Application for FCC Certification
On behalf of

JOHNSON INDUSTRIES(SHANGHAI) CO.,LTD.

Product Name: Console

Model No.: XER

FCC ID: 2AOTTXER

Prepared For : JOHNSON INDUSTRIES(SHANGHAI) CO.,LTD.
A1 NO.4500 BAOQIAN ROAD, ZHUQIAO TOWN,
JIADING DISTRICT, SHANGHAI

.

Prepared By :Audix Technology (Shanghai) Co., Ltd.
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TESTING
NVLAP LAB CODE 200371-0

Report No. : ACI-F18099
Date of Test : 2018.02.02–10
Date of Report : 2018.03.05

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.
The 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.

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TEST REPORT FOR FCC CERTIFICATE

Applicant	:	JOHNSON INDUSTRIES(SHANGHAI) CO.,LTD.
Manufacturer	:	JOHNSON INDUSTRIES(SHANGHAI) CO.,LTD.
EUT Description	:	Console
		(A) Model No. : XER
		(B) Power Supply : AC 120V/60Hz
		(C) Test Voltage : AC 120V/60Hz

Test Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C
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, which was tested on 2018.02.02-10 is 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.

Date of Test : 2018.02.02–10 Date of Report : 2018.03.05

Producer : Alan He
ALAN HE / Assistant

Review : Byron Wu
BYRON WU / Deputy Assistant Manager

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

Signatory :
Authorized Signature(s) 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 AND ANSI C63.10:2013	Pass	15.207
Spurious Radiated Emissions Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND ANSI C63.4:2009 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	:	Console
Model Number	:	XER
Type of EUT		☑ Production ☐ Pre-product ☐ Pro-type
Radio Tech	:	IEEE 802.11b/g/n (802.11n is 2.4GHz HT20 only)
	:	Bluetooth V4.0
Channel Freq.	:	IEEE 802.11b/g/n, 2412MHz ~ 2462MHz (Ch1-Ch11) Bluetooth V4.0, 2402MHz-2480MHz(Ch79):
Tested Freq.	:	2402MHz(Ch00),2441MHz (Ch39),2480 MHz (Ch78)
Modulation	:	DQPSK, DBPSK, CCK, OFDM/64-QAM, 16-QAM
	:	QPSK, BPSK, FHSS, GFSK, DPSK
Antenna Type	:	SMA interface Small antenna(Cu) Note: According to KDB 353028 D01 A 2) b) ii) (3) antenna connector comply with 15.203
Connectoe Type	:	SMA Connector
Antenna Gain	:	2 dBi
Applicant	:	JOHNSON INDUSTRIES(SHANGHAI) CO.,LTD.
	:	A1 NO.4500 BAOQIAN ROAD, ZHUQIAO TOWN,
	:	JIADING DISTRICT, SHANGHAI.
Manufacturer	:	Same as Applicant
Factory	:	Same as Applicant

2.2 Tested Supporting System Details

2.2.1 Earphone

Manufacturer	:	EDIFIER
Model Number	:	H210

2.2.2 Mobile Phone

Manufacturer	:	SUMSUNG
Model Number	:	GT-I9100G
Serial Number	:	69351520011519
Certificate	:	CE/EMC

2.3 Description of Test Facility

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3 F 34 Bldg 680 Guiping Rd.,
Caohejing Hi-Tech Park,
Shanghai 200233, China

Accredited by NVLAP, Lab Code : 200371-0

FCC registration Number : 91789

Test Firm Registration Number : 954668

2.4 Measurement Uncertainty

Conducted Emission Expanded Uncertainty : U = 3.4dB

Radiated Emission Expanded Uncertainty (30-1000MHz):
U = 3.99dB

Radiated Emission Expanded Uncertainty (1000M-26.5GHz):
U = 4.98dB

6 dB Bandwidth Expanded Uncertainty : U = $1x10^{-8}$ MHz

Maximum Peak Output Power Expanded Uncertainty : U = 1.56 dB

Power Spectral Density Expanded Uncertainty : U = 0.38 dB

Spurious RF Conducted Emissions Expanded Uncertainty : U = 1.20 dB

3 CONDUCTED EMISSION TEST

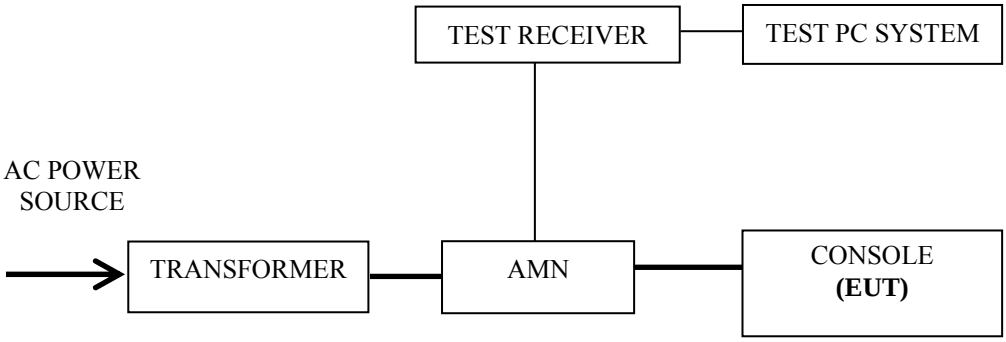
3.1 Test Equipment

The following test equipment 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	101303	May 07, 2017	May 06, 2018
2.	Artificial Mains Network (AMN)	R&S	ENV4200	100125	Jun 24, 2017	Jun 23, 2018
3.	50Ω Terminator	Anritsu	BNC	001	Mar 18, 2017	Mar 17, 2018
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 C63.4:2009 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.

EUT	:	Console	Temperature :	25℃	
Model No.	:	XER	Humidity	:	48%RH
Test Mode	:	Transmitting	Date of Test	:	2018.02.02

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.16589	40.3	10.58	50.88	65.16	14.28	QP
	0.26724	34.9	10.47	45.37	61.2	15.83	
	0.53498	30.3	10.39	40.69	56	15.31	
	0.82172	17.5	10.39	27.89	56	28.11	
	3.509	15.1	10.44	25.54	56	30.46	
	7.769	23.8	10.49	34.29	60	25.71	
	0.16589	24	10.58	34.58	55.16	20.58	AV
	0.26724	20.6	10.47	31.07	51.2	20.13	
	0.53498	21.6	10.39	31.99	46	14.01	
	0.82172	6.8	10.39	17.19	46	28.81	
	3.509	8.3	10.44	18.74	46	27.26	
	7.769	15.4	10.49	25.89	50	24.11	
Neutral	0.16589	39.2	10.51	49.71	65.16	15.45	QP
	0.48119	28.6	10.38	38.98	56.32	17.34	
	0.54644	31.5	10.38	41.88	56	14.12	
	0.94308	22	10.39	32.39	56	23.61	
	4.874	17.7	10.47	28.17	56	27.83	
	9.654	21.5	10.5	32	60	28.00	
	0.16589	23.3	10.51	33.81	55.16	21.35	AV
	0.48119	20.5	10.38	30.88	46.32	15.44	
	0.54644	25	10.38	35.38	46	10.62	
	0.94308	13	10.39	23.39	46	22.61	
	4.874	11.7	10.47	22.17	46	23.83	
	9.654	13.4	10.5	23.9	50	26.10	

TEST ENGINEER: Kalsi

4 RADIATED EMISSION TEST

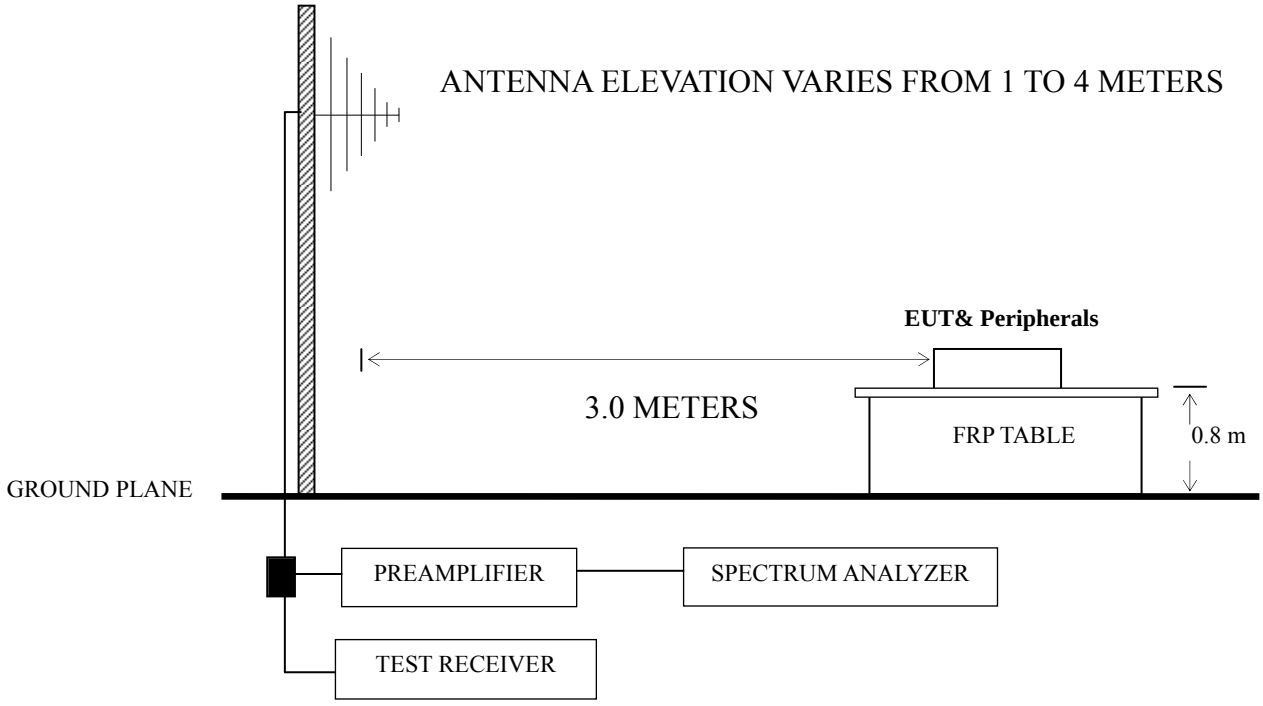
4.1 Test Equipment

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, 2017	Apr 26, 2018
2.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2017	Mar 19, 2018
3.	Spectrum Analyzer	Agilent	N9010A	MY52221182	May 25, 2017	May 24, 2018
4.	Test Receiver	R&S	ESCI	101303	May 07, 2017	May 06, 2018
5.	Bi-log Antenna	Schwarz beck	VULB 9168	708	Jul 20, 2017	Jul 19, 2018
6.	Horn Antenna	EMCO	3115	9607-4878	Jun 02, 2017	Jun 01, 2018
7.	Horn Antenna	EMCO	3116	00062643	Sep 08, 2017	Sep 08, 2019
8.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Sep 17, 2017	Mar 17, 2018
9.	Software	Audix	E3	SET00200 9912M295-2	--	--

4.2 Block Diagram of Test Setup

4.2.1 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 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 C63.4:2009 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.

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	Modulation	Channel	Frequency	Data Page	
1.	Transmitting	Worst case emission < 1GHz			P15	
2.		DH1	00	2402 MHz	P16	
3.			39	2441 MHz		
4.			78	2480 MHz		
5.		3DH5	00	2402 MHz	P17	
6.			39	2441 MHz		
7.			78	2480 MHz		
8.	Receiving	--	--		P18	
9.		DH1/3DH1/DH3/3DH3	01	2412 MHz	Restricted Frequency bands	P19
10.			11	2462 MHz		
11.		DH5/3DH5	01	2412 MHz		P20
12.			11	2462 MHz		

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.

Worst case emission < 1GHz

EUT	:	Console	Temperature :	22℃
Model No.	:	XER	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2018.02.07

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	67.915	17.08	7.35	0.81	25.24	40	14.76	QP
	84.765	16.69	10.3	0.9	27.89	40	12.11	
	183.223	24.65	9.93	1.42	36	43.5	7.50	
	205.234	21.88	10.26	1.52	33.66	43.5	9.84	
	239.365	17	11.62	1.6	30.22	46	15.78	
	595.483	16.55	19.5	2.5	38.55	46	7.45	
Vertical	55.958	22.29	7.83	0.73	30.85	40	9.15	QP
	70.239	20.06	8.96	0.85	29.87	40	10.13	
	144.098	19.24	12.27	1.24	32.75	43.5	10.75	
	203.776	22.8	10.26	1.52	34.58	43.5	8.92	
	596.876	14.39	19.5	2.5	36.39	46	9.61	
	723.204	16.34	20.48	2.73	39.55	46	6.45	

TEST ENGINEER: Sunny

Radiated Emission > 1GHz

EUT	:	Console	Temperature :	22℃
Model No.	:	XER	Humidity :	51%RH
Test Mode	:	Transmitting	Date of Test :	2018.02.07

DH1Ch 00

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	1577.611	45.5	26.24	4.13	35.68	40.19	74	33.81	Peak
	1857.804	44.85	27.31	4.46	35.42	41.2	74	32.80	Peak
	3647.54	45.21	32.02	6.41	34.52	49.12	74	24.88	Peak
Vertical	1721.869	45.71	26.81	4.31	35.54	41.29	74	32.71	Peak
	3388.442	45.98	31.45	6.16	34.78	48.81	74	25.19	Peak
	5093.309	44.22	34.31	7.84	33.93	52.44	74	21.56	Peak

DH1Ch 39

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	1233.105	47.11	24.54	3.63	36.07	39.21	74	34.79	Peak
	2084.491	45.11	27.98	4.72	35.29	42.52	74	31.48	Peak
	3357.376	44.77	31.38	6.11	34.8	47.46	74	26.54	Peak
Vertical	1651.962	45.37	26.55	4.22	35.61	40.53	74	33.47	Peak
	2937.65	43.97	30.31	5.67	35.2	44.75	74	29.25	Peak
	4539.416	44.01	33.83	7.32	34.03	51.13	74	22.87	Peak

DH1Ch 78

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	2280.342	44.8	28.38	5	35.27	42.91	74	31.09	Peak
	3273.407	44.36	31.18	6.06	34.89	46.71	74	27.29	Peak
	4120.975	44.68	32.97	6.85	34.16	50.34	74	23.66	Peak
Vertical	1663.413	46.91	26.58	4.25	35.6	42.14	74	31.86	Peak
	2202.927	45.71	28.23	4.88	35.28	43.54	74	30.46	Peak
	4405.549	43.81	33.61	7.19	34.07	50.54	74	23.46	Peak

3DH5Ch 00

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	1386.756	45.76	25.36	3.87	35.88	39.11	74	34.89	Peak
	3013.006	44.67	30.55	5.75	35.18	45.79	74	28.21	Peak
	5116.818	44.68	34.35	7.84	33.94	52.93	74	21.07	Peak
Vertical	1409.289	45.63	25.48	3.9	35.86	39.15	74	34.85	Peak
	2606.154	45.16	29.18	5.35	35.23	44.46	74	29.54	Peak
	3605.786	44.71	31.93	6.36	34.56	48.44	74	25.56	Peak

3DH5Ch 39

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	2041.738	45.43	27.89	4.68	35.3	42.7	74	31.30	Peak
	3033.891	45.66	30.59	5.75	35.15	46.85	74	27.15	Peak
	5942.921	42.07	35.16	8.43	34.18	51.48	74	22.52	Peak
Vertical	2004.472	45.21	27.81	4.64	35.3	42.36	74	31.64	Peak
	3097.419	46.01	30.75	5.85	35.09	47.52	74	26.48	Peak
	4954.502	44.5	34.17	7.72	33.91	52.48	74	21.52	Peak

3DH5Ch

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	1766.038	44.79	26.98	4.37	35.5	40.64	74	33.36	Peak
	2818.383	43.62	29.91	5.55	35.22	43.86	74	30.14	Peak
	4355.119	43.27	33.5	7.12	34.09	49.8	74	24.20	Peak
Vertical	1297.179	45.92	24.9	3.75	35.99	38.58	74	35.42	Peak
	2060.63	45.48	27.93	4.72	35.29	42.84	74	31.16	Peak
	3539.973	44.2	31.79	6.31	34.62	47.68	74	26.32	Peak

TEST ENGINEER: Sunny

EUT	:	Console	Temperature :	22℃	
Model No.	:	XER	Humidity	:	51%RH
Test Mode	:	Receiving	Date of Test	:	2018.02.07

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	35.234	12.91	0.61	14.55	0	28.07	40	11.93	QP
	57.443	14.2	0.73	7.18	0	22.11	40	17.89	
	174.736	11.98	1.4	10.61	0	23.99	43.5	19.51	
	241.131	18.46	1.6	11.96	0	32.02	46	13.98	
	412.387	13.78	2.06	16.48	0	32.32	46	13.68	
	835.384	3.47	2.96	20.6	0	27.03	46	18.97	
	1111.27	47.3	3.52	24.19	36.25	38.76	74	35.24	PK
	1800.153	44.88	4.47	26.84	35.4	40.79	74	33.21	
	3109.322	43.52	5.97	30.73	35.08	45.14	74	28.86	
Vertical	50.456	17.47	0.75	7.06	0	25.28	40	14.72	QP
	77.328	13.85	0.85	7.9	0	22.6	40	17.40	
	100.827	11.61	0.99	12.32	0	24.92	43.5	18.58	
	123.982	16.41	1.13	12.6	0	30.14	43.5	13.36	
	181.788	19.55	1.39	10.76	0	31.7	43.5	11.80	
	235.776	11.36	1.58	11.82	0	24.76	46	21.24	
	1202.726	46.83	3.58	24.31	36.21	38.51	74	35.49	PK
	1540.827	45.32	4.11	25.77	35.7	39.5	74	34.50	
	2323.298	44.45	5.19	28.22	35.2	42.66	74	31.34	

TEST ENGINEER: Sunny

Radiated Band Edge measurement:

DH1

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	2389.341	57.04	5.12	28.59	35.26	55.49	74	18.51	PK
	2483.515	54.82	5.19	28.77	35.25	53.53	74	20.47	
	2389.341	43.23	5.12	28.59	35.26	41.68	54	12.32	AV
	2483.515	39.75	5.19	28.77	35.25	38.46	54	15.54	
Vertical	2389.376	58.07	5.12	28.59	35.26	56.52	74	17.48	PK
	2483.485	55.38	5.19	28.77	35.25	54.09	74	19.91	
	2389.376	40.33	5.12	28.59	35.26	38.78	54	15.22	AV
	2483.485	37.12	5.19	28.77	35.25	35.83	54	18.17	

3DH1

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	2389.446	57.18	5.12	28.59	35.26	55.63	74	18.37	PK
	2483.575	56.36	5.19	28.77	35.25	55.07	74	18.93	
	2389.446	41.2	5.12	28.59	35.26	39.65	54	14.35	AV
	2483.575	40.01	5.19	28.77	35.25	38.72	54	15.28	
Vertical	2389.551	56.94	5.12	28.59	35.26	55.39	74	18.61	PK
	2483.605	54.82	5.19	28.77	35.25	53.53	74	20.47	
	2389.551	39.42	5.12	28.59	35.26	37.87	54	16.13	AV
	2483.605	39.29	5.19	28.77	35.25	38	54	16.00	

DH3

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	2390.076	56.31	5.12	28.59	35.26	54.76	74	19.24	PK
	2483.755	55.5	5.19	28.77	35.25	54.21	74	19.79	
	2390.076	39.77	5.12	28.59	35.26	38.22	54	15.78	AV
	2483.755	38.64	5.19	28.77	35.25	37.35	54	16.65	
Vertical	2389.076	55.66	5.12	28.59	35.26	54.11	74	19.89	PK
	2483.905	55.94	5.19	28.77	35.25	54.65	74	19.35	
	2389.076	39.28	5.12	28.59	35.26	37.73	54	16.27	AV
	2483.905	39.64	5.19	28.77	35.25	38.35	54	15.65	

3DH3

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	2389.596	57.24	5.12	28.59	35.26	55.69	74	18.31	PK
	2483.696	54.65	5.19	28.77	35.25	53.36	74	20.64	
	2389.596	39.27	5.12	28.59	35.26	37.72	54	16.28	AV
	2483.696	40.04	5.19	28.77	35.25	38.75	54	15.25	
Vertical	2389.996	55.28	5.12	28.59	35.26	53.73	74	20.27	PK
	2483.766	53.81	5.19	28.77	35.25	52.52	74	21.48	
	2389.996	40.11	5.12	28.59	35.26	38.56	54	15.44	AV
	2483.766	38.64	5.19	28.77	35.25	37.35	54	16.65	

DH5

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	2389.756	55.82	5.12	28.59	35.26	54.27	74	19.73	PK
	2484.046	55.34	5.19	28.77	35.25	54.05	74	19.95	
	2389.756	40.28	5.12	28.59	35.26	38.73	54	15.27	AV
	2484.046	37.65	5.19	28.77	35.25	36.36	54	17.64	
Vertical	2389.990	57.52	5.12	28.65	35.26	56.03	74	17.97	PK
	2483.801	53.62	5.19	28.77	35.25	52.33	74	21.67	
	2389.990	40.92	5.12	28.65	35.26	39.43	54	14.57	AV
	2483.801	38.33	5.19	28.77	35.25	37.04	54	16.96	

3DH5

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	2389.955	55.43	5.12	28.65	35.26	53.94	74	20.06	PK
	2483.52	54.89	5.19	28.77	35.25	53.6	74	20.40	
	2389.955	40.79	5.12	28.65	35.26	39.3	54	14.70	AV
	2483.52	39.12	5.19	28.77	35.25	37.83	54	16.17	
Vertical	2389.945	54.52	5.12	28.65	35.26	53.03	74	20.97	PK
	2483.678	50.76	5.23	28.78	35.25	49.52	74	24.48	
	2389.945	40.49	5.12	28.65	35.26	39.00	54	15.00	AV
	2483.678	40.12	5.19	28.78	35.25	38.84	54	15.16	

TEST ENGINEER: Sunny

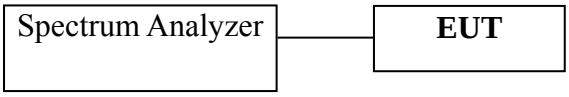
5 20 dB BANDWIDTH MEASUREMENT

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.	EXA Signal Analyzer	Agilent	N9010A	MY52221182	May 25, 2017	May 24, 2018

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: 2018.02.10 Temperature: 23℃ Humidity: 50 %)

DH1

Channel	Frequency	**20dB Bandwidth**
00	2402 MHz	**1.148 MHz**
39	2441 MHz	**1.143 MHz**
78	2480 MHz	**1.144 MHz**

3DH1

Channel	Frequency	**20dB Bandwidth**
00	2402 MHz	**1.162 MHz**
39	2441 MHz	**1.154 MHz**
78	2480 MHz	**1.148 MHz**

DH3

Channel	Frequency	**20dB Bandwidth**
00	2402 MHz	**1.144 MHz**
39	2441 MHz	**1.158 MHz**
78	2480 MHz	**1.144 MHz**

3DH3

Channel	Frequency	**20dB Bandwidth**
00	2402 MHz	**1.123 MHz**
39	2441 MHz	**1.127 MHz**
78	2480 MHz	**1.117 MHz**

2

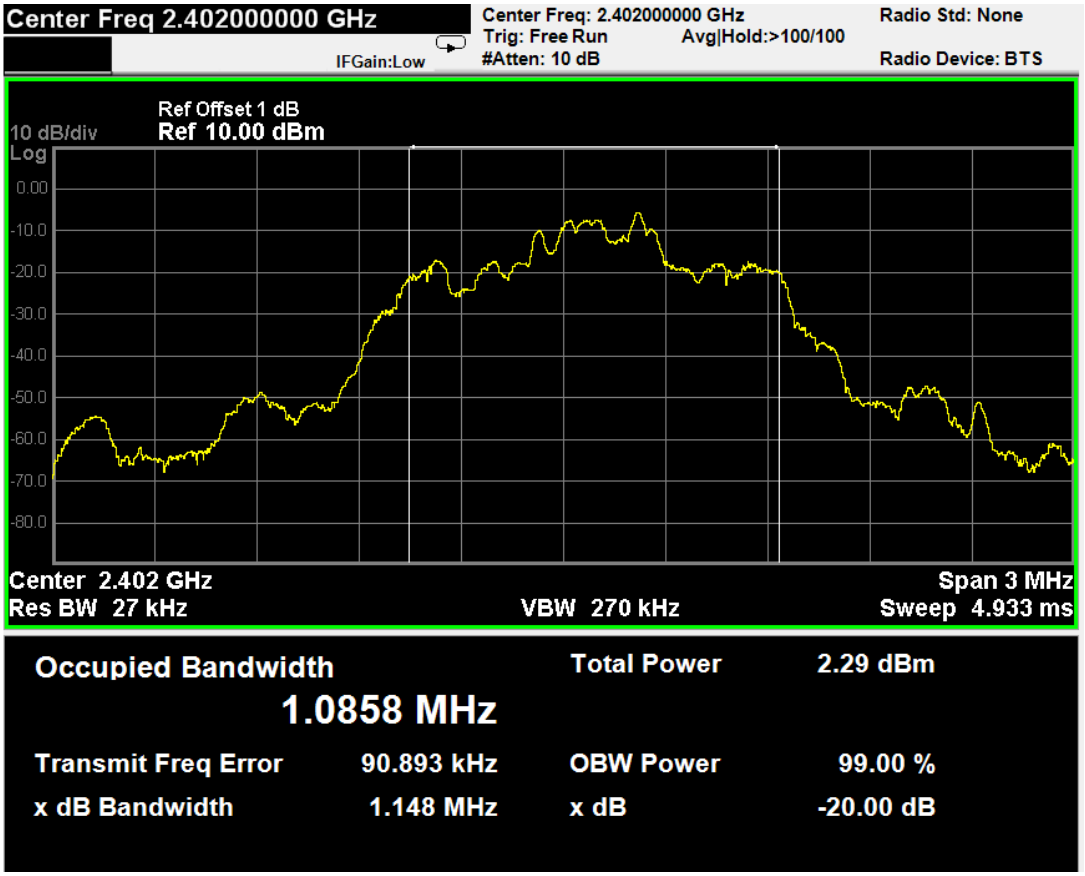
DH5

Channel	Frequency	**20dB Bandwidth**
00	2402 MHz	**1.149 MHz**
39	2441 MHz	**1.150 MHz**
78	2480 MHz	**1.156 MHz**

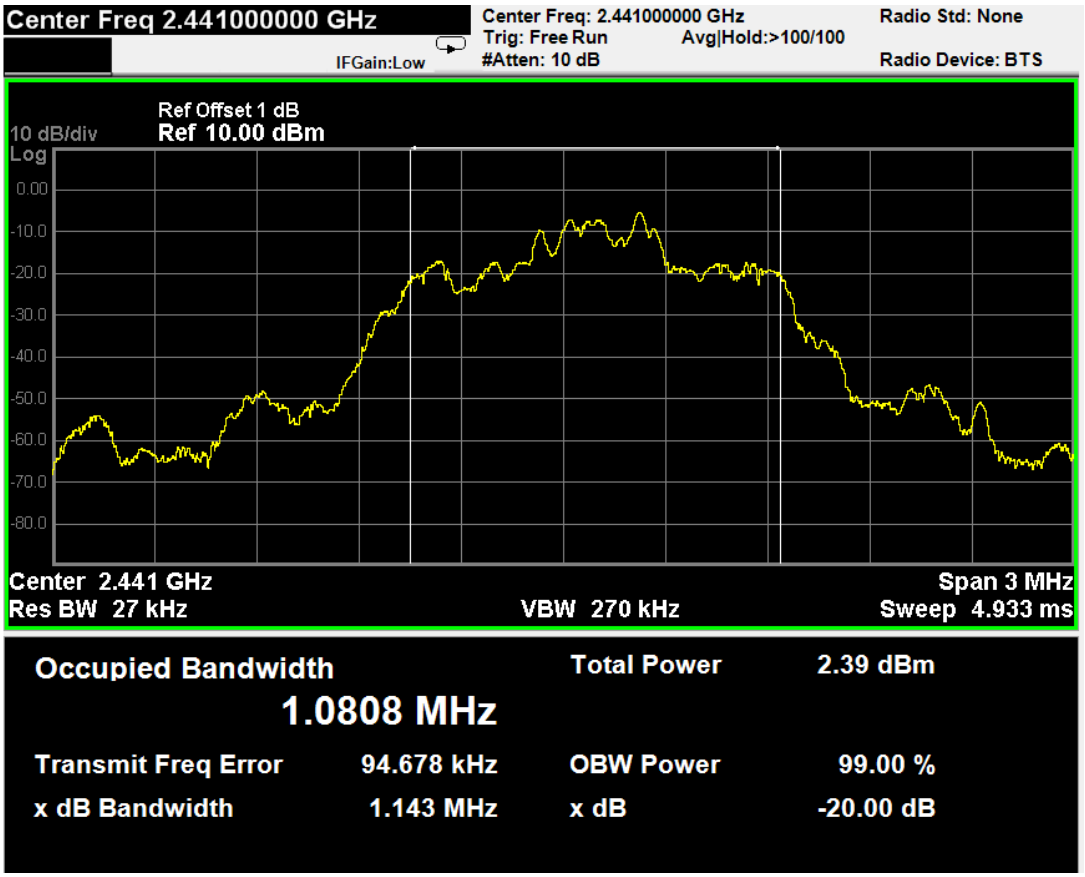
3DH5

Channel	Frequency	**20dB Bandwidth**
00	2402 MHz	**1.199 MHz**
39	2441 MHz	**1.197 MHz**
78	2480 MHz	**1.106 MHz**

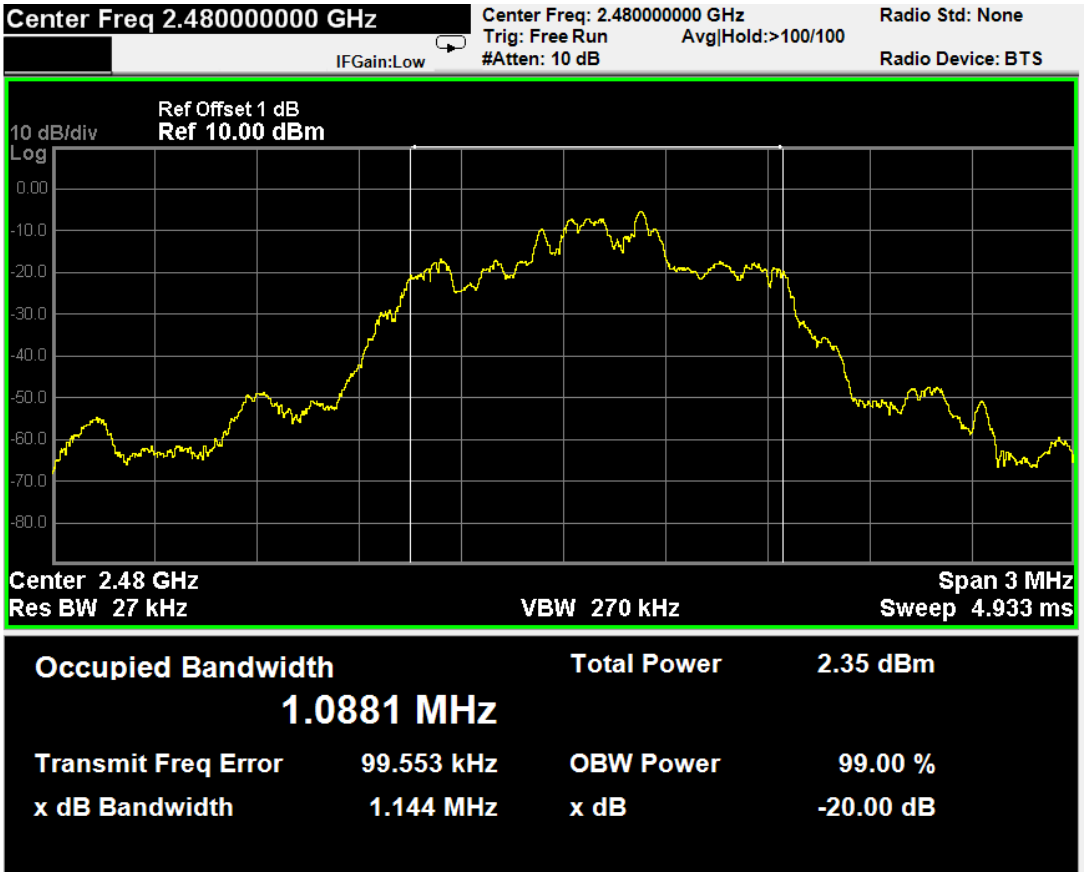
DH1Ch 00



DH1Ch 39

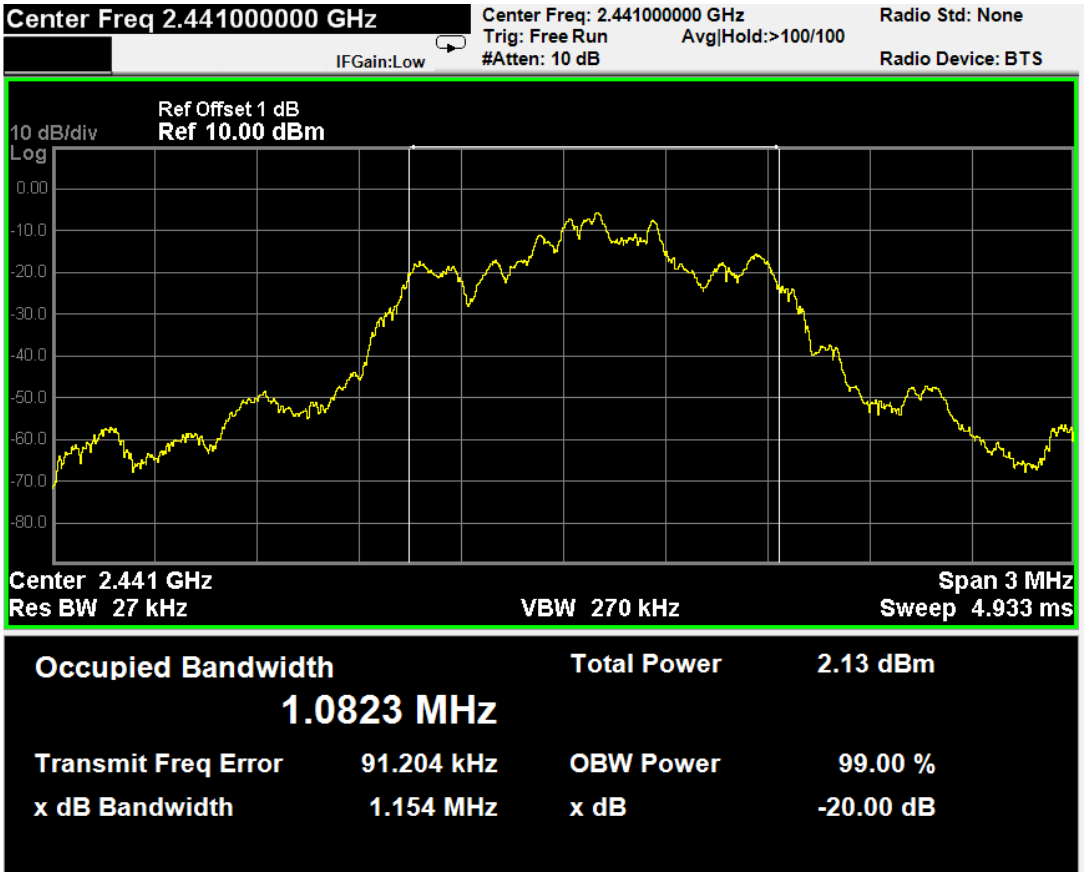


DH1Ch 78



3DH1Ch 00

3DH1Ch 39



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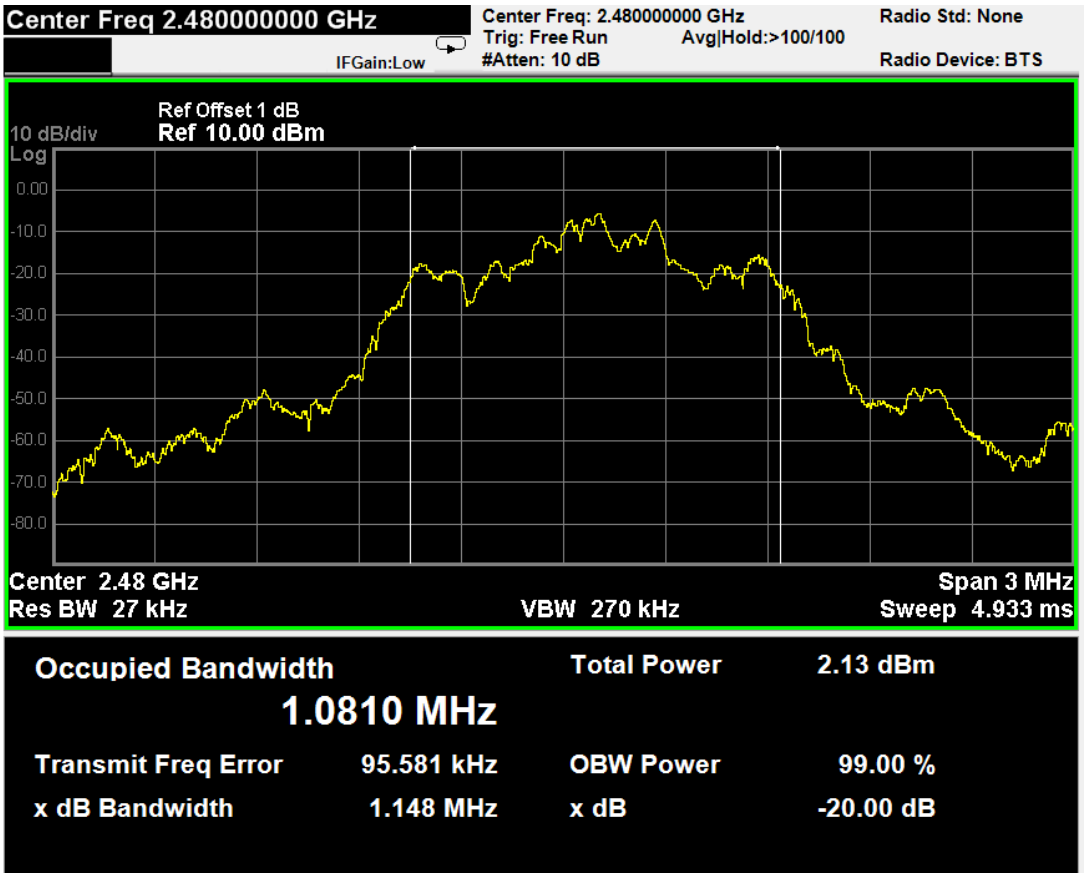
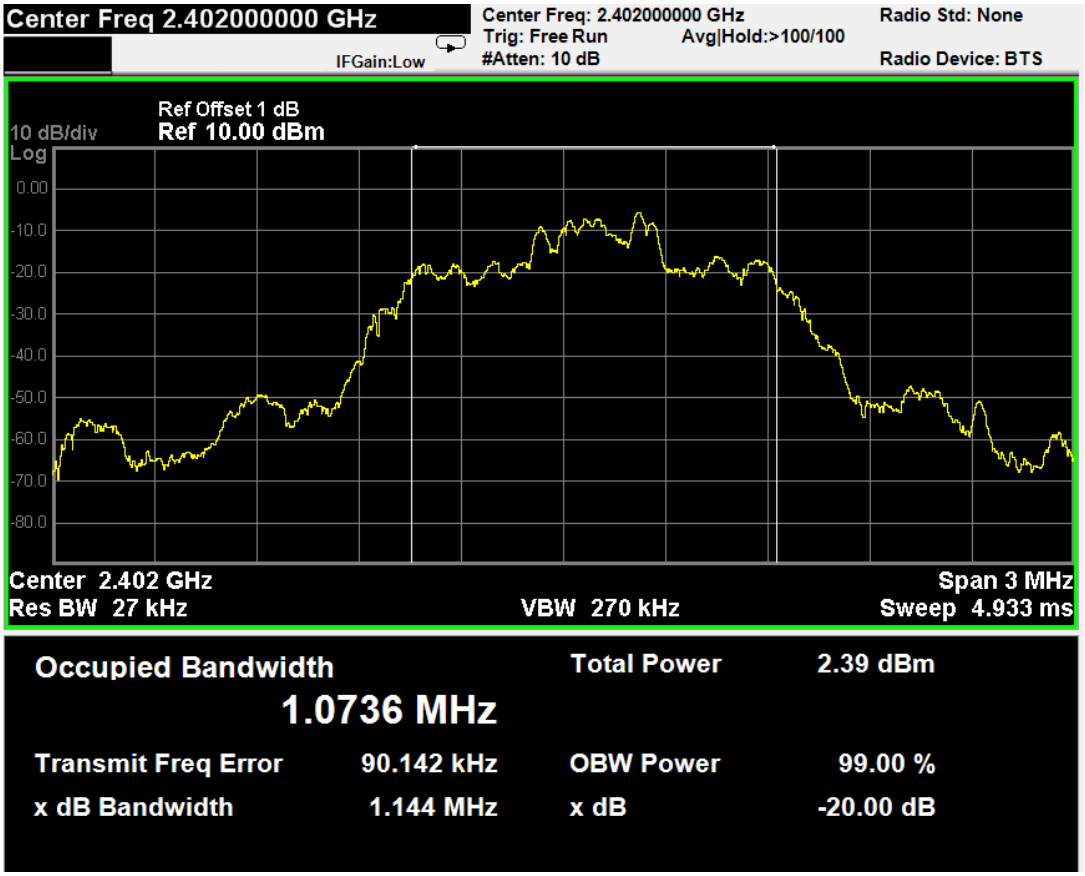
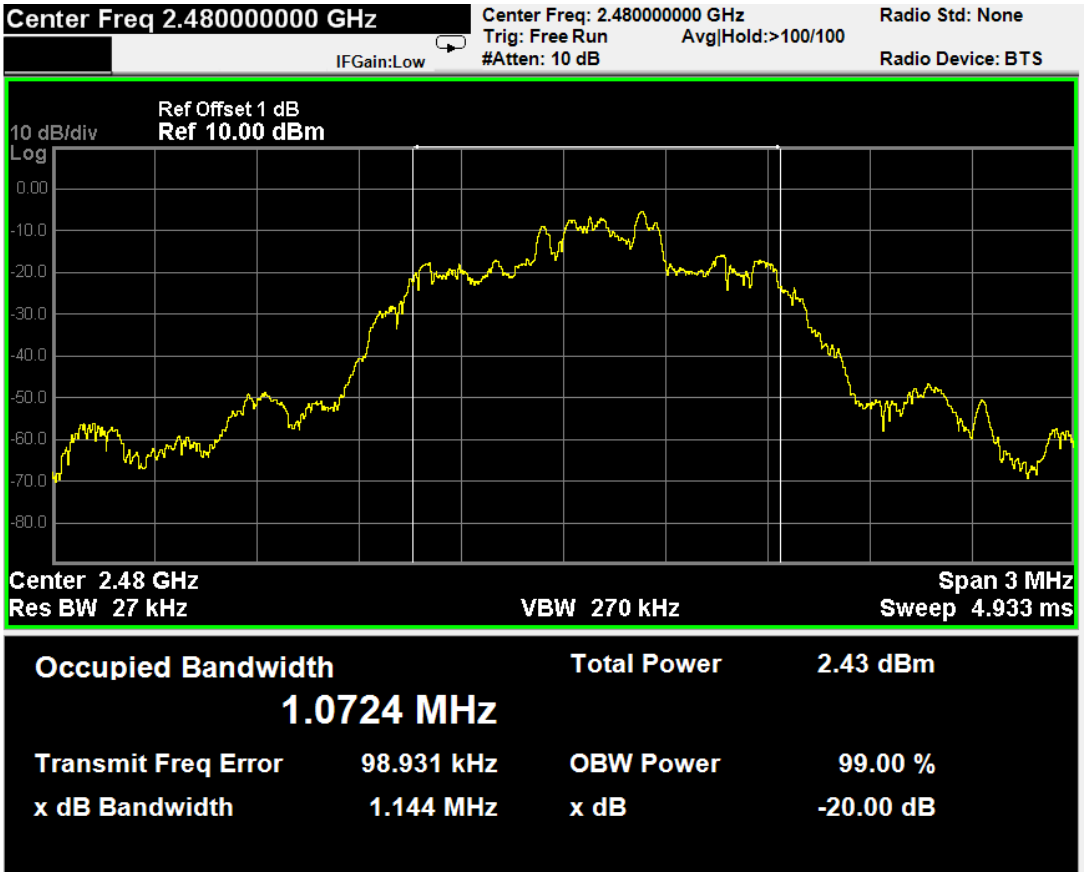


DH3Ch 00

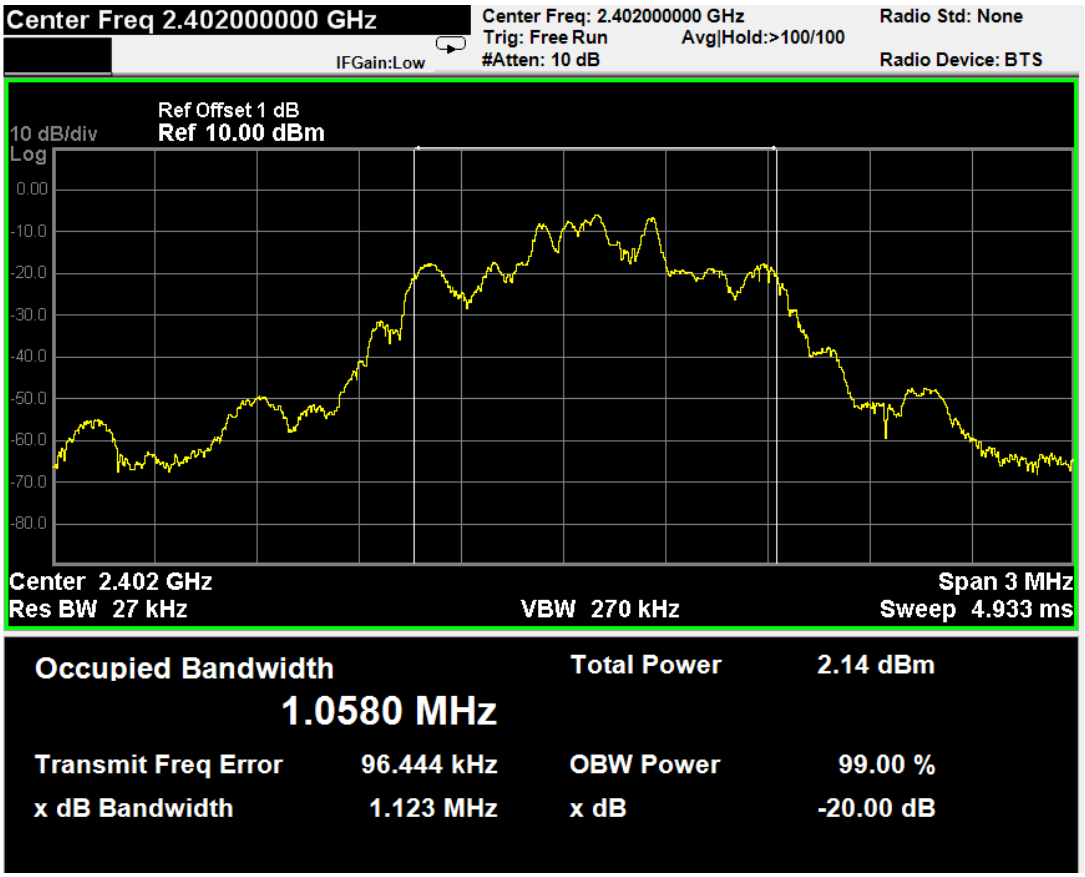


DH3Ch 39

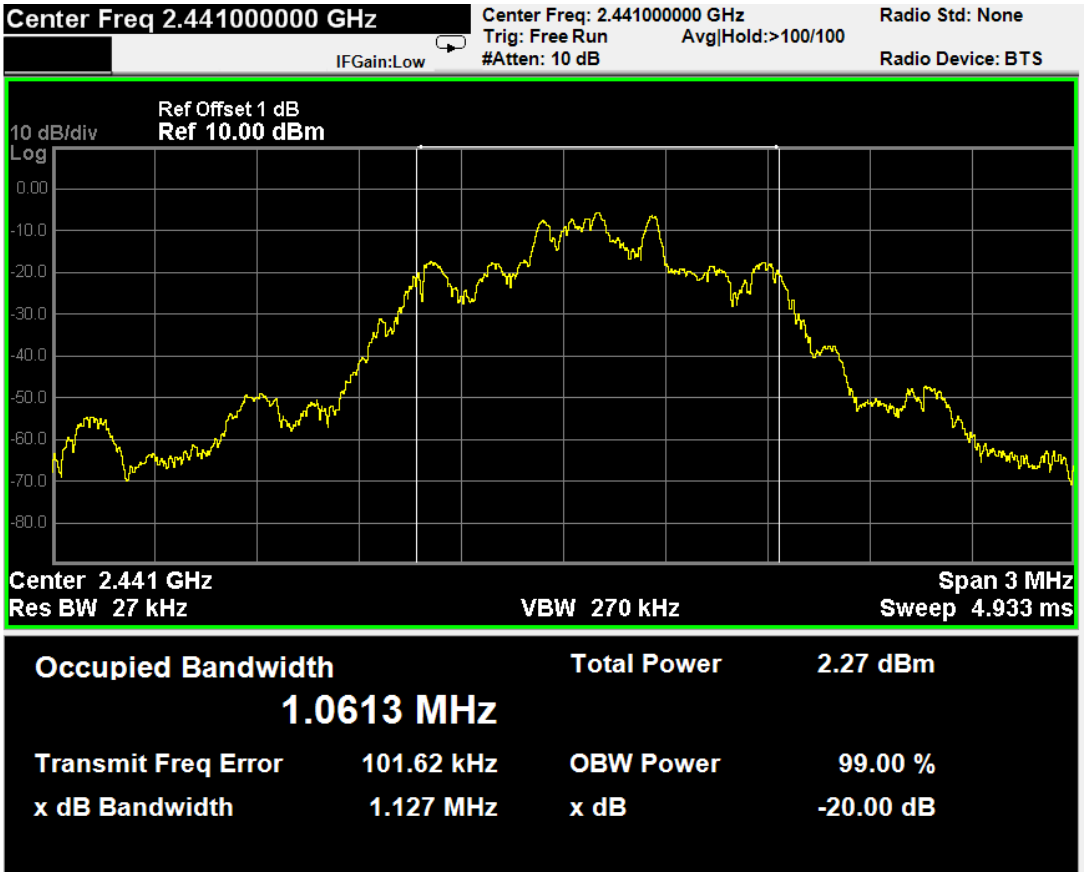
DH3Ch 78



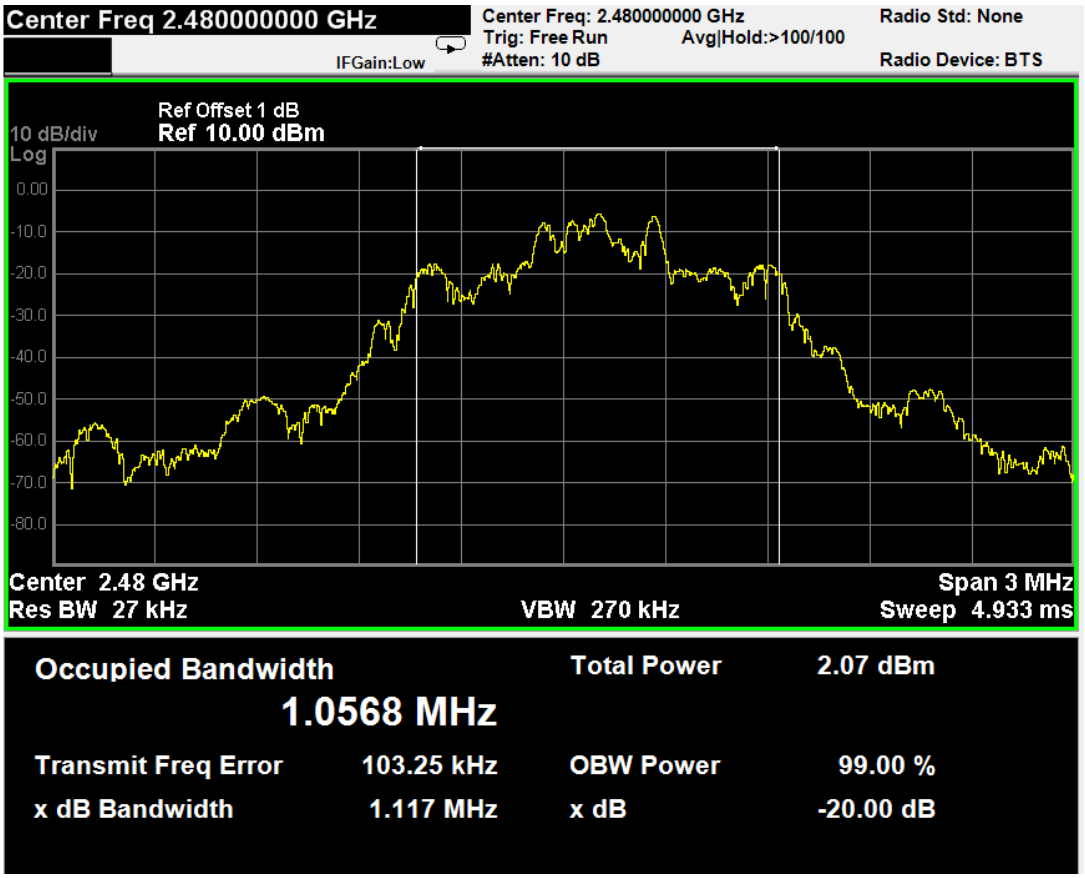
3DH3Ch 00



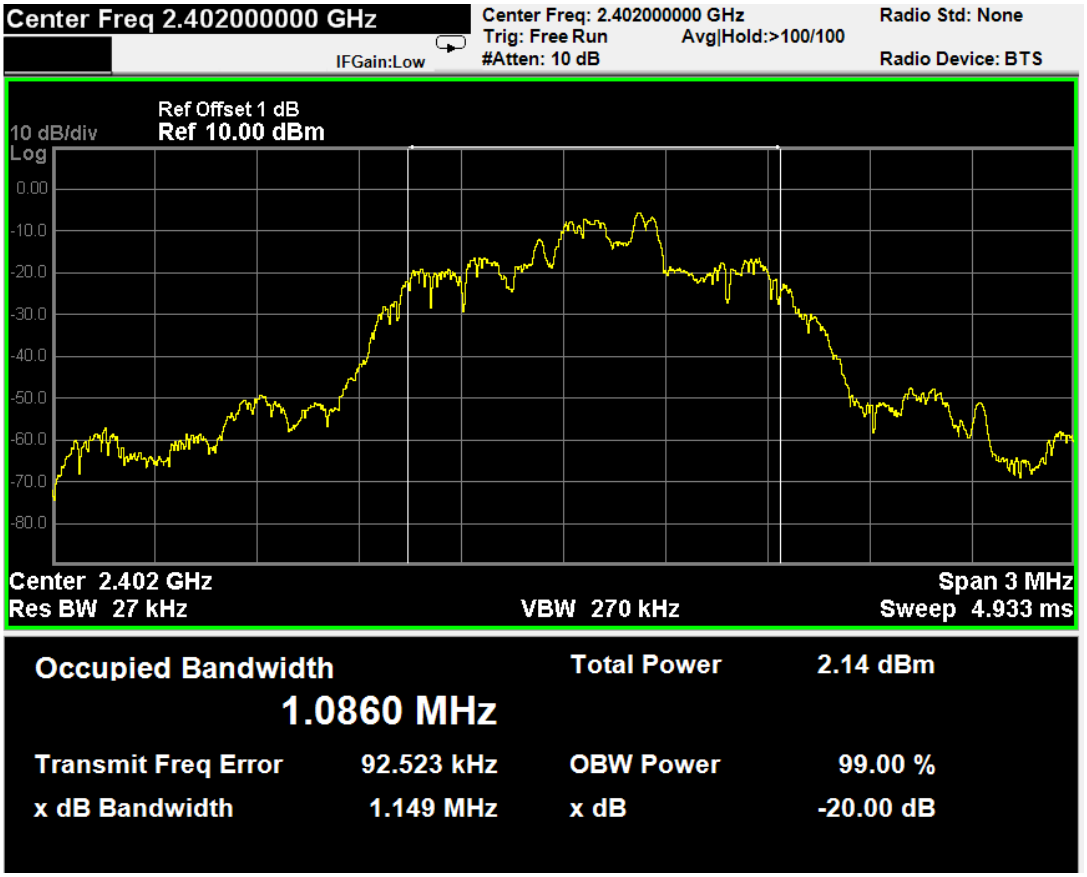
3DH3Ch 39



3DH3Ch 78

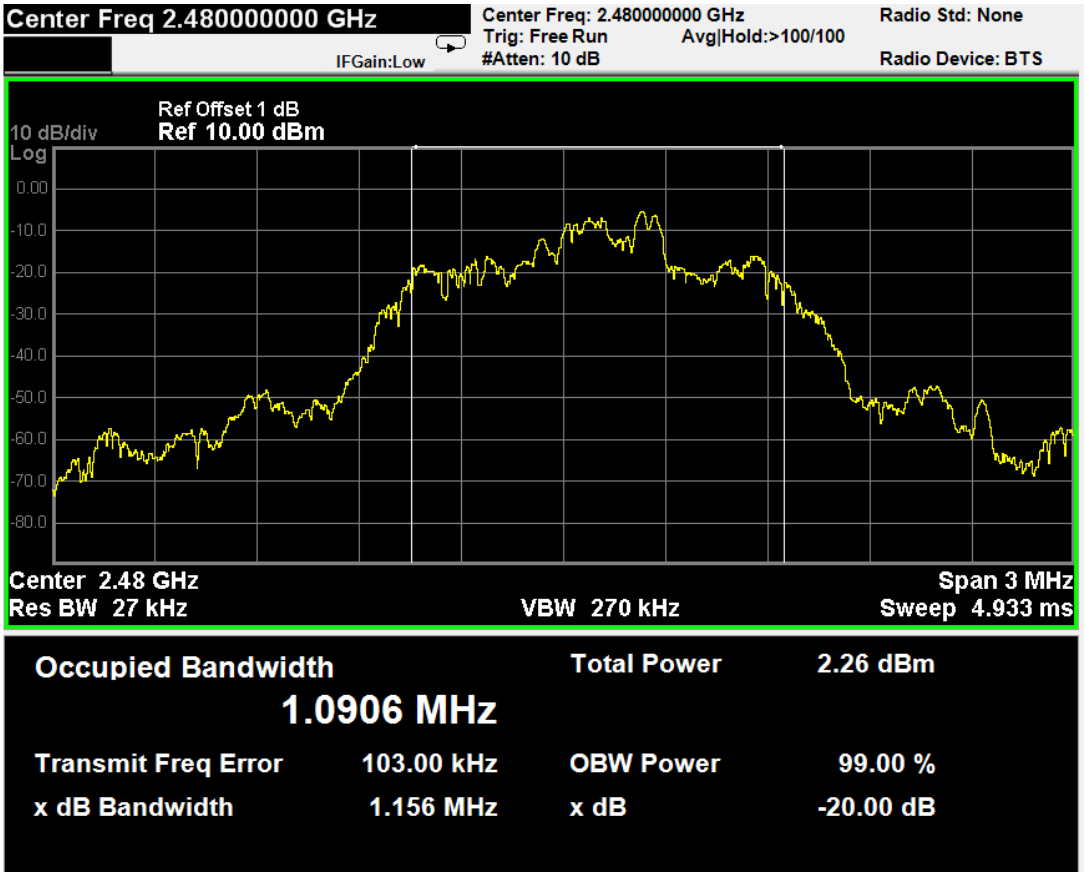


DH5Ch 00



DH5Ch 39

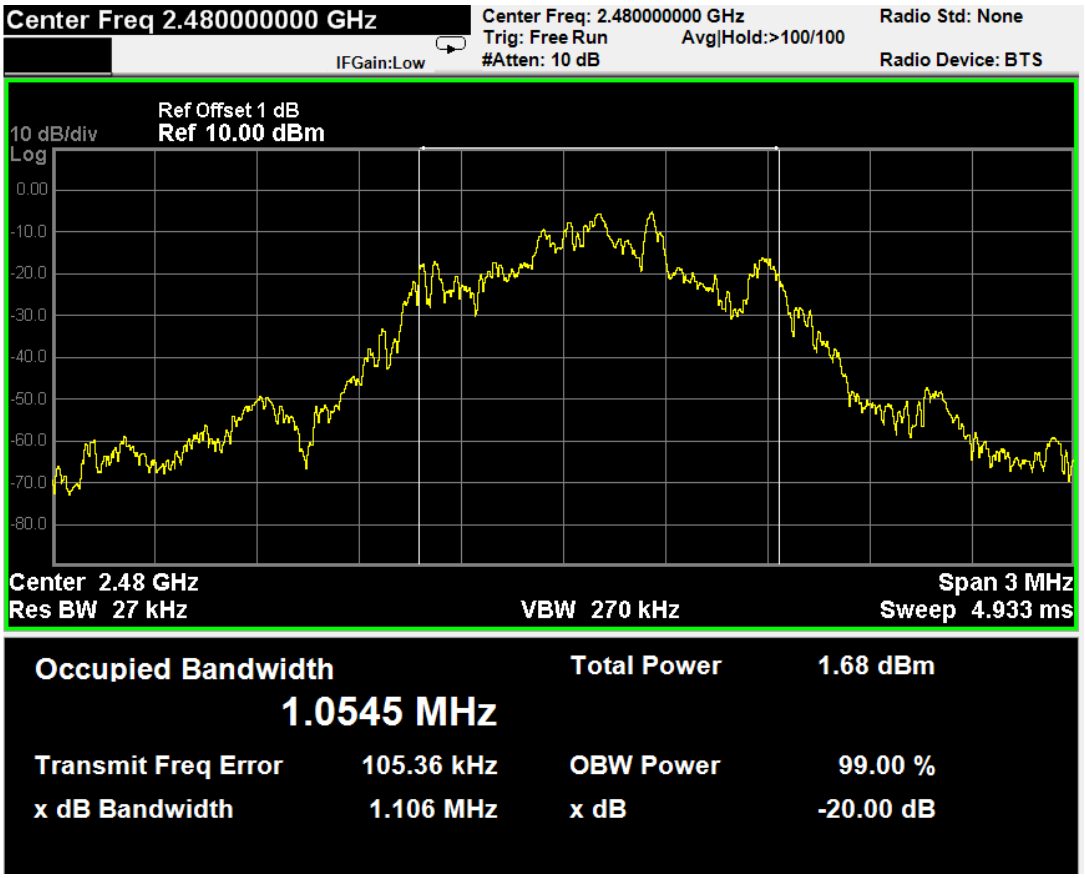
DH5Ch 78



3DH5Ch 00

3DH5Ch 39

3DH5Ch 78



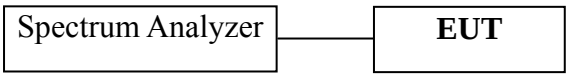
6 PEAK OUTPUT POWER MEASUREMENT

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.	EXA Signal Analyzer	Agilent	N9010A	MY52221182	May 25, 2017	May 24, 2018

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: 2018.02.10 Temperature: 23℃ Humidity: 50 %)

DH1

Channel	Frequency	**Peak Output Power**	Limit
00	2402 MHz	**-3.085 dBm**	30 dBm
39	2441 MHz	**-2.978 dBm**	30 dBm
78	2480 MHz	**-2.872 dBm**	30 dBm

3DH1

Channel	Frequency	**Peak Output Power**	Limit
00	2402 MHz	**-3.282 dBm**	30 dBm
39	2441 MHz	**-3.222 dBm**	30 dBm
78	2480 MHz	**-3.172 dBm**	30 dBm

DH3

Channel	Frequency	**Peak Output Power**	Limit
00	2402 MHz	**-2.788 dBm**	30 dBm
39	2441 MHz	**-2.710 dBm**	30 dBm
78	2480 MHz	**-2.642 dBm**	30 dBm

3DH3

Channel	Frequency	**Peak Output Power**	Limit
00	2402 MHz	**-3.017 dBm**	30 dBm
39	2441 MHz	**-2.893 dBm**	30 dBm
78	2480 MHz	**-2.781 dBm**	30 dBm

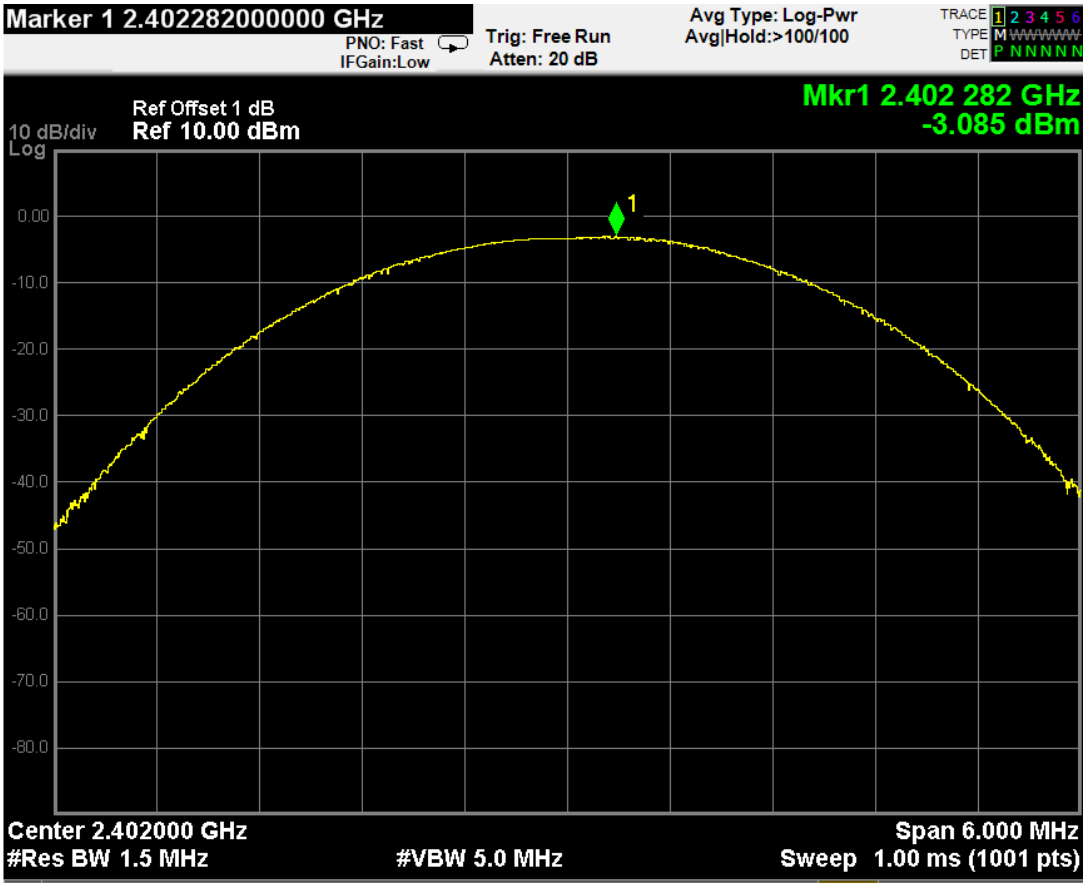
DH5

Channel	Frequency	**Peak Output Power**	Limit
00	2402 MHz	**-3.270 dBm**	30 dBm
39	2441 MHz	**-3.150 dBm**	30 dBm
78	2480 MHz	**-3.047 dBm**	30 dBm

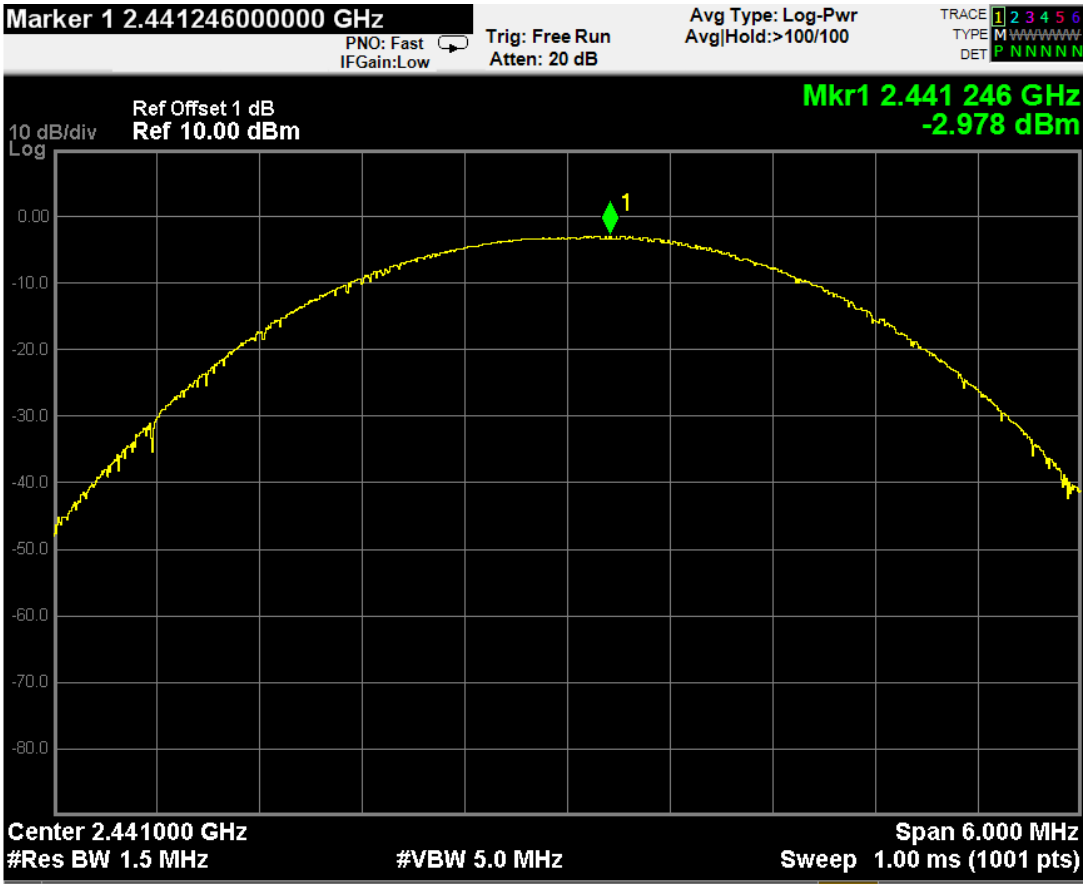
3DH5

Channel	Frequency	**Peak Output Power**	Limit
00	2402 MHz	**-3.314 dBm**	30 dBm
39	2441 MHz	**-3.246 dBm**	30 dBm
78	2480 MHz	**-3.211 dBm**	30 dBm

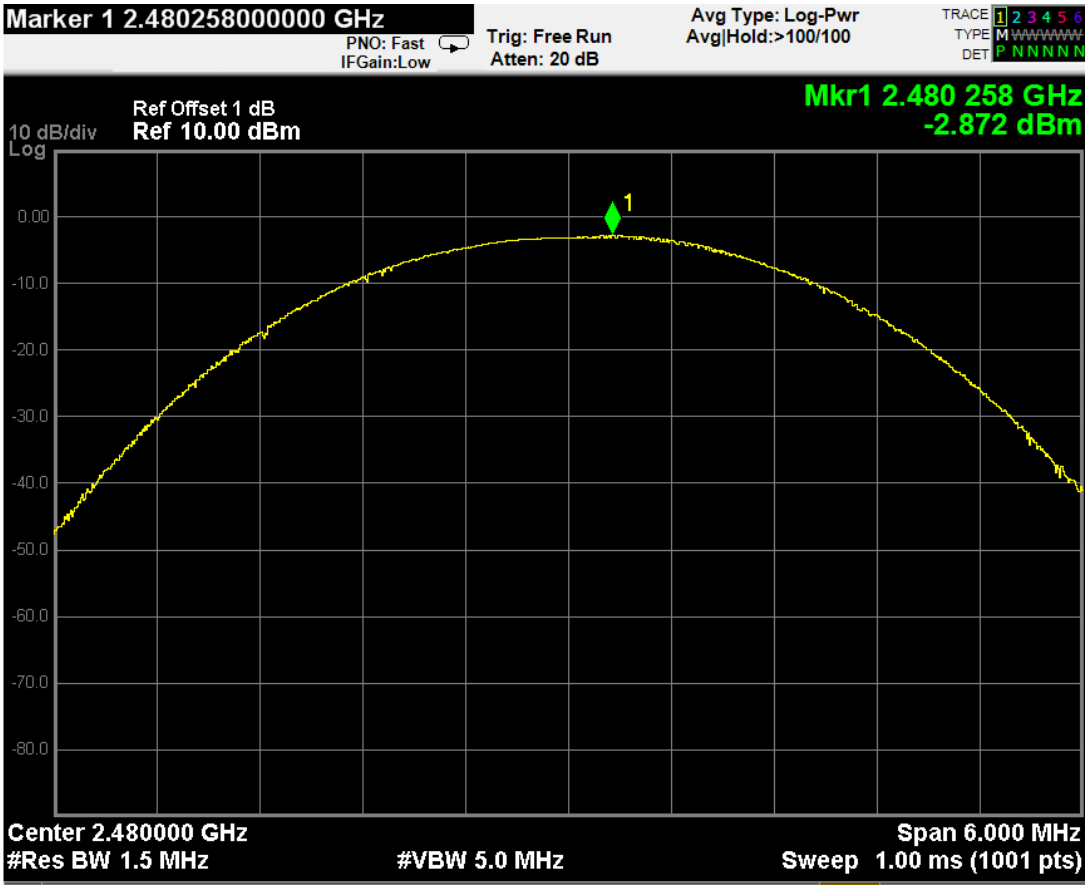
DH1Ch 00



DH1Ch 39



DH1Ch 78



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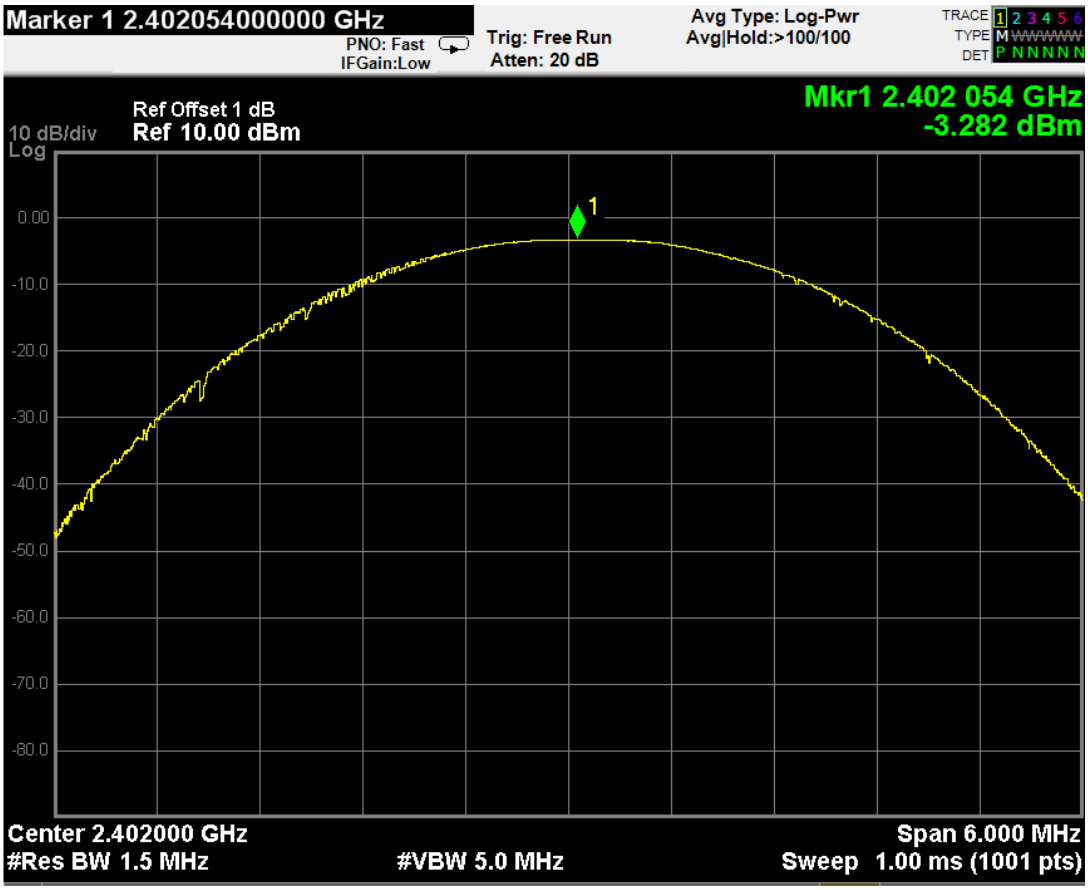
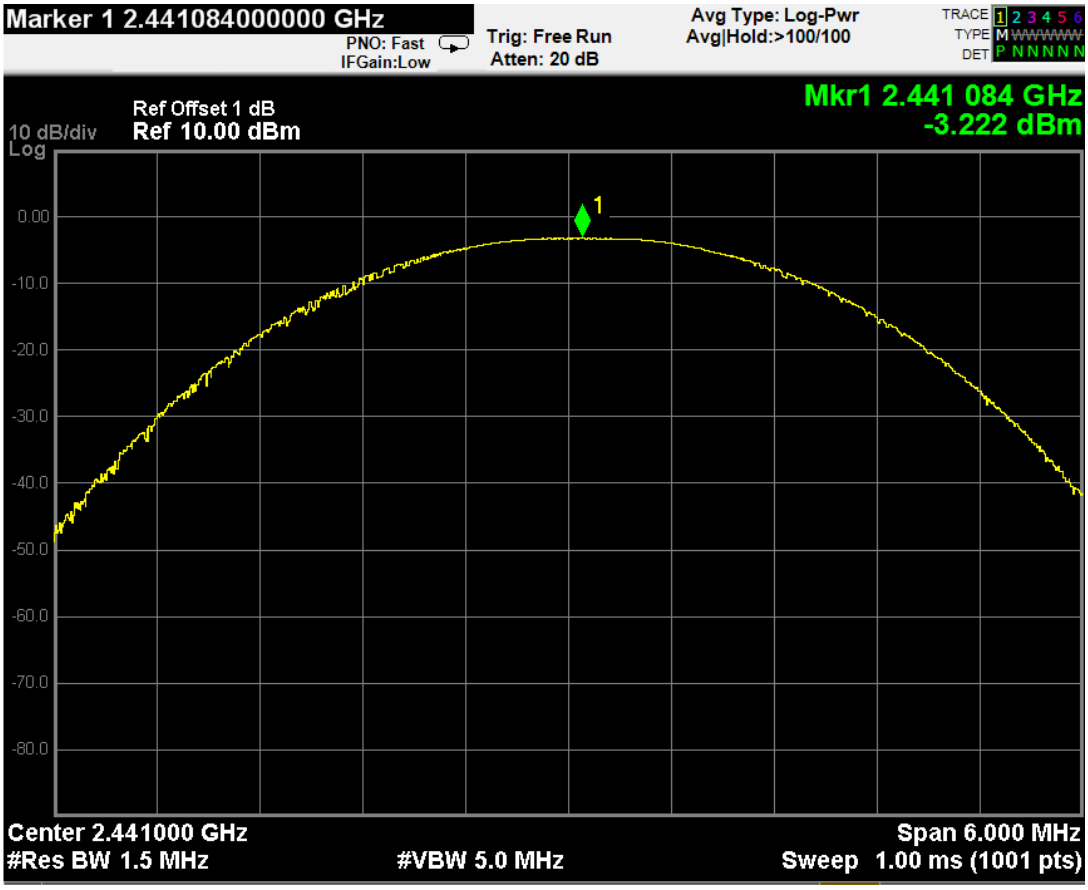


3DH1Ch 39



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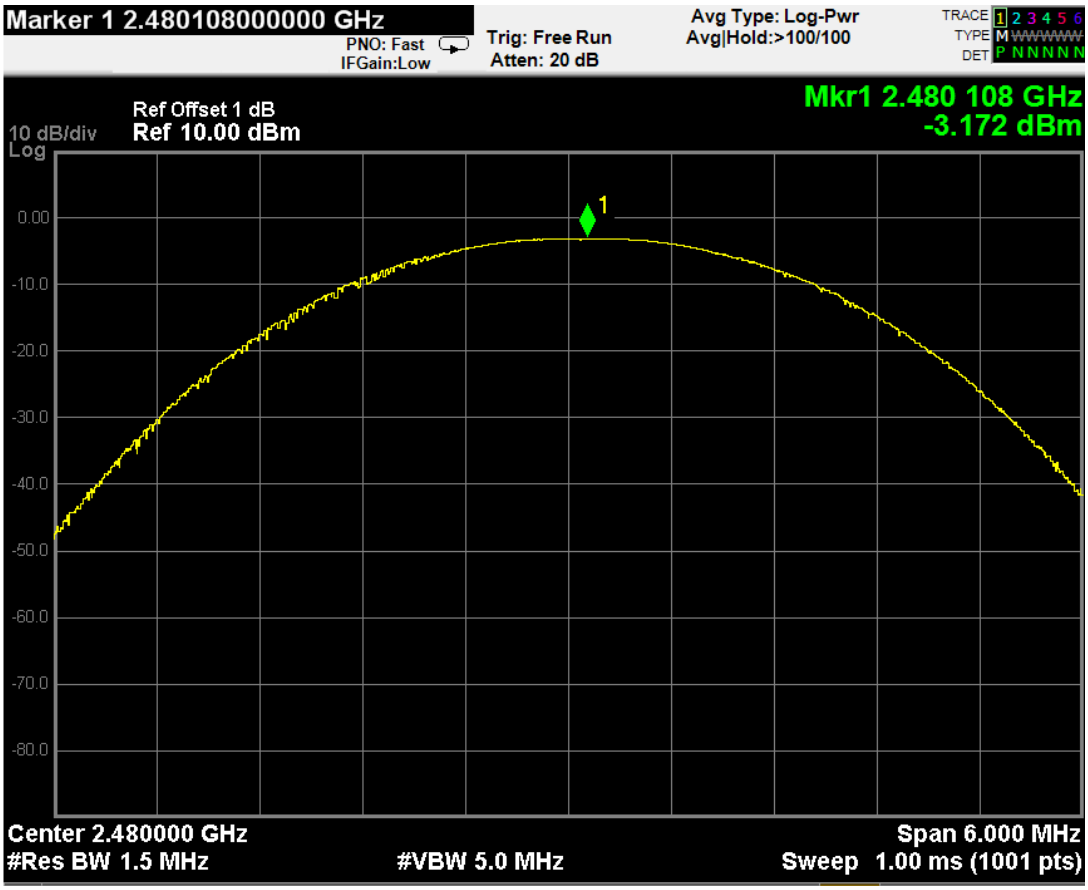
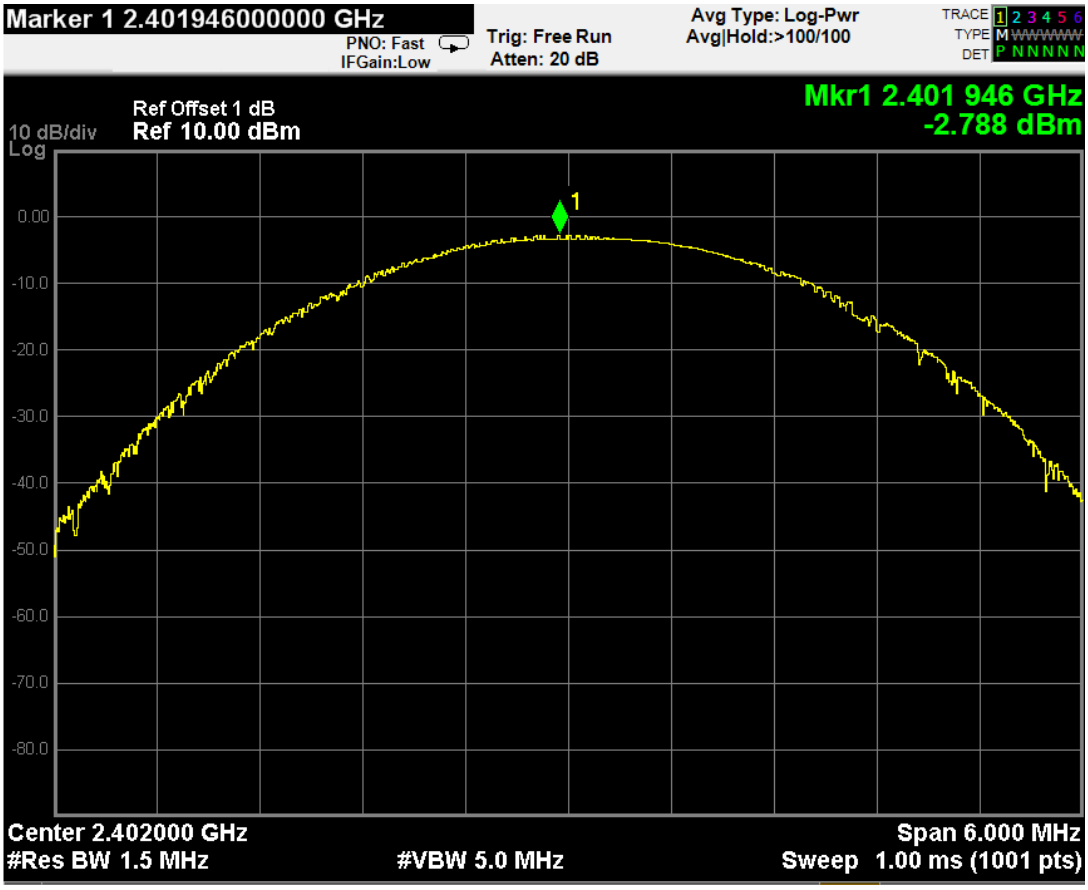
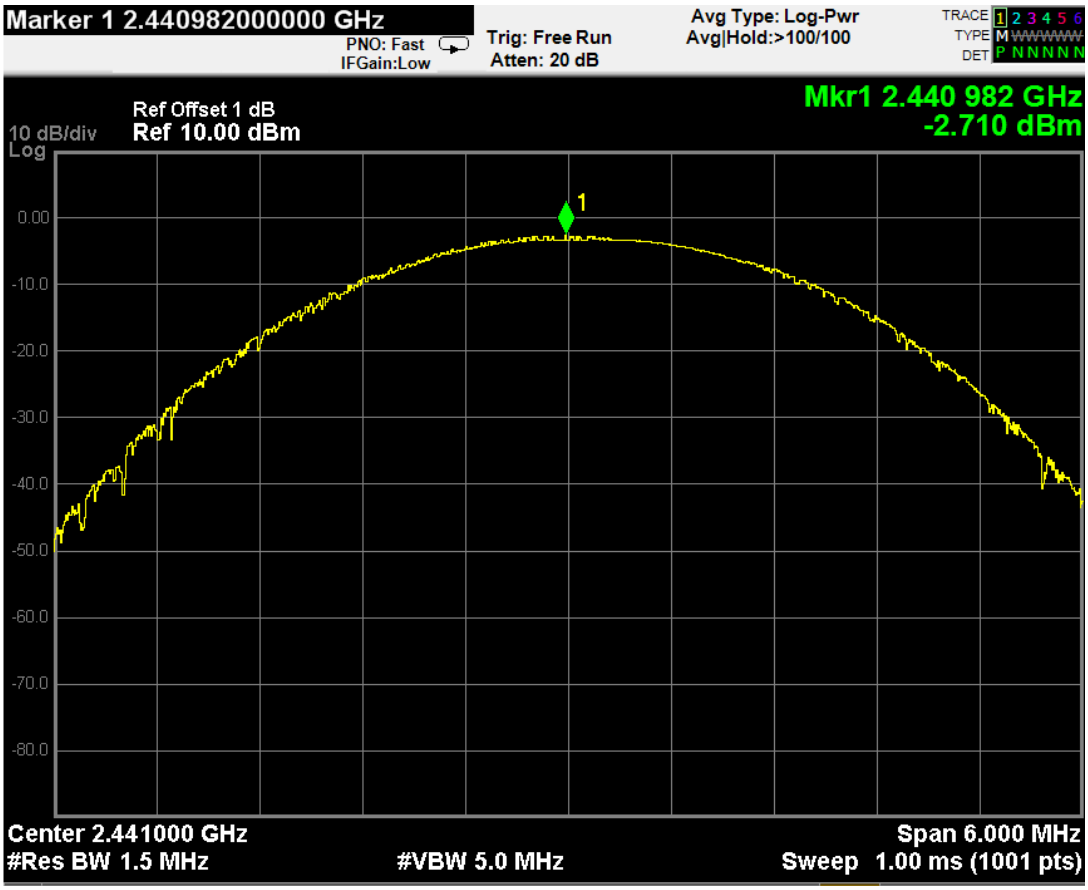


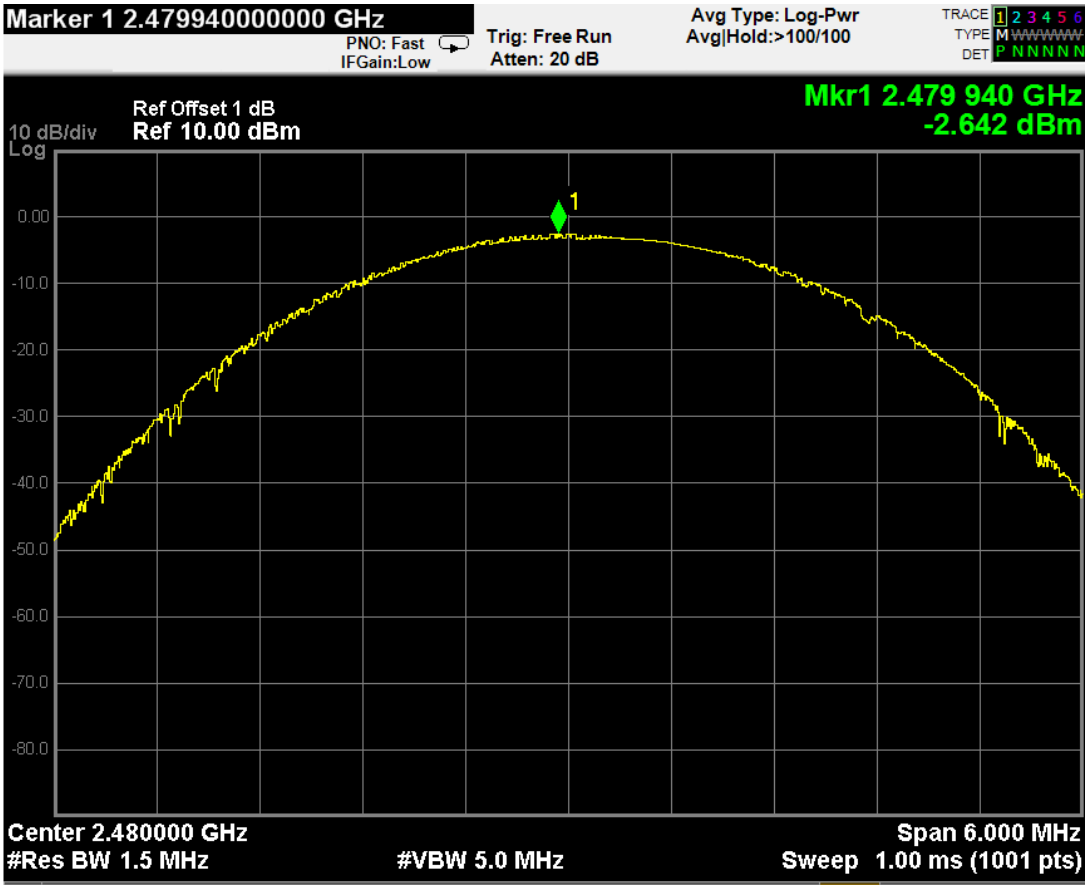
DH3Ch 00



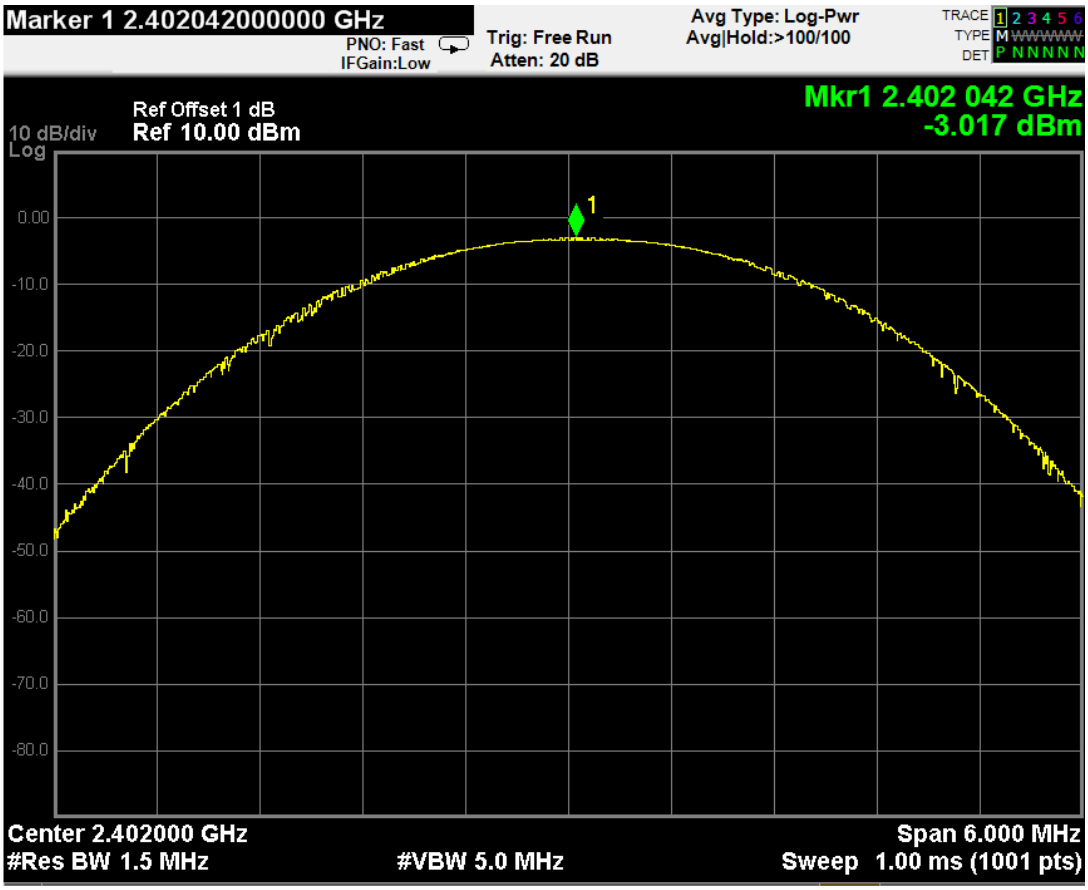
DH3Ch 39



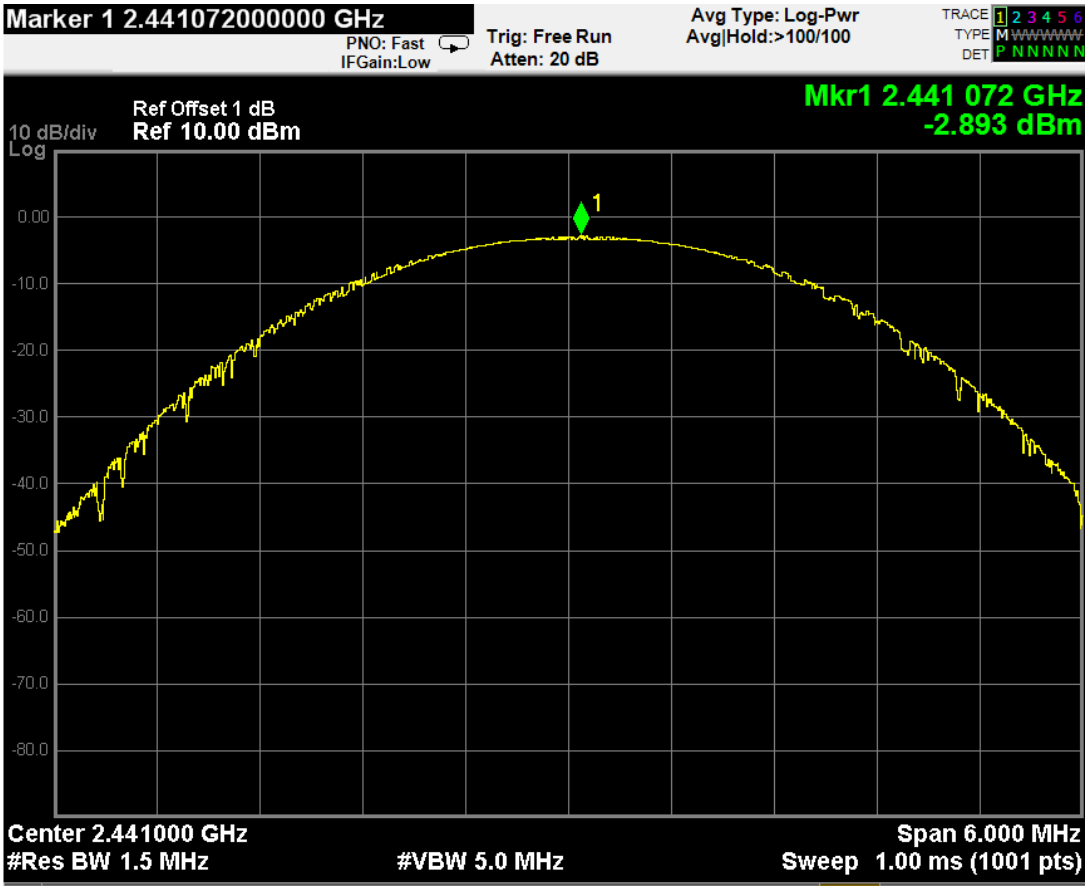
DH3Ch 78



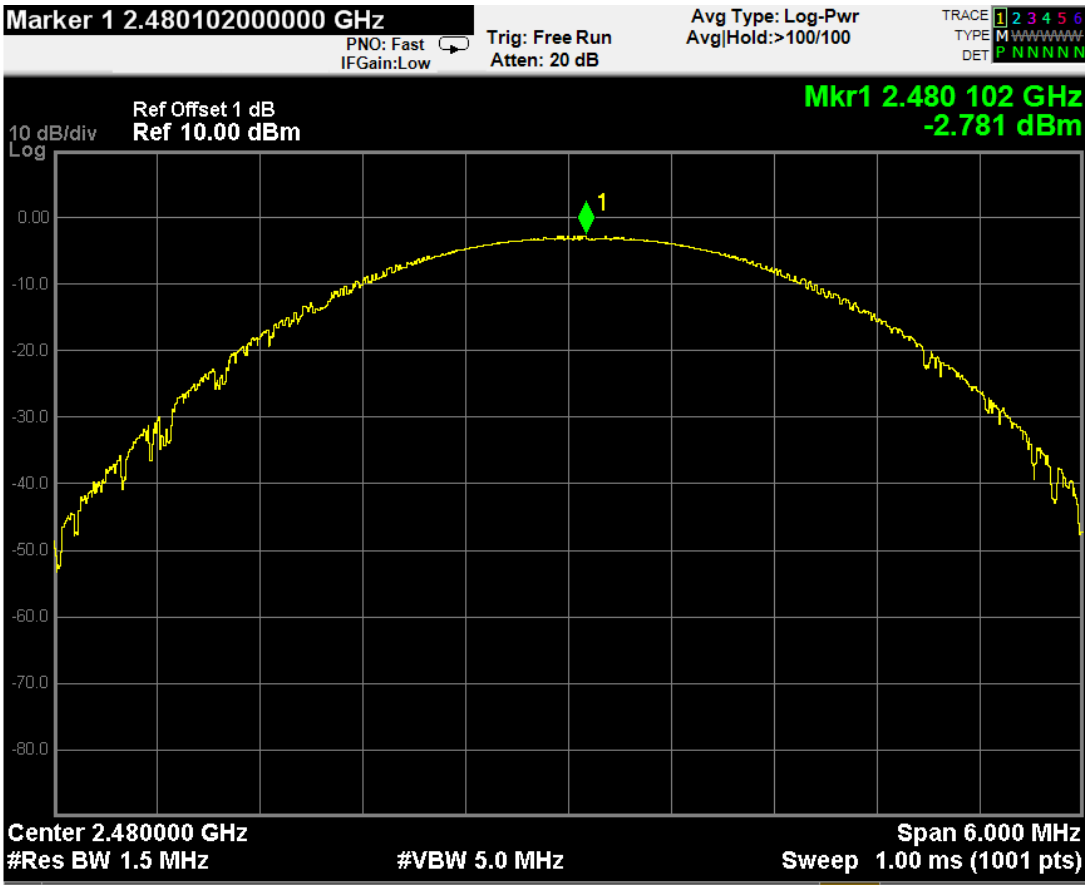
3DH3Ch 00



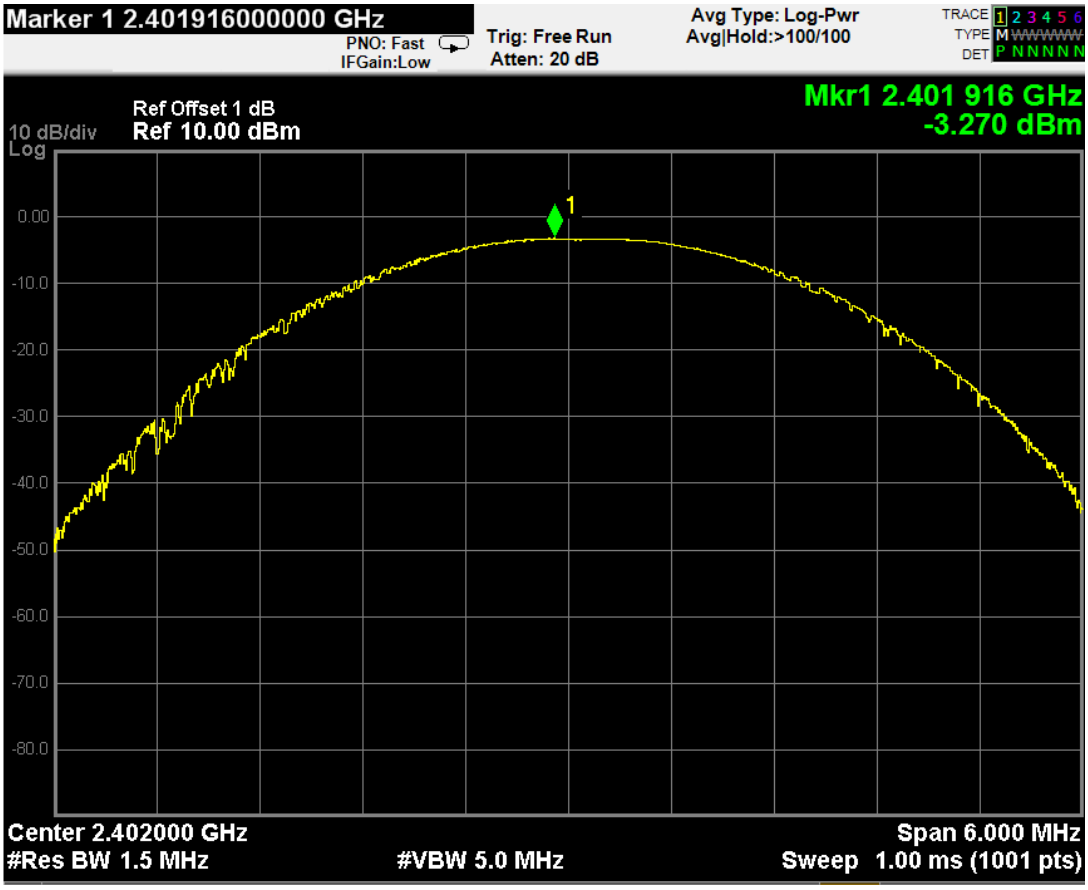
3DH3Ch 39



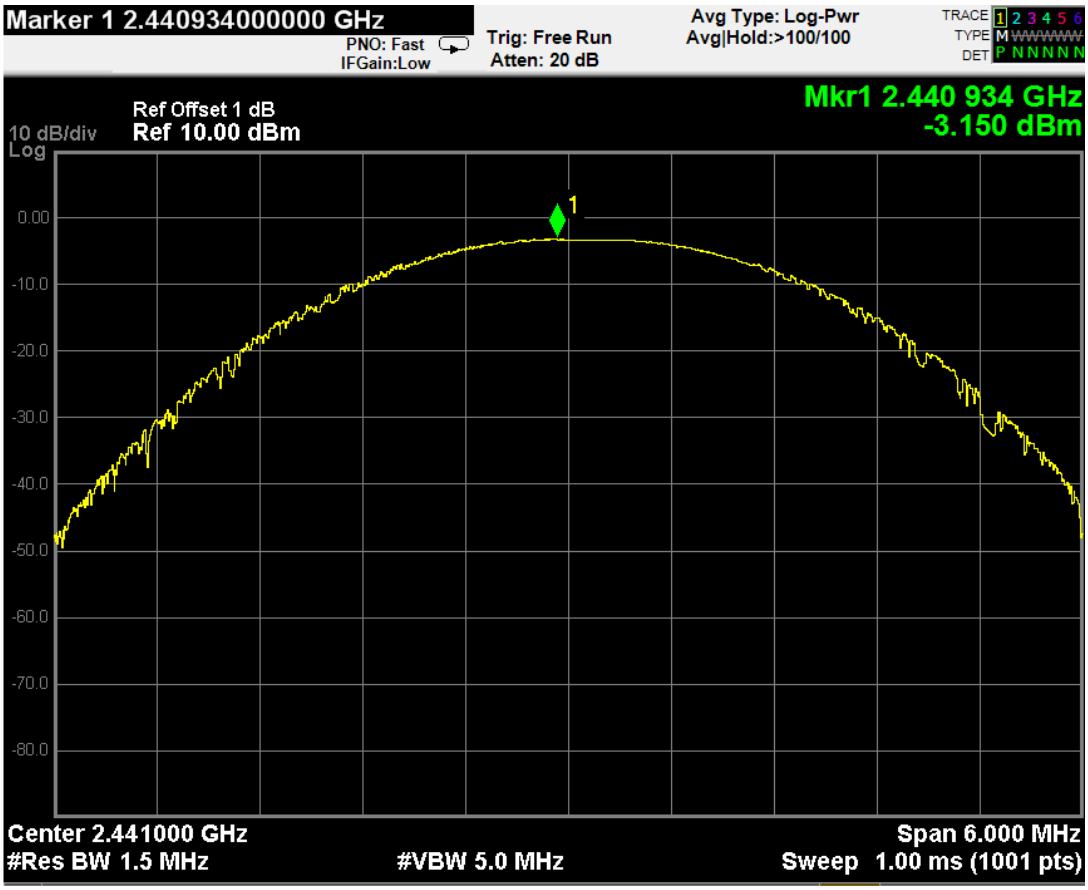
3DH3Ch 78



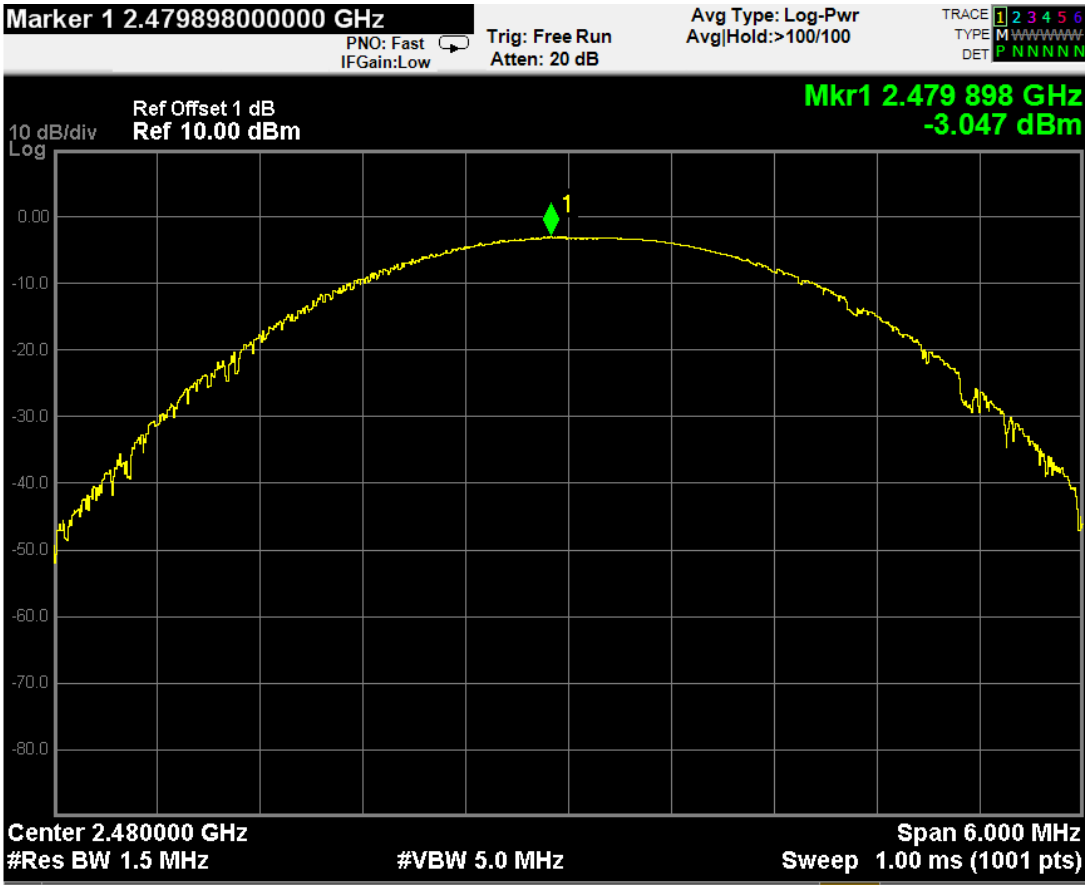
DH5Ch 00



DH5Ch 39



DH5Ch 78



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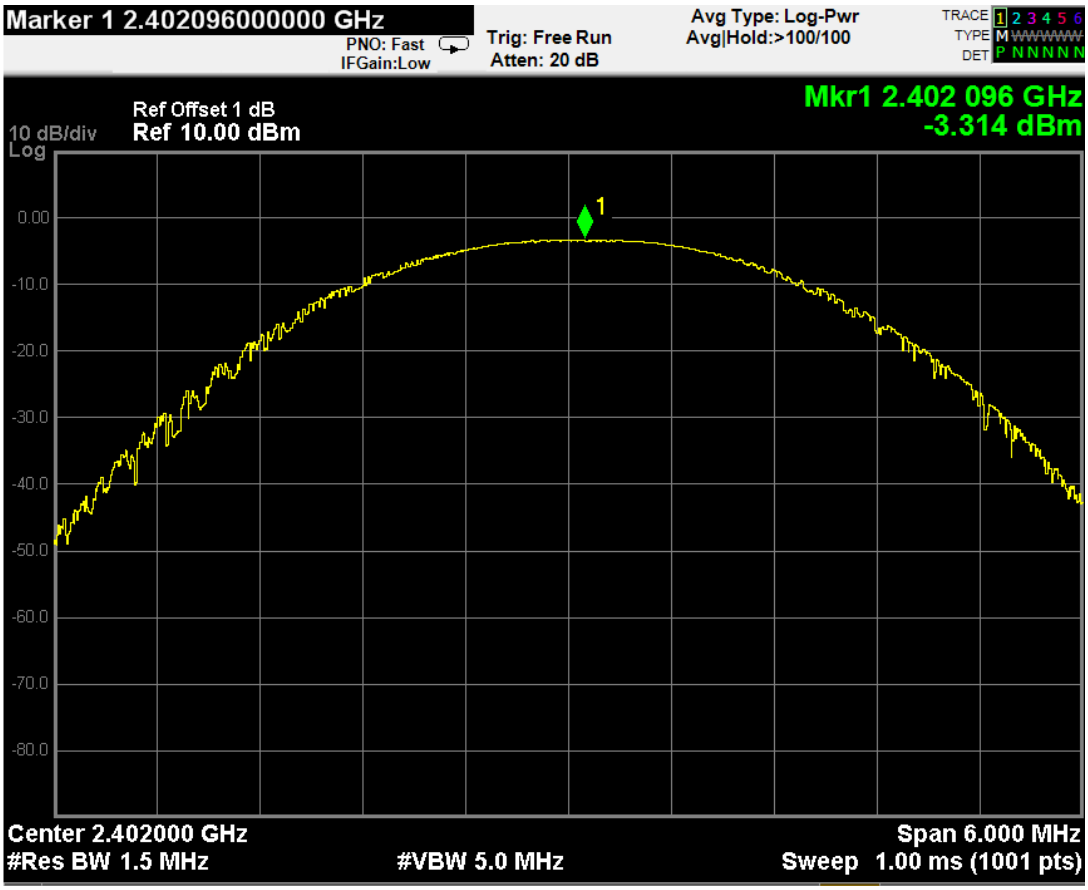
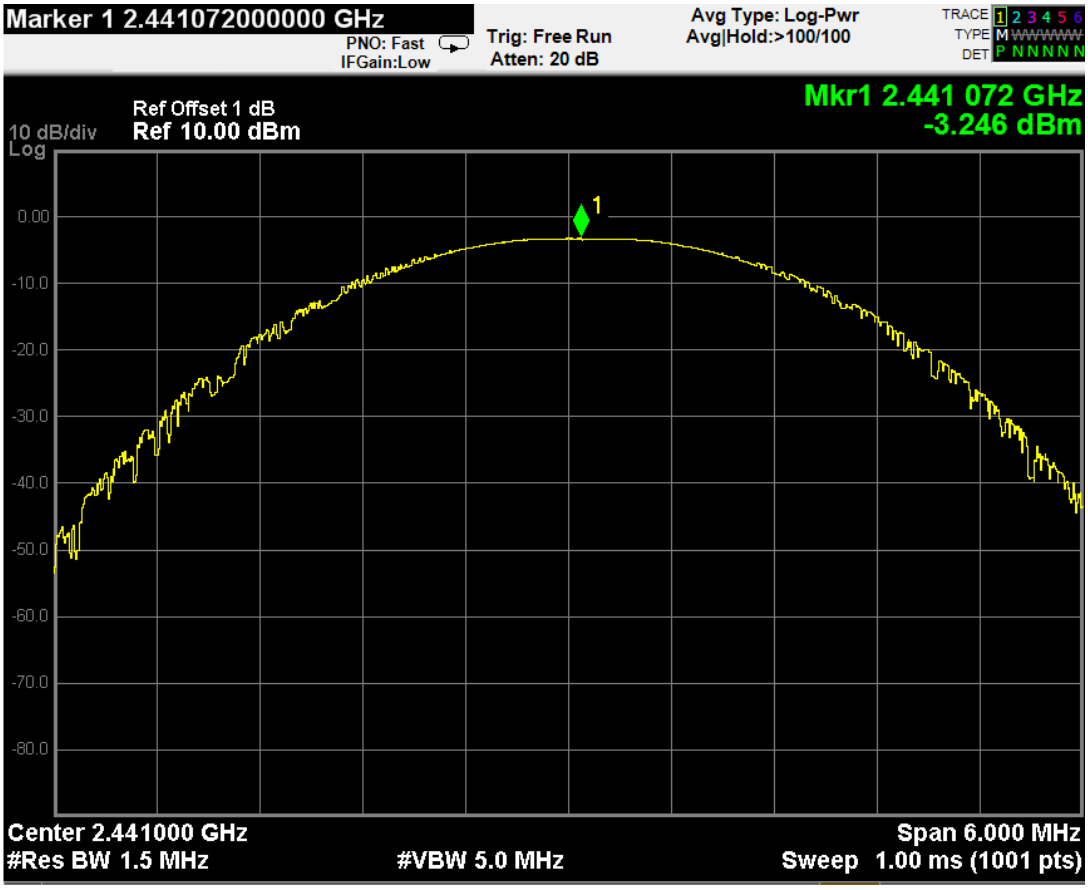
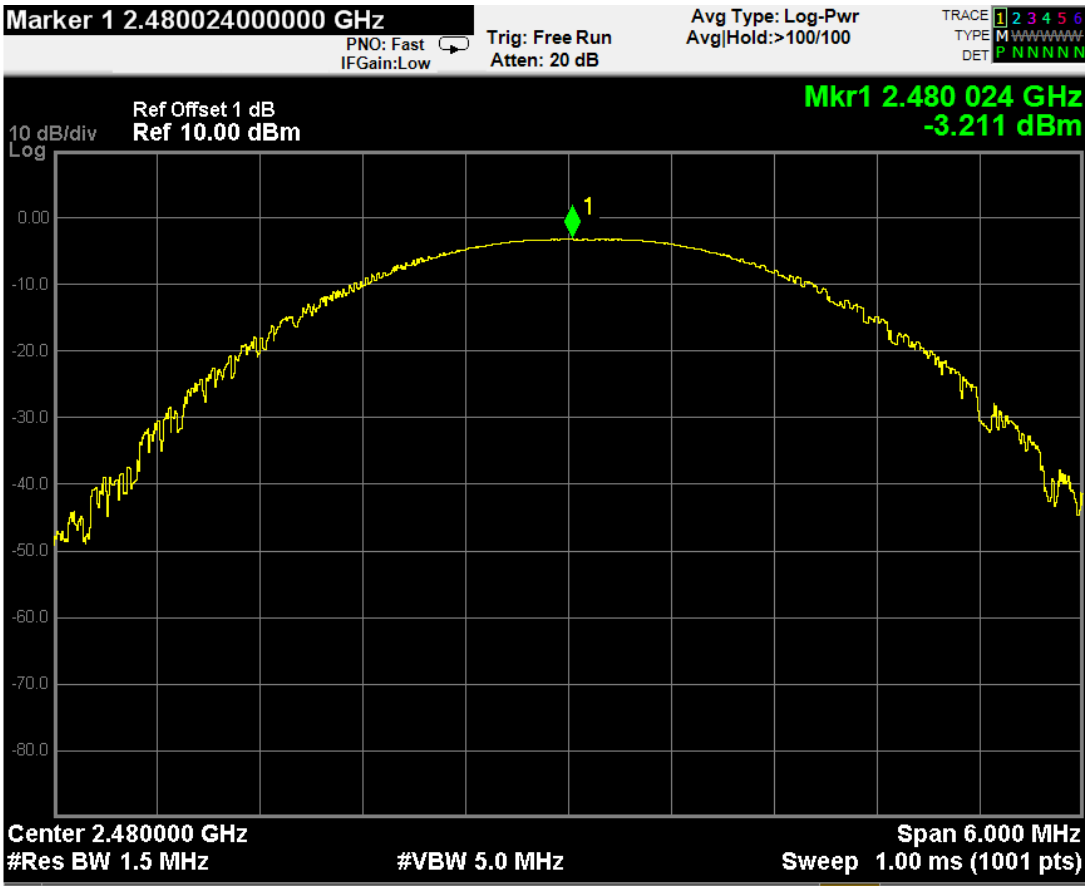


3DH5Ch 39



3DH5Ch 78



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.	EXA Signal Analyzer	Agilent	N9010A	MY52221182	May 25, 2017	May 24, 2018

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

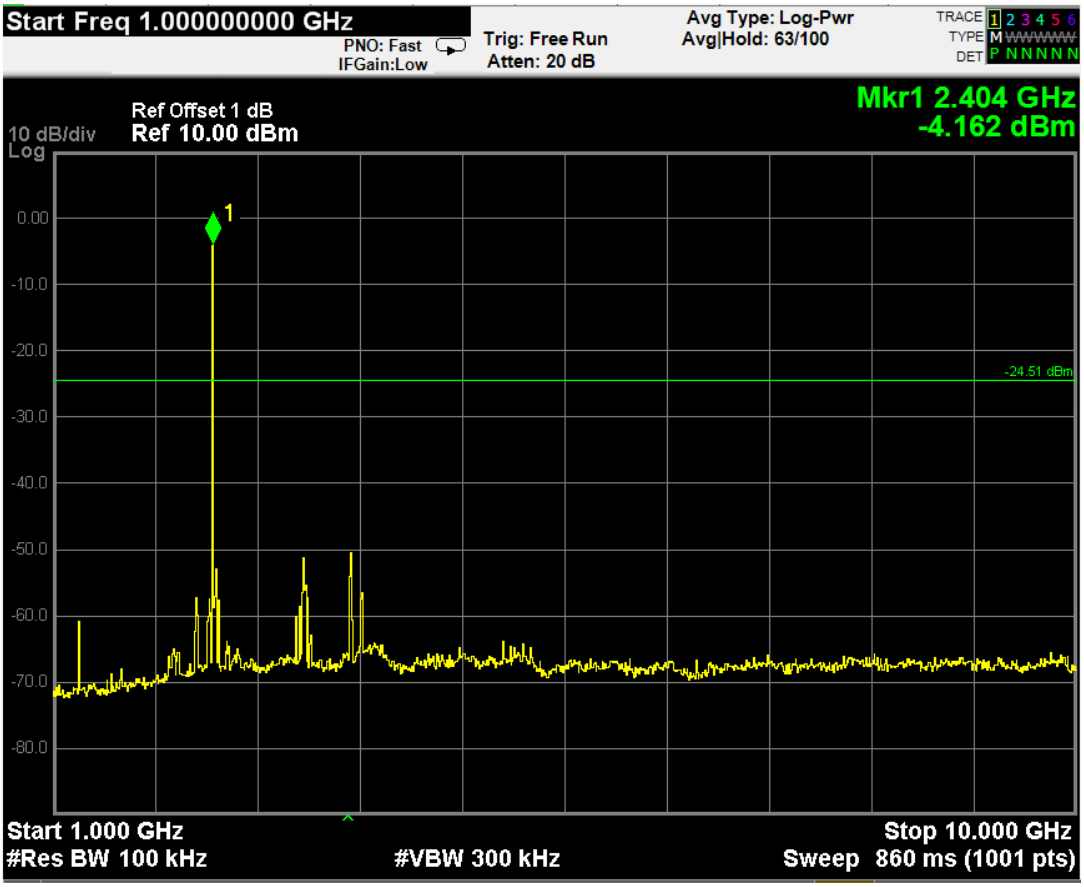
The transmitter output was connected to the spectrum analyzer. Set RBW = 100 kHz, VBW = 300 kHz, scan up through 10^{th} harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
The test procedure is defined in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

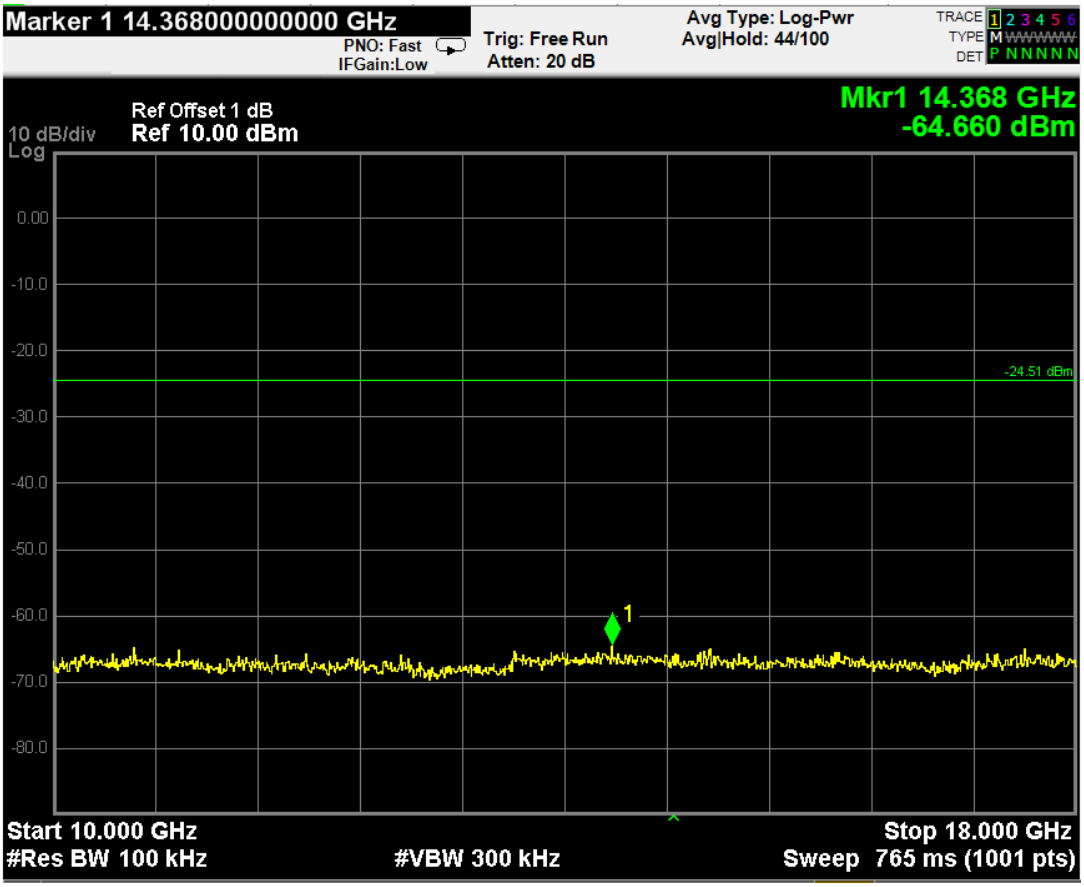
7.6 Test Results

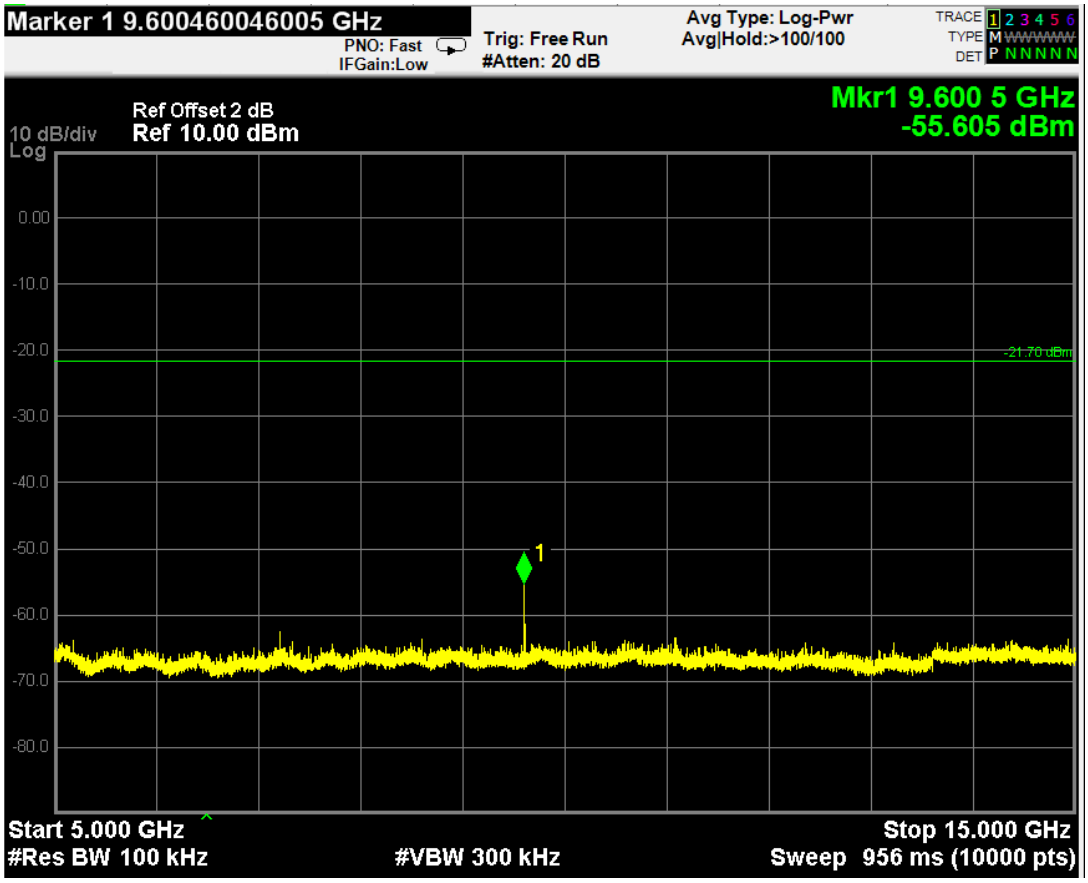
PASSED.
The test data was attached in the next pages.

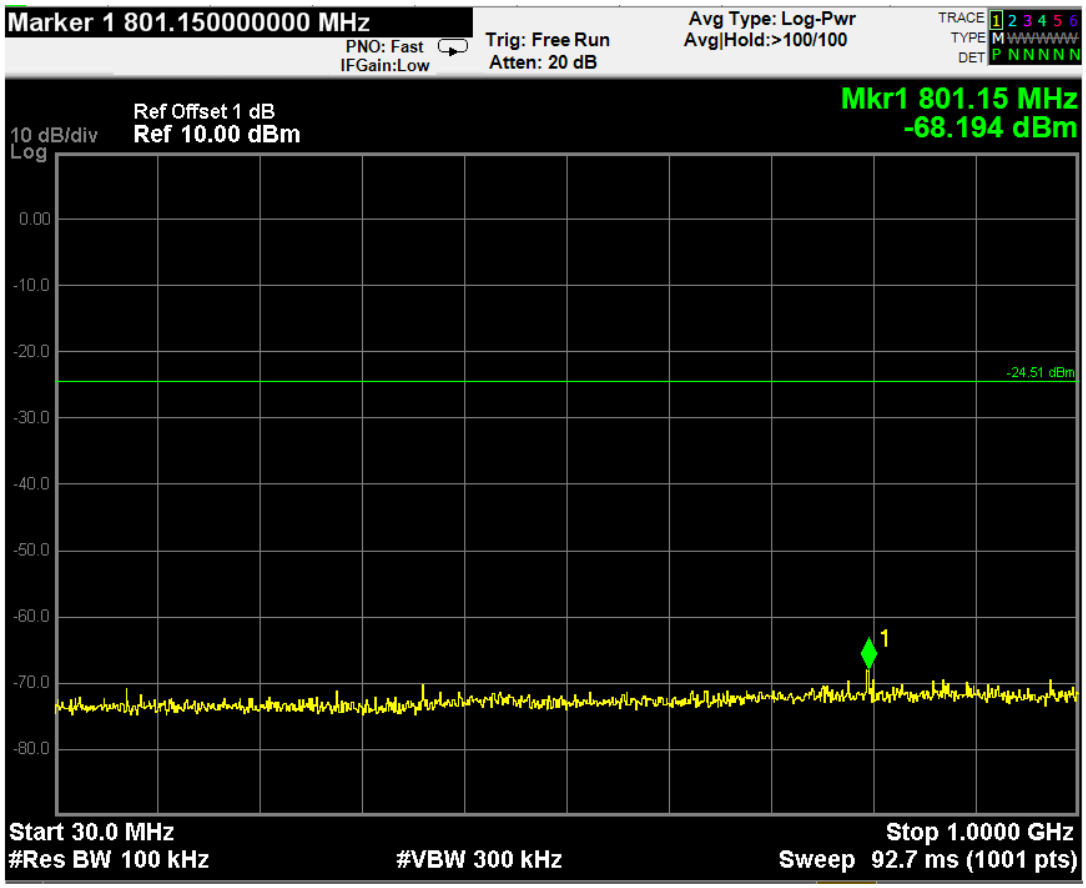
(Test Date: 2018.02.10 Temperature: 23℃ Humidity: 50 %)

DH1Ch 00

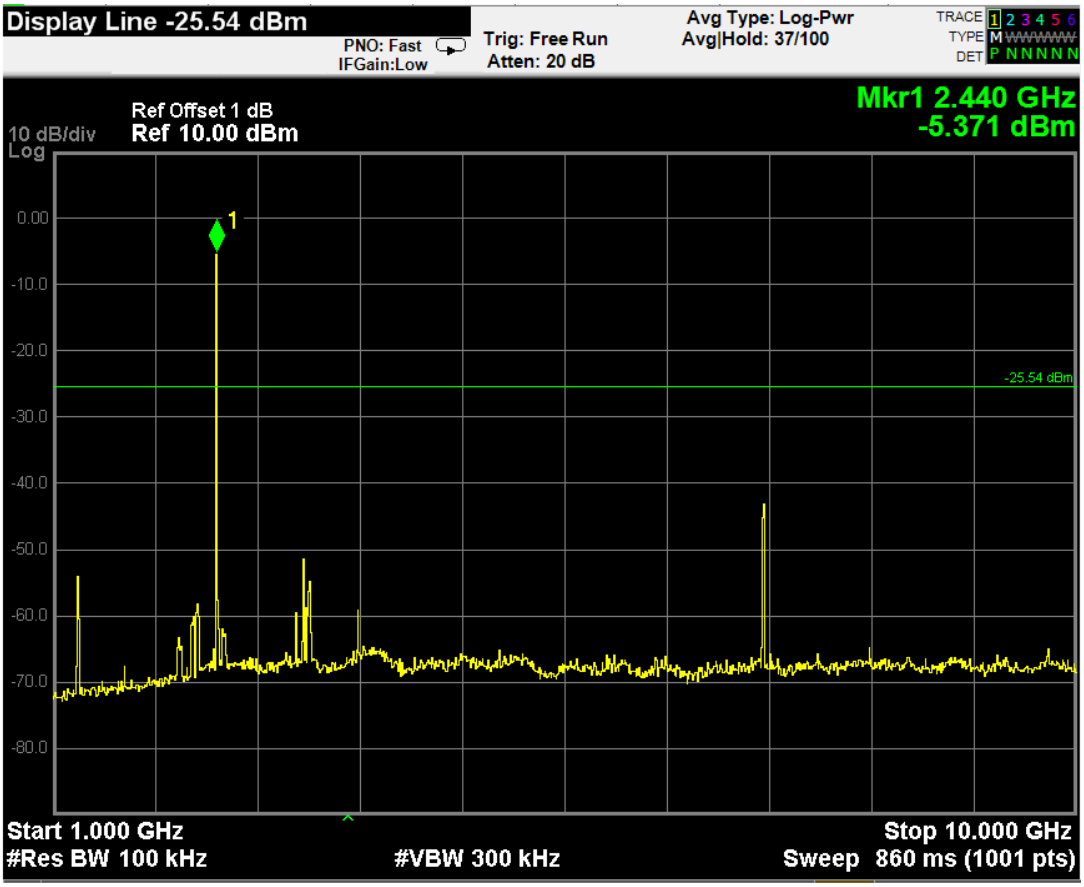

Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 63/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.404 GHz
-4.162 dBm
0.00
-10.0
-20.0
-24.51 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)

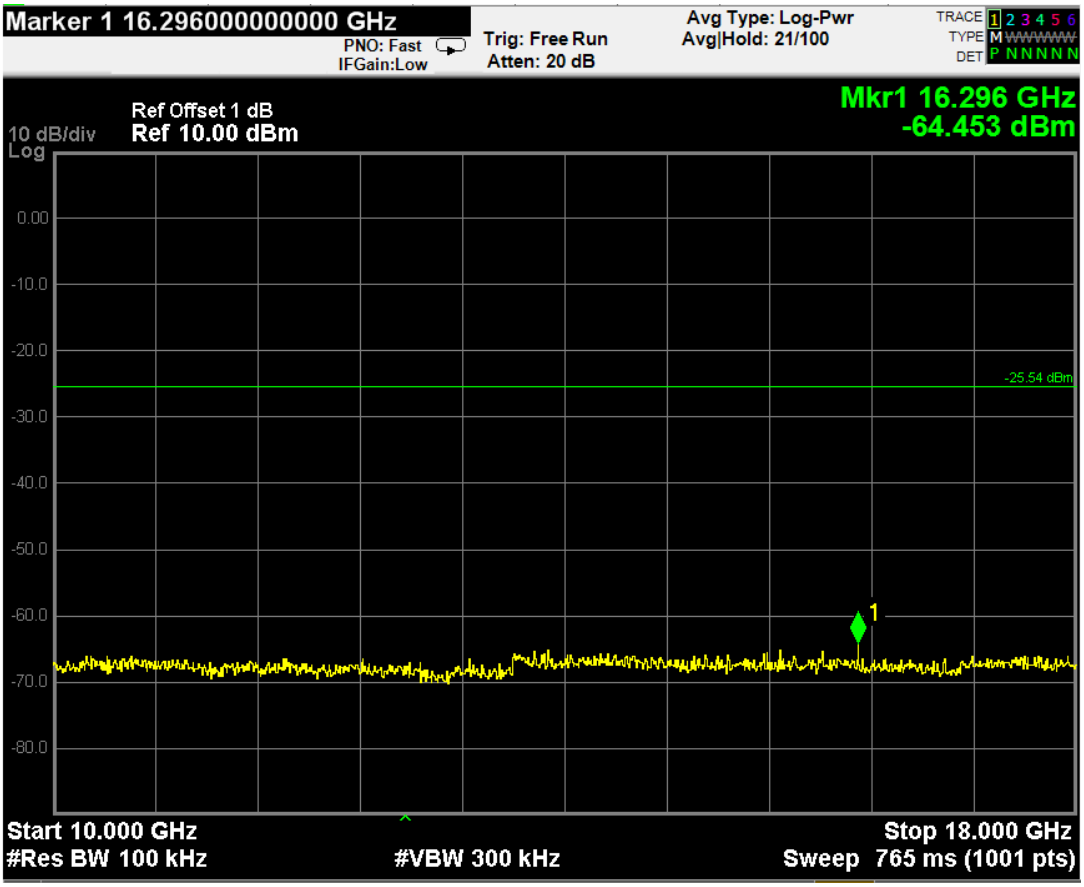

Marker 1 14.368000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 44/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 14.368 GHz
-64.660 dBm
0.00
-10.0
-20.0
-24.51 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)

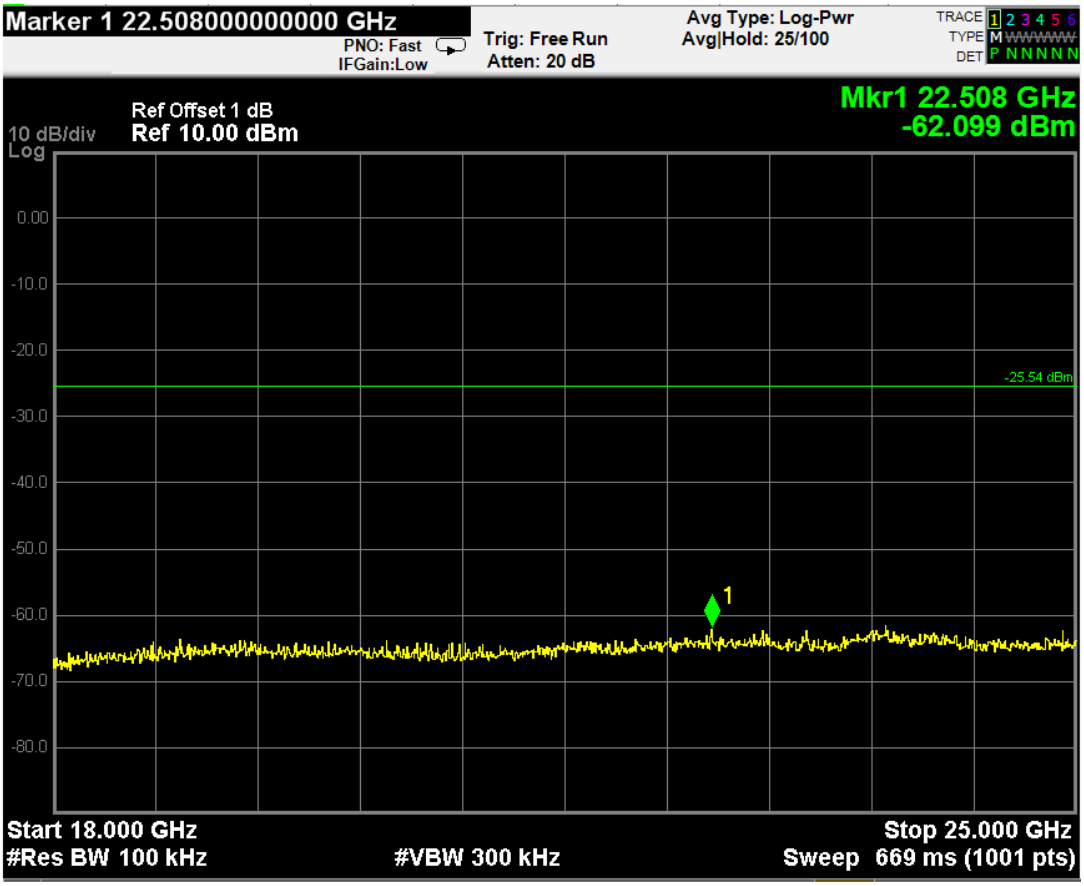

Marker 1 9.600460046005 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 9.600 5 GHz
-55.605 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-21.70 dBm
1
Start 5.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 15.000 GHz
Sweep 956 ms (10000 pts)

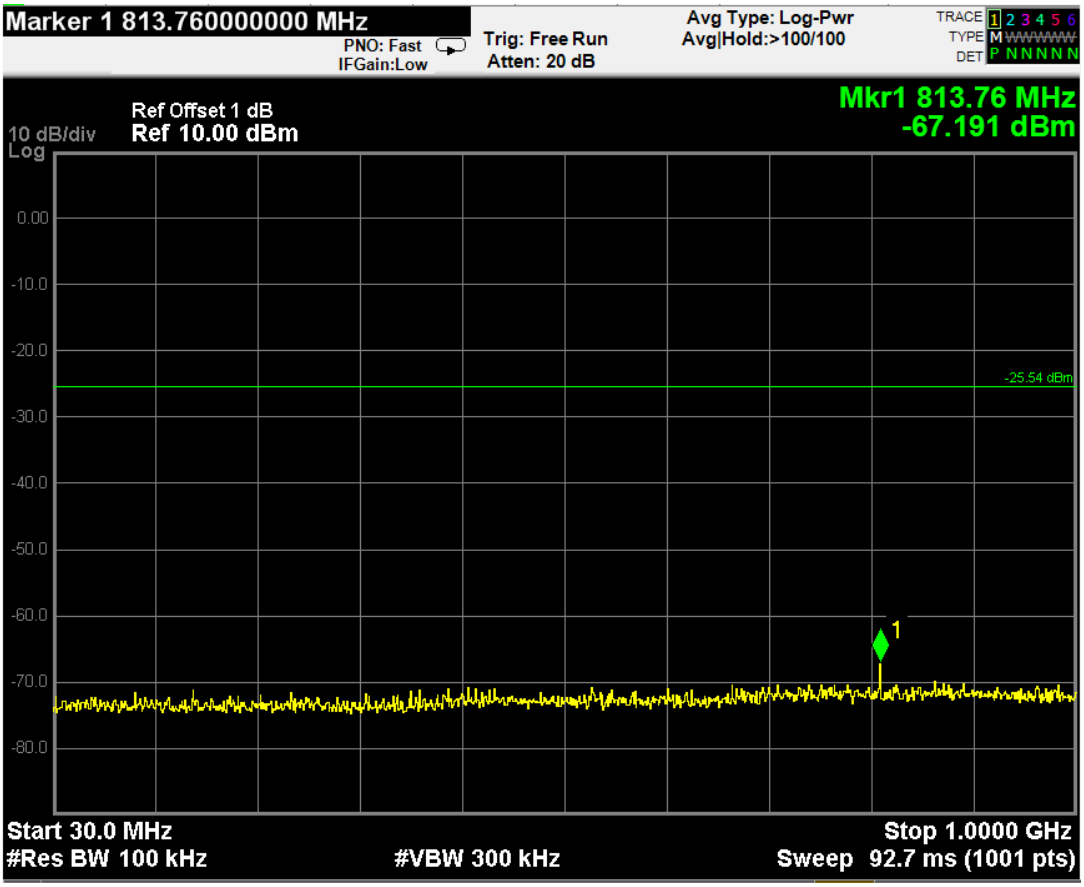

Marker 1 801.150000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 801.15 MHz
-68.194 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.51 dBm
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

DH1Ch 39

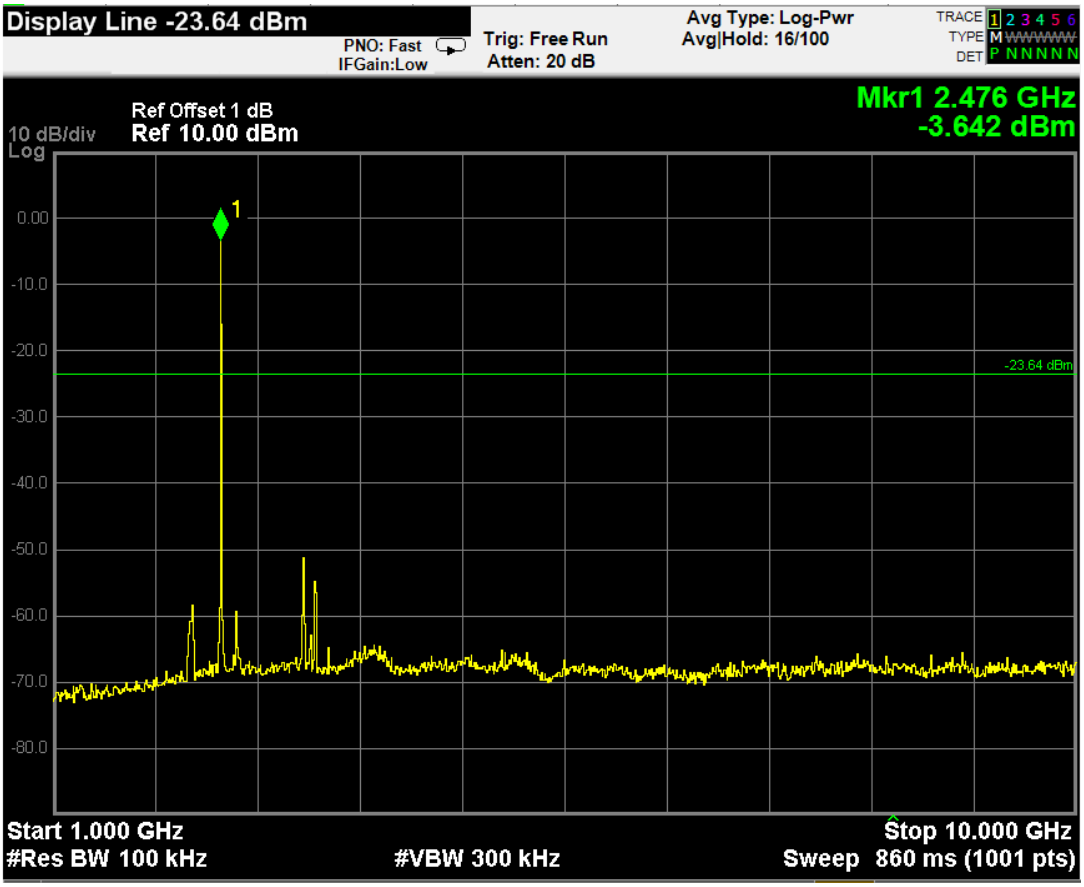

Display Line -25.54 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 37/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.440 GHz
-5.371 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.54 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)

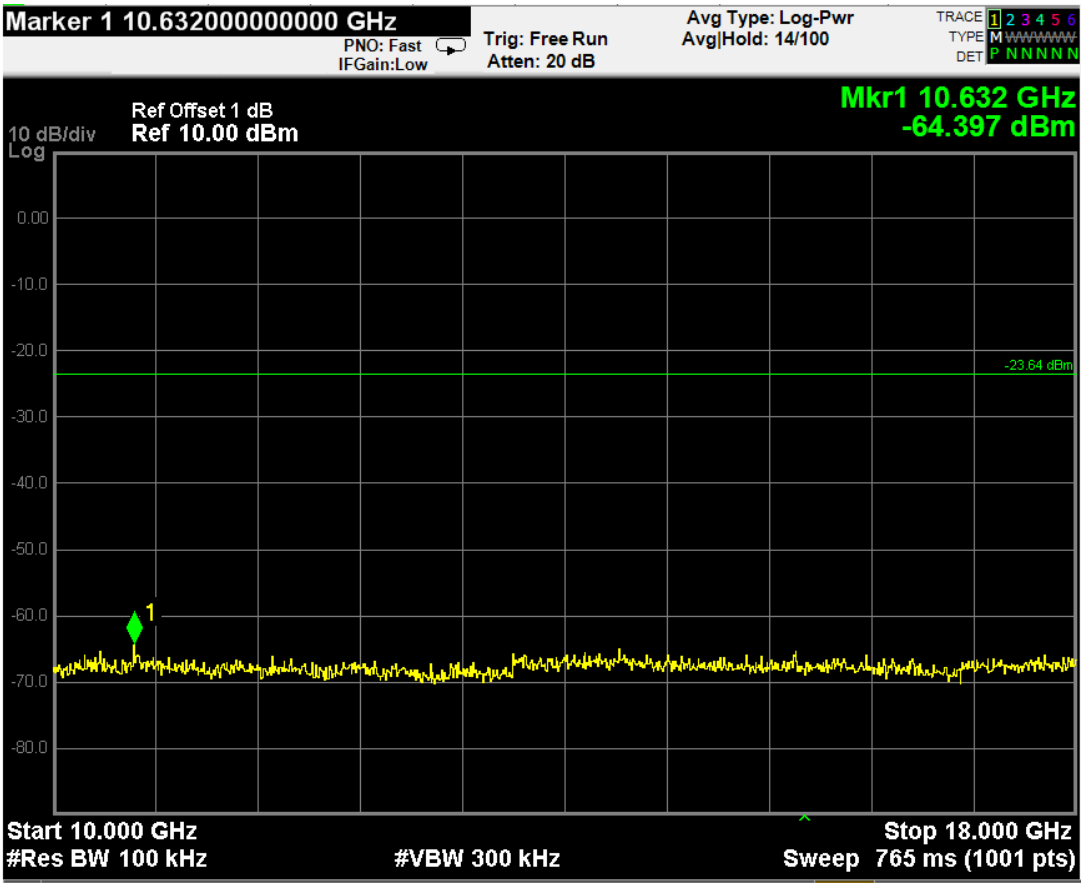

Marker 1 16.296000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 21/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 16.296 GHz
-64.453 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.54 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)

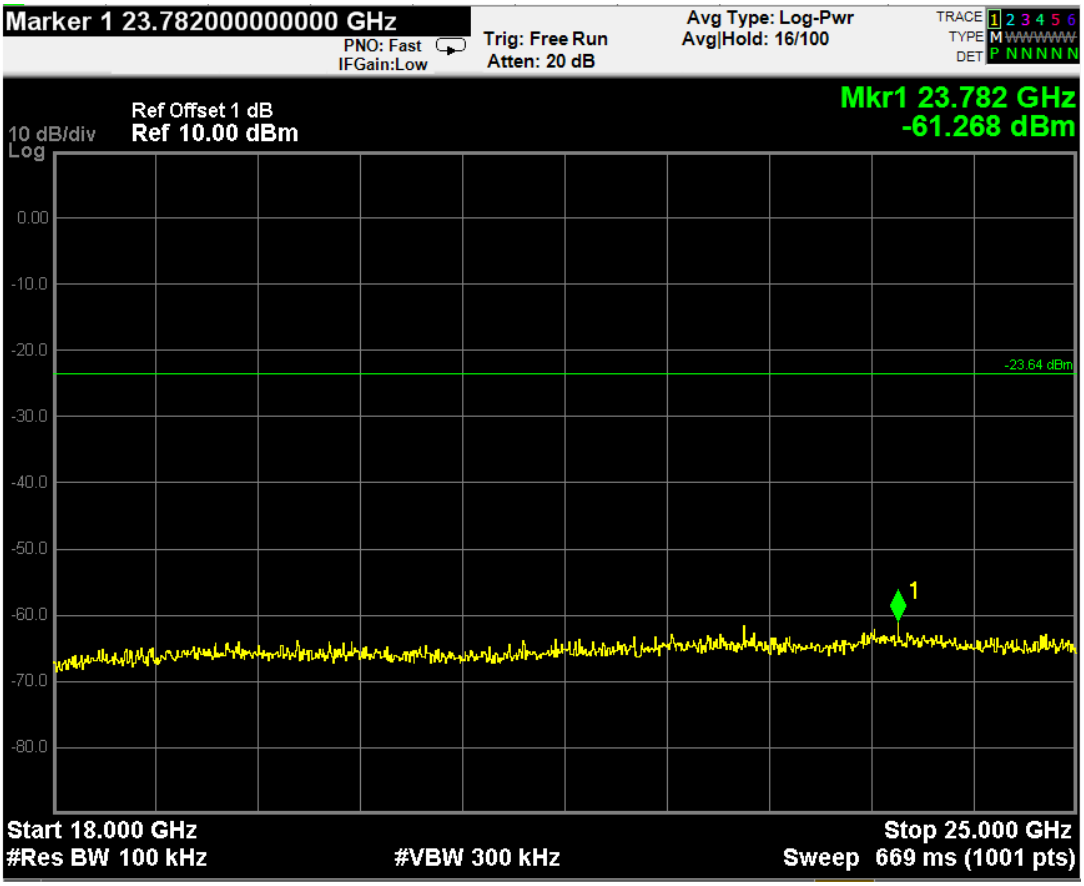

Marker 1 22.508000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 25/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 22.508 GHz
-62.099 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.54 dBm
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)

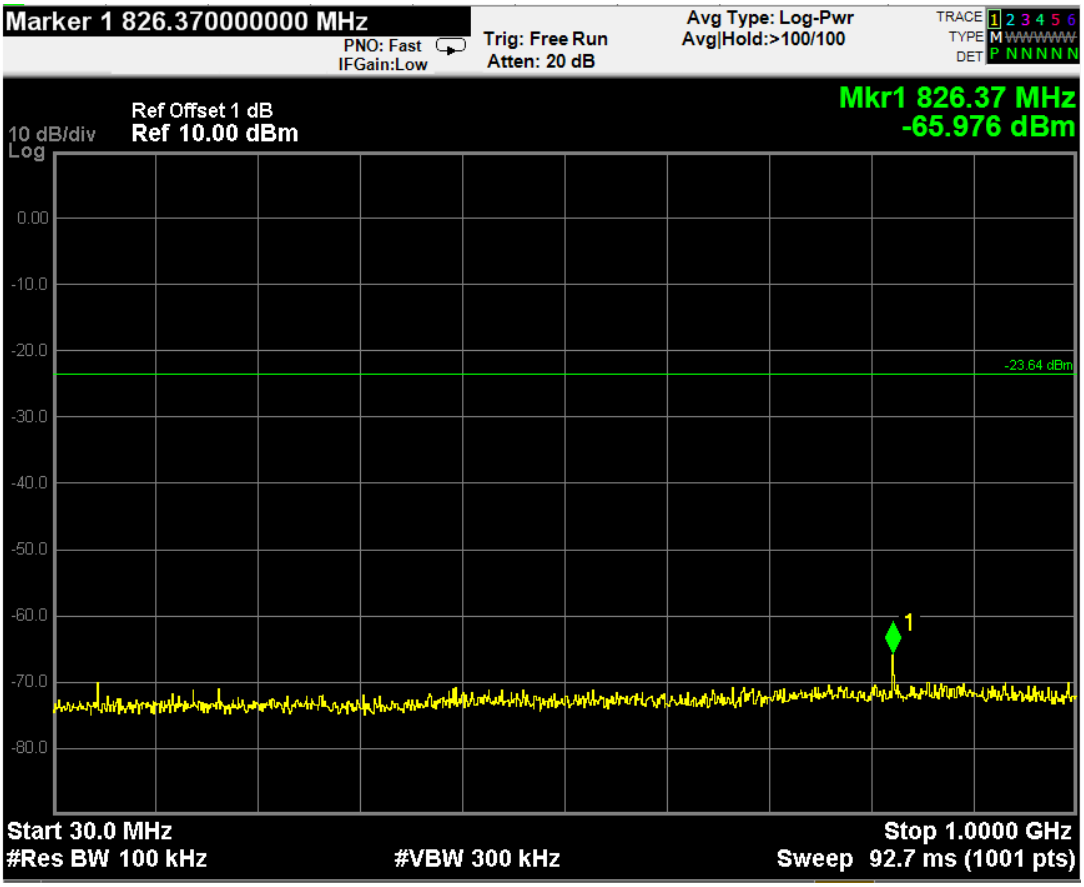

Marker 1 813.760000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 813.76 MHz
-67.191 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.54 dBm
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

DH1Ch 78

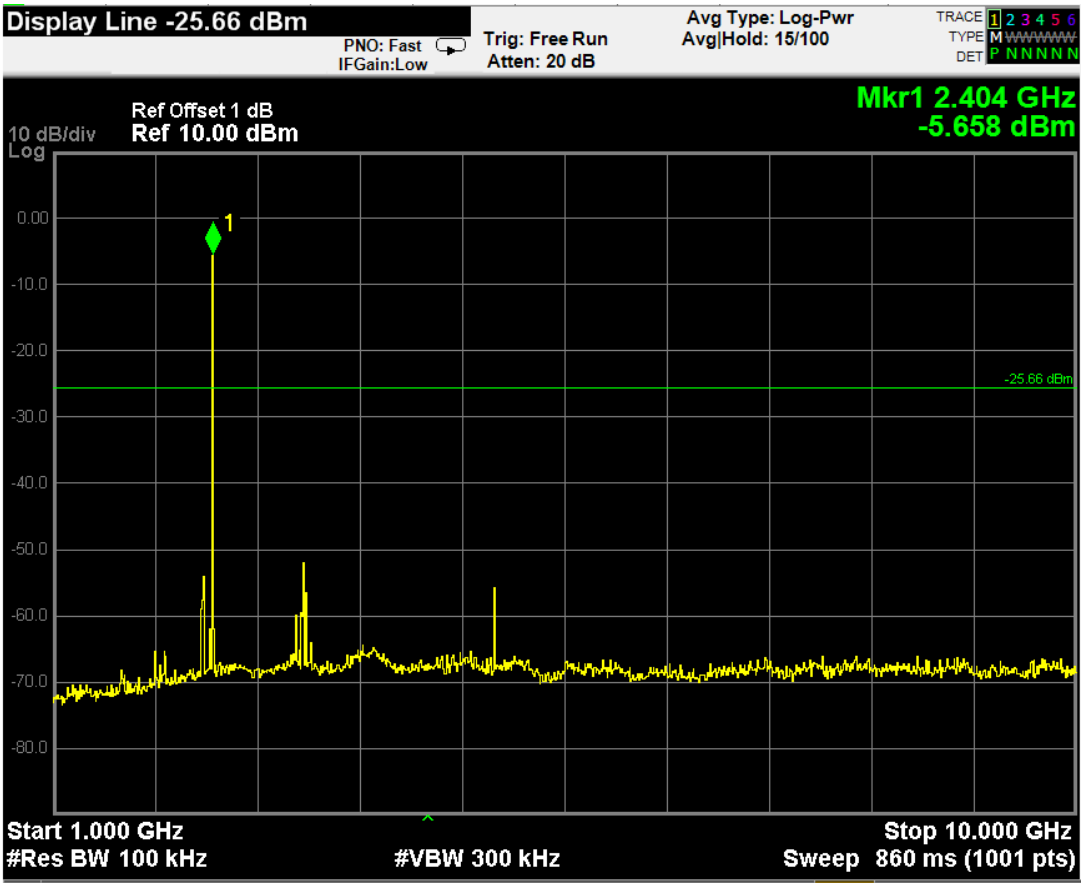

Display Line -23.64 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 16/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.476 GHz
-3.642 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-23.64 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)

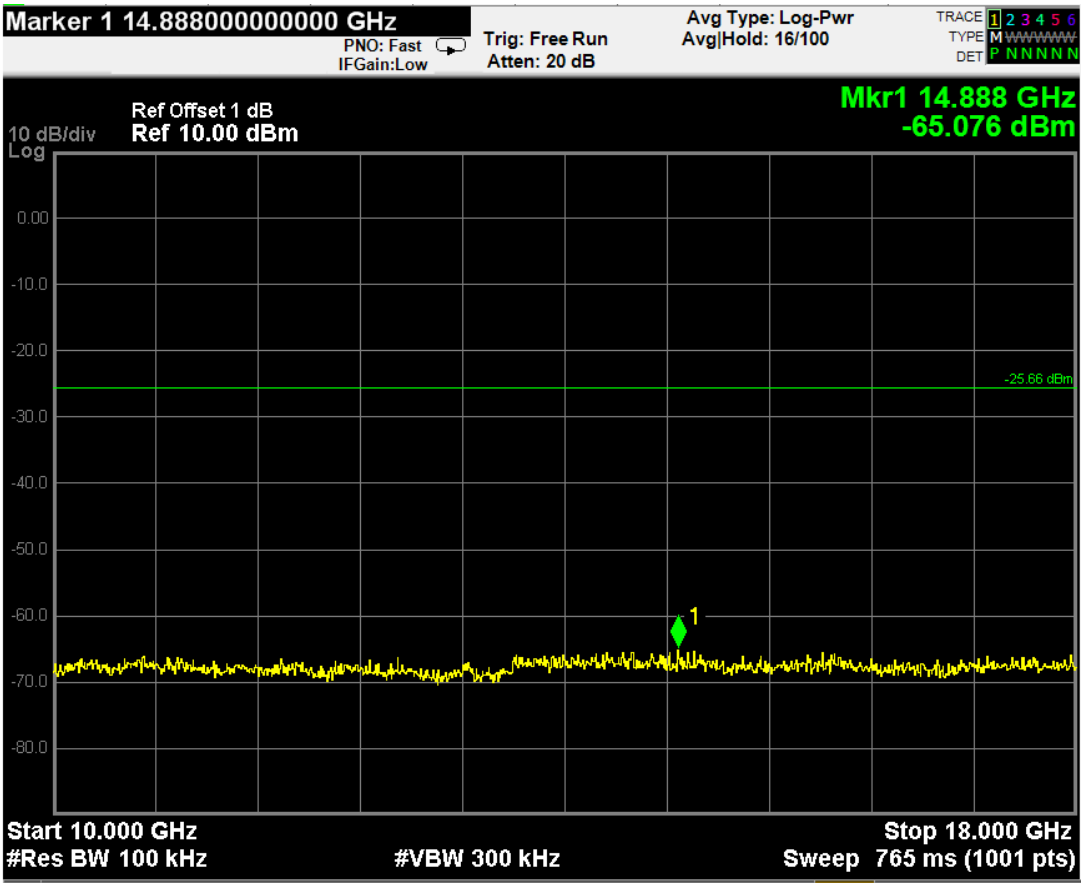

Marker 1 10.632000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 14/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 10.632 GHz
-64.397 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-23.64 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)

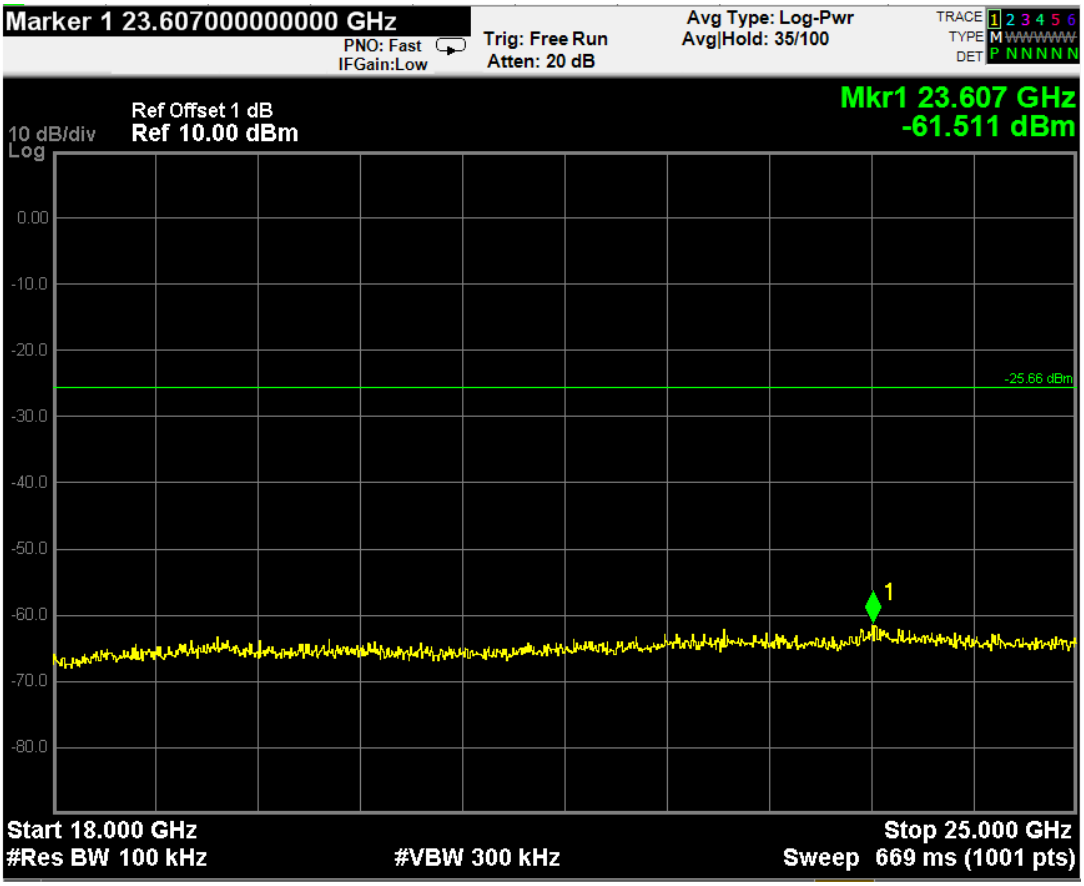

Marker 1 23.782000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 16/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 23.782 GHz
-61.268 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-23.64 dBm
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)

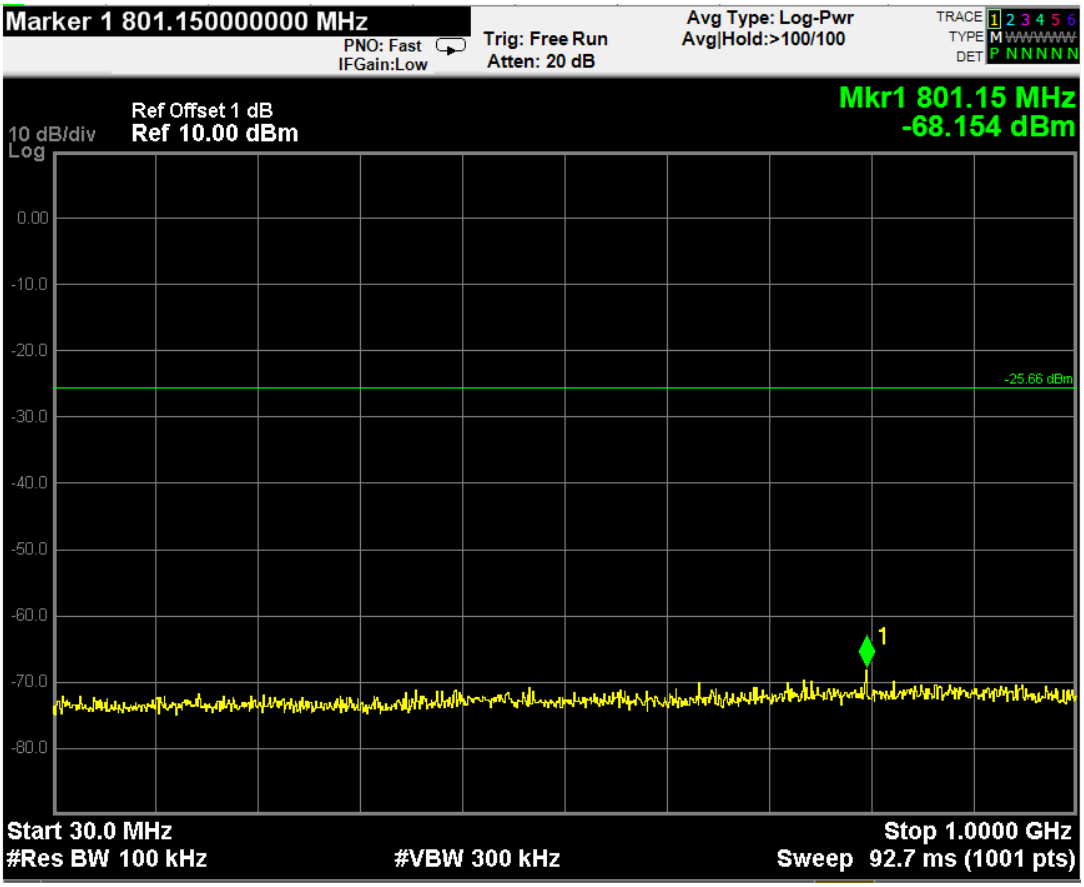

Marker 1 826.370000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 826.37 MHz
-65.976 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-23.64 dBm
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

3DH1Ch 00

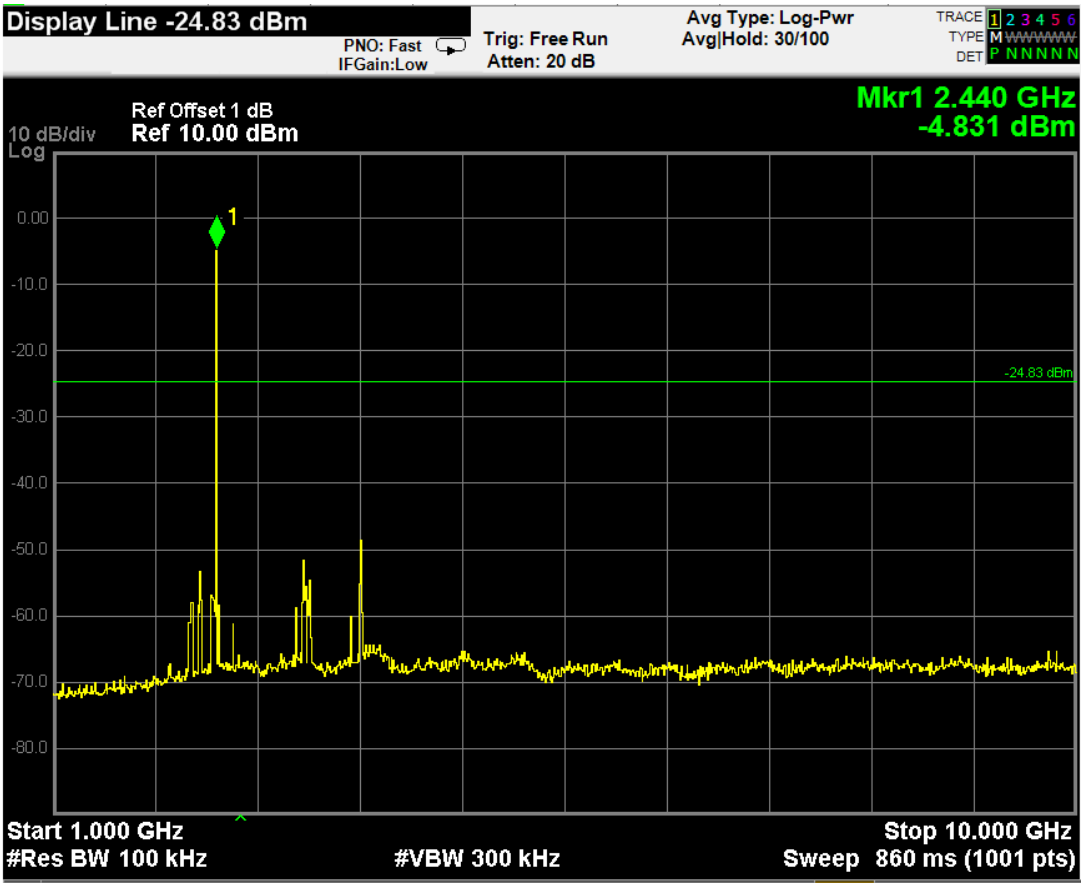

Display Line -25.66 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 15/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.404 GHz
-5.658 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.66 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)

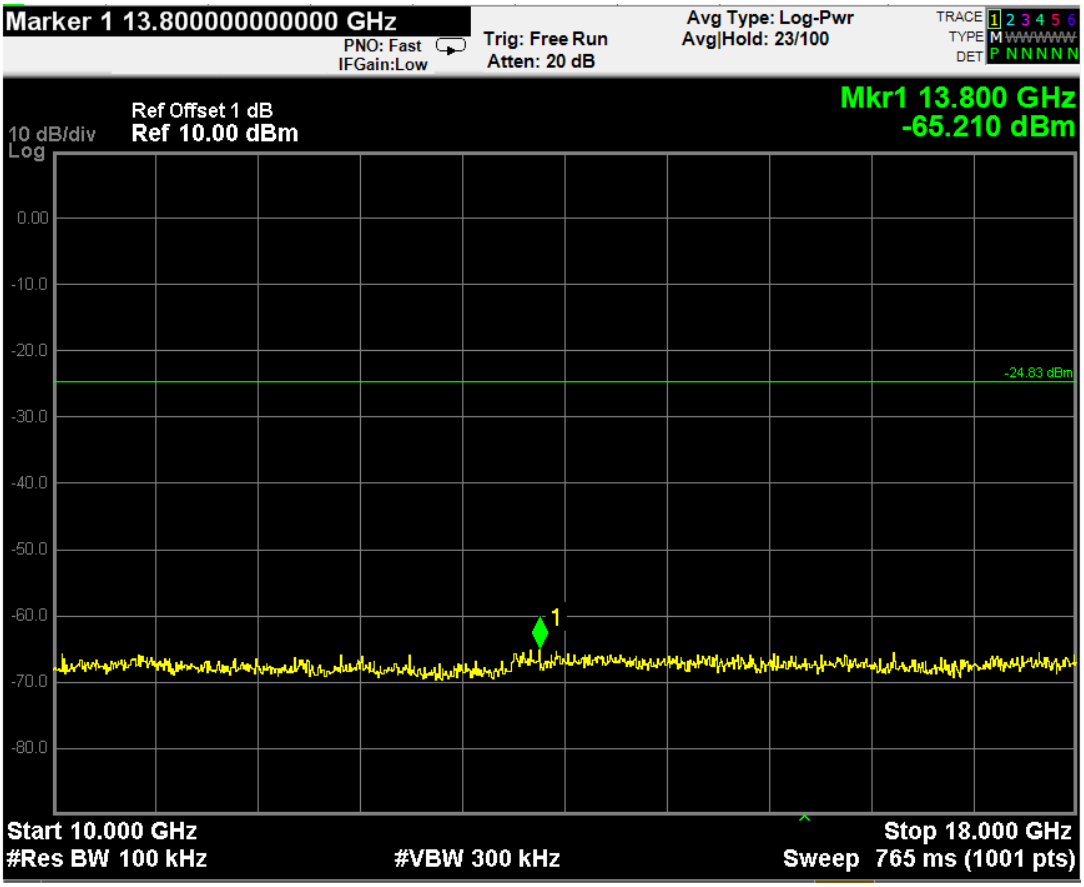

Marker 1 14.888000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 16/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 14.888 GHz
-65.076 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.66 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)

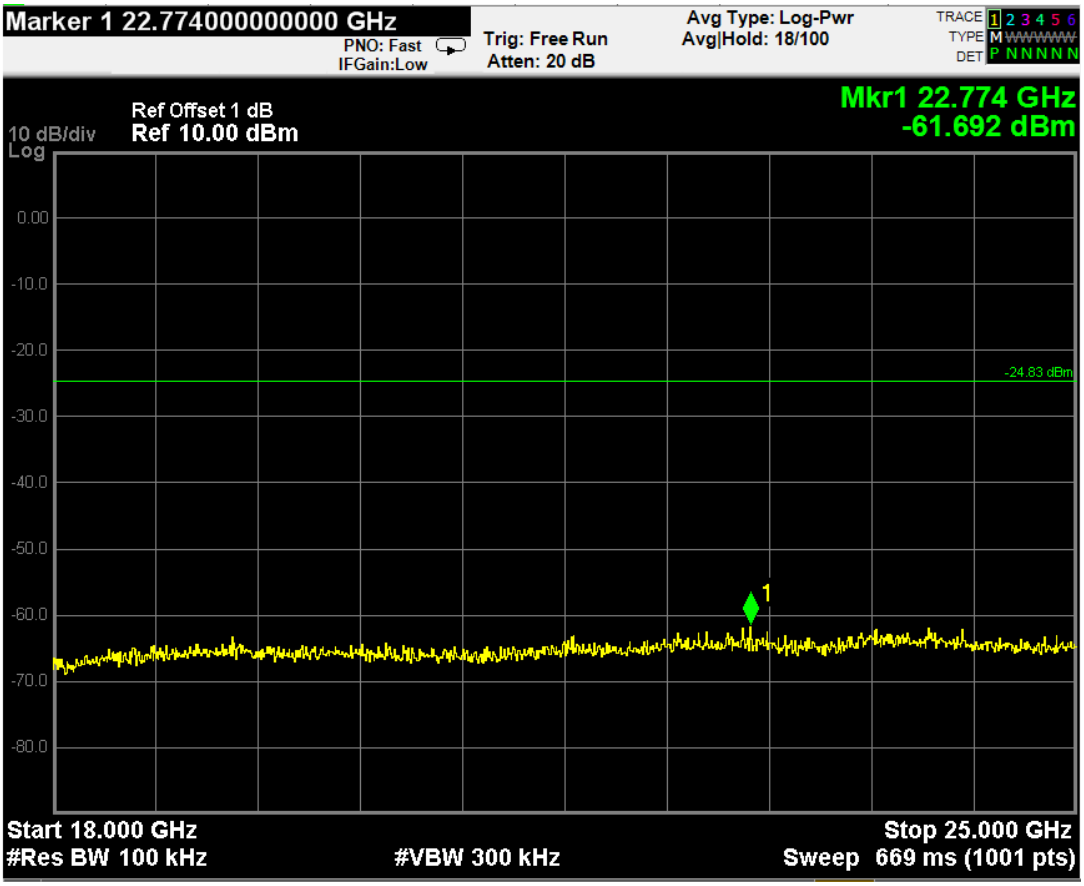

Marker 1 23.607000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 35/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 23.607 GHz
-61.511 dBm
0.00
-10.0
-20.0
-25.66 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)

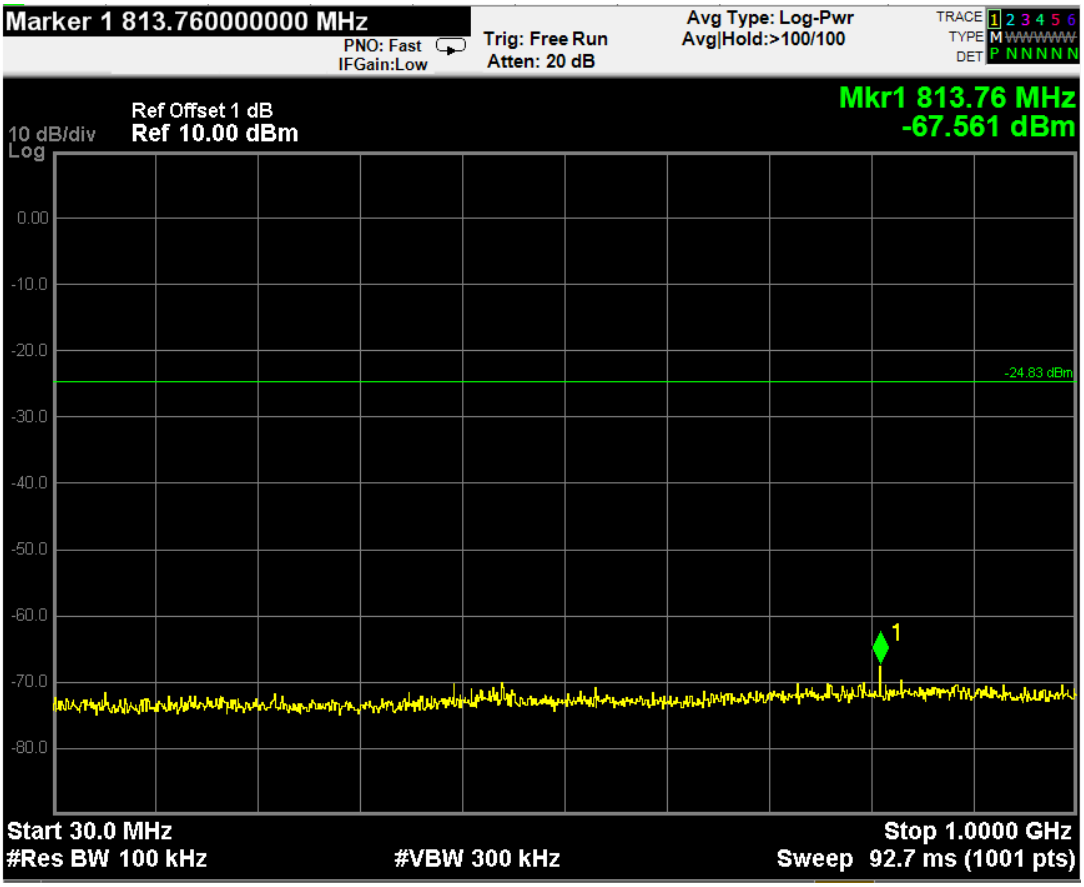

Marker 1 801.150000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 801.15 MHz
-68.154 dBm
0.00
-10.0
-20.0
-25.66 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

3DH1Ch 39

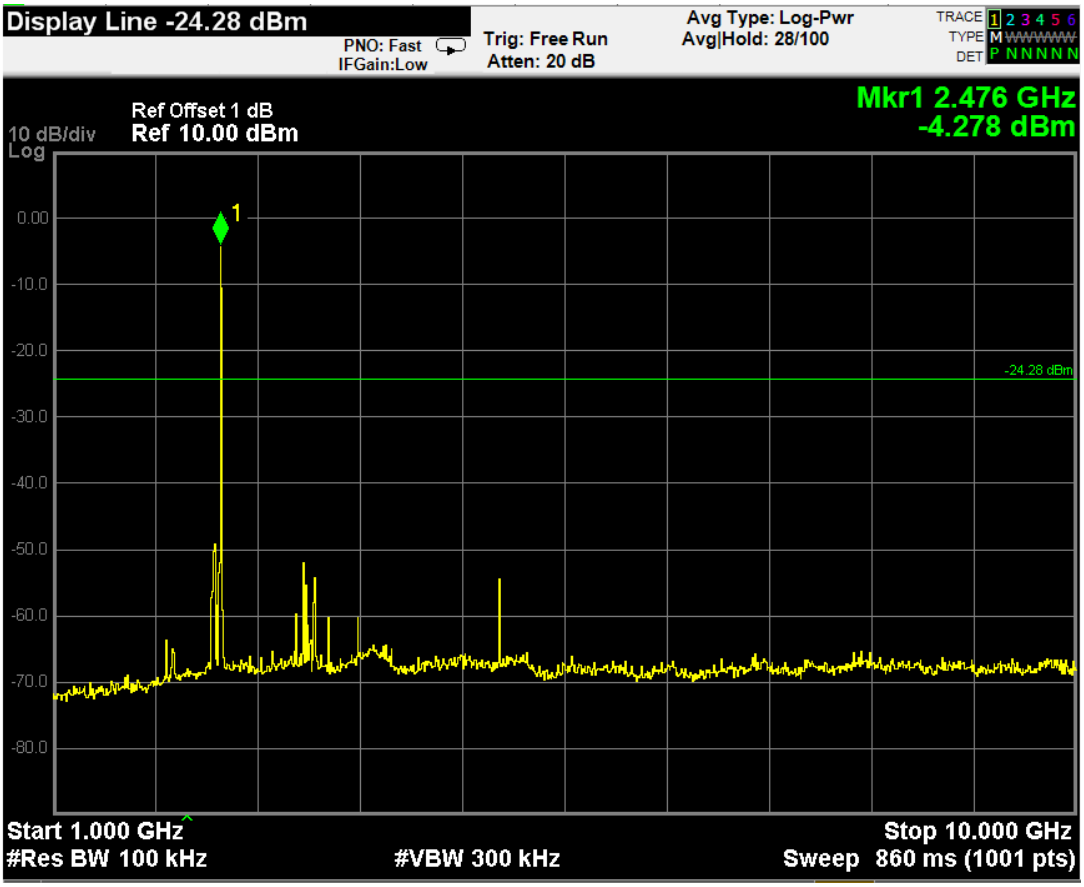

Display Line -24.83 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 30/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.440 GHz
-4.831 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.83 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)

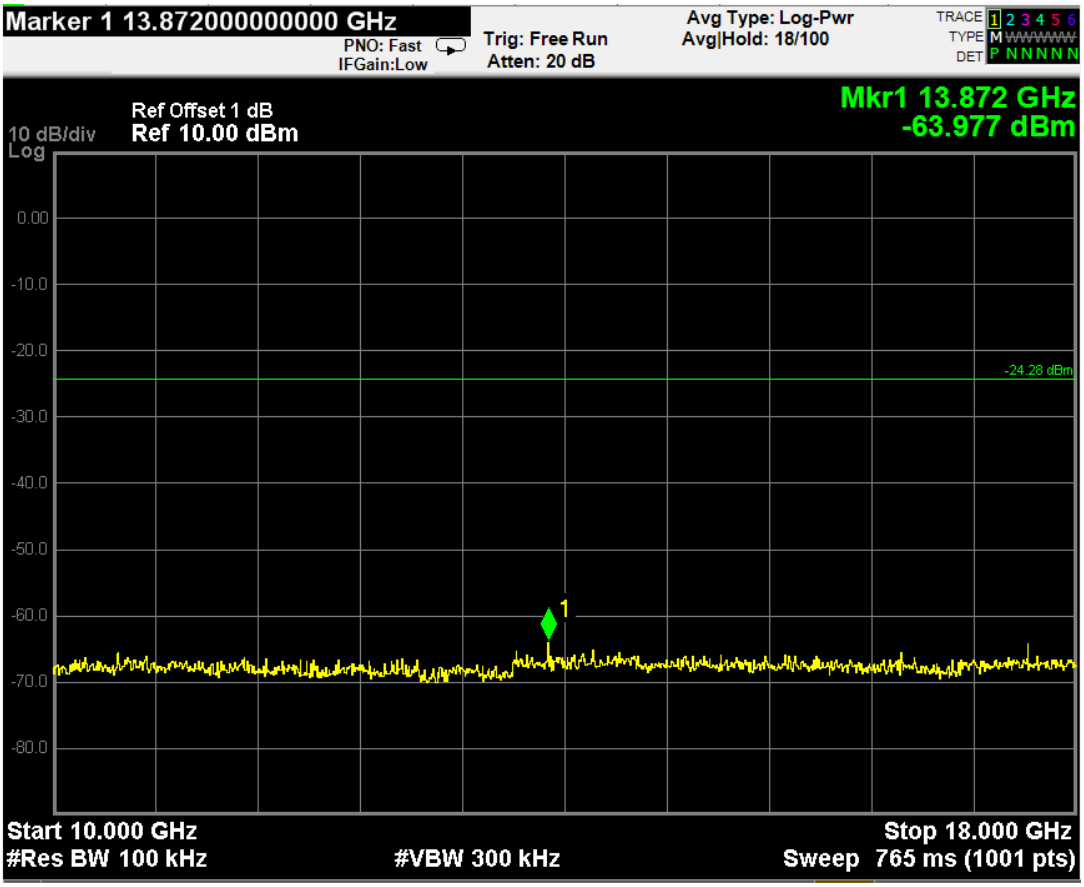

Marker 1 13.800000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 23/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 13.800 GHz
-65.210 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.83 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)

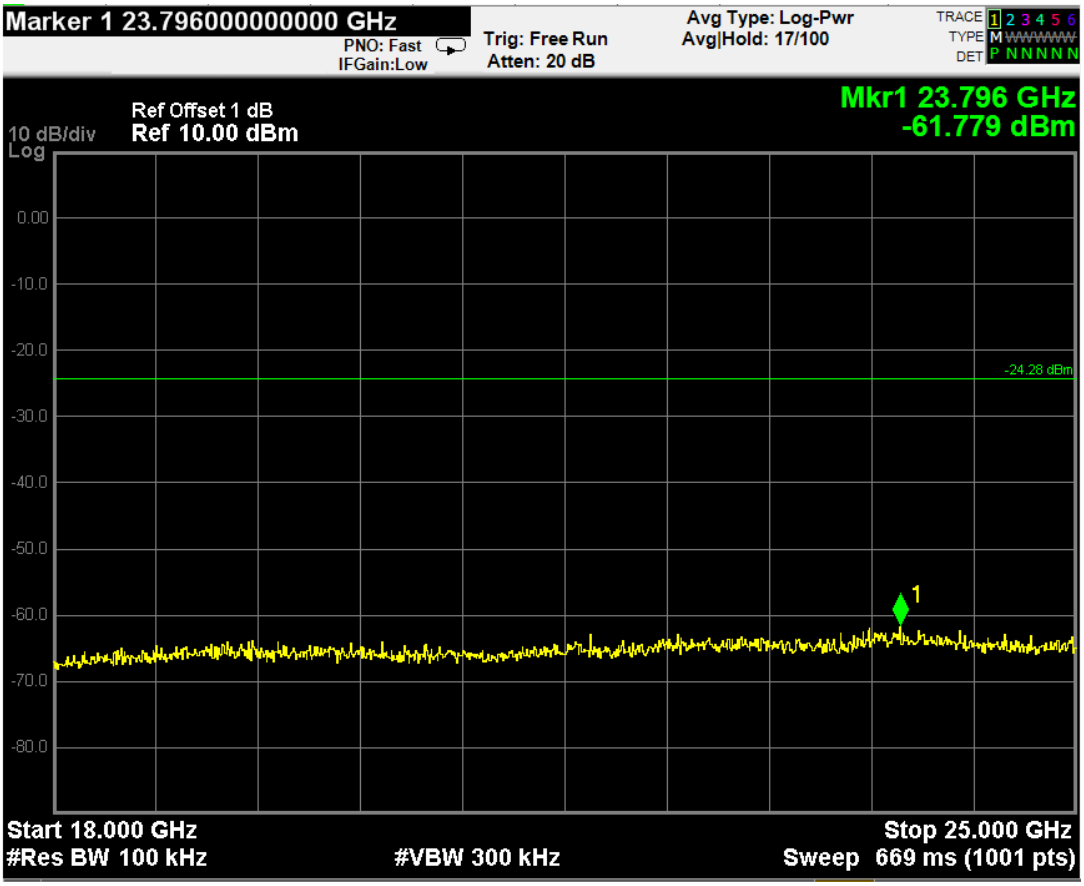

Marker 1 22.774000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 18/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 22.774 GHz
-61.692 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.83 dBm
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)

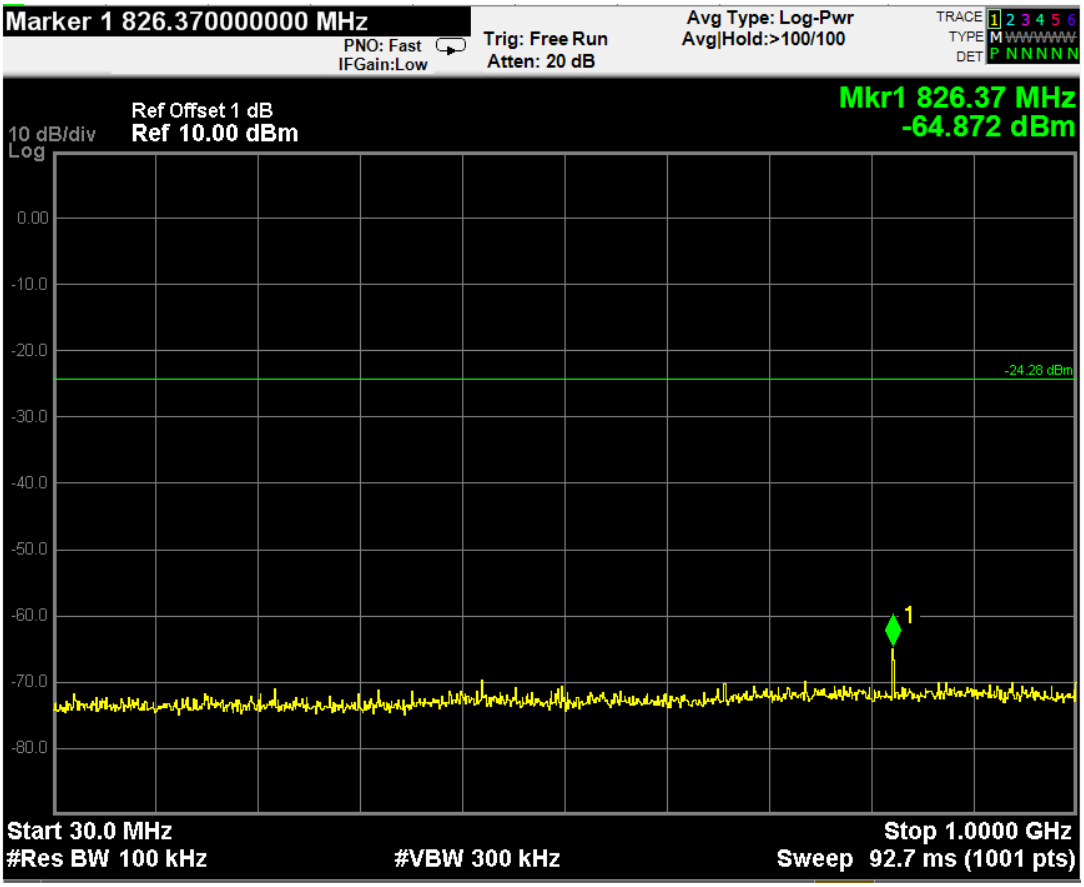

Marker 1 813.760000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 813.76 MHz
-67.561 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.83 dBm
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

3DH1Ch 78

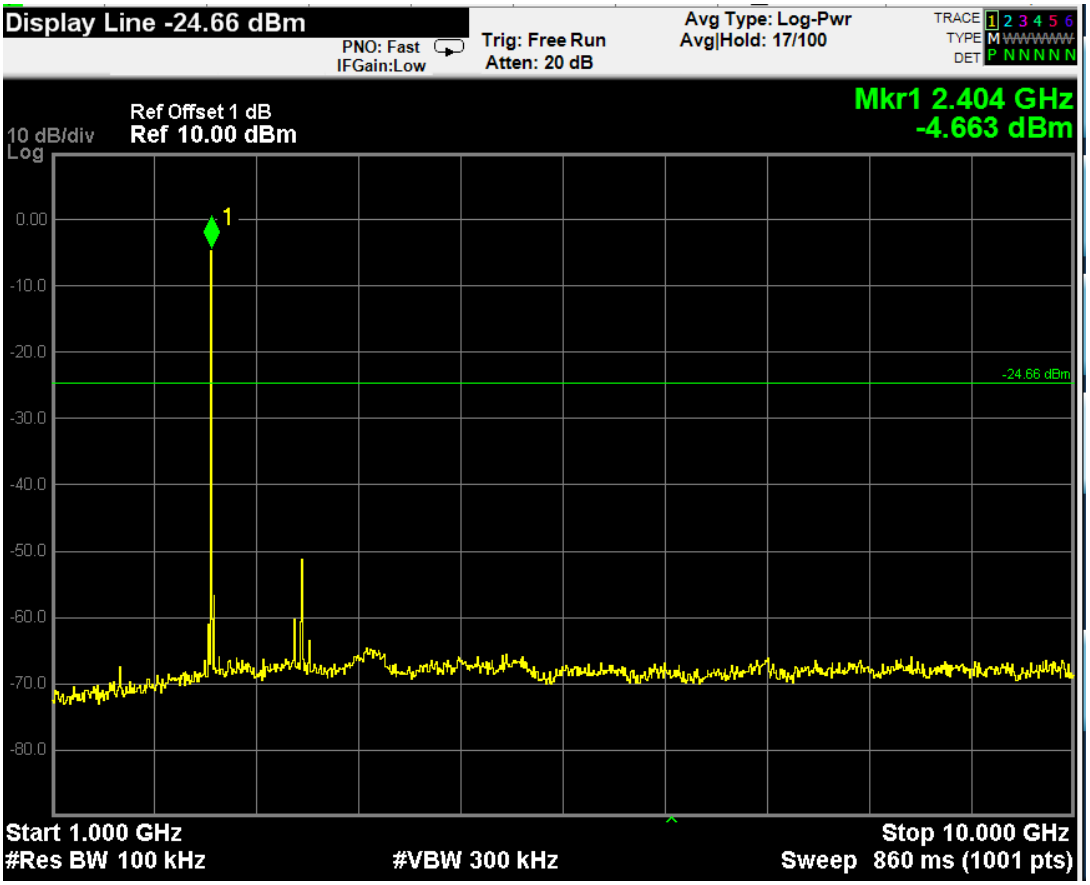

Display Line -24.28 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 28/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.476 GHz
-4.278 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.28 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)

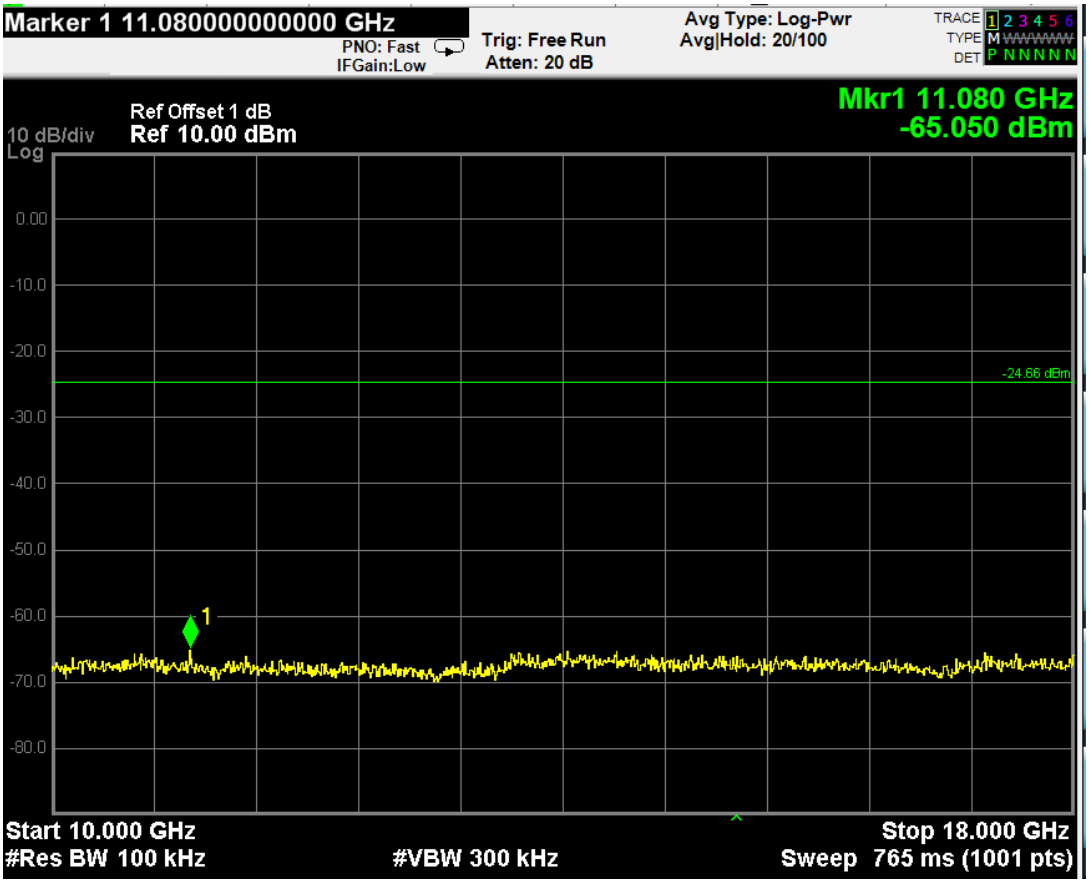

Marker 1 13.872000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 18/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 13.872 GHz
-63.977 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.28 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)

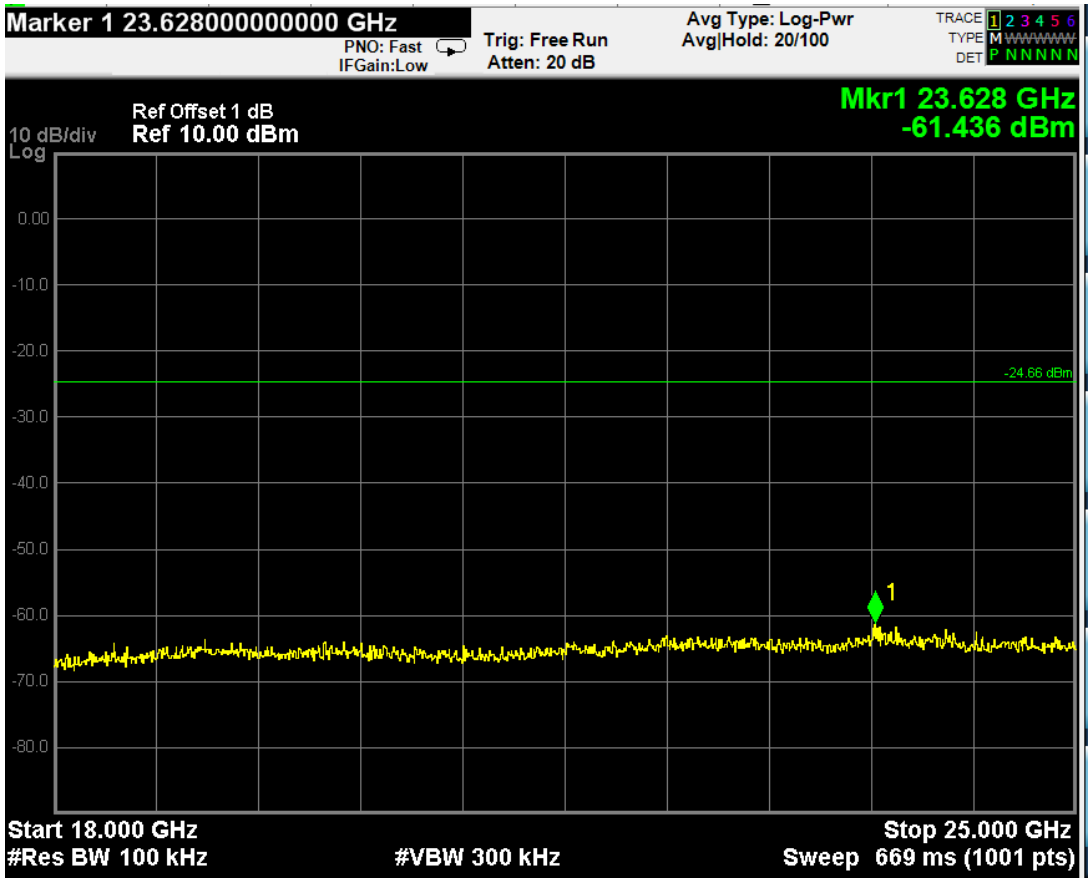

Marker 1 23.796000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 17/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 23.796 GHz
-61.779 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.28 dBm
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)

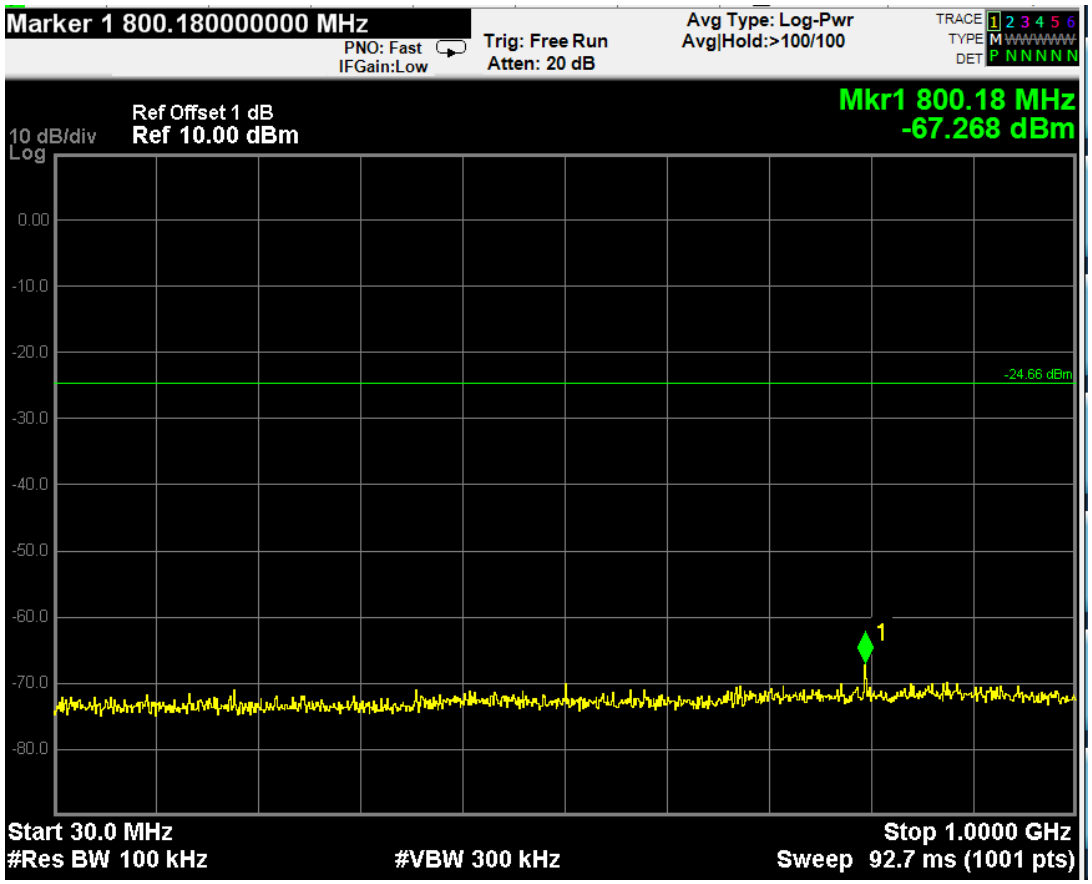

Marker 1 826.370000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 826.37 MHz
-64.872 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.28 dBm
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

DH3Ch 00


Display Line -24.66 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 17/100
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 2.404 GHz
-4.663 dBm
0.00
-10.0
-20.0
-24.66 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)


Marker 1 11.080000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
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 11.080 GHz
-65.050 dBm
0.00
-10.0
-20.0
-24.66 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)


Marker 1 23.628000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
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 23.628 GHz
-61.436 dBm
0.00
-10.0
-20.0
-24.66 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)


Marker 1 800.180000000 MHz
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 800.18 MHz
-67.268 dBm
0.00
-10.0
-20.0
-24.66 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

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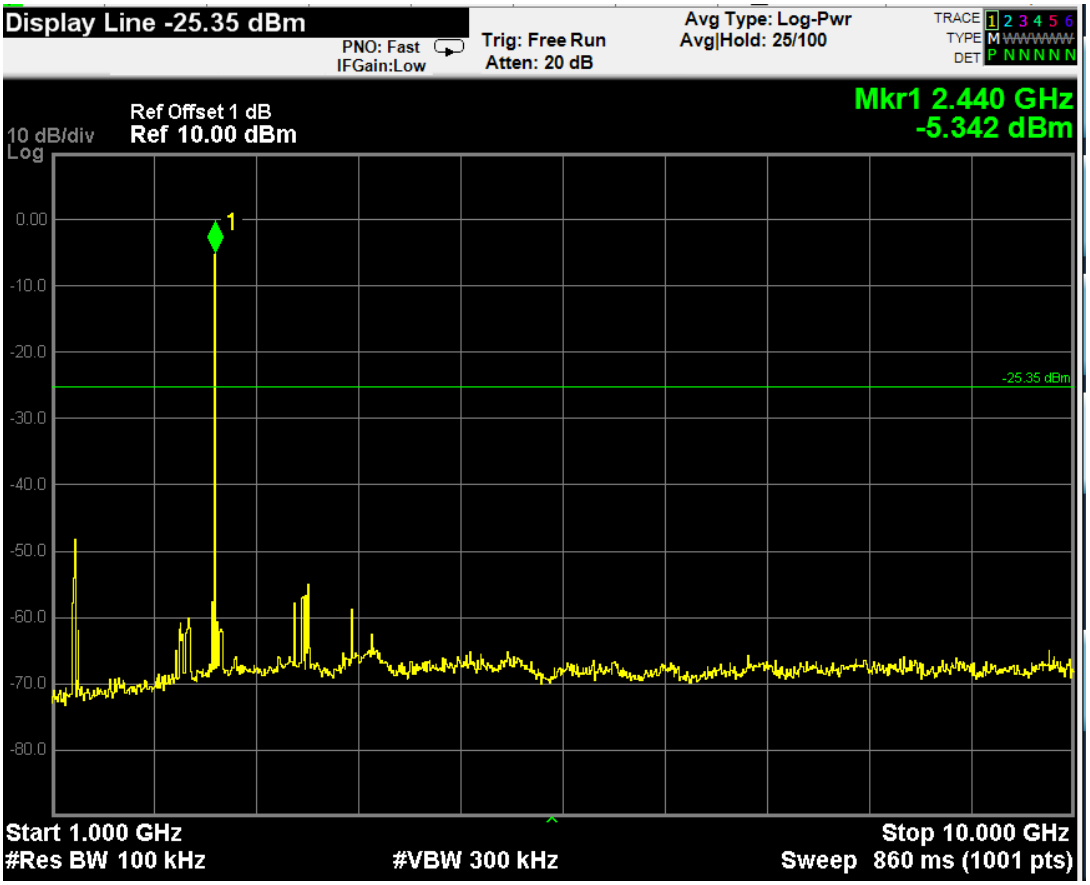
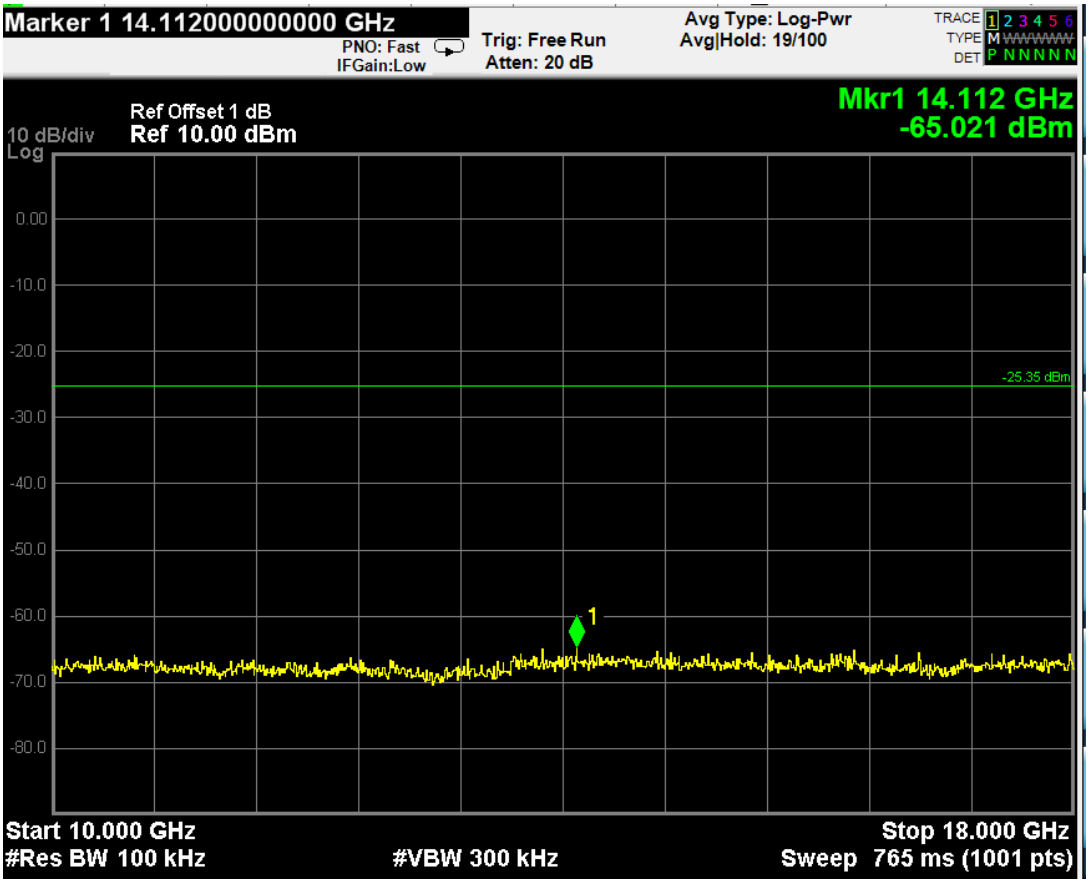
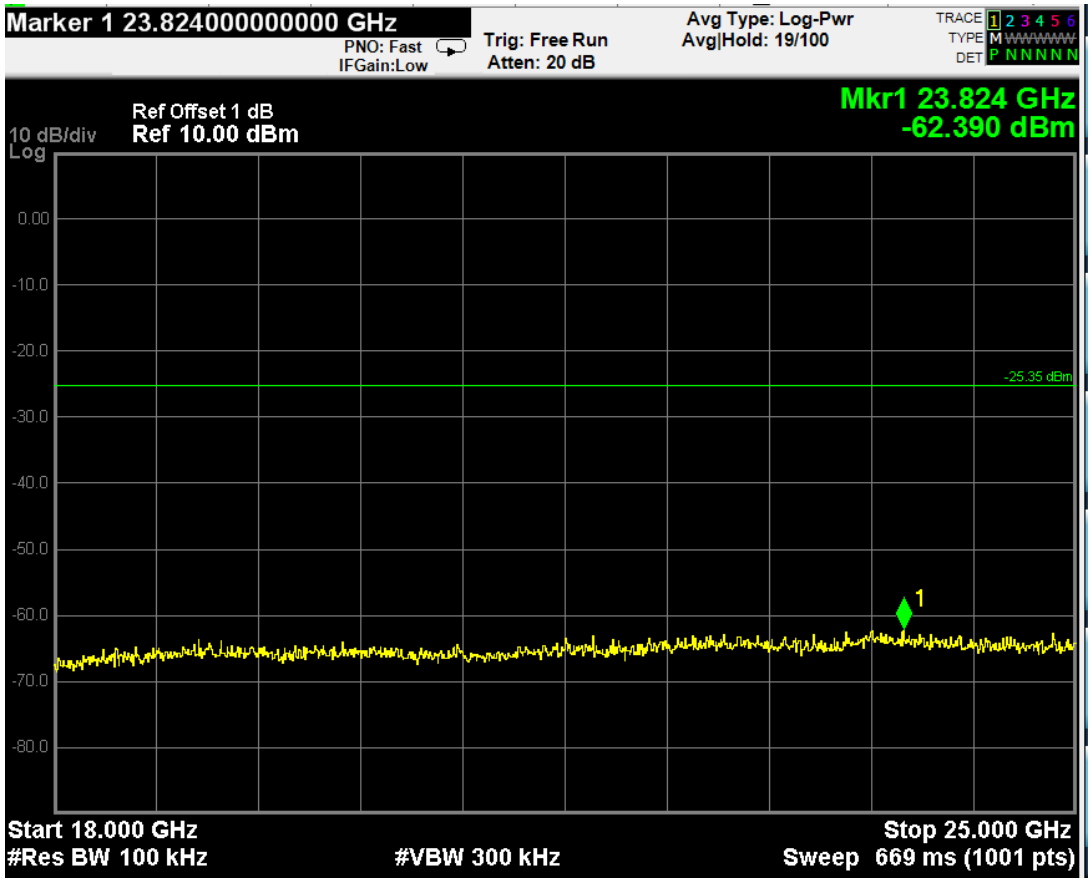
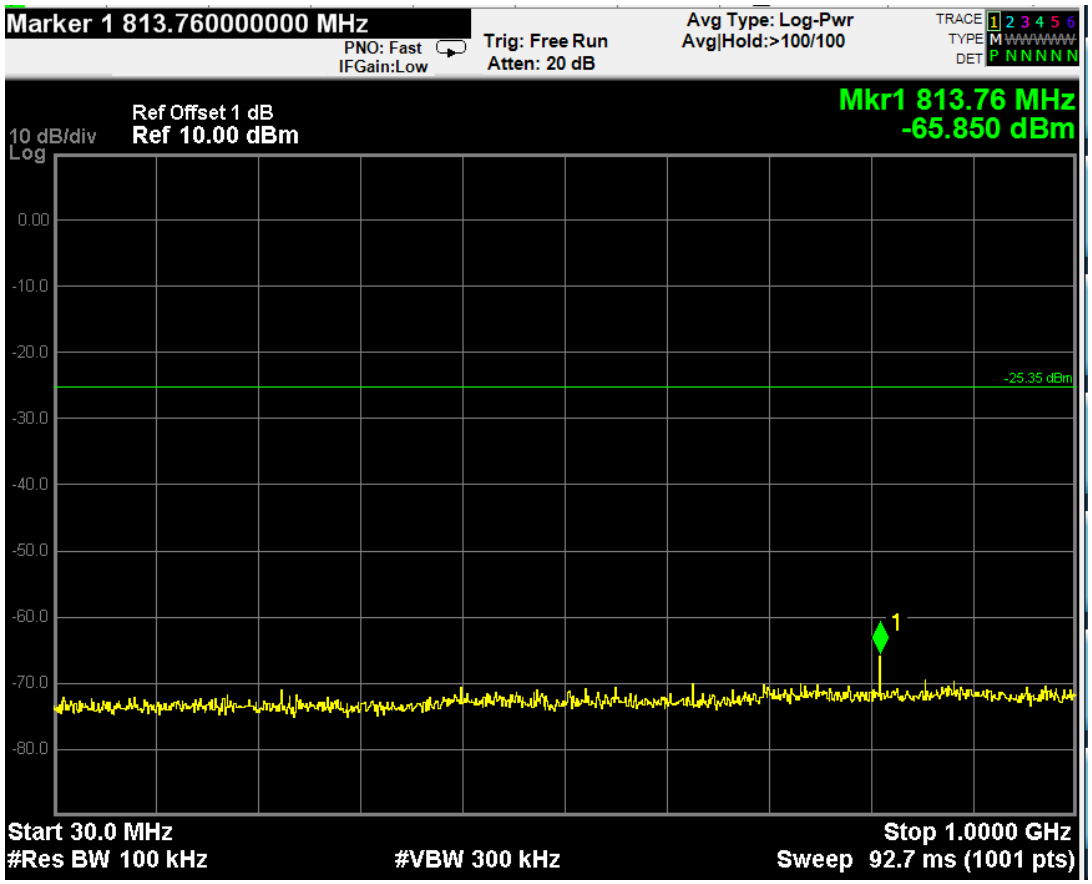

Display Line -25.35 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 25/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.440 GHz
-5.342 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.35 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)


Marker 1 14.112000000000 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 14.112 GHz
-65.021 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.35 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)


Marker 1 23.824000000000 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 23.824 GHz
-62.390 dBm
0.00
-10.0
-20.0
-25.35 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)


Marker 1 813.760000000 MHz
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 813.76 MHz
-65.850 dBm
0.00
-10.0
-20.0
-25.35 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

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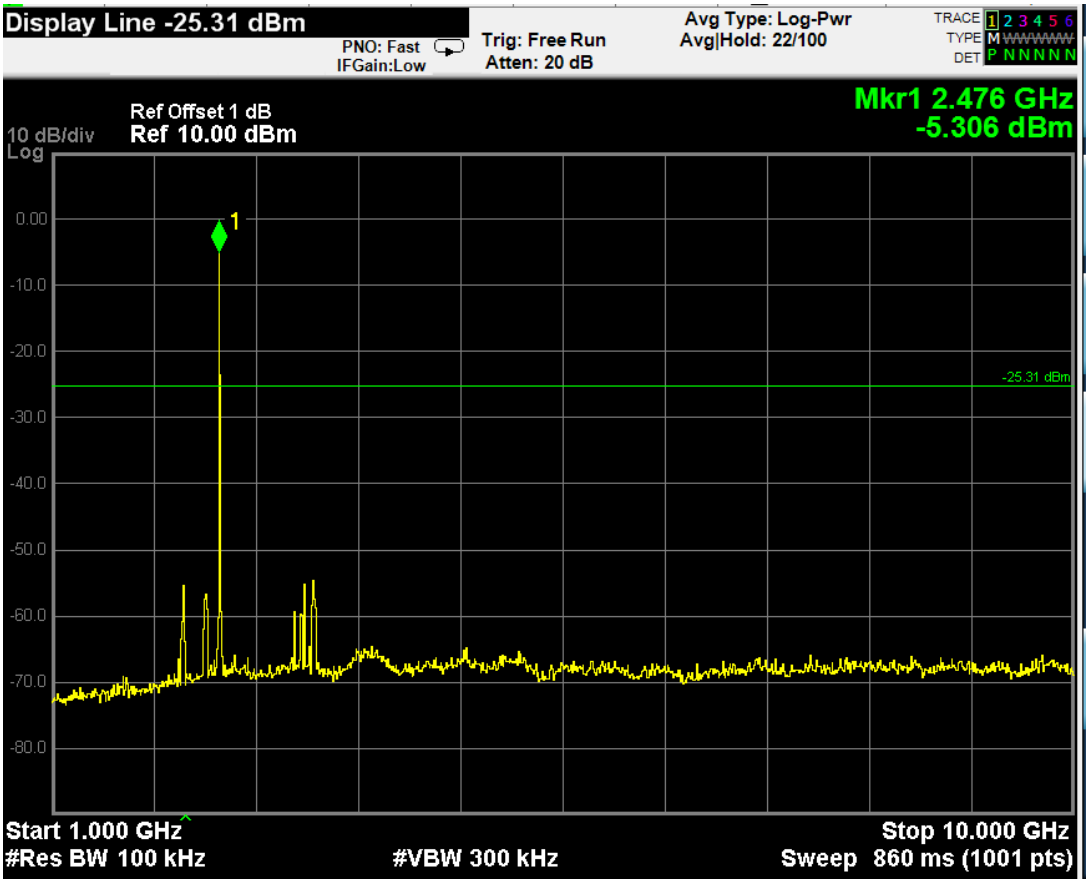
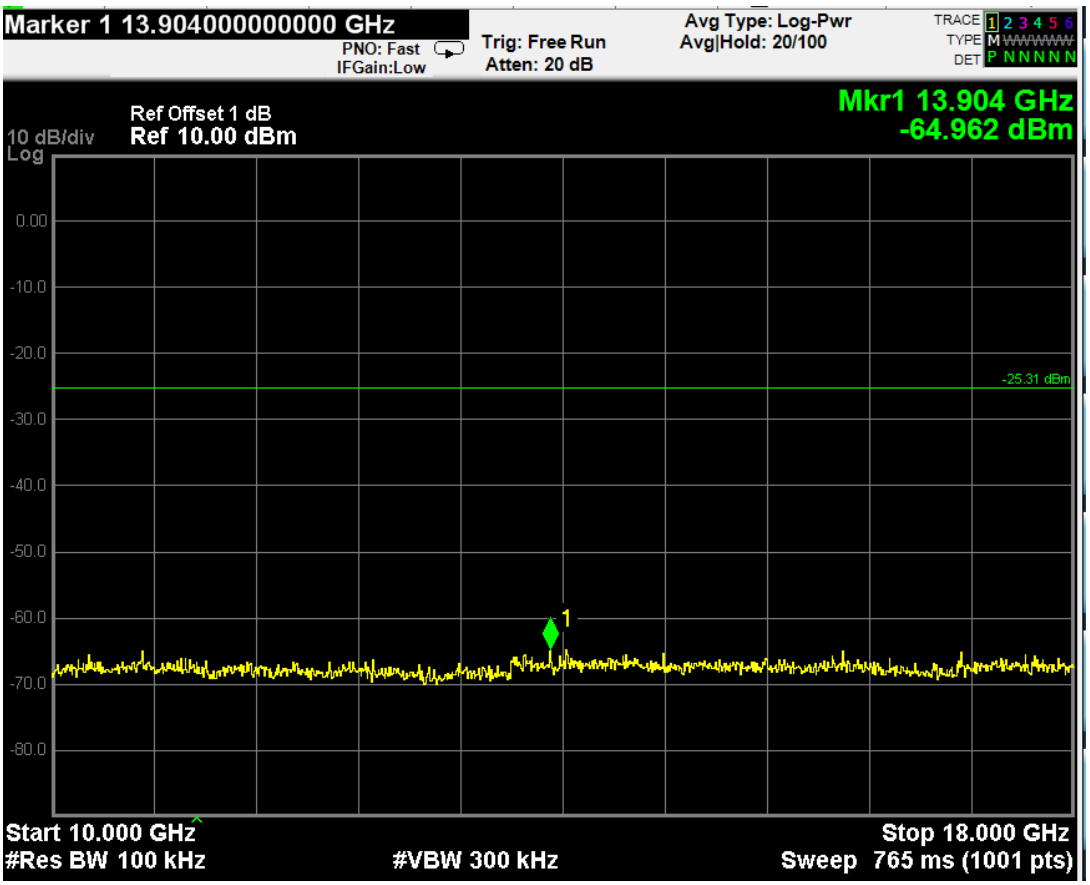
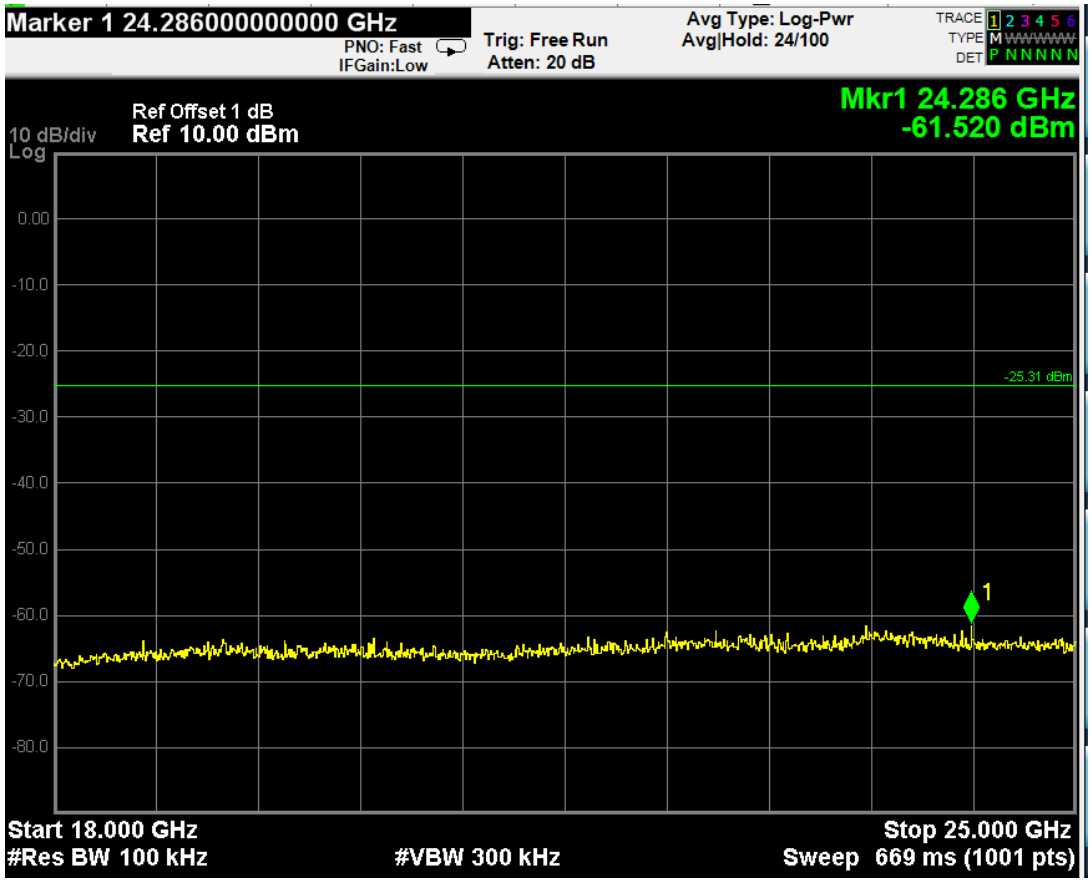
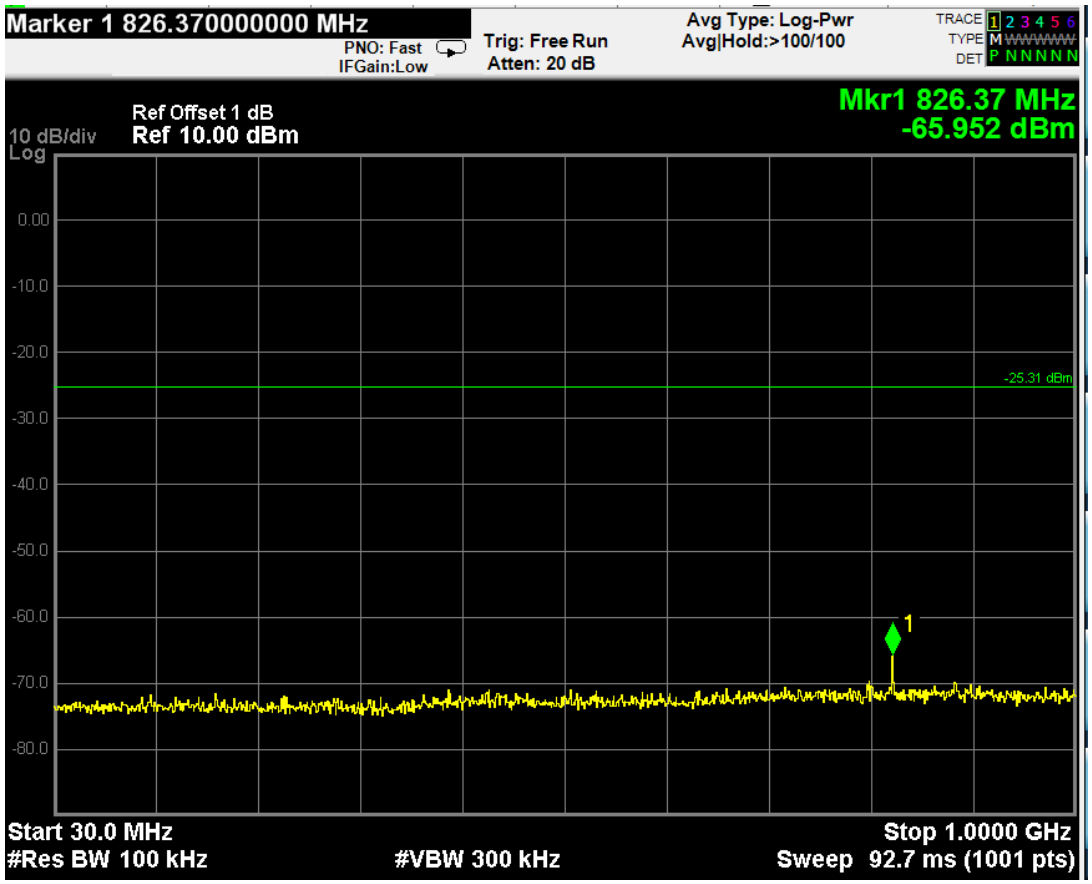
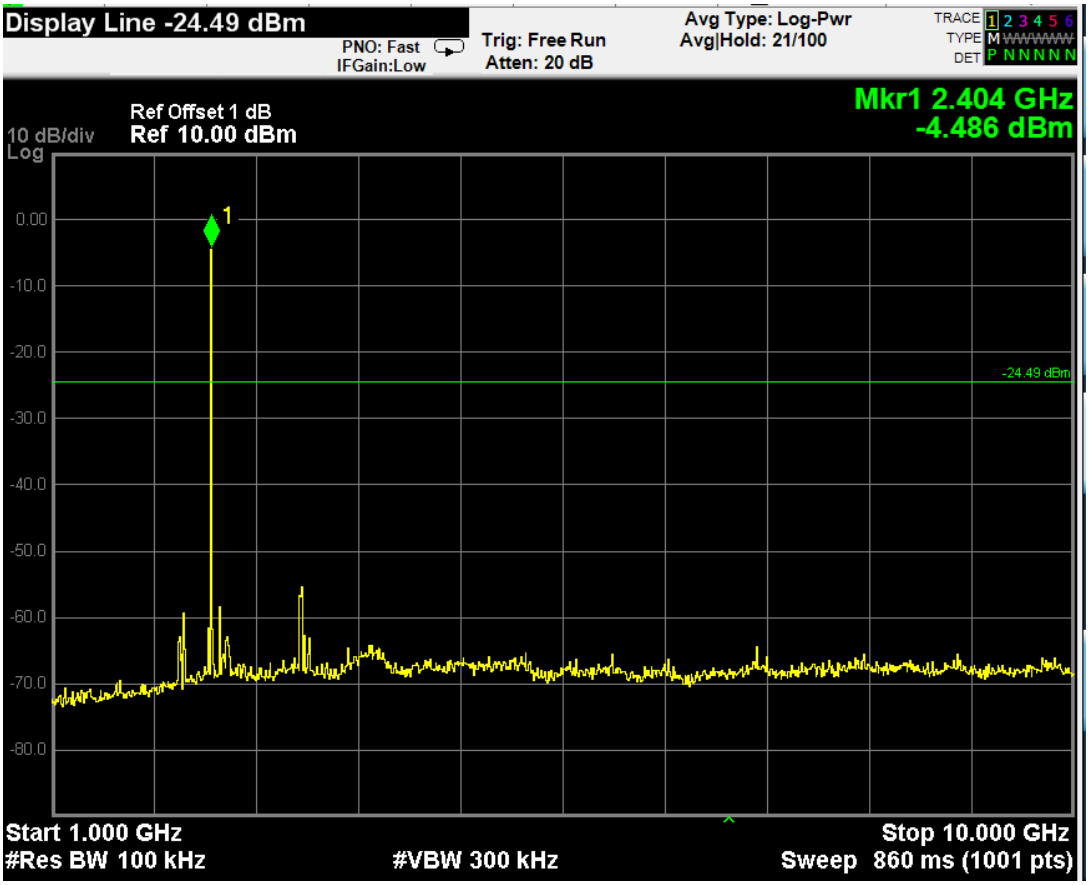

Display Line -25.31 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 22/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.476 GHz
-5.306 dBm
0.00
-10.0
-20.0
-25.31 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)

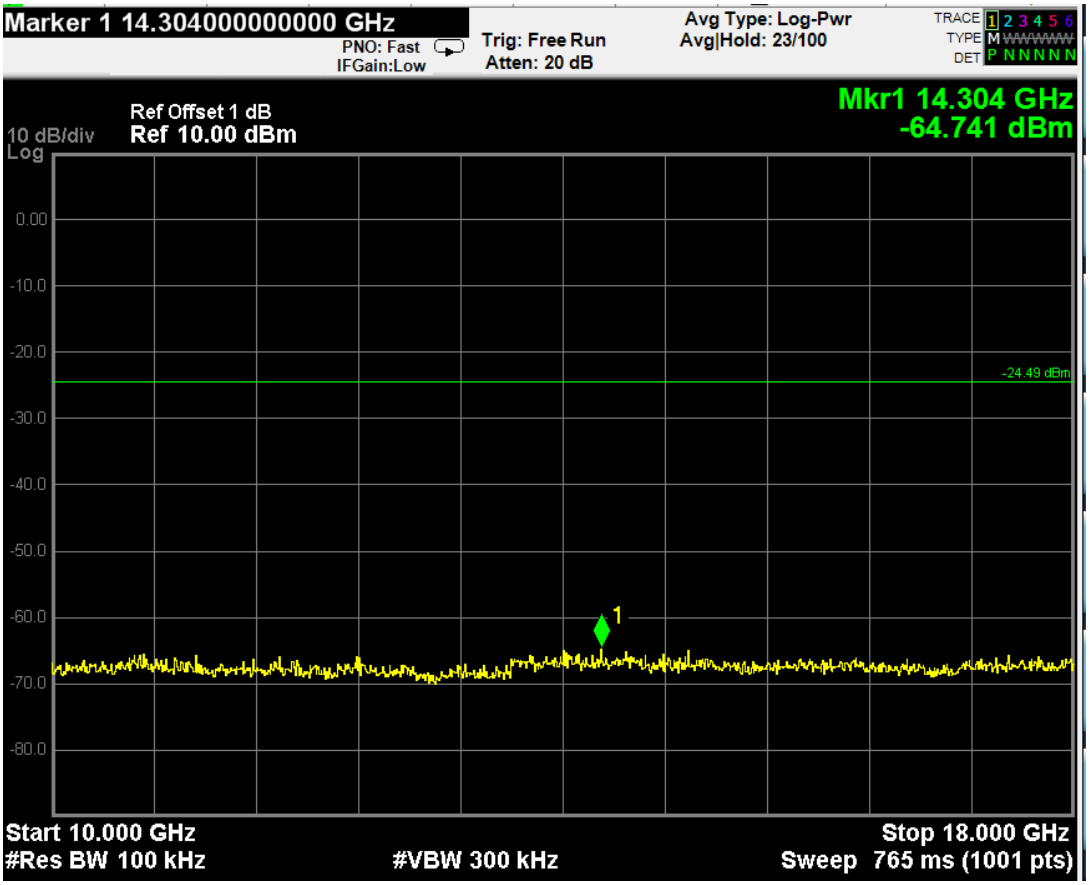

Marker 1 13.904000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 13.904 GHz
-64.962 dBm
0.00
-10.0
-20.0
-25.31 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)

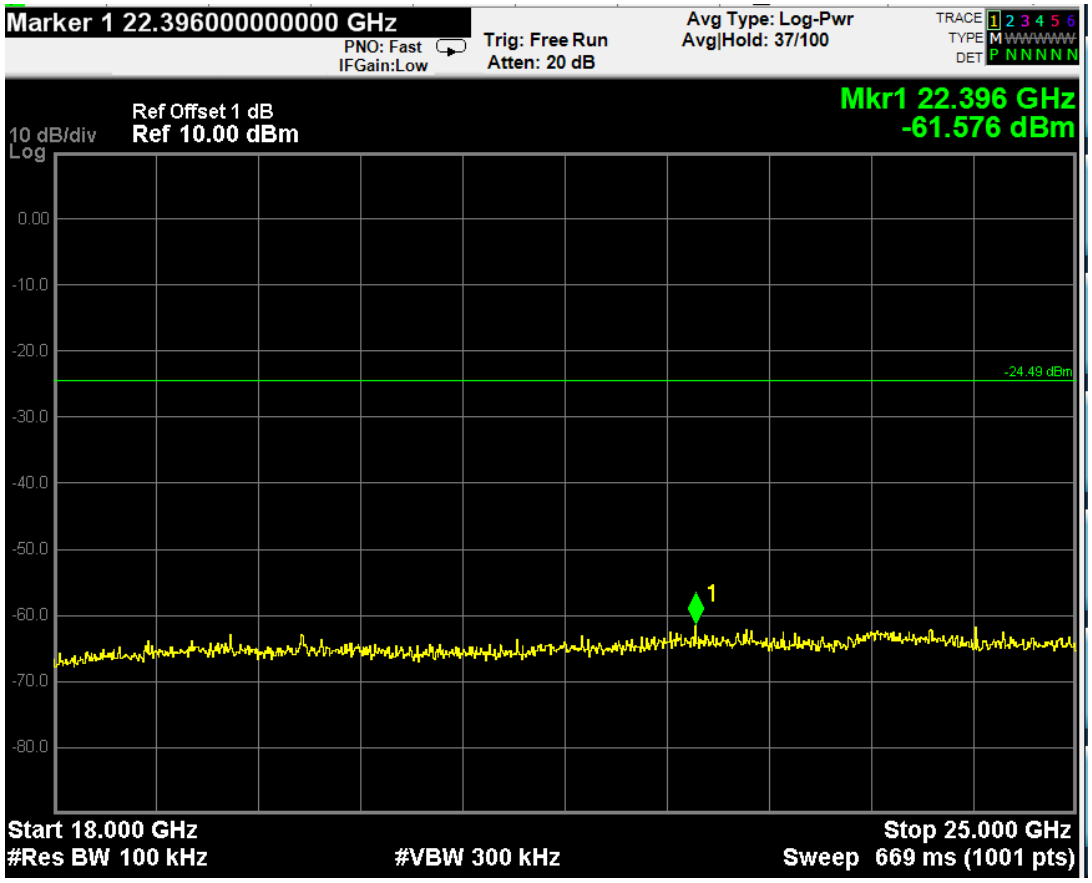

Marker 1 24.286000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 24/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 24.286 GHz
-61.520 dBm
0.00
-10.0
-20.0
-25.31 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)

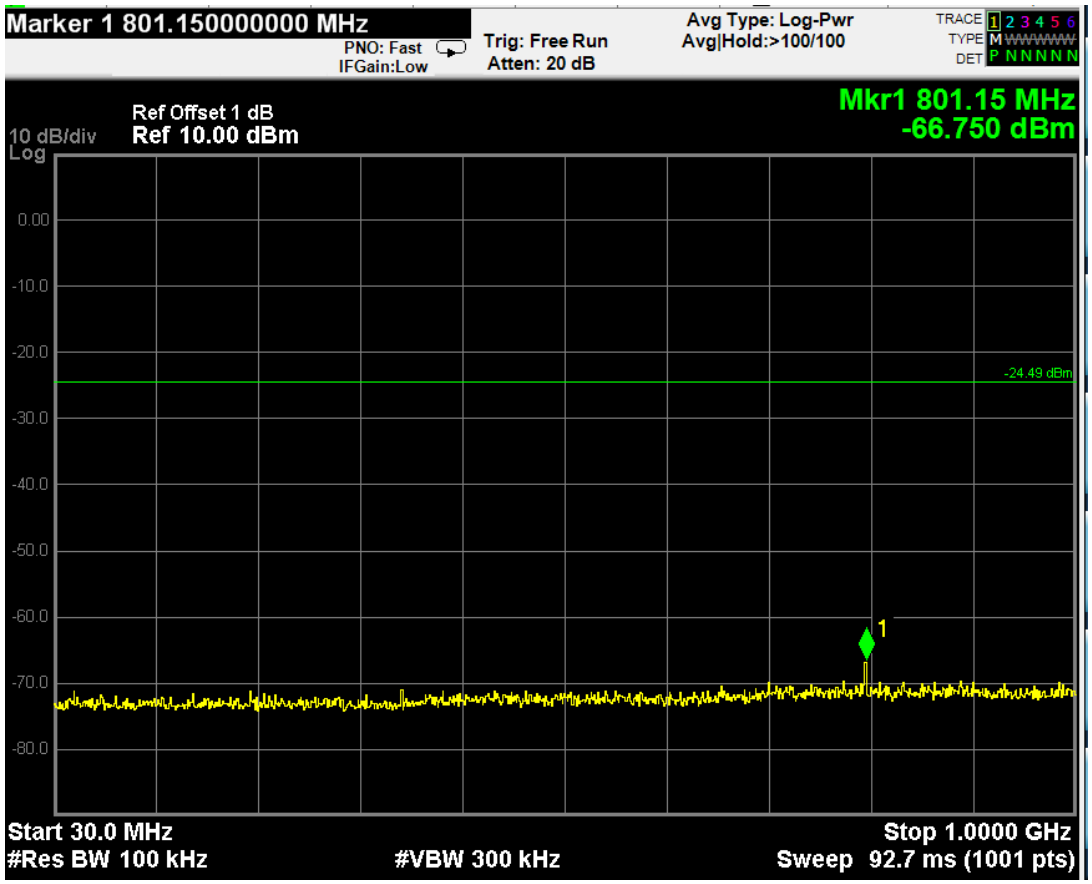

Marker 1 826.370000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 826.37 MHz
-65.952 dBm
0.00
-10.0
-20.0
-25.31 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

3DH3Ch 00

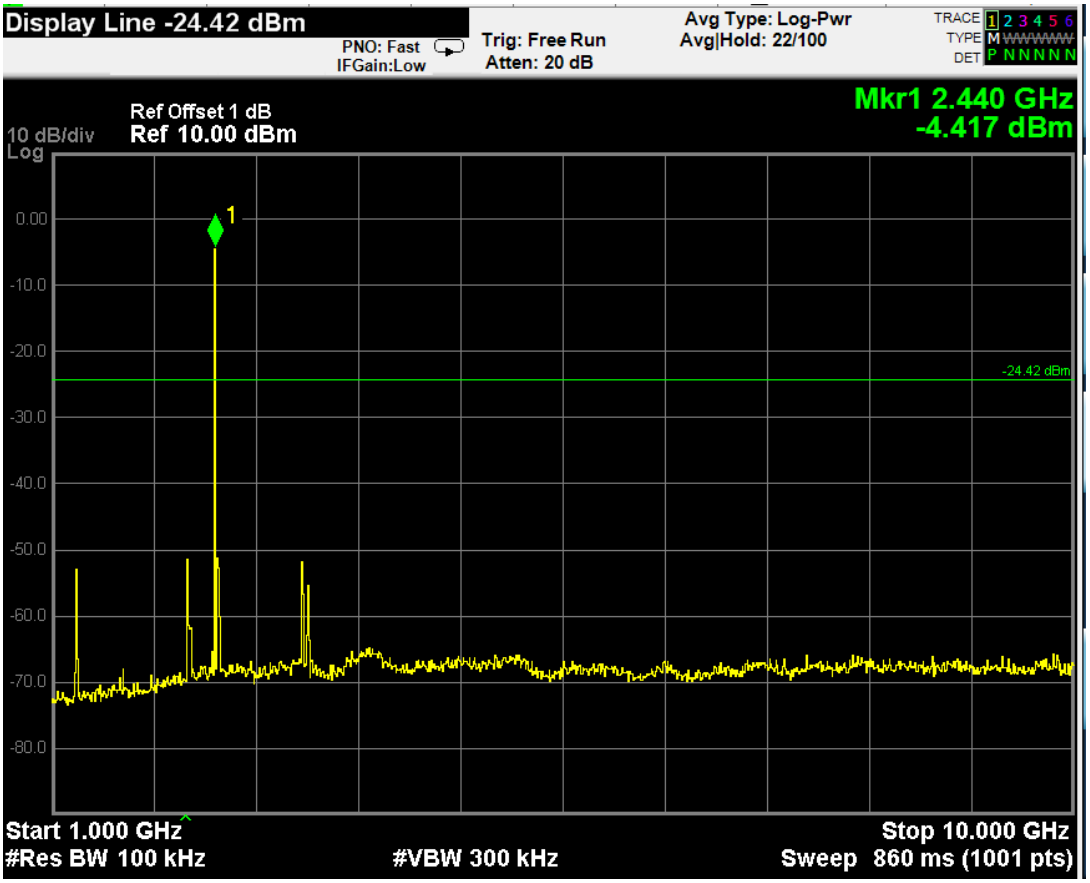

Display Line -24.49 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 21/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.404 GHz
-4.486 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.49 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)

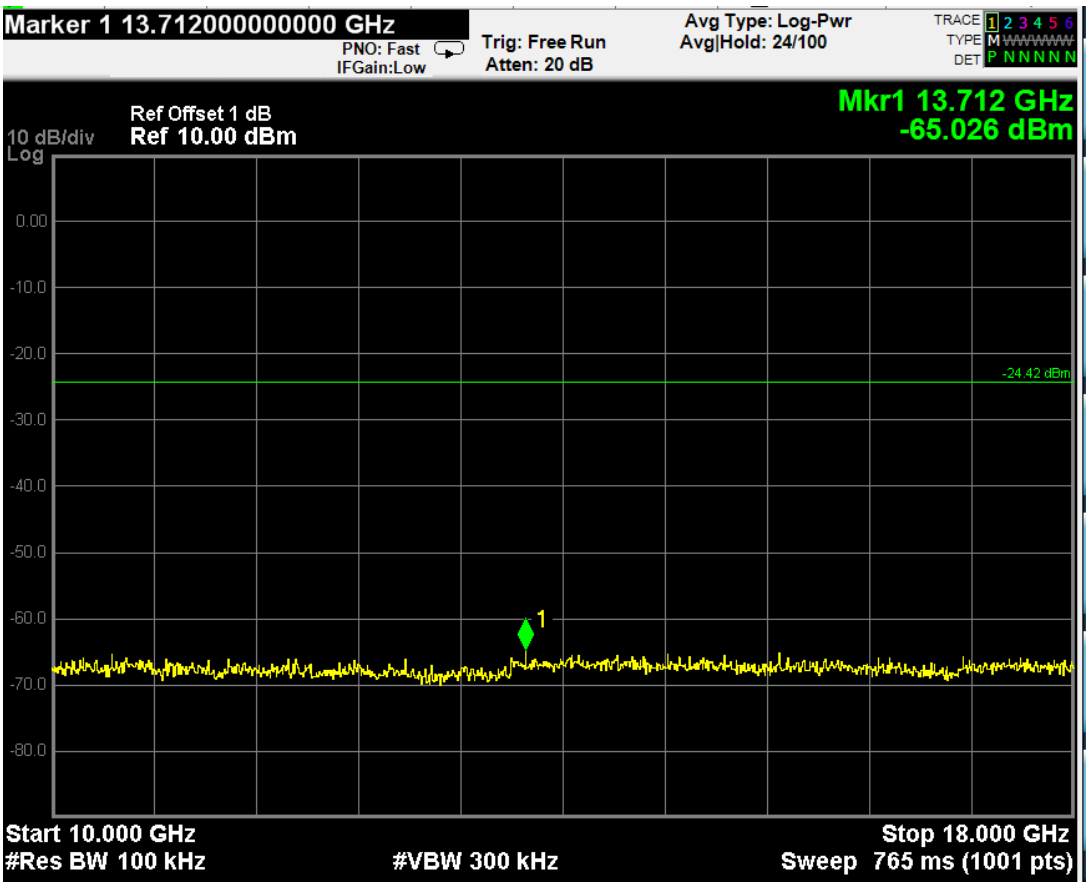

Marker 1 14.304000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 23/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 14.304 GHz
-64.741 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.49 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)

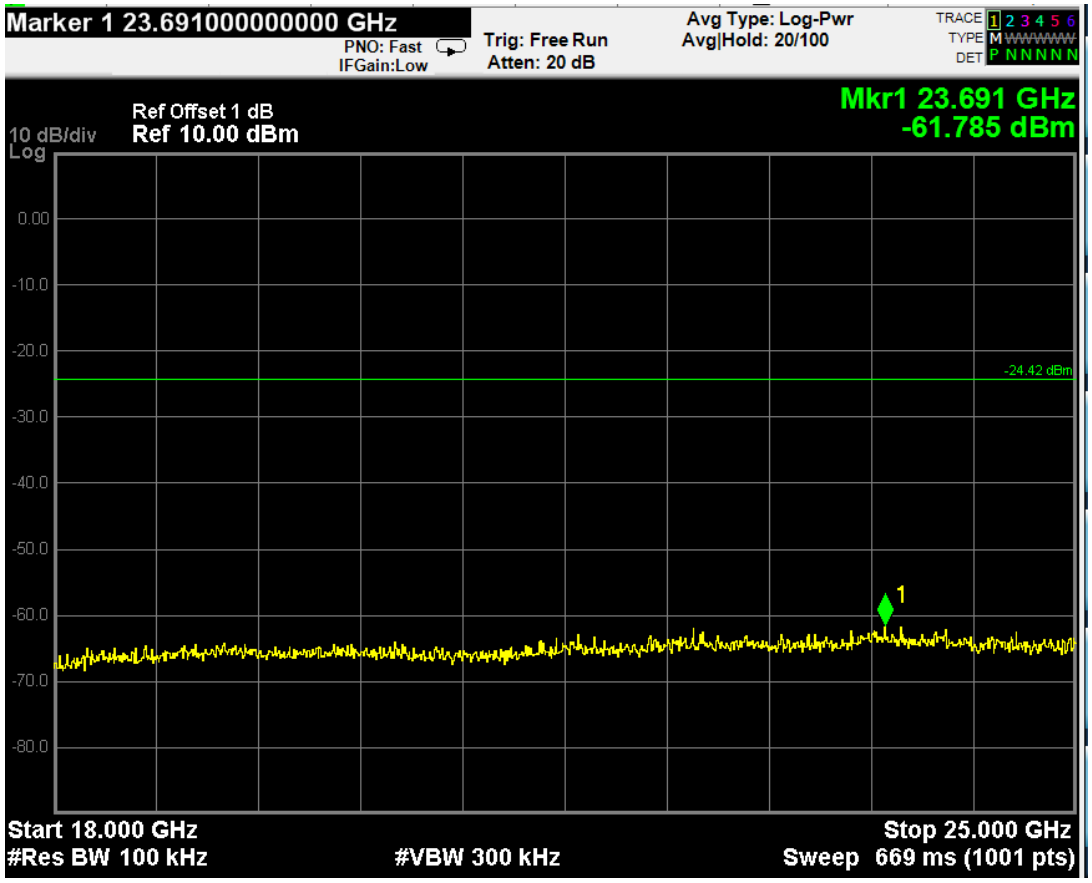

Marker 1 22.396000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 37/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 22.396 GHz
-61.576 dBm
0.00
-10.0
-20.0
-24.49 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)

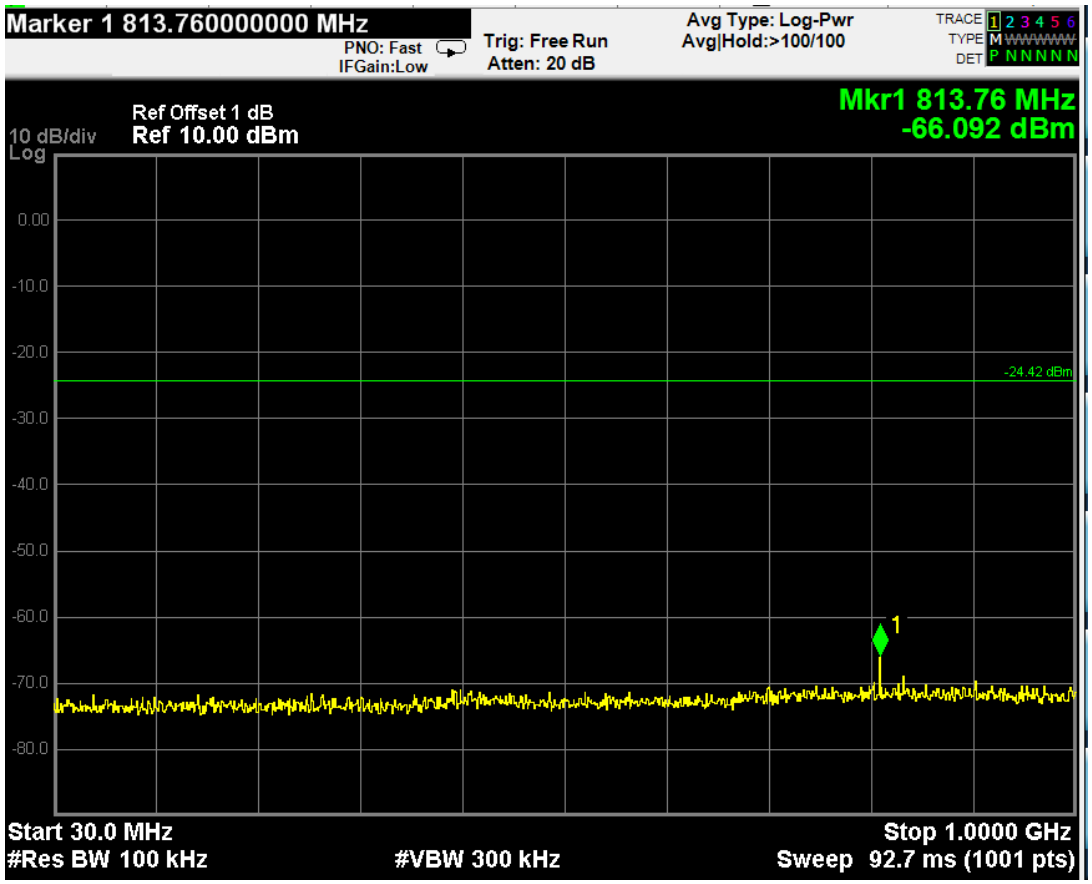

Marker 1 801.150000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 801.15 MHz
-66.750 dBm
0.00
-10.0
-20.0
-24.49 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

3DH3Ch 39


Display Line -24.42 dBm
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 2.440 GHz
-4.417 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.42 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)


Marker 1 13.712000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 24/100
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 13.712 GHz
-65.026 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.42 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)


Marker 1 23.691000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
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 23.691 GHz
-61.785 dBm
0.00
-10.0
-20.0
-24.42 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)


Marker 1 813.760000000 MHz
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 813.76 MHz
-66.092 dBm
0.00
-10.0
-20.0
-24.42 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

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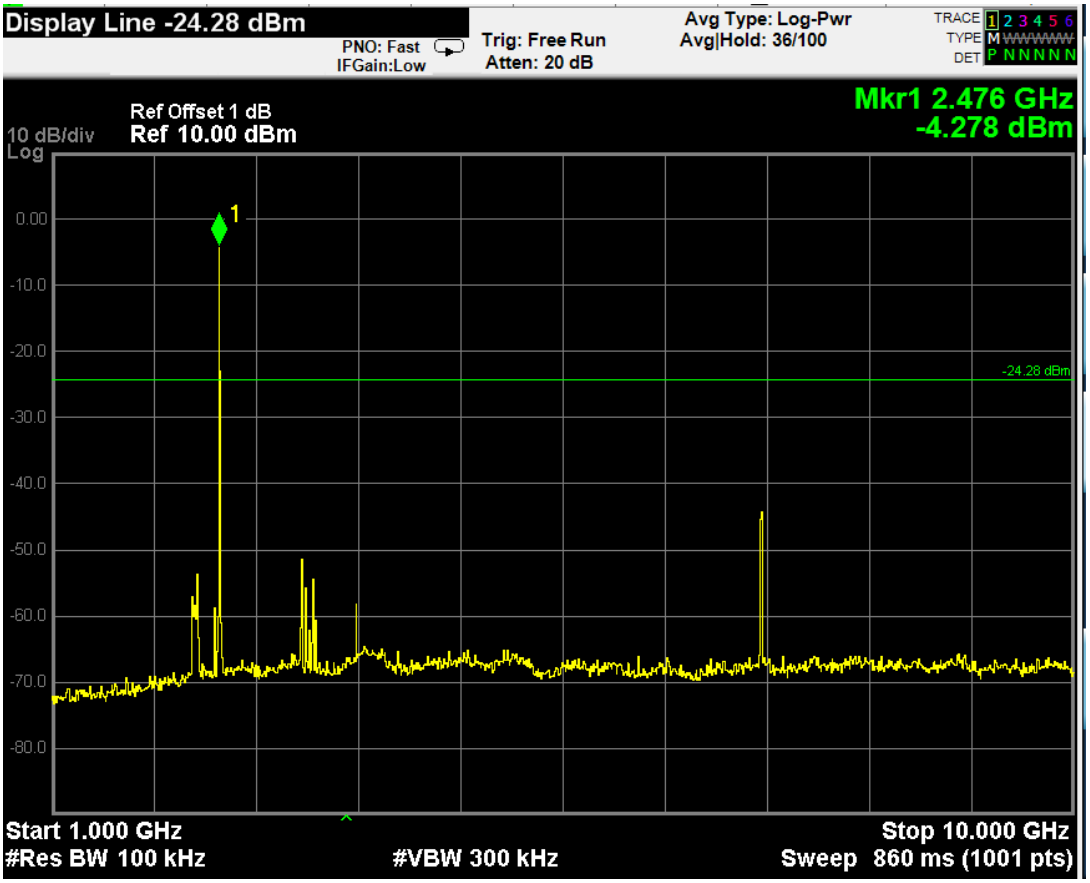
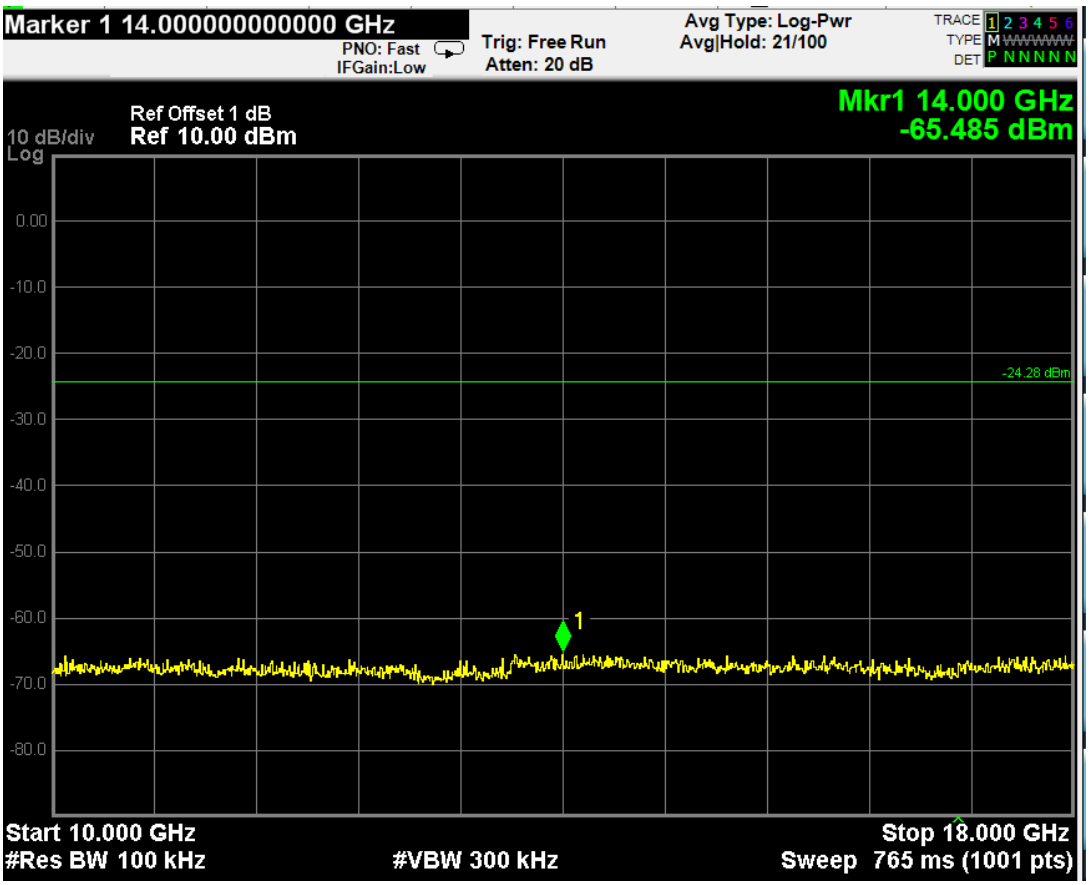
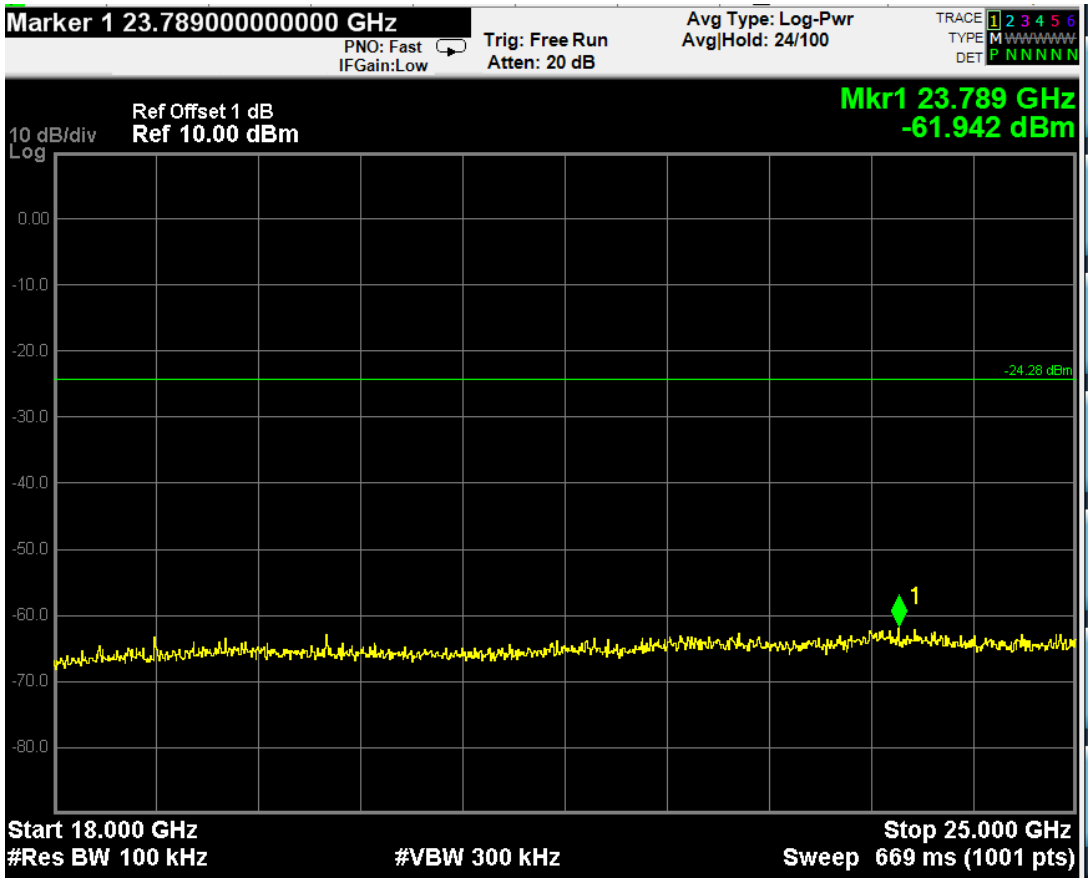
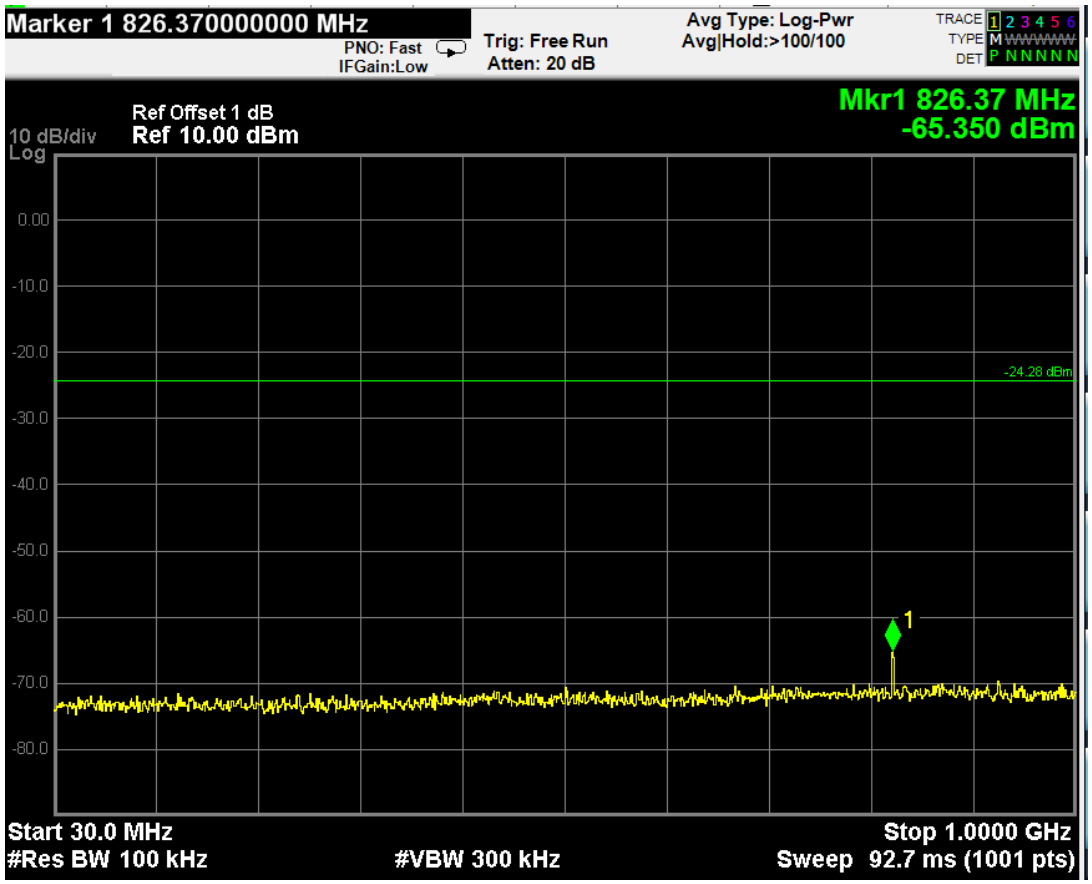

Display Line -24.28 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 36/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.476 GHz
-4.278 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.28 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)


Marker 1 14.000000000000 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 14.000 GHz
-65.485 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.28 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)


Marker 1 23.789000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 24/100
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 23.789 GHz
-61.942 dBm
0.00
-10.0
-20.0
-24.28 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)


Marker 1 826.370000000 MHz
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 826.37 MHz
-65.350 dBm
0.00
-10.0
-20.0
-24.28 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

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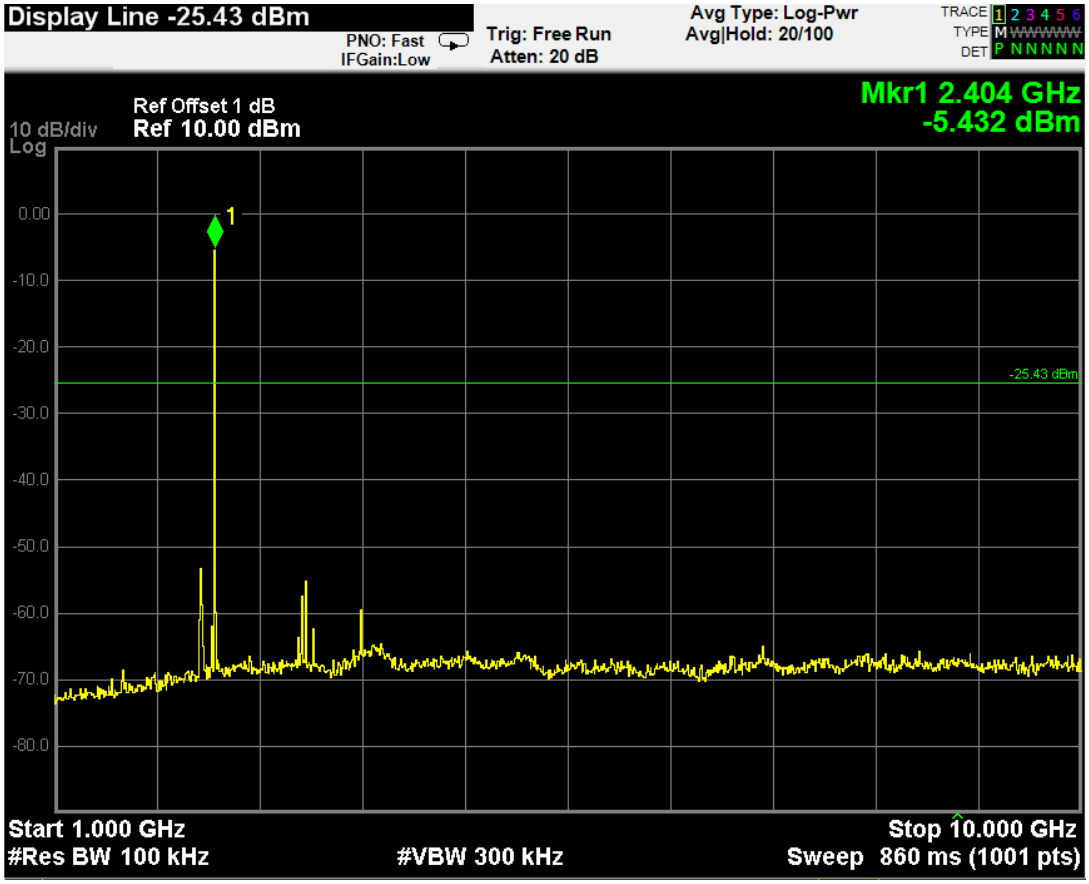
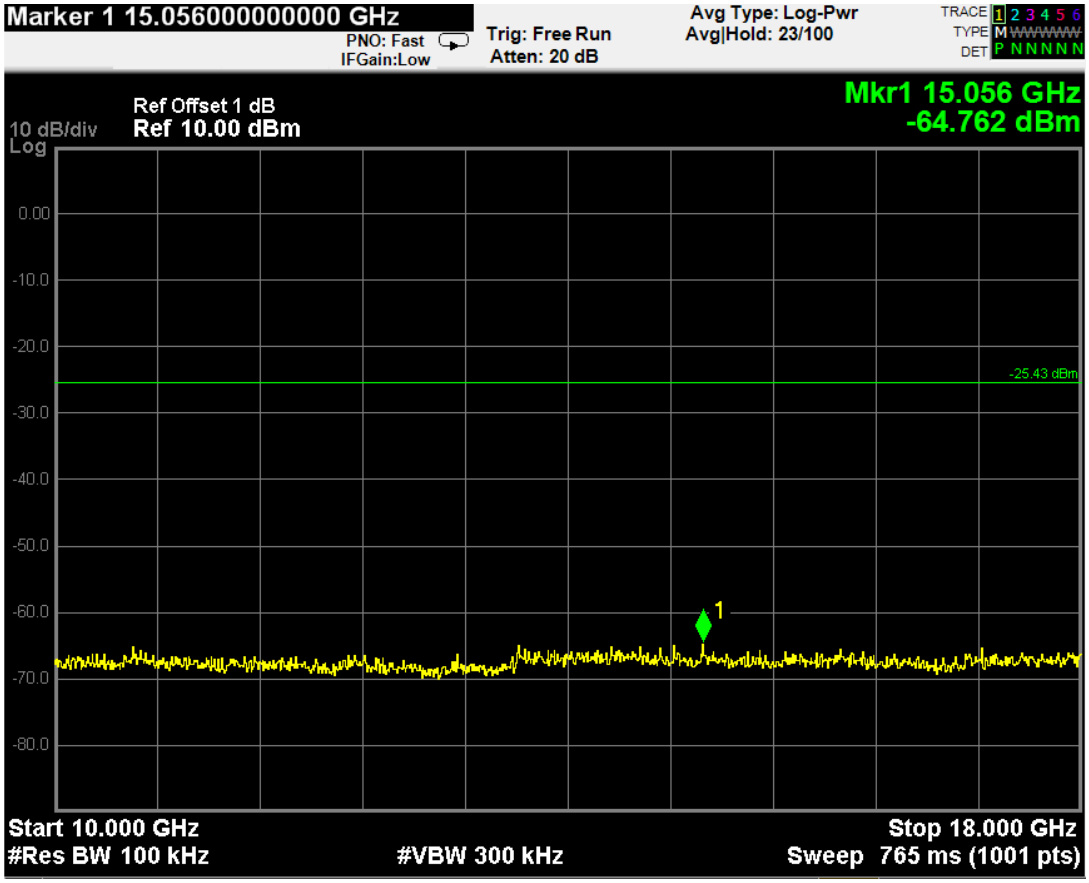
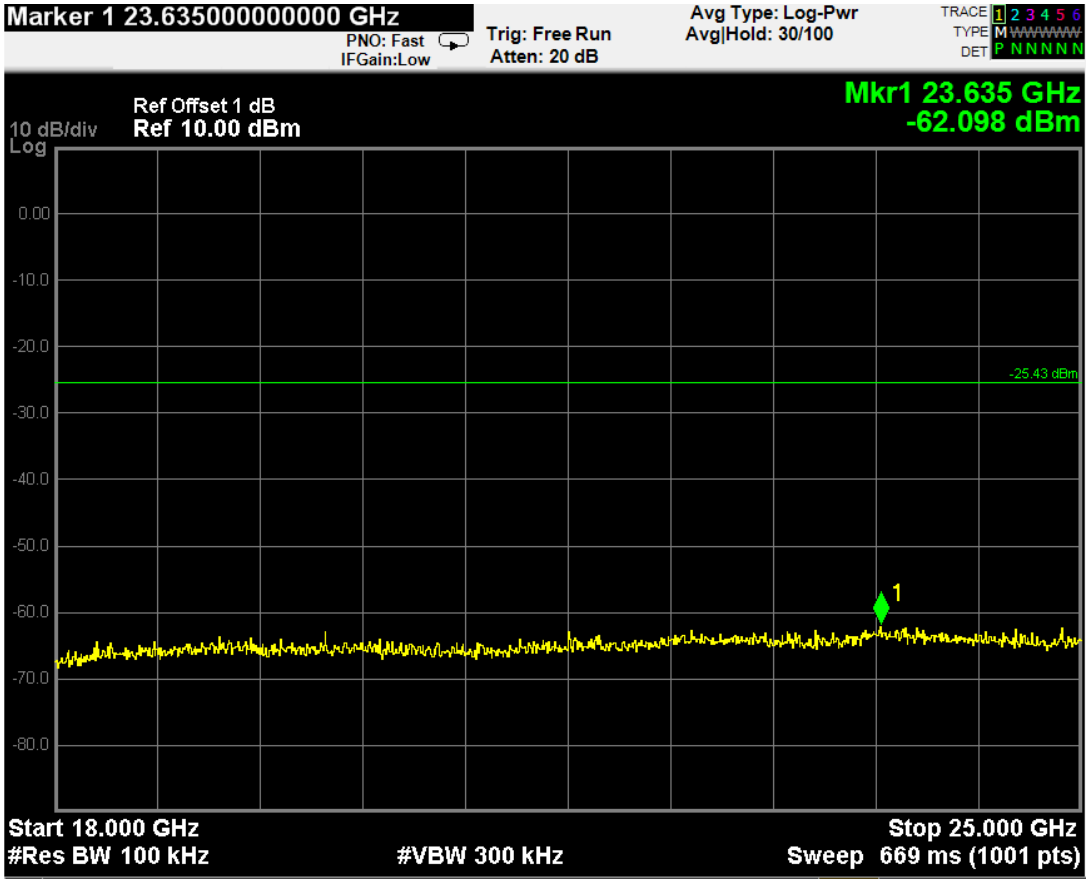
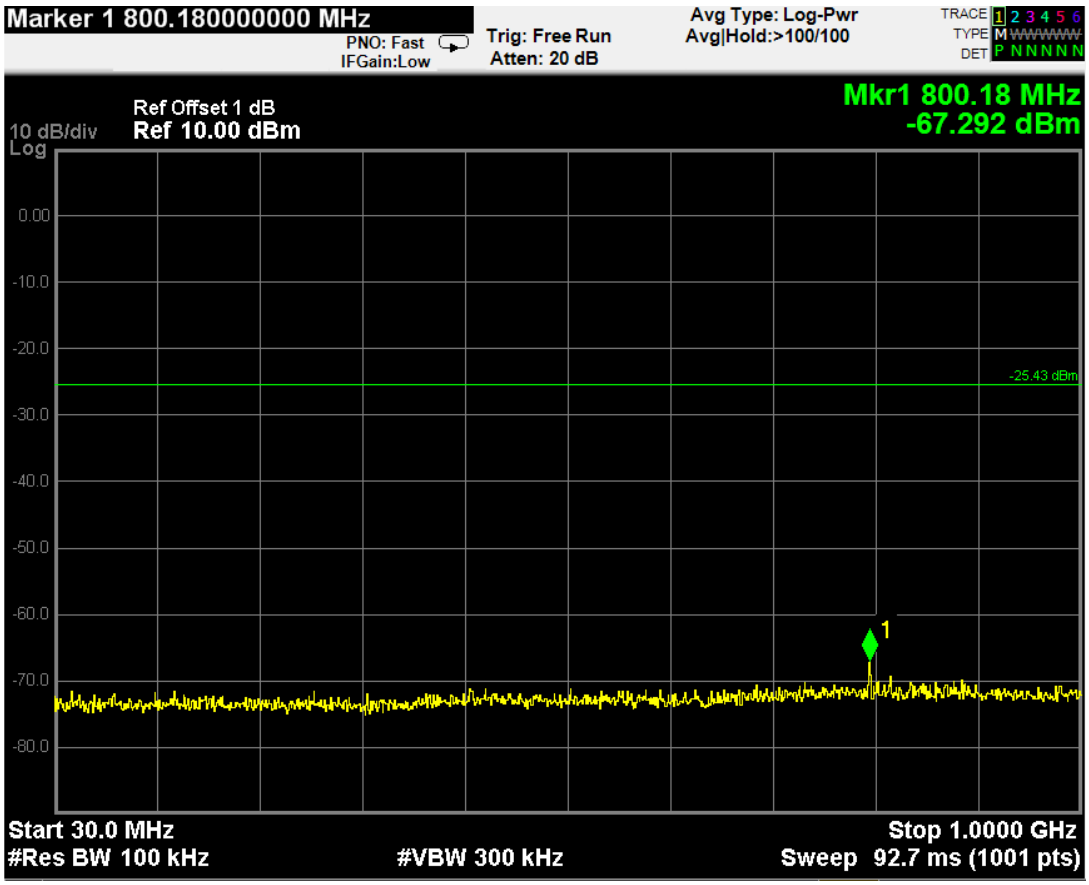

Display Line -25.43 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.404 GHz
-5.432 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.43 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)


Marker 1 15.056000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 23/100
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 15.056 GHz
-64.762 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.43 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)


Marker 1 23.635000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 30/100
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 23.635 GHz
-62.098 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.43 dBm
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)


Marker 1 800.180000000 MHz
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 800.18 MHz
-67.292 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.43 dBm
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

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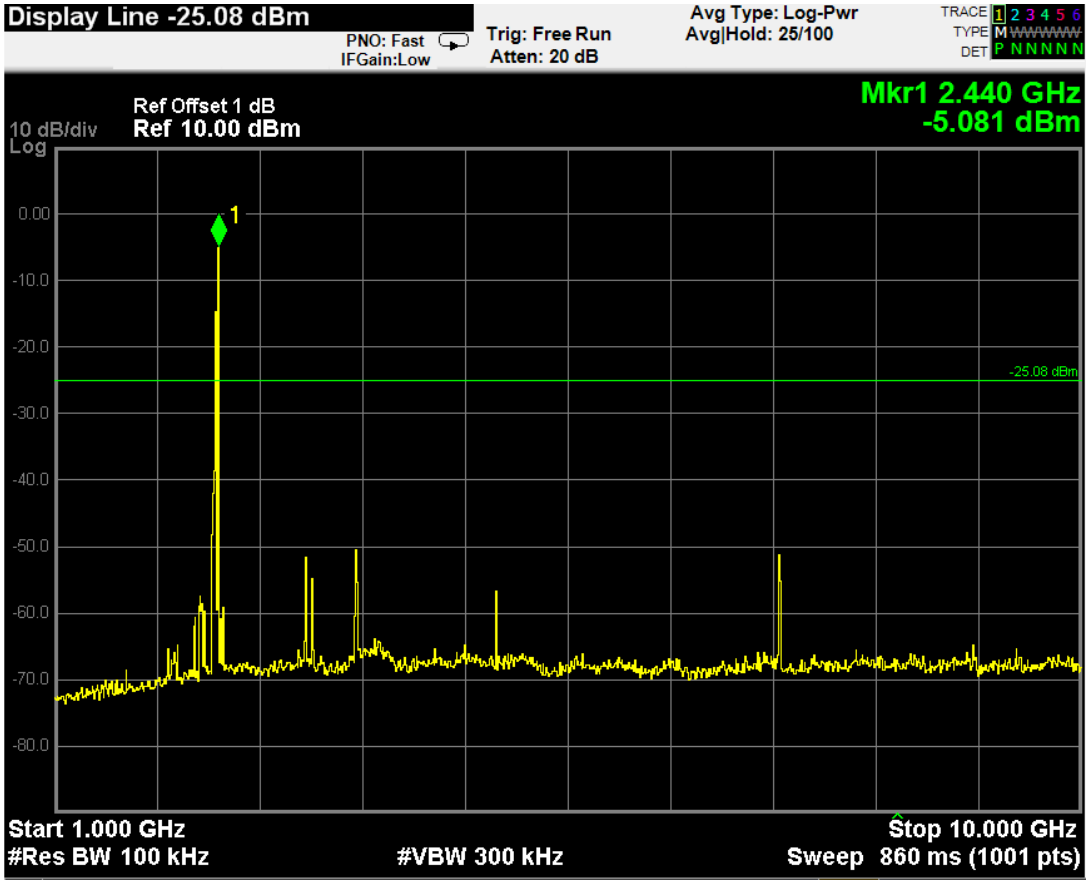
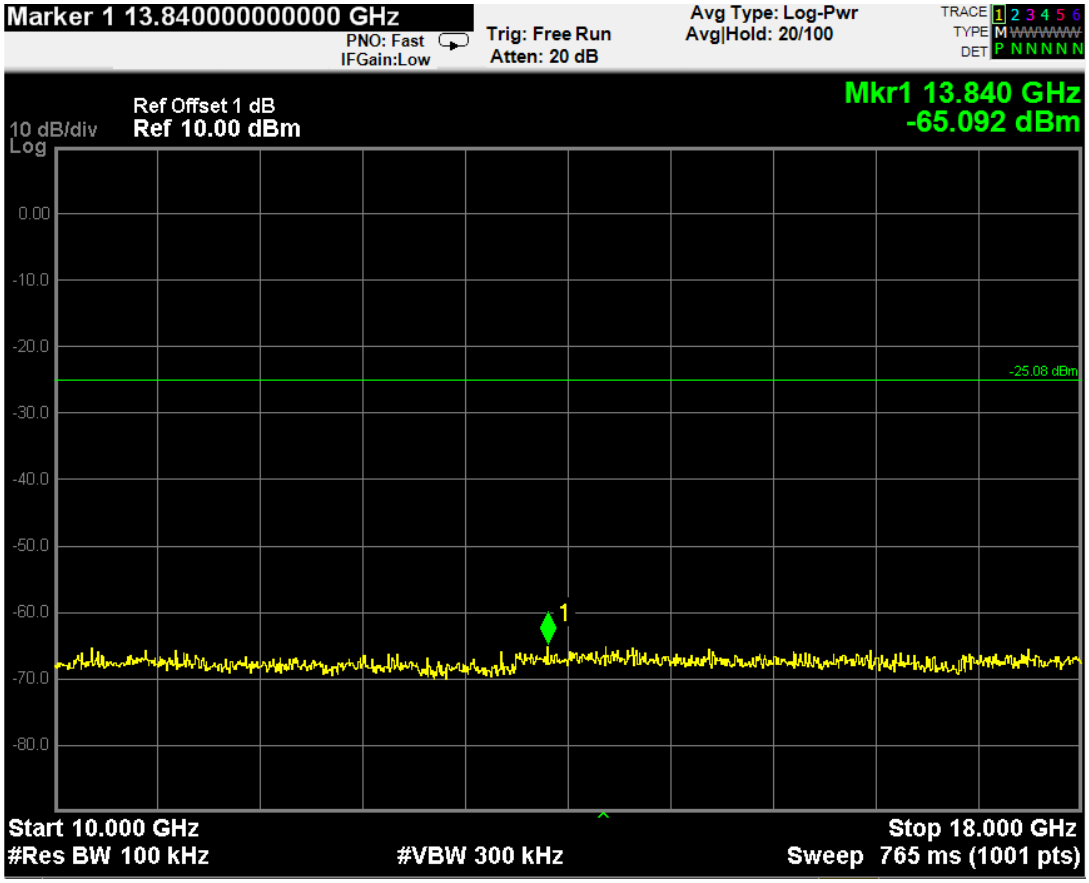
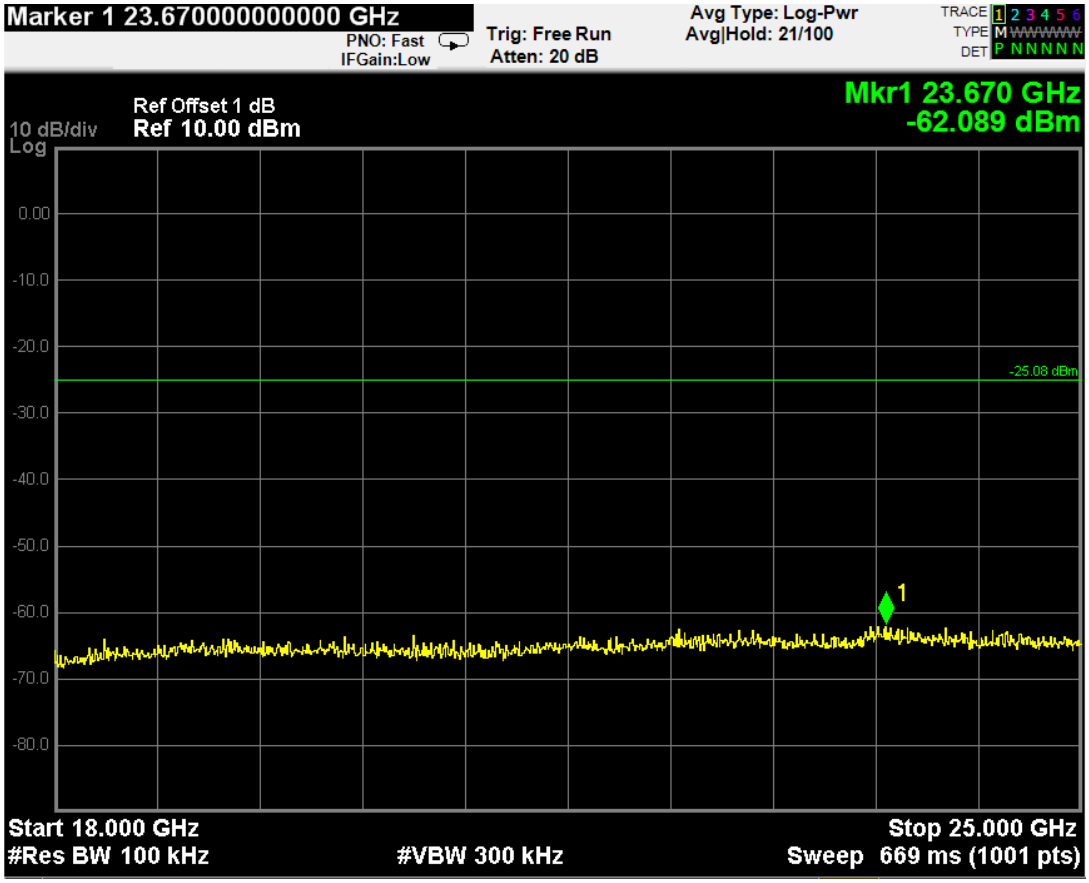
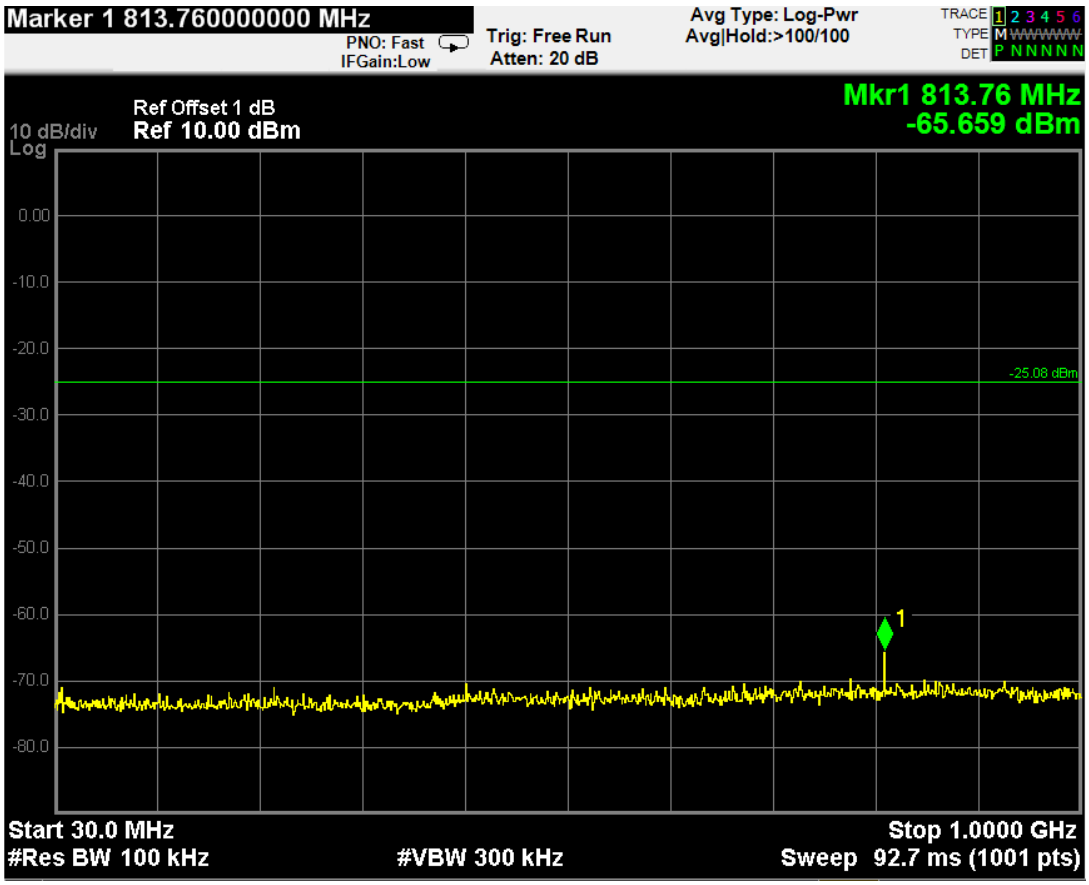

Display Line -25.08 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 25/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.440 GHz
-5.081 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.08 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)


Marker 1 13.840000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 13.840 GHz
-65.092 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.08 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)


Marker 1 23.670000000000 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
Ref 10.00 dBm
Mkr1 23.670 GHz
-62.089 dBm
Log
0.00
-10.0
-20.0
-25.08 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)


Marker 1 813.760000000 MHz
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
Ref 10.00 dBm
Mkr1 813.76 MHz
-65.659 dBm
Log
0.00
-10.0
-20.0
-25.08 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

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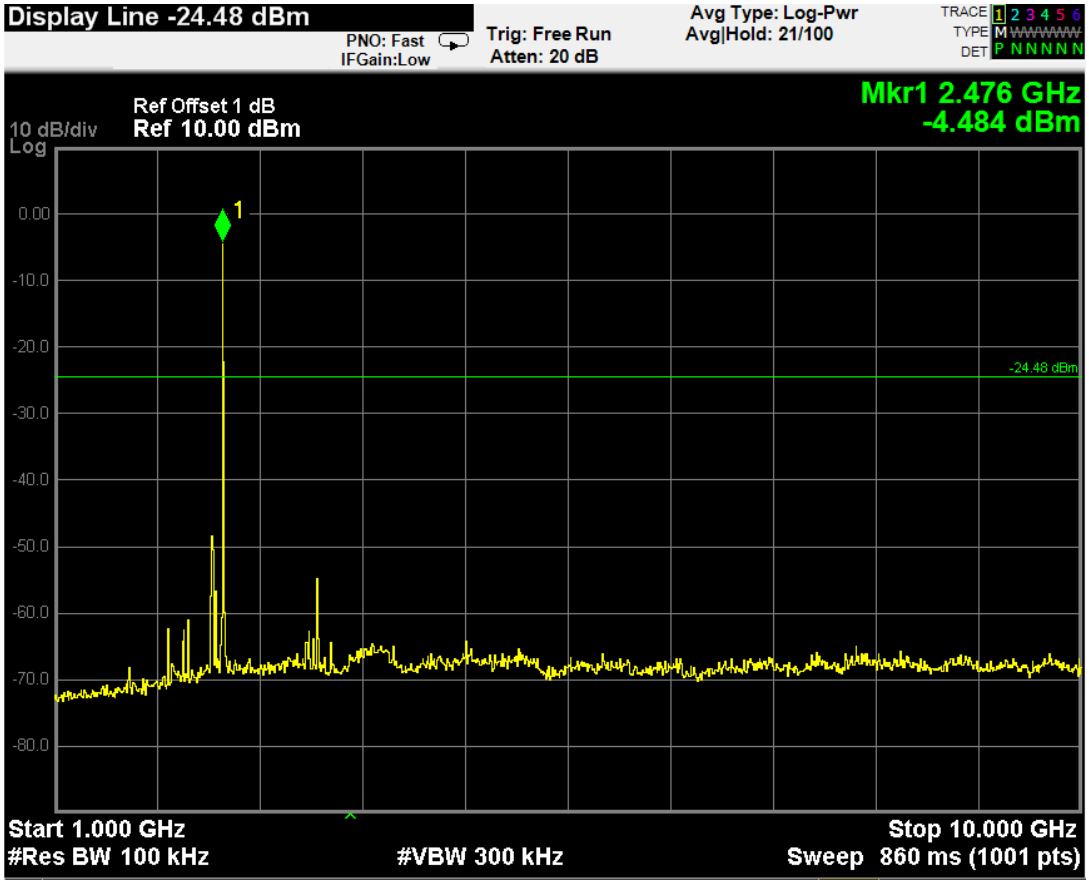
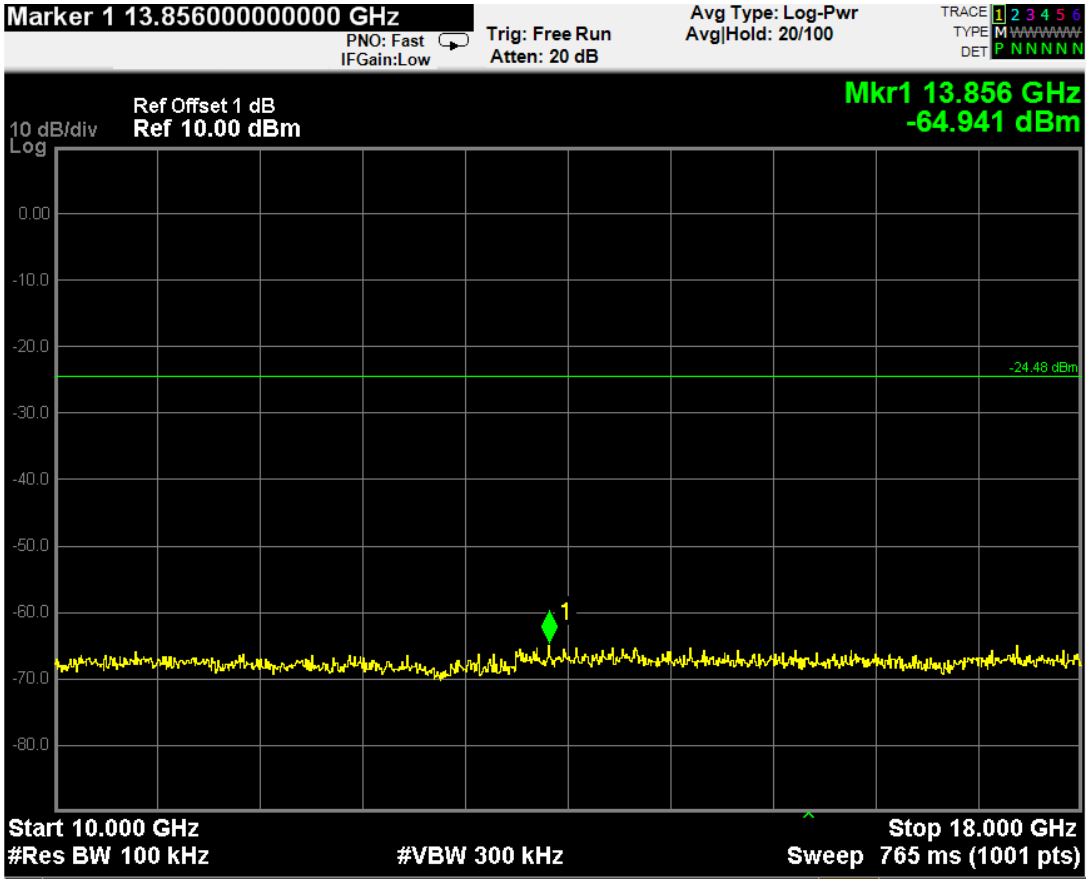
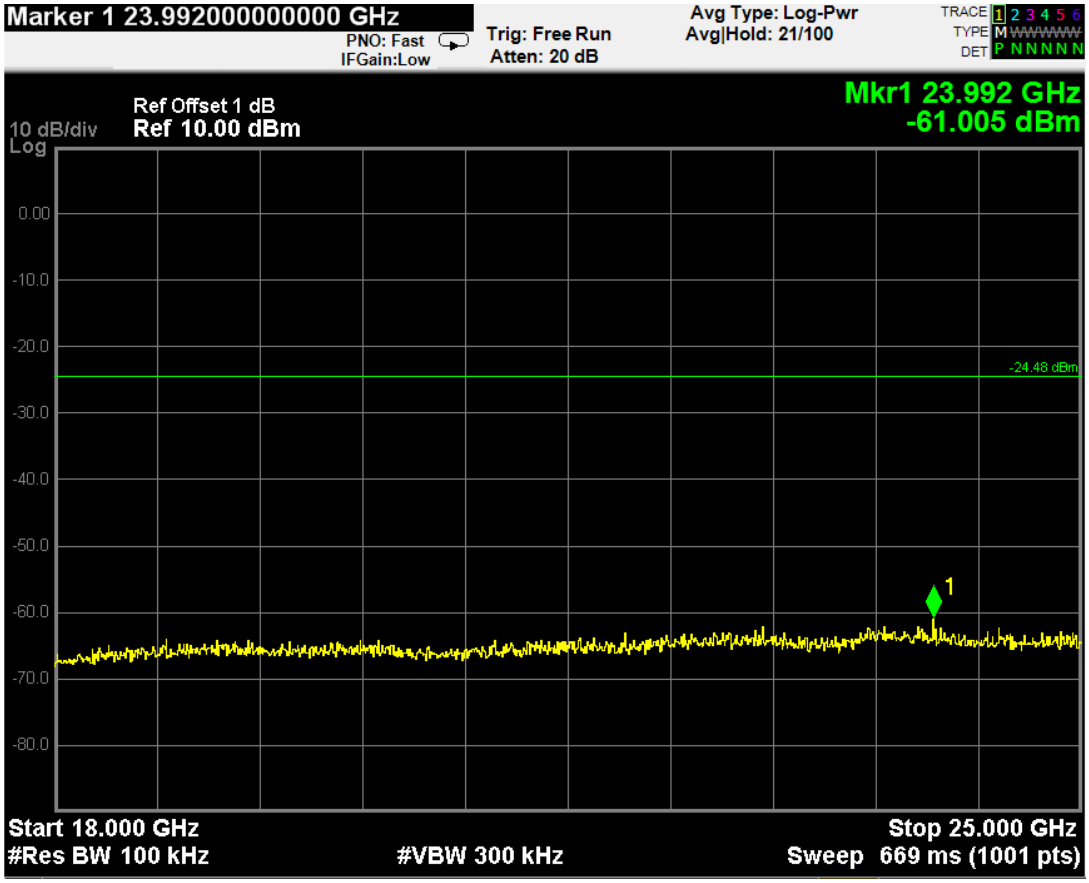
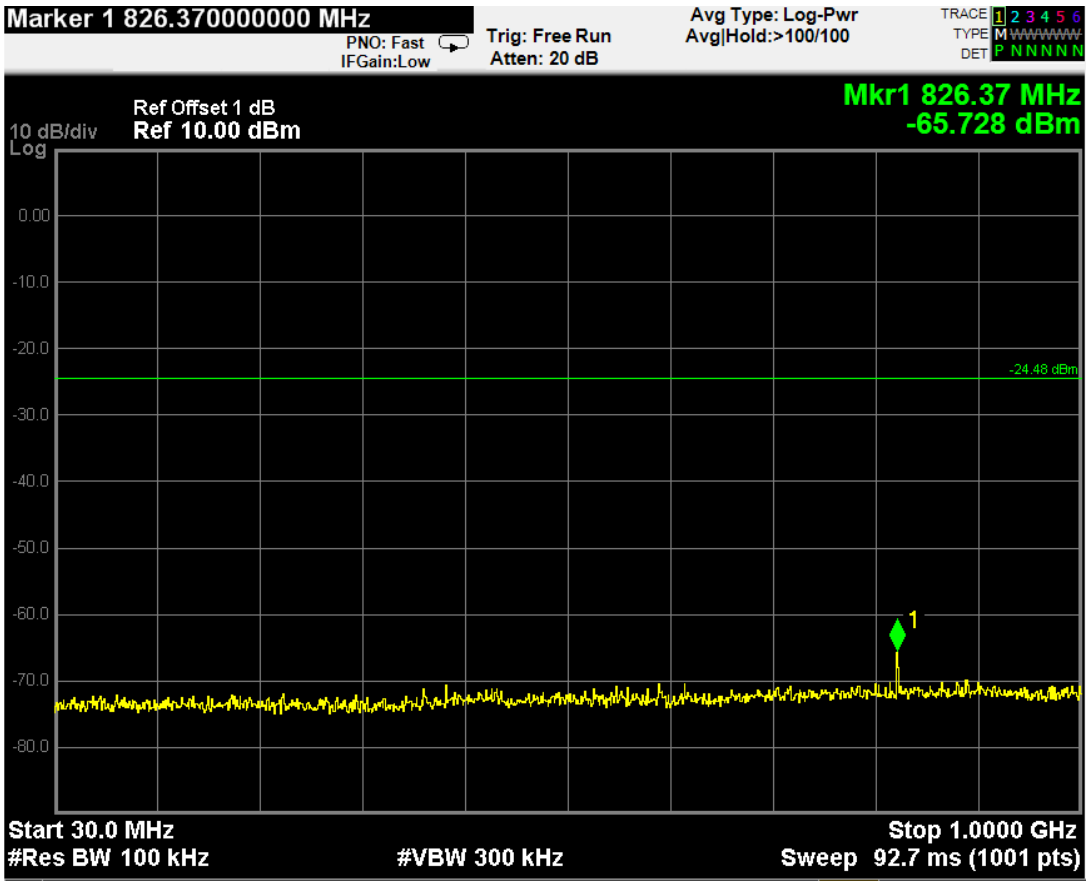

Display Line -24.48 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 21/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.476 GHz
-4.484 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.48 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)


Marker 1 13.856000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
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 13.856 GHz
-64.941 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.48 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)


Marker 1 23.992000000000 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 23.992 GHz
-61.005 dBm
0.00
-10.0
-20.0
-24.48 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)


Marker 1 826.370000000 MHz
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 826.37 MHz
-65.728 dBm
0.00
-10.0
-20.0
-24.48 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

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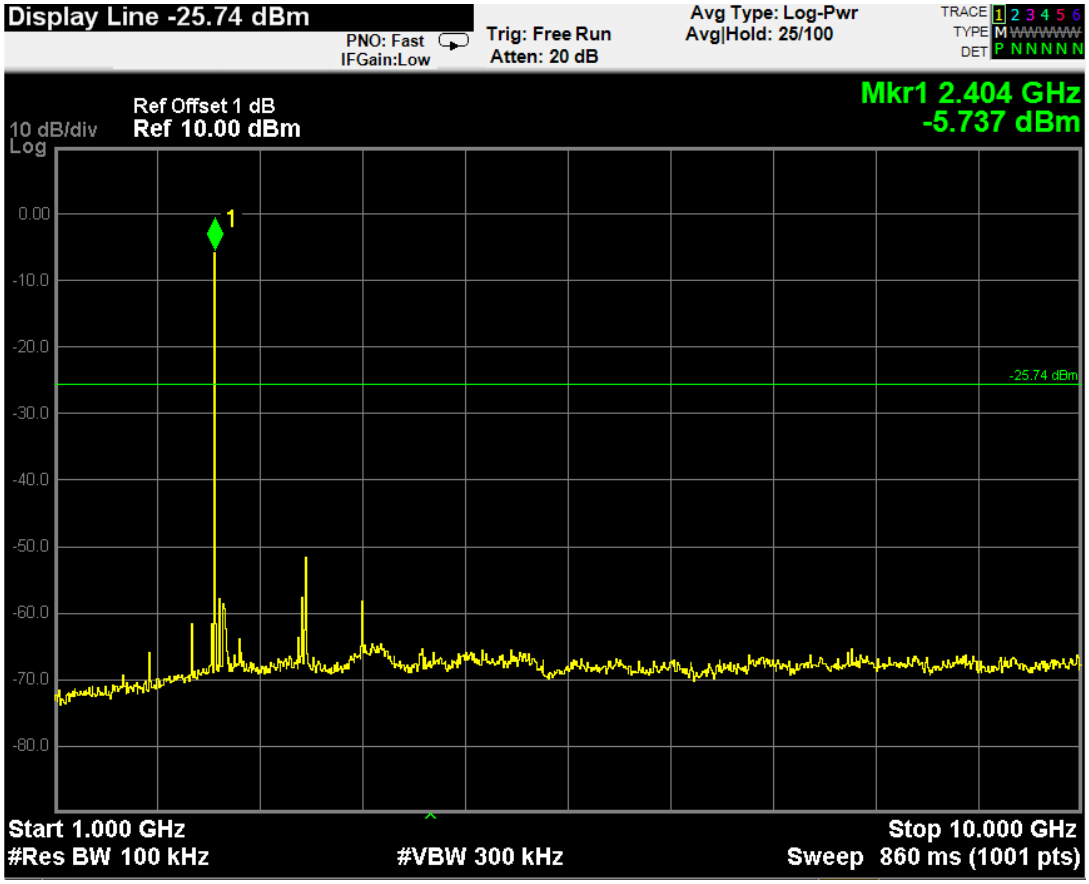
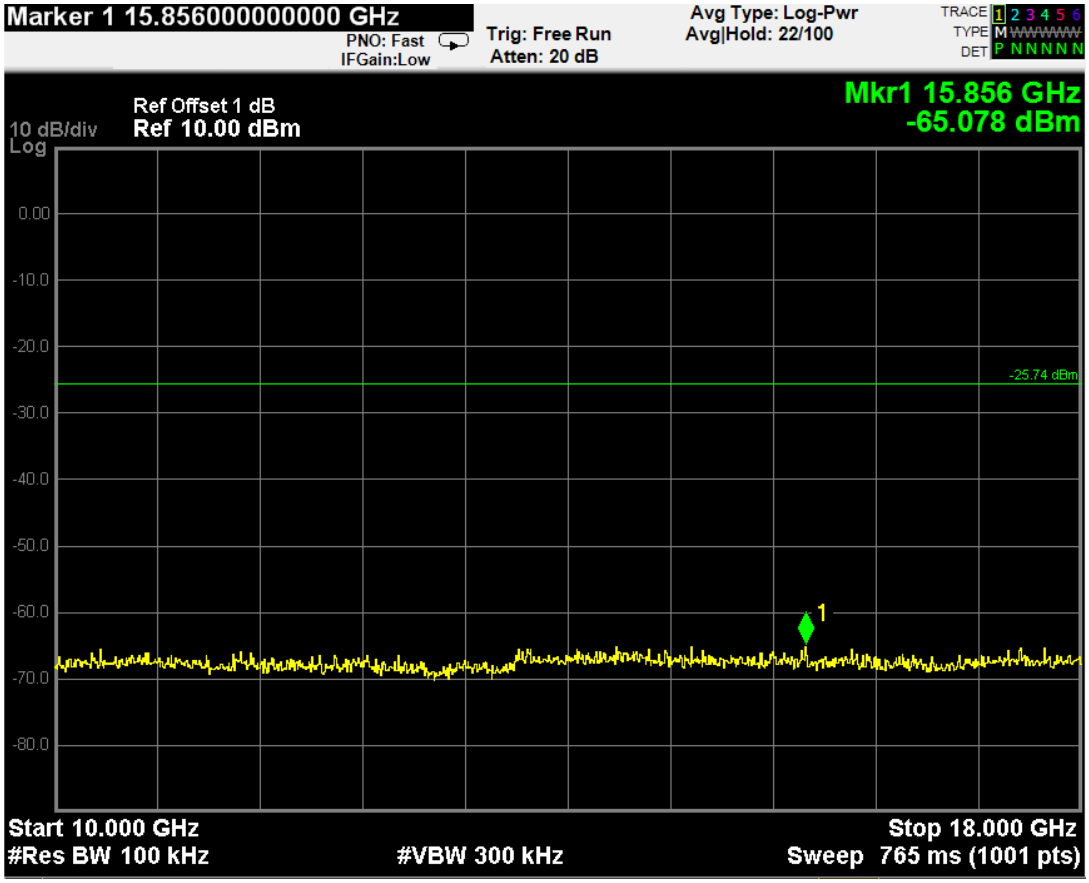
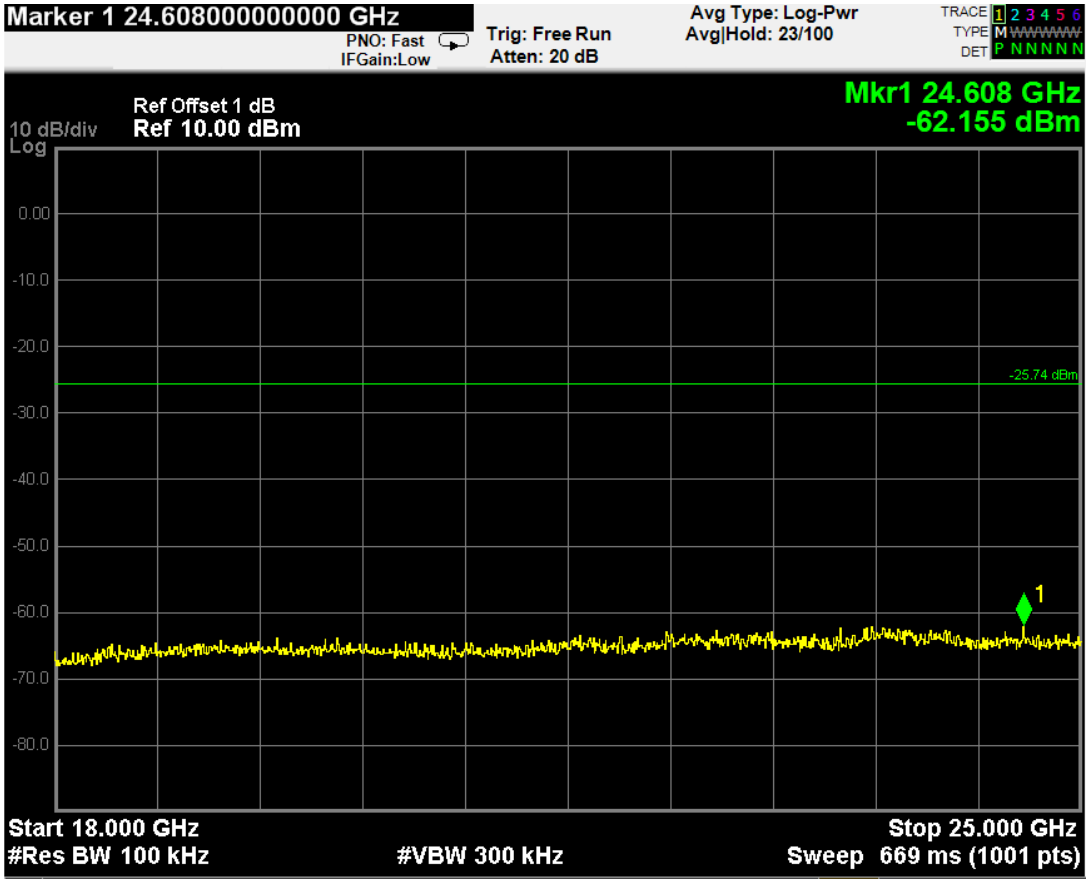
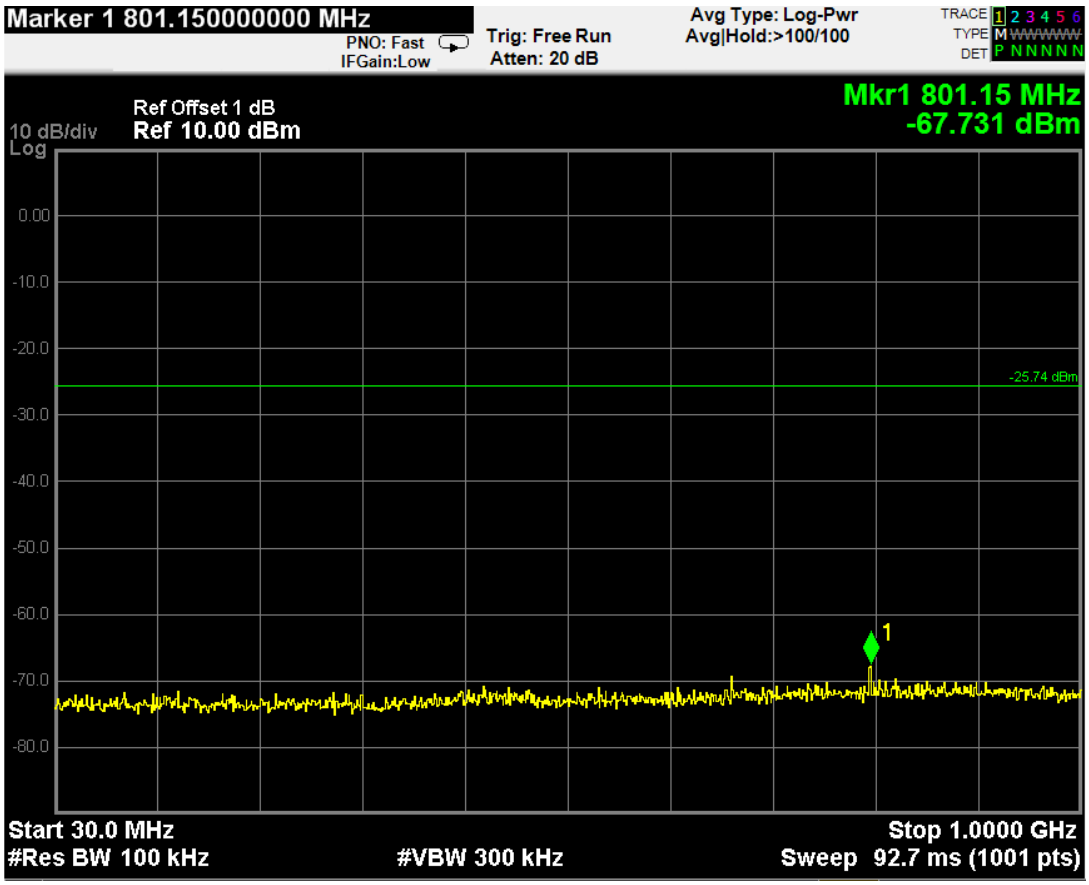

Display Line -25.74 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 25/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.404 GHz
-5.737 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.74 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)


Marker 1 15.856000000000 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 15.856 GHz
-65.078 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-25.74 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)


Marker 1 24.608000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 23/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 24.608 GHz
-62.155 dBm
0.00
-10.0
-20.0
-25.74 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)


Marker 1 801.150000000 MHz
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
Ref 10.00 dBm
Log
Mkr1 801.15 MHz
-67.731 dBm
0.00
-10.0
-20.0
-25.74 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

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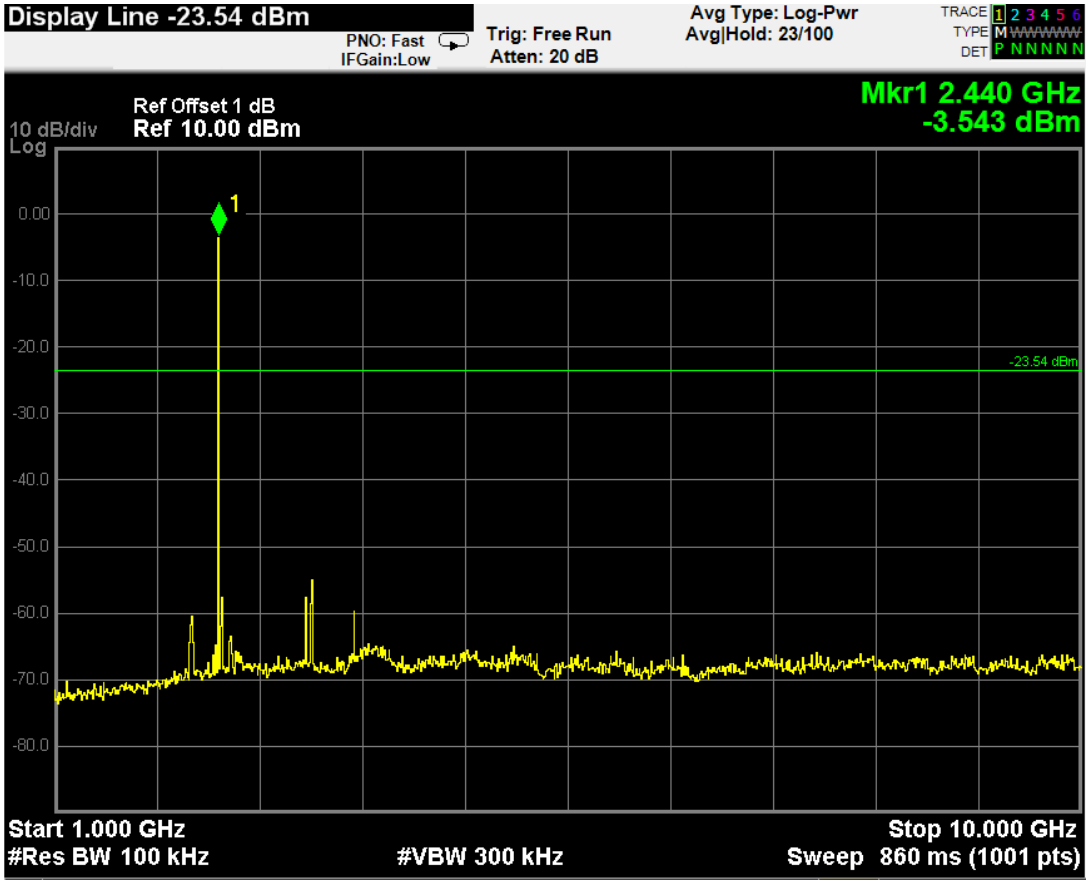
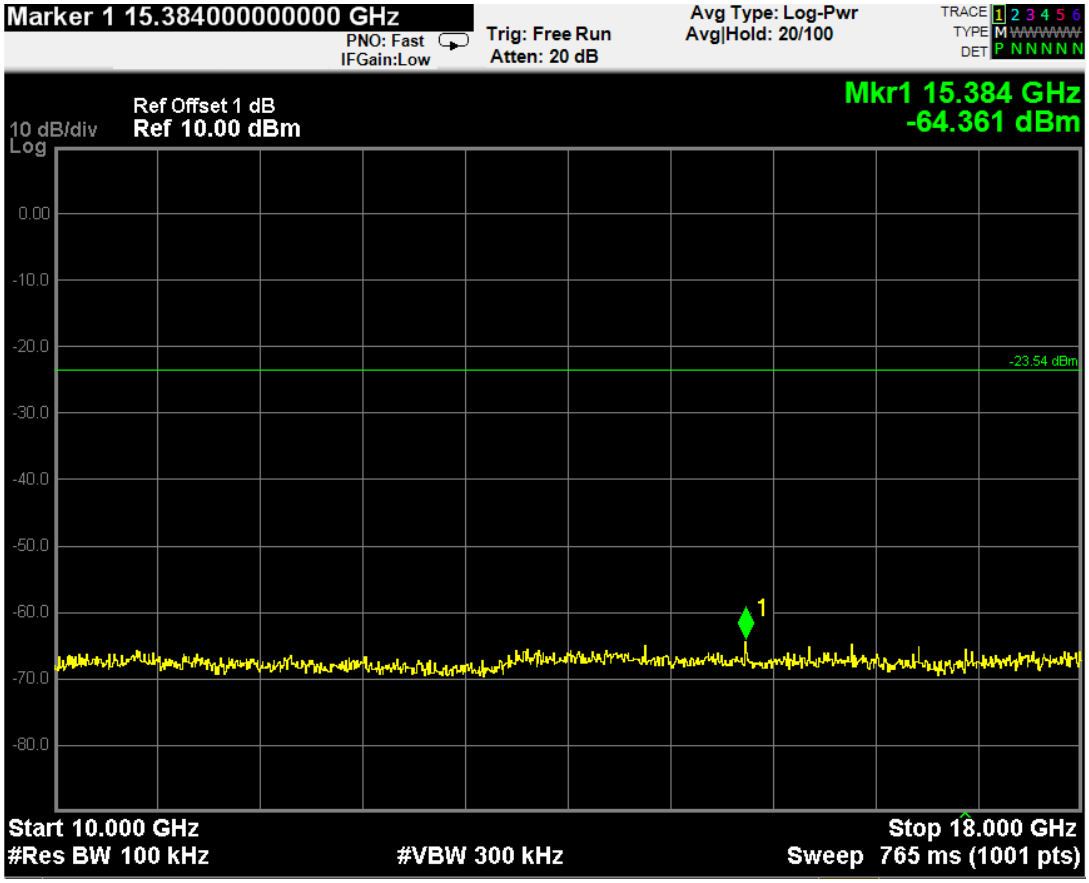
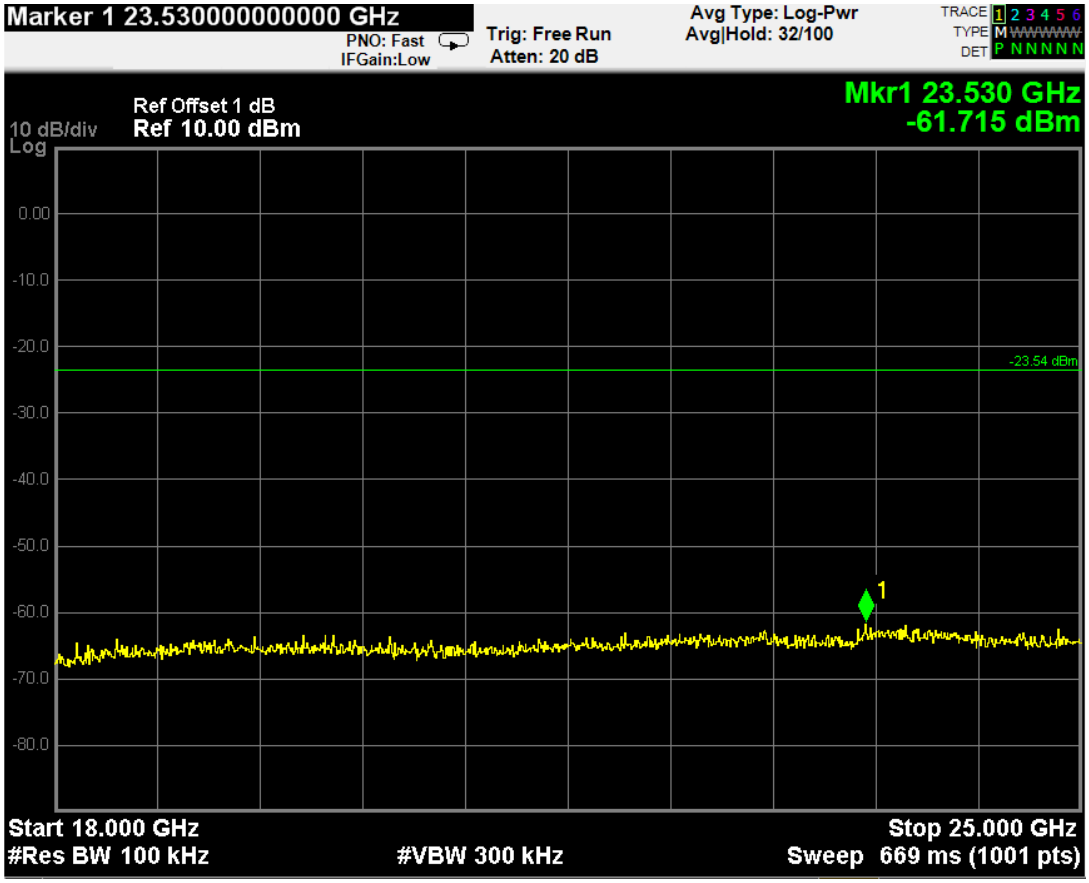
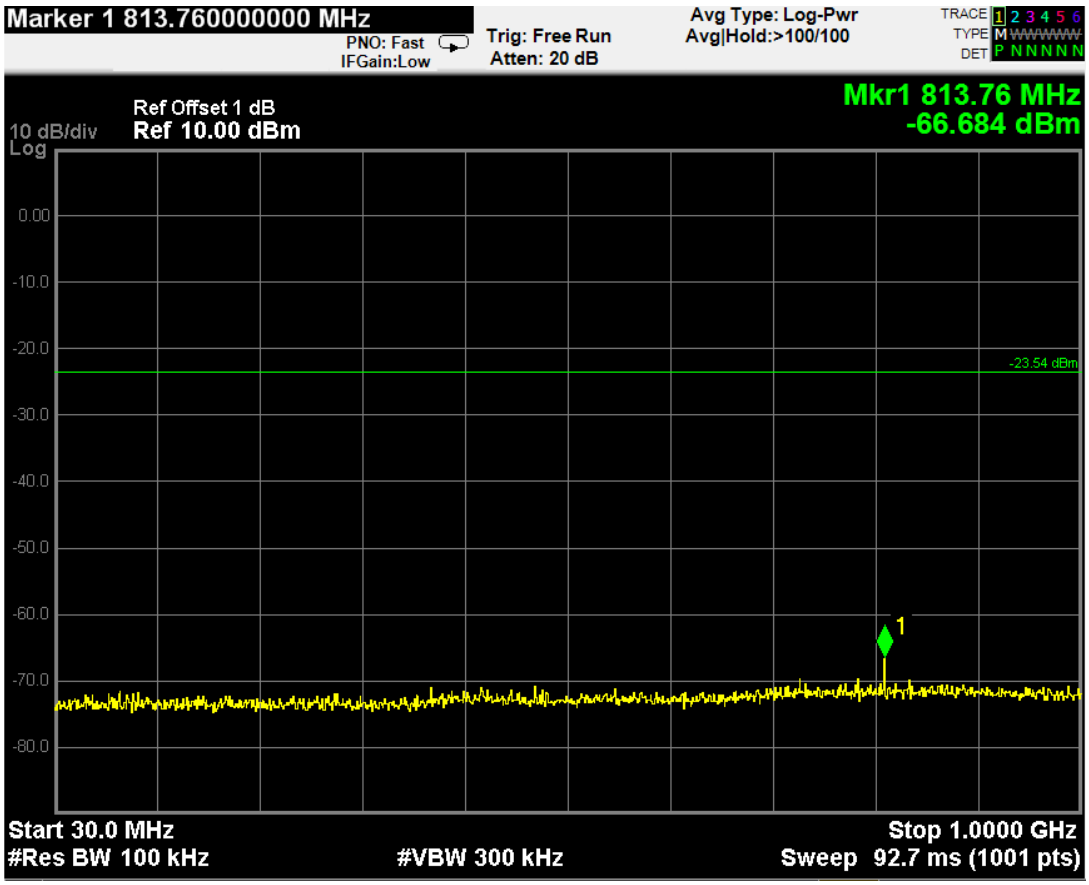
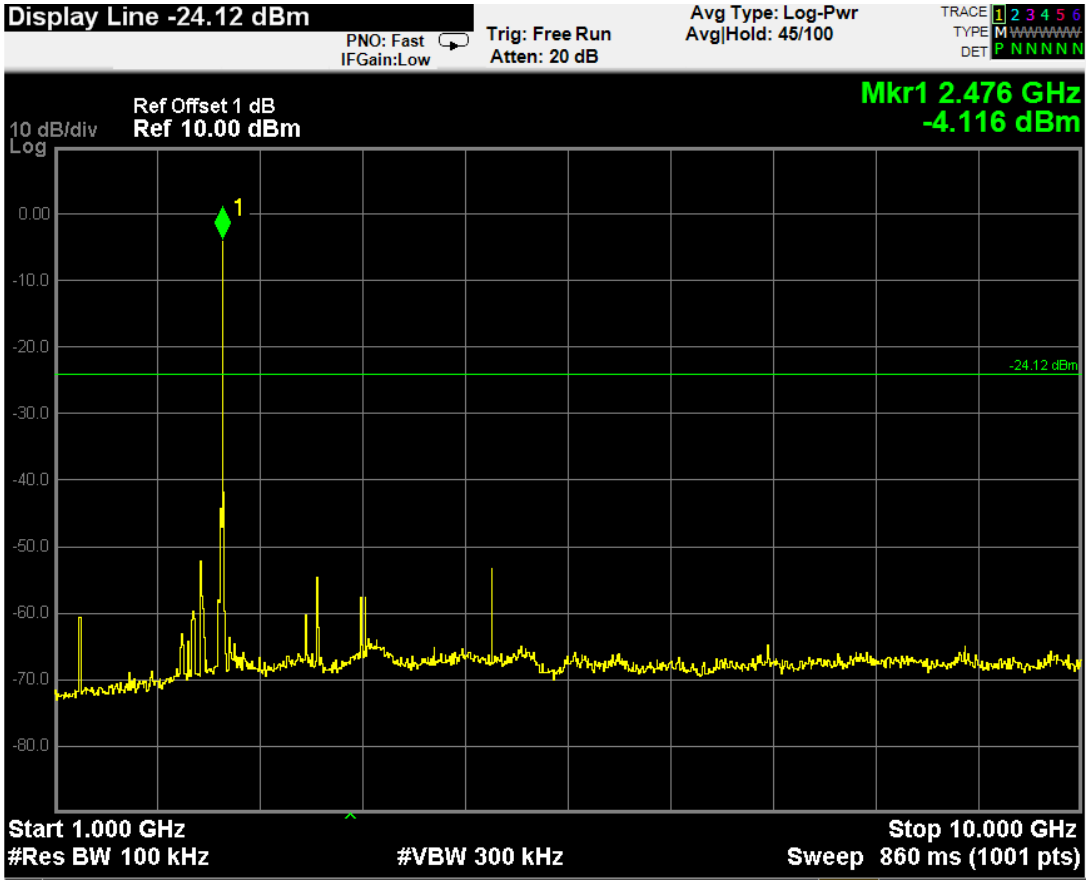

Display Line -23.54 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 23/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.440 GHz
-3.543 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-23.54 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)

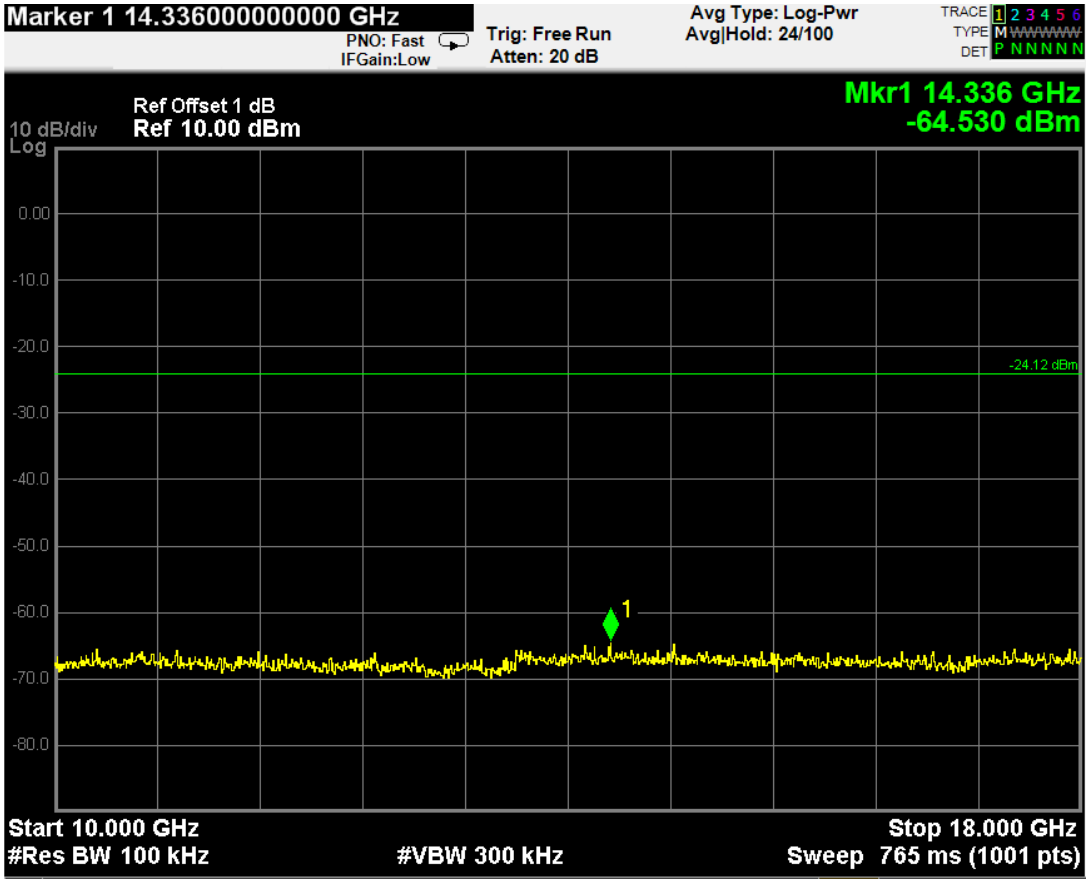

Marker 1 15.384000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 15.384 GHz
-64.361 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-23.54 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)

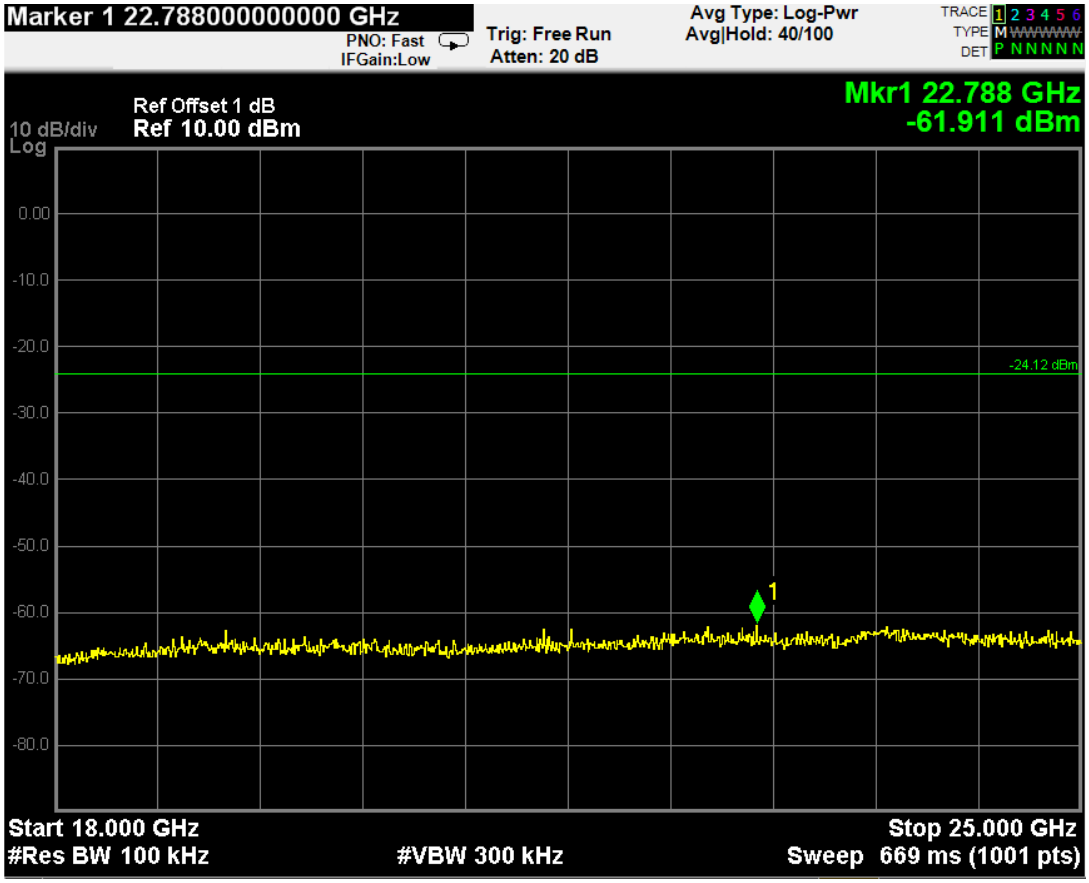

Marker 1 23.530000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 32/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 23.530 GHz
-61.715 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-23.54 dBm
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)

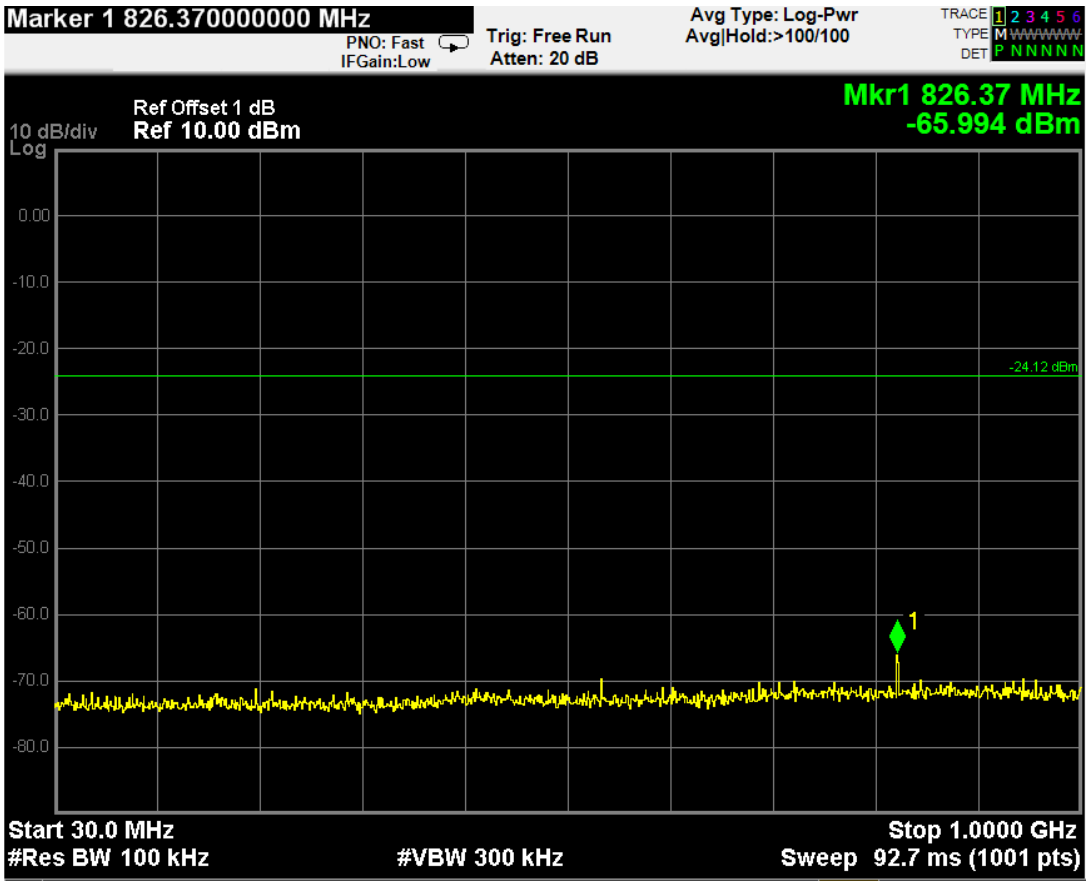

Marker 1 813.760000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 813.76 MHz
-66.684 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-23.54 dBm
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)

3DH5Ch 78


Display Line -24.12 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 45/100
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 2.476 GHz
-4.116 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.12 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)


Marker 1 14.336000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 24/100
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 14.336 GHz
-64.530 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.12 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 18.000 GHz
Sweep 765 ms (1001 pts)


Marker 1 22.788000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 40/100
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 22.788 GHz
-61.911 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.12 dBm
1
Start 18.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 669 ms (1001 pts)


Marker 1 826.370000000 MHz
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 826.37 MHz
-65.994 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-24.12 dBm
1
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 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.	EXA Signal Analyzer	Agilent	N9010A	MY52221182	May 25, 2017	May 24, 2018

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.

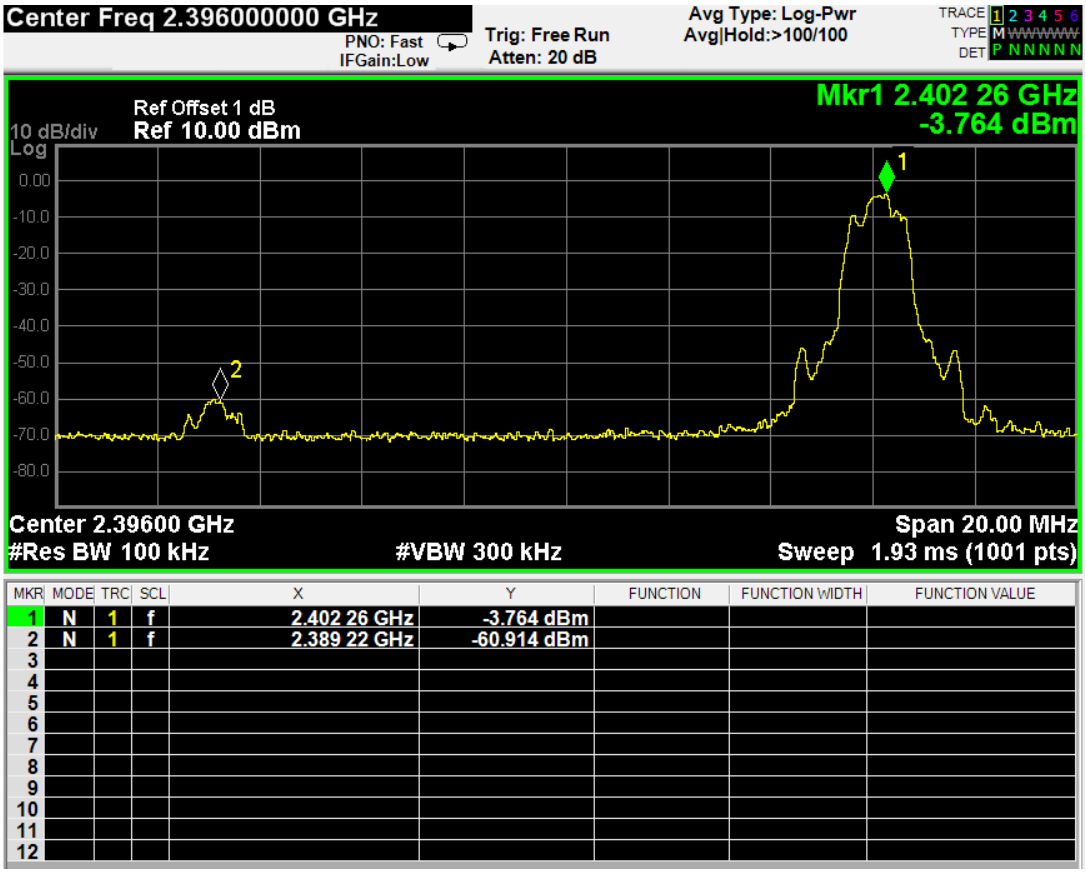
8.6 Test Results

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

(Test Date: 2018.02.10 Temperature: 23℃ Humidity: 50 %)

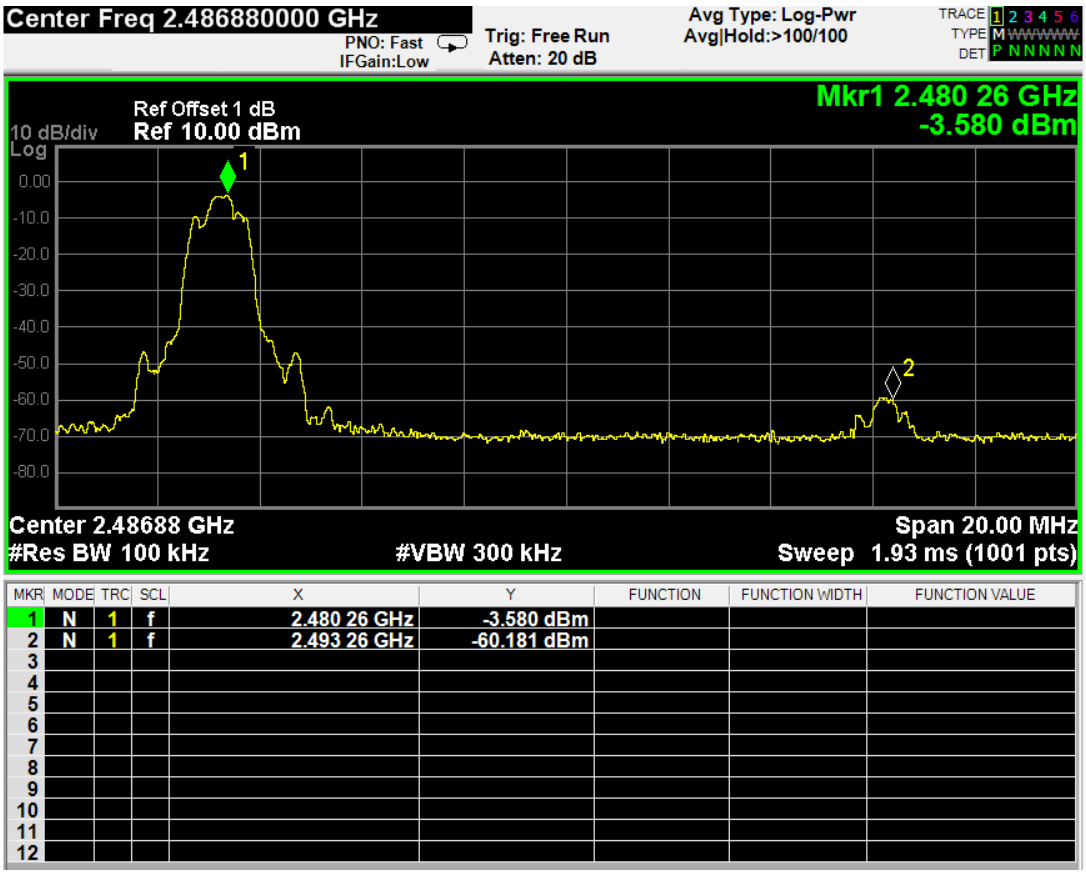
Hopping off

DH1Ch 00



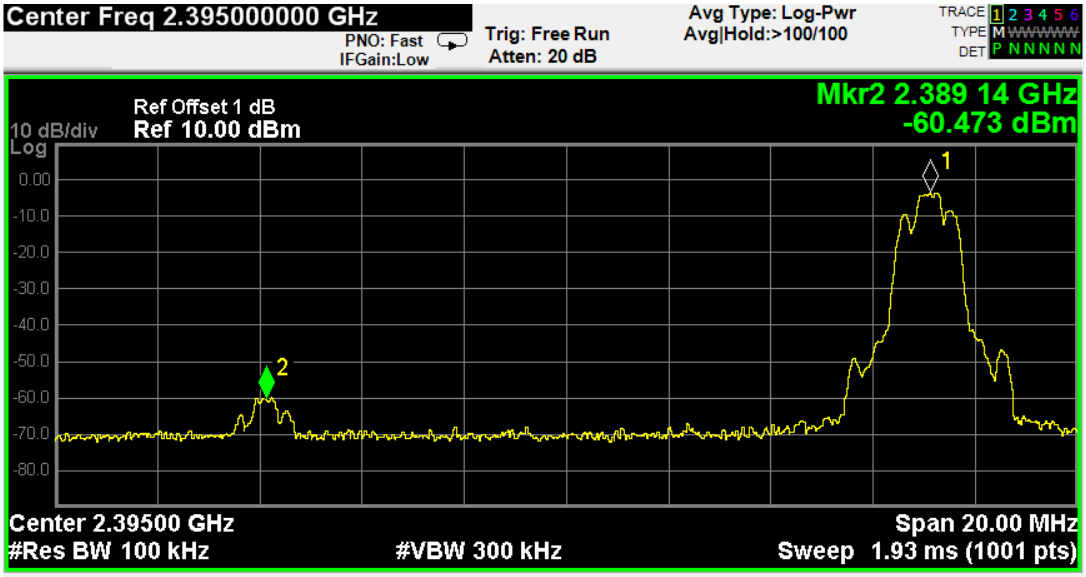
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.402 26 GHz	-3.764 dBm			
2	N	1	f	2.389 22 GHz	-60.914 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

DH1Ch 78



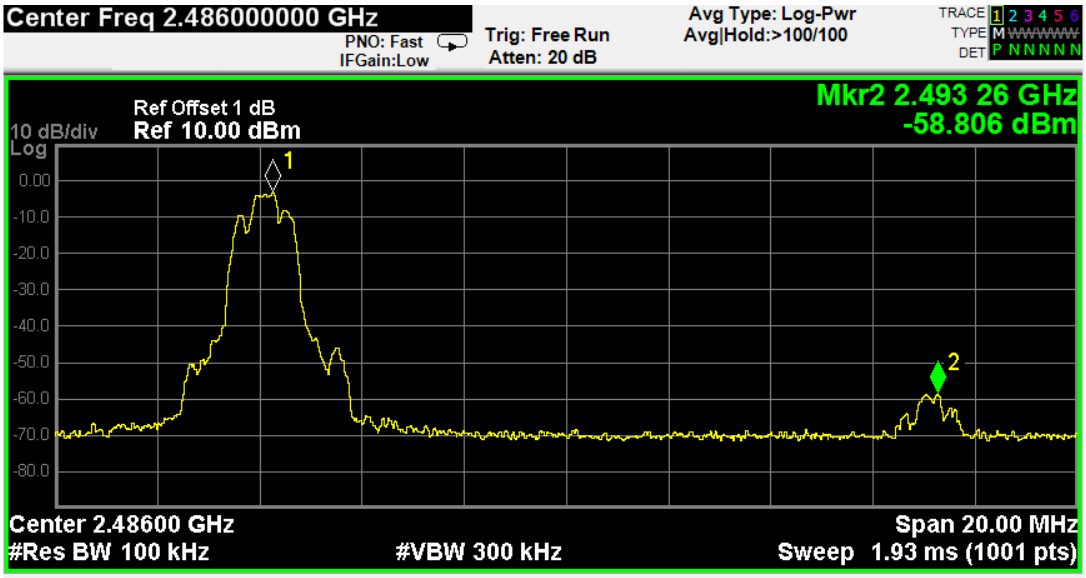
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 26 GHz	-3.580 dBm			
2	N	1	f	2.493 26 GHz	-60.181 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH1Ch 00



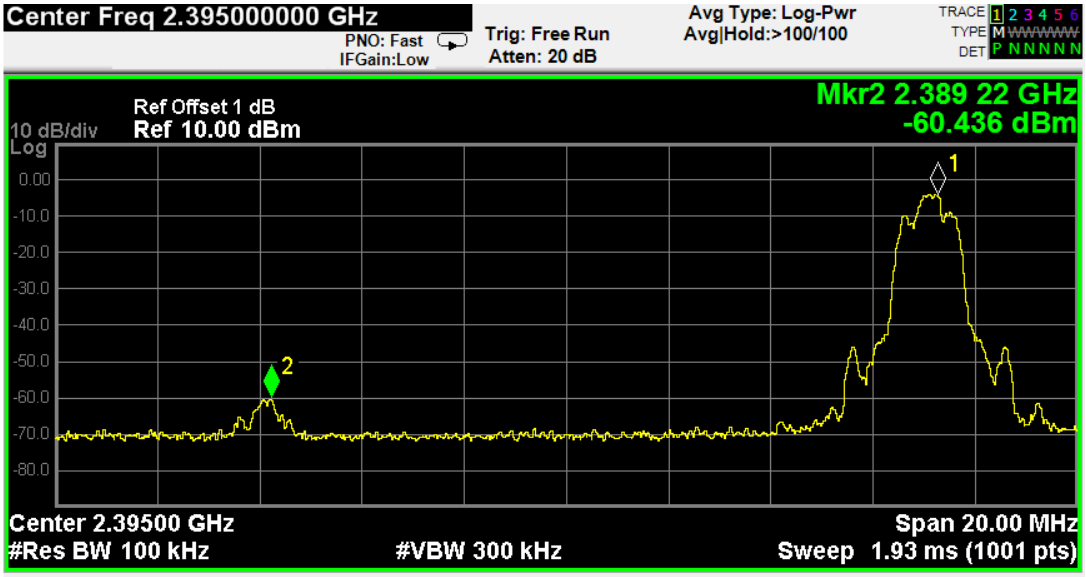
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.402 12 GHz	-3.892 dBm			
2	N	1	f	2.389 14 GHz	-60.473 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH1Ch 78



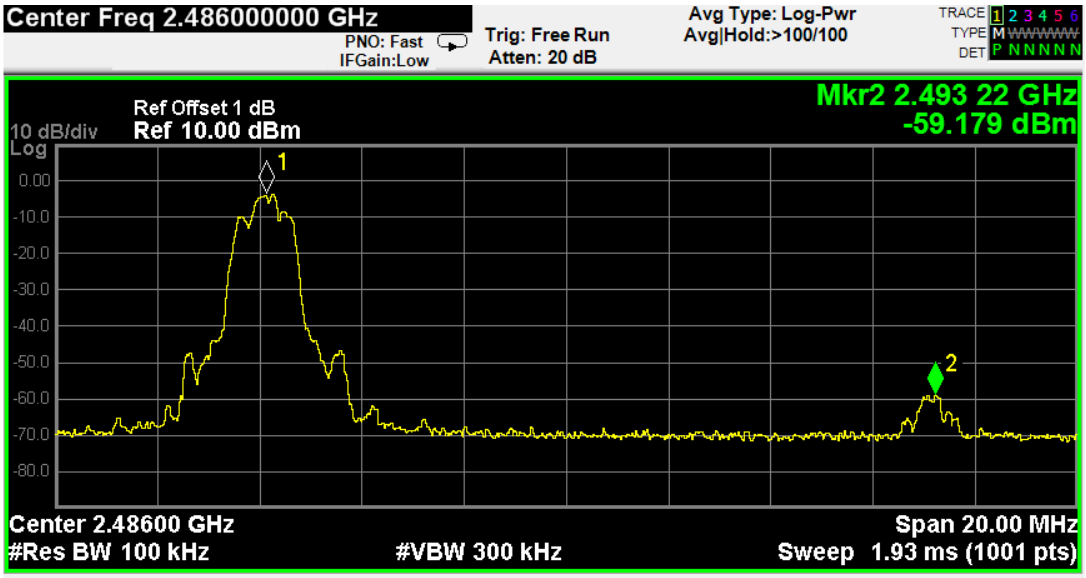
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 26 GHz	-3.530 dBm			
2	N	1	f	2.493 26 GHz	-58.806 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

DH3Ch 00



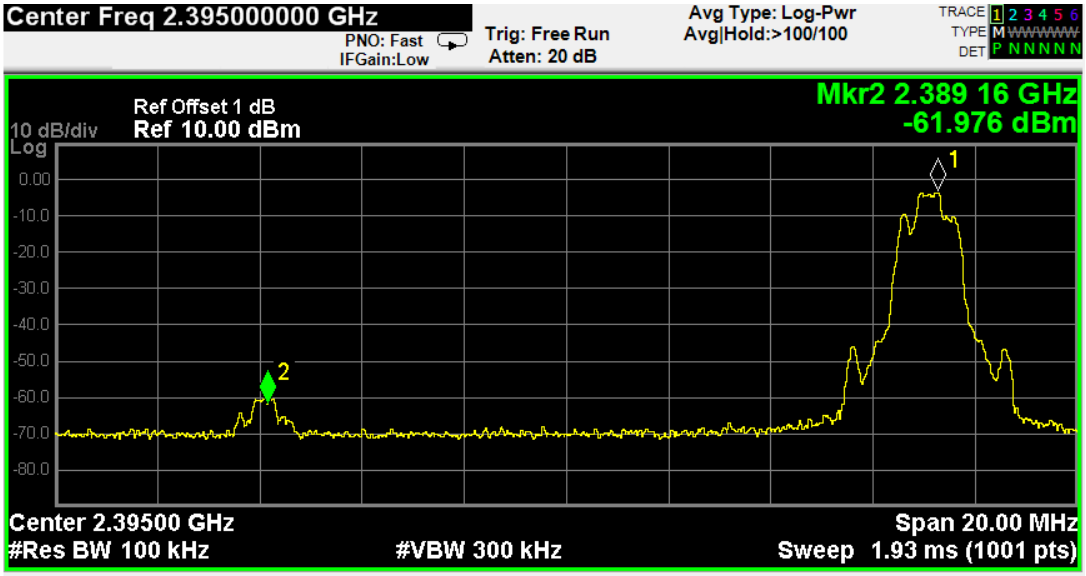
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.402 26 GHz	-4.583 dBm			
2	N	1	f	2.389 22 GHz	-60.436 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

DH3Ch 78



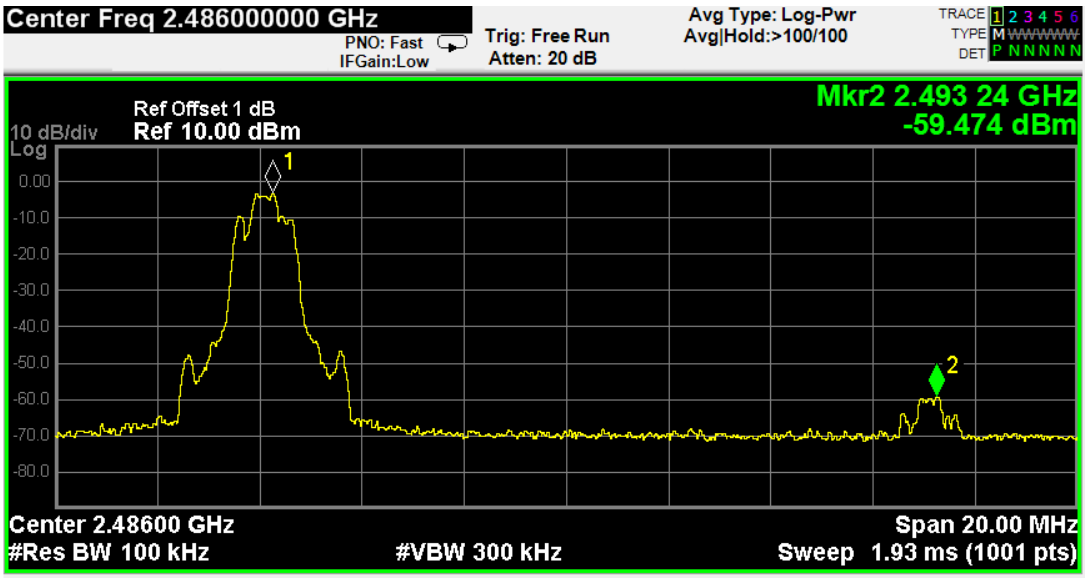
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 12 GHz	-3.992 dBm			
2	N	1	f	2.493 22 GHz	-59.179 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH3Ch 00



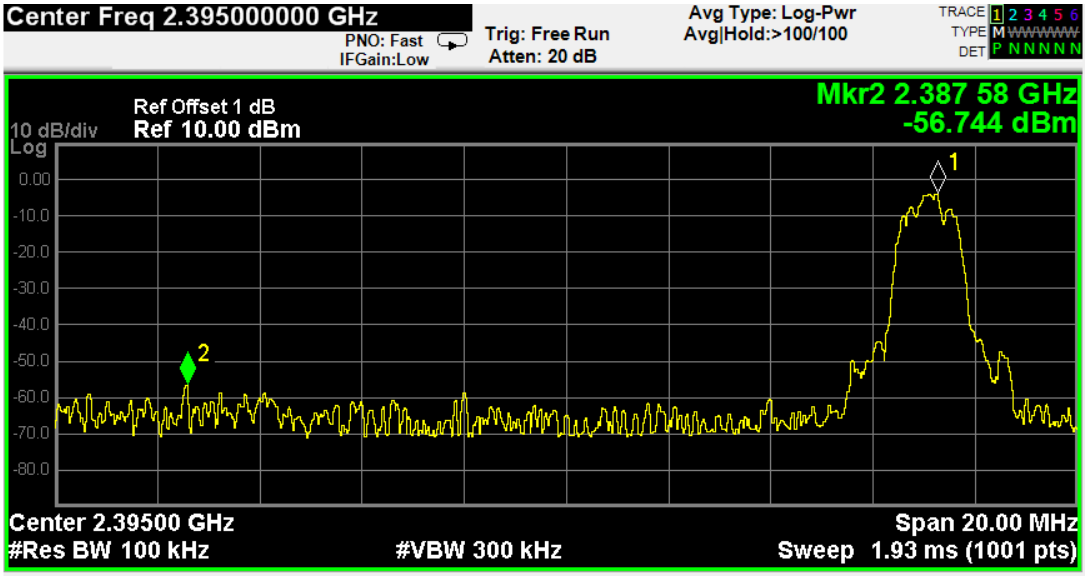
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.402 26 GHz	-3.614 dBm			
2	N	1	f	2.389 16 GHz	-61.976 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH3Ch 78



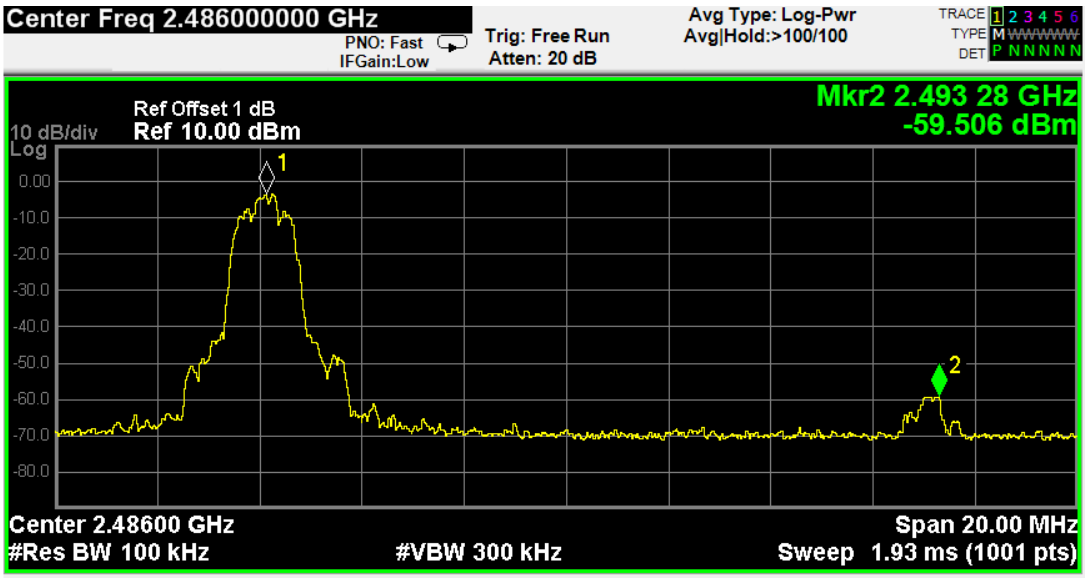
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 26 GHz	-3.417 dBm			
2	N	1	f	2.493 24 GHz	-59.474 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

DH5Ch 00



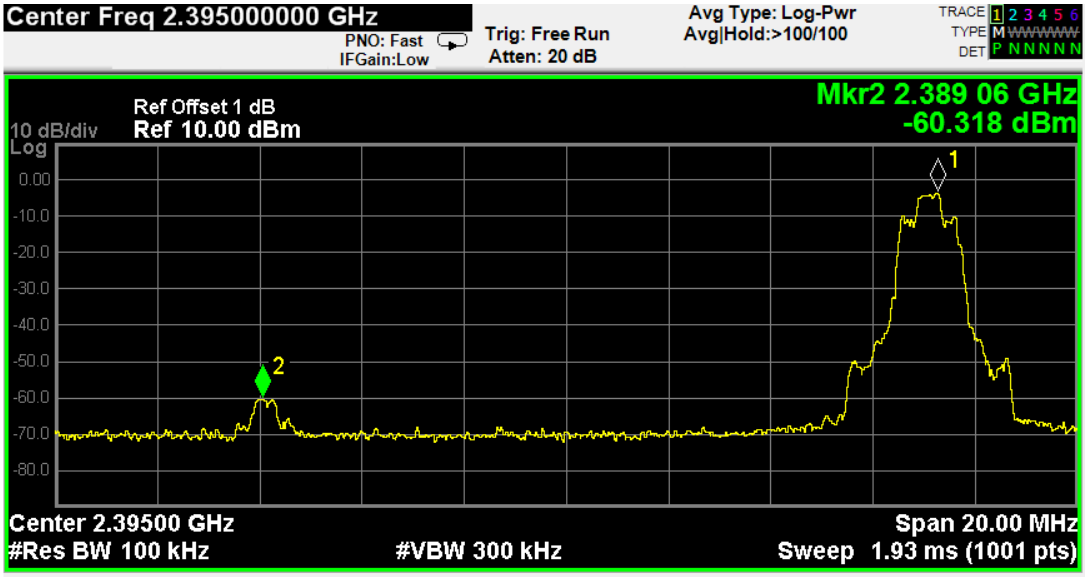
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.402 26 GHz	-4.243 dBm			
2	N	1	f	2.387 58 GHz	-56.744 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

DH5Ch 78



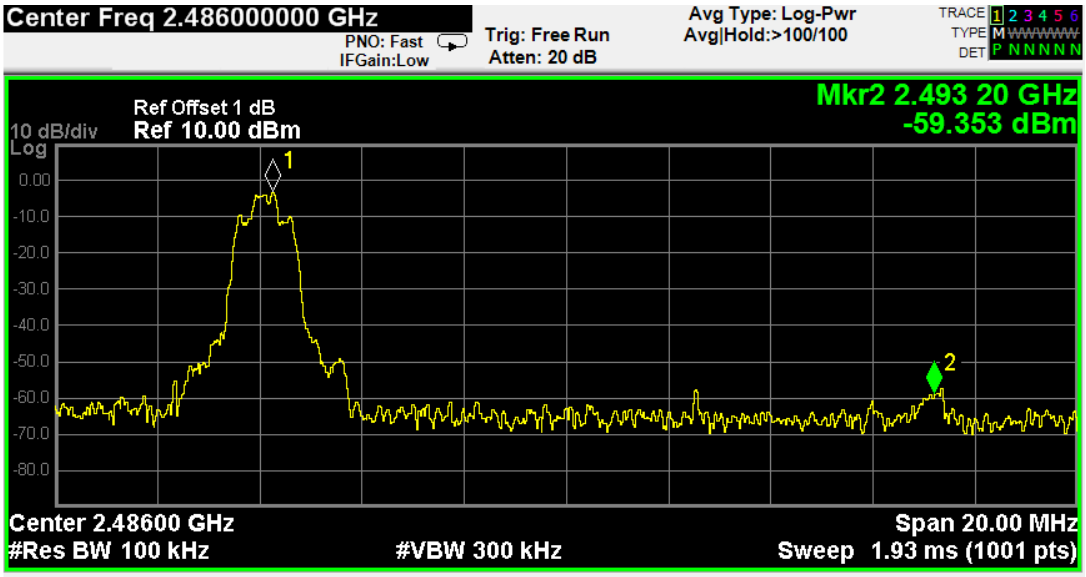
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 12 GHz	-3.905 dBm			
2	N	1	f	2.493 28 GHz	-59.506 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH5Ch 00



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.402 26 GHz	-3.707 dBm			
2	N	1	f	2.389 06 GHz	-60.318 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

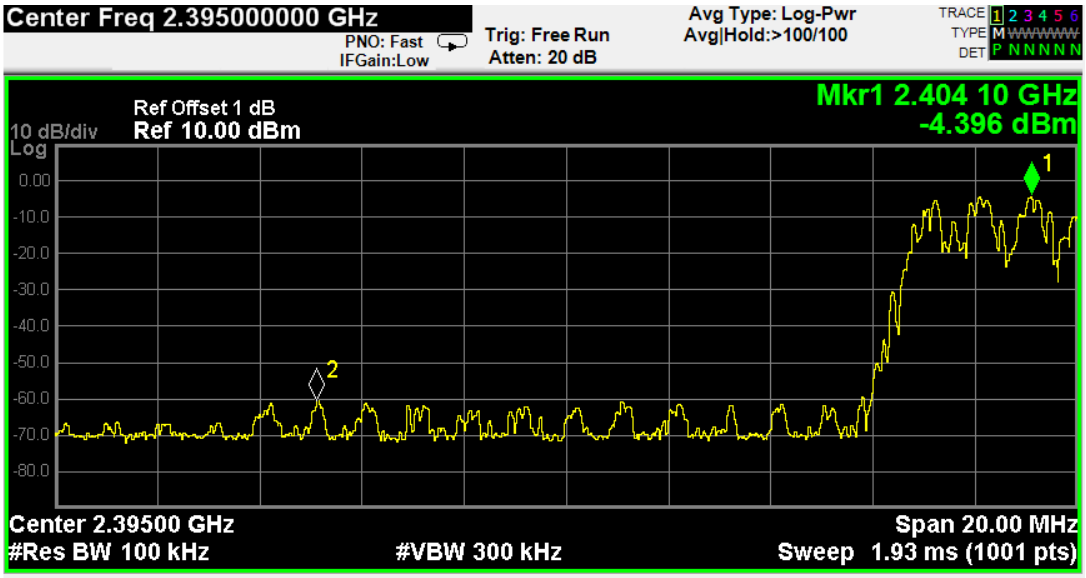
3DH5Ch 78



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 26 GHz	-3.452 dBm			
2	N	1	f	2.493 20 GHz	-59.353 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

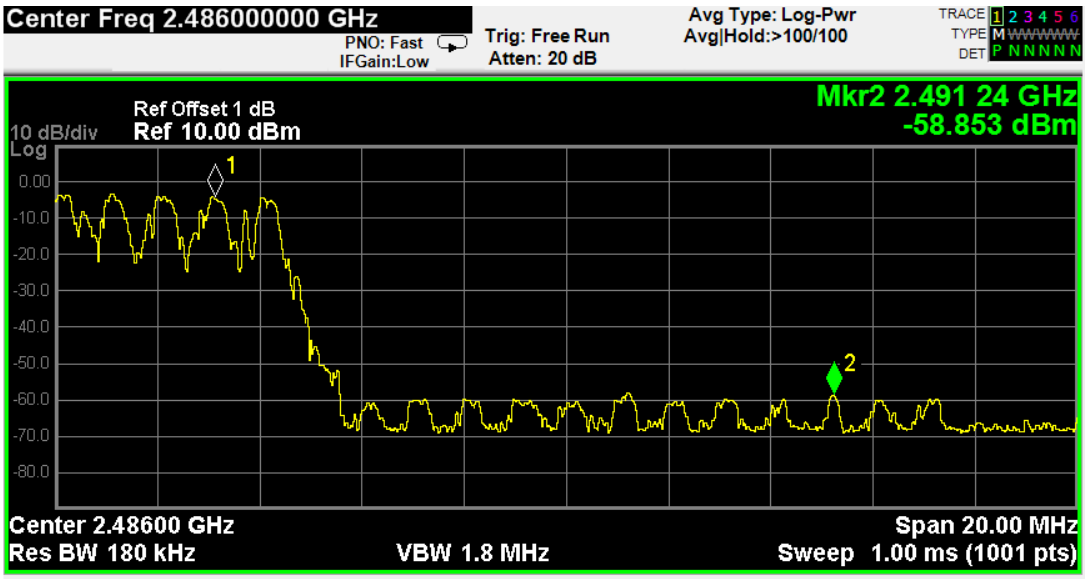
Hopping

DH1Ch 00



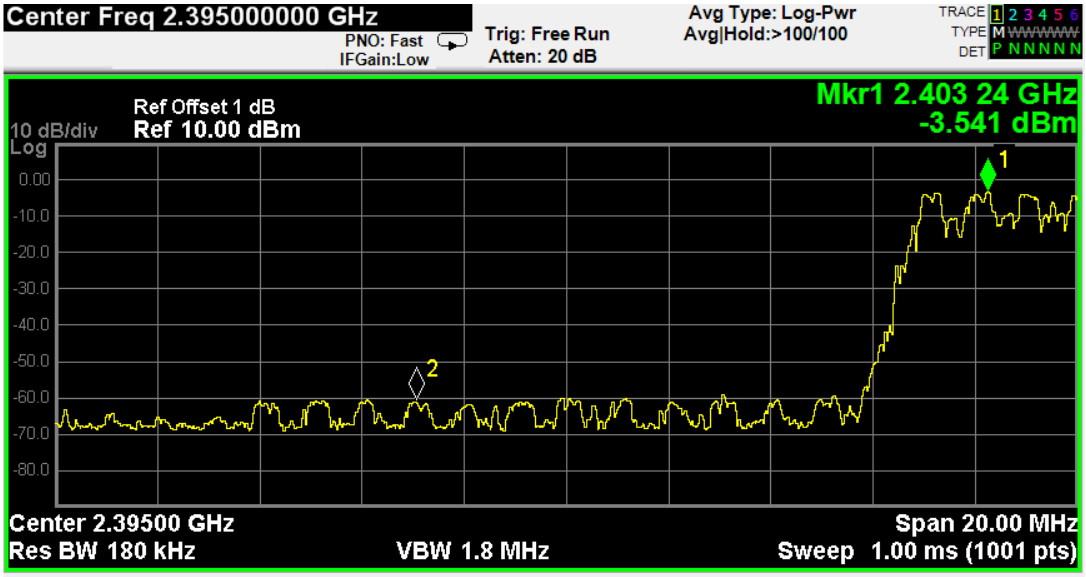
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.404 10 GHz	-4.396 dBm			
2	N	1	f	2.390 12 GHz	-60.896 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

DH1Ch 78



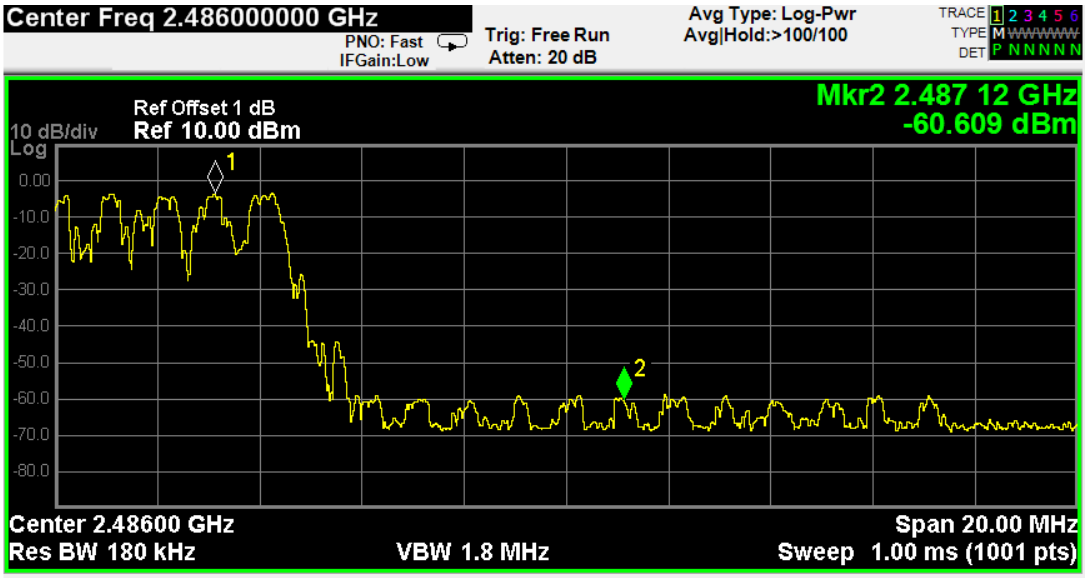
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.479 12 GHz	-4.651 dBm			
2	N	1	f	2.491 24 GHz	-58.853 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH1Ch 00



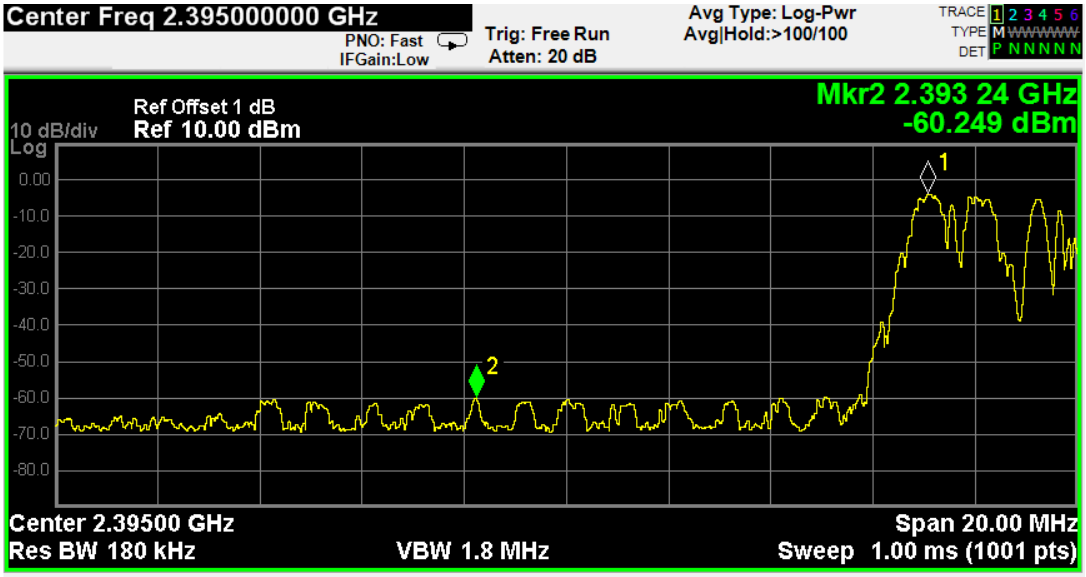
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.403 24 GHz	-3.541 dBm			
2	N	1	f	2.392 06 GHz	-60.984 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH1Ch 78



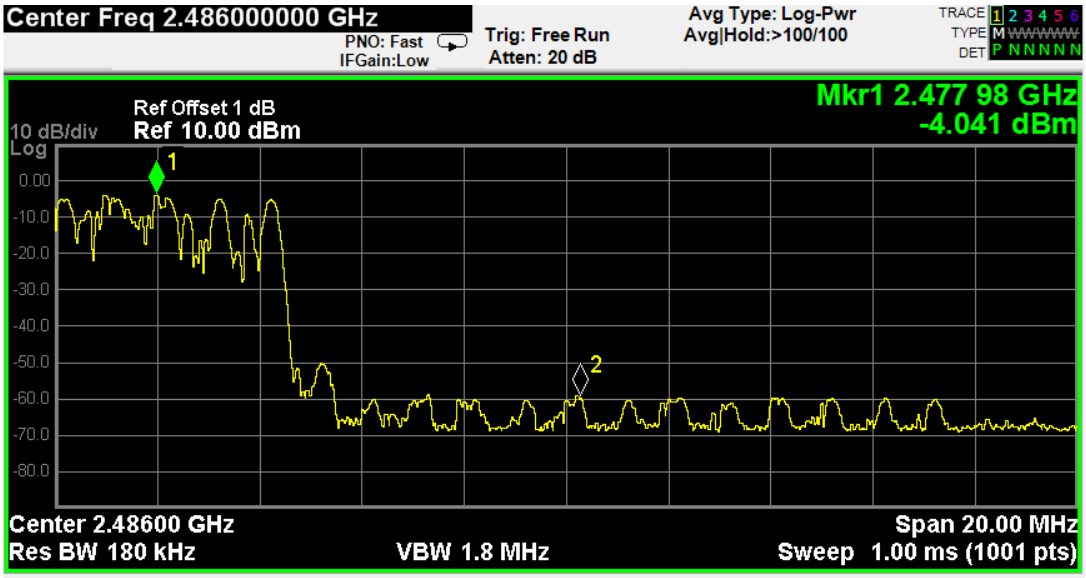
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.479 12 GHz	-3.831 dBm			
2	N	1	f	2.487 12 GHz	-60.609 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

DH3Ch 00



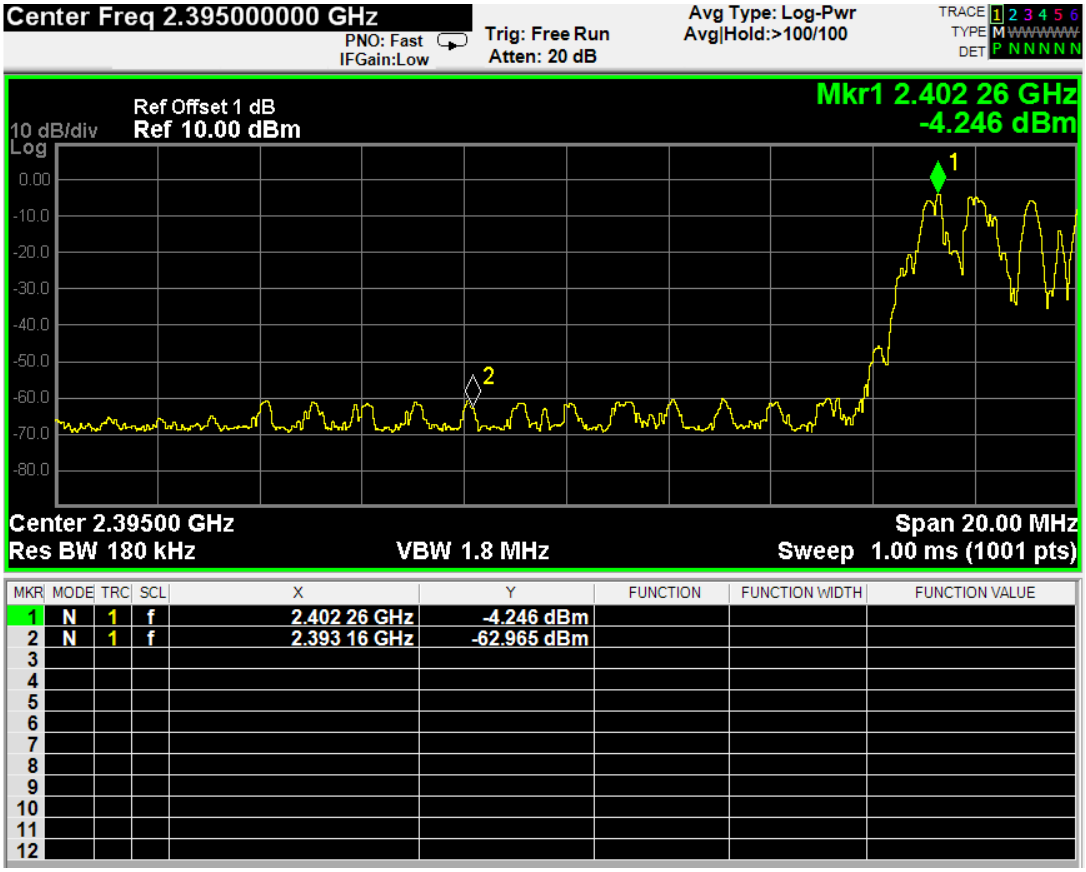
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.402 06 GHz	-4.201 dBm			
2	N	1	f	2.393 24 GHz	-60.249 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

DH3Ch 78



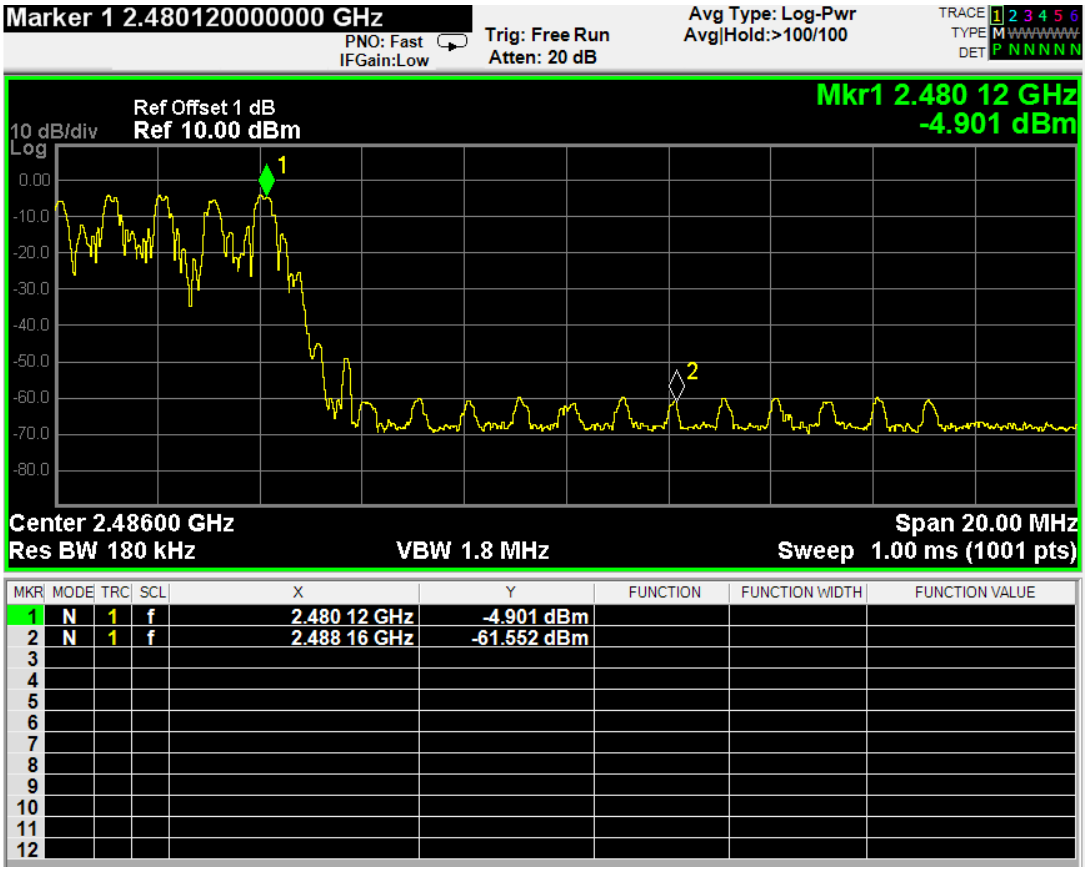
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.477 98 GHz	-4.041 dBm			
2	N	1	f	2.486 28 GHz	-59.725 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH3Ch 00



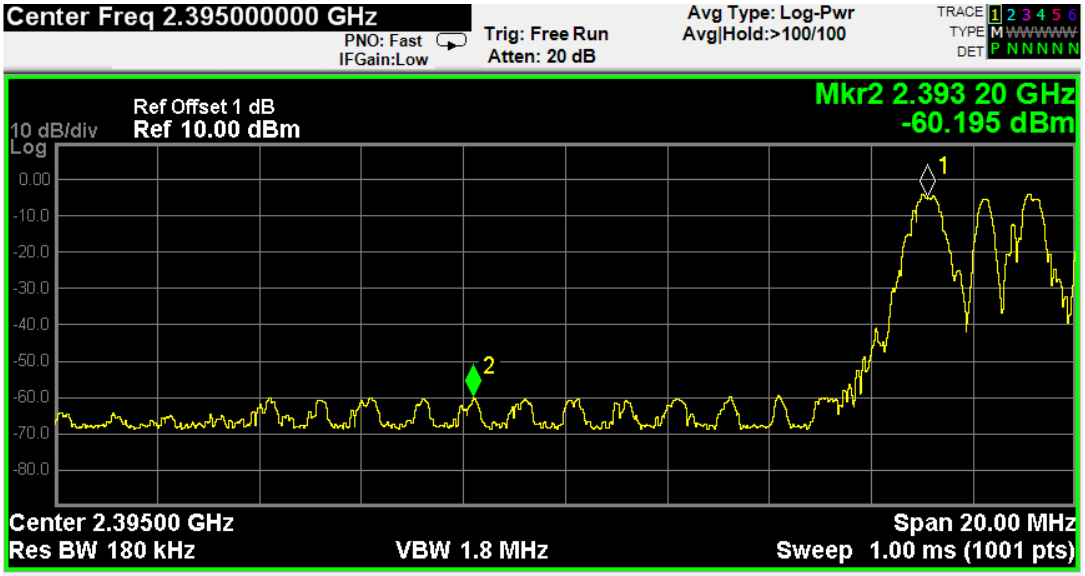
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.402 26 GHz	-4.246 dBm			
2	N	1	f	2.393 16 GHz	-62.965 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH3Ch 78



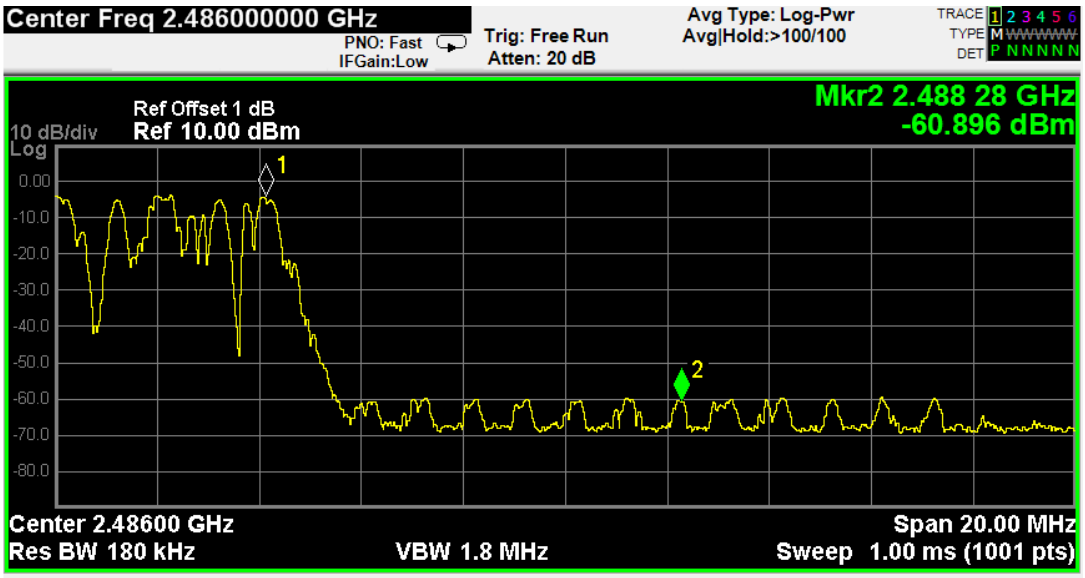
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 12 GHz	-4.901 dBm			
2	N	1	f	2.488 16 GHz	-61.552 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

DH5Ch 00



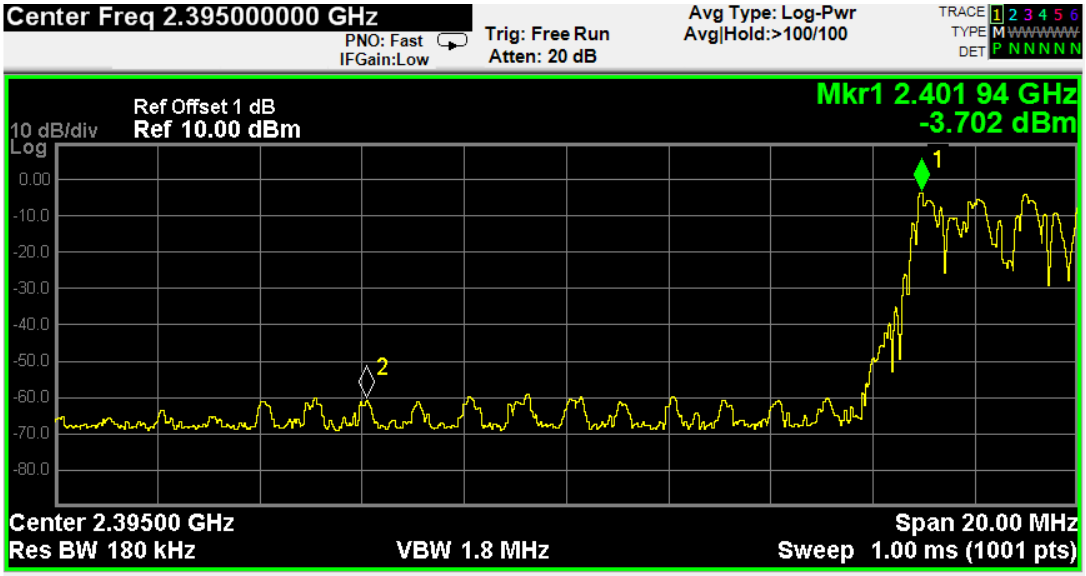
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.402 10 GHz	-5.318 dBm			
2	N	1	f	2.393 20 GHz	-60.195 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

DH5Ch 78



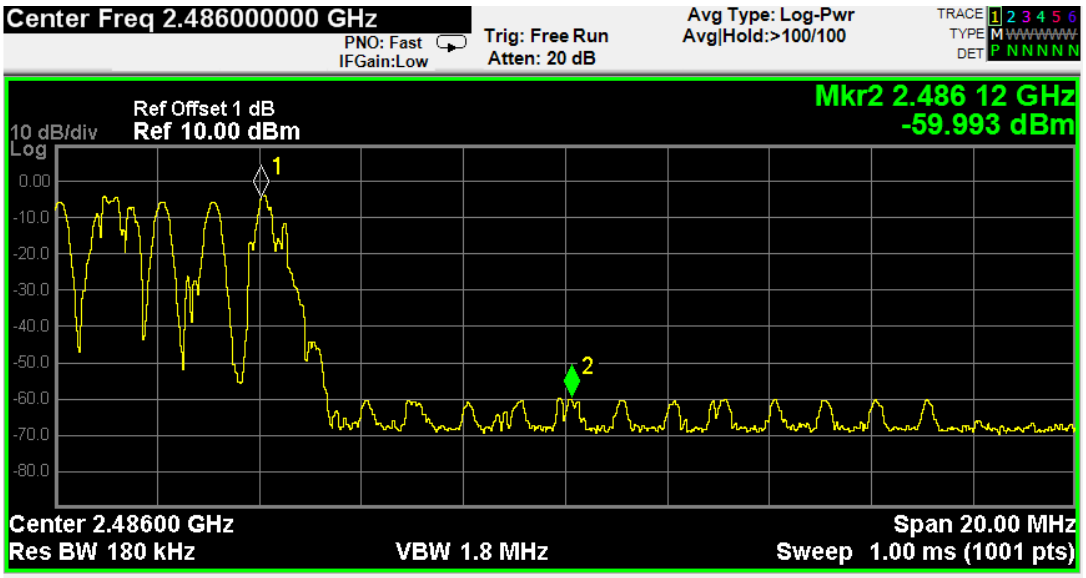
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 12 GHz	-4.650 dBm			
2	N	1	f	2.488 28 GHz	-60.896 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH5Ch 00



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.401 94 GHz	-3.702 dBm			
2	N	1	f	2.391 10 GHz	-60.729 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

3DH5Ch 78



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 04 GHz	-5.041 dBm			
2	N	1	f	2.486 12 GHz	-59.993 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

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.	EXA Signal Analyzer	Agilent	N9010A	MY52221182	May 25, 2017	May 24, 2018

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

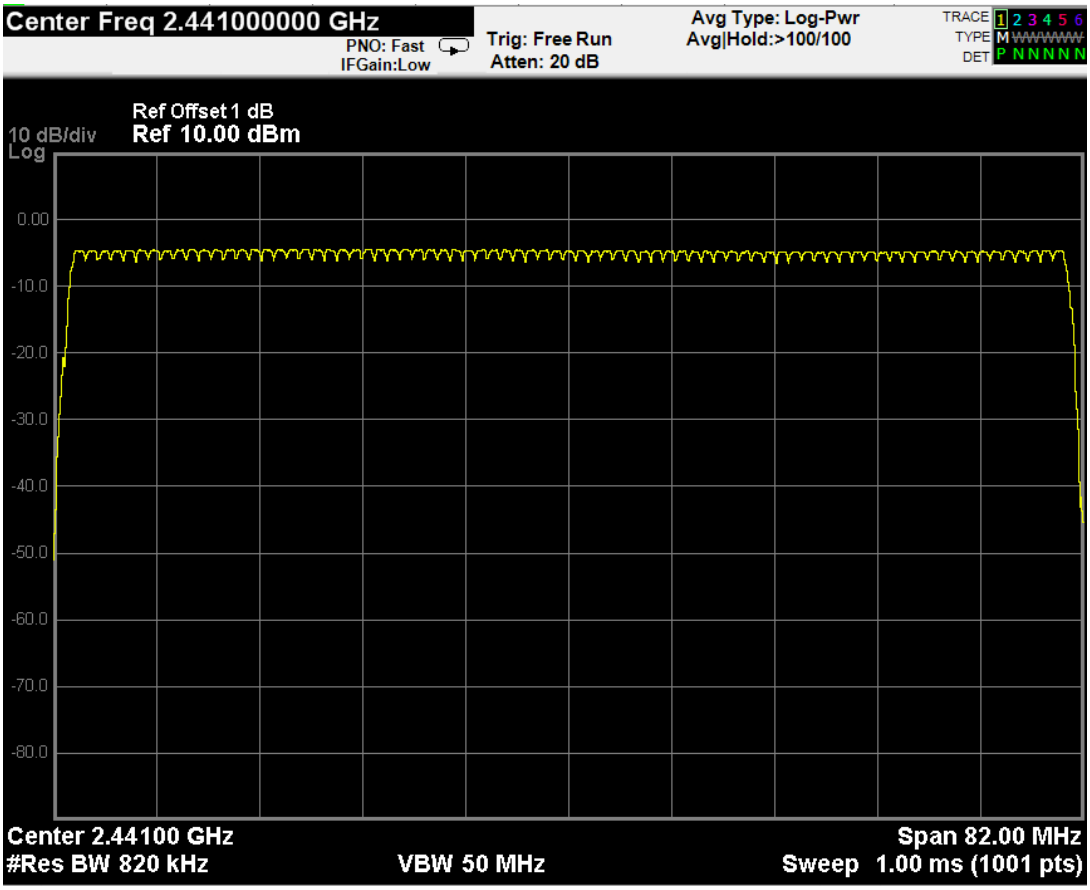
The transmitter output was connected to the spectrum analyzer. The spectrum analyzer was set as RBW = 820kHz, VBW≥ RBW, count the number of hopping frequencies used and recorded.
The test procedure is defined in DA 00-705.

9.6 Test Results

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

(Test Date: 2018.02.10 Temperature: 23℃ Humidity:50 %)

Result	Limit	Conclusion
79	> 15	Pass


Center Freq 2.441000000 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
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.44100 GHz
#Res BW 820 kHz
VBW 50 MHz
Span 82.00 MHz
Sweep 1.00 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.	EXA Signal Analyzer	Agilent	N9010A	MY52221182	May 25, 2017	May 24, 2018

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.

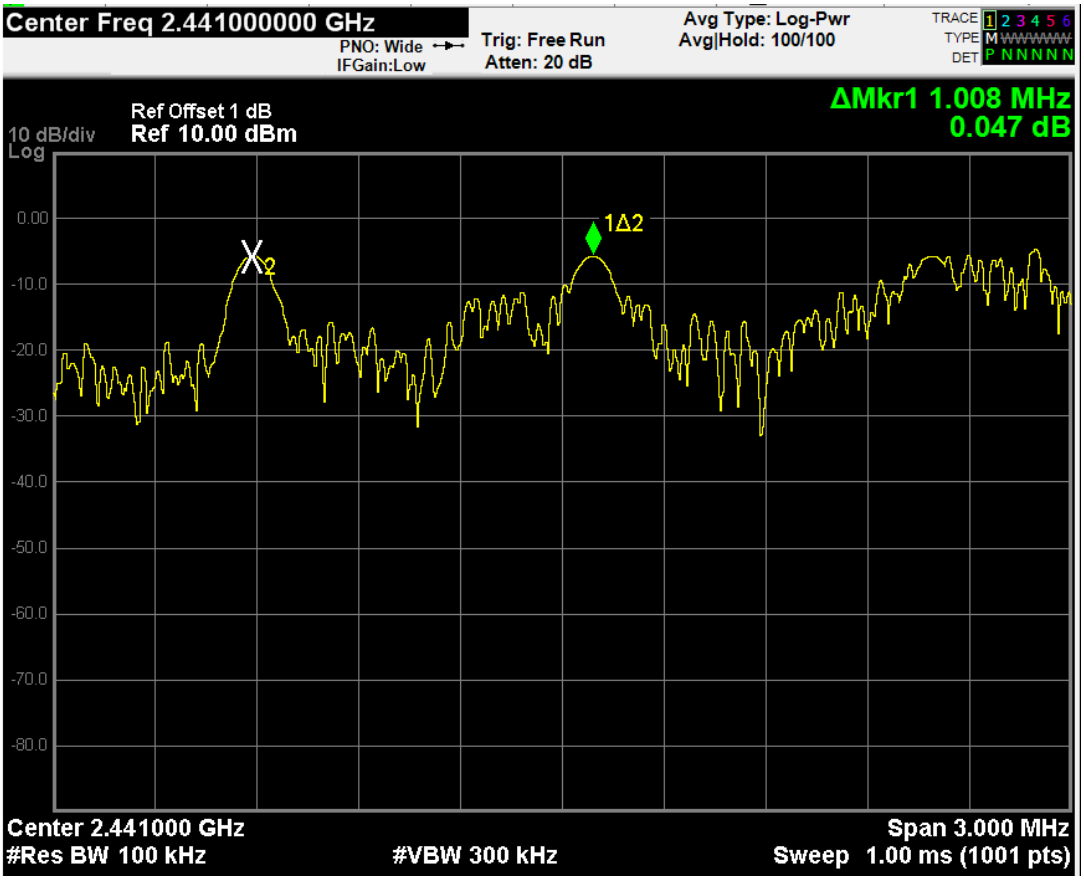
10.6 Test Results

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

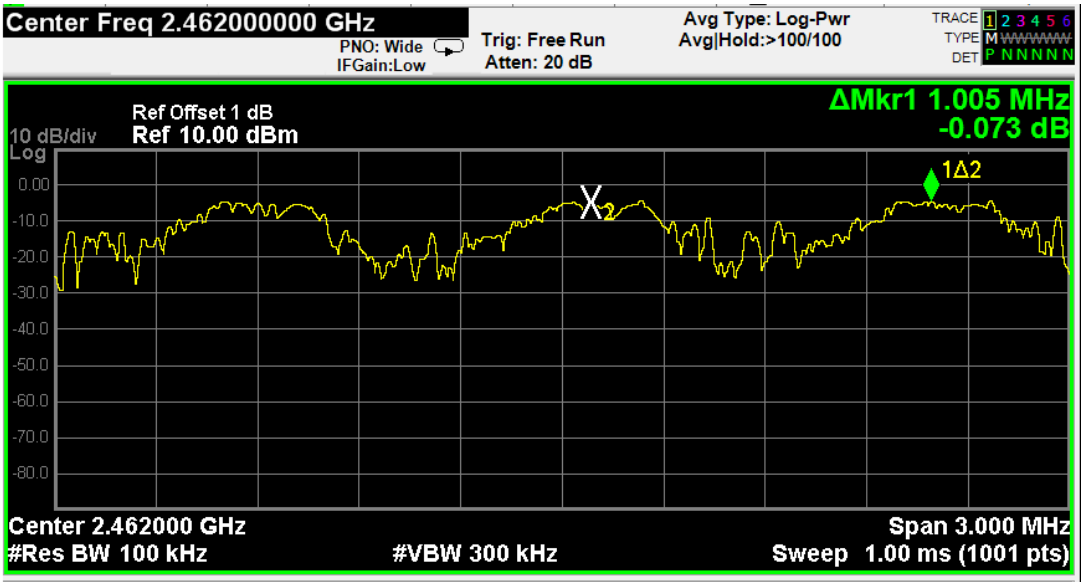
(Test Date: 2018.02.10 Temperature: 23℃ Humidity: 50 %)

Mode	Result	Limit (2/3 of the 20dB bandwidth)	Conclusion
DH1	1.008 MHz	> 0.560 MHz	Pass
3DH5	1.005 MHz	> 0.804 MHz	Pass

DH1



3DH5



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	1	f	(Δ) 1.005 MHz	(Δ) -0.073 dB			
2	F	1	f	2.462 084 GHz	-4.780 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

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.	EXA Signal Analyzer	Agilent	N9010A	MY52221182	May 25, 2017	May 24, 2018

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

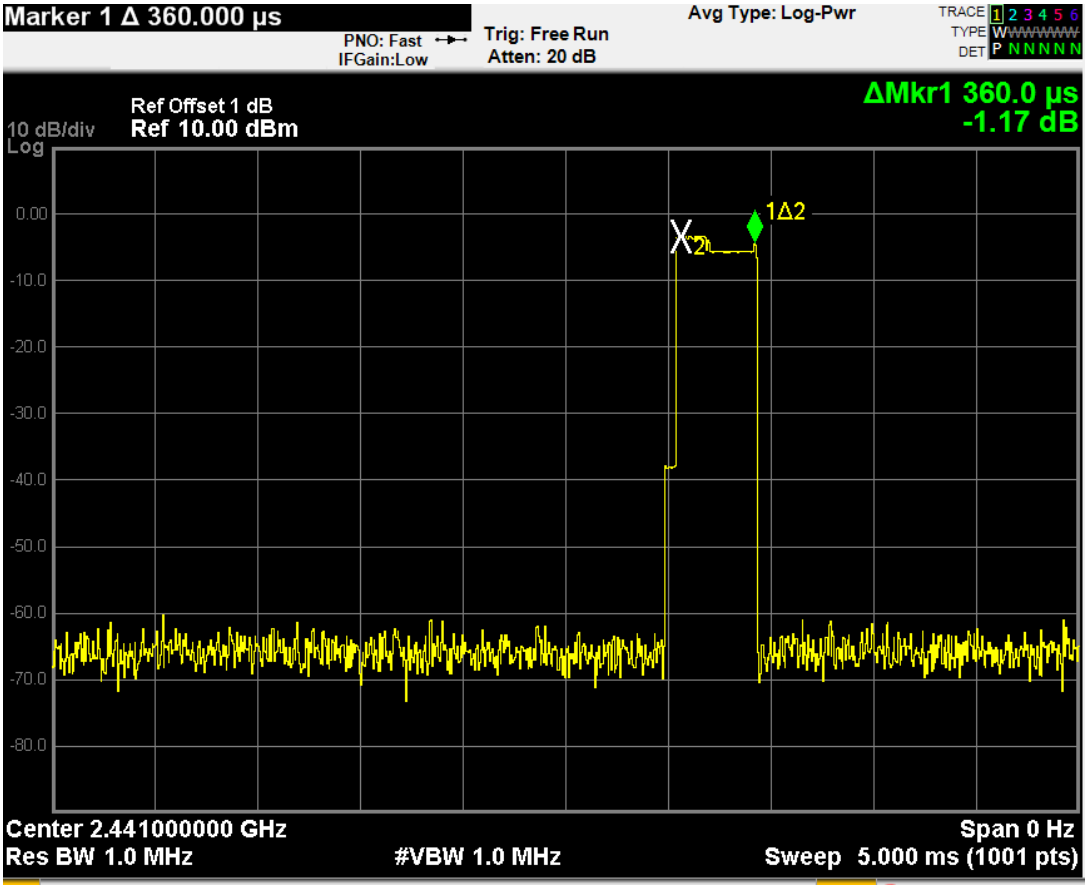
PASSED. All the test results are attached in next pages.

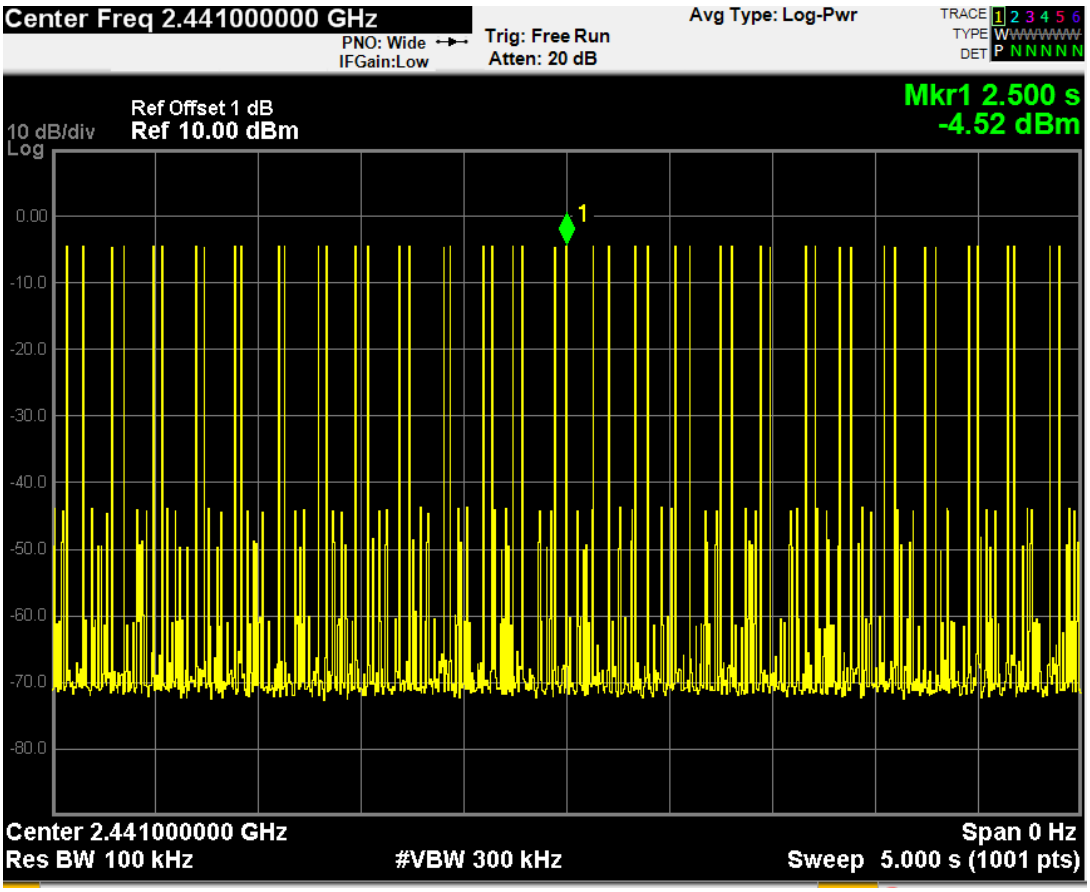
(Test Date: 2018.02.10 Temperature: 23℃ Humidity: 50 %)

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	0.360	316*0.360 = 113.76	< 400	Pass
DH3	25 times/5 sec * 31.6=158 times	1.635	158*1.635 = 258.33	< 400	Pass
DH5	17 times/5 sec * 31.6=107.44 times	2.875	107.44*2.875 = 308.89	< 400	Pass

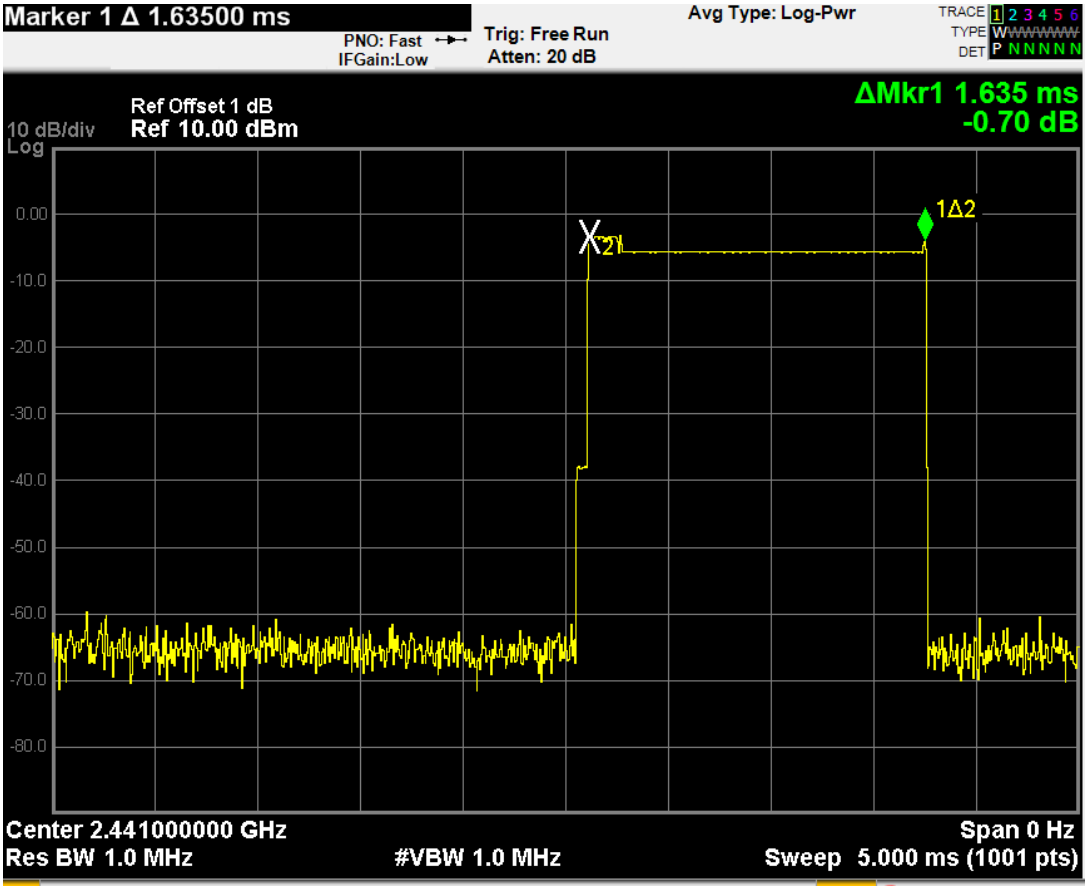
Mode	Number of transmission in a 31.6 (79 hopping*0.4) second period	Length of transmission time (msec)	Result (msec)	Limit (msec)	Conclusion
3DH1	50 times/5 sec * 31.6=316 times	0.360	316*0.360 = 123.76	< 400	Pass
3DH3	26 times/5 sec * 31.6=164.32 times	1.640	164.32*1.640 = 269.49	< 400	Pass
3DH5	19 times/5 sec * 31.6=120.08 times	2.88	120.08*2.870 = 345.83	< 400	Pass

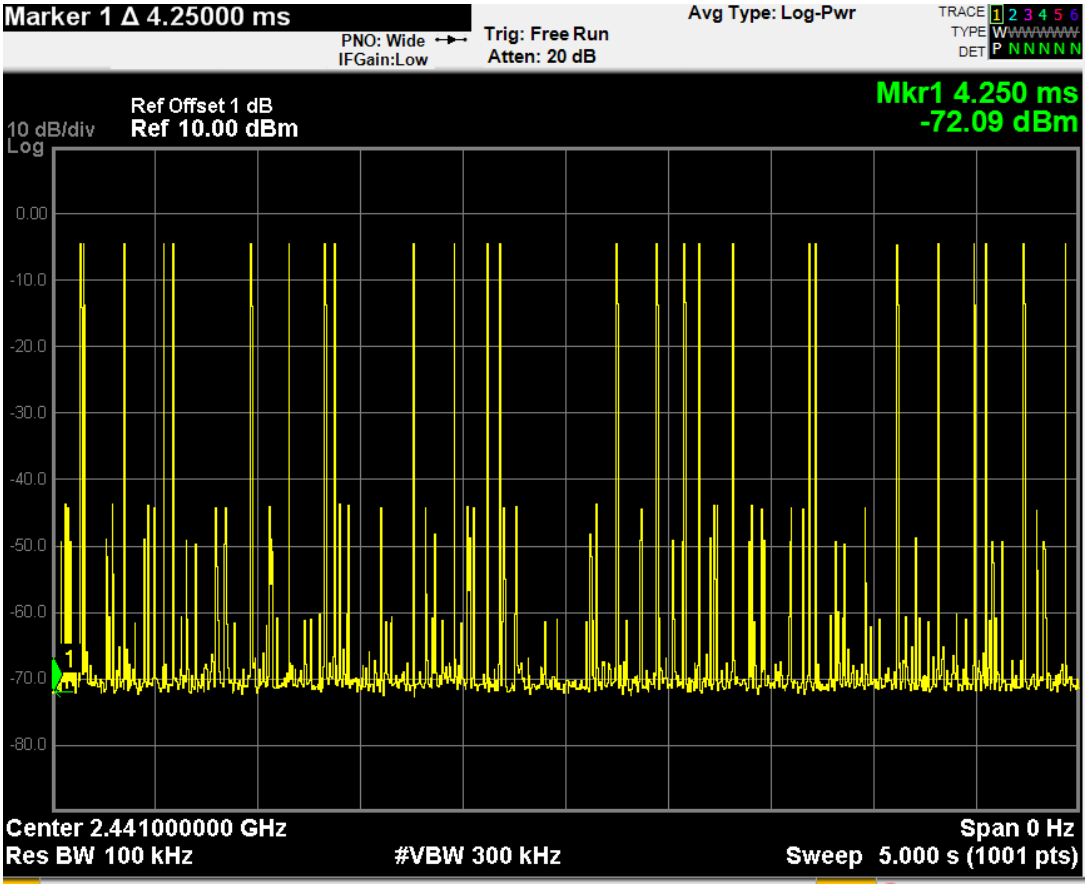
DH1


Marker 1 Δ 360.000 µs
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
ΔMkr1 360.0 µs
-1.17 dB
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)

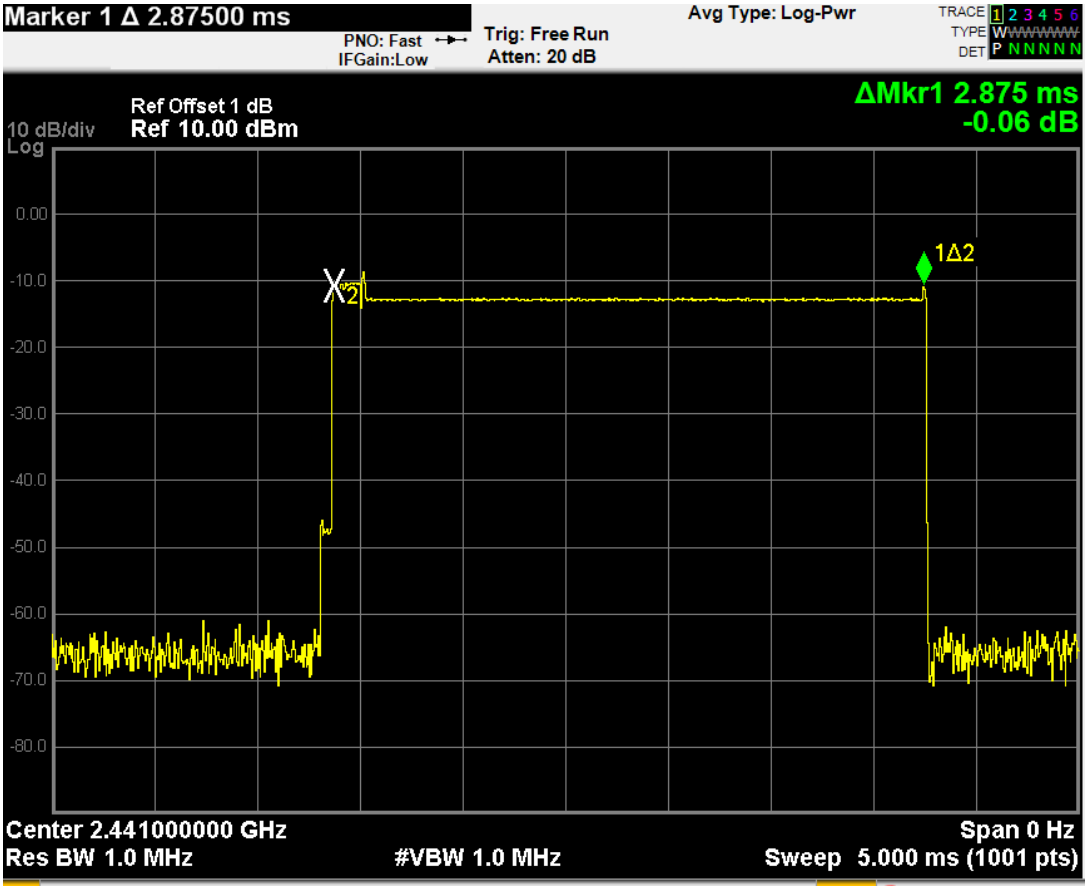

Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.500 s
-4.52 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)

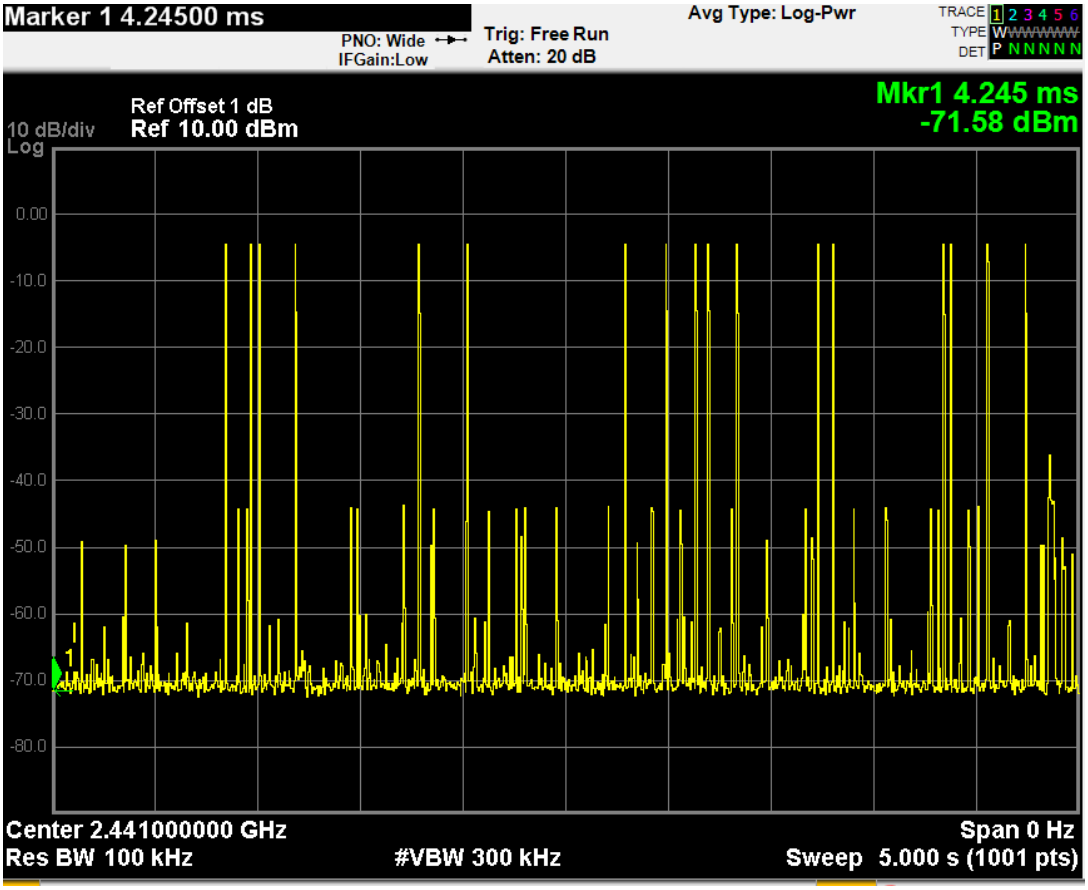
DH3


Marker 1 Δ 1.63500 ms
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
ΔMkr1 1.635 ms
-0.70 dB
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)

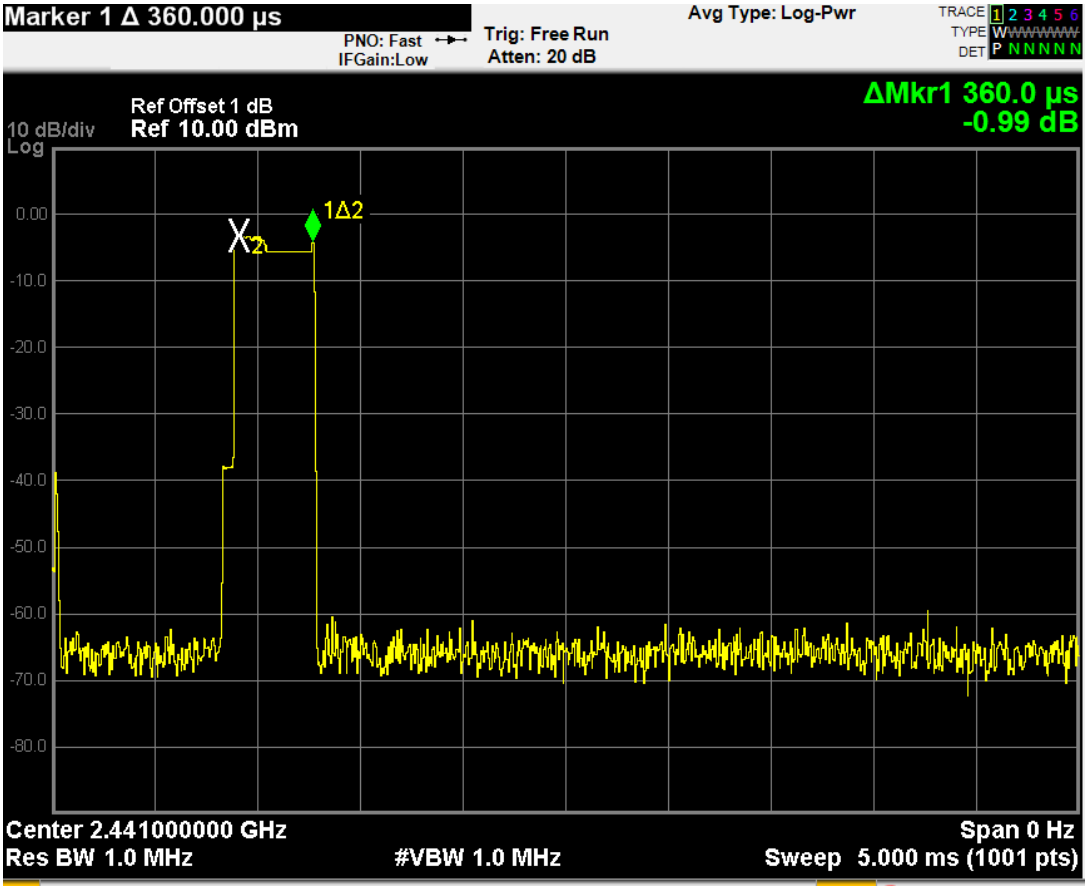

Marker 1 Δ 4.25000 ms
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 4.250 ms
-72.09 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)

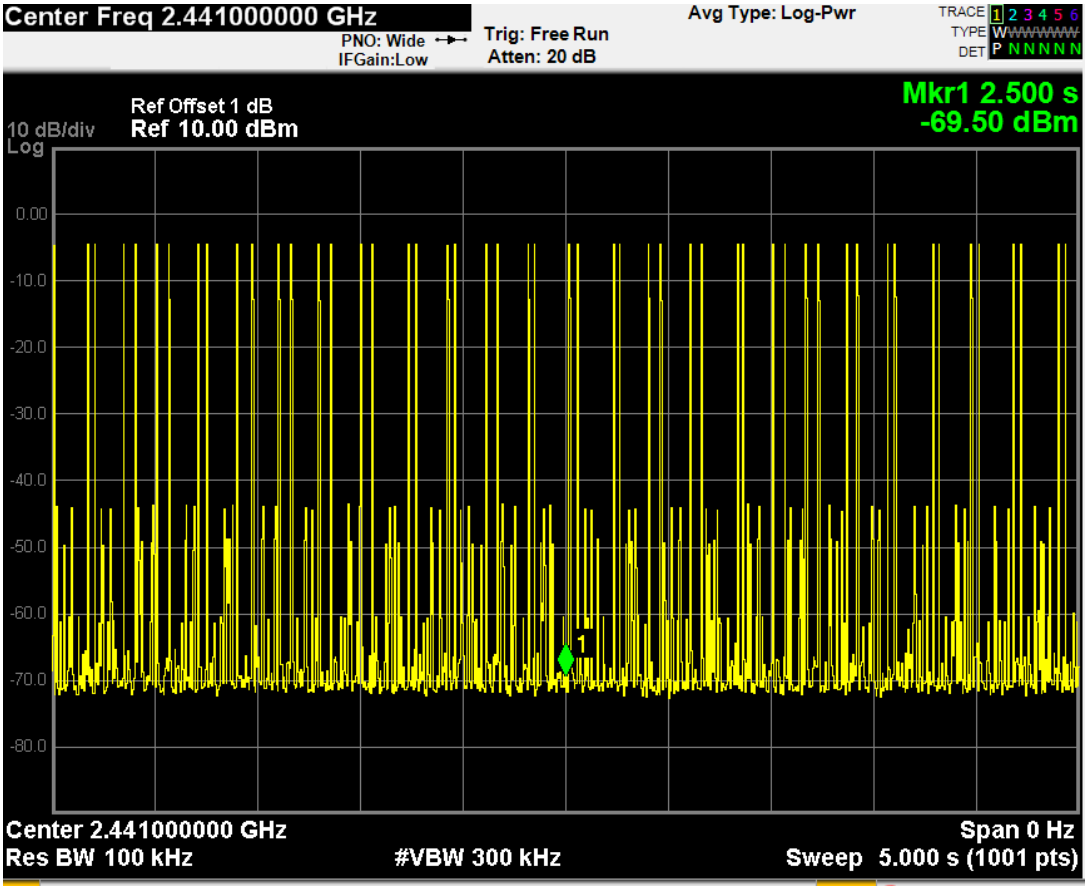
DH5


Marker 1 Δ 2.87500 ms
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
ΔMkr1 2.875 ms
-0.06 dB
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)

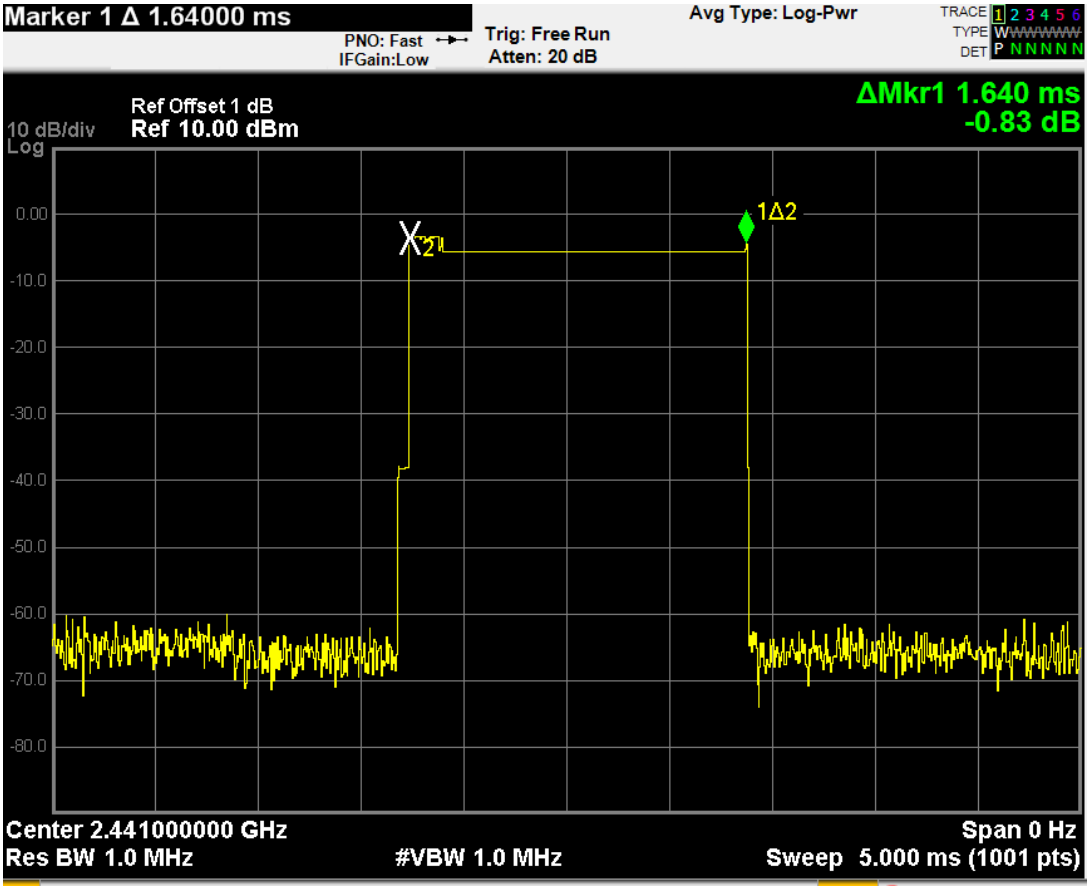

Marker 1 4.24500 ms
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 4.245 ms
-71.58 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)

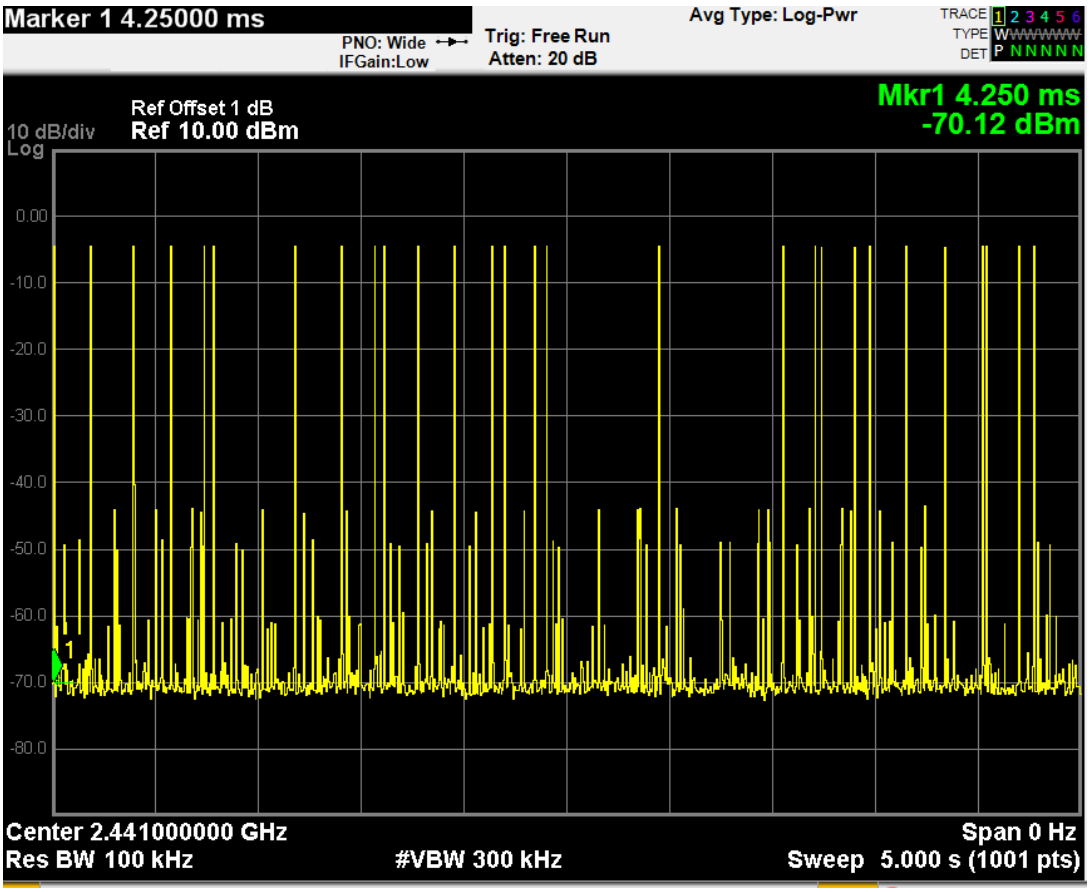
3DH1


Marker 1 Δ 360.000 µs
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
ΔMkr1 360.0 µs
-0.99 dB
1Δ2
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)

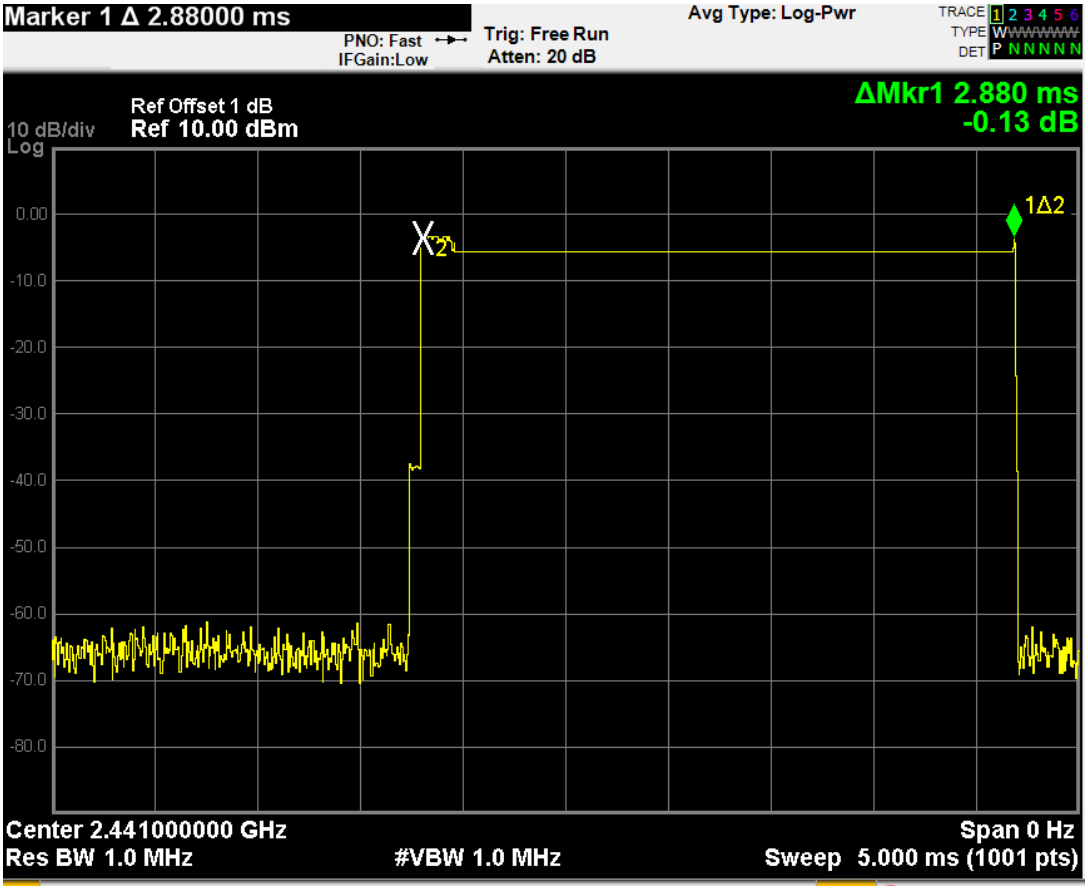

Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.500 s
-69.50 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)

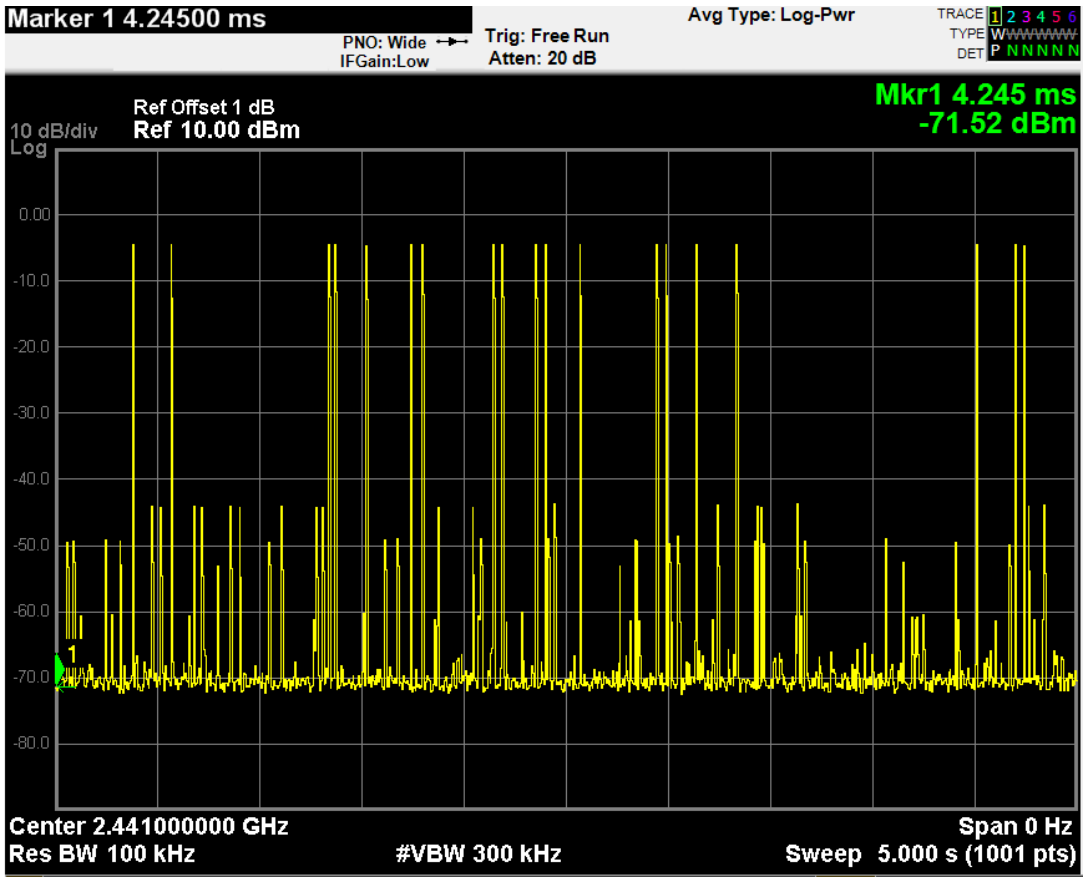
3DH3


Marker 1 Δ 1.64000 ms
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
ΔMkr1 1.640 ms
-0.83 dB
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)


Marker 1 4.25000 ms
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 4.250 ms
-70.12 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)

3DH5


Marker 1 Δ 2.88000 ms
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
ΔMkr1 2.880 ms
-0.13 dB
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)


Marker 1 4.24500 ms
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W
DET P N N N N N
Ref Offset 1 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 4.245 ms
-71.52 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
1
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)

12 DEVIATION TO TEST SPECIFICATIONS

None.