Application for FCC Certification
On behalf of

Bellman & Symfon Europe AB

Product Name: Visit Smart Hub

Model No.: BE1310

FCC ID: WMSBE1310US

Prepared For : Bellman & Symfon Europe AB
Sodra Langebergsgatan 30 421 32
Vastra Frolunda, Sweden

Prepared By :Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F15209
Date of Test : Oct. 26 – Nov. 01, 2015
Date of Report : Nov. 02, 2015

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TEST REPORT FOR FCC CERTIFICATE

Applicant : Bellman & Symfon Europe AB

Manufacturer : Bellman & Symfon Europe AB

EUT Description : Visit Smart Hub

(A) Model No. : BE1310
(B) Power Supply : AC 120V/60Hz
(C) Test Voltage : AC 120V/60Hz

Test Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2014 AND ANSI C63.10-2013

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: BE1310), which was tested on Oct. 26 – Nov. 01, 2015is technically compliance with the FCC limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report contains data that are not covered by the NVLAP accreditation.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Oct. 25 – Nov. 01, 2015 **Date of Report :** Nov. 02, 2015

Producer : Alan He
ALAN HE / Assistant

Review : Sammy Chen
SAMMY CHEN/ Manager

AUDIX® For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory :
Authorized Signature EMC **BYRON KWO/Assistant General Manager**

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

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

Description / Test Item	Test Standard	Results	Meets Limit
EMISSION			
Conducted Emission Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND ANSI C63.10:2013	Pass	15.207
Spurious Radiated Emissions Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND ANSI C63.10:2013 AND DA 00-705	Pass	15.209(a) 15.205(a)(c)
20 dB Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND DA 00-705	Pass	15.247(a)(1)
Peak Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND DA 00-705	Pass	15.247(b)(1)
Spurious RF Conducted Emissions Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND DA 00-705	Pass	15.247(d)
Band-edge Compliance of RF Conducted Emissions Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND DA 00-705	Pass	15.247(d)
Number of Hopping Frequencies Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND DA 00-705	Pass	15.247(a)(1)
Carrier Frequency Separation Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND DA 00-705	Pass	15.247(a)(1)
Dwell Time Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND DA 00-705	Pass	15.247(a)(1)
N/A is an abbreviation for Not Applicable.			

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description	:	Visit Smart Hub
Model Number	:	BE1310
Type of EUT		☑ Production ☐ Pre-product ☐ Pro-type
Radio Tech	:	Bluetooth 3.0 (GFSK, π/4-DQPSK, 8DPSK)
Freq. Band	:	2402 MHz ~ 2480 MHz Total 79 Channels:
Tested Freq.	:	2402 MHz (Channel 00) 2441 MHz (Channel 39) 2480 MHz (Channel 78)
Antenna Type	:	PCB antenna
Antenna Gain	:	2.0 dBi
RF Test Offset	:	1dB (cable loss)
Power Supply	:	Manufacturer : LEADER ELECTRONIC INC. M/N : MU03B6050055-A1 Input : 100~240V~50/60Hz Output : 5.0V 0.55A
Applicant	:	Bellman & Symfon Europe AB Sodra Langebergsgatan 30 421 32 Vastra Frolunda, Sweden
Manufacturer	:	Same as Applicant
Factory	:	Xingtel Xiamen Group Co., Ltd. Xingtel Building, Torch Industrial District, Xiamen 361006, P.R. China

2.2 Peripherals

2.2.1 Notebook PC

Manufacturer	:	DELL
Model Number	:	P51F
Certificate	:	FCC DoC; CE/EMC; VCCI; IC

2.3 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	: Sept. 17, 1998 file on Jan. 15, 2015 Renewed Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, USA
Name of Firm	: Audix Technology (Shanghai) Co., Ltd.
Site Location	: 3 F 34 Bldg 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai 200233, China
FCC registration Number	: 91789
Accredited by NVLAP, Lab Code	: 200371-0

2.4 Measurement Uncertainty

Conducted Emission Expanded Uncertainty	:	U = 3.4dB
Radiated Emission Expanded Uncertainty (30-200MHz):		U = 4.6 dB (H) U = 4.3 dB (V)
Radiated Emission Expanded Uncertainty (200M-1GHz):		U = 5.4 dB (H) U = 4.5 dB (V)
Radiated Emission Expanded Uncertainty (Above 1GHz):		U = 5.1 dB
20 dB Bandwidth Expanded Uncertainty	:	U = $1x10^{-8}$ MHz
Peak Output Power Expanded Uncertainty	:	U = 1.56 dB
Spurious RF Conducted Emissions Expanded Uncertainty	:	U = 1.20 dB

3 CONDUCTED EMISSION TEST

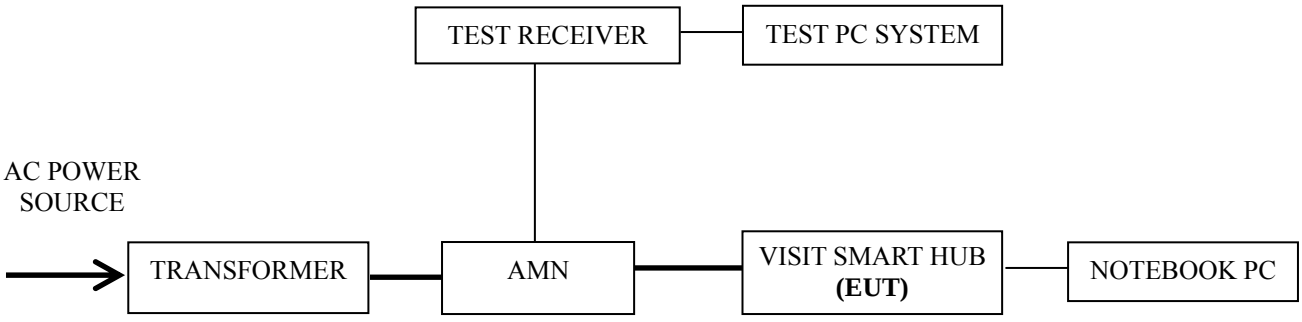
3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Apr 27, 2015	Apr 26, 2016
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Feb 25, 2015	Feb 24, 2016
3.	50Ω Coaxial Switch	Anritsu	MP59B	6200426389	Sep 18, 2015	Mar 17, 2016
4.	Software	Audix	E3	SET00200 9804M592	--	--

3.2 Block Diagram of Test Setup

3.2.1 Conducted Disturbance Test Setup



—— : Signal Line
▬ : Power Line

3.3 Conducted Emission Limit [FCC Part 15 Subpart B 15.207]

Frequency Range (MHz)	Limits dB (μV)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56	56~46
0.5 ~ 5	56	46
5 ~ 30	60	50
NOTE 1 – The lower limit shall apply at the transition frequencies. NOTE 2 – The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz~0.50 MHz		

3.4 Test Configuration

The EUT (listed in Sec.2.1) and the peripherals (listed in Sec 2.2) were installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner that tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipments and the EUT.

3.5.3 Turn the EUT on the test mode, and then test.

3.6 Test Procedures

The EUT were connected to the power mains through an Artificial Mains Network (AMN). This provided a 50 ohm coupling impedance for the measuring equipment.

Both sides of AC line (Line & Neutral) were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.10:2013 during conducted emission test.

The bandwidth of R&S Test Receiver ESCI was set at 9 kHz.

The frequency range from 150 kHz to 30 MHz was checked.

The test modes were done on conducted disturbance test and all the test results are listed in Sec. 3.7.

3.7 Test Results

< PASS >

The frequency and amplitude of the highest conducted emission relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

NOTE 1 – Factor = Cable Loss + AMN Factor.
NOTE 2 – Emission Level = Meter Reading + Factor.
NOTE 3 – "QP" means "Quasi-Peak" values, "AV" means "Average" values.
NOTE 4 –The worst emission is detected at 1.403 MHz (Average Value) with corrected signal level of 13.86dB (μV) (limit is 46.00 dB (μV)), when the Neutral of the EUT is connected to AMN.

EUT	:	Visit Smart Hub	Temperature :	22℃	
Model No.	:	BE1310	Humidity	:	48%RH
Test Mode	:	Transmitting	Date of Test	:	Oct. 30, 2015

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	29.98	0.16	30.14	66.00	35.86	QP
	0.174	27.82	0.16	27.98	64.77	36.79	
	0.247	22.80	0.17	22.97	61.86	38.89	
	1.282	16.67	0.27	16.94	56.00	39.06	
	1.449	**15.58**	**0.28**	**15.86**	**56.00**	**40.14**	
	3.472	16.29	0.33	16.62	56.00	39.38	
	0.150	14.56	0.16	14.72	56.00	41.28	AV
	0.174	14.26	0.16	14.42	54.77	40.35	
	0.247	10.51	0.17	10.68	51.86	41.18	
	1.282	10.28	0.27	10.55	46.00	35.45	
	1.449	**10.45**	**0.28**	**10.73**	**46.00**	**35.27**	
	3.472	4.59	0.33	4.92	46.00	41.08	
Neutral	0.150	30.05	0.16	30.21	66.00	35.79	QP
	0.180	27.81	0.17	27.98	64.50	36.52	
	0.247	22.73	0.17	22.90	61.86	38.96	
	0.796	14.46	0.23	14.69	56.00	41.31	
	1.403	**15.18**	**0.28**	**15.46**	**56.00**	**40.54**	
	3.364	16.07	0.36	16.43	56.00	39.57	
	0.150	15.69	0.16	15.85	56.00	40.15	AV
	0.180	14.69	0.17	14.86	54.50	39.64	
	0.247	12.37	0.17	12.54	51.86	39.32	
	0.796	12.64	0.23	12.87	46.00	33.13	
	1.403	**13.58**	**0.28**	**13.86**	**46.00**	**32.14**	
	3.364	12.37	0.36	12.73	46.00	33.27	

TEST ENGINEER: WENCY YANG

4 RADIATED EMISSION TEST

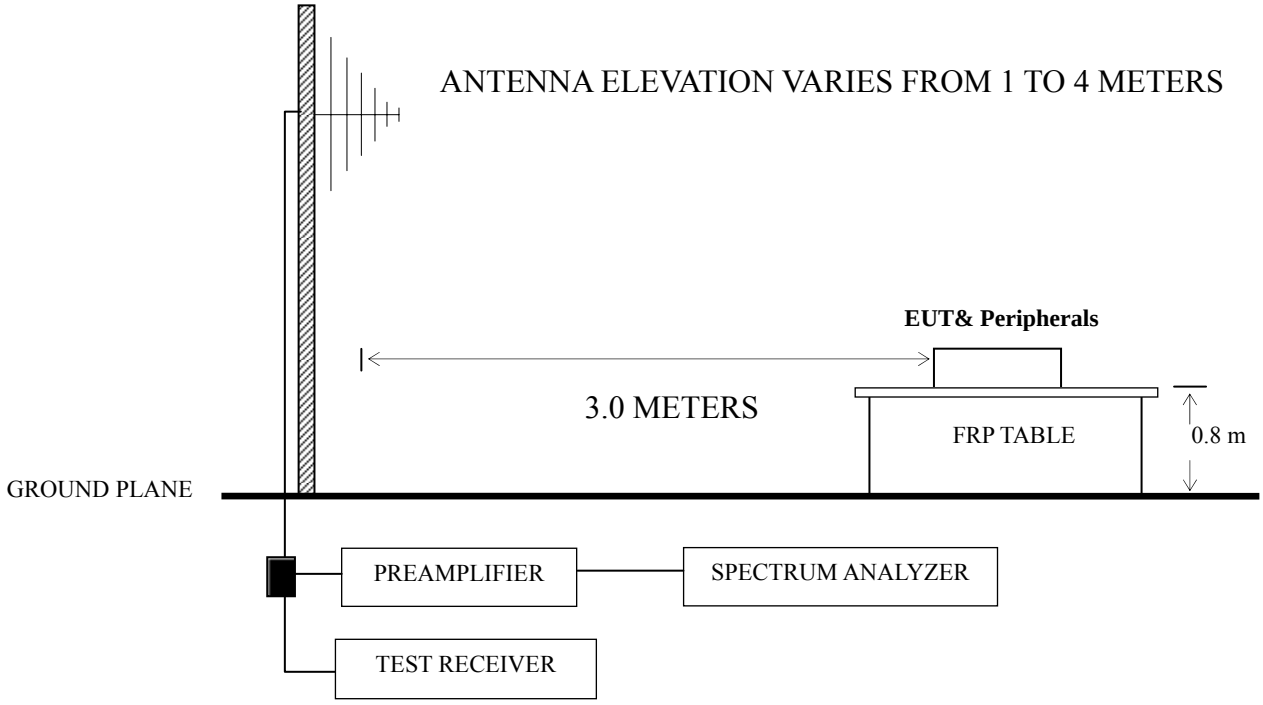
4.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Preamplifier	Agilent	8447D	2944A06664	Apr 27, 2015	Apr 26, 2016
2.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2015	Mar 19, 2016
3.	EXA Signal Analyzer	Agilent	N9010A	MY52221182	Jun 12, 2015	Jun 11, 2016
4.	Test Receiver	R&S	ESCI	101303	May 07, 2015	May 06, 2016
5.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 15, 2015	May 15, 2016
6.	Horn Antenna	EMCO	3115	96074878	Jun 03, 2015	Jun 02, 2016
7.	Horn Antenna	EMCO	3116	00062643	Jul 03, 2015	Jul 02, 2016
8.	50Ω Coaxial Switch	Anritsu	MP59B	6200426389	Sep 18, 2015	Mar 17, 2016
9.	Software	Audix	E3	6.2007-9-10	-	-

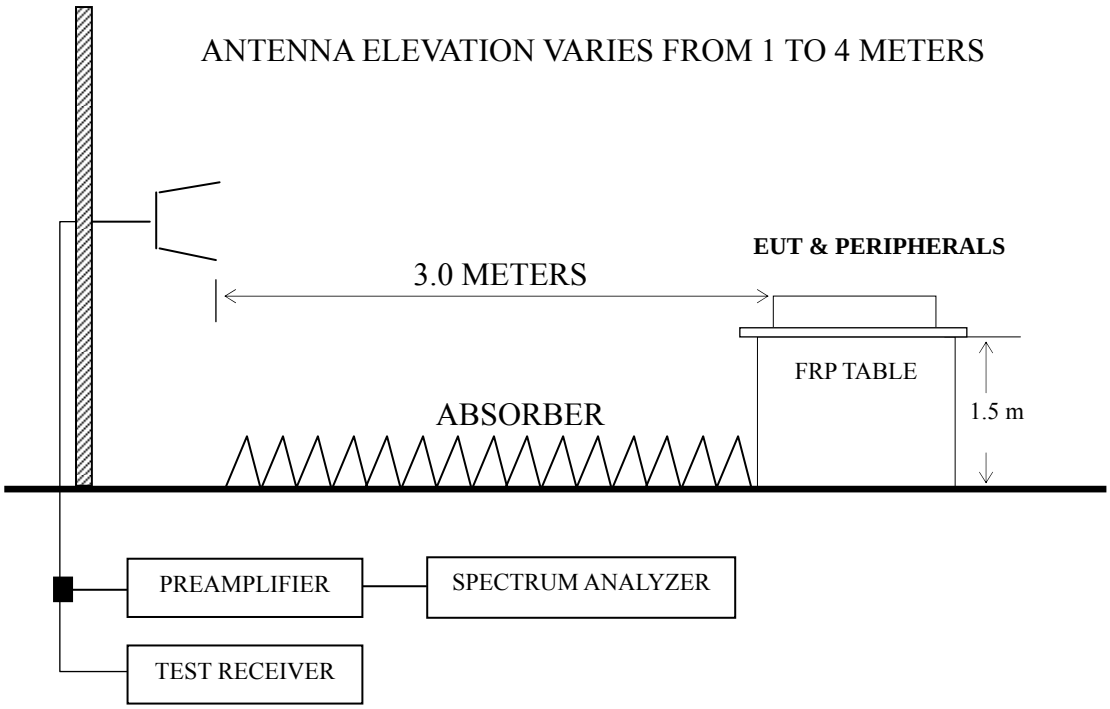
4.2 Block Diagram of Test Setup

4.2.1 Test Setup



■ : 50 ohm Coaxial Switch

4.2.2 Test Setup



■ : 50 ohm Coaxial Switch

4.3 Radiated Emission Limit [FCC Part 15 Subpart C 15.209]

Frequency (MHz)	Distance (m)	Field strength limits (μV/m)	
		(μV/m)	dB(μV/m)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

NOTE 1 - Emission Level dB (μV/m) = 20 log Emission Level (μV/m)
NOTE 2 - The tighter limit applies at the band edges.
NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.
NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT

4.4 Test Configuration

The EUT (listed in Sec.2.1) and the peripherals (listed in Sec.2.2) were installed as shown on Sec.4.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

4.5 Operating Condition of EUT

4.5.1 Setup the EUT as shown in Sec. 4.2.

4.5.2 Turn on the power of all equipment.

4.5.3 Turn the EUT on the test mode, and then test.

4.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a turntable that is 0.8 meter below 1GHz or 1.5m above 1GHz above ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.10:2013 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of the VBW was set at 1MHz and RBW was set at 1MHz for peak emission measurement above 1GHz for Spectrum Agilent N9010A.

The frequency range from 30 MHz to 25 GHz (Up to 10^{th} harmonics from fundamental frequency) was checked.

The EUT was tested under the following test modes:

Mode	Operation	Channel	Frequency
1.	Transmitting	00	2402 MHz
2.		39	2441 MHz
3.		78	2480 MHz
4.	Receiving	--	--
5.	Transmitting Band-Edge	00	2402 MHz
6.		78	2480 MHz

All the test results are listed in Sec.4.7.

4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

No.	Operation	Channel	Frequency	Data Page
1.	Transmitting (1M GFSK)	00	2402 MHz	P15
2.		39	2441 MHz	P16
3.		78	2480 MHz	P17
4.	Transmitting (3M 8-DPSK)	00	2402 MHz	P18
5.		39	2441 MHz	P19
6.		78	2480 MHz	P20
7.	Receiving	--	--	P21
8.	Transmitting	Band Edge		P22

NOTE 1 – Level = Read Level + Antenna Factor + Cable Loss (<1GHz)
NOTE 2 – Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor (>1GHz)
NOTE 3 – All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.
For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

EUT	:	Visit Smart Hub	Temperature :	22℃
Model No.	:	BE1310	Humidity :	40%RH
Test Mode	:	Transmitting Ch00 (1M GFSK)	Date of Test :	Nov. 01, 2015

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	50.94	23.89	0.82	7.38	--	32.09	40.00	7.91	QP
	191.75	23.25	1.92	10.23	--	35.40	43.50	8.10	
	213.02	**23.49**	**2.02**	**10.13**	**--**	**35.64**	**43.50**	**7.86**	
	224.52	23.17	2.07	10.75	--	35.99	46.00	10.01	
	255.62	18.18	2.22	12.70	--	33.10	46.00	12.90	
	303.54	17.64	2.60	13.91	--	34.15	46.00	11.85	
	1603.25	56.88	4.01	26.04	35.55	51.38	74.00	22.62	PK
	3147.75	48.74	5.93	30.82	35.05	50.44	74.00	23.56	
	4804.00	46.19	6.33	33.91	33.97	52.46	74.00	21.54	
Vertical	**52.95**	**15.14**	**0.83**	**6.92**	**--**	**22.89**	**40.00**	**17.11**	QP
	107.89	10.92	1.38	12.56	--	24.86	43.50	18.64	
	172.00	8.93	1.78	10.81	--	21.52	43.50	21.98	
	226.89	11.40	2.08	10.96	--	24.44	46.00	21.56	
	265.68	11.10	2.29	13.20	--	26.59	46.00	19.41	
	310.00	10.91	2.60	14.10	--	27.61	46.00	18.39	
	1803.01	49.82	4.15	26.82	35.31	45.48	74.00	28.52	PK
	4197.59	48.12	6.31	33.12	34.21	53.34	74.00	20.66	
	4804.00	46.70	6.33	33.91	33.97	52.97	74.00	21.03	

TEST ENGINEER: BILL WU

EUT	:	Visit Smart Hub	Temperature :	22℃
Model No.	:	BE1310	Humidity :	40%RH
Test Mode	:	Transmitting Ch39 (1M GFSK)	Date of Test :	Nov. 01, 2015

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	52.03	22.54	0.83	7.10	--	30.47	40.00	9.53	QP
	104.90	17.97	1.35	12.50	--	31.82	43.50	11.68	
	191.75	18.41	1.92	10.23	--	30.56	43.50	12.94	
	223.73	20.50	2.07	10.70	--	33.27	46.00	12.73	
	255.62	20.50	2.22	12.70	--	35.42	46.00	10.58	
	302.48	**21.13**	**2.59**	**13.88**	**--**	**37.60**	**46.00**	**8.40**	
	1629.30	56.92	4.03	26.15	35.52	51.58	74.00	22.42	PK
	3140.51	48.78	5.93	30.80	35.06	50.45	74.00	23.55	
	4882.00	45.81	6.24	33.99	33.94	52.10	74.00	21.90	
Vertical	47.99	20.02	0.79	8.90	--	29.71	40.00	10.29	QP
	52.03	**23.10**	**0.83**	**7.10**	**--**	**31.03**	**40.00**	**8.97**	
	114.92	10.69	1.43	12.70	--	24.82	43.50	18.68	
	191.75	13.35	1.92	10.23	--	25.50	43.50	18.00	
	223.73	16.74	2.07	10.70	--	29.51	46.00	16.49	
	245.09	13.72	2.14	12.30	--	28.16	46.00	17.84	
	3296.10	48.03	6.03	31.12	34.90	50.28	74.00	23.72	PK
	4197.59	48.47	6.31	33.12	34.21	53.69	74.00	20.31	
	4882.00	45.80	6.24	33.99	33.94	52.09	74.00	21.91	

TEST ENGINEER: BILL WU

EUT	:	Visit Smart Hub	Temperature :	22℃	
Model No.	:	BE1310	Humidity :	40%RH	
Test Mode	:	Transmitting Ch78 (1M GFSK)	Date of Test :	Nov. 01, 2015	

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	50.06	21.12	0.81	7.60	--	29.53	40.00	10.47	QP
	128.11	8.65	1.51	12.90	--	23.06	43.50	20.44	
	191.75	19.70	1.92	10.23	--	31.85	43.50	11.65	
	223.73	20.73	2.07	10.70	--	33.50	46.00	12.50	
	272.28	**22.15**	**2.35**	**13.26**	**--**	**37.76**	**46.00**	**8.24**	
	303.54	20.99	2.60	13.91	--	37.50	46.00	8.50	
	1655.77	54.36	4.06	26.25	35.48	49.19	74.00	24.81	PK
	3147.75	45.50	5.93	30.82	35.05	47.20	74.00	22.80	
	4960.00	44.58	6.14	34.06	33.91	50.87	74.00	23.13	
Vertical	**50.94**	**21.66**	**0.82**	**7.38**	**--**	**29.86**	**40.00**	**10.14**	QP
	107.89	11.45	1.38	12.56	--	25.39	43.50	18.11	
	191.75	17.13	1.92	10.23	--	29.28	43.50	14.22	
	223.73	16.97	2.07	10.70	--	29.74	46.00	16.26	
	255.62	10.95	2.22	12.70	--	25.87	46.00	20.13	
	287.99	12.01	2.49	13.58	--	28.08	46.00	17.92	
	3296.10	47.67	6.03	31.12	34.90	49.92	74.00	24.08	PK
	4197.59	47.30	6.31	33.12	34.21	52.52	74.00	21.48	
	4960.00	46.06	6.14	34.06	33.91	52.35	74.00	21.65	

TEST ENGINEER: BILL WU

EUT	:	Visit Smart Hub	Temperature :	22℃	
Model No.	:	BE1310	Humidity :	40%RH	
Test Mode	:	Transmitting Ch00 (3M 8-DPSK)	Date of Test :	Nov. 01, 2015	

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	50.94	13.60	0.82	7.38	--	21.80	40.00	18.20	QP
	104.90	16.06	1.35	12.50	--	29.91	43.50	13.59	
	128.11	14.73	1.51	12.90	--	29.14	43.50	14.36	
	191.75	21.89	1.92	10.23	--	34.04	43.50	9.46	
	224.00	**25.50**	**2.07**	**10.75**	**--**	**38.32**	**46.00**	**7.68**	
	294.11	21.03	2.52	13.60	--	37.15	46.00	8.85	
	1603.25	56.88	4.01	26.04	35.55	51.38	74.00	22.62	PK
	3147.75	49.85	5.93	30.82	35.05	51.55	74.00	22.45	
	4804.00	47.19	6.33	33.91	33.97	59.46	74.00	20.54	
Vertical	**50.94**	**21.33**	**0.82**	**7.38**	**--**	**29.53**	**40.00**	**10.47**	QP
	55.03	20.85	0.85	6.52	--	28.22	40.00	11.78	
	191.75	17.32	1.92	10.23	--	29.47	43.50	14.03	
	223.73	19.47	2.07	10.70	--	32.24	46.00	13.76	
	255.62	18.32	2.22	12.70	--	33.24	46.00	12.76	
	294.11	11.25	2.52	13.60	--	27.37	46.00	18.63	
	1803.02	54.65	4.15	26.82	35.31	50.31	74.00	23.69	PK
	4197.59	48.12	6.31	33.12	34.21	53.34	74.00	20.66	
	4804.00	46.70	6.33	33.91	33.97	52.97	74.00	21.03	

TEST ENGINEER: BILL WU

EUT	:	Visit Smart Hub	Temperature :	22℃
Model No.	:	BE1310	Humidity :	40%RH
Test Mode	:	Transmitting Ch39 (3M 8-DPSK)	Date of Test :	Nov. 01, 2015

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	52.95	16.61	0.83	6.92	--	24.36	40.00	15.64	QP
	104.90	10.17	1.35	12.50	--	24.02	43.50	19.48	
	128.11	10.83	1.51	12.90	--	25.24	43.50	18.26	
	191.75	22.00	1.92	10.23	--	34.15	43.50	9.35	
	223.73	**24.78**	**2.07**	**10.70**	**--**	**37.55**	**46.00**	**8.45**	
	264.75	21.74	2.29	13.20	--	37.23	46.00	8.77	
	1629.30	56.92	4.03	26.15	35.52	51.58	74.00	22.42	PK
	3140.51	49.89	5.93	30.80	35.06	51.56	74.00	22.44	
	4882.00	46.81	6.24	33.99	33.94	59.10	74.00	20.90	
Vertical	56.99	21.47	0.86	6.25	--	28.58	40.00	11.42	QP
	104.90	15.60	1.35	12.50	--	29.45	43.50	14.05	
	128.11	15.17	1.51	12.90	--	29.58	43.50	13.92	
	191.75	**21.94**	**1.92**	**10.23**	**--**	**34.09**	**43.50**	**9.41**	
	223.73	20.23	2.07	10.70	--	33.00	46.00	13.00	
	271.33	15.01	2.35	13.28	--	30.64	46.00	15.36	
	3296.10	49.14	6.03	31.12	34.90	51.39	74.00	22.61	PK
	4197.59	48.47	6.31	33.12	34.21	53.69	74.00	20.31	
	4882.00	46.80	6.24	33.99	33.94	59.09	74.00	20.91	

TEST ENGINEER: BILL WU

EUT	:	Visit Smart Hub	Temperature :	22℃	
Model No.	:	BE1310	Humidity :	40%RH	
Test Mode	:	Transmitting Ch78 (3M 8-DPSK)	Date of Test :	Nov. 01, 2015	

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	56.00	13.03	0.85	6.30	--	20.18	40.00	19.82	QP
	104.90	13.35	1.35	12.50	--	27.20	43.50	16.30	
	191.75	19.98	1.92	10.23	--	32.13	43.50	11.37	
	223.73	23.59	2.07	10.70	--	36.36	46.00	9.64	
	255.62	20.65	2.22	12.70	--	35.57	46.00	10.43	
	302.48	**21.42**	**2.59**	**13.88**	**--**	**37.89**	**46.00**	**8.11**	
	1655.77	54.36	4.06	26.25	35.48	49.19	74.00	24.81	PK
	3147.75	49.40	5.93	30.82	35.05	51.10	74.00	22.90	
	4960.00	44.58	6.14	34.06	33.91	50.87	74.00	23.13	
Vertical	47.99	17.63	0.79	8.90	--	27.32	40.00	12.68	QP
	51.12	18.09	0.82	7.32	--	26.23	40.00	13.77	
	112.13	8.35	1.41	12.65	--	22.41	43.50	21.09	
	200.69	19.36	1.97	9.72	--	31.05	43.50	12.45	
	223.73	**23.67**	**2.07**	**10.70**	**--**	**36.44**	**46.00**	**9.56**	
	302.48	9.17	2.59	13.88	--	25.64	46.00	20.36	
	3296.10	49.78	6.03	31.12	34.90	52.03	74.00	21.97	PK
	4197.59	47.30	6.31	33.12	34.21	52.52	74.00	21.48	
	4960.00	47.06	6.14	34.06	33.91	59.35	74.00	20.65	

TEST ENGINEER: BILL WU

EUT	:	Visit Smart Hub	Temperature :	22℃
Model No.	:	BE1310	Humidity :	40%RH
Test Mode	:	Receiving	Date of Test :	Nov. 01, 2015

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	49.71	17.45	0.81	7.86	--	26.12	40.00	13.88	QP
	77.05	13.29	1.04	8.89	--	23.22	40.00	16.78	
	116.95	15.45	1.44	12.74	--	29.63	43.50	13.87	
	222.17	23.64	2.05	10.65	--	36.34	46.00	9.66	
	275.16	**22.04**	**2.39**	**13.20**	**--**	**37.63**	**46.00**	**8.37**	
	294.11	19.86	2.52	13.60	--	35.98	46.00	10.02	
	1196.74	54.45	3.52	24.43	36.14	46.26	74.00	27.74	PK
	2404.36	49.44	4.81	28.25	35.15	47.35	74.00	26.65	
	3147.75	48.61	5.93	30.82	35.05	50.31	74.00	23.69	
Vertical	**47.99**	**17.11**	**0.79**	**8.90**	**--**	**26.80**	**40.00**	**13.20**	QP
	58.00	18.29	0.87	6.20	--	25.36	40.00	14.64	
	116.95	13.03	1.44	12.74	--	27.21	43.50	16.29	
	178.76	15.74	1.83	10.56	--	28.13	43.50	15.37	
	210.79	16.75	2.01	10.03	--	28.79	43.50	14.71	
	294.11	13.95	2.52	13.60	--	30.07	46.00	15.93	
	1803.02	49.82	4.15	26.82	35.31	45.48	74.00	28.52	PK
	2393.32	52.06	4.81	28.22	35.14	49.95	74.00	24.05	
	4187.94	48.43	6.19	33.12	34.22	53.52	74.00	20.48	

TEST ENGINEER: BILL WU

Radiated Band Edge measurement:

For 1M GFSK mode:

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	2389.55	57.18	4.81	28.22	35.14	55.07	74.00	18.93	PK
	2483.81	53.73	4.89	28.38	35.15	51.85	74.00	22.15	
	2389.55	**40.46**	**4.81**	**28.22**	**35.14**	**38.35**	**54.00**	**15.65**	AV
	2483.81	35.46	4.89	28.38	35.15	33.58	54.00	20.42	
Vertical	2389.98	51.35	4.81	28.22	35.14	49.24	74.00	24.76	PK
	2483.62	**55.72**	**4.86**	**28.38**	**35.15**	**53.81**	**74.00**	**20.19**	
	2389.98	32.56	4.81	28.22	35.14	30.45	54.00	23.55	AV
	2483.62	35.46	4.86	28.38	35.15	33.55	54.00	20.45	

For 3M 8-DPSK mode:

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	2389.78	57.13	4.81	28.22	35.14	55.02	74.00	18.98	PK
	2483.74	53.55	4.89	28.38	35.15	51.67	74.00	22.33	
	2389.78	**40.60**	**4.81**	**28.22**	**35.14**	**38.49**	**54.00**	**15.51**	AV
	2483.74	35.59	4.89	28.38	35.15	33.71	54.00	20.29	
Vertical	2389.69	51.32	4.81	28.22	35.14	49.21	74.00	24.79	PK
	2483.88	**55.66**	**4.86**	**28.38**	**35.15**	**53.75**	**74.00**	**20.25**	
	2389.69	33.43	4.81	28.22	35.14	31.32	54.00	22.68	AV
	2483.88	35.44	4.86	28.38	35.15	33.53	54.00	20.47	

TEST ENGINEER: BILL WU

5 20 dB BANDWIDTH MEASUREMENT

5.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jun 12, 2015	Jun 11, 2016

5.2 Block Diagram of Test Setup

5.3 Specification Limits (§15.247(a)(1))

For frequency hopping systems, hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of hopping channel, whichever is greater.

5.4 Operating Condition of EUT

Enable the EUT to transmit data at different channel frequency individually.

5.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured by spectrum analyzer.
Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
The test procedure is defined in DA 00-705.

5.6 Test Results

PASSED.

All the test results are attached in next pages.

(Test Date: Oct. 28, 2015 Temperature: 21℃ Humidity: 42 %)

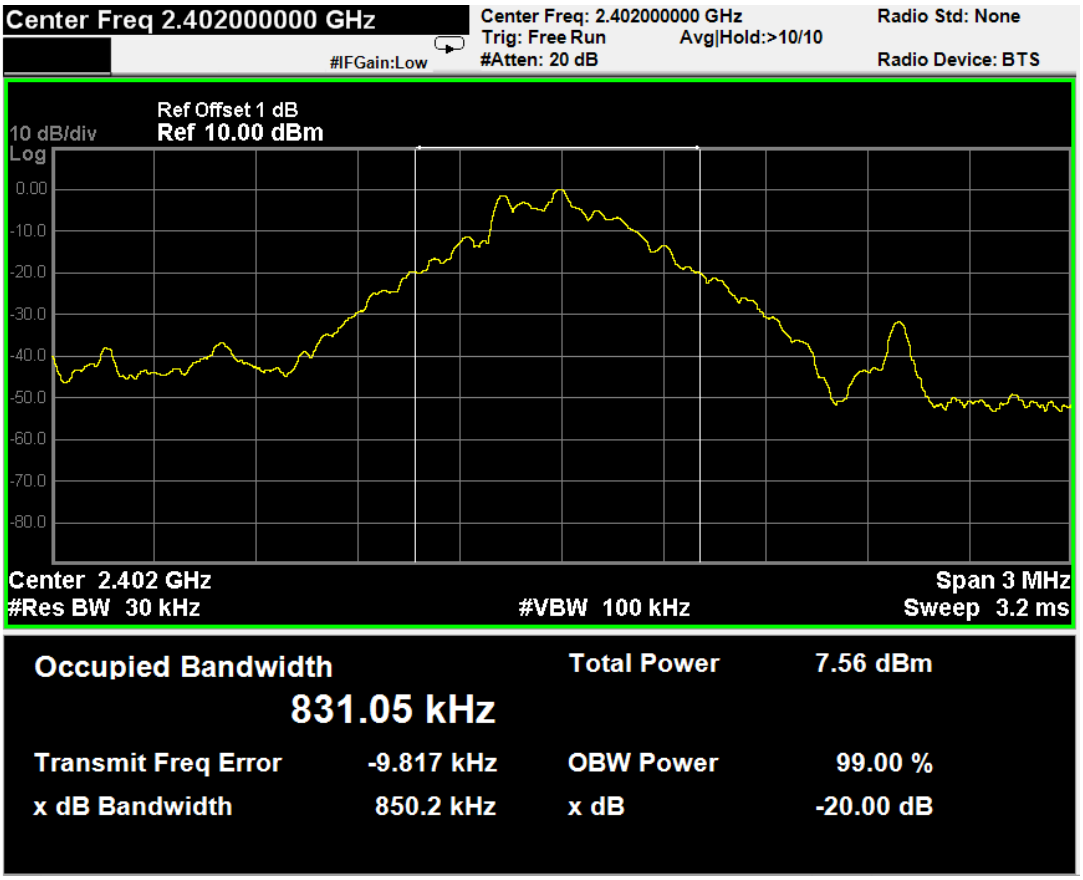
For 1M GFSK

Channel	Frequency	**20dB Bandwidth**
00	2402 MHz	**0.8502 MHz**
39	2441 MHz	**0.8400 MHz**
78	2480 MHz	**0.8399 MHz**

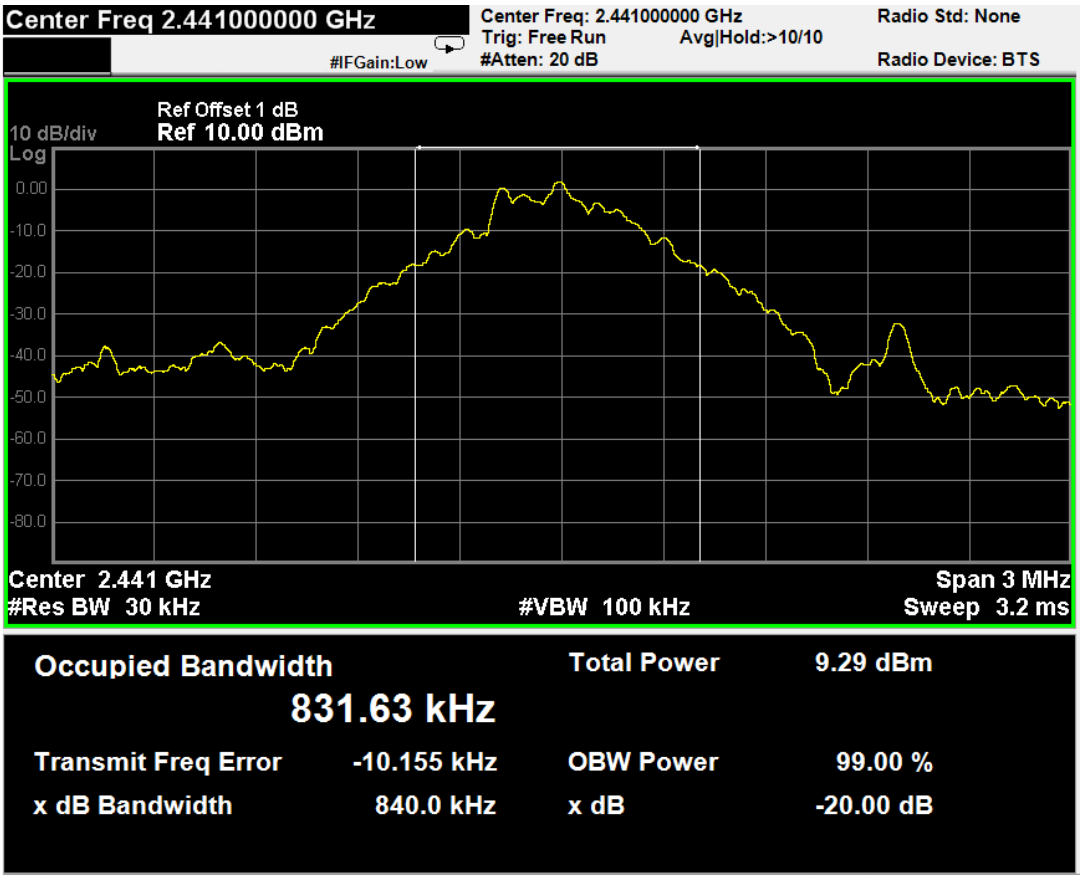
For 3M 8-DPSK

Channel	Frequency	**20dB Bandwidth**
00	2402 MHz	**1.211 MHz**
39	2441 MHz	**1.208 MHz**
78	2480 MHz	**1.206 MHz**

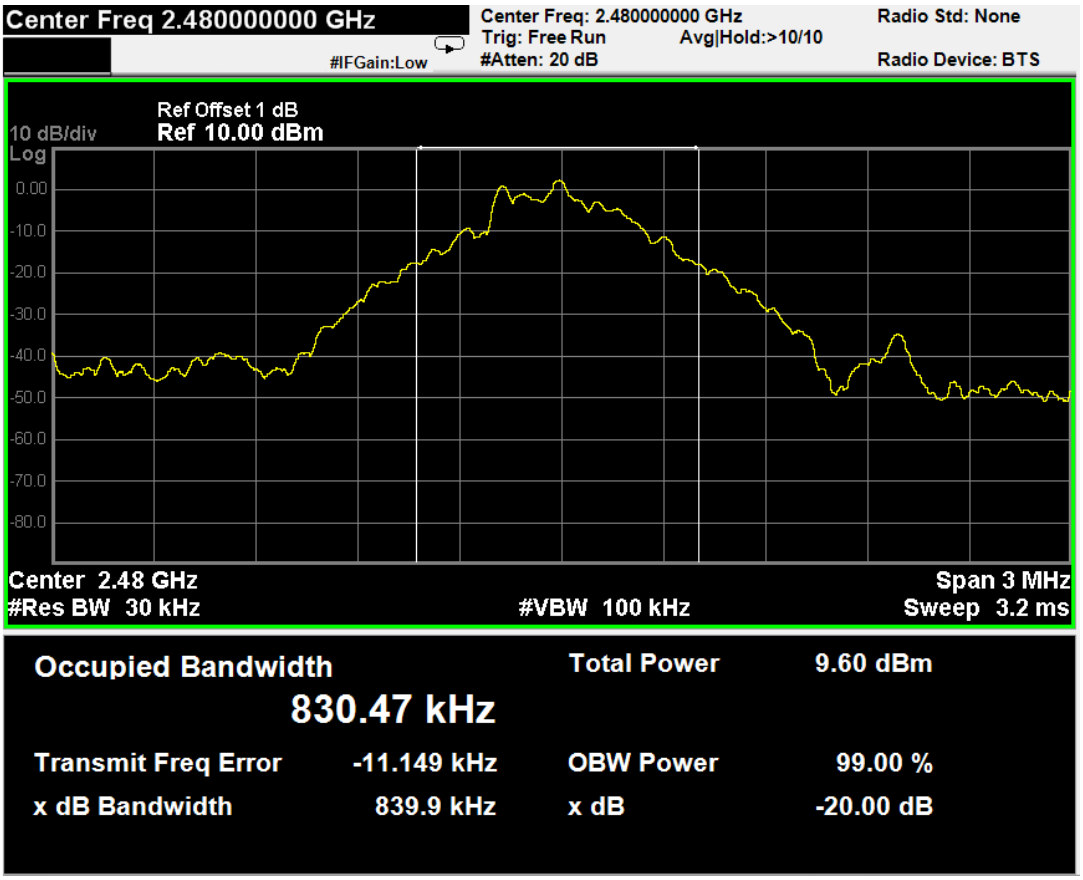
Ch 00 (2402 MHz) 1M GFSK



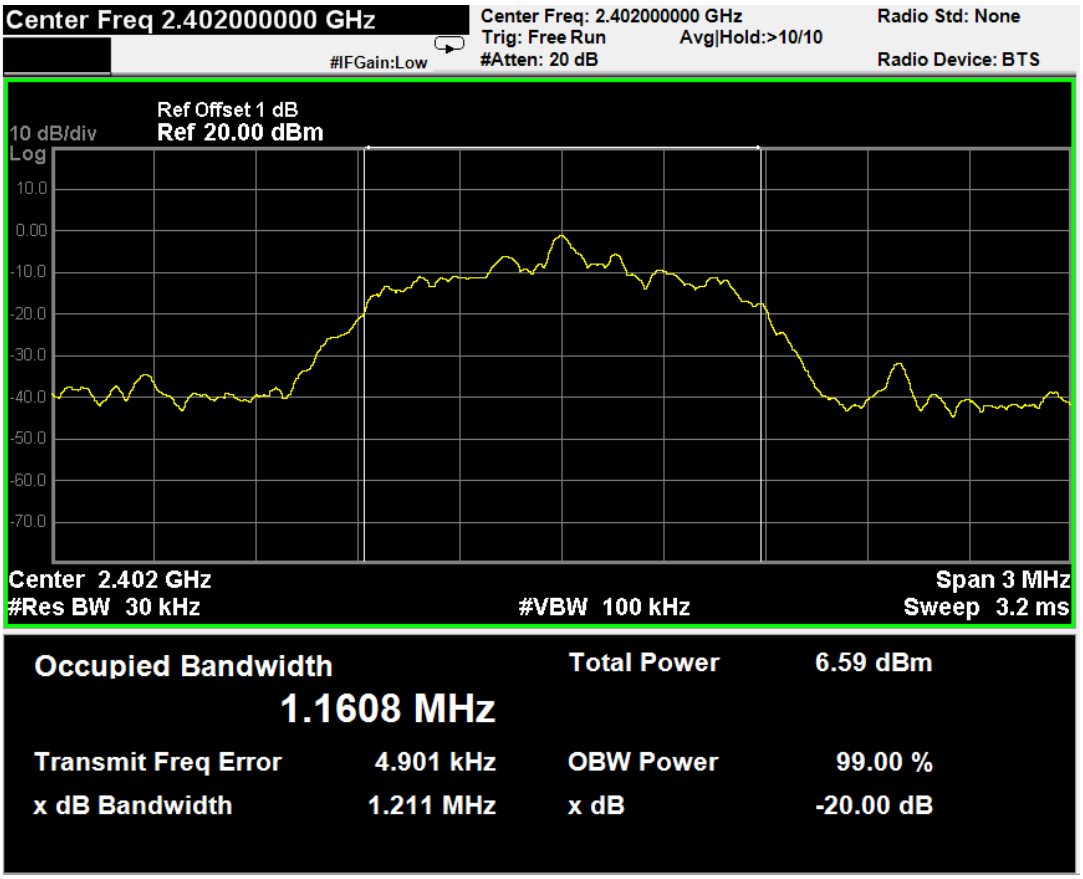
Ch 39 (2441 MHz) 1M GFSK



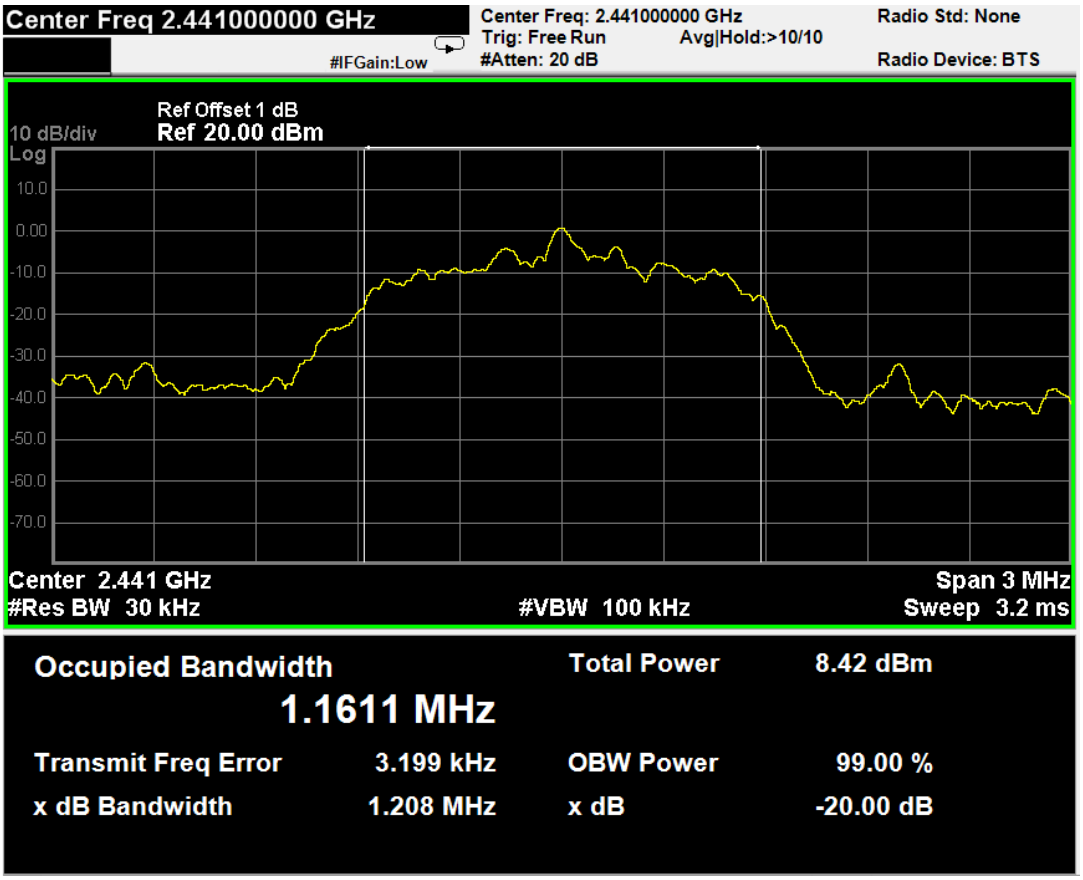
Ch 78 (2480 MHz) 1M GFSK



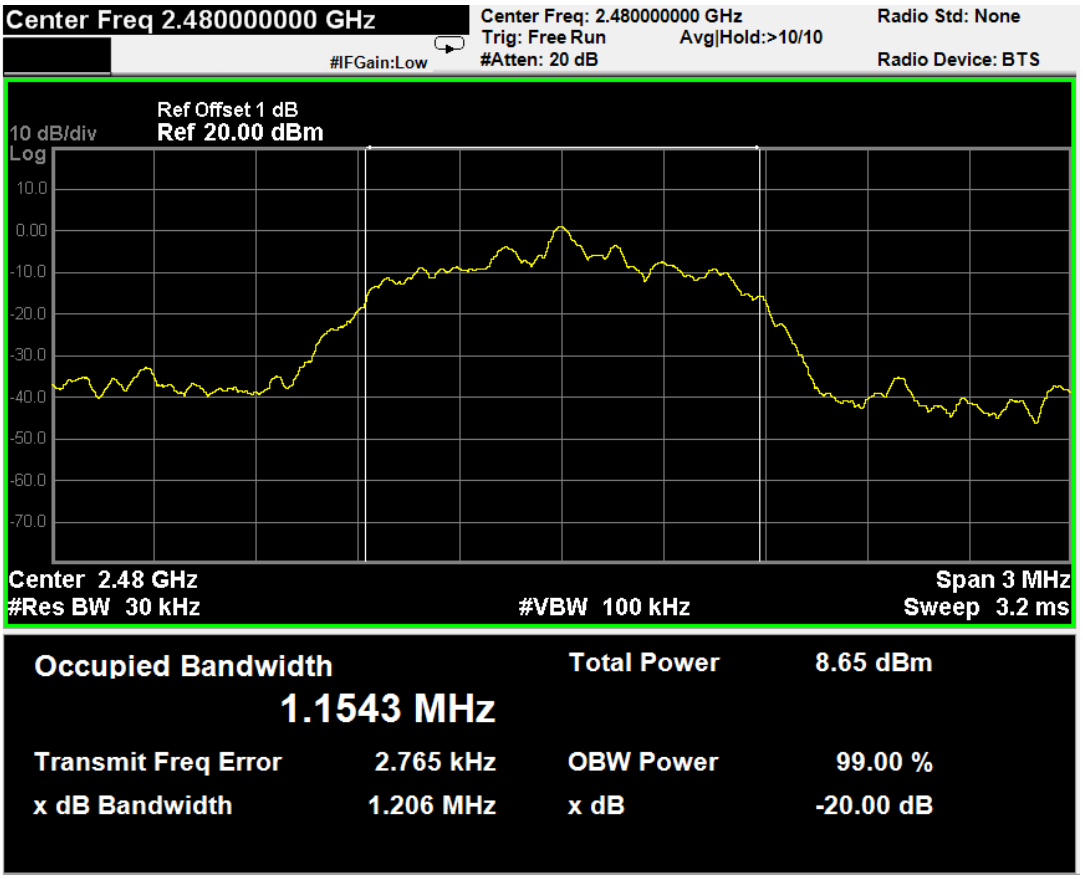
Ch 00 (2402 MHz) 3M 8-DPSK



Ch 39 (2441 MHz) 3M 8-DPSK



Ch 78 (2480 MHz) 3M 8-DPSK



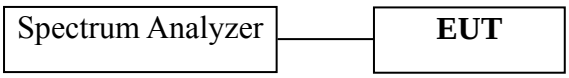
6 PEAK OUTPUT POWER MEASUREMENT

6.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jun 12, 2015	Jun 11, 2016

6.2 Block Diagram of Test Setup



6.3 Specification Limits ((§15.247(b)(1))

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt. (30 dBm)

6.4 Operating Condition of EUT

Enable the EUT to transmit data at different channel frequency individually.

6.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.
The test procedure is defined in DA 00-705.

6.6 Test Results

PASSED.

(Test Date: Oct. 28, 2015 Temperature: 21℃ Humidity: 42 %)

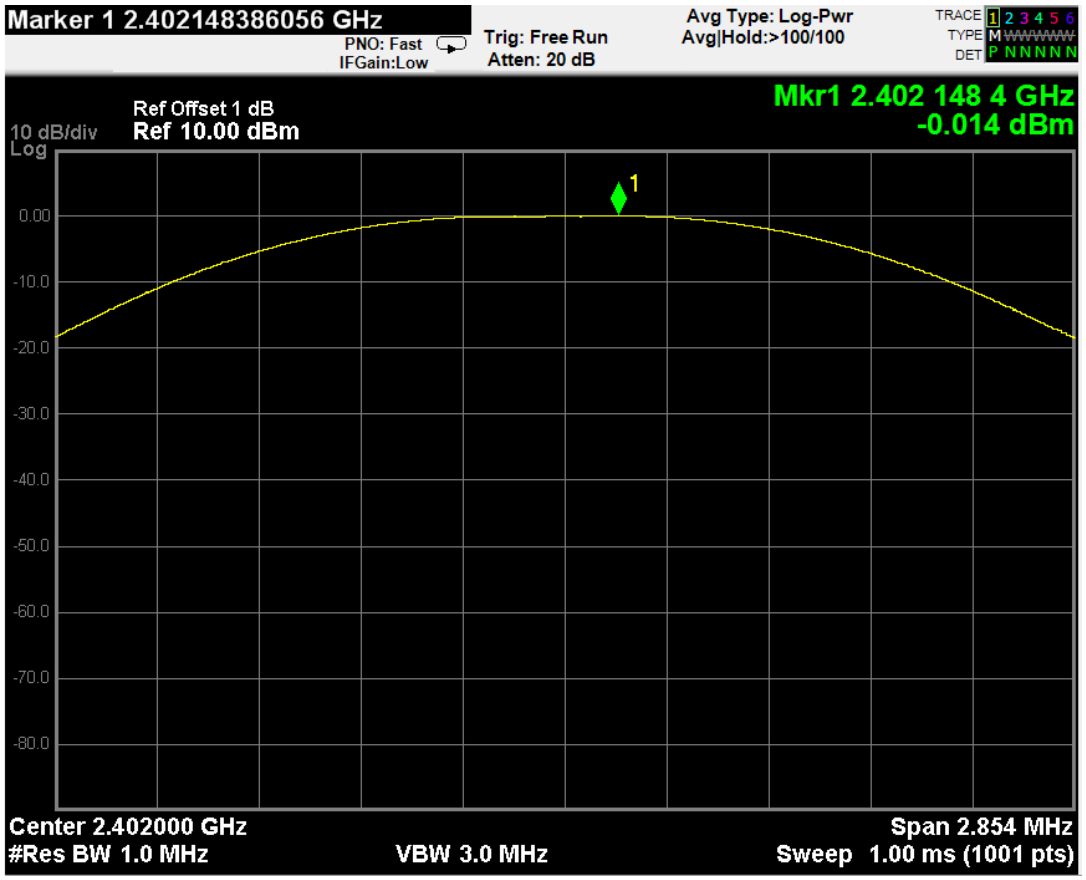
For 1M GFSK

Channel	Frequency	**Peak Output Power**	Limit
00	2402 MHz	**-0.014 dBm**	30 dBm
39	2441 MHz	**1.743 dBm**	30 dBm
78	2480 MHz	**2.069 dBm**	30 dBm

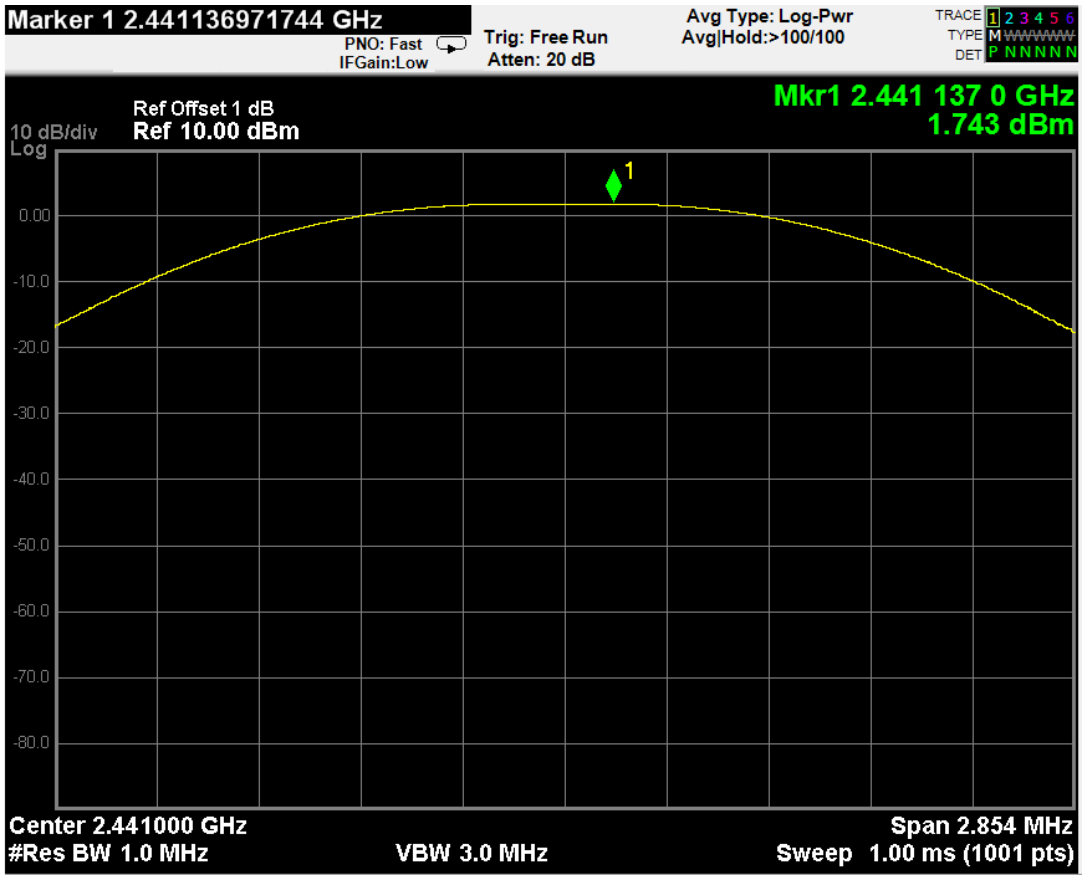
For 3M 8-DPSK

Channel	Frequency	**Peak Output Power**	Limit
00	2402 MHz	**-0.756 dBm**	30 dBm
39	2441 MHz	**1.112 dBm**	30 dBm
78	2480 MHz	**1.385 dBm**	30 dBm

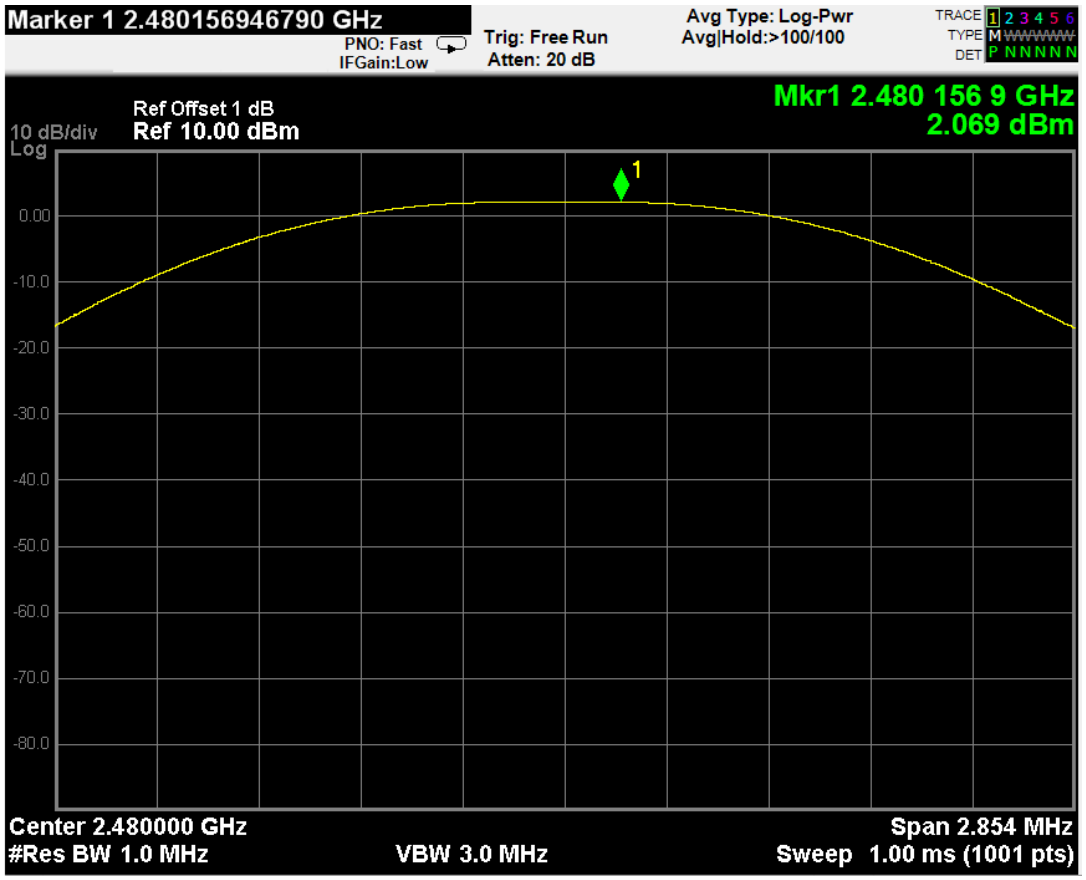
Ch 00 (2402 MHz) 1M GSFK



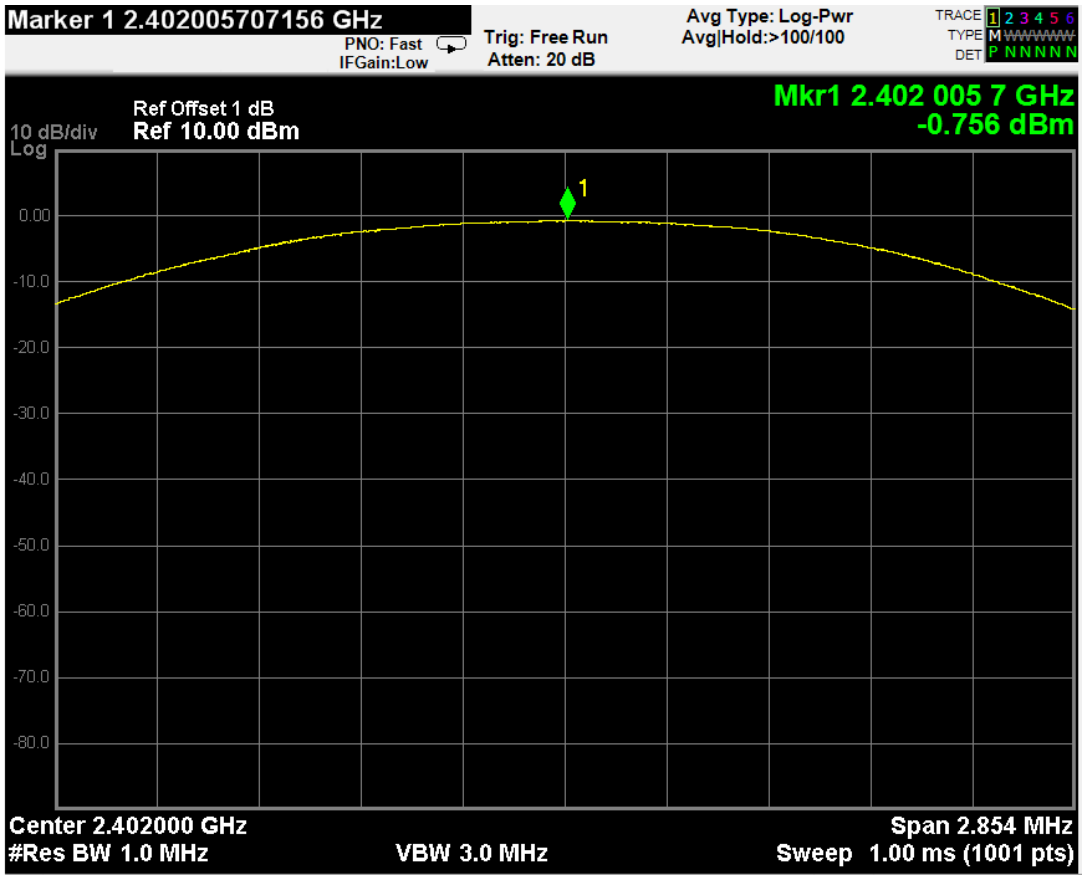
Ch 39 (2441 MHz) 1M GSFK



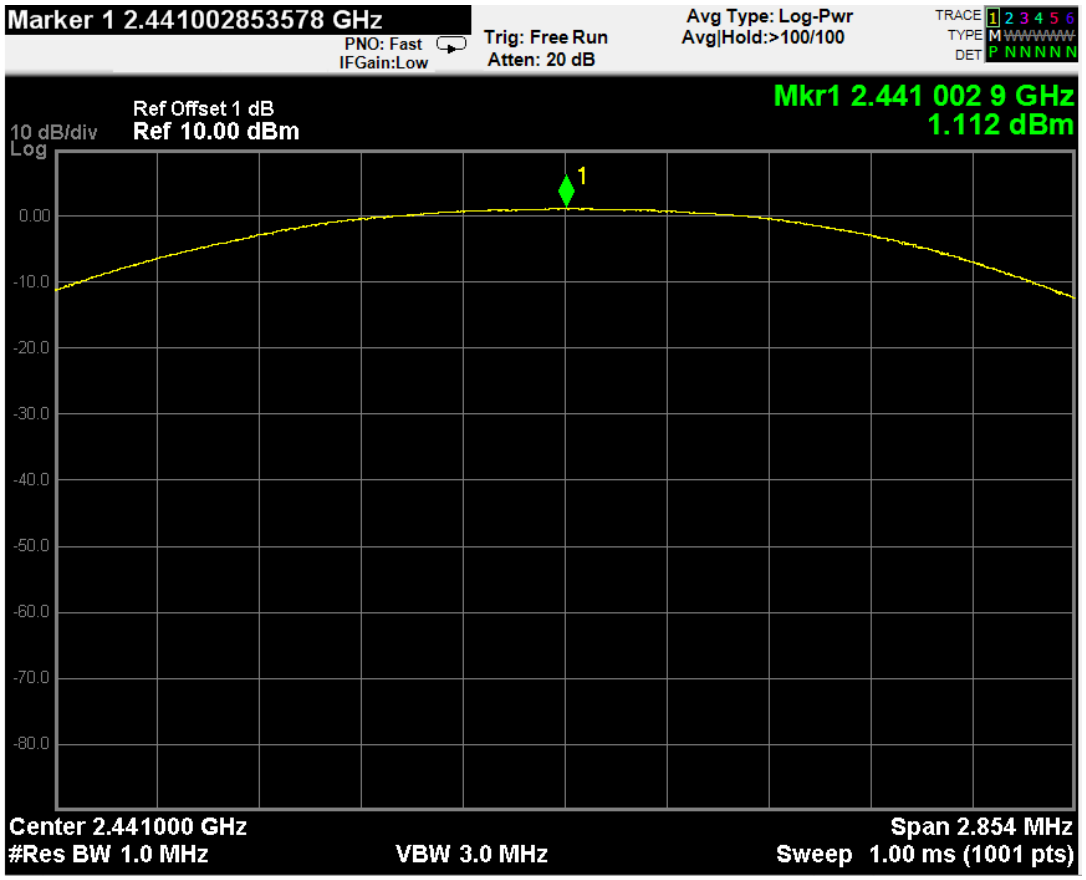
Ch 78 (2480 MHz) 1M GSFK



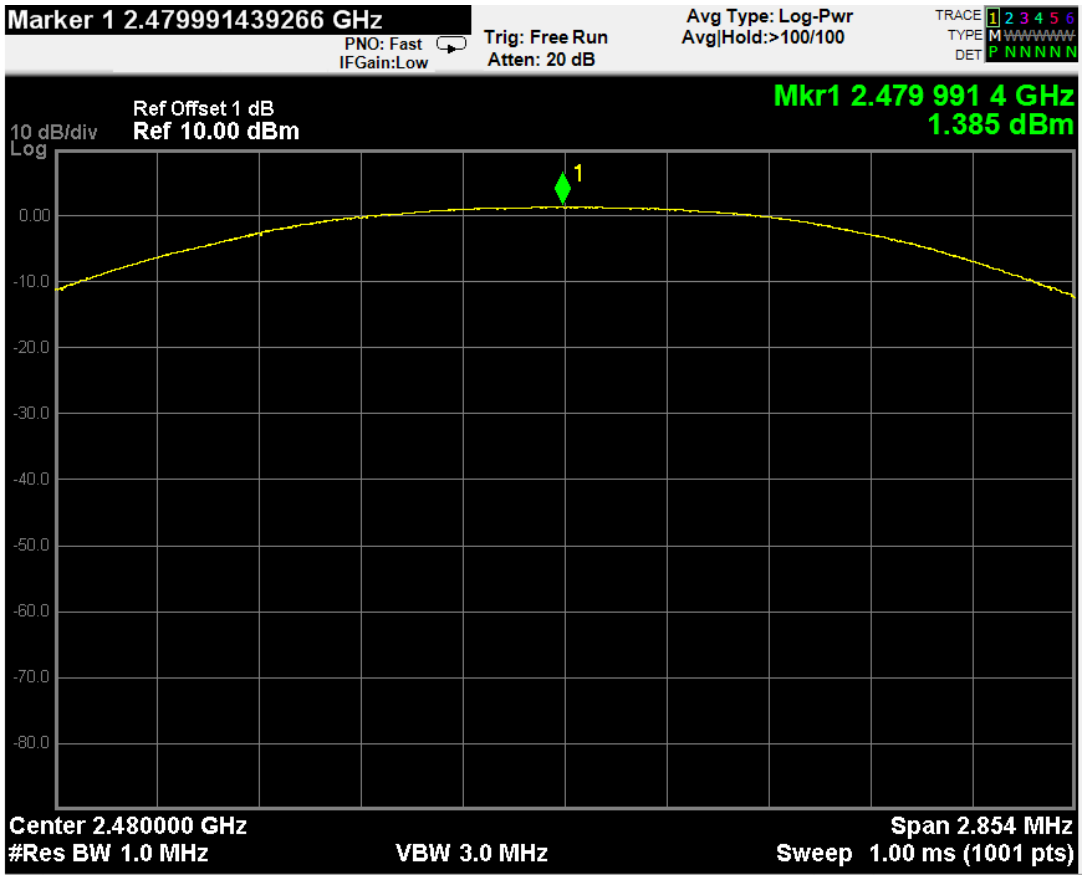
Ch 00 (2402 MHz) 3M 8-DPSK



Ch 39 (2441 MHz) 3M 8-DPSK



Ch 78 (2480 MHz) 3M 8-DPSK



7 SPURIOUS RF CONDUCTED EMISSIONS MEASUREMENT

7.1 Test Equipment

The following test equipment was used during the emission limitations test：

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jun 12, 2015	Jun 11, 2016

7.2 Block Diagram of Test Setup

The same as Section. 4.2.

7.3 Specification Limits (§15.247(d))

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

In addition, radiated emissions which fall in 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)).(※This test result attaching to Section. 4.7)

7.4 Operating Condition of EUT

Enable the EUT to transmit data at different channel frequency individually.

7.5 Test Procedure

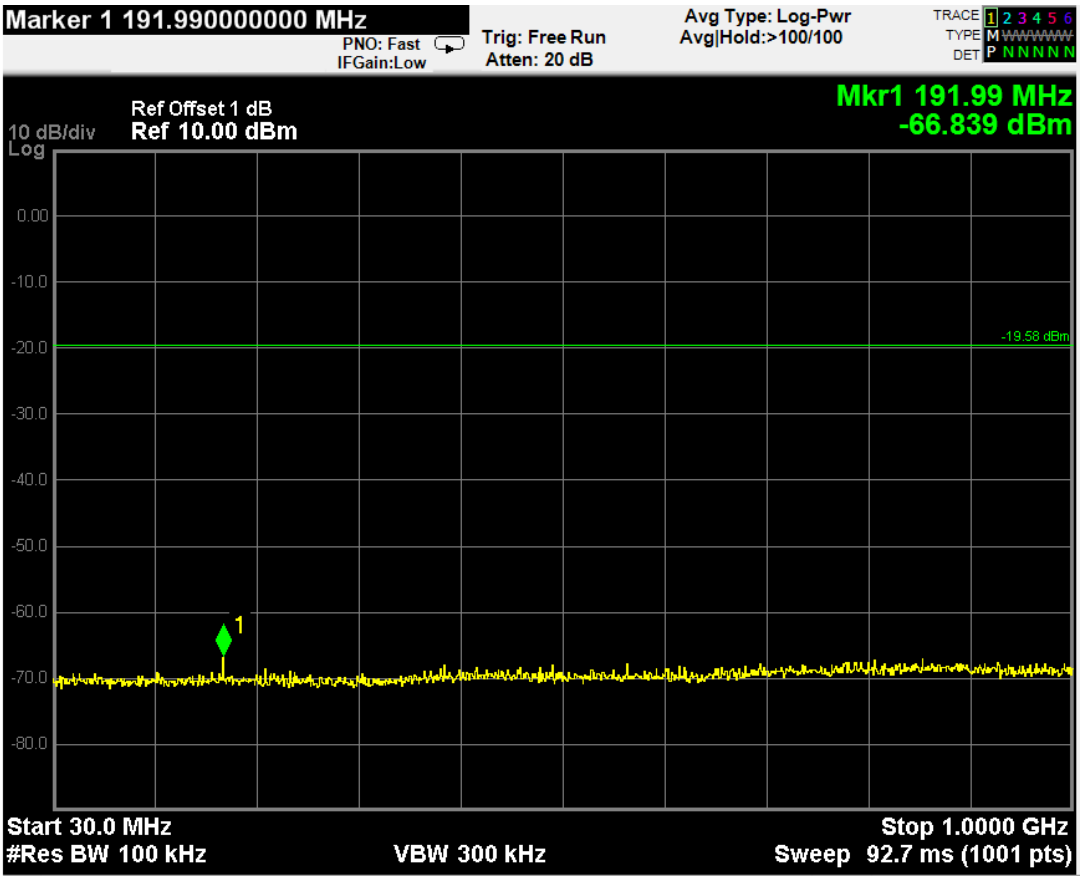
The transmitter output was connected to the spectrum analyzer. Set RBW = 100 kHz, VBW = 300 kHz, scan up through 10^{th} harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
The test procedure is defined in DA 00-705.

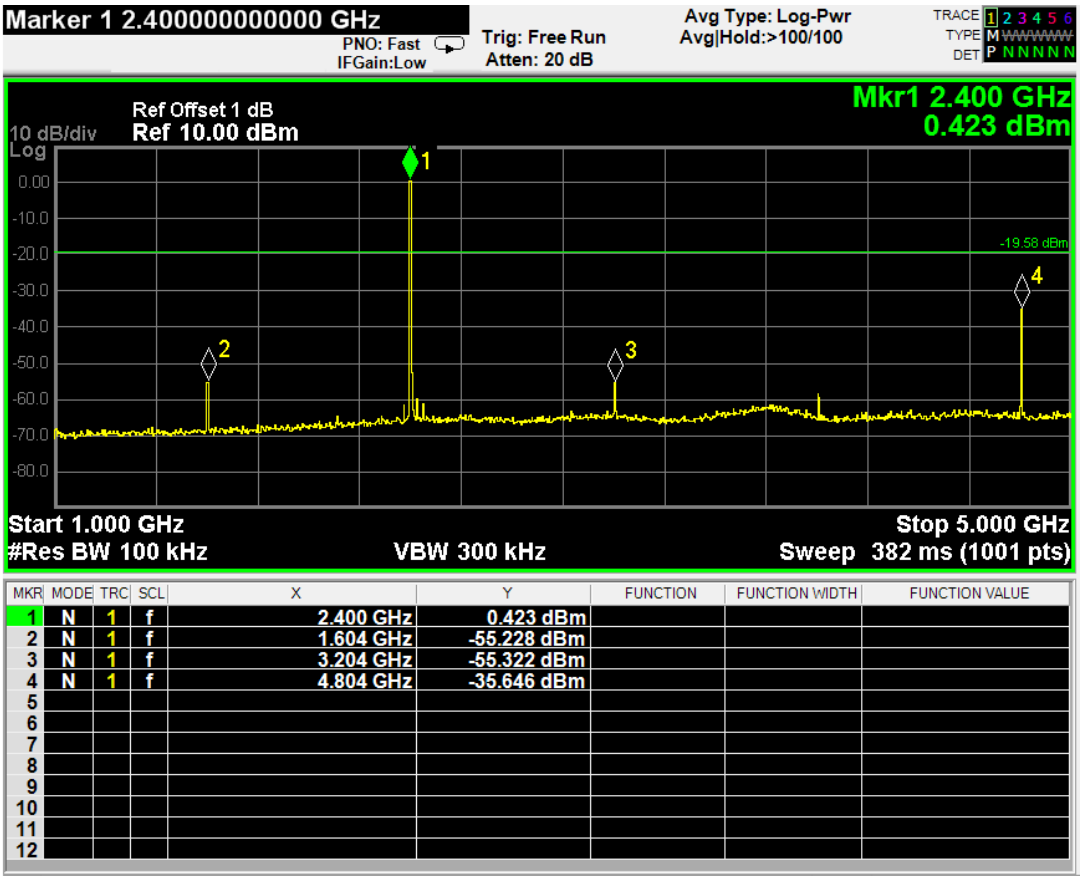
7.6 Test Results

PASSED.
The test data was attached in the next pages.

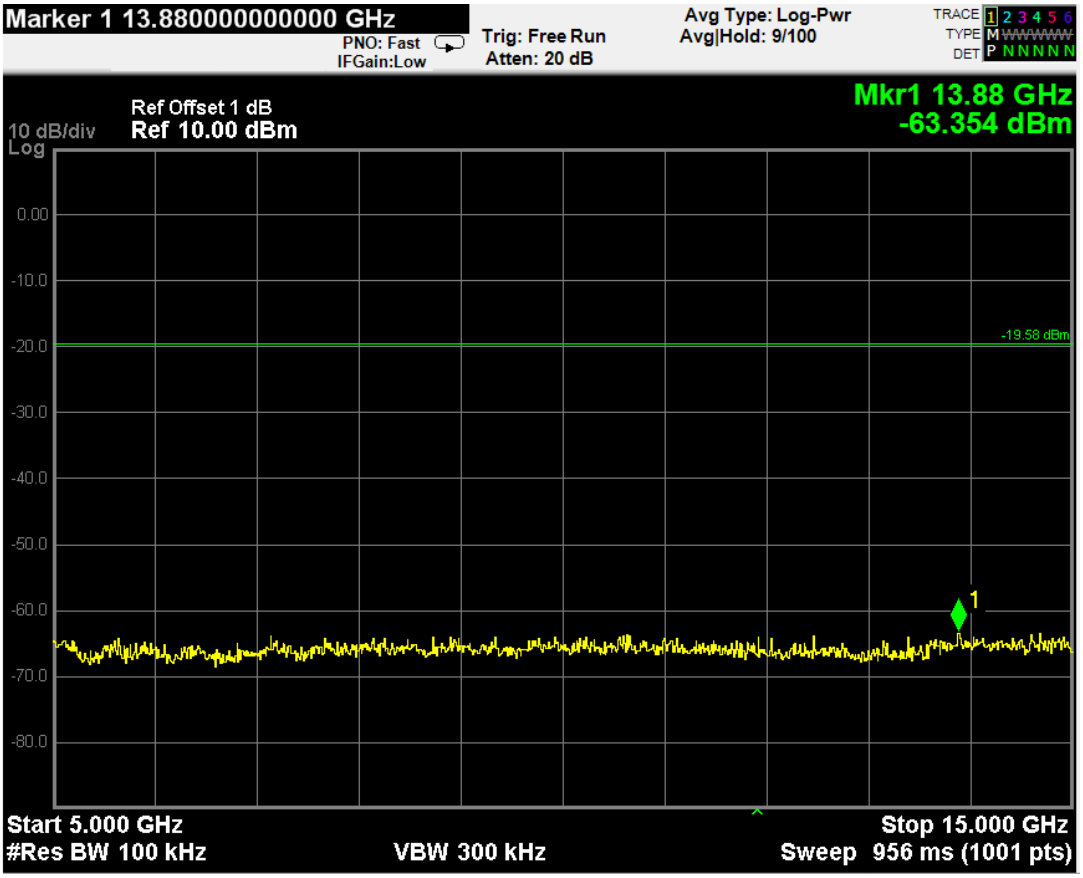
(Test Date: Oct. 28, 2015 Temperature: 21℃ Humidity: 42 %)

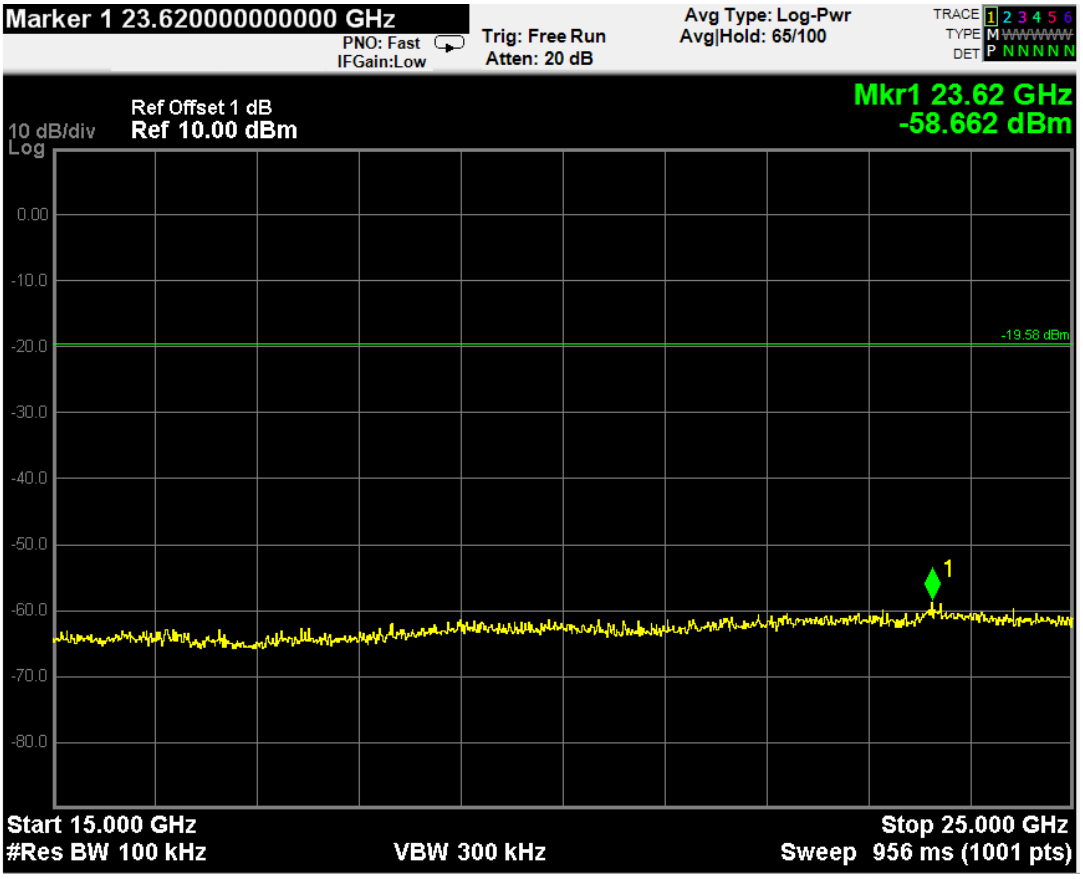
1M GFSK Ch 00 (2402 MHz)



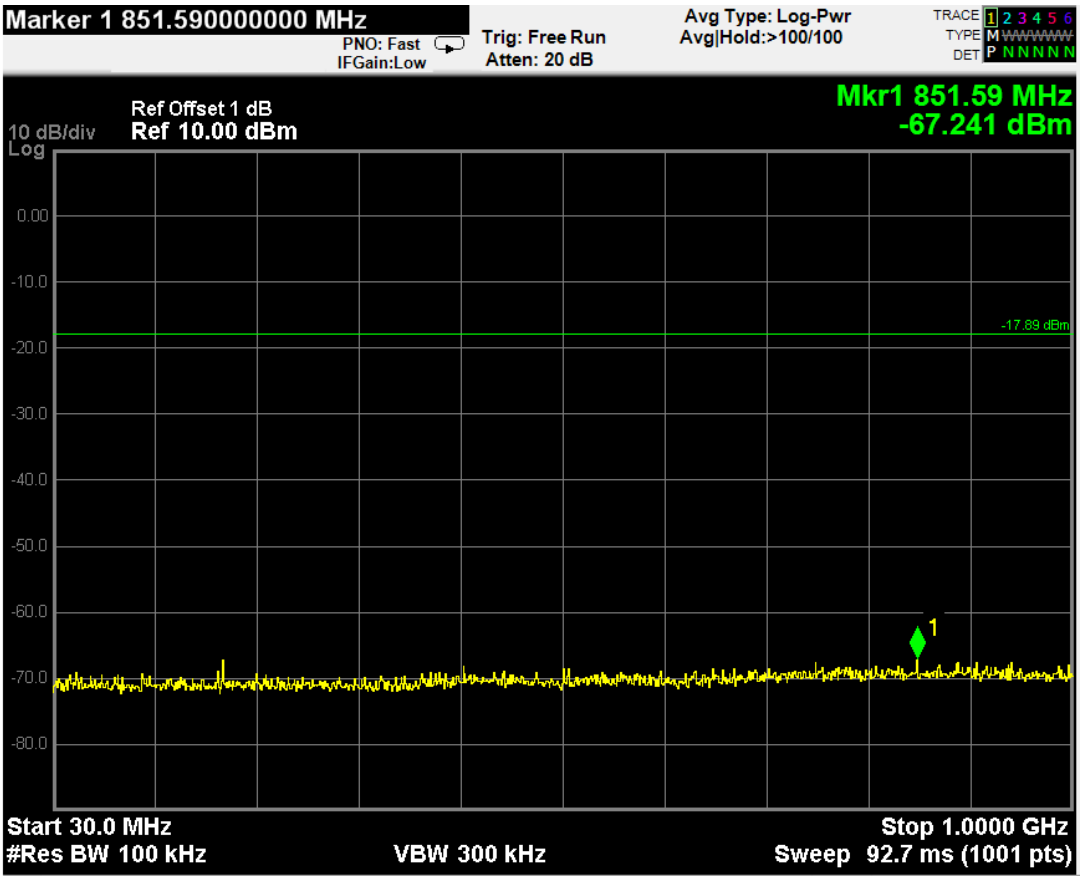


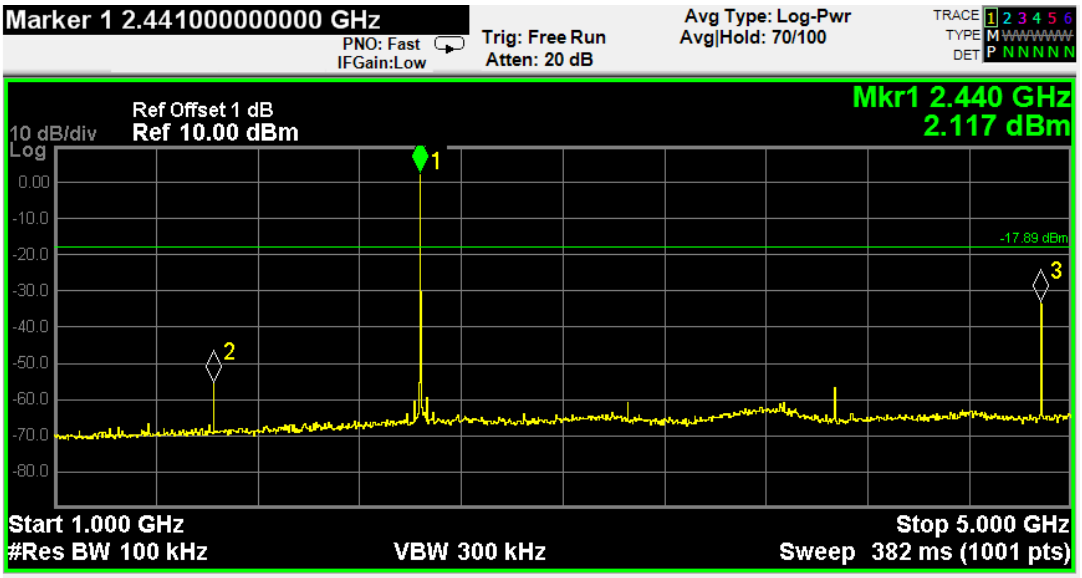
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.400 GHz	0.423 dBm			
2	N	1	f	1.604 GHz	-55.228 dBm			
3	N	1	f	3.204 GHz	-55.322 dBm			
4	N	1	f	4.804 GHz	-35.646 dBm			
5								
6								
7								
8								
9								
10								
11								
12								


Marker 1 13.880000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 9/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 13.88 GHz
-63.354 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-19.58 dBm
1
Start 5.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 15.000 GHz
Sweep 956 ms (1001 pts)

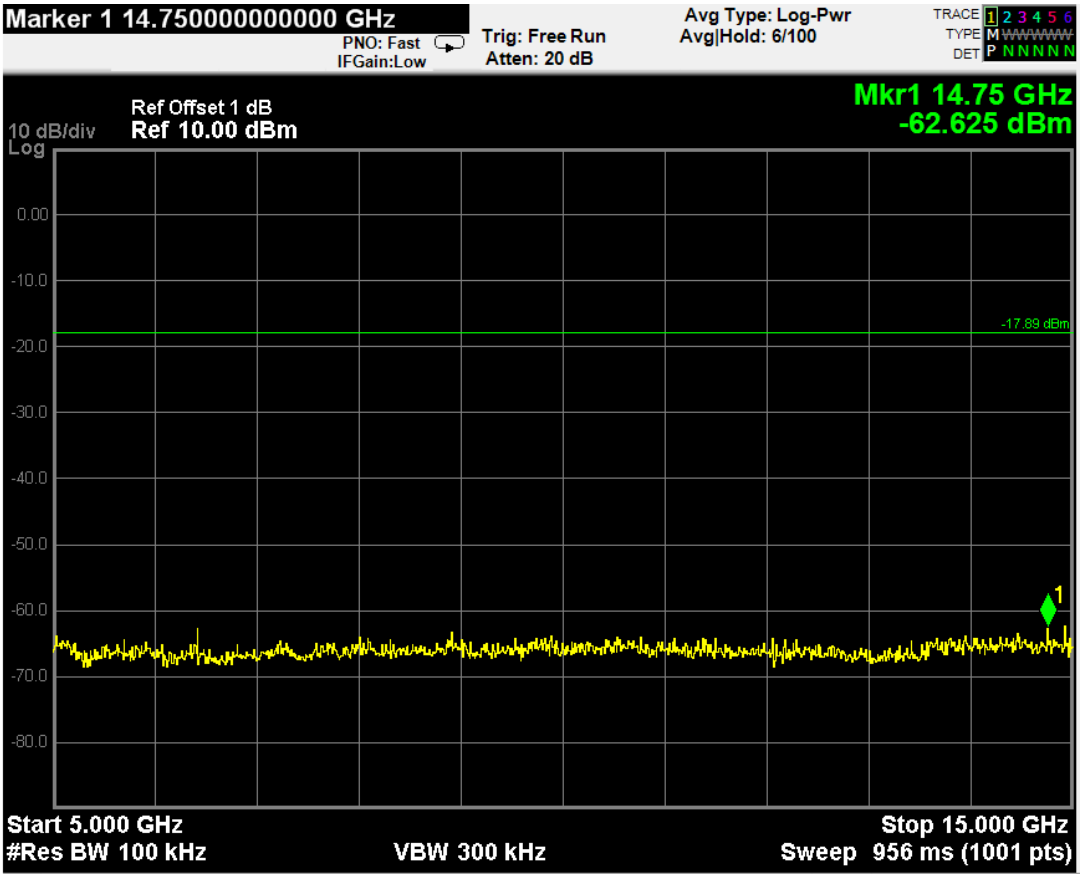

Marker 1 23.620000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 65/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 23.62 GHz
-58.662 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-19.58 dBm
1
Start 15.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 25.000 GHz
Sweep 956 ms (1001 pts)

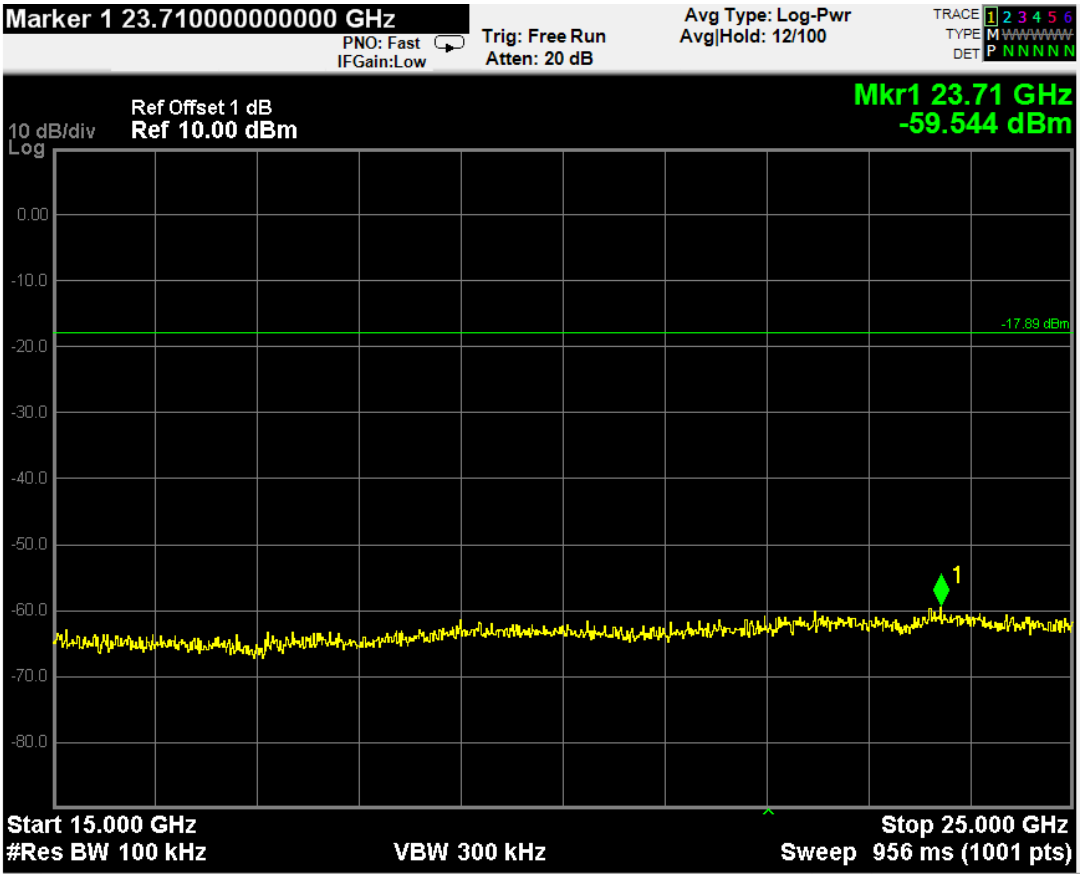
1M GFSK Ch 39 (2441 MHz)



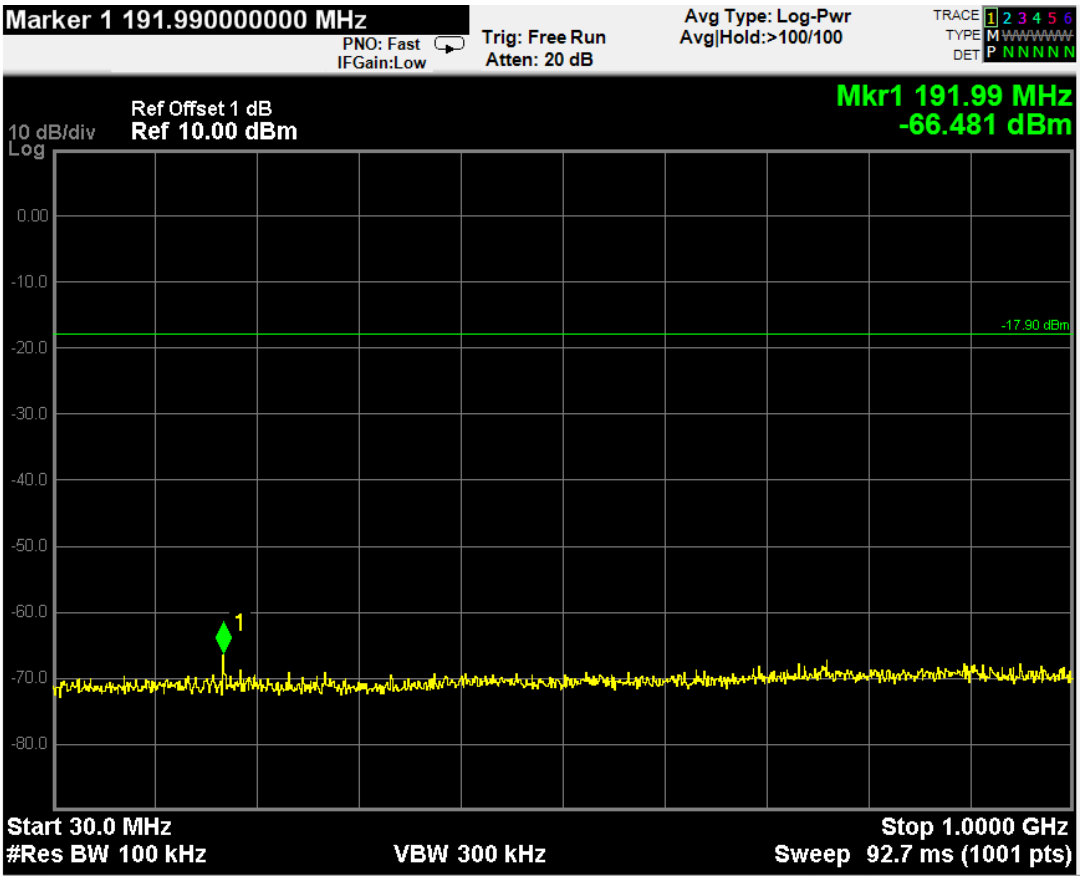


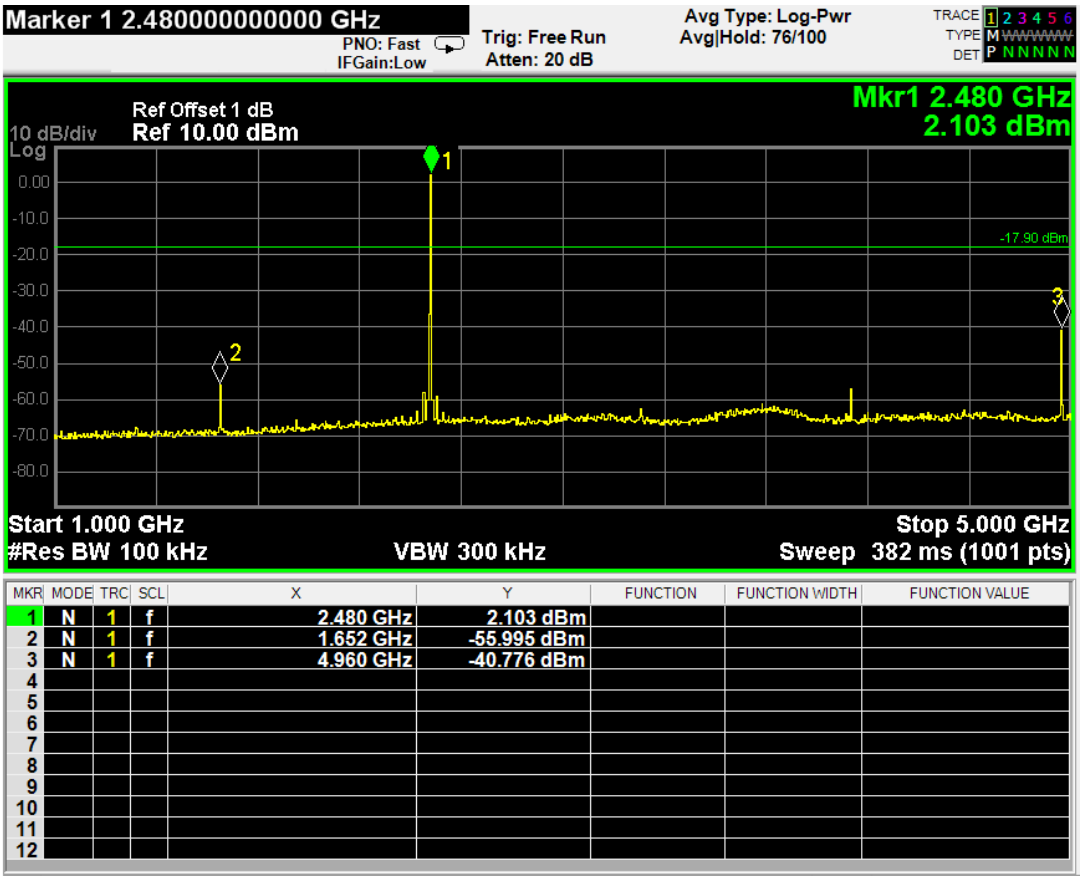
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.441 GHz	2.117 dBm			
2	N	1	f	1.628 GHz	-55.758 dBm			
3	N	1	f	4.882 GHz	-33.449 dBm			
4								
5								
6								
7								
8								
9								
10								
11								
12								


Marker 1 14.750000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 6/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 14.75 GHz
-62.625 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-17.89 dBm
1
Start 5.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 15.000 GHz
Sweep 956 ms (1001 pts)

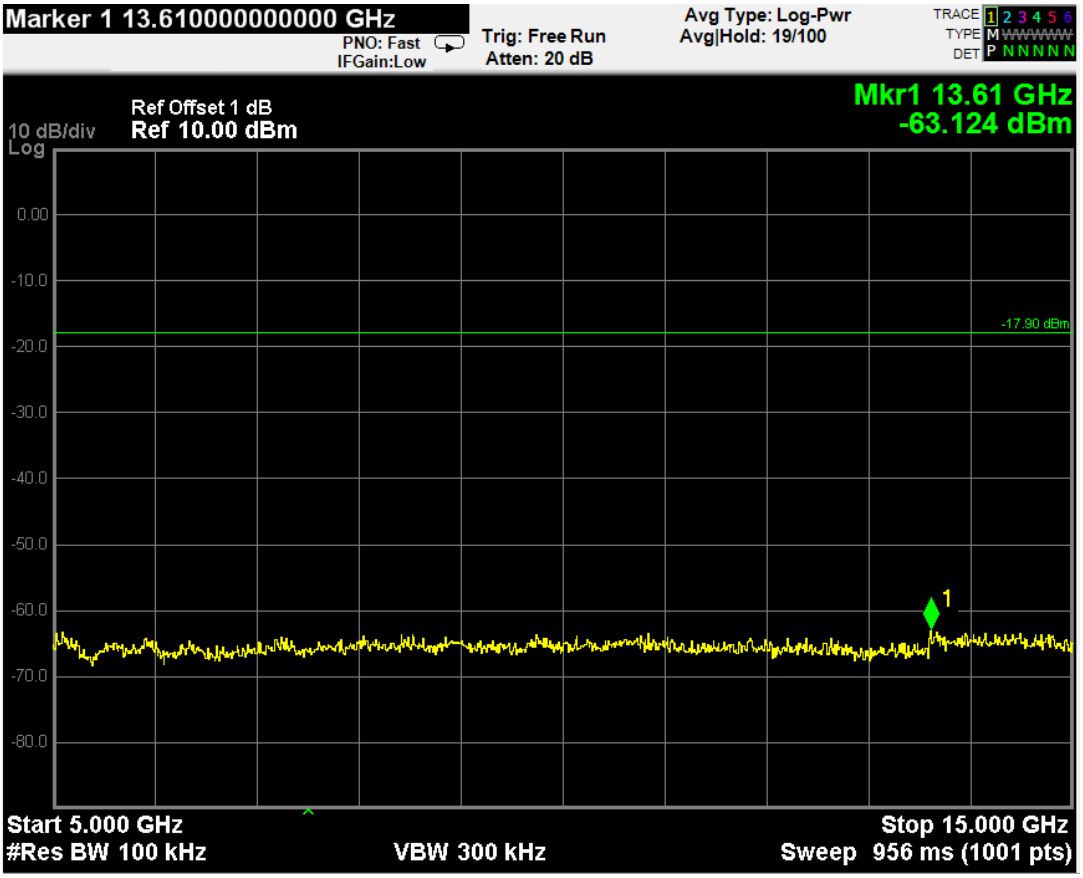

Marker 1 23.710000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 12/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 23.71 GHz
-59.544 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-17.89 dBm
1
Start 15.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 25.000 GHz
Sweep 956 ms (1001 pts)

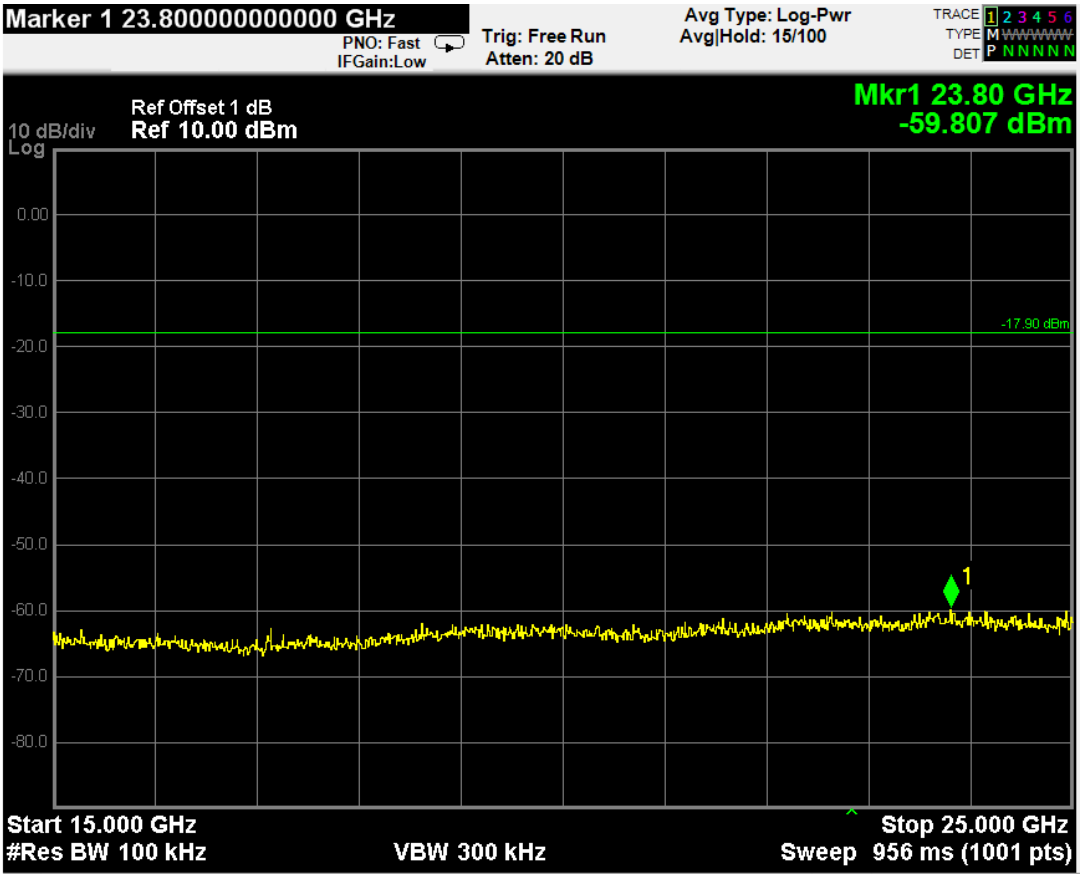
1M GFSK Ch 78 (2480 MHz)



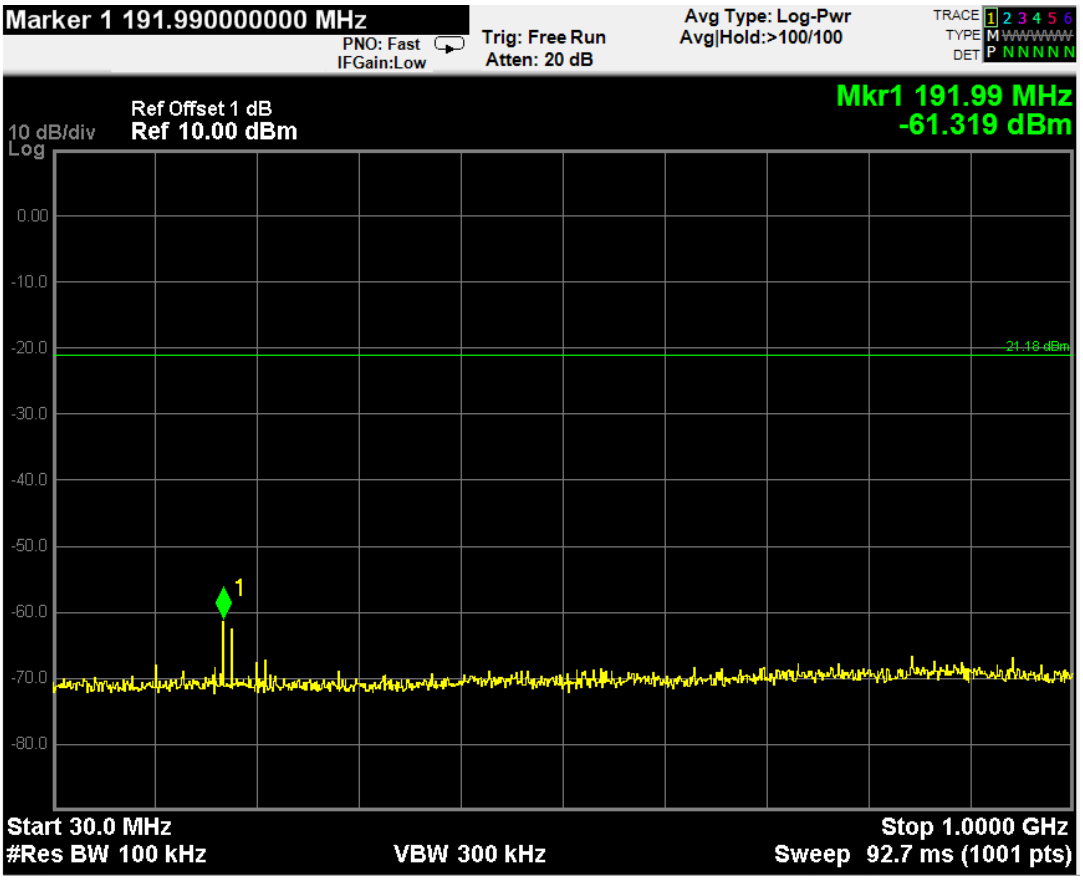


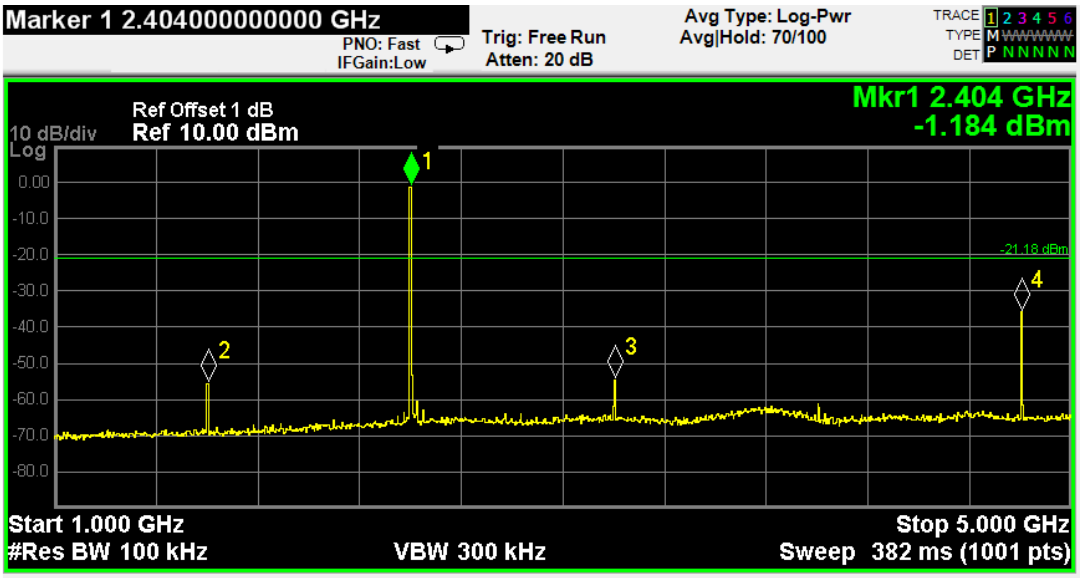
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 GHz	2.103 dBm			
2	N	1	f	1.652 GHz	-55.995 dBm			
3	N	1	f	4.960 GHz	-40.776 dBm			
4								
5								
6								
7								
8								
9								
10								
11								
12								


Marker 1 13.610000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 19/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 13.61 GHz
-63.124 dBm
0.00
-10.0
-17.90 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 5.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 15.000 GHz
Sweep 956 ms (1001 pts)

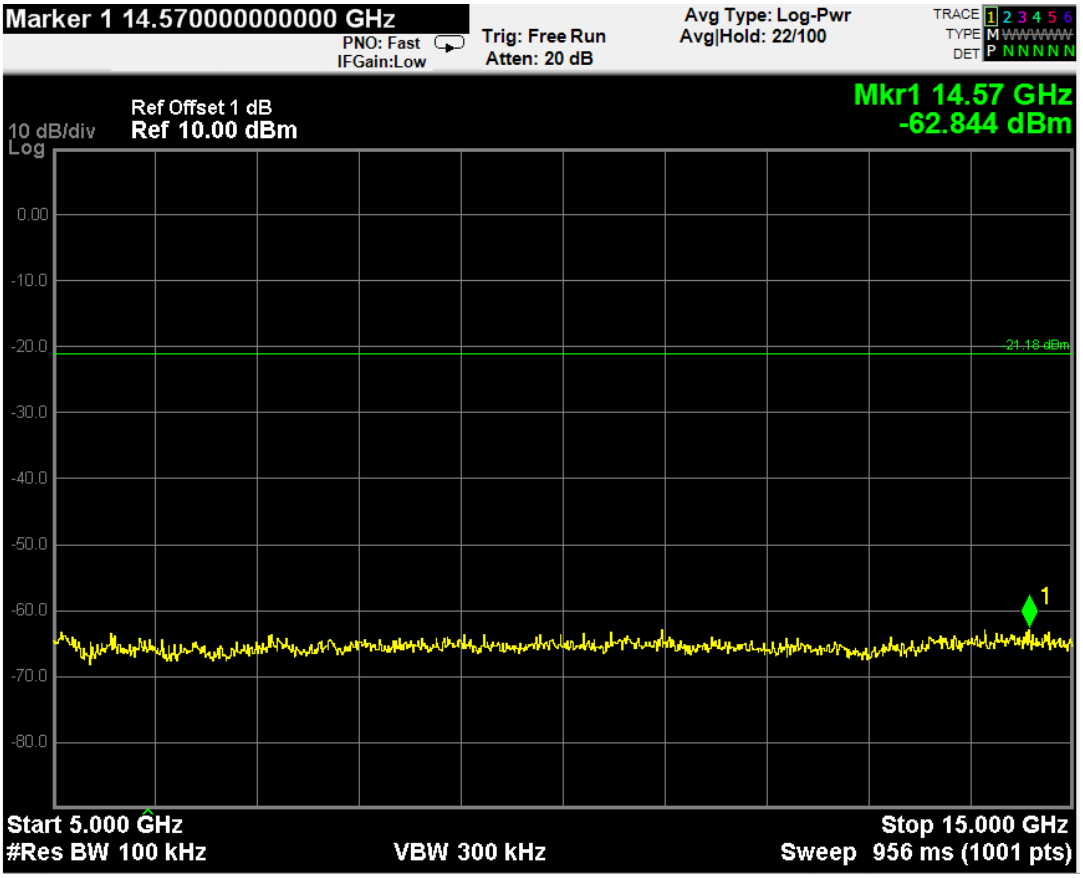

Marker 1 23.800000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 15/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 23.80 GHz
-59.807 dBm
0.00
-10.0
-17.90 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 15.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 25.000 GHz
Sweep 956 ms (1001 pts)

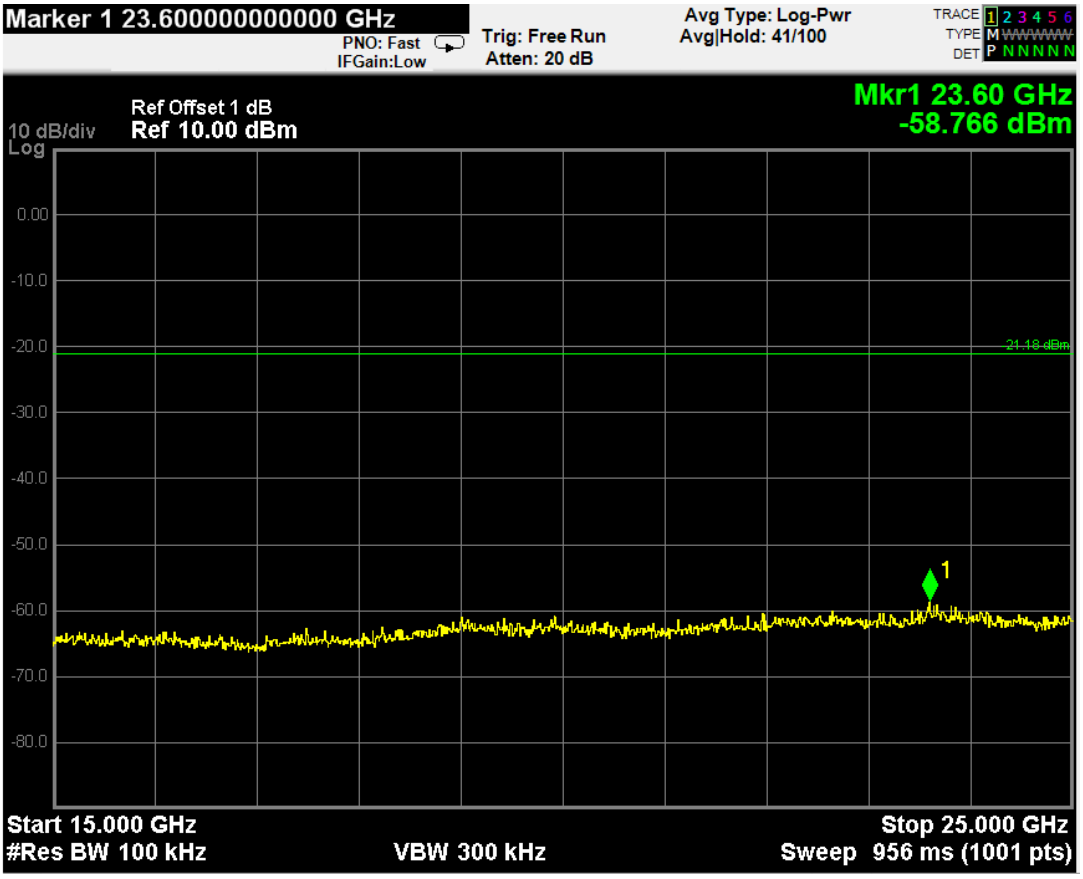
3M 8-DPSK Ch 00 (2402 MHz)



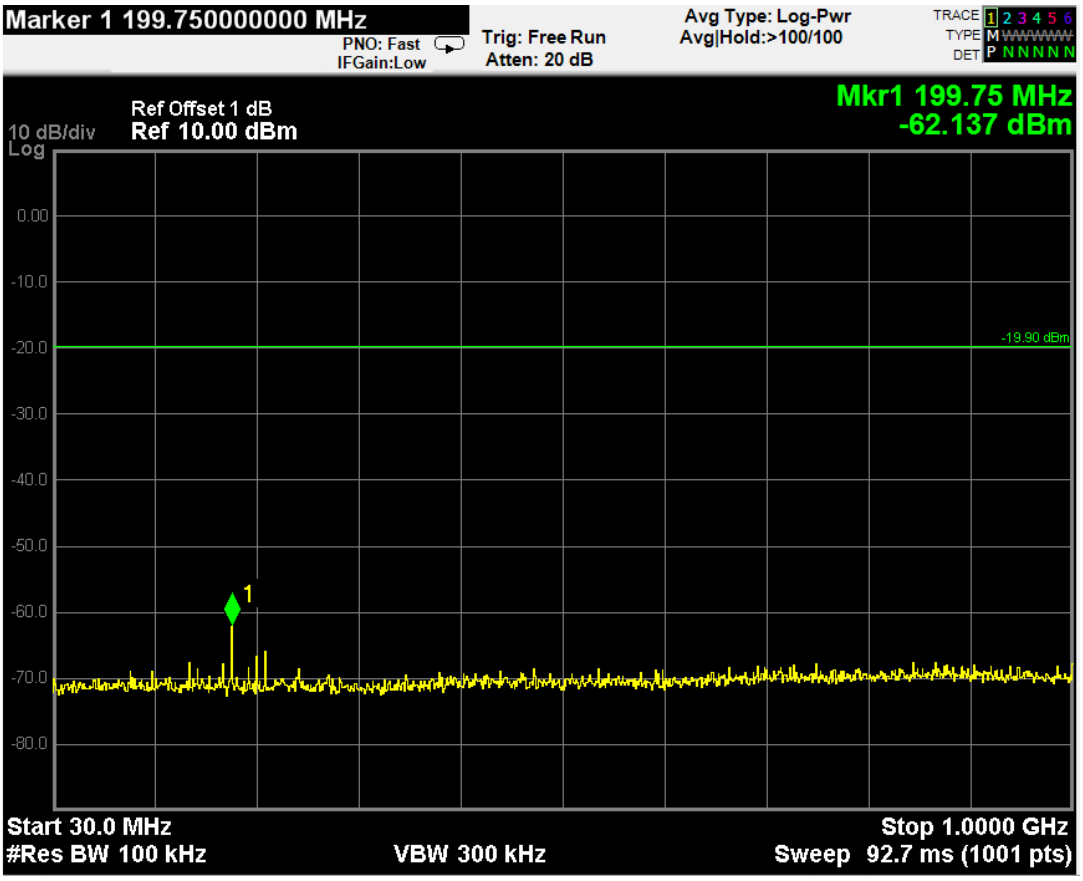


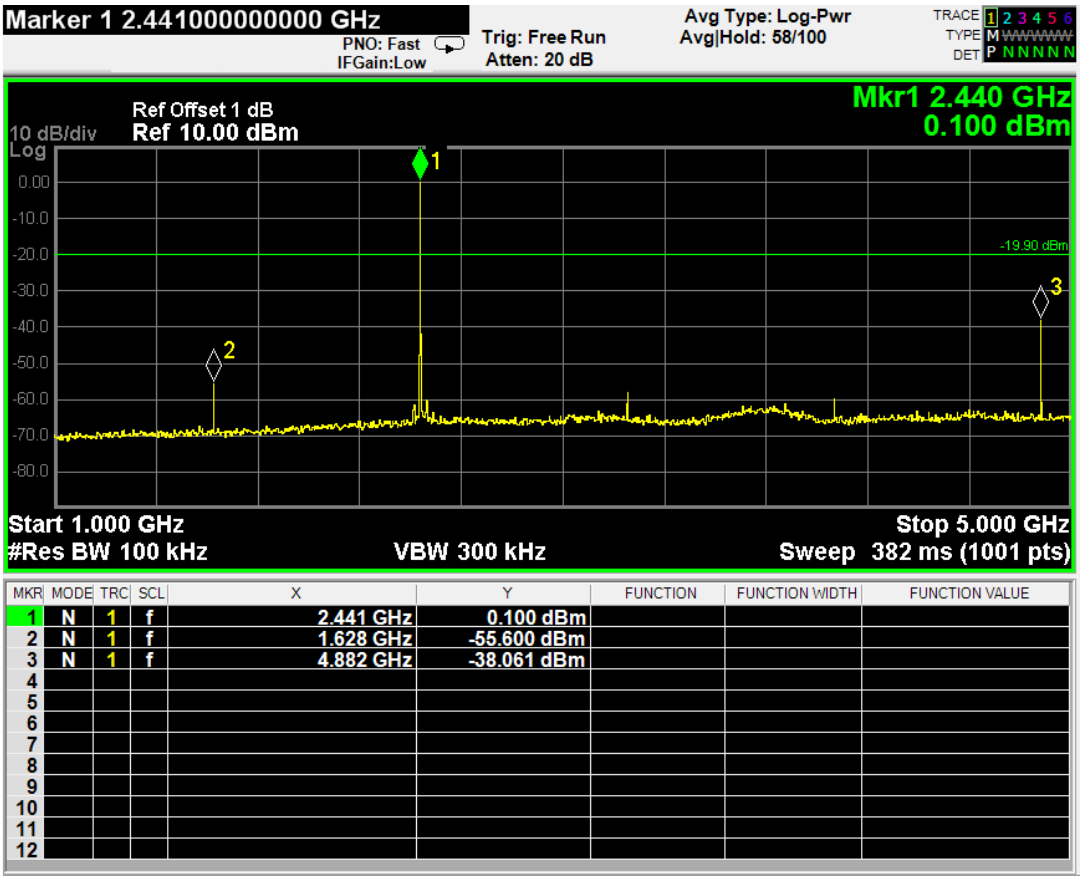
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.404 GHz	-1.184 dBm			
2	N	1	f	1.604 GHz	-55.501 dBm			
3	N	1	f	3.204 GHz	-54.493 dBm			
4	N	1	f	4.804 GHz	-35.761 dBm			
5								
6								
7								
8								
9								
10								
11								
12								


Marker 1 14.570000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 22/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 14.57 GHz
-62.844 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
21.18 dBm
1
Start 5.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 15.000 GHz
Sweep 956 ms (1001 pts)

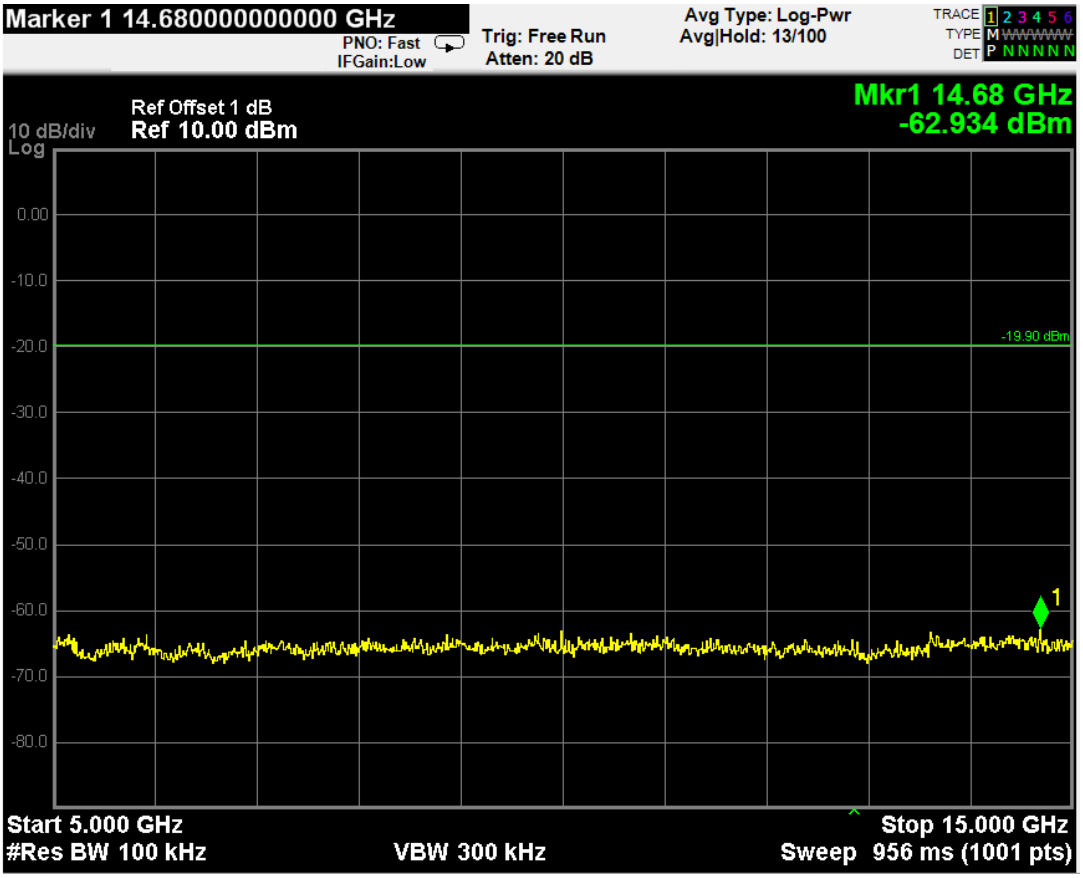

Marker 1 23.600000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 41/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 23.60 GHz
-58.766 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
21.18 dBm
1
Start 15.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 25.000 GHz
Sweep 956 ms (1001 pts)

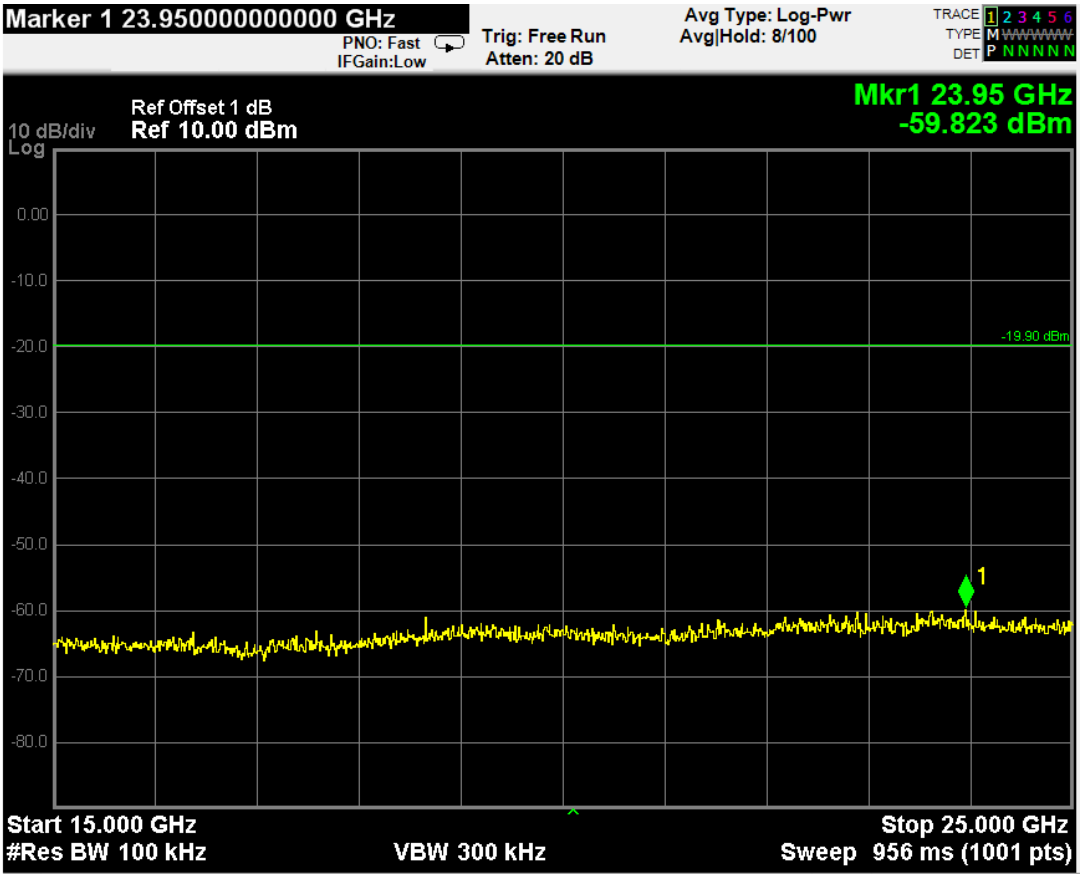
3M 8-DPSK Ch 39 (2441 MHz)



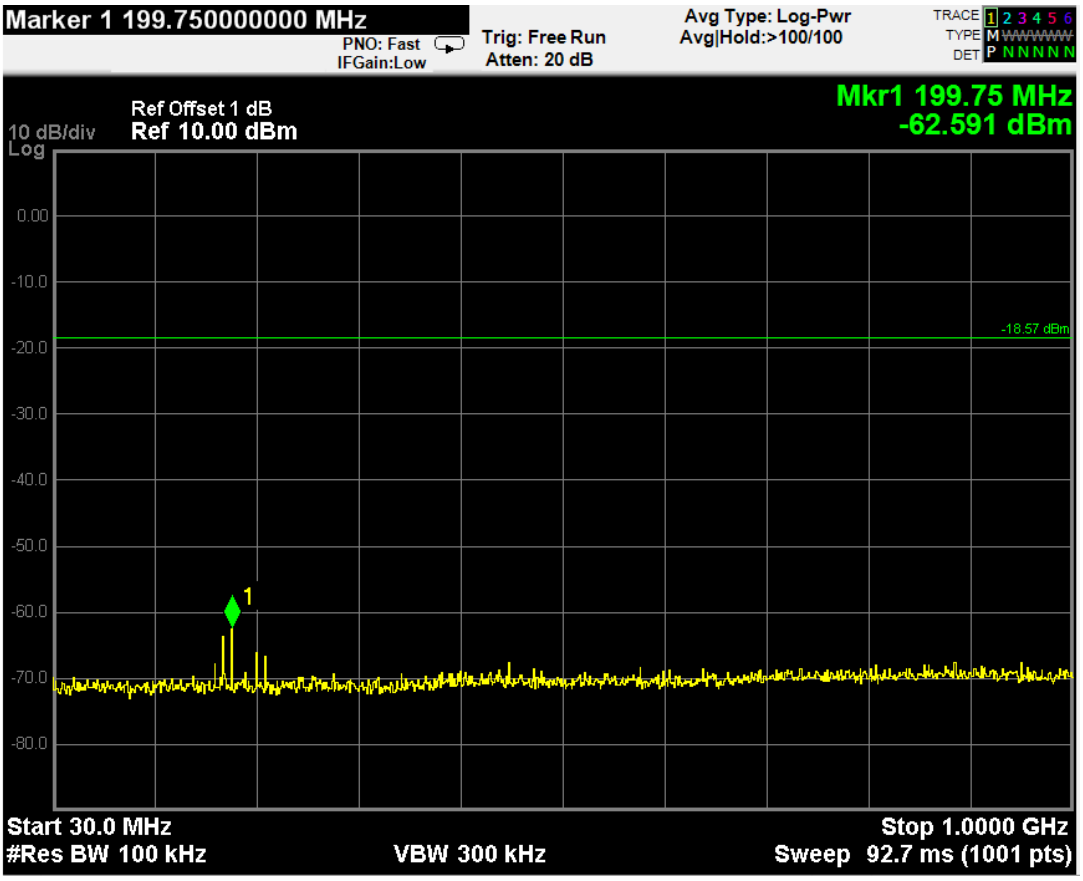


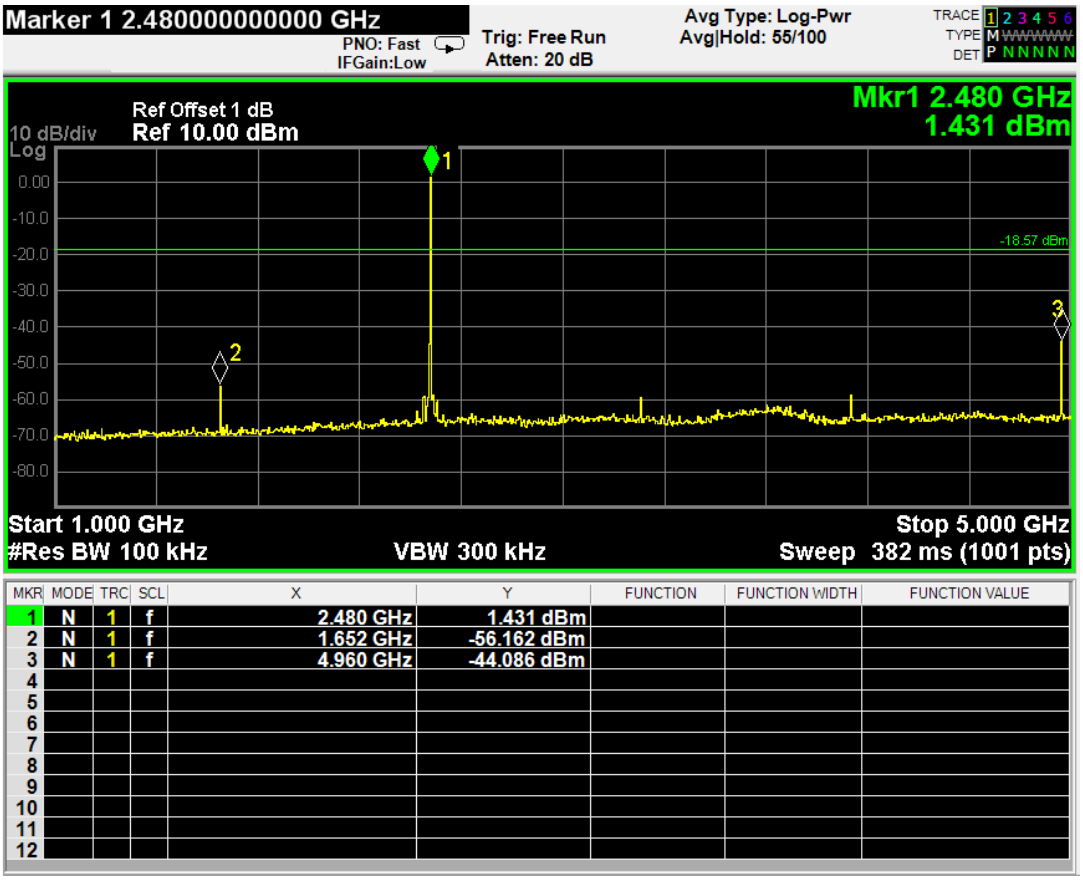
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.441 GHz	0.100 dBm			
2	N	1	f	1.628 GHz	-55.600 dBm			
3	N	1	f	4.882 GHz	-38.061 dBm			
4								
5								
6								
7								
8								
9								
10								
11								
12								


Marker 1 14.680000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 13/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 14.68 GHz
-62.934 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-19.90 dBm
1
Start 5.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 15.000 GHz
Sweep 956 ms (1001 pts)

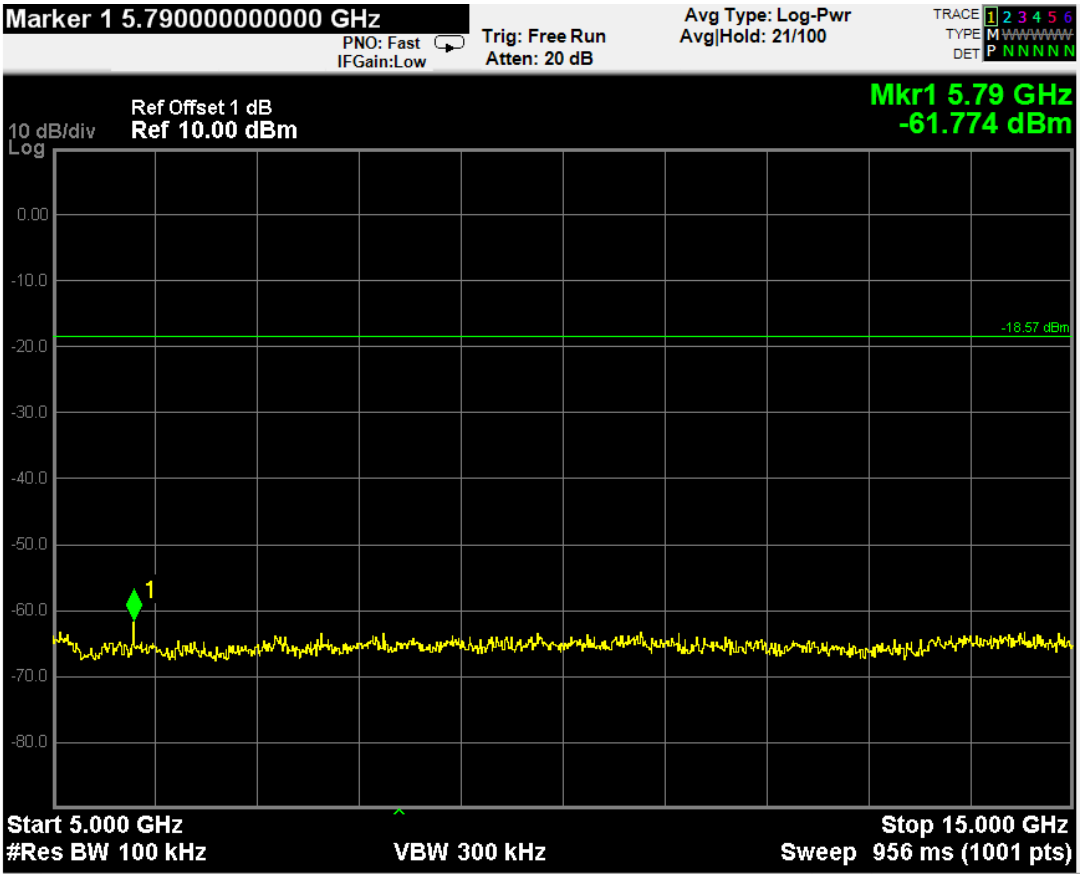

Marker 1 23.950000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 8/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 23.95 GHz
-59.823 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-19.90 dBm
1
Start 15.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 25.000 GHz
Sweep 956 ms (1001 pts)

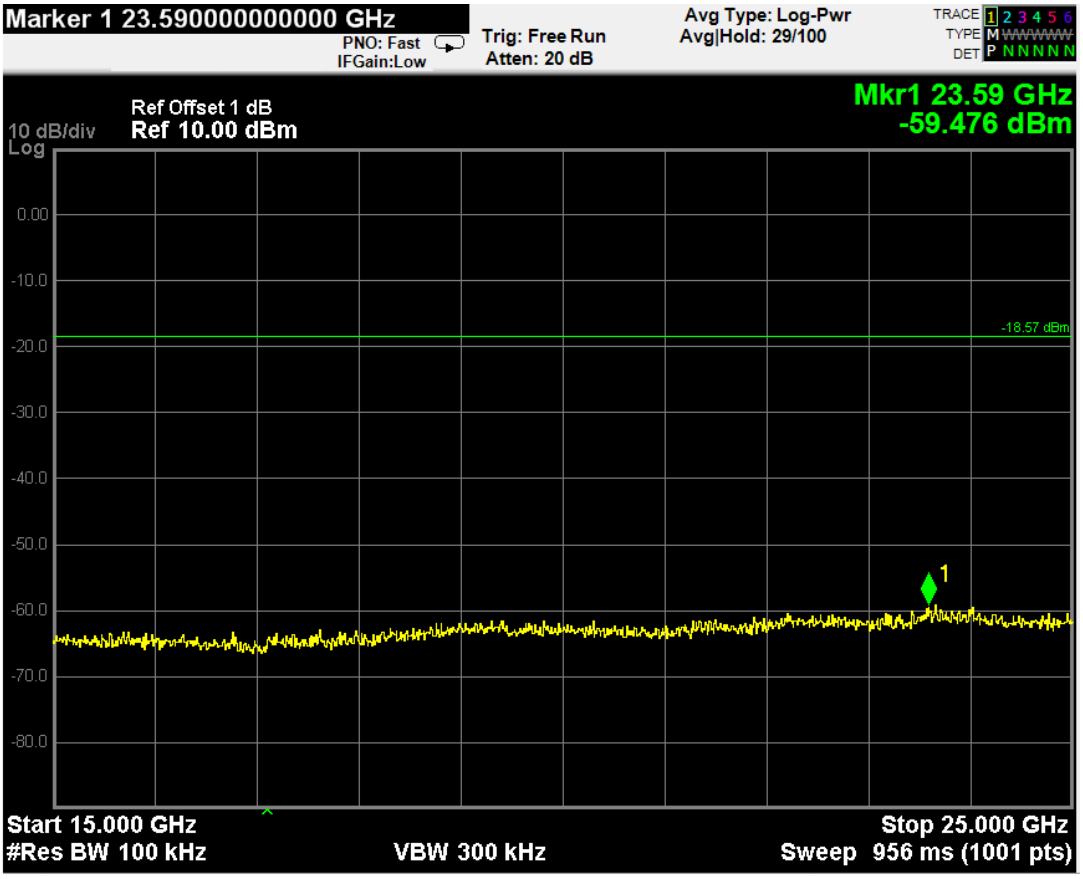
3M 8-DPSK Ch 78 (2480 MHz)





MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 GHz	1.431 dBm			
2	N	1	f	1.652 GHz	-56.162 dBm			
3	N	1	f	4.960 GHz	-44.086 dBm			
4								
5								
6								
7								
8								
9								
10								
11								
12								


Marker 1 5.790000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 21/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 5.79 GHz
-61.774 dBm
0.00
-10.0
-18.57 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 5.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 15.000 GHz
Sweep 956 ms (1001 pts)


Marker 1 23.590000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 29/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 23.59 GHz
-59.476 dBm
0.00
-10.0
-18.57 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 15.000 GHz
#Res BW 100 kHz
VBW 300 kHz
Stop 25.000 GHz
Sweep 956 ms (1001 pts)

8 BAND-EDGE COMPLIANCE OF RF CONDUCTED EMISSIONS MEASUREMENT

8.1 Test Equipment

The following test equipment was used during the band edges measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jun 12, 2015	Jun 11, 2016

8.2 Block Diagram of Test Setup

The same as section.4.2.

8.3 Specification Limits (§15.247(d))

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

8.4 Operating Condition of EUT

Enable the EUT to transmit data at different channel frequency individually.

8.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with span wide enough to fully capture the emission being measured.
The test procedure is defined in DA 00-705.

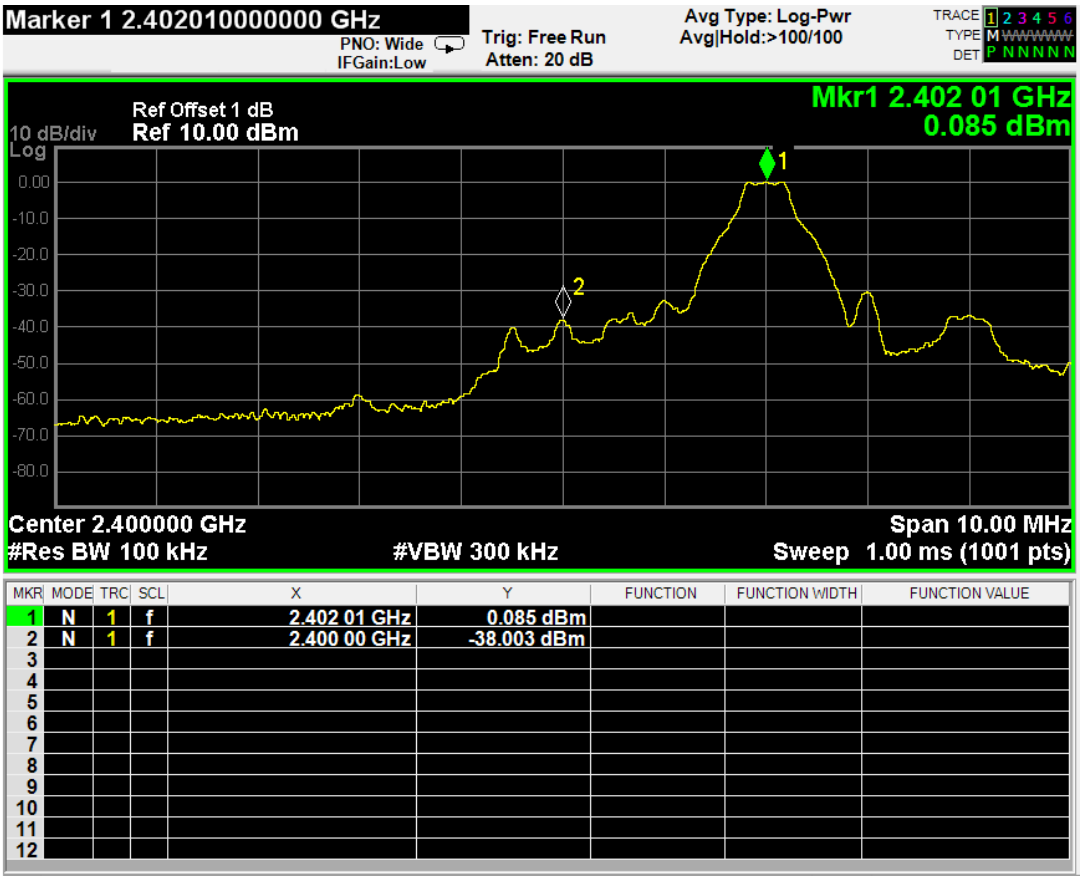
8.6 Test Results

PASSED. All the test results are attached in next pages.

(Test Date: Oct. 28, 2015 Temperature: 21℃ Humidity: 42 %)

Modulation	Location	Channel	Frequency	**Delta Marker (worst)**	Data Page	Result
1M GFSK	Below Band Edge	00	2402 MHz	**38.088 dB** (non-hopping)	P47	More than **20 dB** below the highest level of the desired power
				38.465 dB (hopping)		
	Upper Band Edge	78	2480 MHz	**47.311 dB** (non-hopping)	P48	
				50.584 dB (hopping)		
3M 8-DPSK	Below Band Edge	00	2402 MHz	**40.820 dB** (non-hopping)	P49	
				41.388 dB (hopping)		
	Upper Band Edge	78	2480 MHz	**48.870 dB** (non-hopping)	P50	
				49.010 dB (hopping)		

Ch00 2402MHz (Below Edge 2400 MHz) 1M GFSK

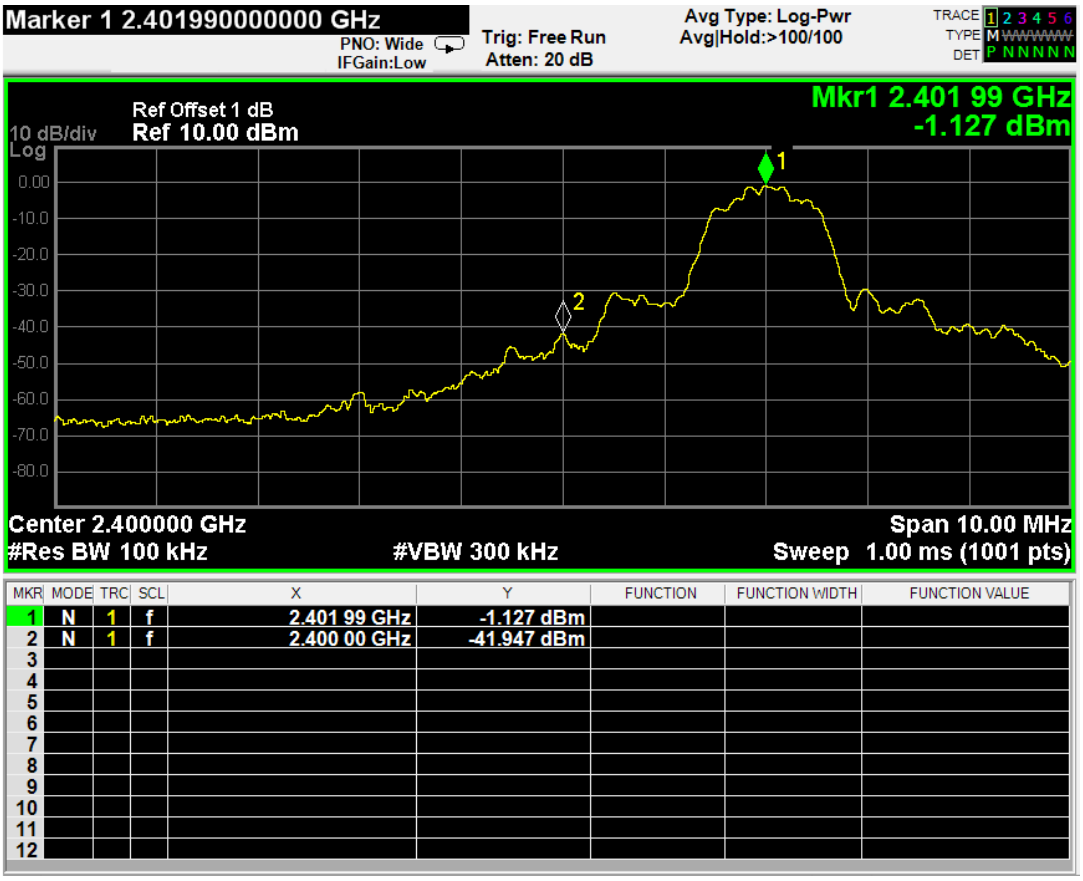


Ch00 2402MHz (Below Edge 2400 MHz) 1M GFSK HOPPING

Ch78 2480MHz (Upper Edge 2483.5 MHz) 1M GFSK

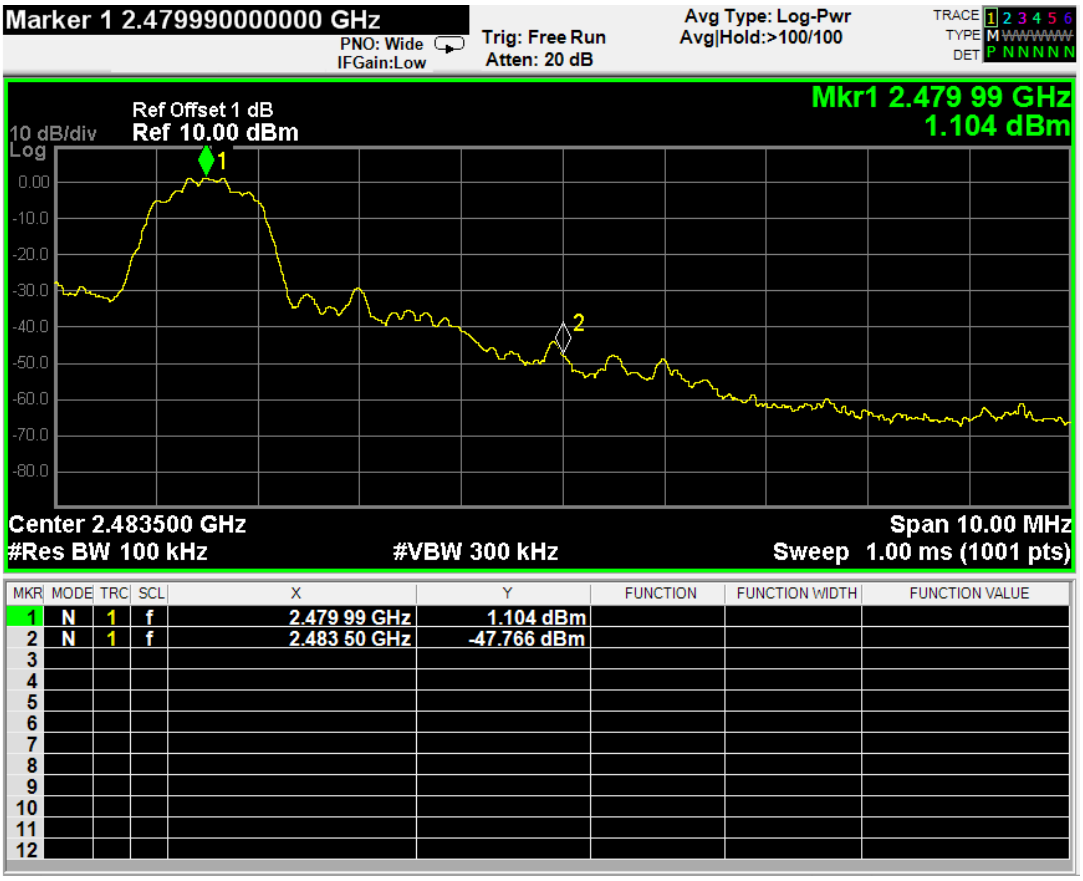
Ch78 2480MHz (Upper Edge 2483.5 MHz) 1M GFSK HOPPING

Ch00 2402MHz (Below Edge 2400 MHz) 3M 8-DPSK



Ch00 2402MHz (Below Edge 2400 MHz) 3M 8-DPSK HOPPING

Ch78 2480MHz (Upper Edge 2483.5 MHz) 3M 8-DPSK



Ch78 2480MHz (Upper Edge 2483.5 MHz) 3M 8-DPSK HOPPING

9 NUMBER OF HOPPING FREQUENCIES MEASUREMENT

9.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jun 12, 2015	Jun 11, 2016

9.2 Block Diagram of Test Setup

The same as section.4.2.

9.3 Specification Limits (§15.247(a)(1)(iii))

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

9.4 Operating Condition of EUT

Enable the EUT hopping function.

9.5 Test Procedure

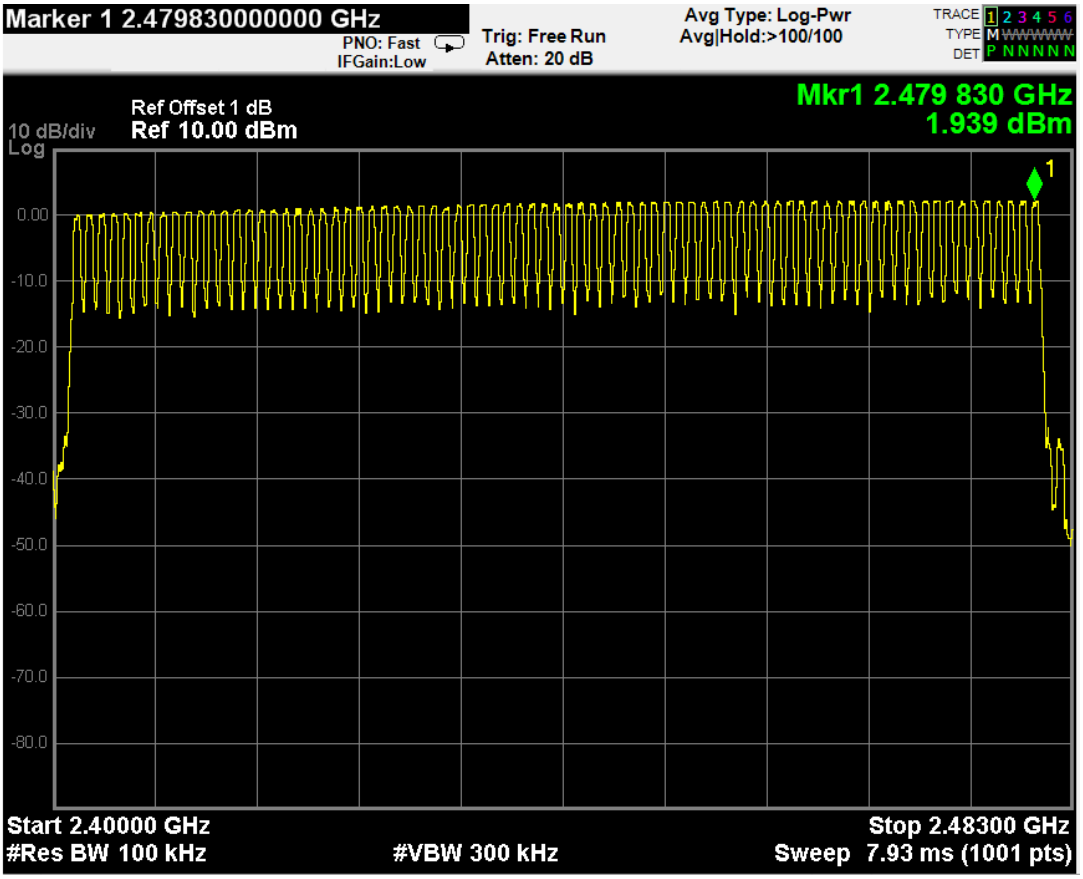
The transmitter output was connected to the spectrum analyzer. The spectrum analyzer was set as RBW = 300kHz, VBW = 300kHz, count the number of hopping frequencies used and recorded.
The test procedure is defined in DA 00-705.

9.6 Test Results

PASSED. All the test results are attached in next pages.

(Test Date: Oct. 28, 2015 Temperature: 21℃ Humidity: 42 %)

Result	Limit	Conclusion
79	> 15	Pass


Marker 1 2.479830000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.479 830 GHz
1.939 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48300 GHz
Sweep 7.93 ms (1001 pts)

10 CARRIER FREQUENCY SEPARATION MEASUREMENT

10.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jun 12, 2015	Jun 11, 2016

10.2 Block Diagram of Test Setup

The same as section.4.2.

10.3 Specification Limits (§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.

10.4 Operating Condition of EUT

Enable the EUT hopping function.

10.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The spectrum analyzer was set as RBW = 100 kHz, VBW = 300 kHz, span = wide enough to capture the peaks of two adjacent channels. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.
The test procedure is defined in DA 00-705.

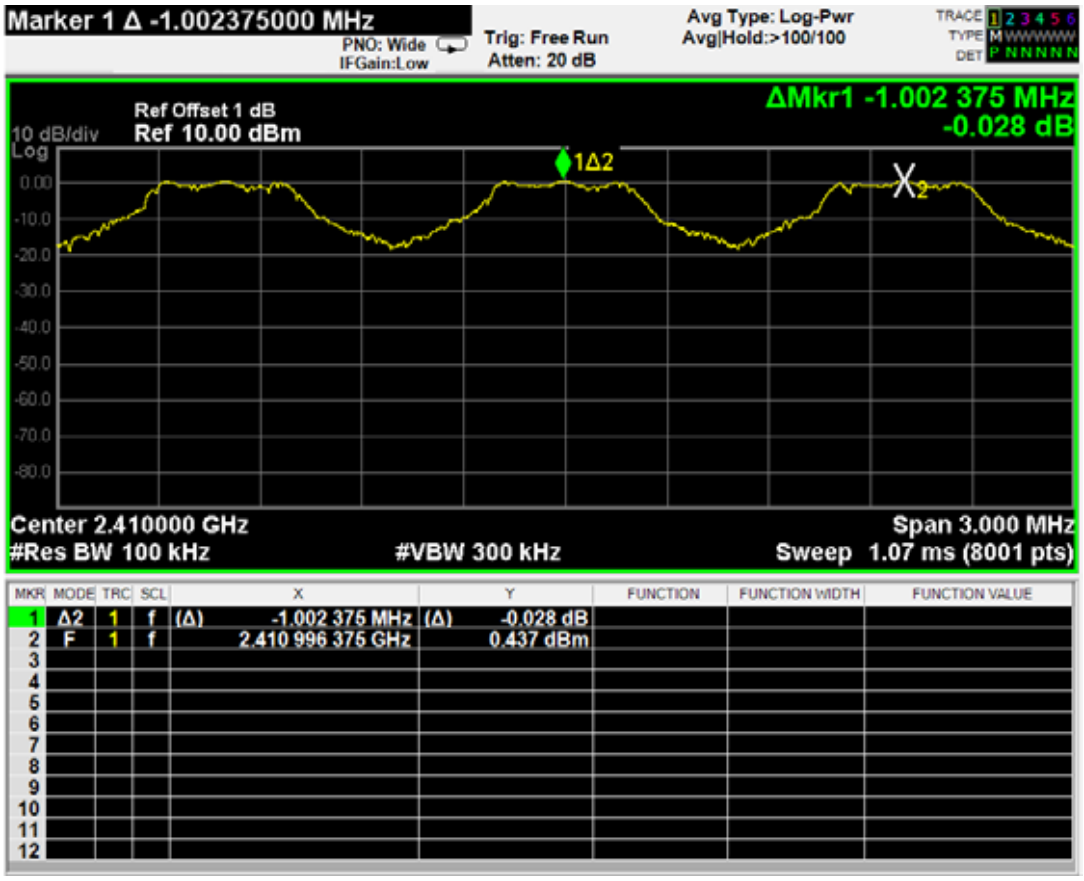
10.6 Test Results

PASSED. All the test results are attached in next pages.

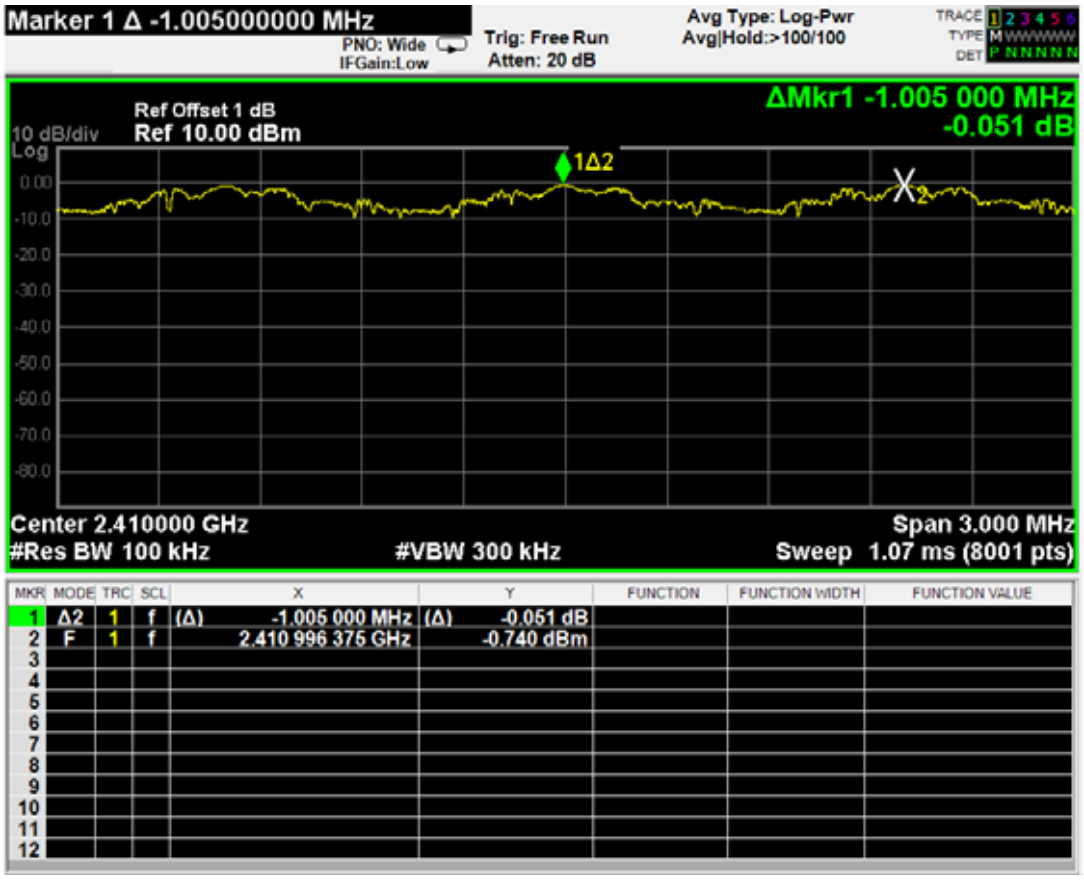
(Test Date: Oct. 28, 2015 Temperature: 21℃ Humidity: 42 %)

Mode	Result	Limit (2/3 of the 20dB bandwidth)	Conclusion
1M GFSK	1.002 MHz	> 0.560 MHz	Pass
3M 8-DPSK	1.005 MHz	> 0.804 MHz	Pass

1M GFSK



3M 8-DPSK



11 DEWLL TIME MEASUREMENT

11.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101303	Sep 11, 2014	Sep 11, 2014

11.2 Block Diagram of Test Setup

The same as section.4.2.

11.3 Specification Limits (§15.247(a)(1)(iii))

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.

11.4 Operating Condition of EUT

Enable the EUT hopping function.

11.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The spectrum analyzer was set as RBW = 1MHz, VBW = 1MHz, span = zero span, centered on a hopping channel. Use the marker-delta function to calculate the dwell time.
The test procedure is defined in DA 00-705.

11.6 Test Results

PASSED. All the test results are attached in next pages.

(Test Date: Oct. 28, 2015 Temperature: 21℃ Humidity: 42 %)

No.	Channel	Frequency	Data Page
1.	00	2402 MHz	P60-66
2.	39	2441 MHz	P67-73
3.	78	2480 MHz	P74-80

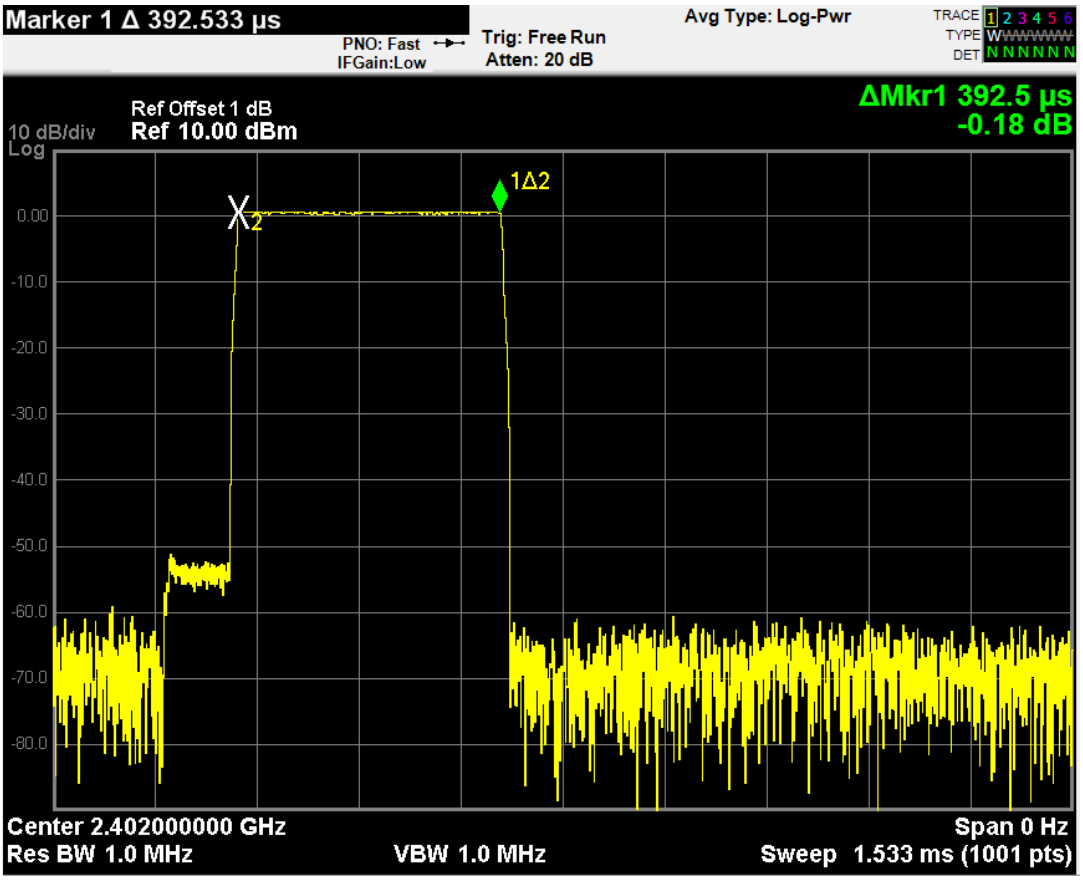
Ch 00 2402MHz 1M GFSK

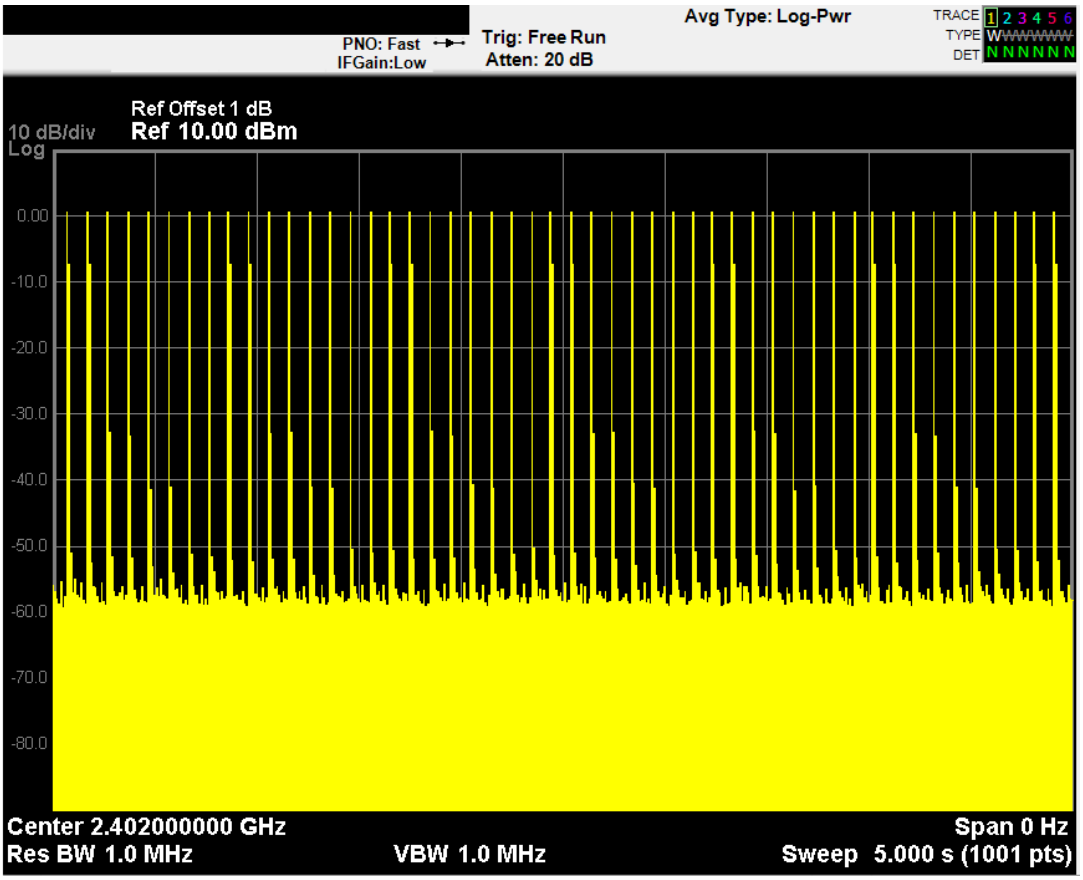
Mode	Number of transmission in a 31.6 (79 hopping*0.4) second period	Length of transmission time (msec)	Result (msec)	Limit (msec)	Conclusion
DH1	50 times/5 sec * 31.6=316 times	0.3925	316*0.3925 = 124.03	< 400	Pass
DH3	17 times/5 sec * 31.6=108 times	1.645	108*1.645 = 177.66	< 400	Pass
DH5	20 times/10 sec * 31.6=63 times	2.900	63*2.900 = 182.70	< 400	Pass

Ch 00 2402MHz 3M 8-DPSK

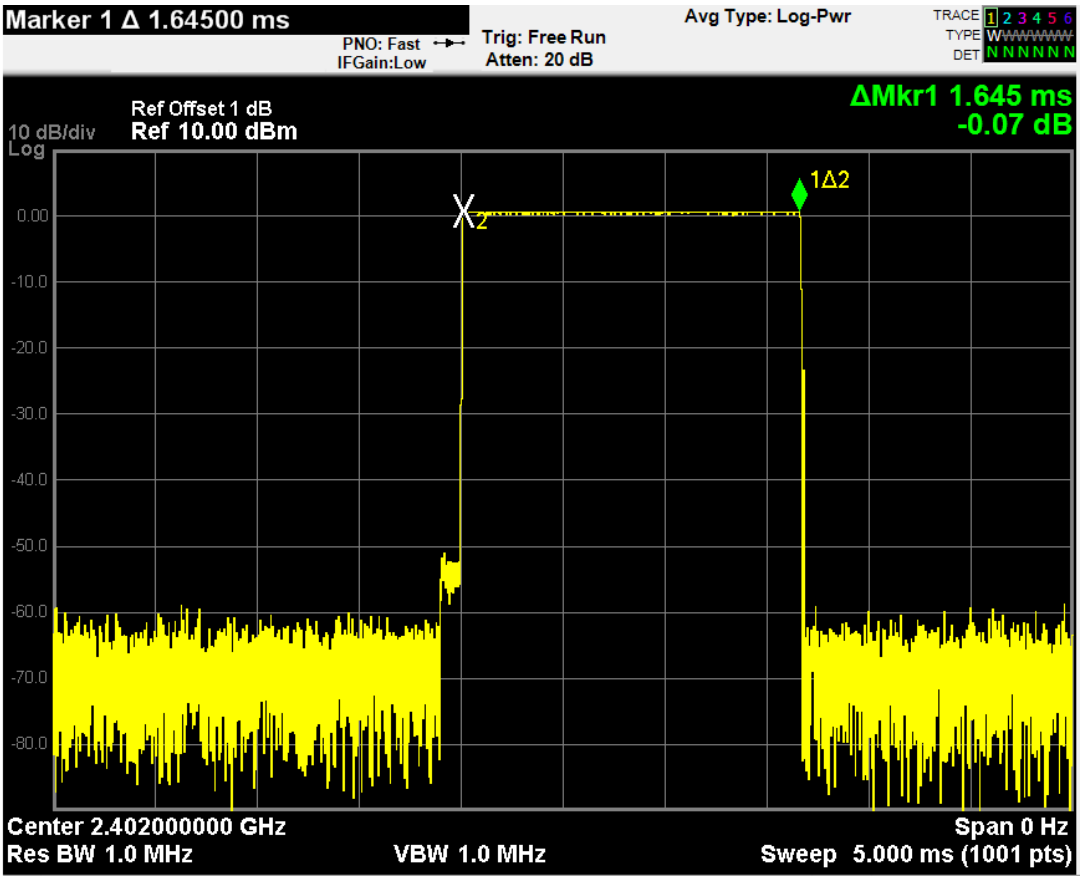
Mode	Number of transmission in a 31.6 (79 hopping*0.4) second period	Length of transmission time (msec)	Result (msec)	Limit (msec)	Conclusion
3DH1	30 times/3 sec * 31.6=316 times	0.407	316*0.407 = 128.61	< 400	Pass
3DH3	17 times/5 sec * 31.6=108 times	1.656	108*1.656 = 178.85	< 400	Pass
3DH5	20 times/10 sec * 31.6=63 times	2.910	63*2.910 = 183.33	< 400	Pass

For Ch 00 2402MHz 1M GFSK DH1

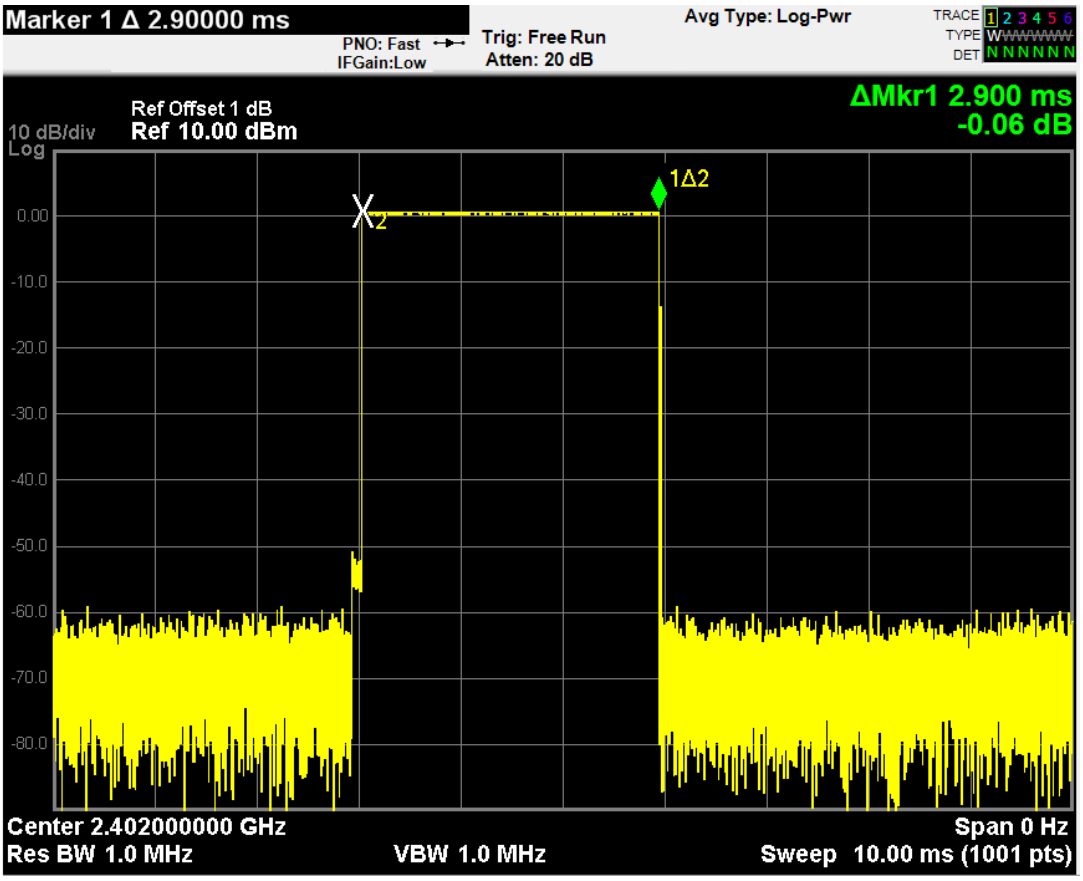




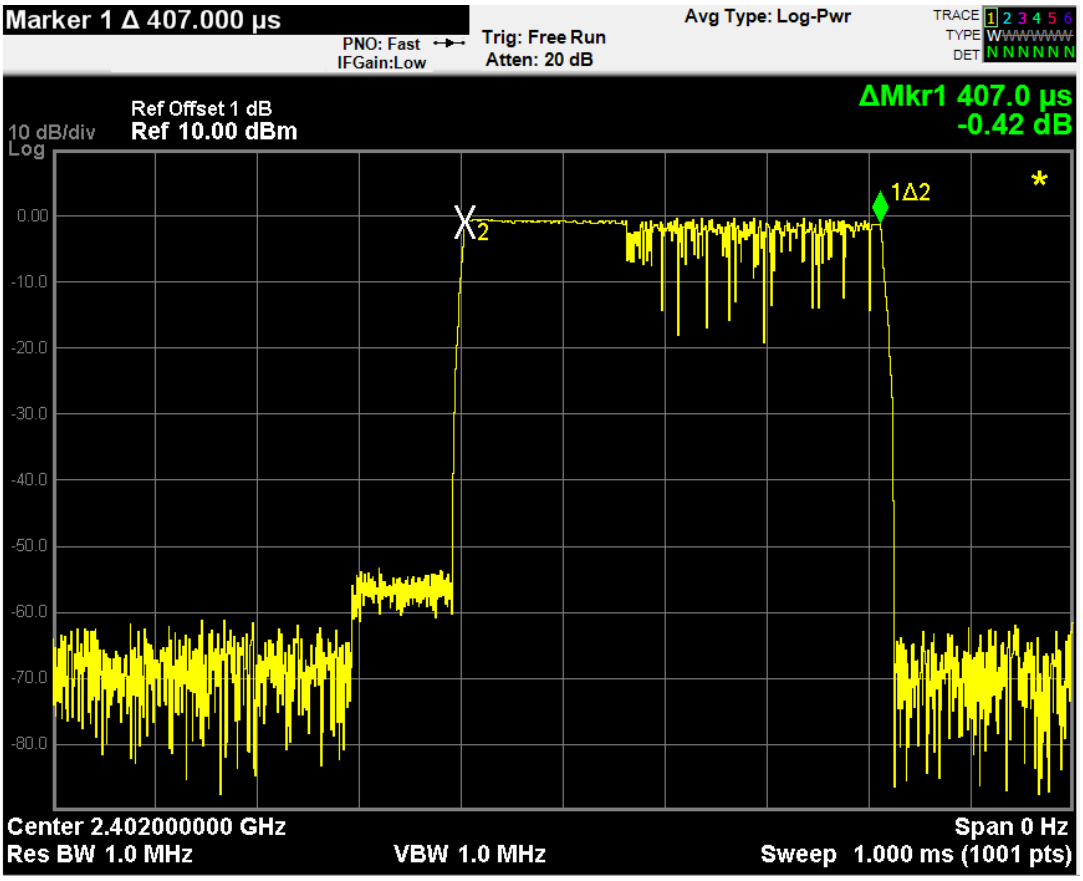
For Ch 00 2402MHz 1M GFSK DH3

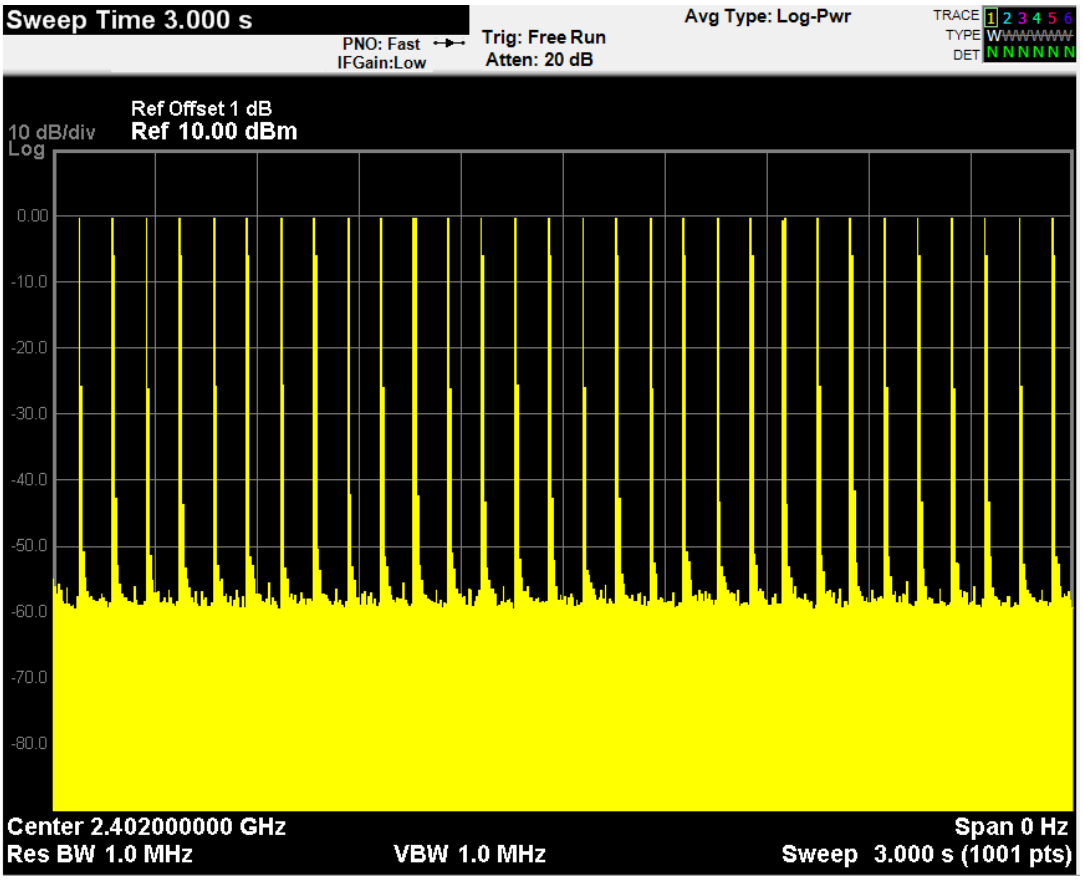


For Ch 00 2402MHz 1M GFSK DH5

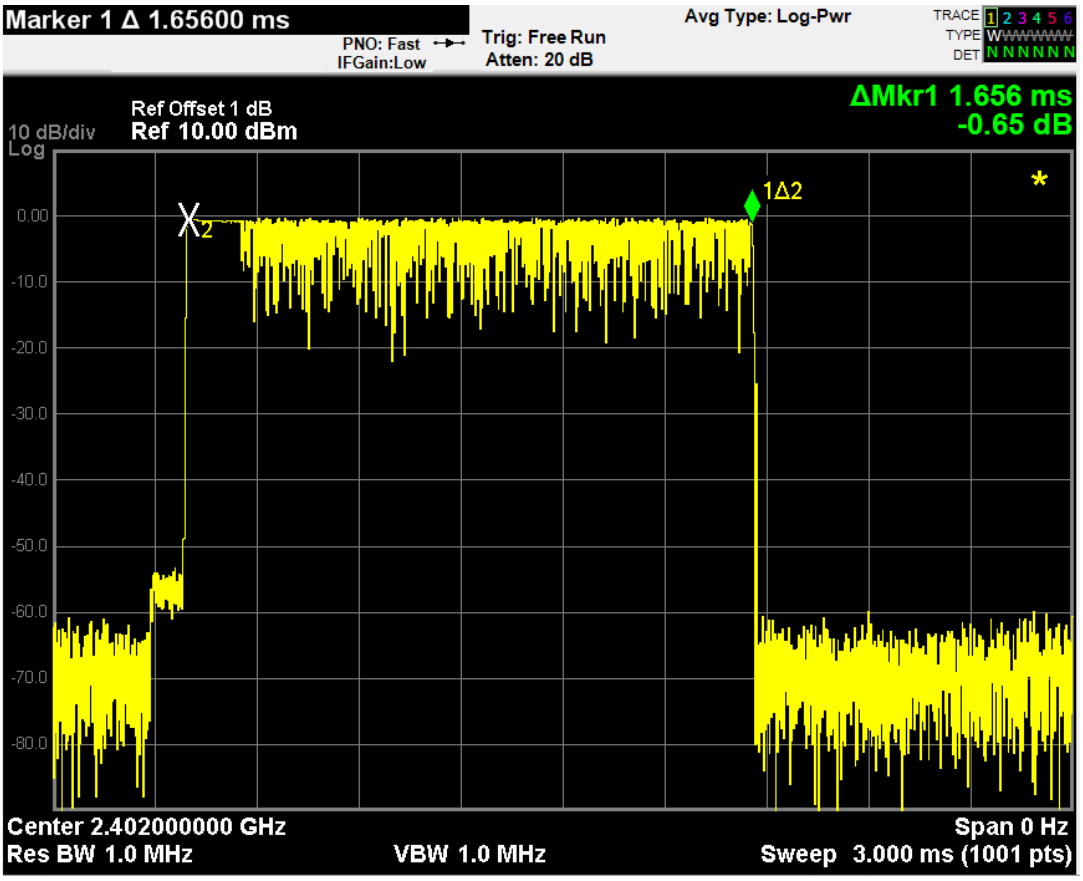


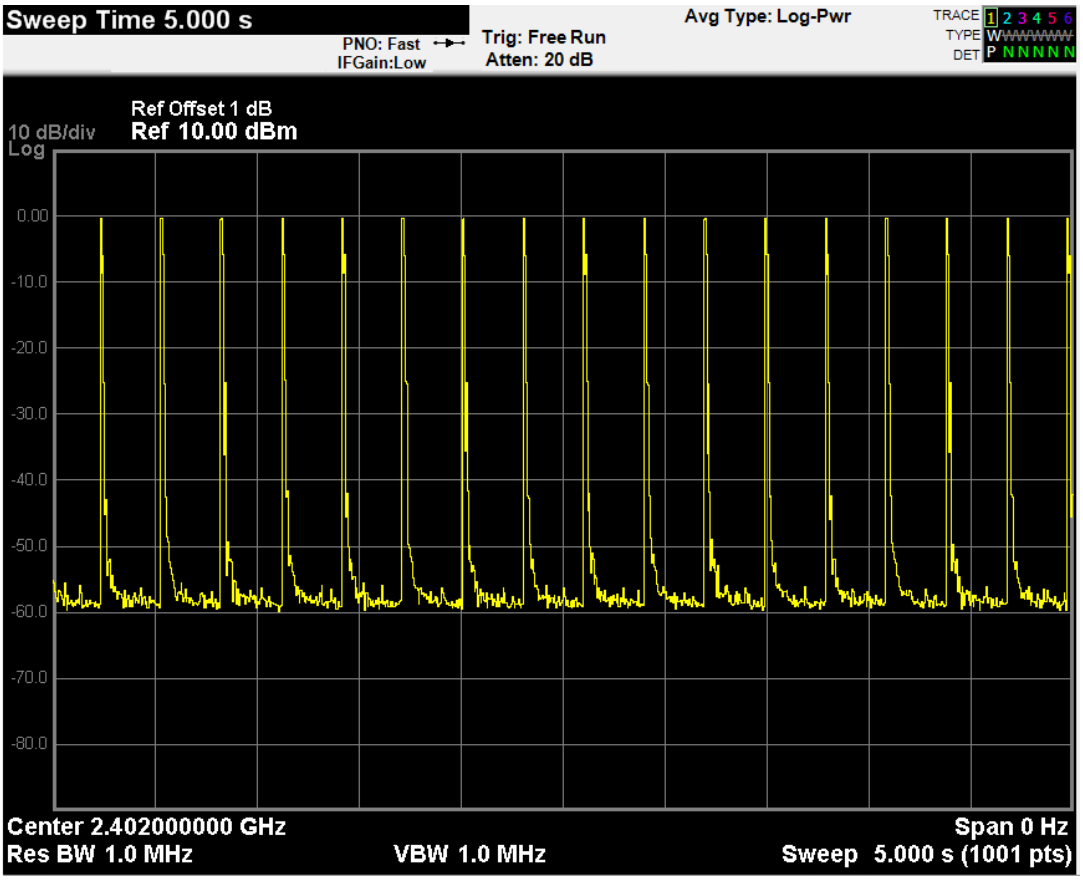
For Ch 00 2402MHz 3M 8-DPSK DH1



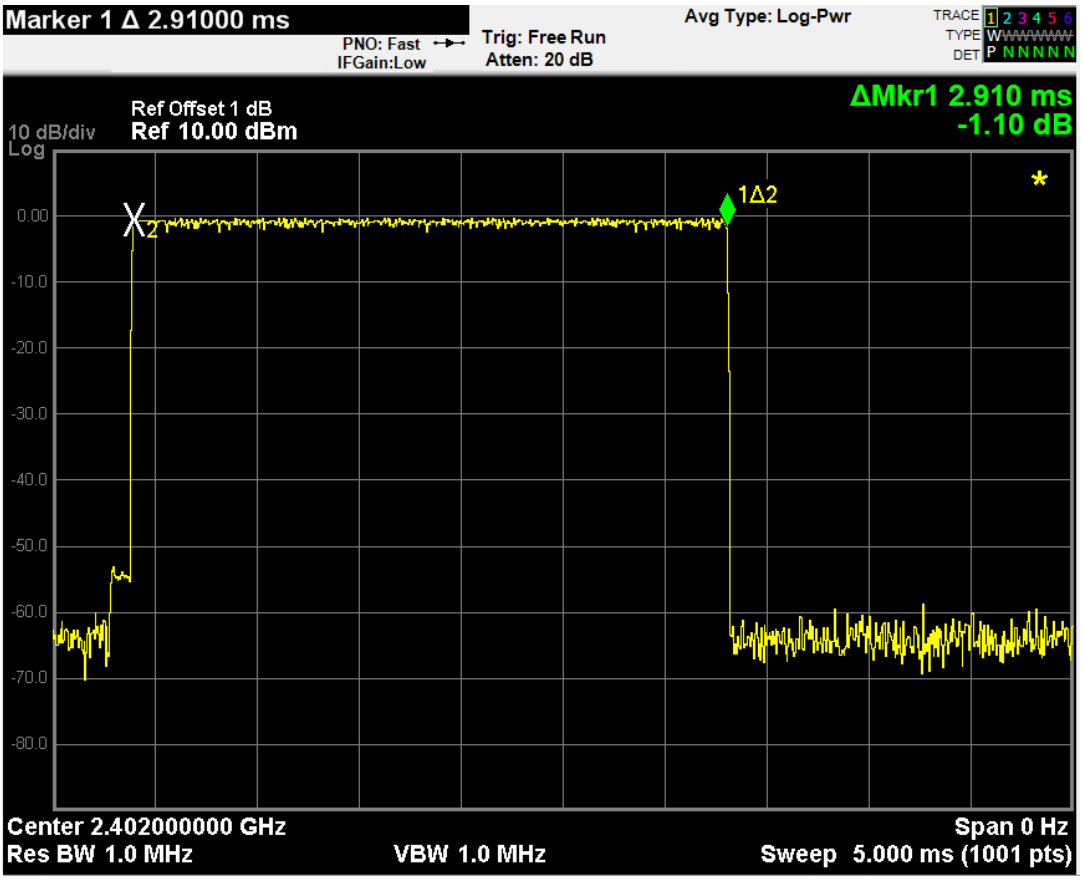


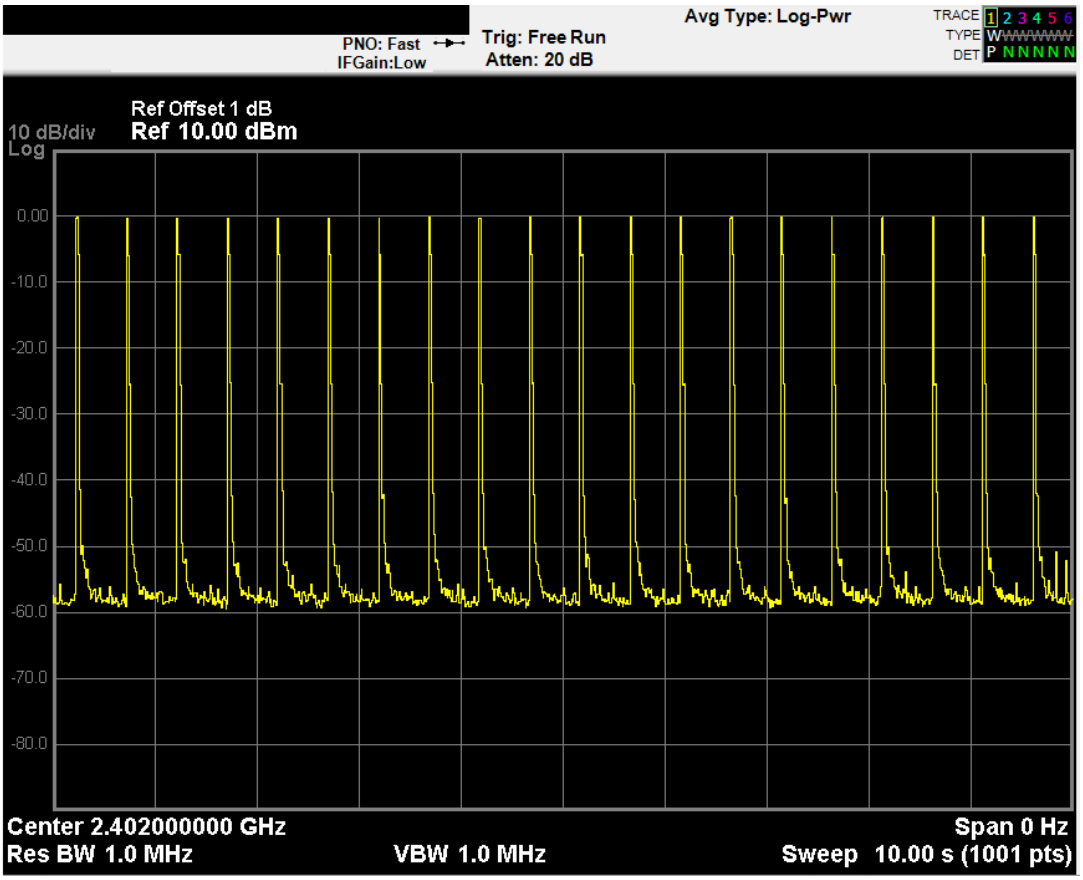
For Ch 00 2402MHz 3M 8-DPSK DH3





For Ch 00 2402MHz 3M 8-DPSK DH5





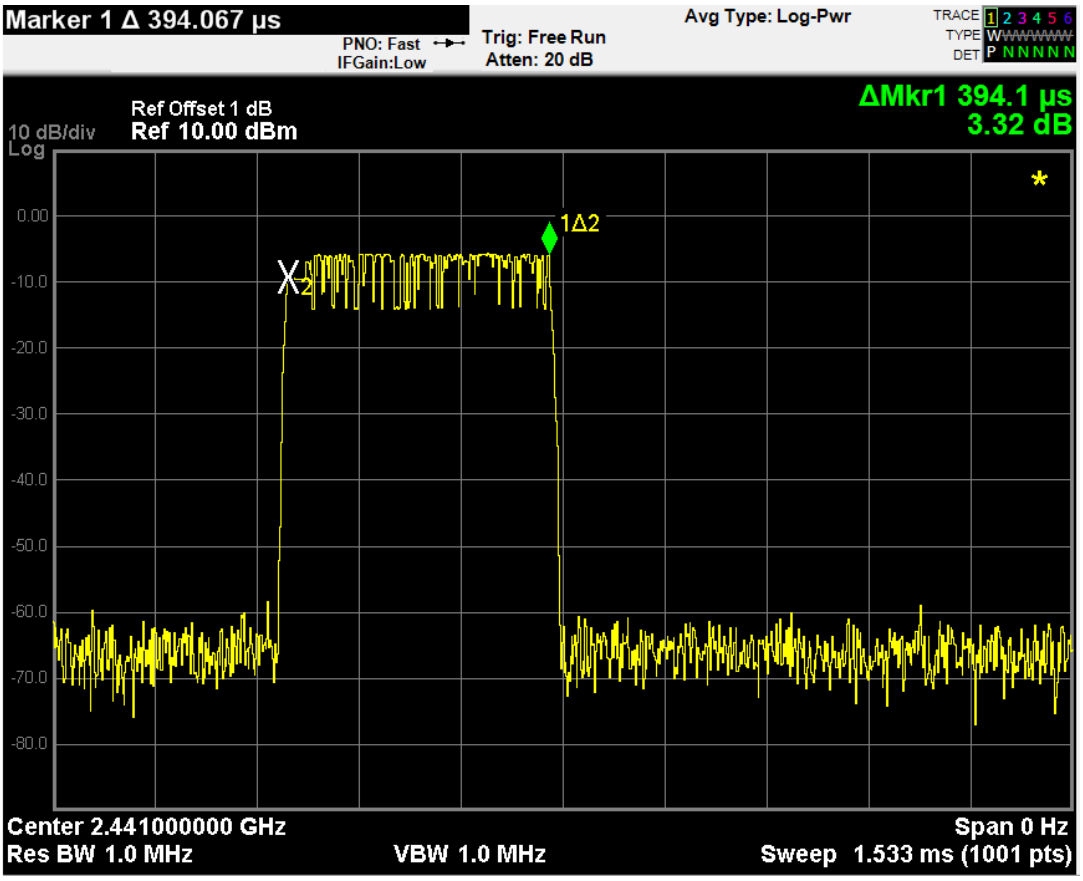
Ch 39 2441MHz 1M GFSK

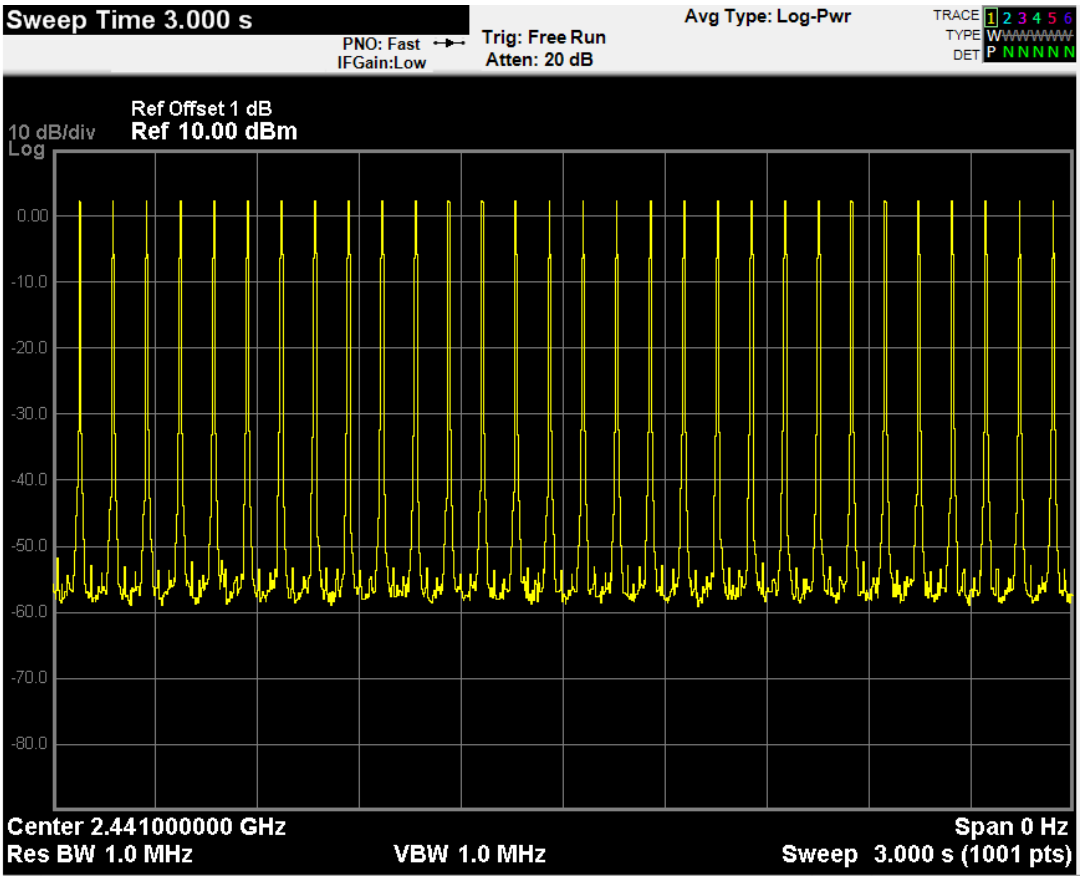
Mode	Number of transmission in a 31.6 (79 hopping*0.4) second period	Length of transmission time (msec)	Result (msec)	Limit (msec)	Conclusion
DH1	30 times/3 sec * 31.6=316 times	0.394	316*0.394 = 124.5	< 400	Pass
DH3	17 times/5 sec * 31.6=108 times	1.645	108*1.645 = 177.66	< 400	Pass
DH5	20 times/10 sec * 31.6=63 times	2.895	63*2.895 = 182.38	< 400	Pass

Ch 39 2441MHz 3M 8-DPSK

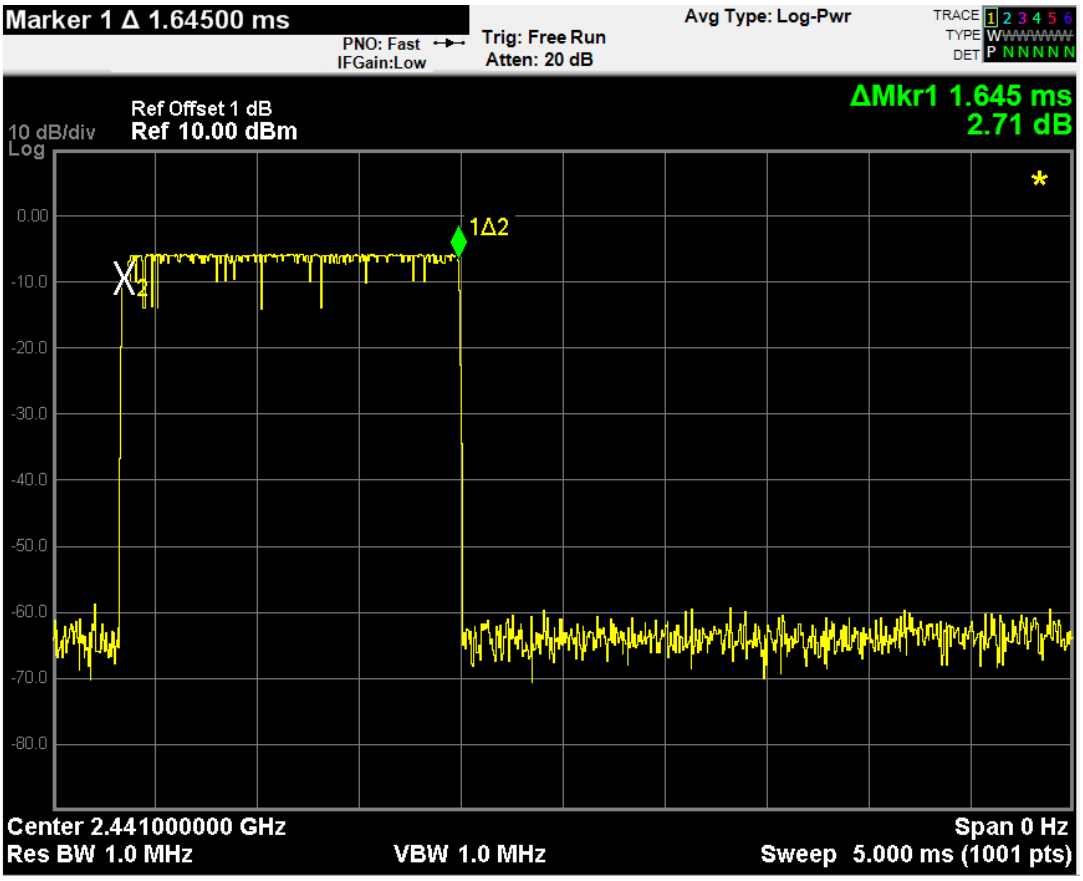
Mode	Number of transmission in a 31.6 (79 hopping*0.4) second period	Length of transmission time (msec)	Result (msec)	Limit (msec)	Conclusion
3DH1	30 times/3 sec * 31.6=316 times	0.406	316*0.406 = 128.30	< 400	Pass
3DH3	34 times/10 sec * 31.6=108 times	1.600	108*1.600 = 172.80	< 400	Pass
3DH5	20 times/10 sec * 31.6=63 times	2.870	63*2.870 = 180.81	< 400	Pass

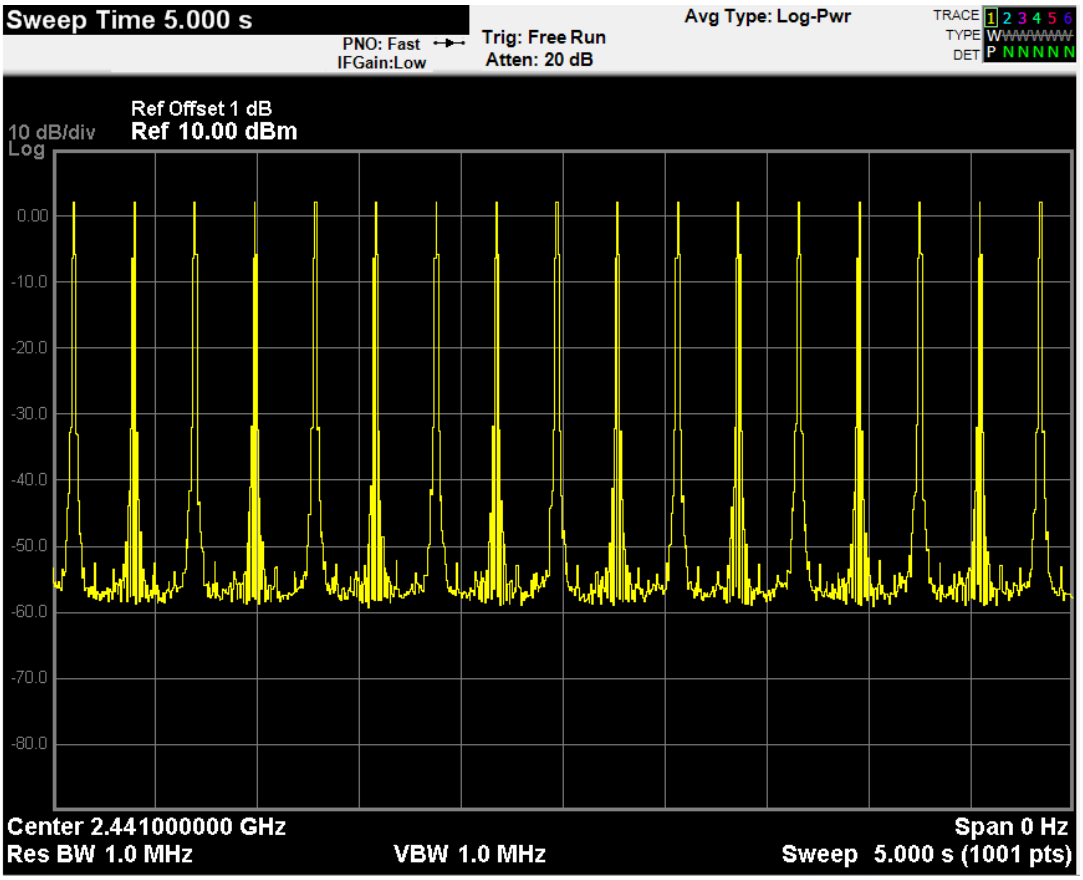
For Ch 39 2441MHz 1M GFSK DH1



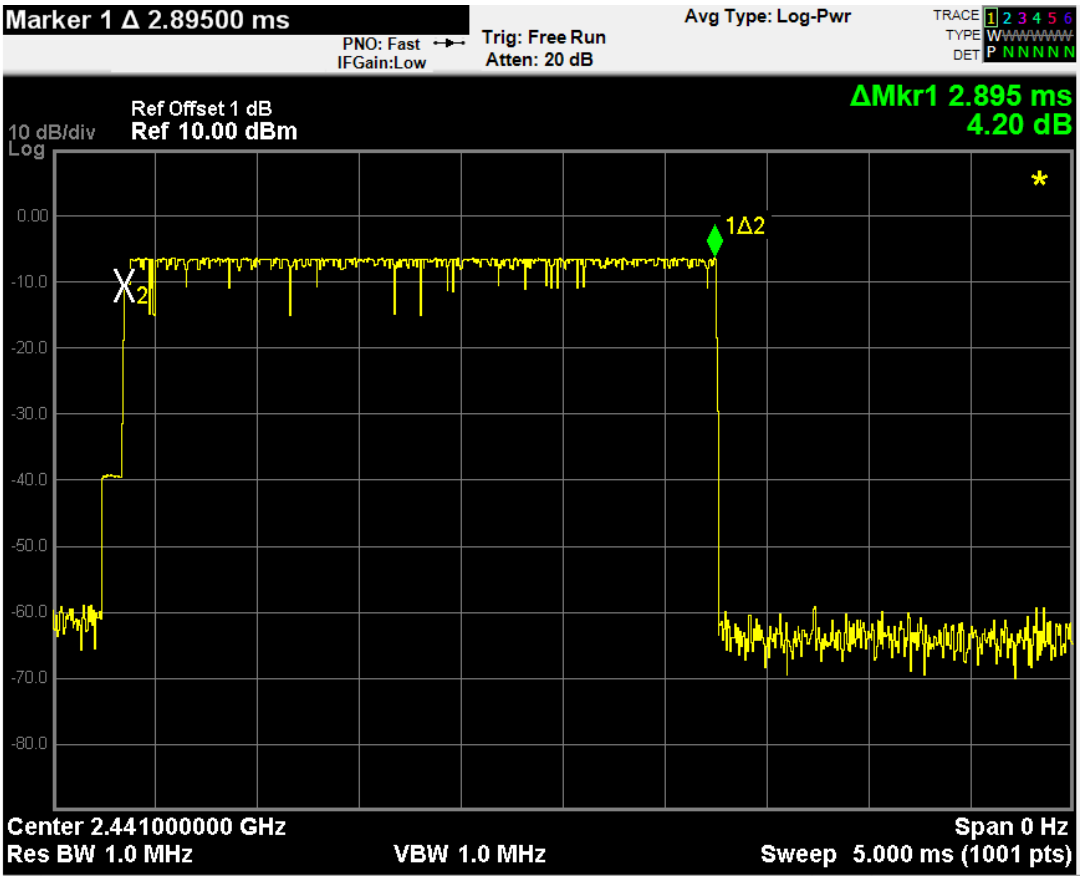


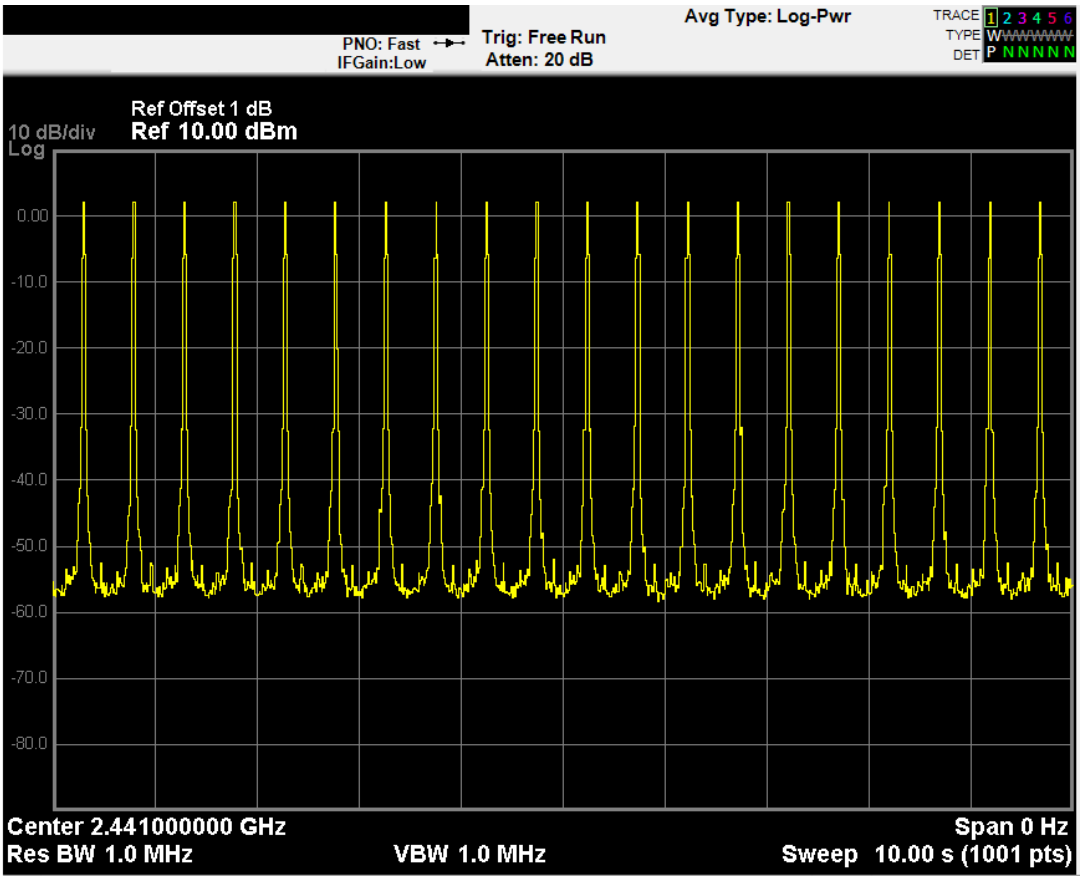
For Ch 39 2441MHz 1M GFSK DH3



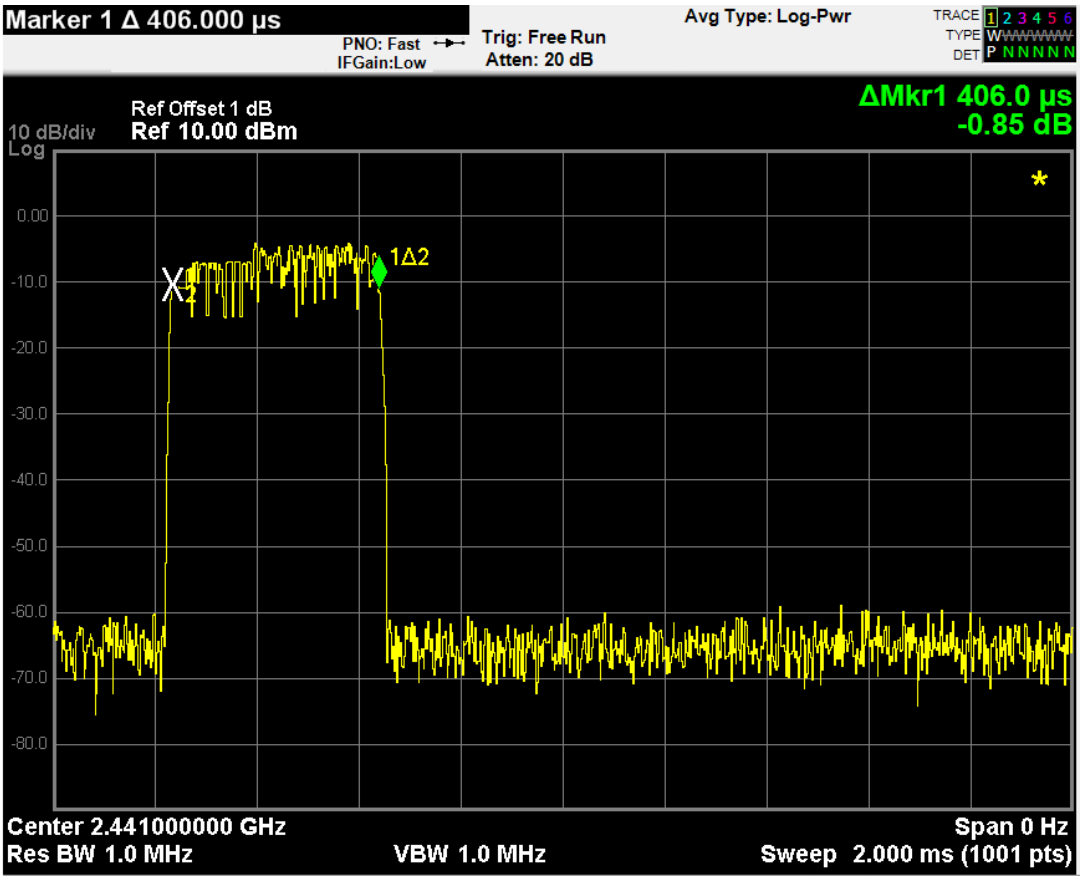


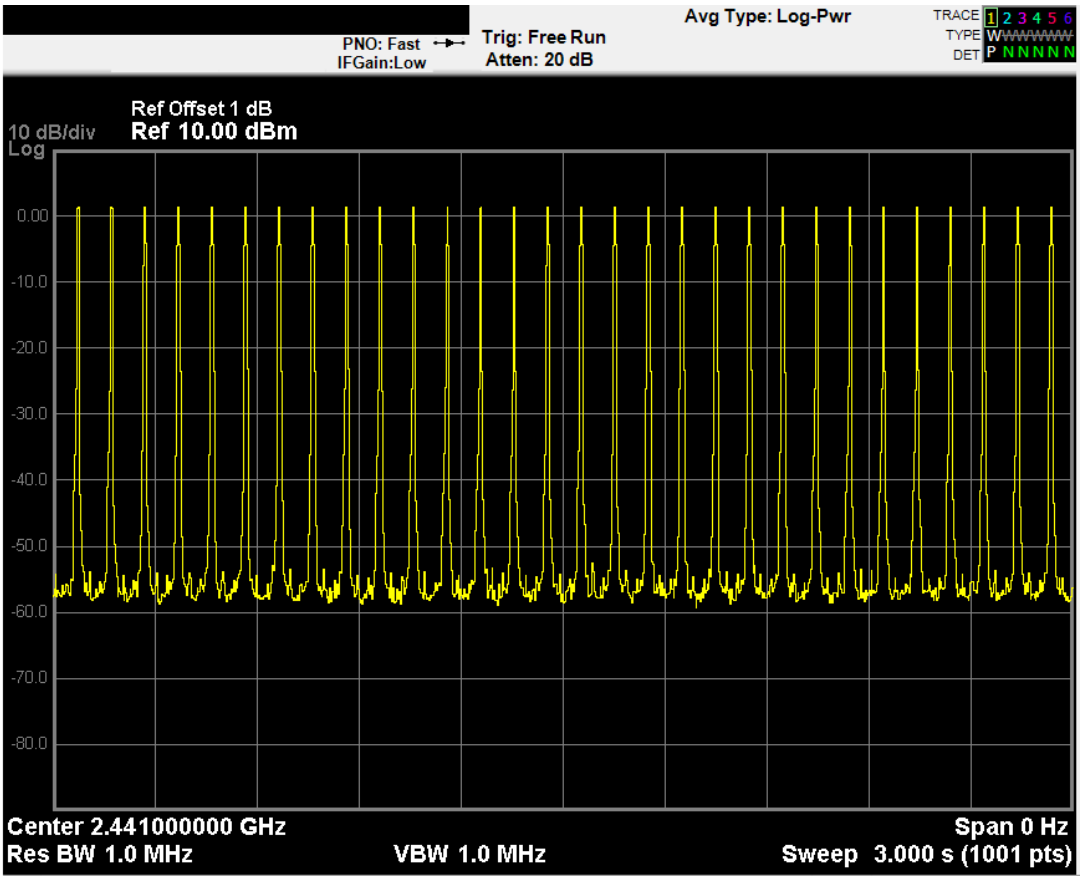
For Ch 39 2441MHz 1M GFSK DH5



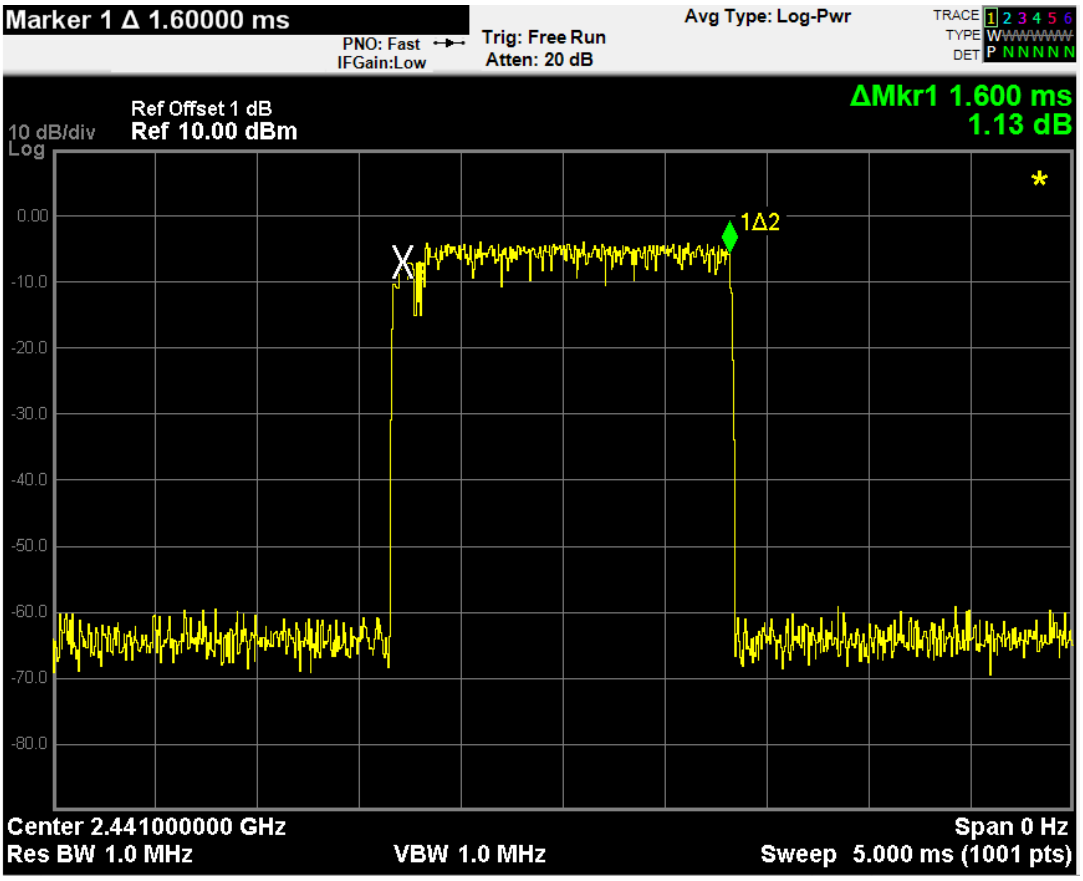


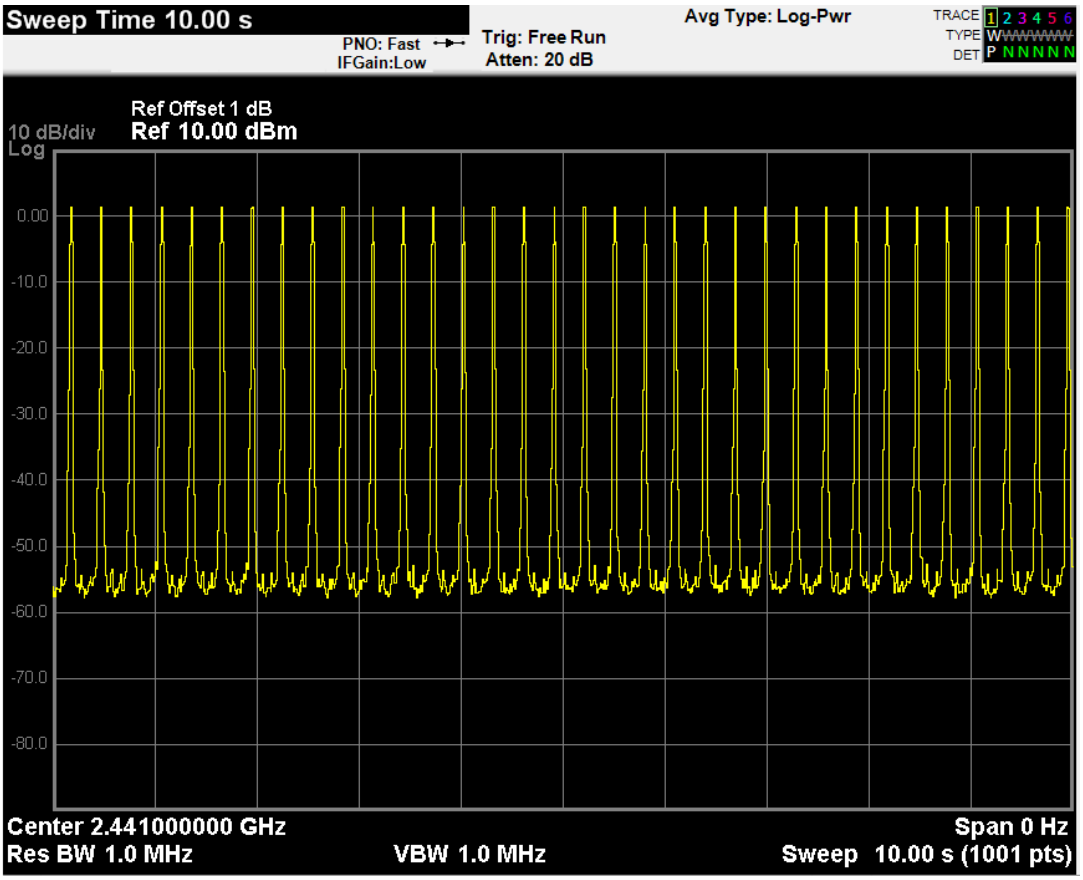
For Ch 39 2441MHz 3M 8-DPSK DH1



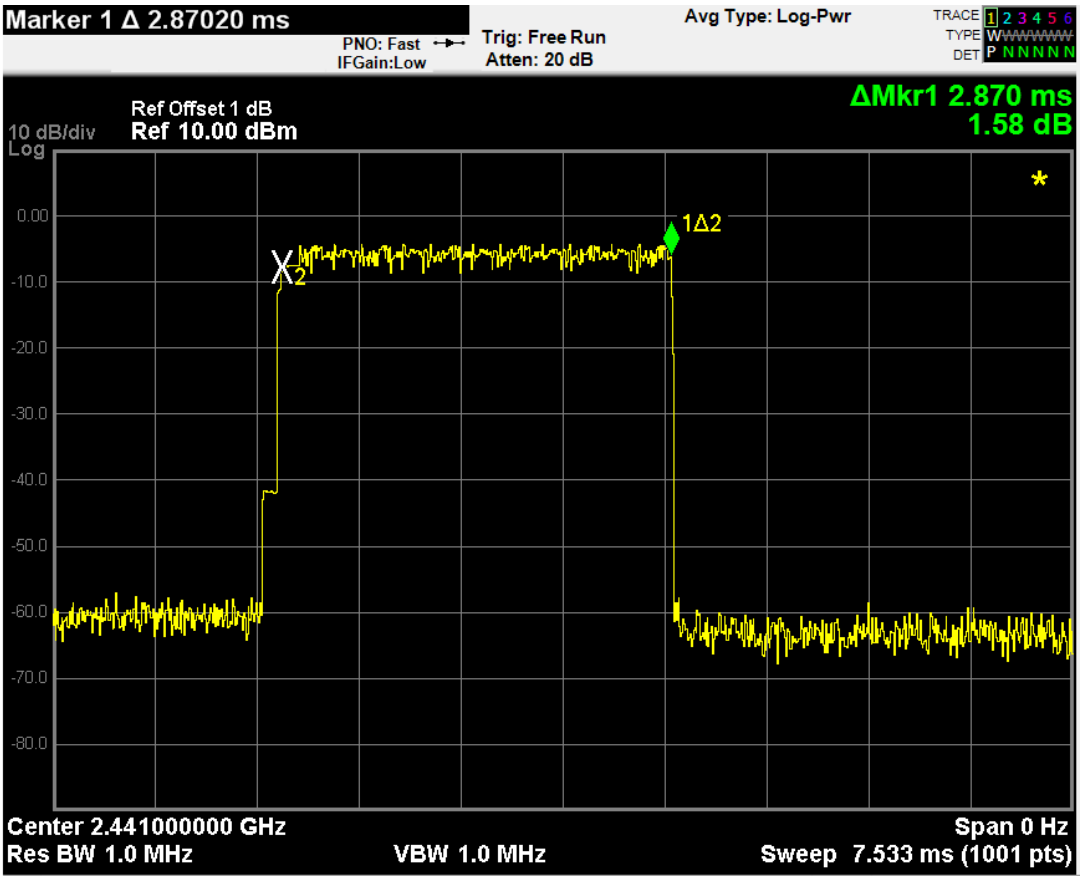


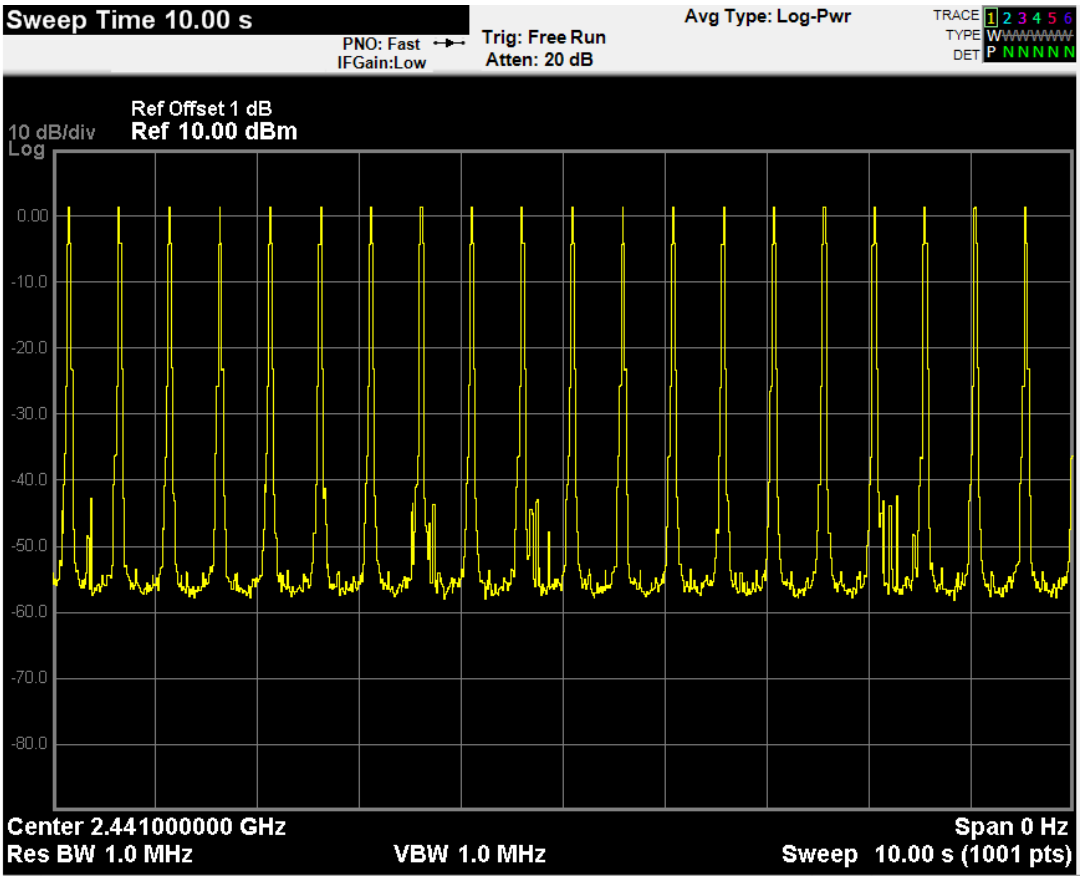
For Ch 39 2441MHz 3M 8-DPSK DH3





For Ch 39 2441MHz 3M 8-DPSK DH5





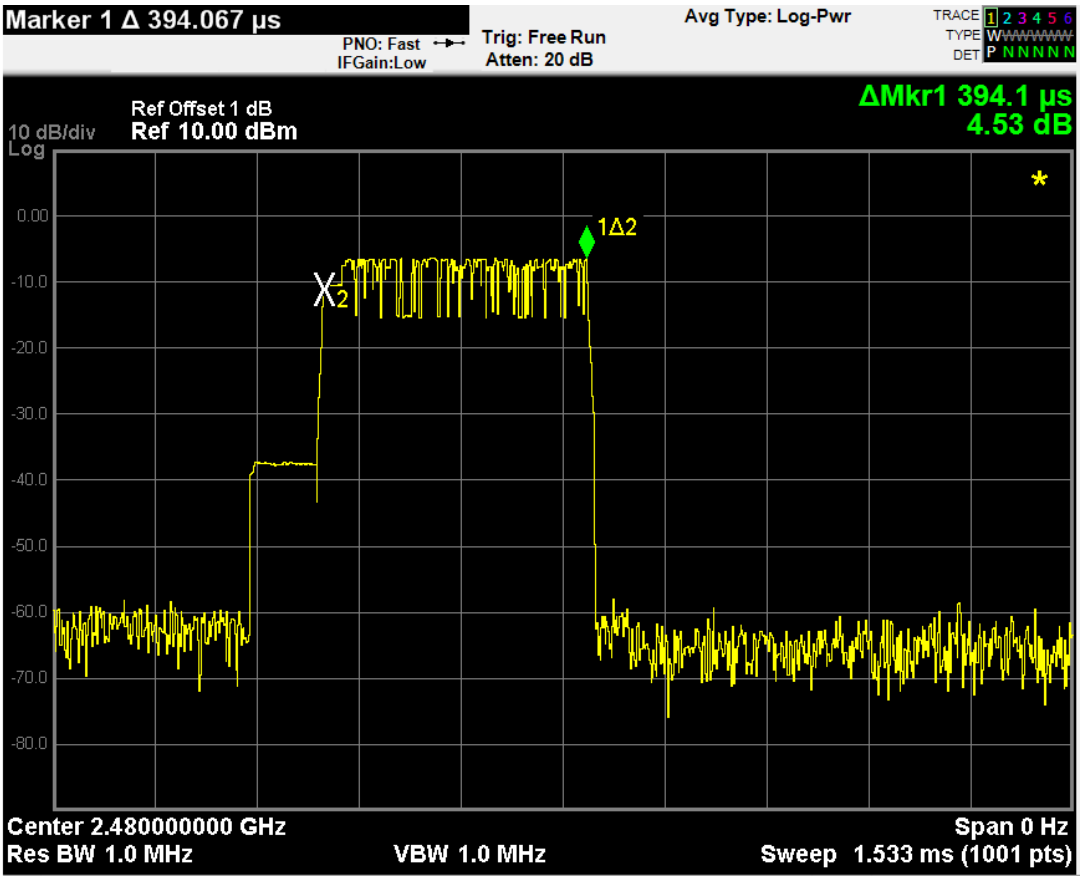
Ch 78 2480MHz 1M GFSK

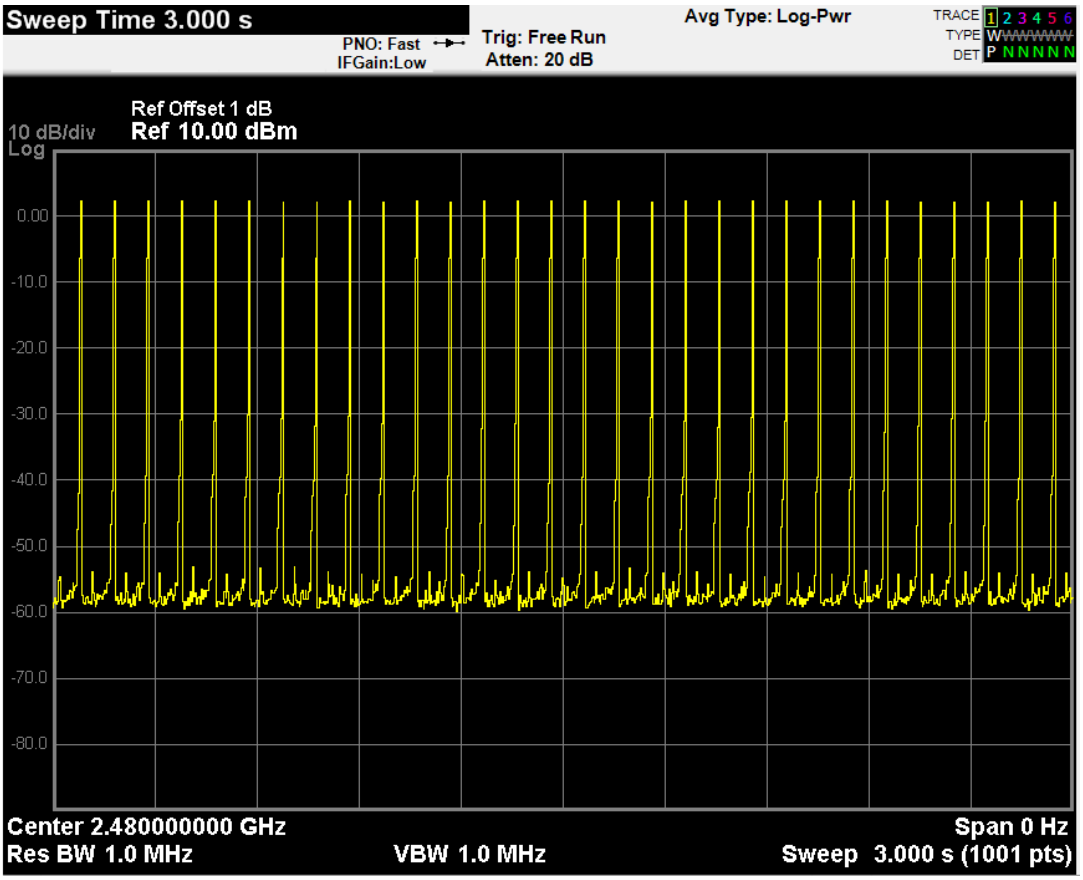
Mode	Number of transmission in a 31.6 (79 hopping*0.4) second period	Length of transmission time (msec)	Result (msec)	Limit (msec)	Conclusion
DH1	30 times/3 sec * 31.6=316 times	0.394	316*0.394 = 124.50	< 400	Pass
DH3	25 times/7.5 sec * 31.6=106 times	1.650	106*1.650 = 174.90	< 400	Pass
DH5	20 times/10 sec * 31.6=63 times	2.885	63*2.885 = 181.76	< 400	Pass

Ch 78 2480MHz 3M 8-DPSK

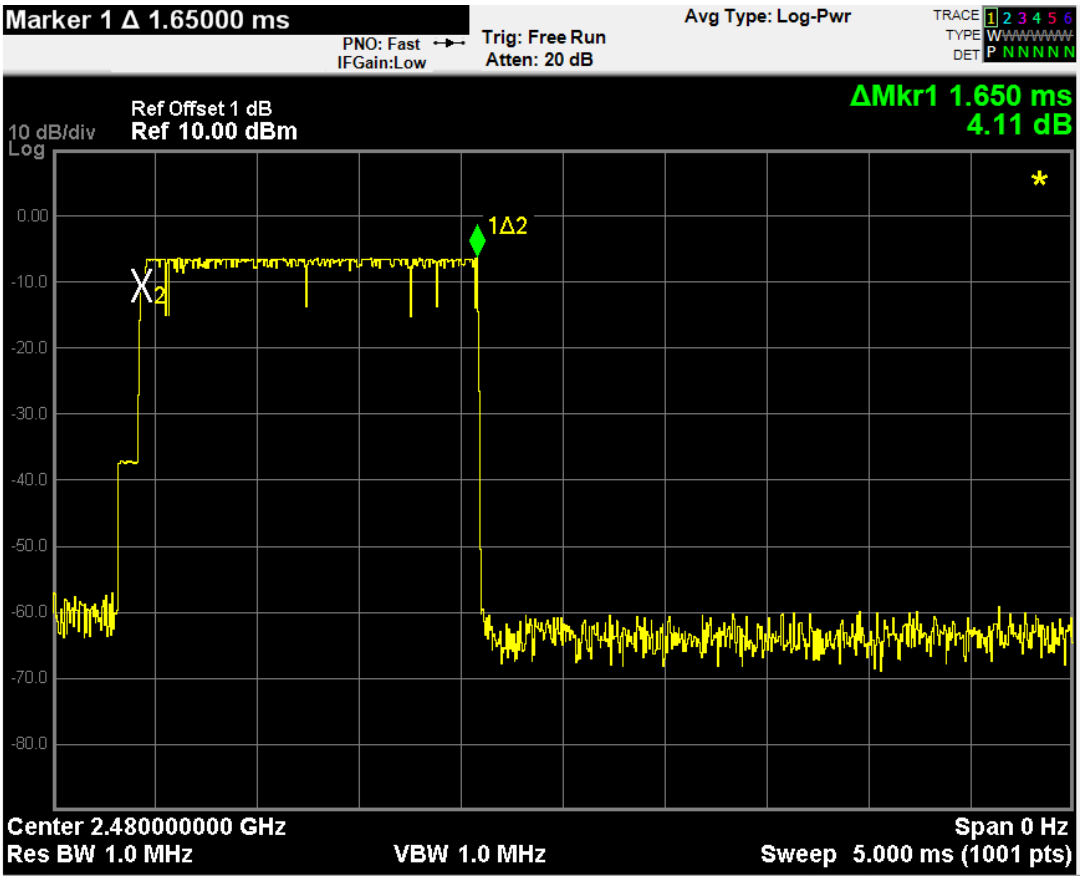
Mode	Number of transmission in a 31.6 (79 hopping*0.4) second period	Length of transmission time (msec)	Result (msec)	Limit (msec)	Conclusion
3DH1	30 times/3 sec * 31.6=316 times	0.404	316*0.404 = 127.66	< 400	Pass
3DH3	25 times/7.5 sec * 31.6=106 times	1.605	106*1.605 = 170.13	< 400	Pass
3DH5	20 times/10 sec * 31.6=63 times	2.855	107*0.167 = 179.87	< 400	Pass

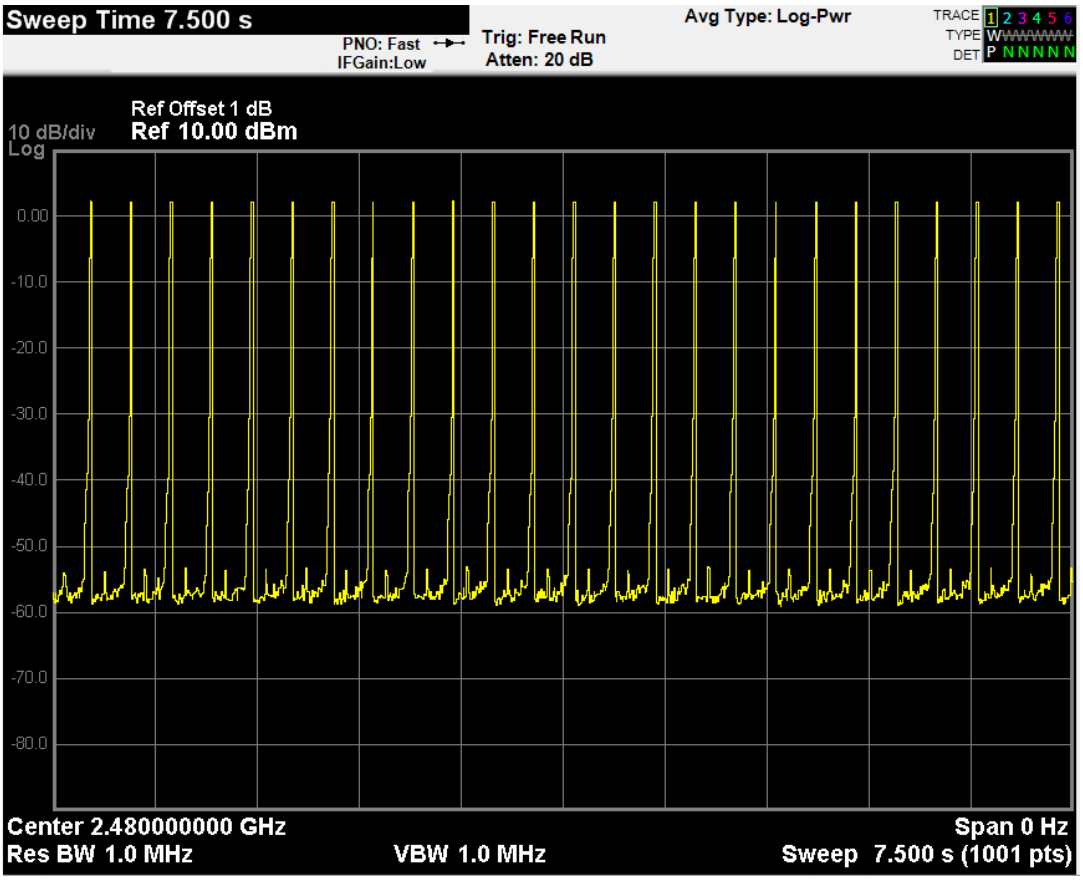
For Ch 78 2480MHz 1M GFSK DH1



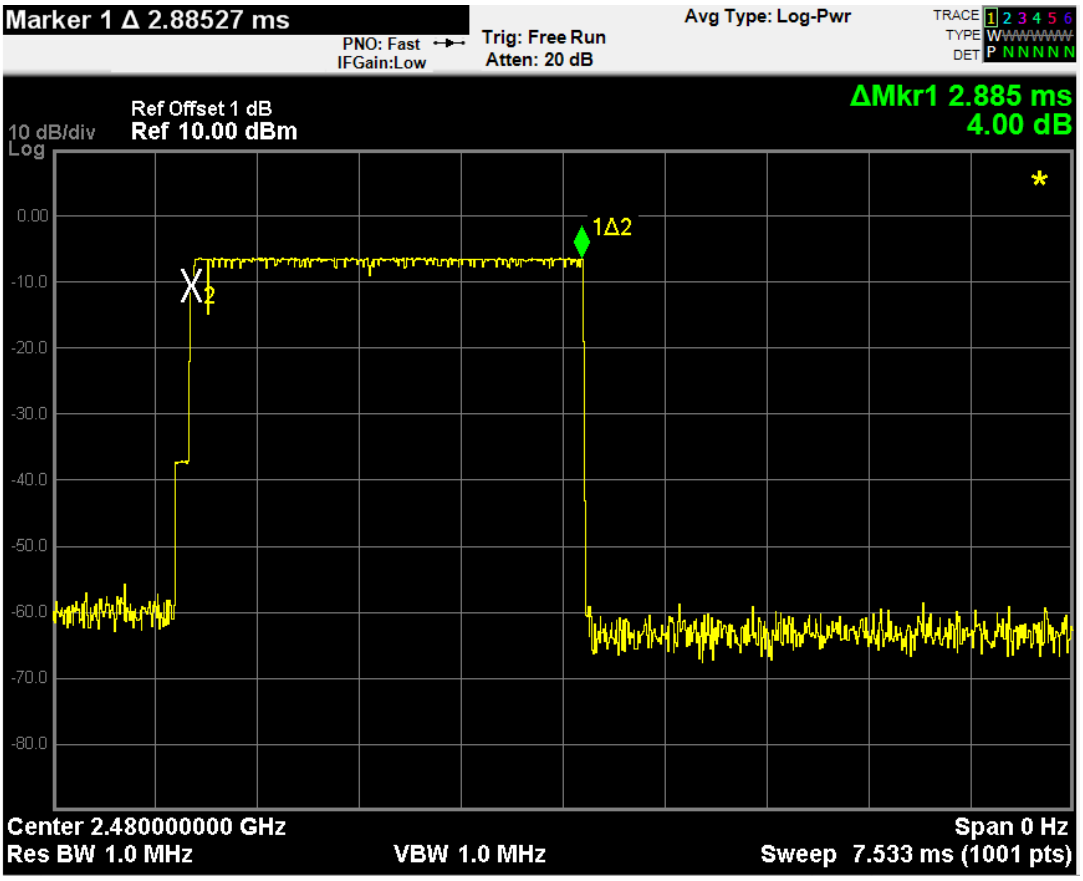


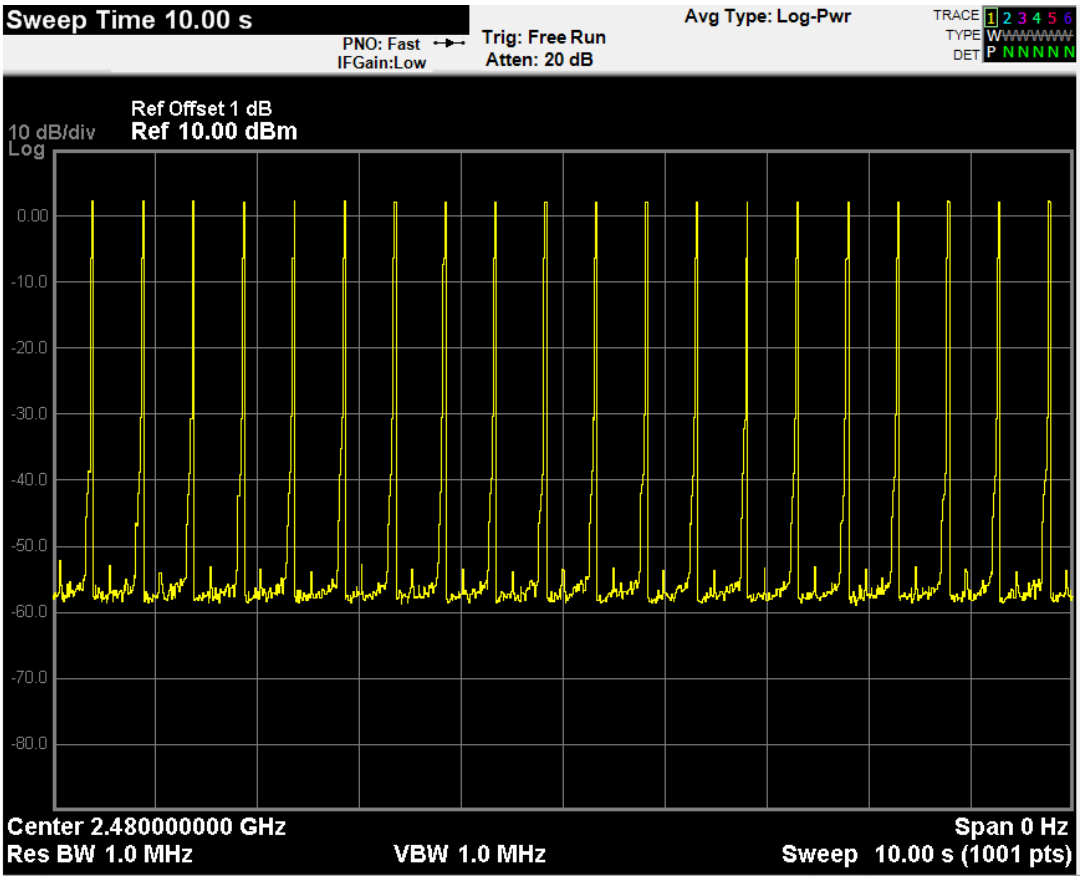
For Ch 78 2480MHz 1M GFSK DH3



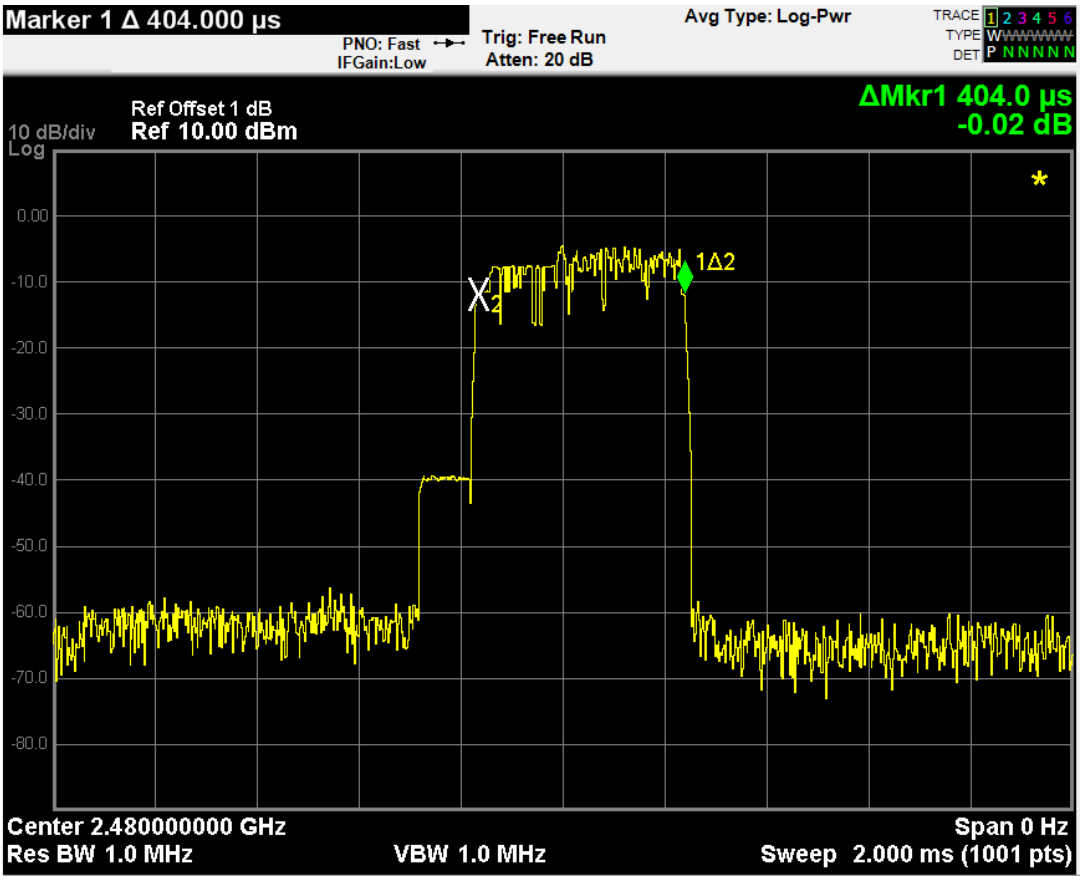


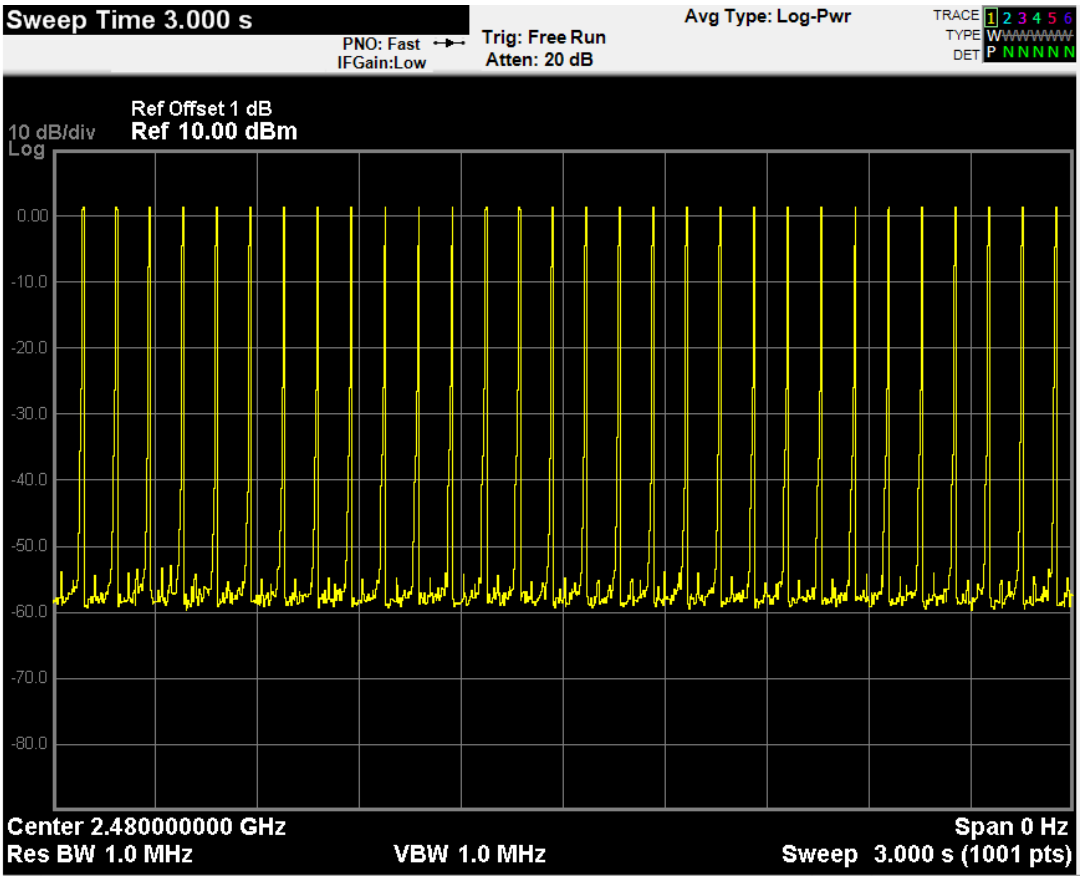
For Ch 78 2480MHz 1M GFSK DH5



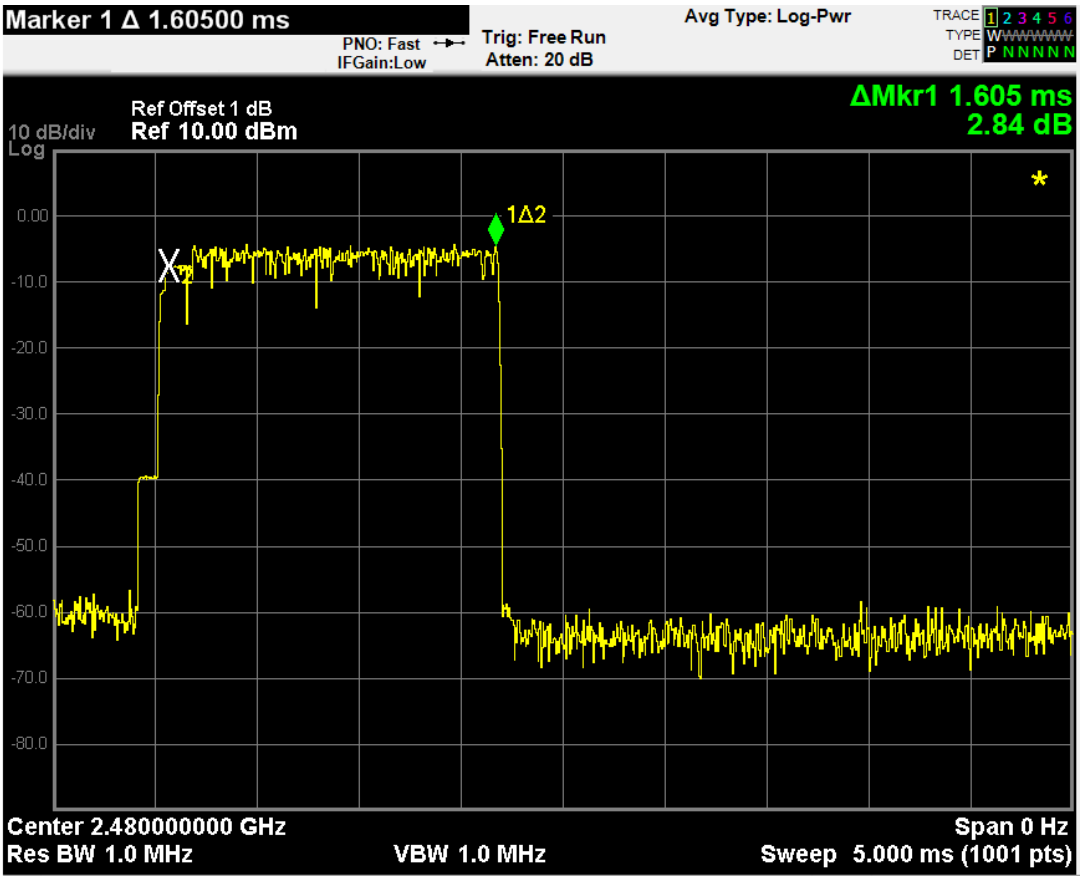


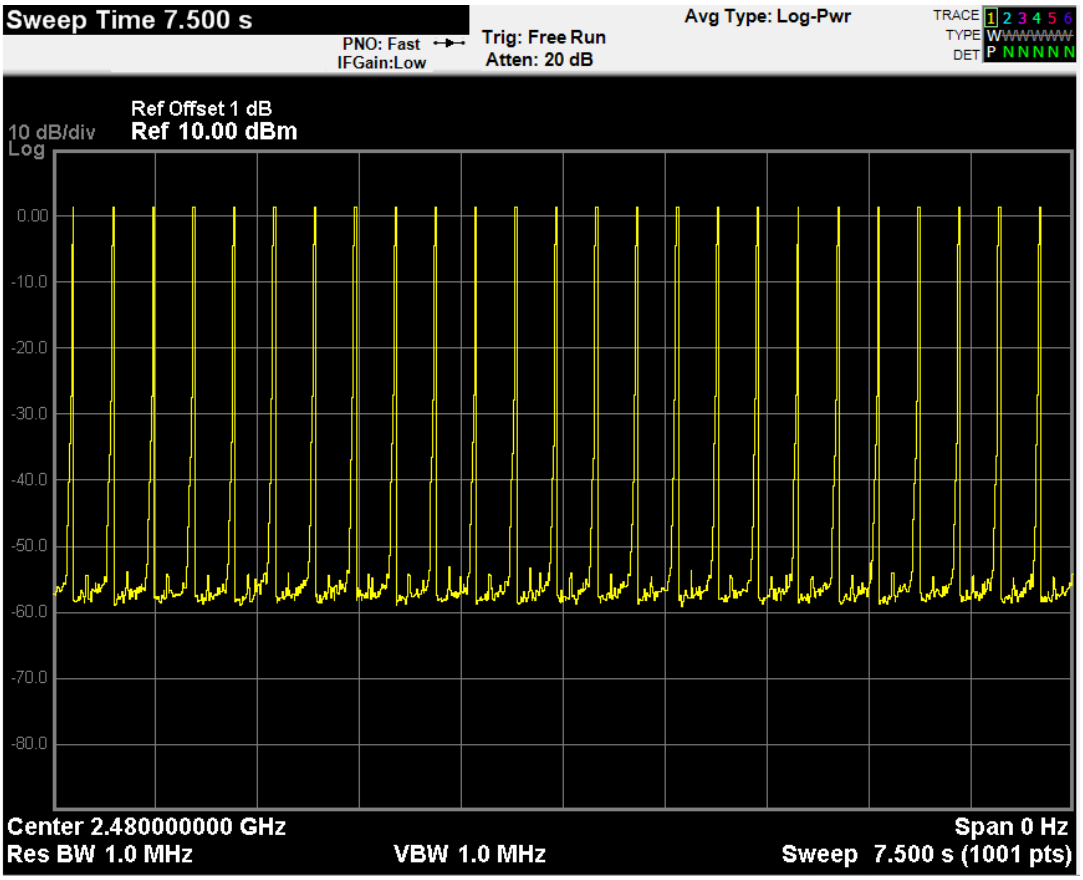
For Ch 78 2480MHz 3M 8-DPSK DH1



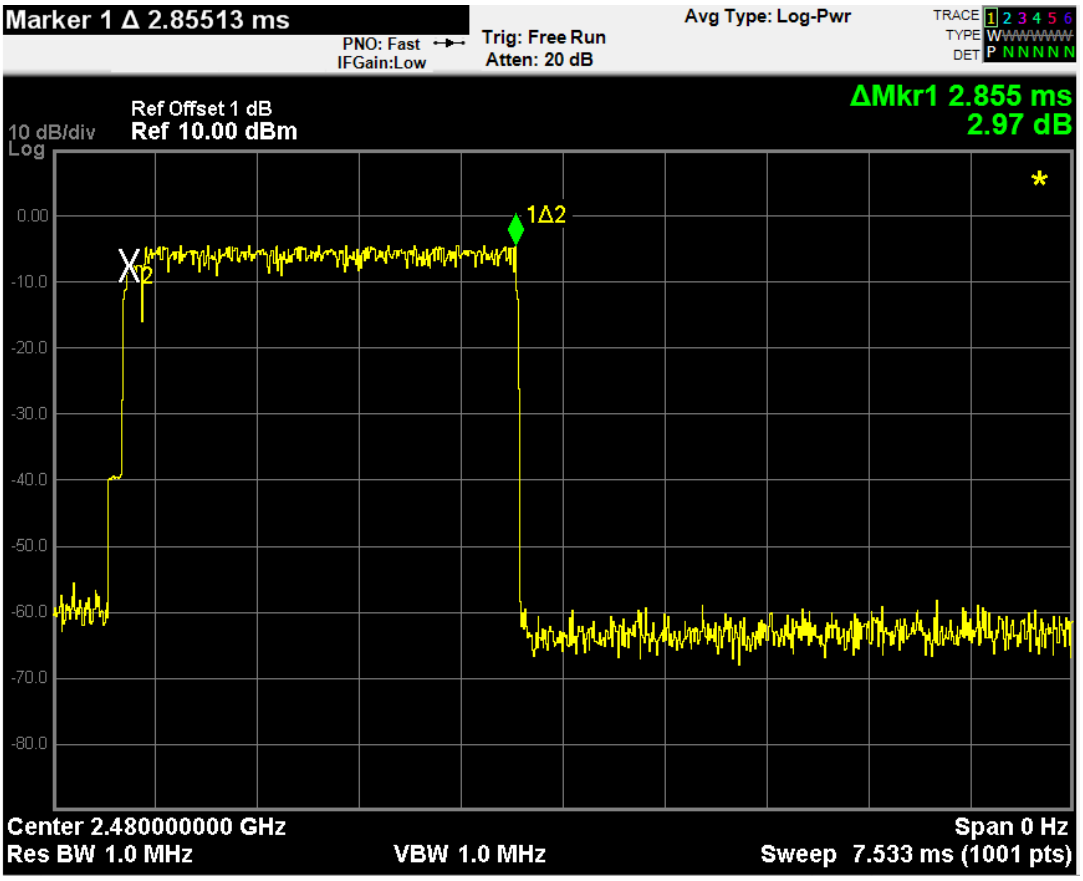


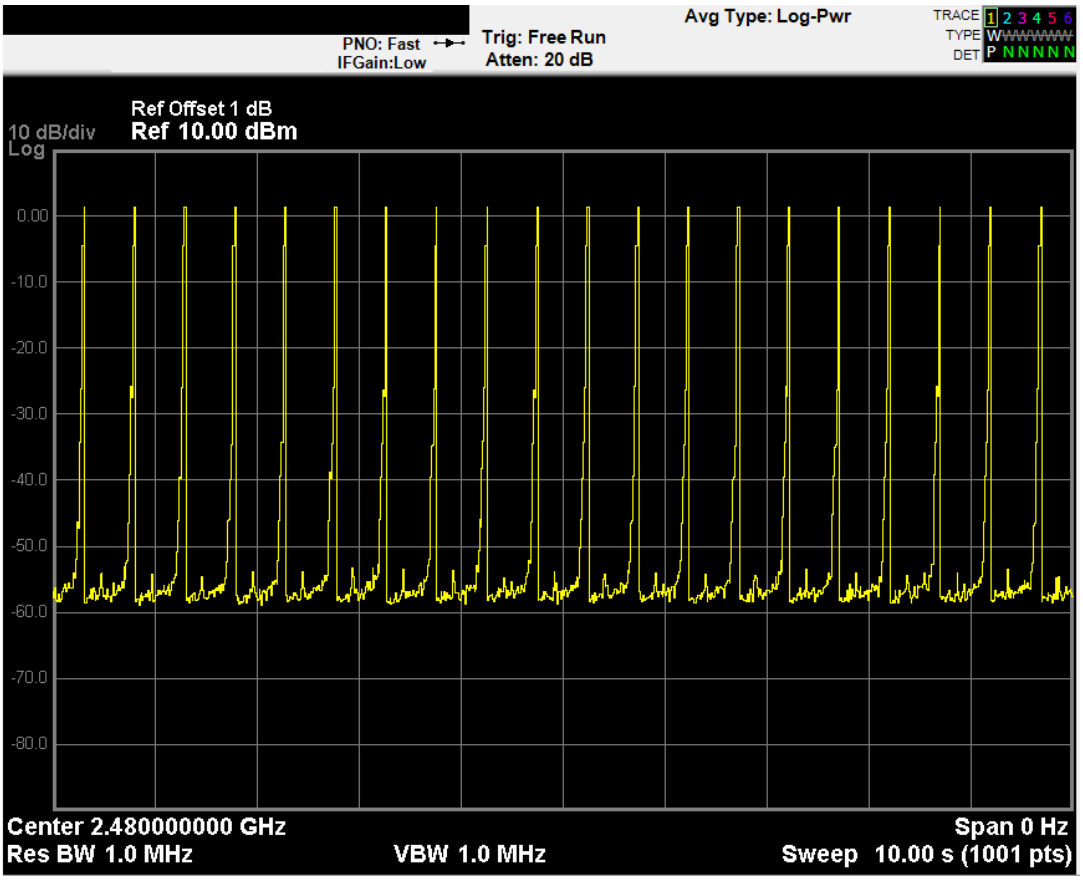
For Ch 78 2480MHz 3M 8-DPSK DH3





For Ch 78 2480MHz 3M 8-DPSK DH5





12 DEVIATION TO TEST SPECIFICATIONS

None.