

Product Name: Smart Phone	Report No: FCC022023-00288RF1
Product Model: V20Pro	Security Classification: Open
Version: V1.0	Total Page: 71

TIRT Testing Report

Prepared By:	Checked By:	Approved By:	
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RF TEST REPORT

FCC ID: 2AX4YV20PRO

According to

47 CFR FCC Part 15, Subpart C(Section 15.247)

ANSI C63.10:2013

Equipment : Smart Phone
Model No. : V20Pro
Trademark : DOOGEE
Applicant : Shenzhen DOOGEE Hengtong Technology CO.,LTD
B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park, No. 22,
Longhua New District, Shenzhen, China

- The test result referred exclusively to the presented test model /sample.
- Without written approval of TIRT Inc. the test report shall not reproduced except in full.
- Test date: 2023/02/01~2023/02/14

Lab: Beijing TIRT Technology Service Co.,Ltd Shenzhen

Add: 101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street,
Pingshan District, Shenzhen, China

TEL: +86-0755-27087573

TABLE OF CONTENTS

Description	Page
1. Summary of Standards And Results -----	6
1.1. Description of Standards and Results -----	6
2. General Information -----	7
2.1. Description of Device (EUT) -----	7
2.2. Accessories of Device (EUT) -----	8
2.3. Tested Supporting System Details -----	8
2.4. Block Diagram of connection between EUT and simulators -----	8
2.5. Test Mode Description -----	8
2.6. Test Conditions -----	9
2.7. Test Facility -----	9
2.8. Measurement Uncertainty -----	9
2.9. Test Equipment List -----	10
3. Maximum Peak Output power -----	11
3.1. Limit -----	11
3.2. Test Procedure -----	11
3.3. Test Setup -----	11
3.4. Test Result -----	11
4. Bandwidth -----	12
4.1. Limit -----	12
4.2. Test Procedure -----	12
4.3. Test Result -----	12
5. Carrier Frequency Separation -----	22
5.1. Limit -----	22
5.2. Test Procedure -----	22
5.3. Test Result -----	22
6. Number Of Hopping Channel -----	24
6.1. Limit -----	24
6.2. Test Procedure -----	24
6.3. Test Result -----	24
7. Dwell Time -----	26
7.1. Test limit -----	26
7.2. Test Procedure -----	26
7.3. Test Result -----	26
8. Radiated emissions -----	42
8.1. Limit -----	42
8.2. Block Diagram of Test setup -----	43
8.3. Test Procedure -----	43
8.4. Test Result -----	44
9. Band Edge Compliance -----	59
9.1. Block Diagram of Test Setup -----	59
9.2. Limit -----	59
9.3. Test Procedure -----	59
9.4. Test Result -----	59
10. Power Line Conducted Emissions -----	66
10.1. Block Diagram of Test Setup -----	66
10.2. Limit -----	66
10.3. Test Procedure -----	66

10.4. Test Result	67
11. Antenna Requirements	69
11.1. Limit	69
11.2. Result	69
12. Test setup photo	70
12.1. Photo of Radiated Emission test	70
12.2. Photo of Conducted Emission test	71

History of this test report

Original Report Issue Date: 2023.02.17

- No additional attachment
- Additional attachments were issued following record

Attachment No.	Issue Date	Description

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:

Test Item	Standards Paragraph	Result
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1) ANSI C63.10 :2013	P
Bandwidth	FCC Part 15: 15.215 ANSI C63.10 :2013	P
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1) ANSI C63.10 :2013	P
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10 :2013	P
Dwell Time	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10 :2013	P
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10 :2013	P
Band Edge Compliance	FCC Part 15: 15.247(d) ANSI C63.10 :2013	P
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.10 :2013	P
Antenna requirement	FCC Part 15: 15.203	P

Note: 1. P is an abbreviation for Pass.

2. F is an abbreviation for Fail.

3. N/A is an abbreviation for Not Applicable.

4. The conclusion of this test report is judged by actual test data without considering measurement uncertainty.

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT Name	: Smart Phone
Model No.	: V20Pro
DIFF.	: N/A
Power supply	: DC 11V from adapter, DC 3.7V from battery
Radio Technology	: Bluetooth V5.0 EDR
Operation frequency	: 2402-2480MHz
Channel No.	: 79 Channels
Channel spacing	: 1MHz
Modulation type	: GFSK, $\pi/4$ DQPSK, 8DPSK
Antenna Type	: Internal antenna, Maximum Gain is 1.0dBi. Antenna information is provided by applicant.
Software version	: DOOGEE-V20Pro-EEA-Android12.0-20221209
Hardware version	: A201_01
Connector cable loss	: N/A
Intend use environment	: Residential, commercial and light industrial environment

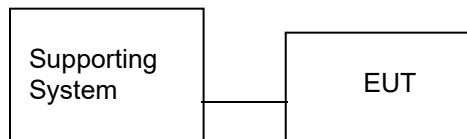
2.2. Accessories of Device (EUT)

Accessories : /
Manufacturer : /
Model : /
Ratings : /

2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDoC
1.	--	--	--	--	--

2.4. Block Diagram of connection between EUT and simulators



2.5. Test Mode Description

Tested mode, channel information		
Mode	Channel	Frequency (MHz)
GFSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480
$\pi/4$ DQPSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480
8DPSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480

2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35°C	24°C
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	980kPa

2.7. Test Facility

Company:	Beijing TIRT Technology Service Co.,Ltd Shenzhen
Address:	101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street, Pingshan District, Shenzhen, China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6049.01
FCC Designation Number:	CN1309
Test Firm Registration Number:	825524
Telephone:	+86-0755-27087573

2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Uncertainty	
Parameter	Uncertainty
Occupied Channel Bandwidth	±142.12 KHz
RF power conducted	±0.74 dB
RF power radiated	±3.25dB
Spurious emissions, conducted	±1.78dB
Spurious emissions, radiated (9KHz~30MHz)	±2.56dB
Spurious emissions, radiated (30MHz~1GHz)	±4.6dB
Spurious emissions, radiated (Above 1GHz)	±4.9dB
Conduction Emissions(150kHz~30MHz)	±3.1 dB
Humidity	±4.6%
Temperature	±0.7°C
Time	±1.25%

2.9. Test Equipment List

No.	Equipment	Manufacturer	Type No.	Serial No.	Cal. date (yyyy/mm/dd)	Cal. Due date (yyyy/mm/dd)
1	EMI Receiver	Rohde&Schwarz	ESCI	100718	2022/11/09	2023/11/10
2	AMN	Rohde&Schwarz	ENV216	100075	2022/11/09	2023/11/10
3	AMN	Schwarzbeck	NSLK8127	#829	2022/11/09	2023/11/10
4	ECSI RF IN RF Cable	Rohde&Schwarz	RP-X1	\	2022/11/17	2023/11/16
5	ECSI RF IN RF Cable	Rohde&Schwarz	Sapre sm	\	2022/11/09	2023/11/10
6	EMI Receiver	Rohde&Schwarz	ESR7	102013	2022/11/09	2023/11/10
7	Spectrum analyzer	Rohde&Schwarz	FSV30	103741	2022/11/09	2023/11/10
8	Spectrum analyzer	KEYSIGHT	N9010A	MY51440158	2022/11/09	2023/11/10
9	Integral Antenna	Schwarzbeck	VULB 9163	9163-868	2022/12/25	2023/12/24
10	Integral Antenna	Schwarzbeck	BBHA 9120D	BBHA 9120D 1201	2022/11/09	2023/11/10
11	Integral Antenna	Schwarzbeck	BBHA 9170	9170#685	2022/11/06	2023/11/10
12	Preamplifier	CD Systems Inc	PAP-03036- 30	85060000	2022/11/09	2023/11/10
13	Preamplifier	Schwarzbeck	BBV9721	9721-019	2022/11/09	2023/11/10
14	Preamplifier	emci	EMC012645 SE	980417	2022/11/09	2023/11/10
15	ECSI RF IN RF Cable	Rohde&Schwarz	AP-X1	\	2022/11/09	2023/11/10
16	Spectrum Analyzer	Agilent	N9010A	MY52221119	2022/11/09	2023/11/10
17	Power Collection Unit	Tonscend	JS0806-2	188060134	2022/09/12	2023/09/11
18	Tonscend Test System	Tonscend	2.6.77.0518	NA	NA	NA
19	Power Sensor	Agilent	U2021XA	MY55410011	2022/09/12	2023/09/11
20	Power Sensor	Agilent	U2021XA	MY55410012	2022/09/12	2023/09/11
21	Power Sensor	Agilent	U2021XA	MY55410018	2022/09/12	2023/09/11
22	Power Sensor	Agilent	U2021XA	MY55410019	2022/09/12	2023/09/11
23	Temp&Humidity Recorder	Anymetre	JR900	NA	2022/11/03	2023/11/02
24	Temp&Humidity Chamber	ETOMA	NTH1100-30 A	16080628	2022/09/01	2023/08/30

3. MAXIMUM PEAK OUTPUT POWER

3.1. Limit

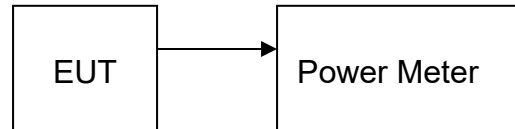
Please refer section 15.247.

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W

3.2. Test Procedure

The transmitter output is connected to the RF Power Meter. The RF Power Meter is set to the peak power detection.

3.3. Test Setup



3.4. Test Result

Mode	Freq (MHz)	PK Output Power(dBm)	Limit(dBm)	Result
GFSK	2402	5.54	21	Pass
	2441	5.27	21	Pass
	2480	5.69	21	Pass
$\pi/4$ DQPSK	2402	6.23	30	Pass
	2441	5.98	30	Pass
	2480	5.31	30	Pass
8DPSK	2402	6.17	30	Pass
	2441	6.06	30	Pass
	2480	5.43	30	Pass

4. BANDWIDTH

4.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

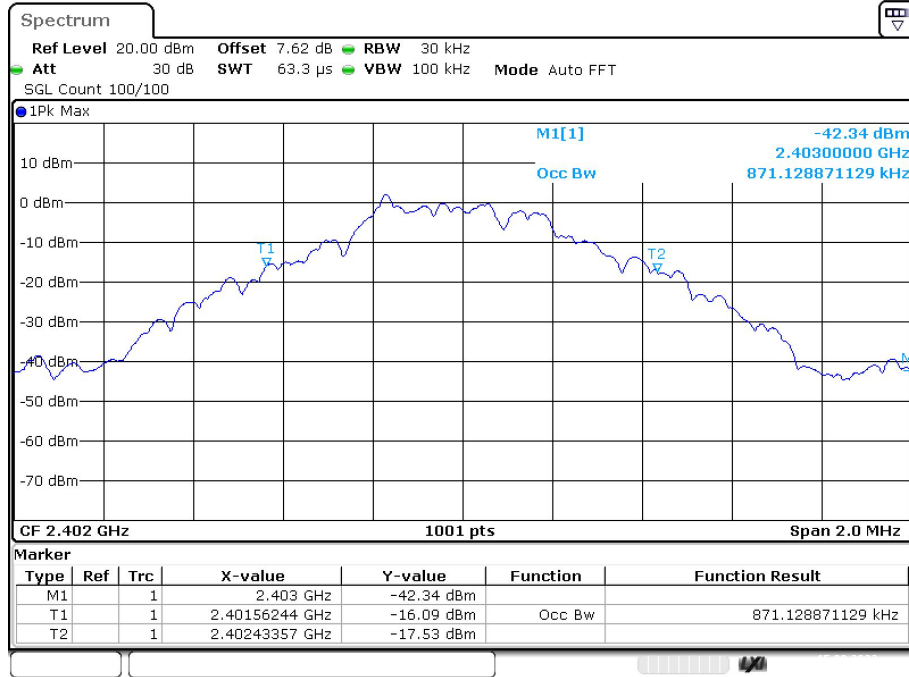
4.2. Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

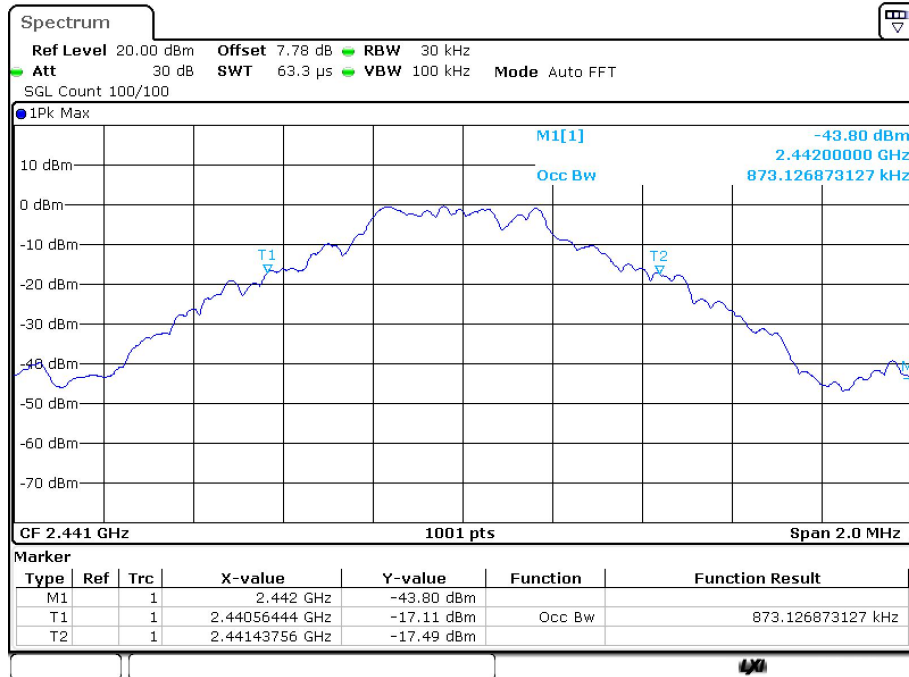
4.3. Test Result

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	Ant 1	0.871	1.02	N/A	Pass
NVNT	1-DH1	2441	Ant 1	0.873	1.028	N/A	Pass
NVNT	1-DH1	2480	Ant 1	0.845	1.024	N/A	Pass
NVNT	2-DH1	2402	Ant 1	1.125	1.202	N/A	Pass
NVNT	2-DH1	2441	Ant 1	1.133	1.228	N/A	Pass
NVNT	2-DH1	2480	Ant 1	1.133	1.172	N/A	Pass
NVNT	3-DH1	2402	Ant 1	1.109	1.252	N/A	Pass
NVNT	3-DH1	2441	Ant 1	1.109	1.23	N/A	Pass
NVNT	3-DH1	2480	Ant 1	1.113	1.248	N/A	Pass

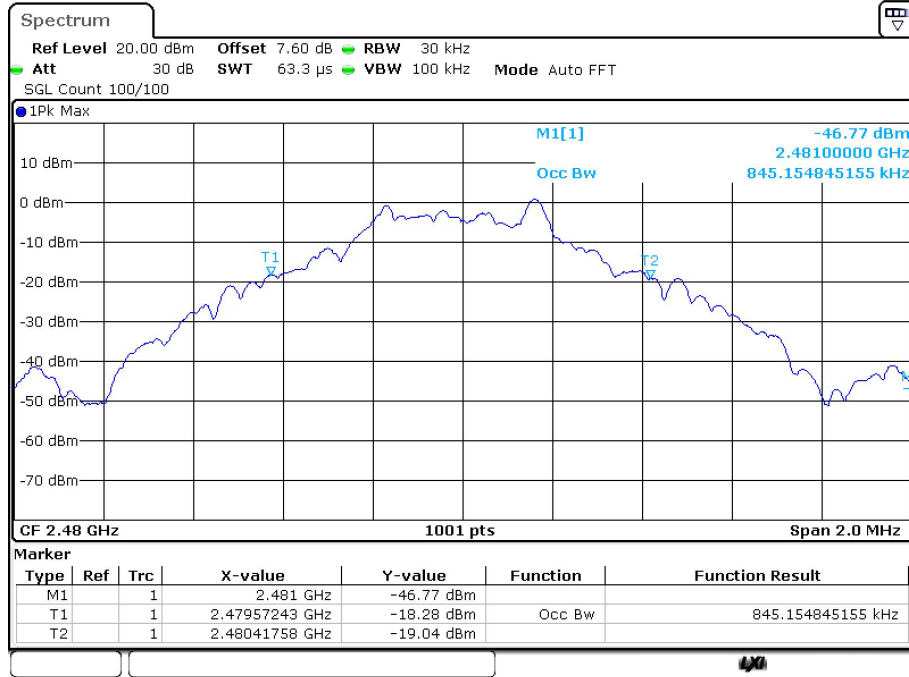
OBW NVNT 1-DH1 2402MHz Ant1



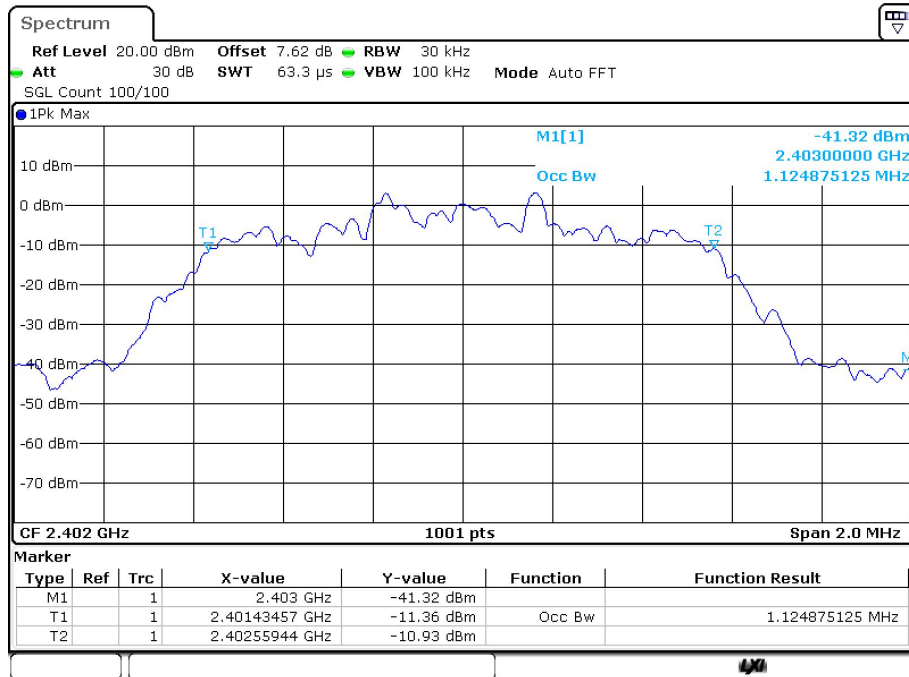
OBW NVNT 1-DH1 2441MHz Ant1



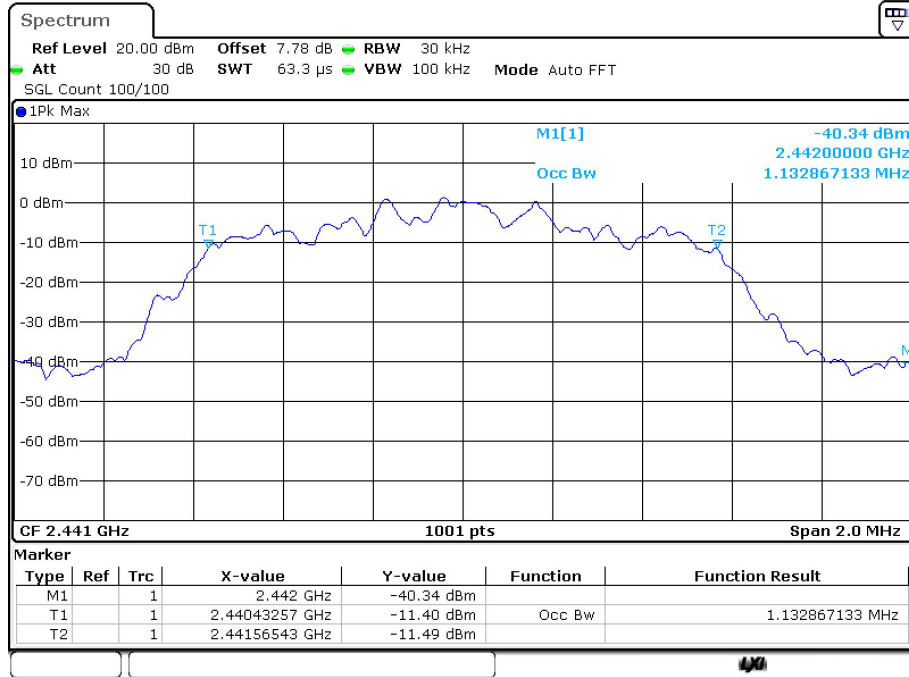
OBW NVNT 1-DH1 2480MHz Ant1



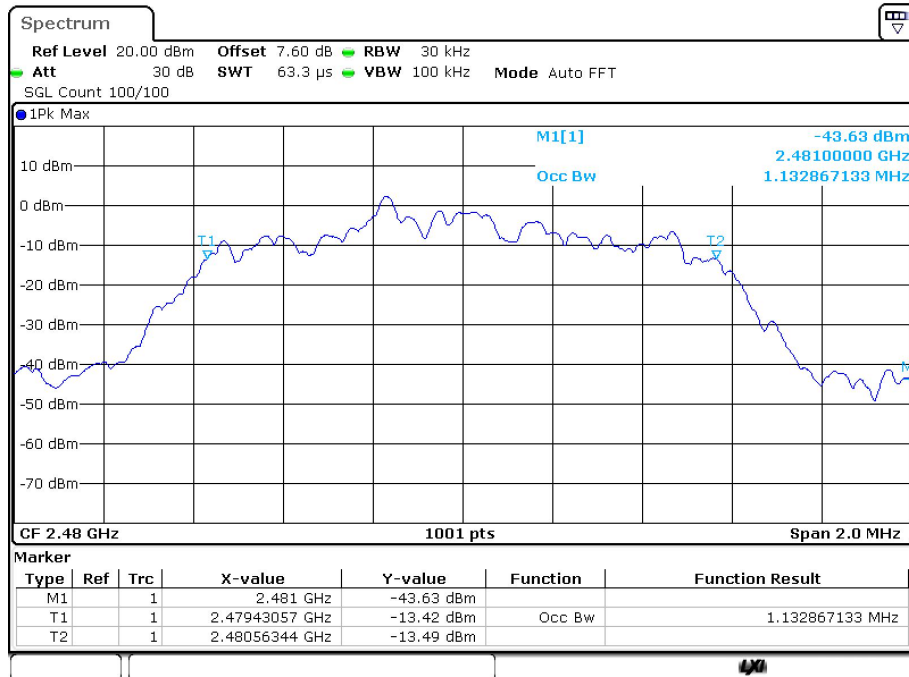
OBW NVNT 2-DH1 2402MHz Ant1



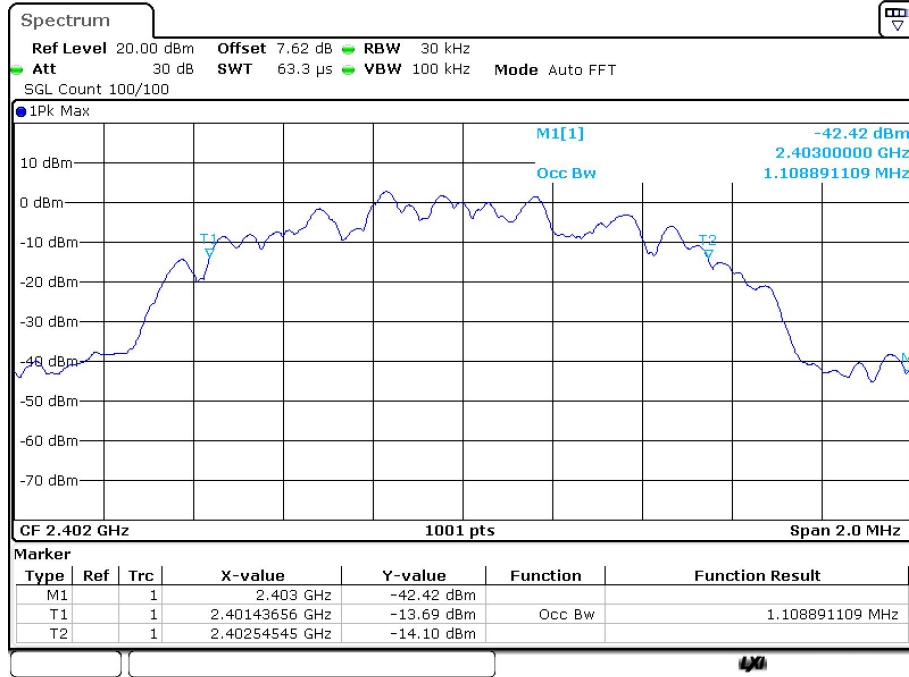
OBW NVNT 2-DH1 2441MHz Ant1



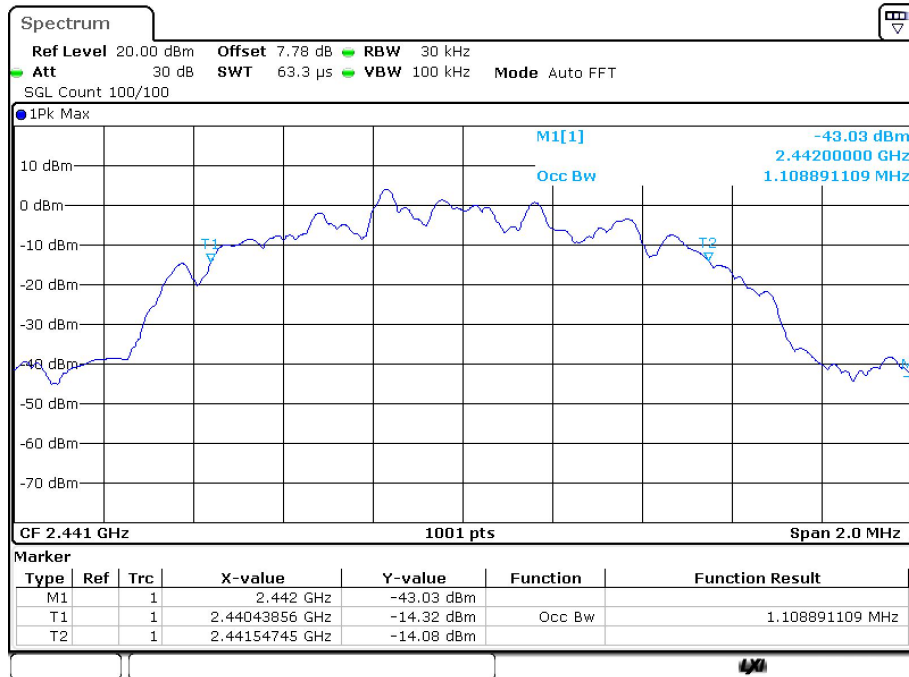
OBW NVNT 2-DH1 2480MHz Ant1



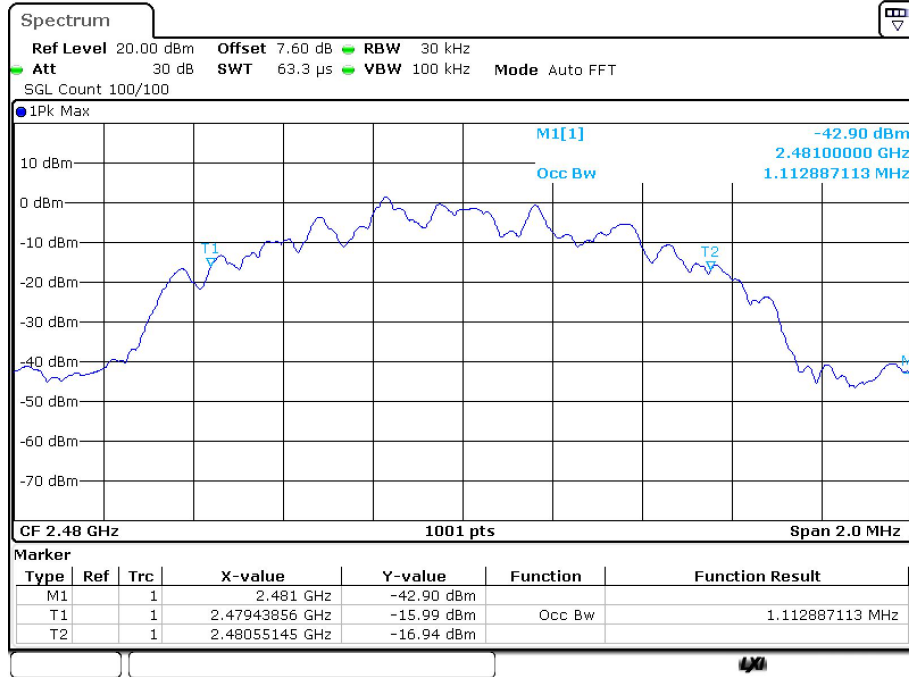
OBW NVNT 3-DH1 2402MHz Ant1



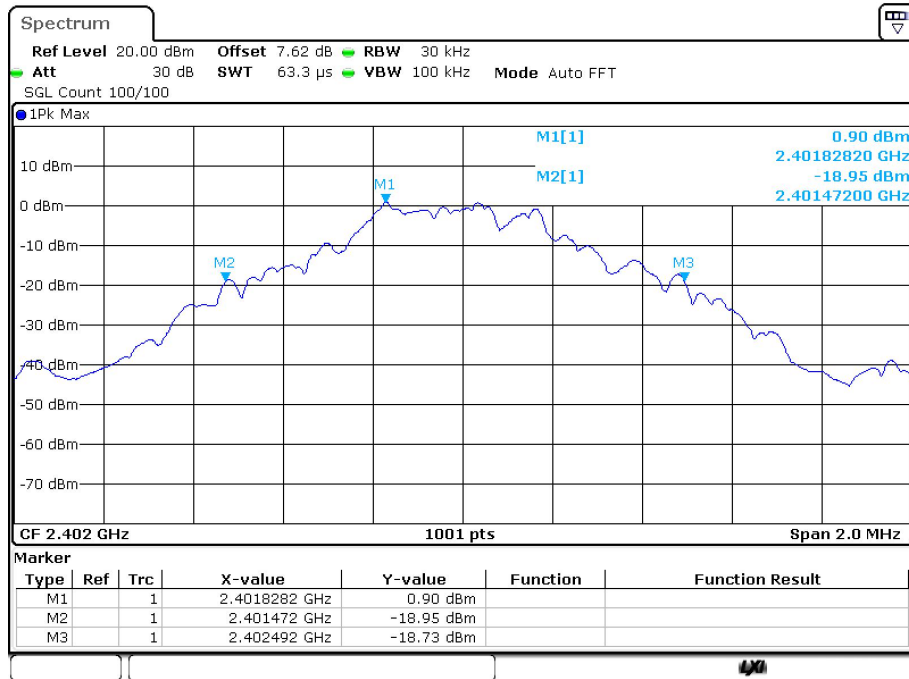
OBW NVNT 3-DH1 2441MHz Ant1



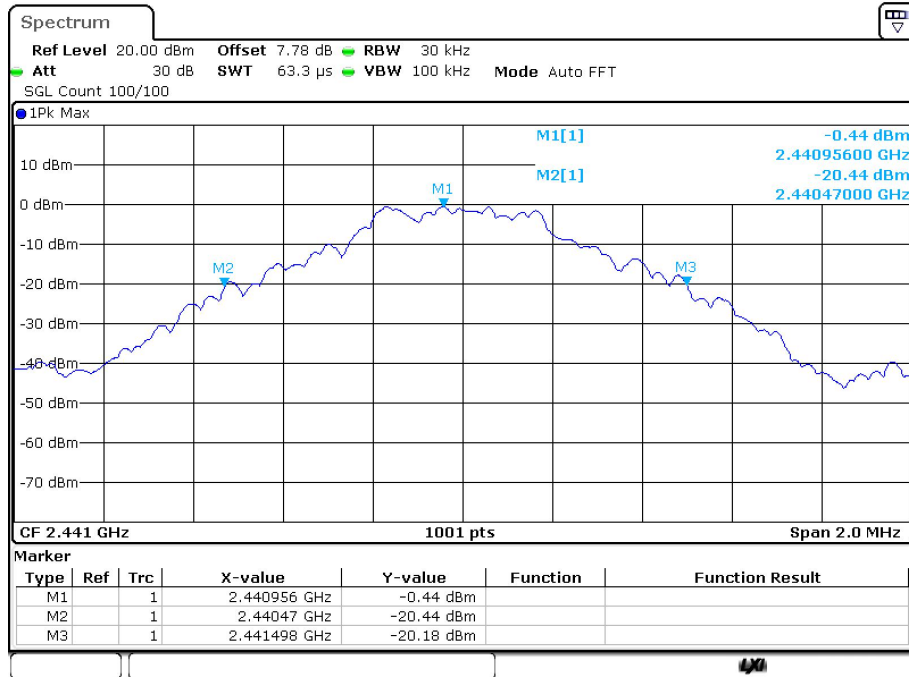
OBW NVNT 3-DH1 2480MHz Ant1



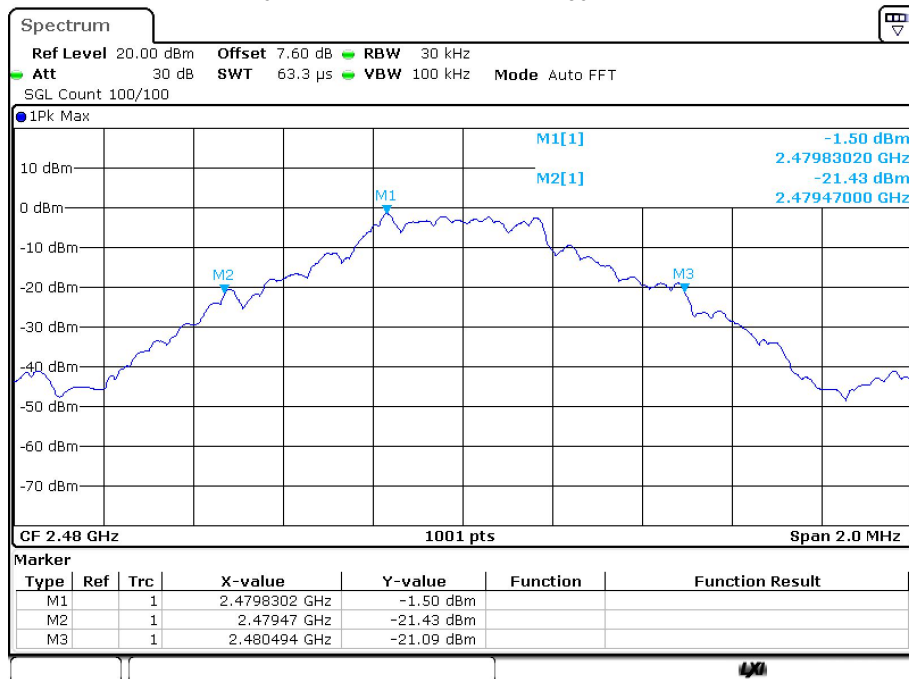
-20dB Bandwidth NVNT 1-DH1 2402MHz Ant1



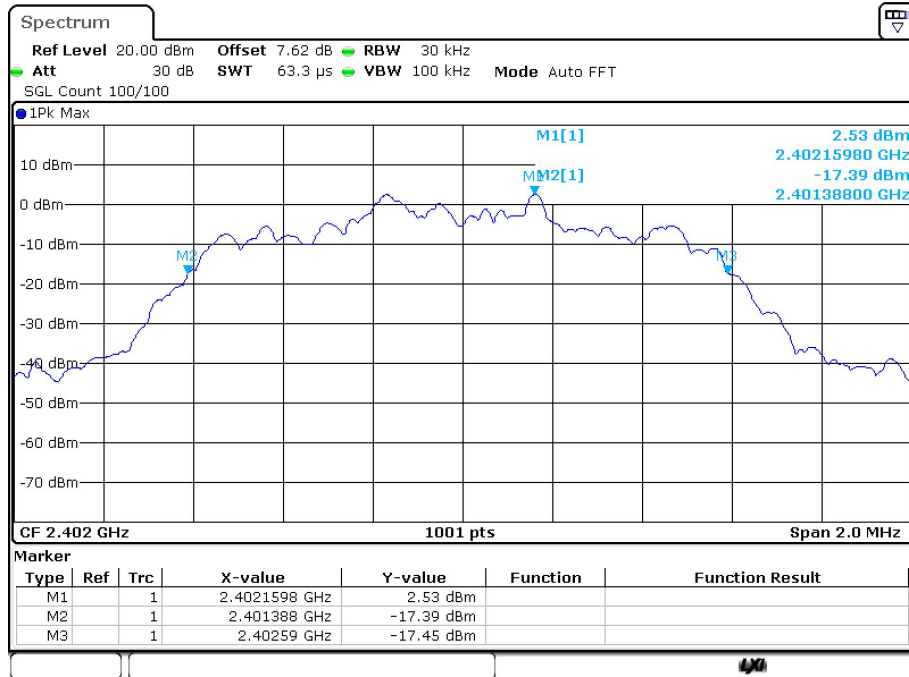
-20dB Bandwidth NVNT 1-DH1 2441MHz Ant1



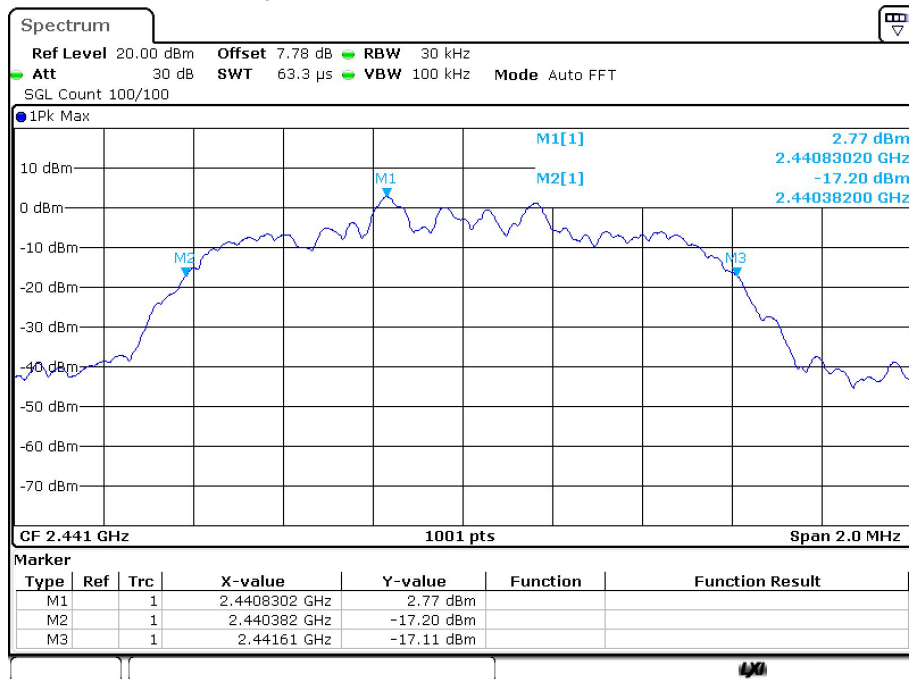
-20dB Bandwidth NVNT 1-DH1 2480MHz Ant1



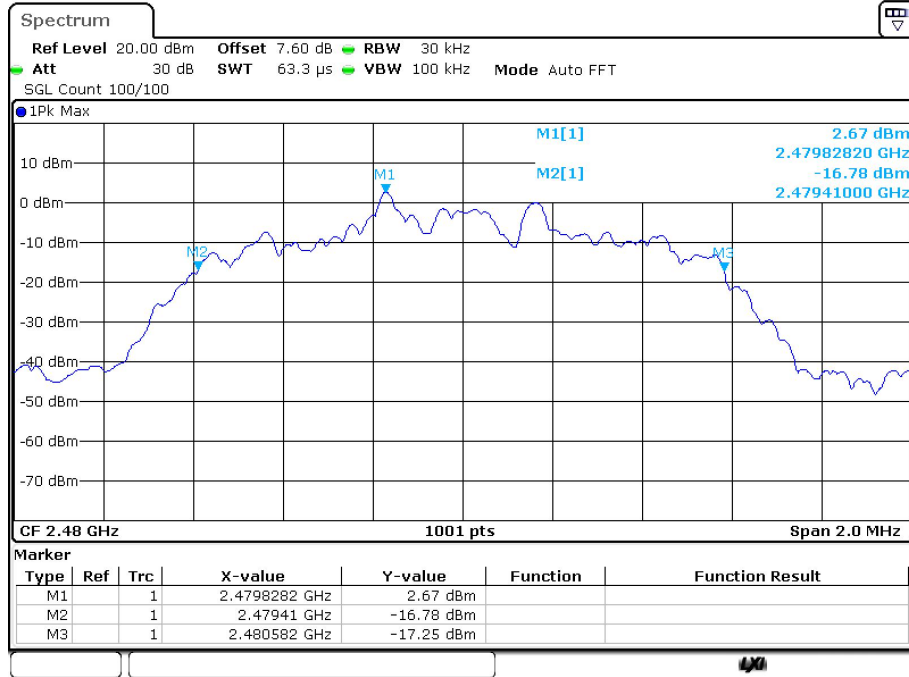
-20dB Bandwidth NVNT 2-DH1 2402MHz Ant1



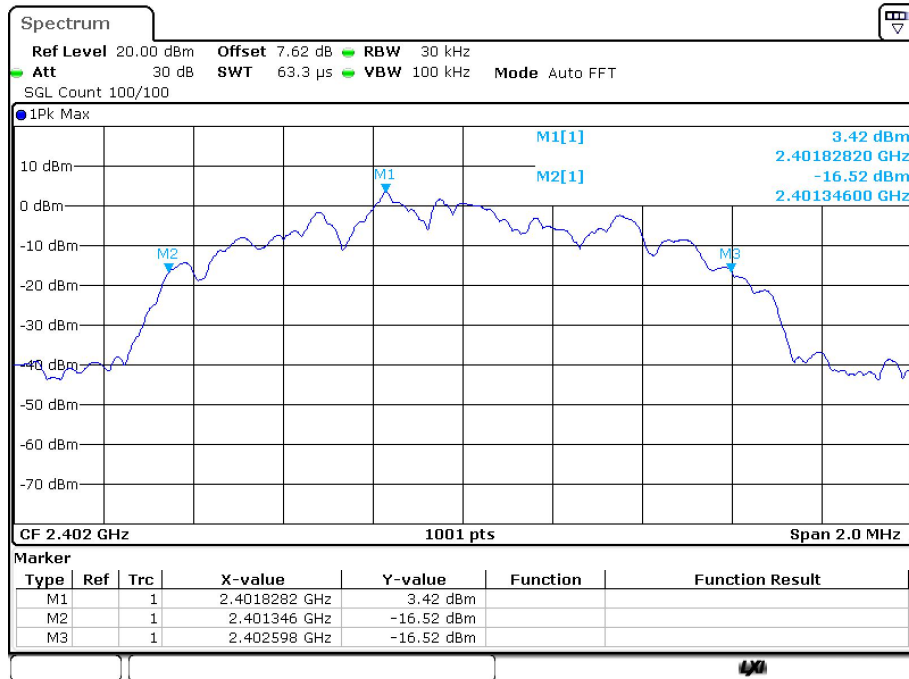
-20dB Bandwidth NVNT 2-DH1 2441MHz Ant1



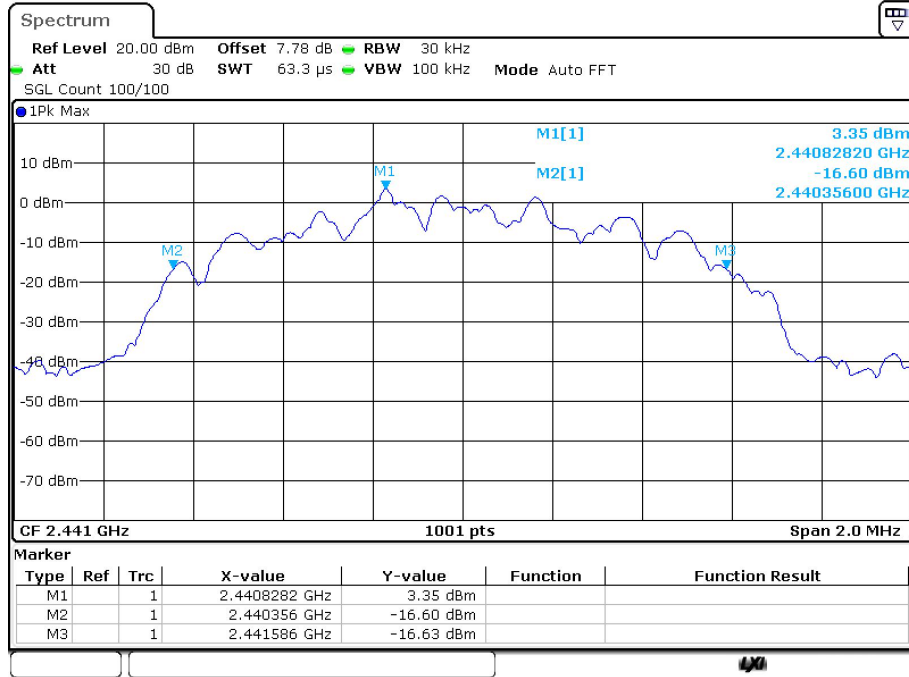
-20dB Bandwidth NVNT 2-DH1 2480MHz Ant1



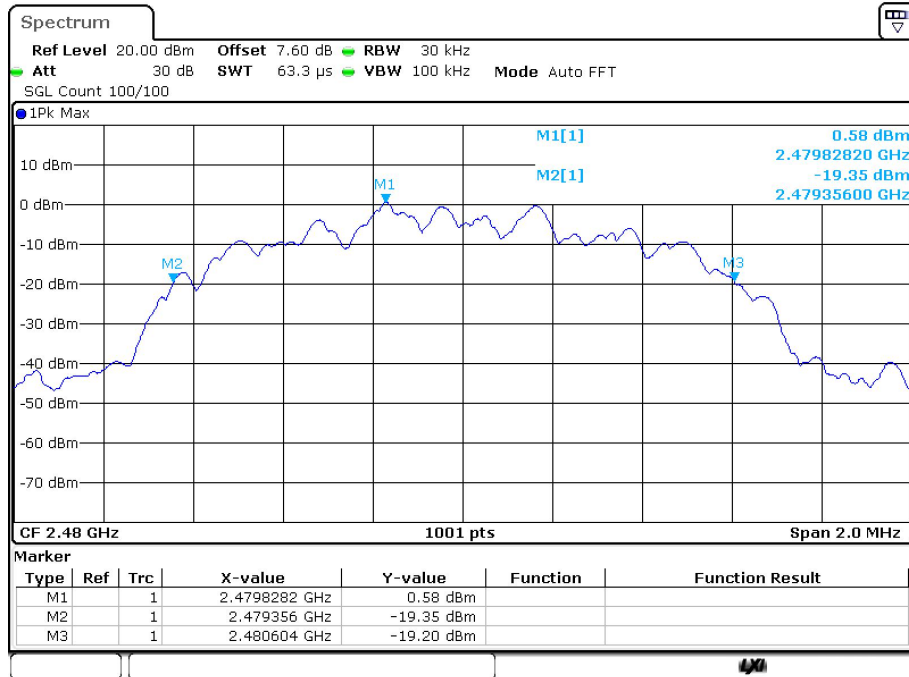
-20dB Bandwidth NVNT 3-DH1 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH1 2441MHz Ant1



-20dB Bandwidth NVNT 3-DH1 2480MHz Ant1



5. CARRIER FREQUENCY SEPARATION

5.1. Limit

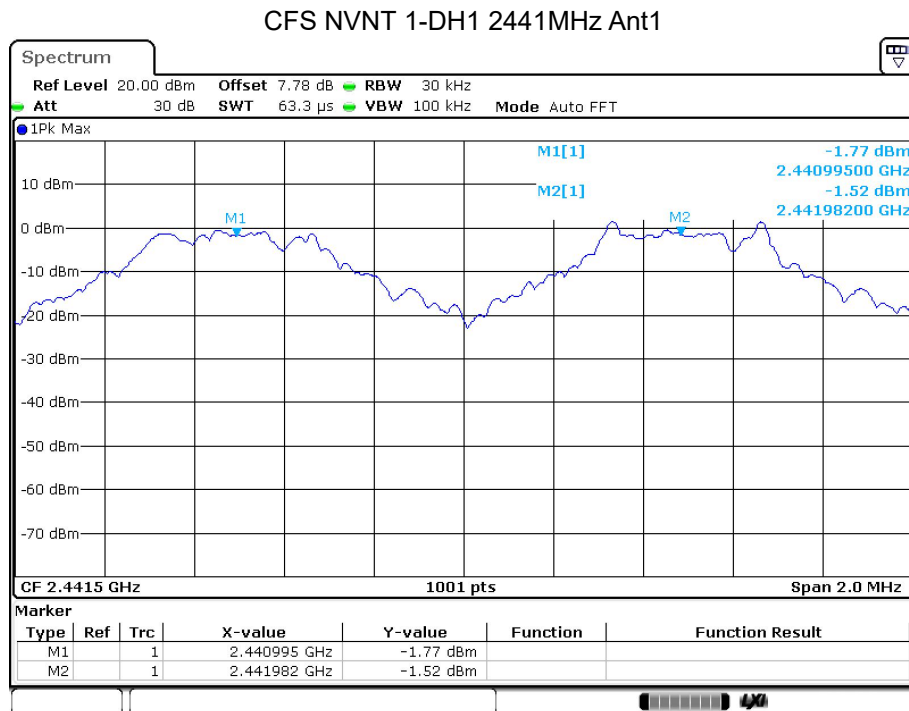
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that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

5.2. Test Procedure

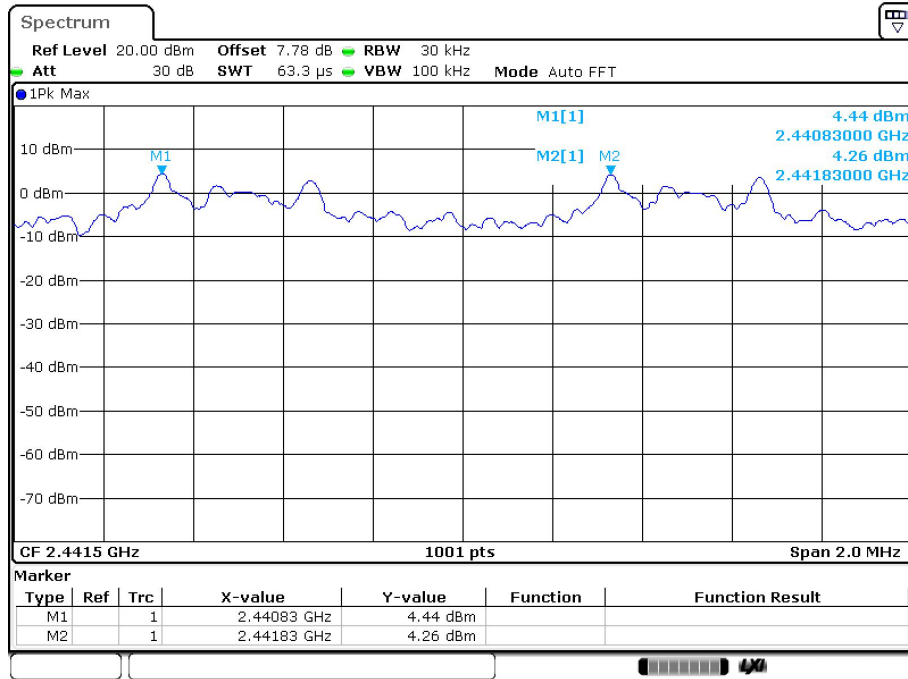
The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The carrier frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW.

5.3. Test Result

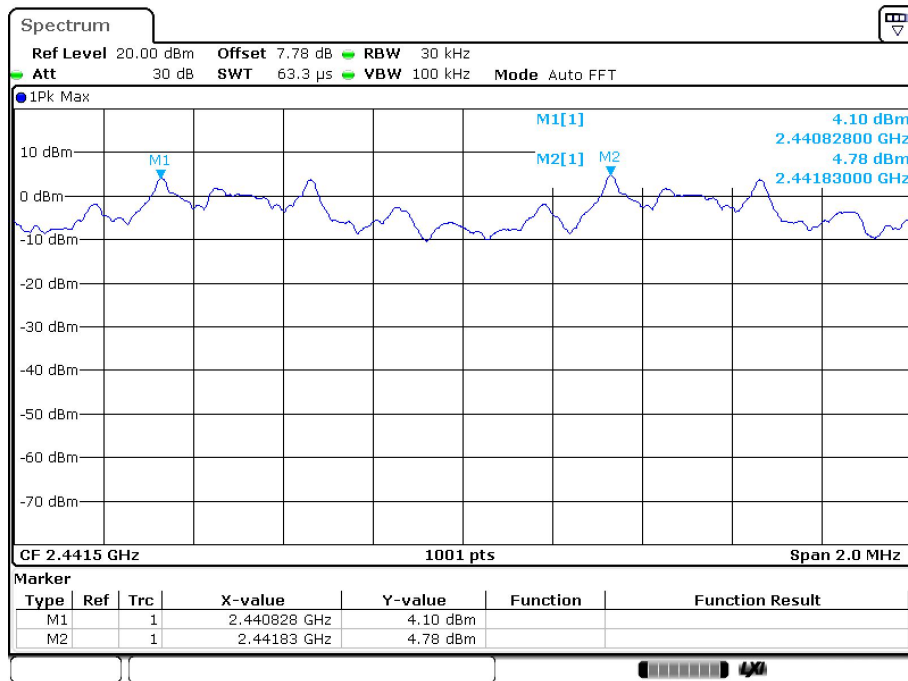
Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH1	2440.995	2441.982	0.987	0.98	Pass
NVNT	2-DH1	2440.83	2441.83	1	0.819	Pass
NVNT	3-DH1	2440.828	2441.83	1.002	0.82	Pass



CFS NVNT 2-DH1 2441MHz Ant1



CFS NVNT 3-DH1 2441MHz Ant1



6. NUMBER OF HOPPING CHANNEL

6.1. Limit

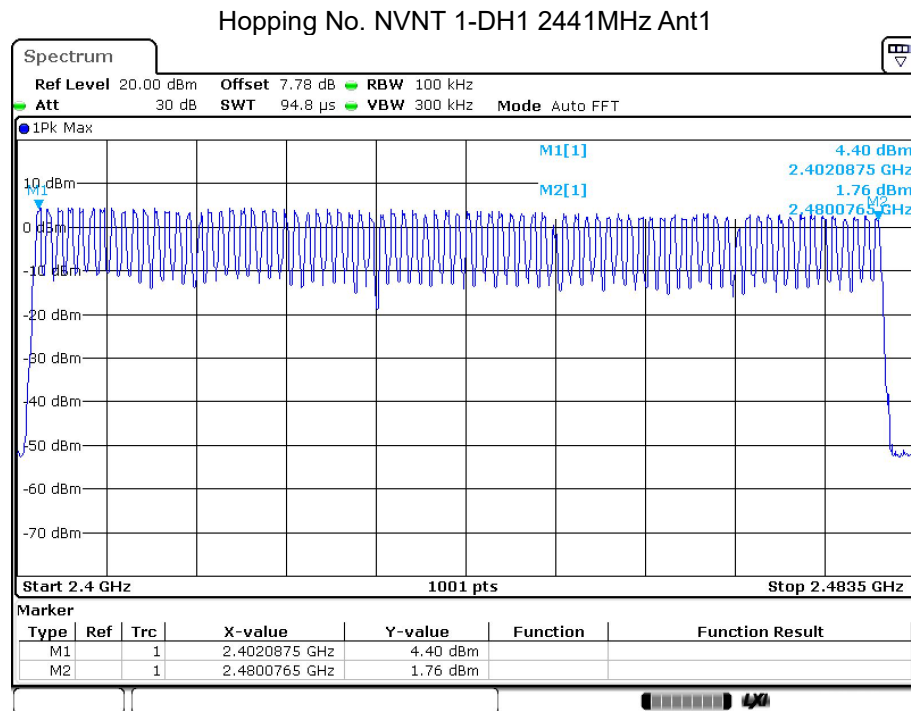
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

6.2. Test Procedure

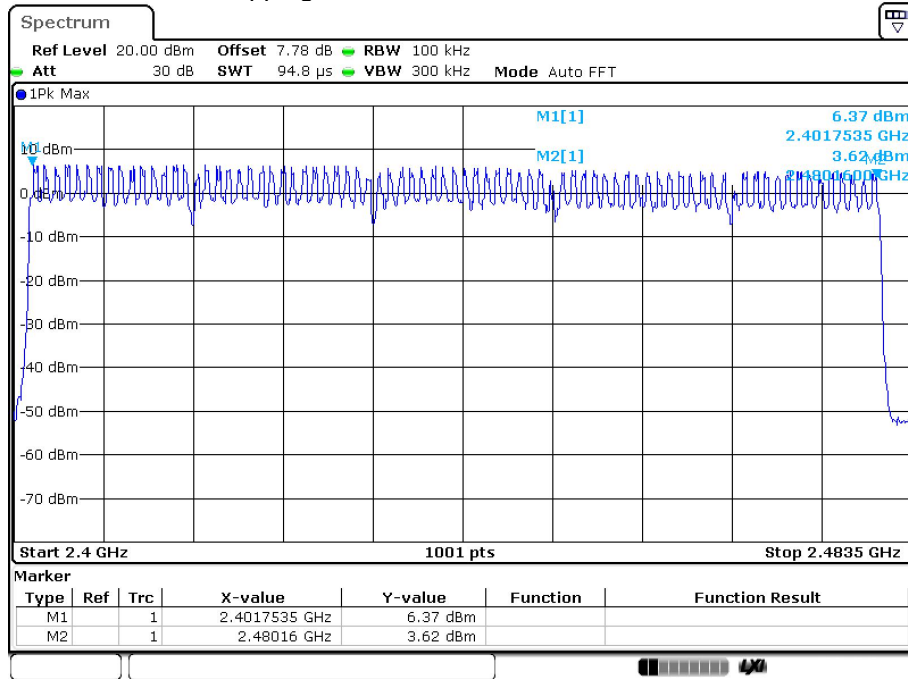
The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The number of hopping channel was measured by spectrum analyzer with 100kHz RBW and 300KHz VBW.

6.3. Test Result

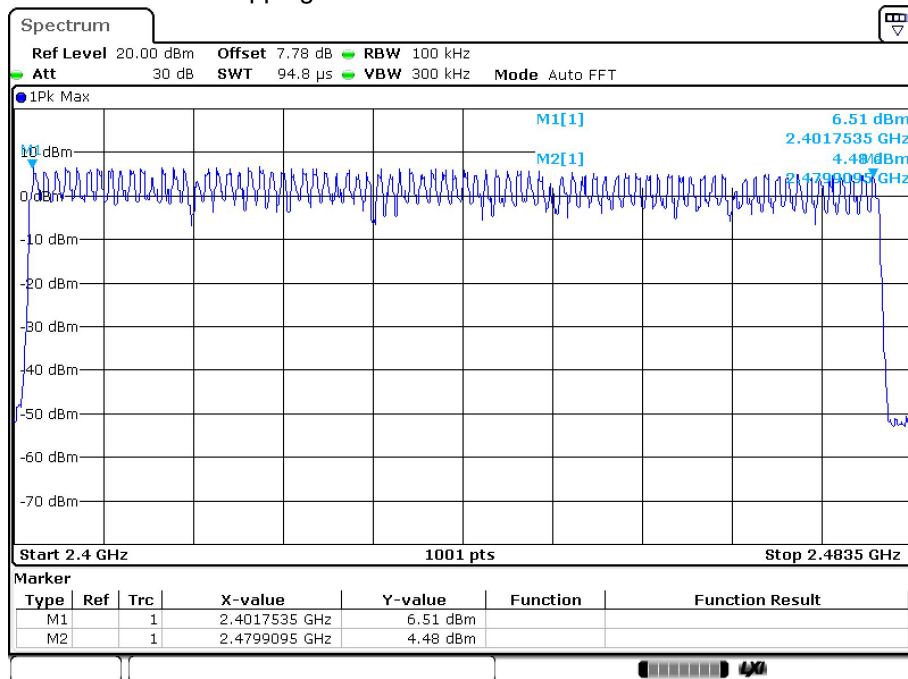
Condition	Mode	Hopping Number	Limit	Verdict
NVNT	1-DH1	79	15	Pass
NVNT	2-DH1	79	15	Pass
NVNT	3-DH1	79	15	Pass



Hopping No. NVNT 2-DH1 2441MHz Ant1



Hopping No. NVNT 3-DH1 2441MHz Ant1



7. DWELL TIME

7.1. Test limit

Please refer section 15.247

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz.

The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 sec- onds multiplied by the number of hopping channel employed.

7.2. Test Procedure

7.2.1. Place the EUT on the table and set it in transmitting mode.

7.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

7.2.3. Set center frequency of spectrum analyzer = operating frequency.

7.2.4. Set the spectrum analyzer as RBW=1MHz, VBW=1MHz, Span = 0Hz, Sweep = auto.

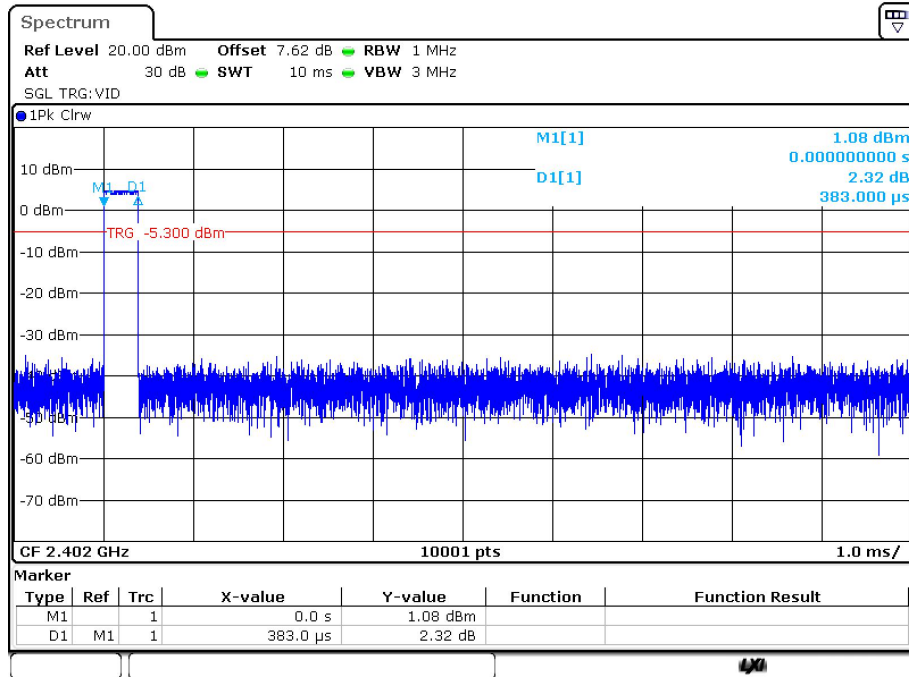
7.2.5. Repeat above procedures until all frequency measured were complete.

7.3. Test Result

Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2402	Ant1	0.383	121.028	316	31600	400	Pass
NVNT	1-DH1	2441	Ant1	0.383	121.028	316	31600	400	Pass
NVNT	1-DH1	2480	Ant1	0.383	122.177	319	31600	400	Pass
NVNT	1-DH3	2441	Ant1	1.639	245.85	150	31600	400	Pass
NVNT	1-DH5	2441	Ant1	2.887	314.683	109	31600	400	Pass
NVNT	2-DH1	2402	Ant1	0.391	124.338	318	31600	400	Pass
NVNT	2-DH1	2441	Ant1	0.391	123.947	317	31600	400	Pass
NVNT	2-DH1	2480	Ant1	0.391	123.947	317	31600	400	Pass
NVNT	2-DH3	2441	Ant1	1.643	249.736	152	31600	400	Pass
NVNT	2-DH5	2441	Ant1	2.891	323.792	112	31600	400	Pass
NVNT	3-DH1	2402	Ant1	0.391	123.947	317	31600	400	Pass
NVNT	3-DH1	2441	Ant1	0.391	124.729	319	31600	400	Pass
NVNT	3-DH1	2480	Ant1	0.391	123.165	315	31600	400	Pass
NVNT	3-DH3	2441	Ant1	1.642	256.152	156	31600	400	Pass
NVNT	3-DH5	2441	Ant1	2.893	318.23	110	31600	400	Pass

Note: Total Dwell Time= Pulse Time* Burst Count

Dwell NVNT 1-DH1 2402MHz Ant1 One Burst



Dwell NVNT 1-DH1 2402MHz Ant1 Accumulated

