0
DH5	6	2.852		304.2

8-DPSK

Packet	N	x(ms)	Calculation formula	Result(T)(ms)
DH1	2	0.396	$T = \frac{1600}{79 \times N} \times x \times (0.4 \times 79) = \frac{1600}{79 \times N} \times x \times 31.6$ DH1, N=2; DH3, N=4; DH5, N=6	126.7
DH3	4	1.618		258.9
DH5	6	2.885		307.7

8. PEAK OUTPUT POWER (CONDUCTION)

8.1 TEST SETUP



8.2 LIMITS

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 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.
2. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
3. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.3 TEST PROCEDURE

After a radio link has been established between EUT and Base station, using spectrum analyzer to measure the output power of the cell signal of the EUT, and record the max. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration.

The measurement will be conducted at three channels:

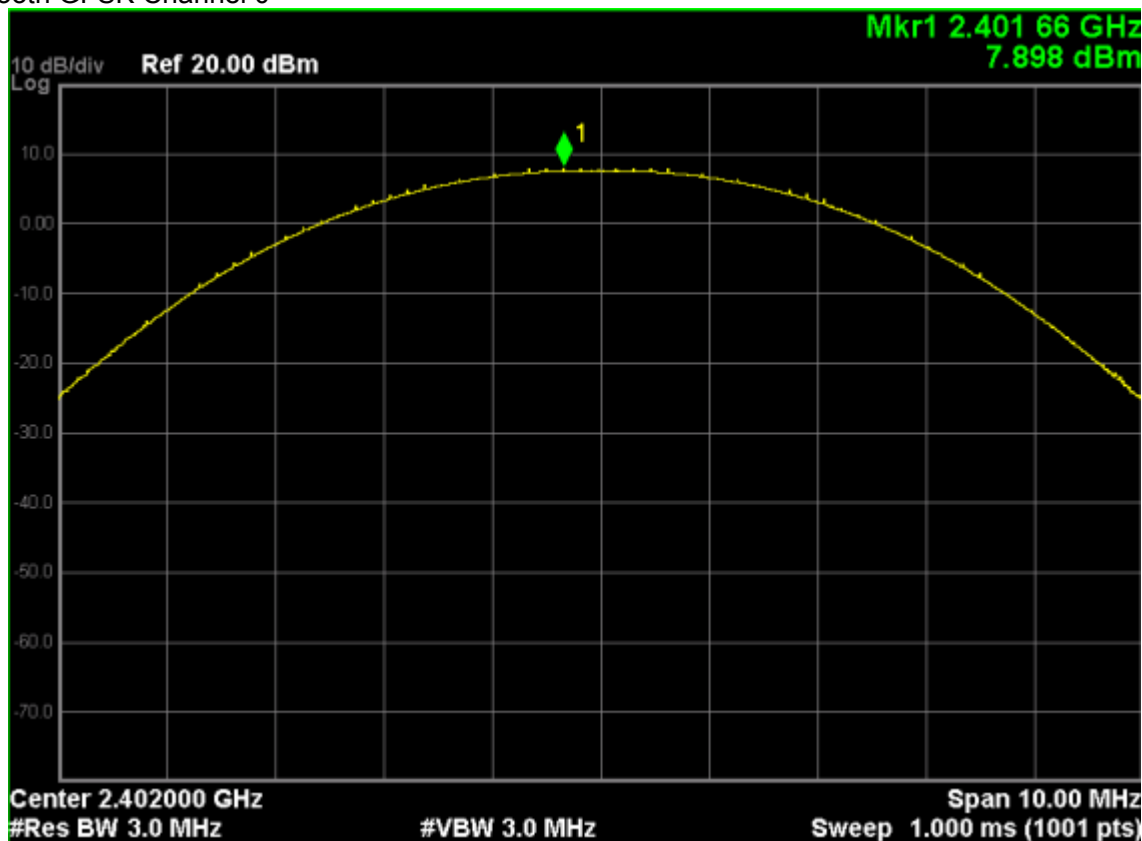
Bluetooth: Low(0), middle(39) and High (78),

Set the spectrum analyzer as RBW = 3MHz, VBW = 3MHz, Span = 10MHz, Sweep = auto
Detector = Peak, Trace mode = max hold

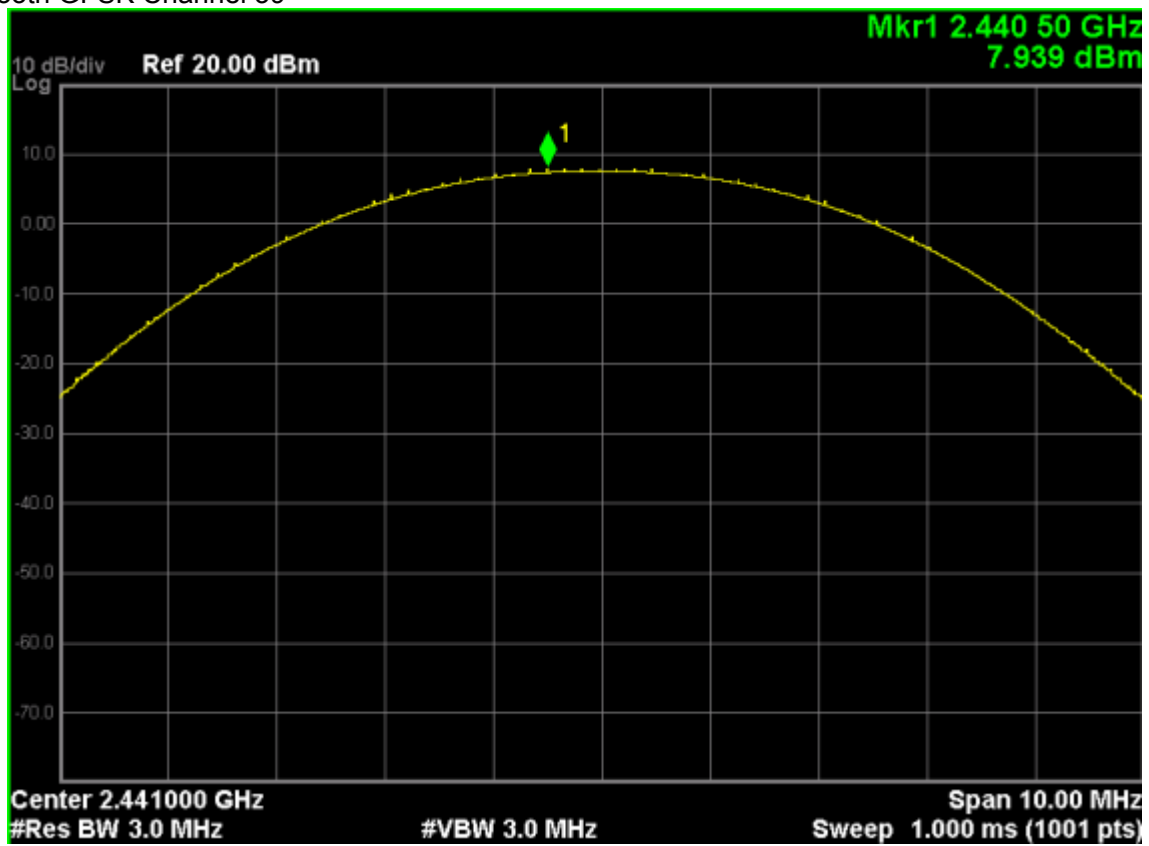
8.4 RESULTS & PERFORMANCE

GFSK				
Channel	Peak power (dBm)	Peak power (mW)	Limit (mW)	Result
0 (2402MHz)	7.898	6.16	125	Pass
39 (2441MHz)	7.939	6.22		Pass
78 (2480MHz)	7.879	6.14		Pass
π/4-DQPSK				
Channel	Peak power (dBm)	Peak power (mW)	Limit (mW)	Result
0 (2402MHz)	7.819	6.05	125	Pass
39 (2441MHz)	7.828	6.06		Pass
78 (2480MHz)	7.817	6.05		Pass
8-DPSK				
Channel	Peak power (dBm)	Peak power (mW)	Limit (dBm)	Result
0 (2402MHz)	8.600	7.24	125	Pass
39 (2441MHz)	8.507	7.09		Pass
78 (2480MHz)	8.509	7.09		Pass

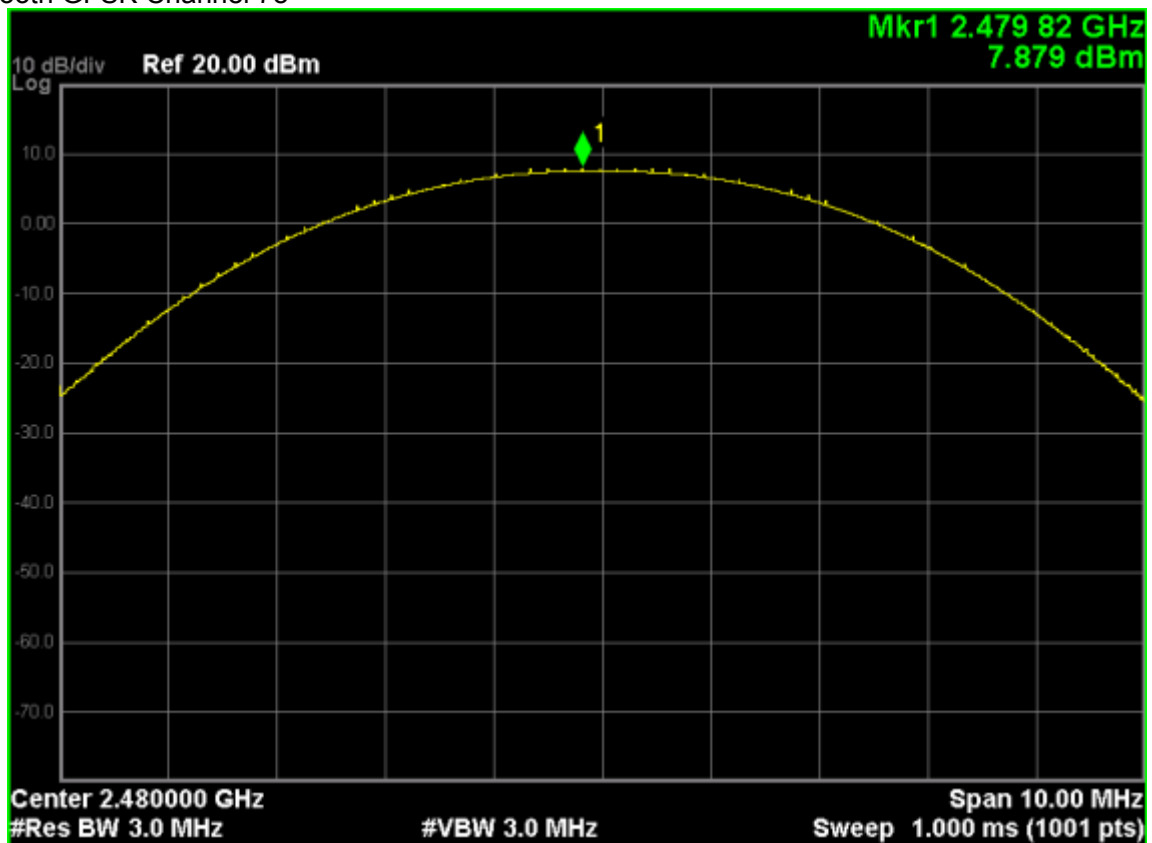
Bluetooth GFSK Channel 0



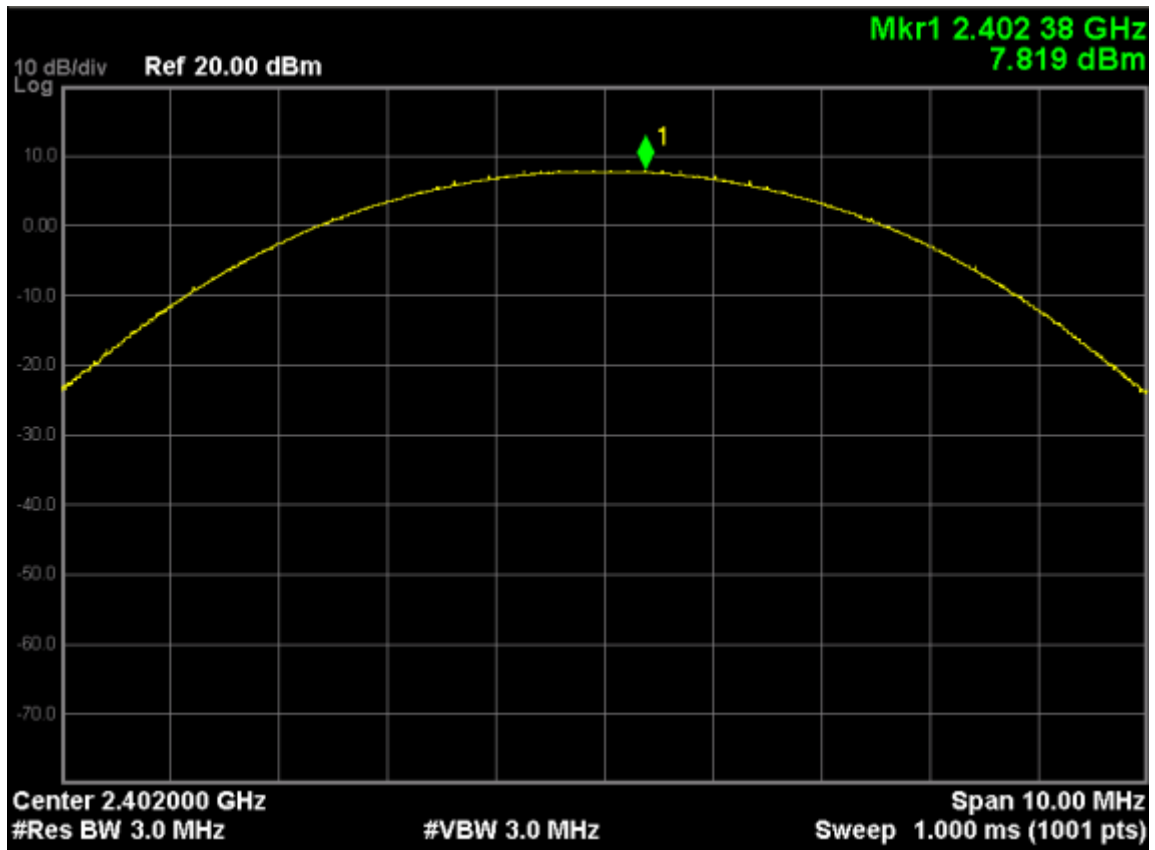
Bluetooth GFSK Channel 39



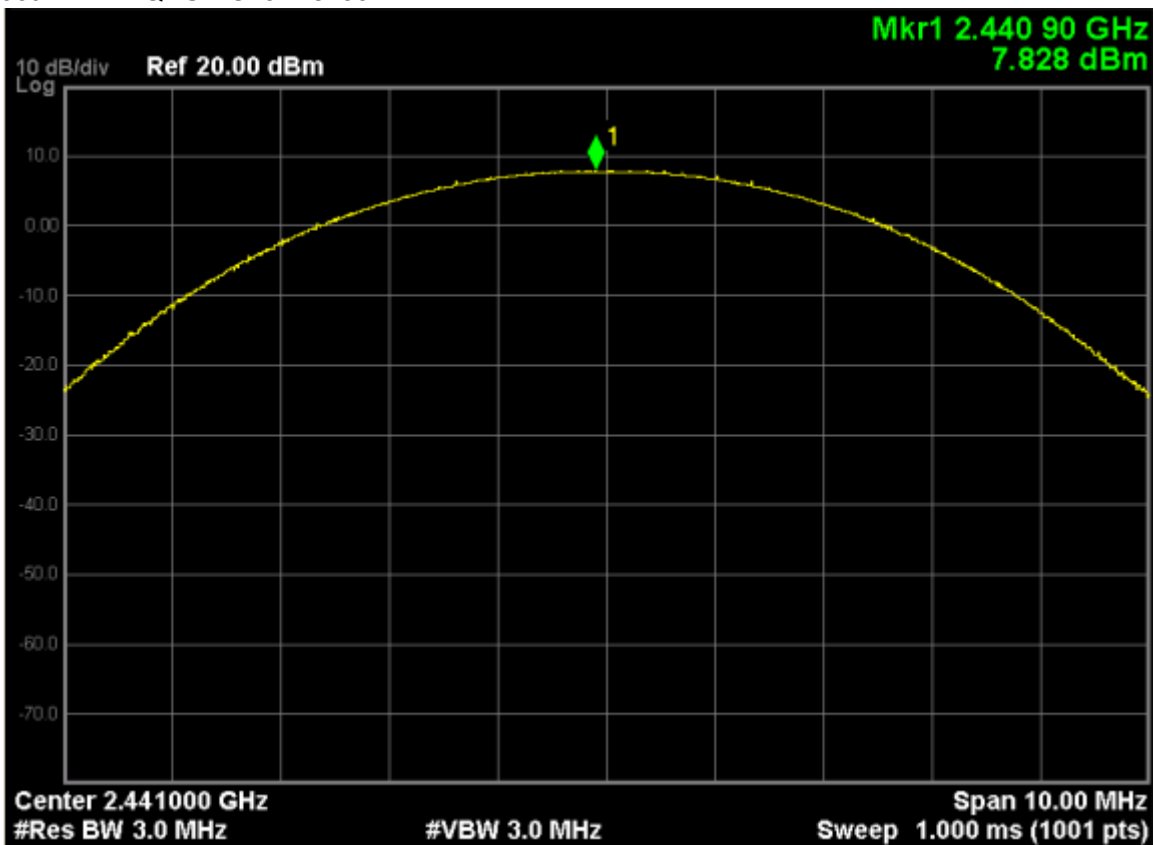
Bluetooth GFSK Channel 78



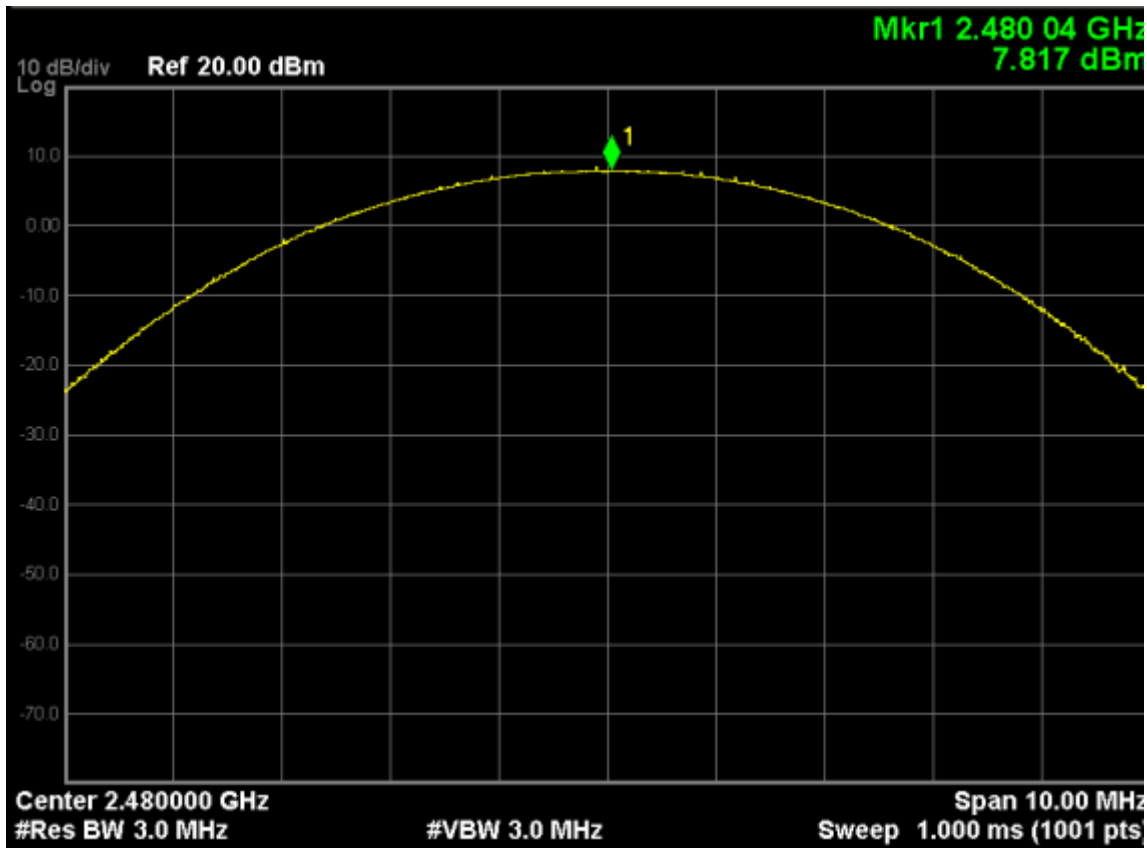
Bluetooth II/4-DQPSK Channel 0



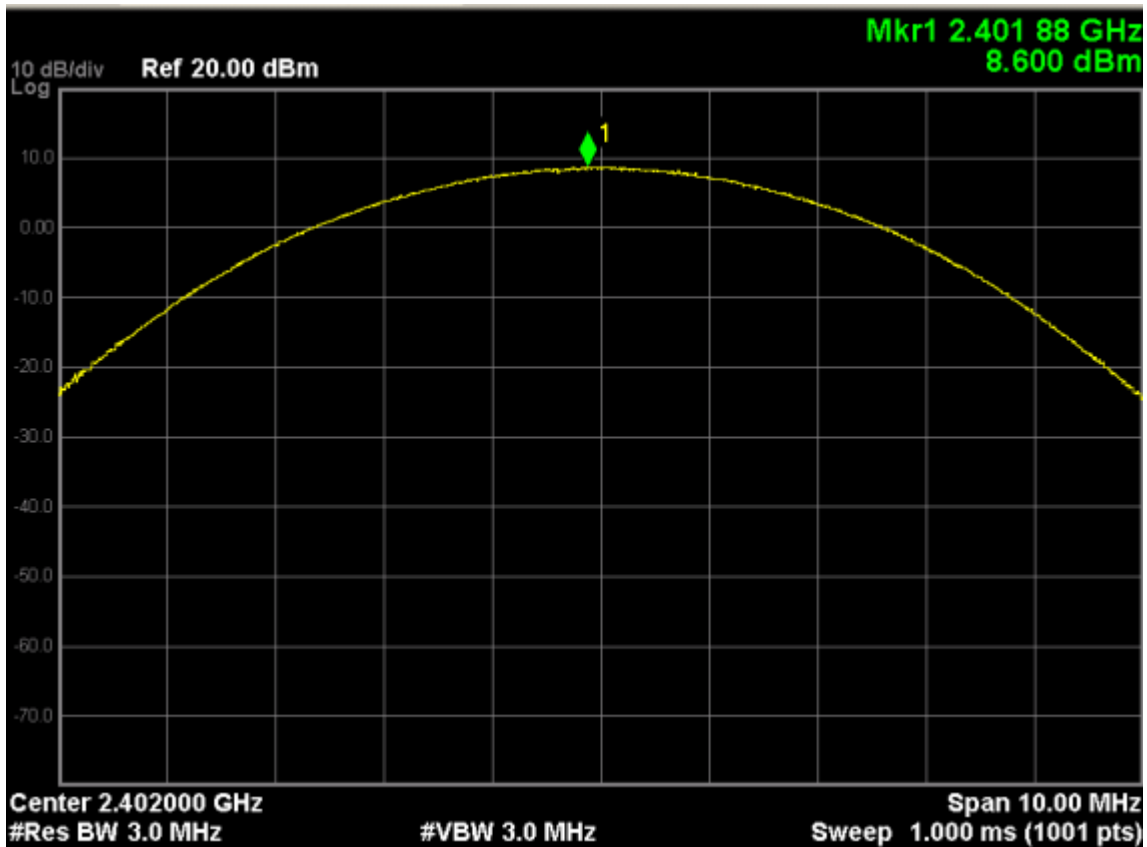
Bluetooth II/4-DQPSK Channel 39



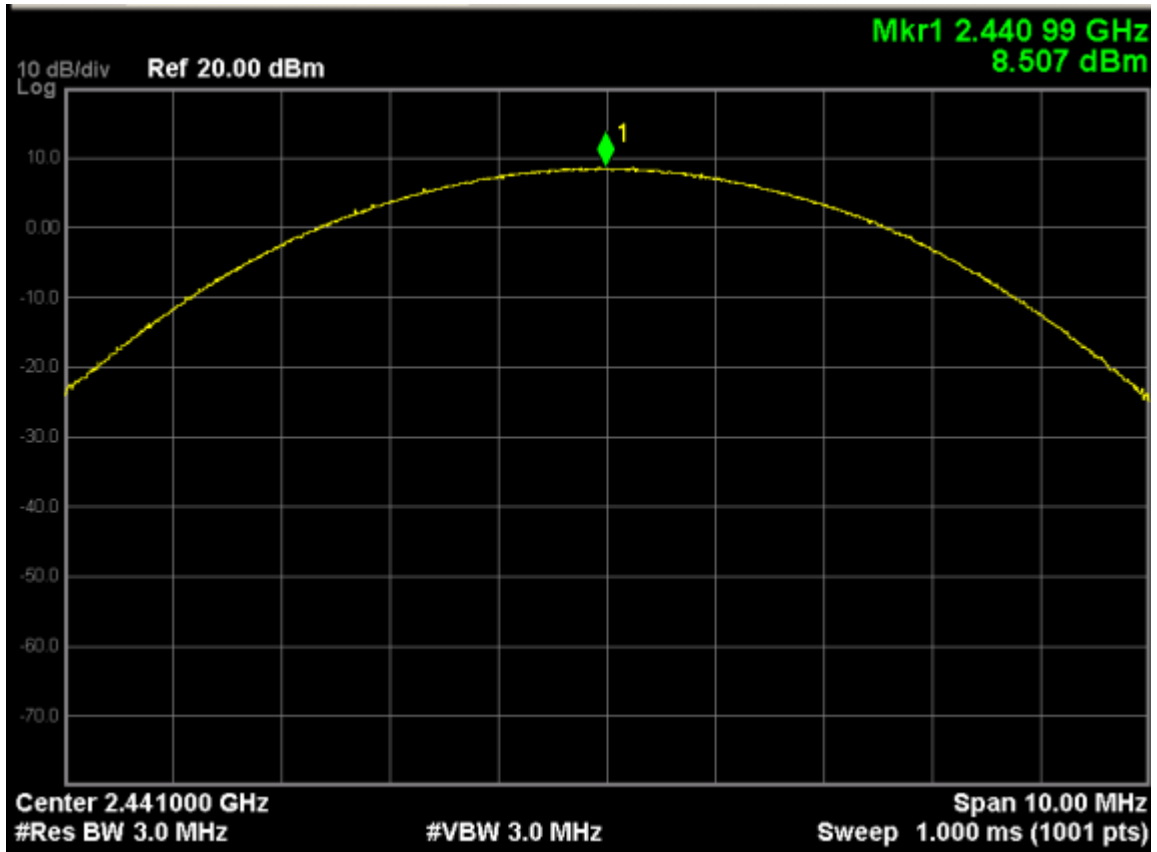
Bluetooth II/4-DQPSK Channel 78



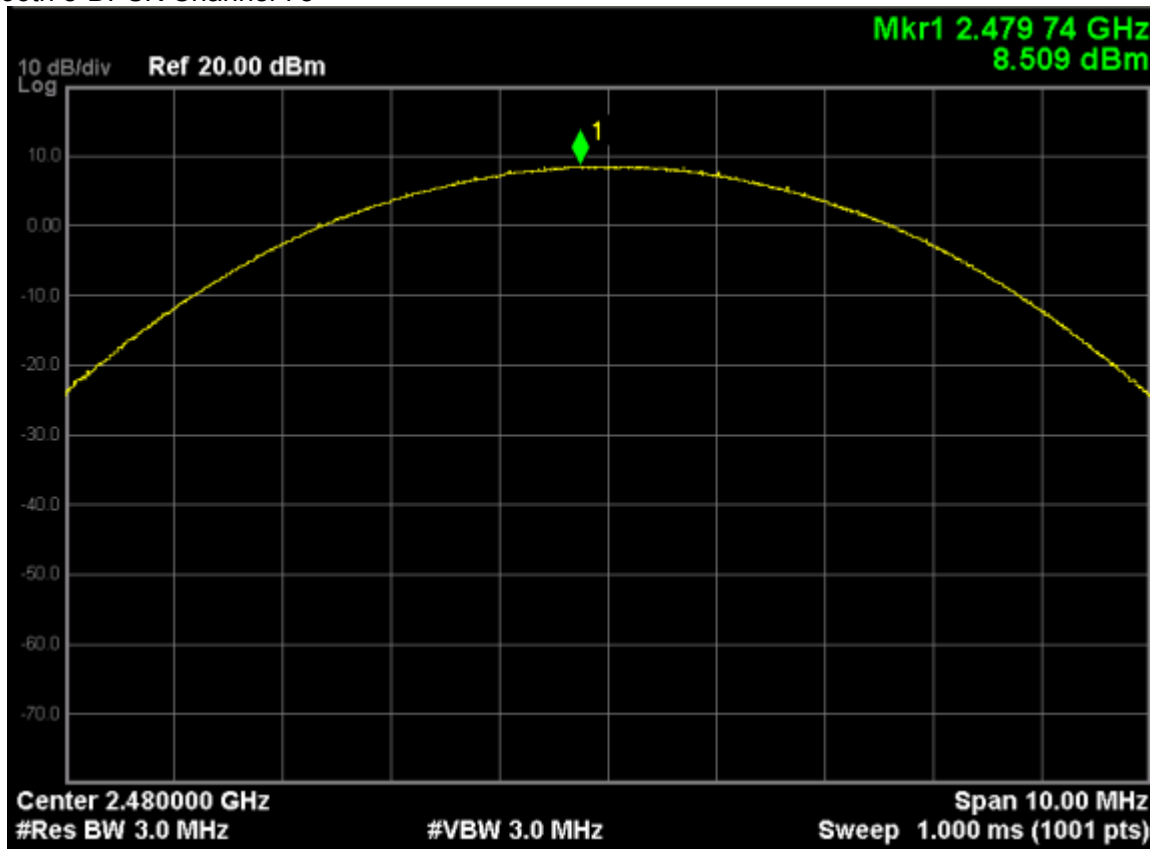
Bluetooth 8-DPSK Channel 0



Bluetooth 8-DPSK Channel 39

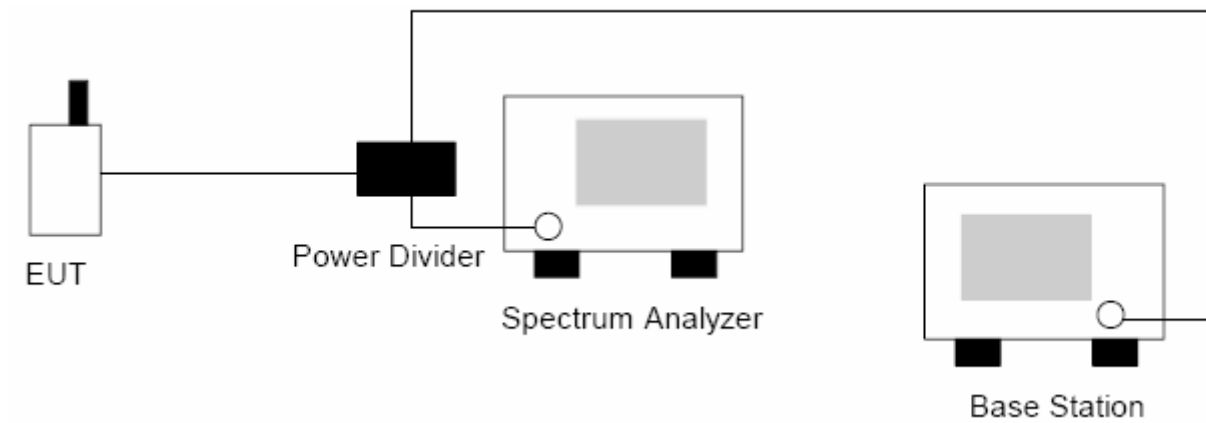


Bluetooth 8-DPSK Channel 78



9. SPURIOUS EMISSIONS (CONDUCTION)

9.1 TEST SETUP



9.2 LIMITS

Limit	<(P-20dB)
Note: P is the highest level of the desired power	

9.3 TEST PROCEDURE

The EUT was connected to Spectrum Analyzer and Base Station via power divider. Use the following spectrum analyzer settings:

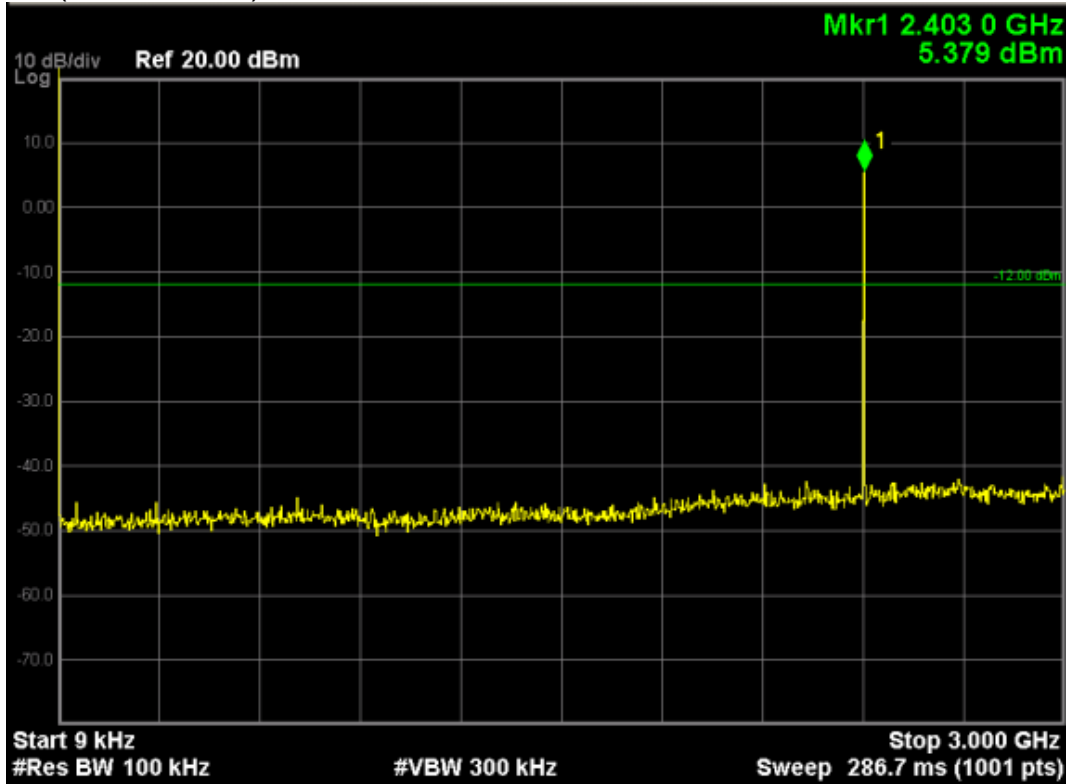
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

RBW = 100 kHz; VBW=300 kHz; Sweep = auto; Detector function = peak; Trace = max hold
Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section.

9.4 RESULTS & PERFORMANCE

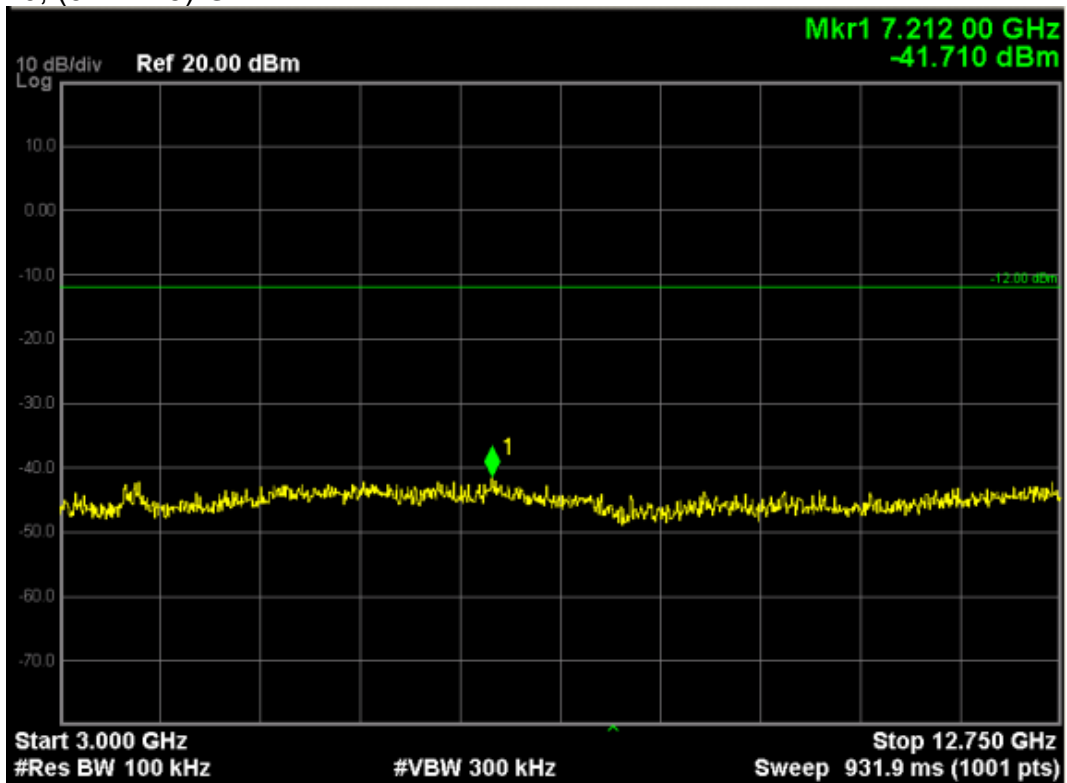
Bluetooth traffic mode GFSK

Channel 0; (9 kHz~3GHz)

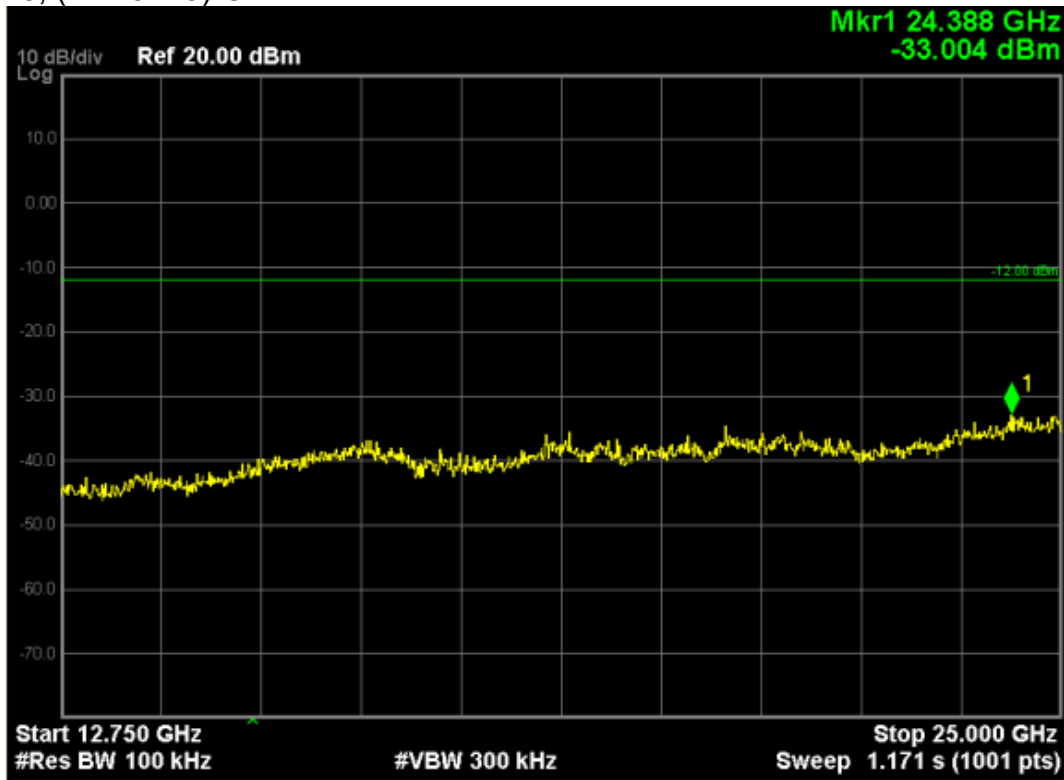


Note: The point mark1 is carrier.

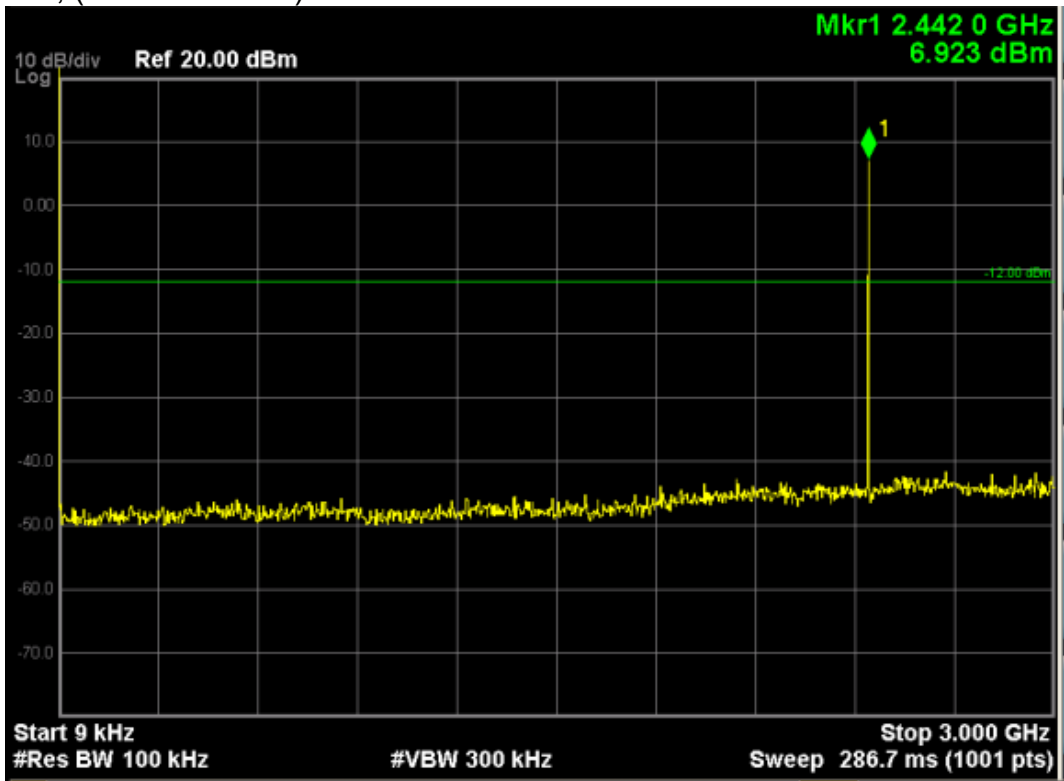
Channel 0; (3~12.75) GHz



Channel 0; (12.75~25) GHz

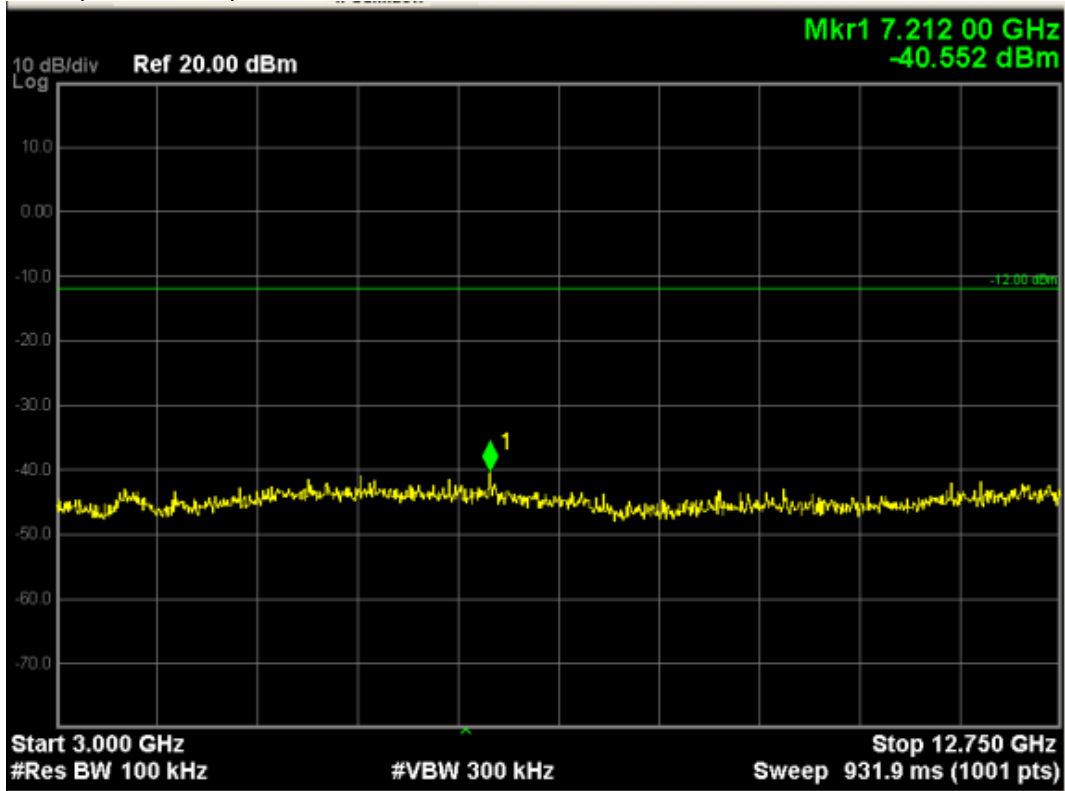


Channel 39; (9 kHz~3.0GHz)

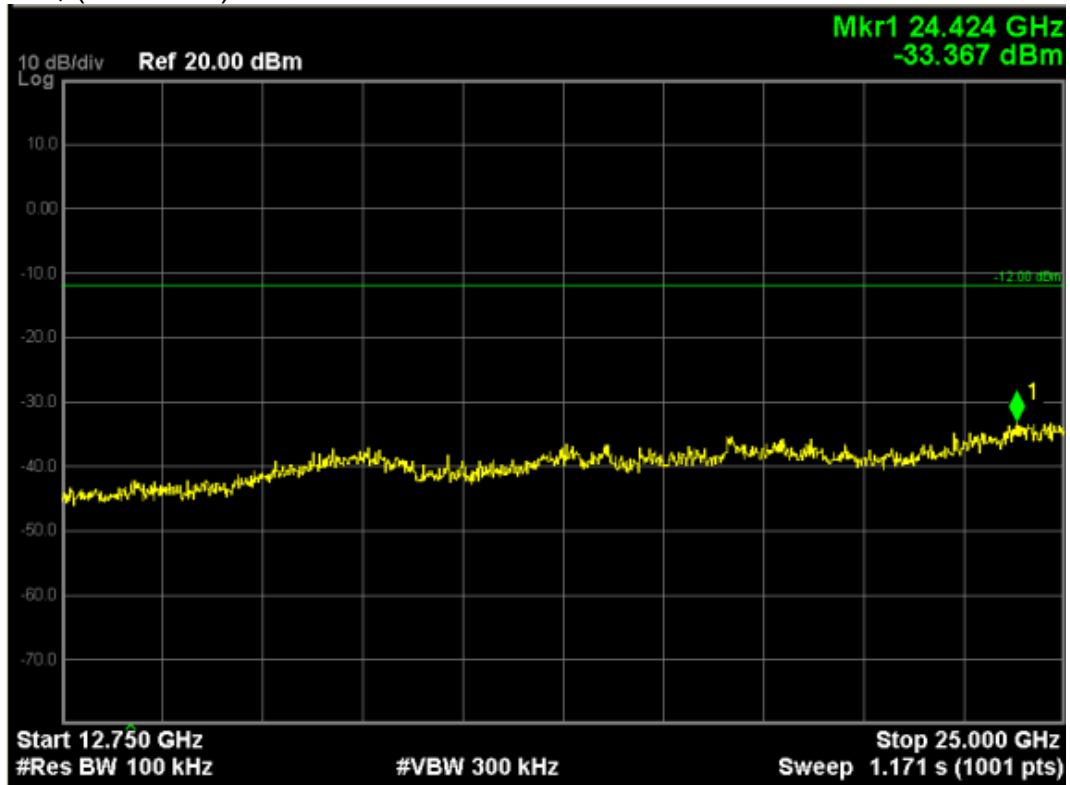


Note: The point mark1 is carrier.

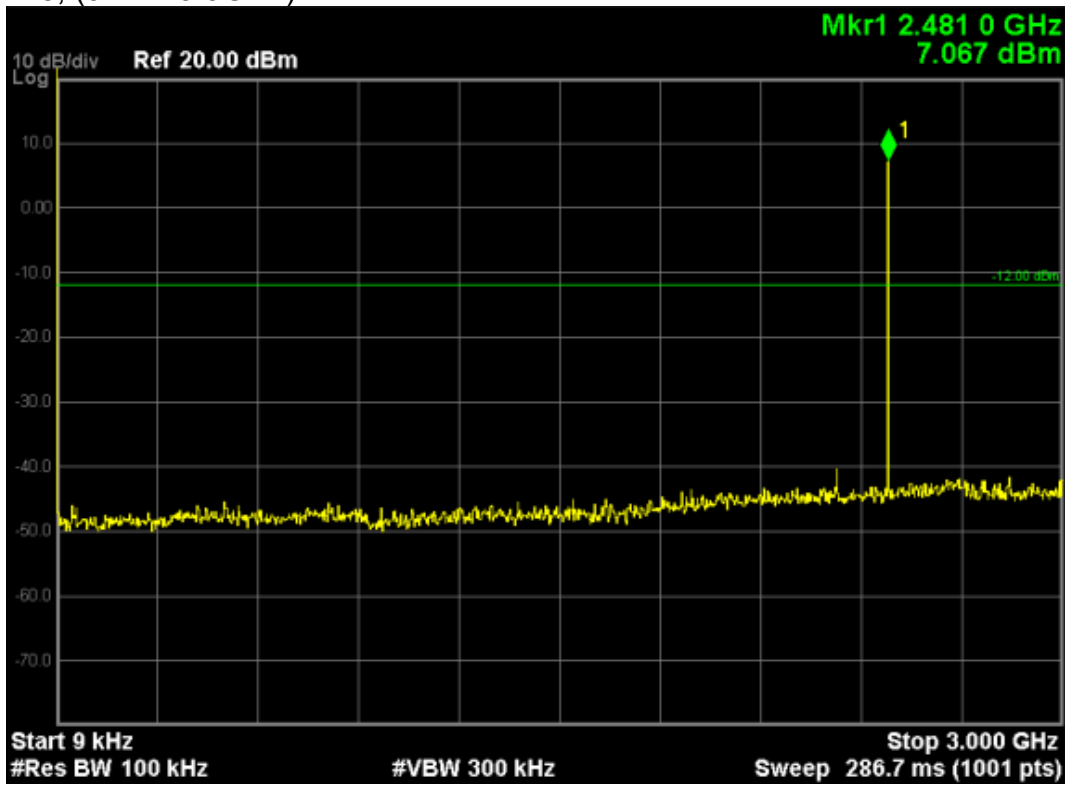
Channel 39; (3.0~12.75) GHz



Channel 39; (12.75~25) GHz

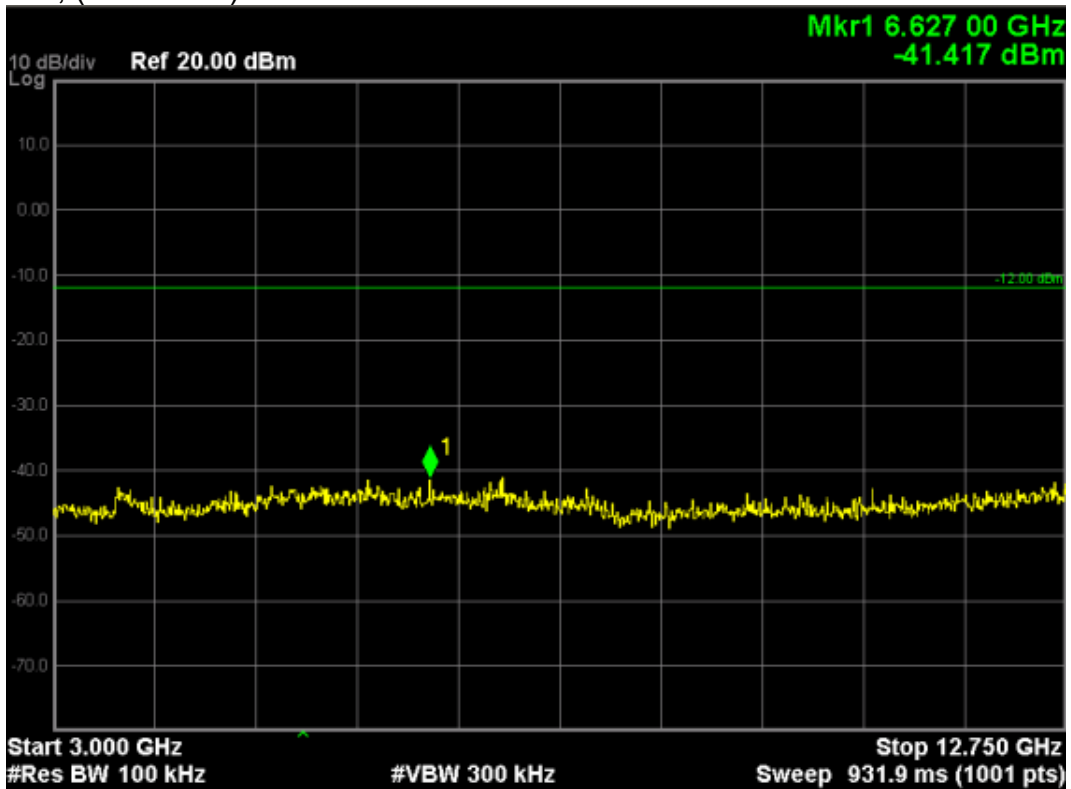


Channel 78; (9kHz~3.0GHz)

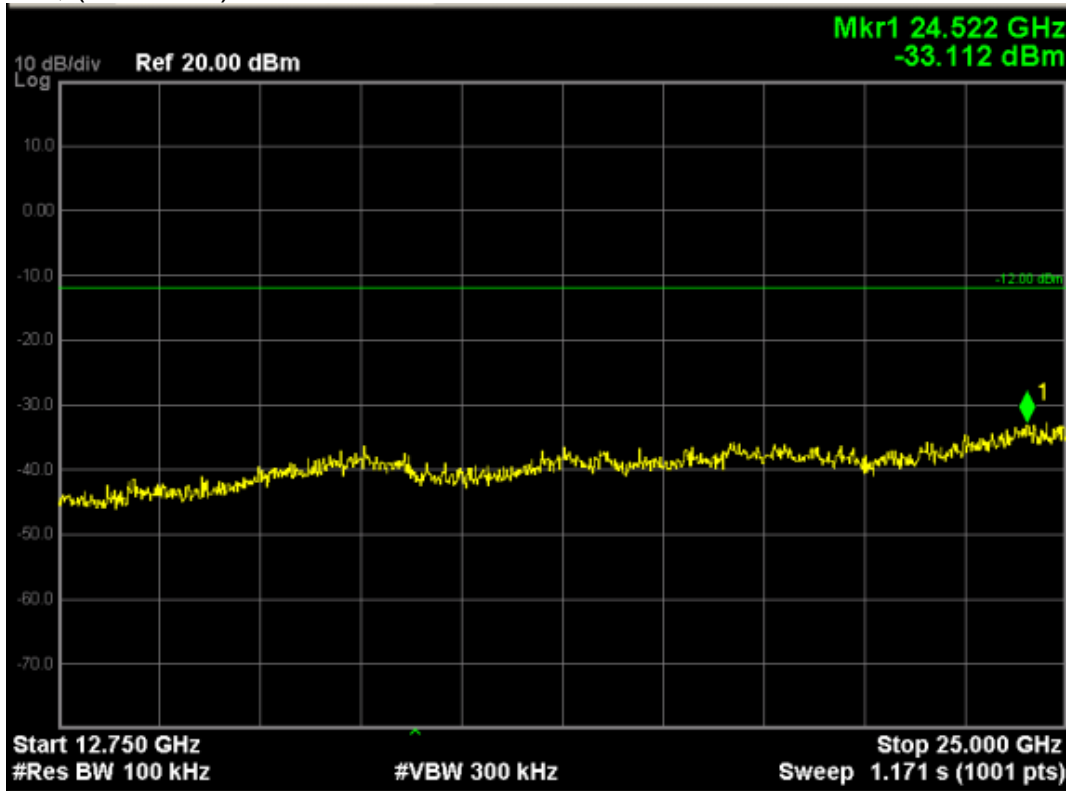


Note: The point mark 1 is carrier.

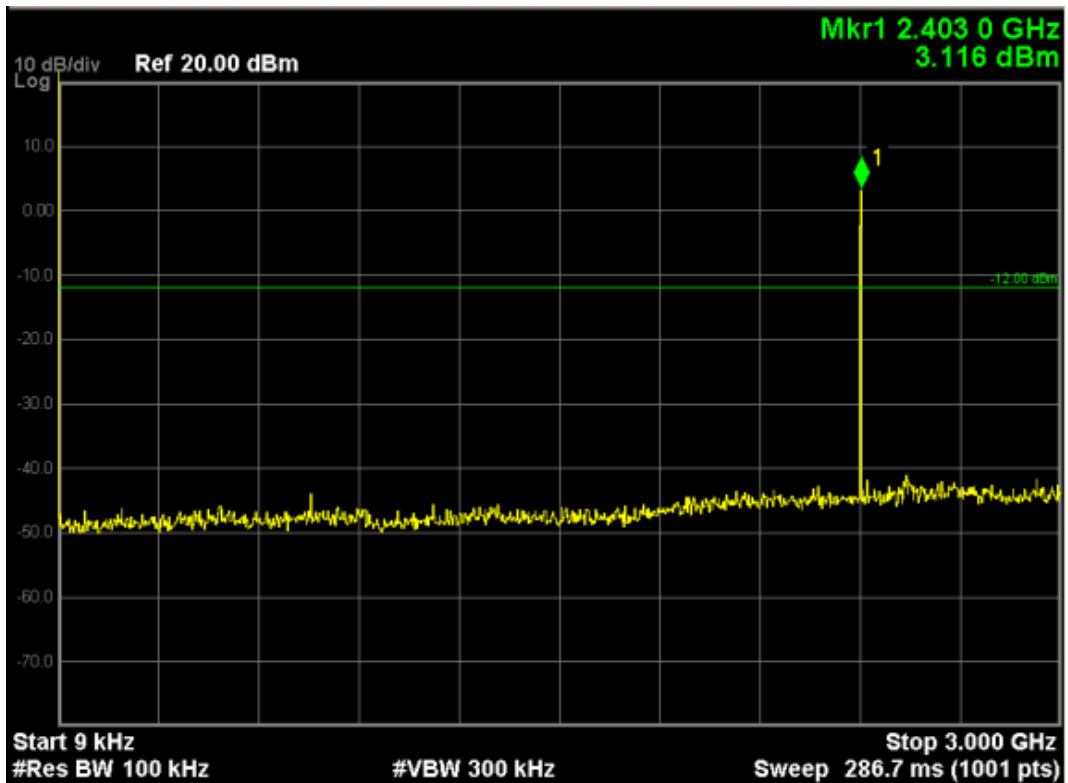
Channel 78; (3.0~12.75) GHz



Channel 78; (12.75~25) GHz

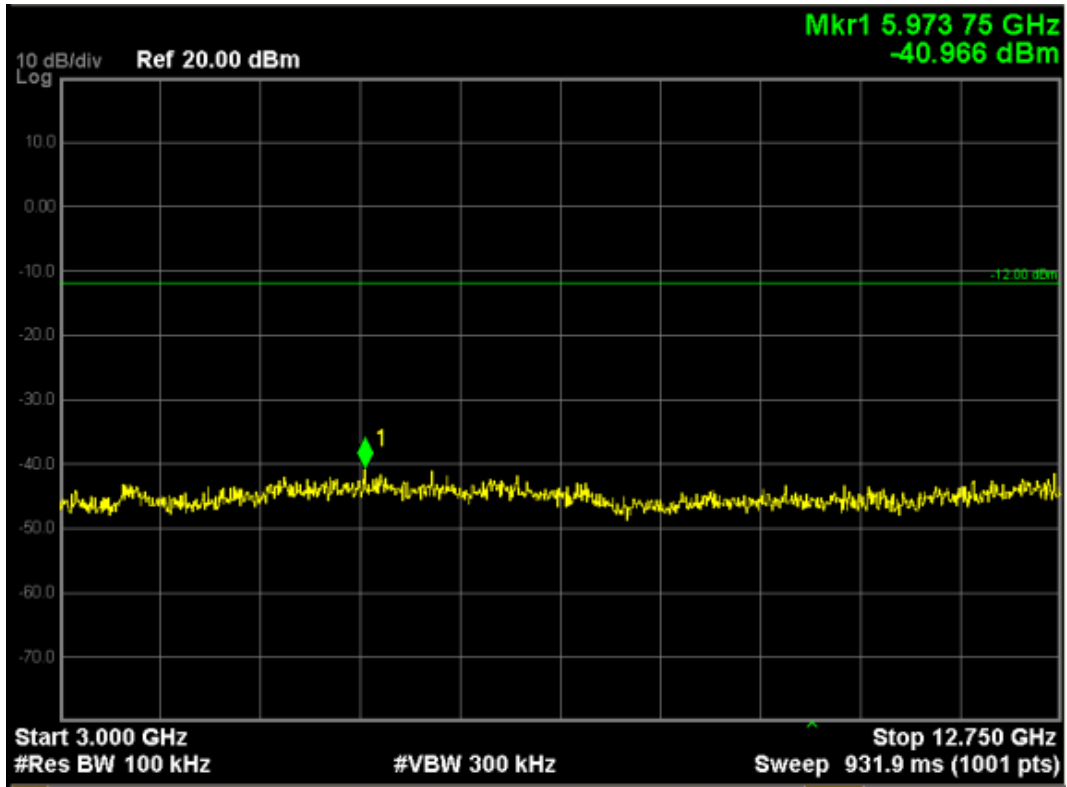


Bluetooth; traffic mode; $\pi/4$ -DQPSK
Channel 0 (9 kHz~3.0GHz)

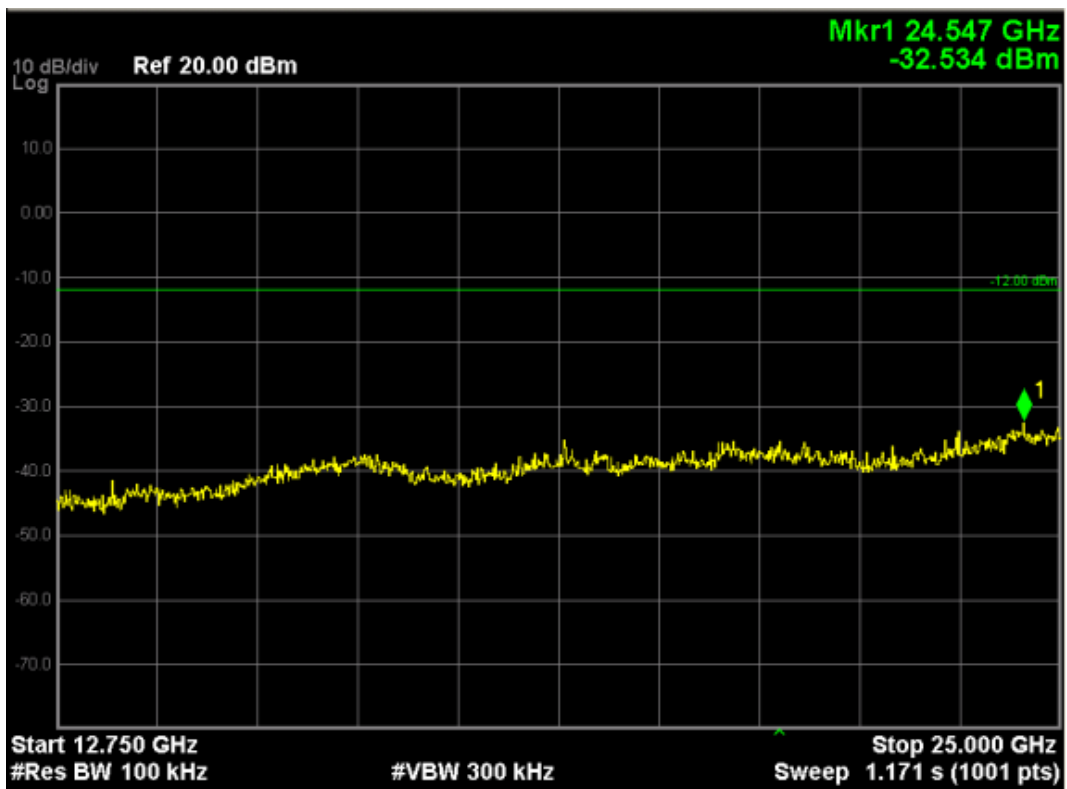


Note: The point mark1 is carrier.

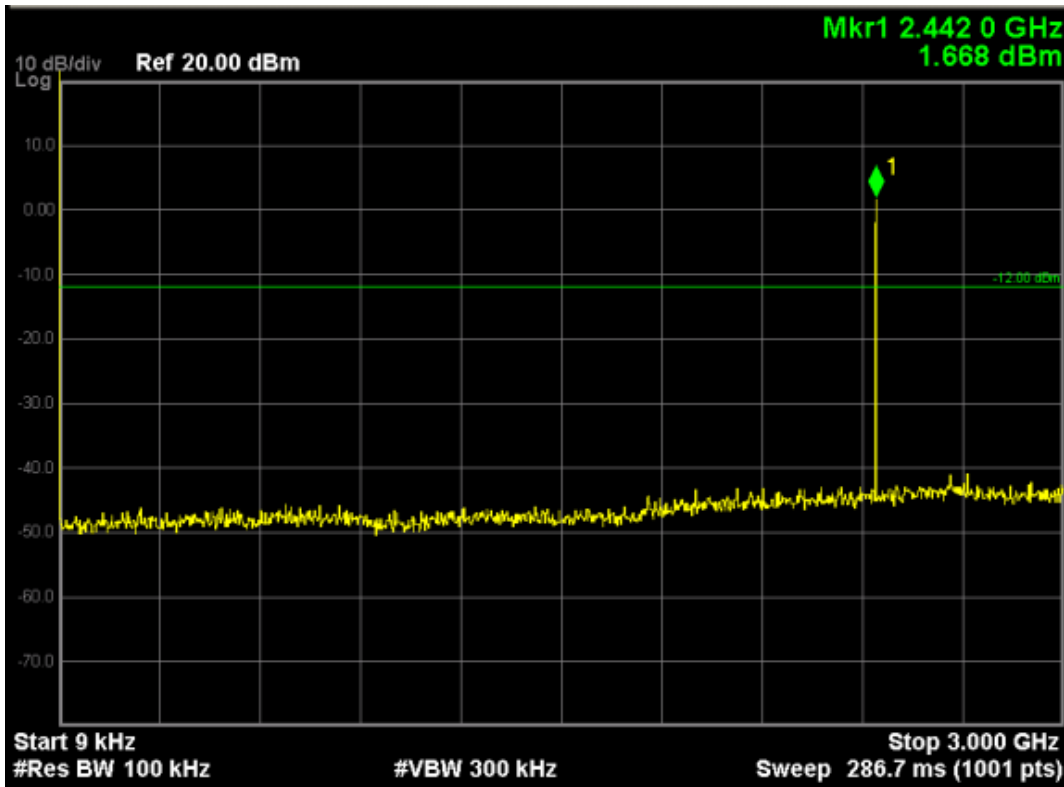
Channel 0 (3GHz~12.75GHz)



Channel 0 (12.75GHz~25GHz)

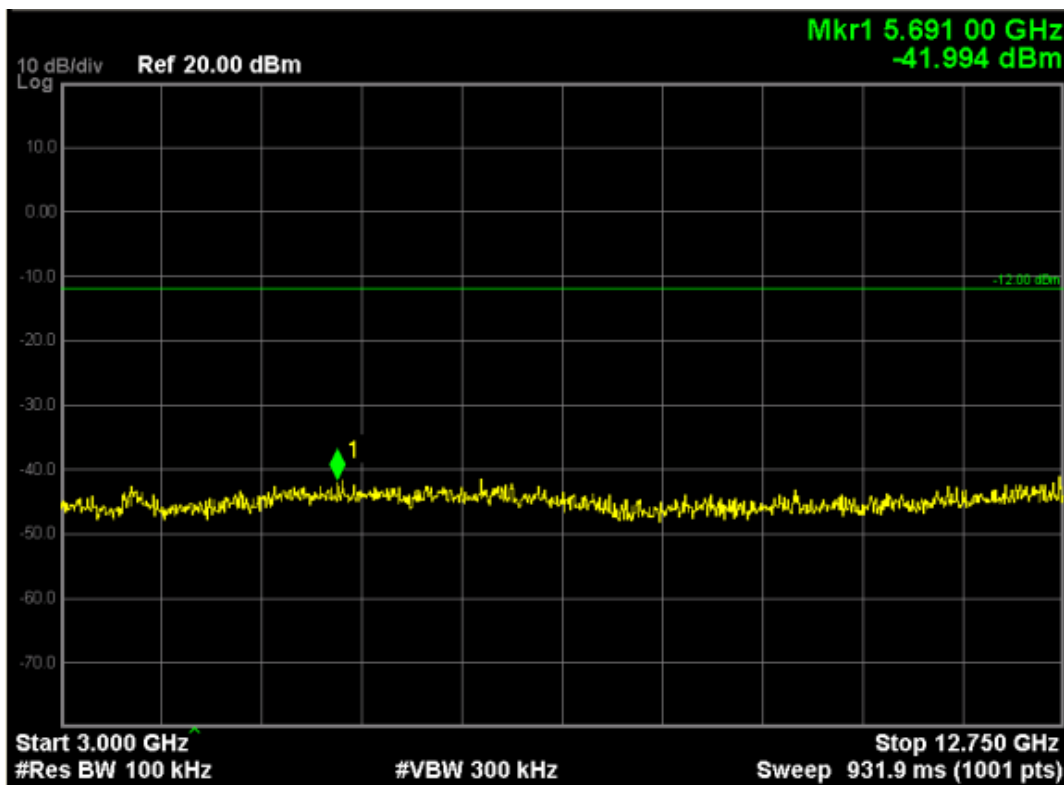


Channel 39 (9 kHz~3.0GHz)

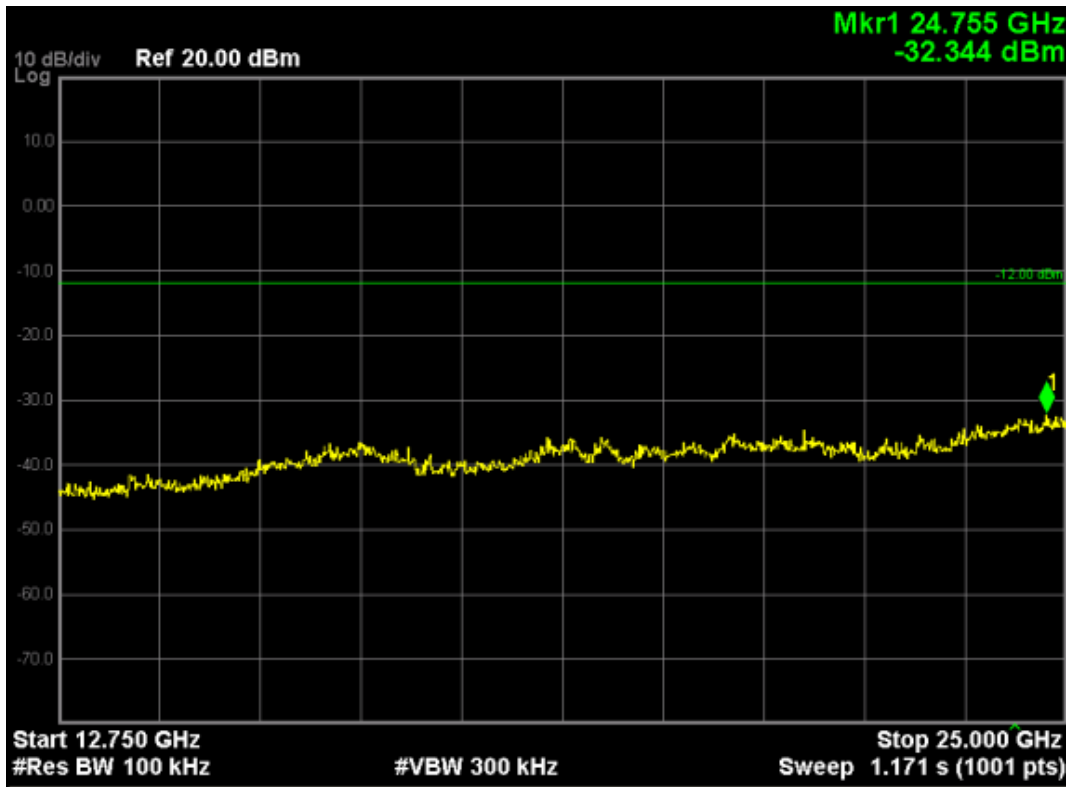


Note:The point mark1 is carrier.

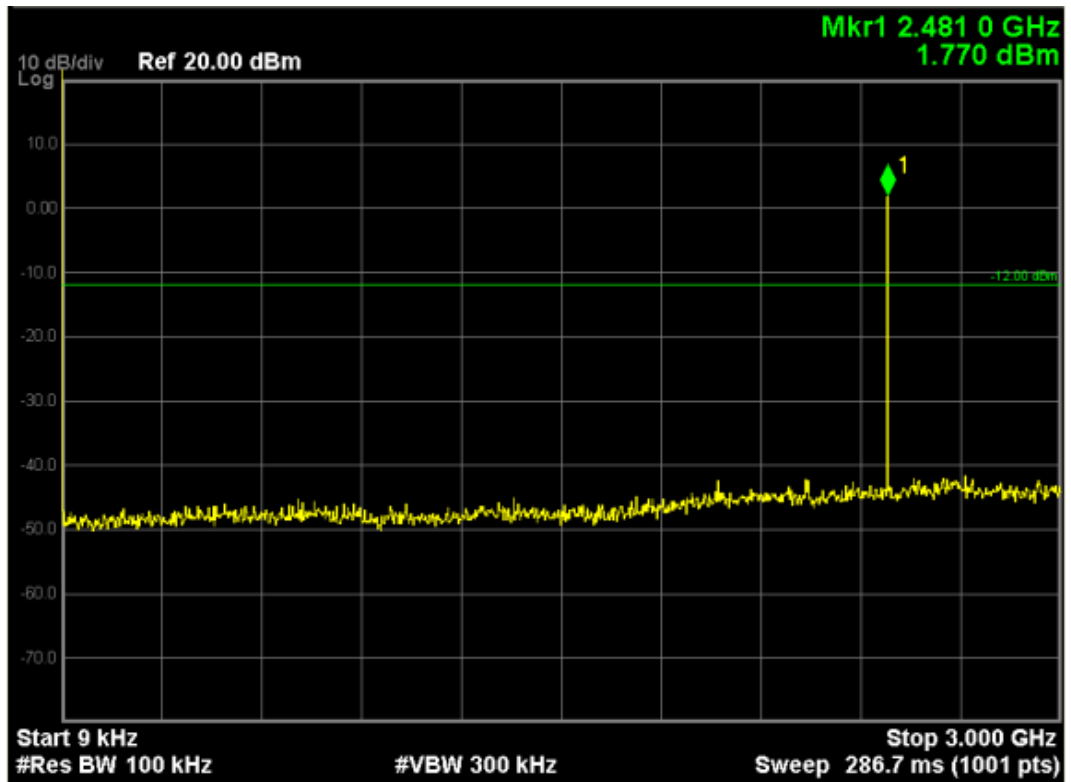
Channel 39 (3.0GHz ~12.75GHz)



Channel 39 (12.75GHz ~25GHz)

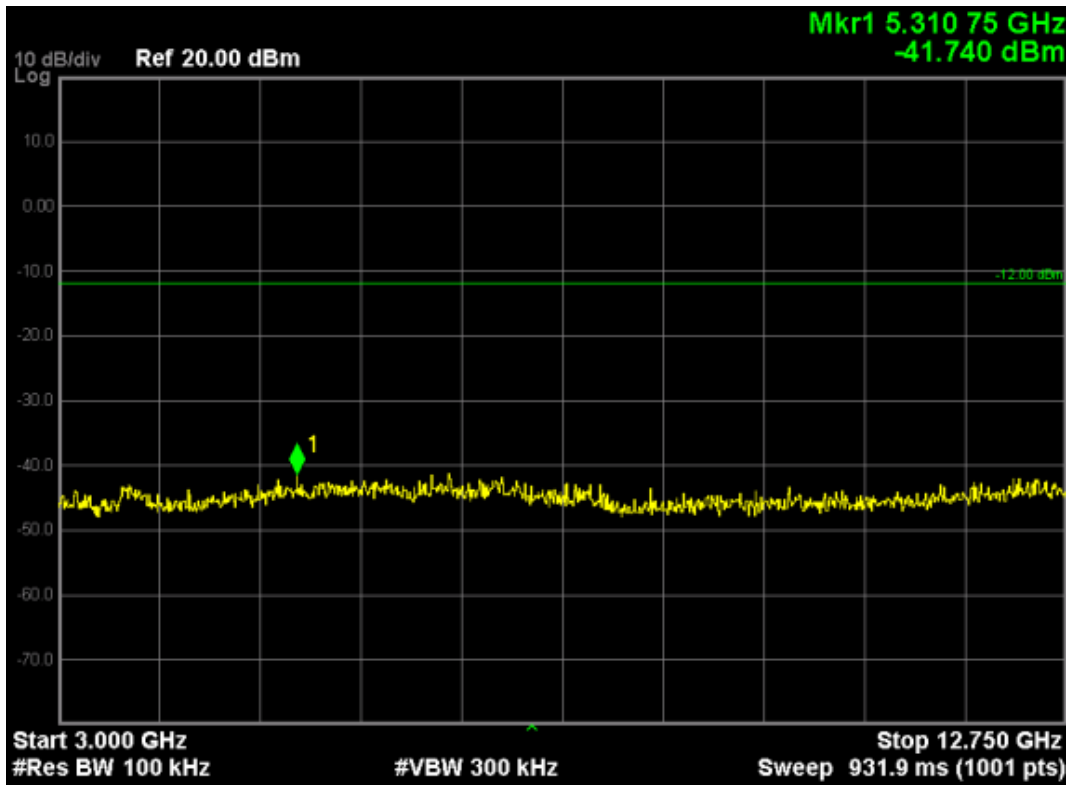


Channel 78 (9 kHz~3.0GHz)

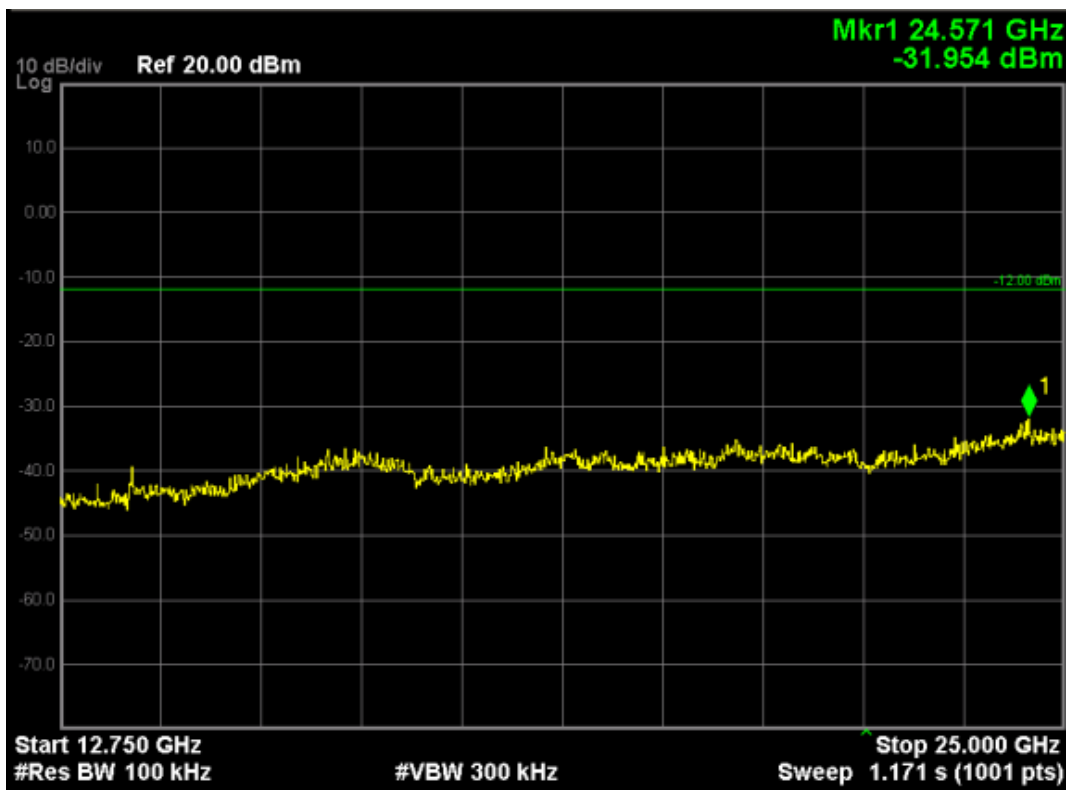


Note:The point mark1 is carrier.

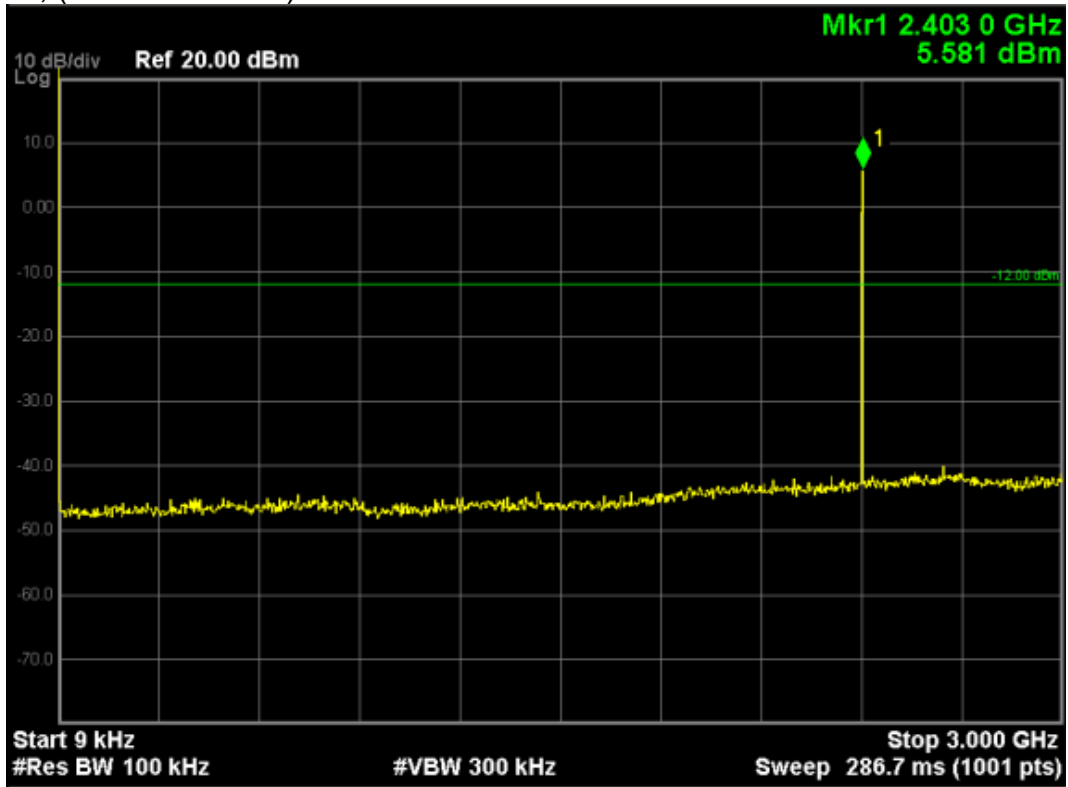
Channel 78 (3.0GHz ~12.75GHz)



Channel 78 (12.75GHz ~25GHz)

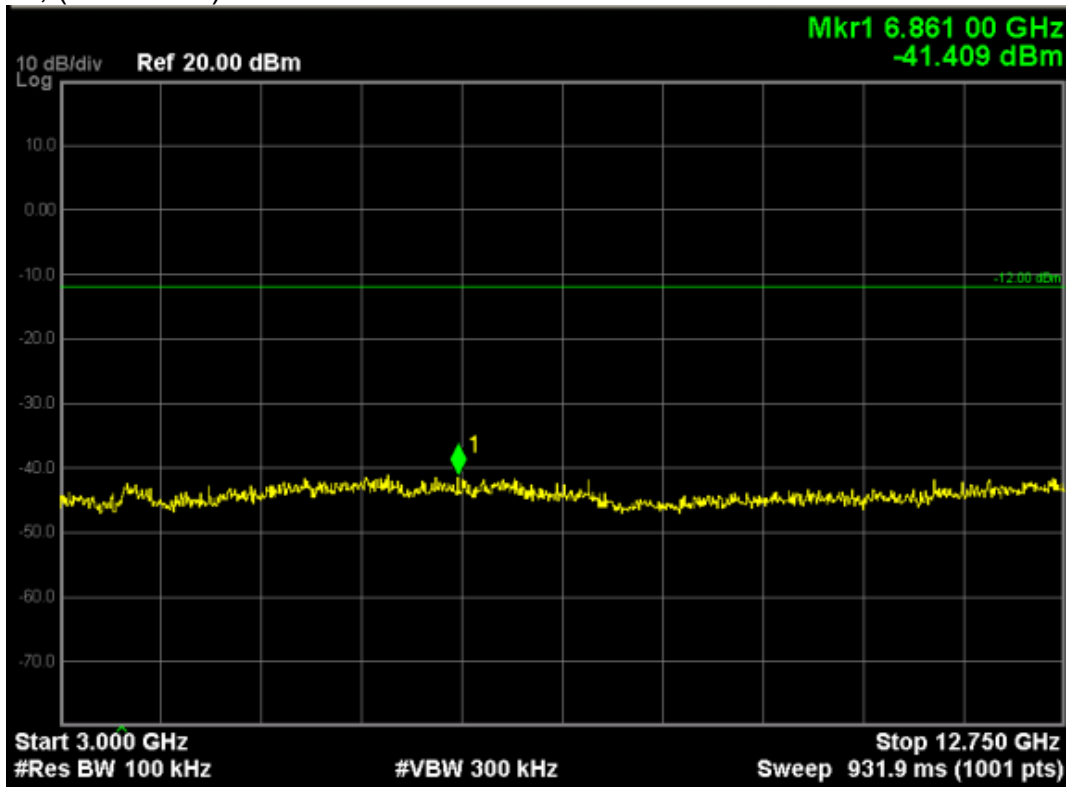


Bluetooth traffic mode 8-DPSK Channel 0; (9 kHz~3.0 GHz)



Note: The point mark 1 is carrier.

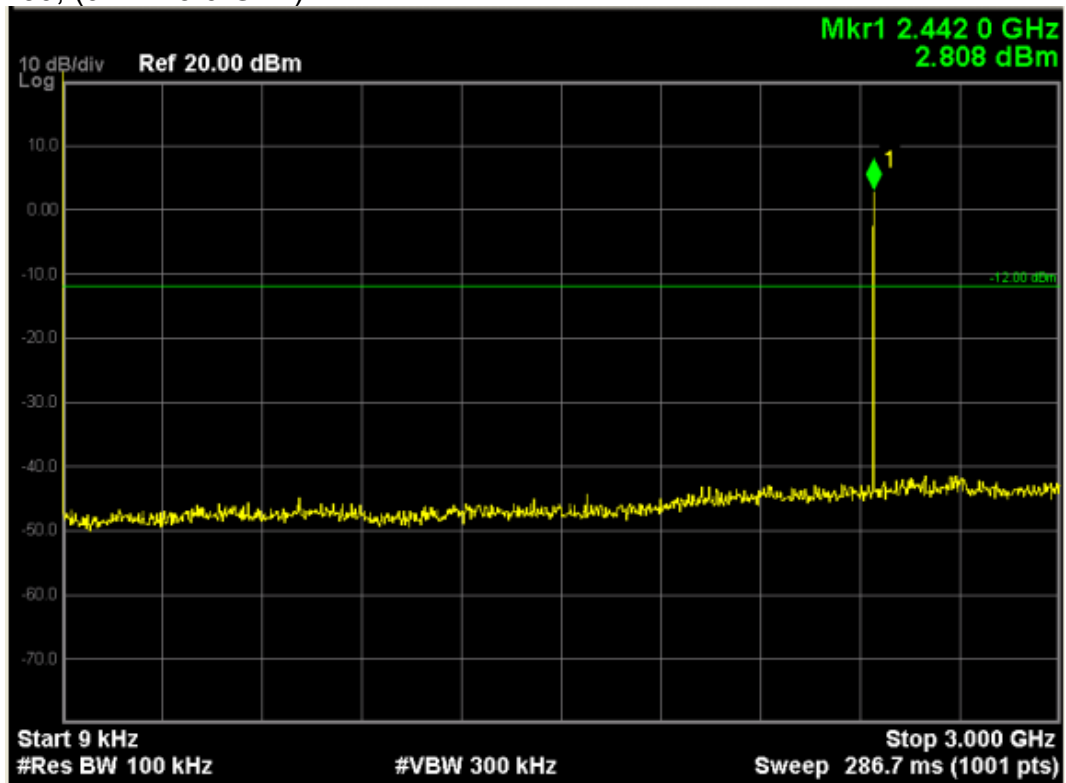
Channel 0; (3.0~12.75) GHz



Channel 0; (12.75~25) GHz

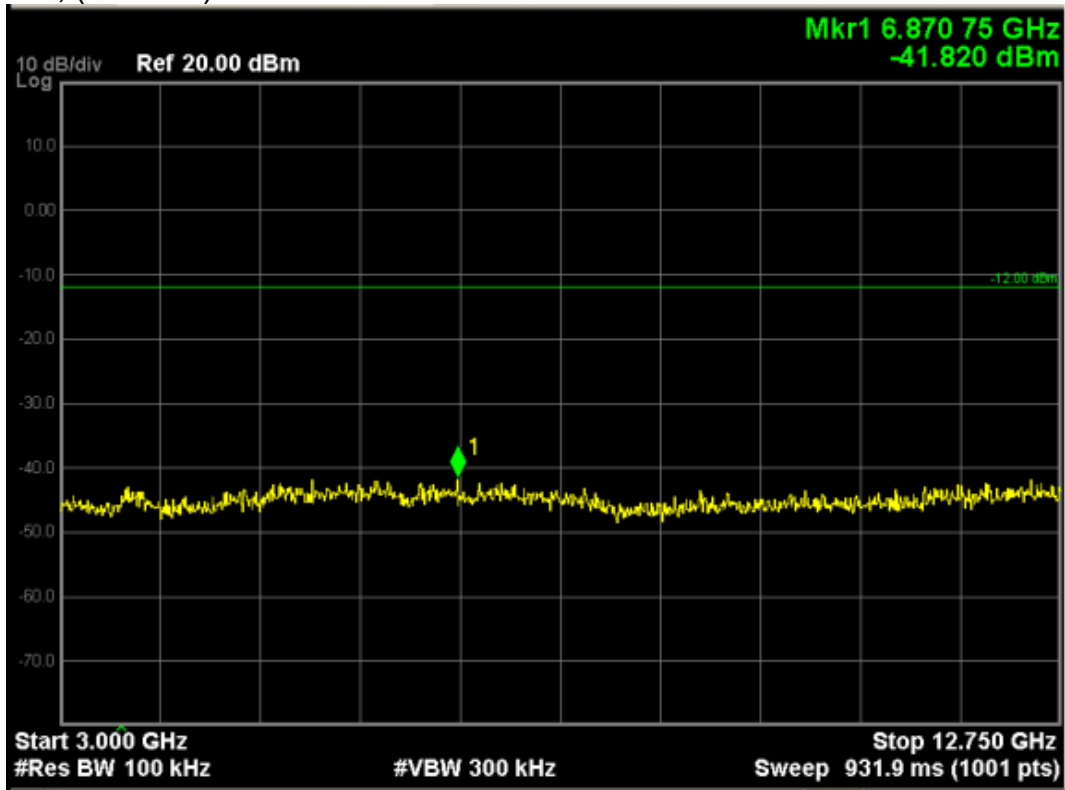


Channel 39; (9kHz~3.0 GHz)

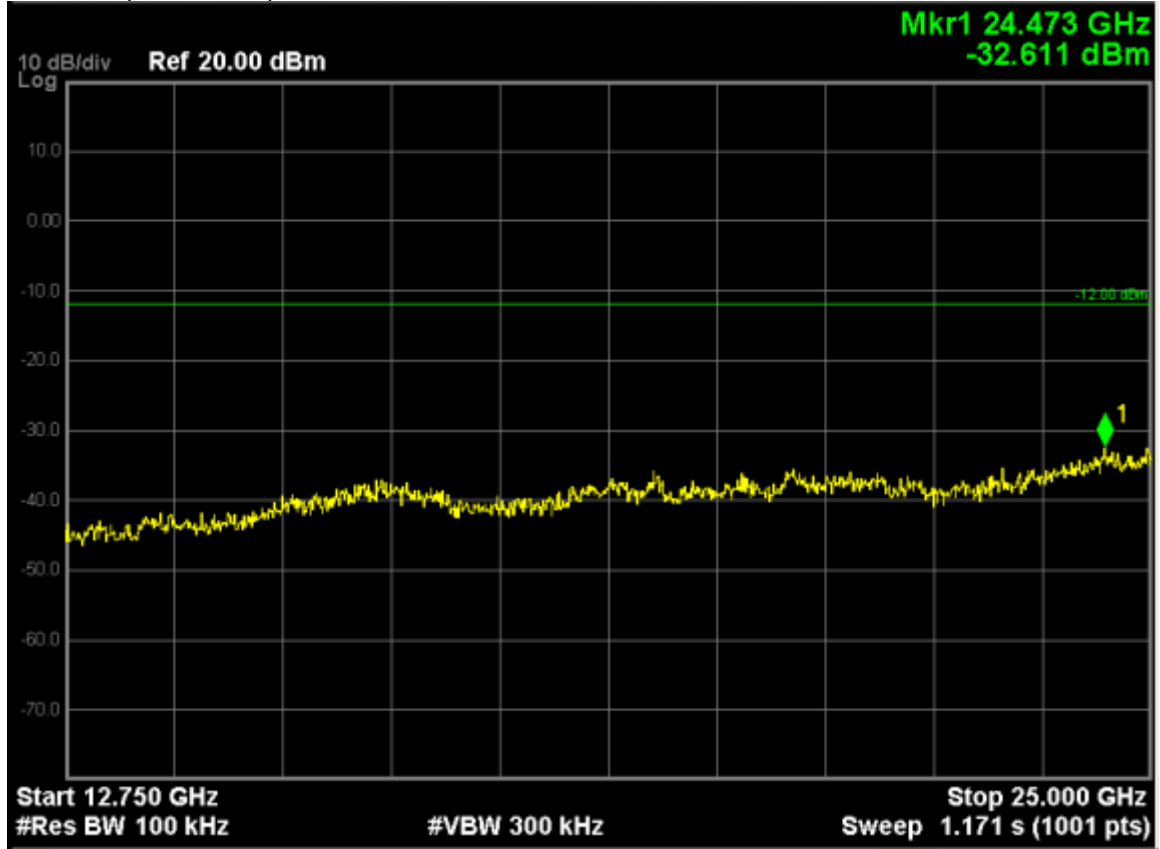


Note: The point mark1 is carrier.

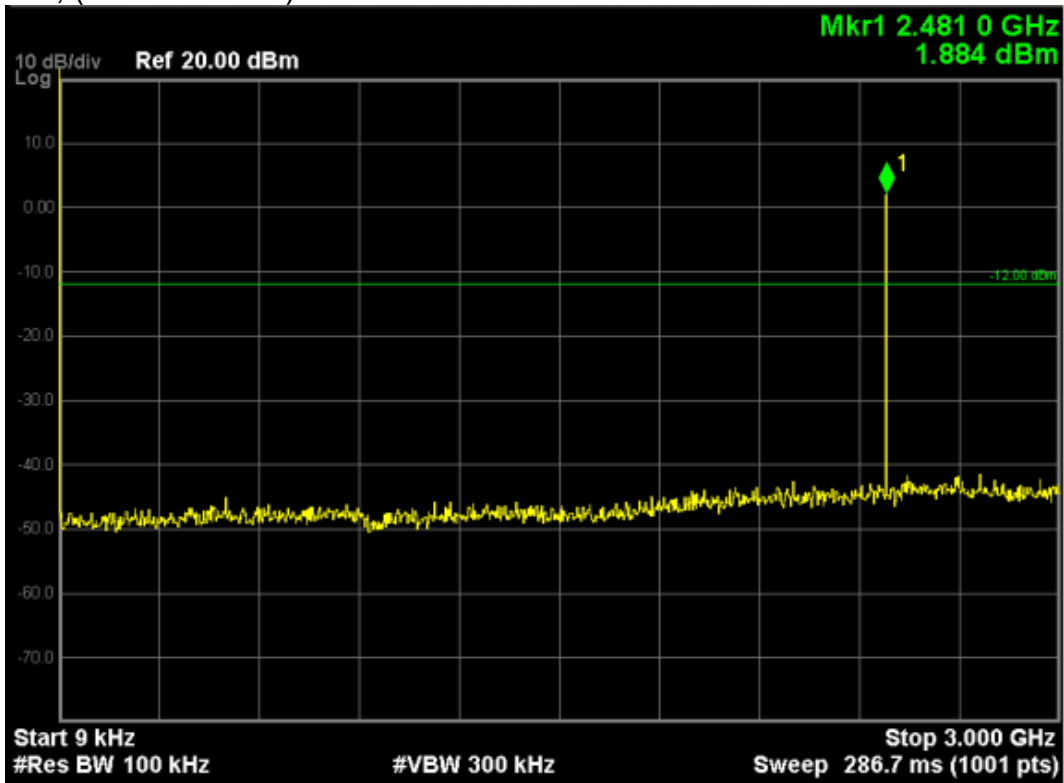
Channel 39; (3~12.75) GHz



Channel 39; (12.75~25) GHz

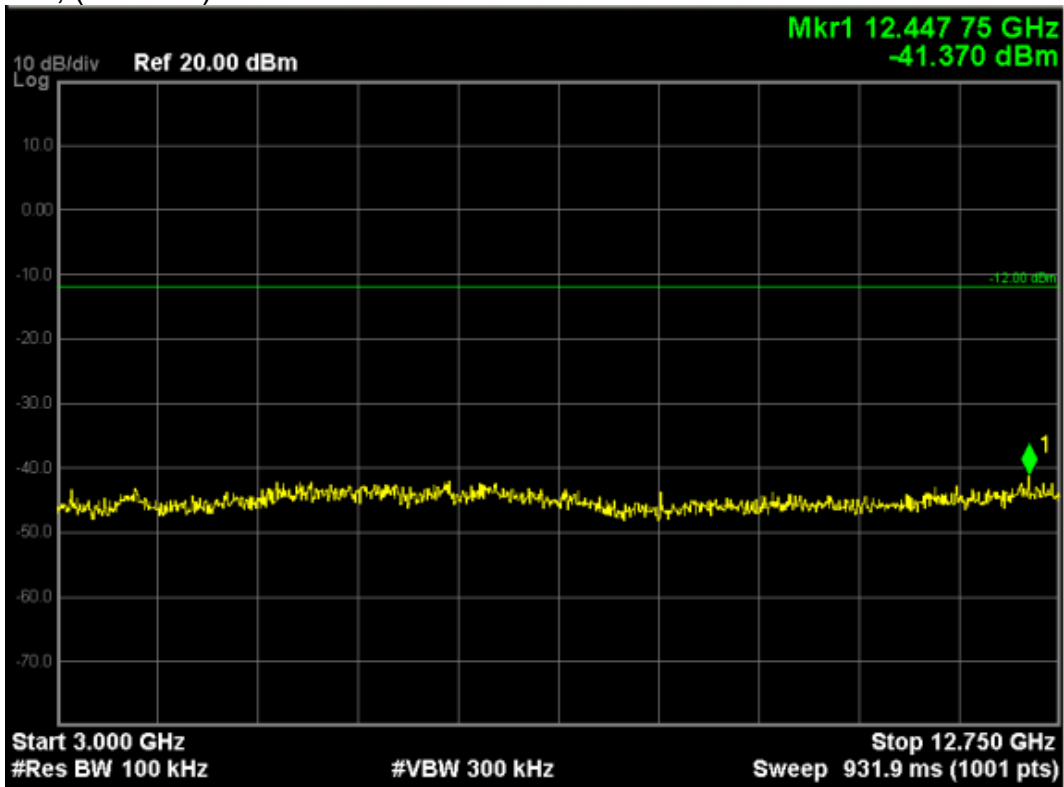


Channel 78; (9kHz~3.0GHz)

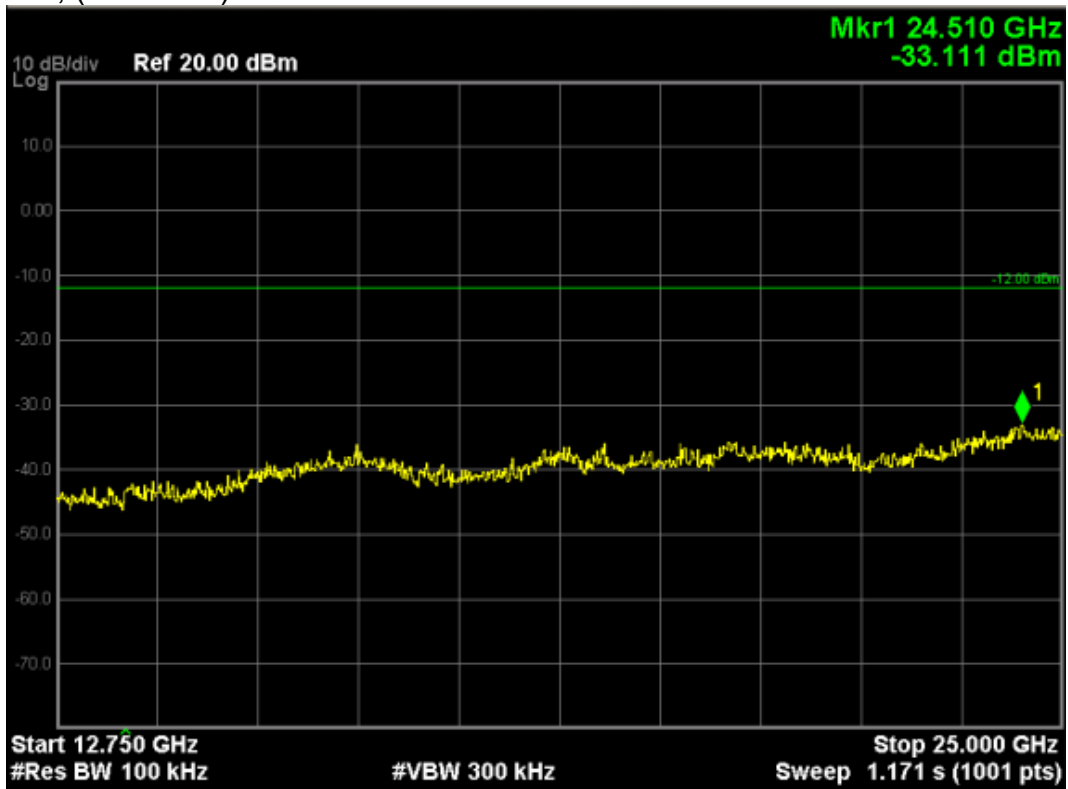


Note: The point mark1 is carrier.

Channel 78; (3~12.75) GHz

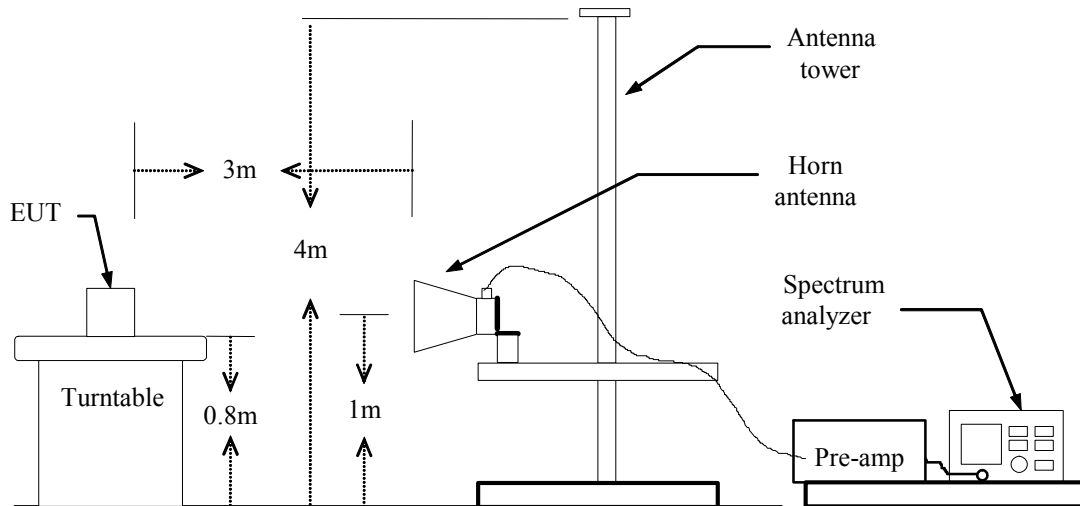


Channel 78; (12.75~25) GHz



10. BAND EDGE MEASUREMENT

10.1 TEST SETUP



10.2 LIMITS

According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power. 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).

10.3 TEST PROCEDURE

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

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

EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

PEAK: RBW=VBW=1MHz / Sweep=AUTO

AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

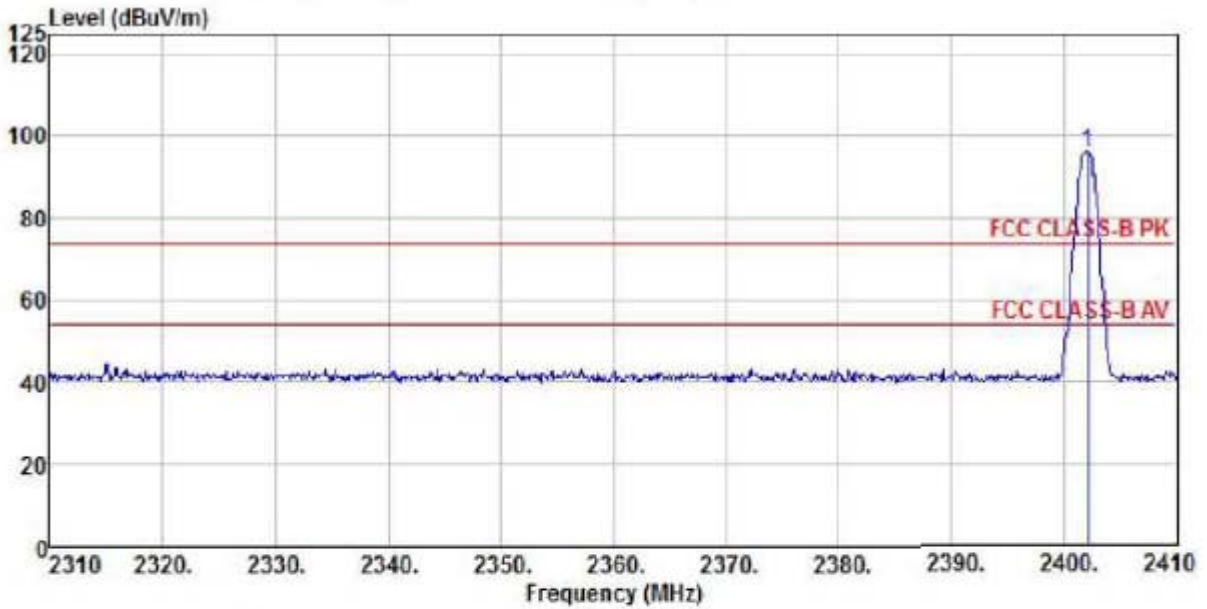
10.4 RESULTS & PERFORMANCE

Radiated Band Edge:

BT GFSK (Low Channel)

Detector mode: Peak

Polarity: Horizontal



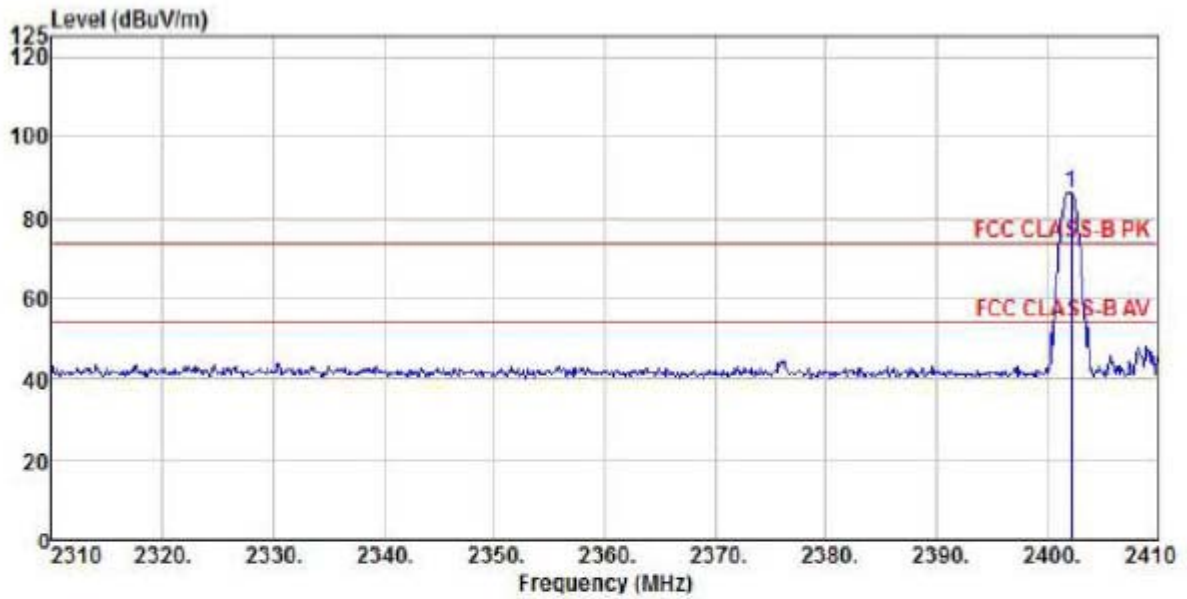
Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
 EUT :
 Model Name :
 Temp/Humi : 23 °C /52 %
 Power Rating: AC 120V/60Hz
 Mode : GFSK CH0
 Memo :

	ReadAntenna	Cable	Preamp		Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 pp 2402.20	99.72	27.54	7.13	38.34	96.05	74.00	22.05

Peak

Detector mode: Peak

Polarity: Vertical

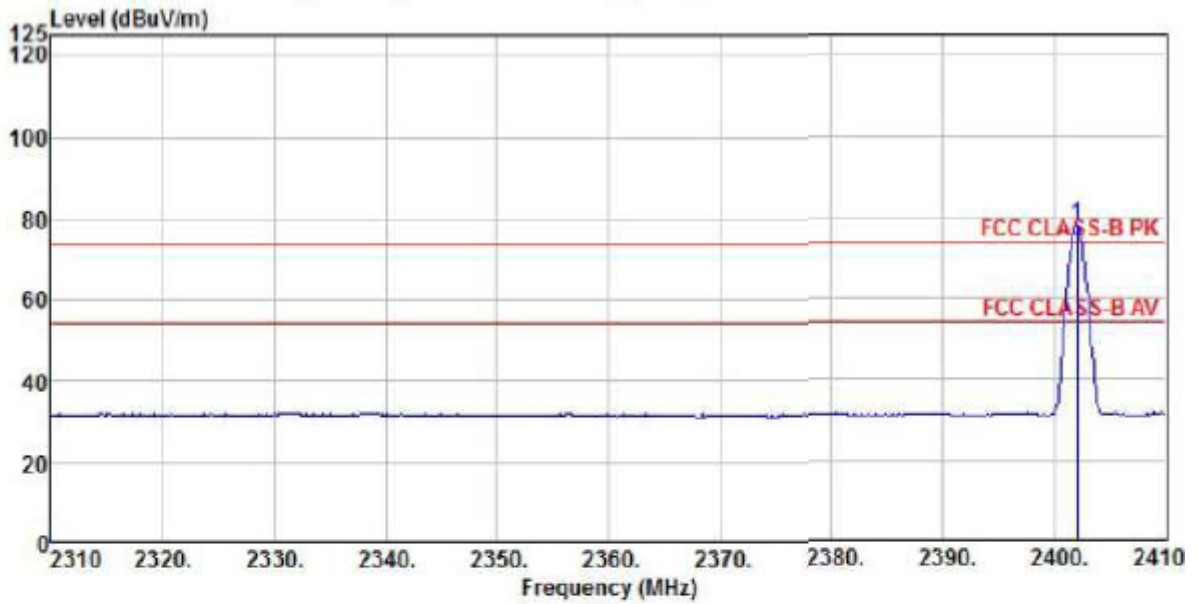


Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
 EUT :
 Model Name :
 Temp/Humi : 23 °C /52 %
 Power Rating: AC 120V/60Hz
 Mode : GFSK CH0
 Memo :

	ReadAntenna	Cable	Preamp	Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp 2402.20	90.11	27.54	7.13	38.34	86.44	74.00	12.44	Peak

Detector mode: Average

Polarity: Horizontal

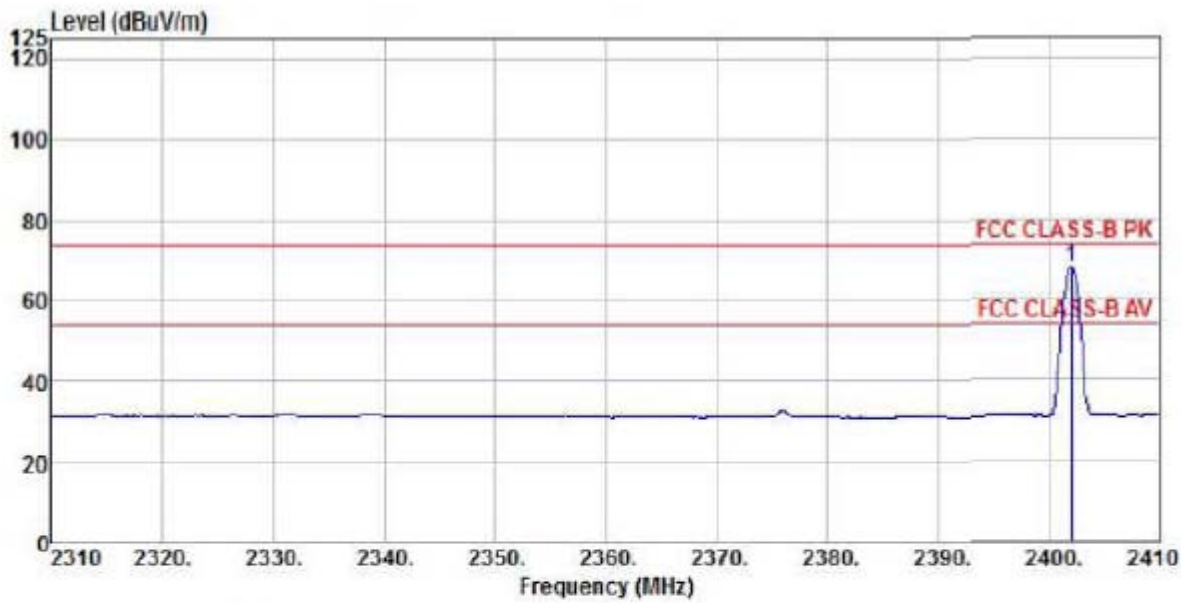


Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
 EUT :
 Model Name :
 Temp/Humi : 23 °C /52 %
 Power Rating: AC 120V/60Hz
 Mode : GFSK CH0
 Memo :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 pp 2402.00	81.69	27.54	7.13	38.34	78.02	54.00	24.02 Average

Detector mode: Average

Polarity: Vertical



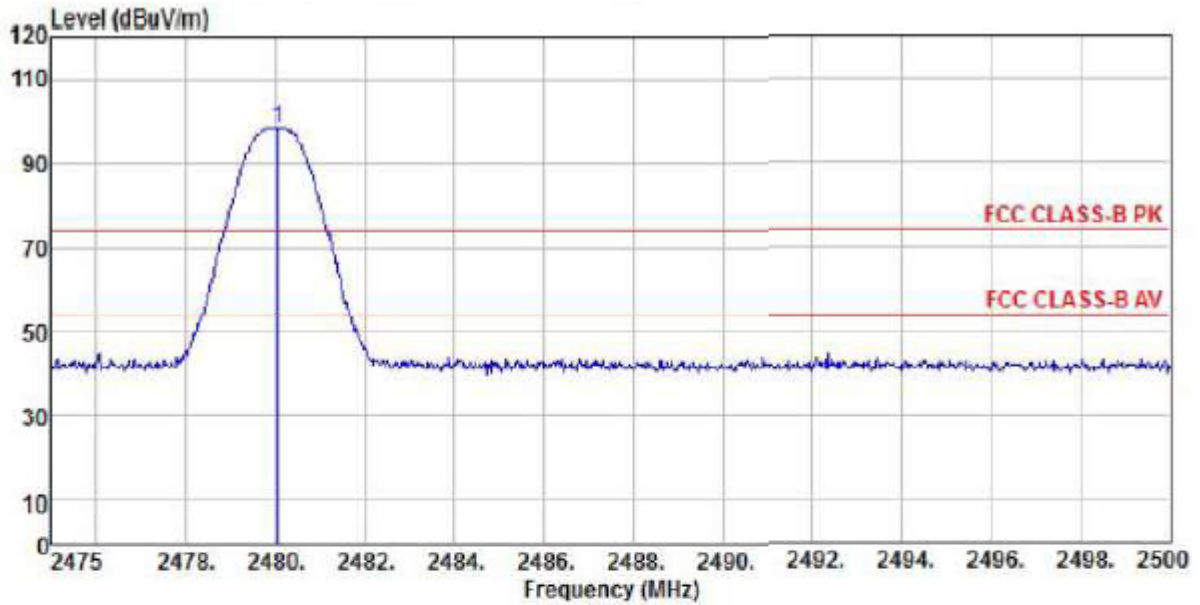
Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
 EUT :
 Model Name :
 Temp/Humi : 23 °C /52 %
 Power Rating: AC 120V/60Hz
 Mode : GFSK CH0
 Memo :

	ReadAntenna	Cable	Preamp		Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp 2402.00	71.62	27.54	7.13	38.34	67.95	54.00	13.95	Average

BT GFSK (High Channel)

Detector mode: Peak

Polarity: Horizontal

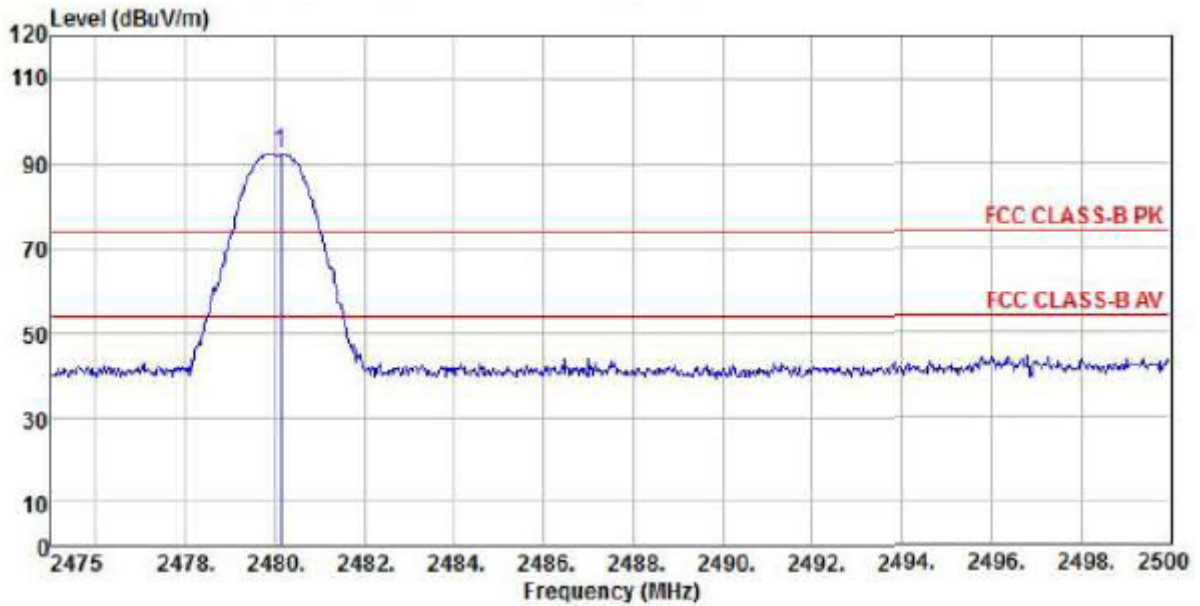


Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
 EUT :
 Model Name :
 Temp/Humi : 23 °C /52 %
 Power Rating: AC 120V/60Hz
 Mode : GFSK CH78
 Memo :

	ReadAntenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	
1 pp 2480.05	101.72	27.52	7.41	38.31	98.34	74.00	24.34 Peak

Detector mode: Peak

Polarity: Vertical

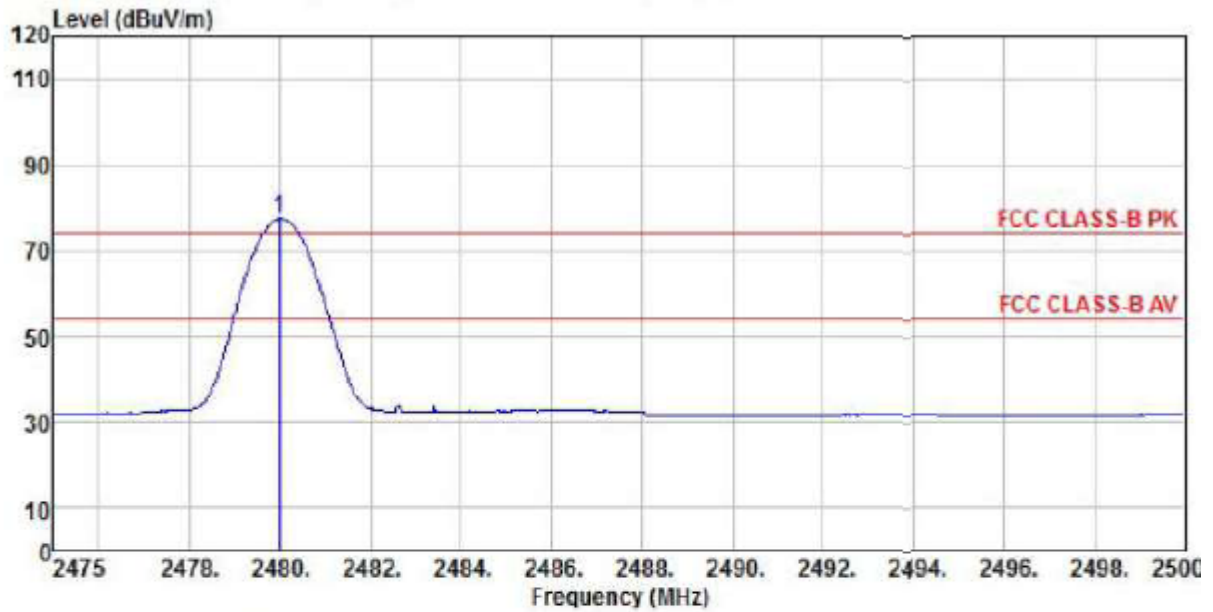


Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
 EUT :
 Model Name :
 Temp/Humi : 23 °C /52 %
 Power Rating: AC 120V/60Hz
 Mode : GFSK CH78
 Memo :

	ReadAntenna	Cable	Preamp		Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 pp 2480.11	95.72	27.52	7.41	38.31	92.34	74.00	18.34 Peak

Detector mode: Average

Polarity: Horizontal

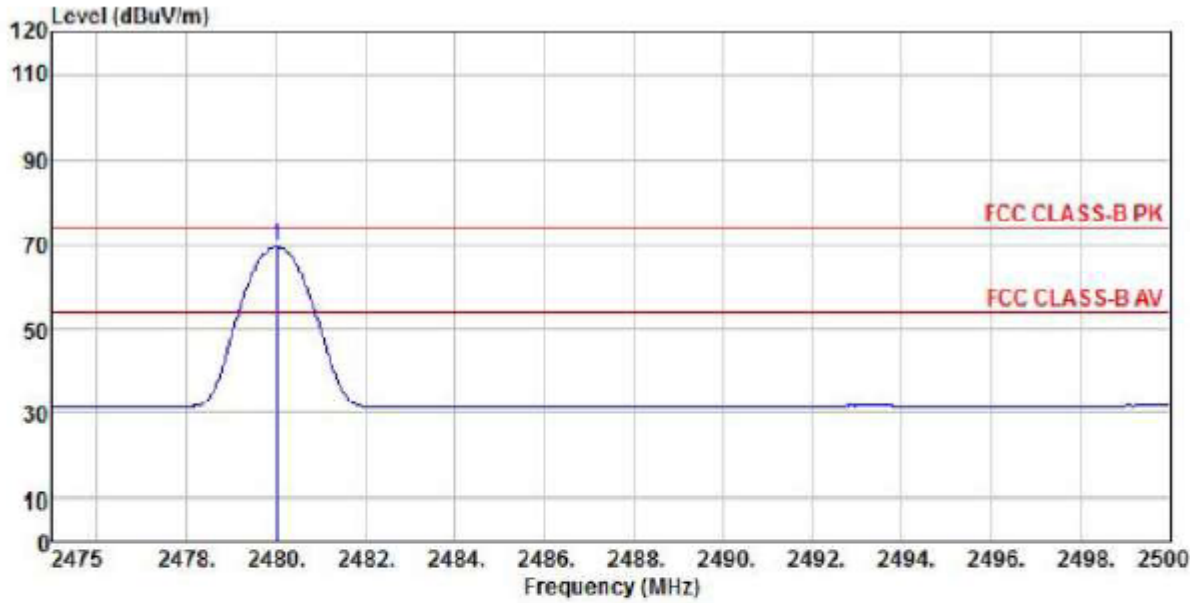


Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
 EUT :
 Model Name :
 Temp/Humi : 23 °C /52 %
 Power Rating: AC 120V/60Hz
 Mode : GFSK CH78
 Memo :

	ReadAntenna	Cable	Preamp		Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 pp 2480.00	80.67	27.52	7.41	38.31	77.29	54.00	23.29	Average	

Detector mode: Average

Polarity: Vertical



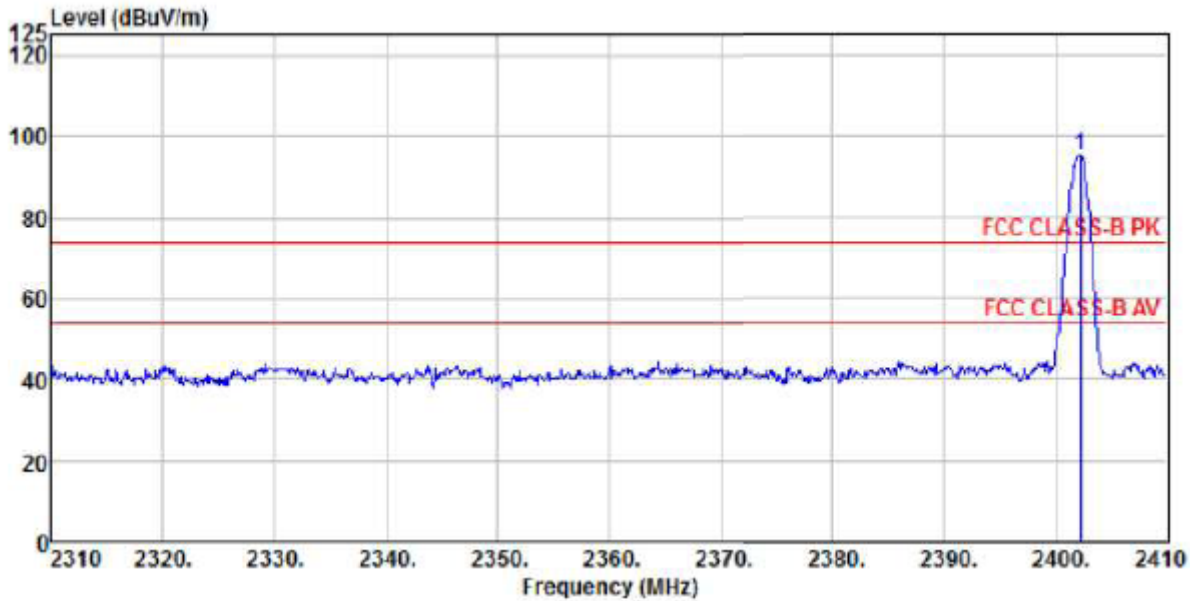
Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
 EUT :
 Model Name :
 Temp/Humi : 23 °C /52 %
 Power Rating: AC 120V/60Hz
 Mode : GFSK CH78
 Memo :

	ReadAntenna	Cable	Preamp	Limit	Over		
Freq	Level	Loss	Factor	Line	Limit	Remark	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	
1 pp 2480.03	72.82	27.52	7.41	38.31	69.44	54.00	15.44 Average

BT Π/4-DQPSK (Low Channel)

Detector mode: Peak

Polarity: Horizontal



Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
 EUT :
 Model Name :
 Temp/Humi : 23 °C /52 %
 Power Rating: AC 120V/60Hz
 Mode : Pi/4-DPSK CH0
 Memo :

	ReadAntenna	Cable	Preamp		Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 pp 2402.20	98.72	27.54	7.13	38.34	95.05	74.00	21.05 Peak