SGS-CSTC Standards Technical Services
(Shanghai) Co., Ltd.

588 West Jindu Road,Songjiang District,Shanghai,China
Telephone: +86 (0) 21 6191 5666
Fax: +86 (0) 21 6191 5678
ee.shanghai@sgs.com

1 Cover Page

RF TEST REPORT for BT

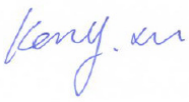
Application No.:	SHEM1308001626RF
Applicant:	Hansong (Nanjing) Technology Ltd.
Manufacturer:	Vifa Denmark A/S
FCC ID:	XCO-VIFANORDIC
IC:	7756A-VIFANORDIC
Equipment Under Test (EUT): **NOTE:** The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	Active wireless loudspeaker
Model No.(EUT):	VIFA010, VIFA020
Standards:	FCC PART 15 Subpart C: 2012 RSS-210 Issue 8 (December 2010) RSS-Gen Issue 3 (December 2010)
Date of Receipt:	November 01, 2013
Date of Test:	October 30, 2013 to November 04, 2013
Date of Issue:	November 28, 2013
Test Result:	**Pass***

* In the configuration tested, the EUT (Equipment under test) complied with the standards specified above.

Tony Wu
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00	/	November 28, 2013	/	Original

Authorized for issue by:				
Engineer		Eddy Zong **Print Name**		
Clerk		Susie Liu **Print Name**		
Reviewer		Keny Xu **Print Name**		

3 Test Summary

Test Item	FCC Test Requirement	IC Test Requirement	Test method	Result
Antenna Requirement	FCC Part 15, Subpart C Section 15.203/15.247 (c)	RSS-Gen 7.1.2	---	PASS
AC Power Line Conducted Emission	FCC Part 15, Subpart C Section 15.207	RSS-Gen Section 7.2.4	ANSI C63.10 (2009) Section 6.2	PASS
20dB Occupied Bandwidth	FCC Part 15, Subpart C Section 15.247 (a)(1)	RSS 210 A 8.1(a)	ANSI C63.10 (2009) Section 6.9.1	PASS
Conducted Peak Output Power	FCC Part 15, Subpart C Section 15.247 (b)(1)	RSS 210 A 8.4(2)	ANSI C63.10 (2009) Section 6.10.1	PASS
Carrier Frequencies Separation	FCC Part 15, Subpart C Section 15.247 (a)(1)	RSS 210 A 8.1(b)	ANSI C63.10 (2009) Section 7.7.2	PASS
Hopping Channel Number	FCC Part 15, Subpart C Section 15.247 (b)	RSS 210 A 8.1(d)	ANSI C63.10 (2009) Section 7.7.3	PASS
Dwell Time	FCC Part 15, Subpart C Section 15.247 (a)(1)	RSS 210 A 8.1(d)	ANSI C63.10 (2009) Section 7.7.4	PASS
RF Conducted Spurious Emissions	FCC Part 15, Subpart C Section 15.247(d)	RSS 210 A 8.5	ANSI C63.10 (2009) Section 7.7.10	PASS
Radiated Spurious emissions	FCC Part 15, Subpart C Section 15.209 and Section 15.205	RSS-Gen section 4.9	ANSI C63.10 (2009) Section 6.12	PASS
Radiated Band-edge	FCC Part 15, Subpart C Section 15.205	RSS-Gen section 4.9	ANSI C63.10 (2009) Section 6.5	PASS
99% Occupied Bandwidth	---	RSS-Gen section 4.6.1	RSS-Gen section 4.6.1	PASS

Note: There are 2 models mentioned in this report, The main board and PSU board and operating panel of above models, the electrical circuit design, PCB layout, electrical components used, internal wiring and functions are identical, only different on their physical design and

1. VIFA010 contains an independent Charging board and a Li-ion Battery,

2. and VIFA020 contains an independent RF remote receiver board.

The test of Radiated method to be required to 2 models, and the test of conducted method is performed in VIFA010 only

4 Contents

5 General Information

5.1 Client Information

Applicant:	Hansong (Nanjing) Technology Ltd.
Address of Applicant:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China
Manufacturer:	Vifa Denmark A/S
Address of Manufacturer:	Mariendalsvej 2A, DK8800 Viborg, Denmark
Factory:	Guoguang Electric Co., Ltd
Address of Factory:	No.8 Jinghu Road, Xinhua Street, Huadu Reg, Guangzhou, China

5.2 General Description of E.U.T.

Product Name:	Active wireless loudspeaker
Model No.(EUT):	VIFA010, VIFA020
Brand Name:	Vifa
Product Description:	Mobile Product

5.3 Details of E.U.T.

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	3.0+EDR
Modulation Technique:	FHSS(GFSK, π/4DQPSK, 8DPSK)
Number of Channel:	79
Antenna Type	Integral
Antenna Gain	2 dBi
Power Supply:	AC100-240V 50/60Hz
Cable Type:	About 150cm length (2Wires)
Engineering Mode:	Using test software to control EUT working in continuous transmitting, and select channel and modulation type

5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Serial No.	Supplied by
Laptop	ThinkPad X100e	2876A65	/	SGS

Software name	Manufacturer	Supplied By
Blue Test3 (For CSR)	N/A	SGS

5.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China.201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

5.6 Test Facility

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

- **CNAS (No. CNAS L0599)**

  CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

  SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

  The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

6 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	Spectrum Analyzer	Rohde & Schwarz	FSP-30	2705121009	2013-02-23	2014-02-22
2	EMI test receiver	Rohde & Schwarz	ESU40	100109	2013-02-23	2014-02-22
3	Horn Antenna (1GHz to 18GHz)	SCHWARZBECK	BBHA9120 D	9120D-679	2013-03-07	2014-03-06
4	Horn Antenna (14GHz to 40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170373	2013-03-07	2014-03-06
5	ANTENNA (25MHz to 2GHz)	SCHWARZBECK	VULB9168	9168-313	2013-03-07	2014-03-06
6	Ultra broadband antenna (30MHz to3GHz)	Rohde & Schwarz	HL562	100227	2013-10-09	2014-10-08
7	Horn Antenna (1GHz to 18GHz)	Rohde & Schwarz	HF906	100284	2013-06-02	2014-06-01
8	Active Loop Antenna (9kHz to 30MHz)	Rohde & Schwarz	FMZB 1519	1519-034	2013-07-28	2014-07-27
9	High-low temperature cabinet	Suzhou Zhihe	TL-40	50110050	2013-04-13	2014-04-12
10	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/880.0-0.2/40-5SSK	9	2013-06-02	2014-06-01
11	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2013-06-02	2014-06-01
12	Low noise amplifier	TESEQ	LNA6900	70133	2013-02-23	2014-02-22
13	Attenuator	HUAXIANG	TS2-6dB	11051002	/	/
14	Attenuator	HUAXIANG	TS2-6dB	11051001	/	/
15	AC power stabilizer	WOCEN	6100	51122	2013-06-02	2014-06-01
16	DC power	QJE	QJ30003SII	611145	2013-06-02	2014-06-01

7 Test Results

7.1 E.U.T. test conditions

Test Power: AC 120V, 60Hz

Requirements: 15.31(e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

Operating Environment:

Temperature: 20.0 -25.0 °C

Humidity: 35-75 % RH

Atmospheric Pressure: 992 -1020 mbar

Test frequencies: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. if required. reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top. 1 near middle and 1 near bottom

Pursuant to Part 15.31(c) For swept frequency equipment, measurements shall be made with the frequency sweep stopped at those frequencies chosen for the measurements to be reported.
Test frequency is the lowest channel: 0 channel (2402MHz), middle channel: 39 channel (2441MHz) and highest channel: 78 channel (2480MHz) with fixed at channel.

7.2 Antenna Requirement

Standard requirement

15.203 requirement:

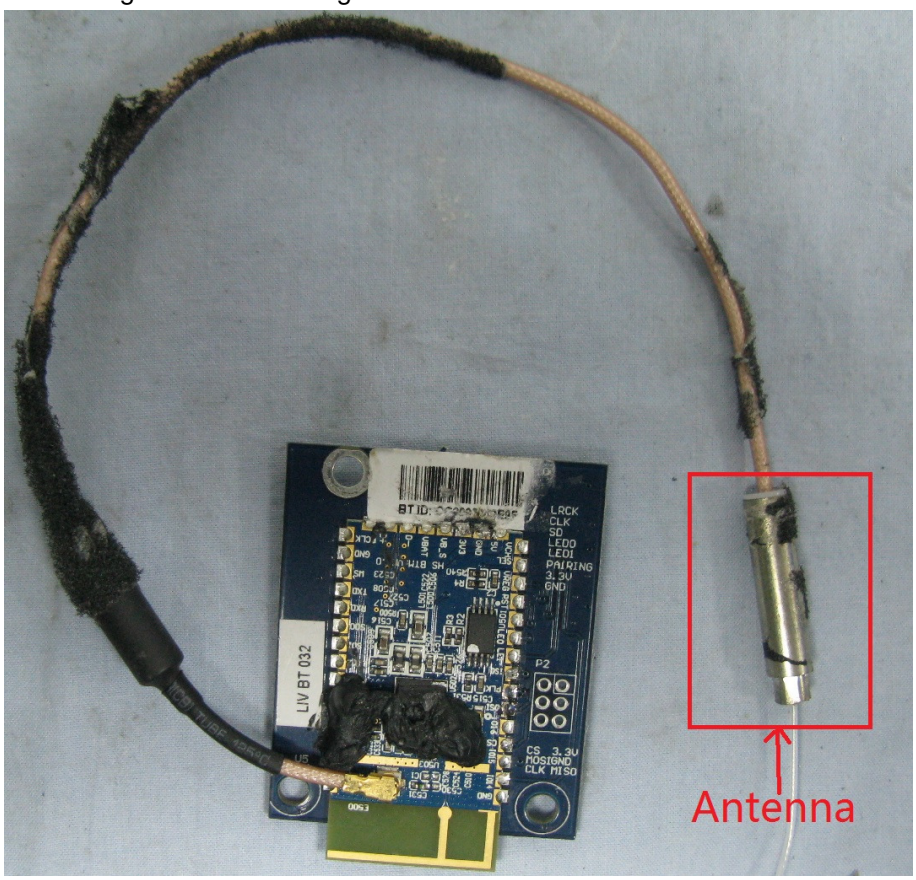
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

15.247(b) (4) requirement:

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.

EUT Antenna

The antenna is Plug-in antenna. The gain of the antenna is less than 2.0 dBi.



7.3 Conducted Emissions on Mains Terminals

Test Requirement: FCC Part 15C, Section 15.207
RSS-Gen Section 7.2.4

Test Method: ANSI C63.10:2009 Section 6.2

Test Result: Pass

Test Voltage: AC 120V 60Hz

Frequency Range: 150 KHz to 30 MHz

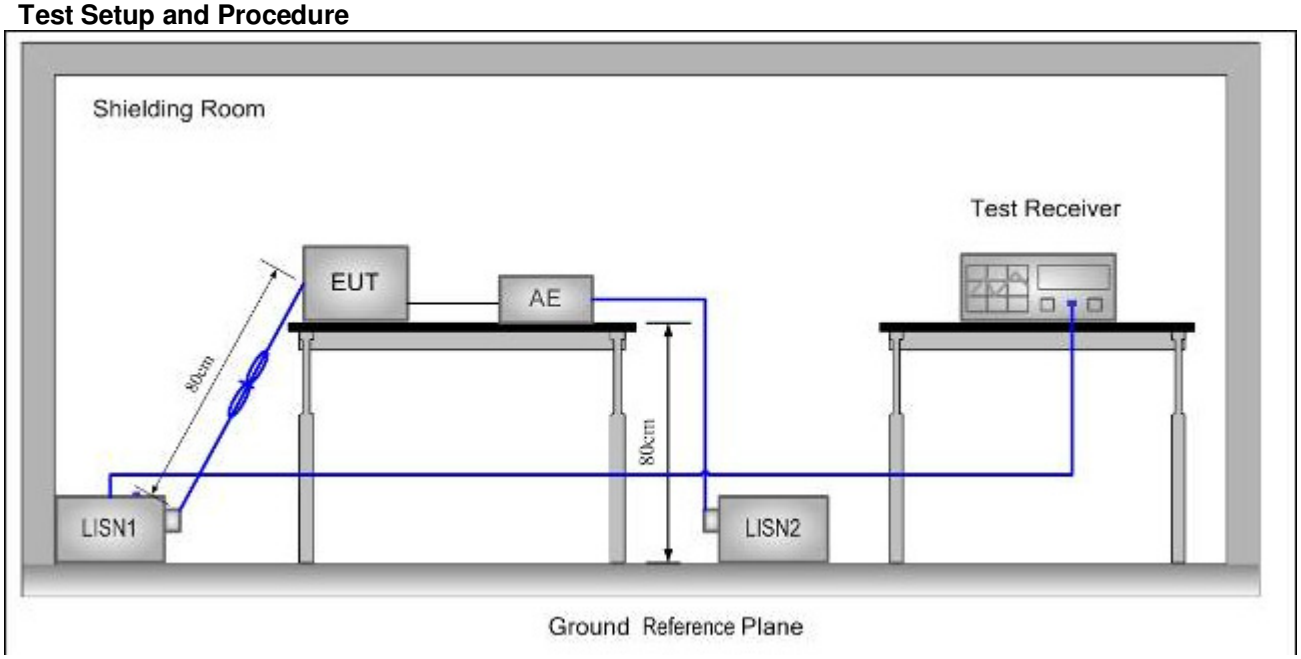
Class/Severity: Class B

Test mode: Engineering mode

Limit:

Frequency range MHz	Class B Limits dB (μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz. Note2: The lower limit is applicable at the transition frequency.		

Test Setup and Procedure



1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance was between the closest points of the LISN and the EUT. The mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m. All other units of the EUT and associated equipment was at least 0,8 m from the LISN.

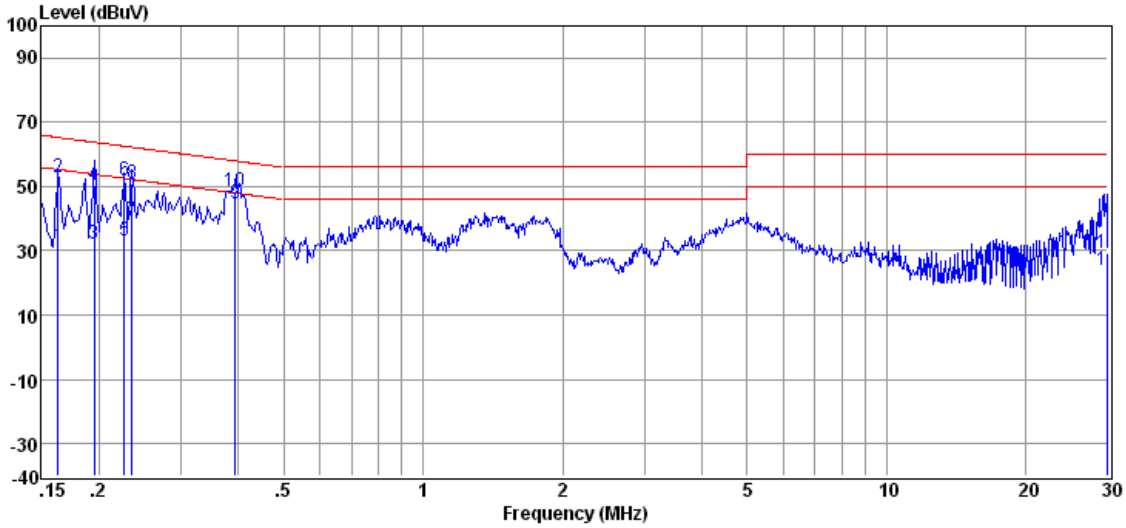
Measurement Data

Pre-scan was performed with peak detected on all ports, Quasi-peak & average measurements were performed at the frequencies at which maximum peak emission level were detected.

Please see the attached Quasi-peak and Average test results.

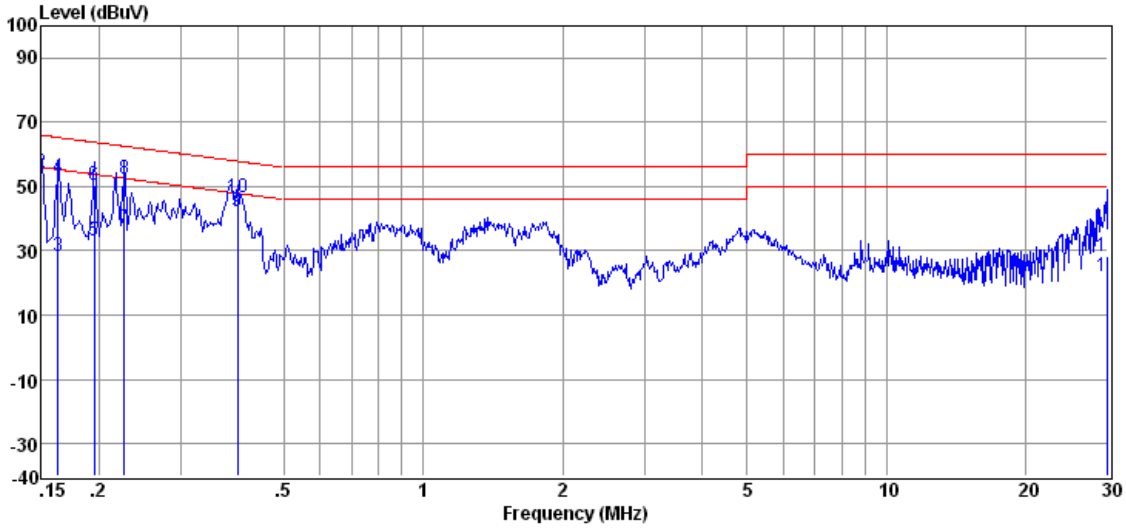
Level = Read Level + LISN/ISN Factor + Cable Loss.

Test Mode: Engineering mode **Test Port:** AC Live Line



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)	
1	0.163	30.98	0.17	0.10	31.25	55.30	-24.05	Average
2	0.163	52.41	0.17	0.10	52.68	65.30	-12.62	QP
3	0.196	32.07	0.11	0.10	32.28	53.80	-21.52	Average
4	0.196	50.30	0.11	0.10	50.51	63.80	-13.29	QP
5	0.227	32.96	0.11	0.10	33.17	52.57	-19.40	Average
6	0.227	51.66	0.11	0.10	51.87	62.57	-10.70	QP
7	0.235	38.99	0.11	0.10	39.20	52.26	-13.06	Average
8	0.235	50.51	0.11	0.10	50.72	62.26	-11.54	QP
9	0.393	44.46	0.16	0.10	44.72	47.99	-3.27	Average
10	0.393	48.41	0.16	0.10	48.67	57.99	-9.32	QP
11	29.841	22.89	0.90	0.20	23.99	50.00	-26.01	Average
12	29.841	28.01	0.90	0.20	29.11	60.00	-30.89	QP

Test Mode: Engineering mode **Test Port:** AC Neutral Line



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)	
1	0.150	28.77	0.20	0.10	29.07	55.99	-26.92	Average
2	0.150	54.16	0.20	0.10	54.46	65.99	-11.53	QP
3	0.163	28.24	0.17	0.10	28.51	55.30	-26.79	Average
4	0.163	52.53	0.17	0.10	52.80	65.30	-12.50	QP
5	0.196	32.77	0.11	0.10	32.98	53.80	-20.82	Average
6	0.196	50.42	0.11	0.10	50.53	63.80	-13.17	QP
7	0.227	36.92	0.10	0.10	37.12	52.57	-15.45	Average
8	0.227	52.12	0.10	0.10	52.32	62.57	-10.25	QP
9	0.398	42.06	0.10	0.10	42.26	47.90	-5.64	Average
10	0.398	46.36	0.10	0.10	46.56	57.90	-11.34	QP
11	29.841	21.01	0.90	0.20	22.11	50.00	-27.89	Average
12	29.841	27.16	0.90	0.20	28.26	60.00	-31.74	QP

7.4 20dB Occupied Bandwidth

Test Requirement: FCC Part 15 C Section 15.247 (a)(1)
RSS 210 A 8.1(a)

Test Method: ANSI C63.10:2009 Clause 6.9.1

Final Test Mode: Engineering mode

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centred on the hopping channel;
3. Set the spectrum analyzer: RBW >= 1% of the 20dB bandwidth (set 30 kHz). VBW >= RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold.
4. Mark the peak frequency and -20dB points.

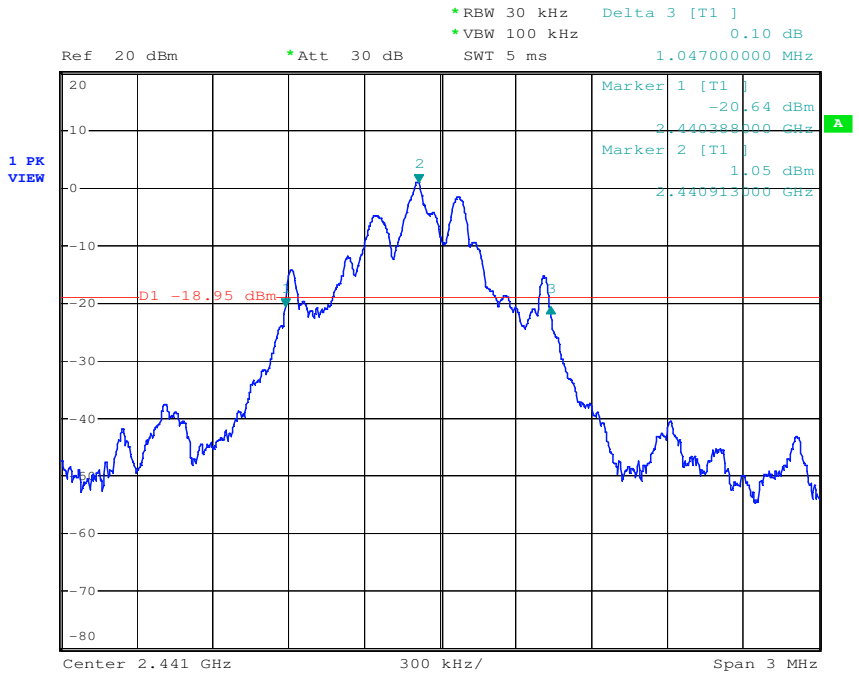
Test date

Test Channel	Channel Frequency (MHz)	Modulation	Bandwidth(MHz)
Low	2402	GFSK	1.047
Middle	2441	GFSK	1.047
High	2480	GFSK	1.044
Low	2402	π/4DQPSK	1.173
Middle	2441	π/4DQPSK	1.119
High	2480	π/4DQPSK	1.116
Low	2402	8DPSK	1.185
Middle	2441	8DPSK	1.179
High	2480	8DPSK	1.182

Test plot as follows:

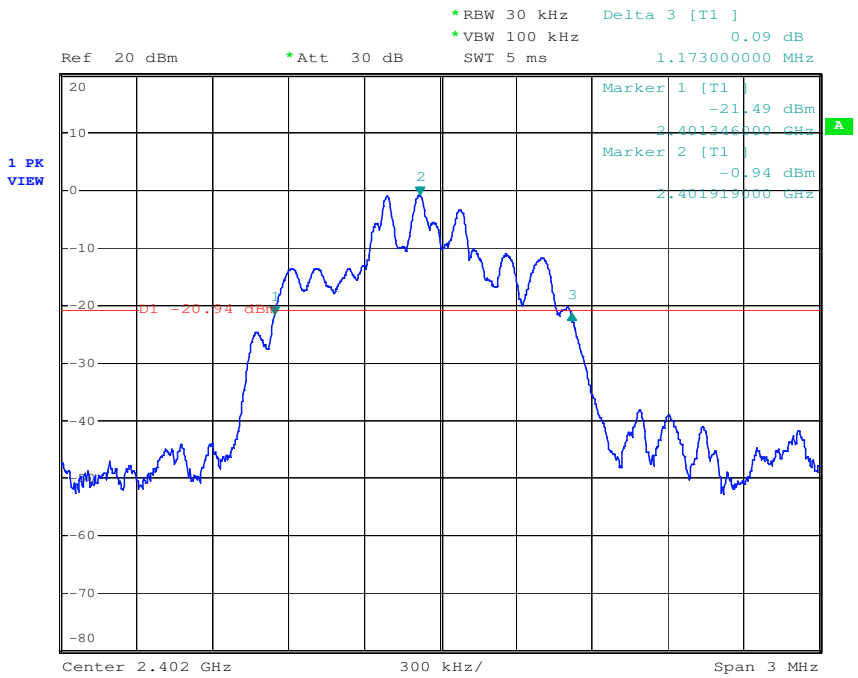
Test mode:	GFSK	Test channel:	Lowest

Test mode:	GFSK	Test channel:	Middle

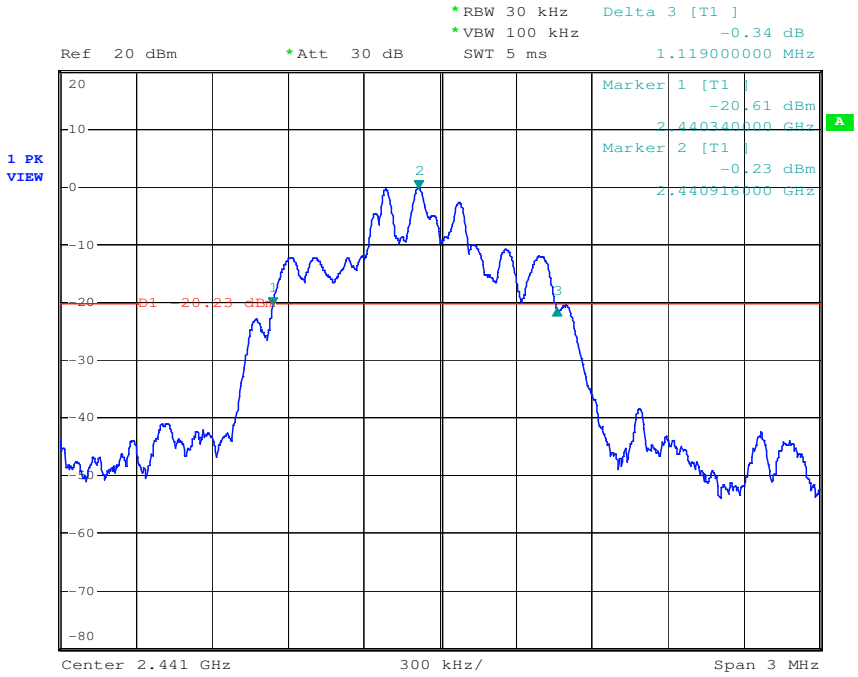


Test mode:	GFSK	Test channel:	Highest

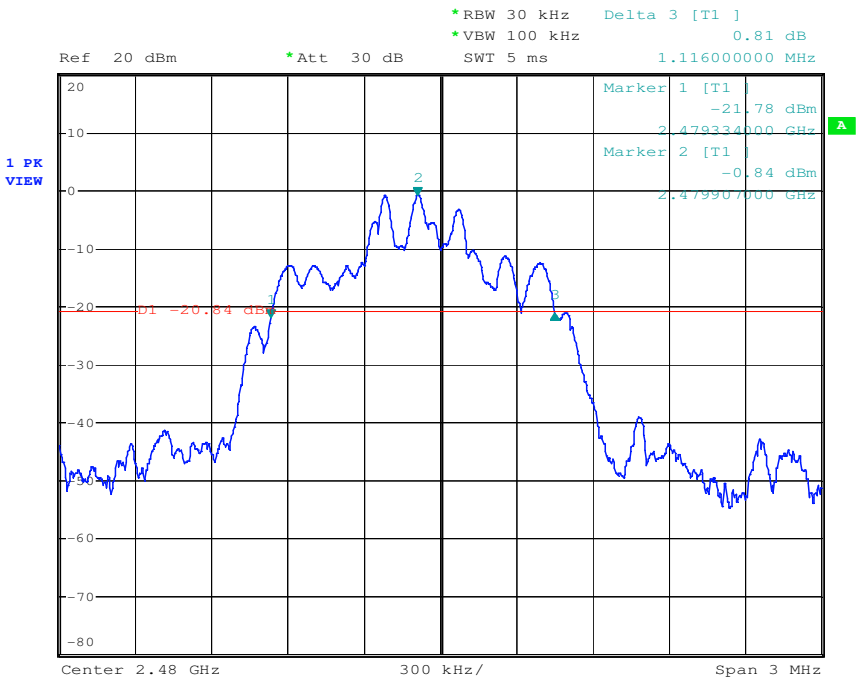
Test mode:	π/4DQPSK	Test channel:	Lowest



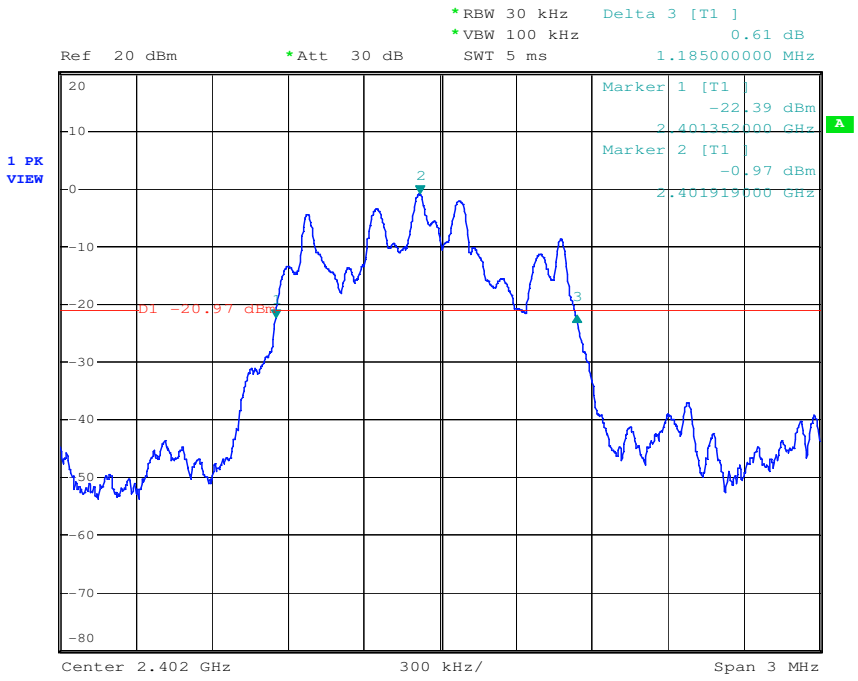
Test mode:	π/4DQPSK	Test channel:	Middle



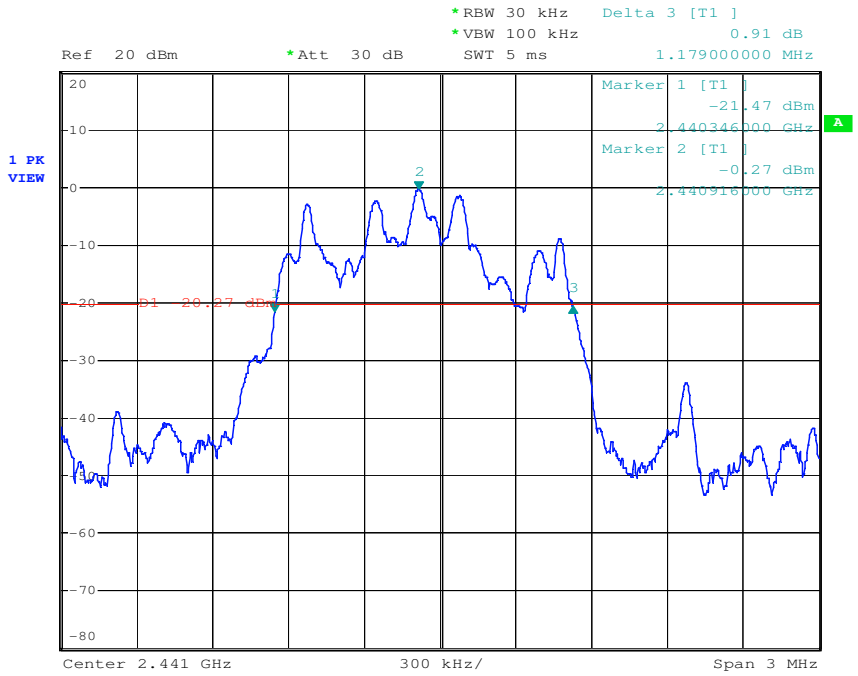
Test mode:	π/4DQPSK	Test channel:	Highest



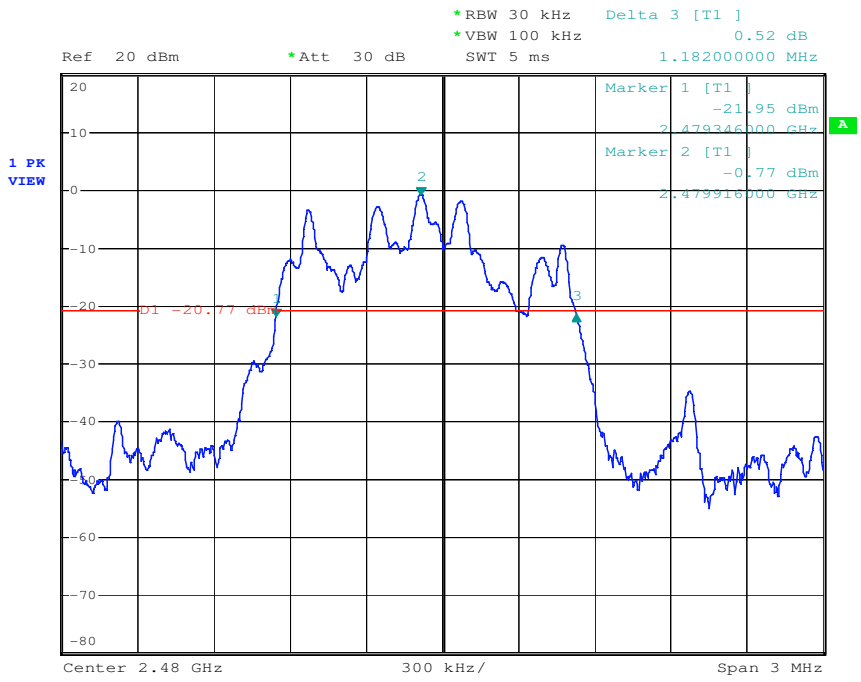
Test mode:	8DPSK	Test channel:	Lowest



Test mode:	8DPSK	Test channel:	Middle



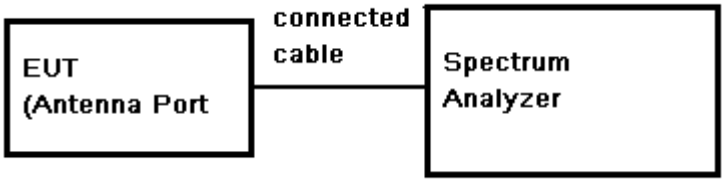
Test mode:	8DPSK	Test channel:	Highest



7.5 Conducted Peak Output Power

Test Requirement:	FCC Part 15.247 Section 15.247(b)(1) RSS 210 A 8.4(2)
Test Method:	ANSI C64.10:2009 Section 6.10.1
Test Result:	Pass
Test Limit:	Regulation 15.247 (b)(1)For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. Refer to the result "Hopping channel number" of this document. The 1 watt (30.0dBm) limit applies.
Final Test Mode:	Engineering mode

Test Configuration:



Test Procedure:

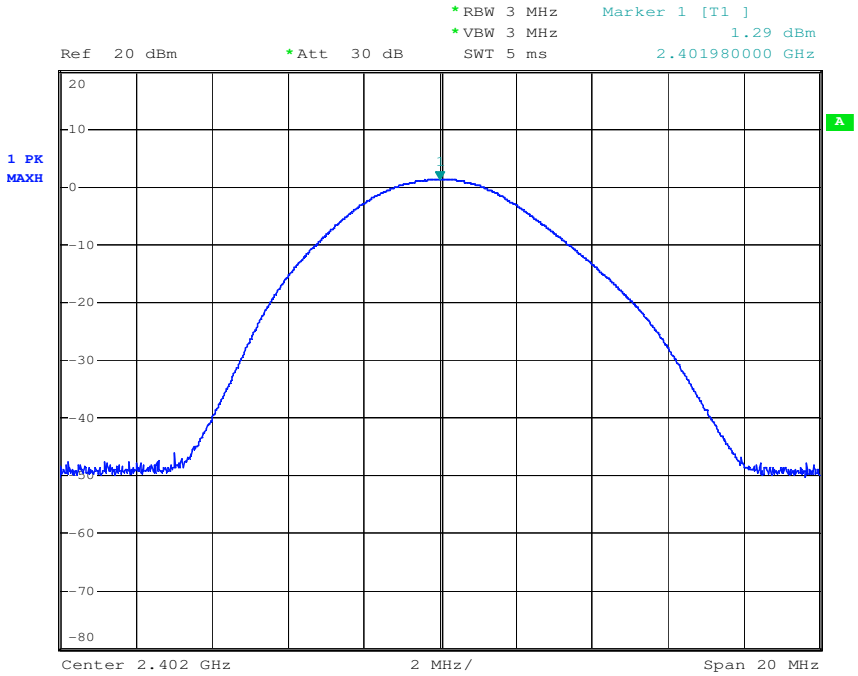
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3 MHz, VBW = 3 MHz, Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, middle and highest channel individually. Record the max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

Test Results record:

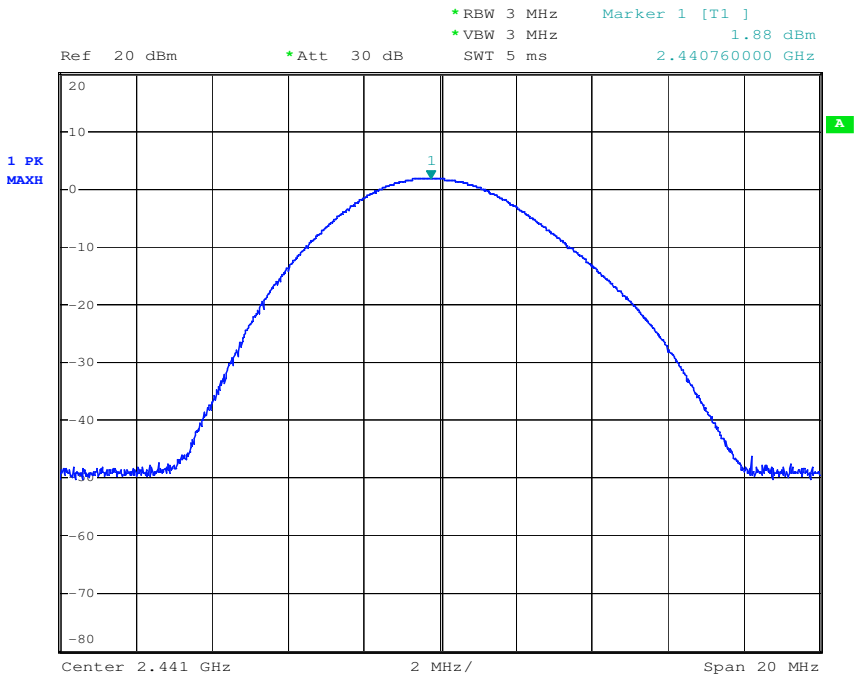
Test Channel	Modulation	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Lowest	GFSK	2402	1.29	0.5	1.79	30	31.15
Middle	GFSK	2441	1.88	0.5	**2.38**	30	31.28
Highest	GFSK	2480	0.44	0.5	0.94	30	31.83
Lowest	π/4DQPSK	2402	0.85	0.5	1.35	30	31.27
Middle	π/4DQPSK	2441	1.60	0.5	2.1	30	30.58
Highest	π/4DQPSK	2480	1.40	0.5	1.9	30	30.66
Lowest	8DPSK	2402	1.00	0.5	1.5	30	30.92
Middle	8DPSK	2441	1.06	0.5	1.56	30	30.33
Highest	8DPSK	2480	1.84	0.5	2.34	30	30.83

Test result plot as follows:

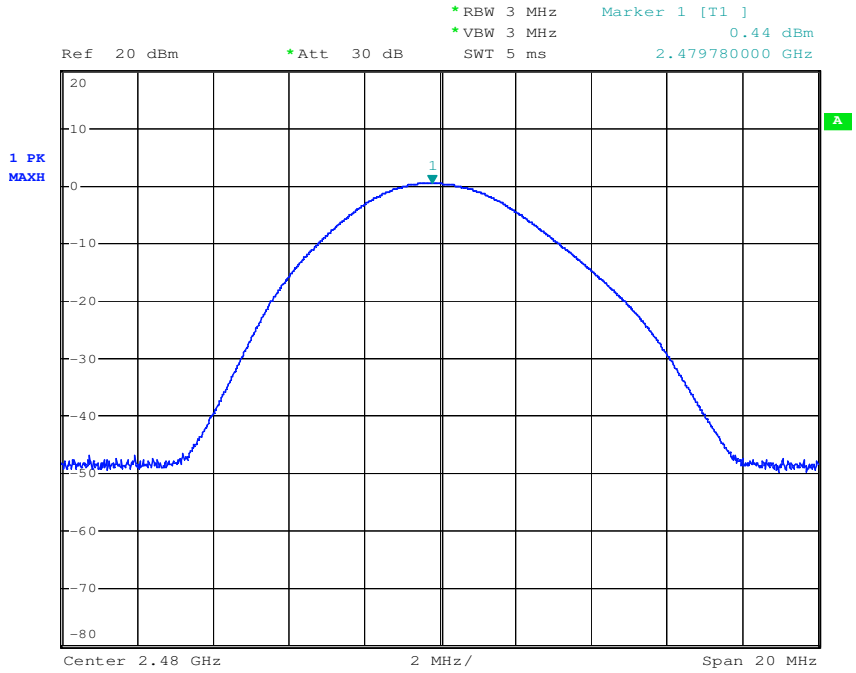
Test mode:	GFSK	Test channel:	Lowest



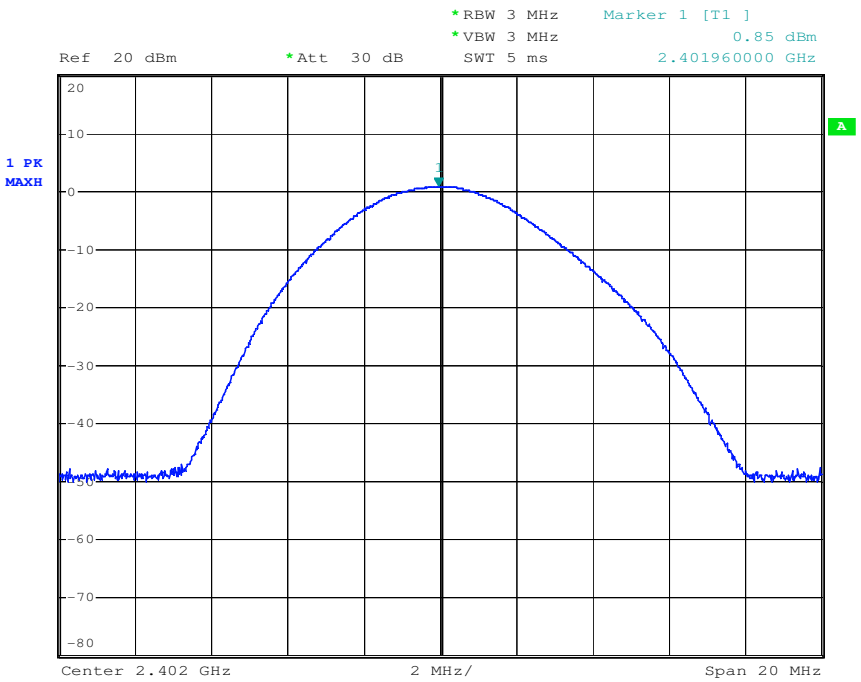
Test mode:	GFSK	Test channel:	Middle



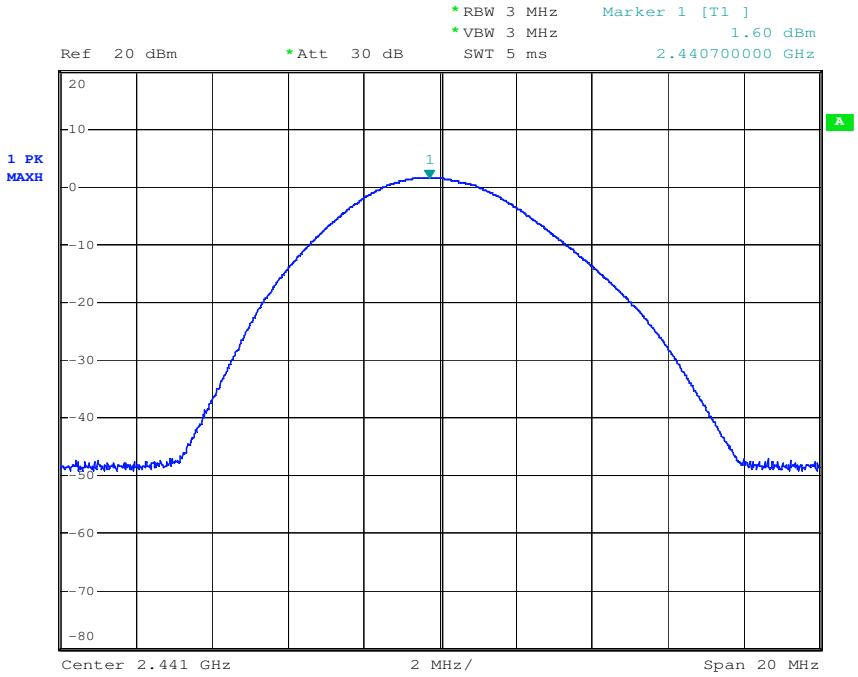
Test mode:	GFSK	Test channel:	Highest



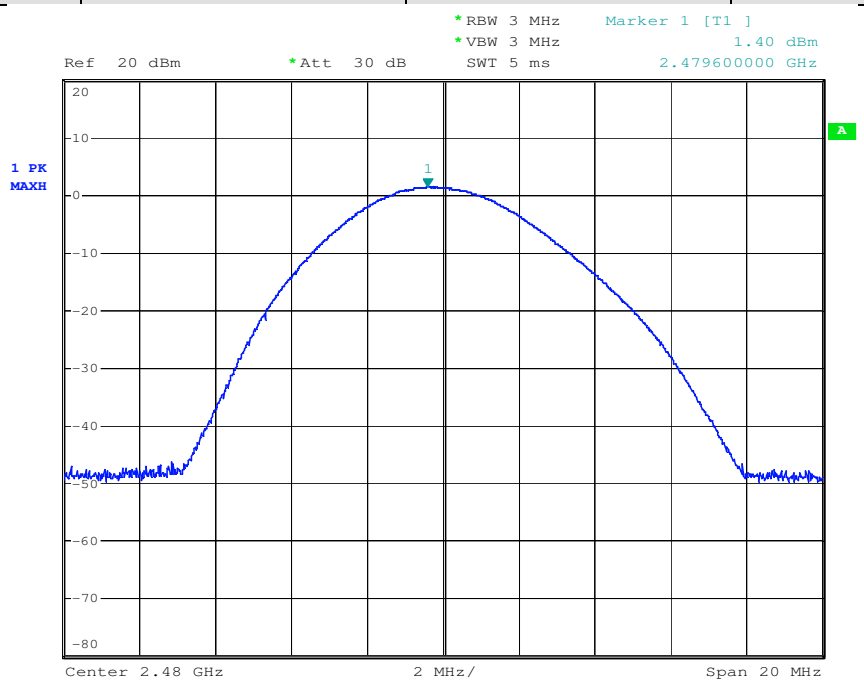
Test mode:	π/4DQPSK	Test channel:	Lowest



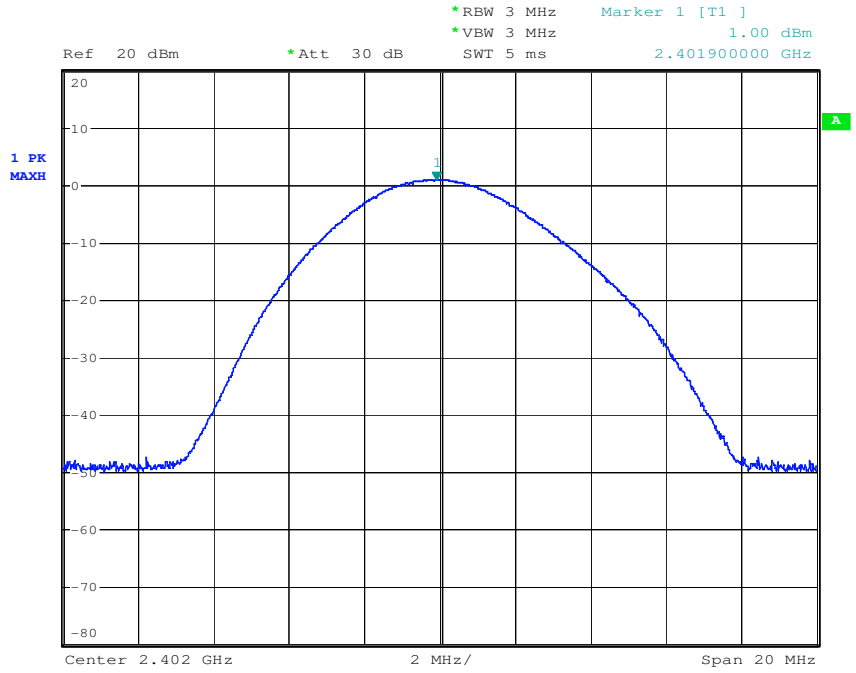
Test mode:	π/4DQPSK	Test channel:	Middle



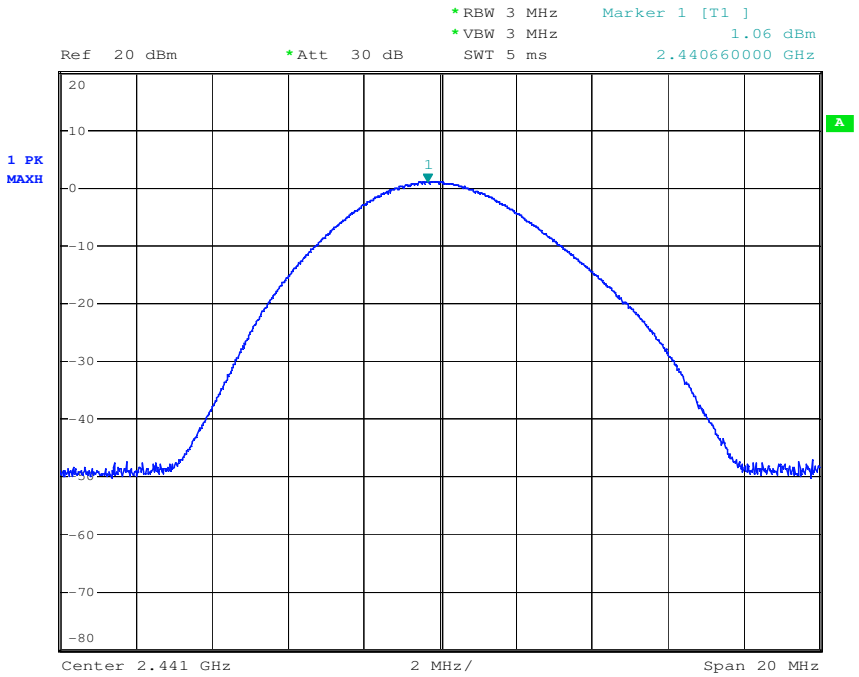
Test mode:	π/4DQPSK	Test channel:	Highest



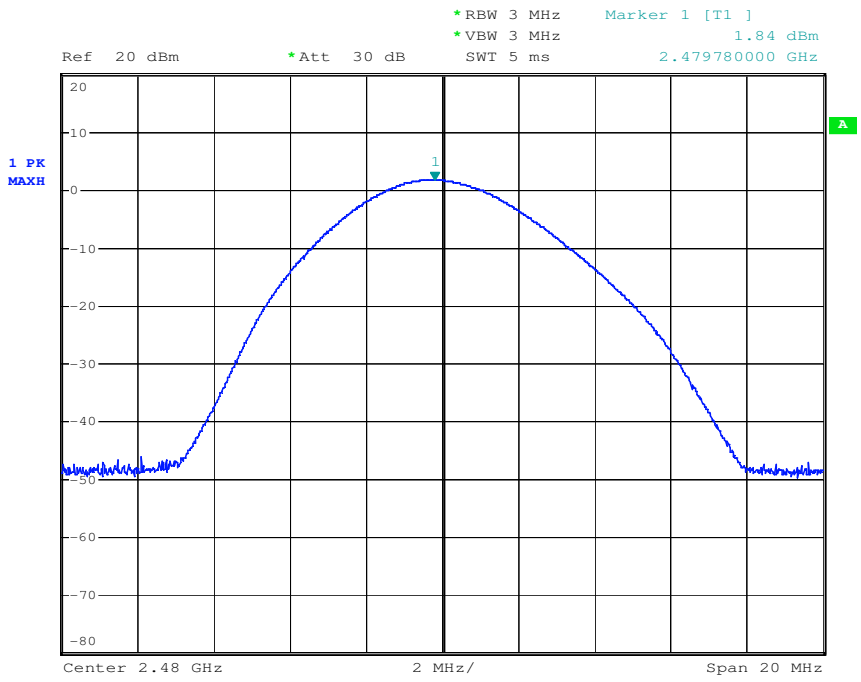
Test mode:	8DPSK	Test channel:	Lowest



Test mode:	8DPSK	Test channel:	Middle



Test mode:	8DPSK	Test channel:	Highest



7.6 Carrier Frequencies Separated

Test Requirement: FCC Part 15 C Section 15.247 (a)(1)
RSS 210 A 8.4(2)

Test Method: ANSI C63.10:2009 Clause 7.7.2

Limit: 0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)

Test result: Pass

Final Test Mode: Engineering mode

Test Procedure:

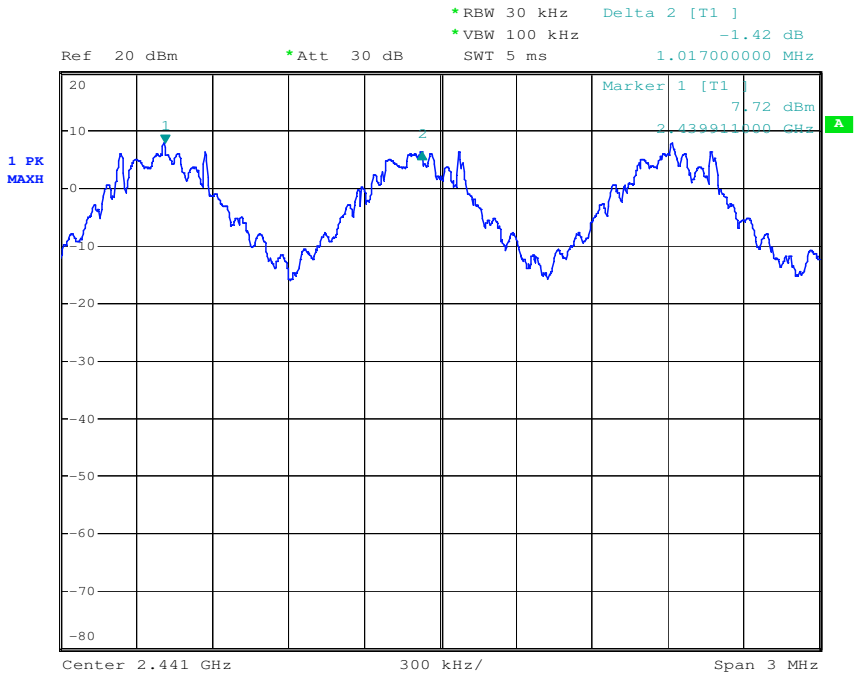
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW >= 1% of the span (set 30 kHz). VBW >= RBW, Span = 3MHz. Sweep = auto; Detector Function = Peak. Trace = Maxhold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

Test Channel	Modulation	Carrier Frequencies Separated (MHz)	Limit (25kHz or two-thirds of the 20 dB bandwidth)	Results
Middle Channels (channel 39 and channel 40)	GFSK	1.017	25kHz/698kHz	PASS
Middle Channels (channel 39 and channel 40)	π/4DQPSK	1.005	25kHz/782kHz	PASS
Middle Channels (channel 39 and channel 40)	8DPSK	1.005	25kHz/790kHz	PASS

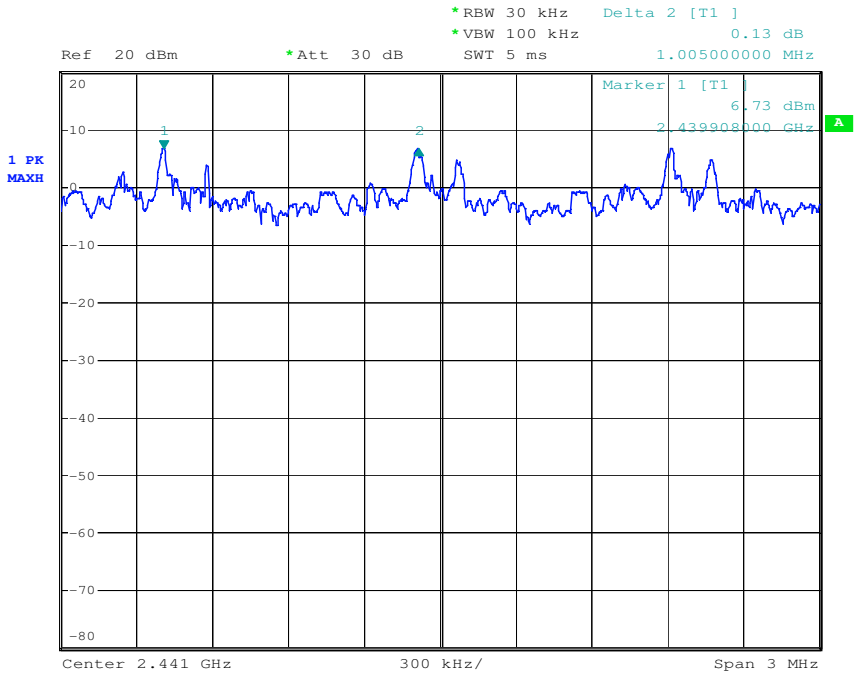
Note: 20dB bandwidth reference Section 7.4

Test plot as follows:

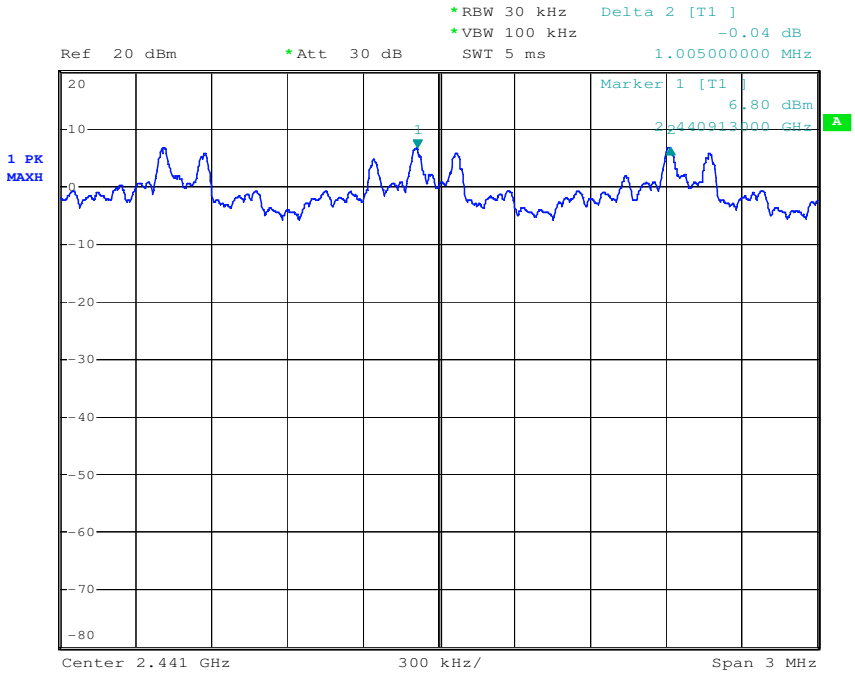
Test mode:	GFSK	Test channel:	Middle



Test mode:	π/4DQPSK	Test channel:	Middle



Test mode:	8DPSK	Test channel:	Middle



7.7 Hopping Channel Number

Test Requirement: FCC Part15 C Section 15.247(b)

RSS 210 A 8.1(d)

Test Method: ANSI C63.10:2009 Clause 7.7.3

Limit: At least 15 channels

Test Result: Pass

Test Mode: Engineering mode

Test Procedure:

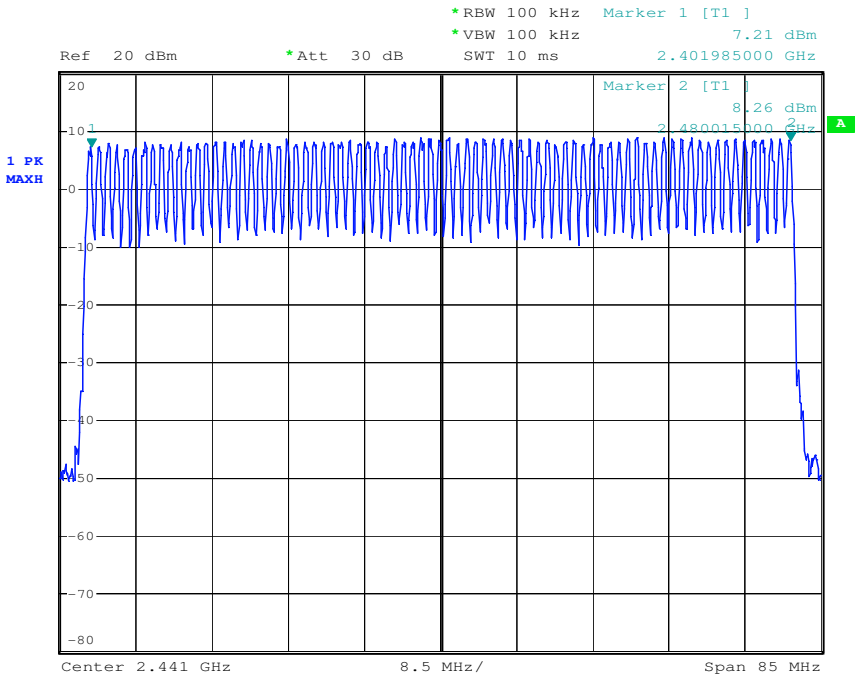
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 100 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

Measurement Data

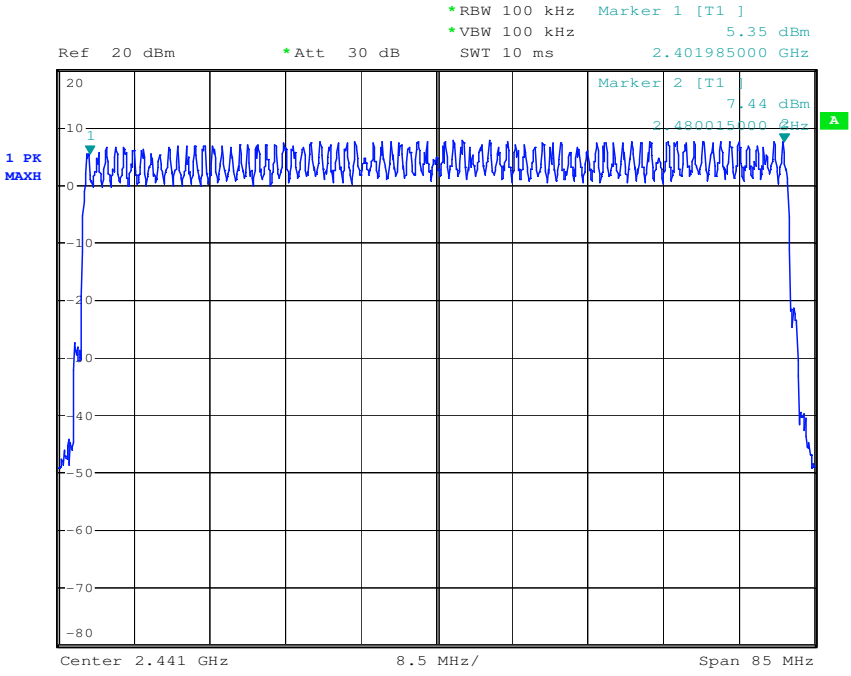
Mode	Hopping channel numbers	Limit	Results
8DPSK	79	≥15	Pass
GFSK	79	≥15	Pass
π/4DQPSK	79	≥15	Pass

Test plot as follows:

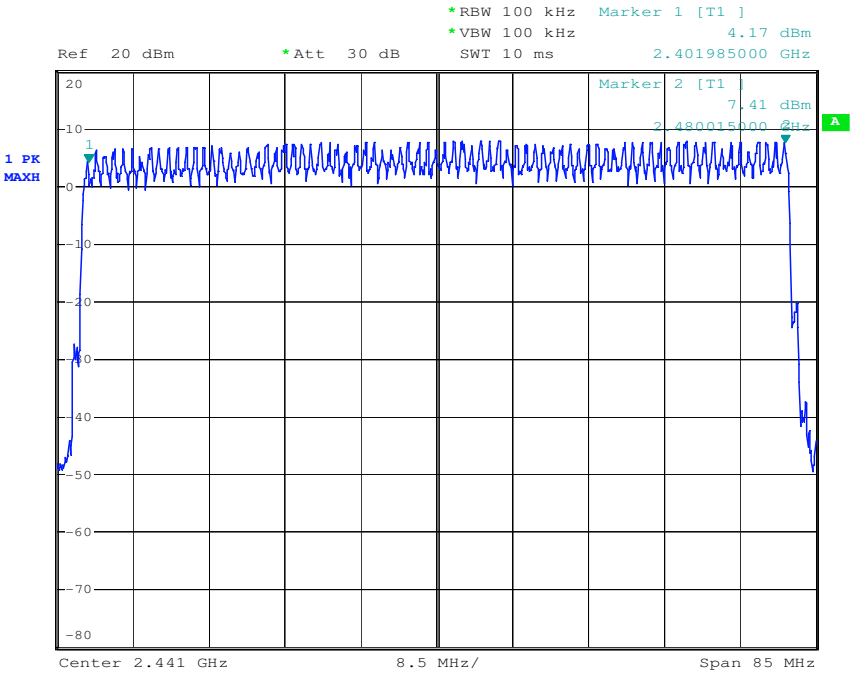
Test mode:	GFSK	Test channel:	Middle



Test mode:	π/4DQPSK	Test channel:	Middle



Test mode:	8DPSK	Test channel:	Middle



7.8 Dwell Time

Test Requirement: FCC Part 15 C Section 15.247(a)(1)
RSS 210 A 8.1(d)

Test Method: ANSI C63.10:2009 Clause 7.7.4

Test Date: May 28, 2013

Limit: Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Status: Hopping transmitting with all kind of modulation.

Test Result: Pass

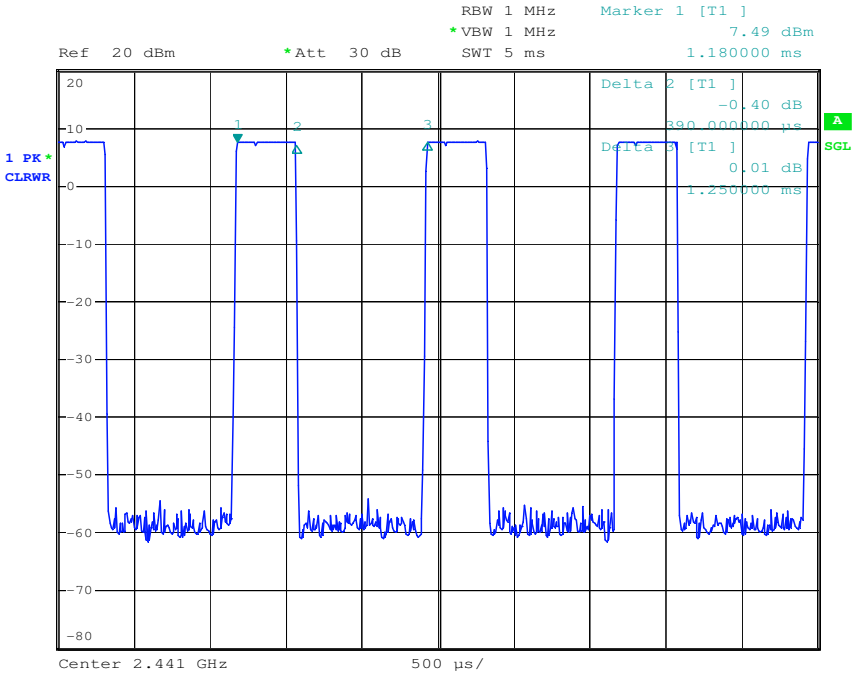
Test Procedure:

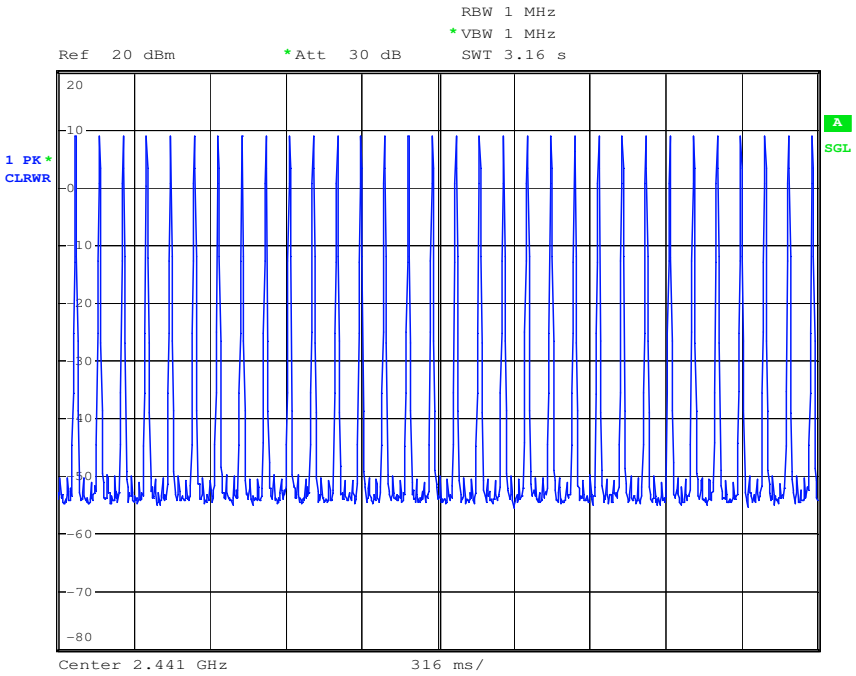
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. centered on a hopping channel;
3. Use Emission width * No. of Hopping Channels in 31.6s to determine the dwell time.

Frequency (MHz)	Modulation	Packet	Emission Width (ms)	Number of Hopping Channel in 31.6s	Average Time of Occupancy(s)	Limit(s)	Result
2441	GFSK	DH1	0.39	320	0.125	0.4	Pass
		DH3	1.67	160	0.267	0.4	Pass
		DH5	2.90	110	0.319	0.4	Pass
	π/4DQPSK	DH1	0.40	320	0.128	0.4	Pass
		DH3	1.66	160	0.266	0.4	Pass
		DH5	1.72	110	0.189	0.4	Pass
	8DPSK	DH1	0.41	320	0.131	0.4	Pass
		DH3	1.67	160	0.267	0.4	Pass
		DH5	2.90	110	0.319	0.4	Pass

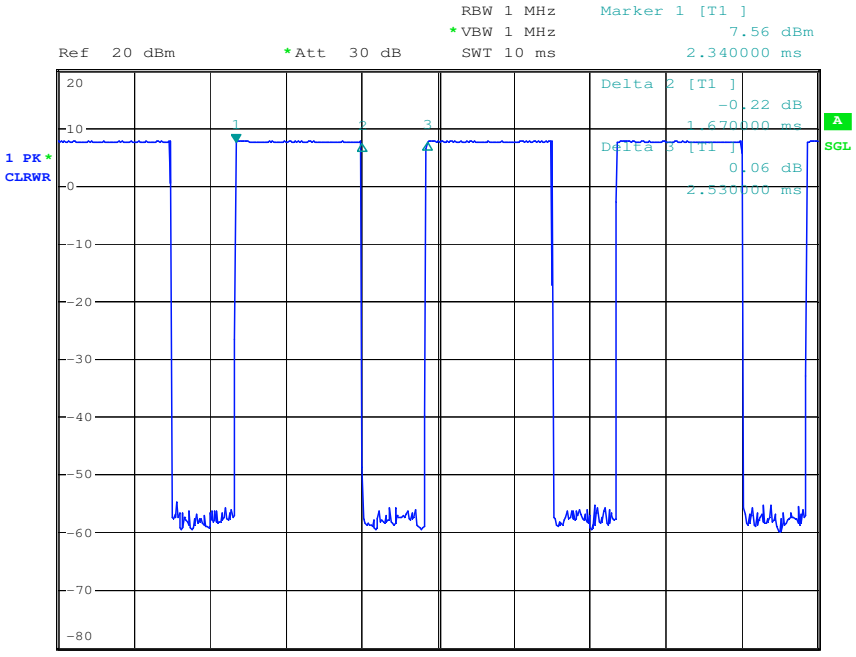
Test plot as follows::

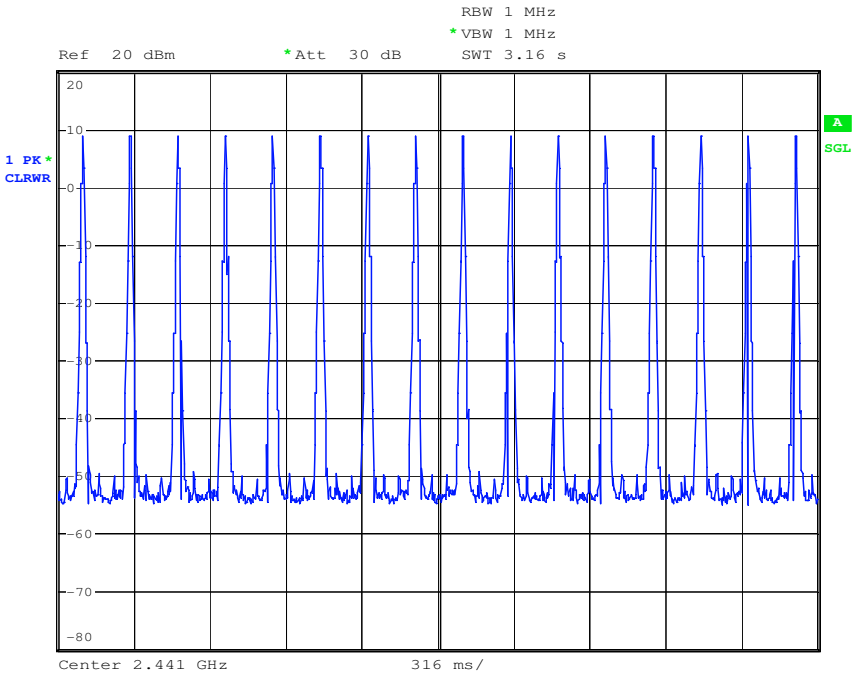
Frequency 2441MHz: Modulation: GFSK-DH1



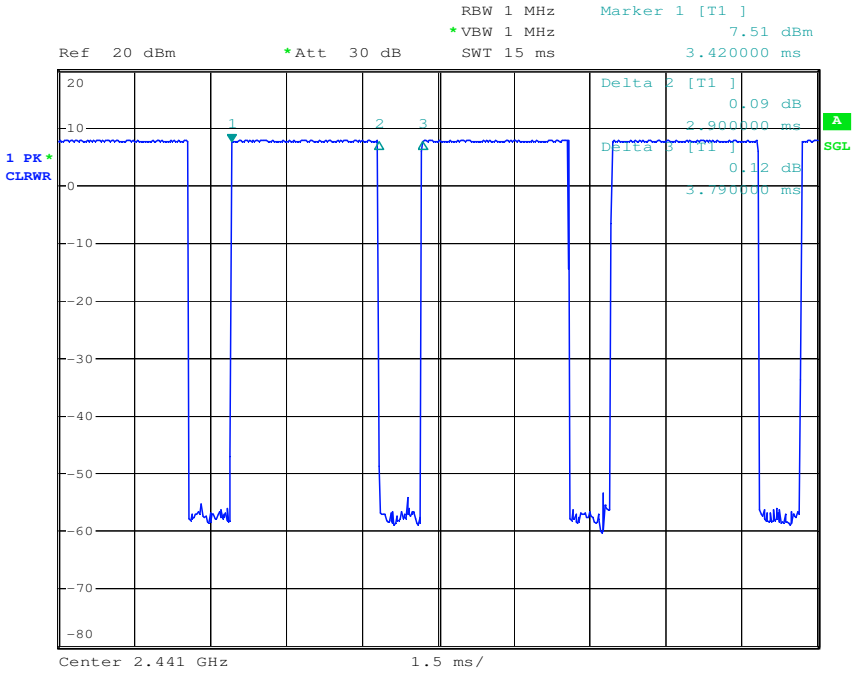


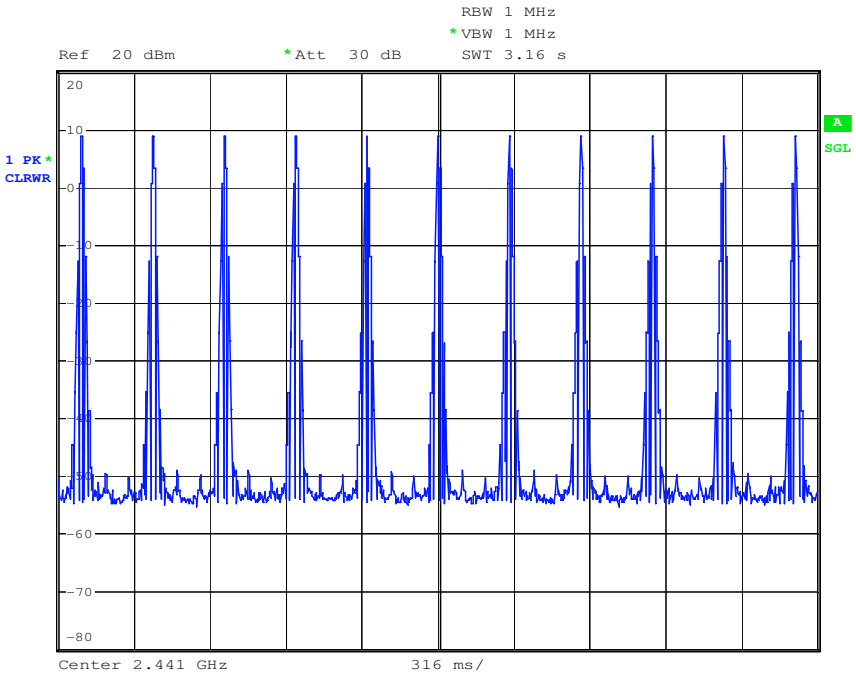
Frequency 2441MHz: Modulation: GFSK- DH3



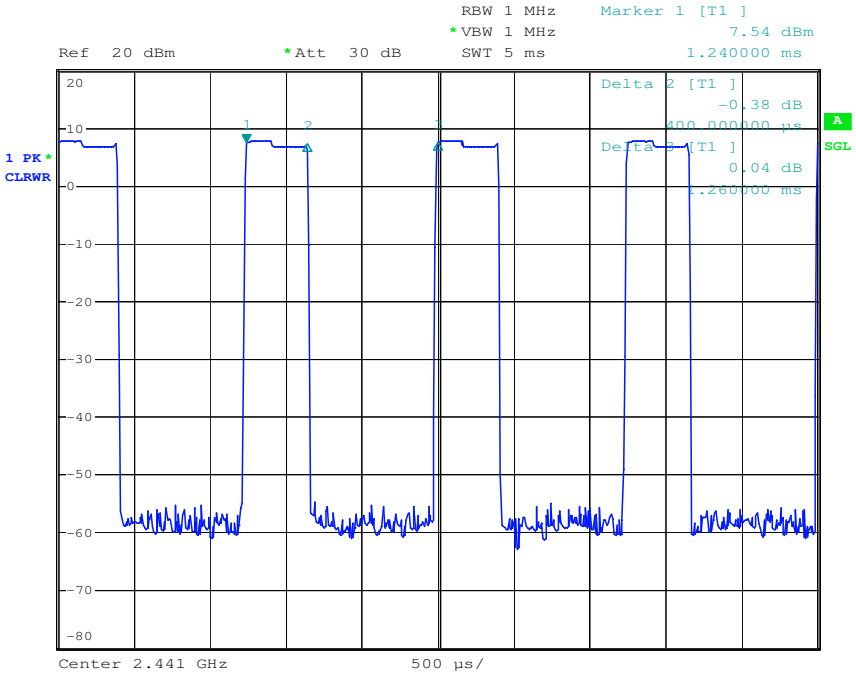


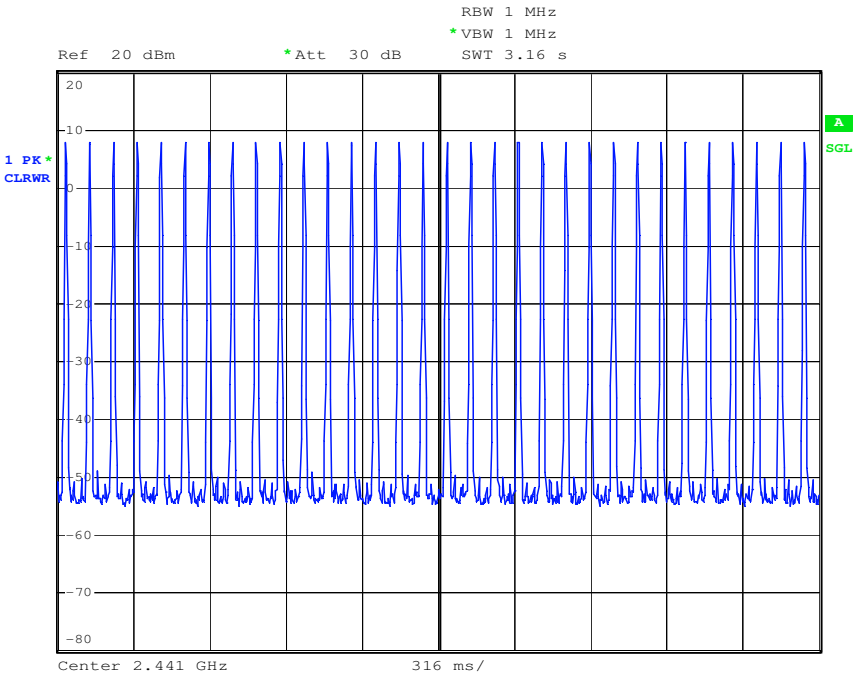
Frequency 2441MHz: Modulation: GFSK- DH5



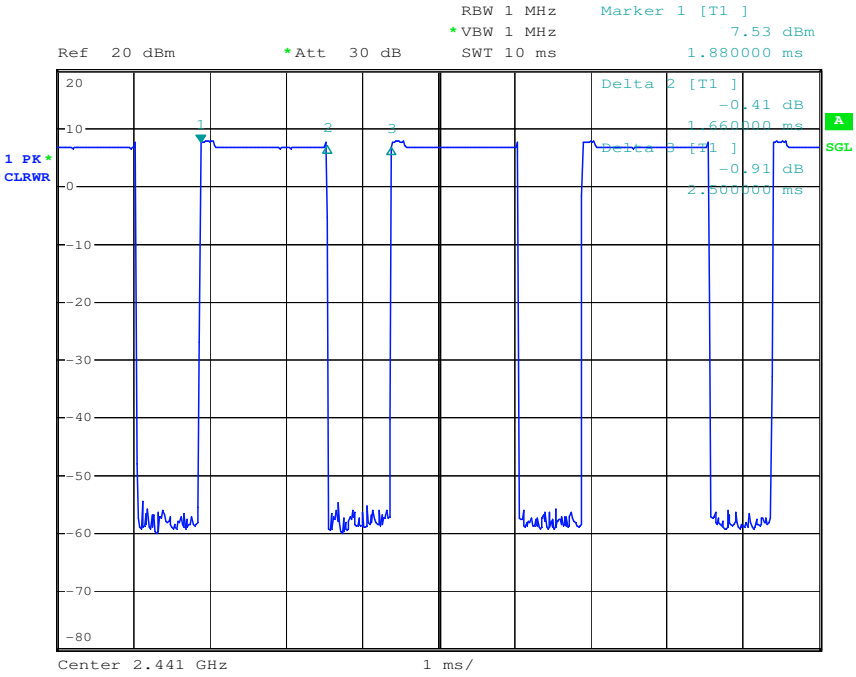


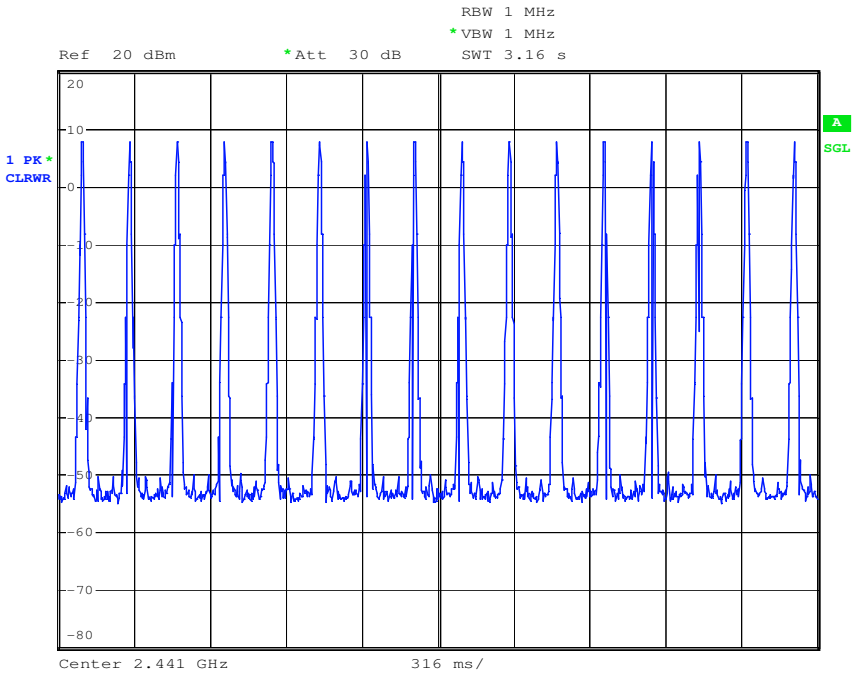
Frequency 2441MHz: Modulation: π/4DQPSK -DH1



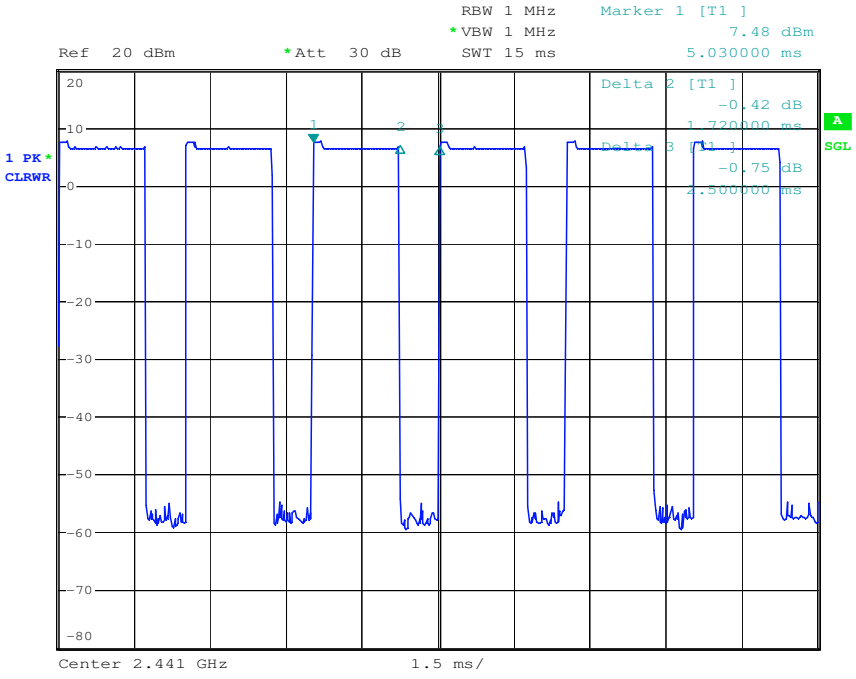


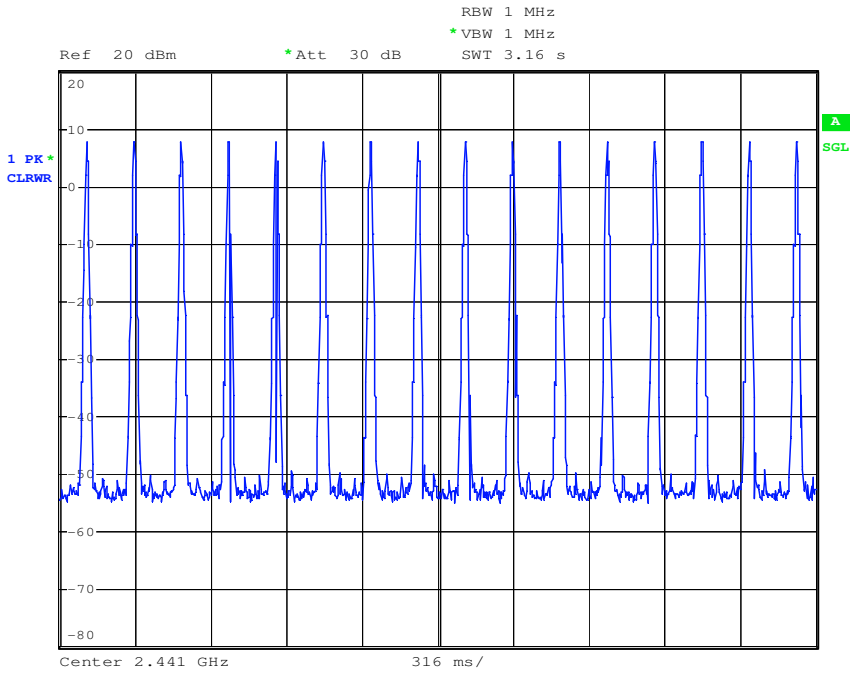
Frequency 2441MHz: Modulation: π/4DQPSK - DH3



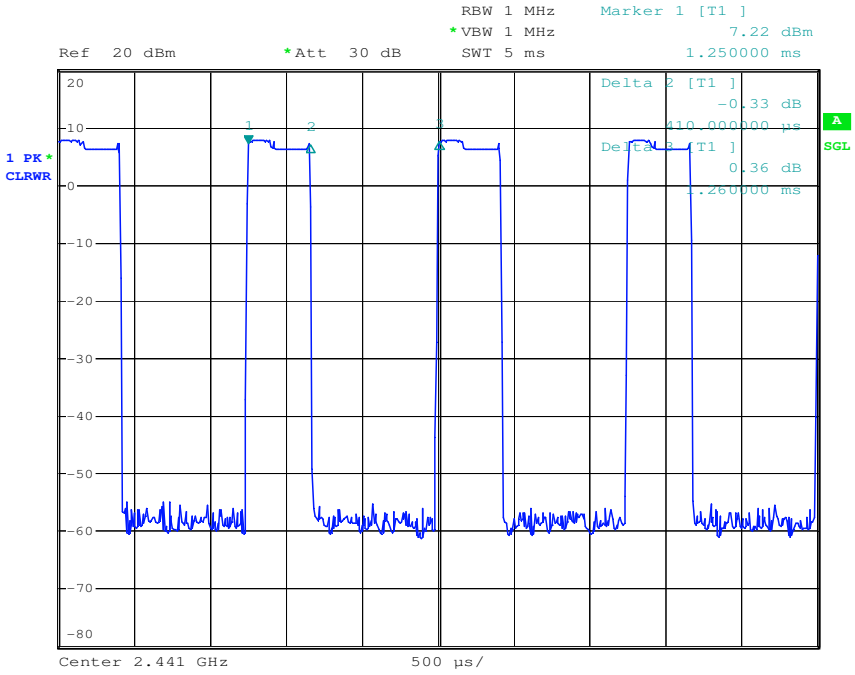


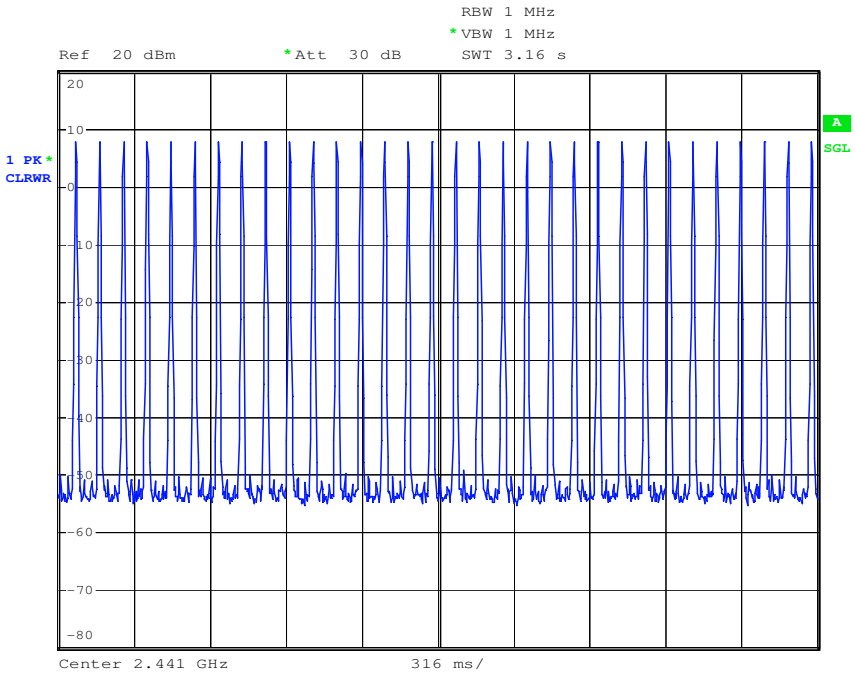
Frequency 2441MHz: Modulation: π/4DQPSK - DH5



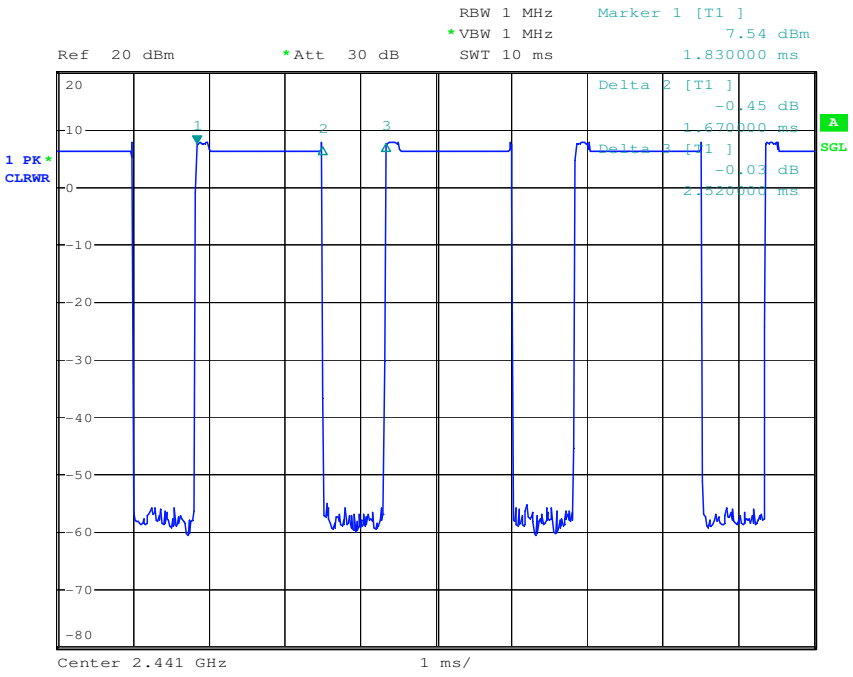


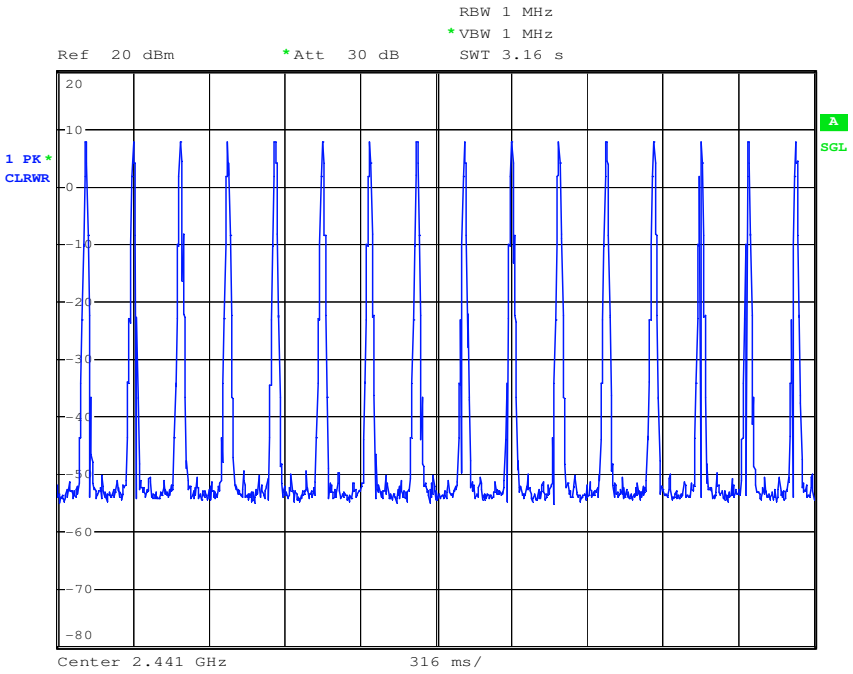
Frequency 2441MHz: Modulation: 8DPSK –DH1



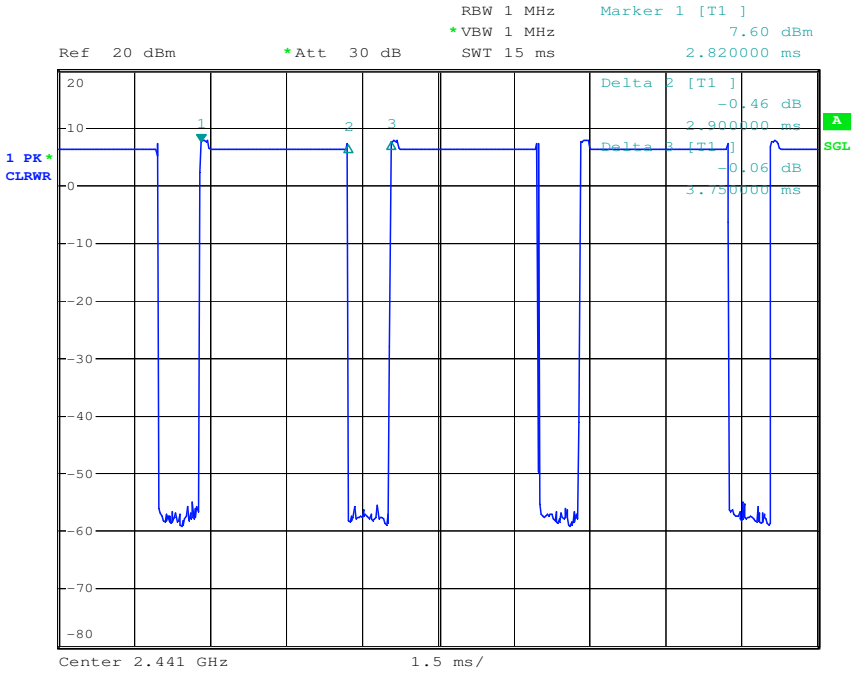


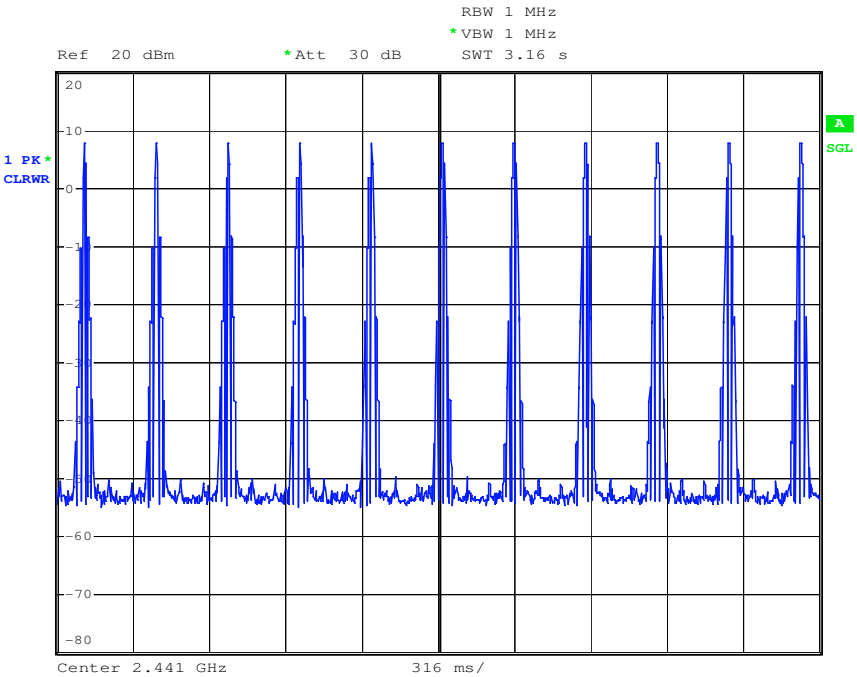
Frequency 2441MHz: Modulation: 8DPSK - DH3





Frequency 2441MHz: Modulation: 8DPSK - DH5





7.9 Conducted Spurious Emissions

Test Requirement: FCC Part 15 Section 15.247(d)
RSS 210 A 8.5

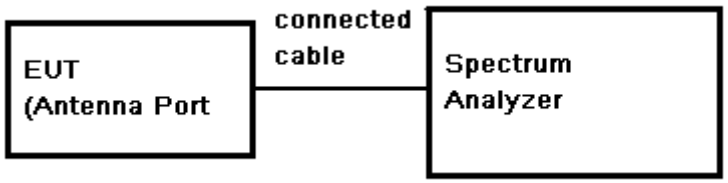
Test Method: ANSI C63.10:2009 Clause 7.7.10

Limit: (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Based on either an RF conducted or a radiated measurement. Provided the transmitter demonstrates compliance with the peak conducted power limits.

Final Test Mode: Engineering mode

Test Result: Pass

Test Configuration:

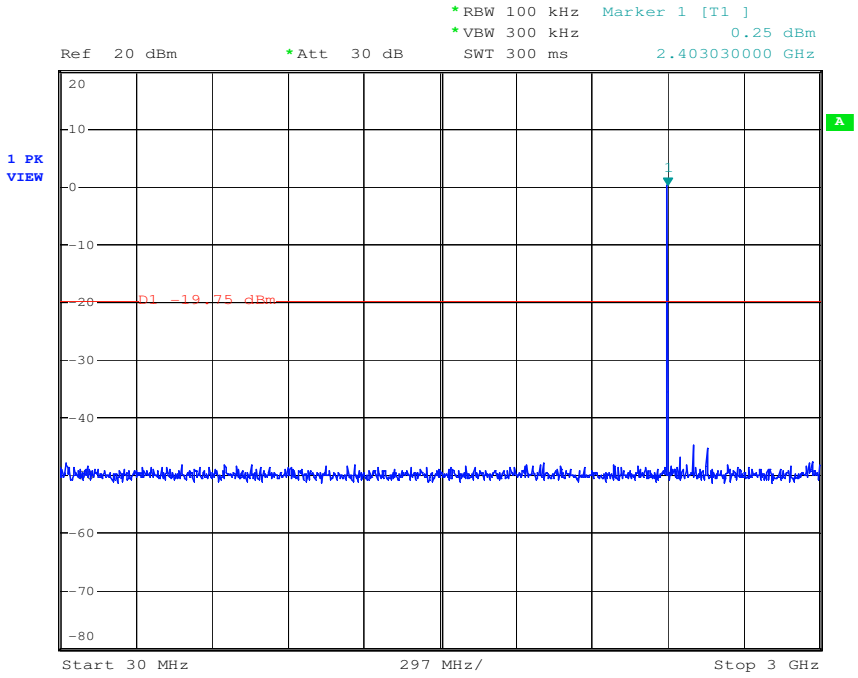


Test Procedure: 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).

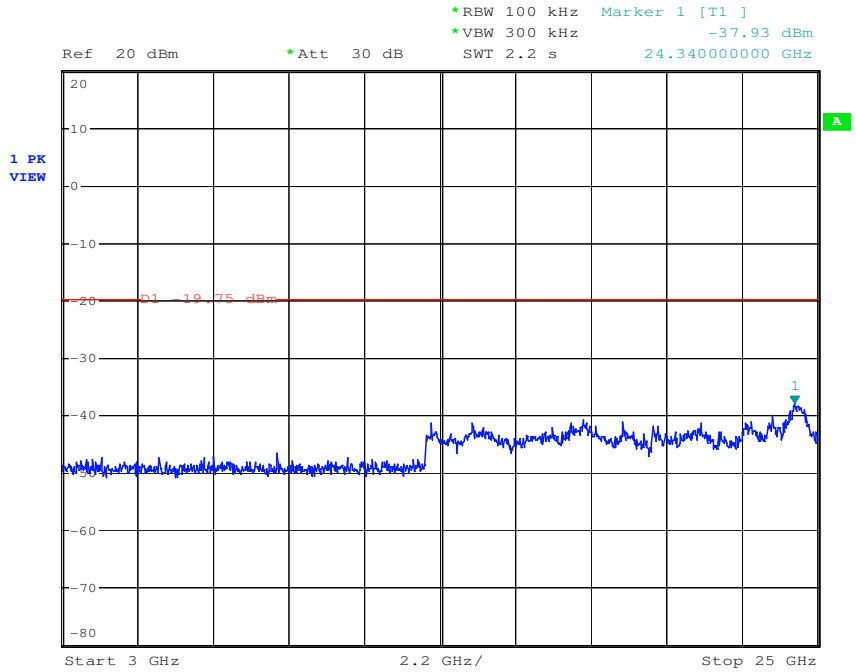
Test plot as follows:

Test mode:	GFSK	Test channel:	Lowest

30MHz-3GHz:

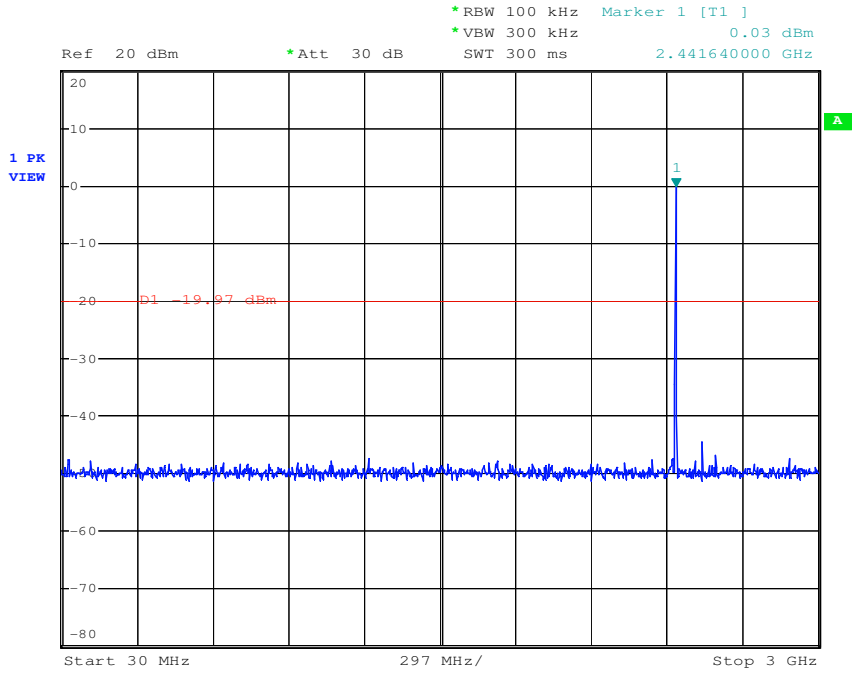


3GHz-25GHz:

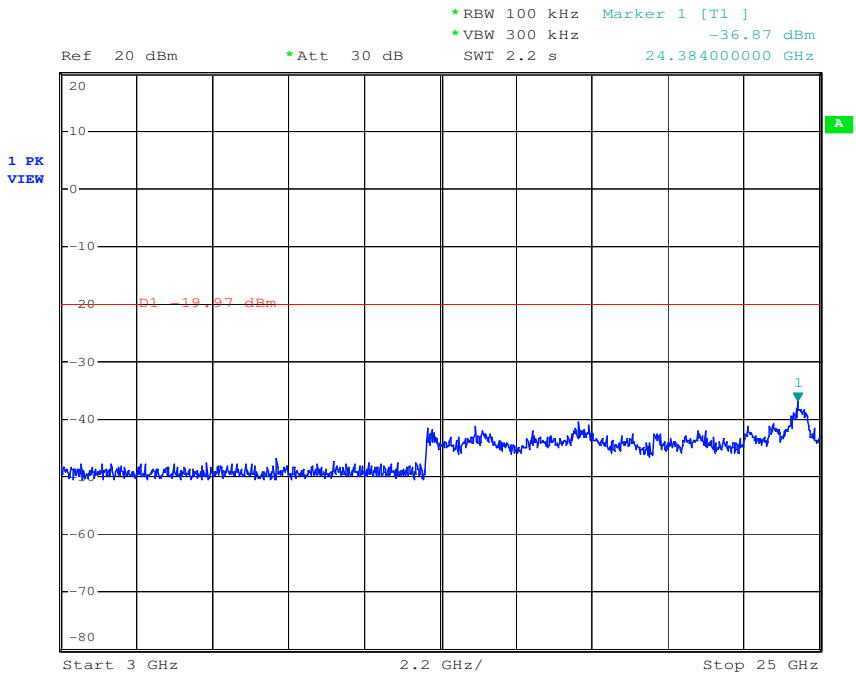


Test mode:	GFSK	Test channel:	Middle

30MHz-3GHz:

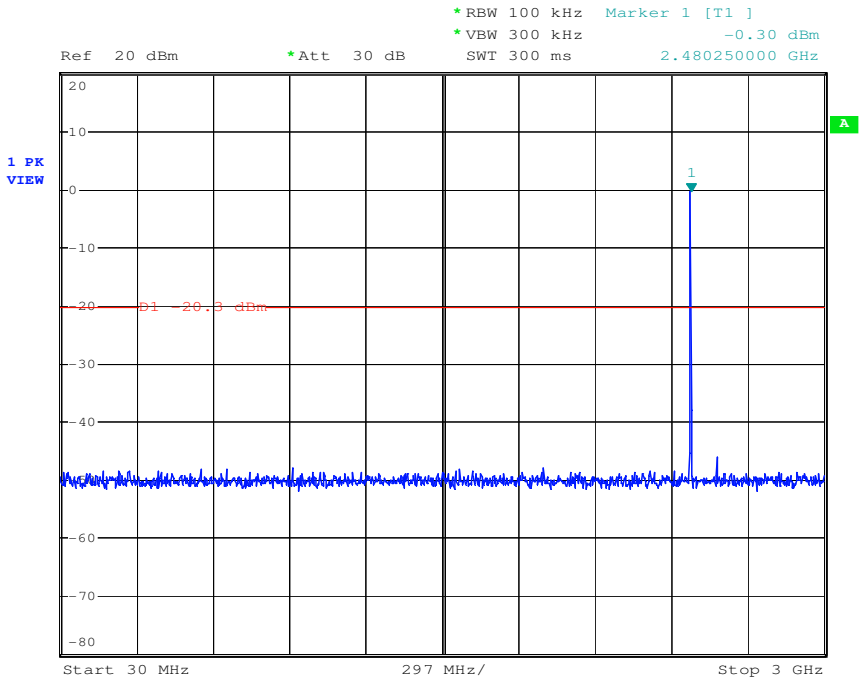


3GHz-25GHz:

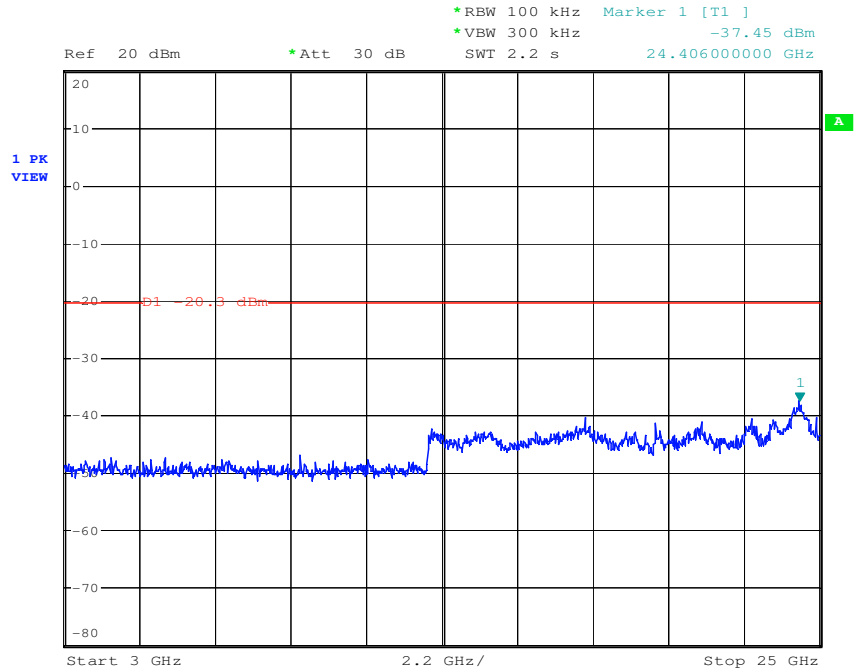


Test mode:	GFSK	Test channel:	Highest

30MHz-3GHz:

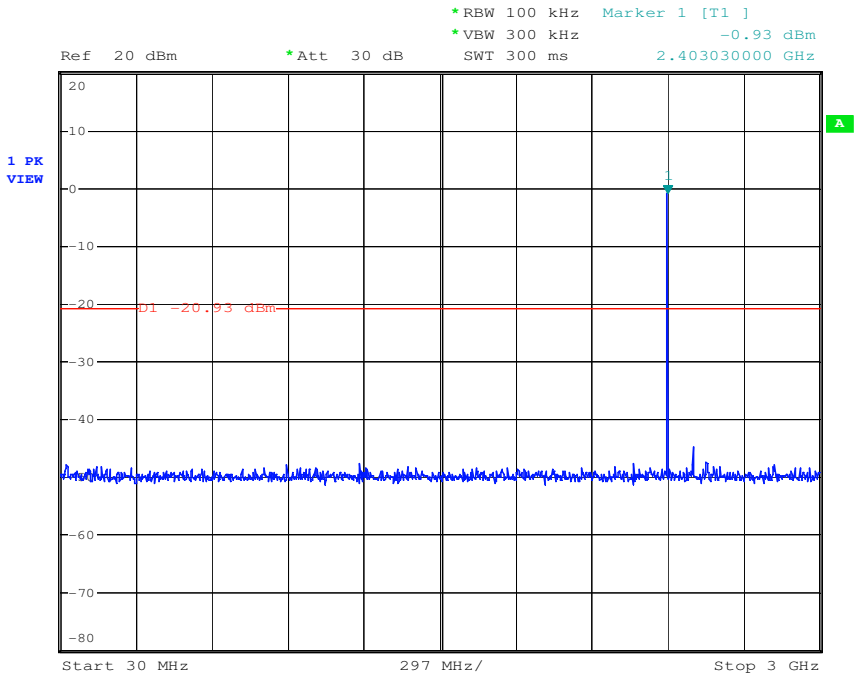


3GHz-25GHz:

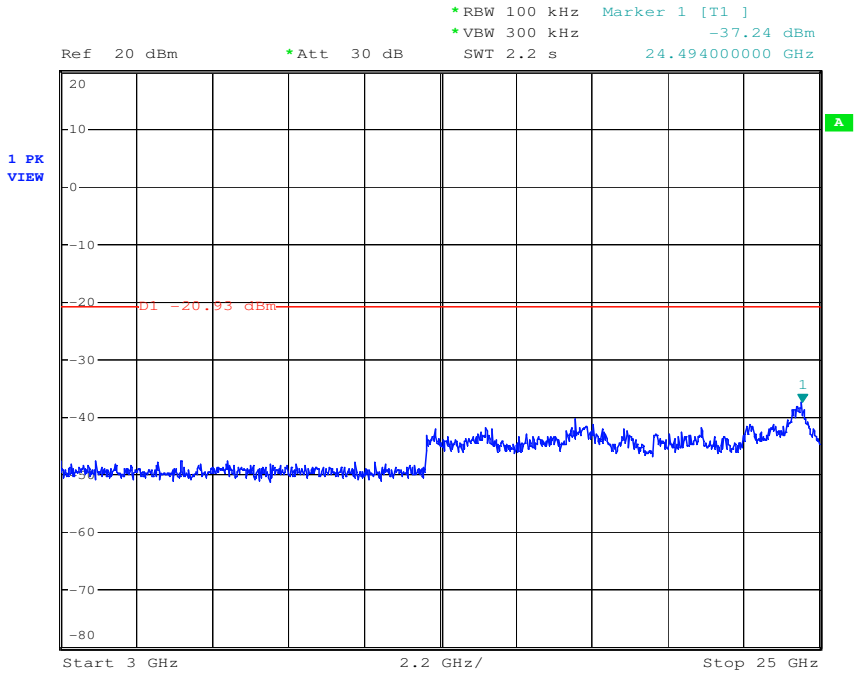


Test mode:	π/4DQPSK	Test channel:	Lowest

30MHz-3GHz:

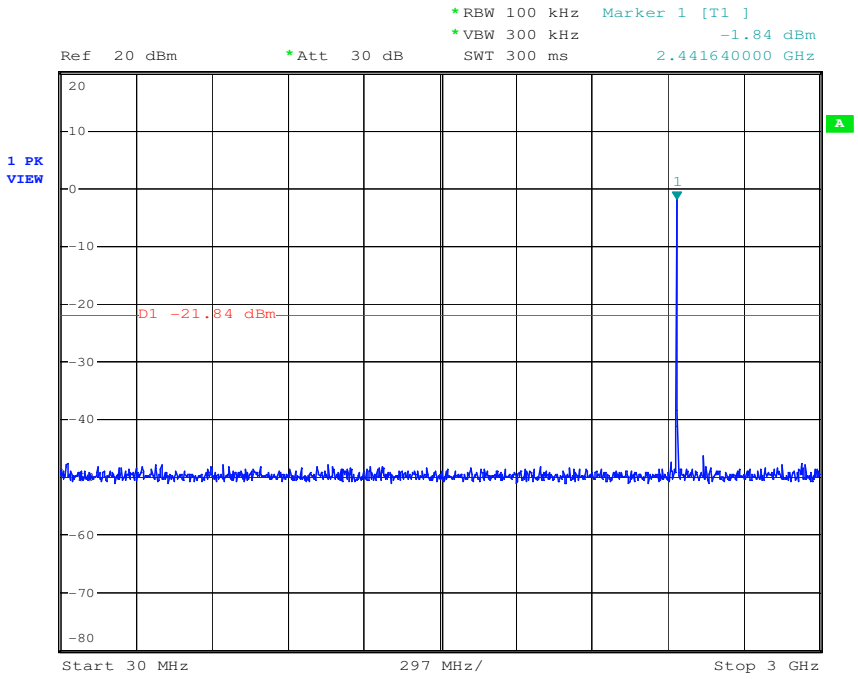


3GHz-25GHz:

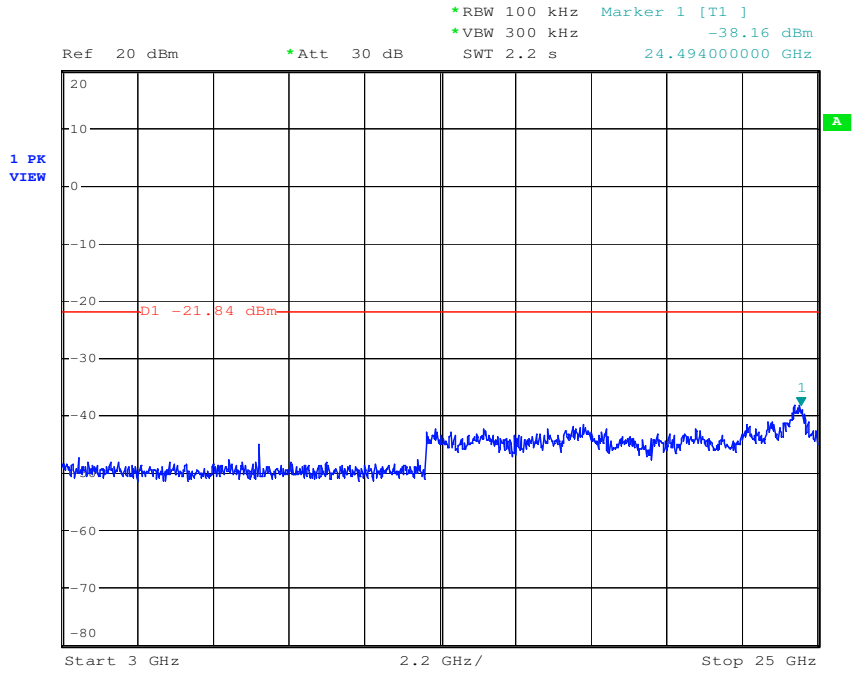


Test mode:	π/4DQPSK	Test channel:	Middle

30MHz-3GHz:

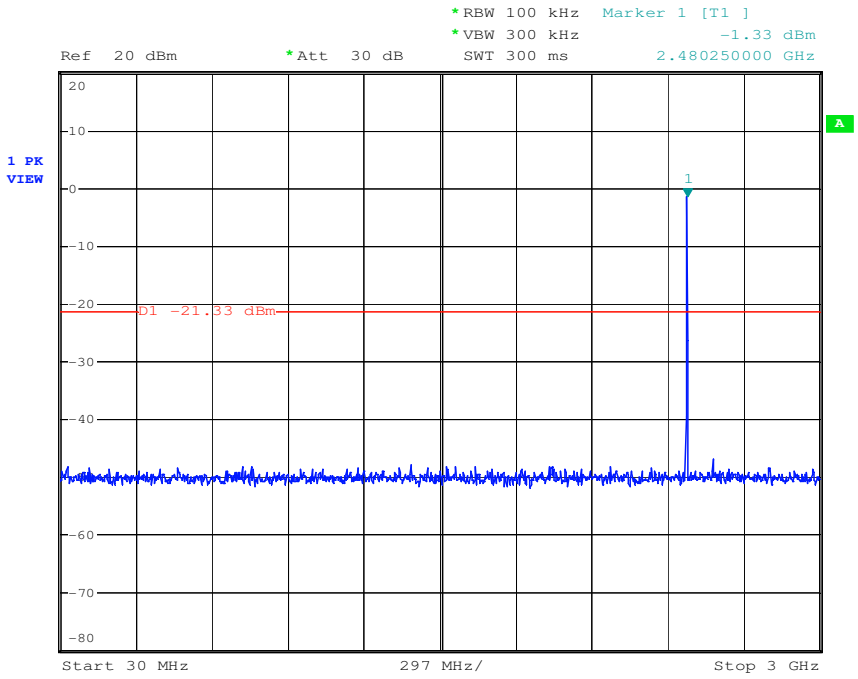


3GHz-25GHz:

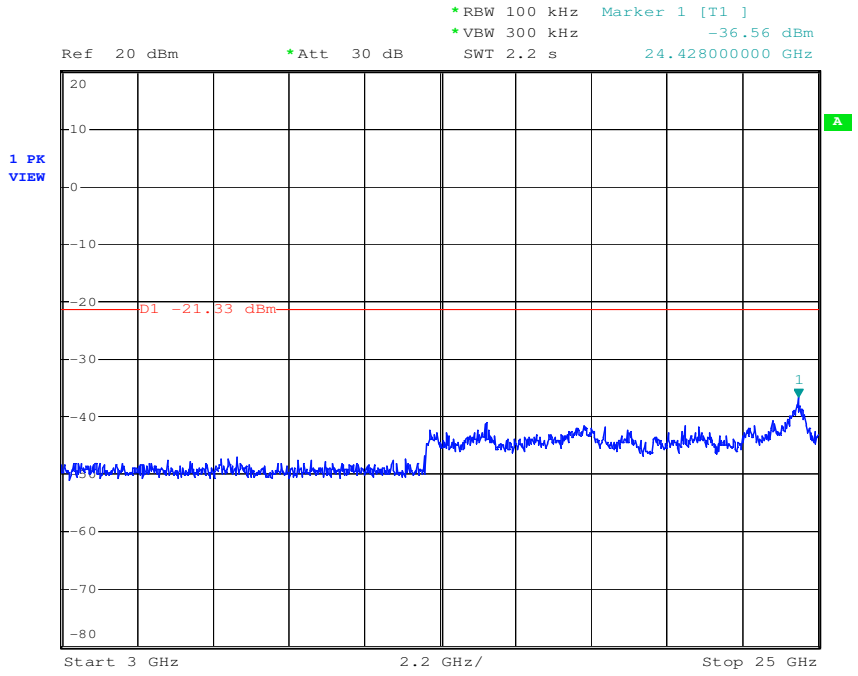


Test mode:	π/4DQPSK	Test channel:	Highest

30MHz-3GHz:

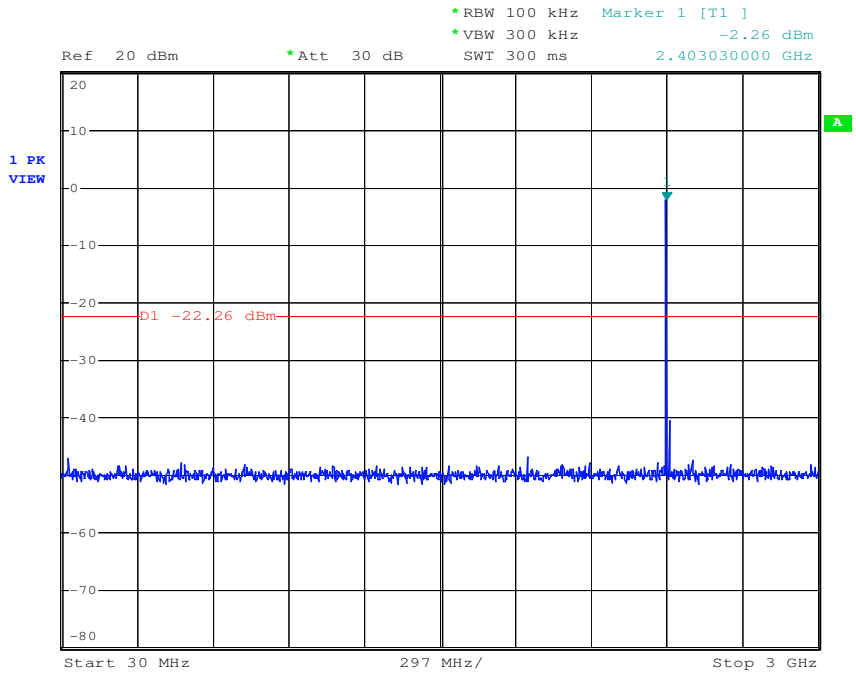


3GHz-25GHz:

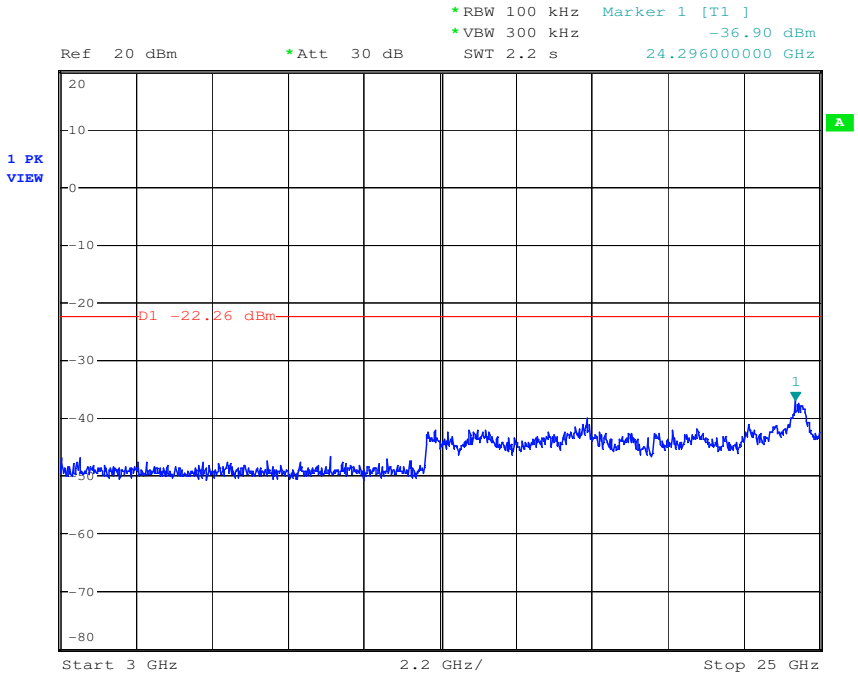


Test mode:	8DPSK	Test channel:	Lowest

30MHz-3GHz:

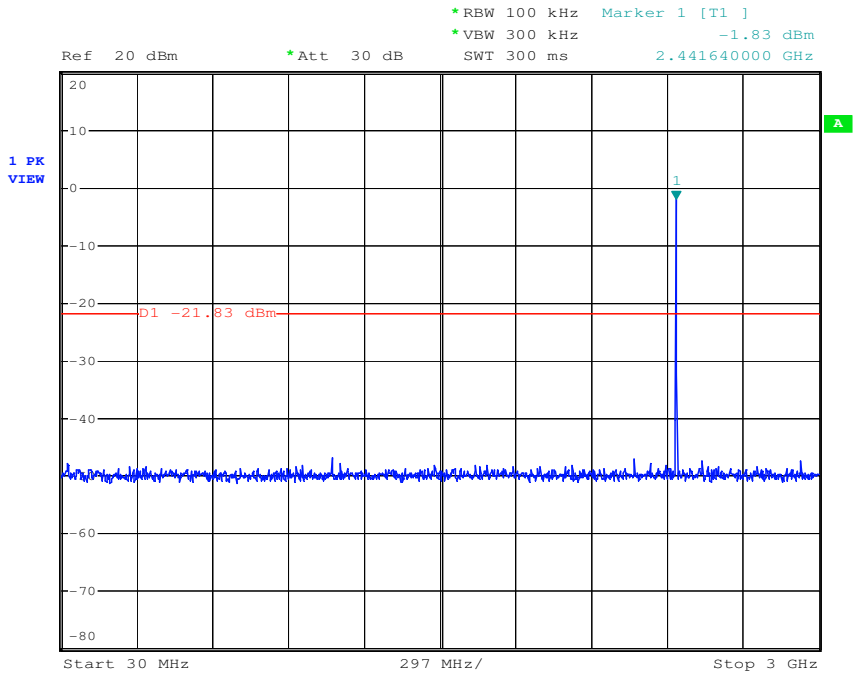


3GHz-25GHz:

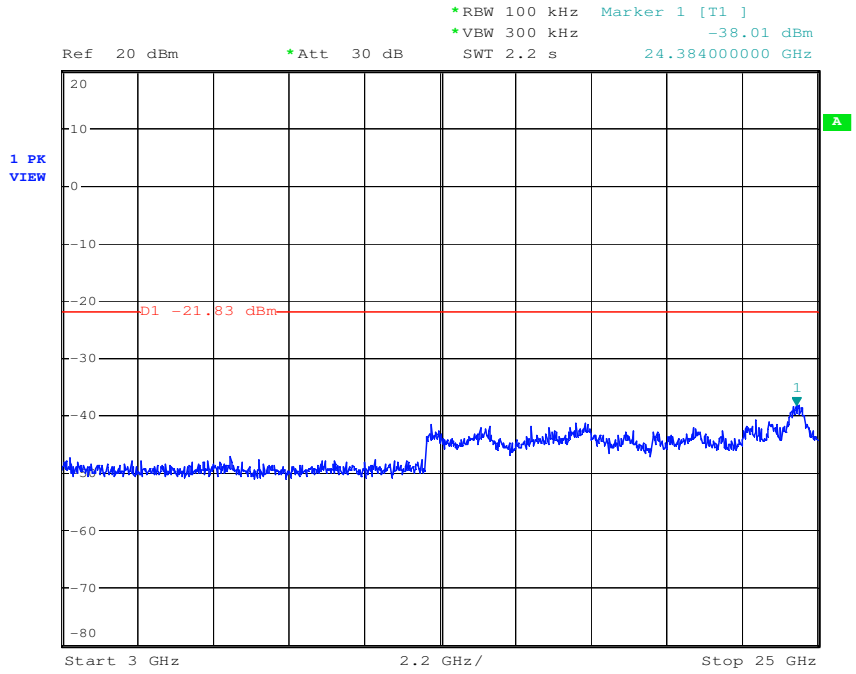


Test mode:	8DPSK	Test channel:	Middle

30MHz-3GHz:

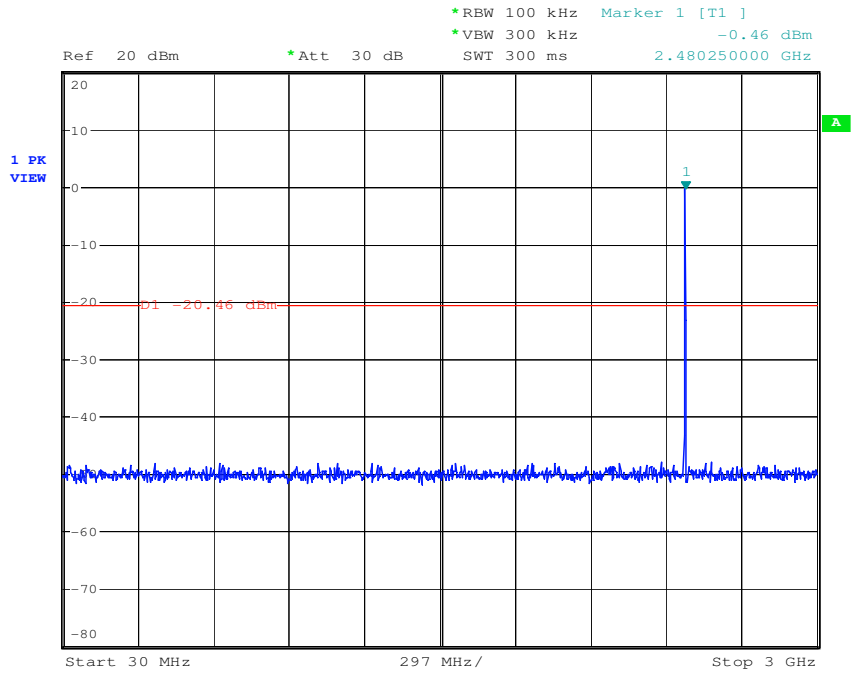


3GHz-25GHz:

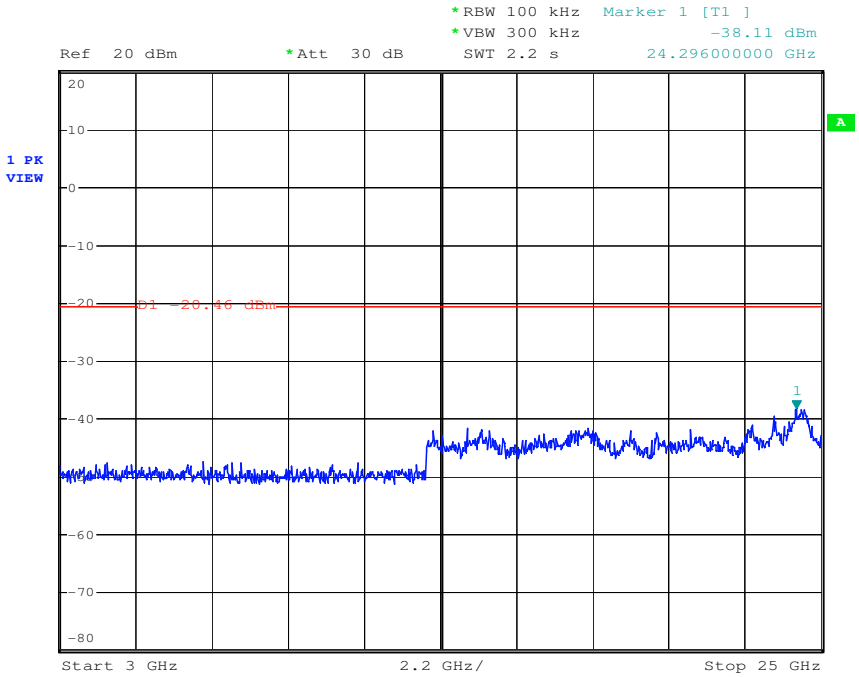


Test mode:	8DPSK	Test channel:	Highest

30MHz-3GHz:



3GHz-25GHz:



7.10 Conducted Band-edge

Test Requirement: FCC Part 15 Section 15.247(d)
RSS-Gen section 4.9

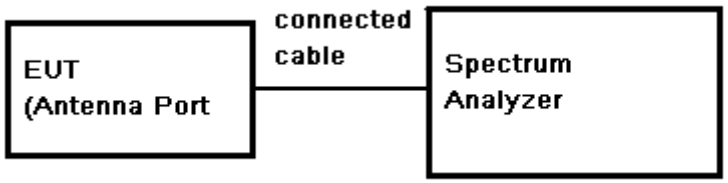
Test Method: ANSI C63.10:2009 Clause 7.7.10

Limit: (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. based on either an RF conducted or a radiated measurement. provided the transmitter demonstrates compliance with the peak conducted power limits.

Final Test Mode: Engineering mode

Test Result: Pass

Test Configuration:

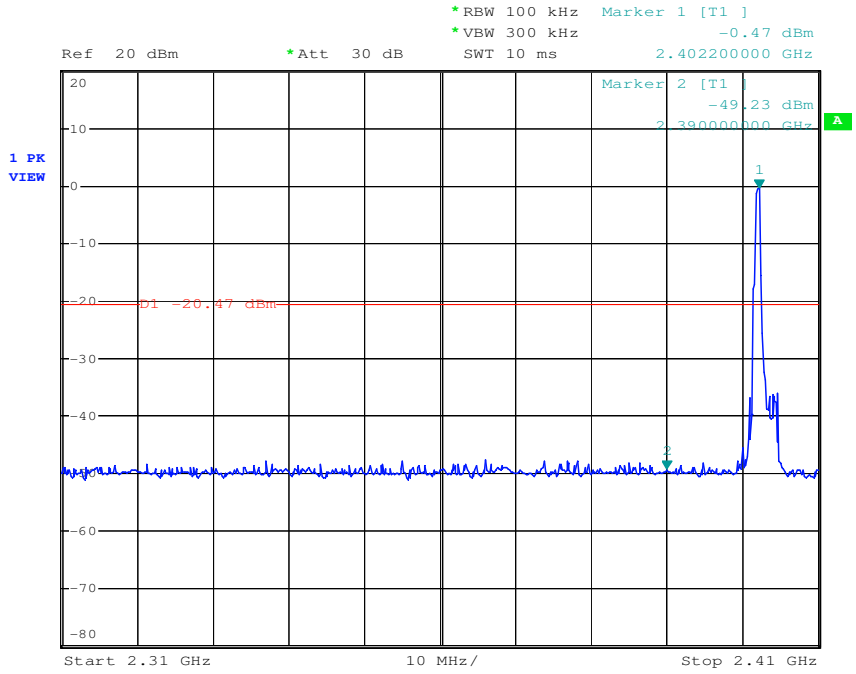


Test Procedure: 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).

Test plot as follows:

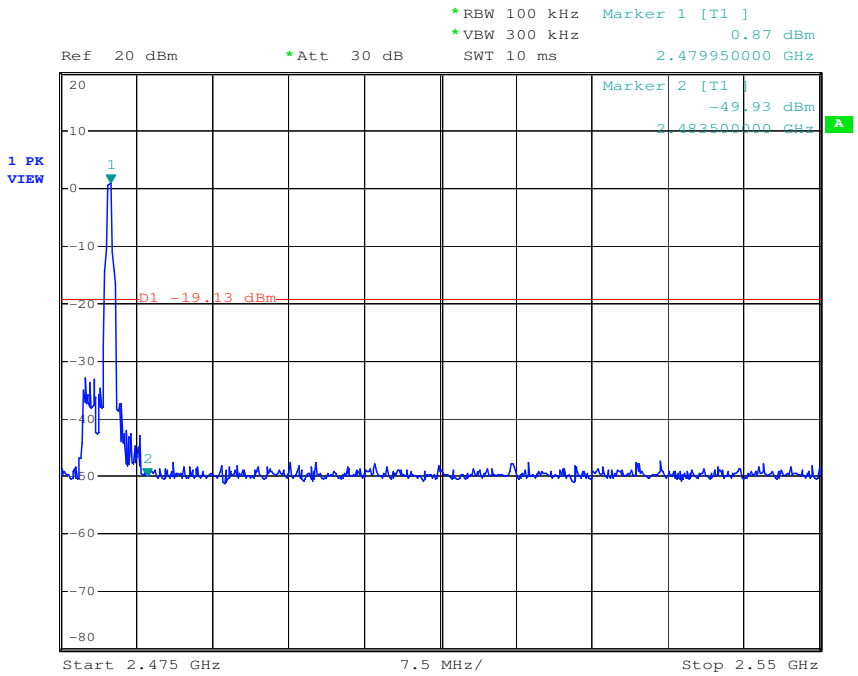
Test mode:	GFSK	Test channel:	Lowest

For Static:



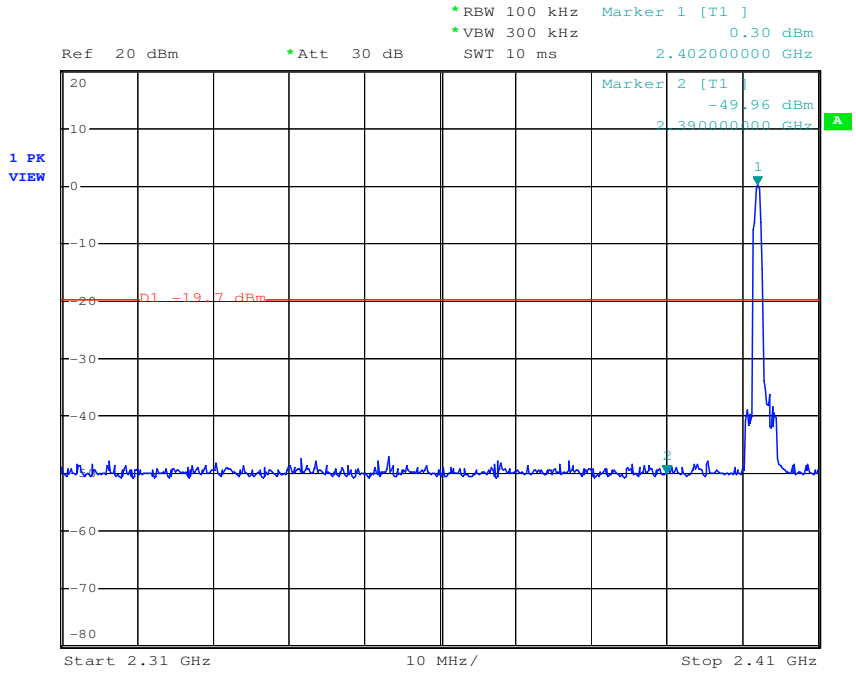
Test mode:	GFSK	Test channel:	Highest

For Static:



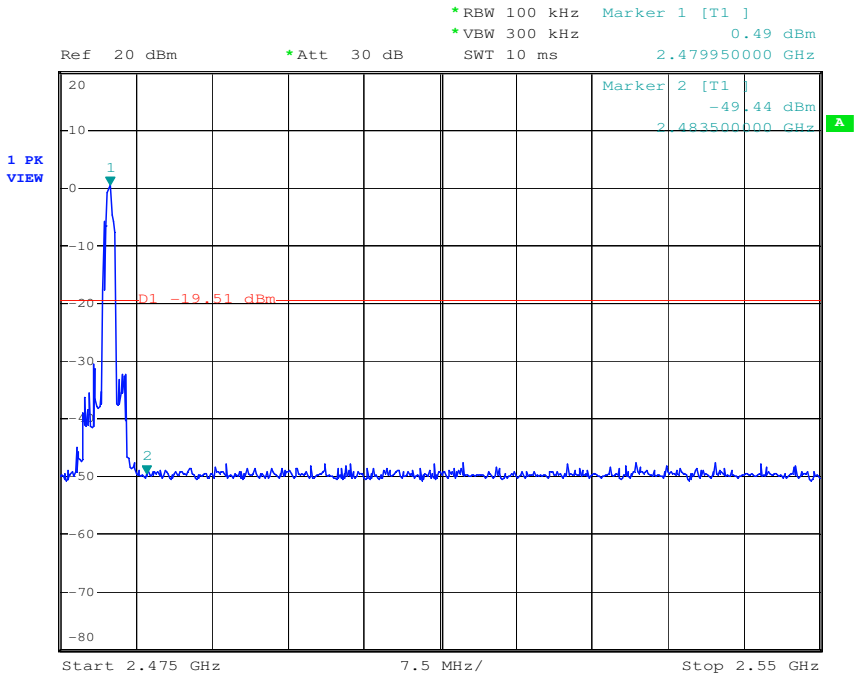
Test mode:	π/4DQPSK	Test channel:	Lowest

For Static:



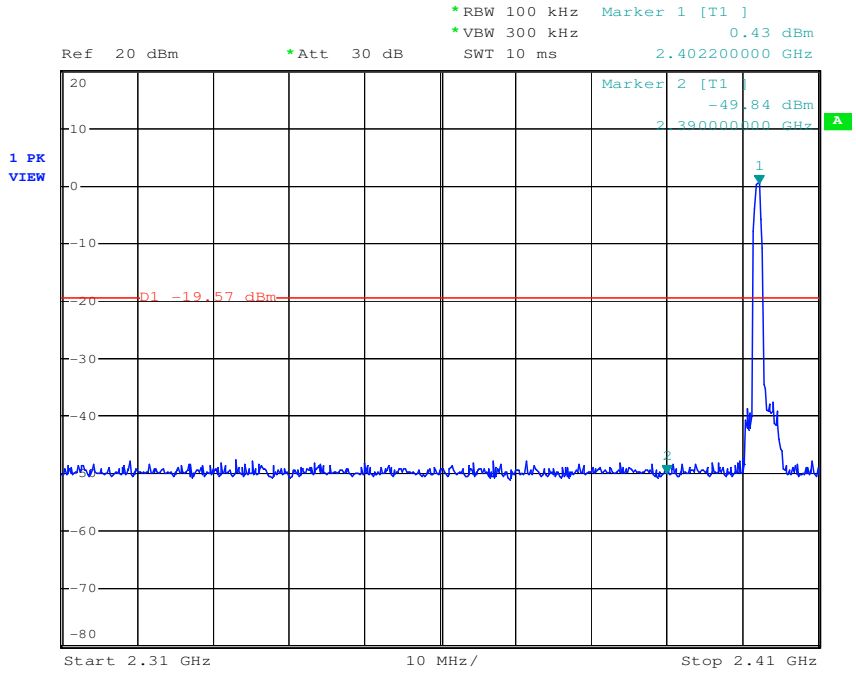
Test mode:	π/4DQPSK	Test channel:	Highest

For Static:



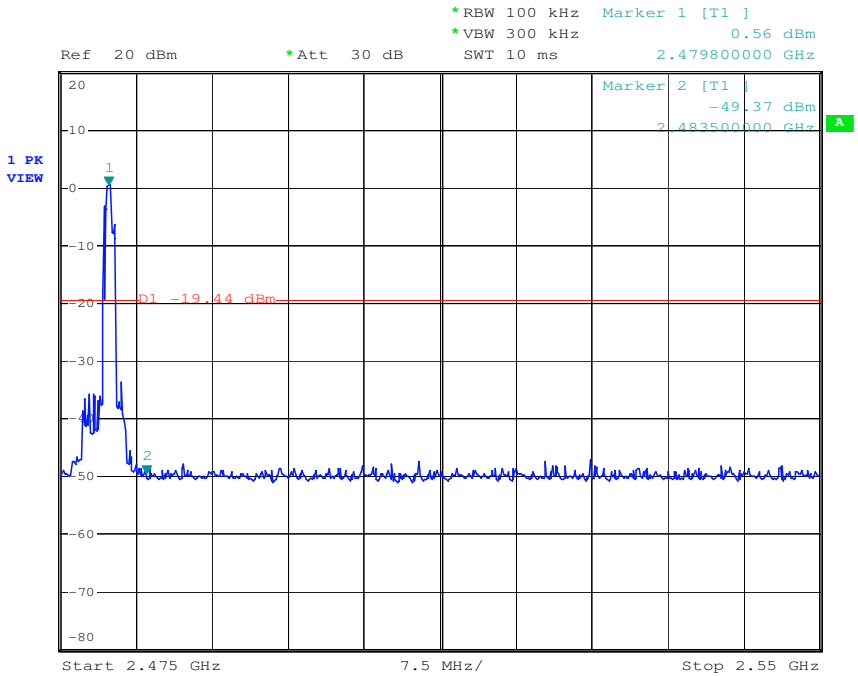
Test mode:	8DPSK	Test channel:	Lowest

For Static:



Test mode:	8DPSK	Test channel:	Highest

For Static:



7.11 Radiated Spurious Emissions

Test Requirement:	FCC Part 15 Section 15.209 and Section 15.205 RSS-Gen section 4.9
Test Method:	ANSI C63.10:2009 Clause 6.12
Final Test Mode:	Engineering mode
Test site/setup:	Measurement Distance: 3m (Semi-Anechoic Chamber) Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). For PK value: RBW = 1 MHz for f ≥ 1 GHz VBW ≥ RBW; Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for f ≥ 1 GHz VBW =10Hz; Sweep = auto Detector function = peak Trace = max hold Receive antenna scan height 1 m - 4 m. polarization Vertical / Horizontal
15.209 Limit:	40.0 dBμV/m between 30MHz & 88MHz 43.5 dBμV/m between 88MHz & 216MHz 46.0 dBμV/m between 216MHz & 960MHz 54.0 dBμV/m above 960MHz

Test Configuration:

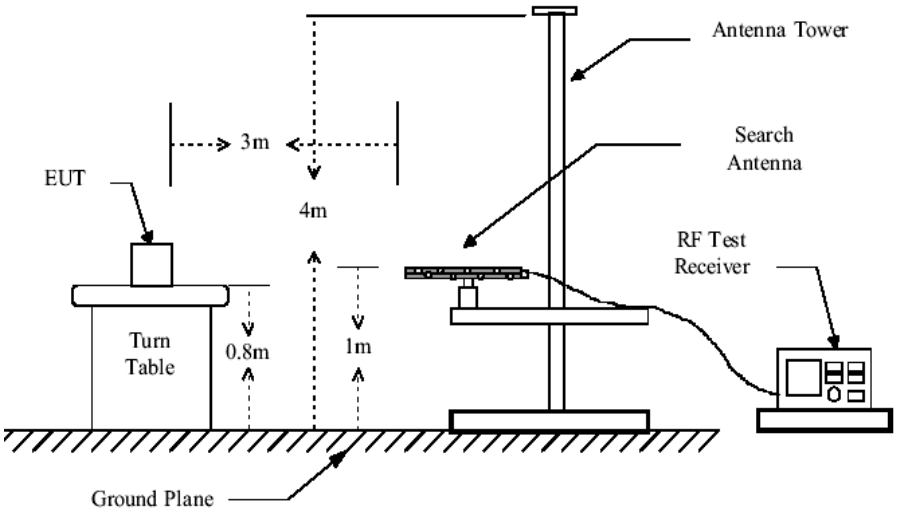


Figure 1. 30MHz to 1GHz radiated emissions test configuration

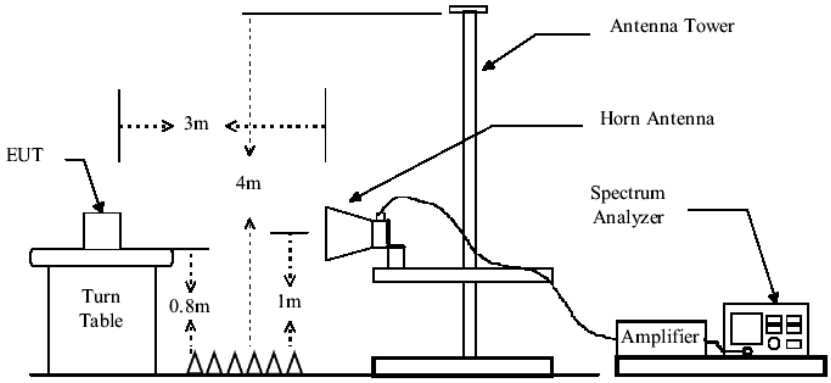


Figure 2. Above 1GHz radiated emissions test configuration

Test Procedure:

The procedure used was ANSI Standard C63.10:2009. The receiver was scanned from 30MHz to 25GHz.When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

Low noise amplifier was used below 1GHz, High pass Filter was used above 3GHz.

Between 1G and 3GHz, we did not use any amplifier or filter.

Pre-test was performed on GFSK and EDR mode with adapter, Compliance test was

performed on worse case (8DPSK mode with adapter).

Test were performed for there spatial orthogonal(X, Y, Z), the worst test data (X orthogonal) was submitted.

1) For this intentional radiator operates below 25 GHz. the spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 5rd harmonic.

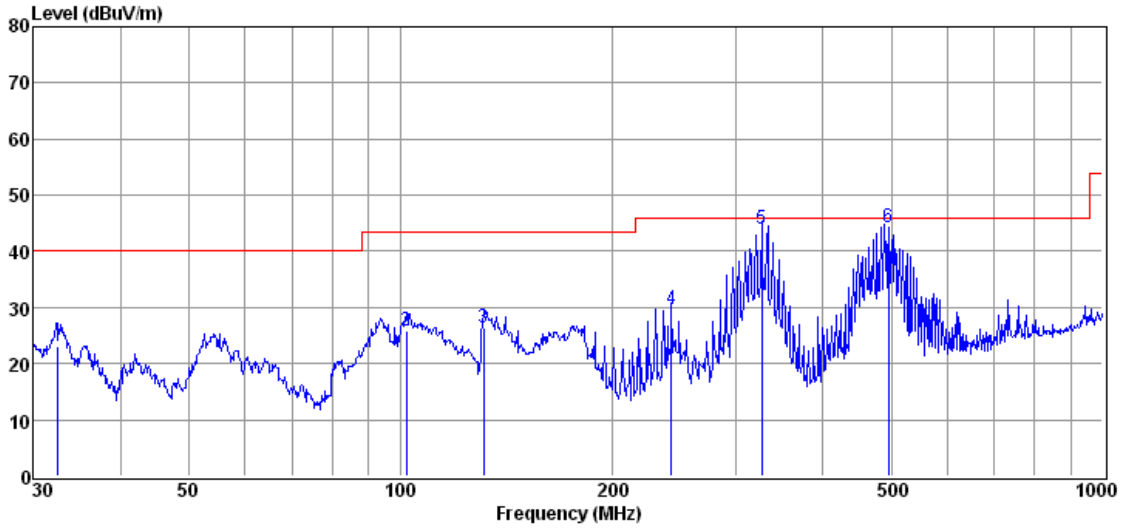
As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

VIFA010:

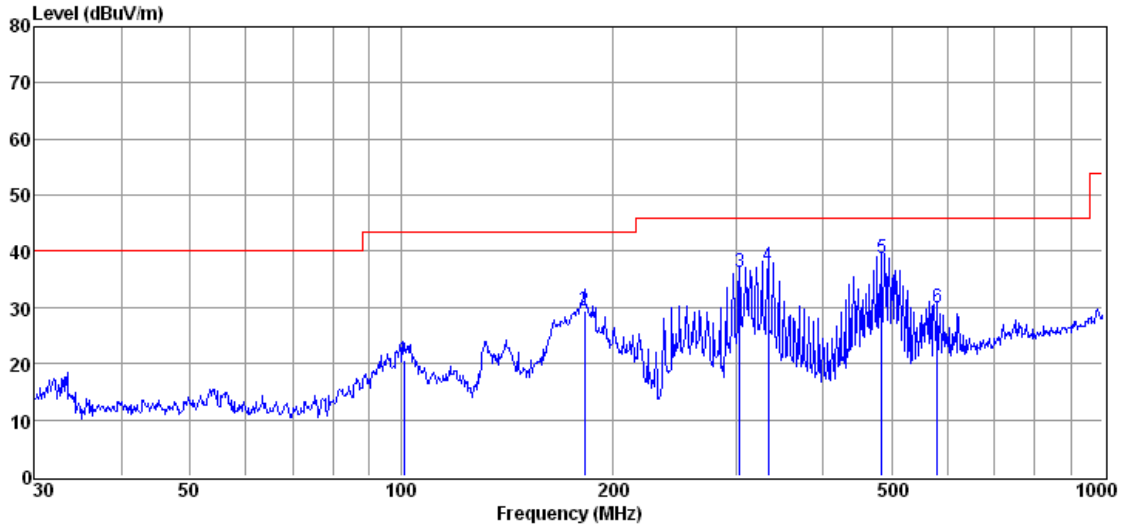
30MHz-1GHz:

Vertical:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	32.52	35.17	12.25	24.70	0.46	23.18	40.00	-16.82	QP
2	102.00	40.15	9.38	24.70	1.05	25.88	43.50	-17.62	QP
3	131.30	39.02	10.79	24.70	1.19	26.30	43.50	-17.20	QP
4	243.38	42.07	10.43	24.50	1.70	29.70	46.00	-16.30	QP
5	326.77	53.29	13.14	24.50	2.05	43.98	46.00	-2.02	QP
6	495.36	49.61	16.46	24.32	2.60	44.35	46.00	-1.65	QP

Horizontal:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	100.93	35.03	9.28	24.70	1.04	20.65	43.50	-22.85	QP
2	182.56	41.83	10.74	24.60	1.42	29.39	43.50	-14.11	QP
3	303.54	46.30	12.50	24.50	1.96	36.26	46.00	-9.74	QP
4	333.69	46.61	13.27	24.50	2.07	37.45	46.00	-8.55	QP
5	483.91	44.33	16.37	24.36	2.56	38.90	46.00	-7.10	QP
6	580.70	32.67	18.74	24.20	2.85	30.06	46.00	-15.94	QP

Test in **Channel Low** in transmitting status- **Horizontal** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4795.25	42.34	8.31	50.65	74	-23.35	peak
2	7192.25	41.98	10.60	52.58	74	-21.42	peak
3	9612.75	41.13	14.24	55.37	74	-18.63	peak

Test in **Channel Low** in transmitting status- **Vertical** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4795.25	41.72	8.31	50.03	74	-23.97	peak
2	7192.25	41.98	10.6	52.58	74	-21.42	peak
3	9612.75	40.63	14.24	54.87	74	-19.13	peak

Test in **Channel Middle** in transmitting status- **Horizontal** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4877.50	41.31	8.83	50.14	74	-23.86	peak
2	7309.75	41.10	10.88	51.98	74	-22.02	peak
3	9765.50	41.76	14.43	56.19	74	-17.81	peak

Test in **Channel Middle** in transmitting status- **Vertical** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4877.50	42.12	8.83	50.95	74	-23.05	peak
2	7309.75	41.11	10.88	51.99	74	-22.01	peak
3	9765.50	42.31	14.43	56.74	74	-17.26	peak

Test in **Channel High** in transmitting status- **Horizontal** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4959.75	42.15	8.94	51.09	74	-22.91	peak
2	7427.25	43.49	11.14	54.63	74	-19.37	peak
3	9918.25	41.36	14.69	56.05	74	-17.95	peak

Test in **Channel High** in transmitting status- **Vertical** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4959.75	42.79	8.94	51.73	74	-22.27	peak
2	7427.25	42.58	11.14	53.72	74	-20.28	peak
3	9918.25	41.45	14.69	56.14	74	-17.86	peak

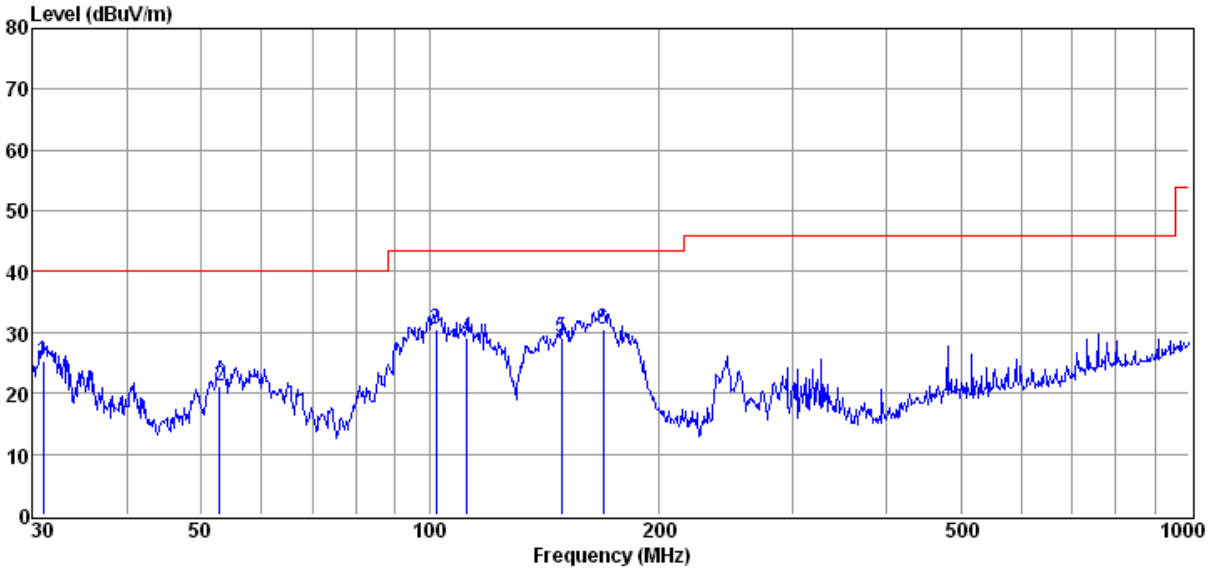
Remark: No other radiation has been found.

If the Peak value below the AV Limit, the AV test doesn't perform for this submission.

VIFA020:

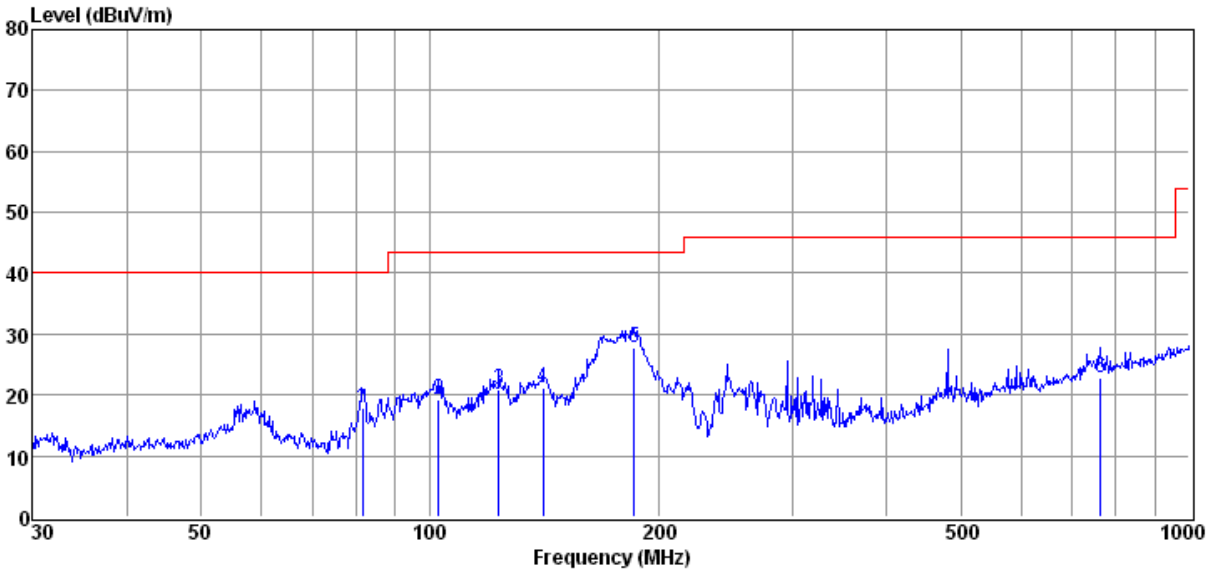
30MHz-1GHz:

Vertical:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1	30.96	37.29	12.16	24.70	0.43	25.18	40.00	-14.82	QP
2	52.95	32.71	12.62	24.70	0.67	21.30	40.00	-18.70	QP
3	101.97	44.87	9.38	24.70	1.05	30.60	43.50	-12.90	QP
4	112.00	42.57	10.12	24.70	1.10	29.09	43.50	-14.41	QP
5	148.93	39.83	12.64	24.70	1.27	29.04	43.50	-14.46	QP
6	169.36	41.56	12.32	24.61	1.36	30.63	43.50	-12.87	QP

Horizontal:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	81.62	33.08	8.75	24.70	0.88	18.01	40.00	-21.99	QP
2	102.83	33.40	9.45	24.70	1.05	19.20	43.50	-24.30	QP
3	123.35	33.13	11.33	24.70	1.15	20.91	43.50	-22.59	QP
4	140.89	32.42	12.15	24.70	1.23	21.10	43.50	-22.40	QP
5	185.76	40.62	10.29	24.60	1.44	27.75	43.50	-15.75	QP
6	763.38	21.57	21.77	24.00	3.36	22.70	46.00	-23.30	QP

Test in **Channel Low** in transmitting status- **Horizontal** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4795.25	42.36	8.31	50.67	74	-23.33	peak
2	7227.5	42.75	10.69	53.44	74	-20.56	peak
3	9624.5	42.64	14.25	56.89	74	-17.11	peak

Test in **Channel Low** in transmitting status- **Vertical** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4795.25	42.81	8.31	51.12	74	-22.88	peak
2	7227.5	41.93	10.69	52.62	74	-21.38	peak
3	9624.5	42.73	14.25	56.98	74	-17.02	peak

Test in **Channel Middle** in transmitting status- **Horizontal** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4889.25	42.17	8.9	51.07	74	-22.93	peak
2	7356.75	43.67	10.98	54.65	74	-19.35	peak
3	9753.75	42.74	14.41	57.15	74	-16.85	peak

Test in **Channel Middle** in transmitting status- **Vertical** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4889.25	41.85	8.9	50.75	74	-23.25	peak
2	7356.75	44.3	10.98	55.28	74	-18.72	peak
3	9753.75	42.08	14.41	56.49	74	-17.51	peak

Test in **Channel High** in transmitting status- **Horizontal** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4983.25	43.16	8.94	52.1	74	-21.9	peak
2	7450.75	42.94	11.19	54.13	74	-19.87	peak
3	9906.5	42.4	14.67	57.07	74	-16.93	peak

Test in **Channel High** in transmitting status- **Vertical** polarization

1GHz-12GHz:

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector
1	4983.25	42.85	8.94	51.79	74	-22.21	peak
2	7450.75	42.82	11.19	54.01	74	-19.99	peak
3	9906.5	42.32	14.67	56.99	74	-17.01	peak

Remark: No other radiation has been found.

If the Peak value below the AV Limit, the AV test doesn't perform for this submission.

7.12 Band edge (Radiated Emission)

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c).
Test Method:	ANSI 63.10:2009 Clause 6.12
Measurement Distance:	3m (Semi-Anechoic Chamber)
Limit:	40.0 dBμV/m between 30MHz & 88MHz; 43.5 dBμV/m between 88MHz & 216MHz; 46.0 dBμV/m between 216MHz & 960MHz; 54.0 dBμV/m above 960MHz.
Detector:	For PK value: RBW = 1 MHz for f ≥ 1 GHz VBW ≥ RBW; Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for f ≥ 1 GHz VBW =10Hz; Sweep = auto Detector function = peak Trace = max hold

According to section,15.35(b) for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Pre-test were performed for there spatial orthogonal(X, Y, Z), the worst test data (X orthogonal) was sumitted.

Test Result: The EUT does meet the FCC requirements.

Test Result:

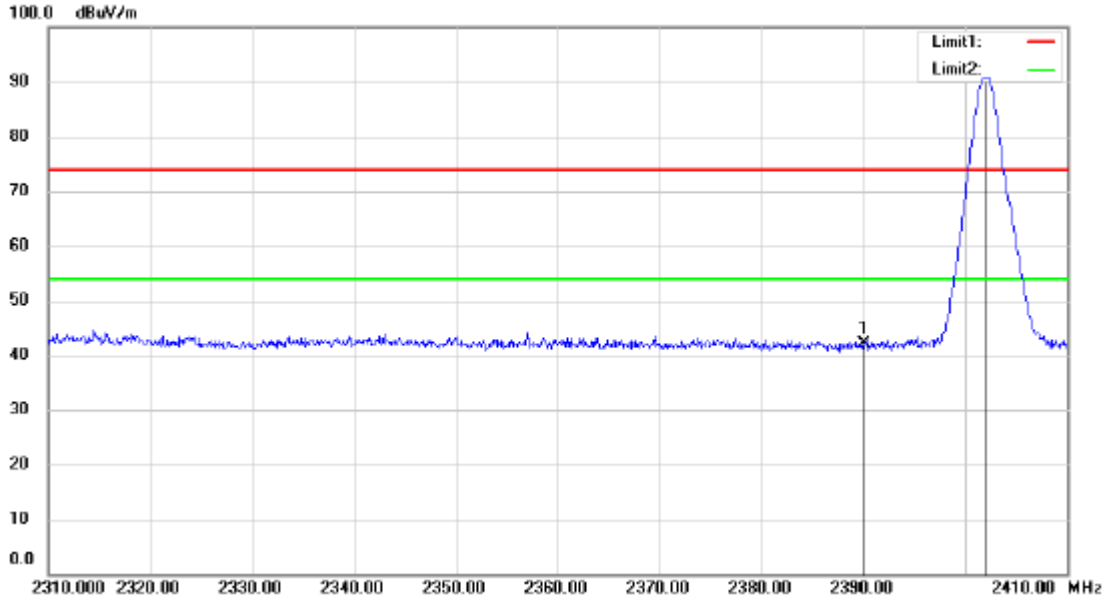
VIFA010:

The EUT does meet the FCC requirements.

Modulation: GFSK

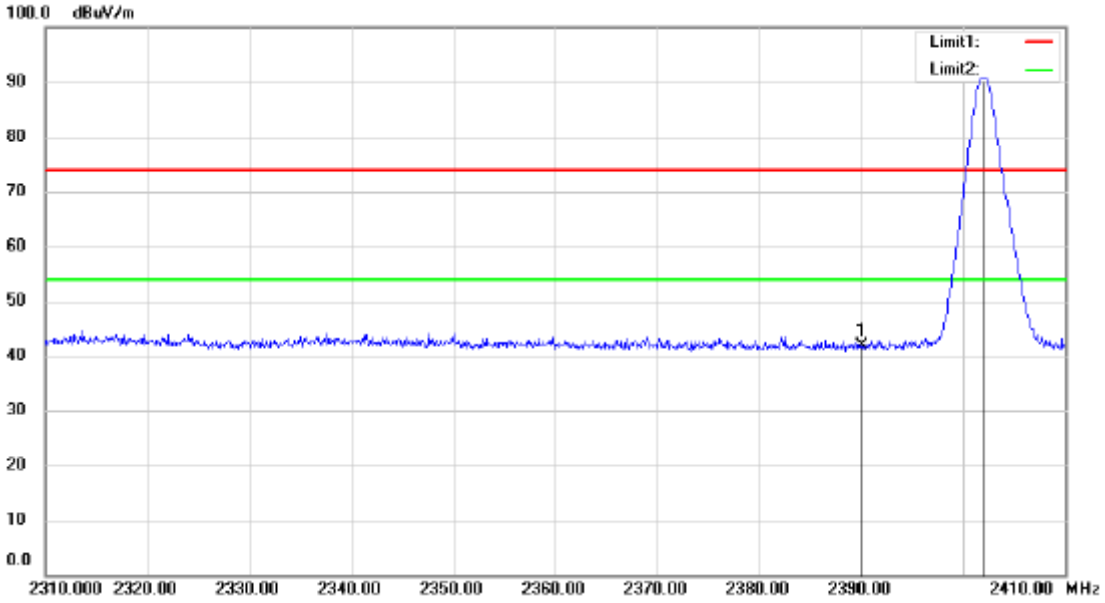
CH Low 2402MHz

Horizontal, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	42.62	-0.56	42.06	74	-31.94	Peak
2	2402.100	91.57	-0.63	90.94	74	16.94	Peak

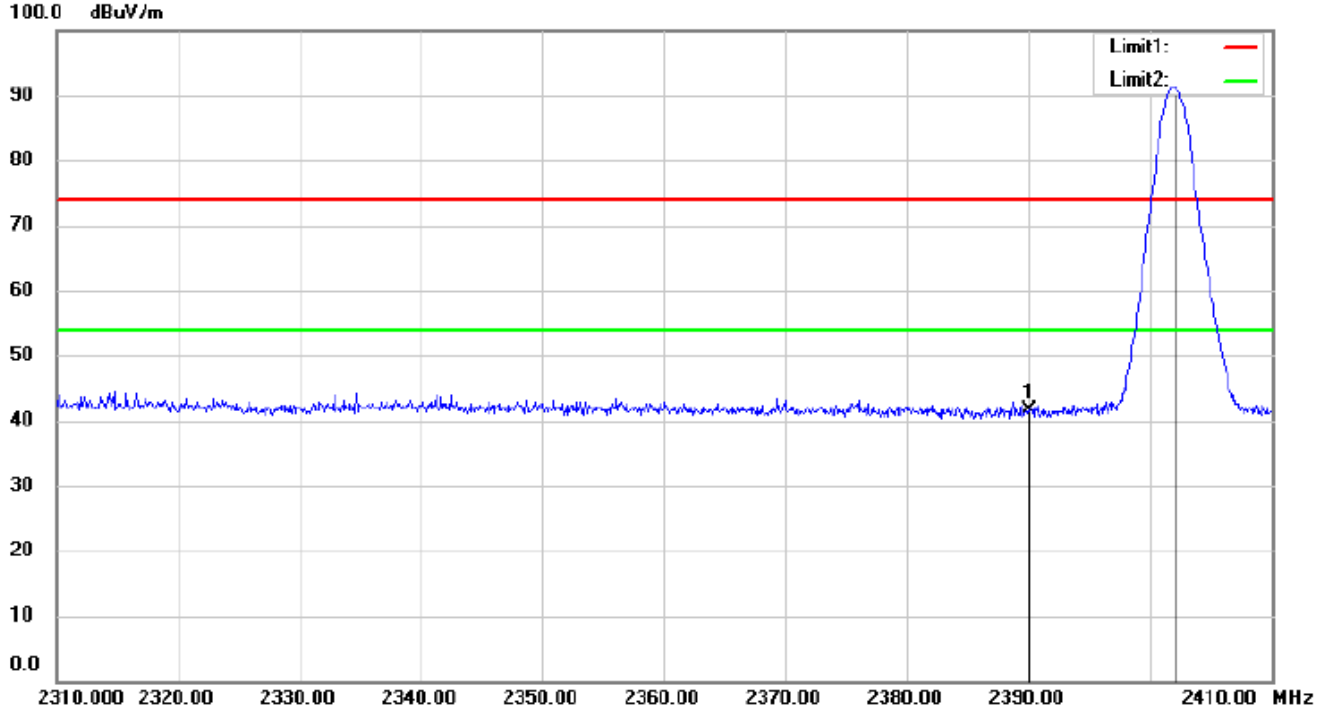
Vertical, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	42.52	-0.56	41.96	74	-32.04	Peak
2	2402.100	91.57	-0.63	90.94	74	16.94	Peak

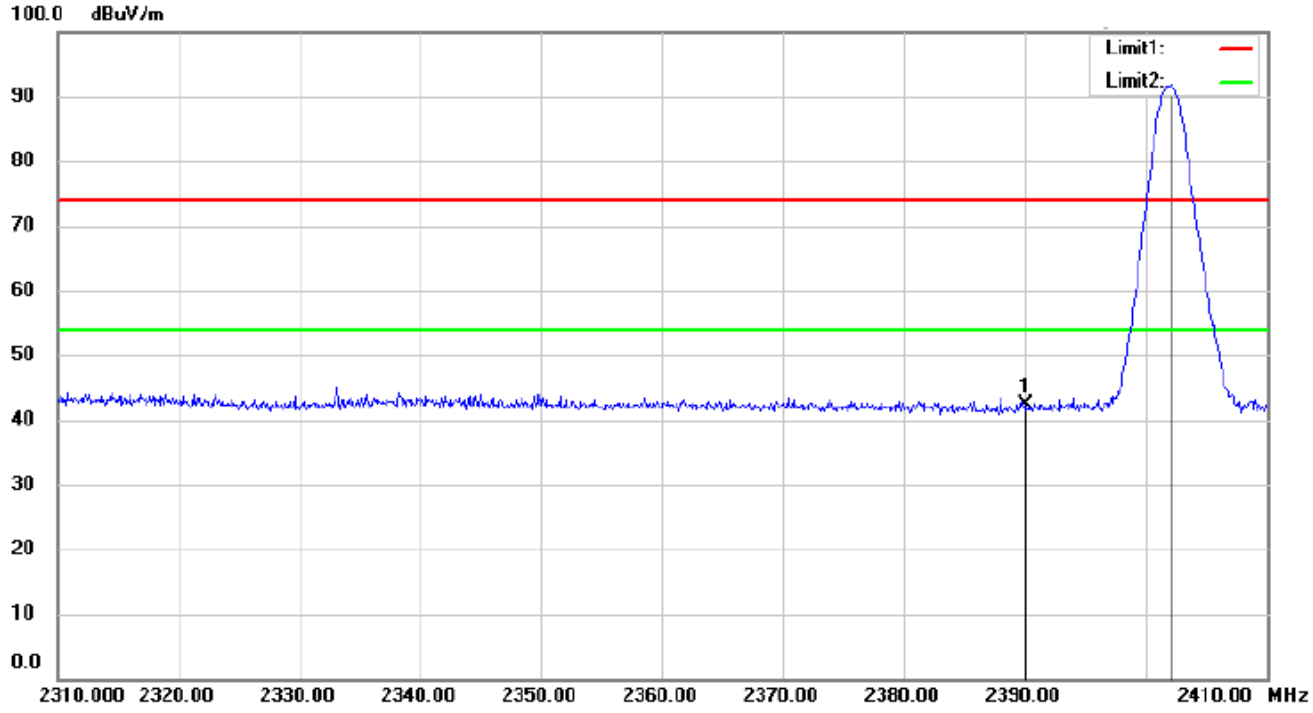
CH Low 2402MHz **Modulation: π/4DQPSK**

Horizontal, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	42.30	-0.56	41.74	74	-32.26	Peak
2	2402.100	91.90	-0.63	91.27	74	17.27	Peak

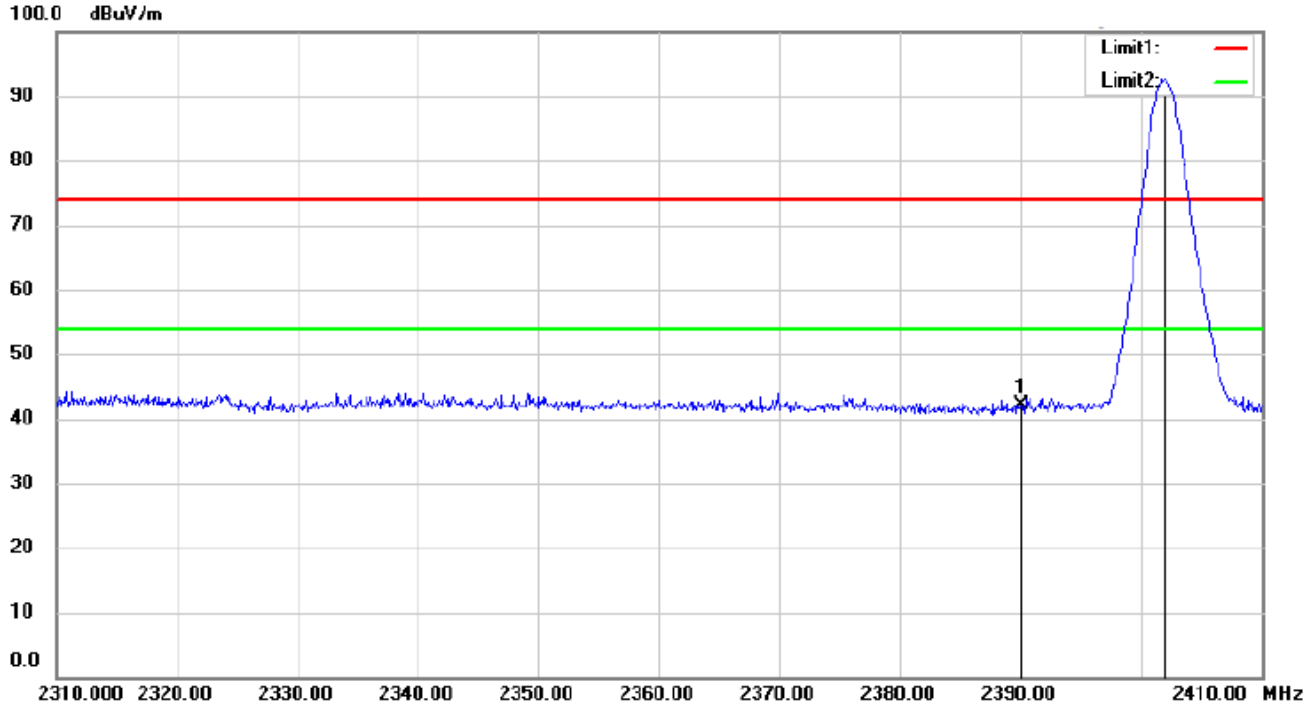
Vertical, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	42.83	-0.56	42.27	74	-31.73	Peak
2	2402.100	92.50	-0.63	91.87	74	17.87	Peak

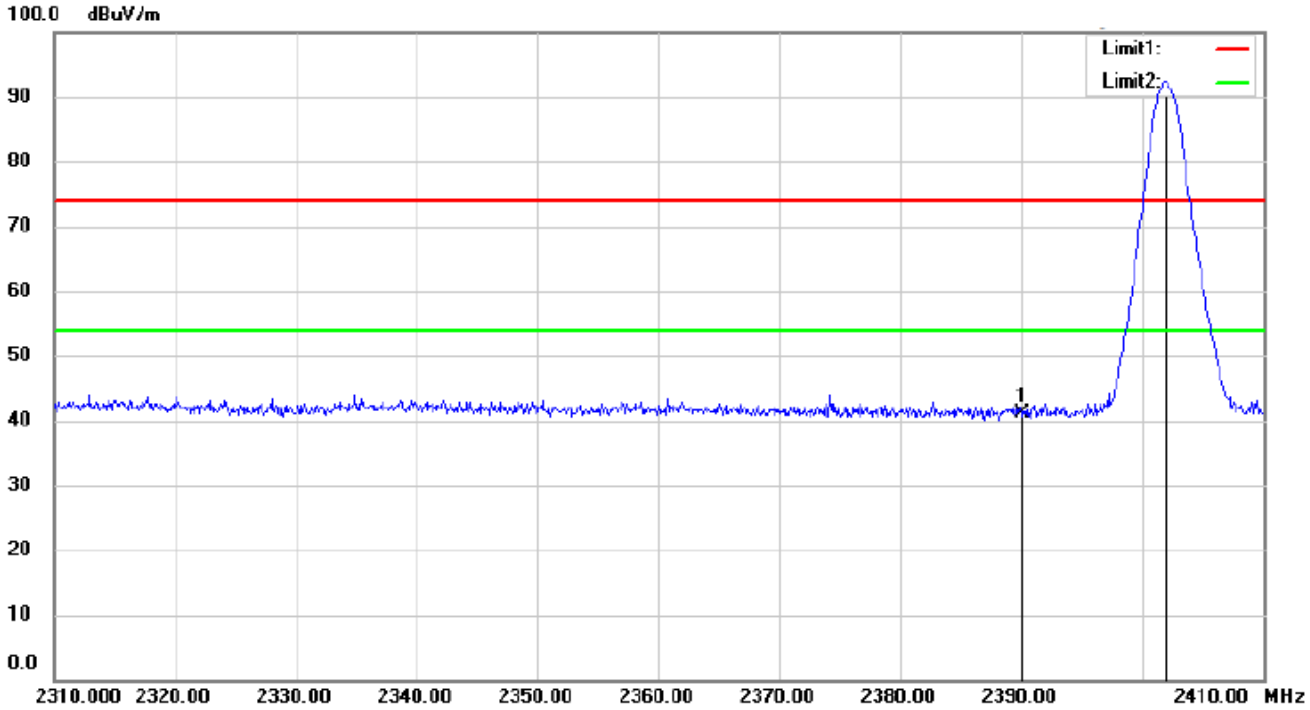
CH Low 2402MHz **Modulation: 8DPSK**

Horizontal, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	42.76	-0.56	42.20	74	-31.80	Peak
2	2401.900	93.21	-0.62	92.59	74	18.59	Peak

Vertical, Peak Detector:

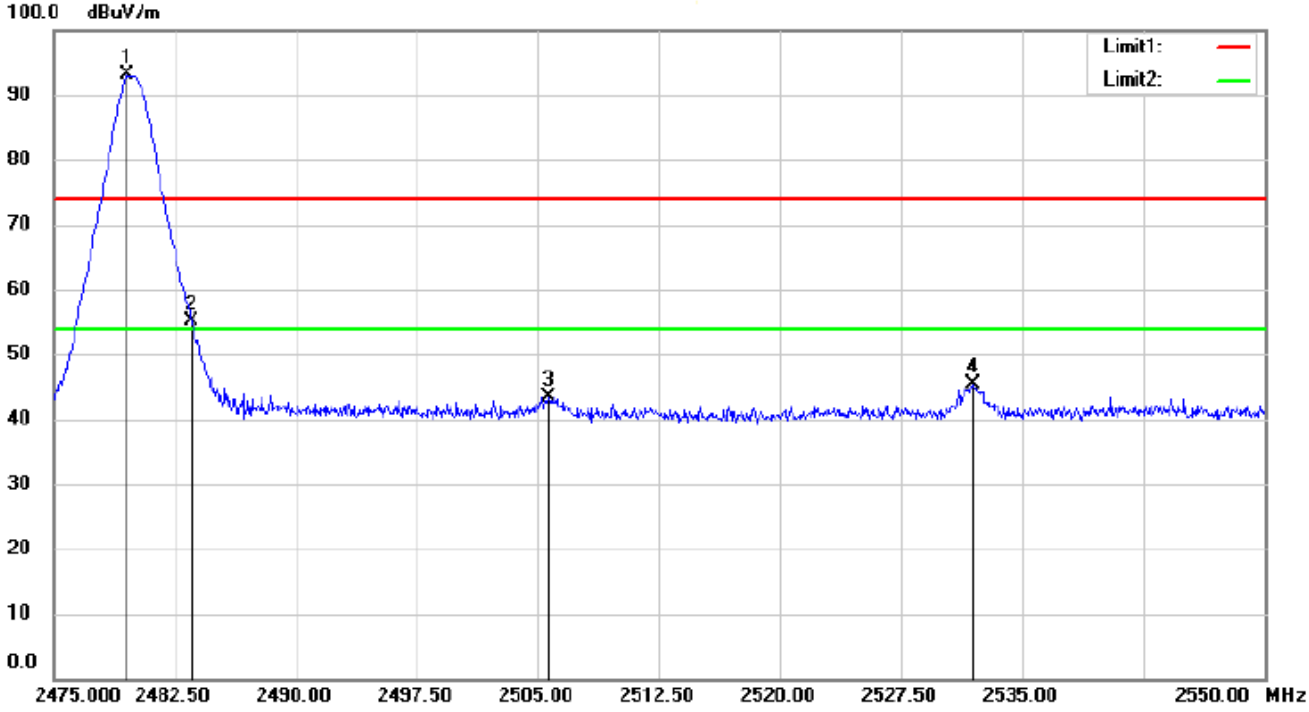


MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	41.60	-0.56	41.04	74	-32.96	Peak
2	2401.900	92.92	-0.62	92.30	74	18.30	Peak

Remark: Because of the Peak value below the AV Limit, so the AV test doesn't perform for this submission.

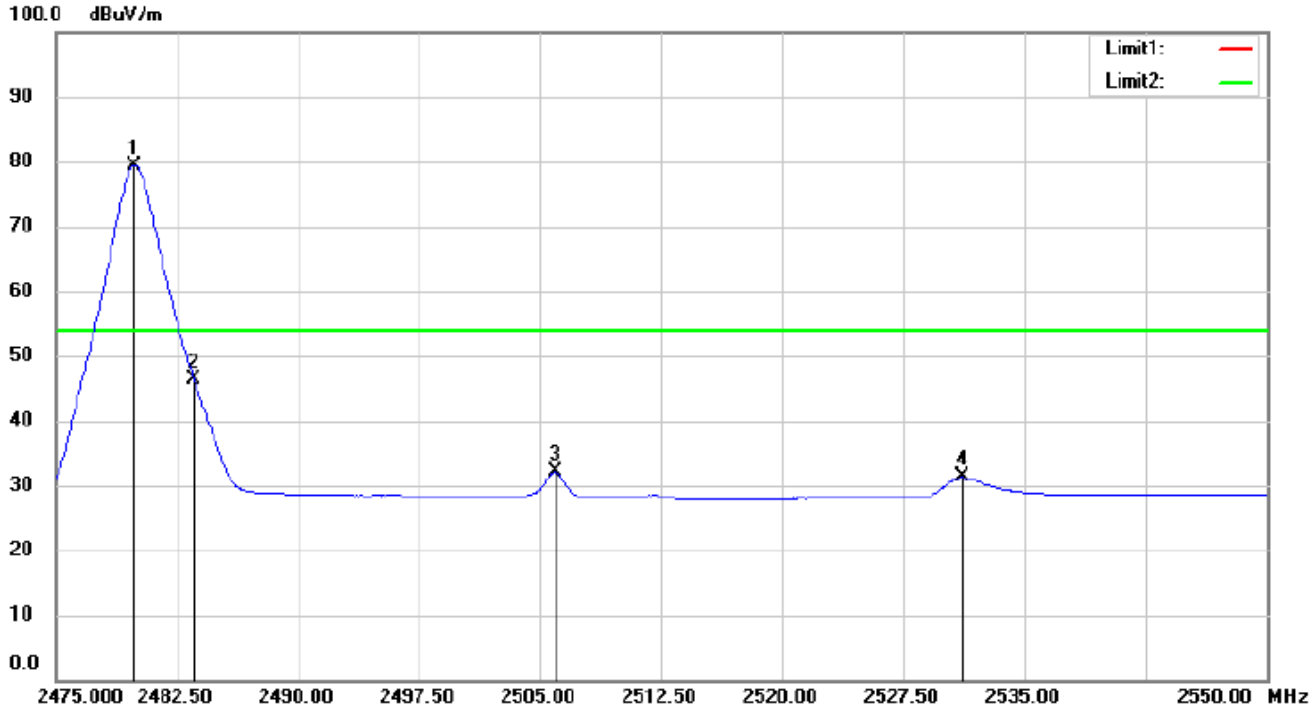
CH Low 2480MHz **Modulation: GFSK**

Horizontal, Peak Detector:



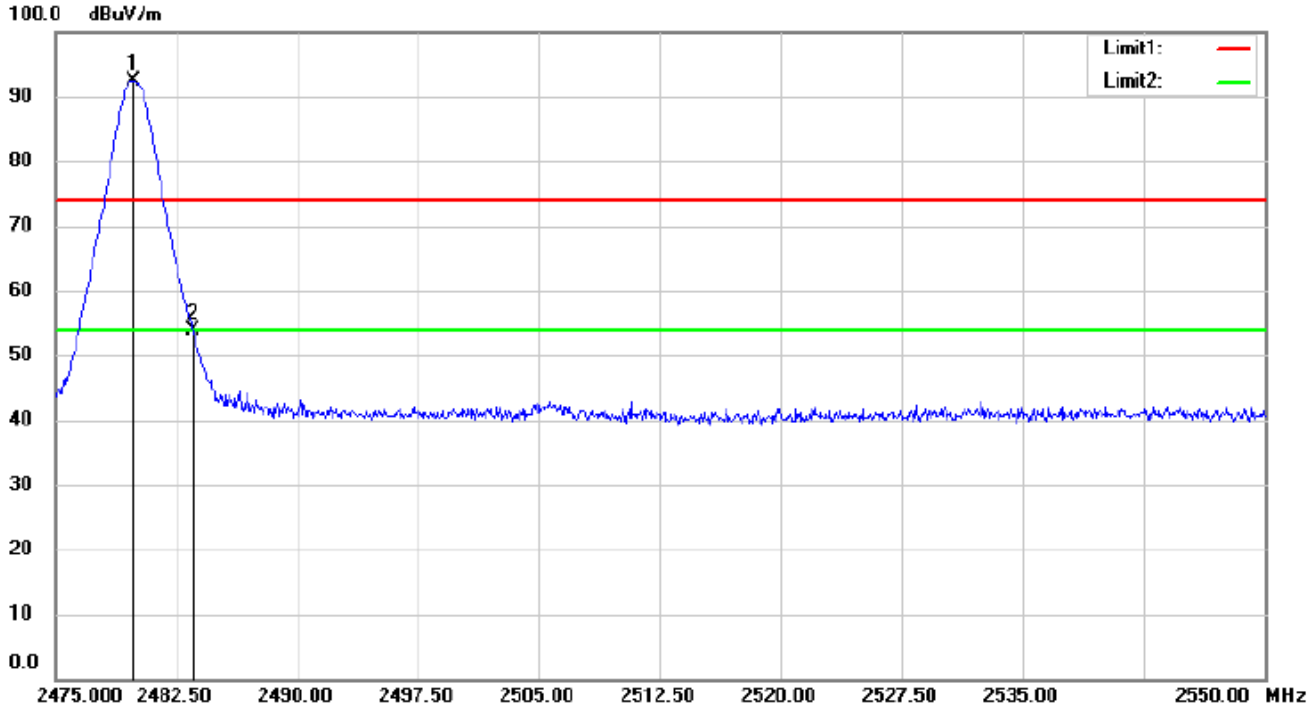
MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.500	94.07	-0.99	93.08	74	19.08	Peak
2	2483.500	56.17	-1.01	55.16	74	-18.84	Peak
3	2502.675	44.52	-1.03	43.49	74	-30.51	Peak
4	2531.925	46.11	-0.75	45.36	74	-28.64	Peak

Horizontal, Average Detector:



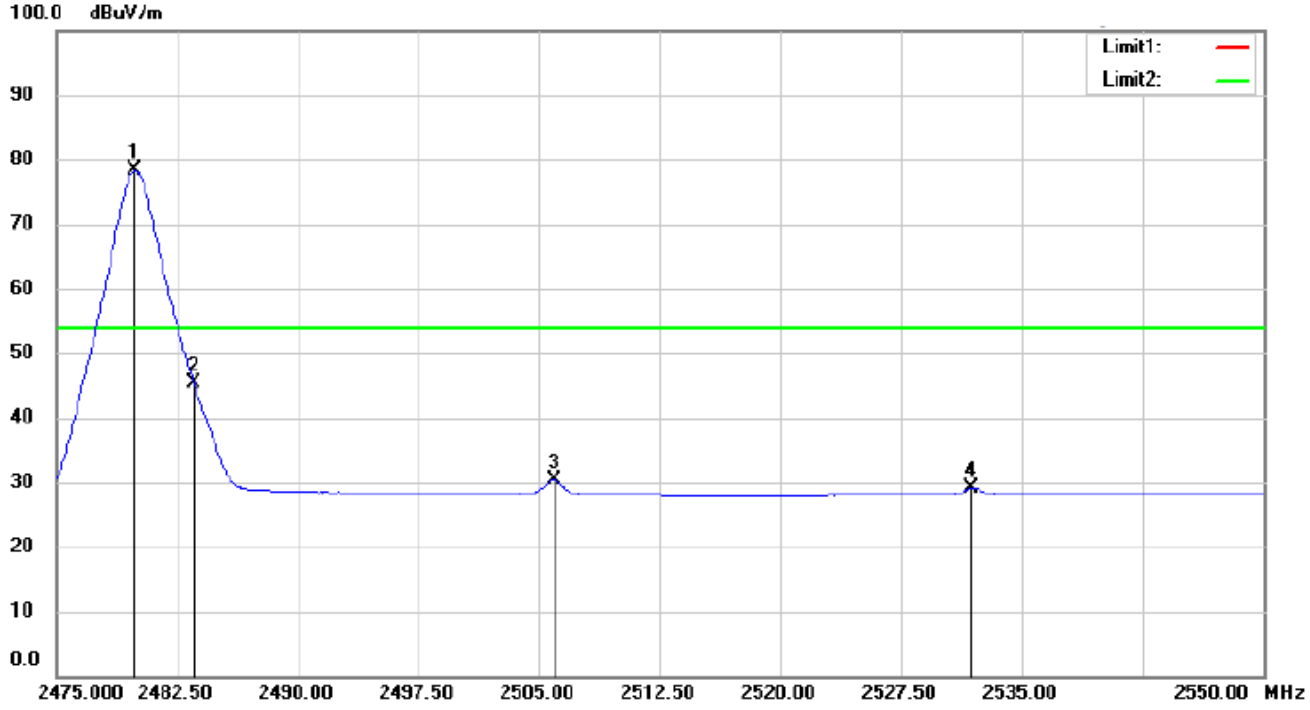
MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.875	80.47	-0.99	79.48	54	25.48	Peak
2	2483.500	47.41	-1.01	46.40	54	-7.60	Peak
3	2505.900	33.13	-1.02	32.11	54	-21.89	Peak
4	2531.100	32.08	-0.76	31.32	54	-22.68	Peak

Vertical, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.800	93.38	-0.99	92.39	74	18.39	Peak
2	2483.550	54.80	-1.01	53.79	74	-20.21	Peak

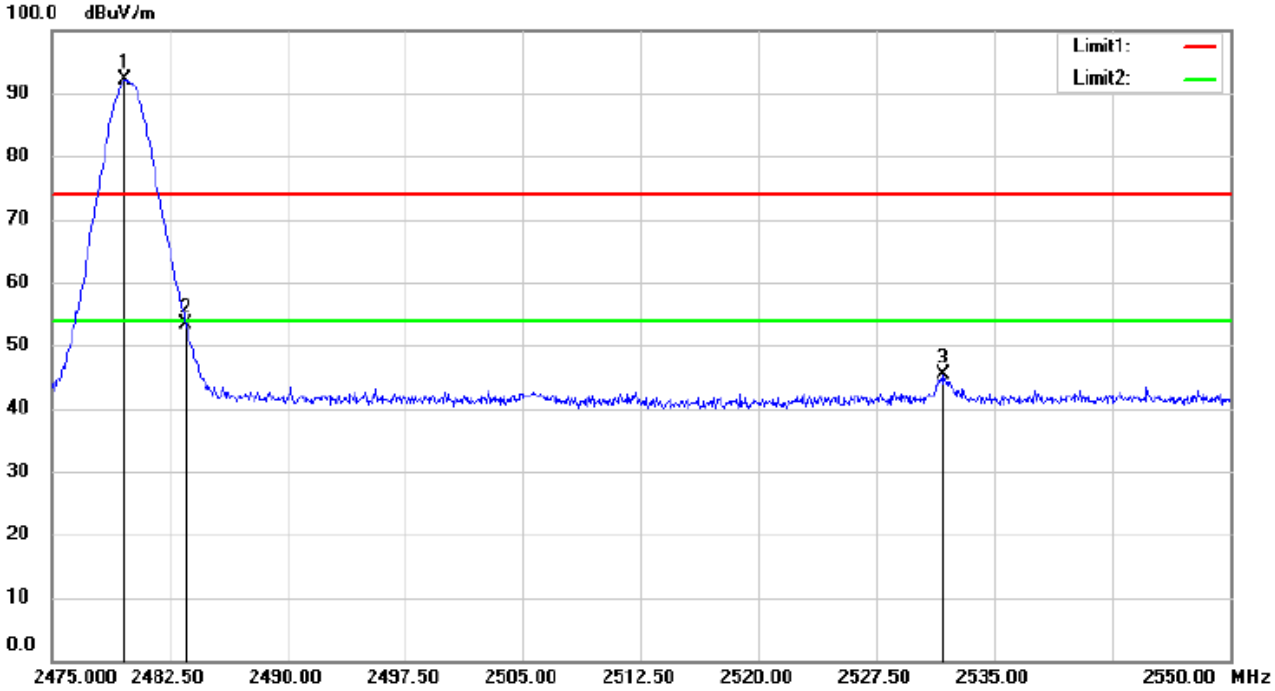
Vertical, Average Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.875	79.39	-0.99	78.40	54	24.40	Peak
2	2483.500	46.31	-1.01	45.30	54	-8.70	Peak
3	2505.900	31.36	-1.02	30.34	54	-23.66	Peak
4	2531.850	29.89	-0.75	29.14	54	-24.86	Peak

CH Low 2480MHz **Modulation: π/4DQPSK**

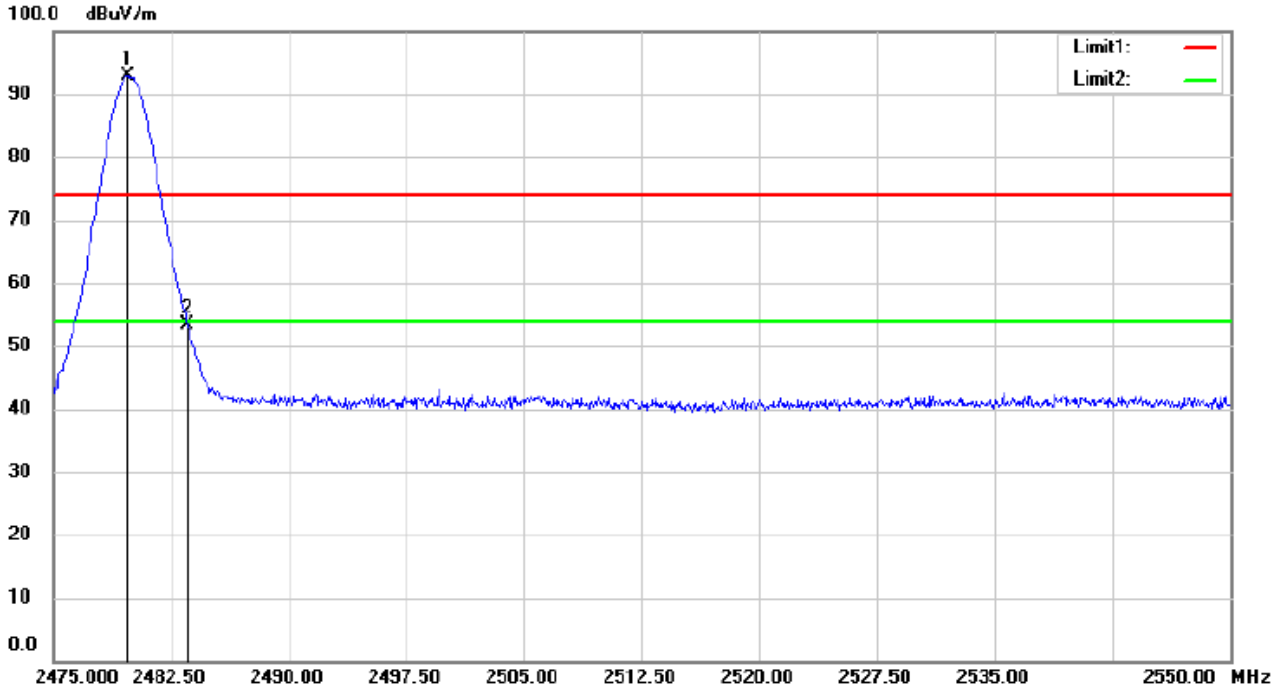
Horizontal, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.650	93.00	-0.99	82.01	74	18.01	Peak
2	2483.500	54.29	-1.01	53.28	74	-20.72	Peak
3	2531.700	46.11	-0.75	45.36	74	-28.64	Peak

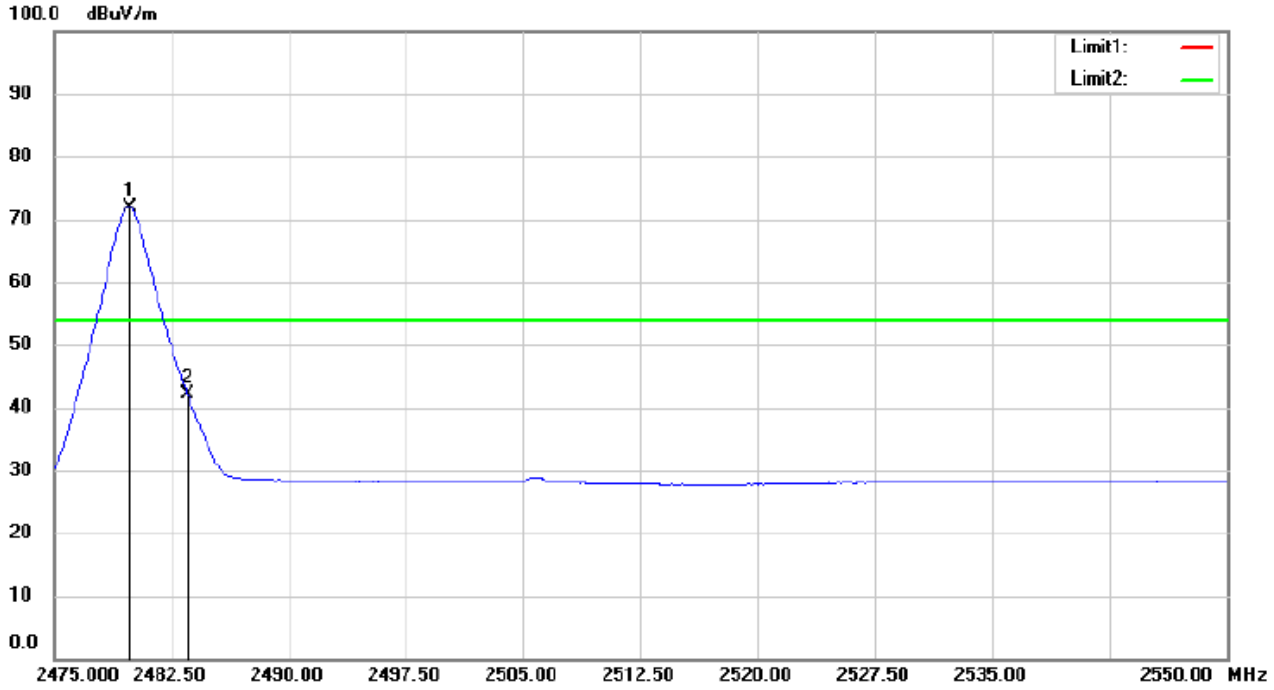
Remark: Because of the Peak value below the AV Limit, so the AV test doesn't perform for this submission.

Vertical, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.725	93.89	-0.99	90.90	74	18-90	Peak
2	2483.500	54.44	-1.01	53.43	74	-20.57	Peak

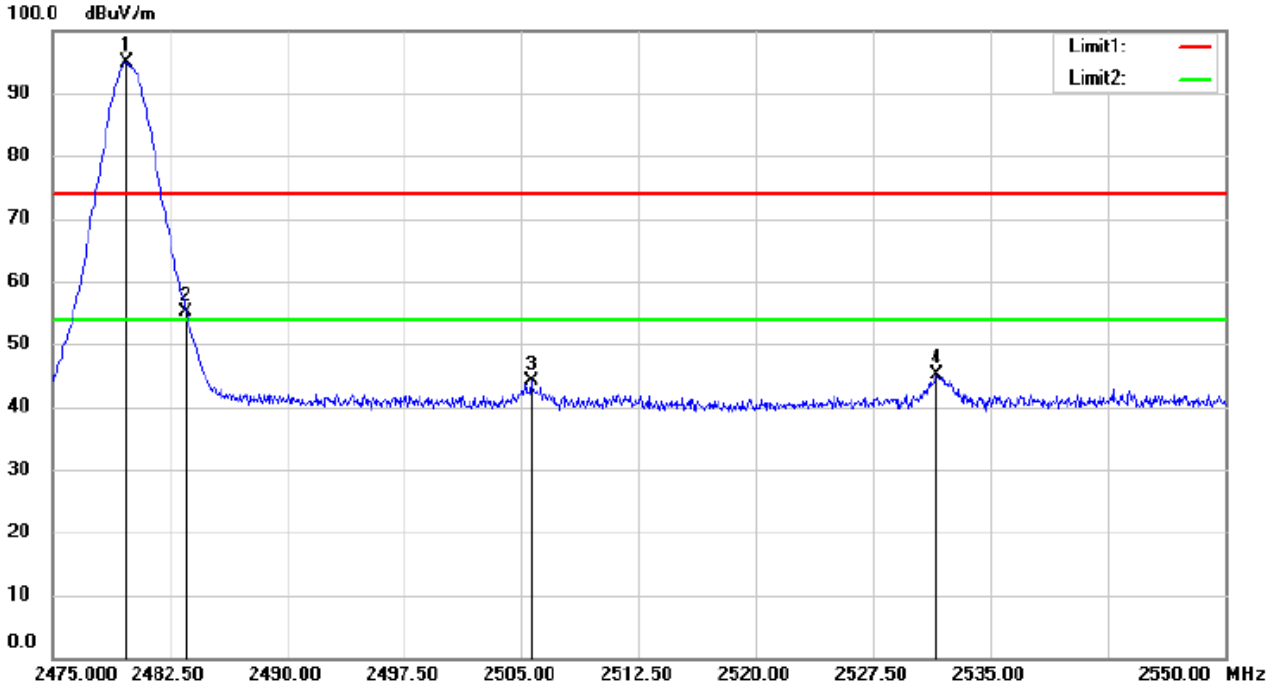
Vertical, Average Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.800	72.91	-0.99	71.92	54	17-92	Peak
2	2483.550	43.10	-1.01	42.09	54	-11.91	Peak

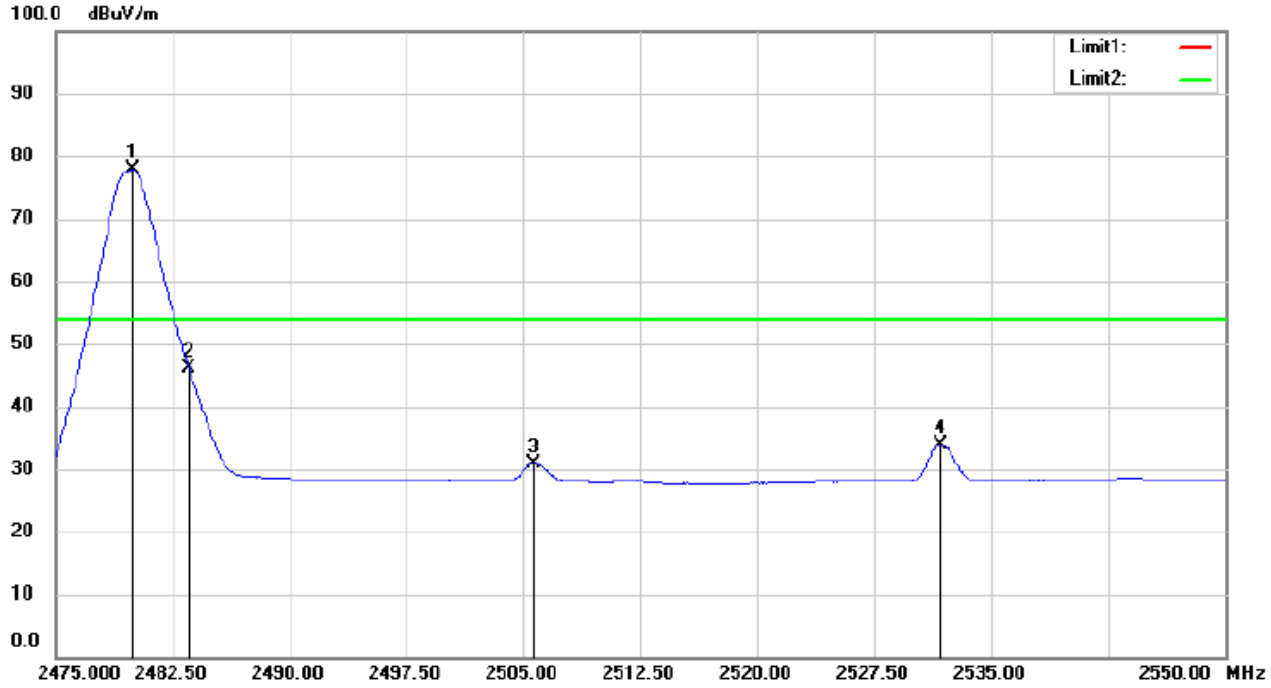
CH Low 2480MHz **Modulation: 8DPSK**

Horizontal, Peak Detector:



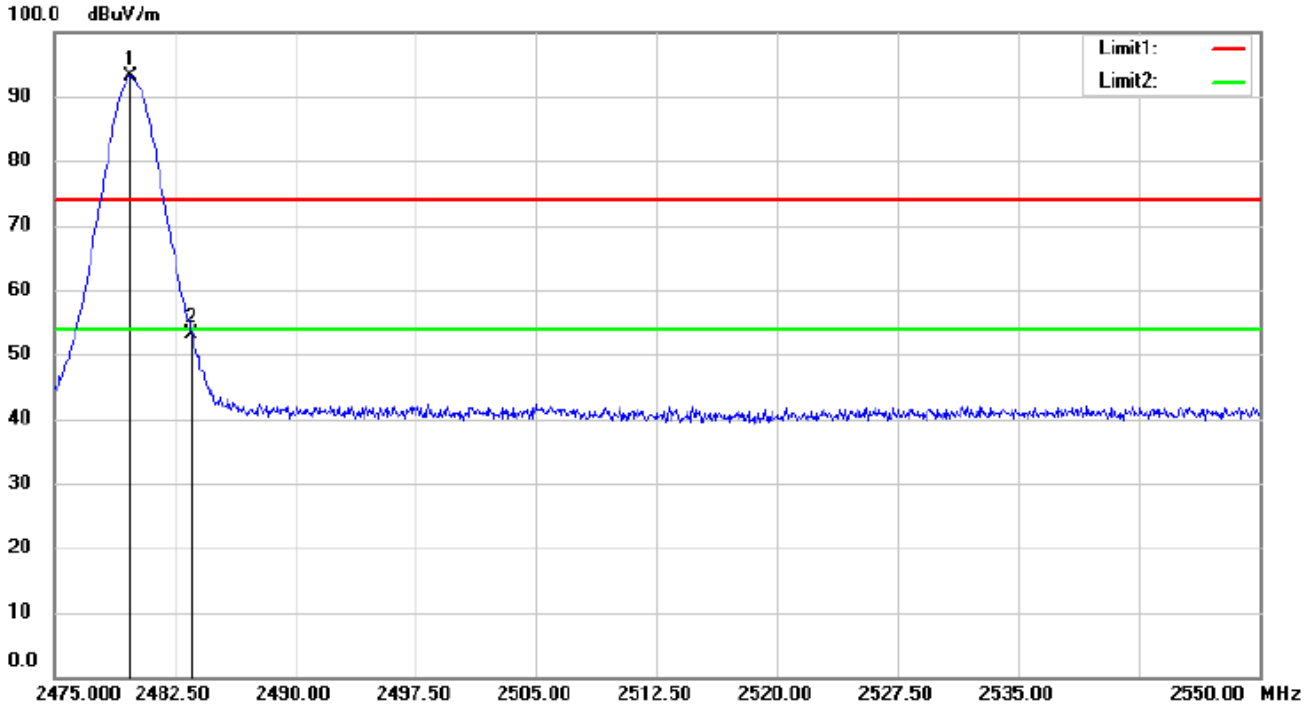
MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.725	95.88	-0.99	94.89	74	20.89	Peak
2	2483.500	56.13	-1.01	55.12	74	-18.88	Peak
3	2505.600	45.07	-1.03	44.04	74	-29.96	Peak
4	2531.550	45.83	-0.76	45.07	74	-28.93	Peak

Horizontal, Average Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.950	78.79	-0.99	77.80	54	23.80	Peak
2	2483.530	47.05	-1.01	46.04	54	-7.96	Peak
3	2505.600	32.01	-1.03	30.98	54	-23.02	Peak
4	2531.775	34.70	-0.75	33.95	54	-20.05	Peak

Vertical, Peak Detector:

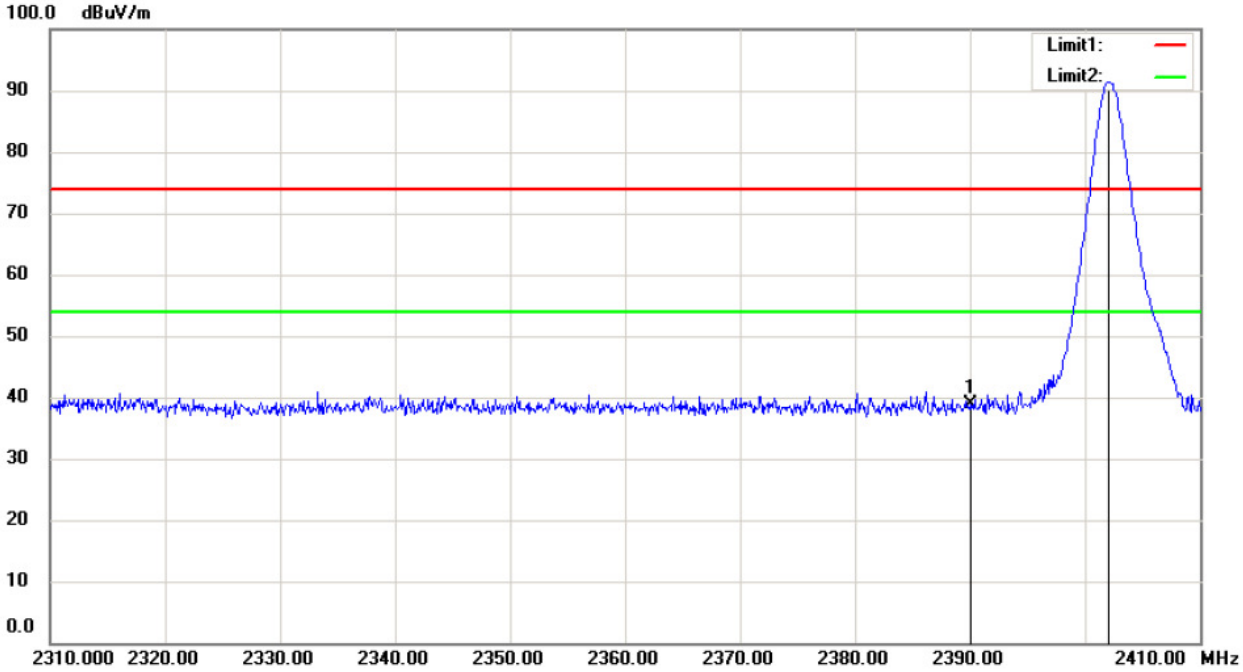


MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.725	94.07	-0.99	93.08	74	19.08	Peak
2	2483.500	54.20	-1.01	53.19	74	-20.81	Peak

Remark: Because of the Peak value below the AV Limit, so the AV test doesn't perform for this submission.

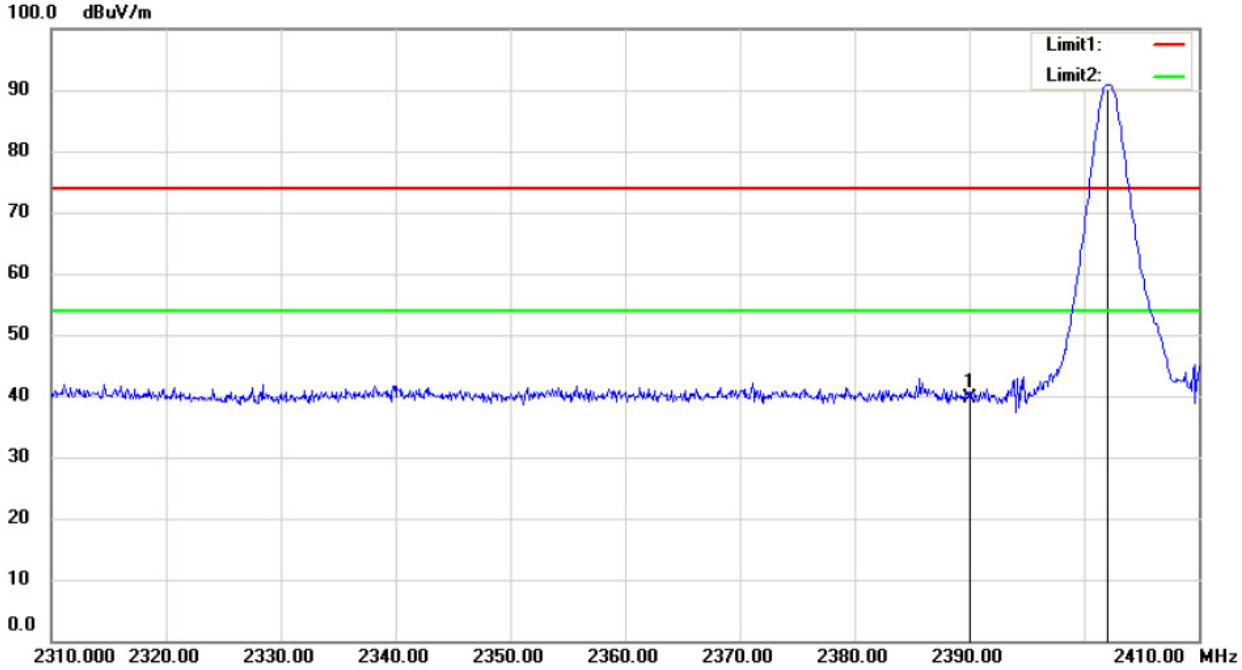
VIFA020:
CH Low 2402MHz
Horizontal, Peak Detector:

The EUT does meet the FCC requirements.
Modulation: GFSK



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	39.35	-0.56	38.79	54	15.21	Peak
2	2402.000	91.89	-0.62	91.27	54	-37.27	Peak

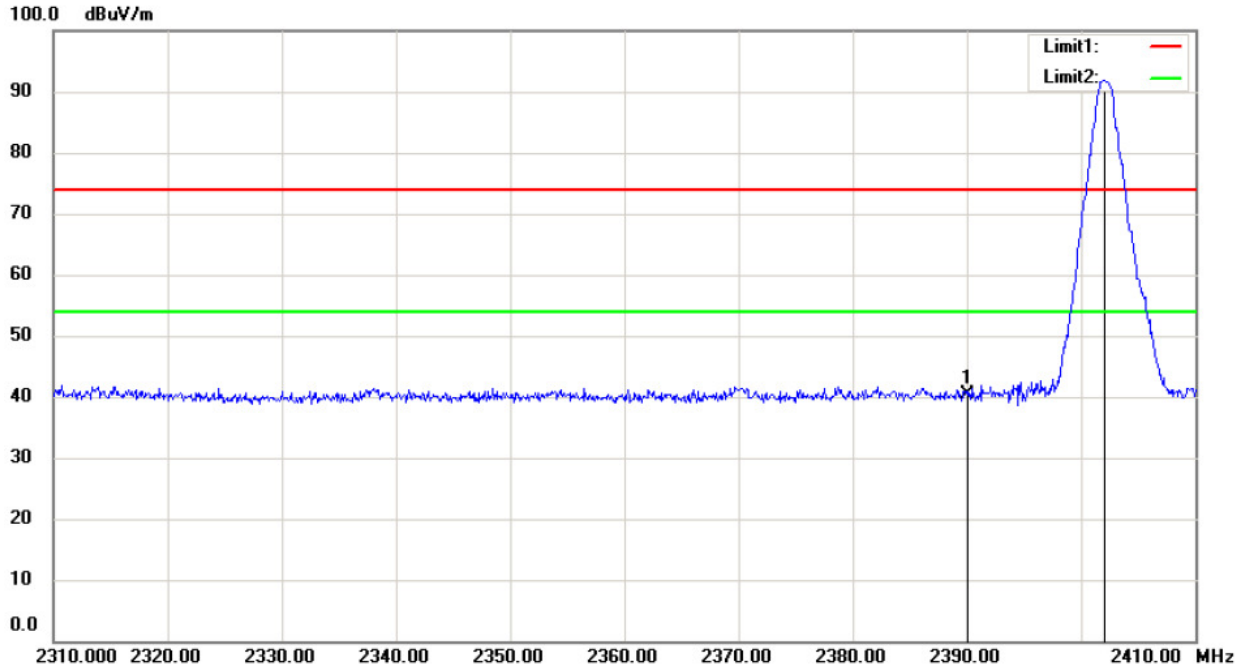
Vertical, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	46.69	-0.98	45.71	54	8.29	Peak
2	2402.000	89.13	-1.04	88.09	54	-34.09	Peak

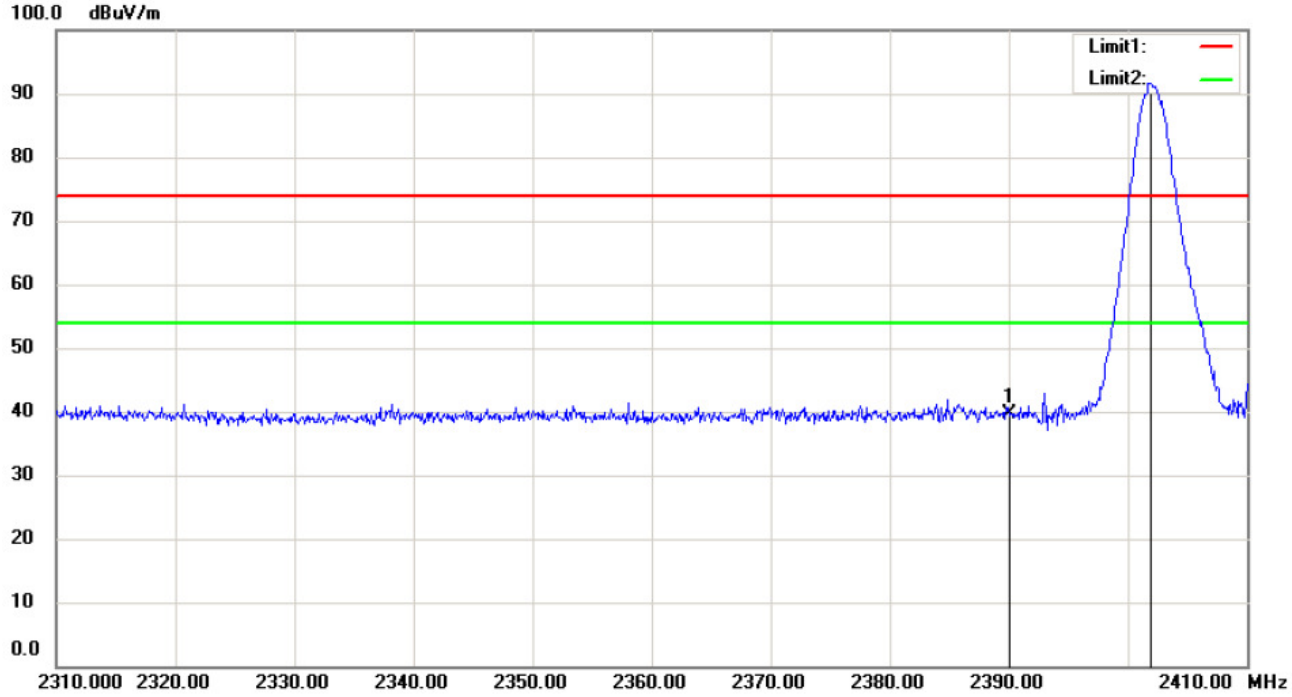
CH Low 2402MHz **Modulation: π/4DQPSK**

Horizontal, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	40.97	-0.56	40.41	54	13.59	Peak
2	2402.000	92.47	-0.62	91.85	54	-37.85	Peak

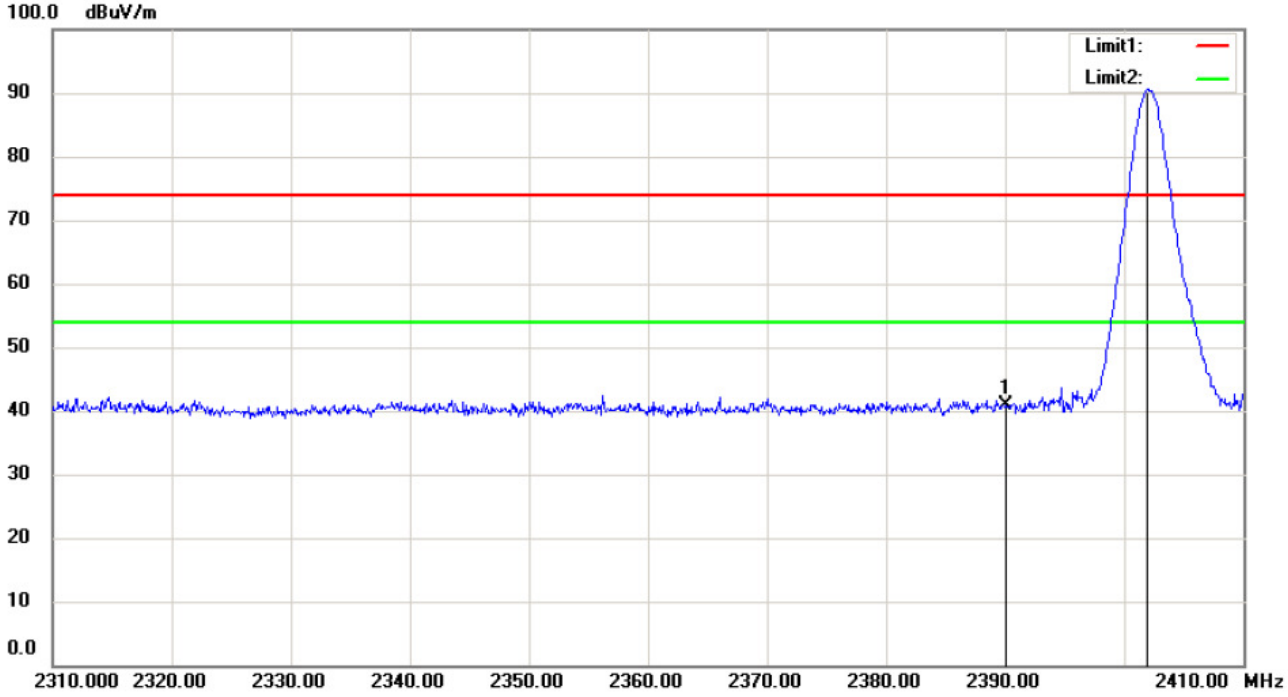
Vertical, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	40.25	-0.56	39.69	54	14.31	Peak
2	2401.900	92.26	-0.62	91.64	54	-37.64	Peak

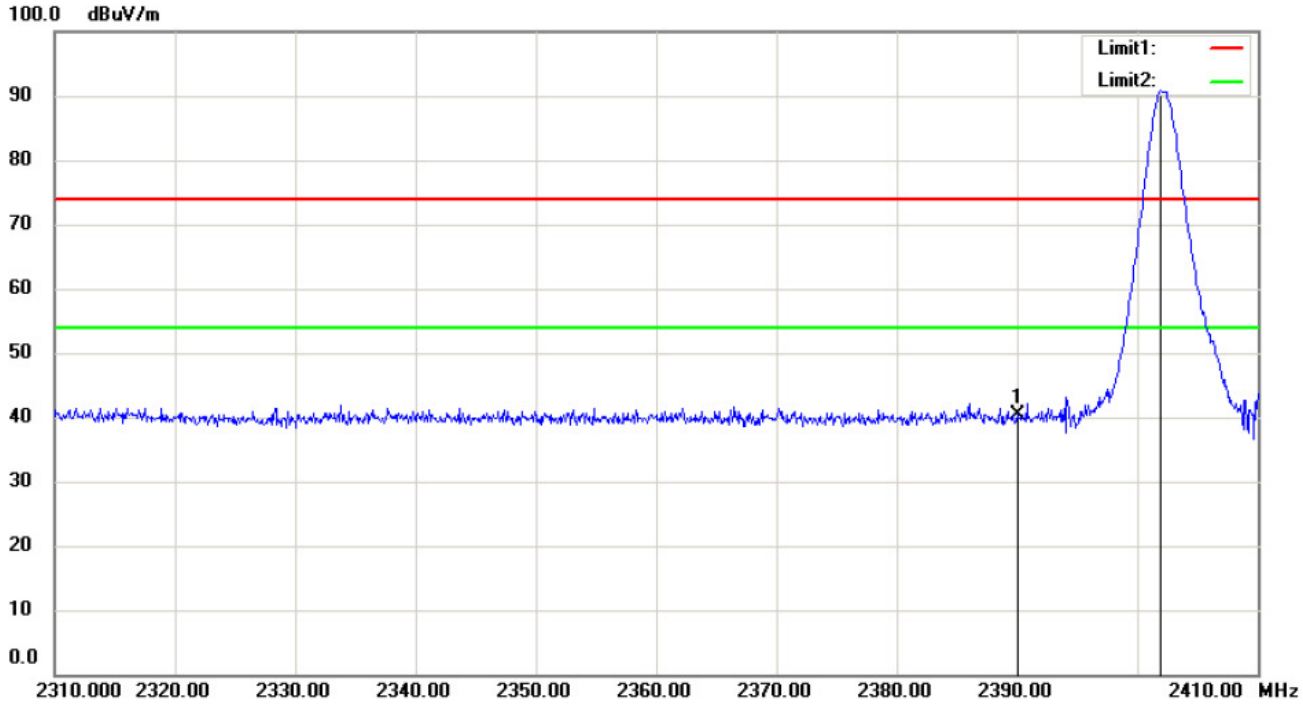
CH Low 2402MHz **Modulation: 8DPSK**

Horizontal, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	41.49	-0.56	40.93	54	13.07	Peak
2	2401.900	91.19	-0.62	90.57	54	-36.57	Peak

Vertical, Peak Detector:

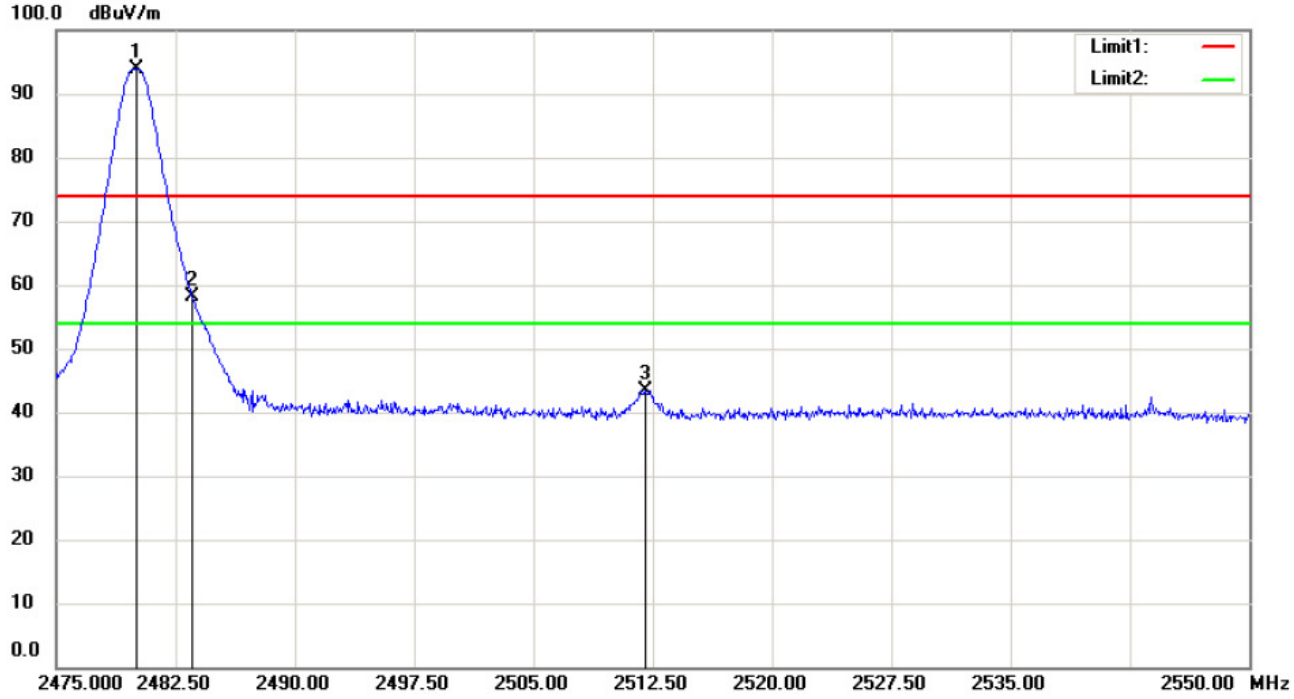


MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2390.000	40.91	-0.56	40.35	54	-13.65	Peak
2	2401.900	91.37	-0.62	90.75	54	36.75	Peak

Remark: Because of the Peak value below the AV Limit, so the AV test doesn't perform for this submission.

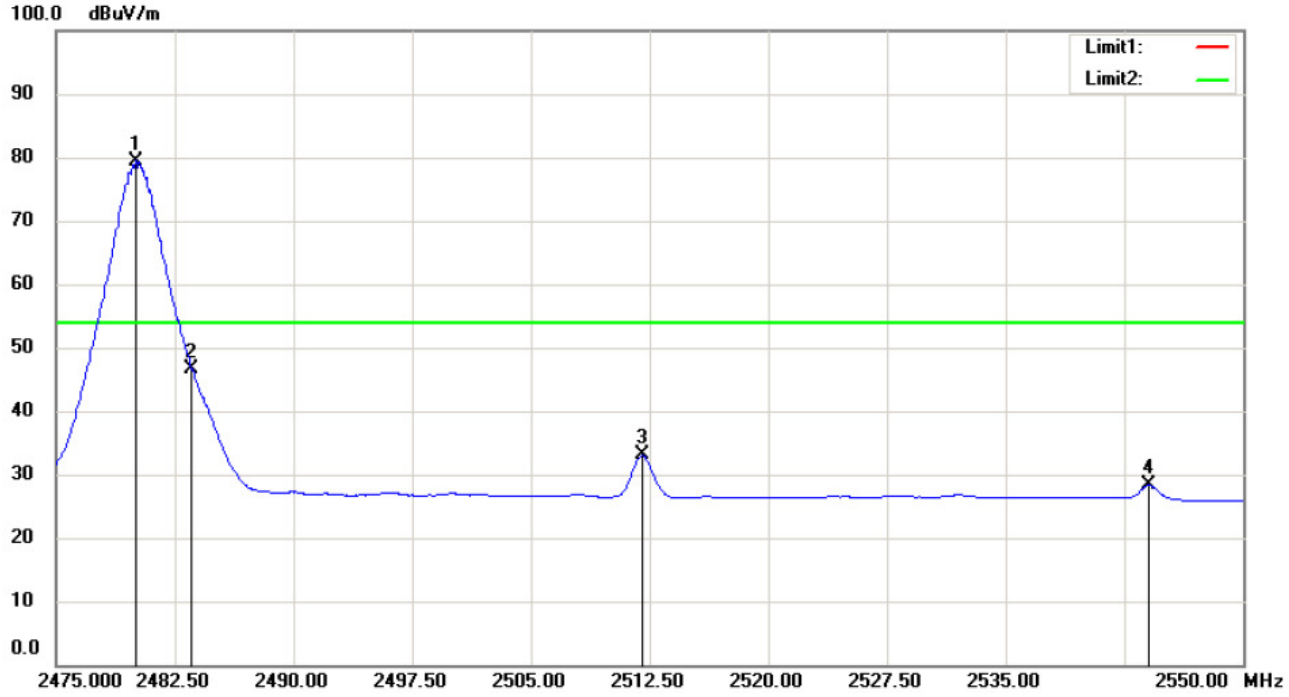
CH Low 2480MHz **Modulation: GFSK**

Horizontal, Peak Detector:



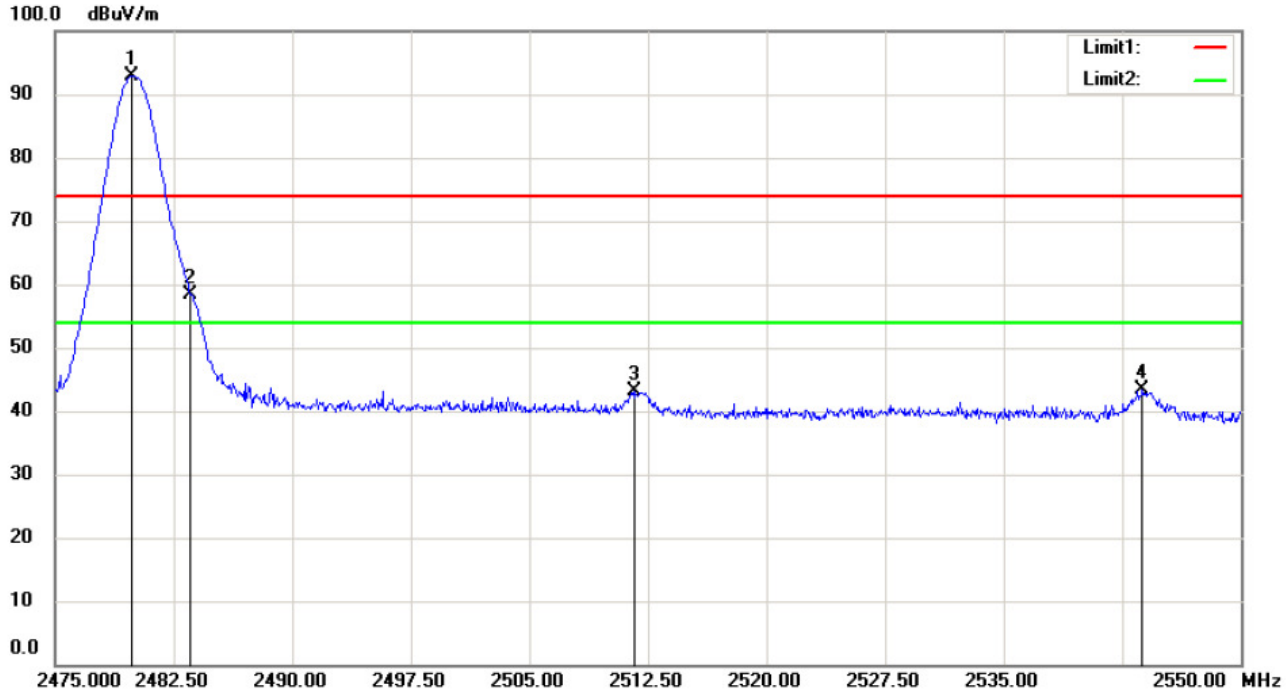
MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2480.025	94.98	-0.99	93.99	74	19.99	Peak
2	2483.500	59.06	-1.01	58.05	74	-15.95	Peak
3	2512.050	44.29	-0.97	43.32	74	-30.68	Peak

Horizontal, Average Detector:



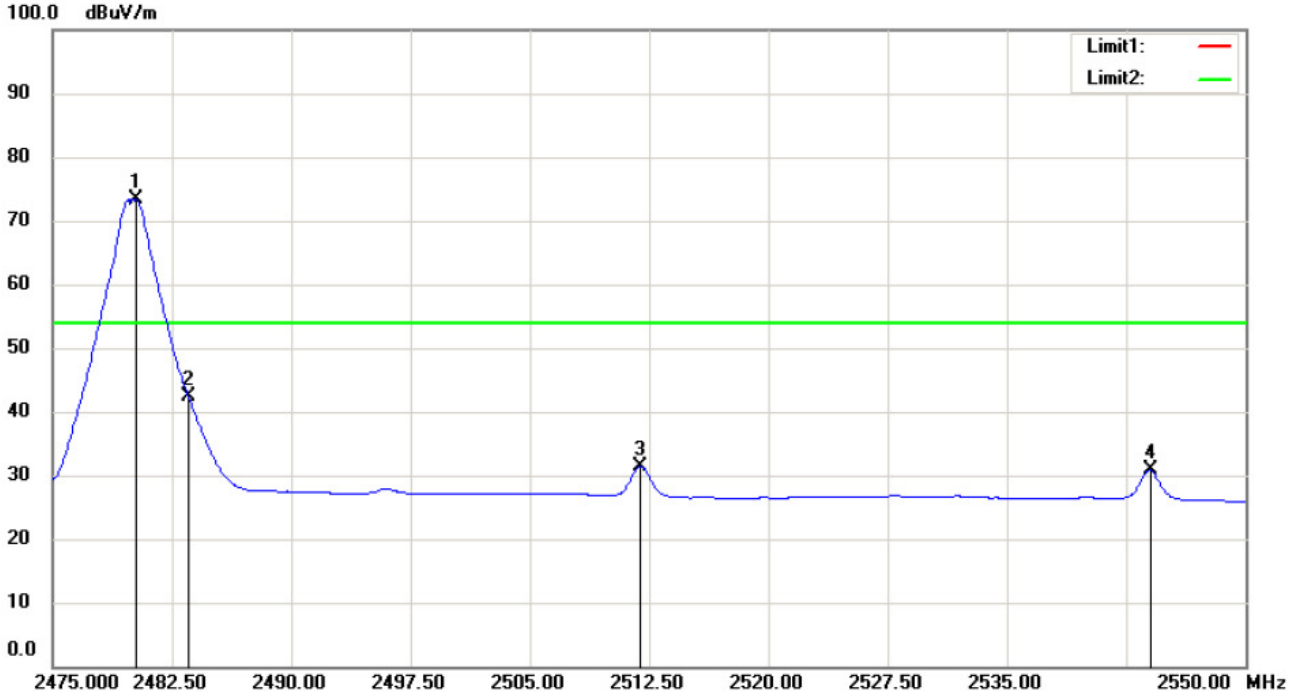
MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2480.025	80.49	-0.99	79.50	54	25.5	Peak
2	2483.500	47.76	-1.01	46.75	54	-7.25	Peak
3	2512.050	34.00	-0.97	33.03	54	-20.97	Peak
4	2544.000	28.97	-0.62	28.35	54	-25.65	Peak

Vertical, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.875	93.90	-0.99	92.91	74	18.91	Peak
2	2483.500	59.46	-1.01	58.45	74	-15.55	Peak
3	2511.675	44.14	-0.97	43.17	74	-30.83	Peak
4	2543.775	43.89	-0.62	43.27	74	-30.73	Peak

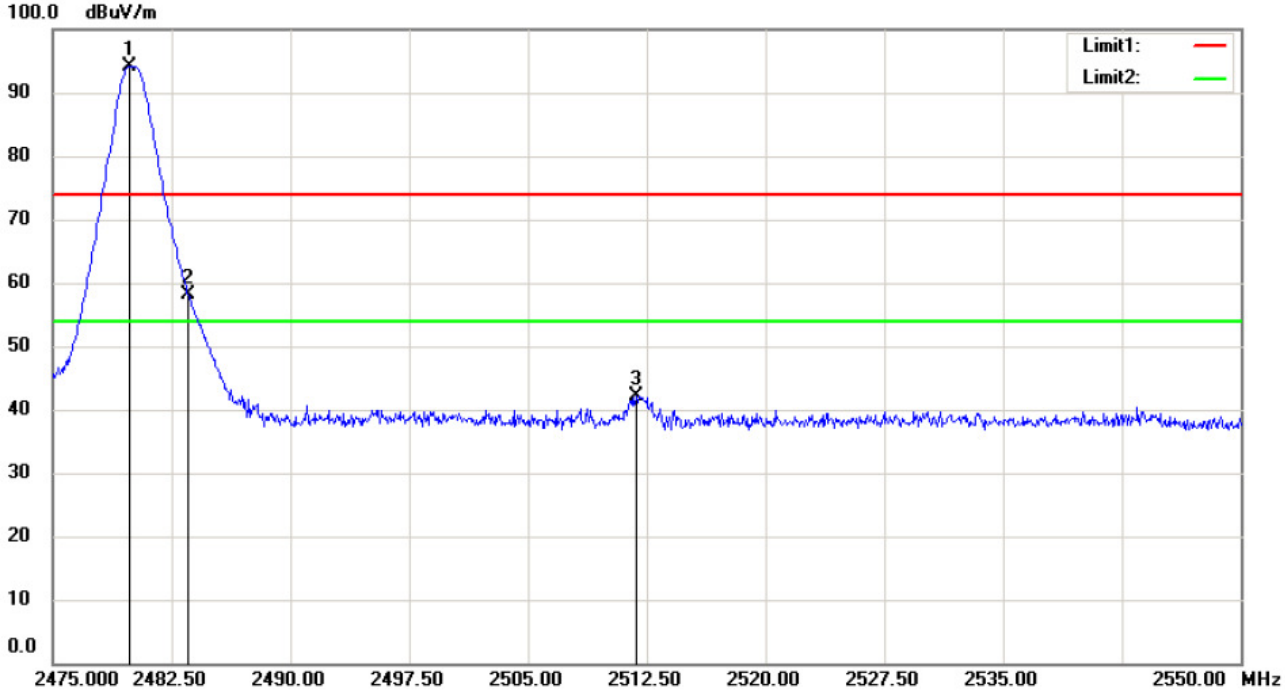
Vertical, Average Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2480.250	74.44	-0.99	73.45	54	19.45	Peak
2	2483.500	43.31	-1.01	42.30	54	-11.7	Peak
3	2511.900	32.38	-0.97	31.41	54	-22.59	Peak
4	2544.000	31.49	-0.62	30.87	54	-23.13	Peak

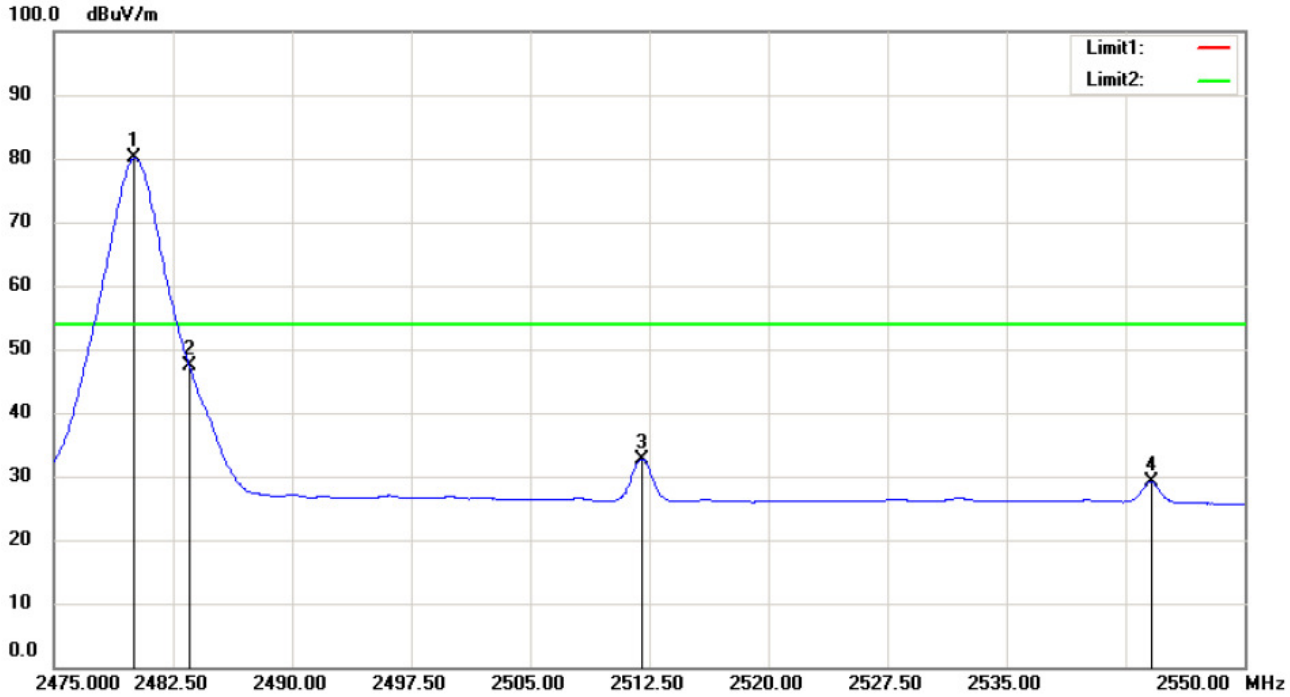
CH Low 2480MHz **Modulation: π/4DQPSK**

Horizontal, Peak Detector:



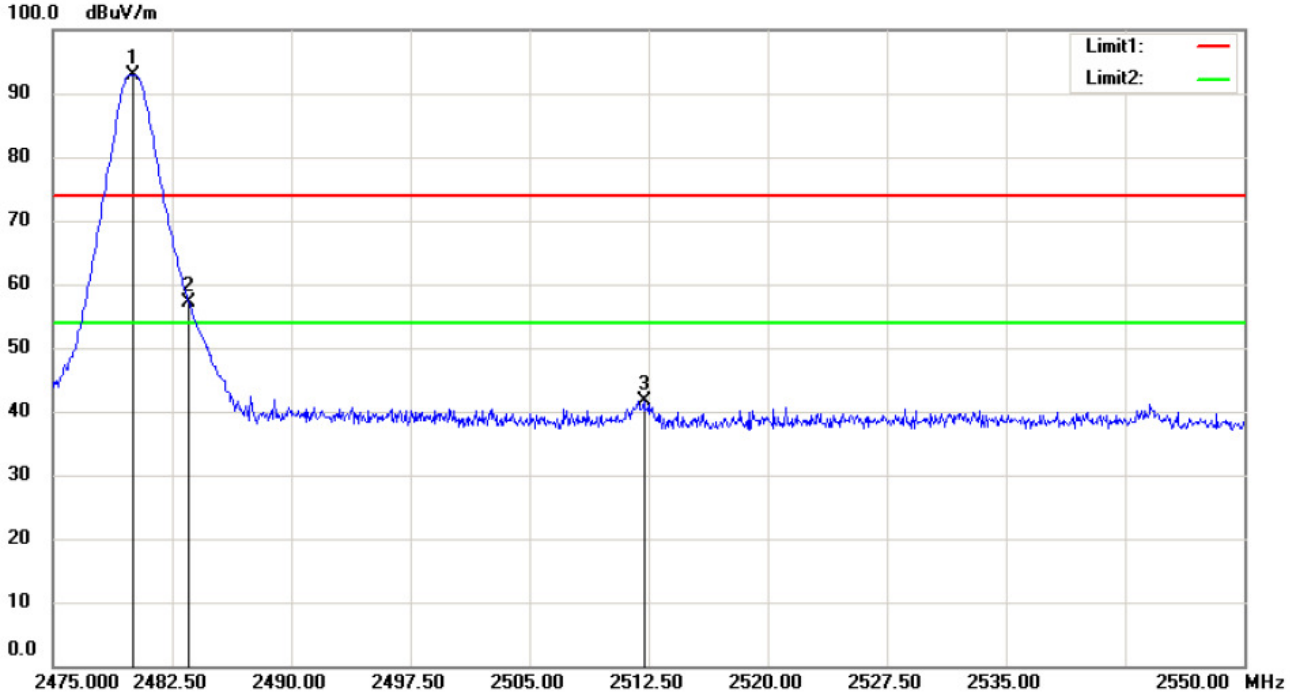
MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.875	95.20	-0.99	94.21	74	20.21	Peak
2	2483.500	59.16	-1.01	58.15	74	-15.85	Peak
3	2511.825	43.20	-0.97	42.23	74	-31.77	Peak

Horizontal, Average Detector:



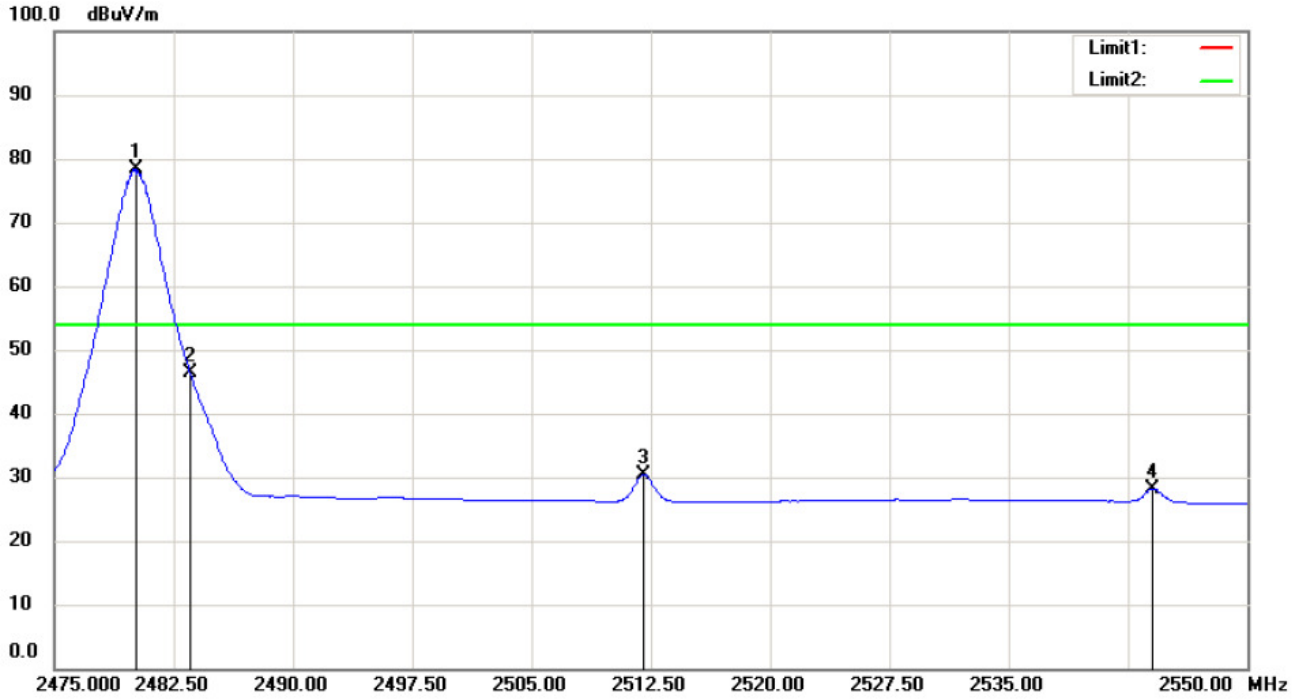
MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2480.025	81.04	-0.99	80.05	54	26.05	Peak
2	2483.500	48.32	-1.01	47.31	54	-6.69	Peak
3	2512.050	33.66	-0.97	32.69	54	-21.31	Peak
4	2544.150	29.73	-0.62	29.11	54	-24.89	Peak

Vertical, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2480.025	93.92	-0.99	92.93	74	18.93	Peak
2	2483.500	58.12	-1.01	57.11	74	-16.89	Peak
3	2512.200	42.57	-0.97	41.60	74	-32.4	Peak

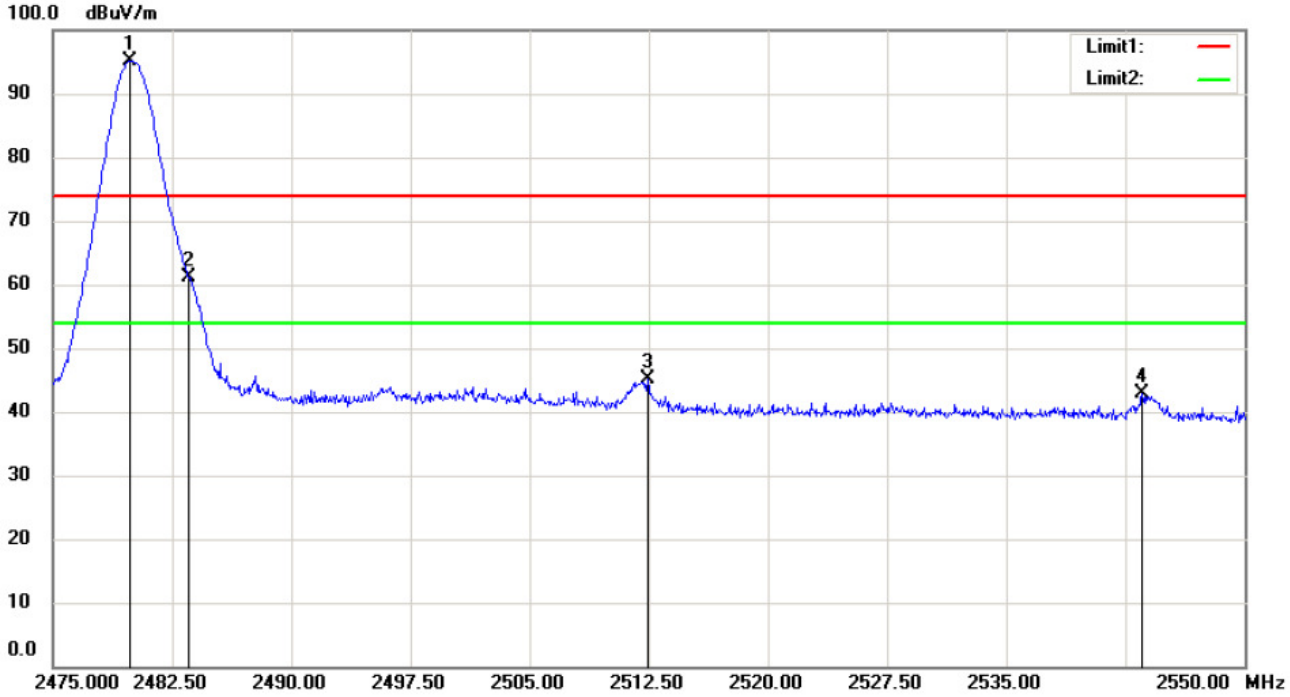
Vertical, Average Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2480.175	79.40	-0.99	78.41	54	24.41	Peak
2	2483.500	47.36	-1.01	46.35	54	-7.65	Peak
3	2512.050	31.44	-0.97	30.47	54	-23.53	Peak
4	2544.075	28.80	-0.62	28.18	54	-25.82	Peak

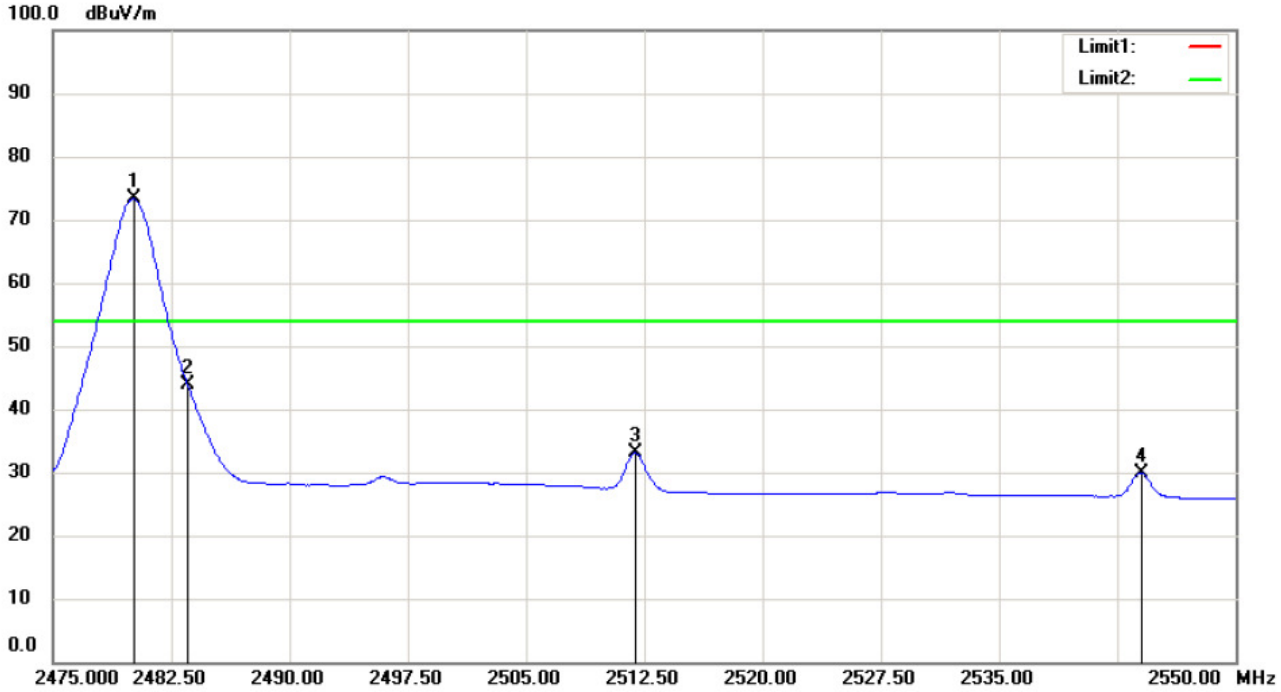
CH Low 2480MHz **Modulation: 8DPSK**

Horizontal, Peak Detector:



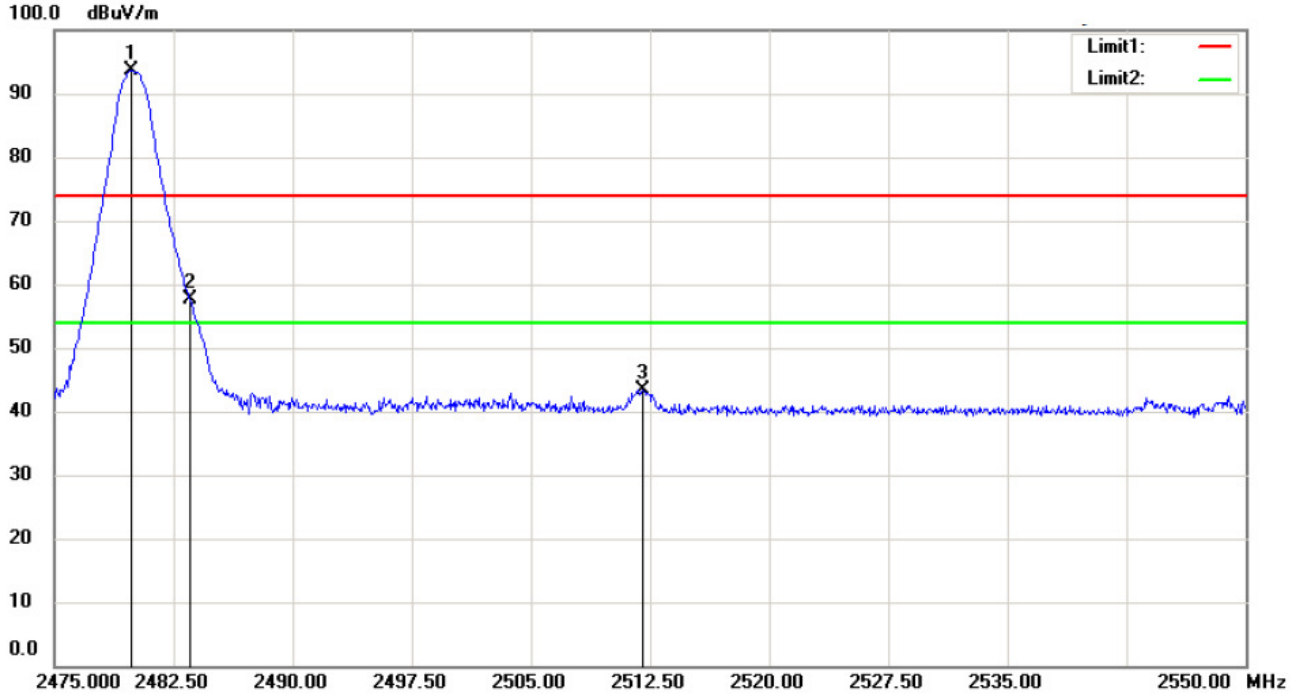
MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.800	96.17	-0.99	95.18	74	21.18	Peak
2	2483.500	62.18	-1.01	61.17	74	-12.83	Peak
3	2512.425	45.98	-0.97	45.03	74	-28.97	Peak
4	2543.550	43.54	-0.62	42.92	74	-31.08	Peak

Horizontal, Average Detector:



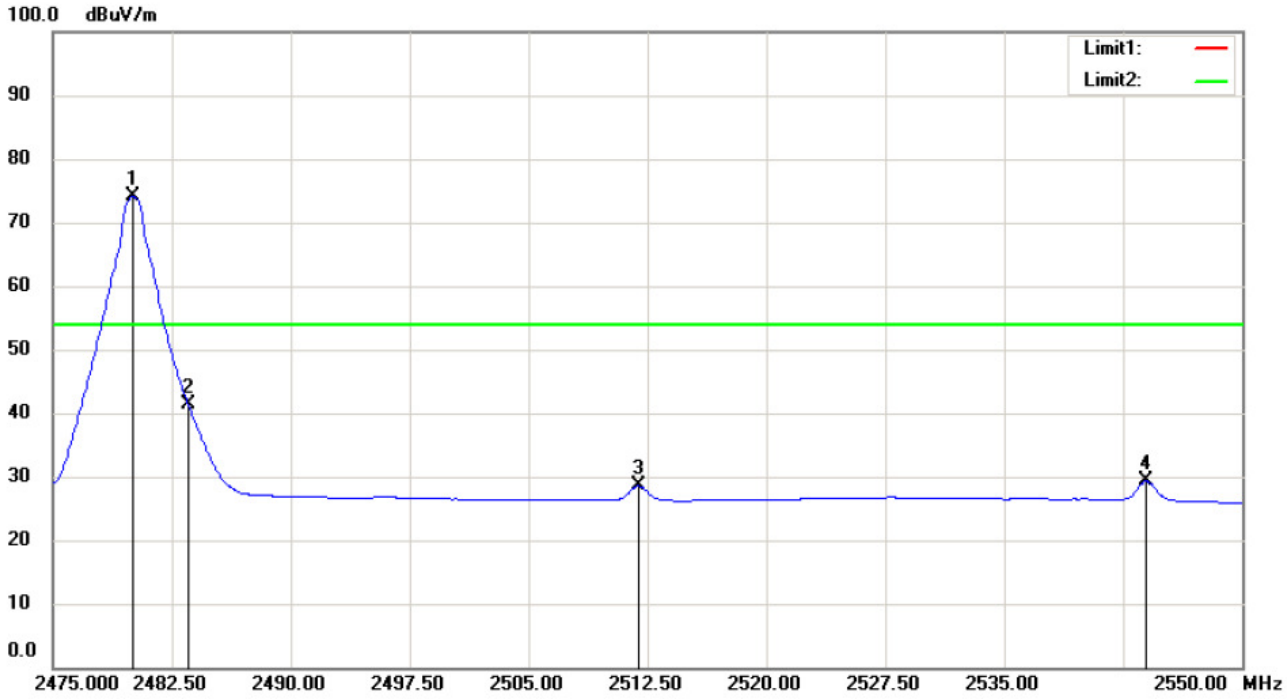
MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2480.100	74.32	-0.99	73.33	54	19.33	Peak
2	2483.500	44.80	-1.01	43.79	54	-10.21	Peak
3	2511.900	34.04	-0.97	33.07	54	-20.93	Peak
4	2544.000	30.58	-0.62	29.96	54	-24.04	Peak

Vertical, Peak Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2479.800	94.61	-0.99	93.62	74	19.62	Peak
2	2483.500	58.57	-1.01	57.56	74	-16.44	Peak
3	2512.050	44.37	-0.97	43.40	74	-30.6	Peak

Vertical, Average Detector:



MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Over Limit (dB)	Detector
1	2480.025	75.04	-0.99	74.05	54	20.05	Peak
2	2483.500	42.46	-1.01	41.45	54	-12.55	Peak
3	2511.900	29.56	-0.97	28.59	54	-25.41	Peak
4	2543.925	29.94	-0.62	29.32	54	-24.68	Peak

Except as shown in paragraph 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
[1]0.495 - 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	10.5 - 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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

7.13 Occupied Bandwidth Test

Test Requirement: RSS-Gen Issue 3 Clause 4.6.1

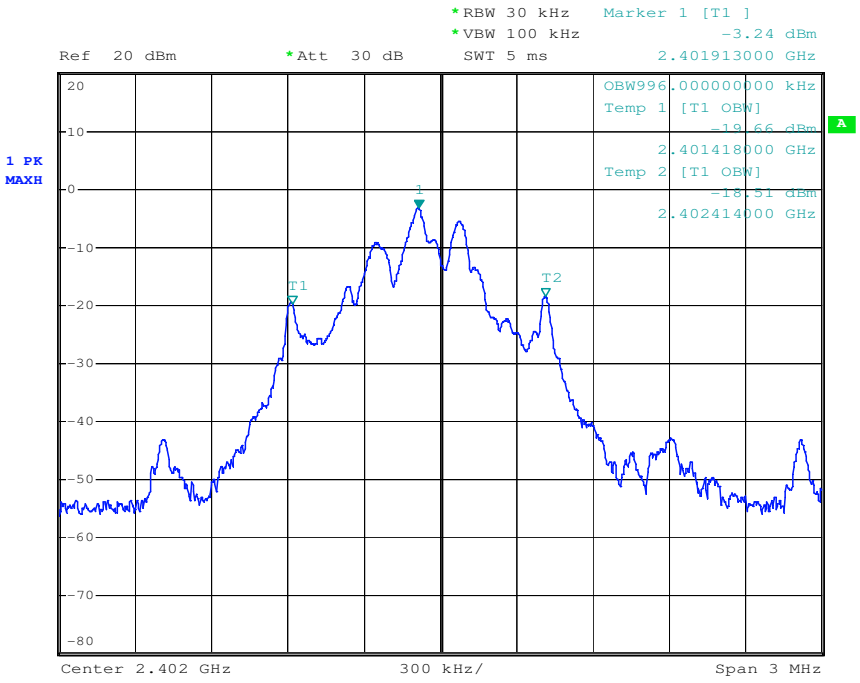
Standard Applicable According to the section RSS-Gen Issue 3 Clause 4.6.1

EUT Setup The occupied bandwidth per RSS-Gen Issue 3 Clause 4.6.1 was measured using the Spectrum Analyzer with the resolutions set at 100kHz,the video bandwidth set at 300kHz.

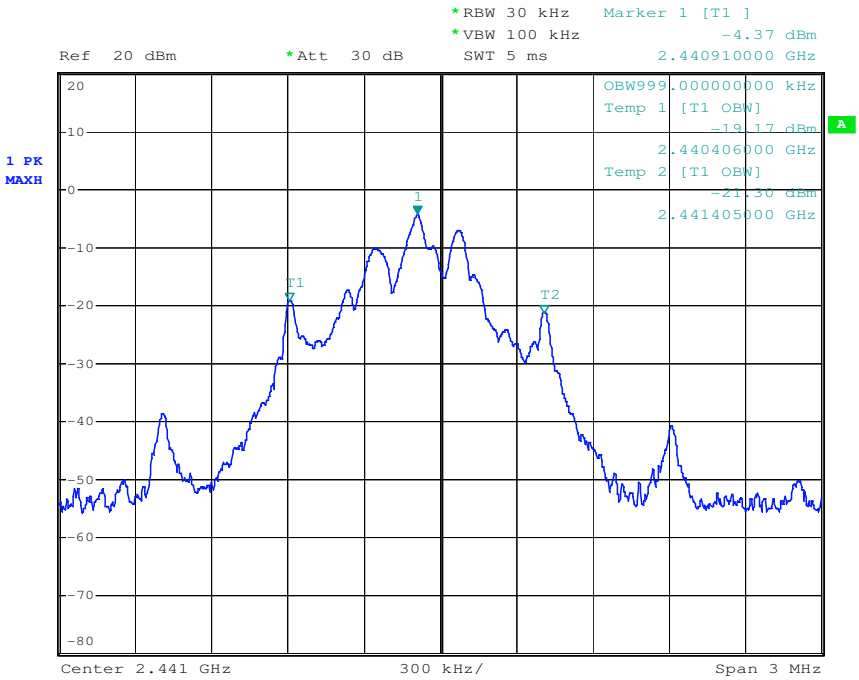
Measurement Result:

Test Mode	Channel	Frequency (MHz)	Bandwidth (MHz)
GFSK	LOW	2402	0.996
	MID	2441	0.999
	HIGH	2480	0.996
π/4DQPSK	LOW	2402	1.077
	MID	2441	1.077
	HIGH	2480	1.074
8DPSK	LOW	2402	1.116
	MID	2441	1.116
	HIGH	2480	1.116

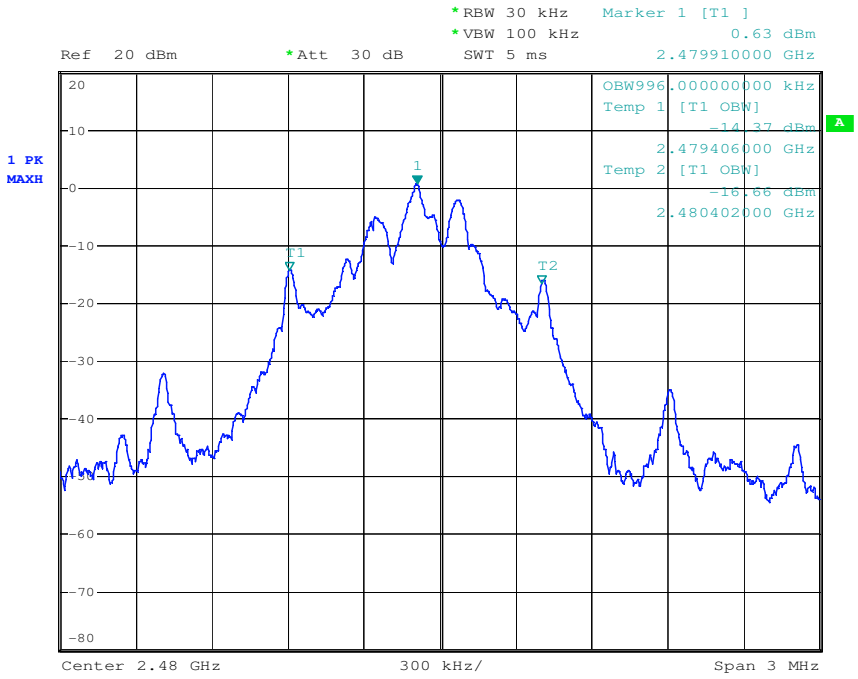
Test mode:	GFSK	Test channel:	Low



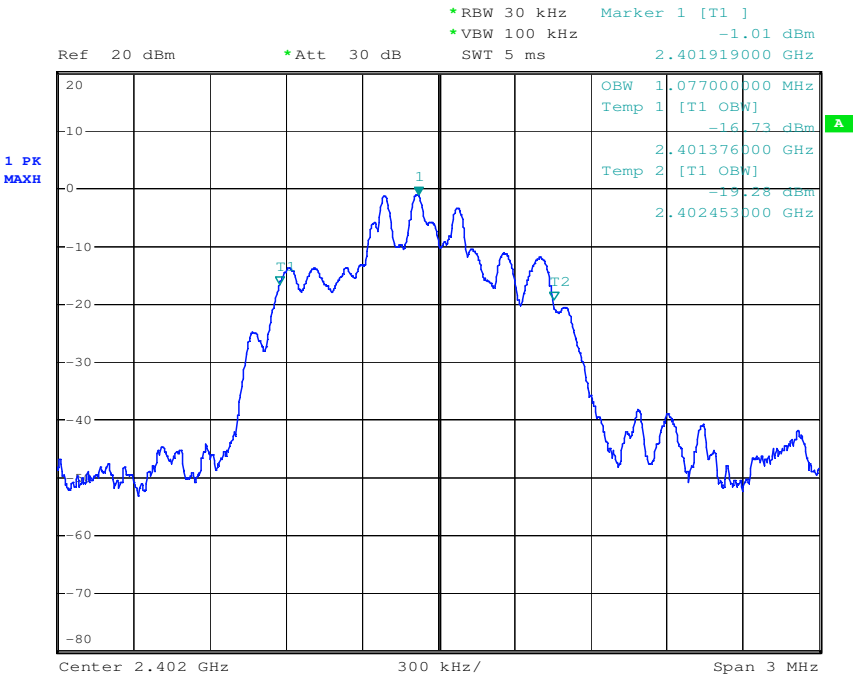
Test mode:	GFSK	Test channel:	Middle



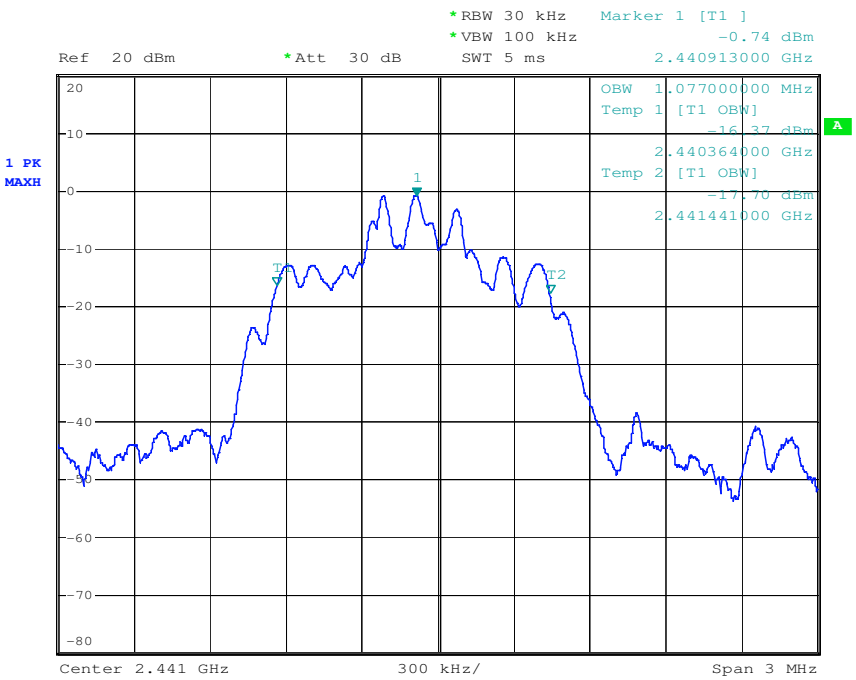
Test mode:	GFSK	Test channel:	High



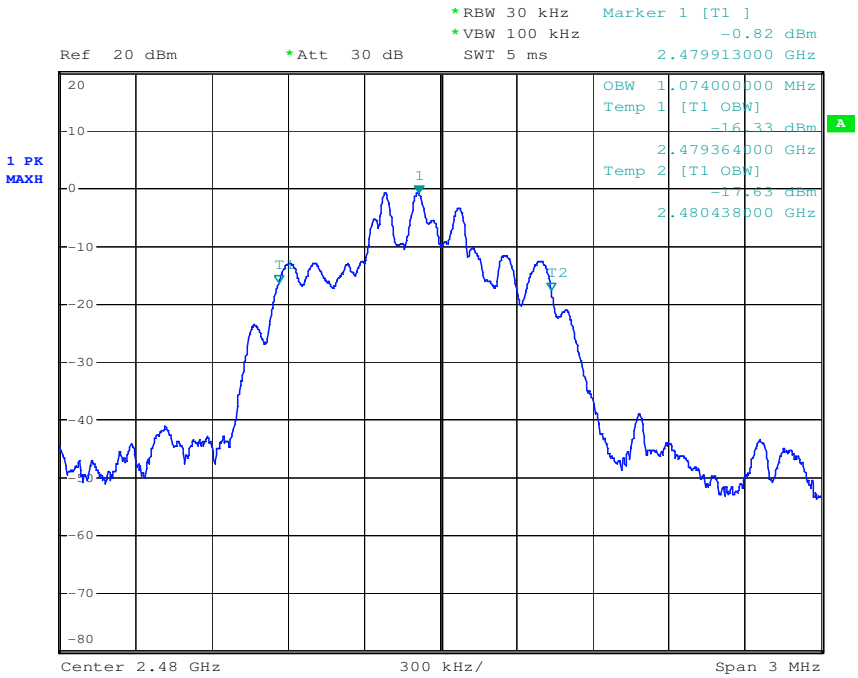
Test mode:	π /4DQPSK	Test channel:	Low



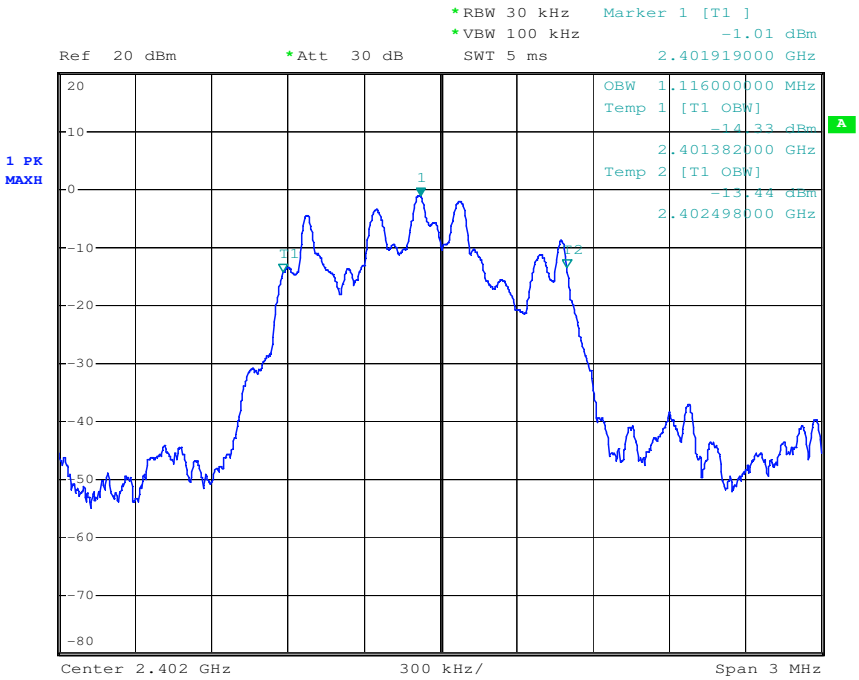
Test mode:	π /4DQPSK	Test channel:	Middle



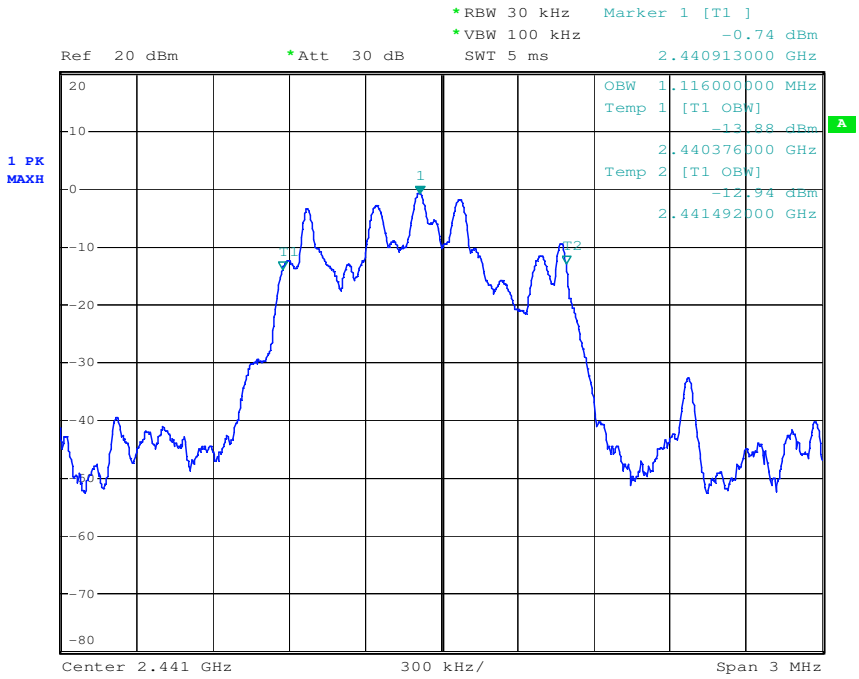
Test mode:	π /4DQPSK	Test channel:	High



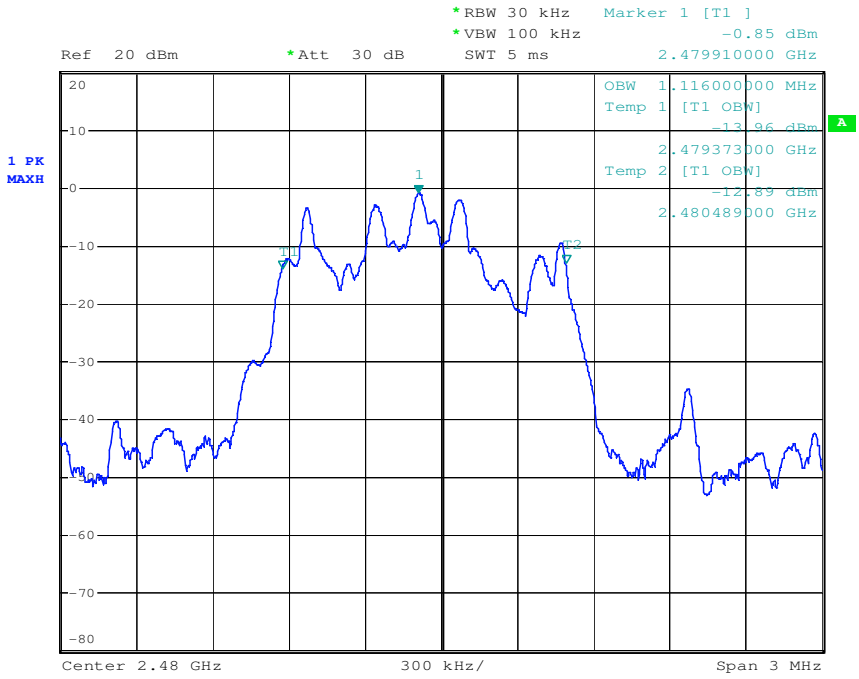
Test mode:	8DPSK	Test channel:	Low



Test mode:	8DPSK	Test channel:	Middle



Test mode:	8DPSK	Test channel:	High



8 Test Setup Photographs

Refer to the <VIFA_Test Setup photos -FCC >.

9 EUT Constructional Details

Refer to the <VIFA_External Photos -FCC > & <VIFA_Internal Photos –FCC >.

--End of the Report--