

FCC AND IC CERTIFICATION TEST REPORT

Report No.: DDT-B21102902-2E09

Applicant	:	Beijing Orion Star Technology Co., Ltd.
Address	:	Room A-2570, 2nd Floor, No. 30, Shixing Street, Shijingshan District, Beijing China
Equipment under Test	:	AI Service Robot
Model No.	:	OS-R-SD03
Trade Mark	:	ORIONSTAR
FCC ID	:	2A3BD-OSRSD03
IC	:	27780-OSRSD03
Manufacturer	:	Beijing Orion Star Technology Co., Ltd.
Address	:	Room A-2570, 2nd Floor, No. 30, Shixing Street, Shijingshan District, Beijing China

Issued By: Tianjin Dongdian Testing Service Co., Ltd.

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REPORT

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Test Report Declare

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Equipment under Test	:	AI Service Robot
Model No.	:	OS-R-SD03
Trade Mark	:	ORIONSTAR
Manufacturer	:	Beijing Orion Star Technology Co., Ltd.
Address	:	Room A-2570, 2nd Floor, No. 30, Shixing Street, Shijingshan District, Beijing China

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C, RSS-247 Issue 2 February 2017.

Test procedure used: ANSI C63.10:2013, RSS-Gen Issue 5, Apr. 2018, KDB 558074 D01 15.247 Meas Guidance v05r02

We Declare:

The equipment described above is tested by Tianjin Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Tianjin Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC&IC standards.

Report No:	DDT-B21102902-2E09		
Date of Receipt:	Feb. 24, 2022	Date of Test:	Feb. 24, 2022 ~ Mar. 26, 2022

Prepared By:

Sunny Zhang

Sunny Zhang/Engineer

Approved By:



Leon Li/RF Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Tianjin Dongdian Testing Service Co., Ltd.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Mar. 26, 2022	

1. Summary of Test Results

The EUT have been tested according to the applicable standards as referenced below.		
Description of Test Item	Standard	Verdict
6dB Bandwidth and 99% Bandwidth	FCC 15.247 (a) (2) RSS-247 Clause 5.2 (a)	Pass
Maximum PK Output Power	FCC 15.247 (b) (3) RSS-247 Clause 5.4 (e)	Pass
Power Spectral Density	FCC 15.247 (e) RSS-247 Clause 5.2 (b)	Pass
Band-edge and Spurious Emissions (Conducted)	FCC 15.247 (d) RSS-247 Clause 5.5	Pass
Radiated Spurious Emissions	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	Pass
Radiated Band Edge Compliance	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	Pass
Power Line Conducted Emission	FCC 15.207 RSS-GEN Clause 8.8	Pass
Antenna Requirement	FCC 15.203 RSS-GEN Clause 6.8	Pass

2. General Test Information

2.1. Description of EUT

EUT* Name	: AI Service Robot
Model Number	: OS-R-SD03
EUT Function Description	: Please reference user manual of this device
Power Supply	: DC 25.2V by Polymer Li-ion built-in battery : AC 100-240V~50/60Hz by ac/dc adapter for charge
Radio Technology	: IEEE 802.11b/g/n
FCC Operation Frequency	: IEEE 802.11b: 2412MHz-2462MHz : IEEE 802.11g: 2412MHz-2462MHz : IEEE 802.11n HT20: 2412MHz-2462MHz : IEEE 802.11n HT40: 2422MHz-2452MHz
Modulation	: IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) : IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) : IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK)
Transmitter Rate	: IEEE 802.11b: 1, 2, 5.5, 11 Mbps : IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps : IEEE 802.11n HT20, HT40: MCS8~MCS15
Antenna Type	: Antenna 1: Dedicated FPC antenna, maximum PK gain: 3.77 dBi : Antenna 2: Dedicated FPC antenna, maximum PK gain: 3.68 dBi
Serial Number	: MC1TCNC010022006VFC1

Note: EUT is the ab. of equipment under test.

Channel information					
CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447	/	/

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Remark
AC/DC ADAPTER	FOSHAN SHUNDE GUANYUDA POWER SUPPLY CO., LTD	GM130-3200393-2F	INPUT:100-240V~50/60Hz 2.5A OUTPUT:32V-3.39A;125.76W	GVE
Charging pile	Beijing Orion Star Technology Co., Ltd.	OS-R-SDCS01S	INPUT:100-240V~50/60Hz 2.5A OUTPUT:32V	ORIONSTAR

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	SN
Notebook	Lenovo Beijing Co. Ltd.	ThinkPad	FCC/CE	TP00067A

2.4. Block diagram of EUT configuration for test



Run the special test software “QRCT.exe” provided by manufacturer to control EUT work in Continuous Tx mode, and select test channel, wireless mode and data rate.

Tested mode, channel, setting Tx power and rand data rate information				
Mode	Setting Tx Power	Data rate (Mbps) (see Note)	Channel	Frequency (MHz)
IEEE 802.11b	16	1	LCH: CH1	2412
	16	1	MCH: CH6	2437
	16	1	HCH: CH11	2462
IEEE 802.11g	14	6	LCH: CH1	2412
	14	6	MCH: CH6	2437
	14	6	HCH: CH11	2462
IEEE 802.11n HT20 MIMO	12	MCS 8	LCH: CH1	2412
	12	MCS 8	MCH: CH6	2437
	12	MCS 8	HCH: CH11	2462
IEEE 802.11n HT40 MIMO	12	MCS 8	LCH: CH3	2422
	12	MCS 8	MCH: CH6	2437
	12	MCS 8	HCH: CH9	2452
Note1: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.				

2.5. Deviations of test standard

No Deviation

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-28℃
Humidity range:	20-75%
Pressure range:	86-106kPa

2.7. Test laboratory

Tianjin Dongdian Testing Service Co., Ltd.

Address: Building D-1, No. 19, Weisi Road, Microelectronics Industrial Park Development Area, Tianjin, China.

Tel: +86-22-58038033, <http://www.ddttest.com>, Email: ddt@dgddt.com

NVLAP (National Voluntary Laboratory Accreditation Program) CODE: 500036-0

CNAS (China National Accreditation Service for Conformity Assessment) CODE: L13402

FCC Designation Number: CN5004; FCC Test Firm Registration Number: 368676

ISED (Innovation, Science and Economic Development Canada) Company Number: 27768

Conformity Assessment Body Identifier: CN0125

VCCI Facility Registration Number: C-20089, T-20093, R-20125, G-20122

2.8. Measurement uncertainty

Test Item	Uncertainty
Bandwidth	0.14%
Peak Output Power (Conducted) (Spectrum Analyzer)	0.12 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$);
	0.32 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Peak Output Power (Conducted) (Power Sensor)	0.51 dB
Power Spectral Density	0.12 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$);
	0.32 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Frequencies Stability	6.7×10^{-8} (Antenna couple method)
	3.4×10^{-8} (Conducted method)
Conducted Spurious Emissions	0.12 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$);
	0.32 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
	0.52 dB ($8 \text{ GHz} \leq f < 22 \text{ GHz}$)
Uncertainty for Radio Frequency (RBW < 20 kHz)	3×10^{-7}
Temperature	$\pm 2^{\circ}\text{C}$
Humidity	$\pm 1\%$
Uncertainty for Radiation Emission Test (30 MHz - 1 GHz)	2.72 dB (Antenna Polarize: V)
	2.72 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission Test (1 GHz - 40 GHz)	2.74 dB (1 - 6 GHz)
	2.72 dB (6 GHz - 18 GHz)
	3.54 dB (18 GHz - 26 GHz)
	4.30 dB (26 GHz - 40 GHz)
Uncertainty for Power Line Conduction Emission Test	3.40 dB (150 kHz - 30 MHz)

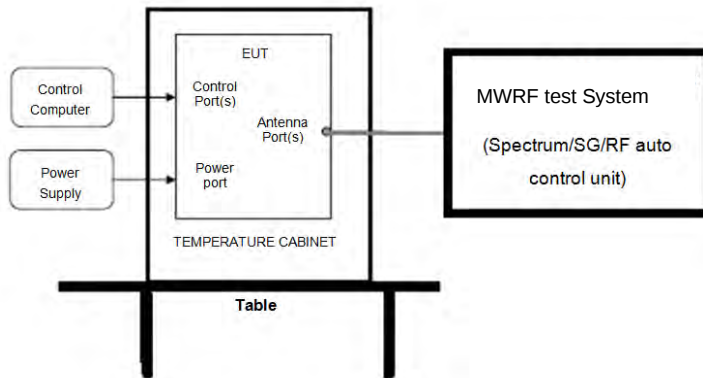
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Equipment Used During Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
RF Connected Test (MWRFTest system)					
Microwave Signal Generator	R&S	SMF100A	101396	2021/06/08	1 Year
MXG Vector Signal Generator	Keysight	N5182A	MY50143288	2021/03/08	1 Year
MXG Vector Signal Generator	Keysight	N5182A	MY50143288	2022/03/07	1 Year
EMI Test Receiver	R&S	ESU26	100243	2021/03/03	1 Year
EMI Test Receiver	R&S	ESU26	100243	2022/03/03	1 Year
Wideband Radio Communication Tester	R&S	CMW500	158800	2021/05/25	1 Year
Power Detector	MWRFTest	MW100-PSB	MW201203008	2021/03/31	1 Year
DC Power Supply	inSTEK	PSP-2010	EN122317	2022/02/12	1 Year
Test Software	MWRFTest	MTS8310	V03	N/A	N/A
Radiated Emission -10m EMI Chamber					
Active Loop Antenna	R&S	HFH2-Z2	100269	2021/05/08	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	2021/05/08	1 Year
Broadband Horn Antenna	TESEQ	BHA 9118	31754	2021/10/12	1 Year
Low noise amplifier	MITEQ	TPA0118-36	0914	2022/02/16	1 Year
EMI Test Receiver	R&S	ESCI	101024	2022/03/03	1 Year
EMI Test Receiver	R&S	ESCI	101030	2021/05/15	1 Year
Bilog Antenna	TESEQ	CBL6112D	29068	2020/10/12	2 Year
Bilog Antenna	TESEQ	CBL6112D	29069	2020/10/12	2 Year
Amplifier	Sonoma	310N	300913	2022/02/15	1 Year
Amplifier	Sonoma	310N	300914	2022/02/15	1 Year
Ant Mast	Innco	MA4000	N/A	N/A	N/A
Ant Mast	Innco	MA4000	N/A	N/A	N/A
Mast Controller	Innco	CO2000	N/A	N/A	N/A
Mast Controller	Innco	CO2000	N/A	N/A	N/A
RF Selector 4CH	TOYO	NS4904N	Selector1	N/A	N/A
RF Selector 4CH	TOYO	NS4904N	Selector2	N/A	N/A
Test software	TOYO	EP5/RSE	Ver 1.9.1	N/A	N/A
Test software	Audix	E3	V 6.11111b	N/A	N/A
Power Line Conducted Emissions Test					
Test Receiver	R&S	ESCI	101397	2021/03/03	1 Year
Test Receiver	R&S	ESCI	101397	2022/03/03	1 Year
LISN	R&S	ENV216	101122	2021/03/31	1 Year
Test software	TOYO	EP5/CE	V 5.4.40	N/A	N/A

4. 6dB Bandwidth and 99% Bandwidth

4.1. Block diagram of test setup



4.2. Limits

For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz

4.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) 99% Bandwidth set the spectrum analyzer as follows:

RBW: 1% to 5% of the OBW

VBW: Three times the RBW

Detector Mode: Peak

Sweep time: auto

Trace mode Max hold

(3) 6dB Bandwidth set the spectrum analyzer as follows:

RBW: 100 kHz

VBW: 300 kHz

Detector Mode: Peak

Sweep time: auto

Trace mode Max hold

(4) Allow the trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.4. Test result

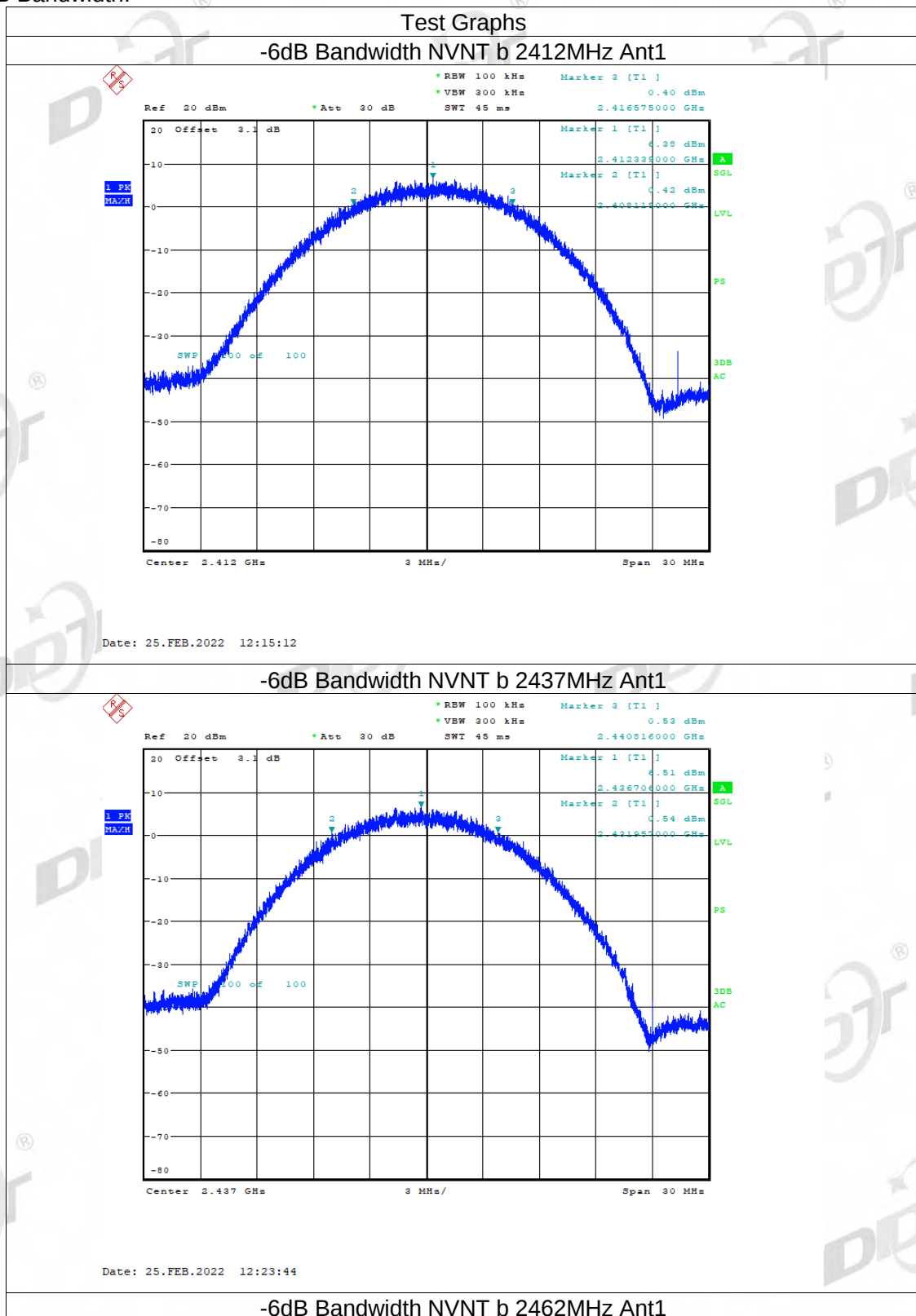
Test Mode	Test Channel	Ant	6dB Bandwidth (MHz)	Limit (MHz)	Verdict
11B	2412	Ant1	8.457	≥ 0.5	Pass
11B	2437	Ant1	8.859	≥ 0.5	Pass
11B	2462	Ant1	7.746	≥ 0.5	Pass
11B	2412	Ant2	8.706	≥ 0.5	Pass
11B	2437	Ant2	8.724	≥ 0.5	Pass
11B	2462	Ant2	9.018	≥ 0.5	Pass
11G	2412	Ant1	16.068	≥ 0.5	Pass
11G	2437	Ant1	15.729	≥ 0.5	Pass
11G	2462	Ant1	15.672	≥ 0.5	Pass
11G	2412	Ant2	16.329	≥ 0.5	Pass
11G	2437	Ant2	16.353	≥ 0.5	Pass
11G	2462	Ant2	15.726	≥ 0.5	Pass
11N20MIMO	2412	Ant1	16.938	≥ 0.5	Pass
11N20MIMO	2412	Ant2	16.953	≥ 0.5	Pass
11N20MIMO	2437	Ant1	16.347	≥ 0.5	Pass
11N20MIMO	2437	Ant2	17.598	≥ 0.5	Pass
11N20MIMO	2462	Ant1	16.332	≥ 0.5	Pass
11N20MIMO	2462	Ant2	16.338	≥ 0.5	Pass
11N40MIMO	2422	Ant1	35.088	≥ 0.5	Pass
11N40MIMO	2422	Ant2	35.112	≥ 0.5	Pass
11N40MIMO	2437	Ant1	35.472	≥ 0.5	Pass
11N40MIMO	2437	Ant2	36.324	≥ 0.5	Pass
11N40MIMO	2452	Ant1	35.712	≥ 0.5	Pass
11N40MIMO	2452	Ant2	35.700	≥ 0.5	Pass

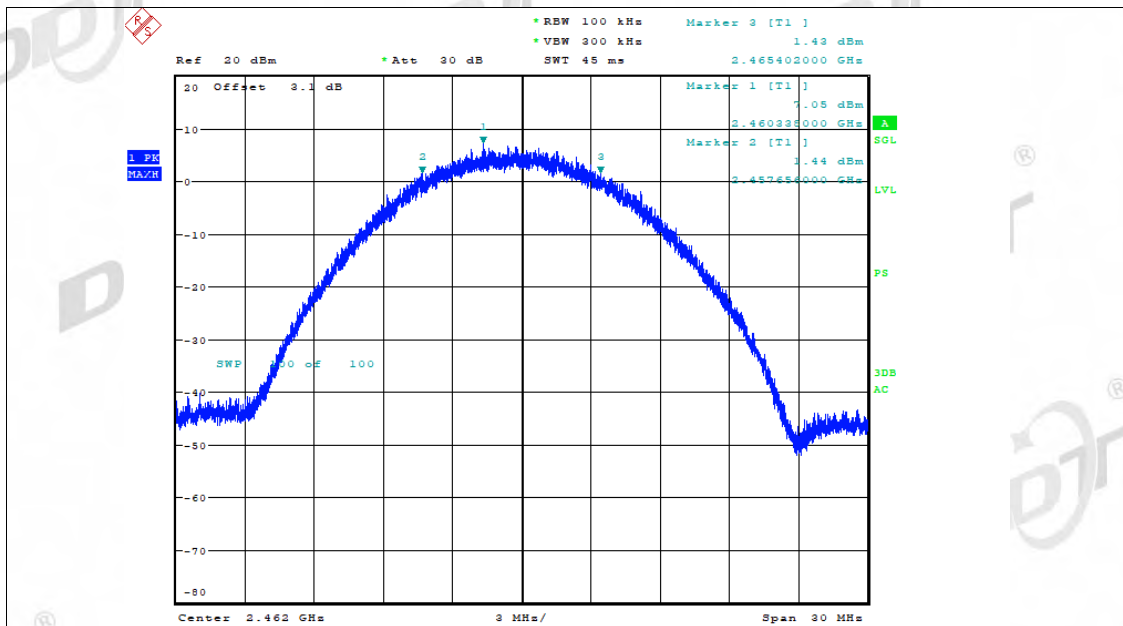
Test Mode	Test Channel	Ant	99% OBW (MHz)	Limit (MHz)	Verdict
11B	2412	Ant1	13.968	---	Pass
11B	2437	Ant1	13.755	---	Pass
11B	2462	Ant1	13.164	---	Pass
11B	2412	Ant2	13.593	---	Pass
11B	2437	Ant2	13.782	---	Pass
11B	2462	Ant2	13.767	---	Pass
11G	2412	Ant1	16.830	---	Pass
11G	2437	Ant1	16.743	---	Pass
11G	2462	Ant1	16.533	---	Pass

11G	2412	Ant2	16.569	---	Pass
11G	2437	Ant2	16.641	---	Pass
11G	2462	Ant2	16.632	---	Pass
11N20MIMO	2412	Ant1	18.042	---	Pass
11N20MIMO	2412	Ant2	17.739	---	Pass
11N20MIMO	2437	Ant1	17.904	---	Pass
11N20MIMO	2437	Ant2	17.823	---	Pass
11N20MIMO	2462	Ant1	17.682	---	Pass
11N20MIMO	2462	Ant2	17.823	---	Pass
11N40MIMO	2422	Ant1	36.336	---	Pass
11N40MIMO	2422	Ant2	36.366	---	Pass
11N40MIMO	2437	Ant1	36.612	---	Pass
11N40MIMO	2437	Ant2	36.600	---	Pass
11N40MIMO	2452	Ant1	36.564	---	Pass
11N40MIMO	2452	Ant2	36.354	---	Pass

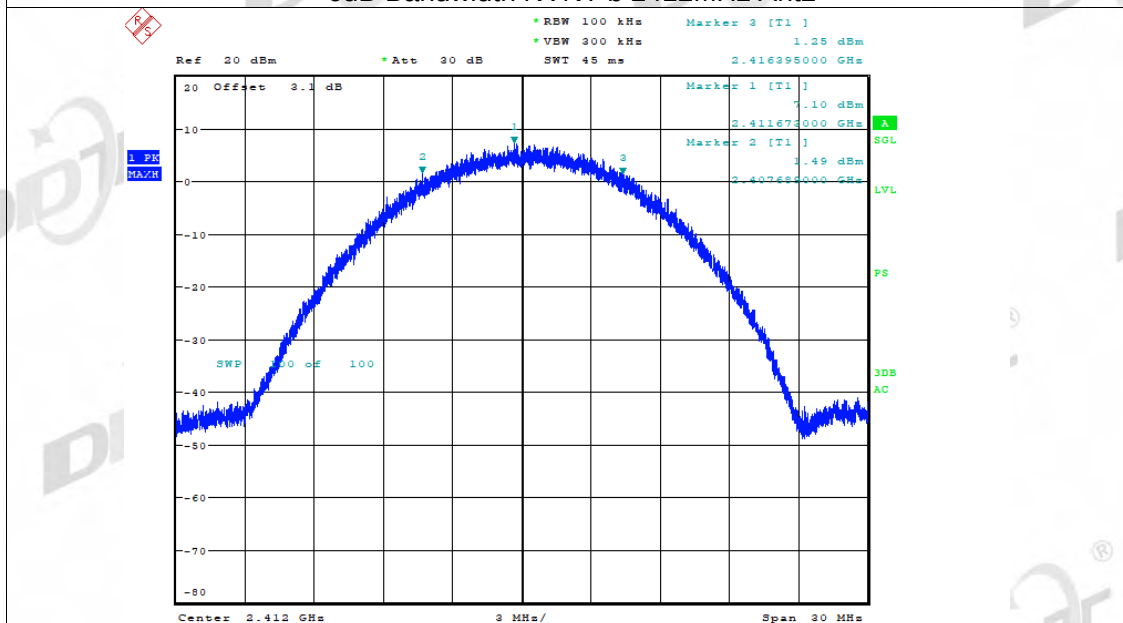
4.5. original test data

6dB Bandwidth:



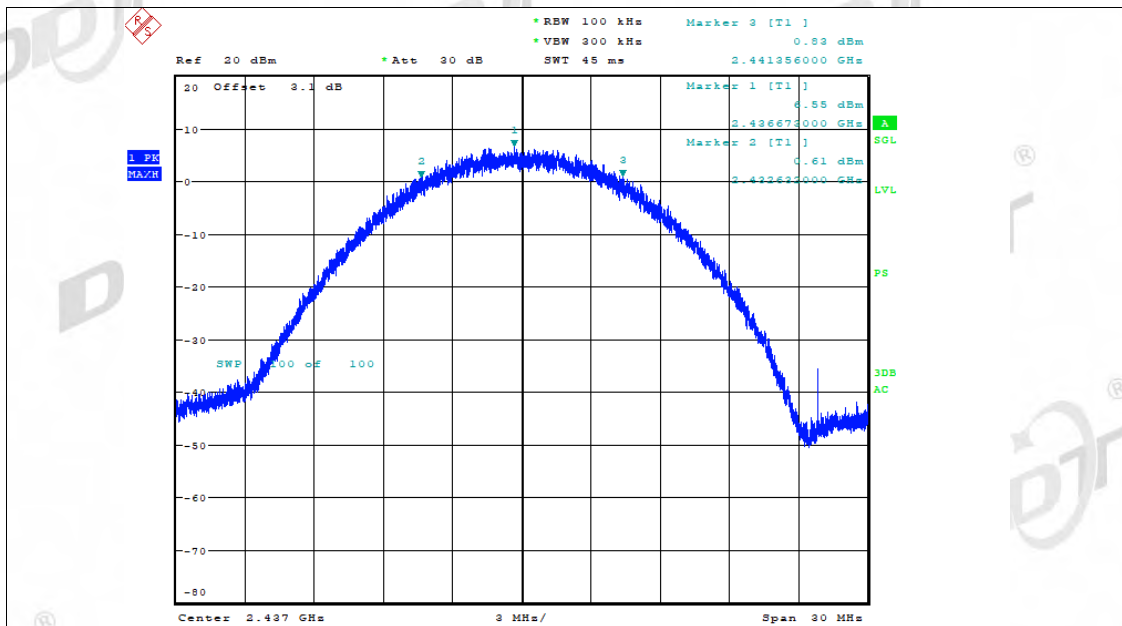


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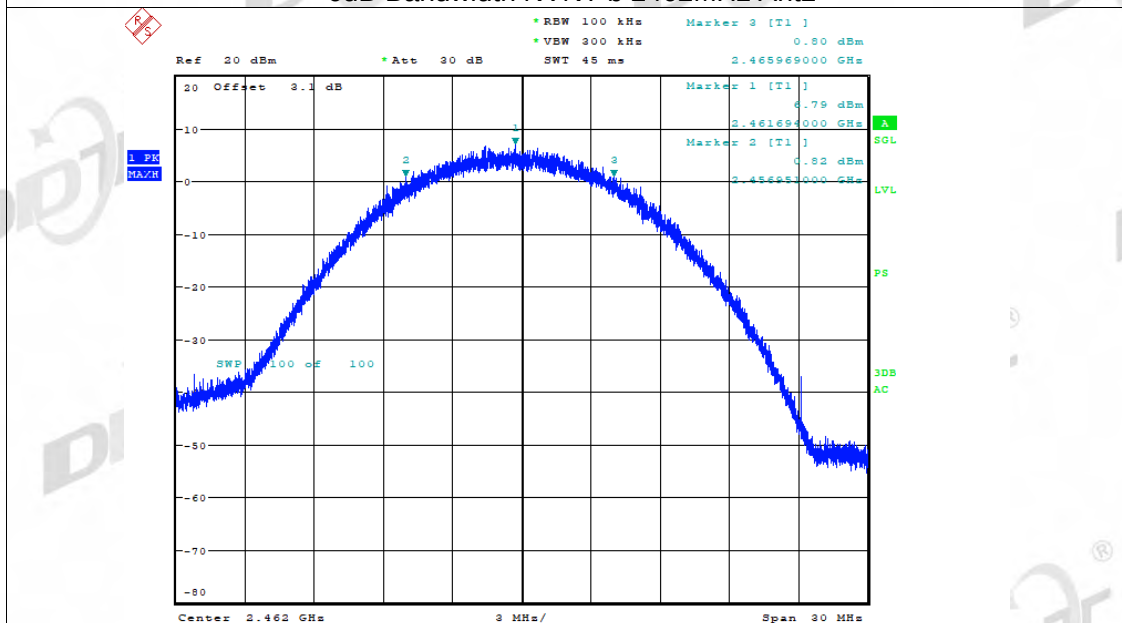
-6dB Bandwidth NVNT b 2412MHz Ant2

Date: 25.FEB.2022 12:18:29

-6dB Bandwidth NVNT b 2437MHz Ant2

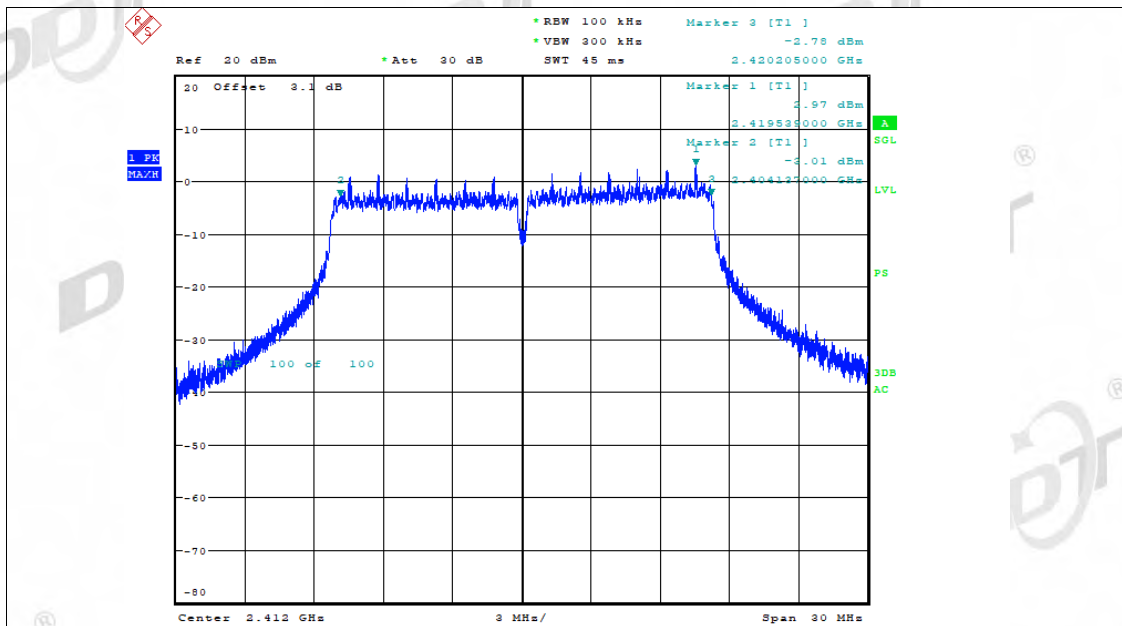


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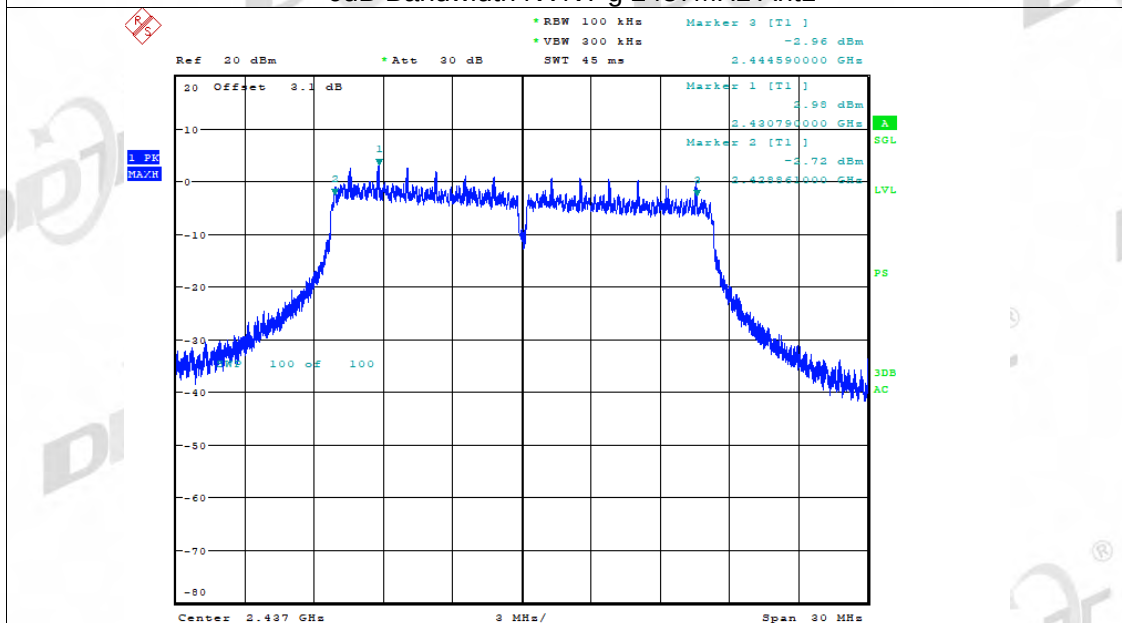
-6dB Bandwidth NVNT b 2462MHz Ant2

Date: 25.FEB.2022 12:41:05

-6dB Bandwidth NVNT g 2412MHz Ant1

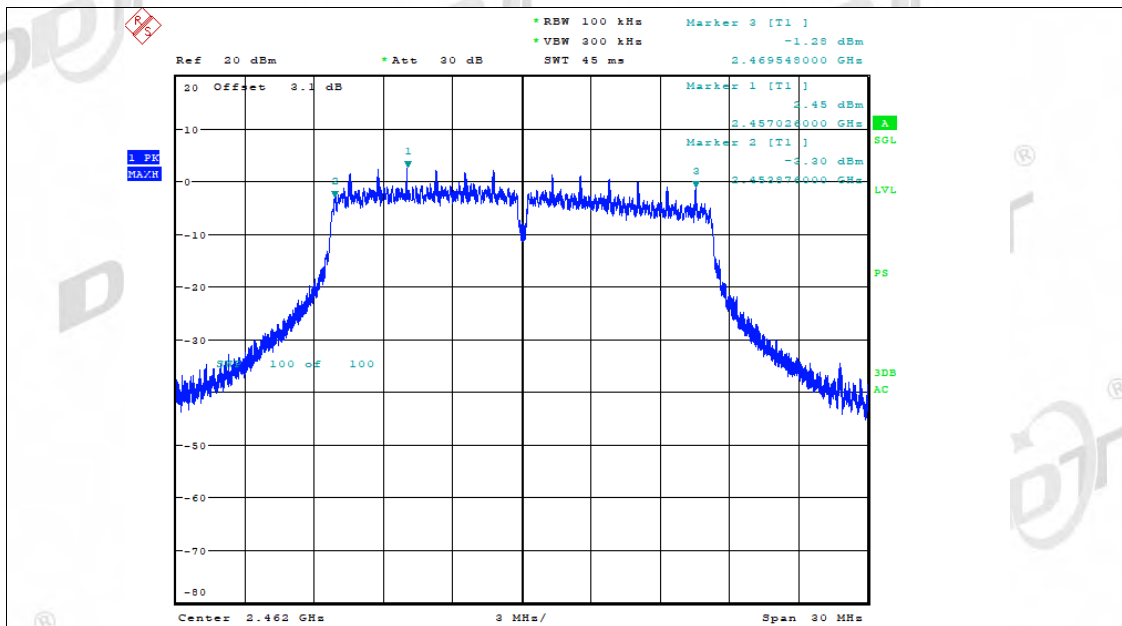


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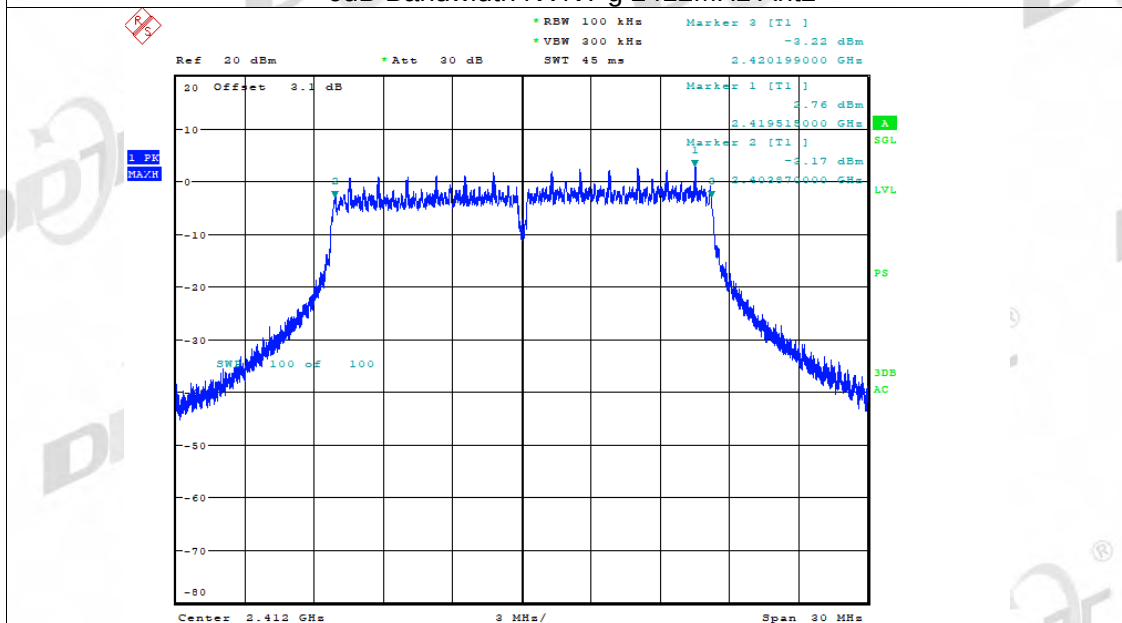
-6dB Bandwidth NVNT g 2437MHz Ant1

Date: 25.FEB.2022 13:19:55

-6dB Bandwidth NVNT g 2462MHz Ant1

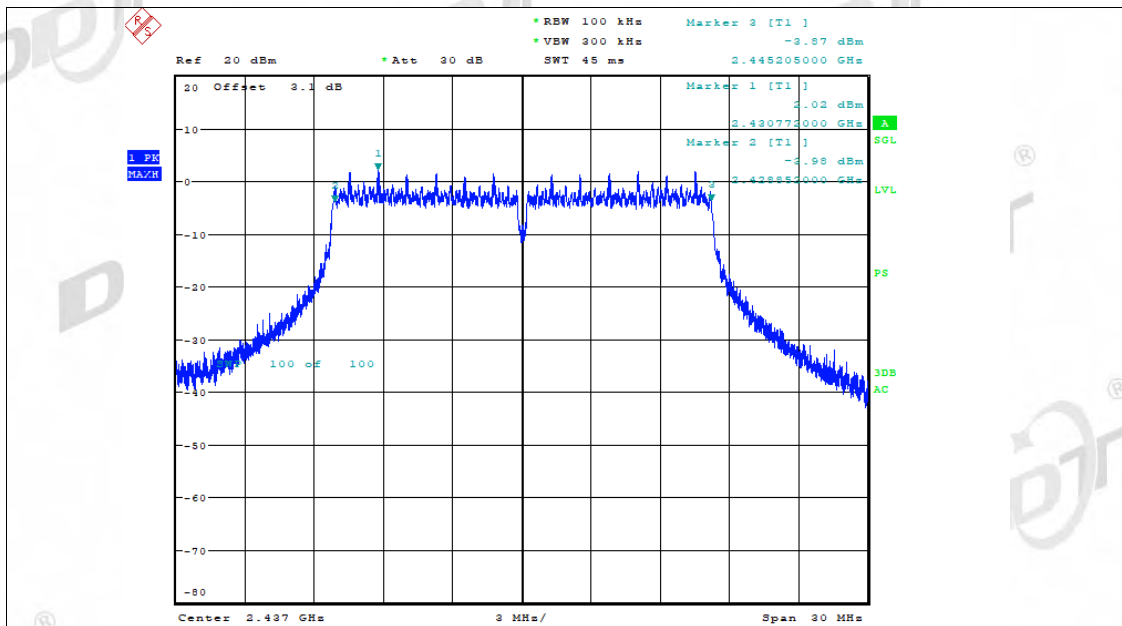


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-6dB Bandwidth NVNT g 2412MHz Ant2

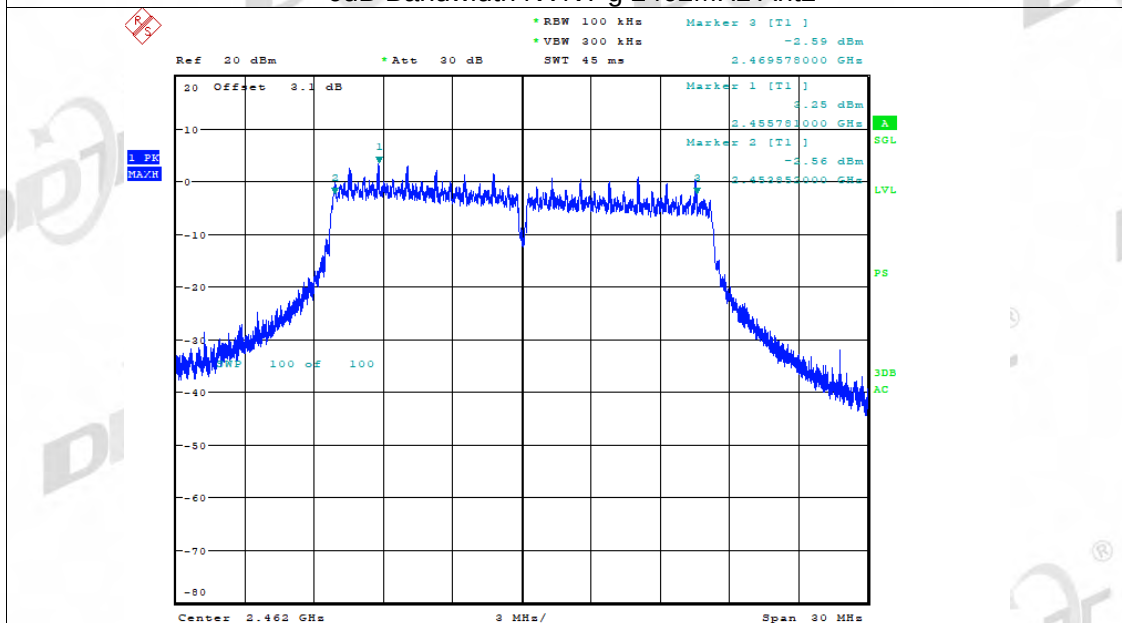
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-6dB Bandwidth NVNT g 2437MHz Ant2



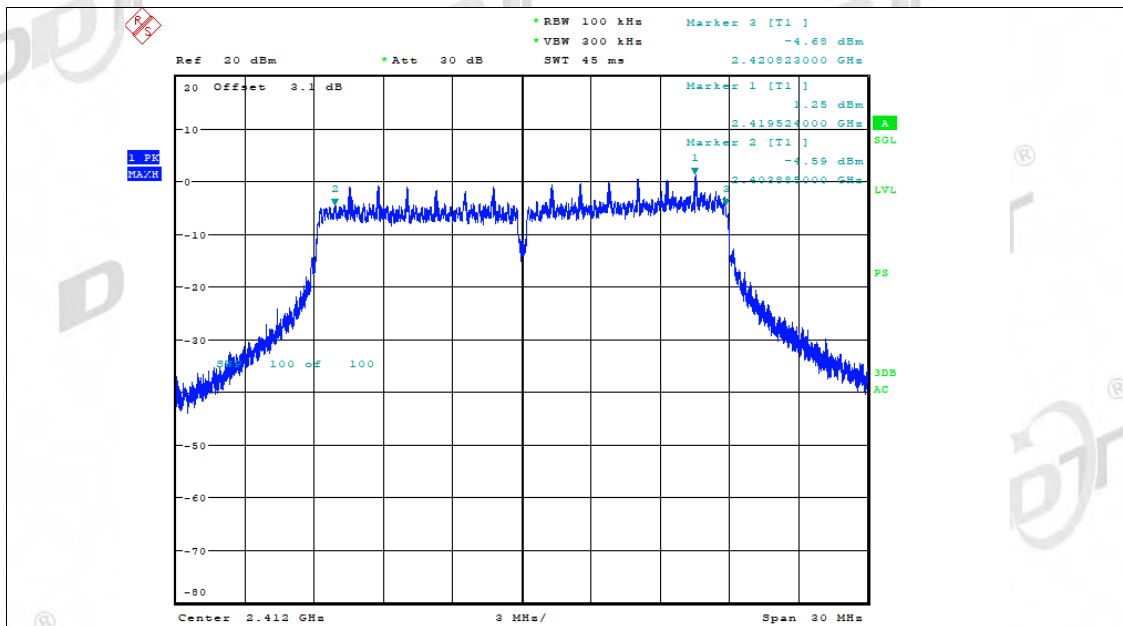
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-6dB Bandwidth NVNT g 2462MHz Ant2

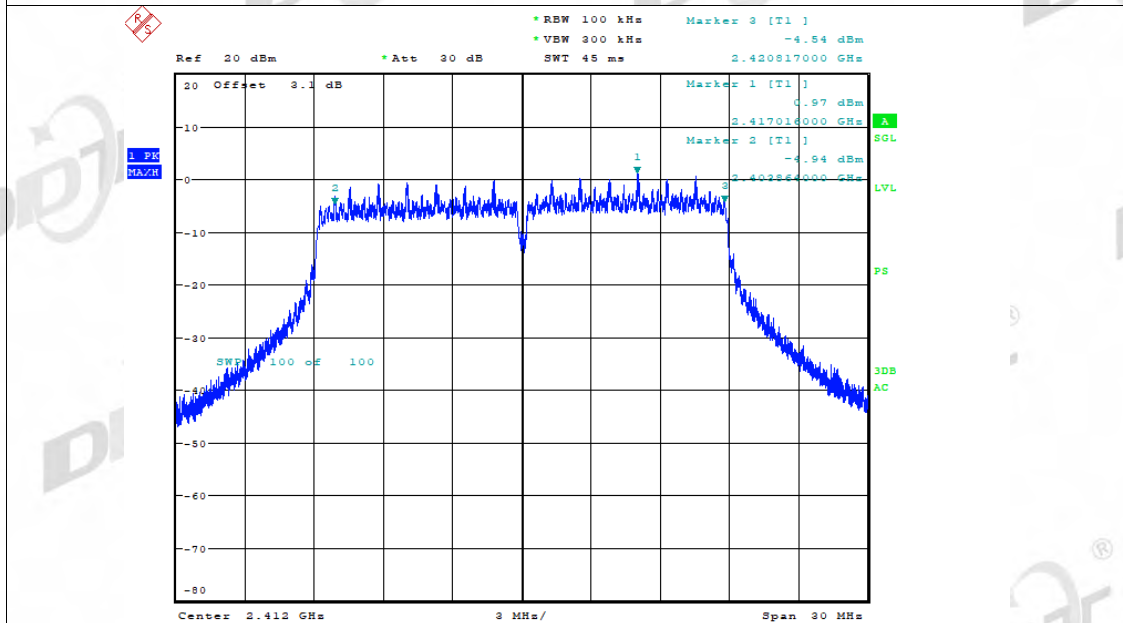


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-6dB Bandwidth NVNT n20 2412MHz Ant1

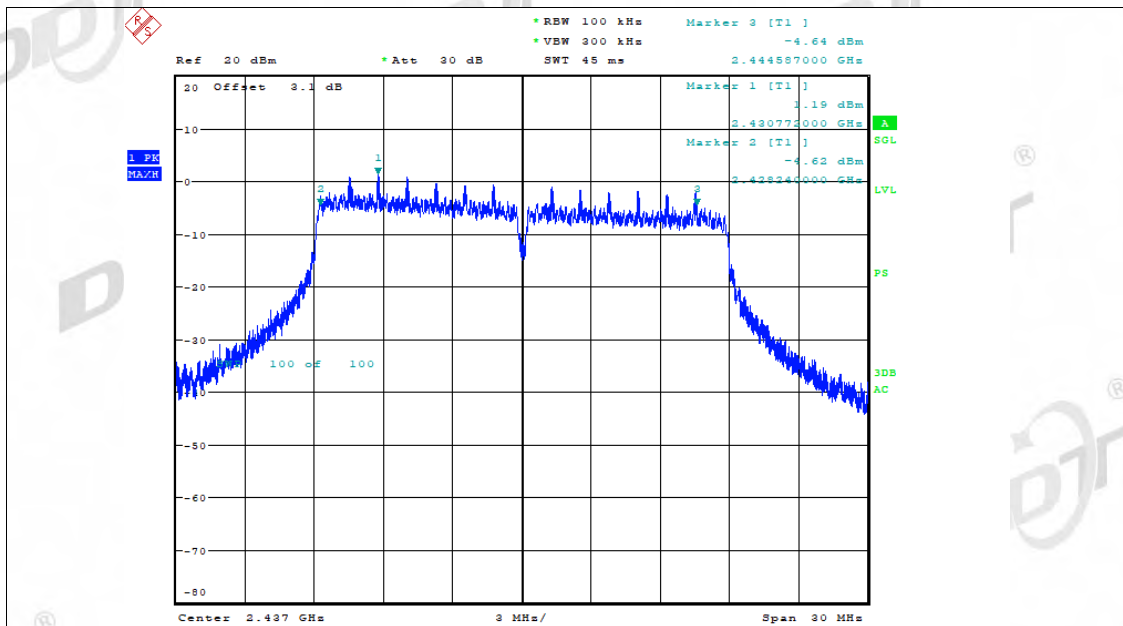


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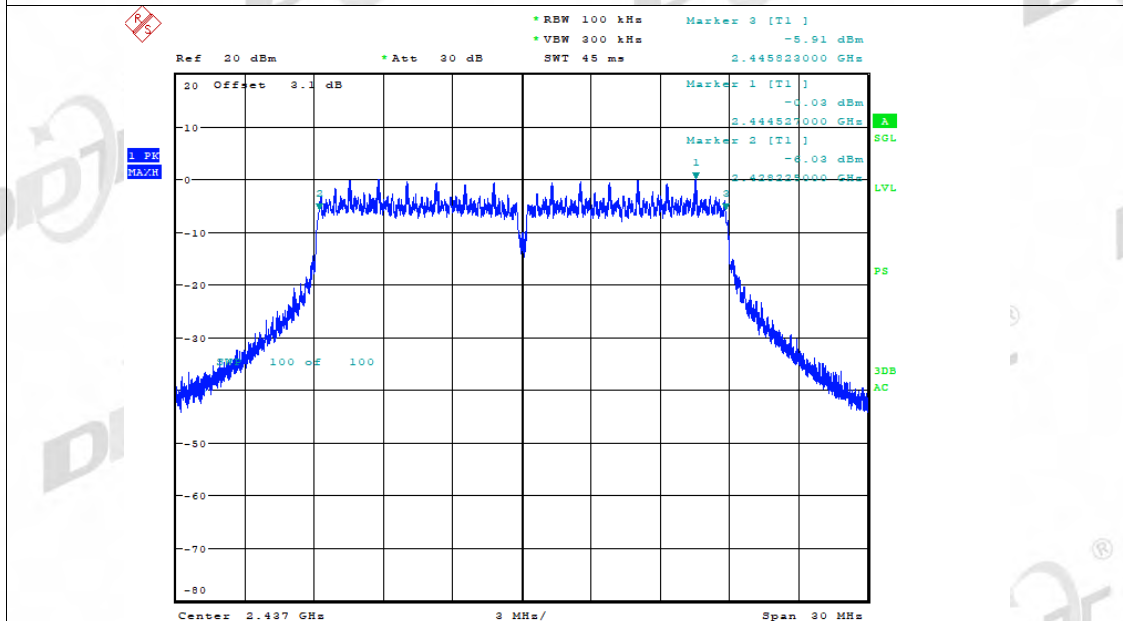
-6dB Bandwidth NVNT n20 2412MHz Ant2

Date: 25.FEB.2022 13:40:18

-6dB Bandwidth NVNT n20 2437MHz Ant1

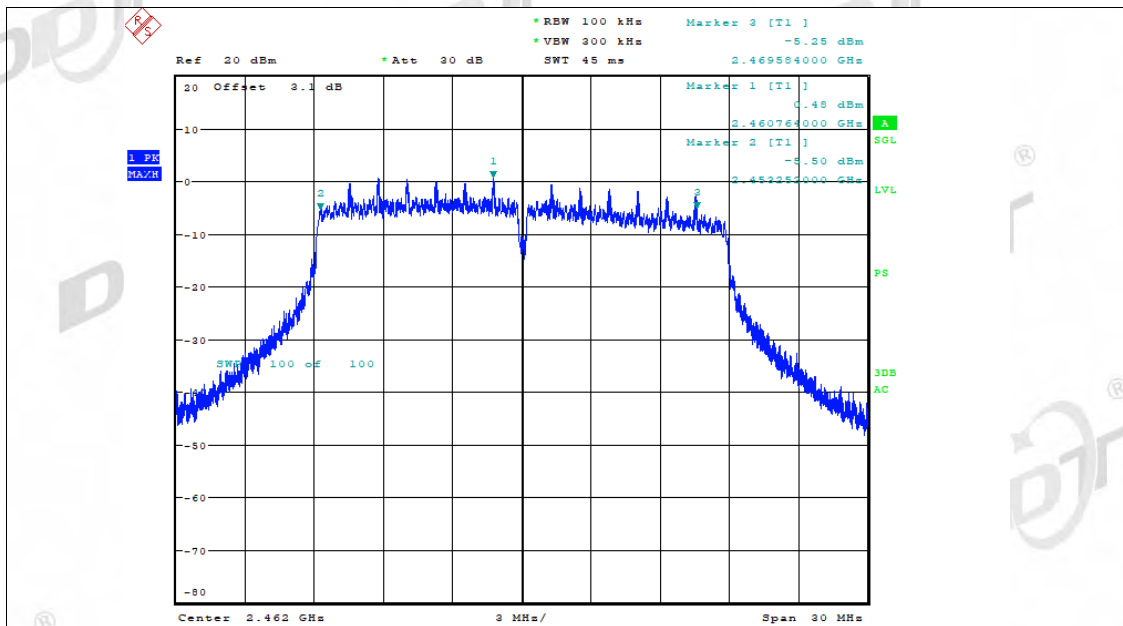


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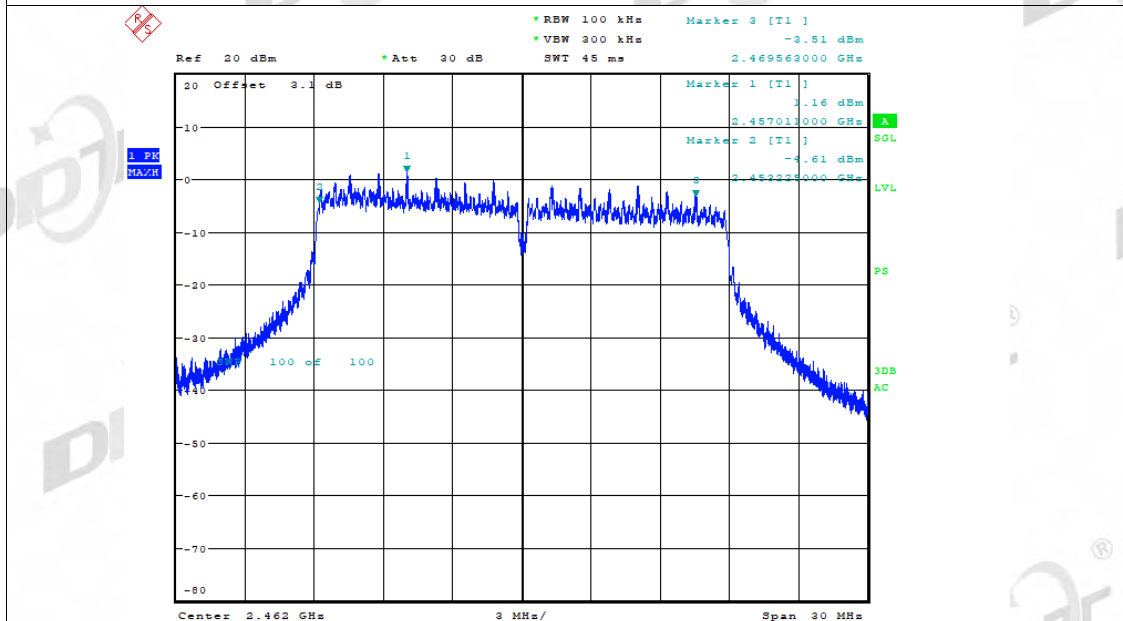
-6dB Bandwidth NVNT n20 2437MHz Ant2

Date: 25.FEB.2022 13:45:24

-6dB Bandwidth NVNT n20 2462MHz Ant1

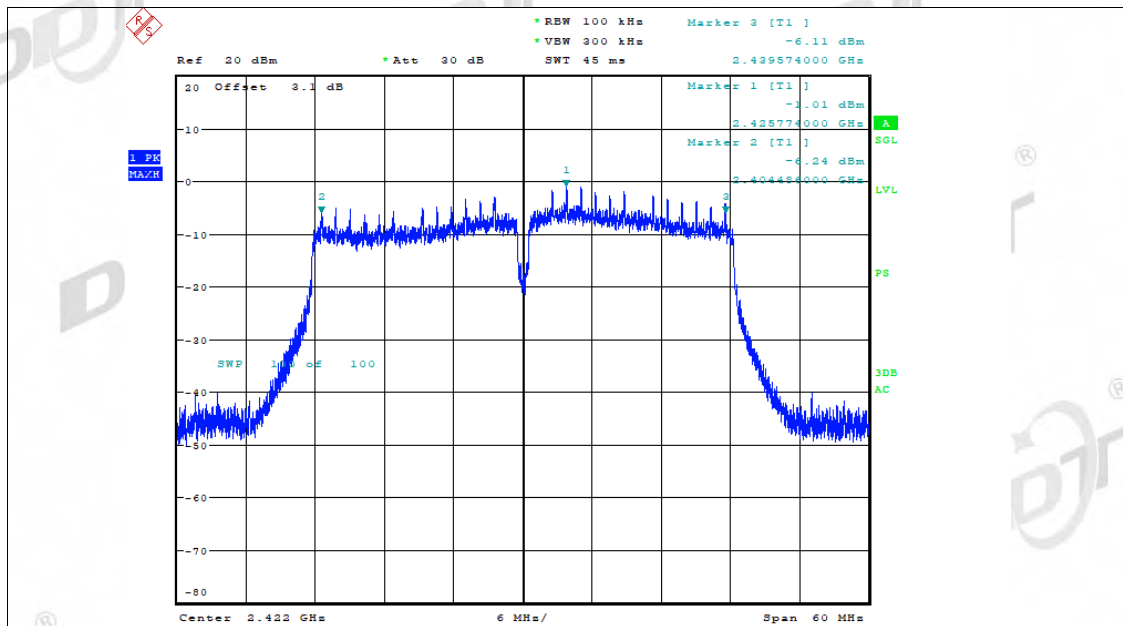


Date: 25.FEB.2022 13:49:48

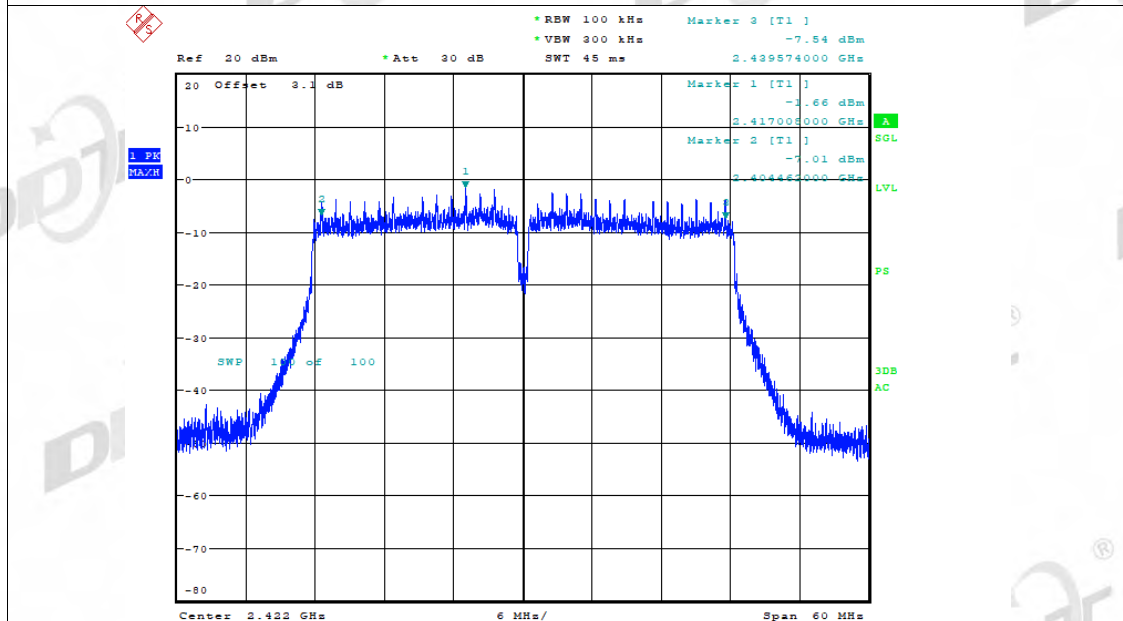
-6dB Bandwidth NVNT n20 2462MHz Ant2

Date: 25.FEB.2022 13:50:10

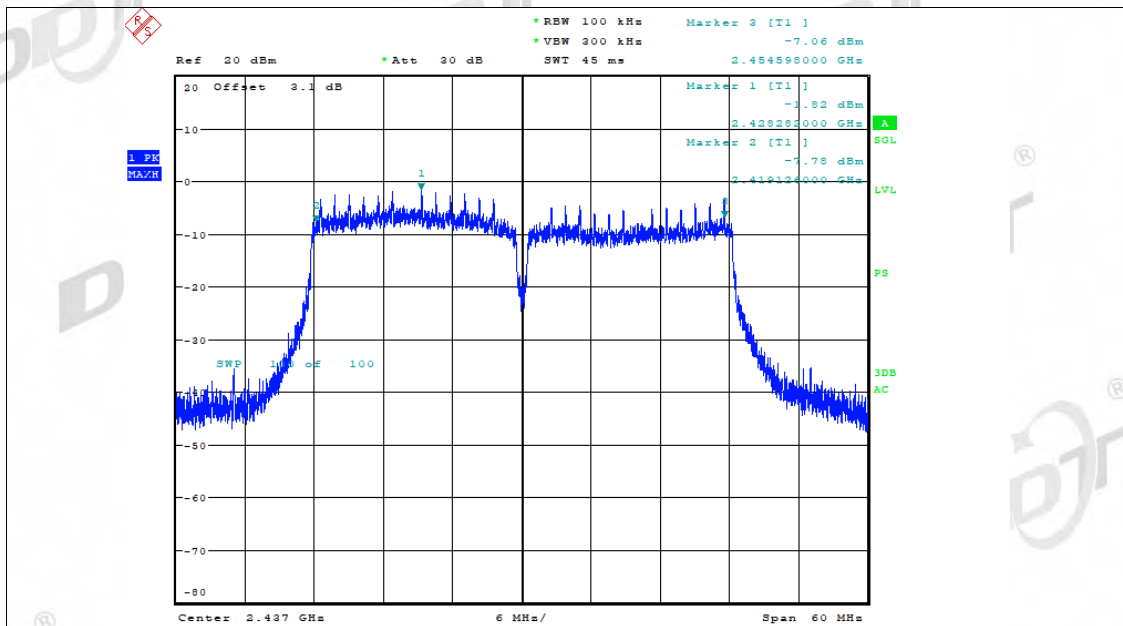
-6dB Bandwidth NVNT n40 2422MHz Ant1



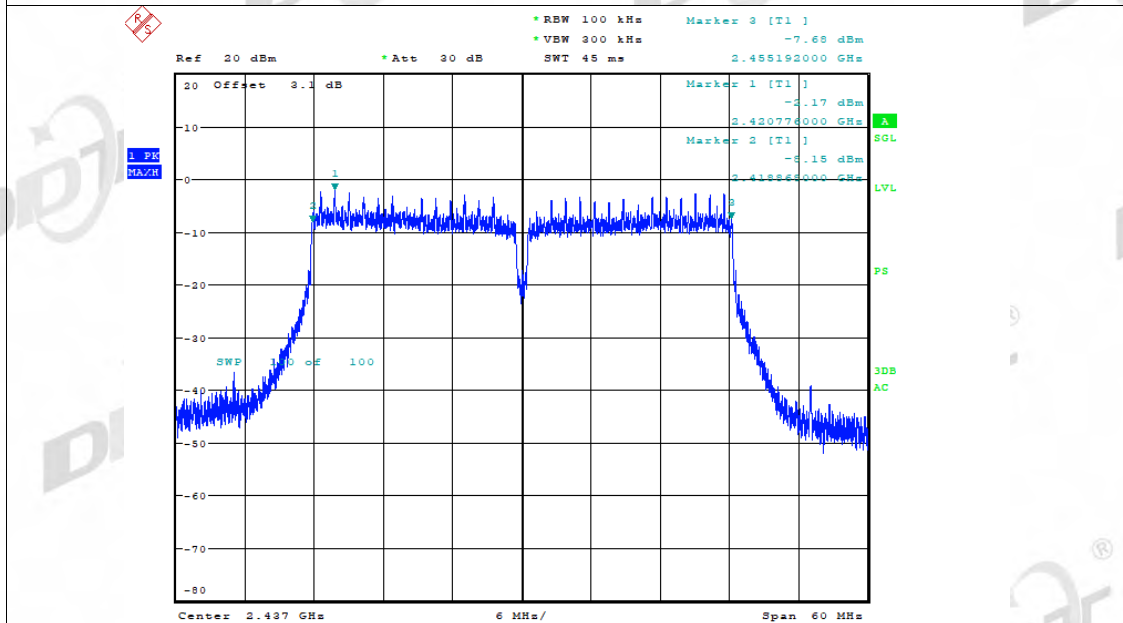
-6dB Bandwidth NVNT n40 2422MHz Ant2



-6dB Bandwidth NVNT n40 2437MHz Ant1

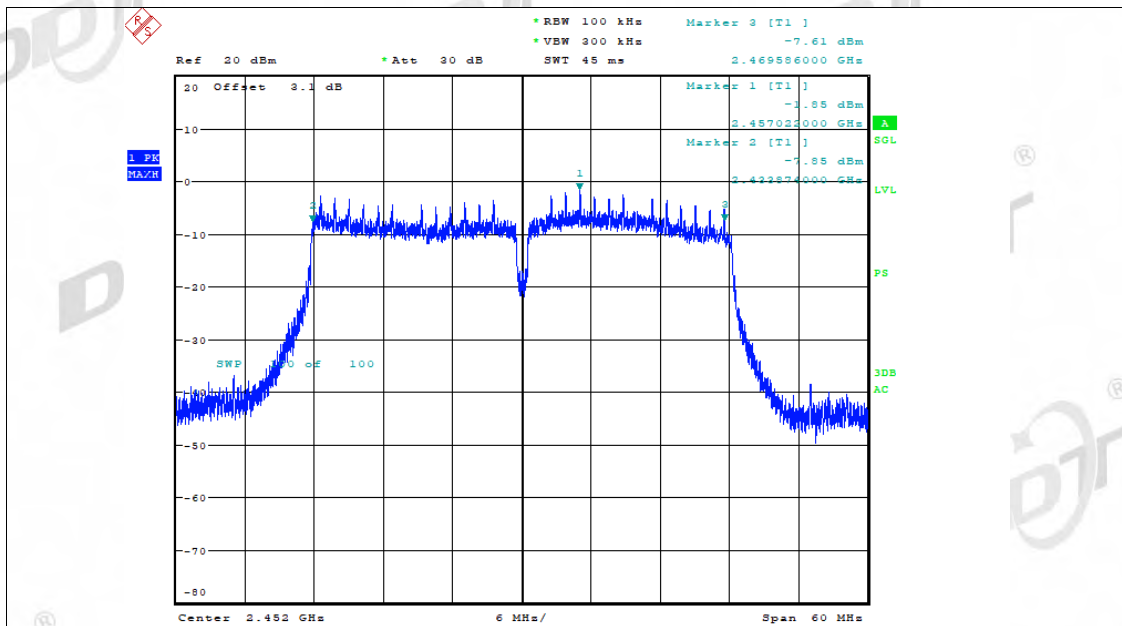


Date: 25.FEB.2022 14:07:15

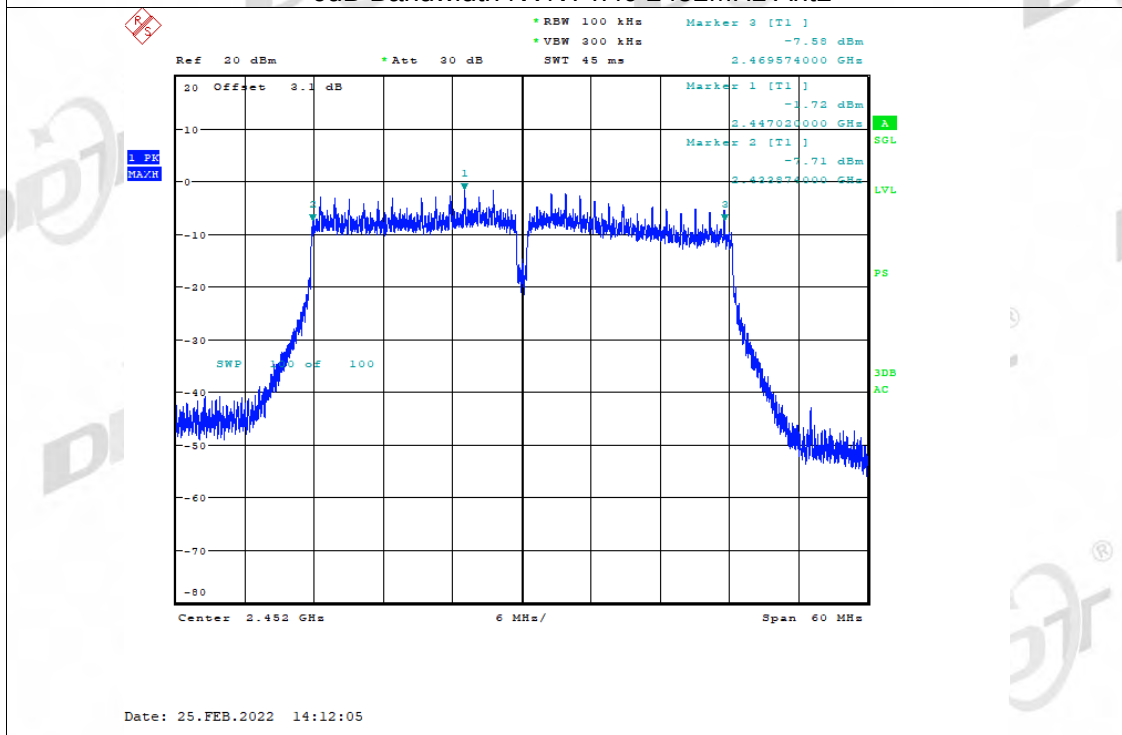
-6dB Bandwidth NVNT n40 2437MHz Ant2

Date: 25.FEB.2022 14:07:35

-6dB Bandwidth NVNT n40 2452MHz Ant1

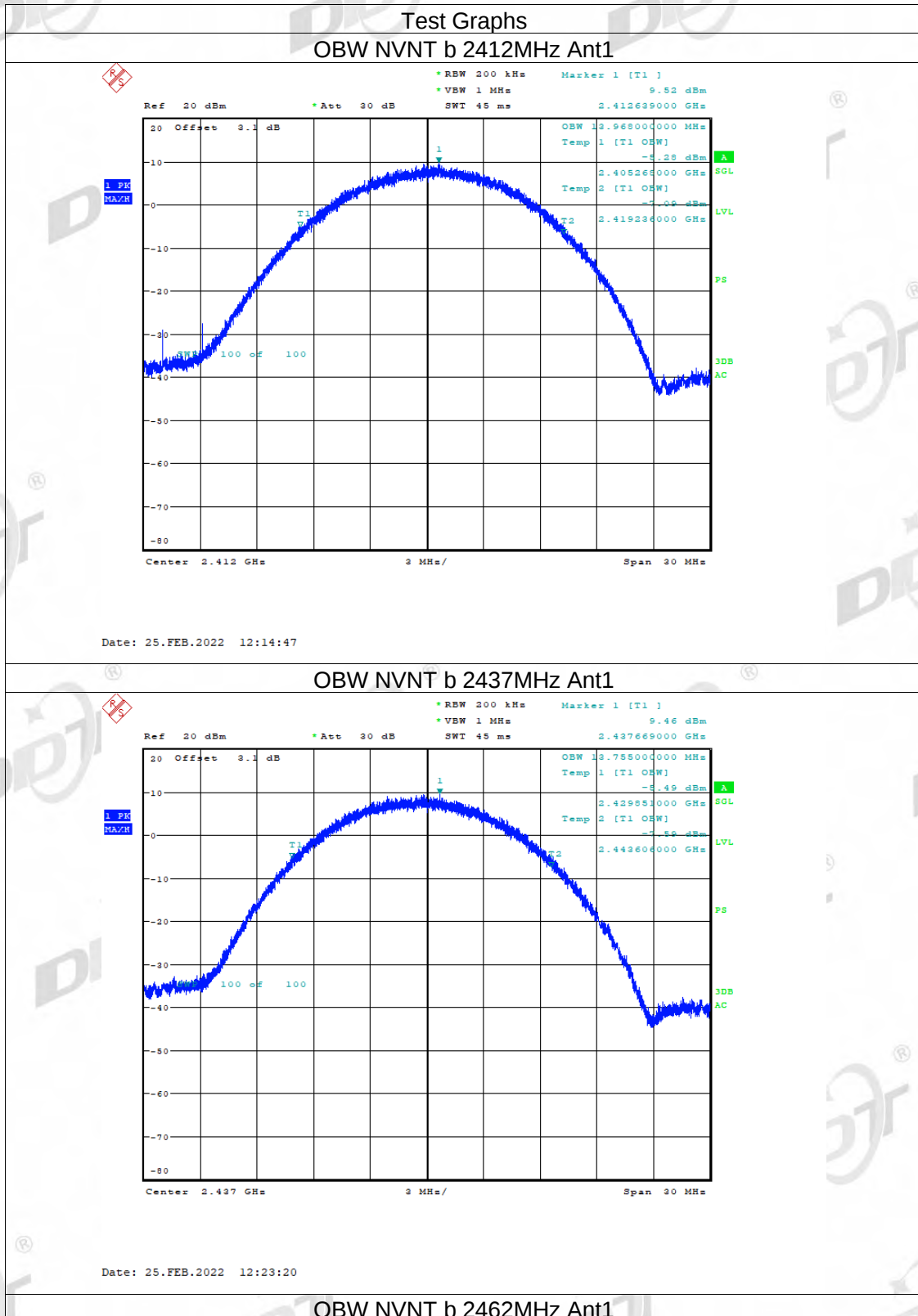


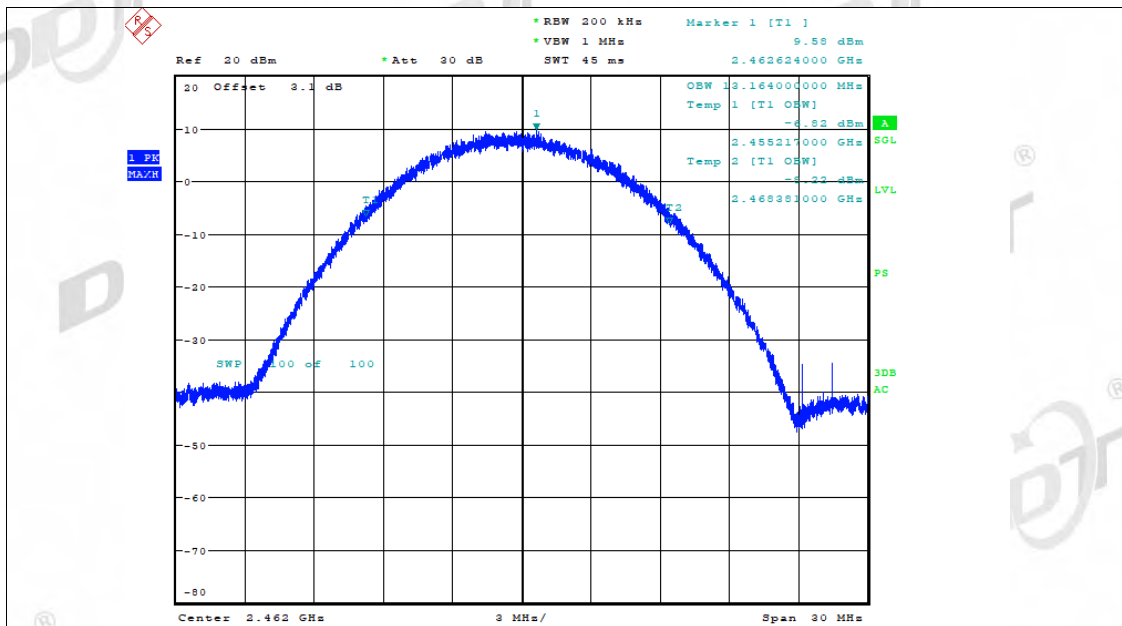
Date: 25.FEB.2022 14:11:46

-6dB Bandwidth NVNT n40 2452MHz Ant2

Date: 25.FEB.2022 14:12:05

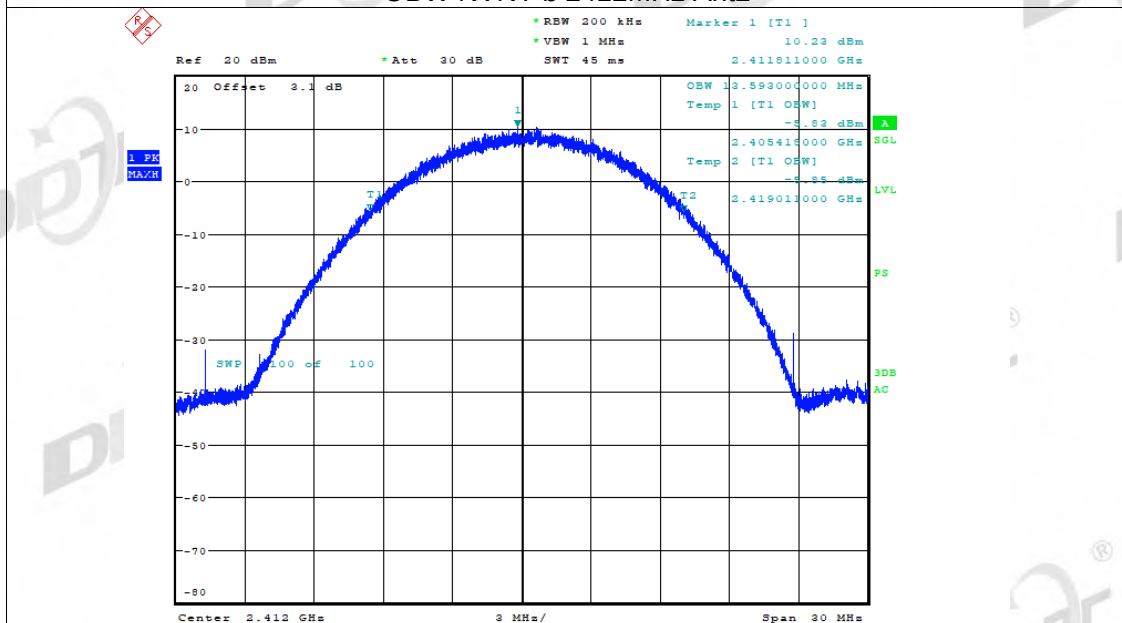
99% Bandwidth





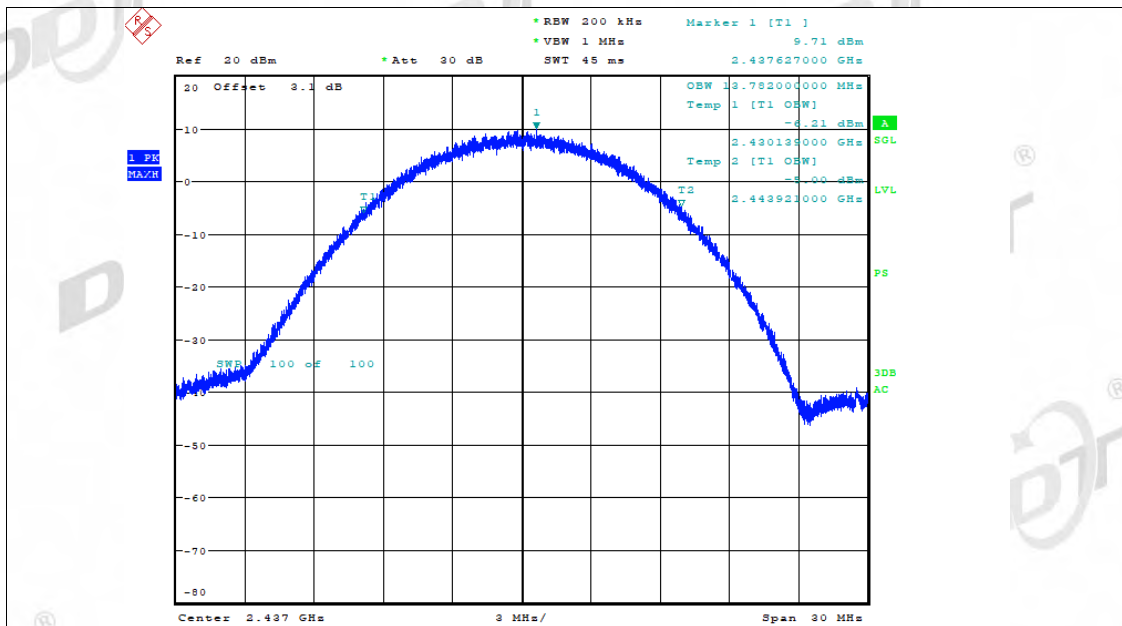
Date: 25.FEB.2022 12:36:47

OBW NVNT b 2412MHz Ant2



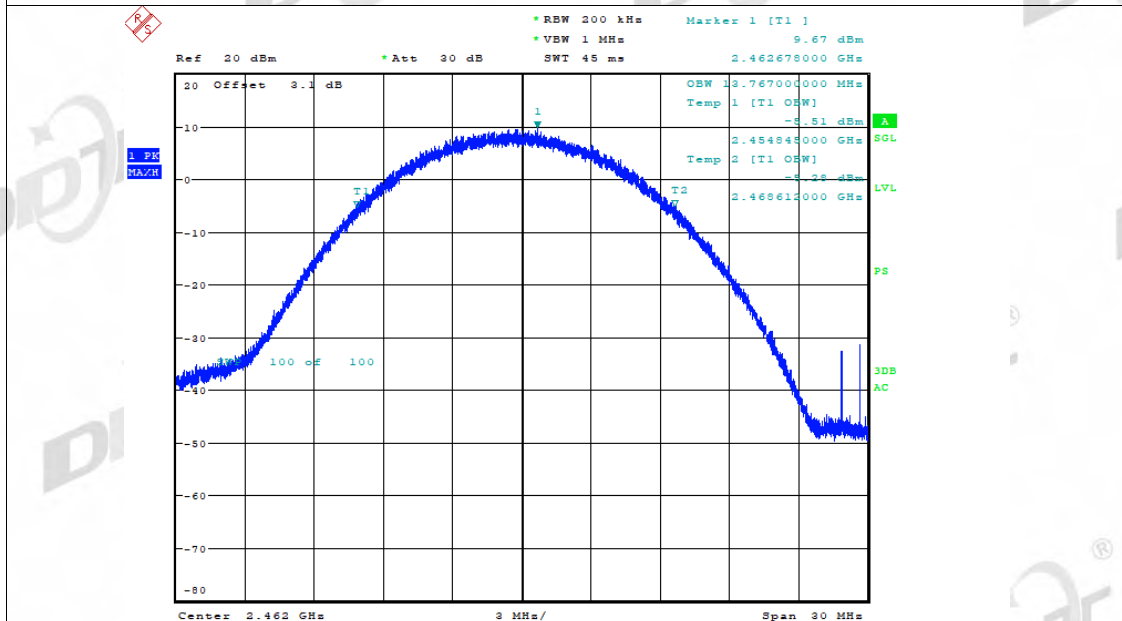
Date: 25.FEB.2022 12:18:03

OBW NVNT b 2437MHz Ant2



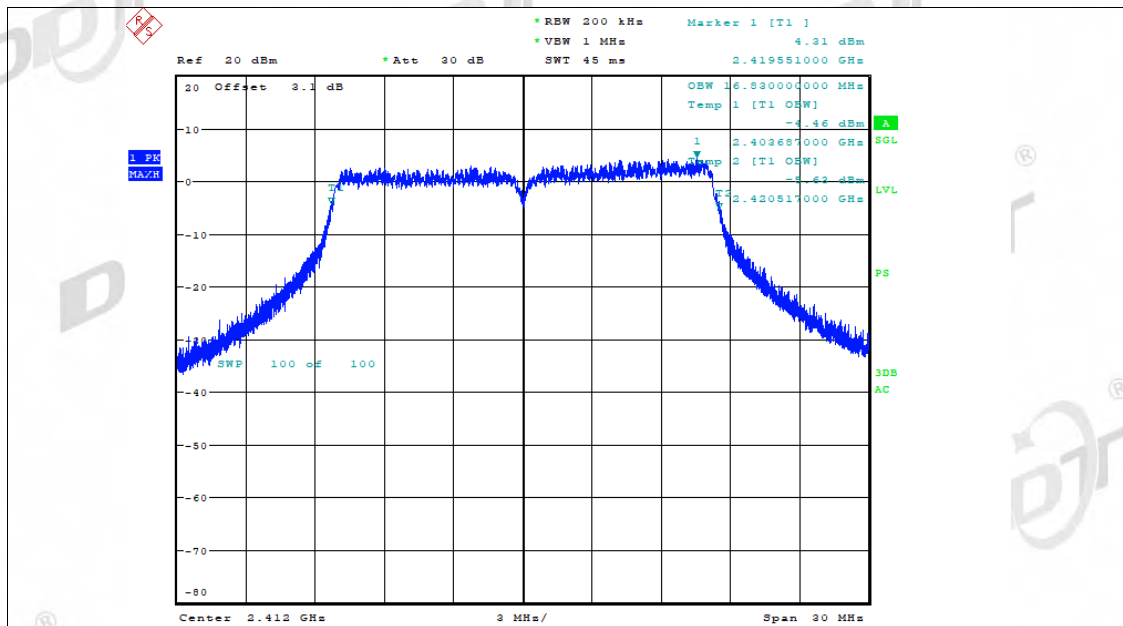
Date: 25.FEB.2022 12:27:18

OBW NVNT b 2462MHz Ant2



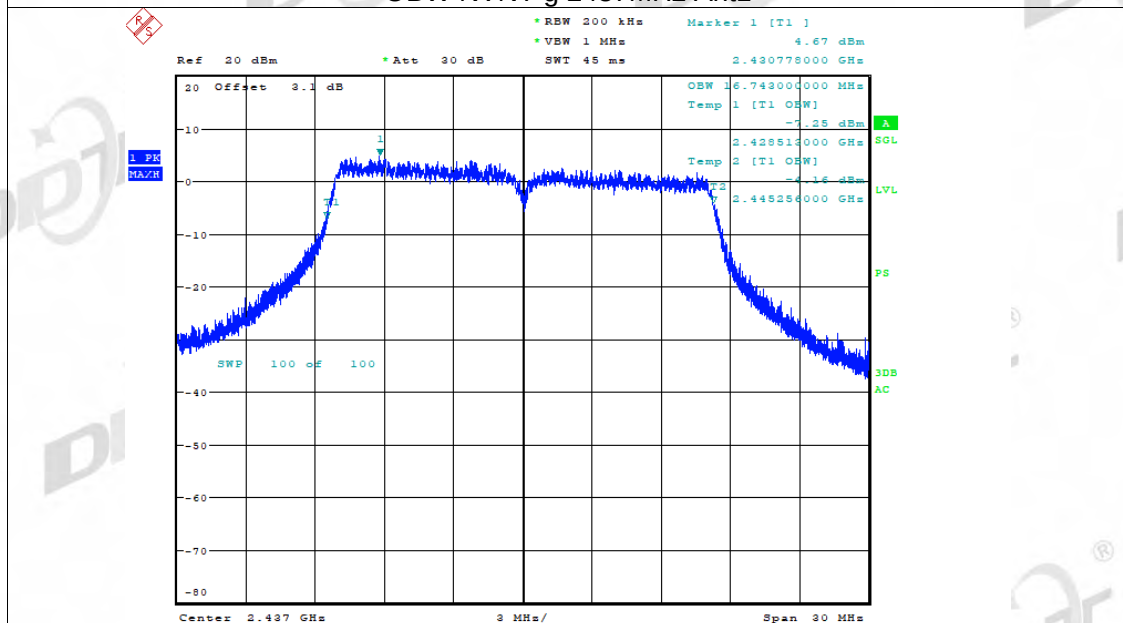
Date: 25.FEB.2022 12:40:38

OBW NVNT g 2412MHz Ant1



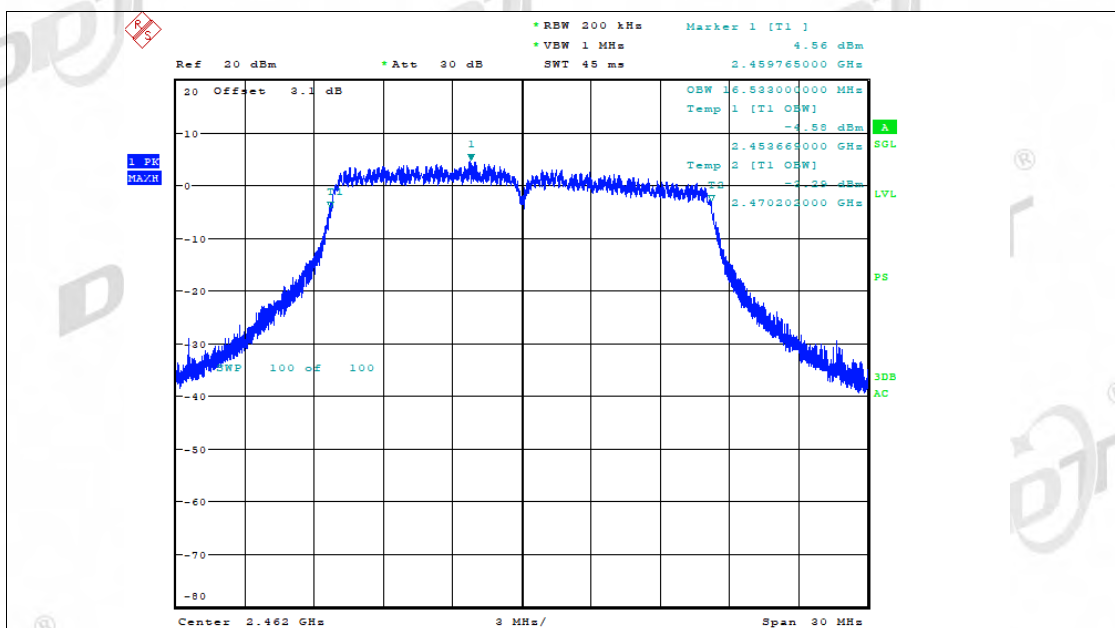
Date: 25.FEB.2022 13:10:44

OBW NVNT g 2437MHz Ant1



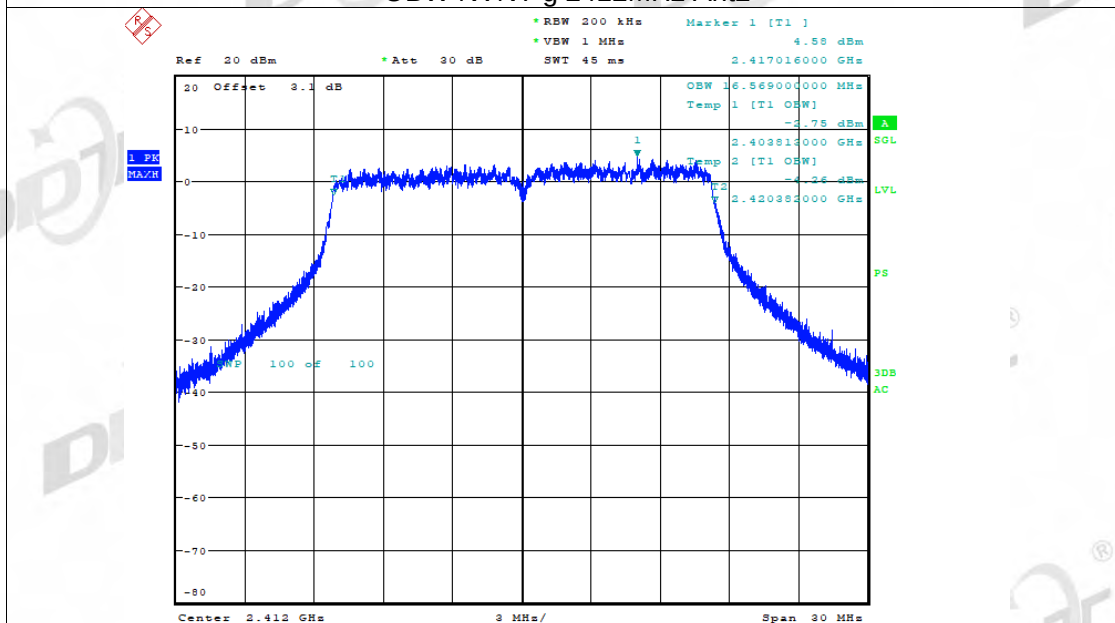
Date: 25.FEB.2022 13:19:29

OBW NVNT g 2462MHz Ant1



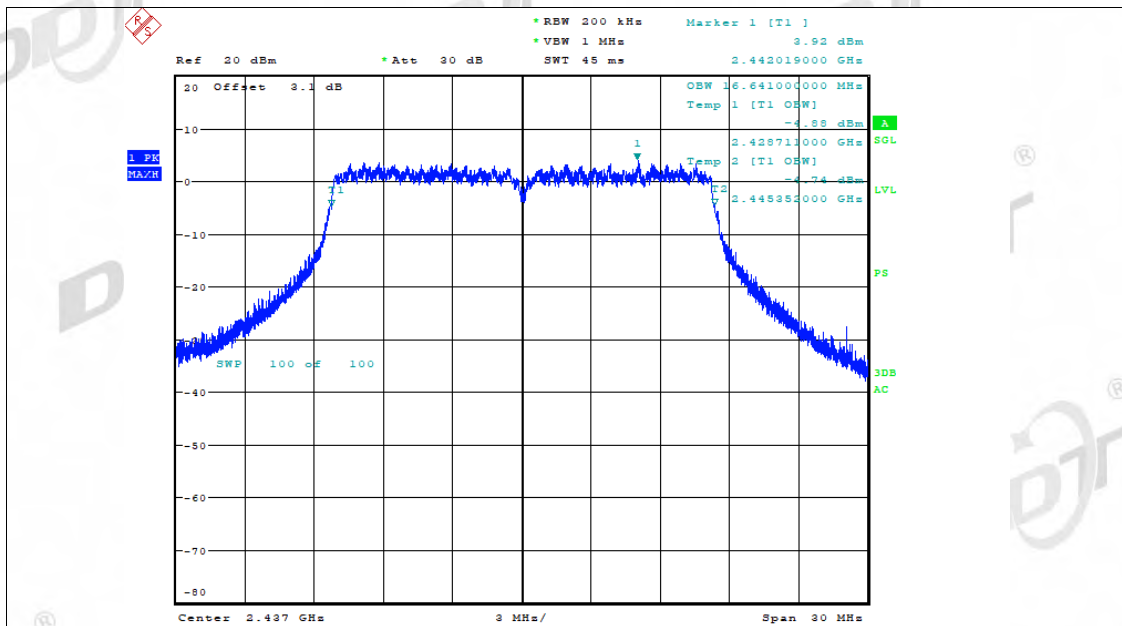
Date: 25.FEB.2022 13:26:36

OBW NVNT g 2412MHz Ant2



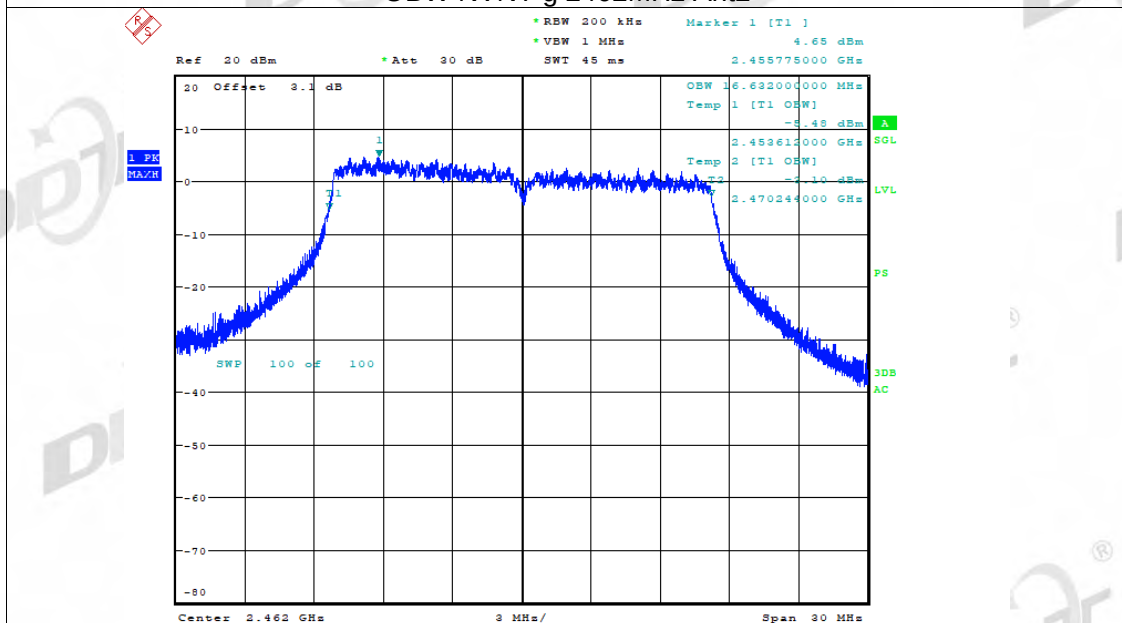
Date: 25.FEB.2022 13:14:31

OBW NVNT g 2437MHz Ant2



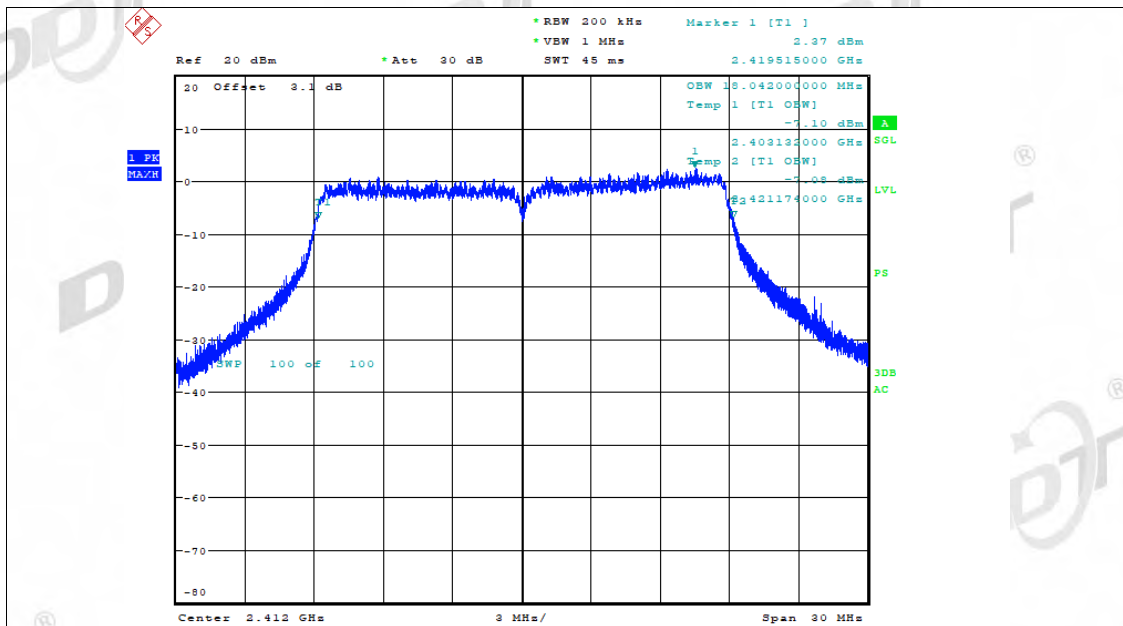
Date: 25.FEB.2022 13:23:08

OBW NVNT g 2462MHz Ant2



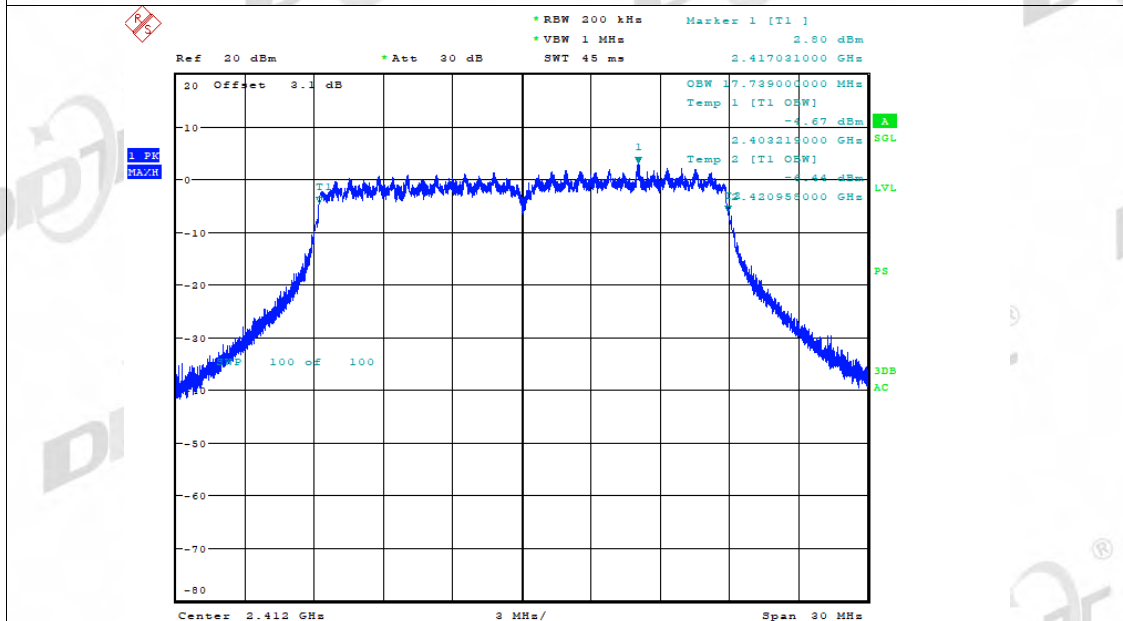
Date: 25.FEB.2022 13:29:33

OBW NVNT n20 2412MHz Ant1



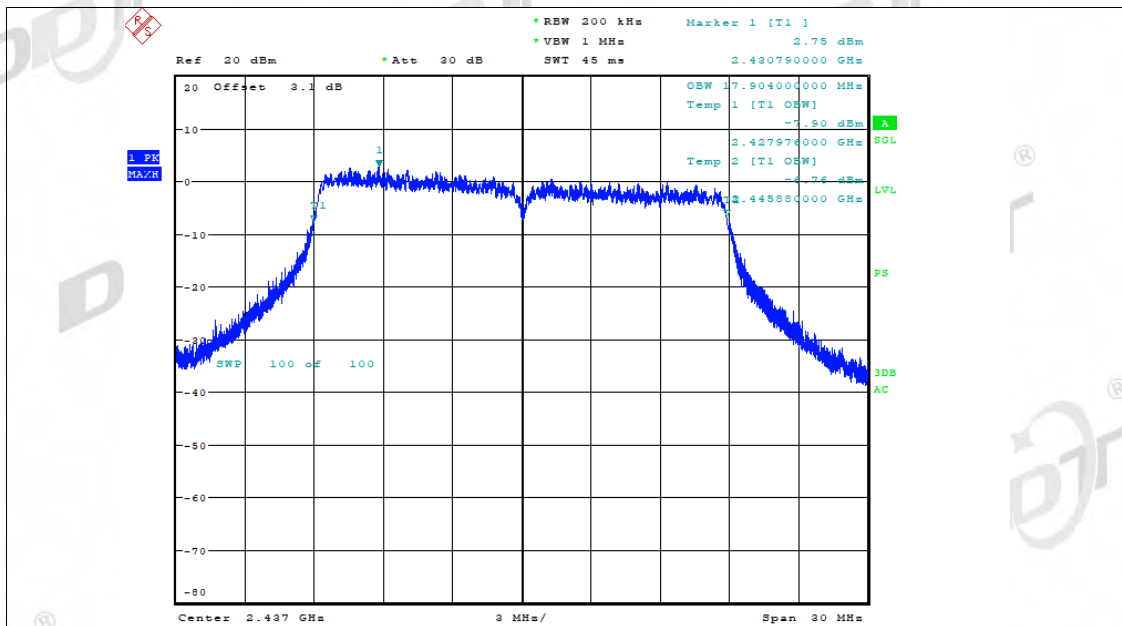
Date: 25.FEB.2022 13:39:06

OBW NVNT n20 2412MHz Ant2



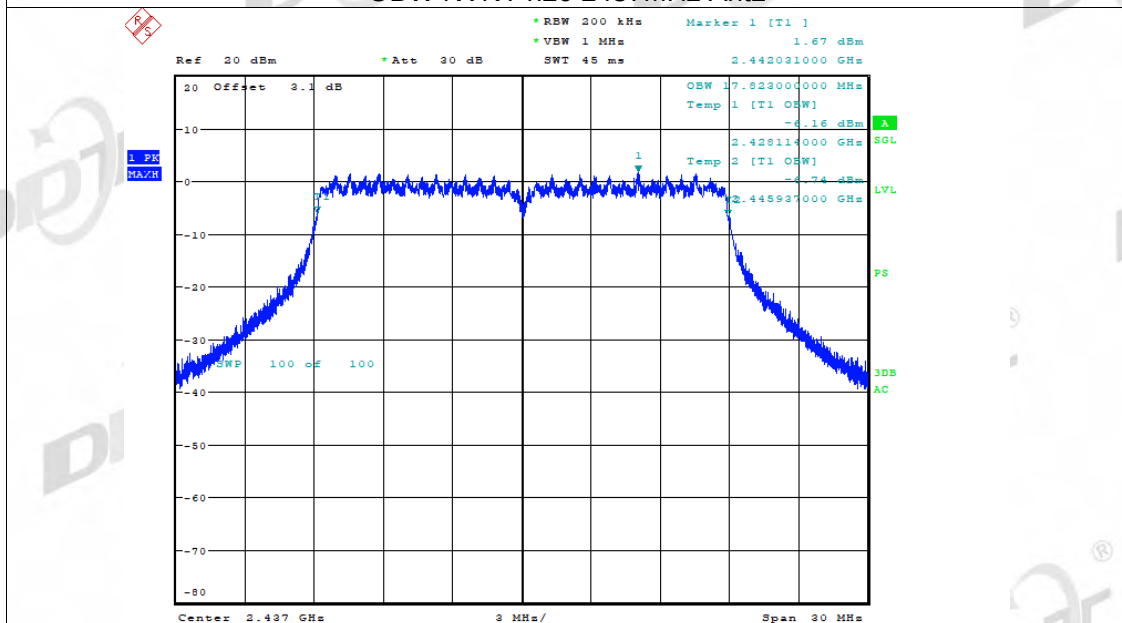
Date: 25.FEB.2022 13:39:28

OBW NVNT n20 2437MHz Ant1



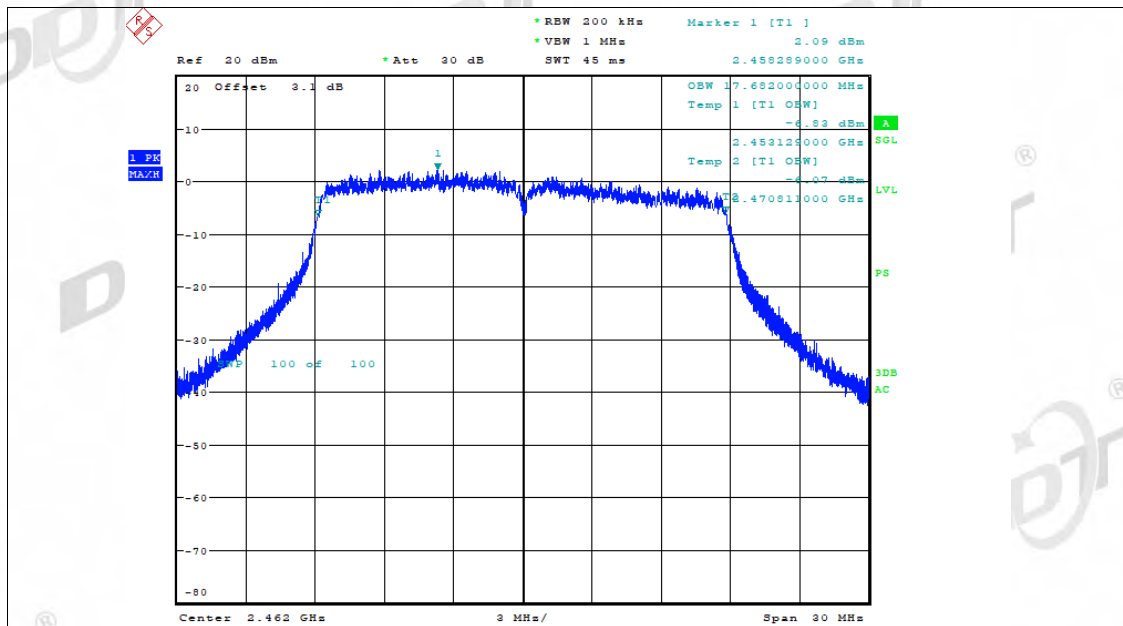
Date: 25.FEB.2022 13:44:17

OBW NVNT n20 2437MHz Ant2



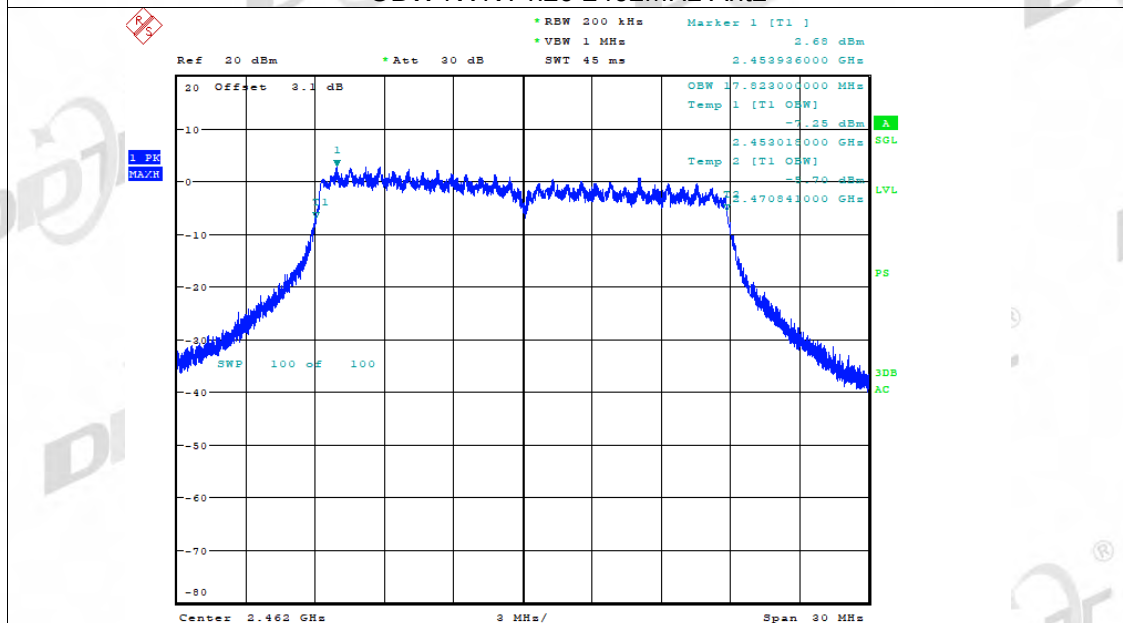
Date: 25.FEB.2022 13:44:37

OBW NVNT n20 2462MHz Ant1



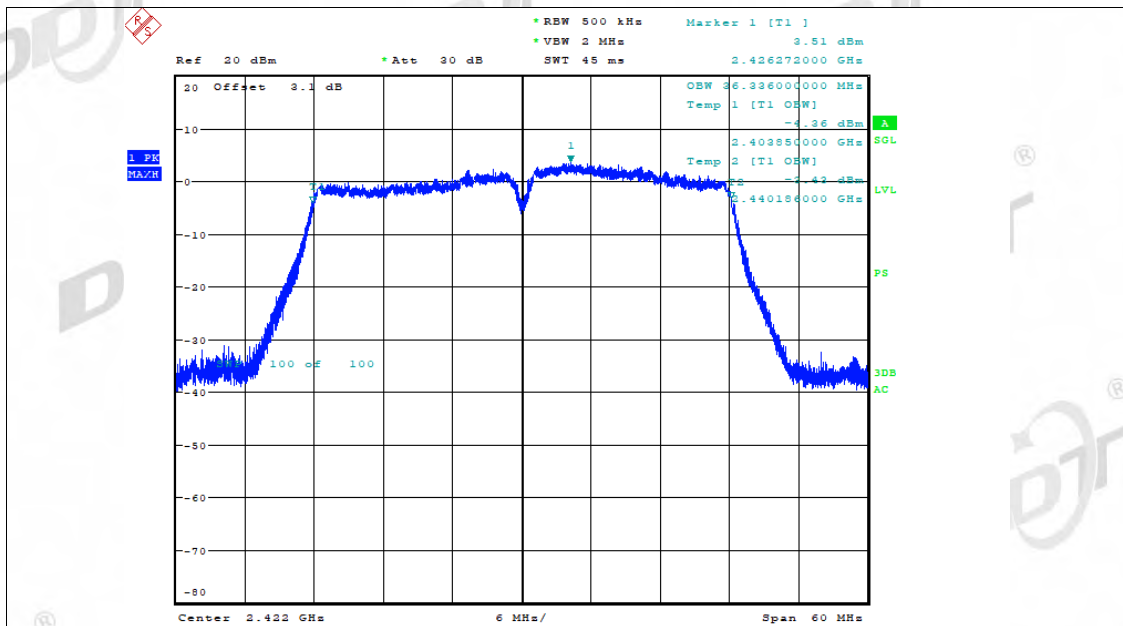
Date: 25.FEB.2022 13:48:57

OBW NVNT n20 2462MHz Ant2



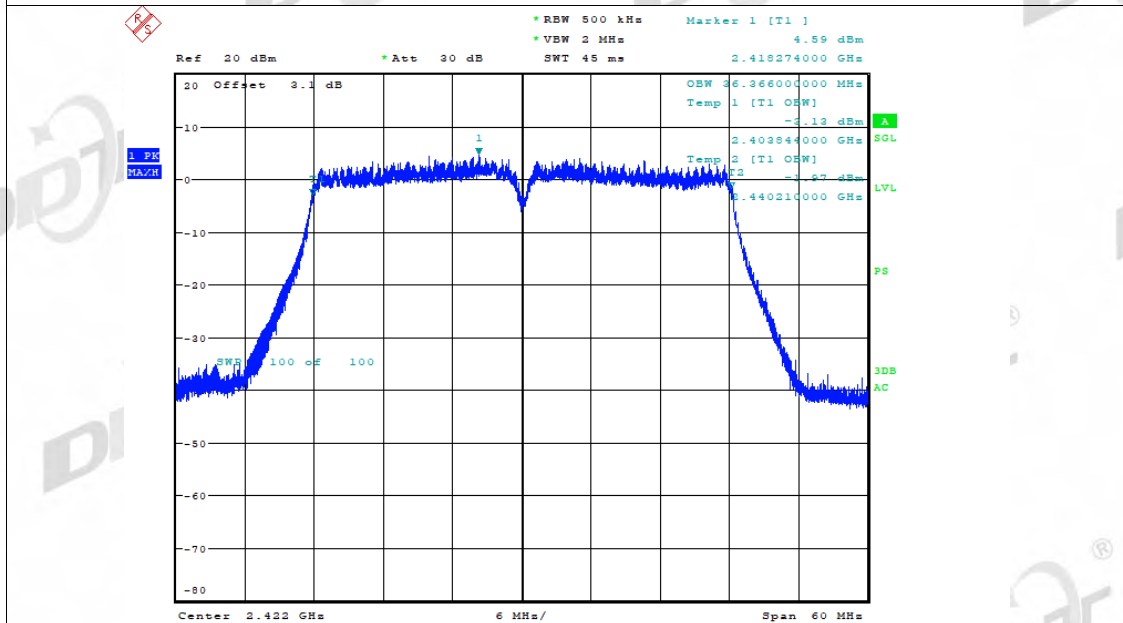
Date: 25.FEB.2022 13:49:19

OBW NVNT n40 2422MHz Ant1



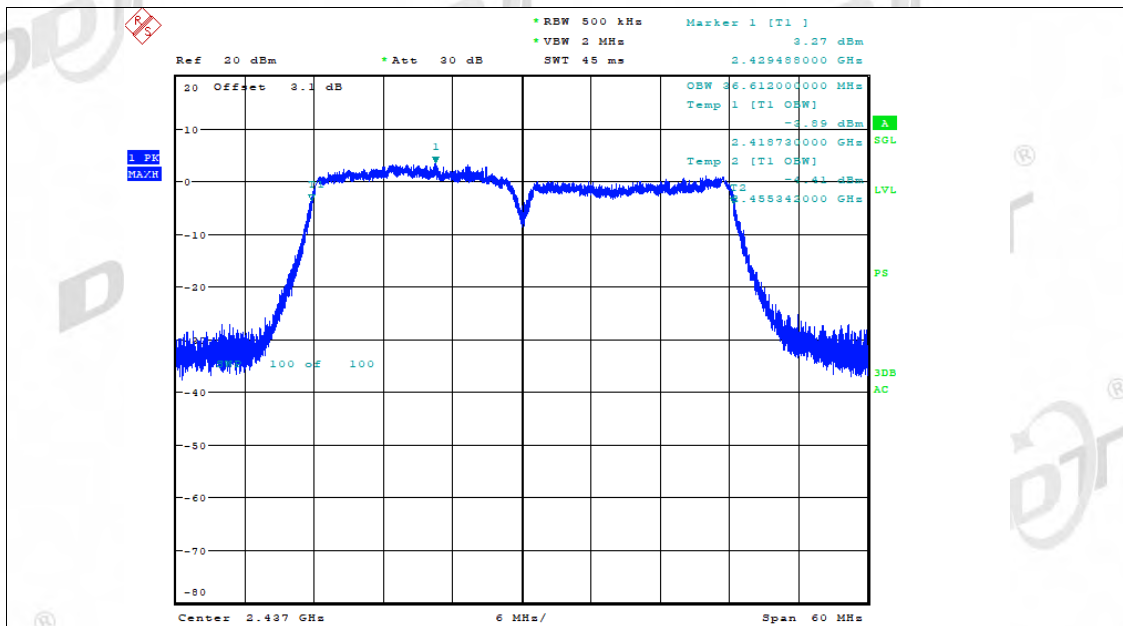
Date: 25.FEB.2022 14:02:09

OBW NVNT n40 2422MHz Ant2



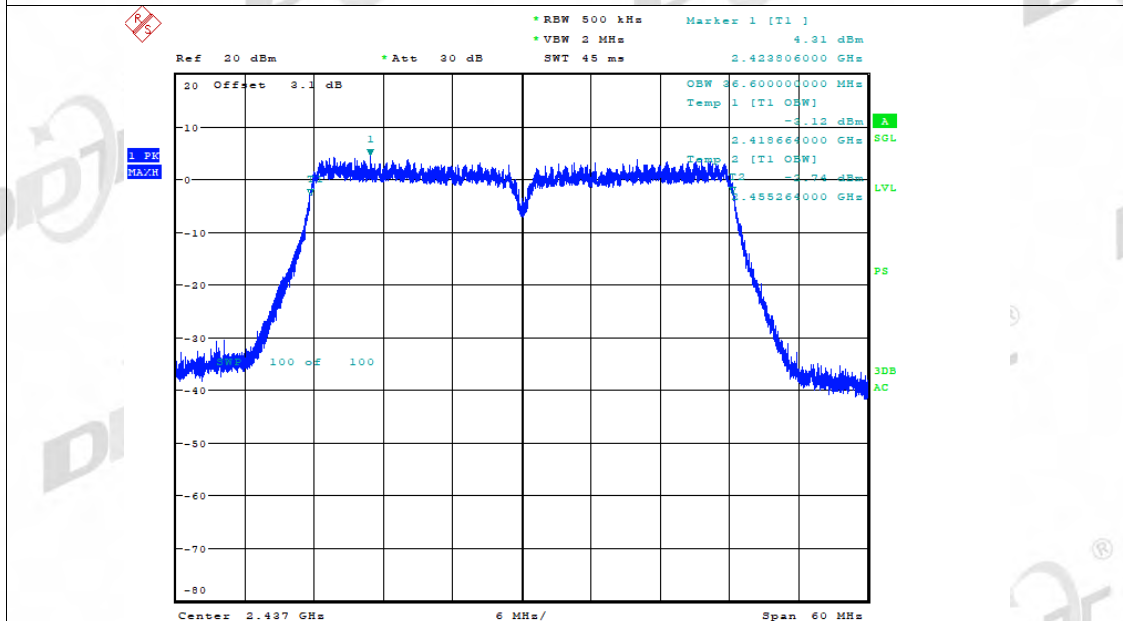
Date: 25.FEB.2022 14:02:29

OBW NVNT n40 2437MHz Ant1



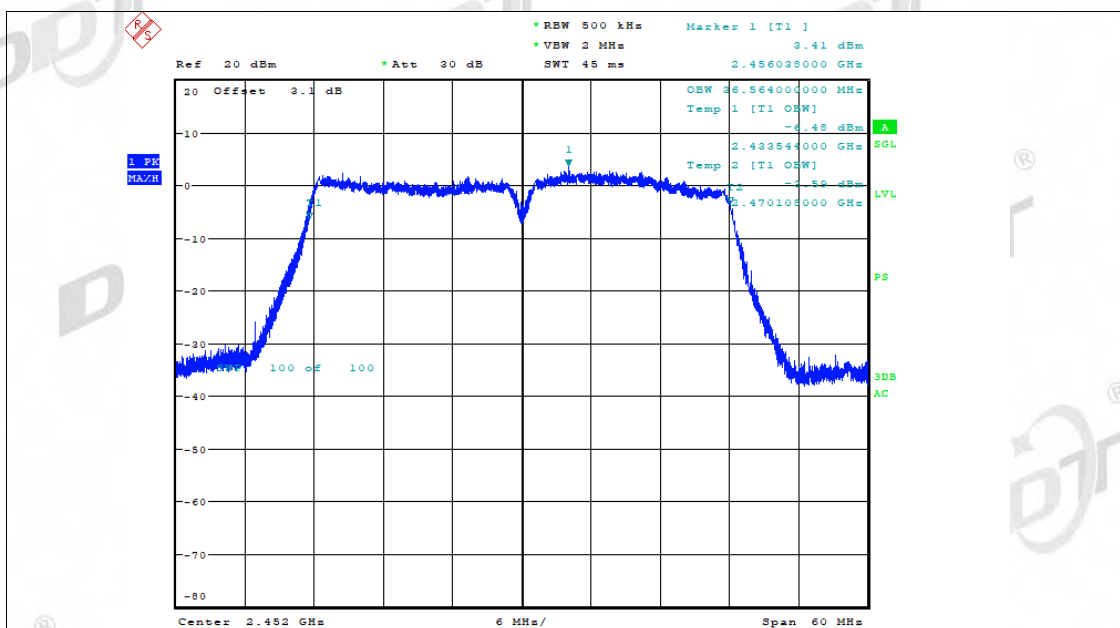
Date: 25.FEB.2022 14:06:31

OBW NVNT n40 2437MHz Ant2



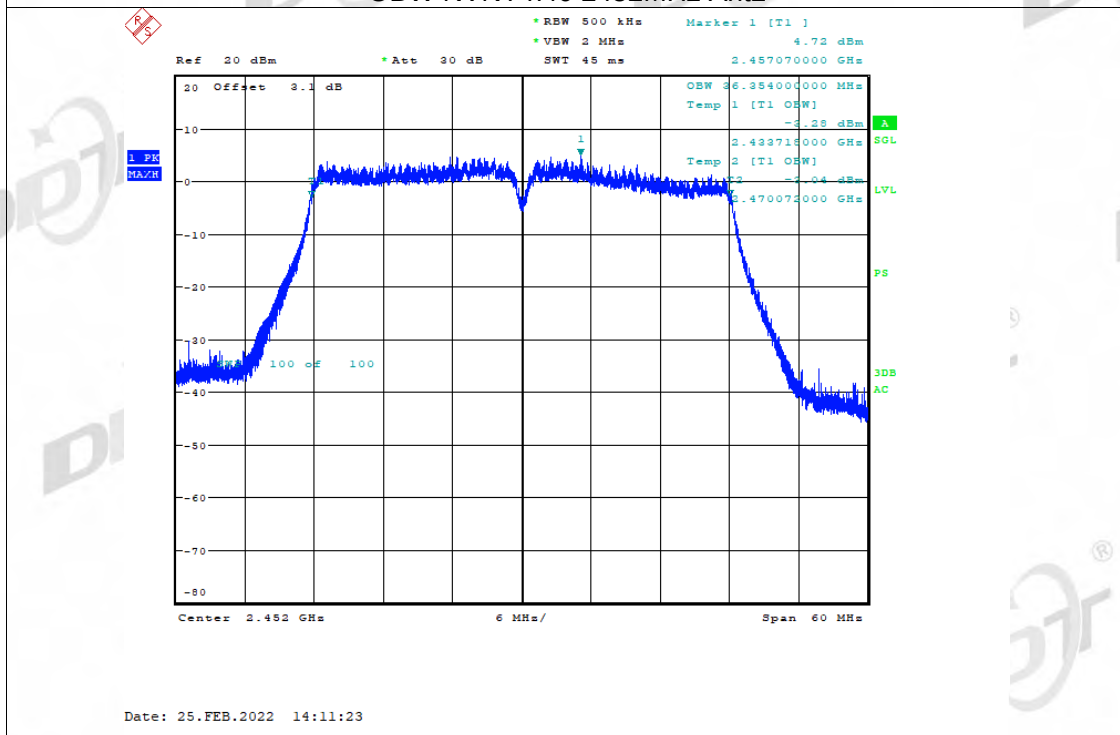
Date: 25.FEB.2022 14:06:52

OBW NVNT n40 2452MHz Ant1



Date: 25.FEB.2022 14:11:03

OBW NVNT n40 2452MHz Ant2



Date: 25.FEB.2022 14:11:23

5. Maximum PK Output Power

5.1. Block diagram of test setup

Same as section 4.1

5.2. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.3. Test procedure

Connect each EUT's antenna output to power sensor by RF cable and attenuator
Measure the Maximum output power of antenna port by power sensor.

5.4. Test result

Test Mode	Test Channel	Ant	PK Power (dBm)	PK Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Verdict
11B	2412	Ant1	21.02	30	24.79	36	Pass
11B	2437	Ant1	21.08	30	24.85	36	Pass
11B	2462	Ant1	21.03	30	24.80	36	Pass
11B	2412	Ant2	21.60	30	25.28	36	Pass
11B	2437	Ant2	21.25	30	24.93	36	Pass
11B	2462	Ant2	21.14	30	24.82	36	Pass
11G	2412	Ant1	21.04	30	24.81	36	Pass
11G	2437	Ant1	20.76	30	24.53	36	Pass
11G	2462	Ant1	20.64	30	24.41	36	Pass
11G	2412	Ant2	21.4	30	25.08	36	Pass
11G	2437	Ant2	21.24	30	24.92	36	Pass
11G	2462	Ant2	21.22	30	24.90	36	Pass
11N20MIMO	2412	Ant1	19.15	30	22.92	36	Pass
11N20MIMO	2412	Ant2	19.52	30	23.20	36	Pass
11N20MIMO	2412	Ant1+Ant2	22.35	30	29.09	36	Pass
11N20MIMO	2437	Ant1	18.92	30	22.69	36	Pass
11N20MIMO	2437	Ant2	19.44	30	23.12	36	Pass
11N20MIMO	2437	Ant1+Ant2	22.20	30	28.94	36	Pass
11N20MIMO	2462	Ant1	18.78	30	22.55	36	Pass
11N20MIMO	2462	Ant2	19.41	30	23.09	36	Pass
11N20MIMO	2462	Ant1+Ant2	22.12	30	28.86	36	Pass
11N40MIMO	2422	Ant1	19.25	30	23.02	36	Pass
11N40MIMO	2422	Ant2	19.53	30	23.21	36	Pass
11N40MIMO	2422	Ant1+Ant2	22.40	30	29.14	36	Pass
11N40MIMO	2437	Ant1	19.13	30	22.90	36	Pass
11N40MIMO	2437	Ant2	19.58	30	23.26	36	Pass
11N40MIMO	2437	Ant1+Ant2	22.37	30	29.11	36	Pass
11N40MIMO	2452	Ant1	19.13	30	22.90	36	Pass
11N40MIMO	2452	Ant2	19.58	30	23.26	36	Pass
11N40MIMO	2452	Ant1+Ant2	22.37	30	29.11	36	Pass

6. Power Spectral Density

6.1. Block diagram of test setup

Same as section 4.1

6.2. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

6.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

Center frequency	DTS Channel center frequency
RBW:	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW:	$\geq 3\text{RBW}$
Span	1.5 times the DTS bandwidth
Detector Mode:	peak
Sweep time:	auto
Trace mode	Max hold

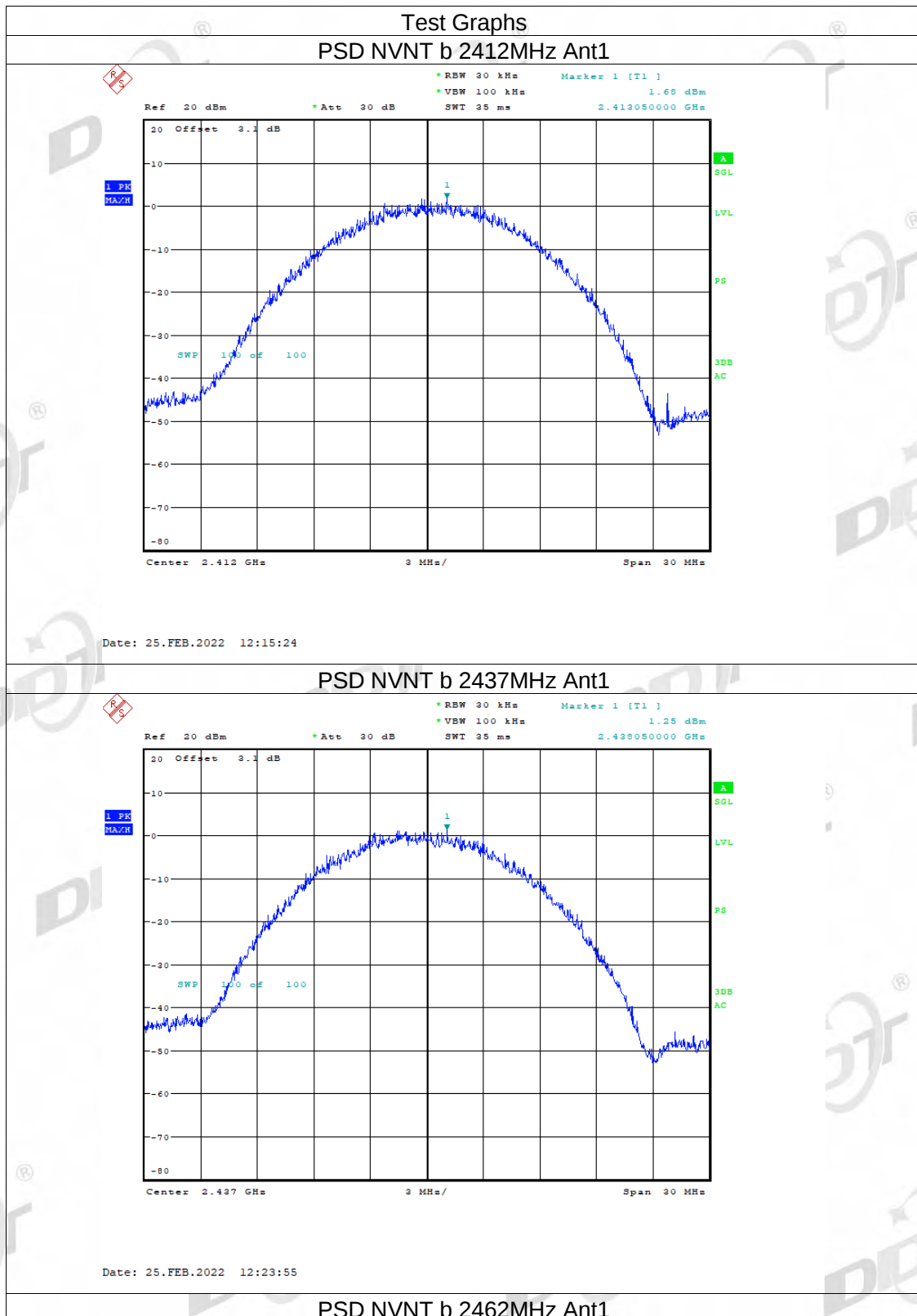
(3) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.

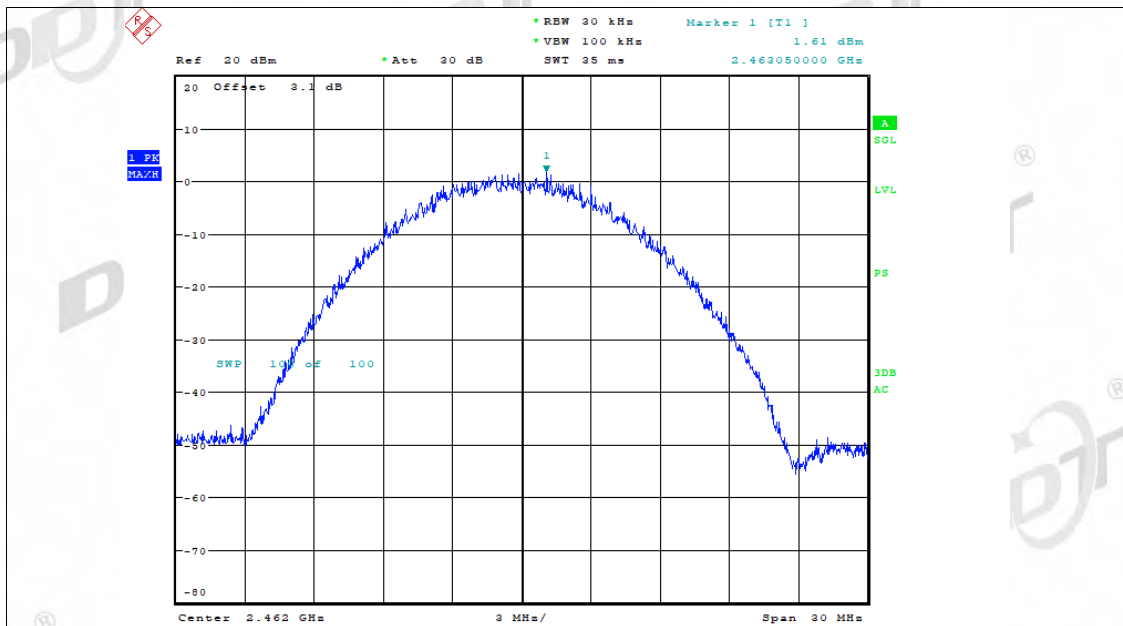
(4) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.4. Test result

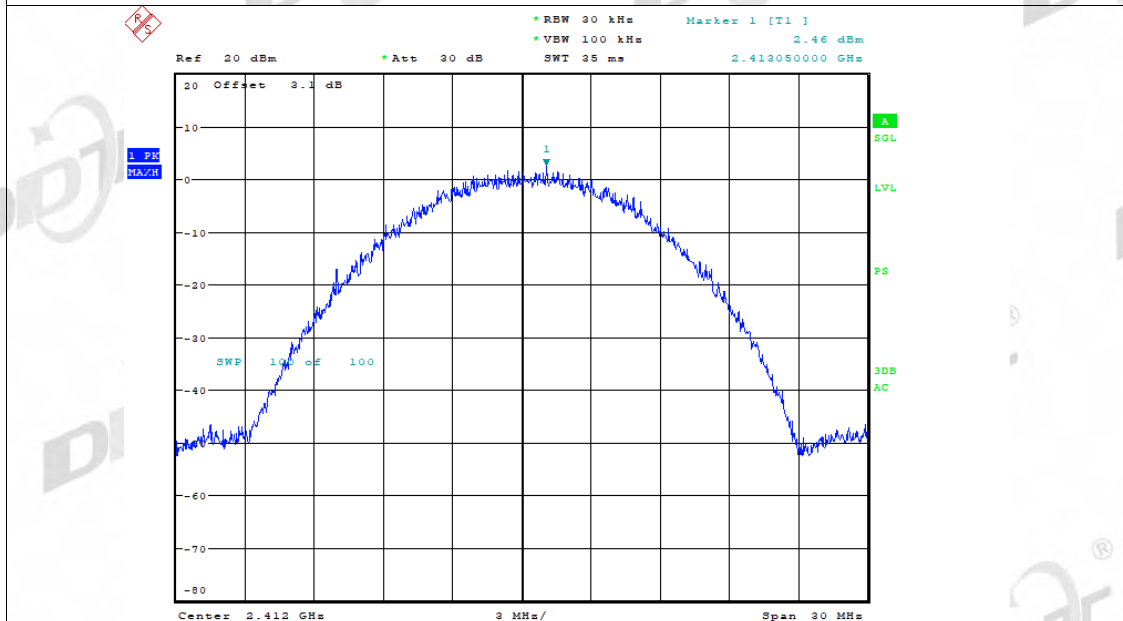
Test Mode	Test Channel	Ant	PSD (dBm/30kHz)	Limit(dBm/3kHz)	Verdict
11B	2412	Ant1	1.68	8.00	Pass
11B	2437	Ant1	1.25	8.00	Pass
11B	2462	Ant1	1.61	8.00	Pass
11B	2412	Ant2	2.46	8.00	Pass
11B	2437	Ant2	1.79	8.00	Pass
11B	2462	Ant2	1.89	8.00	Pass
11G	2412	Ant1	-1.19	8.00	Pass
11G	2437	Ant1	-2.57	8.00	Pass
11G	2462	Ant1	2.11	8.00	Pass
11G	2412	Ant2	-1.98	8.00	Pass
11G	2437	Ant2	-1.75	8.00	Pass
11G	2462	Ant2	2.99	8.00	Pass
11N20MIMO	2412	Ant1	-4.10	8.00	Pass
11N20MIMO	2412	Ant2	-4.11	8.00	Pass
11N20MIMO	2412	Ant1+Ant2	-1.09	8.00	Pass
11N20MIMO	2437	Ant1	-4.93	8.00	Pass
11N20MIMO	2437	Ant2	-4.98	8.00	Pass
11N20MIMO	2437	Ant1+Ant2	-1.94	8.00	Pass
11N20MIMO	2462	Ant1	-4.99	8.00	Pass
11N20MIMO	2462	Ant2	-4.49	8.00	Pass
11N20MIMO	2462	Ant1+Ant2	-1.72	8.00	Pass
11N40MIMO	2422	Ant1	-6.74	8.00	Pass
11N40MIMO	2422	Ant2	-7.38	8.00	Pass
11N40MIMO	2422	Ant1+Ant2	-4.04	8.00	Pass
11N40MIMO	2437	Ant1	-6.62	8.00	Pass
11N40MIMO	2437	Ant2	-7.27	8.00	Pass
11N40MIMO	2437	Ant1+Ant2	-3.92	8.00	Pass
11N40MIMO	2452	Ant1	-7.25	8.00	Pass
11N40MIMO	2452	Ant2	-6.96	8.00	Pass
11N40MIMO	2452	Ant1+Ant2	-4.09	8.00	Pass

6.5. original test data

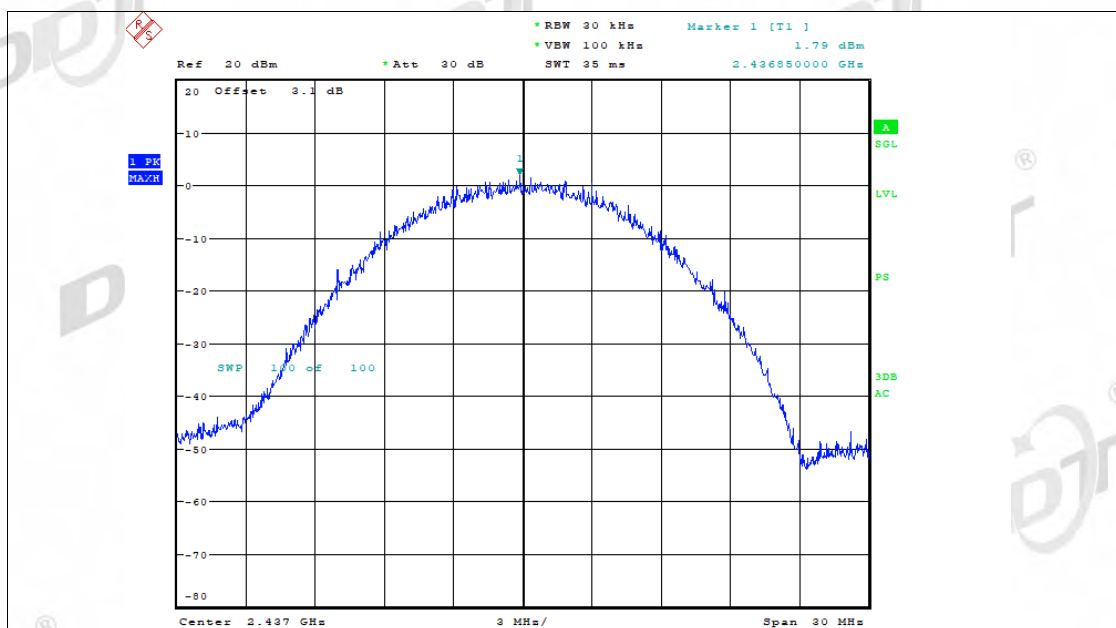




PSD NVNT b 2412MHz Ant2

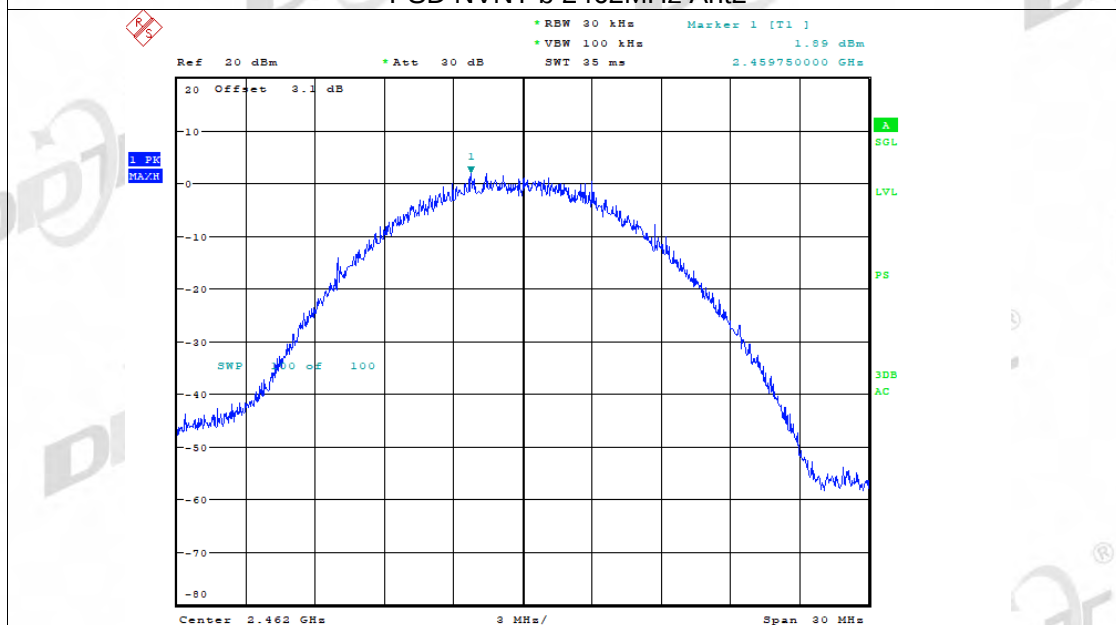


PSD NVNT b 2437MHz Ant2



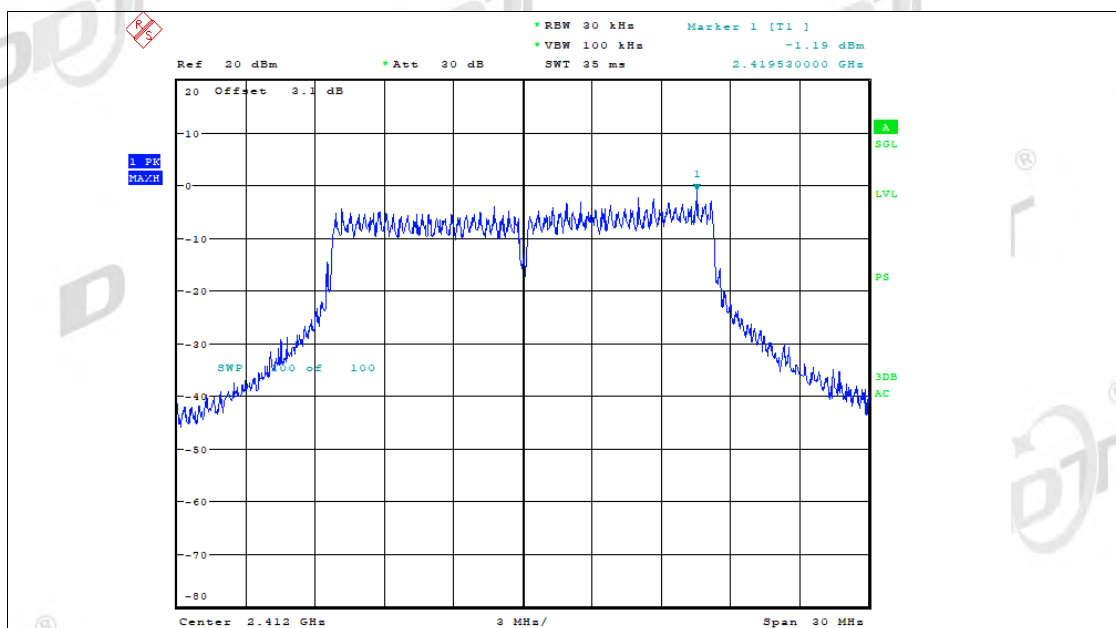
Date: 25.FEB.2022 12:27:53

PSD NVNT b 2462MHz Ant2



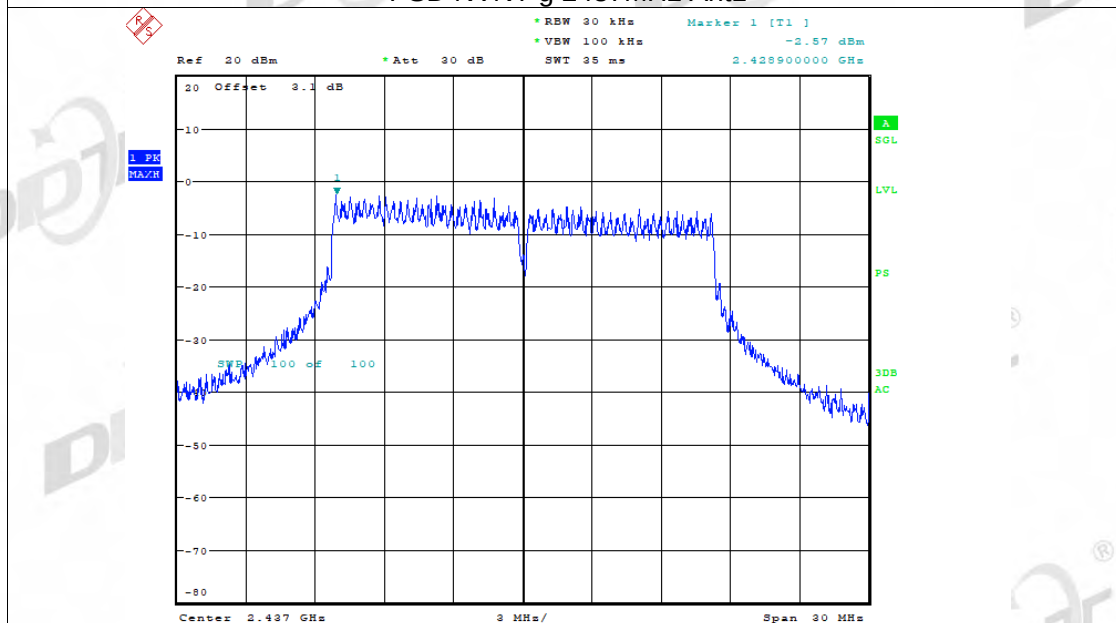
Date: 25.FEB.2022 13:04:20

PSD NVNT g 2412MHz Ant1



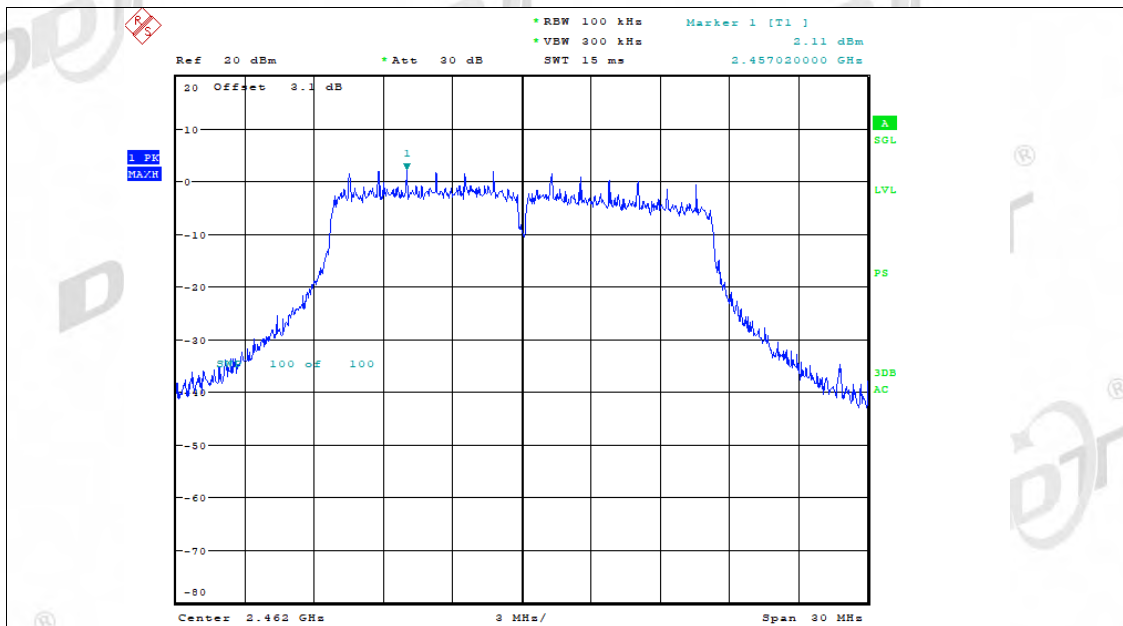
Date: 25.FEB.2022 13:17:50

PSD NVNT g 2437MHz Ant1

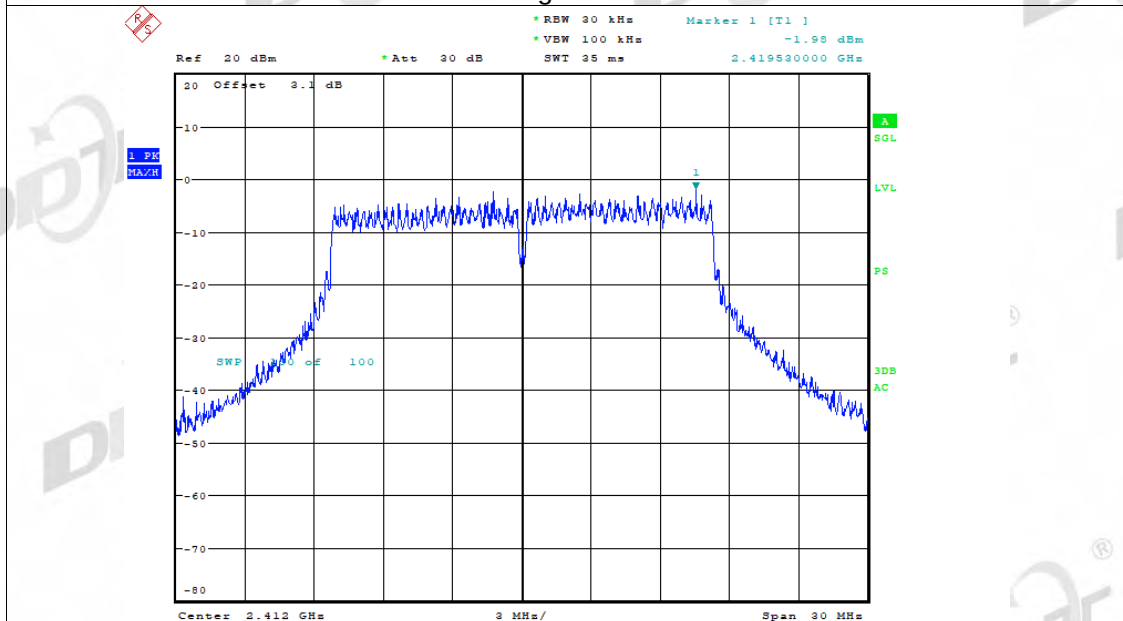


Date: 25.FEB.2022 13:20:08

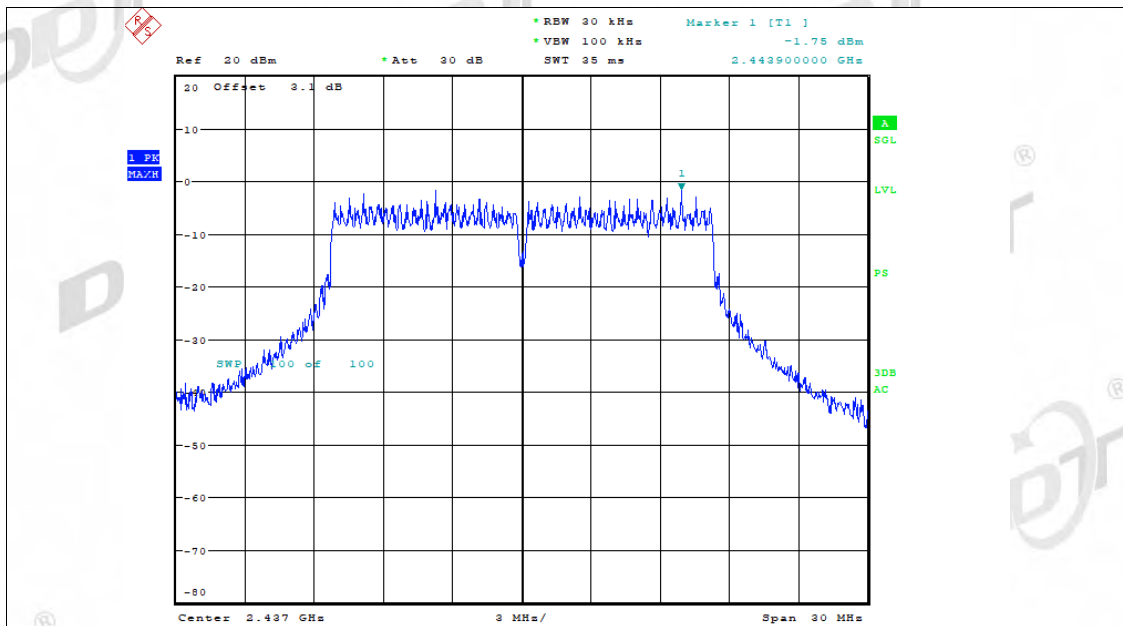
PSD NVNT g 2462MHz Ant1



PSD NVNT g 2412MHz Ant2

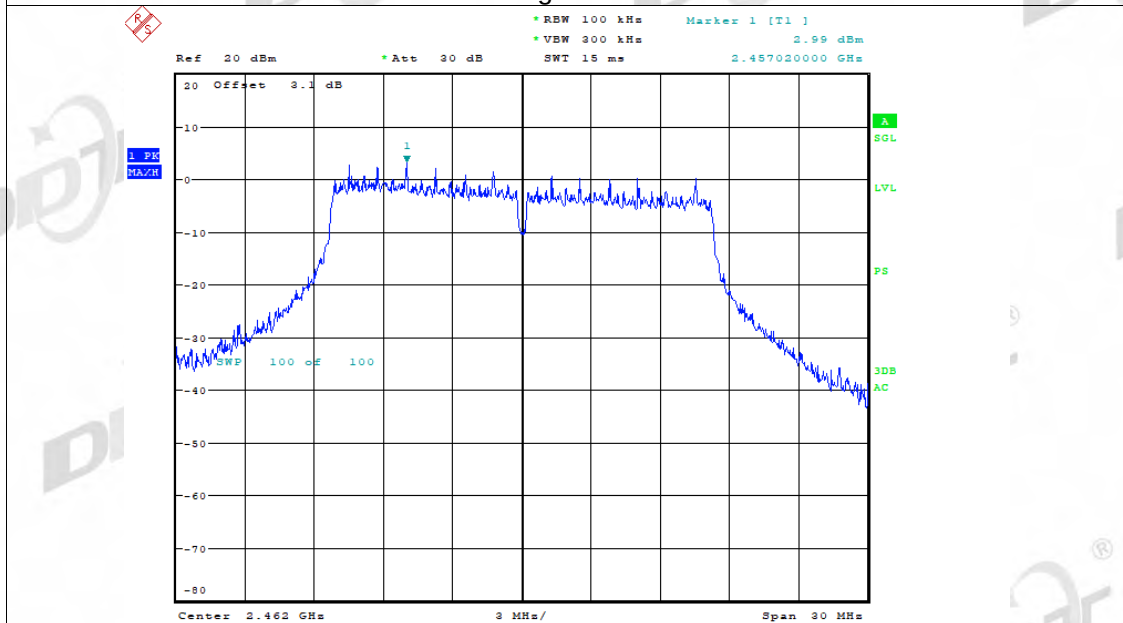


PSD NVNT g 2437MHz Ant2



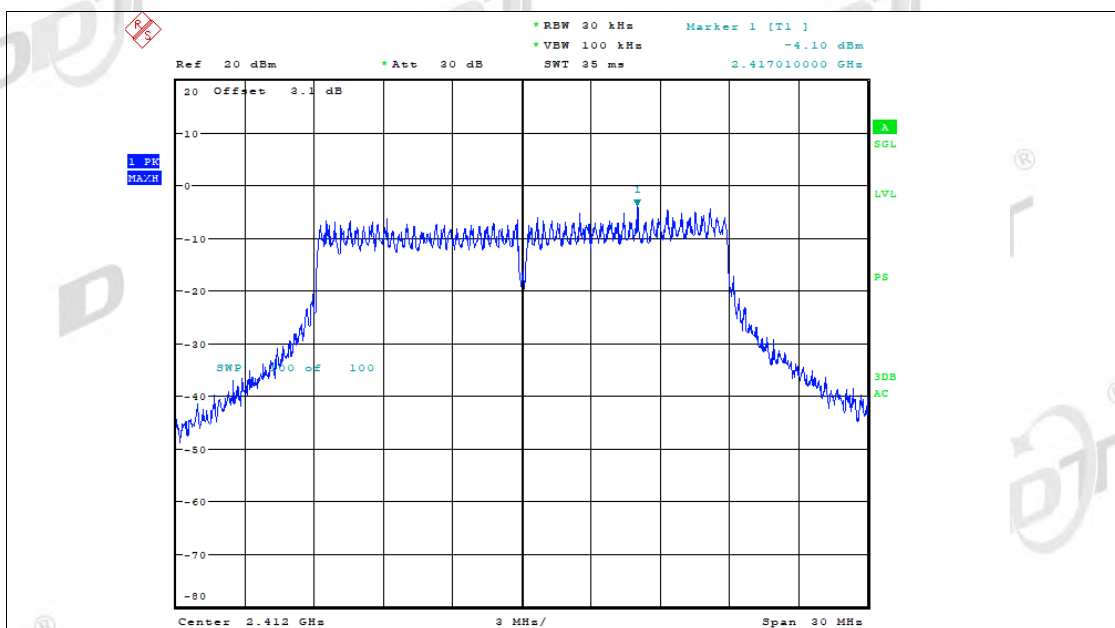
Date: 25.FEB.2022 13:23:48

PSD NVNT g 2462MHz Ant2



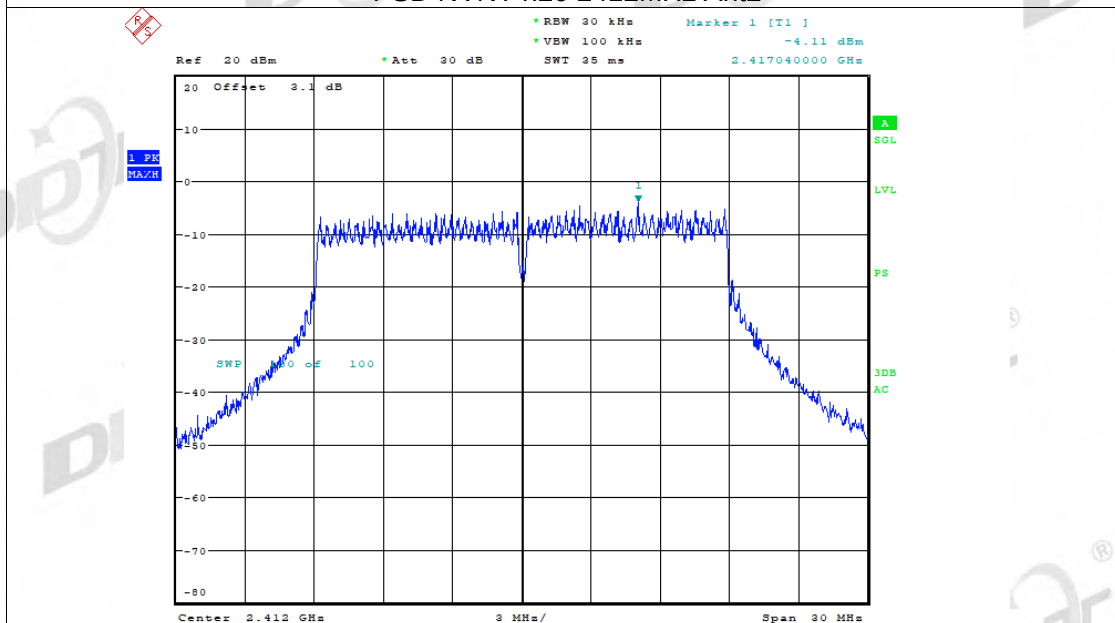
Date: 25.FEB.2022 13:30:18

PSD NVNT n20 2412MHz Ant1



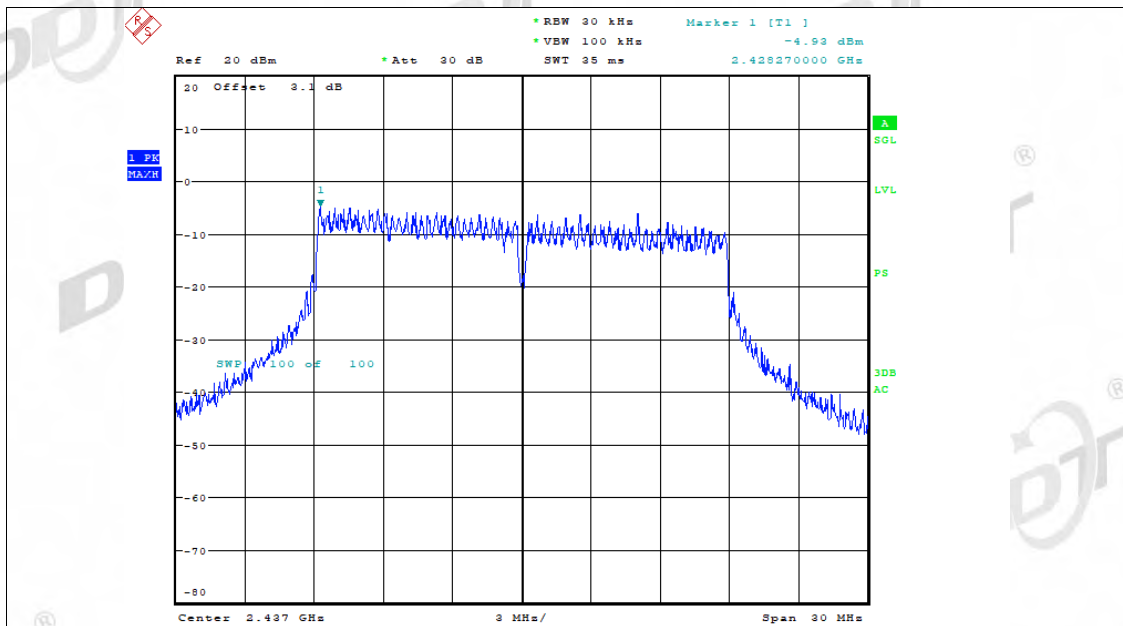
Date: 25.FEB.2022 13:40:34

PSD NVNT n20 2412MHz Ant2

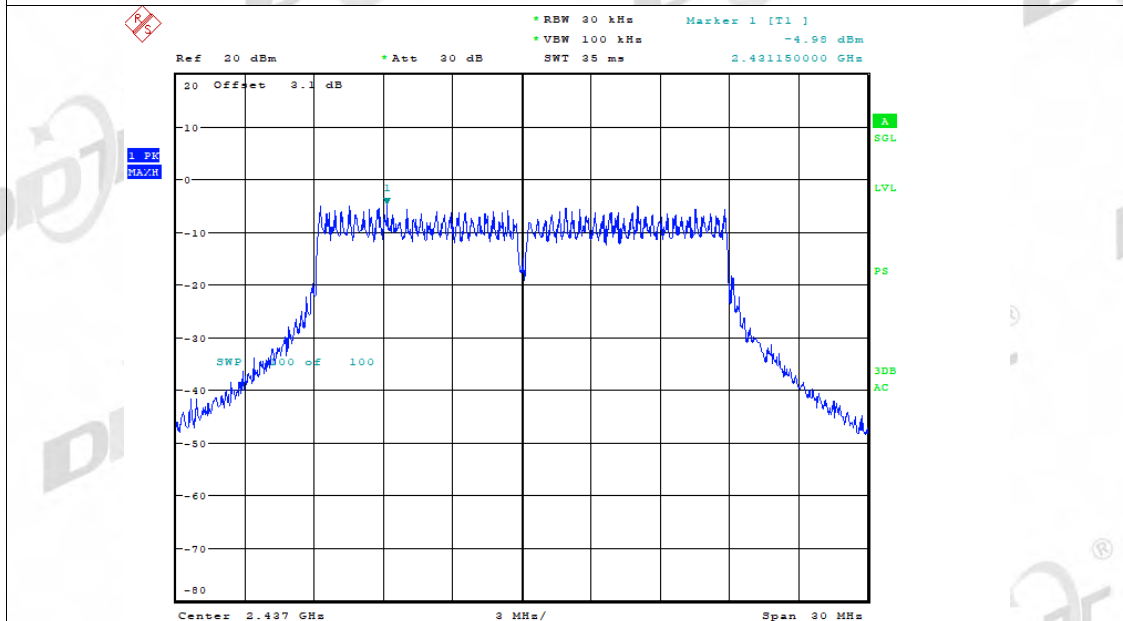


Date: 25.FEB.2022 13:40:42

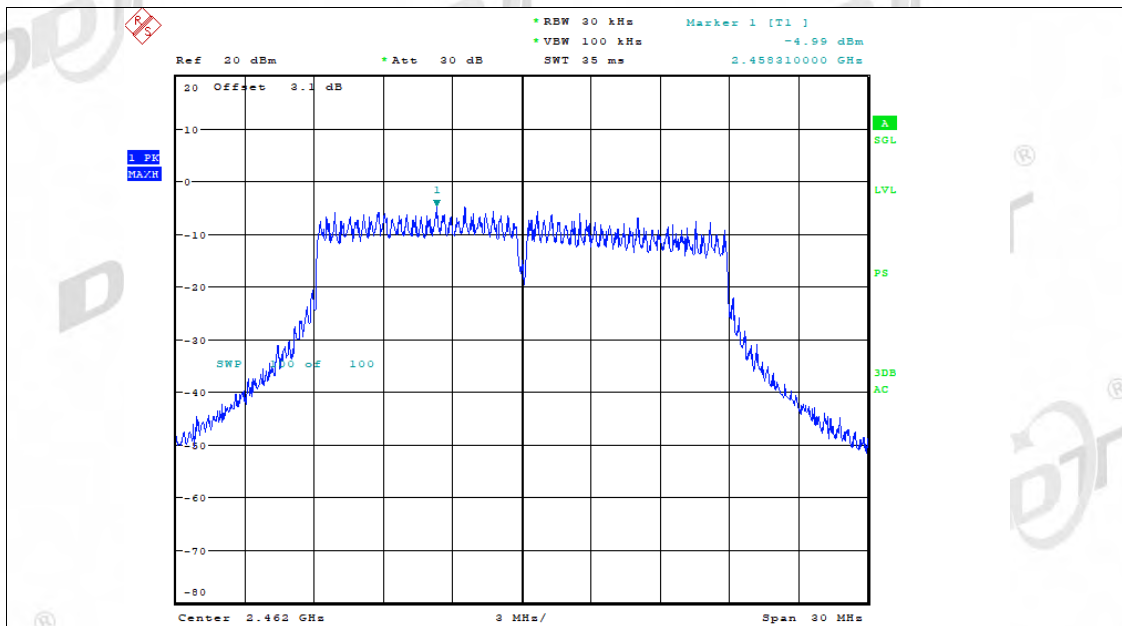
PSD NVNT n20 2437MHz Ant1



PSD NVNT n20 2437MHz Ant2

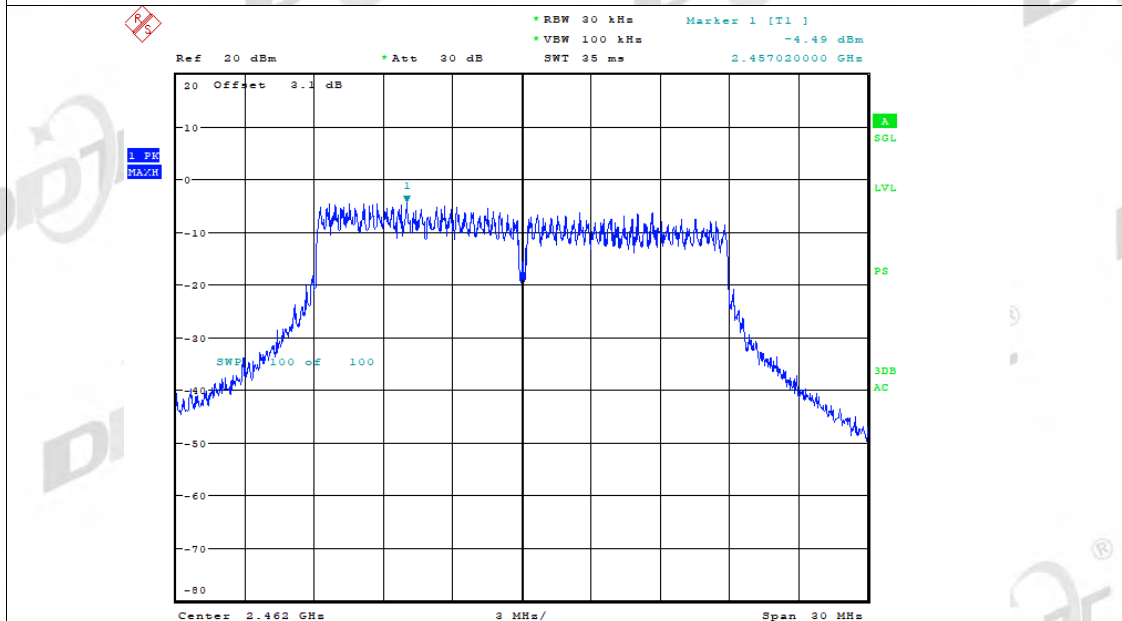


PSD NVNT n20 2462MHz Ant1



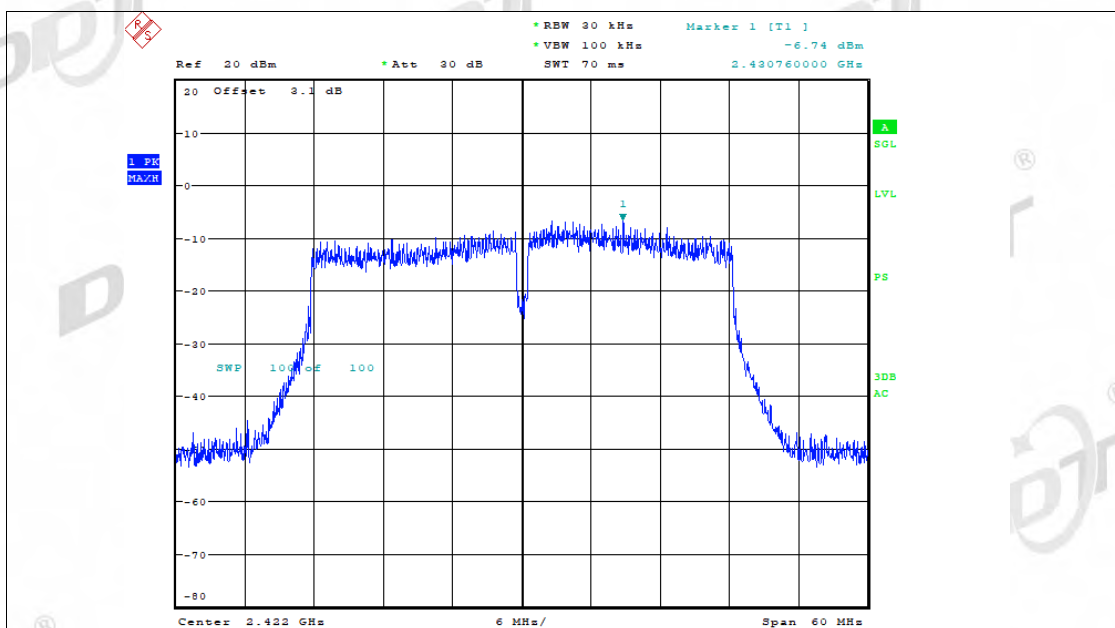
Date: 25.FEB.2022 13:50:26

PSD NVNT n20 2462MHz Ant2

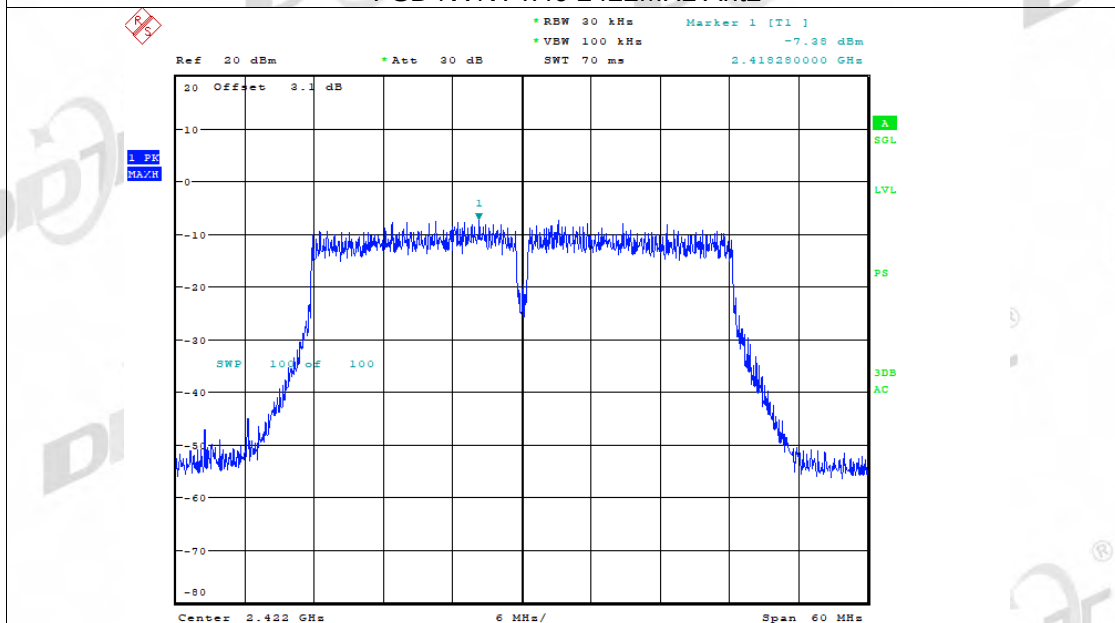


Date: 25.FEB.2022 13:50:35

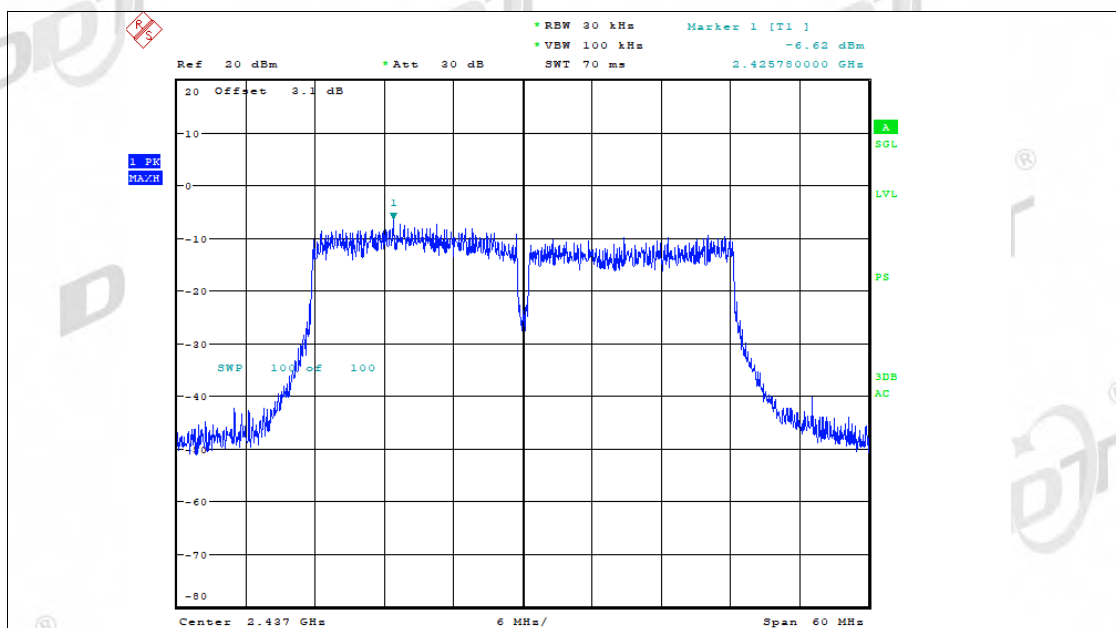
PSD NVNT n40 2422MHz Ant1



PSD NVNT n40 2422MHz Ant2

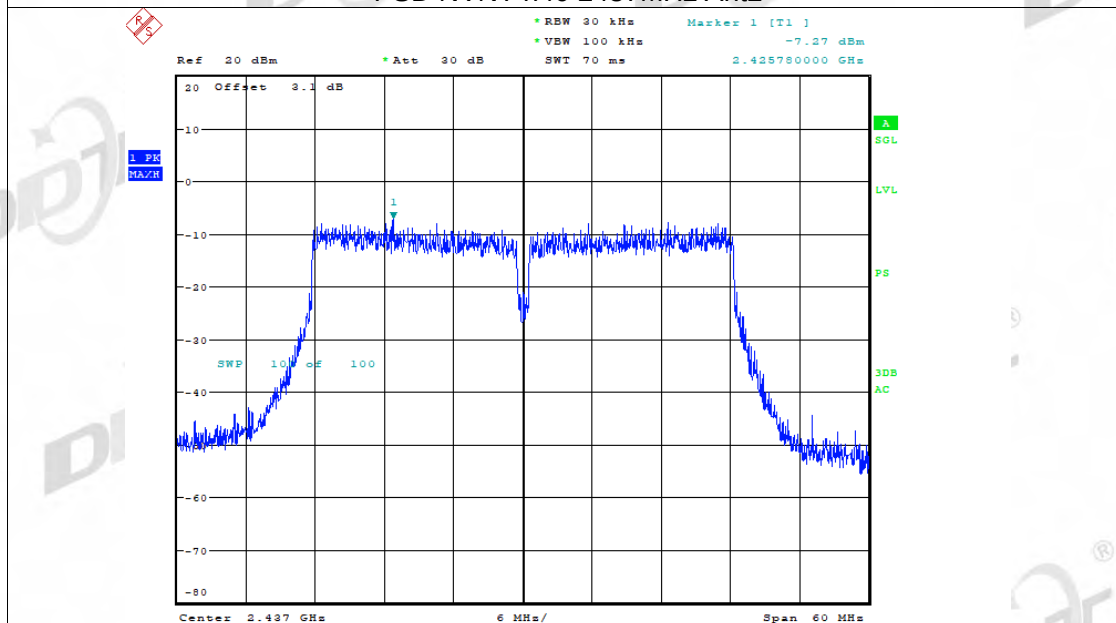


PSD NVNT n40 2437MHz Ant1



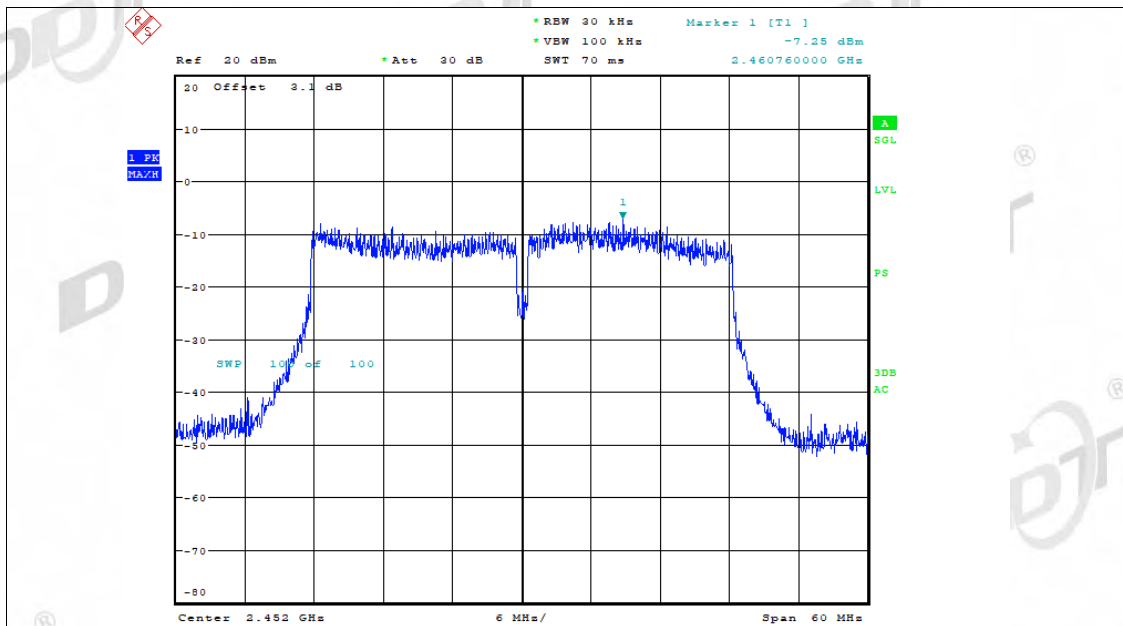
Date: 25.FEB.2022 14:07:48

PSD NVNT n40 2437MHz Ant2



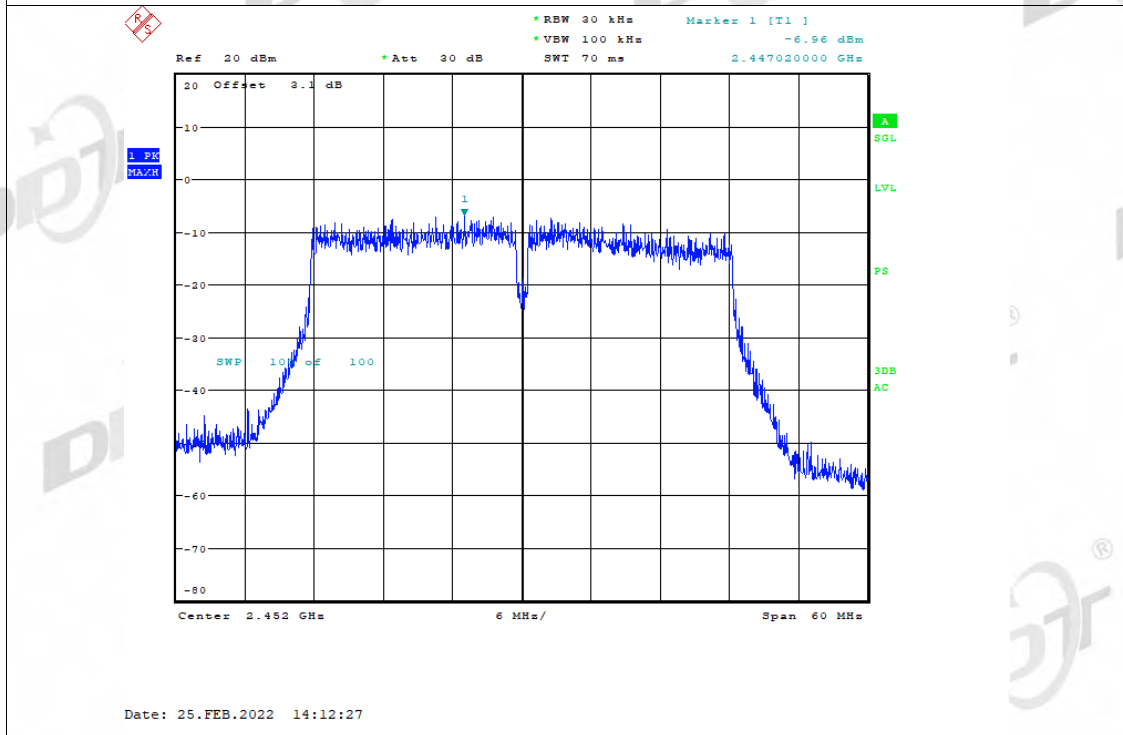
Date: 25.FEB.2022 14:07:58

PSD NVNT n40 2452MHz Ant1



Date: 25.FEB.2022 14:12:18

PSD NVNT n40 2452MHz Ant2



Date: 25.FEB.2022 14:12:27

7. Band Edge and Spurious Emissions (Conducted)

7.1. Block diagram of test setup

Same as section 4.1

7.2. Limits

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

7.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

Center frequency	DTS Channel center frequency
RBW:	100 kHz
VBW:	300 kHz
Span	1.5 times the DTS bandwidth
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

(4) Set the spectrum analyzer as follows:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Number of measurement points	$\geq \text{span/RBW}$
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

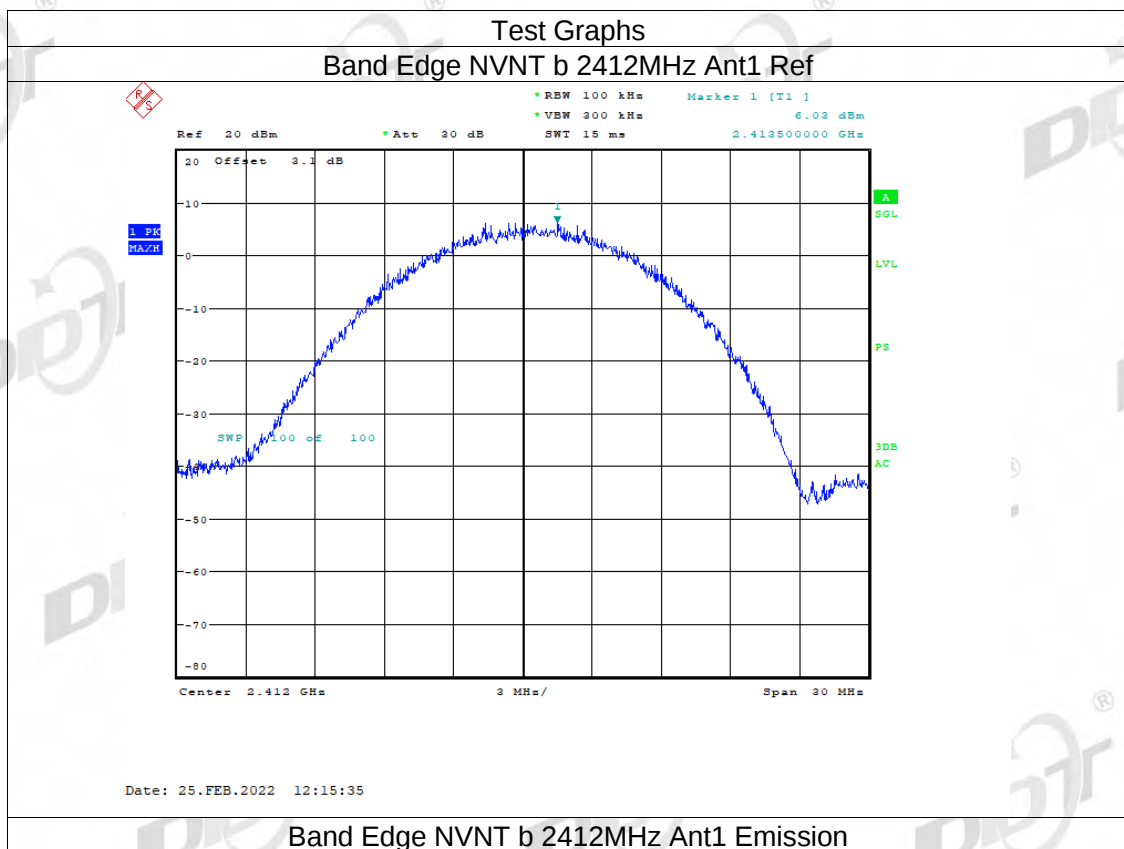
(5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

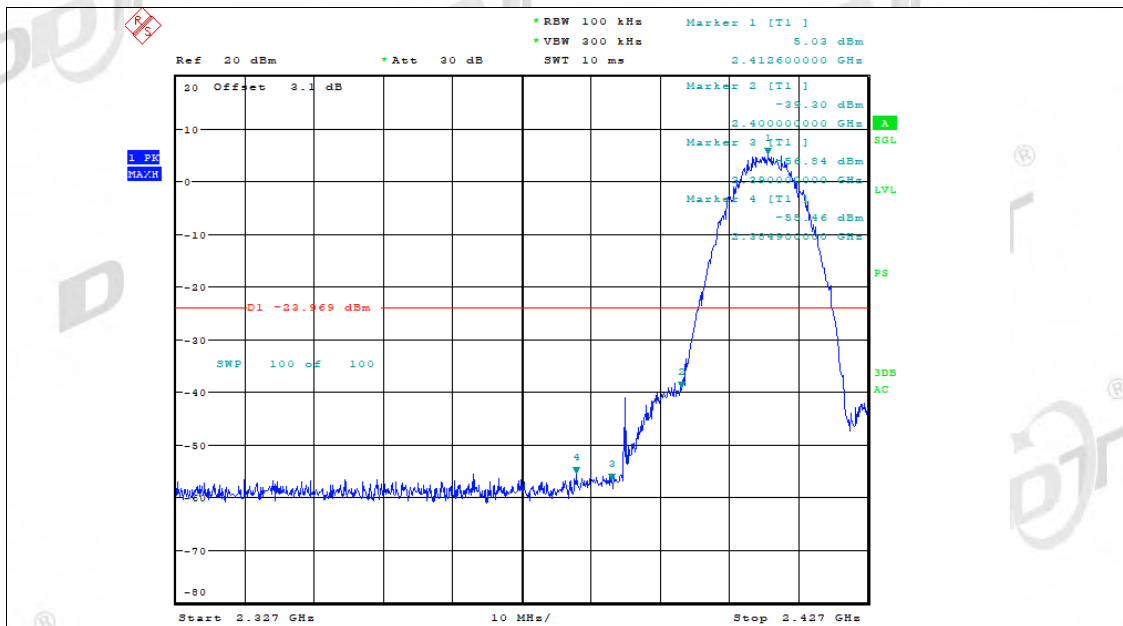
7.4. Test result

EUT Set Mode	CH or Frequency	Ant1 Result (dBm)	EUT Set Mode	CH or Frequency	Ant1 Result (dBm)
11b	CH1	Pass	11n HT 20	CH1	Pass
	CH6	Pass		CH6	Pass
	CH11	Pass		CH11	Pass
11g	CH1	Pass	11n HT 40	CH3	Pass
	CH6	Pass		CH6	Pass
	CH11	Pass		CH9	Pass

7.5. original test data

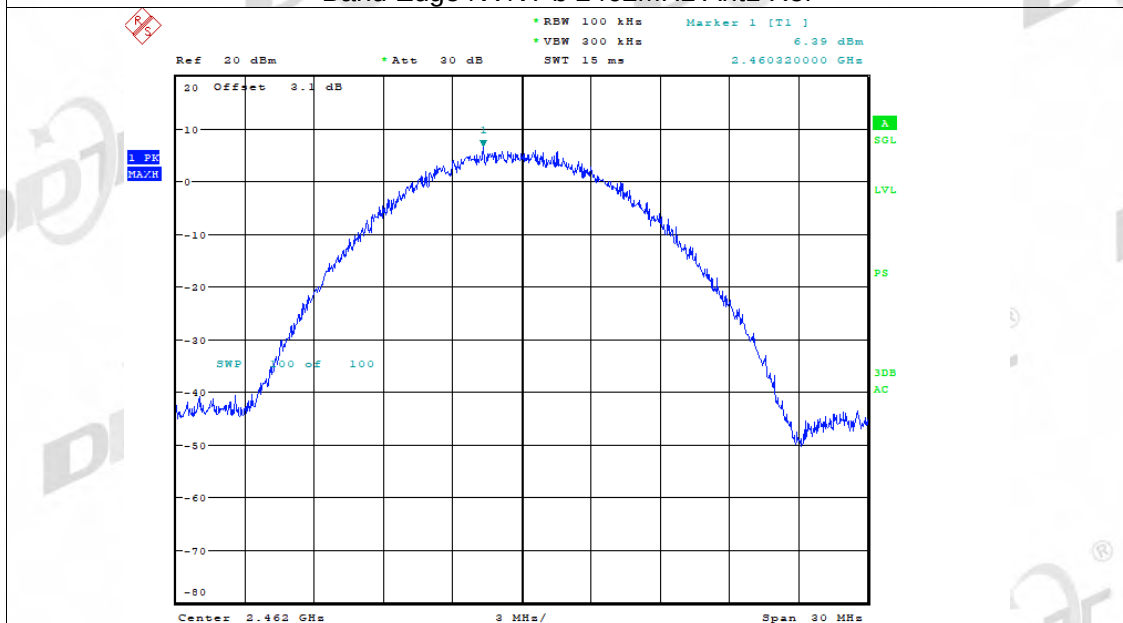
Band Edge





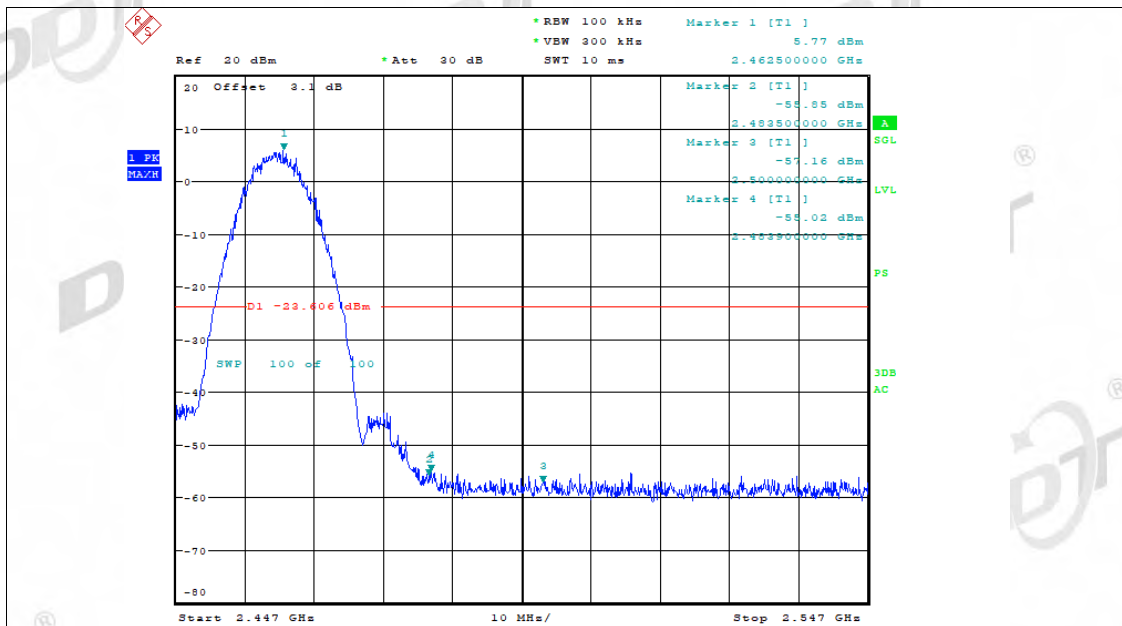
Date: 25.FEB.2022 12:15:40

Band Edge NVNT b 2462MHz Ant1 Ref



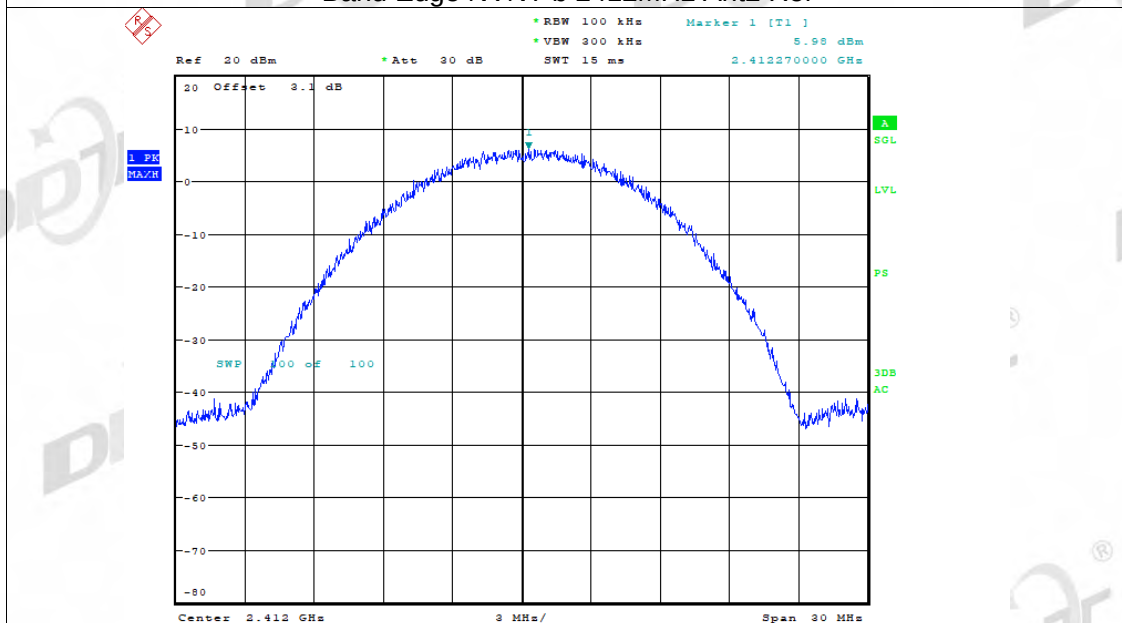
Date: 25.FEB.2022 12:37:37

Band Edge NVNT b 2462MHz Ant1 Emission



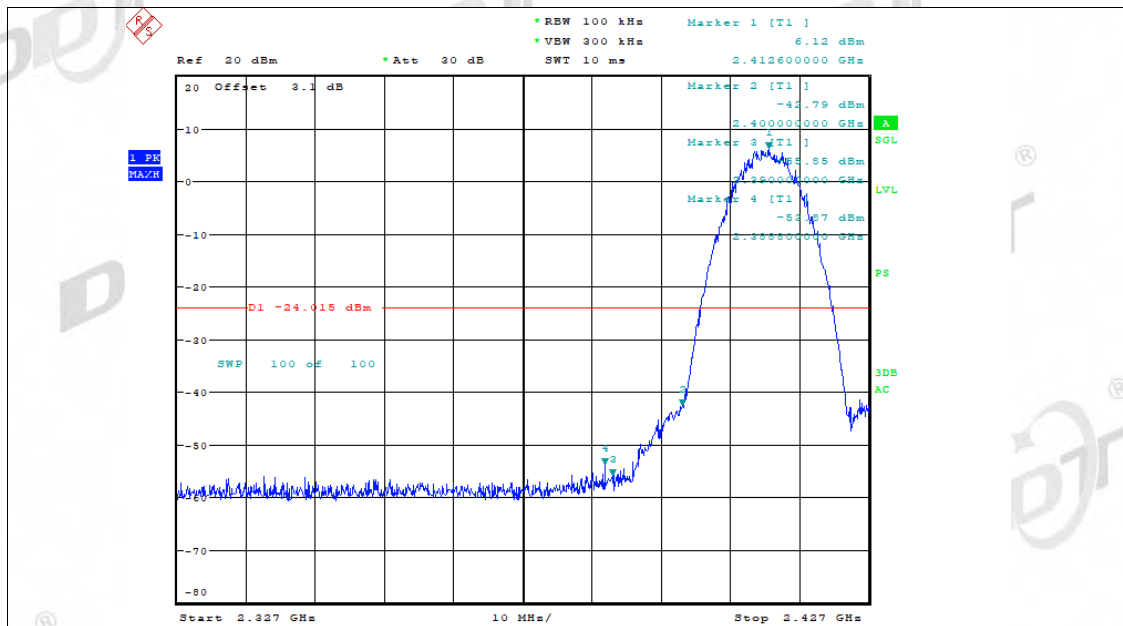
Date: 25.FEB.2022 12:37:42

Band Edge NVNT b 2412MHz Ant2 Ref



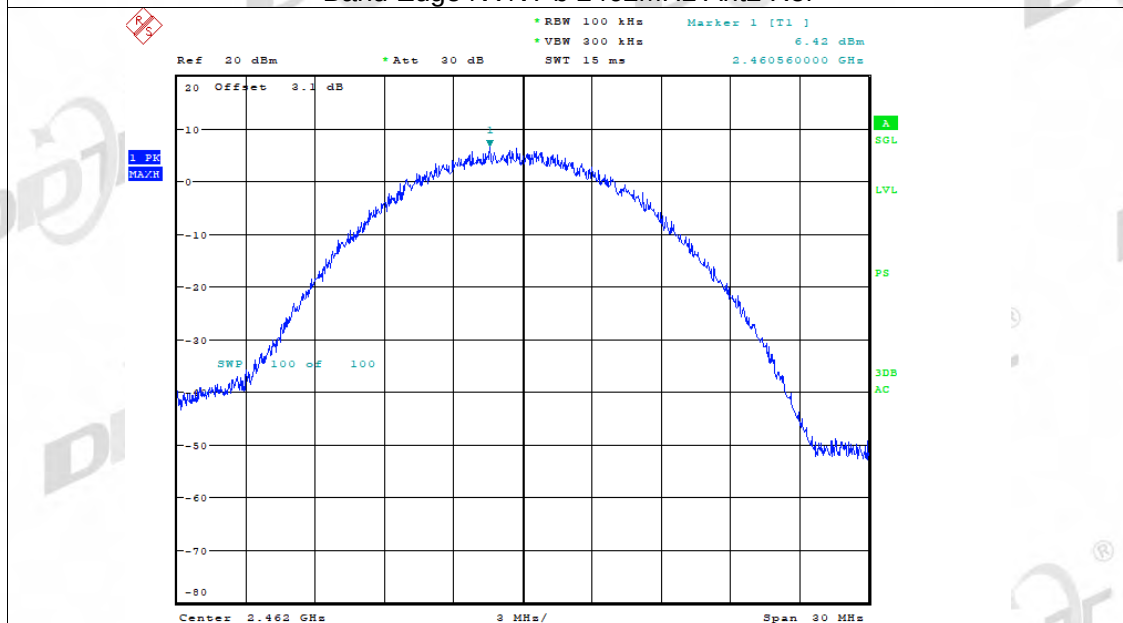
Date: 25.FEB.2022 12:18:52

Band Edge NVNT b 2412MHz Ant2 Emission



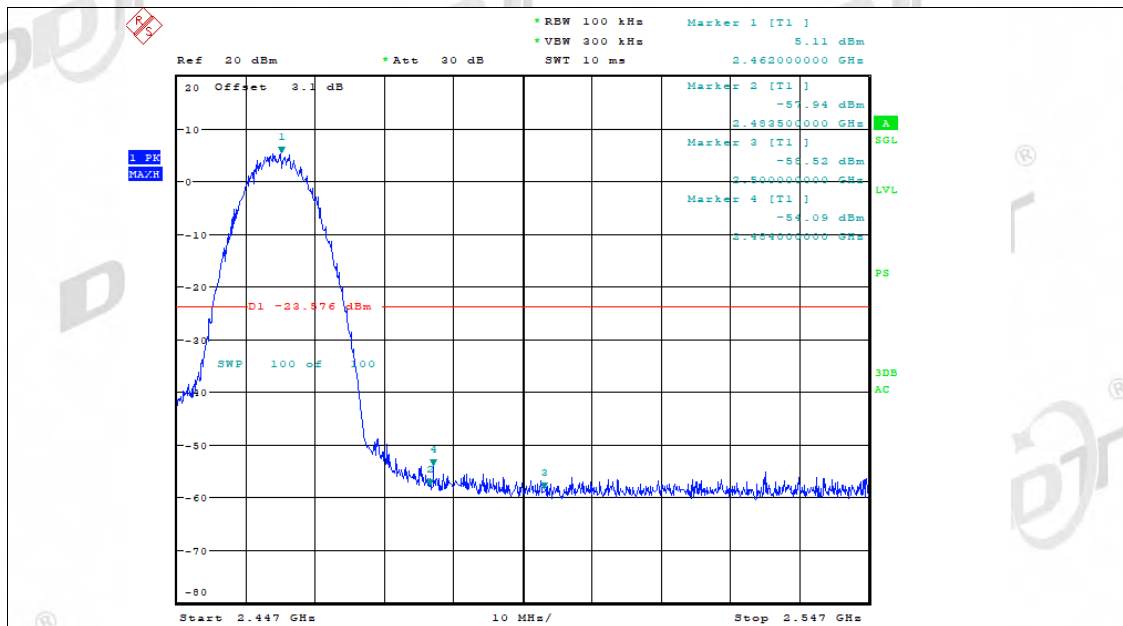
Date: 25.FEB.2022 12:18:57

Band Edge NVNT b 2462MHz Ant2 Ref



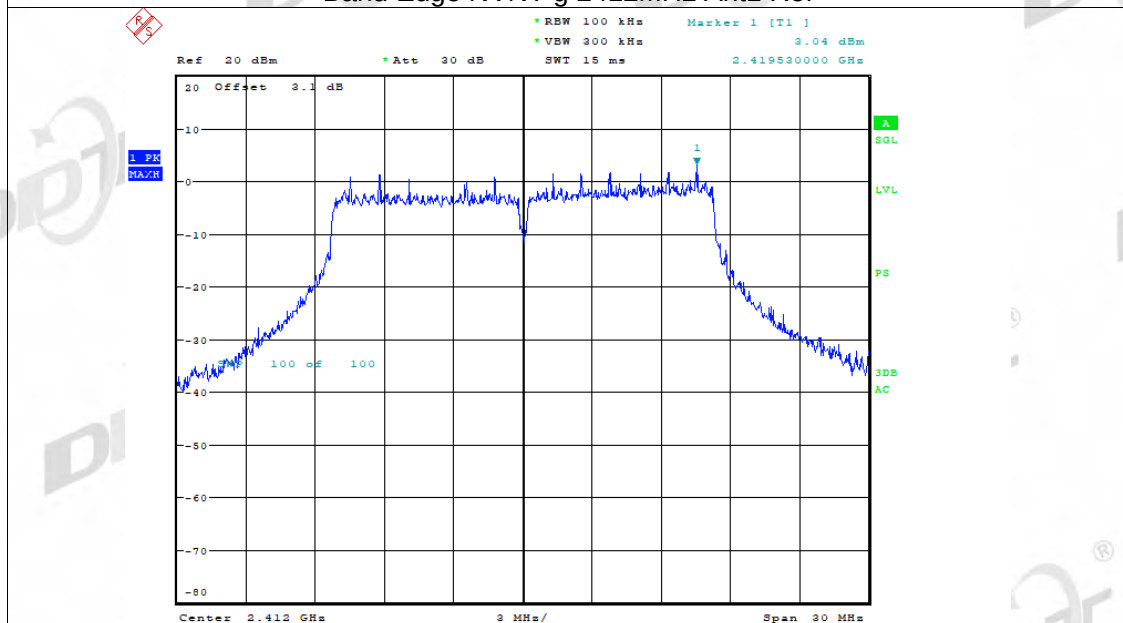
Date: 25.FEB.2022 12:41:30

Band Edge NVNT b 2462MHz Ant2 Emission



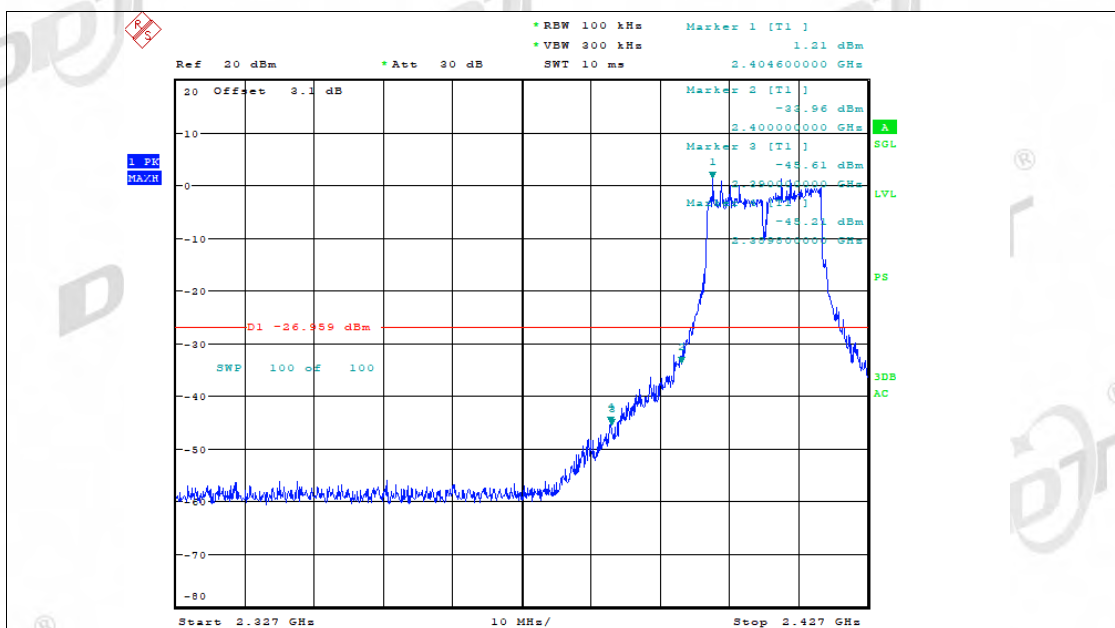
Date: 25.FEB.2022 12:41:34

Band Edge NVNT g 2412MHz Ant1 Ref



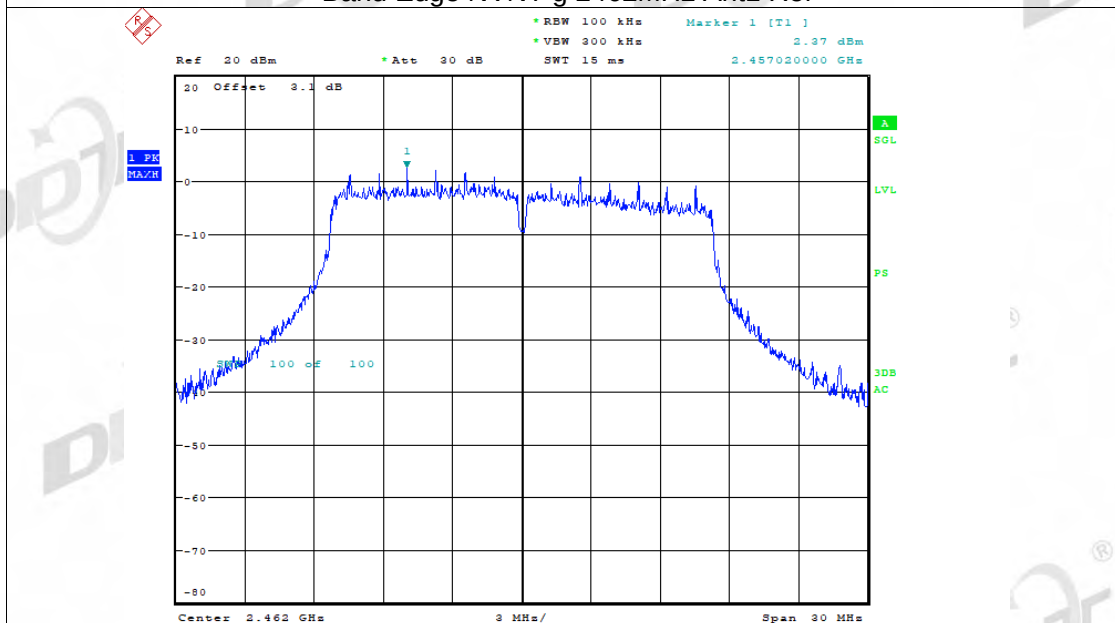
Date: 25.FEB.2022 13:11:36

Band Edge NVNT g 2412MHz Ant1 Emission



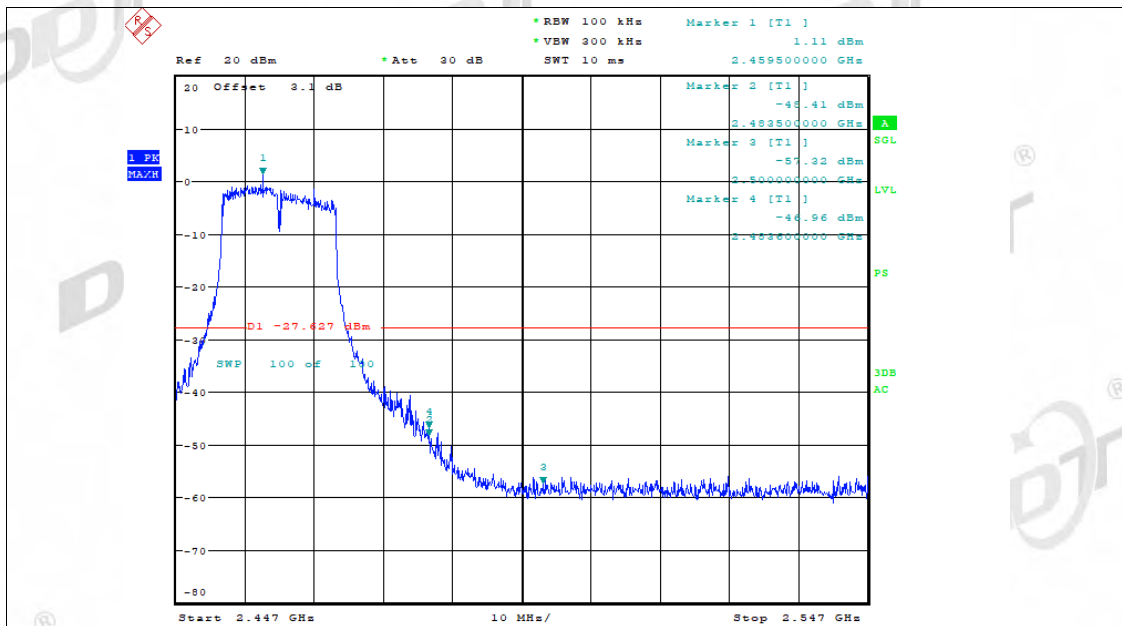
Date: 25.FEB.2022 13:11:41

Band Edge NVNT g 2462MHz Ant1 Ref



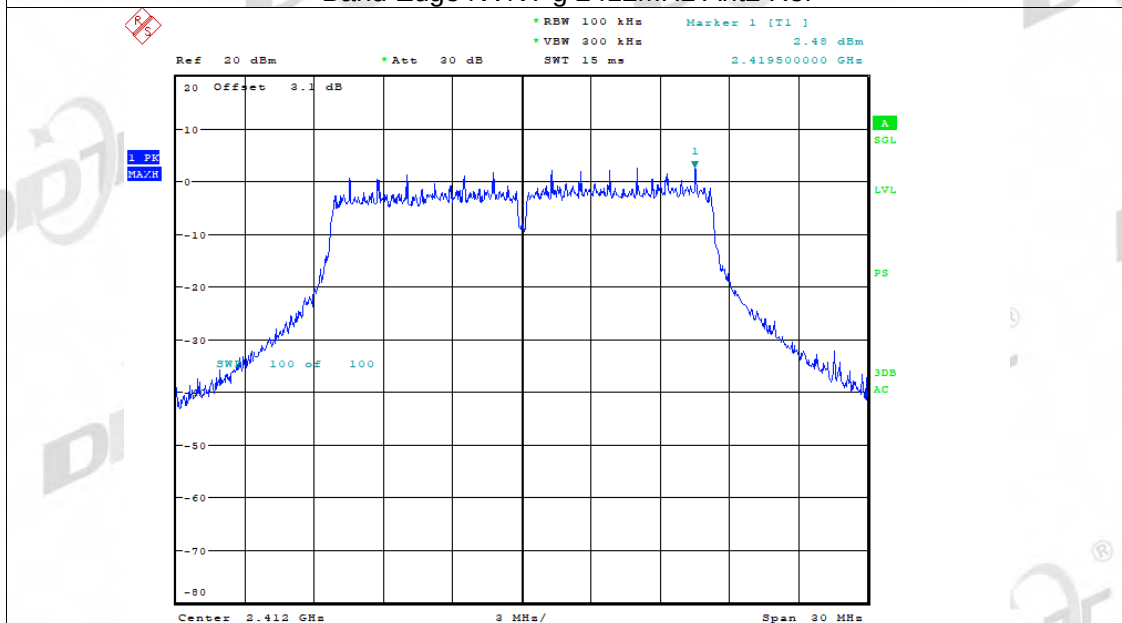
Date: 25.FEB.2022 13:27:34

Band Edge NVNT g 2462MHz Ant1 Emission



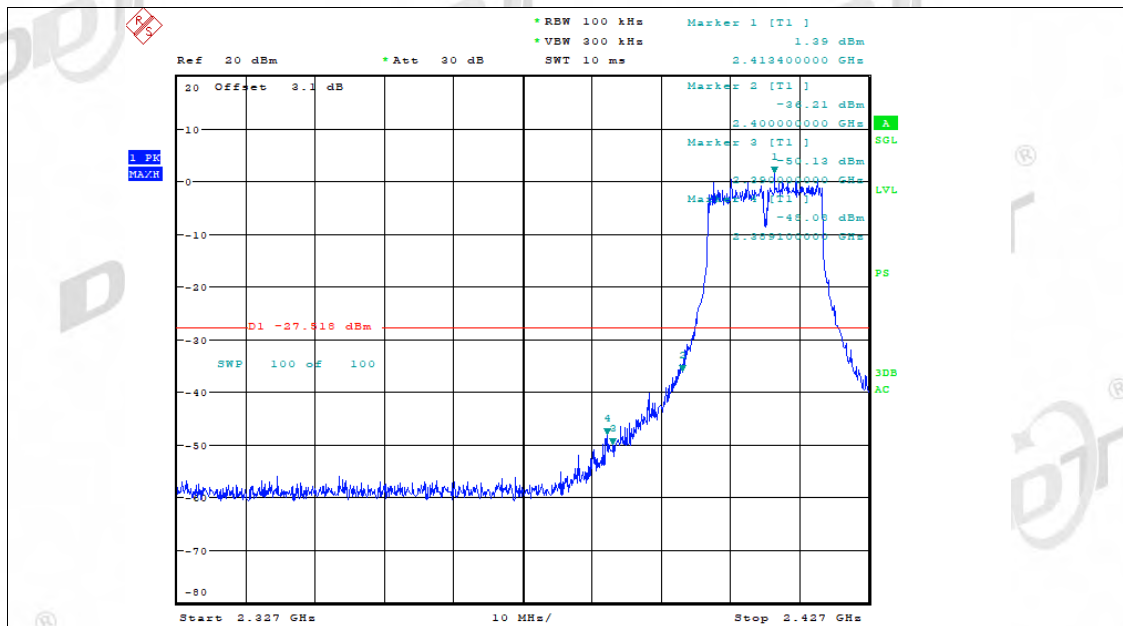
Date: 25.FEB.2022 13:27:39

Band Edge NVNT g 2412MHz Ant2 Ref



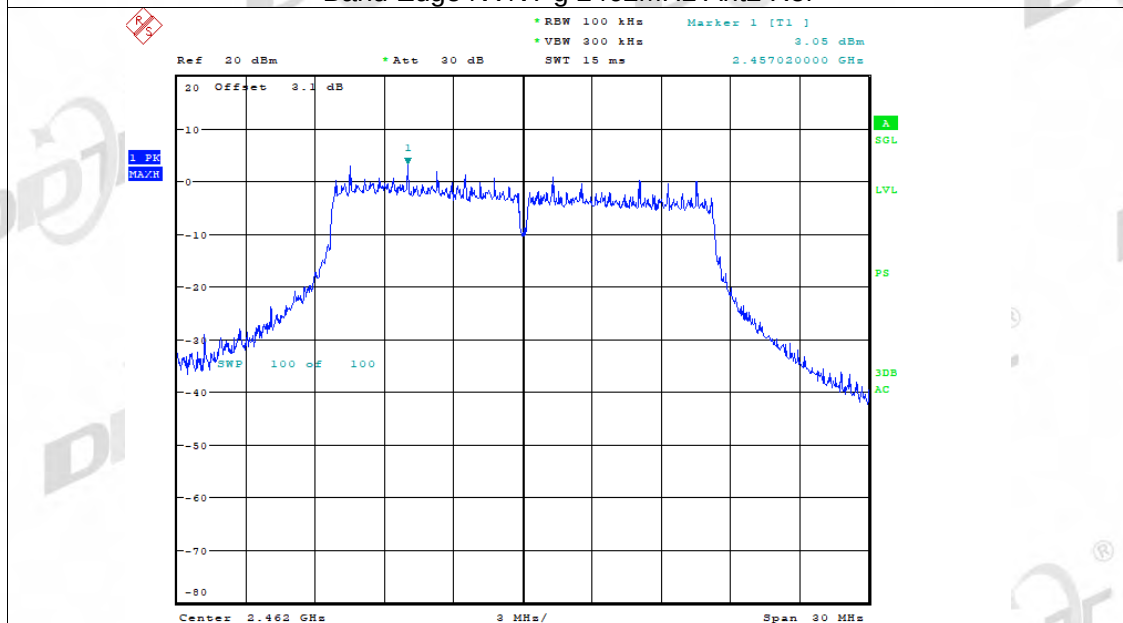
Date: 25.FEB.2022 13:15:24

Band Edge NVNT g 2412MHz Ant2 Emission



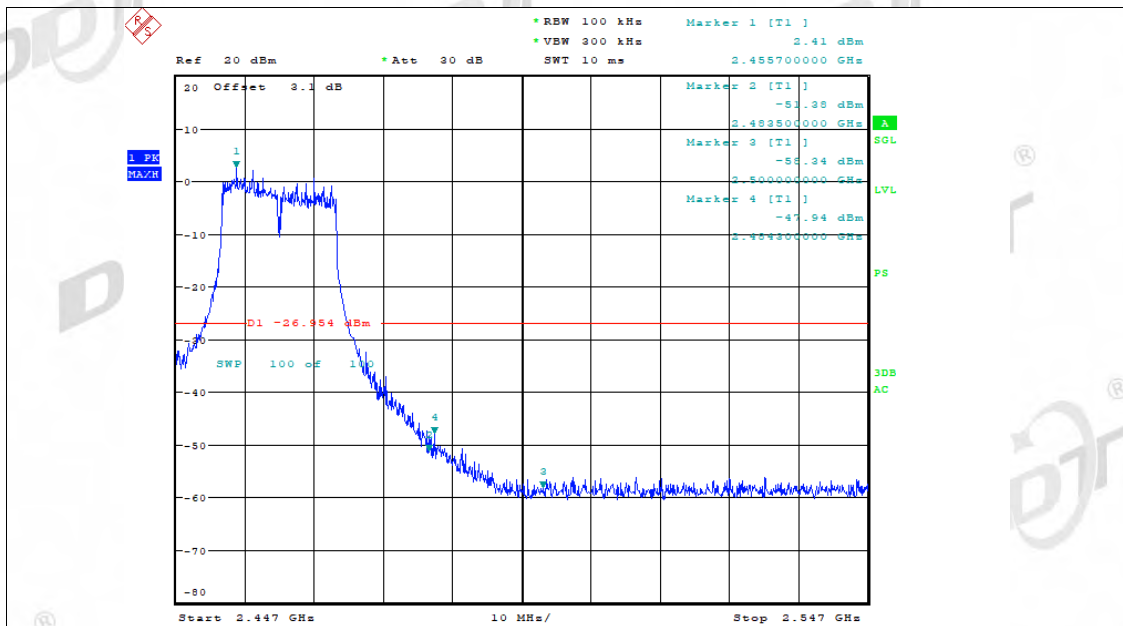
Date: 25.FEB.2022 13:15:28

Band Edge NVNT g 2462MHz Ant2 Ref



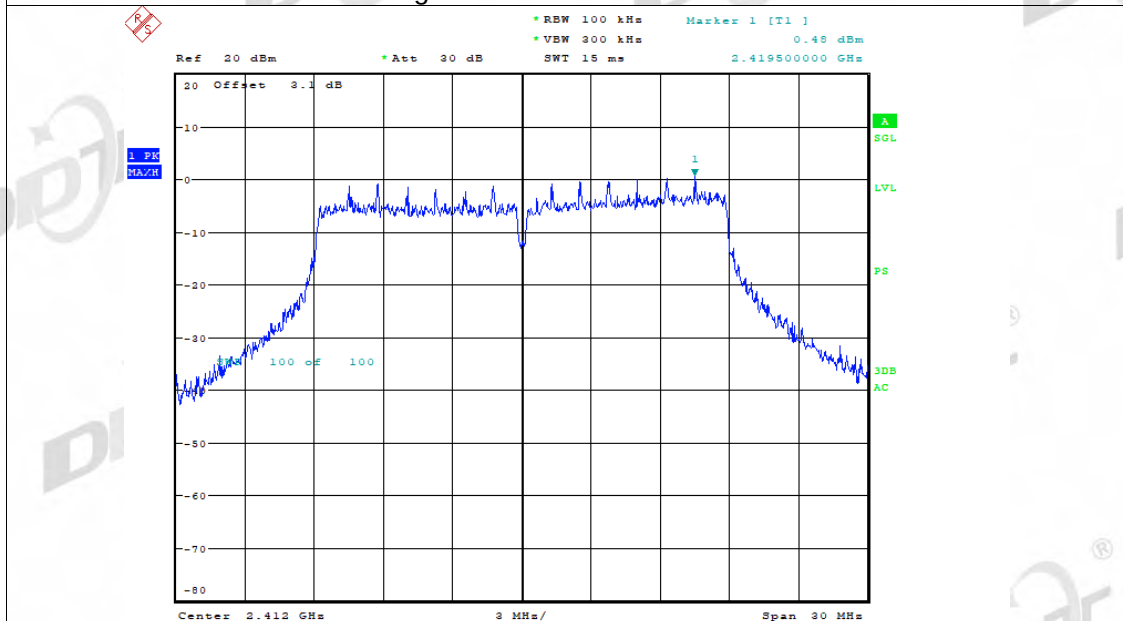
Date: 25.FEB.2022 13:30:33

Band Edge NVNT g 2462MHz Ant2 Emission



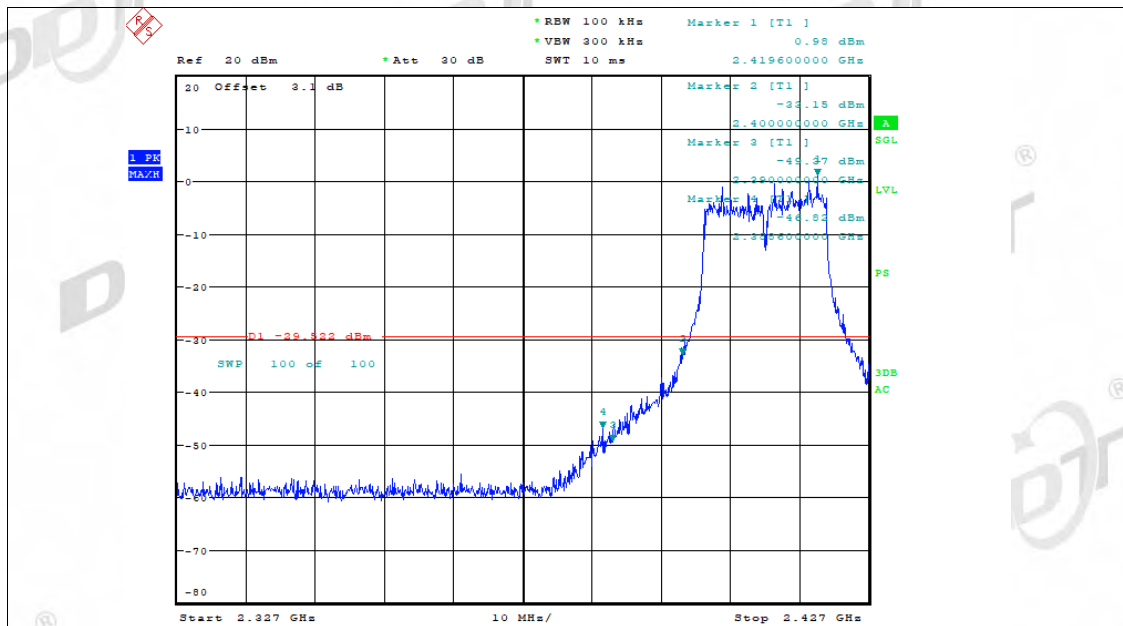
Date: 25.FEB.2022 13:30:37

Band Edge NVNT n20 2412MHz Ant1 Ref



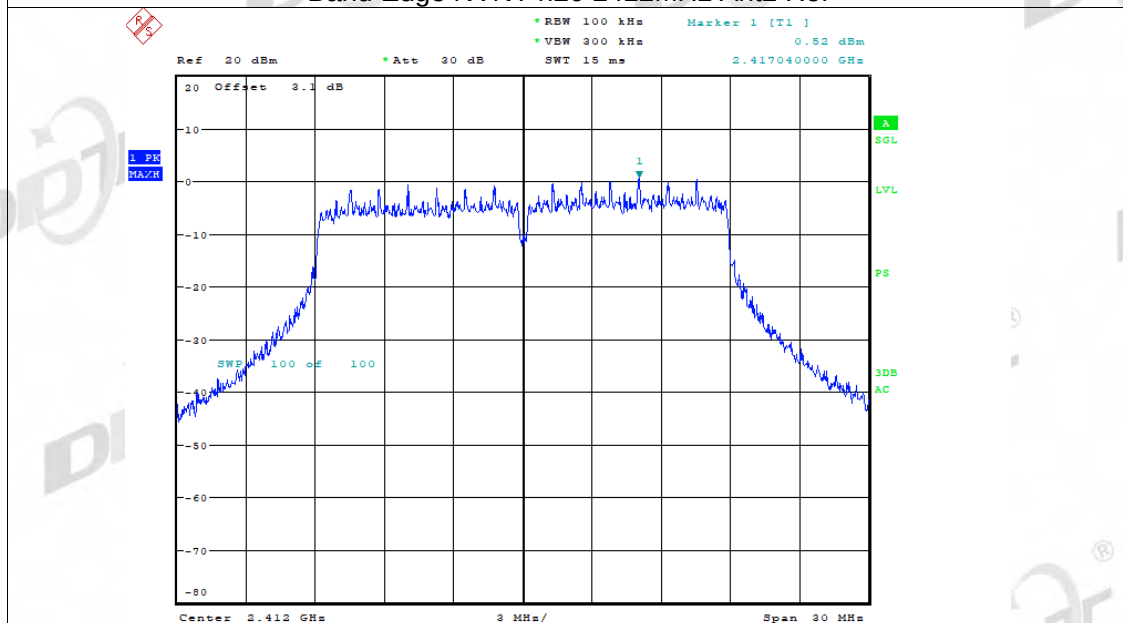
Date: 25.FEB.2022 13:40:57

Band Edge NVNT n20 2412MHz Ant1 Emission



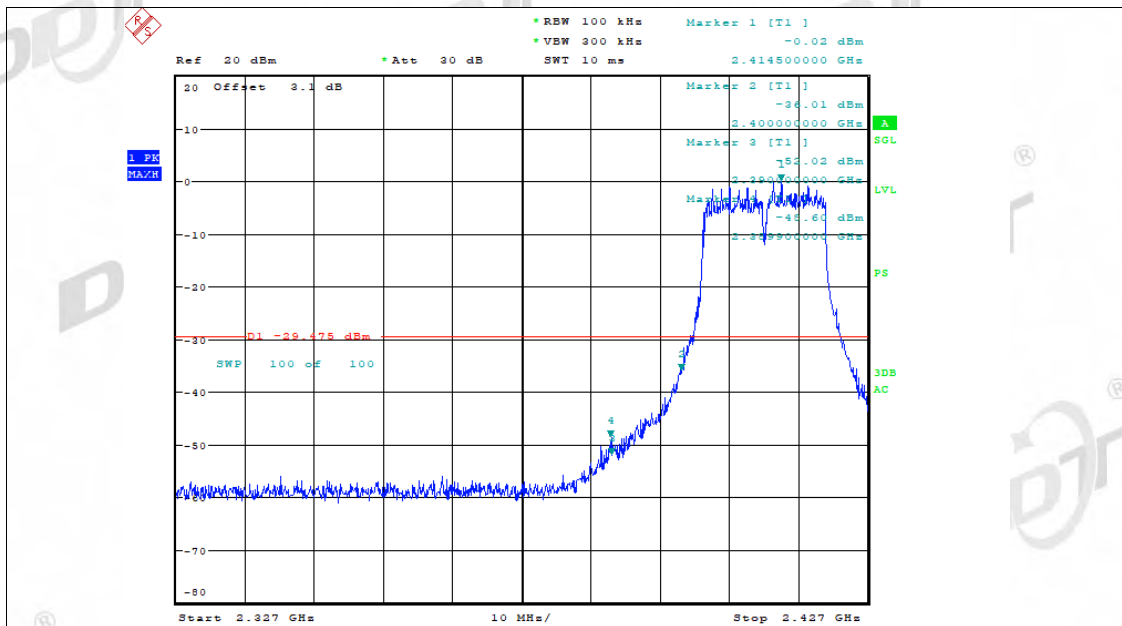
Date: 25.FEB.2022 13:41:02

Band Edge NVNT n20 2412MHz Ant2 Ref



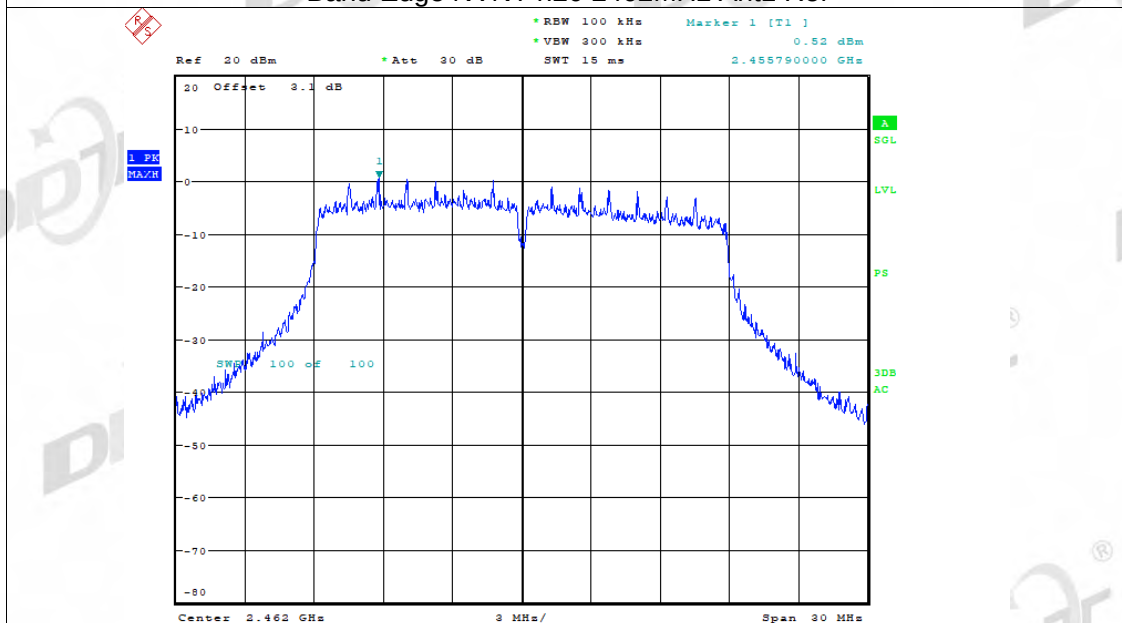
Date: 25.FEB.2022 13:41:09

Band Edge NVNT n20 2412MHz Ant2 Emission



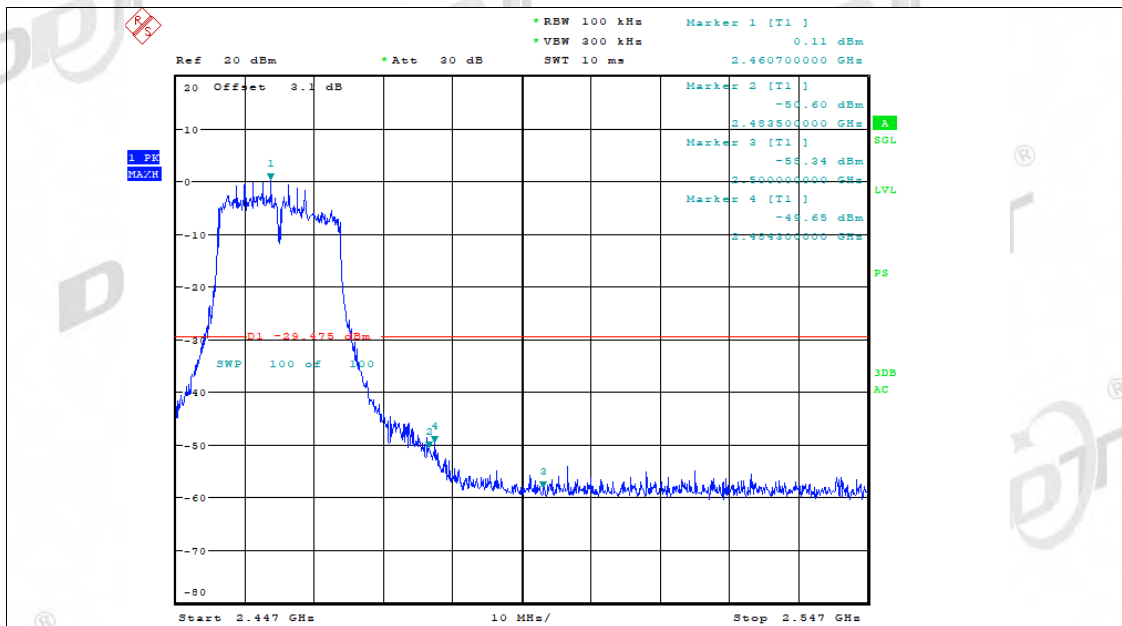
Date: 25.FEB.2022 13:41:14

Band Edge NVNT n20 2462MHz Ant1 Ref



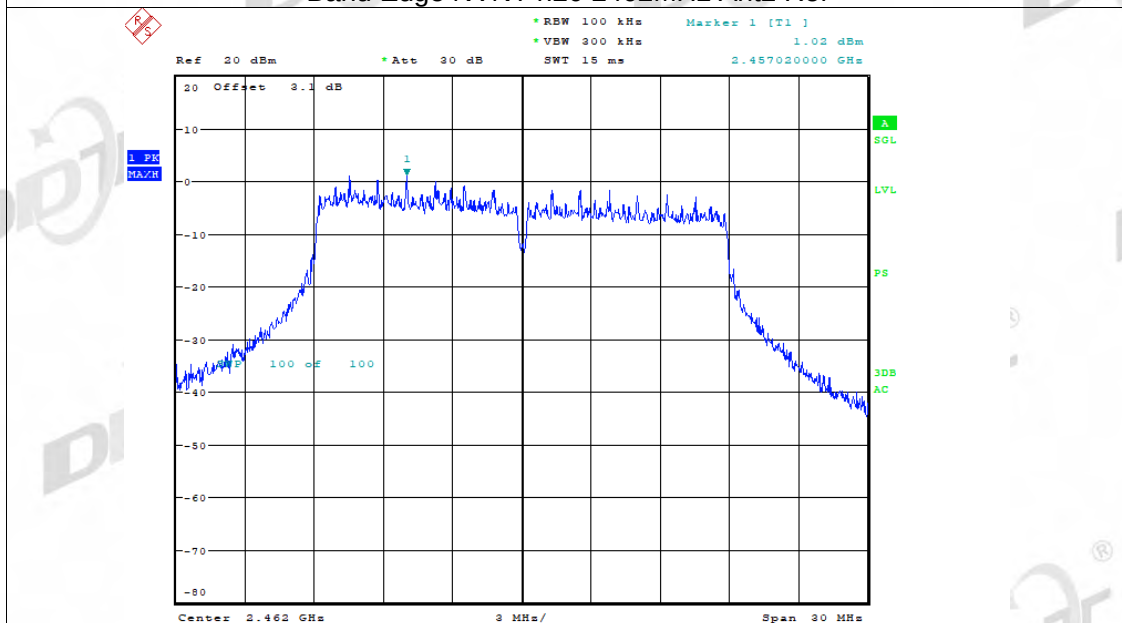
Date: 25.FEB.2022 13:50:50

Band Edge NVNT n20 2462MHz Ant1 Emission



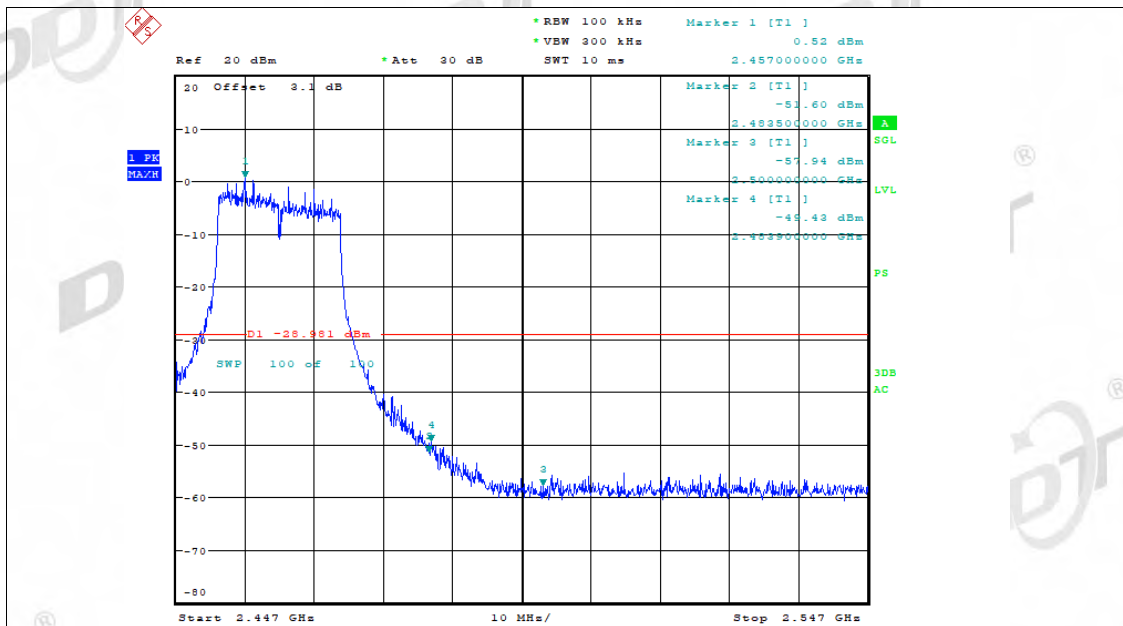
Date: 25.FEB.2022 13:50:54

Band Edge NVNT n20 2462MHz Ant2 Ref



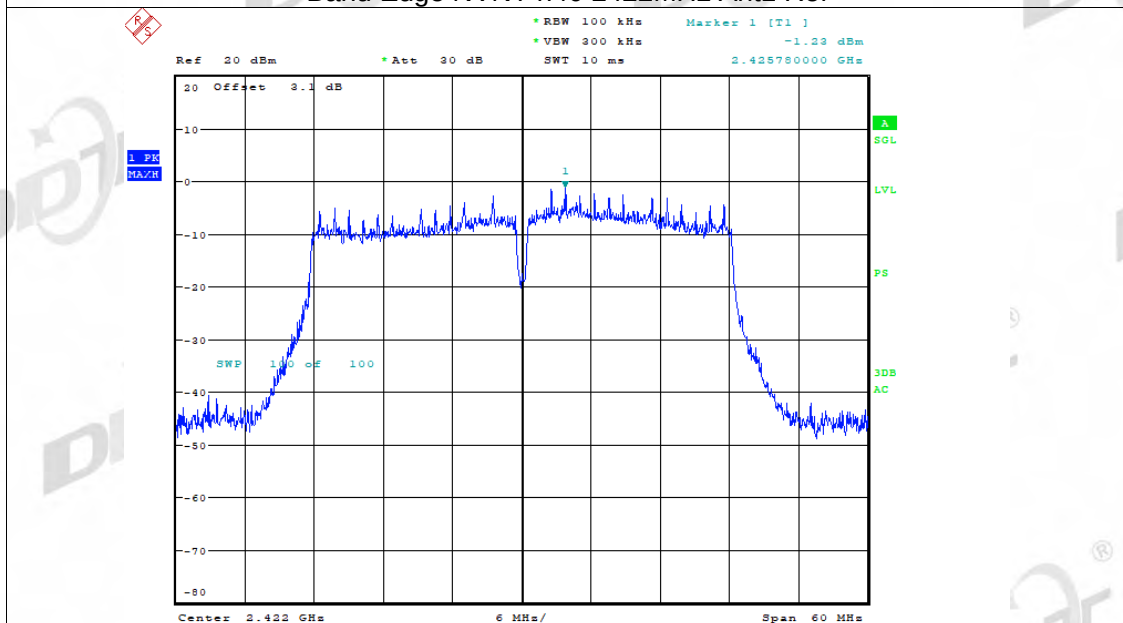
Date: 25.FEB.2022 13:51:02

Band Edge NVNT n20 2462MHz Ant2 Emission



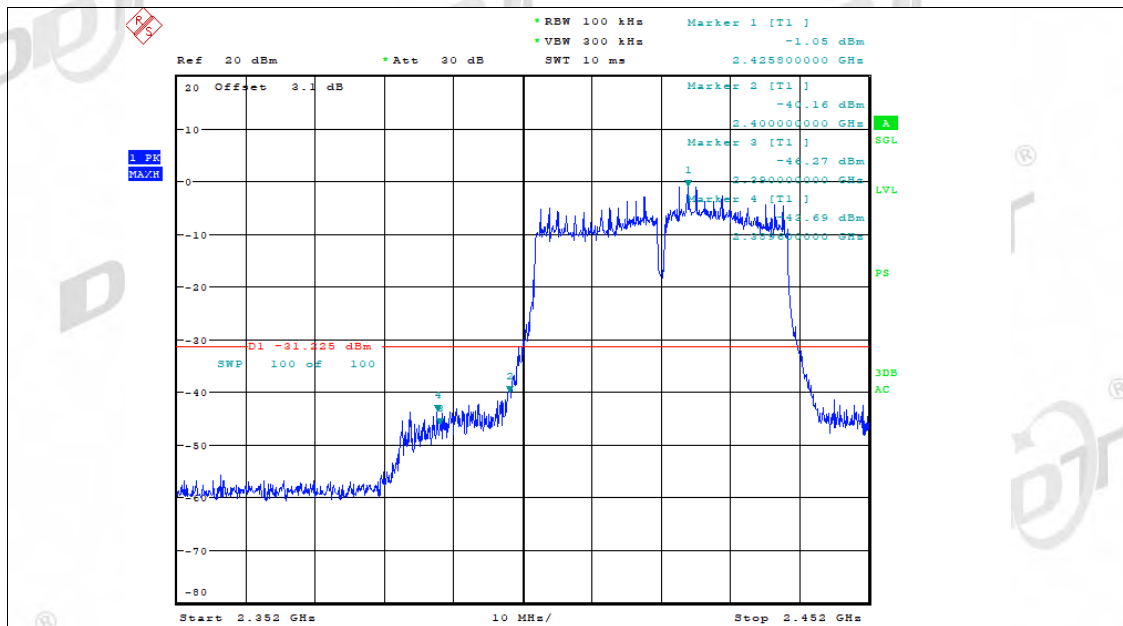
Date: 25.FEB.2022 13:51:06

Band Edge NVNT n40 2422MHz Ant1 Ref



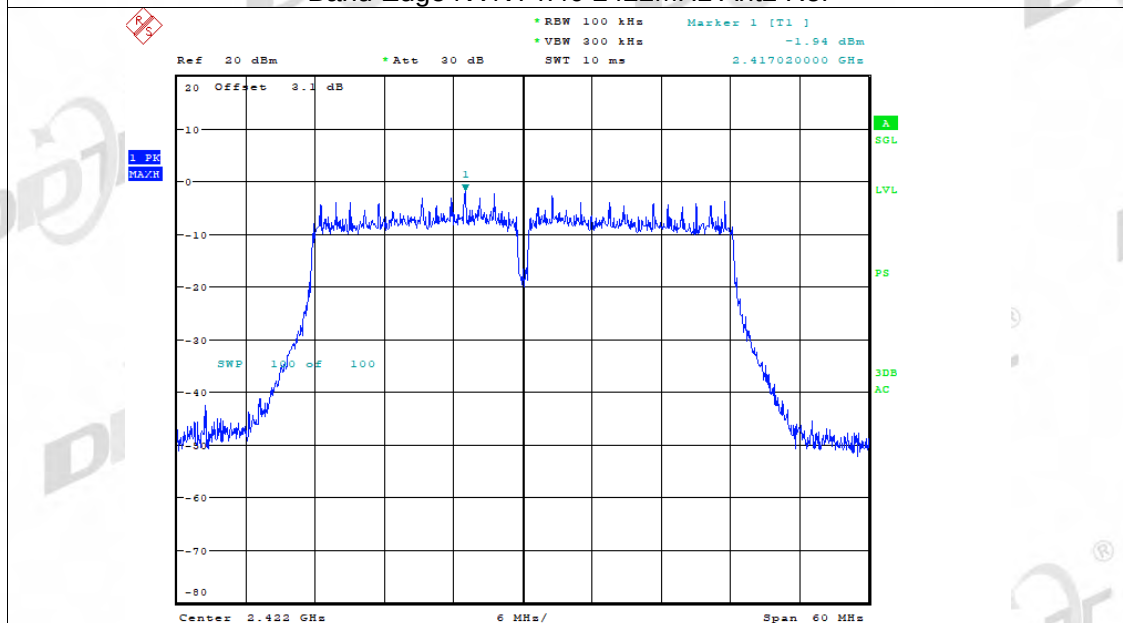
Date: 25.FEB.2022 14:03:41

Band Edge NVNT n40 2422MHz Ant1 Emission



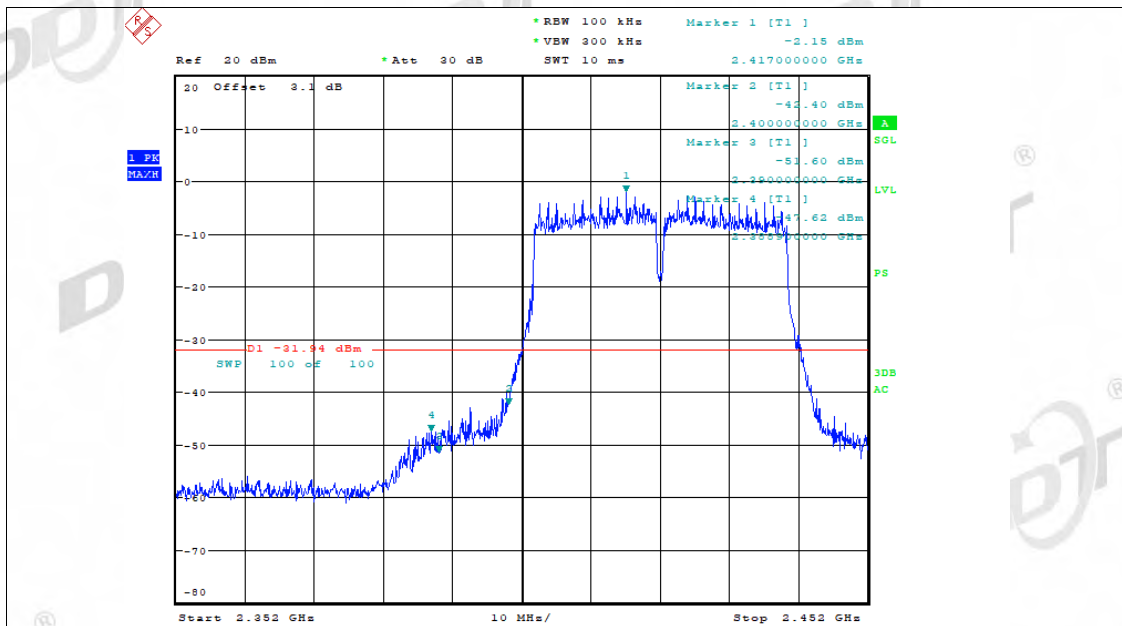
Date: 25.FEB.2022 14:03:45

Band Edge NVNT n40 2422MHz Ant2 Ref



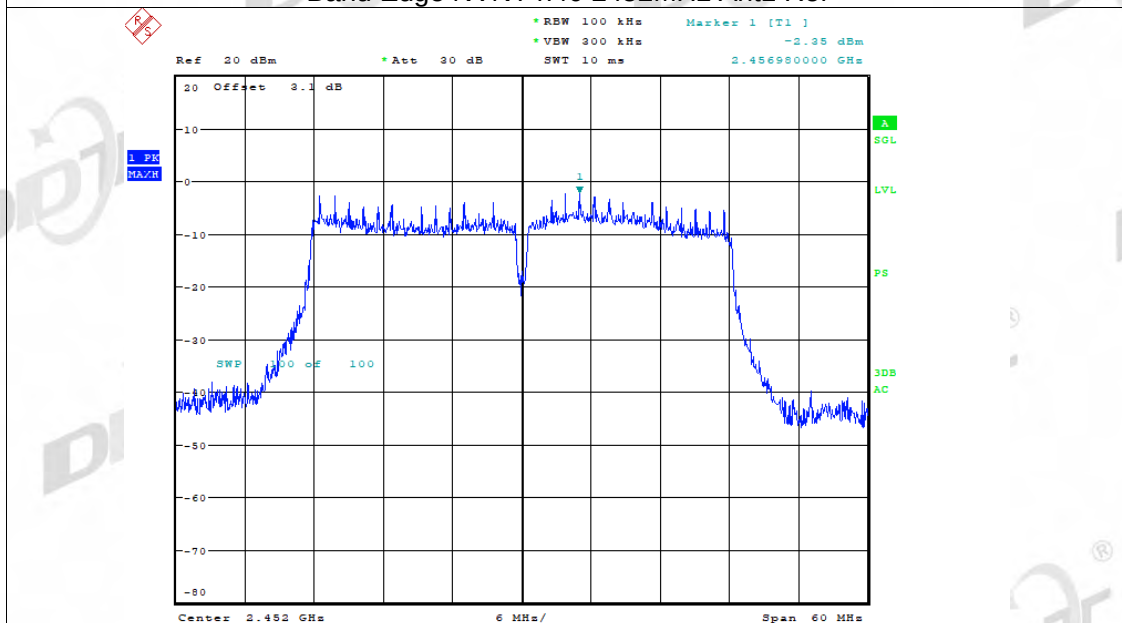
Date: 25.FEB.2022 14:03:50

Band Edge NVNT n40 2422MHz Ant2 Emission



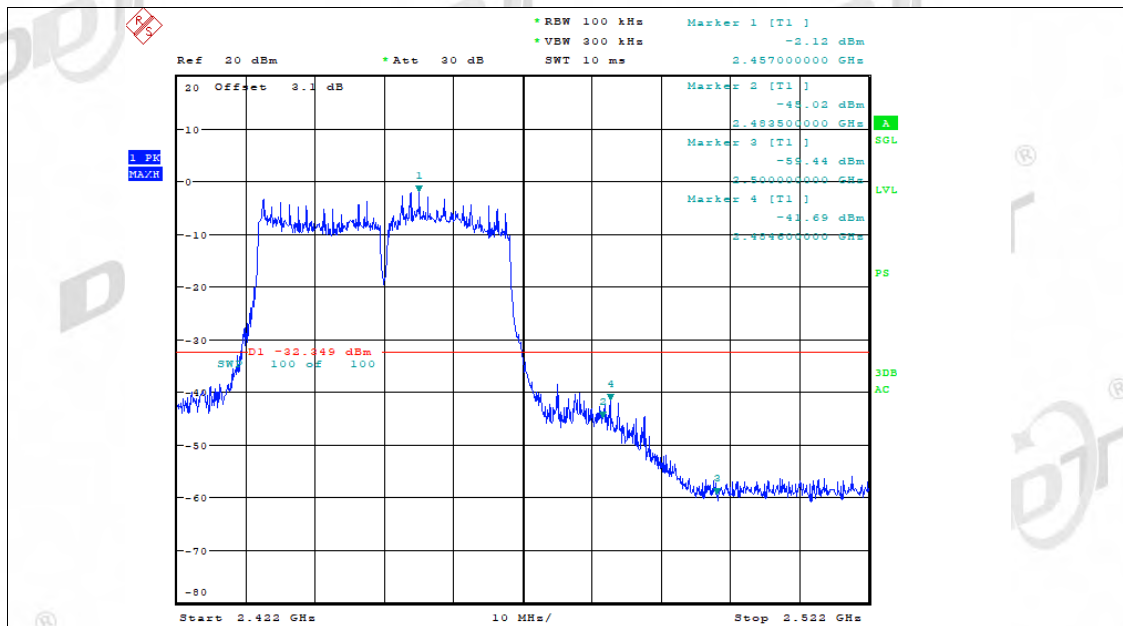
Date: 25.FEB.2022 14:03:55

Band Edge NVNT n40 2452MHz Ant1 Ref



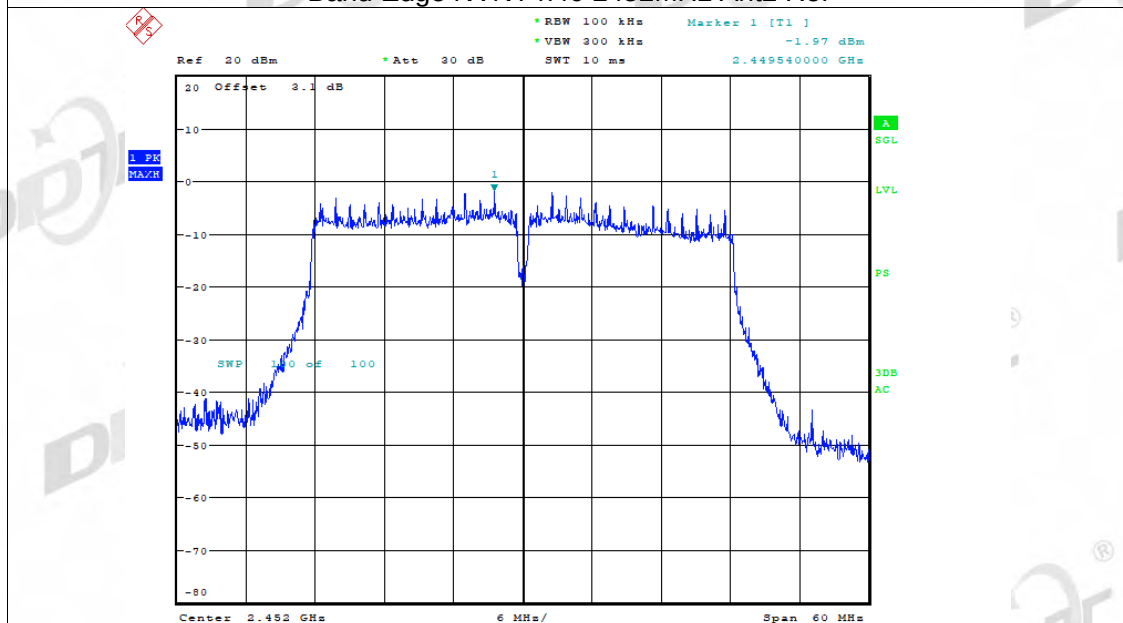
Date: 25.FEB.2022 14:12:35

Band Edge NVNT n40 2452MHz Ant1 Emission



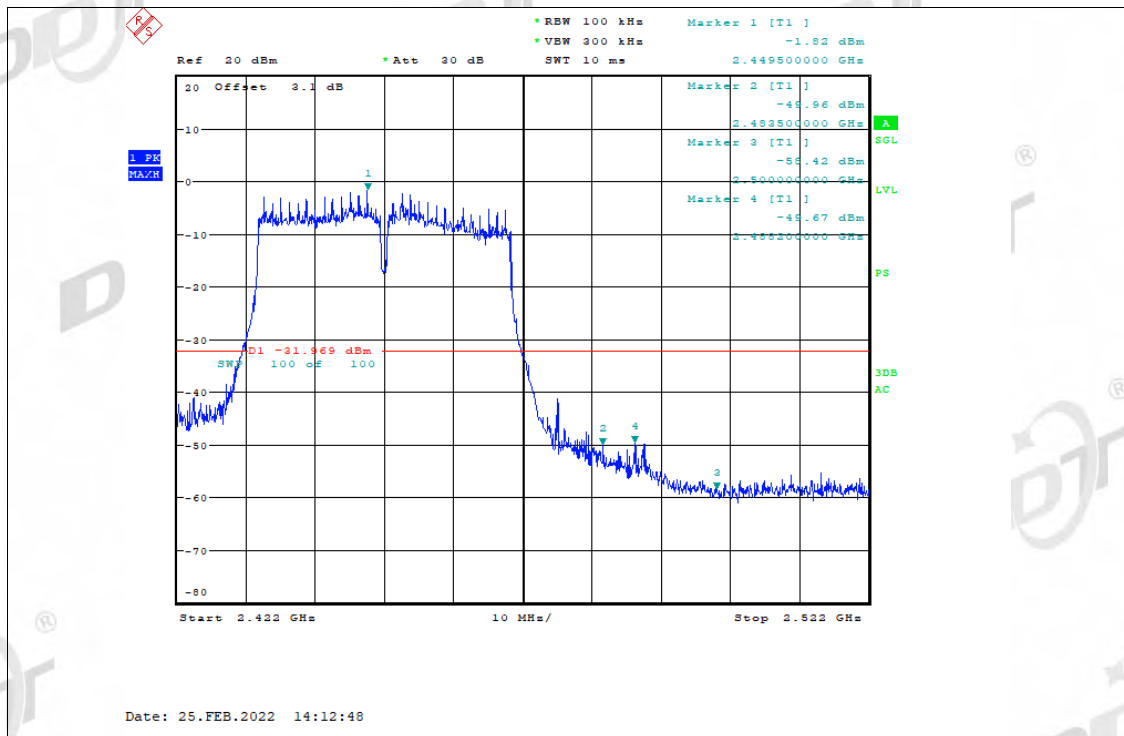
Date: 25.FEB.2022 14:12:39

Band Edge NVNT n40 2452MHz Ant2 Ref

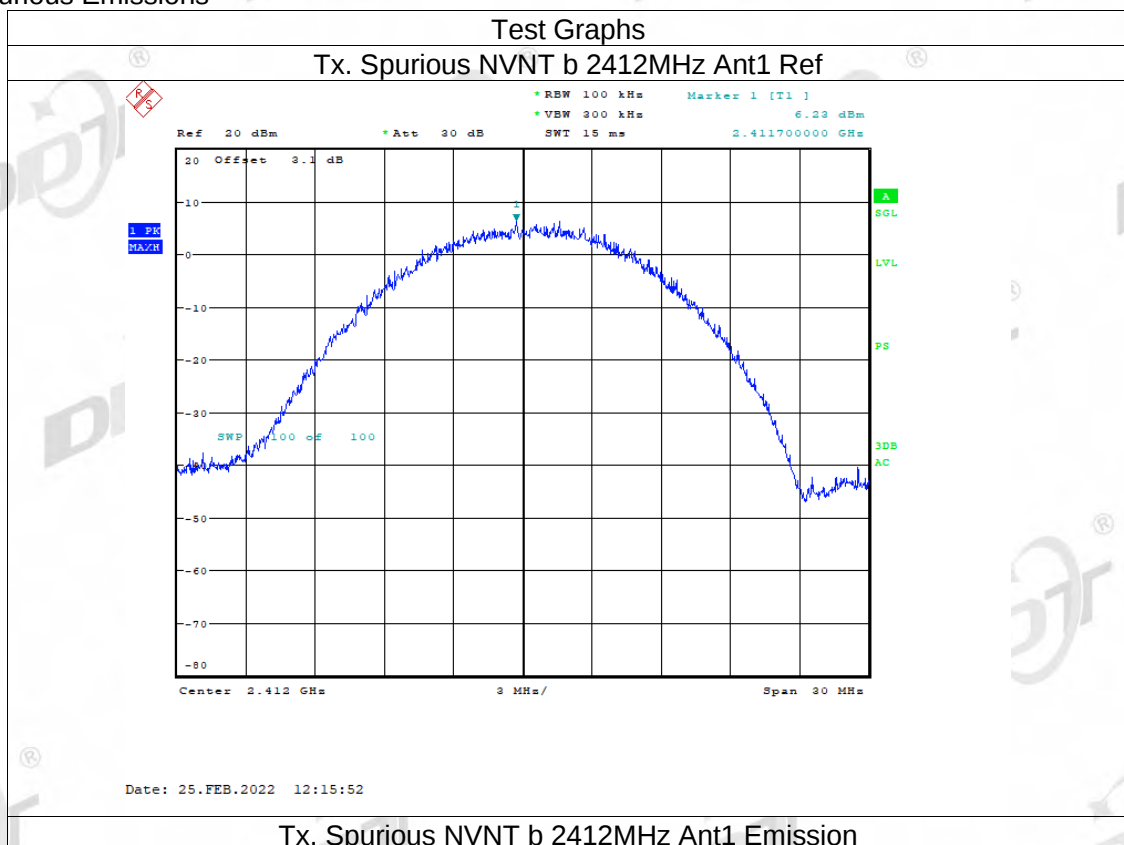


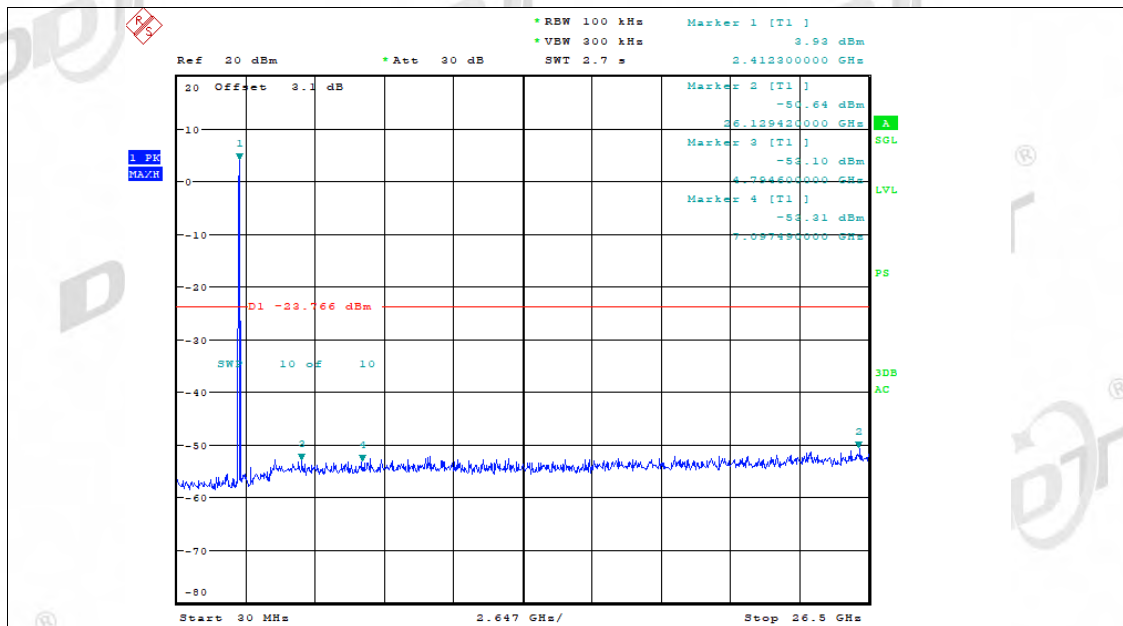
Date: 25.FEB.2022 14:12:44

Band Edge NVNT n40 2452MHz Ant2 Emission



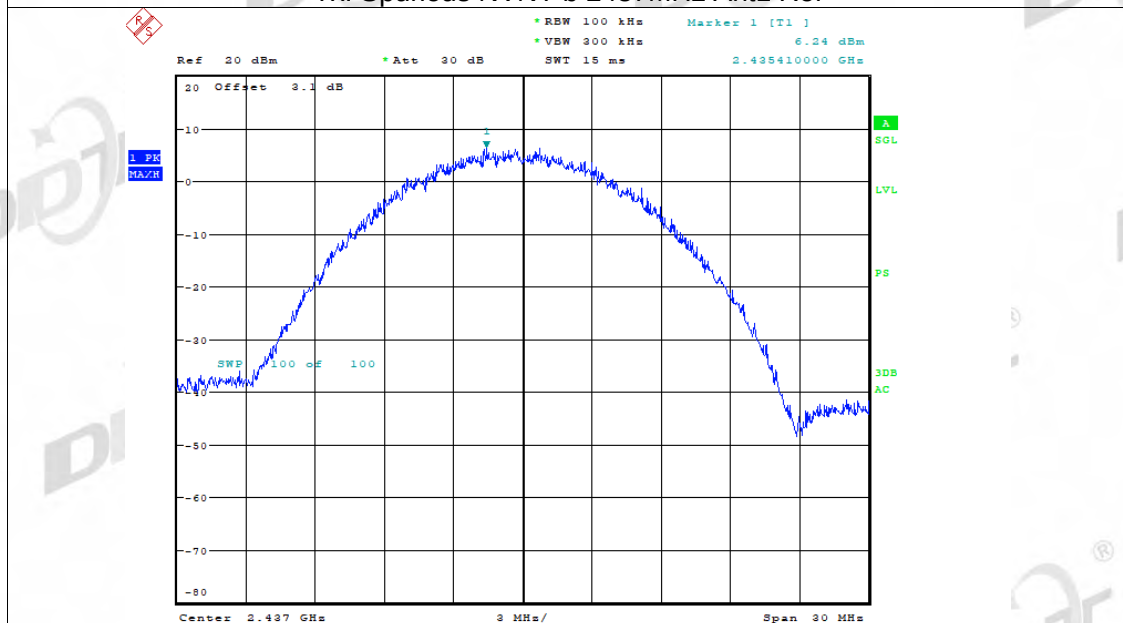
Spurious Emissions





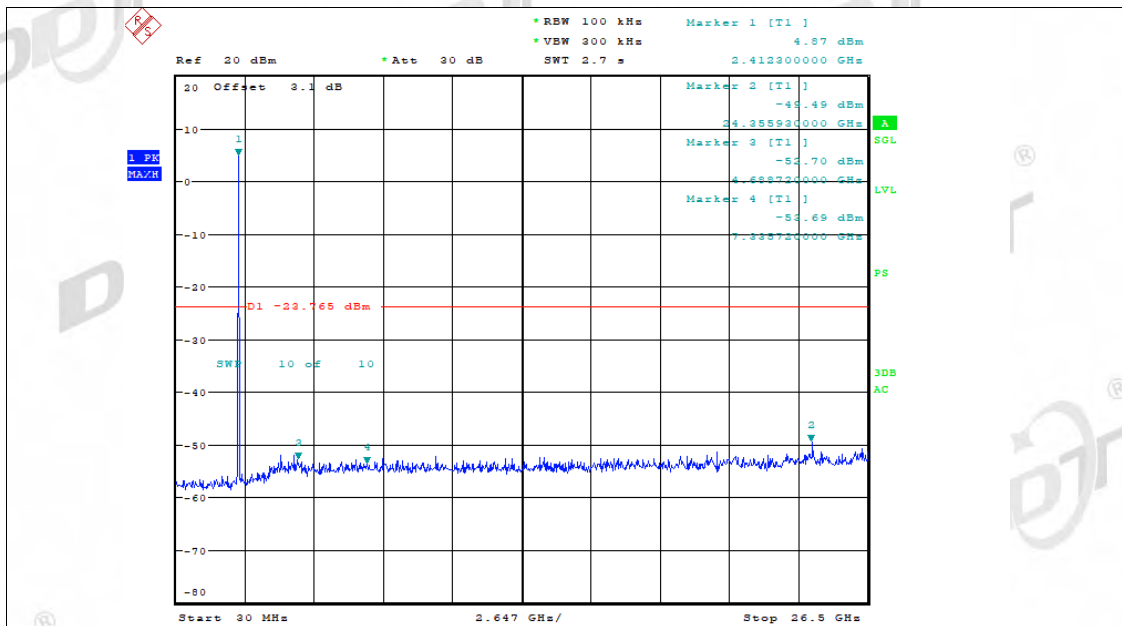
Date: 25.FEB.2022 12:16:25

Tx. Spurious NVNT b 2437MHz Ant1 Ref



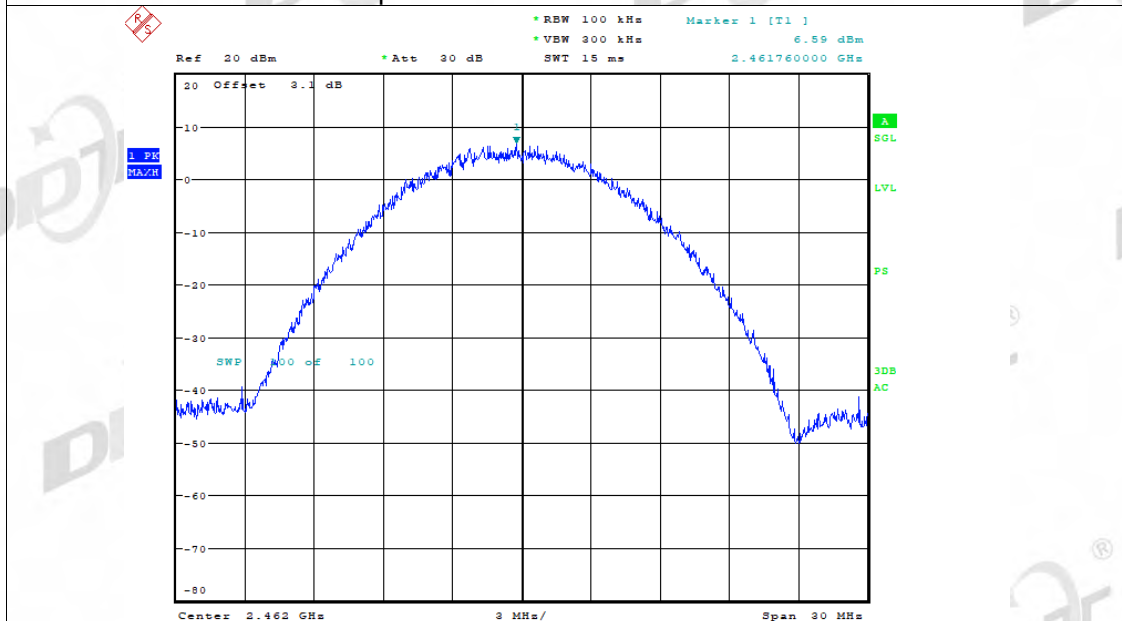
Date: 25.FEB.2022 12:24:04

Tx. Spurious NVNT b 2437MHz Ant1 Emission



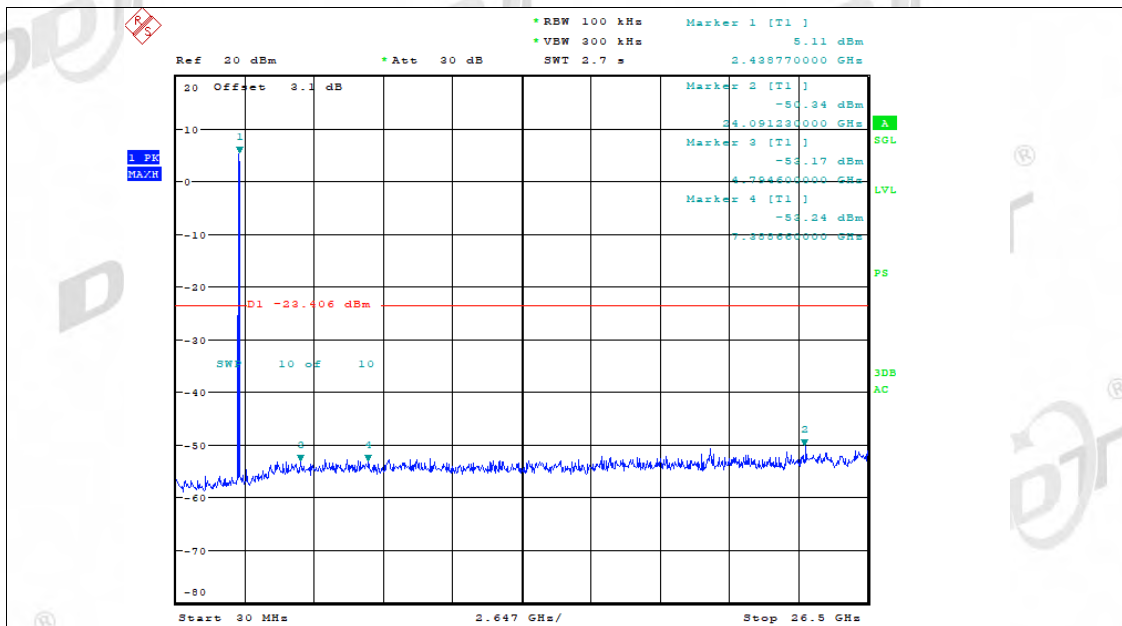
Date: 25.FEB.2022 12:24:37

Tx. Spurious NVNT b 2462MHz Ant1 Ref



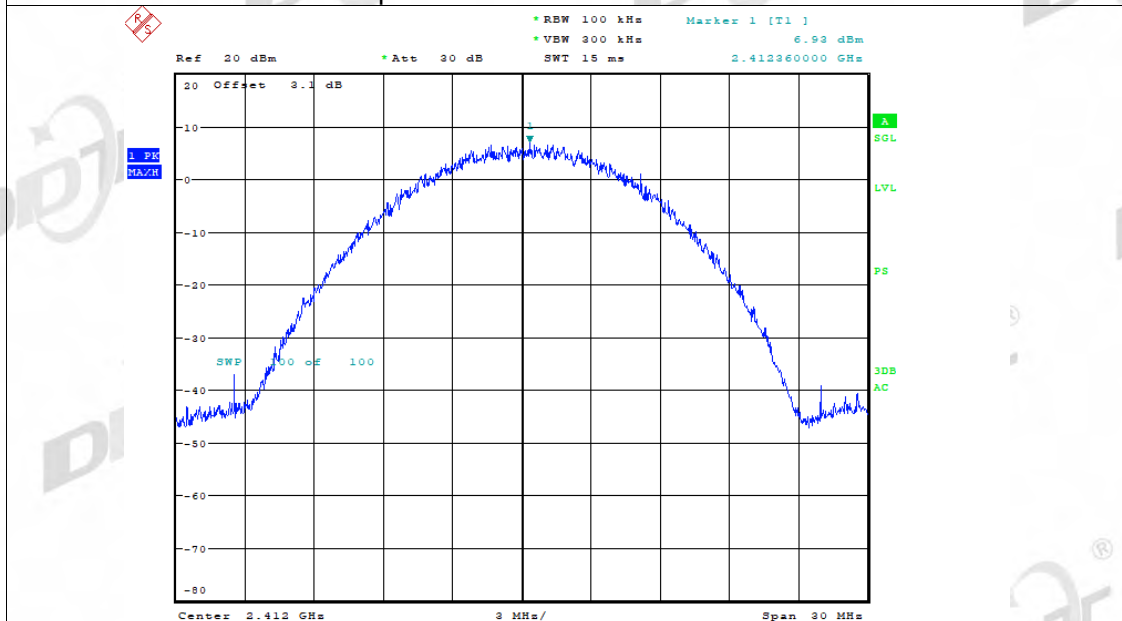
Date: 25.FEB.2022 12:37:54

Tx. Spurious NVNT b 2462MHz Ant1 Emission



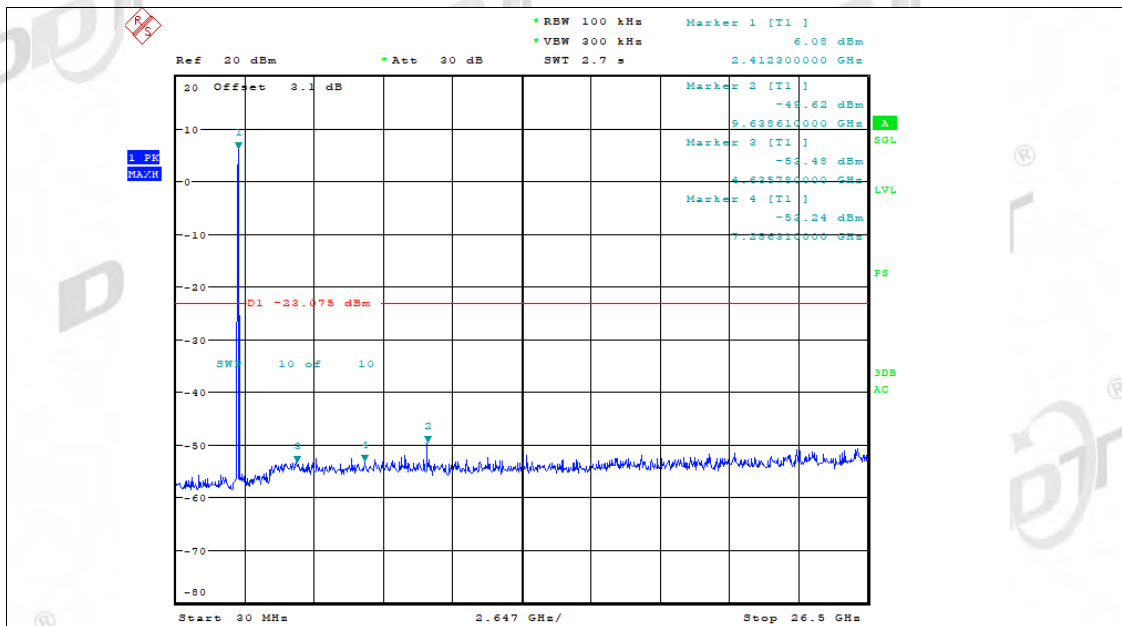
Date: 25.FEB.2022 12:38:27

Tx. Spurious NVNT b 2412MHz Ant2 Ref



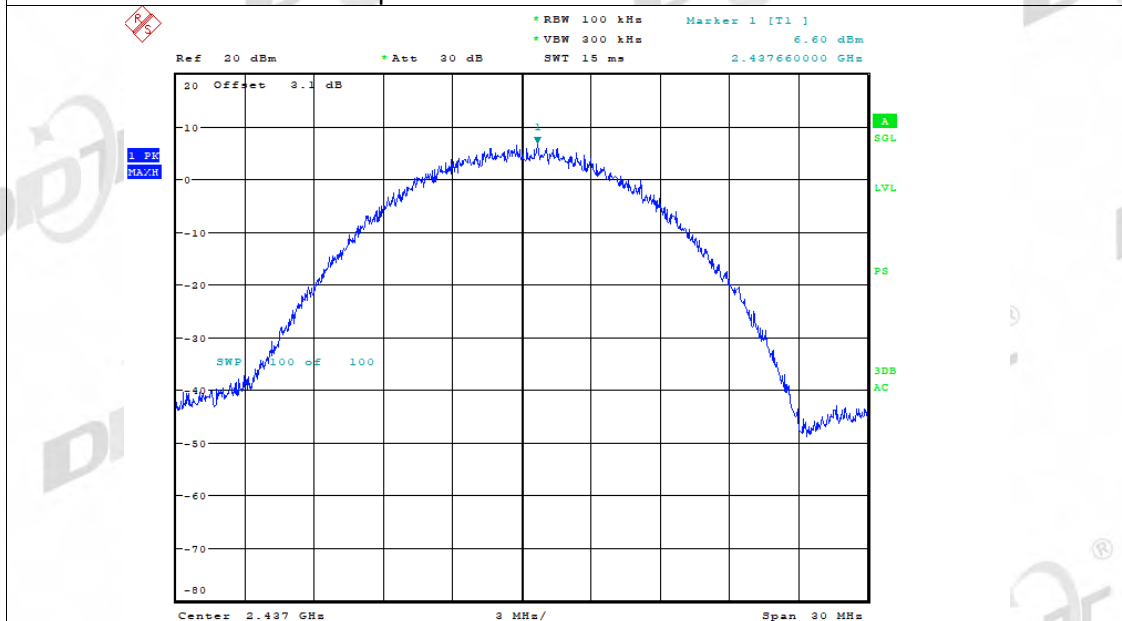
Date: 25.FEB.2022 12:19:08

Tx. Spurious NVNT b 2412MHz Ant2 Emission



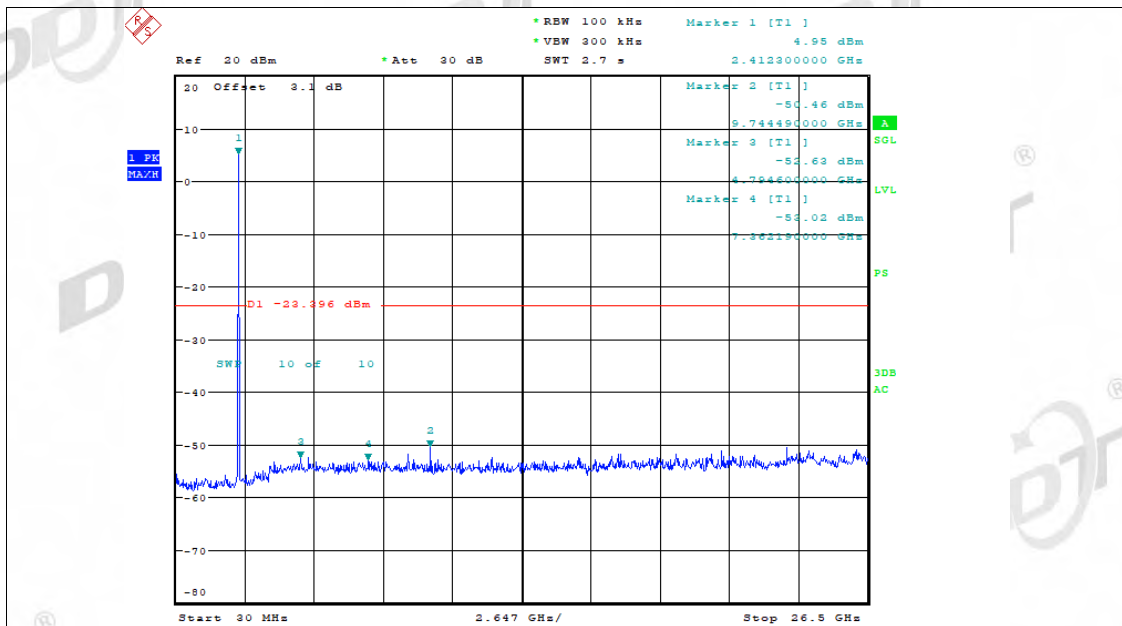
Date: 25.FEB.2022 12:19:41

Tx. Spurious NVNT b 2437MHz Ant2 Ref



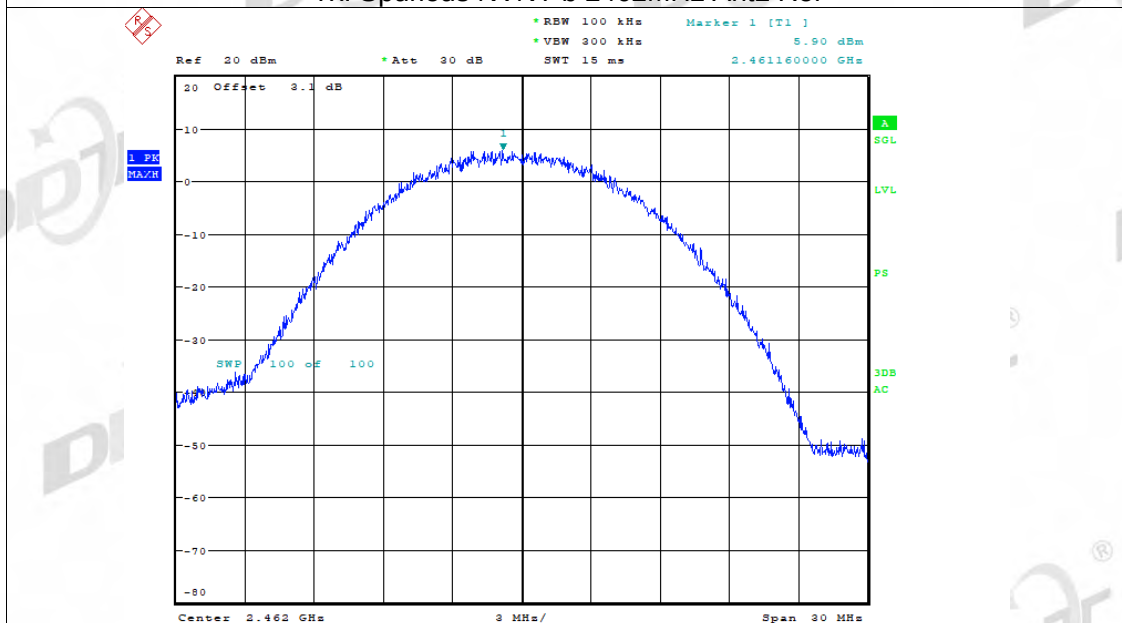
Date: 25.FEB.2022 12:28:03

Tx. Spurious NVNT b 2437MHz Ant2 Emission



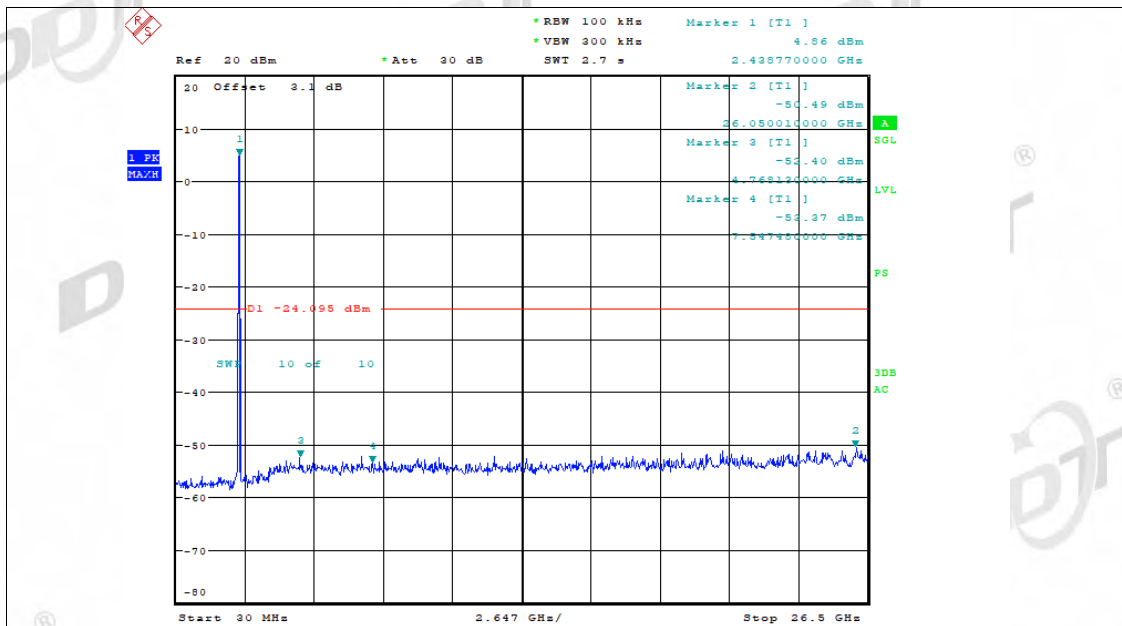
Date: 25.FEB.2022 12:28:36

Tx. Spurious NVNT b 2462MHz Ant2 Ref



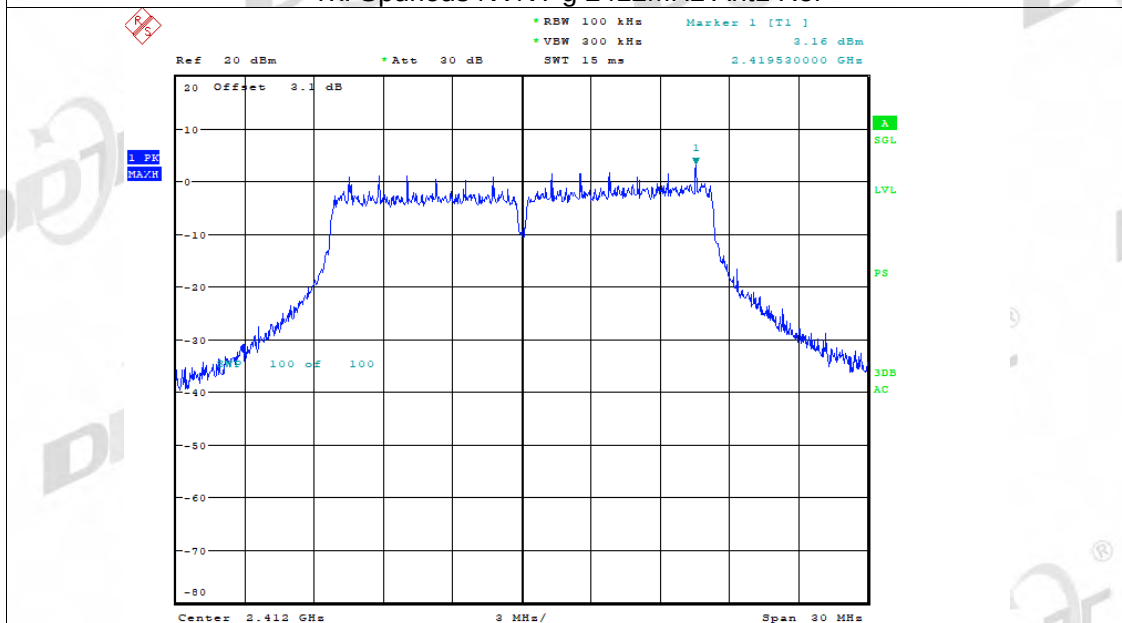
Date: 25.FEB.2022 12:41:47

Tx. Spurious NVNT b 2462MHz Ant2 Emission



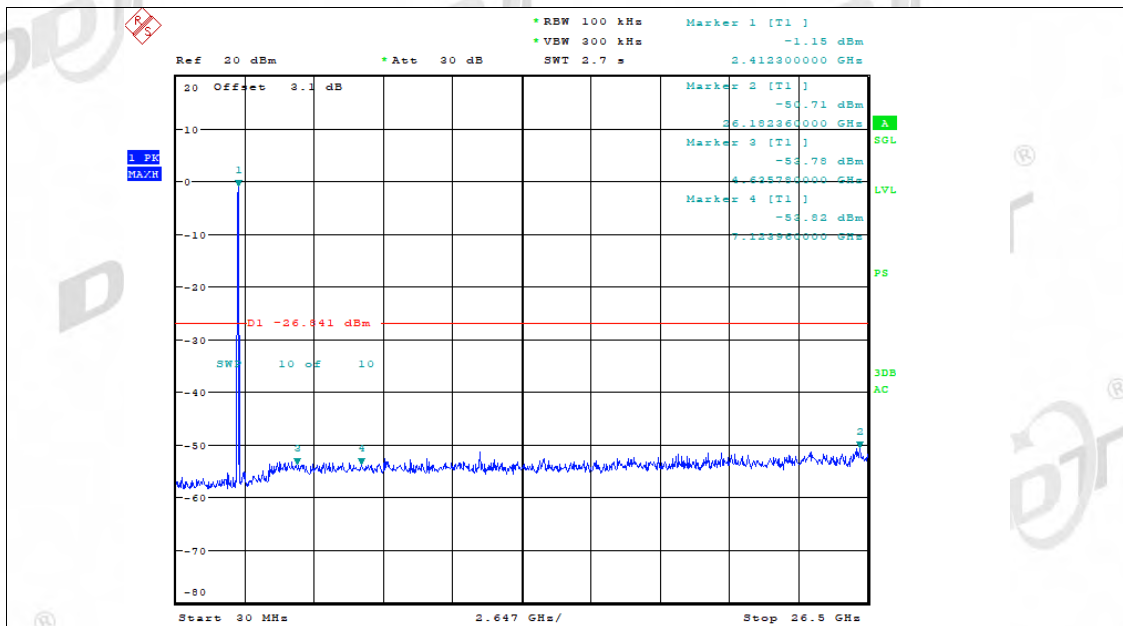
Date: 25.FEB.2022 12:42:20

Tx. Spurious NVNT g 2412MHz Ant1 Ref



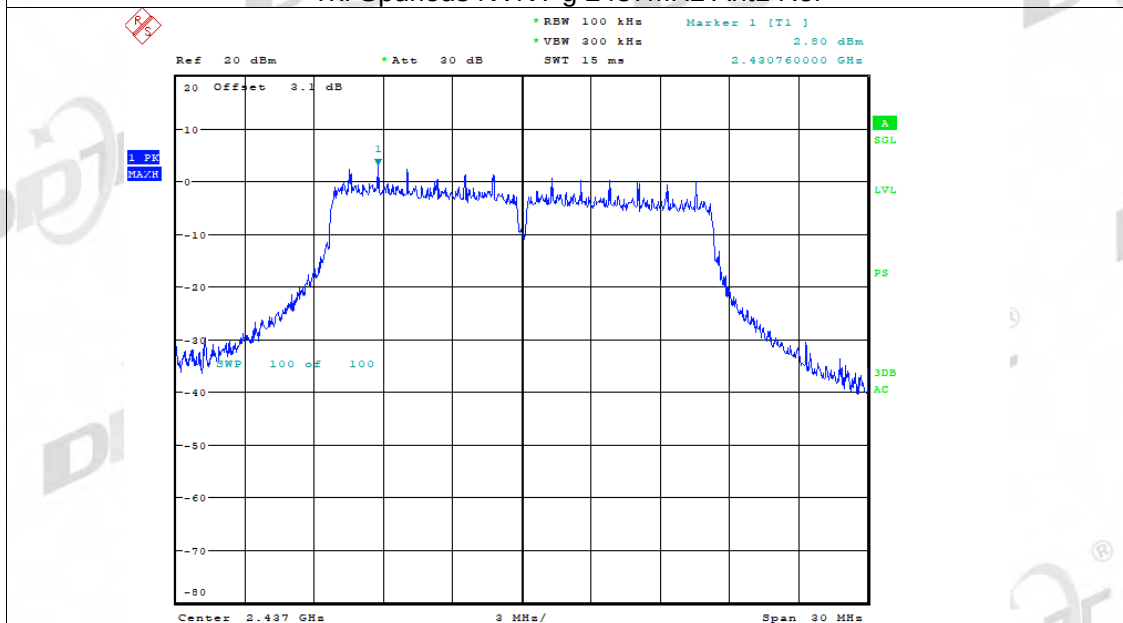
Date: 25.FEB.2022 13:11:53

Tx. Spurious NVNT g 2412MHz Ant1 Emission



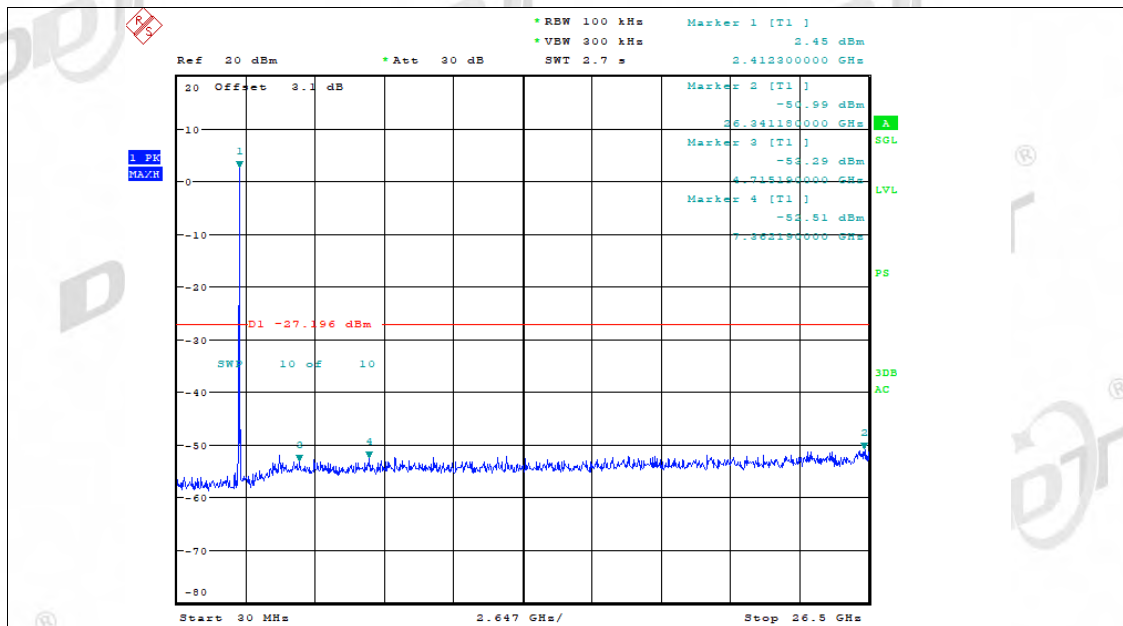
Date: 25.FEB.2022 13:12:26

Tx. Spurious NVNT g 2437MHz Ant1 Ref



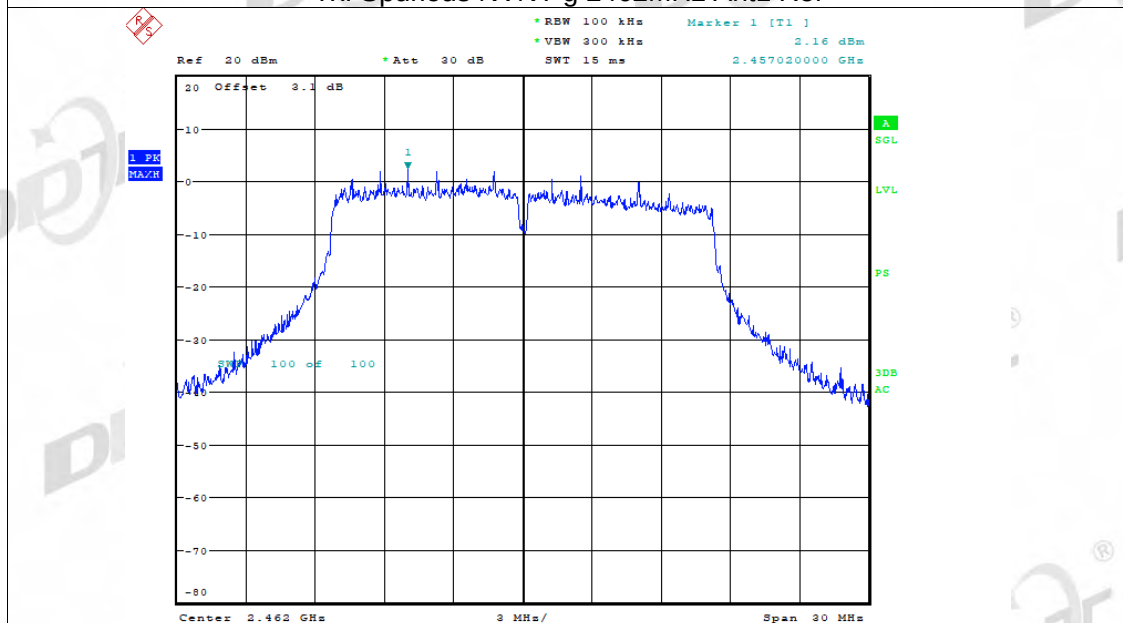
Date: 25.FEB.2022 13:20:19

Tx. Spurious NVNT g 2437MHz Ant1 Emission



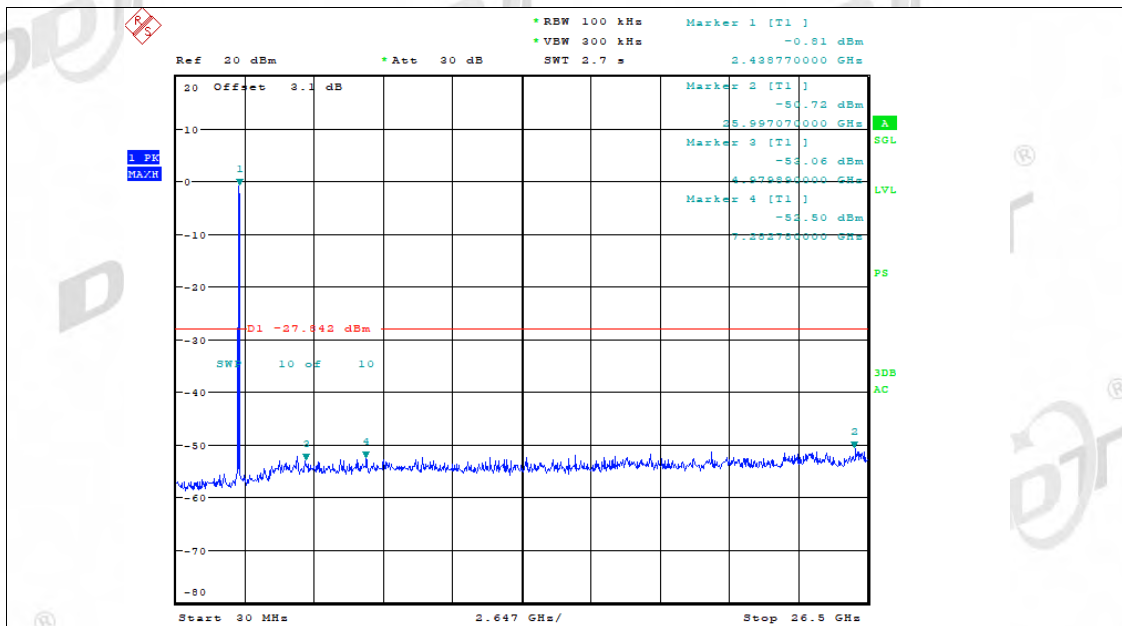
Date: 25.FEB.2022 13:20:52

Tx. Spurious NVNT g 2462MHz Ant1 Ref



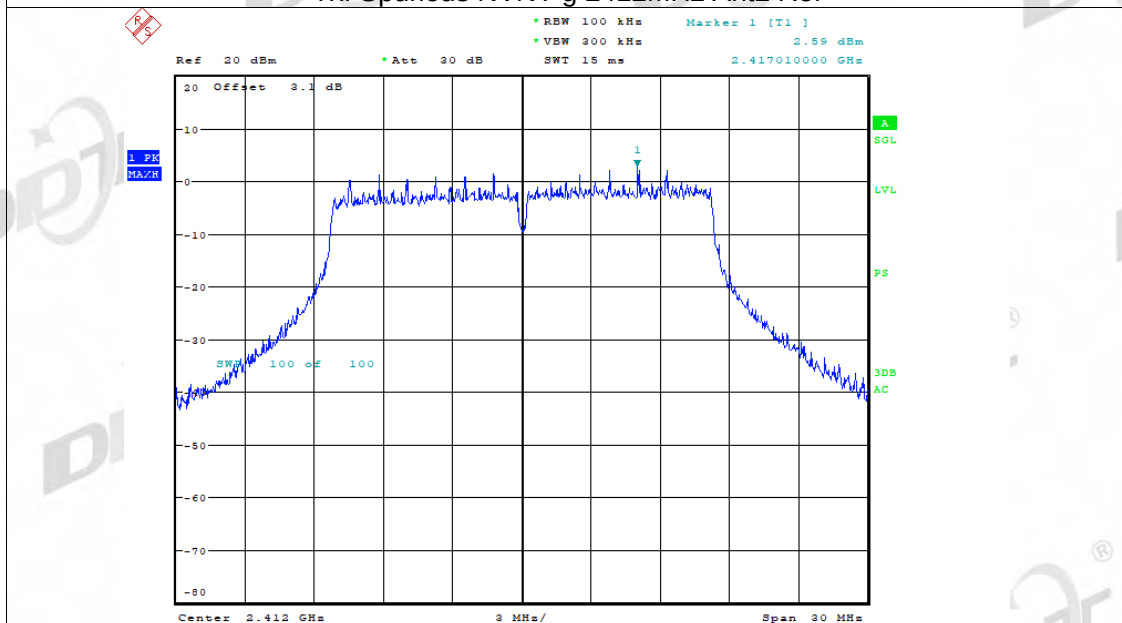
Date: 25.FEB.2022 13:27:53

Tx. Spurious NVNT g 2462MHz Ant1 Emission



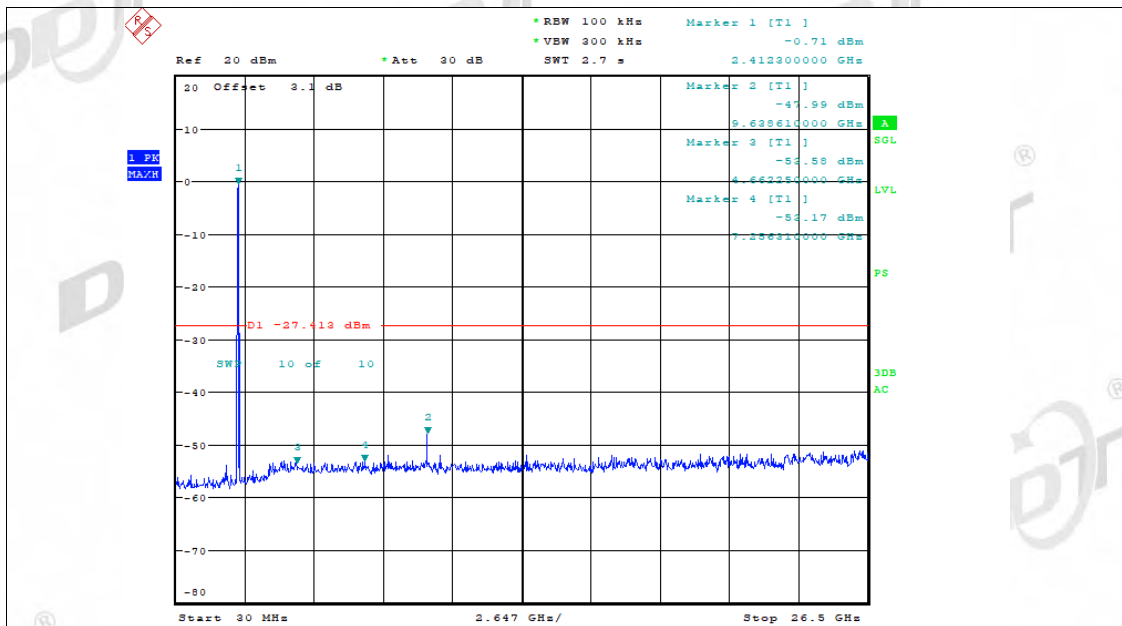
Date: 25.FEB.2022 13:28:26

Tx. Spurious NVNT g 2412MHz Ant2 Ref



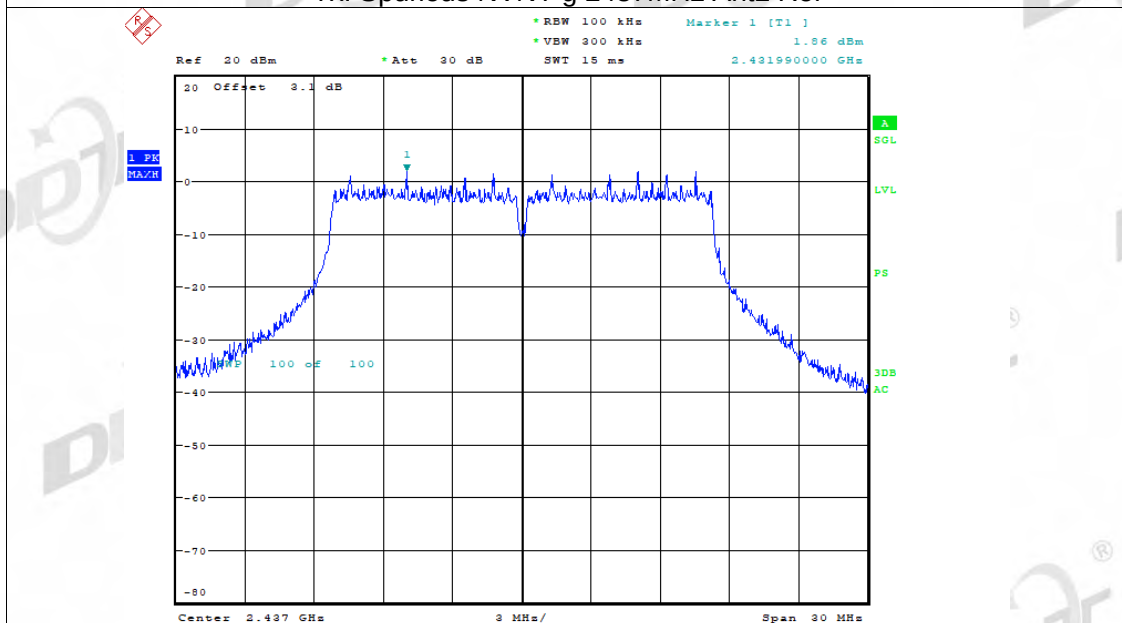
Date: 25.FEB.2022 13:15:41

Tx. Spurious NVNT g 2412MHz Ant2 Emission



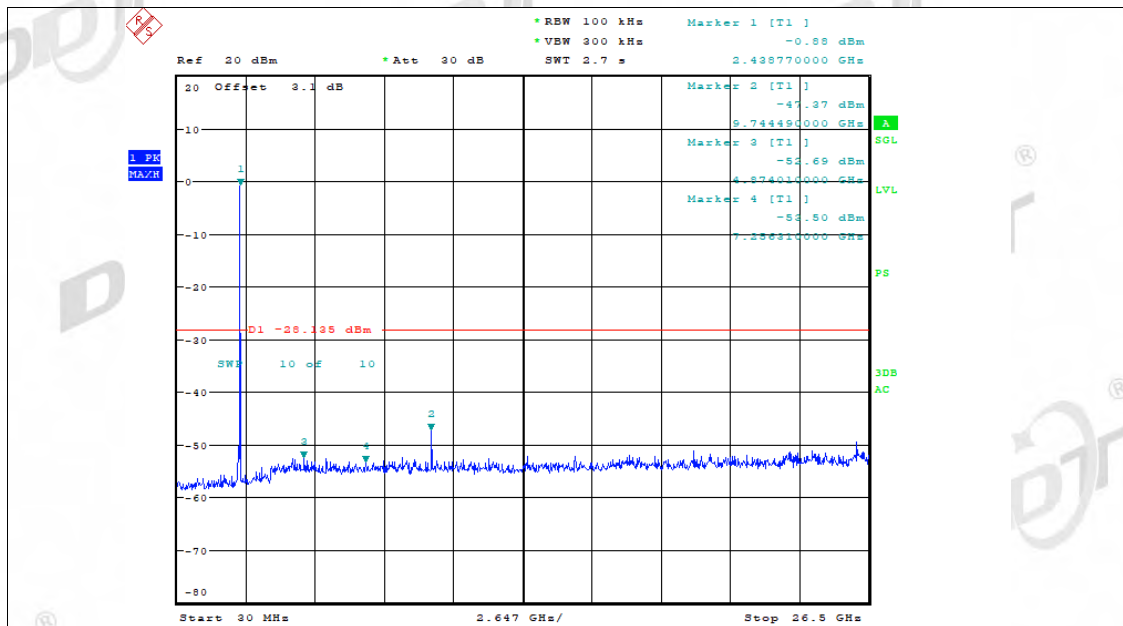
Date: 25.FEB.2022 13:16:14

Tx. Spurious NVNT g 2437MHz Ant2 Ref



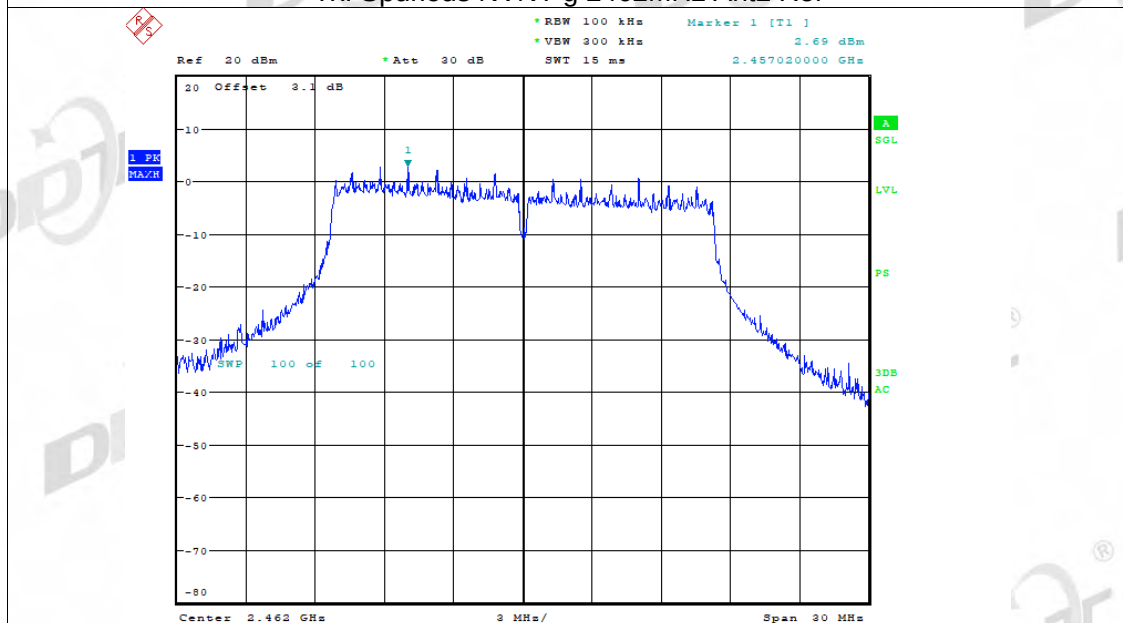
Date: 25.FEB.2022 13:24:00

Tx. Spurious NVNT g 2437MHz Ant2 Emission



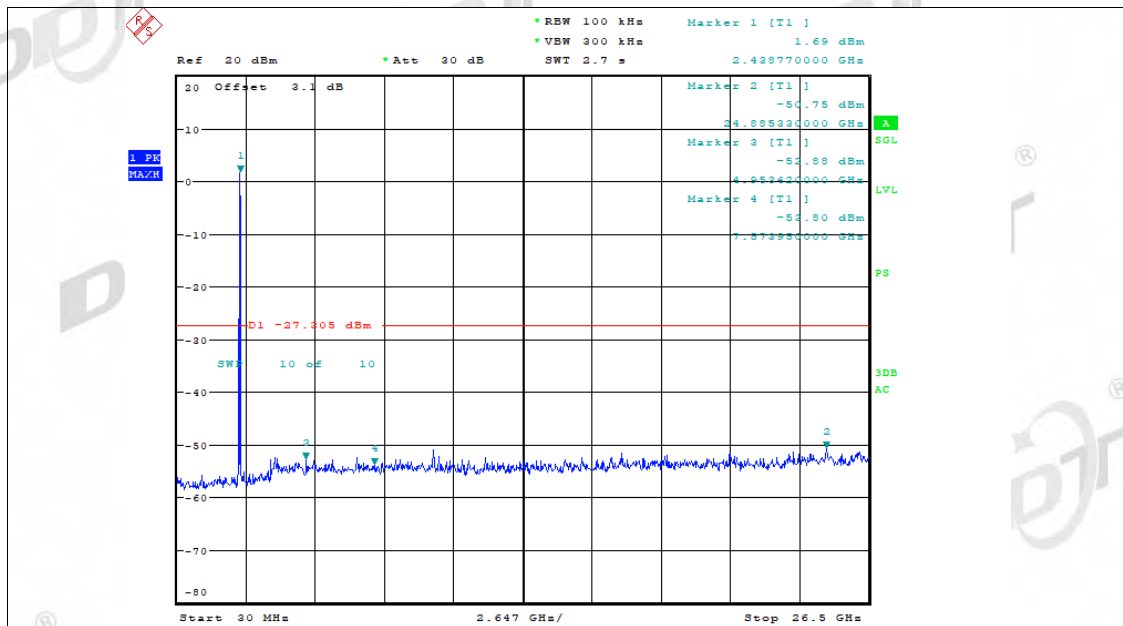
Date: 25.FEB.2022 13:24:33

Tx. Spurious NVNT g 2462MHz Ant2 Ref



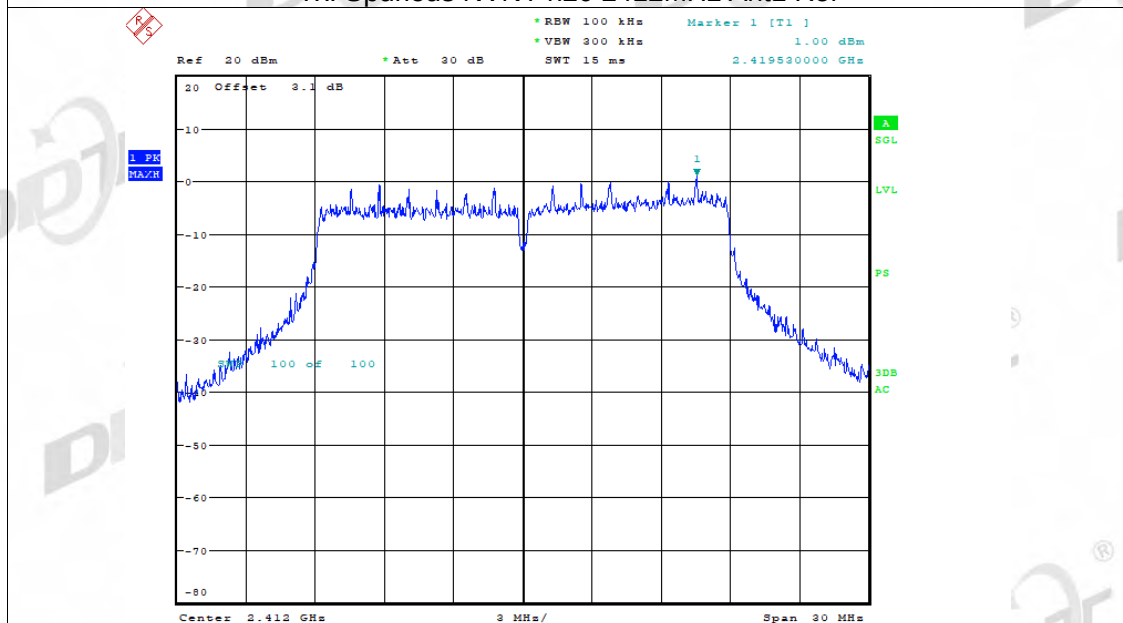
Date: 25.FEB.2022 13:30:53

Tx. Spurious NVNT g 2462MHz Ant2 Emission



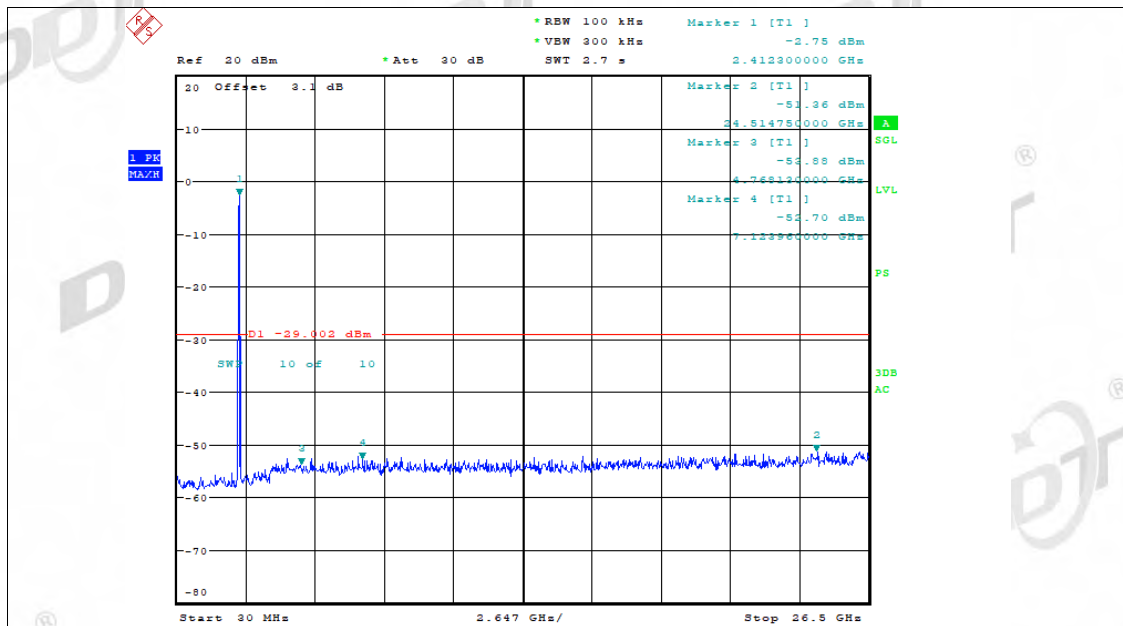
Date: 25.FEB.2022 13:31:26

Tx. Spurious NVNT n20 2412MHz Ant1 Ref



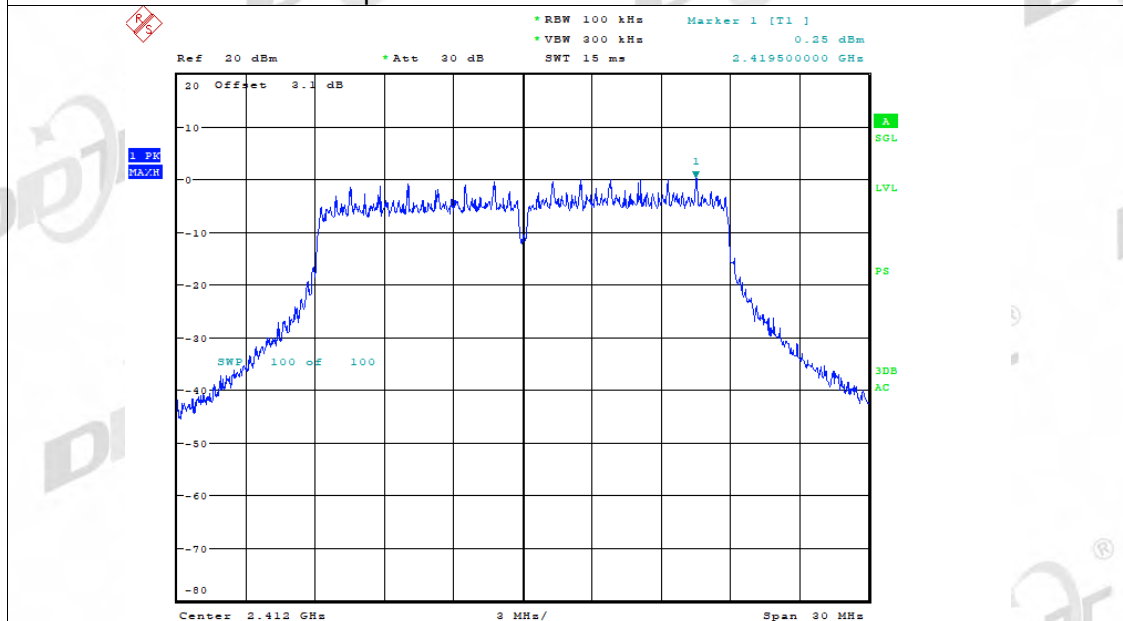
Date: 25.FEB.2022 13:41:29

Tx. Spurious NVNT n20 2412MHz Ant1 Emission



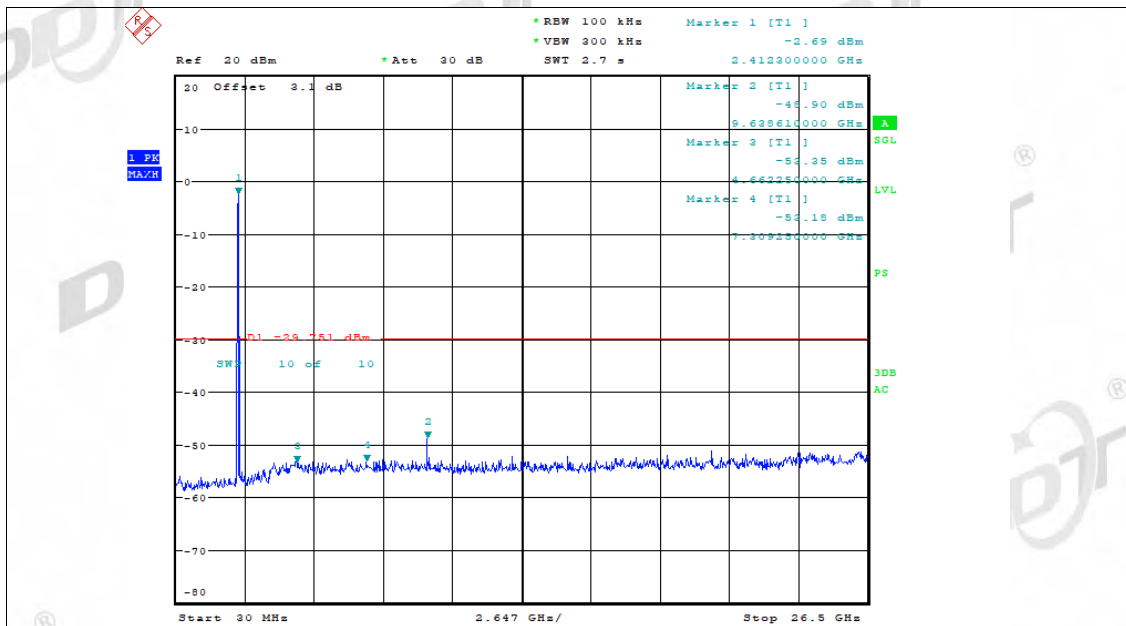
Date: 25.FEB.2022 13:42:02

Tx. Spurious NVNT n20 2412MHz Ant2 Ref



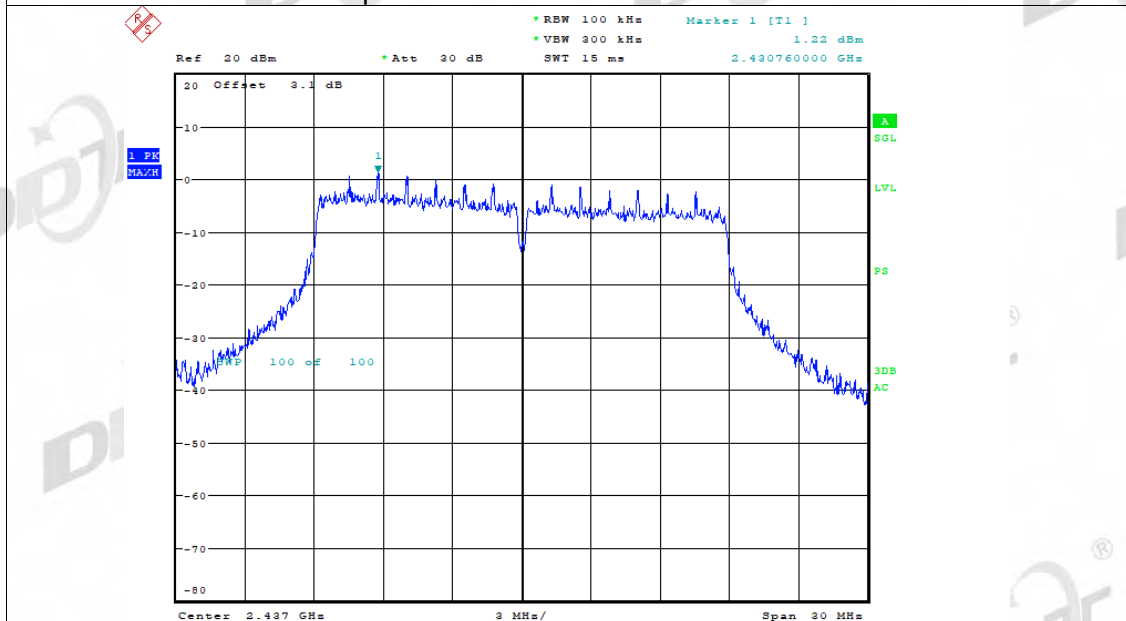
Date: 25.FEB.2022 13:42:09

Tx. Spurious NVNT n20 2412MHz Ant2 Emission



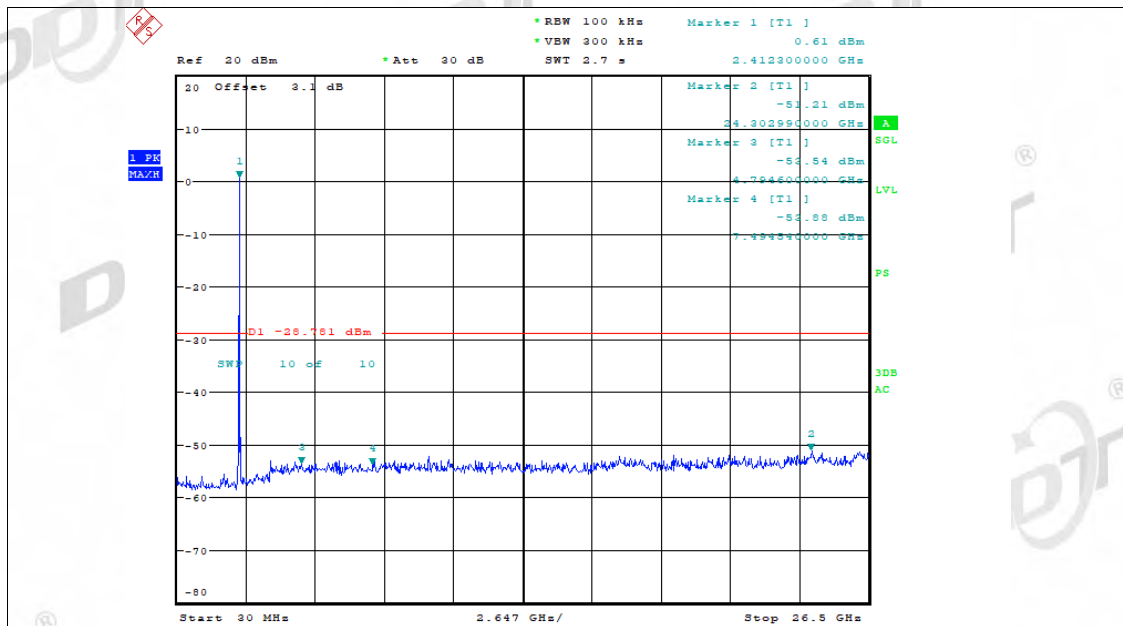
Date: 25.FEB.2022 13:42:43

Tx. Spurious NVNT n20 2437MHz Ant1 Ref



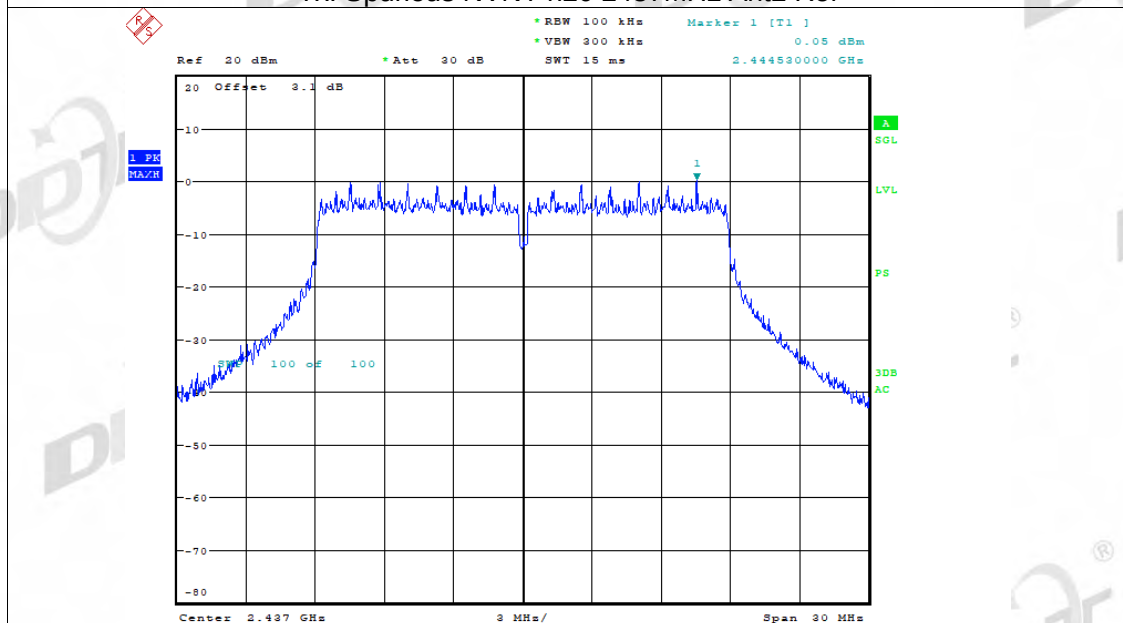
Date: 25.FEB.2022 13:45:58

Tx. Spurious NVNT n20 2437MHz Ant1 Emission



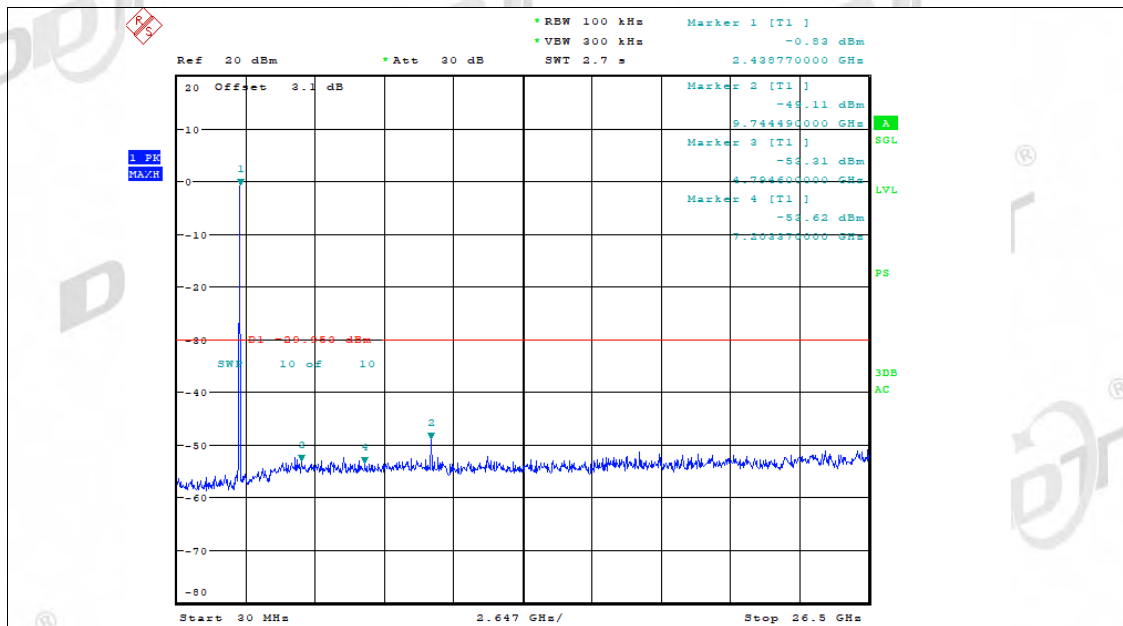
Date: 25.FEB.2022 13:46:31

Tx. Spurious NVNT n20 2437MHz Ant2 Ref



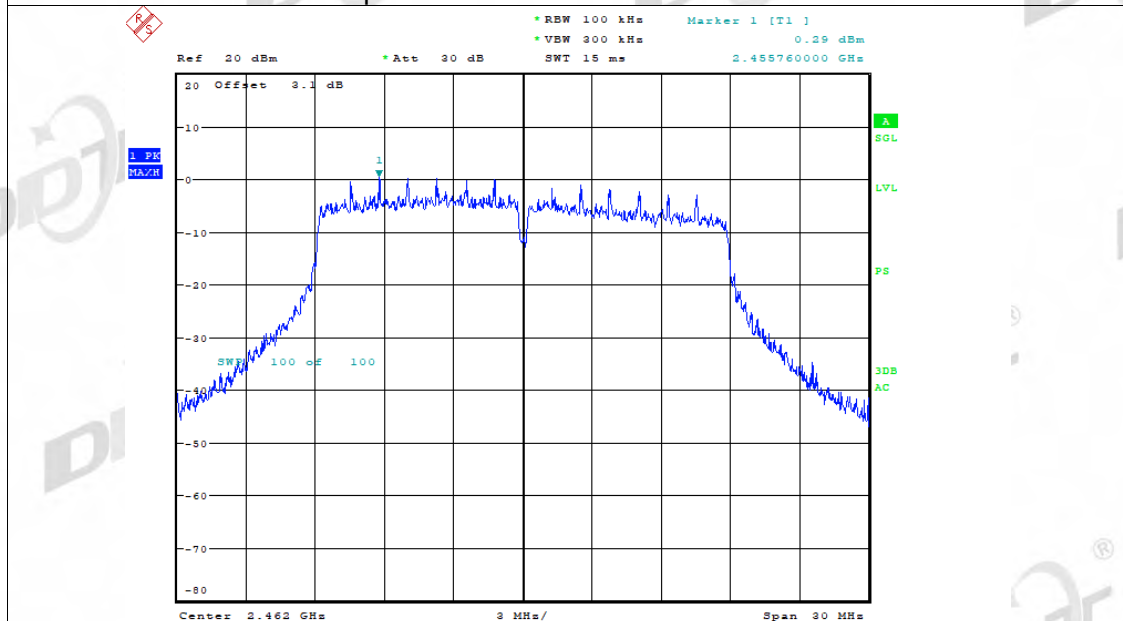
Date: 25.FEB.2022 13:46:37

Tx. Spurious NVNT n20 2437MHz Ant2 Emission



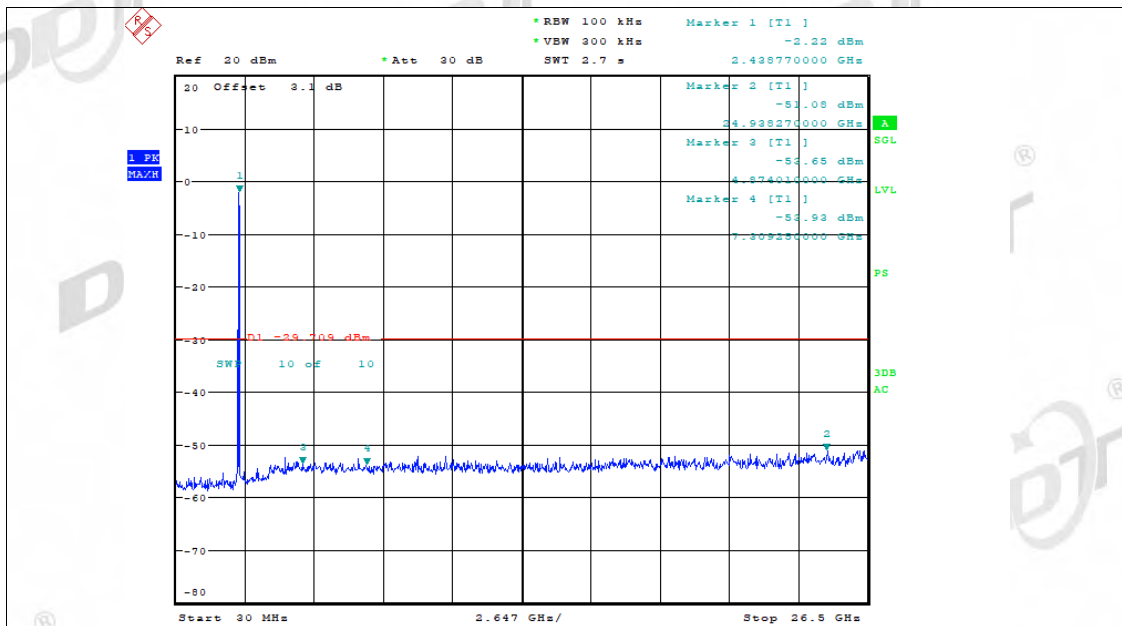
Date: 25.FEB.2022 13:47:10

Tx. Spurious NVNT n20 2462MHz Ant1 Ref



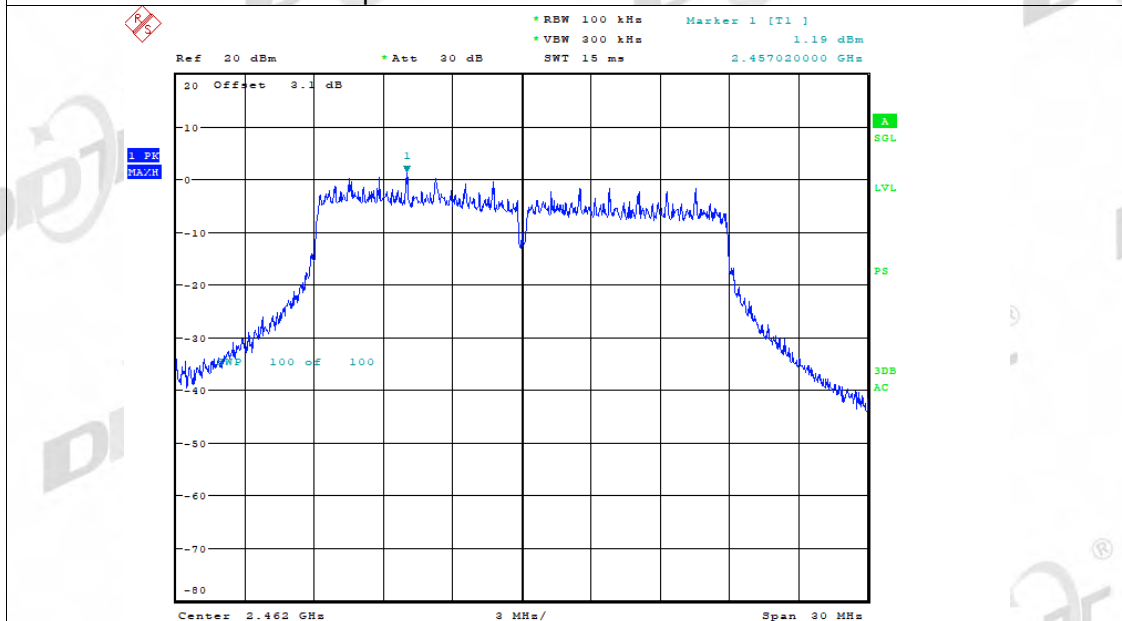
Date: 25.FEB.2022 13:51:22

Tx. Spurious NVNT n20 2462MHz Ant1 Emission



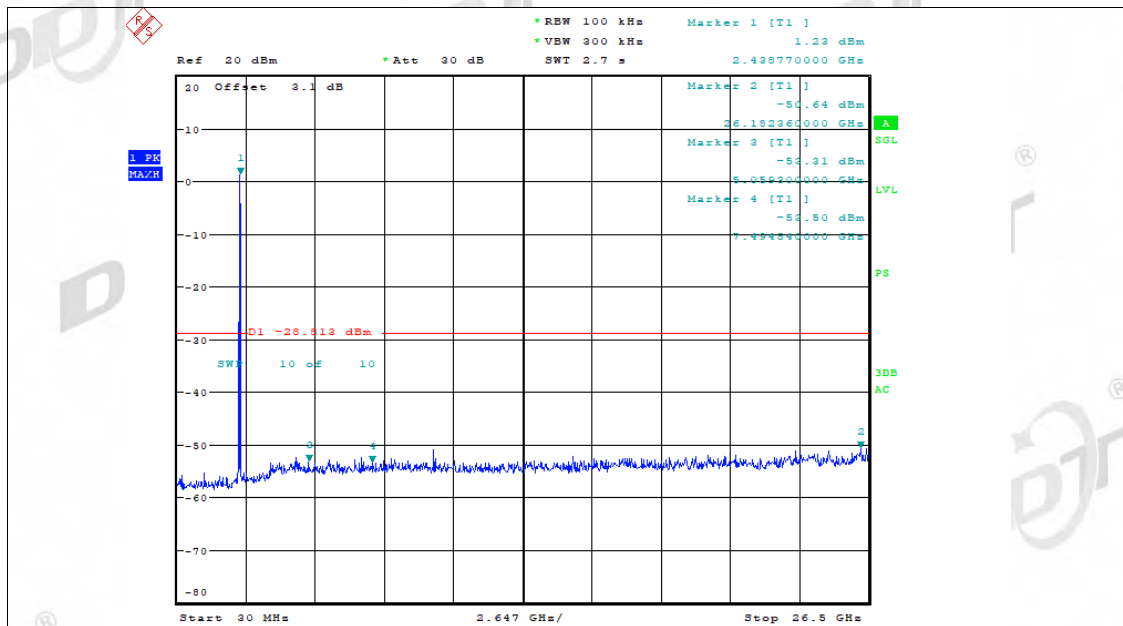
Date: 25.FEB.2022 13:51:55

Tx. Spurious NVNT n20 2462MHz Ant2 Ref



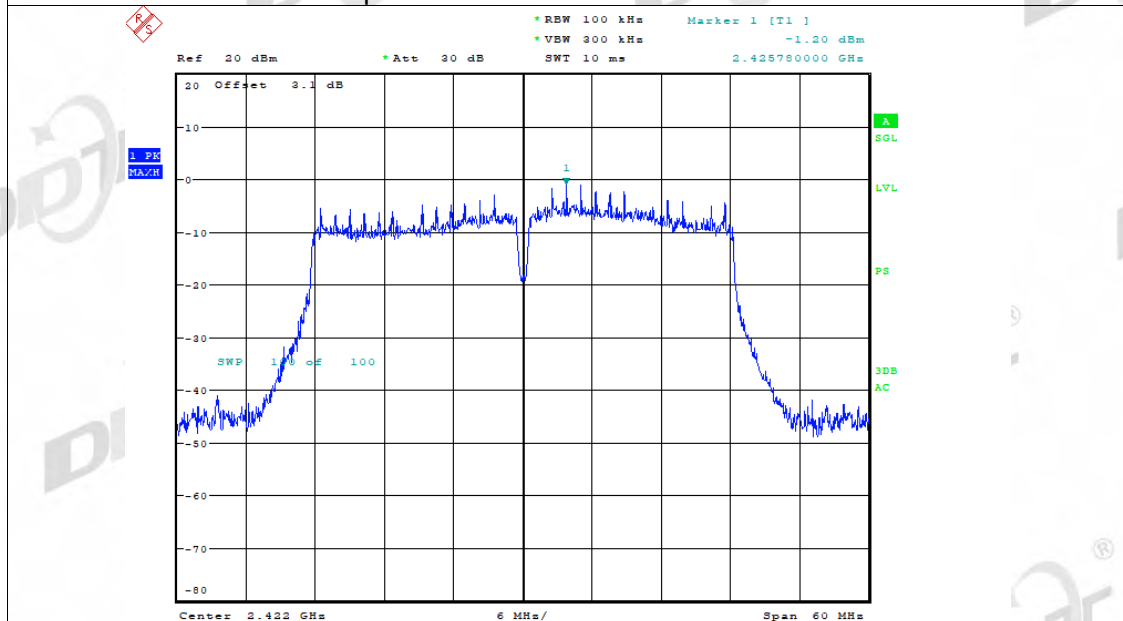
Date: 25.FEB.2022 13:52:02

Tx. Spurious NVNT n20 2462MHz Ant2 Emission



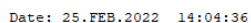
Date: 25.FEB.2022 13:52:35

Tx. Spurious NVNT n40 2422MHz Ant1 Ref



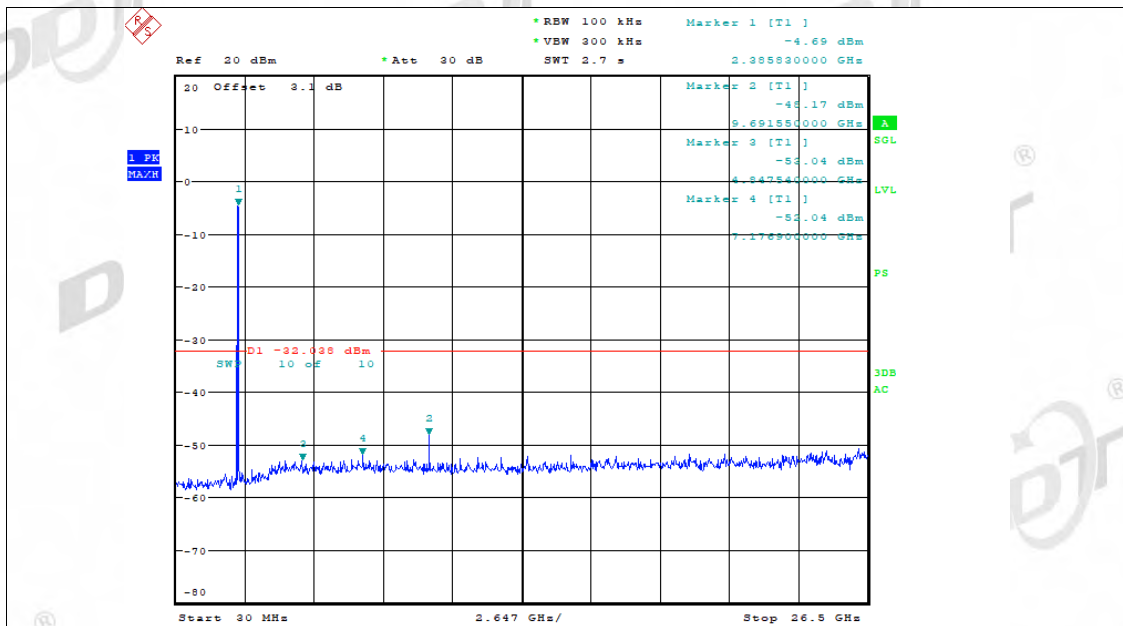
Date: 25.FEB.2022 14:04:03

Tx. Spurious NVNT n40 2422MHz Ant1 Emission



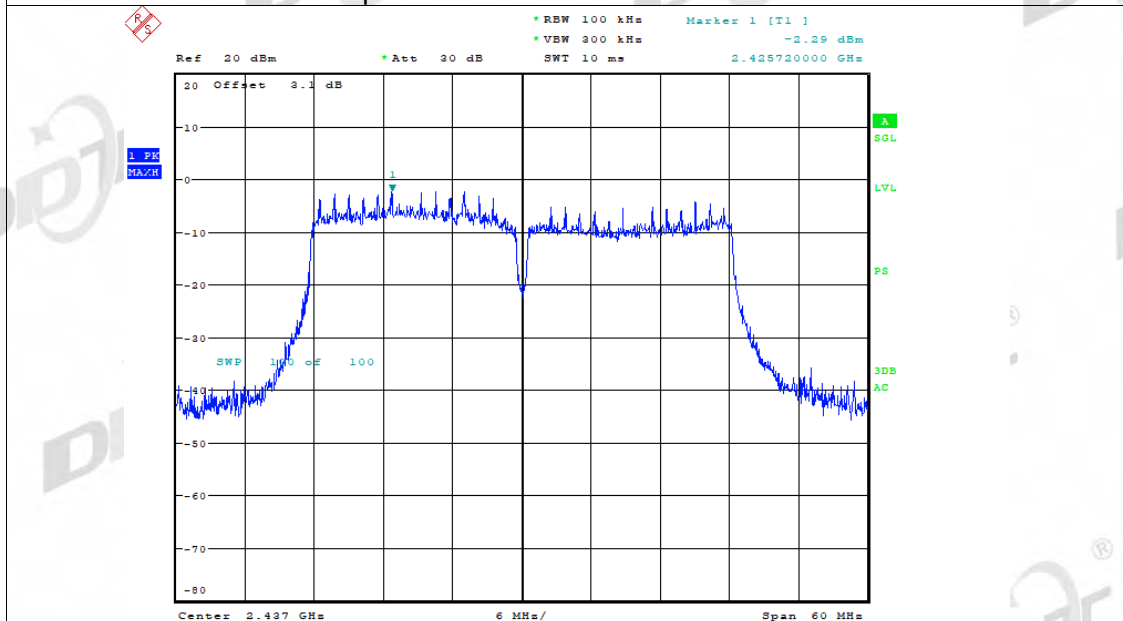
Date: 25.FEB.2022 14:04:41

Tx. Spurious NVNT n40 2422MHz Ant2 Emission



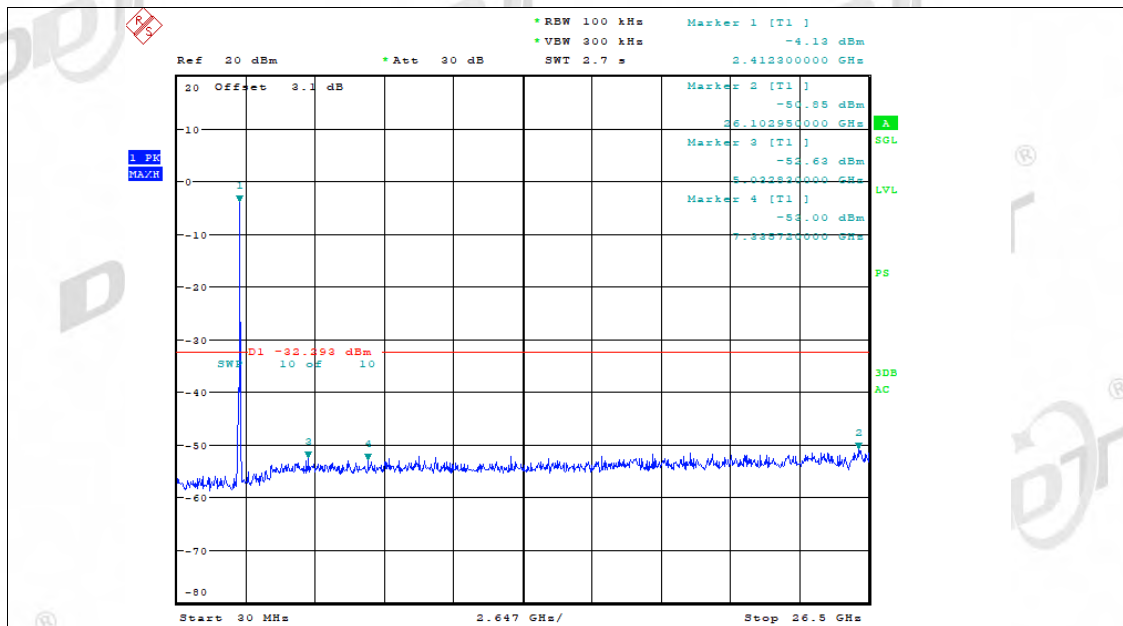
Date: 25.FEB.2022 14:05:14

Tx. Spurious NVNT n40 2437MHz Ant1 Ref



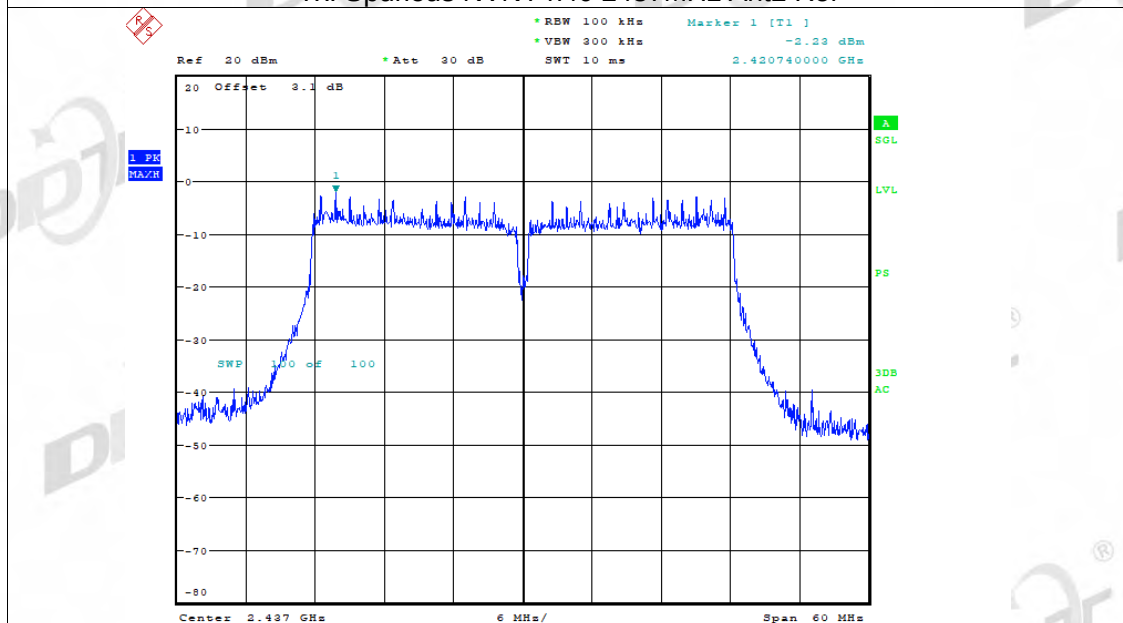
Date: 25.FEB.2022 14:08:05

Tx. Spurious NVNT n40 2437MHz Ant1 Emission



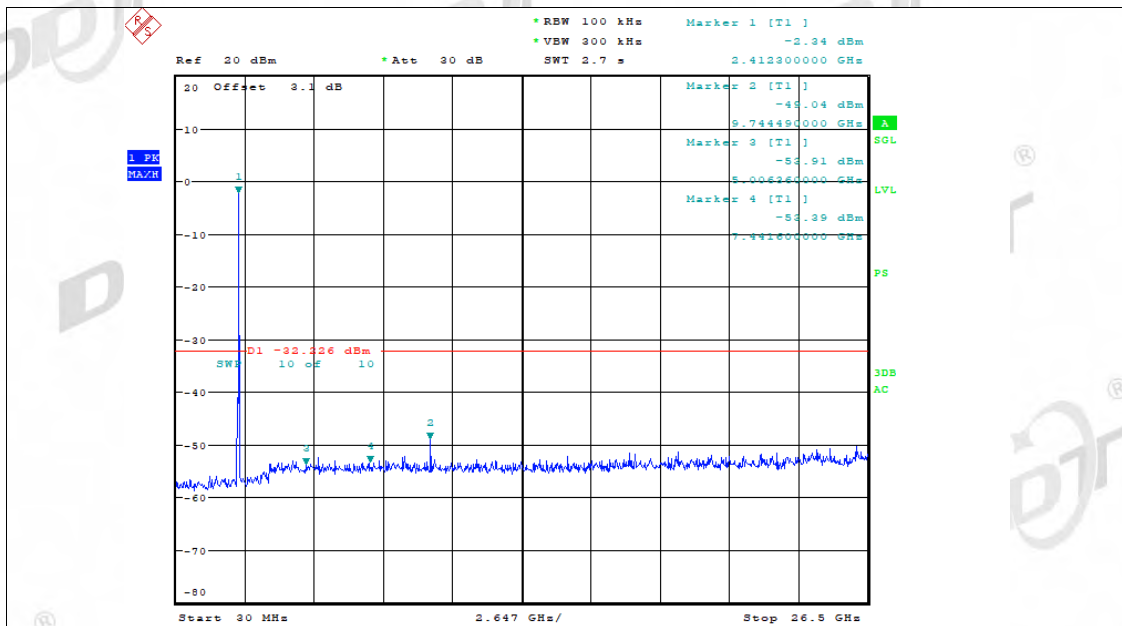
Date: 25.FEB.2022 14:08:39

Tx. Spurious NVNT n40 2437MHz Ant2 Ref



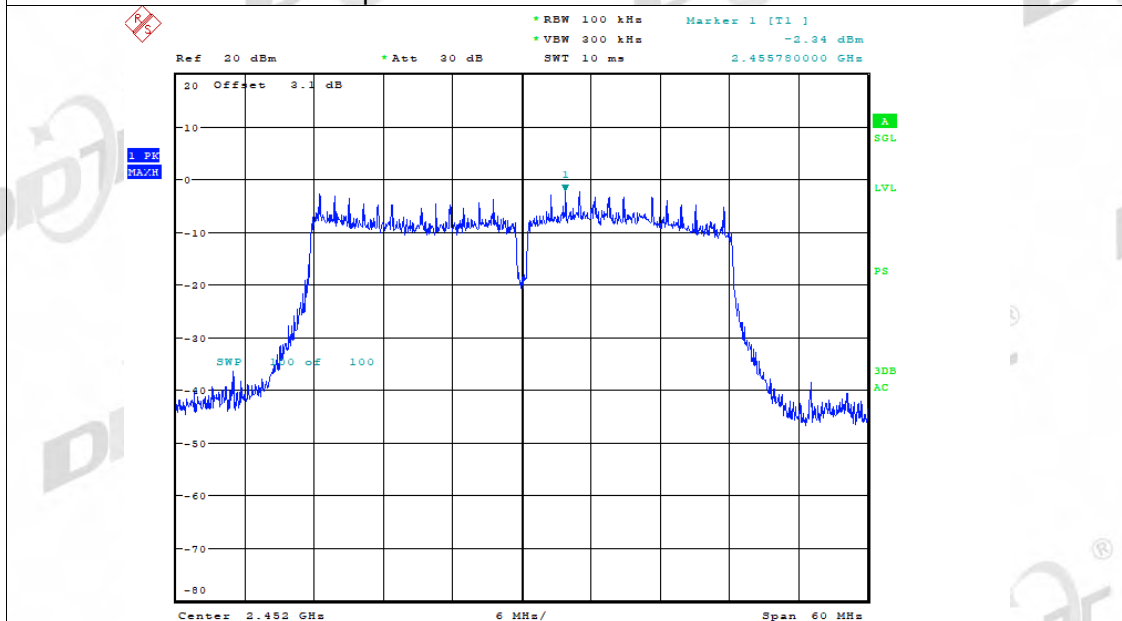
Date: 25.FEB.2022 14:08:43

Tx. Spurious NVNT n40 2437MHz Ant2 Emission



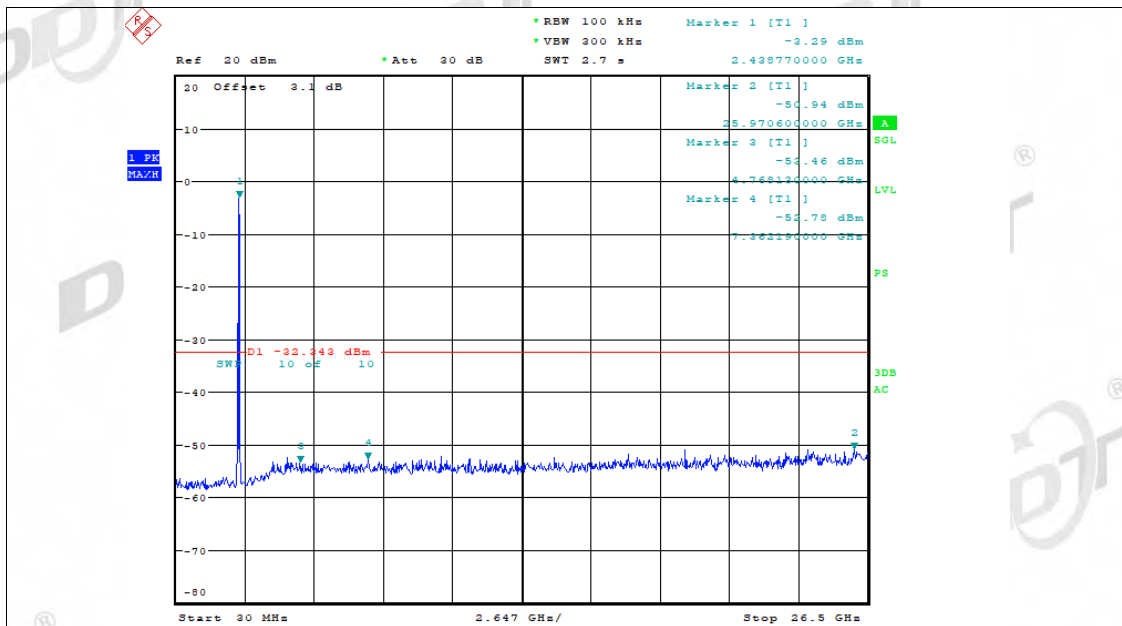
Date: 25.FEB.2022 14:09:16

Tx. Spurious NVNT n40 2452MHz Ant1 Ref



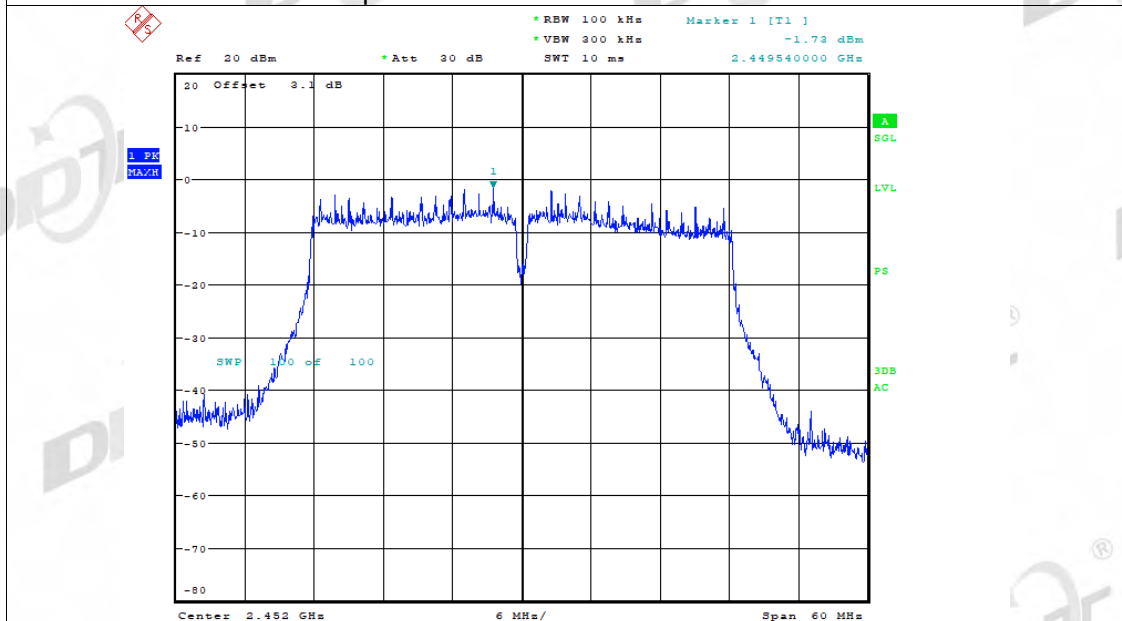
Date: 25.FEB.2022 14:12:56

Tx. Spurious NVNT n40 2452MHz Ant1 Emission



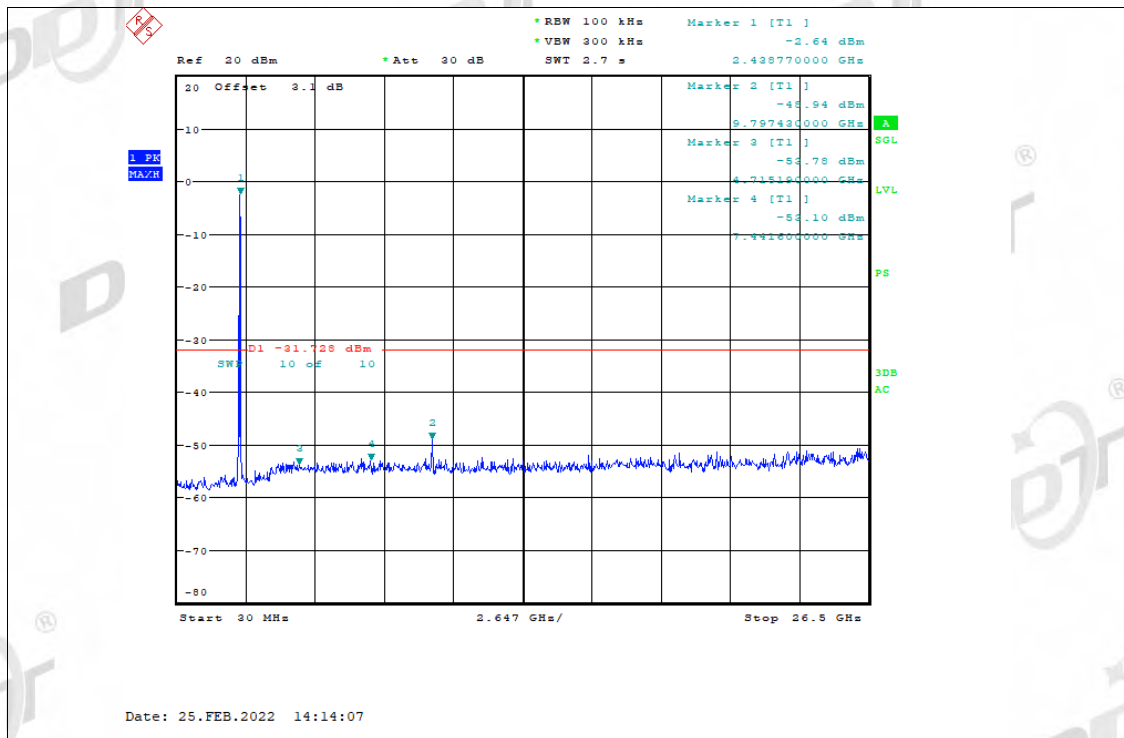
Date: 25.FEB.2022 14:13:29

Tx. Spurious NVNT n40 2452MHz Ant2 Ref



Date: 25.FEB.2022 14:13:34

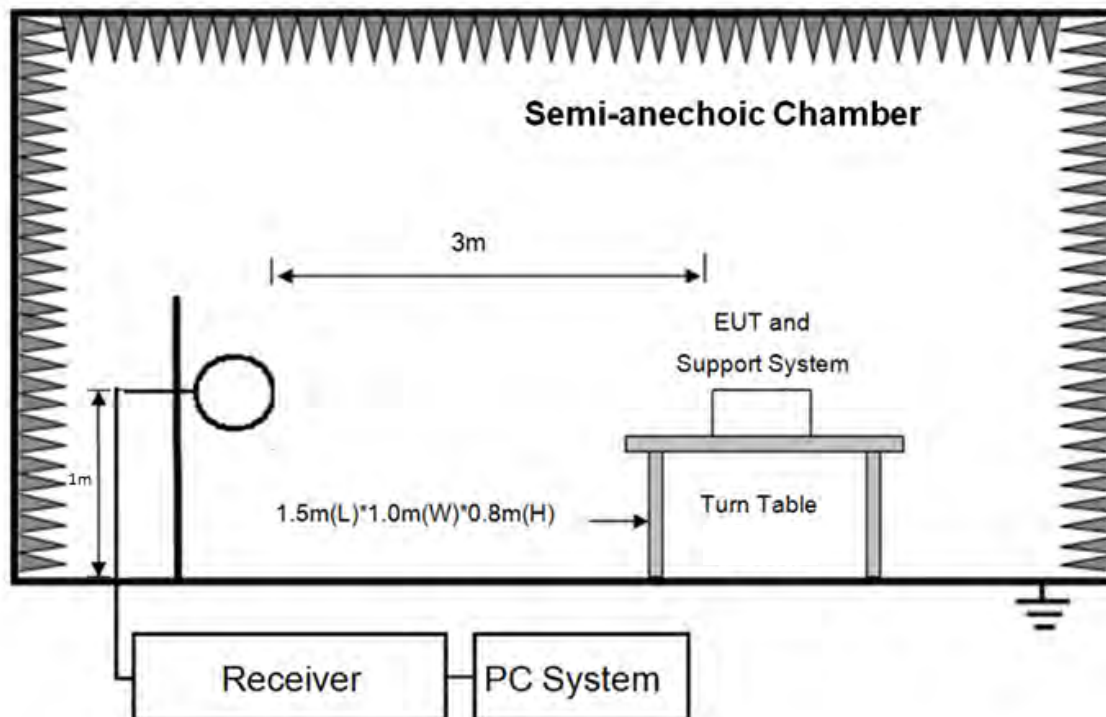
Tx. Spurious NVNT n40 2452MHz Ant2 Emission



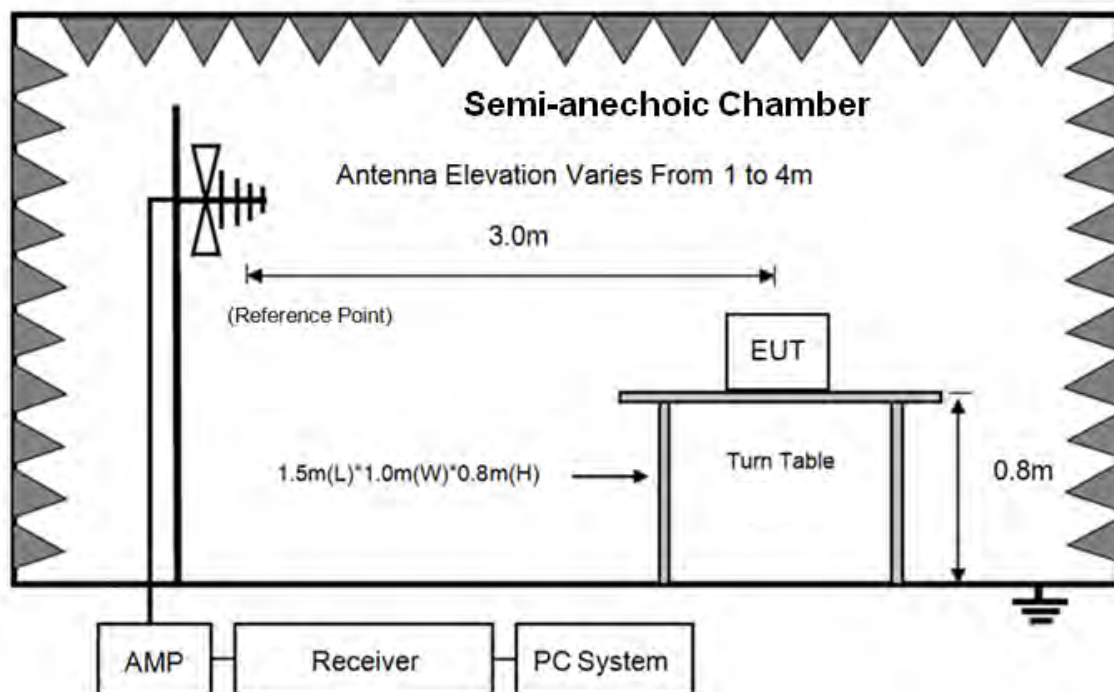
8. Radiated Spurious Emissions

8.1. Block diagram of test setup

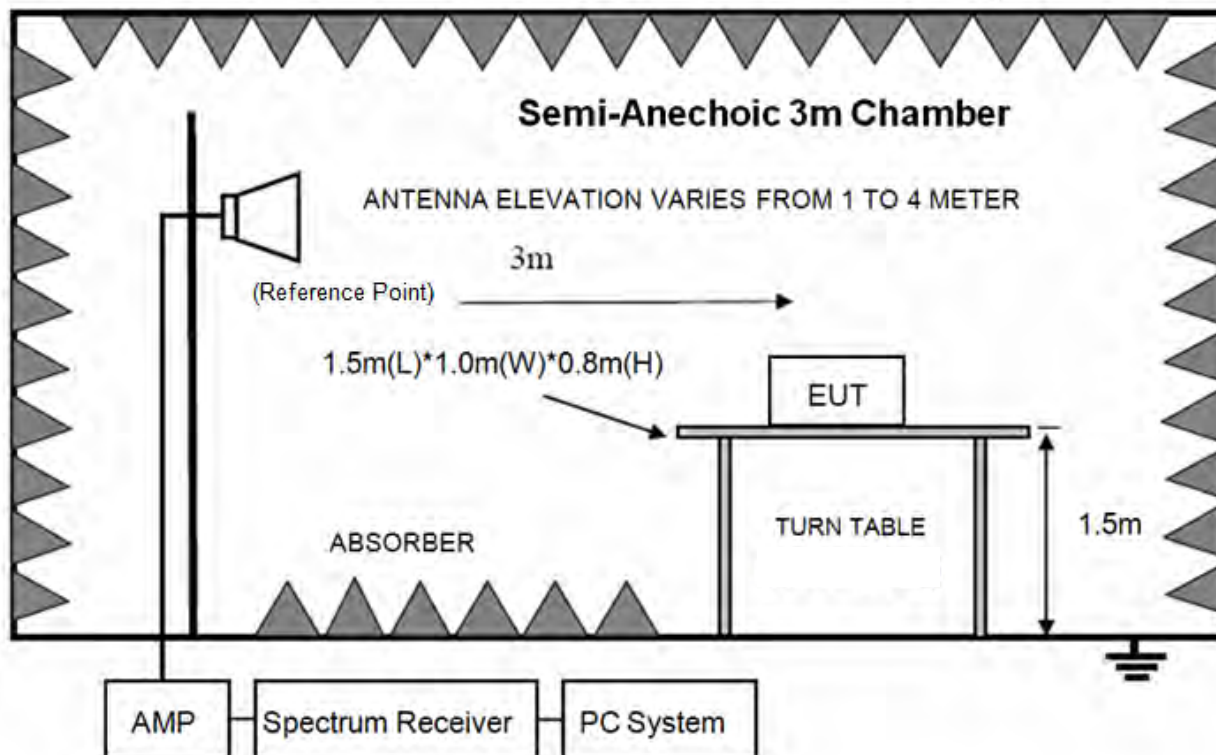
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz – 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

8.2. Limit

(1) FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

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

²Above 38.6

(2) RSS-GEN Restricted frequency band*

MHz	MHz	MHz	GHz
0.090-0.110	12.57675-12.57725	399.9-410	7.25-7.75
0.495-0.505	13.36-13.41	608-614	8.025-8.5
2.1735-2.1905	16.42-16.423	960-1427	9.0-9.2
3.020-3.026	16.69475-16.69525	1435-1626.5	9.3-9.5
4.125-4.128	16.80425-16.80475	1645.5-1646.5	10.6-12.7
4.17725-4.17775	25.5-25.67	1660-1710	13.25-13.4
4.20725-4.20775	37.5-38.25	1718.8-1722.2	14.47-14.5
5.677-5.683	73-74.6	2200-2300	15.35-16.2
6.215-6.218	74.8-75.2	2310-2390	17.7-21.4
6.26775-6.26825	108-138	2483.5-2500	22.01-23.12
6.31175-6.31225	149.9-150.05	2655-2900	23.6-24.0
8.291-8.294	156.52475-156.52525	3260-3267	31.2-31.8
8.362-8.366	156.7-156.9	3332-3339	36.43-36.5
8.37625-8.38675	162.0125-167.17	3345.8-3358	Above 38.6
8.41425-8.41475	167.72-173.2	3500-4400	
12.29-12.293	240-285	4.5-5.15	
12.51975-12.52025	322-335.4	5.35-5.46	

* Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

(3) FCC 15.209 & RSS-GEN Limit.

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	2400/F(kHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(kHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dB}\mu\text{V}/\text{m}) = \text{Limit}_{30\text{m}}(\text{dB}\mu\text{V}/\text{m}) + 40\text{Log}(30\text{m}/3\text{m})$$

(4) Limit for this EUT

All the emissions appearing within 15.205 & RSS-GEN restricted frequency bands shall not exceed the limits shown in 15.209 & RSS-GEN, all the other emissions shall be at least 20dB below the fundamental emissions or comply with 15.209 & RSS-GEN limits.

8.3. Test procedure

(1) EUT height should be 0.8 m for below 1 GHz at a semi-anechoic chamber while EUT height should be 1.5 m for above 1 GHz at full chamber or semi-anechoic chamber ground with absorbers.

(2) The antenna used as below table.

Test frequency range	Test antenna used	Measuring distance
9 kHz-30 MHz	Active Loop antenna	3 m
30 MHz-1 GHz	Trilog Broadband Antenna	3 m
1 GHz-18 GHz	Double Ridged Horn Antenna(1GHz-18GHz)	3 m
18 GHz-40 GHz	Horn Antenna(18GHz-40GHz)	3 m

According ANSI C63.10:2013 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also be positioned with its plane horizontal at the specified distance from the EUT. The center of the

loop is 1 m above the ground. for measurement above 30 MHz, the Trilog Broadband Antenna or Horn Antenna was located 3 m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 25 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Change power supply range from 85% to 115% of the rated supply voltage

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 25 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 18GHz to 25GHz, so below final test was performed with frequency range from 9kHz to 18GHz.

(4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2013 on Radiated Emission test.

(5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz, for emissions from 9 kHz-90 kHz, 110 kHz-490 kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.

(6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW

Frequency band	RBW
9 kHz-150 kHz	200 Hz
150 kHz-30 MHz	9 kHz
30 MHz-1 GHz	120 kHz

(7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3 MHz for Peak measure; RMS detector RBW 1 MHz VBW 10 Hz for Average measure.

8.4. Test result

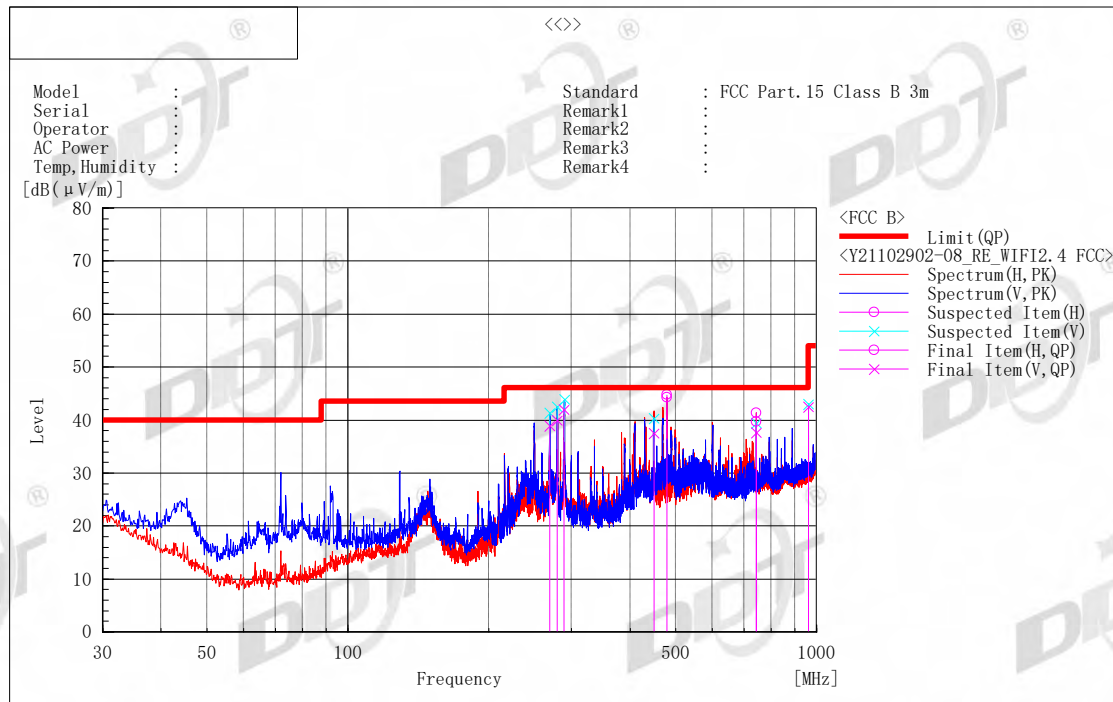
Pass. (See below detailed test result)

All the emissions except fundamental emission from 9 kHz to 25 GHz were comply with 15.209 limit.

Note1: According exploratory test no any obvious emission was detected from 9 kHz to 30 MHz and 18 GHz to 25 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

Note2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in transmission mode.

Radiated Emission test (below 1GHz)



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]	System	Remark
1	430.613	H	47.5	-2.7	44.8	46.0	1.2	100.0	197.8	1	
2	959.983	V	37.1	5.3	42.4	46.0	3.6	100.0	57.5	2	
3	289.494	V	49.2	-7.2	42.0	46.0	4.0	100.0	271.1	2	
4	280.034	V	47.5	-7.5	40.0	46.0	6.0	100.0	293.5	2	
5	743.973	H	38.2	1.5	39.7	46.0	6.3	100.0	65.6	1	
6	269.949	V	46.7	-7.8	38.9	46.0	7.1	100.0	309.9	2	
7	744.091	V	35.6	2.0	37.6	46.0	8.4	100.0	20.0	2	
8	449.922	V	39.7	-2.2	37.5	46.0	8.5	198.0	282.6	2	

Note) Receive antenna polarization: Horizontal and/or Vertical

Test Distance: 3 m, Antenna Height: 1 m to 4 m

Level QP (Quasi-Peak) = Reading QP + Factor (Antenna Factor + Cable Loss - Amp. Gain)

Margin QP (Quasi-Peak) = Limit - Level QP

Radiated Emission test (above 1GHz)

Freq (MHz)	Read level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector type	Polarization
Tx mode 11b Ant1 1M 2412 MHz								
3600.00	49.39	30.64	-32.08	47.95	74.00	-26.05	Peak	HORIZONTAL
4824.00	38.37	32.55	-31.72	39.20	74.00	-34.80	Peak	HORIZONTAL
5400.00	42.81	33.62	-31.61	44.82	74.00	-29.18	Peak	HORIZONTAL
7236.00	38.11	36.98	-30.79	44.30	74.00	-29.70	Peak	HORIZONTAL
8100.00	45.16	37.08	-31.38	50.86	74.00	-23.14	Peak	HORIZONTAL
14205.00	37.44	41.11	-27.10	51.45	74.00	-22.55	Peak	HORIZONTAL
3600.00	43.44	30.64	-32.08	42.00	74.00	-32.00	Peak	VERTICAL
4824.00	37.51	32.55	-31.72	38.34	74.00	-35.66	Peak	VERTICAL
5400.00	47.55	33.62	-31.61	49.56	74.00	-24.44	Peak	VERTICAL
7236.00	38.48	36.98	-30.79	44.67	74.00	-29.33	Peak	VERTICAL
8100.00	47.61	37.08	-31.38	53.31	74.00	-20.69	Peak	VERTICAL
10800.00	40.44	38.62	-28.97	50.09	74.00	-23.91	Peak	VERTICAL
Tx mode 11b Ant1 1M 2437 MHz								
3615.00	55.13	30.68	-31.98	53.83	74.00	-20.17	Peak	HORIZONTAL
4874.00	37.04	32.65	-31.73	37.96	74.00	-36.04	Peak	HORIZONTAL
5415.00	43.38	33.65	-31.57	45.46	74.00	-28.54	Peak	HORIZONTAL
7311.00	37.41	37.10	-30.76	43.75	74.00	-30.25	Peak	HORIZONTAL
8100.00	43.07	37.08	-31.38	48.77	74.00	-25.23	Peak	HORIZONTAL
14205.00	37.09	41.11	-27.10	51.10	74.00	-22.90	Peak	HORIZONTAL
3615.00	47.47	30.68	-31.98	46.17	74.00	-27.83	Peak	VERTICAL
4874.00	36.65	32.65	-31.73	37.57	74.00	-36.43	Peak	VERTICAL
5400.00	47.10	33.62	-31.61	49.11	74.00	-24.89	Peak	VERTICAL
7311.00	36.89	37.10	-30.76	43.23	74.00	-30.77	Peak	VERTICAL
8100.00	47.59	37.08	-31.38	53.29	74.00	-20.71	Peak	VERTICAL
10800.00	40.36	38.62	-28.97	50.01	74.00	-23.99	Peak	VERTICAL
Tx mode 11b Ant1 1M 2462 MHz								
3615.00	54.39	30.68	-31.98	53.09	74.00	-20.91	Peak	HORIZONTAL
4924.00	37.81	32.75	-31.68	38.88	74.00	-35.12	Peak	HORIZONTAL
5400.00	42.28	33.62	-31.61	44.29	74.00	-29.71	Peak	HORIZONTAL
7386.00	38.68	37.22	-30.98	44.92	74.00	-29.08	Peak	HORIZONTAL
8100.00	44.36	37.08	-31.38	50.06	74.00	-23.94	Peak	HORIZONTAL
13710.00	40.47	40.82	-28.91	52.38	74.00	-21.62	Peak	HORIZONTAL
3615.00	45.99	30.68	-31.98	44.69	74.00	-29.31	Peak	VERTICAL
4924.00	38.38	32.75	-31.68	39.45	74.00	-34.55	Peak	VERTICAL
5400.00	48.57	33.62	-31.61	50.58	74.00	-23.42	Peak	VERTICAL
7386.00	37.81	37.22	-30.98	44.05	74.00	-29.95	Peak	VERTICAL
8100.00	48.01	37.08	-31.38	53.71	74.00	-20.29	Peak	VERTICAL
13395.00	40.41	40.21	-29.41	51.21	74.00	-22.79	Peak	VERTICAL
Verdict: Pass								

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss .

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

3. For emissions above 1GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

4. Scan with all modes, the worst case was recorded in this report.

Freq (MHz)	Read level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector type	Polarization
Tx mode 11b Ant2 1M 2412 MHz								
3600.00	49.00	30.64	-32.08	47.56	74.00	-26.44	Peak	HORIZONTAL
4824.00	36.58	32.55	-31.72	37.41	74.00	-36.59	Peak	HORIZONTAL
5400.00	42.44	33.62	-31.61	44.45	74.00	-29.55	Peak	HORIZONTAL
7236.00	37.50	36.98	-30.79	43.69	74.00	-30.31	Peak	HORIZONTAL
8100.00	43.72	37.08	-31.38	49.42	74.00	-24.58	Peak	HORIZONTAL
9645.00	44.90	38.09	-30.01	52.98	74.00	-21.02	Peak	HORIZONTAL
3600.00	47.67	30.64	-32.08	46.23	74.00	-27.77	Peak	VERTICAL
4824.00	37.04	32.55	-31.72	37.87	74.00	-36.13	Peak	VERTICAL
5400.00	48.26	33.62	-31.61	50.27	74.00	-23.73	Peak	VERTICAL
7236.00	39.07	36.98	-30.79	45.26	74.00	-28.74	Peak	VERTICAL
8100.00	47.60	37.08	-31.38	53.30	74.00	-20.70	Peak	VERTICAL
10800.00	40.58	38.62	-28.97	50.23	74.00	-23.77	Peak	VERTICAL
Tx mode 11b Ant2 1M 2437 MHz								
3600.00	47.90	30.64	-32.08	46.46	74.00	-27.54	Peak	HORIZONTAL
4874.00	37.88	32.65	-31.73	38.80	74.00	-35.20	Peak	HORIZONTAL
7311.00	36.94	37.10	-30.76	43.28	74.00	-30.72	Peak	HORIZONTAL
8100.00	45.67	37.08	-31.38	51.37	74.00	-22.63	Peak	HORIZONTAL
9750.00	42.87	38.15	-30.06	50.96	74.00	-23.04	Peak	HORIZONTAL
17850.00	38.36	42.41	-27.12	53.65	74.00	-20.35	Peak	HORIZONTAL
3615.00	43.84	30.68	-31.98	42.54	74.00	-31.46	Peak	VERTICAL
4874.00	38.85	32.65	-31.73	39.77	74.00	-34.23	Peak	VERTICAL
5400.00	48.11	33.62	-31.61	50.12	74.00	-23.88	Peak	VERTICAL
7311.00	37.57	37.10	-30.76	43.91	74.00	-30.09	Peak	VERTICAL
8100.00	47.56	37.08	-31.38	53.26	74.00	-20.74	Peak	VERTICAL
10800.00	42.08	38.62	-28.97	51.73	74.00	-22.27	Peak	VERTICAL
Tx mode 11b Ant2 1M 2462 MHz								
3615.00	52.10	30.68	-31.98	50.80	74.00	-23.20	Peak	HORIZONTAL
4924.00	36.35	32.75	-31.68	37.42	74.00	-36.58	Peak	HORIZONTAL
5400.00	41.87	33.62	-31.61	43.88	74.00	-30.12	Peak	HORIZONTAL
7386.00	38.20	37.22	-30.98	44.44	74.00	-29.56	Peak	HORIZONTAL
8100.00	44.70	37.08	-31.38	50.40	74.00	-23.60	Peak	HORIZONTAL
14145.00	37.72	41.20	-27.68	51.24	74.00	-22.76	Peak	HORIZONTAL
3600.00	45.09	30.64	-32.08	43.65	74.00	-30.35	Peak	VERTICAL
4924.00	36.97	32.75	-31.68	38.04	74.00	-35.96	Peak	VERTICAL
5400.00	47.84	33.62	-31.61	49.85	74.00	-24.15	Peak	VERTICAL
7386.00	37.21	37.22	-30.98	43.45	74.00	-30.55	Peak	VERTICAL
8100.00	47.41	37.08	-31.38	53.11	74.00	-20.89	Peak	VERTICAL
14190.00	37.11	41.13	-27.16	51.08	74.00	-22.92	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss .

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

3. For emissions above 1GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

4. Scan with all modes, the worst case was recorded in this report.

Freq (MHz)	Read level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector type	Polarization
Tx mode: 11B 1M Ant1 2462MHz(wifi1) & 11B 1M 2437MHz(wifi2)								
3255.00	52.98	29.81	-32.37	50.42	74.00	-23.58	Peak	HORIZONTAL
3615.00	51.96	30.68	-31.98	50.66	74.00	-23.34	Peak	HORIZONTAL
4875.00	48.14	32.65	-31.74	49.05	74.00	-24.95	Peak	HORIZONTAL
5400.00	43.75	33.62	-31.61	45.76	74.00	-28.24	Peak	HORIZONTAL
8100.00	45.56	37.08	-31.38	51.26	74.00	-22.74	Peak	HORIZONTAL
17025.00	36.21	42.24	-26.10	52.35	74.00	-21.65	Peak	HORIZONTAL
3255.00	55.78	29.81	-32.37	53.22	74.00	-20.78	Peak	VERTICAL
3615.00	48.66	30.68	-31.98	47.36	74.00	-26.64	Peak	VERTICAL
4875.00	52.83	32.65	-31.74	53.74	74.00	-20.26	Peak	VERTICAL
5400.00	49.19	33.62	-31.61	51.20	74.00	-22.80	Peak	VERTICAL
8100.00	46.72	37.08	-31.38	52.42	74.00	-21.58	Peak	VERTICAL
10800.00	39.74	38.62	-28.97	49.39	74.00	-24.61	Peak	VERTICAL
Tx mode: 11B 1M Ant2 2462MHz(wifi1) & 11B 1M 2437MHz(wifi2)								
3255.00	53.02	29.81	-32.37	50.46	74.00	-23.54	Peak	HORIZONTAL
3600.00	51.34	30.64	-32.08	49.90	74.00	-24.10	Peak	HORIZONTAL
4875.00	48.51	32.65	-31.74	49.42	74.00	-24.58	Peak	HORIZONTAL
5400.00	43.11	33.62	-31.61	45.12	74.00	-28.88	Peak	HORIZONTAL
8100.00	43.36	37.08	-31.38	49.06	74.00	-24.94	Peak	HORIZONTAL
9645.00	45.34	38.09	-30.01	53.42	74.00	-20.58	Peak	HORIZONTAL
3255.00	56.20	29.81	-32.37	53.64	74.00	-20.36	Peak	VERTICAL
3600.00	46.29	30.64	-32.08	44.85	74.00	-29.15	Peak	VERTICAL
4875.00	52.15	32.65	-31.74	53.06	74.00	-20.94	Peak	VERTICAL
5400.00	49.08	33.62	-31.61	51.09	74.00	-22.91	Peak	VERTICAL
8100.00	46.72	37.08	-31.38	52.42	74.00	-21.58	Peak	VERTICAL
10800.00	41.03	38.62	-28.97	50.68	74.00	-23.32	Peak	VERTICAL
Tx mode: 11A 6M Ant1+Ant2 5785MHz(wifi1) & 11B 1M 2437MHz(wifi2)								
3255.00	53.10	29.81	-32.37	50.54	74.00	-23.46	Peak	HORIZONTAL
4875.00	49.65	32.65	-31.74	50.56	74.00	-23.44	Peak	HORIZONTAL
8100.00	42.47	37.08	-31.38	48.17	74.00	-25.83	Peak	HORIZONTAL
11580.00	39.20	38.68	-28.62	49.26	54.00	-4.74	Average	HORIZONTAL
11580.00	48.77	38.68	-28.62	58.83	74.00	-15.17	Peak	HORIZONTAL
14205.00	37.23	41.11	-27.10	51.24	74.00	-22.76	Peak	HORIZONTAL
3255.00	56.50	29.81	-32.37	53.94	74.00	-20.06	Peak	VERTICAL
3615.00	50.84	30.68	-31.98	49.54	74.00	-24.46	Peak	VERTICAL
4875.00	51.44	32.65	-31.74	52.35	74.00	-21.65	Peak	VERTICAL
5400.00	48.81	33.62	-31.61	50.82	74.00	-23.18	Peak	VERTICAL
8100.00	46.67	37.08	-31.38	52.37	74.00	-21.63	Peak	VERTICAL
11580.00	42.61	38.68	-28.62	52.67	74.00	-21.33	Peak	VERTICAL
Verdict: Pass								

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

3. For emissions above 1GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

4. Scan with all modes, the worst case was recorded in this report.

Freq (MHz)	Read level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector type	Polarization
Tx mode: LTE & 11B 1M 2437MHz(wifi2)								
3255.00	52.71	29.81	-32.37	50.15	74.00	-23.85	Peak	HORIZONTAL
3615.00	54.49	30.68	-31.98	53.19	74.00	-20.81	Peak	HORIZONTAL
4875.00	48.19	32.65	-31.74	49.10	74.00	-24.90	Peak	HORIZONTAL
5400.00	42.46	33.62	-31.61	44.47	74.00	-29.53	Peak	HORIZONTAL
8100.00	42.81	37.08	-31.38	48.51	74.00	-25.49	Peak	HORIZONTAL
16965.00	36.22	42.03	-26.22	52.03	74.00	-21.97	Peak	HORIZONTAL
3255.00	55.70	29.81	-32.37	53.14	74.00	-20.86	Peak	VERTICAL
3600.00	44.86	30.64	-32.08	43.42	74.00	-30.58	Peak	VERTICAL
4875.00	52.23	32.65	-31.74	53.14	74.00	-20.86	Peak	VERTICAL
5400.00	48.88	33.62	-31.61	50.89	74.00	-23.11	Peak	VERTICAL
8100.00	45.98	37.08	-31.38	51.68	74.00	-22.32	Peak	VERTICAL
10800.00	40.41	38.62	-28.97	50.06	74.00	-23.94	Peak	VERTICAL
Verdict: Pass								

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

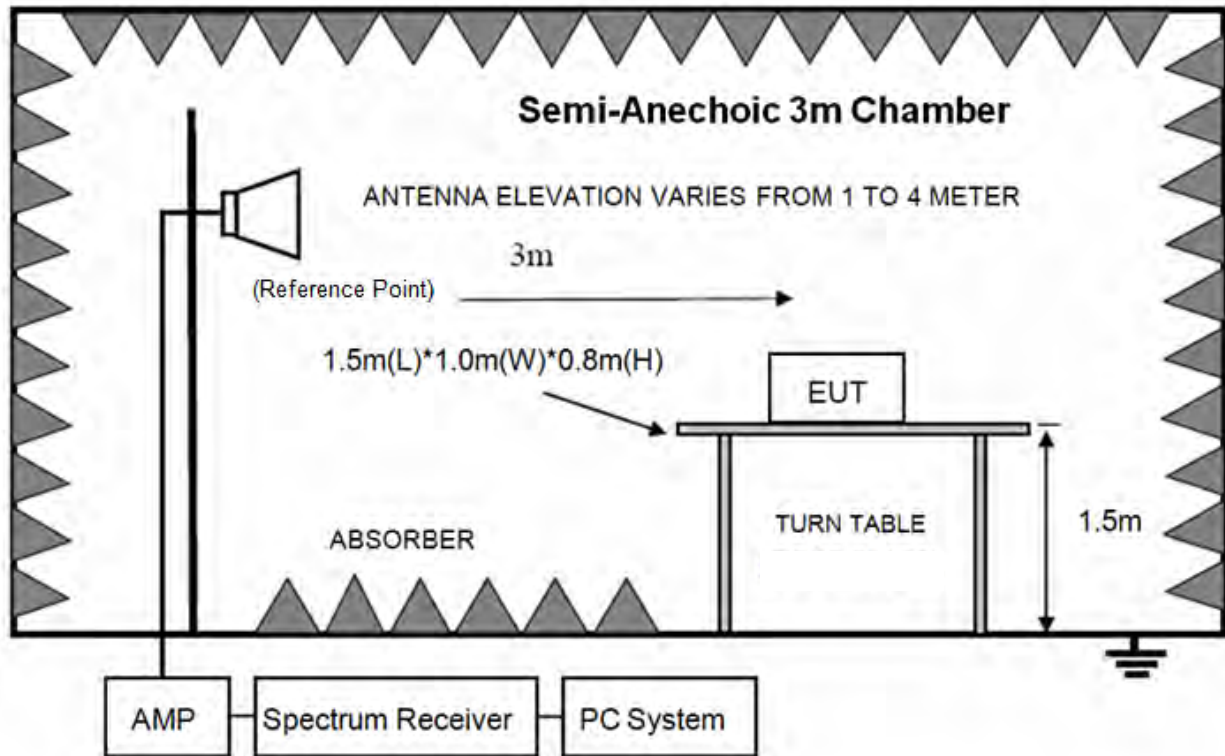
2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

3. For emissions above 1GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

4. Scan with all modes, the worst case was recorded in this report.

9. Radiated Band Edge Compliance

9.1. Block diagram of test setup



9.2. Limit

All restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400 MHz to 2483.5 MHz shall be at least 20dB below the fundamental emissions or comply with RSS-Gen Issue 3 clause 7.2.5 (Same as FCC 15.209) limits.

9.3. Test procedure

Same with clause 8.3 except change investigated frequency range.
Remark: All restriction band have been tested, and shown in report.

9.4. Test result

Pass. (See below detailed test result)

Note: All modes were test and the worst case was record in this report.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

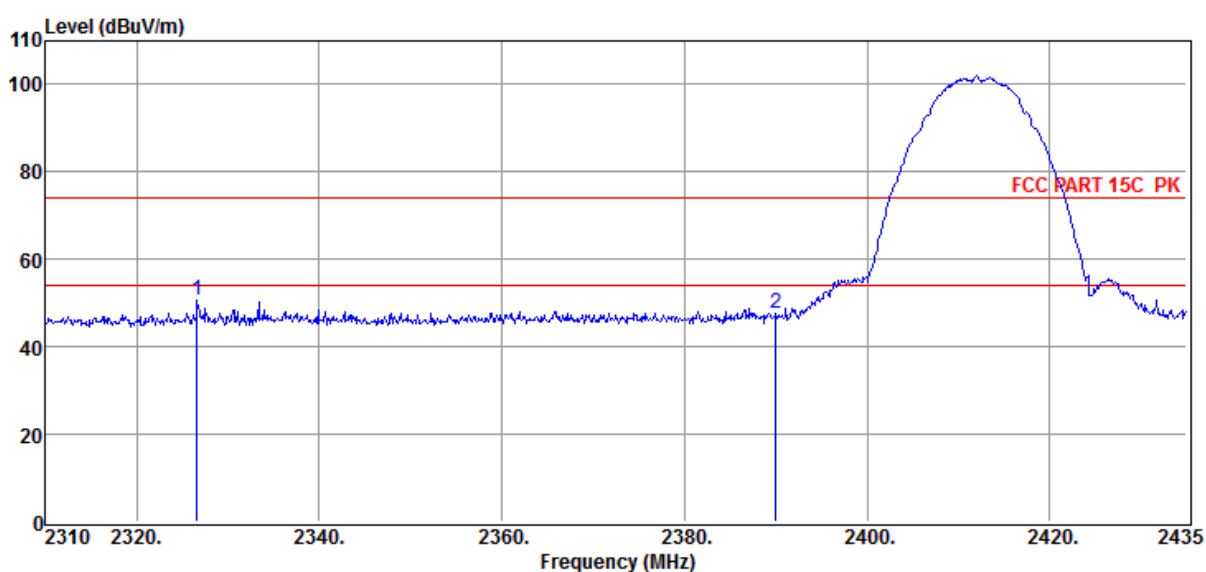
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B Ant1 1M 2412MHz

Data: 53



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2326.63	48.02	34.27	-31.69	50.60	74.00	-23.40	Peak	VERTICAL
2	2390.00	44.39	35.00	-31.70	47.69	74.00	-26.31	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

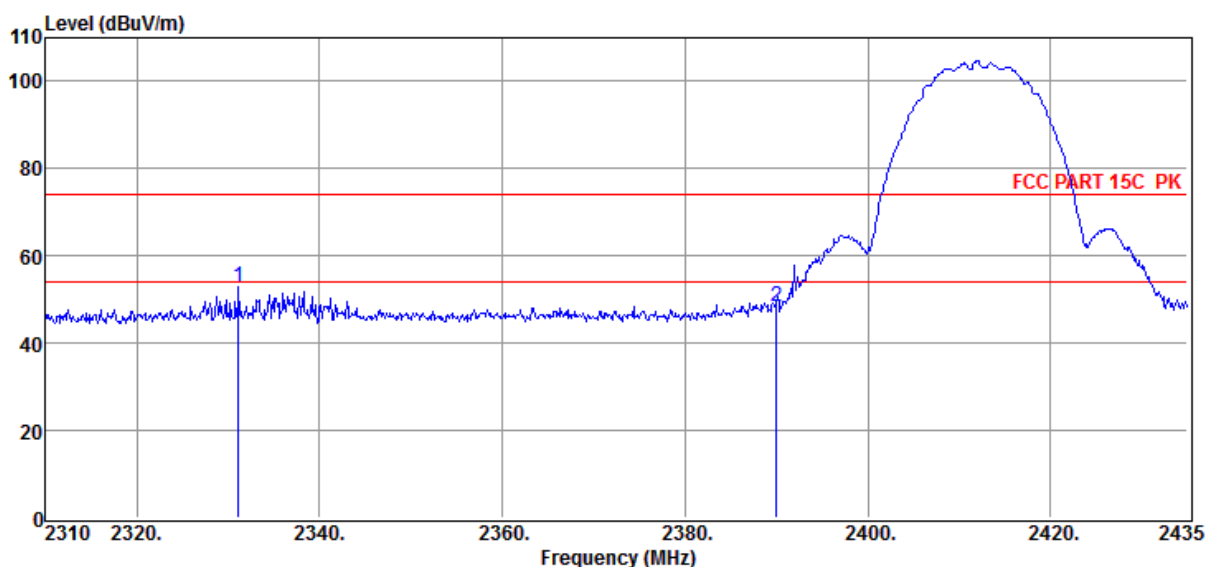
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B Ant1 1M 2412MHz

Data: 54



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2331.13	50.24	34.34	-31.63	52.95	74.00	-21.05	Peak	HORIZONTAL
2	2390.00	45.24	35.00	-31.70	48.54	74.00	-25.46	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

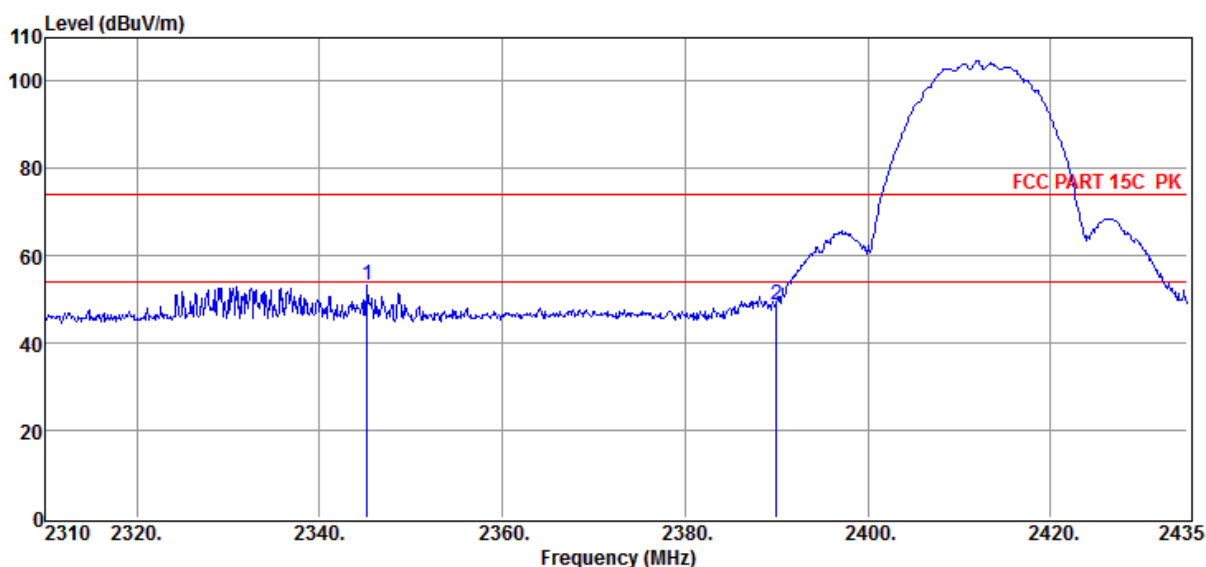
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B Ant2 1M 2412MHz

Data: 55



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2345.25	50.14	34.53	-31.47	53.20	74.00	-20.80	Peak	HORIZONTAL
2	2390.00	45.50	35.00	-31.70	48.80	74.00	-25.20	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

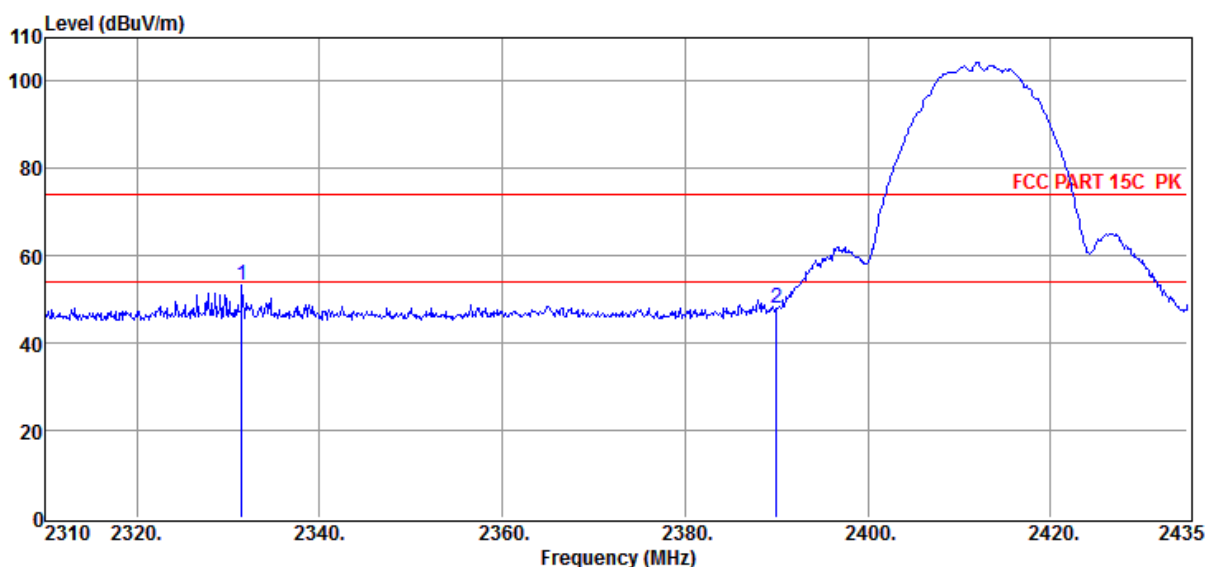
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B Ant2 1M 2412MHz

Data: 56



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2331.50	50.67	34.34	-31.63	53.38	74.00	-20.62	Peak	VERTICAL
2	2390.00	44.74	35.00	-31.70	48.04	74.00	-25.96	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

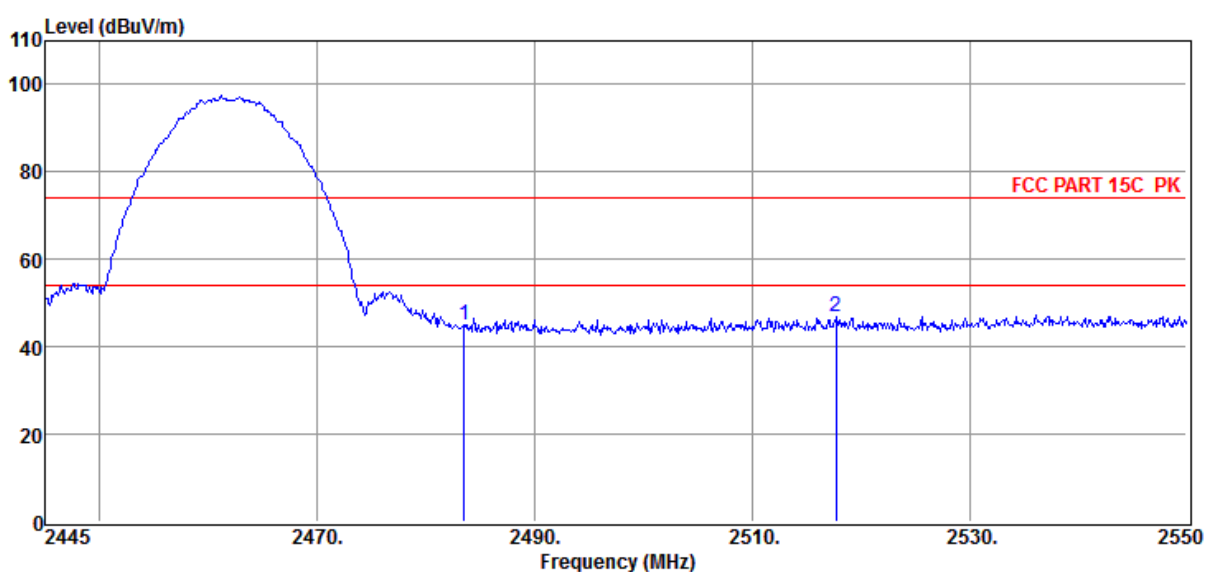
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B Ant1 1M 2462MHz

Data: 243



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	41.38	35.10	-31.58	44.90	74.00	-29.10	Peak	VERTICAL
2	2517.77	42.75	35.48	-31.44	46.79	74.00	-27.21	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

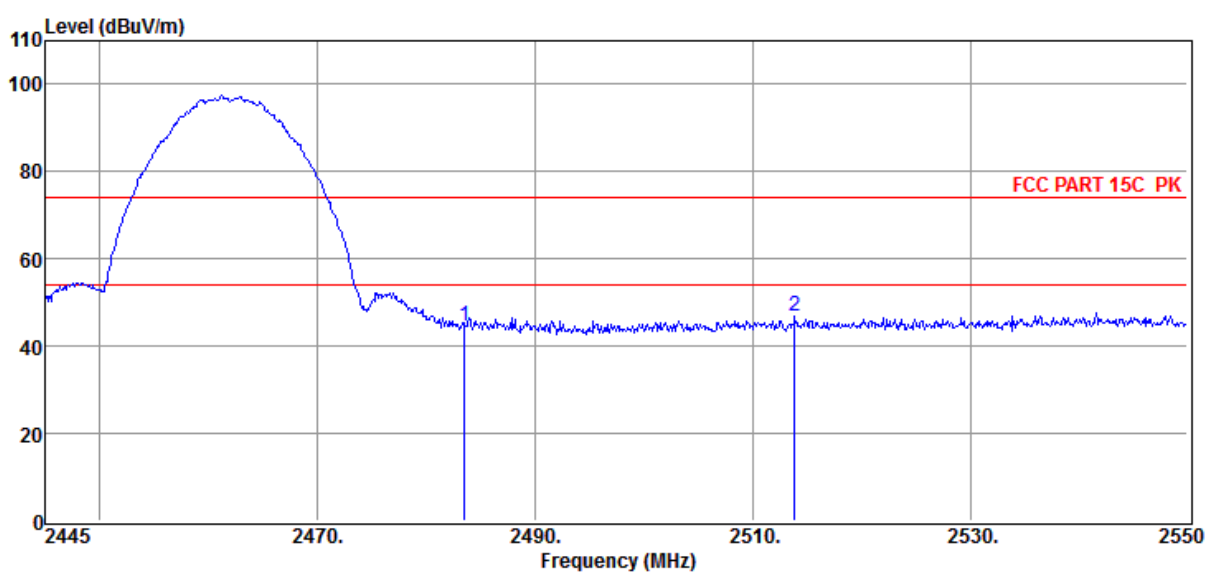
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B Ant1 1M 2462MHz

Data: 244



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	41.18	35.10	-31.58	44.70	74.00	-29.30	Peak	HORIZONTAL
2	2513.88	42.87	35.42	-31.46	46.83	74.00	-27.17	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

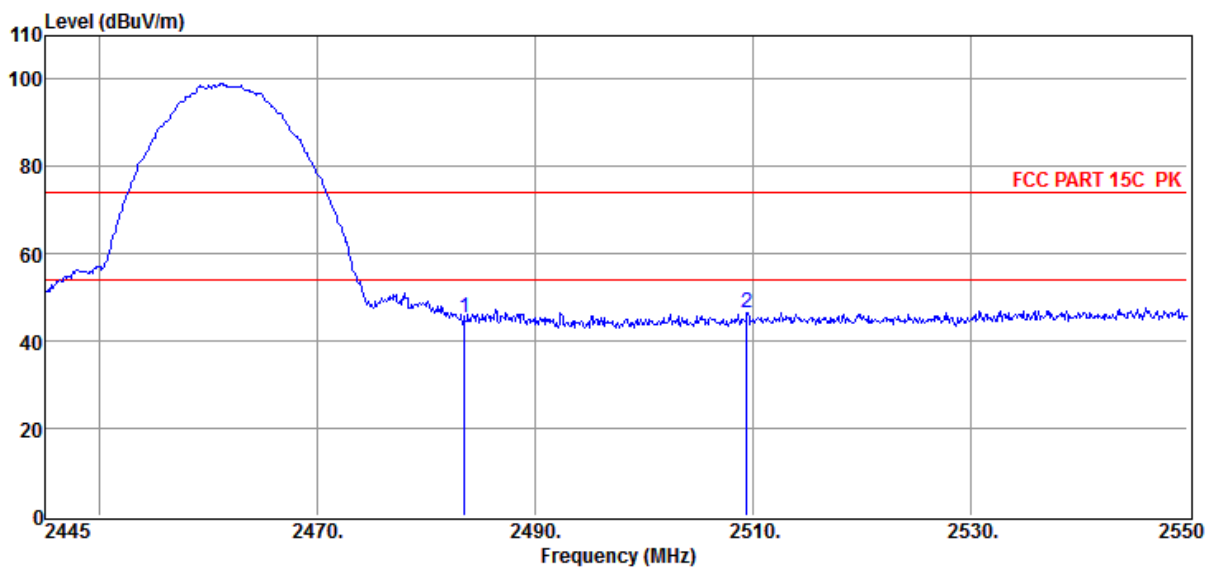
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B Ant2 1M 2462MHz

Data: 245



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	41.70	35.10	-31.58	45.22	74.00	-28.78	Peak	VERTICAL
2	2509.47	42.76	35.35	-31.49	46.62	74.00	-27.38	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

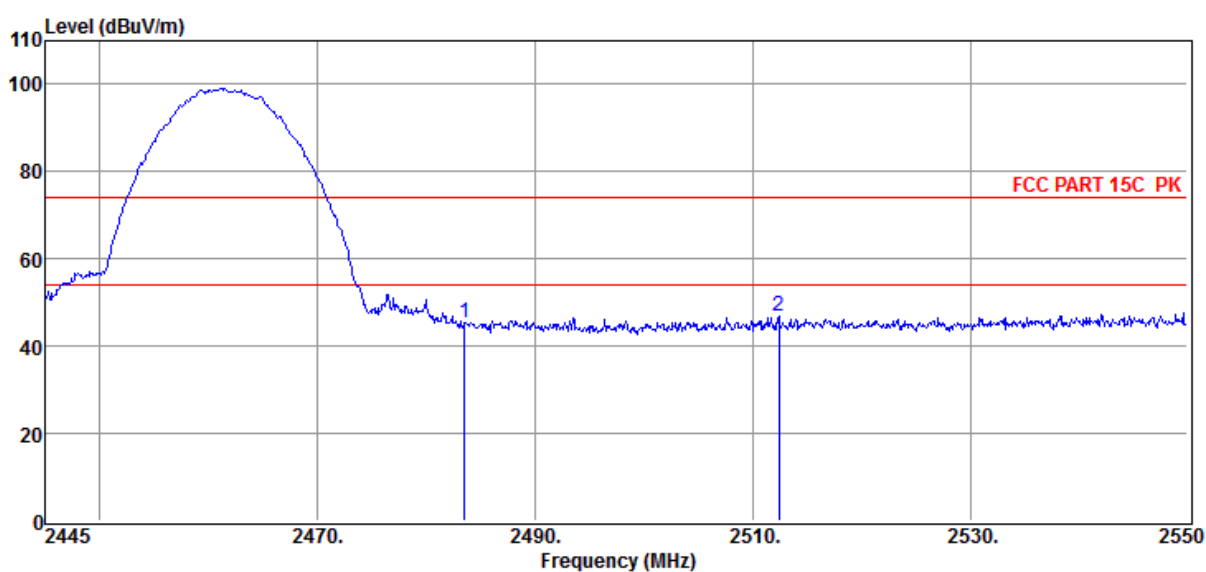
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11B Ant2 1M 2462MHz

Data: 246



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	41.87	35.10	-31.58	45.39	74.00	-28.61	Peak	HORIZONTAL
2	2512.41	42.95	35.40	-31.47	46.88	74.00	-27.12	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

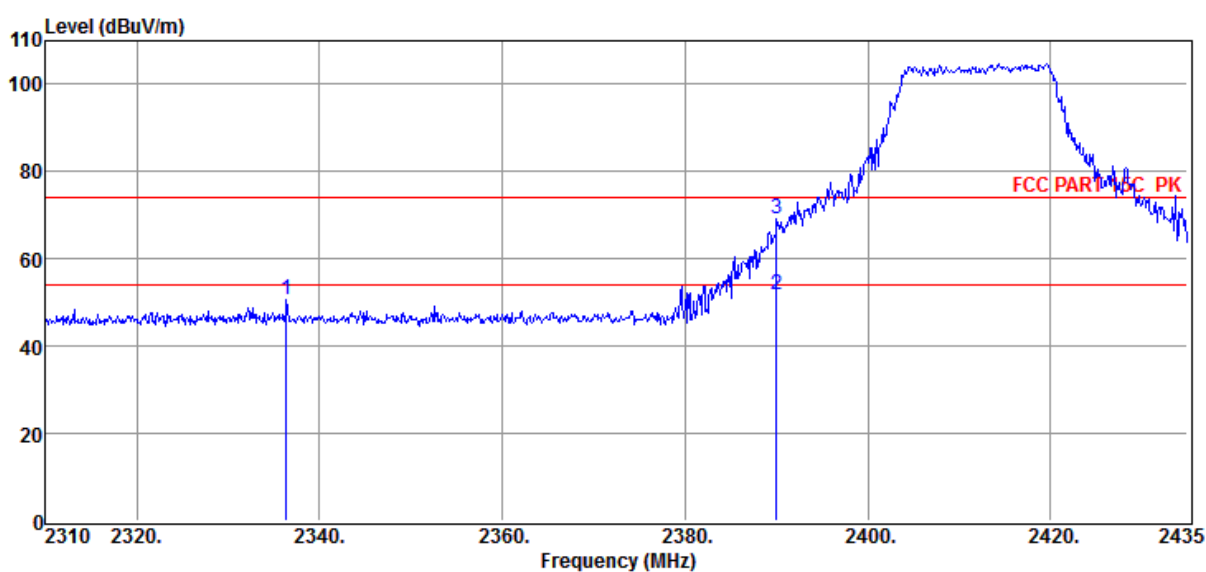
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G Ant1 6M 2412MHz

Data: 61



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2336.38	47.68	34.41	-31.57	50.52	74.00	-23.48	Peak	HORIZONTAL
2	2390.00	48.32	35.00	-31.70	51.62	54.00	-2.38	Average	HORIZONTAL
3	2390.00	65.75	35.00	-31.70	69.05	74.00	-4.95	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

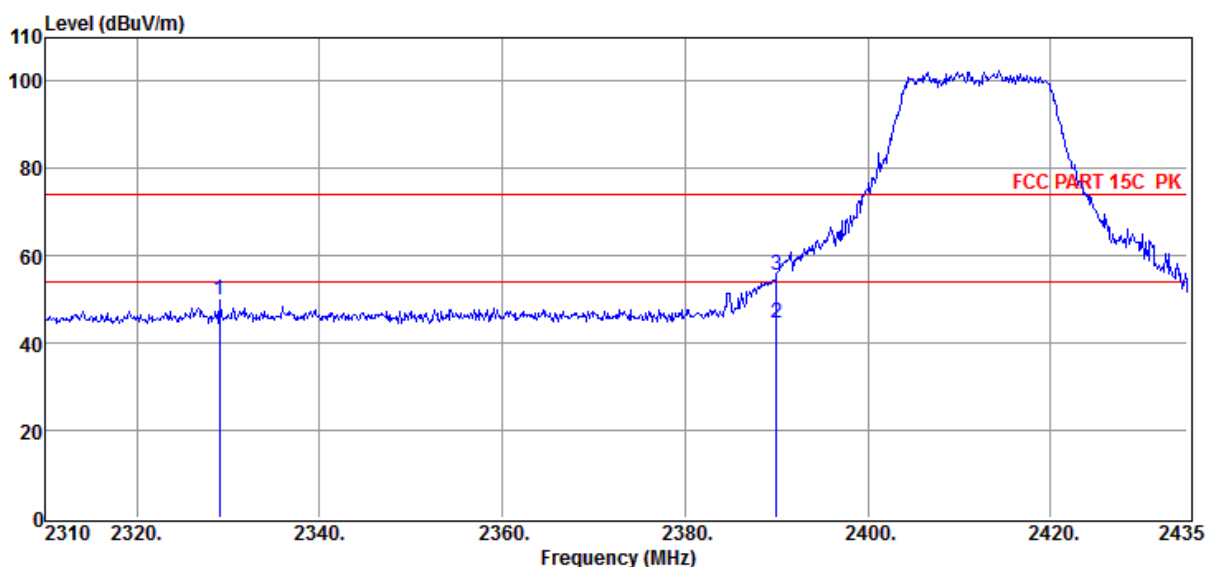
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G Ant1 6M 2412MHz

Data: 62



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2329.00	47.25	34.31	-31.66	49.90	74.00	-24.10	Peak	VERTICAL
2	2390.00	41.38	35.00	-31.70	44.68	54.00	-9.32	Average	VERTICAL
3	2390.00	52.34	35.00	-31.70	55.64	74.00	-18.36	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

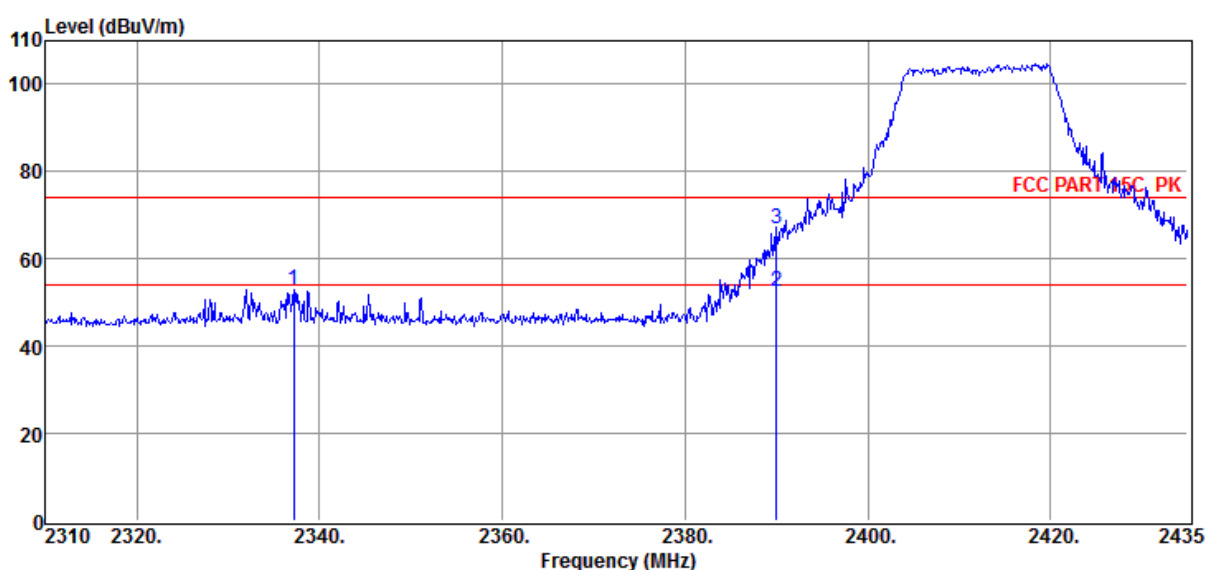
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G Ant2 6M 2412MHz

Data: 63



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2337.13	50.15	34.42	-31.56	53.01	74.00	-20.99	Peak	HORIZONTAL
2	2390.00	49.21	35.00	-31.70	52.51	54.00	-1.49	Average	HORIZONTAL
3	2390.00	63.78	35.00	-31.70	67.08	74.00	-6.92	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

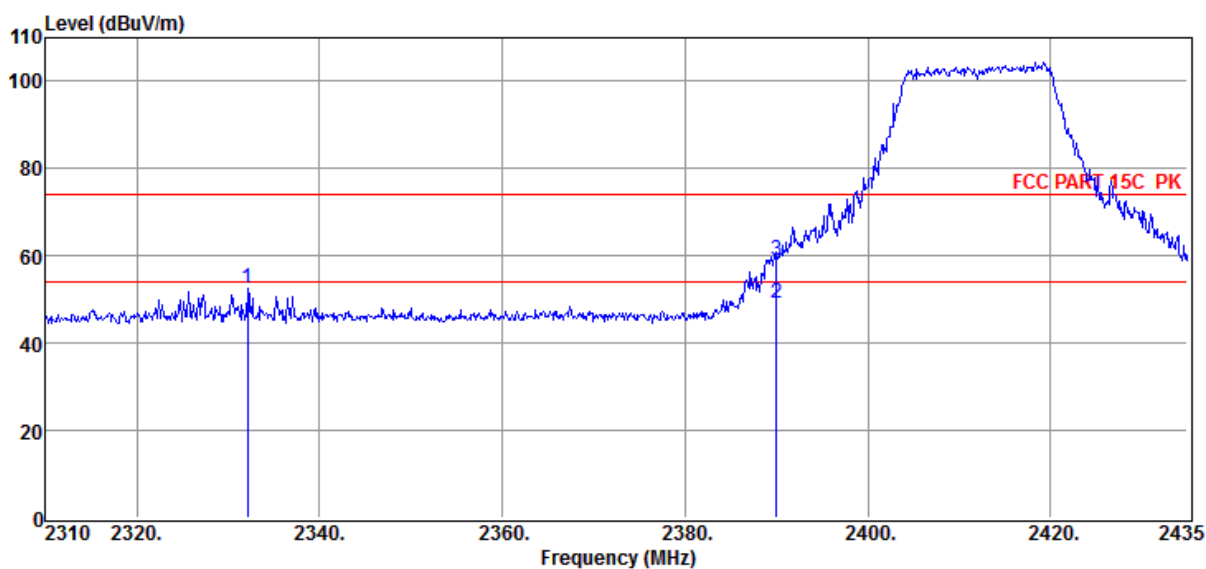
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G Ant2 6M 2412MHz

Data: 64



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2332.13	49.68	34.35	-31.62	52.41	74.00	-21.59	Peak	VERTICAL
2	2390.00	45.91	35.00	-31.70	49.21	54.00	-4.79	Average	VERTICAL
3	2390.00	55.62	35.00	-31.70	58.92	74.00	-15.08	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

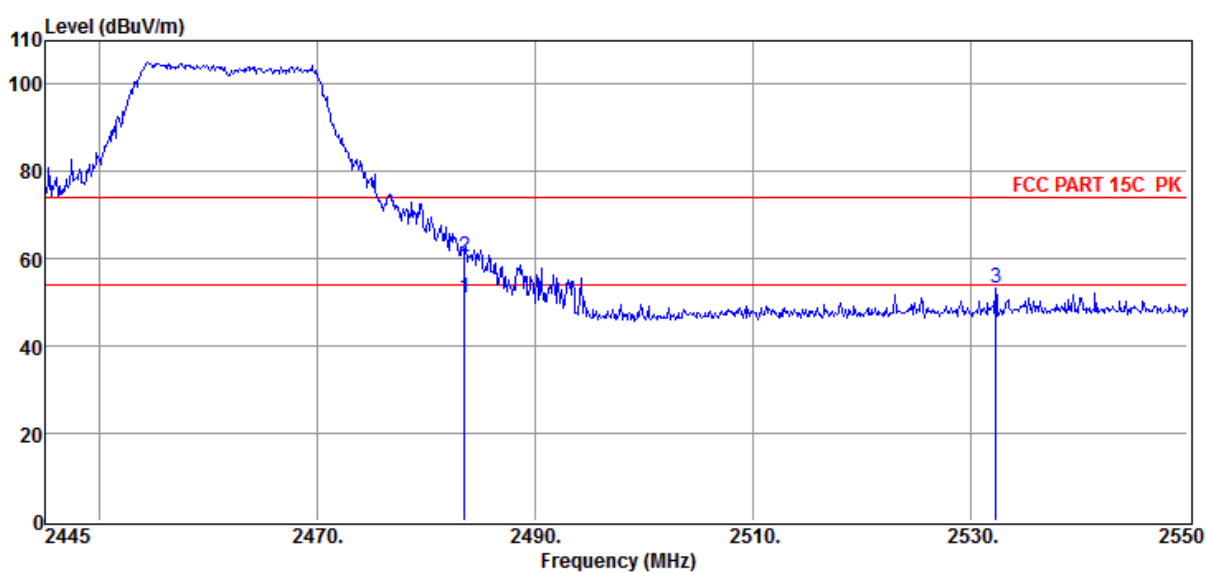
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G Ant2 6M 2462MHz

Data: 65



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	47.57	35.10	-31.58	51.09	54.00	-2.91	Average	HORIZONTAL
2	2483.50	56.87	35.10	-31.58	60.39	74.00	-13.61	Peak	HORIZONTAL
3	2532.36	49.04	35.72	-31.33	53.43	74.00	-20.57	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

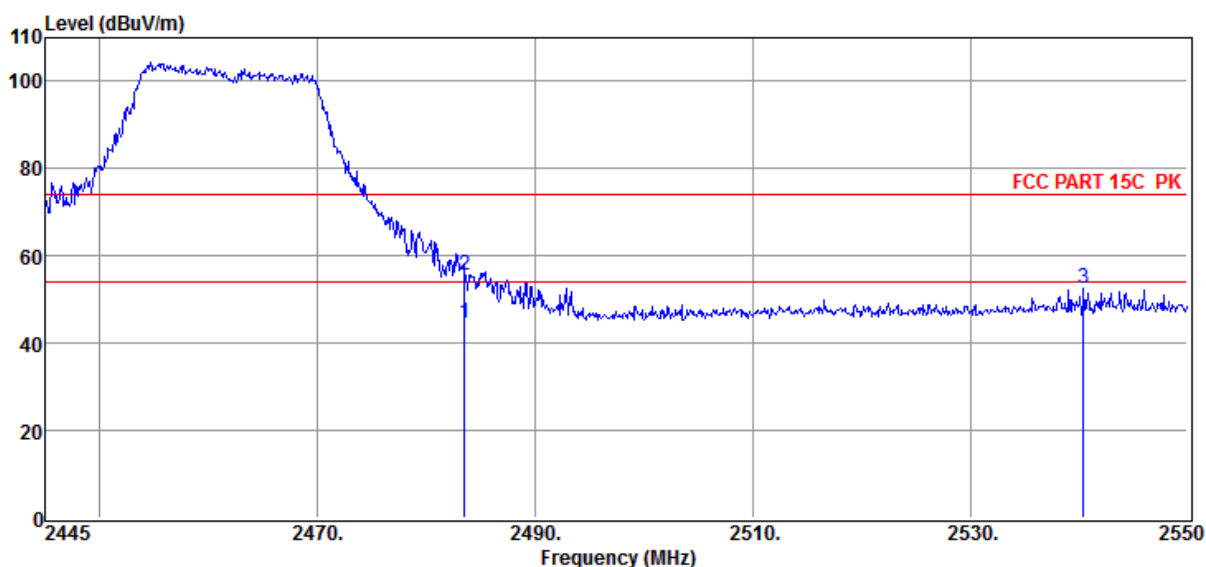
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G Ant2 6M 2462MHz

Data: 66



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	41.17	35.10	-31.58	44.69	54.00	-9.31	Average	VERTICAL
2	2483.50	52.16	35.10	-31.58	55.68	74.00	-18.32	Peak	VERTICAL
3	2540.45	48.02	35.85	-31.28	52.59	74.00	-21.41	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

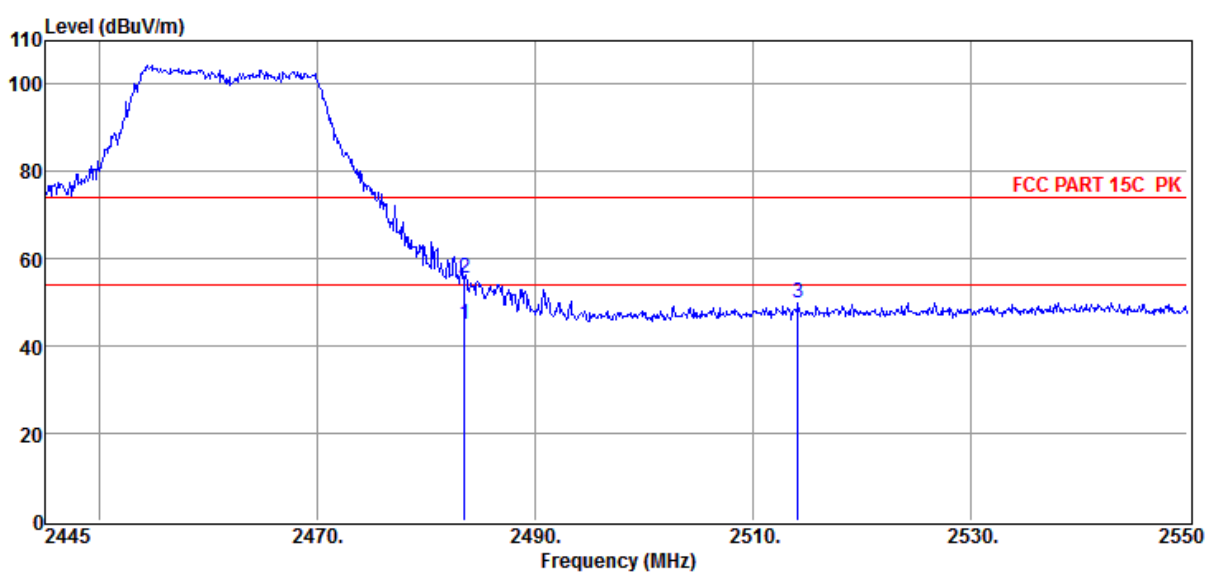
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G Ant1 6M 2462MHz

Data: 67



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	41.35	35.10	-31.58	44.87	54.00	-9.13	Average	HORIZONTAL
2	2483.50	51.98	35.10	-31.58	55.50	74.00	-18.50	Peak	HORIZONTAL
3	2514.20	45.86	35.43	-31.46	49.83	74.00	-24.17	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

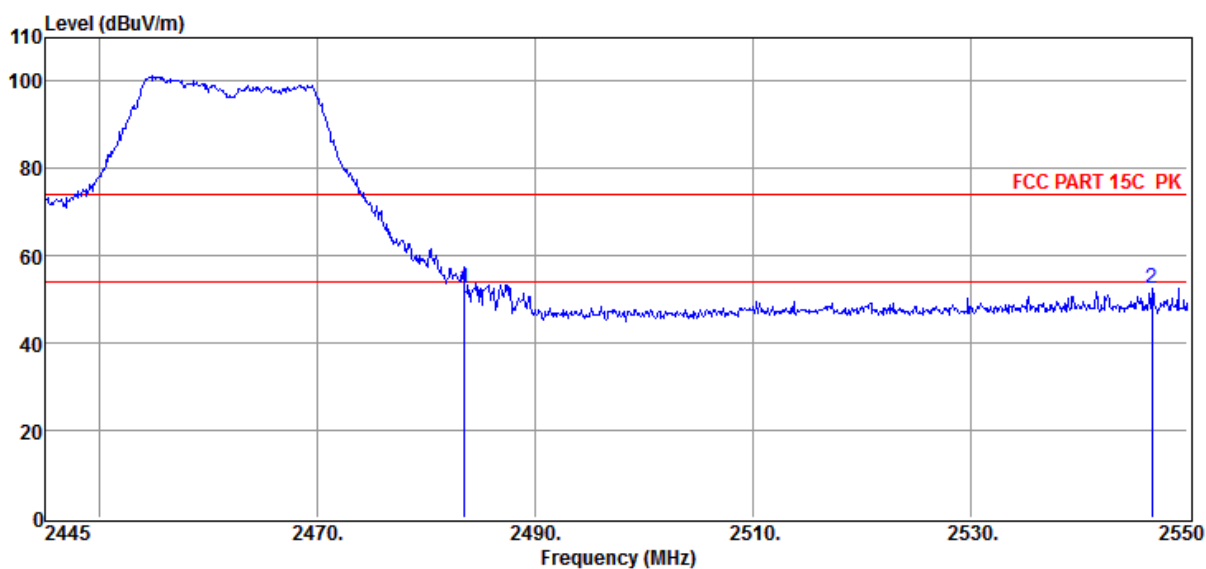
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11G Ant1 6M 2462MHz

Data: 68



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	48.97	35.10	-31.58	52.49	74.00	-21.51	Peak	VERTICAL
2	2546.75	47.95	35.95	-31.23	52.67	74.00	-21.33	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

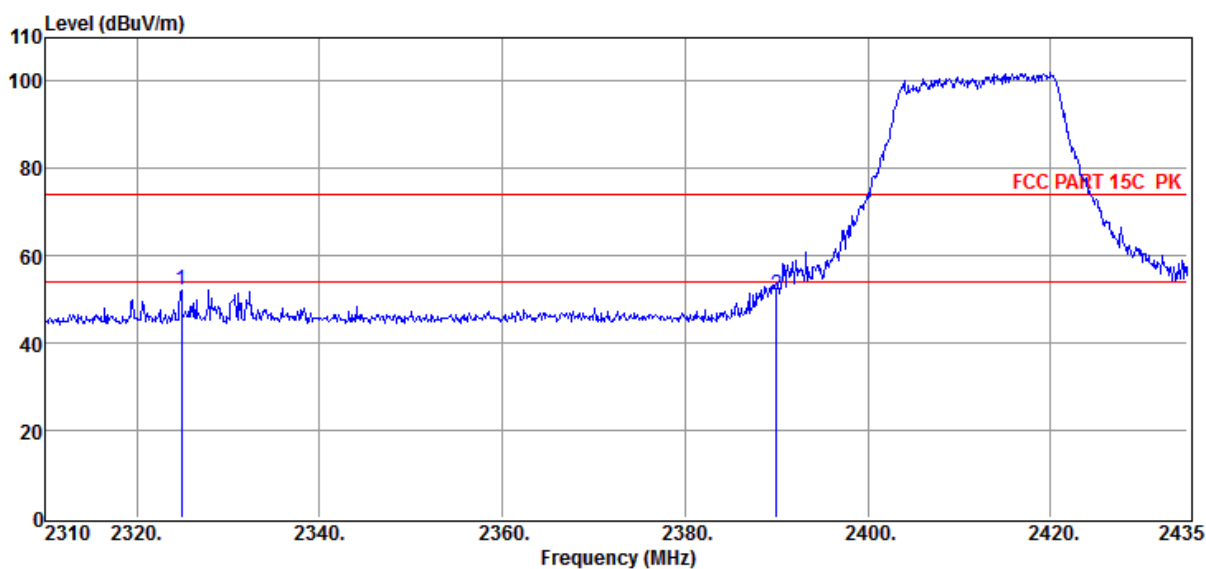
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS8 Ant1+Ant2 2412MHz

Data: 69



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2324.88	49.56	34.25	-31.71	52.10	74.00	-21.90	Peak	VERTICAL
2	2390.00	47.87	35.00	-31.70	51.17	74.00	-22.83	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

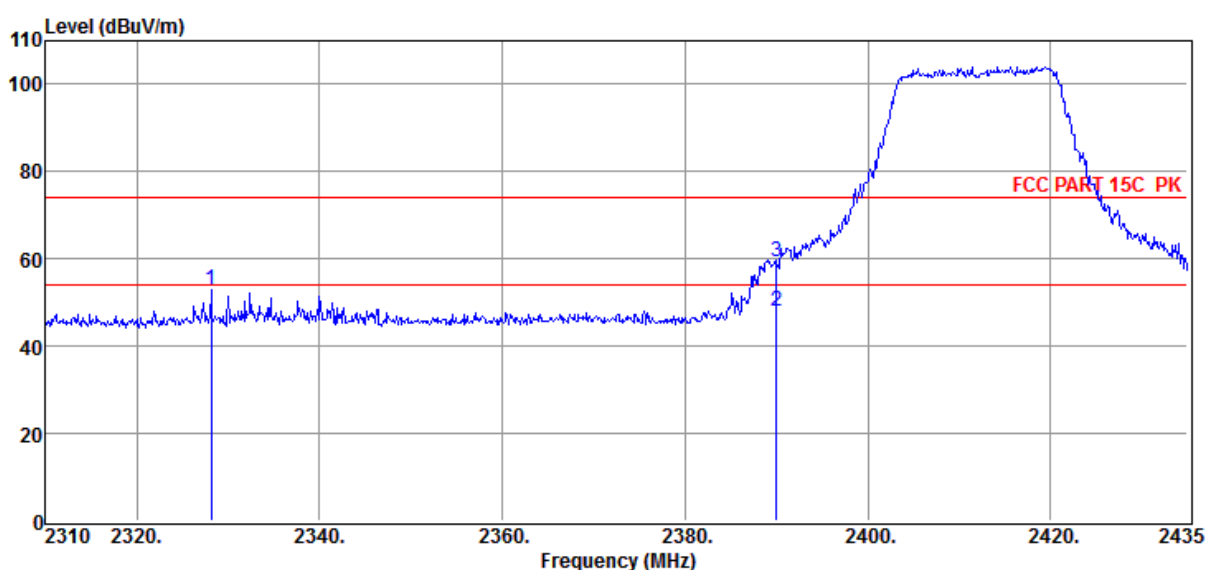
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS8 Ant1+Ant2 2412MHz

Data: 70



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2328.13	50.37	34.29	-31.67	52.99	74.00	-21.01	Peak	HORIZONTAL
2	2390.00	44.56	35.00	-31.70	47.86	54.00	-6.14	Average	HORIZONTAL
3	2390.00	55.88	35.00	-31.70	59.18	74.00	-14.82	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

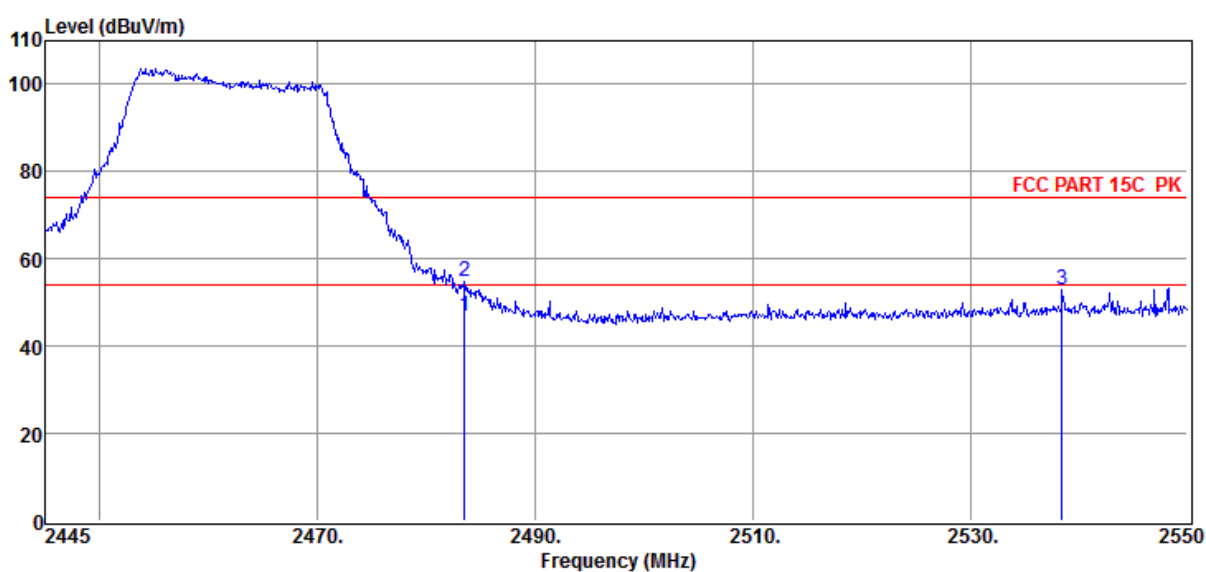
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS8 Ant1+Ant2 2462MHz

Data: 71



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	43.47	35.10	-31.58	46.99	54.00	-7.01	Average	VERTICAL
2	2483.50	51.17	35.10	-31.58	54.69	74.00	-19.31	Peak	VERTICAL
3	2538.45	48.38	35.82	-31.29	52.91	74.00	-21.09	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

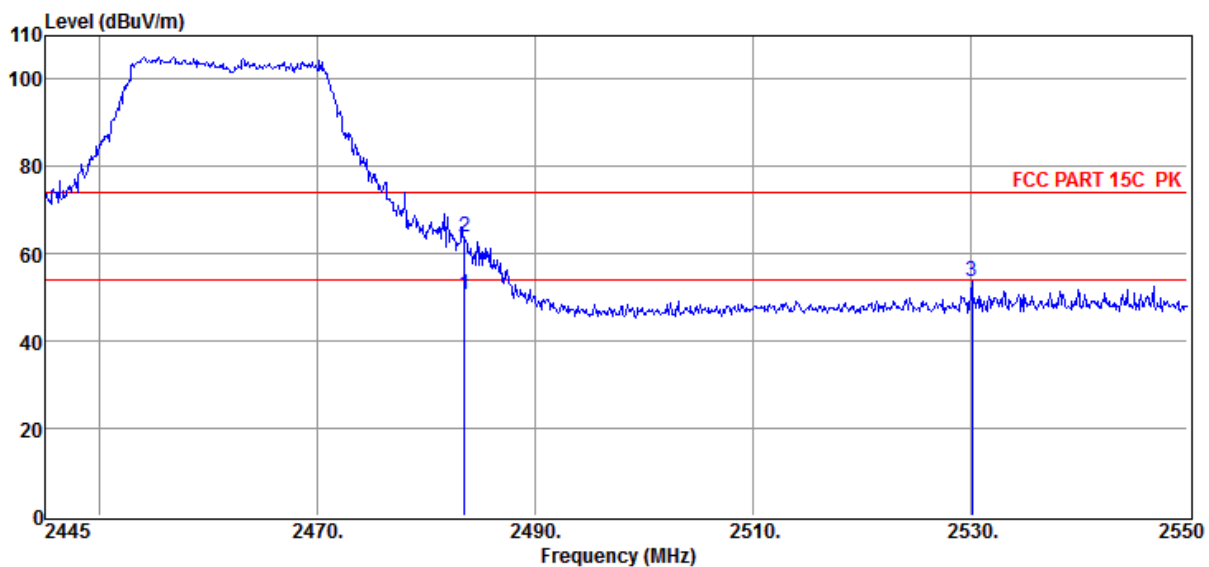
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N20 MCS8 Ant1+Ant2 2462MHz

Data: 72



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	47.01	35.10	-31.58	50.53	54.00	-3.47	Average	HORIZONTAL
2	2483.50	60.49	35.10	-31.58	64.01	74.00	-9.99	Peak	HORIZONTAL
3	2530.16	49.18	35.68	-31.35	53.51	74.00	-20.49	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

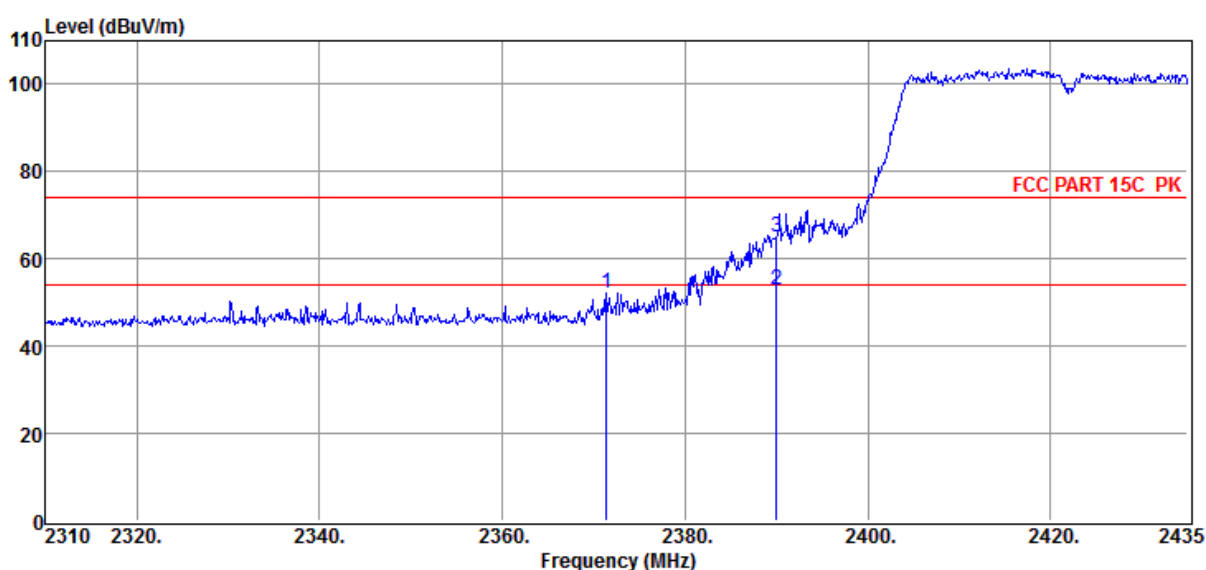
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS8 Ant1+Ant2 2422MHz

Data: 73



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2371.38	49.09	34.81	-31.56	52.34	74.00	-21.66	Peak	HORIZONTAL
2	2390.00	49.46	35.00	-31.70	52.76	54.00	-1.24	Average	HORIZONTAL
3	2390.00	61.76	35.00	-31.70	65.06	74.00	-8.94	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

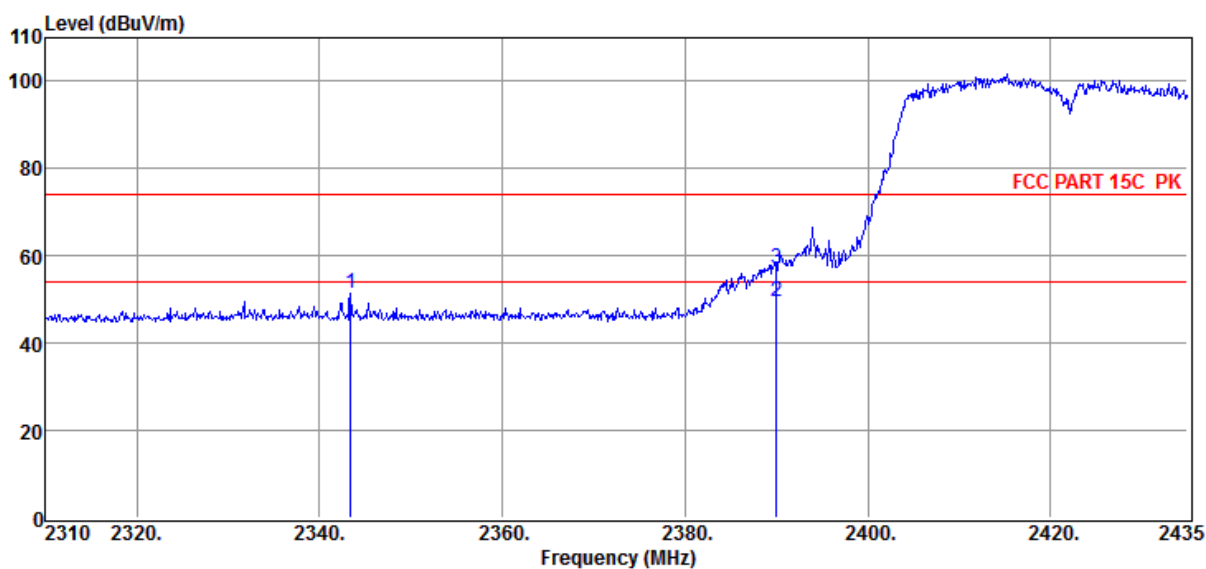
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS8 Ant1+Ant2 2422MHz

Data: 74



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2343.38	48.48	34.51	-31.49	51.50	74.00	-22.50	Peak	VERTICAL
2	2390.00	46.17	35.00	-31.70	49.47	54.00	-4.53	Average	VERTICAL
3	2390.00	53.74	35.00	-31.70	57.04	74.00	-16.96	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

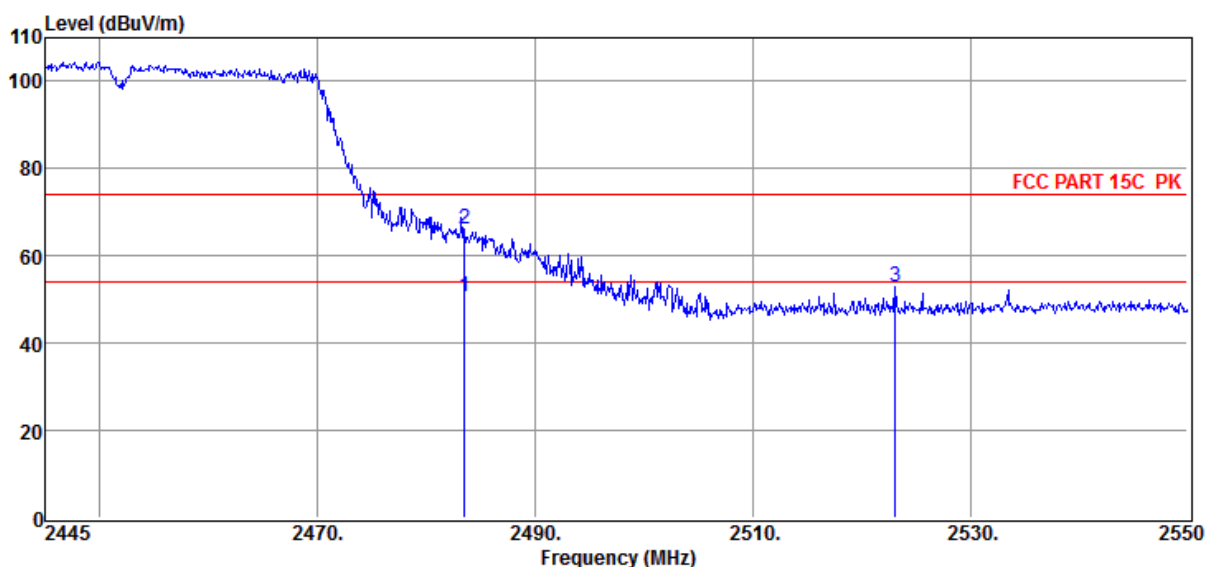
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS8 Ant1+Ant2 2452MHz

Data: 75



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	46.98	35.10	-31.58	50.50	54.00	-3.50	Average	HORIZONTAL
2	2483.50	62.61	35.10	-31.58	66.13	74.00	-7.87	Peak	HORIZONTAL
3	2523.12	48.79	35.57	-31.40	52.96	74.00	-21.04	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

Radiated Emission Test Result

Test Site : 10m Chamber

Test Date : 03-07-2022

Tested By : Sunny

EUT : AI Service Robot

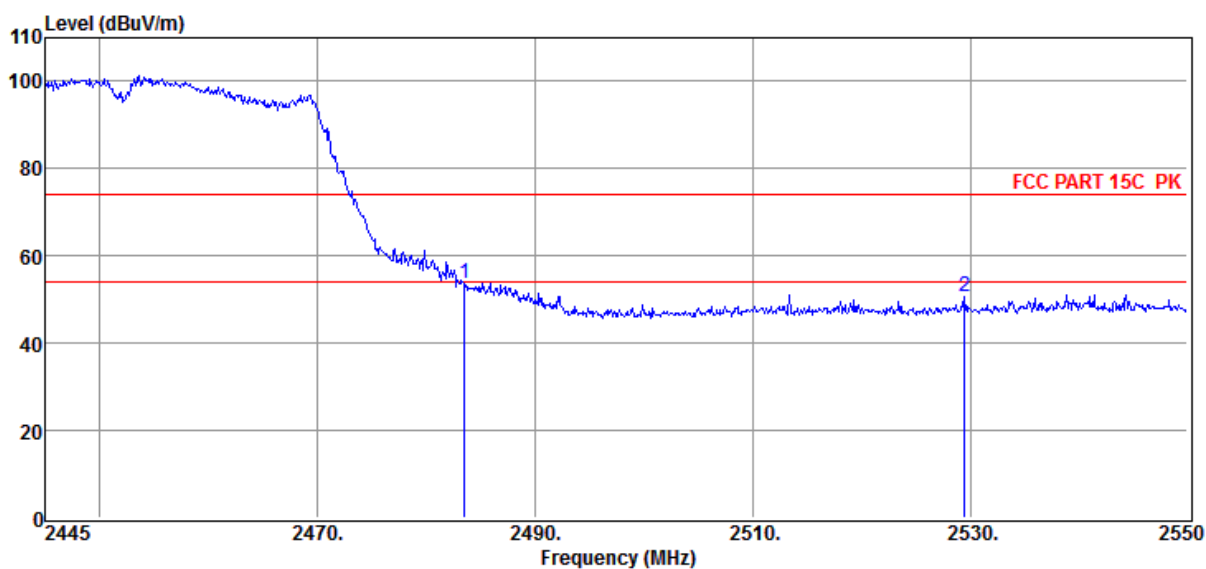
Model Number : OS-R-SD03

Power Supply : Battery

Test Mode : Tx mode

Memo : 11N40 MCS8 Ant1+Ant2 2452MHz

Data: 76



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.54	50.00	35.10	-31.58	53.52	74.00	-20.48	Peak	VERTICAL
2	2529.53	46.44	35.67	-31.35	50.76	74.00	-23.24	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

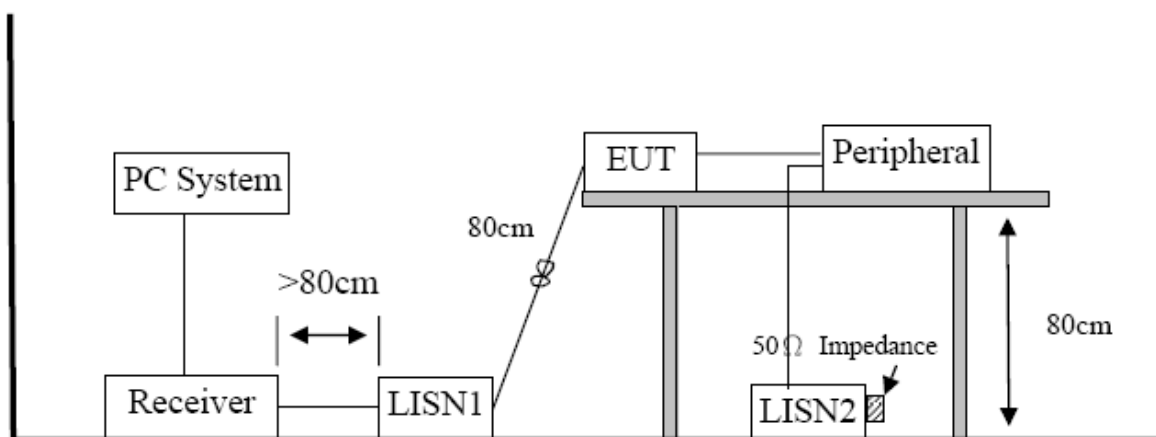
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4. Margin = Result Level – Limit.

10. Power Line Conducted Emission

10.1. Block diagram of test setup



10.2. Power Line Conducted Emission Limits (Class B)

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150 kHz ~ 500 kHz	66 ~ 56*	56 ~ 46*
500 kHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

10.3. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

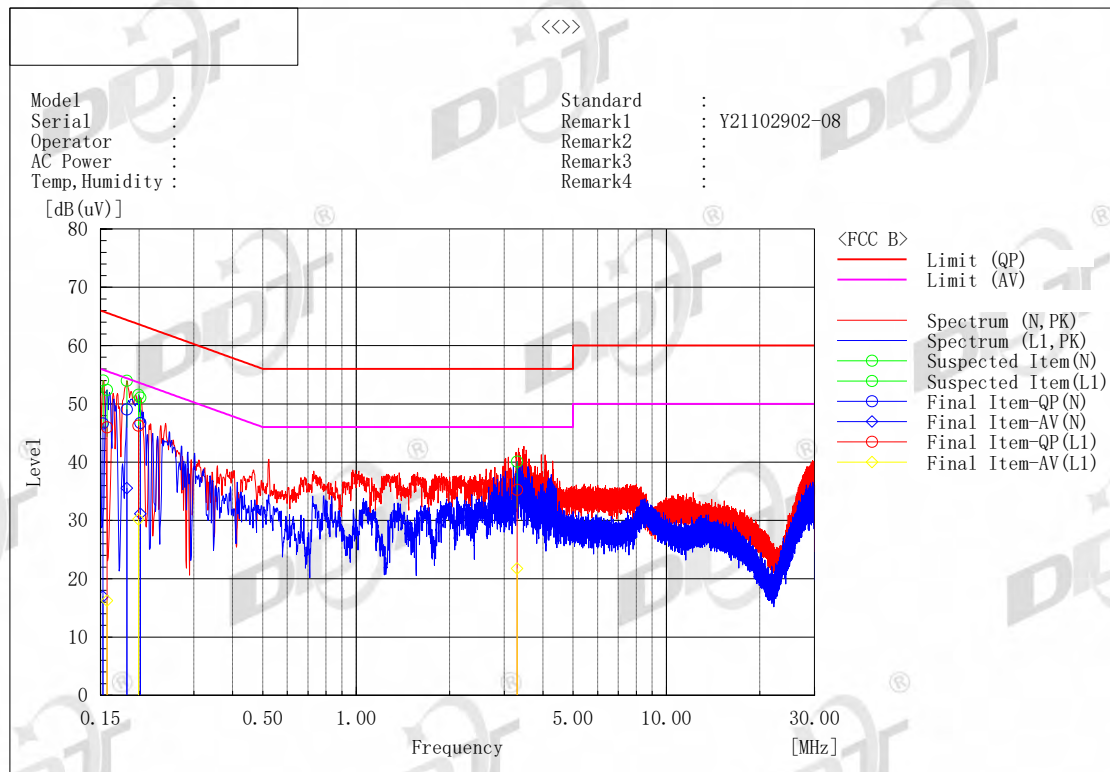
The bandwidth of test receiver is set at 9 kHz.

10.4. Test result

Pass. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: Pre-test AC conducted emission at all mode, only the worst case was recorded in this report.

Test Data
Charging by AC/DC Adapter**Final Result**

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.15276	36.9	7.2	9.7	46.6	16.9	65.8	55.8	19.2	38.9
2	0.18253	39.3	25.8	9.7	49.0	35.5	64.4	54.4	15.4	18.9
3	0.20188	37.0	21.5	9.7	46.7	31.2	63.5	53.5	16.8	22.3

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.15742	36.3	6.5	9.7	46.0	16.2	65.6	55.6	19.6	39.4
2	0.19892	36.5	20.5	9.7	46.2	30.2	63.7	53.7	17.5	23.5
3	3.30446	25.4	11.9	9.8	35.2	21.7	56.0	46.0	20.8	24.3

Note1) Level (Quasi-Peak and/or C/Average) = Meter Reading + Factor

Note2) Line = Polarity of input power (Live or Neutral)

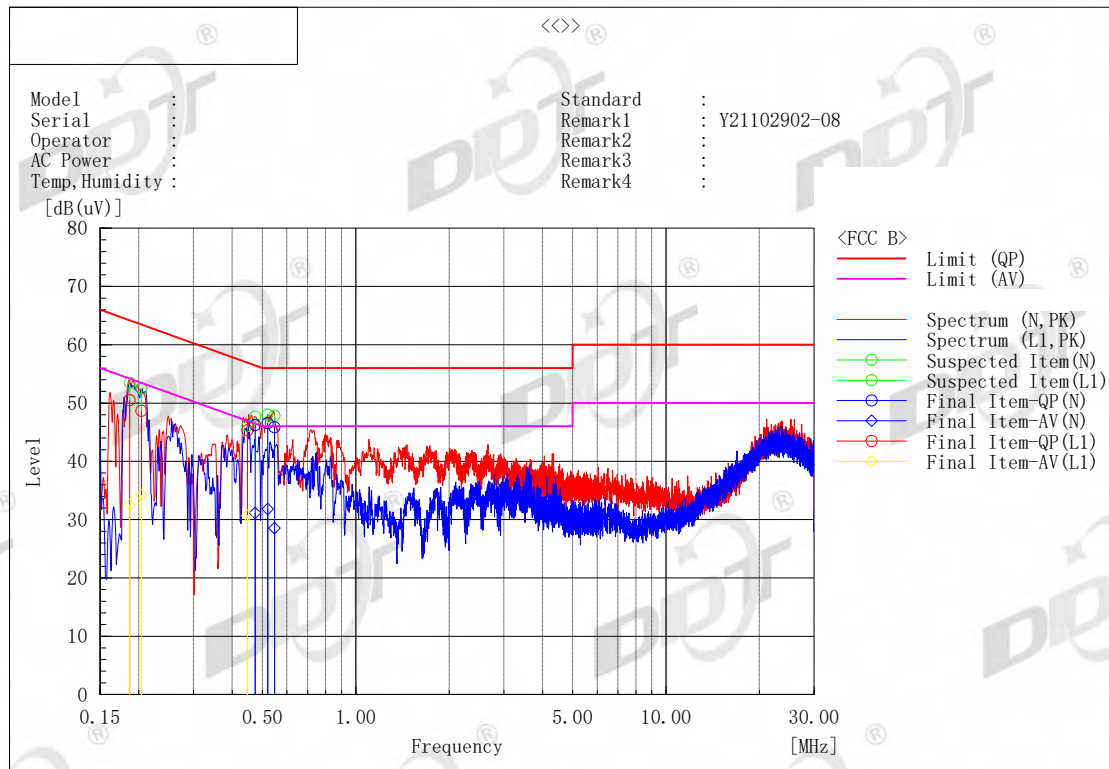
N : Abbreviation of Neutral Polarity, L1 : Abbreviation of Live Polarity,

Note3) Factor = LISN Insertion Loss + Cable Loss

Note4) Margin = Limit – Level (Quasi-Peak and/or C/Average)

Note5) C/Average : Abbreviation of CISPR Average

Charging by pile



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.52015	36.8	22.1	9.7	46.5	31.8	56.0	46.0	9.5	14.2
2	0.54752	36.1	18.8	9.7	45.8	28.5	56.0	46.0	10.2	17.5
3	0.4744	36.5	21.4	9.7	46.2	31.1	56.4	46.4	10.2	15.3

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.18676	40.8	22.9	9.7	50.5	32.6	64.2	54.2	13.7	21.6
2	0.44779	35.6	21.0	9.7	45.3	30.7	56.9	46.9	11.6	16.2
3	0.20375	38.9	24.4	9.7	48.6	34.1	63.5	53.5	14.9	19.4

Note1) Level (Quasi-Peak and/or C/Average) = Meter Reading + Factor

Note2) Line = Polarity of input power (Live or Neutral)

N : Abbreviation of Neutral Polarity, L1 : Abbreviation of Live Polarity,

Note3) Factor = LISN Insertion Loss + Cable Loss

Note4) Margin = Limit – Level (Quasi-Peak and/or C/Average)

Note5) C/Average : Abbreviation of CISPR Average

11. Antenna Requirements

11.1. Limit

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2. Result

The device support 2T2R MIMO, the antennas both used for this product are dedicated FPC antennas and other than that furnished by the responsible party shall be used with the device, maximum antenna gain is 3.77 dBi for antenna 1, 3.68 dBi for antenna 2.