FCC AND IC CERTIFICATION TEST REPORT

Report No.: DDT-B21122101-4E01

Applicant	**:**	Wyze Labs, Inc.
Address	**:**	5808 Lake Washington Blvd NE Ste 300 Kirkland, WA 98033
Equipment under Test	**:**	Wyze Cam Outdoor v2
Model No.	**:**	WVOD2
Trade Mark	**:**	WYZE
FCC ID	**:**	2AUIUWVOD2
IC	**:**	25466-WVOD2
Manufacturer	**:**	Wyze Labs, Inc.
Address	**:**	5808 Lake Washington Blvd NE Ste 300 Kirkland, WA 98033

Issued By: 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, E-mail: ddt@dgddt.com, http://www.ddttest.com

REPORT

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Test Report Declare

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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-B21122101-4E01		
Date of Receipt:	Dec. 21, 2021	**Date of Test:**	Dec. 21, 2021 ~ Jan. 10, 2022

Prepared By:

Sunny Zhang

Sunny Zhang/Engineer

Approved By:

Aaron Zhang

Aaron Zhang/EMC 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	Jan. 10, 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 Conducted 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	:	Wyze Cam Outdoor v2
Model Number	:	WVOD2
EUT Function Description	:	Please reference user manual of this device
Power Supply	:	DC 7.4V Polymer Li-ion built-in battery DC 5V By AC/DC Adapter
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
Modulation	:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: 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: MCS0~MCS7
Antenna Type	:	FPC antenna, maximum PK gain: 4.78 dBi
Serial Number	:	N/A

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
USB Cable	N/A	N/A	Length 1.2m,Unshielded	N/A
AC/DC adapter	WYZ≡™	KA12C-0502000US	Input 100-240V~50/60Hz,Output 5V,2A	N/A

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

EUT

Run the special test software “Putty.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	Default	1	LCH: CH1	2412
	Default	1	MCH: CH6	2437
	Default	1	HCH: CH11	2462
IEEE 802.11g	Default	6	LCH: CH1	2412
	Default	6	MCH: CH6	2437
	Default	6	HCH: CH11	2462
IEEE 802.11n HT20	Default	MCS 0	LCH: CH1	2412
	Default	MCS 0	MCH: CH6	2437
	Default	MCS 0	HCH: CH11	2462
Note1: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test. Note2: There are two factory of battery for this equipment, we tested all battery and the worst battery’s data was recorded in this report.				

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 MHz ≤ f < 3.6 GHz);
	0.32 dB (3.6 GHz ≤ f < 8 GHz)
Peak Output Power (Conducted) (Power Sensor)	0.51 dB
Power Spectral Density	0.12 dB (10 MHz ≤ f < 3.6 GHz);
	0.32 dB (3.6 GHz ≤ f < 8 GHz)
Frequencies Stability	6.7×10^{-8} (Antenna couple method)
	3.4×10^{-8} (Conducted method)
Conducted Spurious Emissions	0.12 dB (10 MHz ≤ f < 3.6 GHz);
	0.32 dB (3.6 GHz ≤ f < 8 GHz)
	0.52 dB (8 GHz ≤ f < 22 GHz)
Uncertainty for Radio Frequency (RBW < 20 kHz)	3×10^{-7}
Temperature	±2℃
Humidity	±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

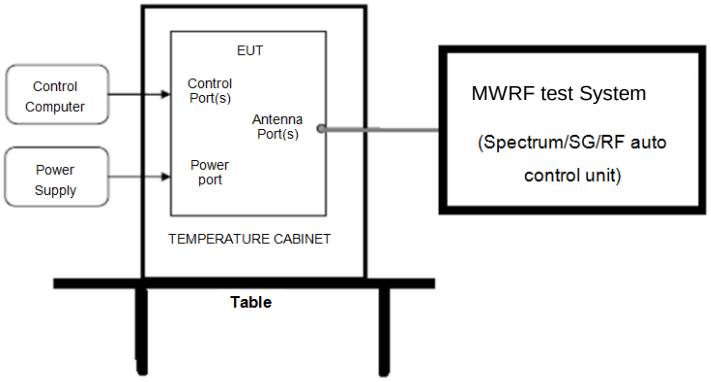
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
RF Connected Test (MWRFtest system)					
Microwave Signal Generator	R&S	SMF100A	101396	2021/05/25	1 Year
MXG Vector Signal Generator	Agilent	N5182A	MY50143288	2021/03/08	1 Year
EMI Test Receiver	R&S	ESU26	100243	2021/03/03	1 Year
Wideband Radio Communication Tester	R&S	CMW500	158800	2021/05/14	1 Year
Power Detector	MWRFtest	MW100-PSB	MW201203008	2021/03/31	1 Year
DC Power Supply	inSTEK	PSP-2010	EH131319	2021/02/27	1 Year
MULTIMETER	FLUKE	15B+	44752963WS	2021/11/17	1 Year
High and low temperature damp heat test chamber	Tinghua	RCR1000-060SE	THS20202015	2021/07/07	1 Year
Test Software	MWRFtest	MTS8310	V03	N/A	N/A
Radiated Emission -10m EMI Chamber					
EXA Signal Analyzer	Keysight	N9010A	MY53281492	2021/03/31	1 Year
Active Loop Antenna	R&S	HFH2-Z2	100269	2021/05/08	1 Year
Double-Ridged Guide Horn Antenna	ETS-LINDGREN	3115	00102808	2021/03/16	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	2021/04/21	1 Year
Broadband Horn Antenna	TESEQ	BHA 9118	31754	2021/10/12	1 Year
Low noise amplifier	MITEQ	TPA0118-36	0914	2021/02/03	1 Year
EMI Test Receiver	R&S	ESCI	101024	2021/03/03	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	2021/03/03	1 Year
Amplifier	Sonoma	310N	300914	2021/03/03	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
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. General information

Test date	2021/12/21 ~ 2022/01/10	Test engineer	Sunny Zhang
Test place	RSE Chamber		

4.2. Block diagram of test setup



4.3. Limits

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

4.4. 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.

4.5. Test result

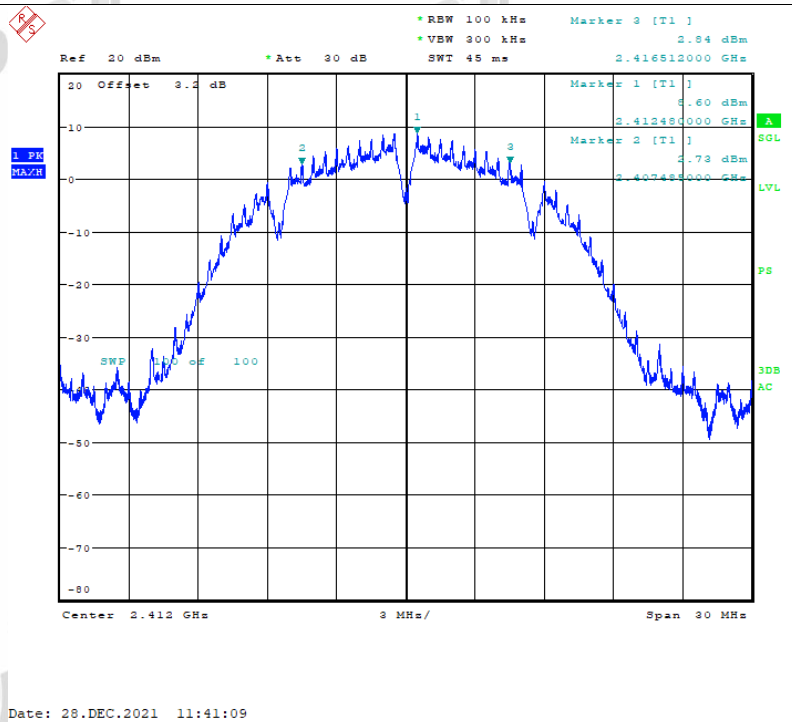
Test Mode	Test	Ant	6dB Bandwidth (MHz)	Limit (MHz)	Verdict
11B	2412	Ant1	9.027	≧0.5	Pass
11B	2437	Ant1	9.030	≧0.5	Pass
11B	2462	Ant1	9.039	≧0.5	Pass
11G	2412	Ant1	15.099	≧0.5	Pass
11G	2437	Ant1	15.075	≧0.5	Pass
11G	2462	Ant1	15.438	≧0.5	Pass
11N20SISO	2412	Ant1	15.036	≧0.5	Pass
11N20SISO	2437	Ant1	15.066	≧0.5	Pass
11N20SISO	2462	Ant1	15.072	≧0.5	Pass

Test Mode	Test Channel	Ant	99% OBW (MHz)	Limit (MHz)	Verdict
11B	2412	Ant1	14.034	---	Pass
11B	2437	Ant1	14.067	---	Pass
11B	2462	Ant1	14.082	---	Pass
11G	2412	Ant1	16.326	---	Pass
11G	2437	Ant1	16.341	---	Pass
11G	2462	Ant1	16.344	---	Pass
11N20SISO	2412	Ant1	17.454	---	Pass
11N20SISO	2437	Ant1	17.472	---	Pass
11N20SISO	2462	Ant1	17.475	---	Pass

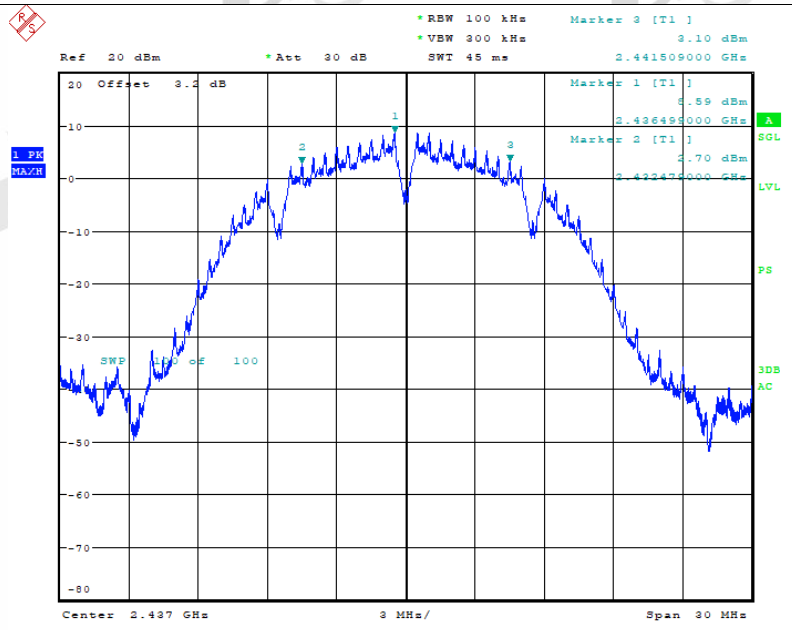
4.6. original test data

6dB Bandwidth:

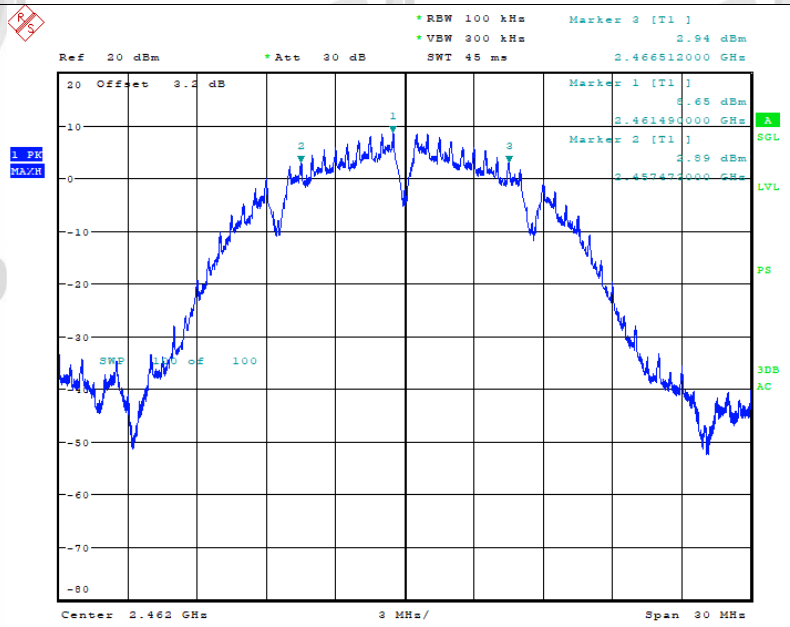
Test Graphs
-6dB Bandwidth NVNT b 2412MHz Ant1



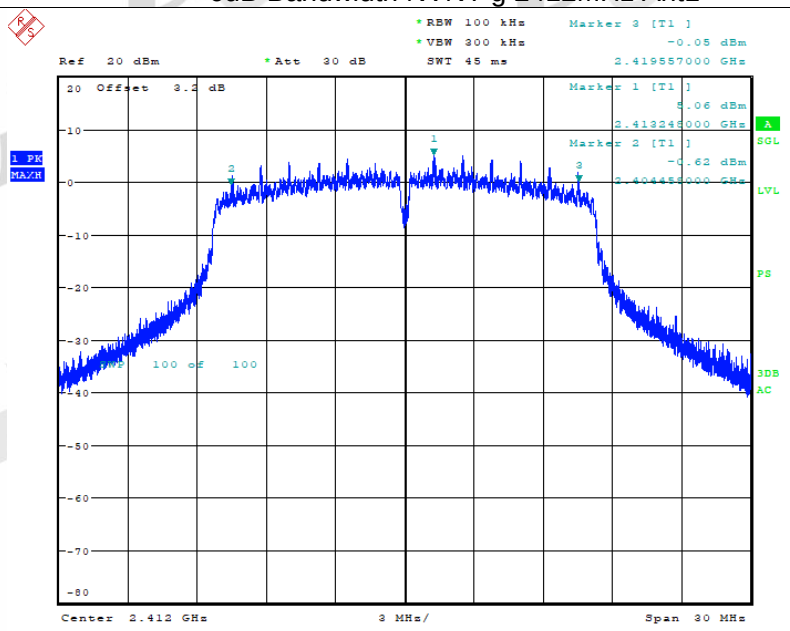
-6dB Bandwidth NVNT b 2437MHz Ant1



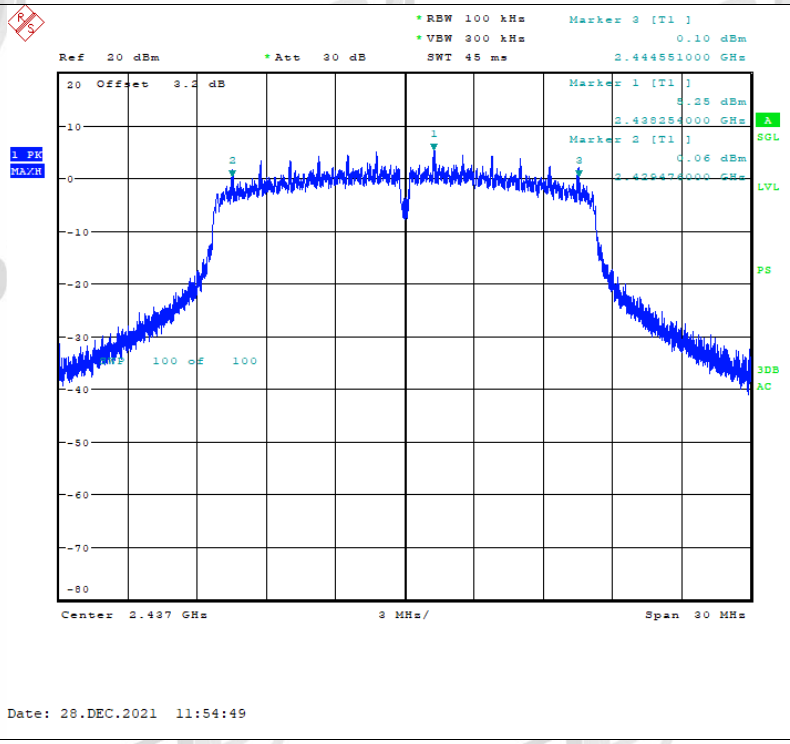
-6dB Bandwidth NVNT b 2462MHz Ant1



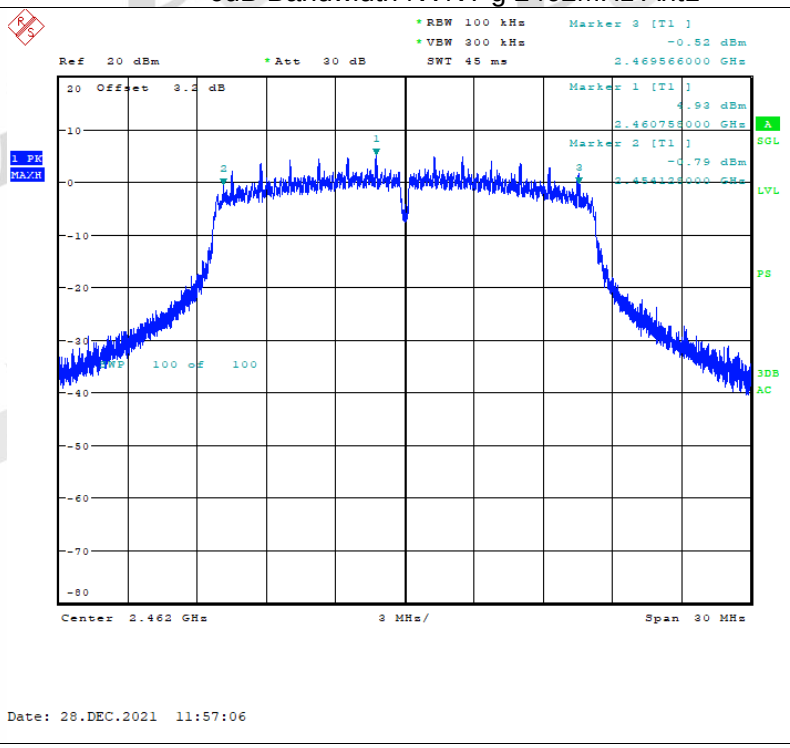
-6dB Bandwidth NVNT g 2412MHz Ant1



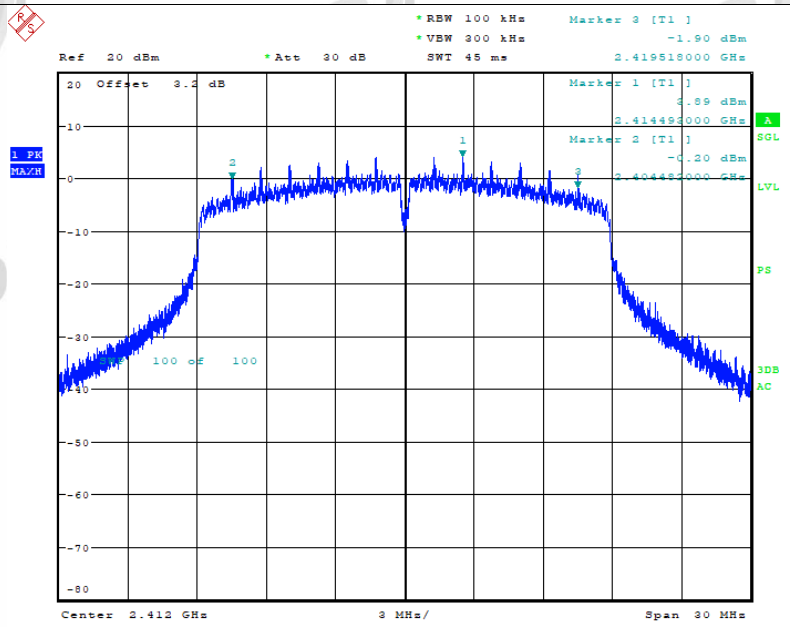
-6dB Bandwidth NVNT g 2437MHz Ant1



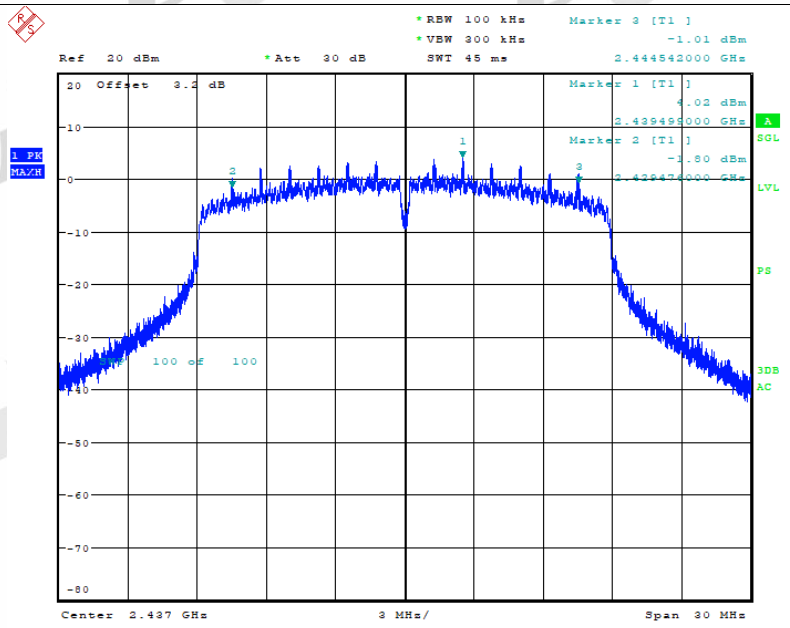
-6dB Bandwidth NVNT g 2462MHz Ant1



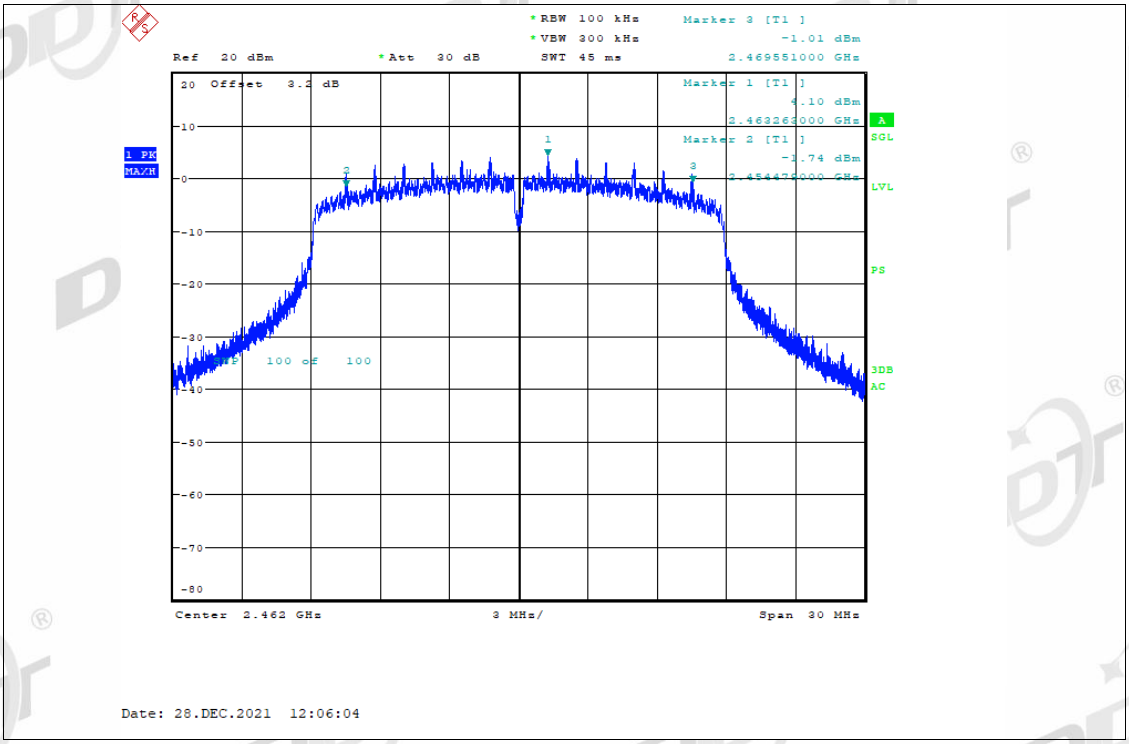
-6dB Bandwidth NVNT n20 2412MHz Ant1



-6dB Bandwidth NVNT n20 2437MHz Ant1



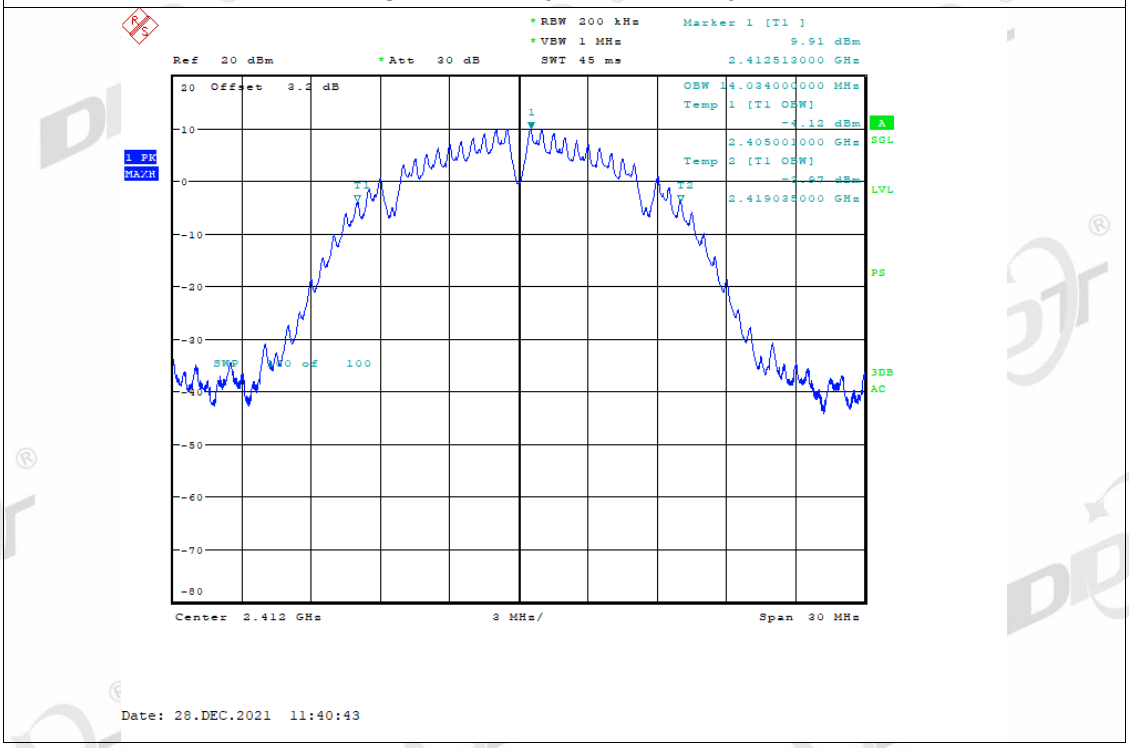
-6dB Bandwidth NVNT n20 2462MHz Ant1



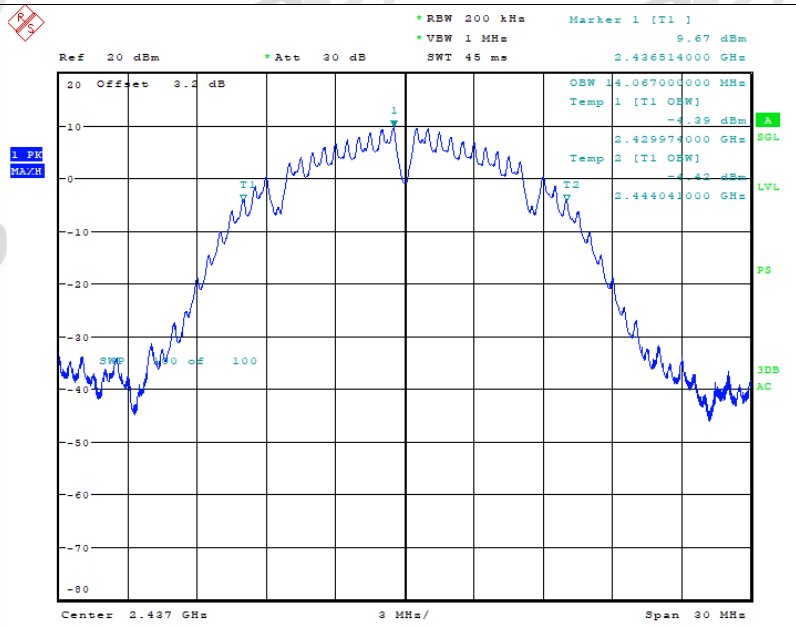
99% Bandwidth

Test Graphs

OBW NVNT b 2412MHz Ant1



OBW NVNT b 2437MHz Ant1



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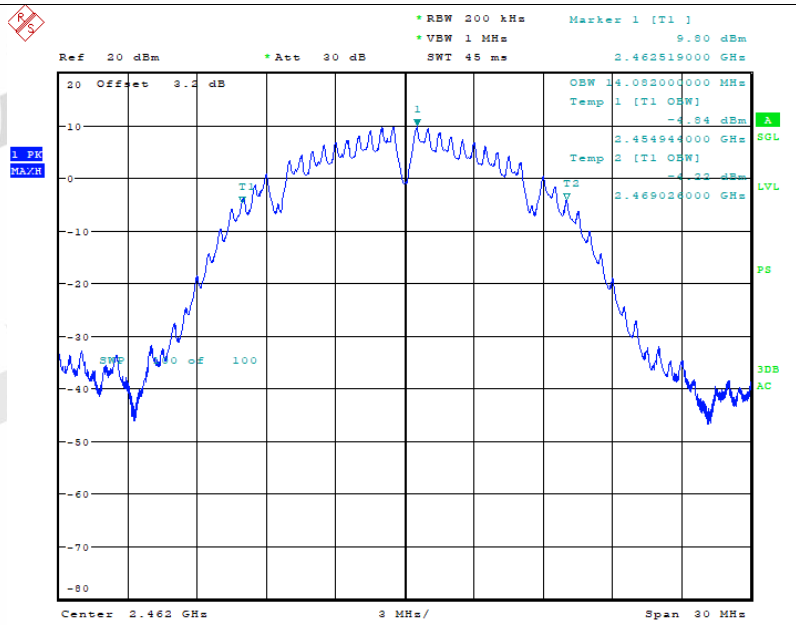

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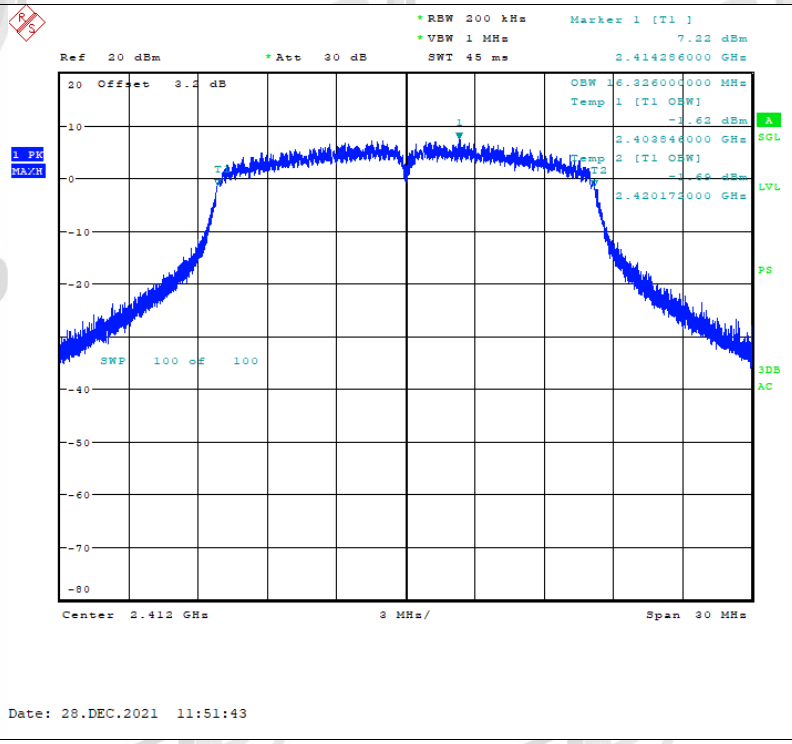
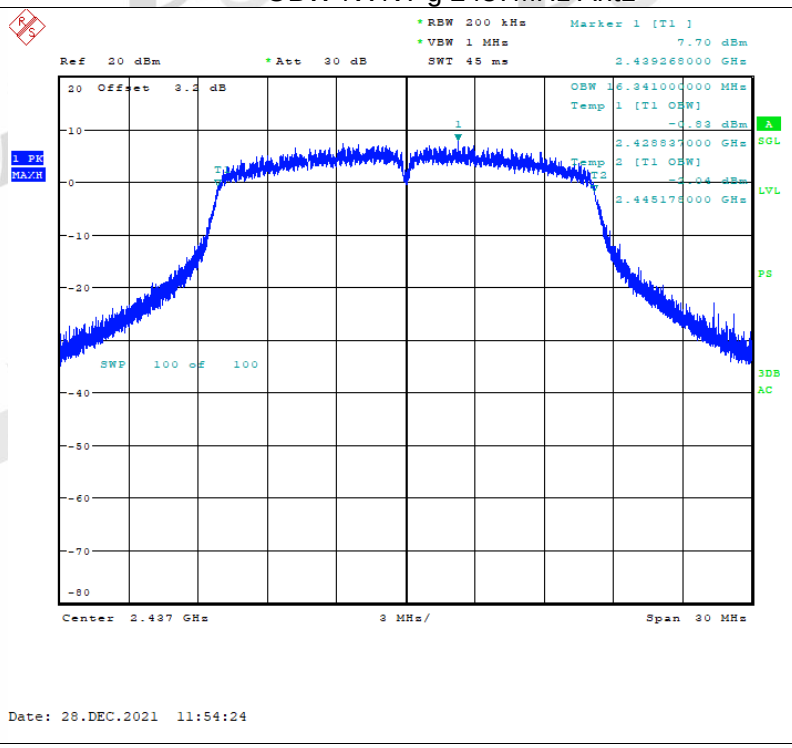
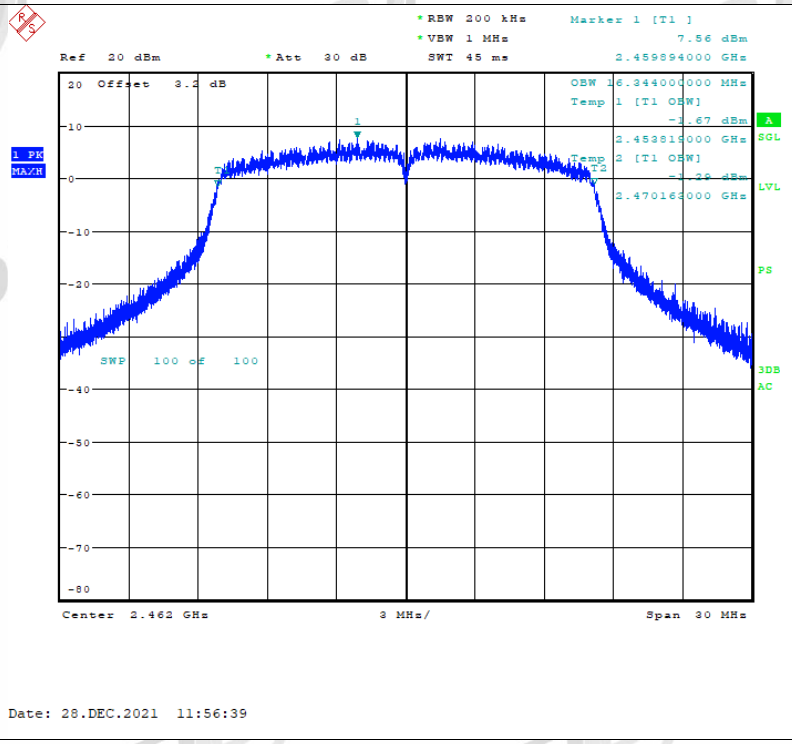


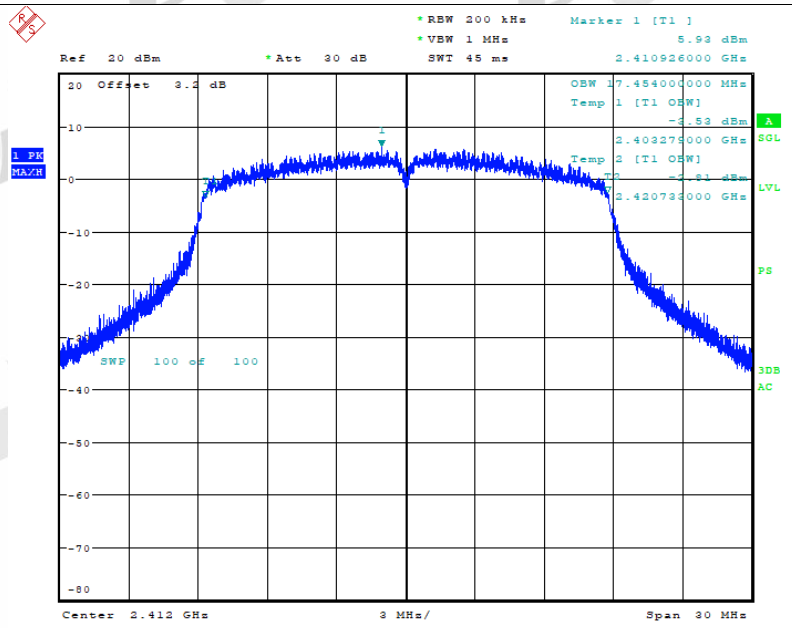
OBW NVNT g 2437MHz Ant1



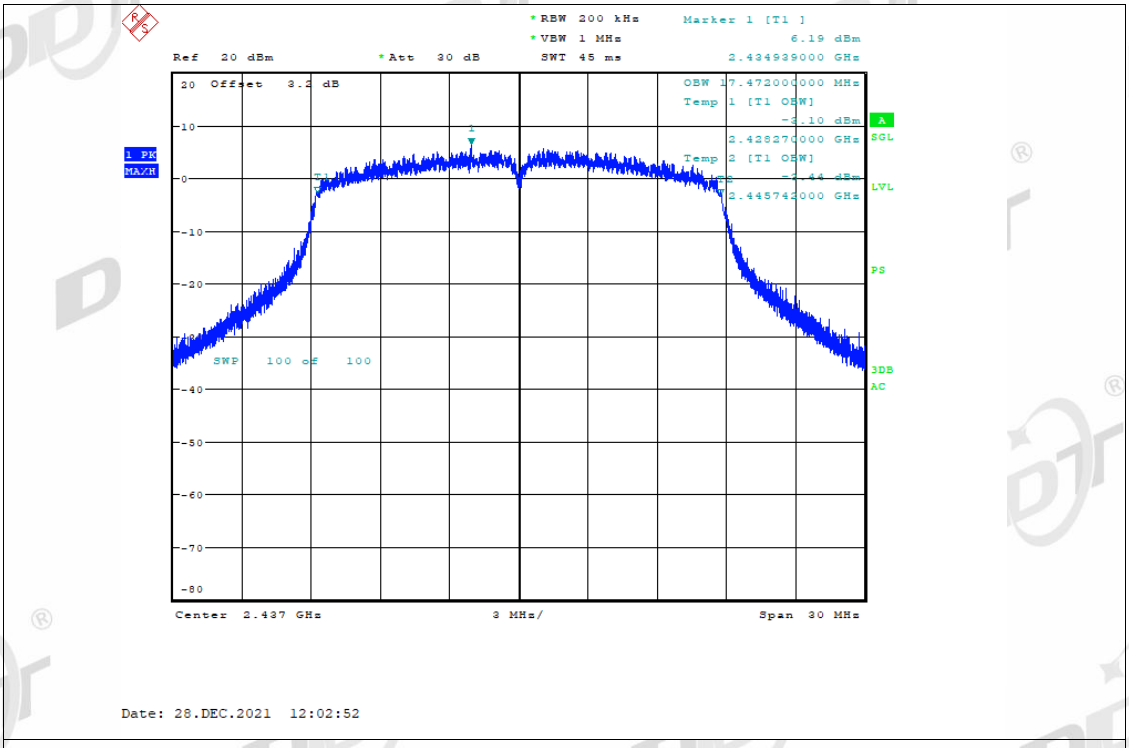
OBW NVNT g 2462MHz Ant1



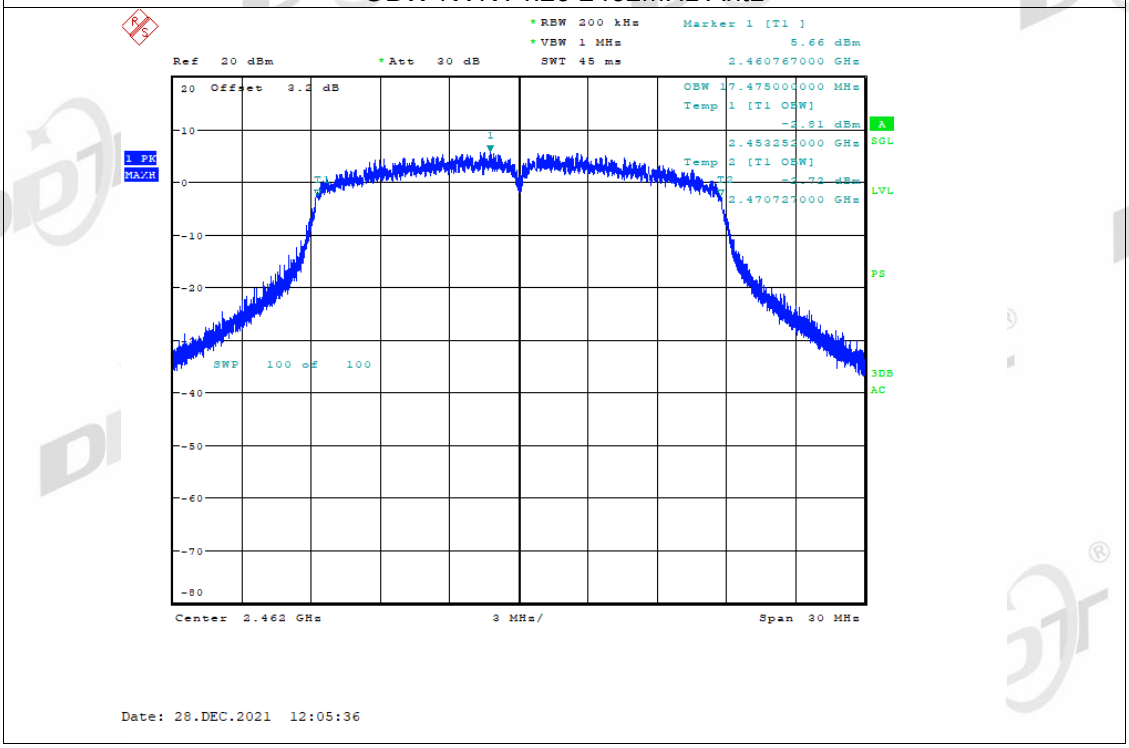
OBW NVNT n20 2412MHz Ant1



OBW NVNT n20 2437MHz Ant1



OBW NVNT n20 2462MHz Ant1



5. Maximum Conducted Output Power

5.1. General information

Test date	2021/12/21 ~ 2022/01/10	Test engineer	Sunny Zhang
Test place	RSE Chamber		

5.2. Block diagram of test setup

Same as section 4.2

5.3. 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.

5.4. Test procedure

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

5.5. Test result

Test Mode	Test Channel	Ant	Power(dBm)	Limit(dBm)	Verdict
11B	2412	ANT1	16.51	30	Pass
11B	2437	ANT1	16.45	30	Pass
11B	2462	ANT1	16.74	30	Pass
11G	2412	ANT1	15.43	30	Pass
11G	2437	ANT1	15.47	30	Pass
11G	2462	ANT1	15.67	30	Pass
11N20SISO	2412	ANT1	14.40	30	Pass
11N20SISO	2437	ANT1	13.95	30	Pass
11N20SISO	2462	ANT1	14.34	30	Pass

6. Power Spectral Density

6.1. General information

Test date	2021/12/21 ~ 2022/01/10	Test engineer	Sunny Zhang
Test place	RSE Chamber		

6.2. Block diagram of test setup

Same as section 4.2

6.3. 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.

6.4. 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 kHz ≤ RBW ≤ 100 kHz
VBW:	≥ 3RBW
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.

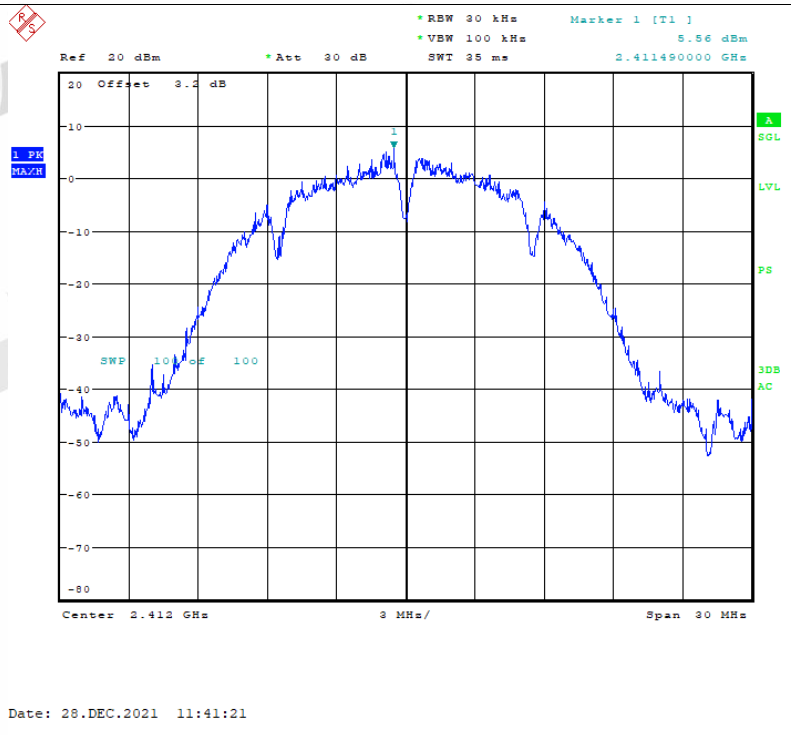
6.5. Test result

Test Mode	Test Channel	Ant	PSD (dBm/30kHz)	Limit(dBm/3kHz)	Verdict
11B	2412	ANT1	5.56	8.00	Pass
11B	2437	ANT1	4.34	8.00	Pass
11B	2462	ANT1	4.41	8.00	Pass
11G	2412	ANT1	0.43	8.00	Pass
11G	2437	ANT1	0.78	8.00	Pass
11G	2462	ANT1	0.25	8.00	Pass
11N20SISO	2412	ANT1	-0.40	8.00	Pass
11N20SISO	2437	ANT1	-1.14	8.00	Pass
11N20SISO	2462	ANT1	-0.76	8.00	Pass

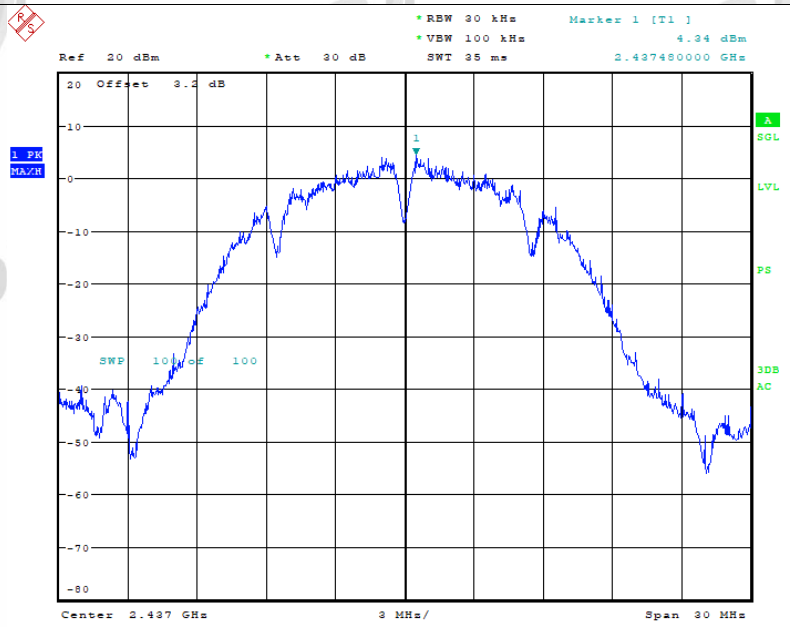
6.6. original test data

Test Graphs

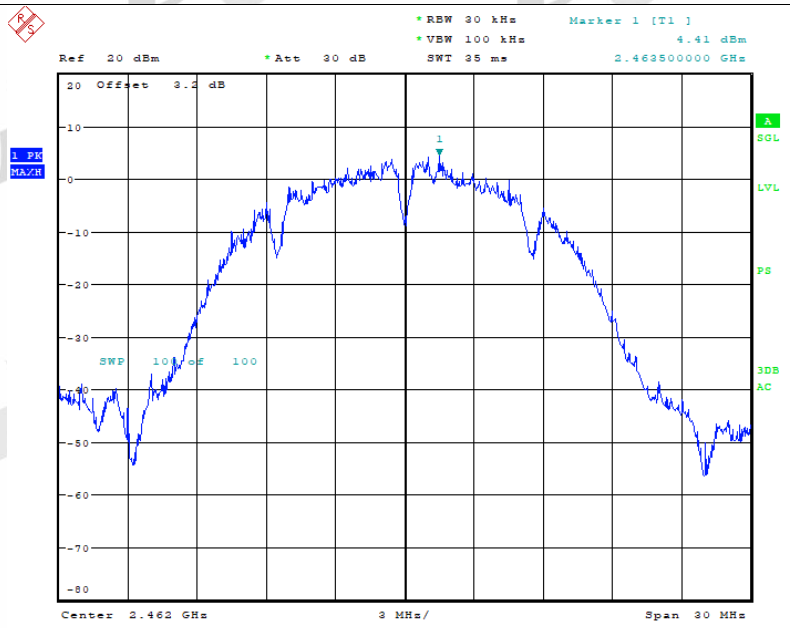
PSD NVNT b 2412MHz Ant1



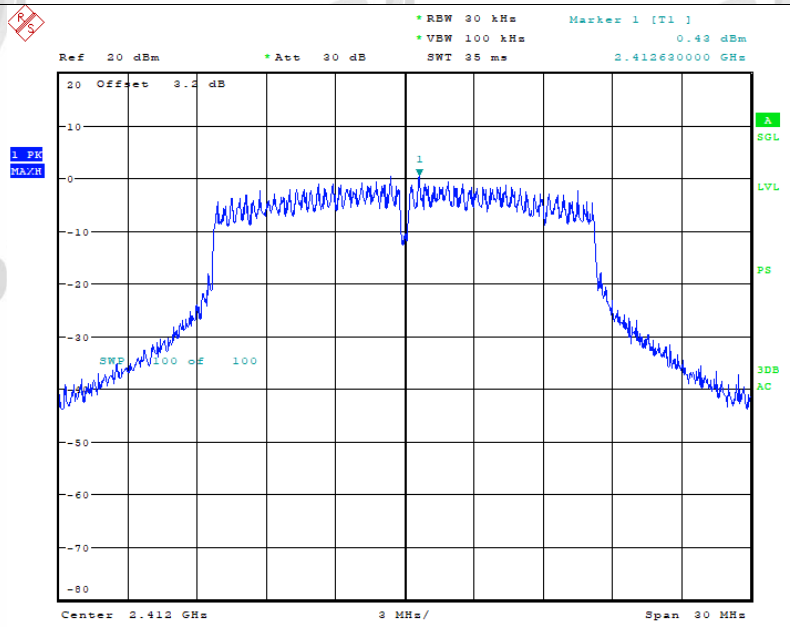
PSD NVNT b 2437MHz Ant1



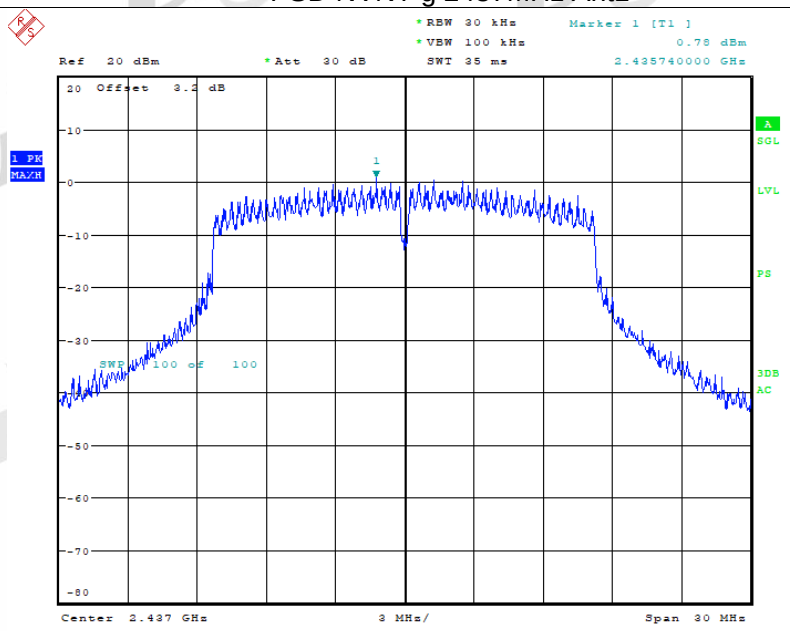
PSD NVNT b 2462MHz Ant1



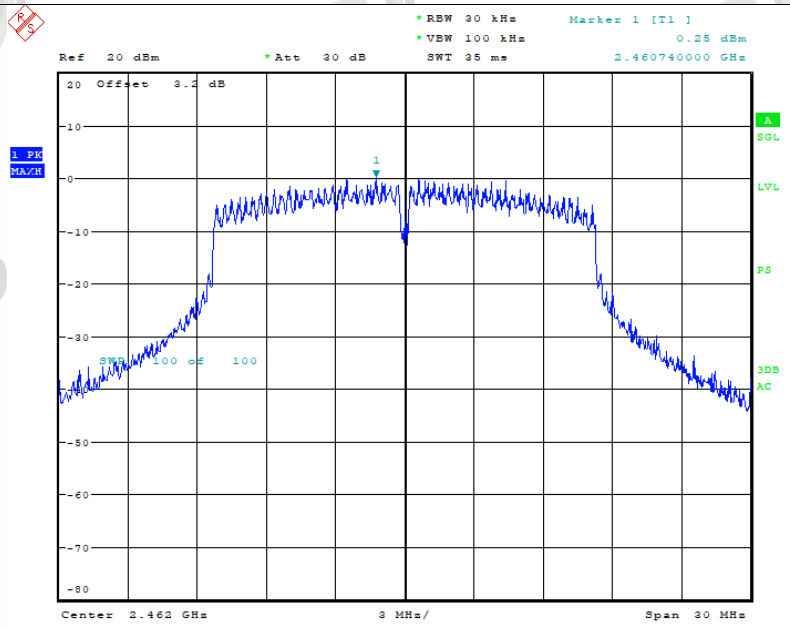
PSD NVNT g 2412MHz Ant1



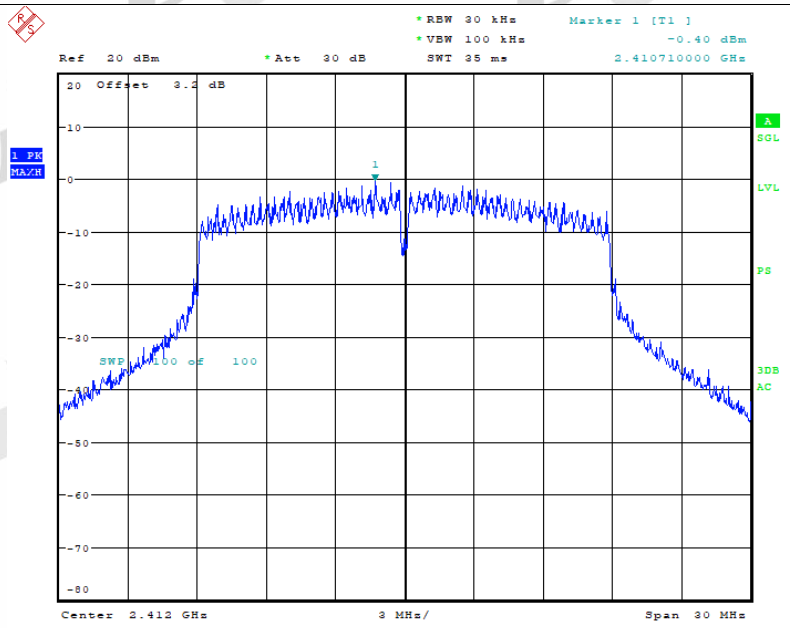
PSD NVNT g 2437MHz Ant1



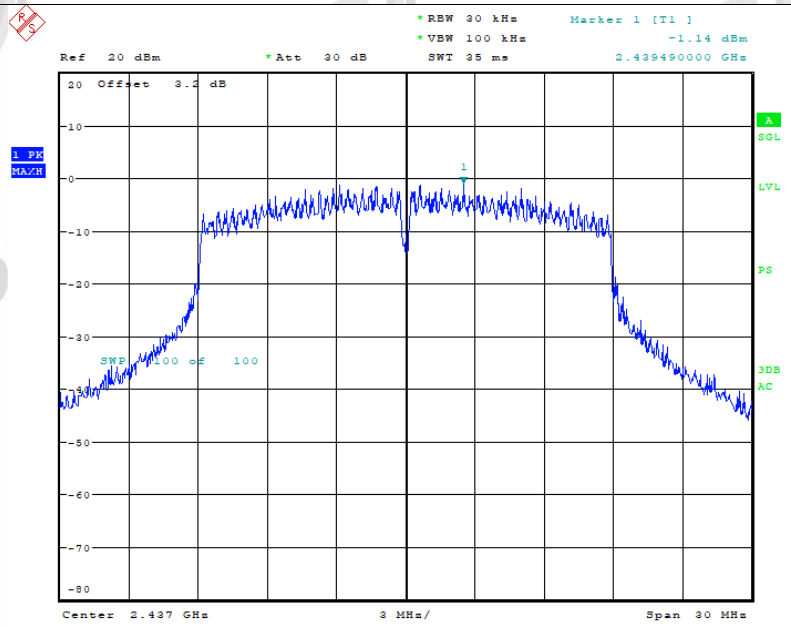
PSD NVNT g 2462MHz Ant1



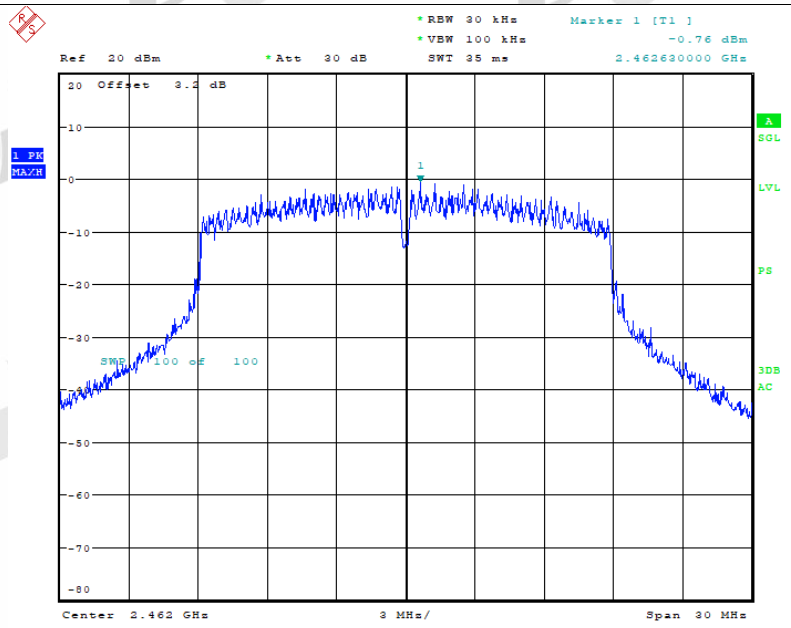
PSD NVNT n20 2412MHz Ant1



PSD NVNT n20 2437MHz Ant1



PSD NVNT n20 2462MHz Ant1



7. Band Edge and Spurious Emissions (Conducted)

7.1. General information

Test date	2021/12/21 ~ 2022/01/10	Test engineer	Sunny Zhang
Test place	RSE Chamber		

7.2. Block diagram of test setup

Same as section 4.2

7.3. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

7.4. 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	≥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

7.5. Test result

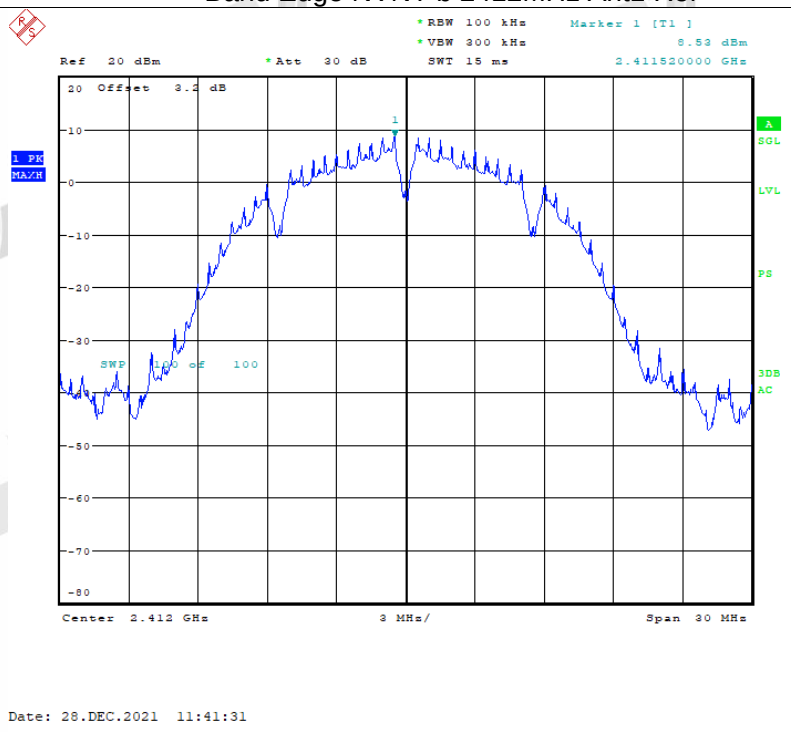
EUT Set Mode	CH or Frequency	Ant1 Result (dBm)	EUT Set Mode	CH or Frequency	Ant1 Result Result (dBm)
11b	CH1	Pass	11n HT 20	CH1	Pass
	CH6	Pass		CH6	Pass
	CH11	Pass		CH11	Pass
11g	CH1	Pass	11n HT 40	CH3	/
	CH6	Pass		CH6	/
	CH11	Pass		CH9	/

7.6. original test data

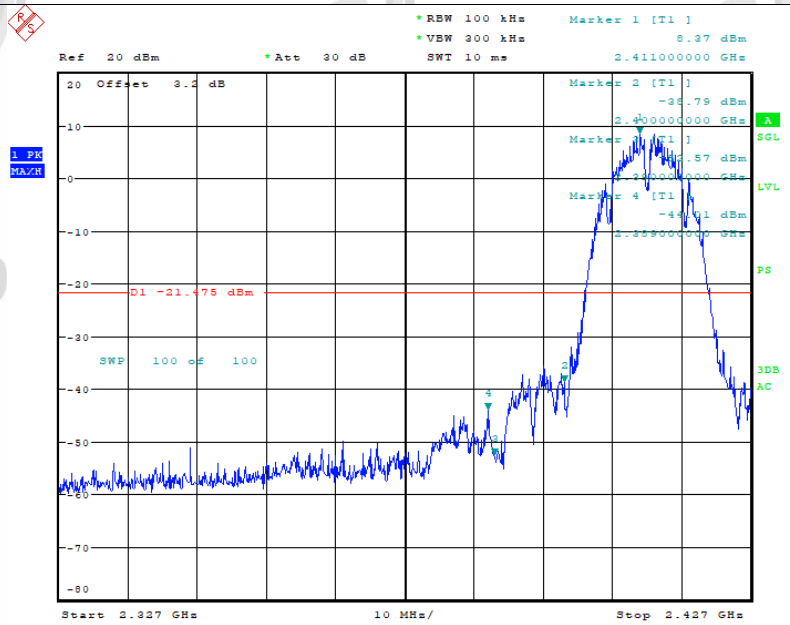
Band Edge

Test Graphs

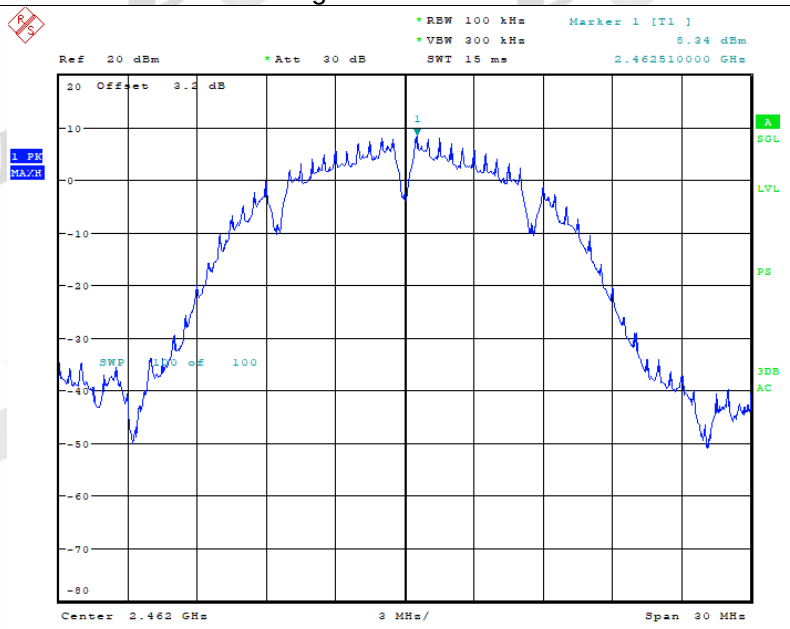
Band Edge NVNT b 2412MHz Ant1 Ref



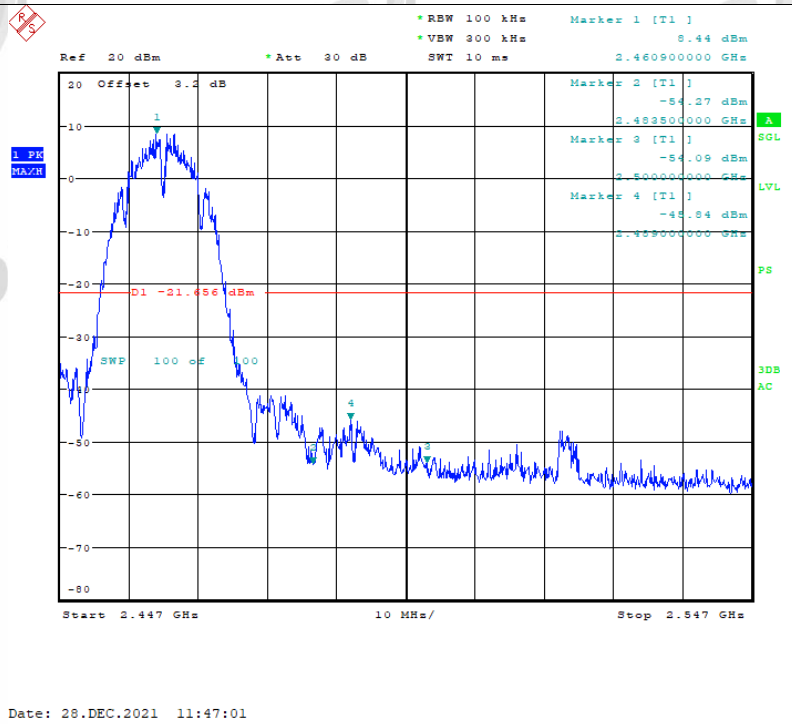
Band Edge NVNT b 2412MHz Ant1 Emission



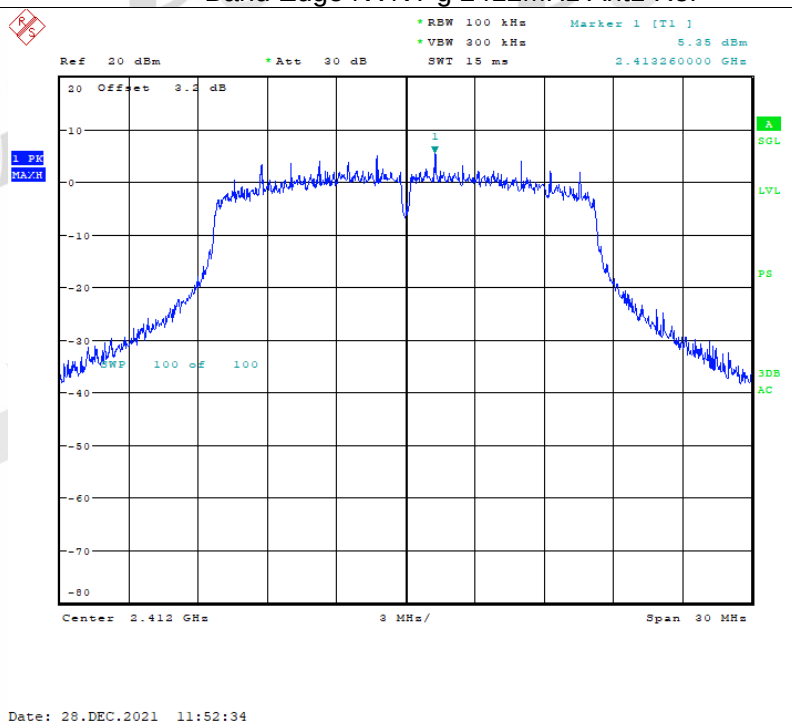
Band Edge NVNT b 2462MHz Ant1 Ref



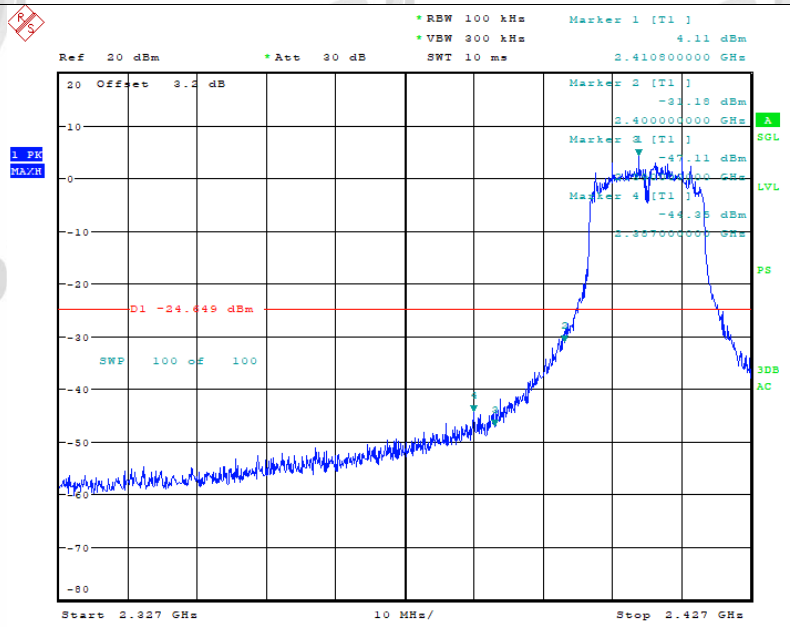
Band Edge NVNT b 2462MHz Ant1 Emission



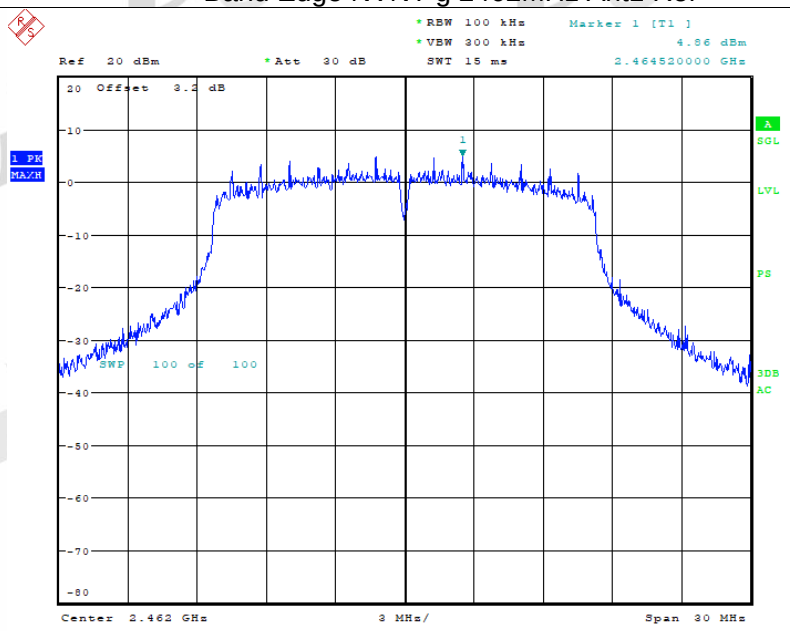
Band Edge NVNT g 2412MHz Ant1 Ref



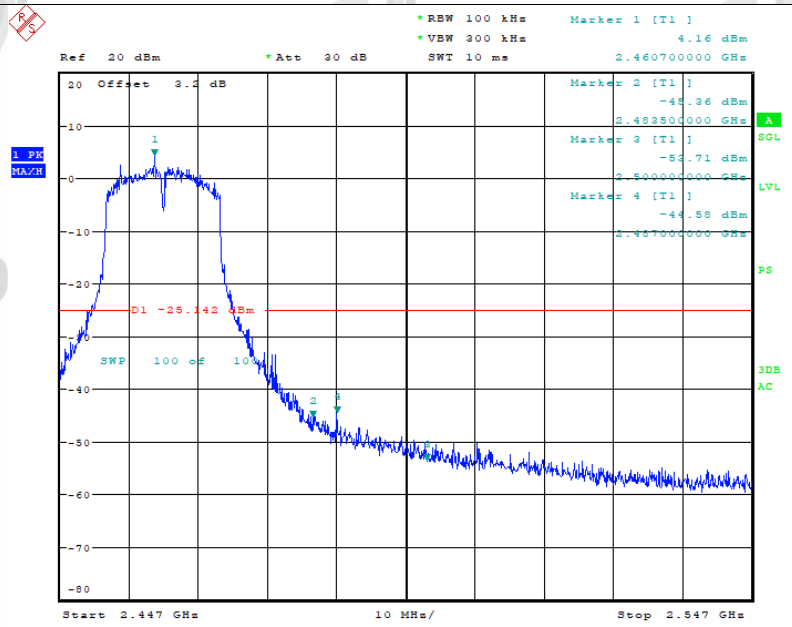
Band Edge NVNT g 2412MHz Ant1 Emission



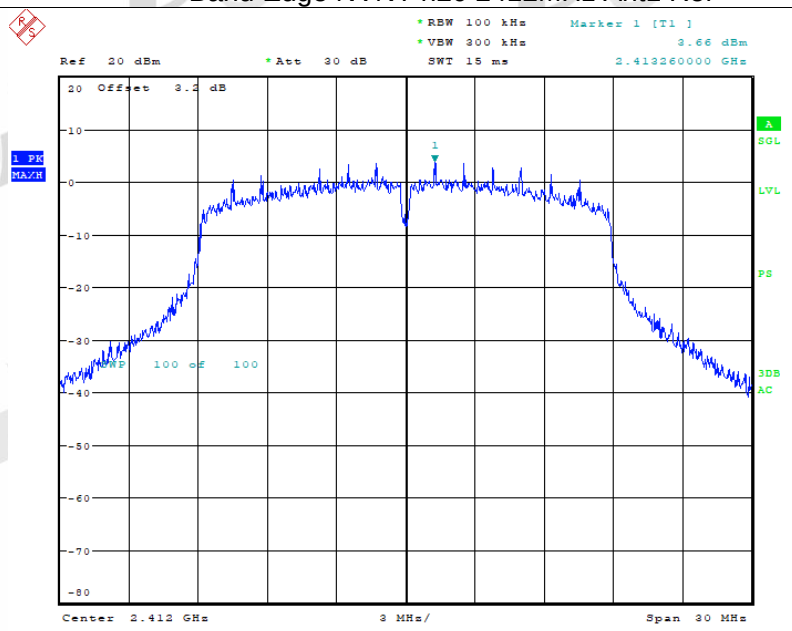
Band Edge NVNT g 2462MHz Ant1 Ref



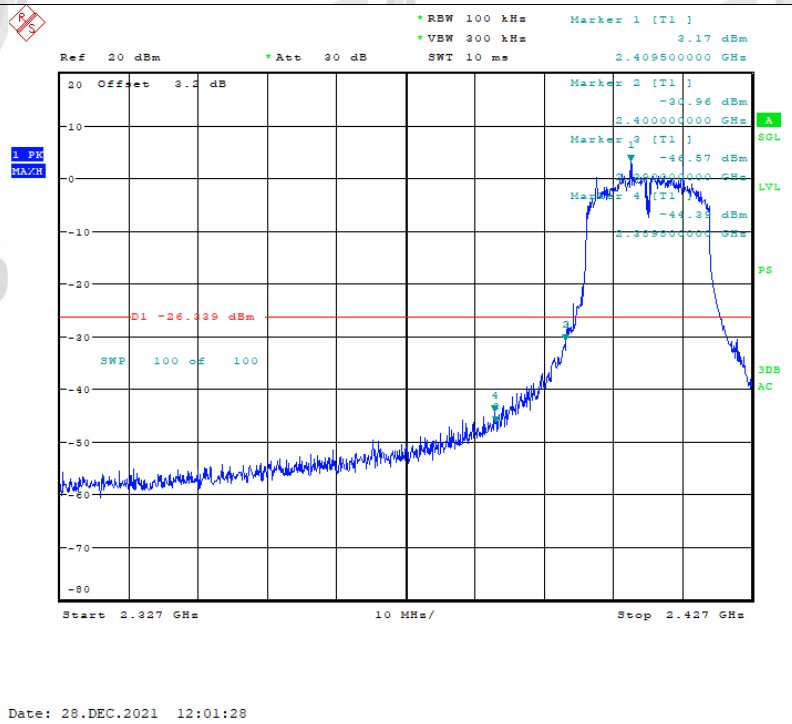
Band Edge NVNT g 2462MHz Ant1 Emission



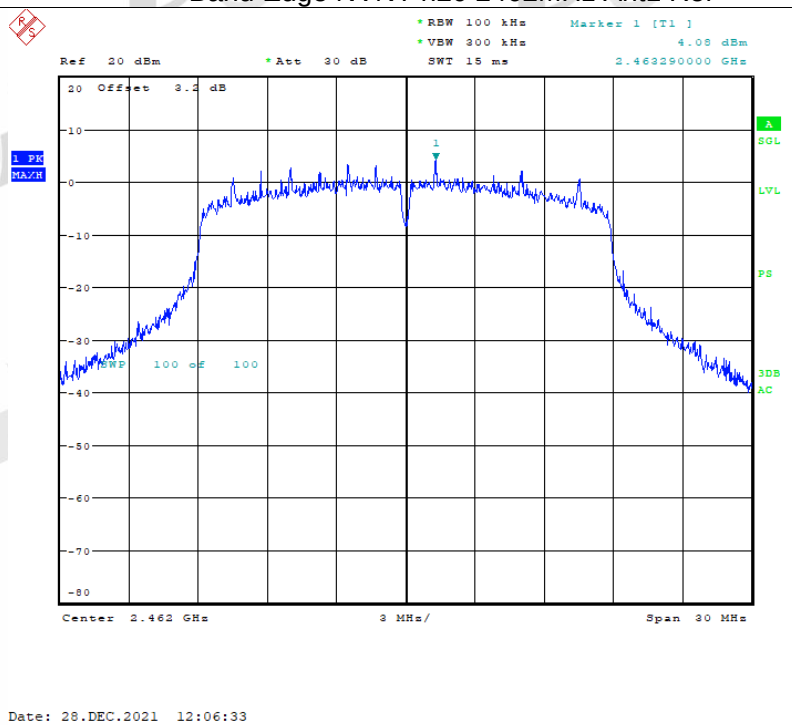
Band Edge NVNT n20 2412MHz Ant1 Ref



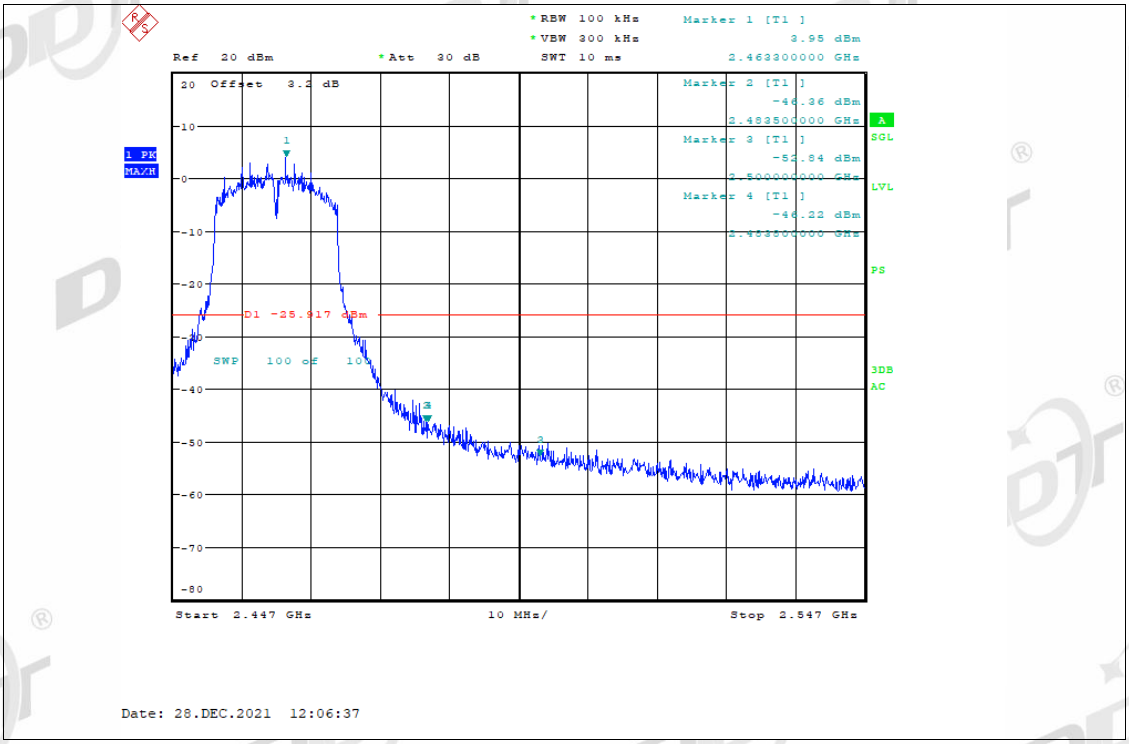
Band Edge NVNT n20 2412MHz Ant1 Emission



Band Edge NVNT n20 2462MHz Ant1 Ref

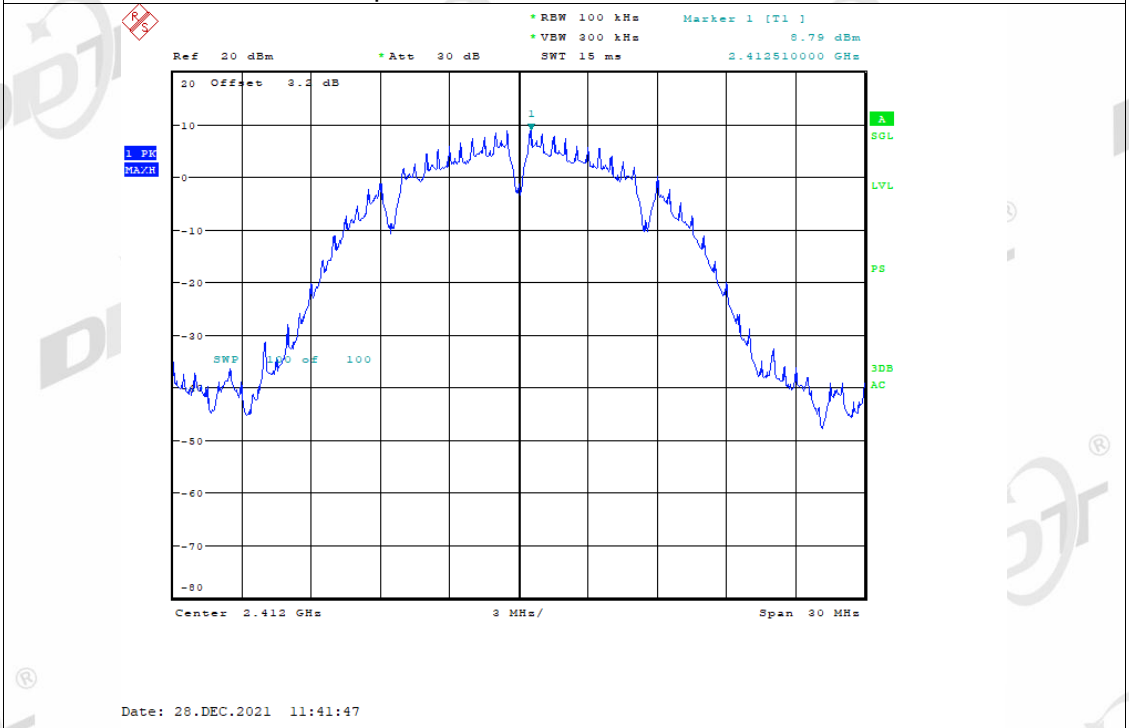


Band Edge NVNT n20 2462MHz Ant1 Emission

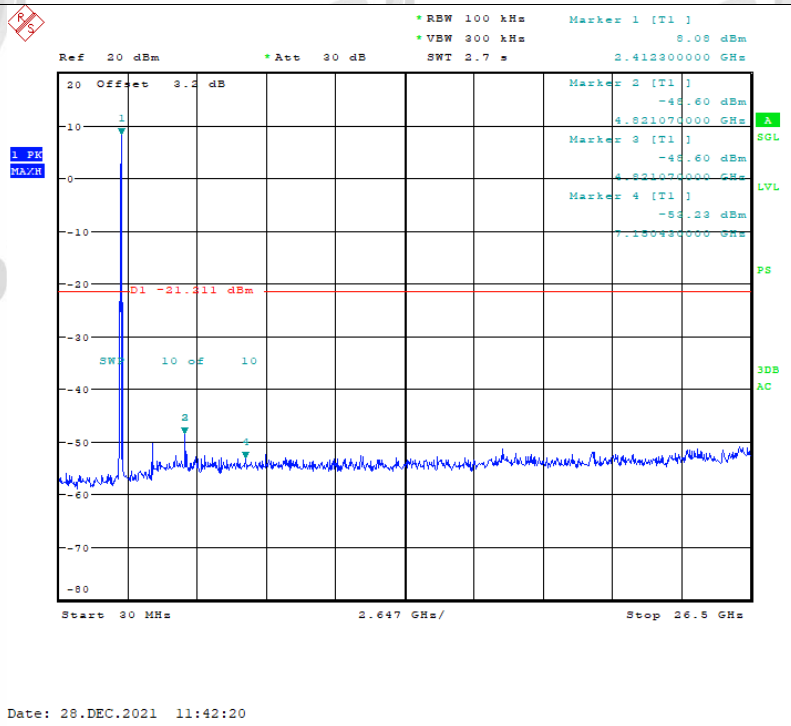


Spurious Emissions

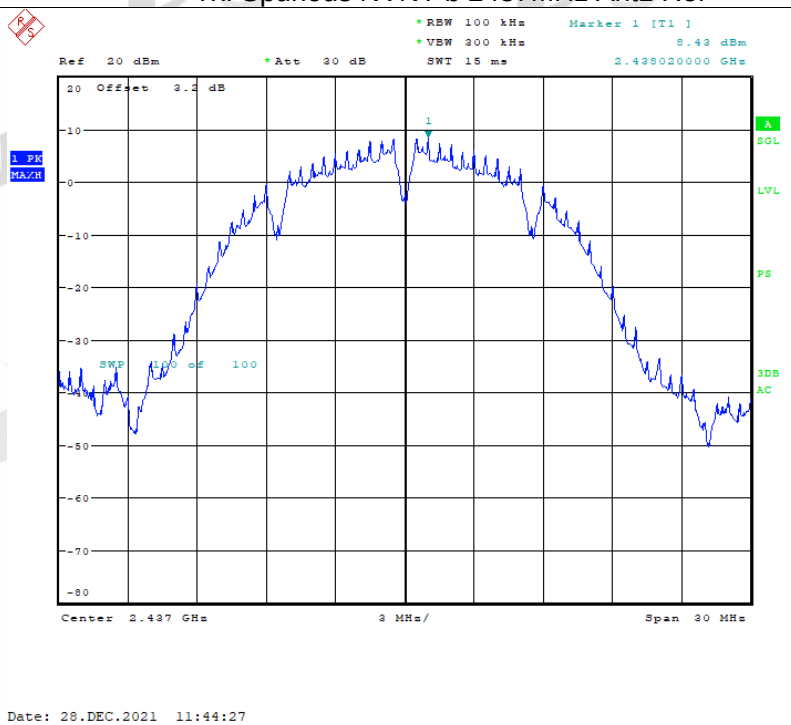
Test Graphs
Tx. Spurious NVNT b 2412MHz Ant1 Ref



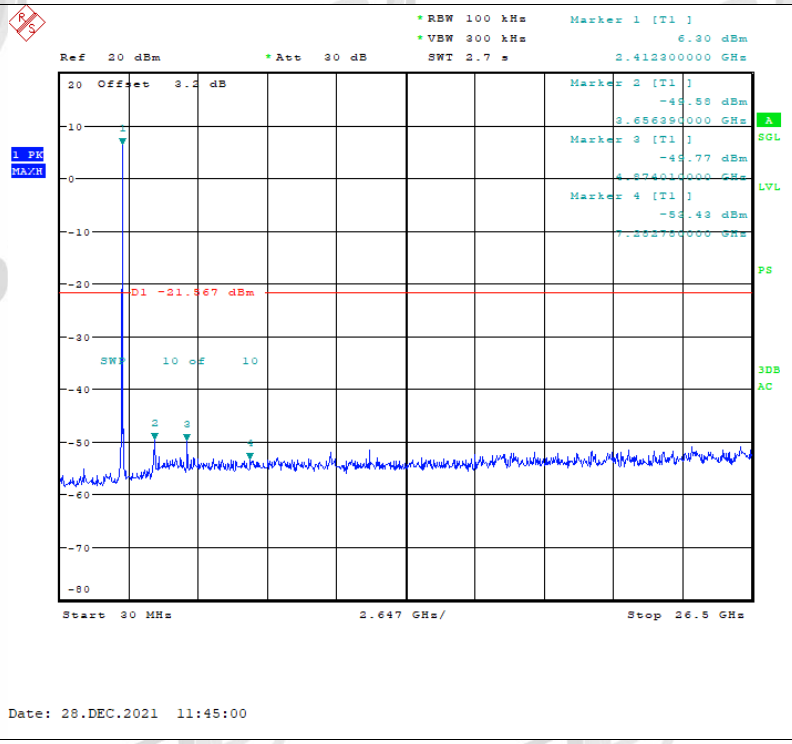
Tx. Spurious NVNT b 2412MHz Ant1 Emission



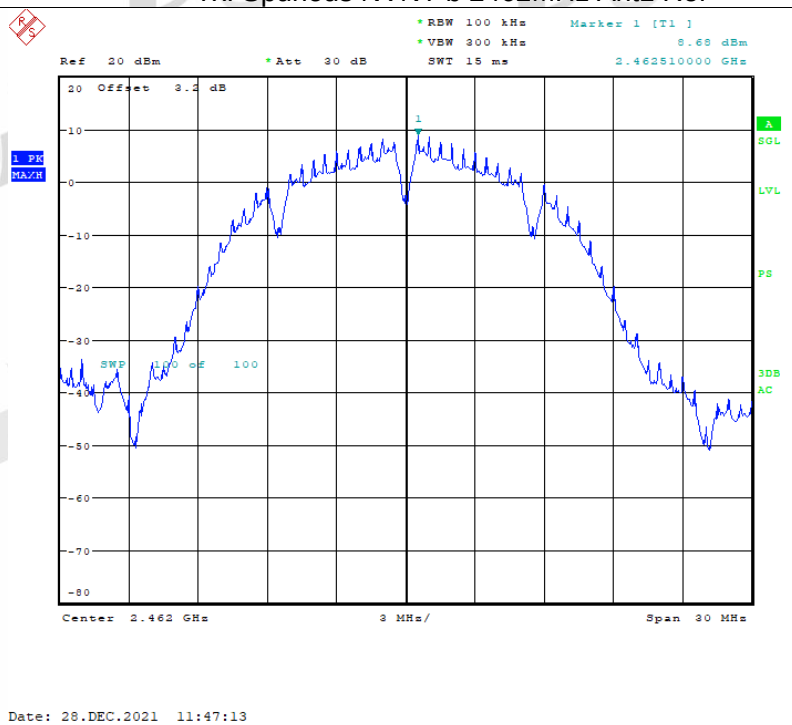
Tx. Spurious NVNT b 2437MHz Ant1 Ref



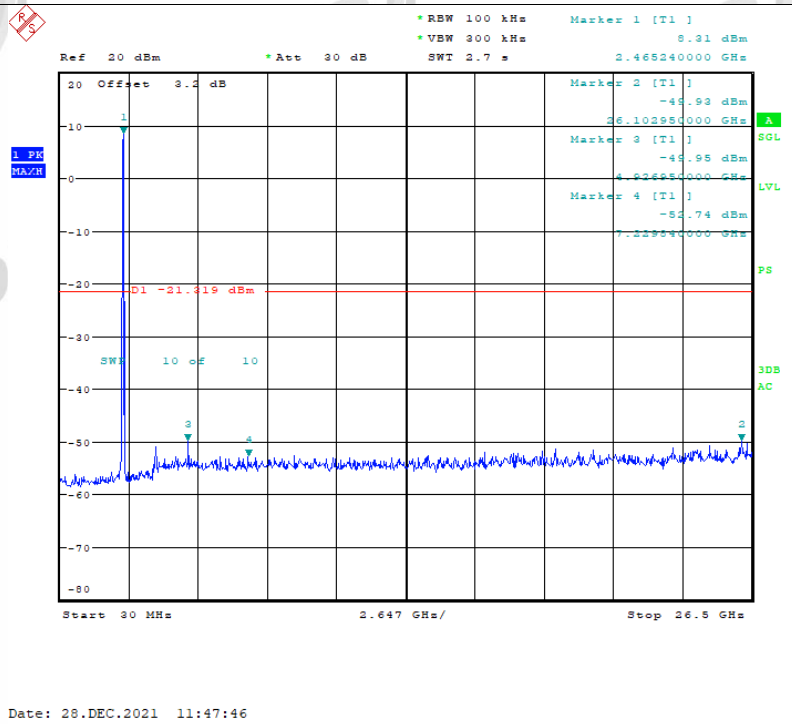
Tx. Spurious NVNT b 2437MHz Ant1 Emission



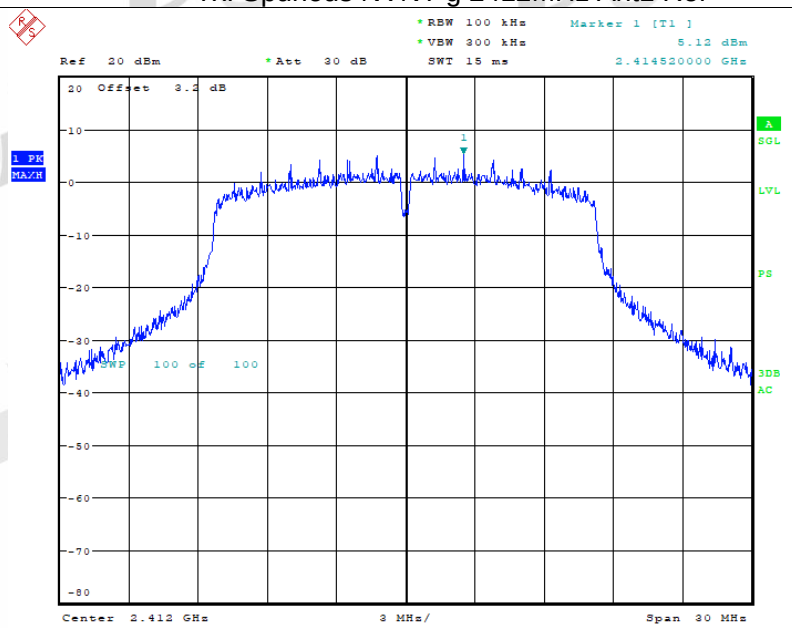
Tx. Spurious NVNT b 2462MHz Ant1 Ref



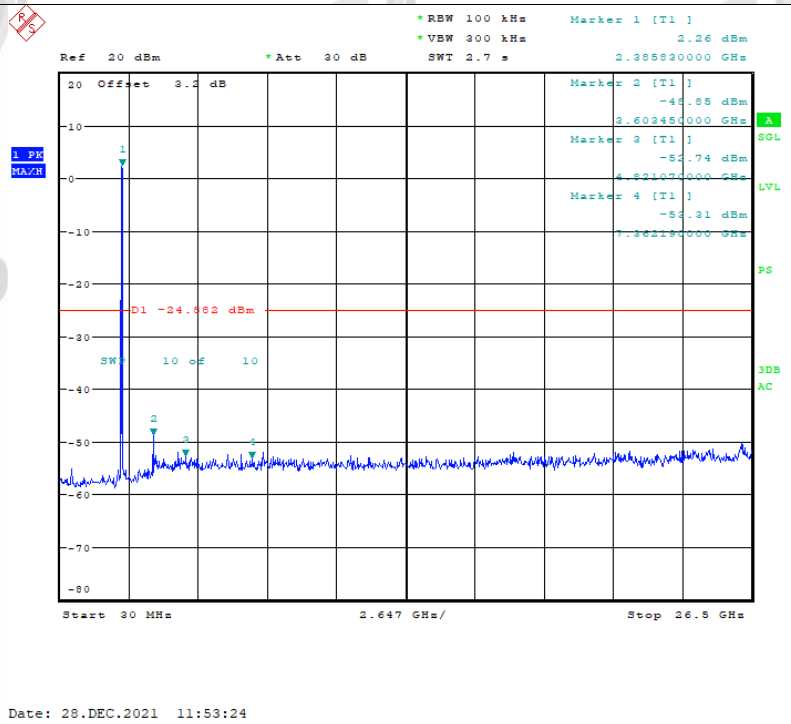
Tx. Spurious NVNT b 2462MHz Ant1 Emission



Tx. Spurious NVNT g 2412MHz Ant1 Ref



Tx. Spurious NVNT g 2412MHz Ant1 Emission



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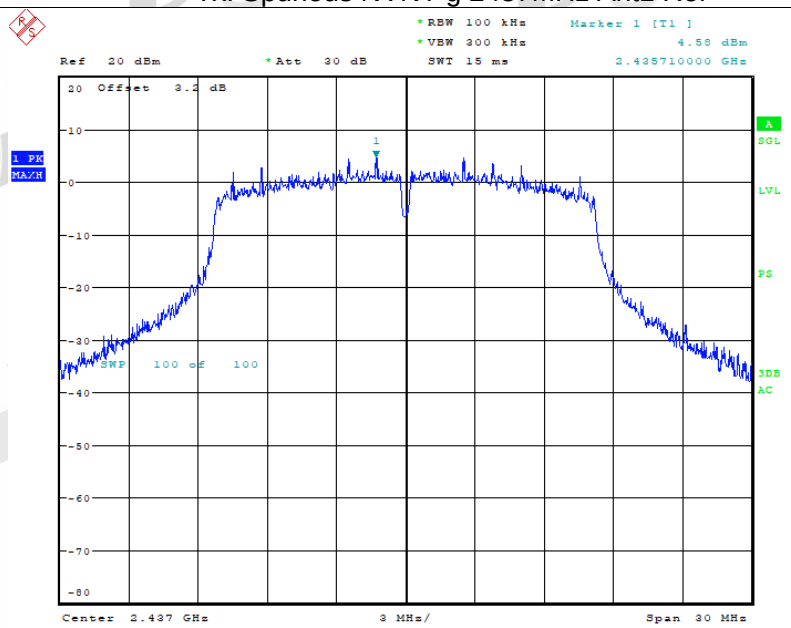
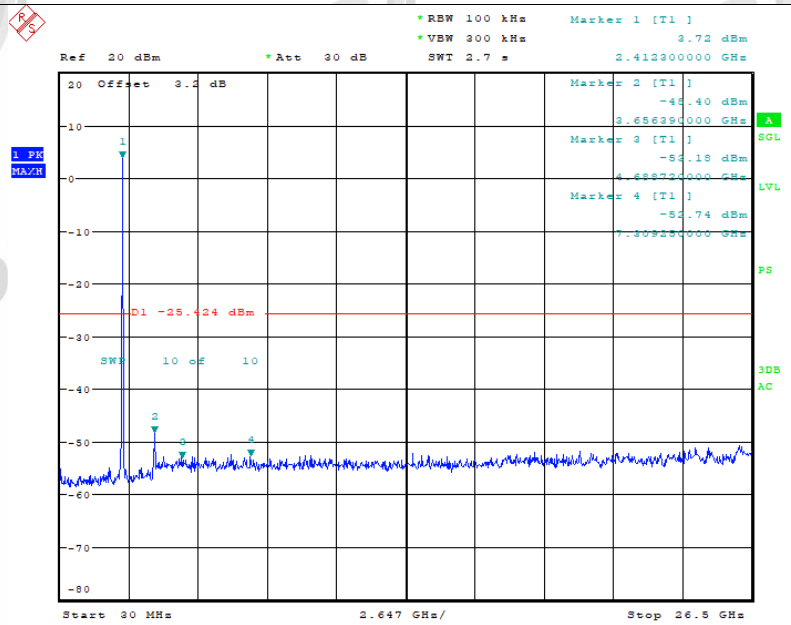
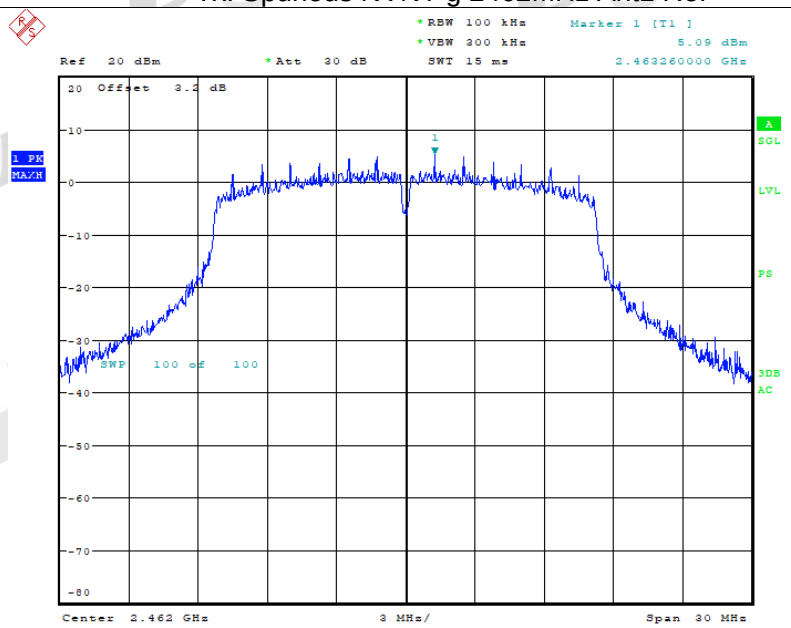


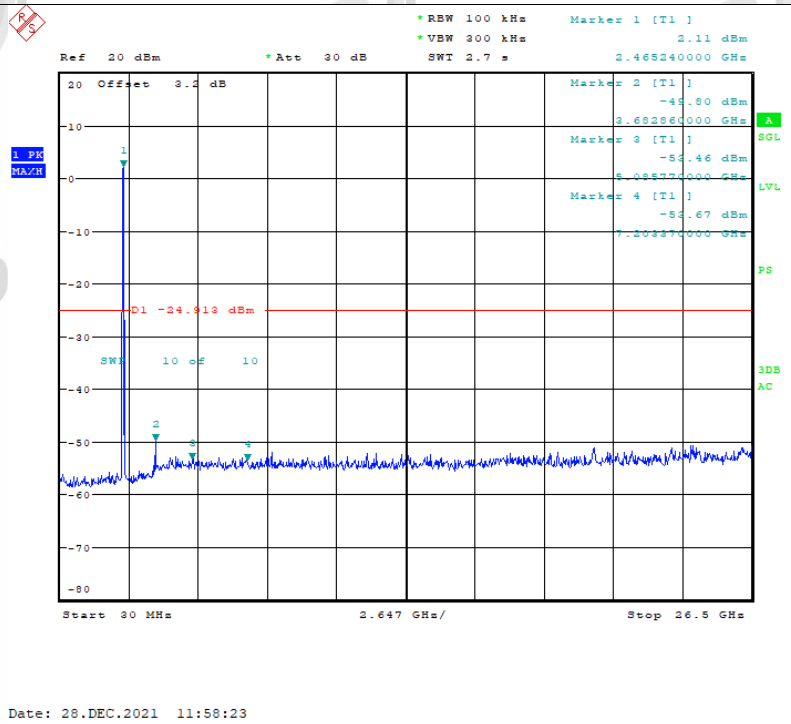
Tx. Spurious NVNT g 2437MHz Ant1 Emission



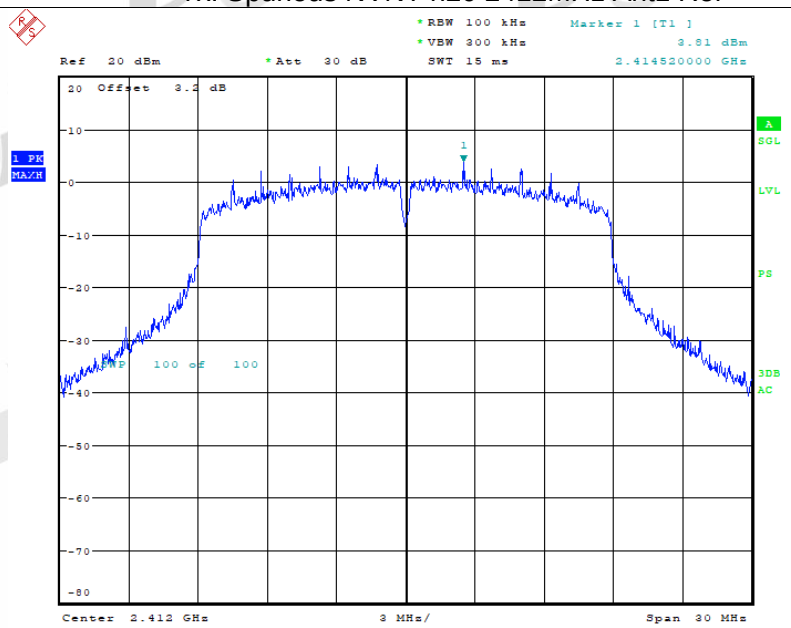
Tx. Spurious NVNT g 2462MHz Ant1 Ref



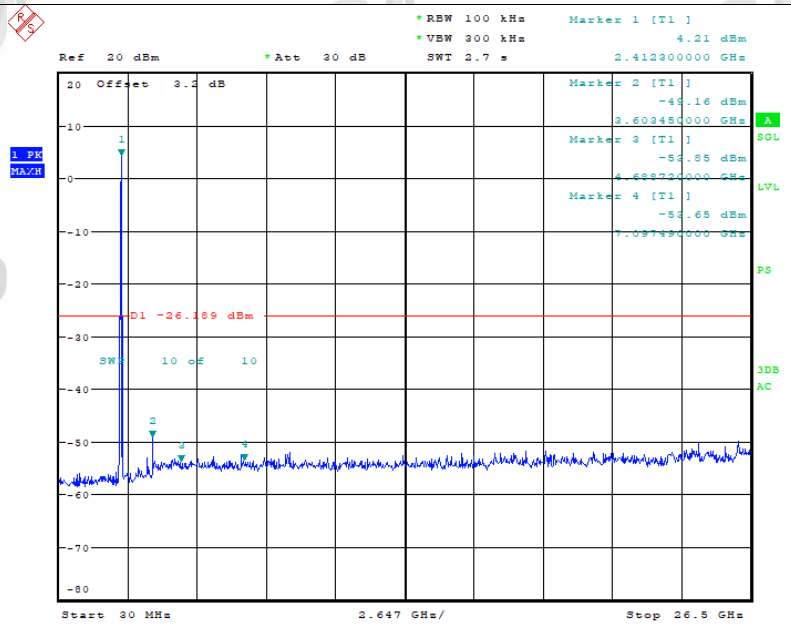
Tx. Spurious NVNT g 2462MHz Ant1 Emission



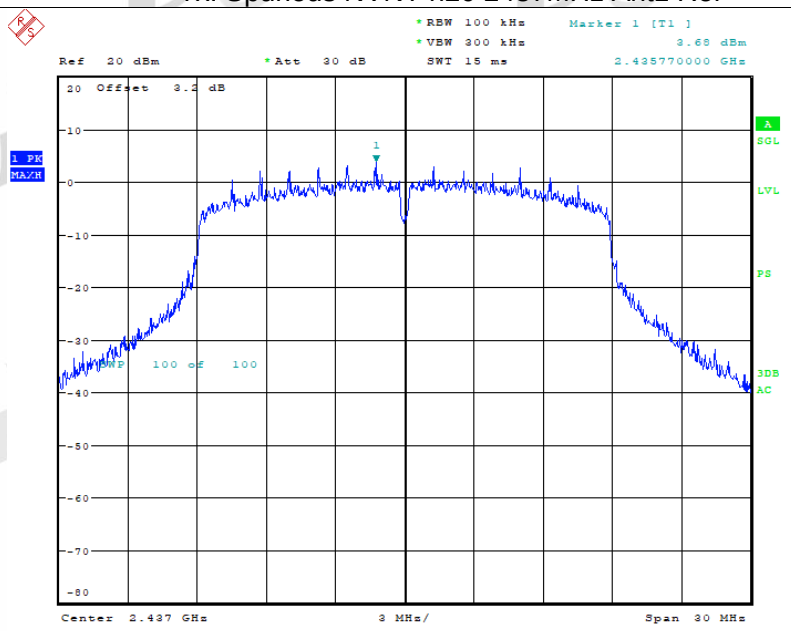
Tx. Spurious NVNT n20 2412MHz Ant1 Ref



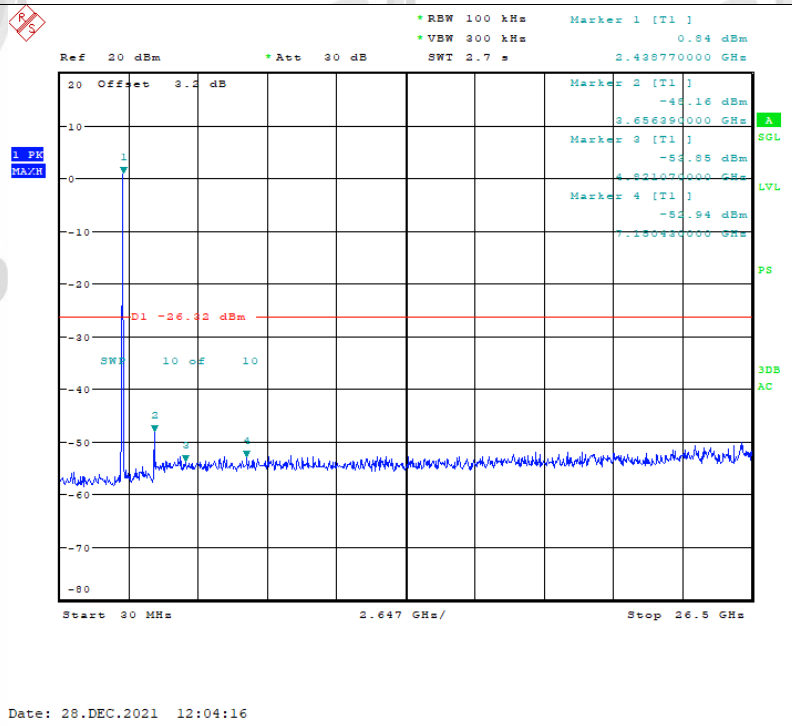
Tx. Spurious NVNT n20 2412MHz Ant1 Emission



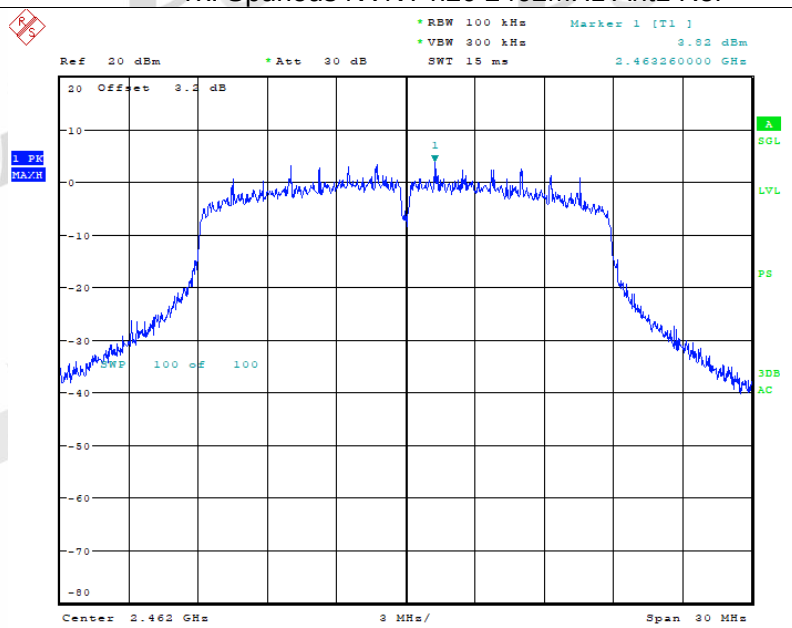
Tx. Spurious NVNT n20 2437MHz Ant1 Ref



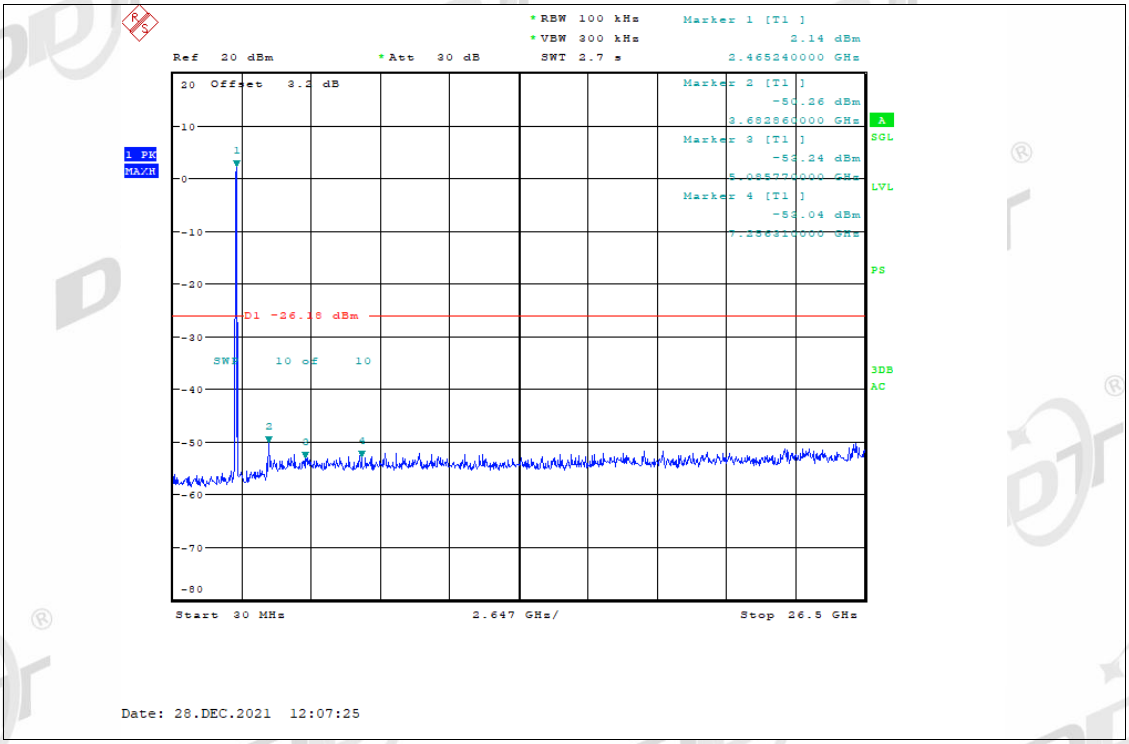
Tx. Spurious NVNT n20 2437MHz Ant1 Emission



Tx. Spurious NVNT n20 2462MHz Ant1 Ref



Tx. Spurious NVNT n20 2462MHz Ant1 Emission


RBW 100 kHz
VBW 300 kHz
SWT 2.7 s
Ref 20 dBm
Att 30 dB
Offset 3.2 dB
Marker 1 [T1]
2.14 dBm
2.465240000 GHz
Marker 2 [T1]
Marker 3 [T1]
Marker 4 [T1]
1 PK
MAXH
A
SGL
LVL
PS
3DB
AC
D1 -26.16 dBm
SWT 10 of 10
Start 30 MHz
2.647 GHz/
Stop 26.5 GHz
Date: 28.DEC.2021 12:07:25

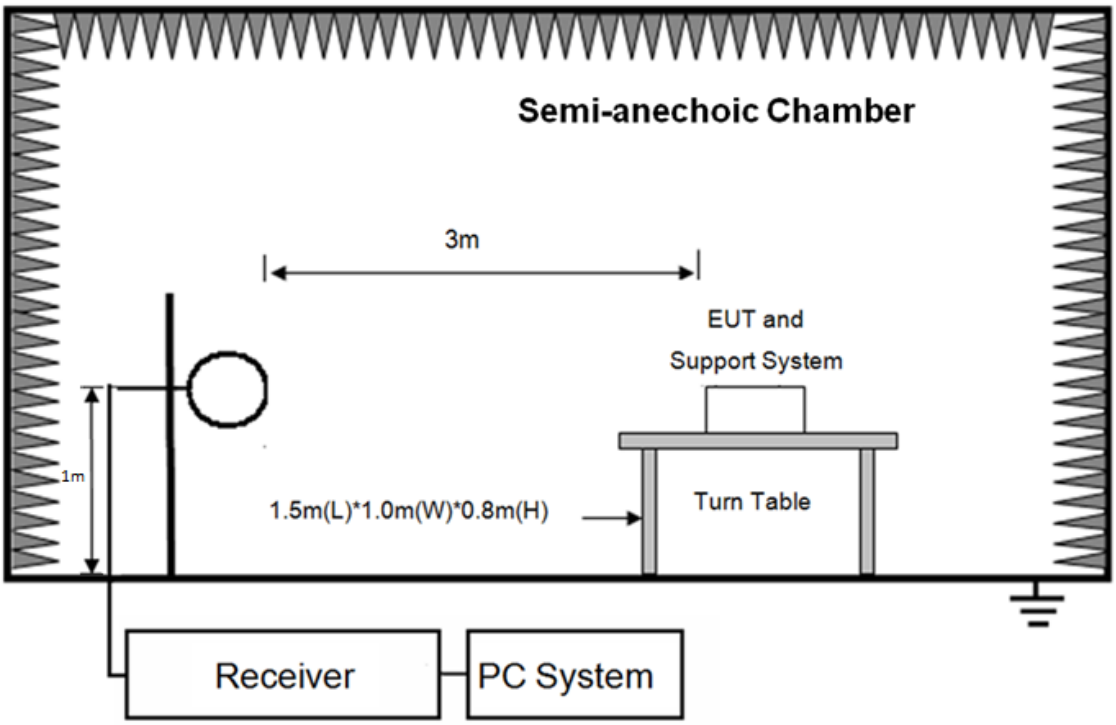
8. Radiated Spurious Emissions

8.1. General information

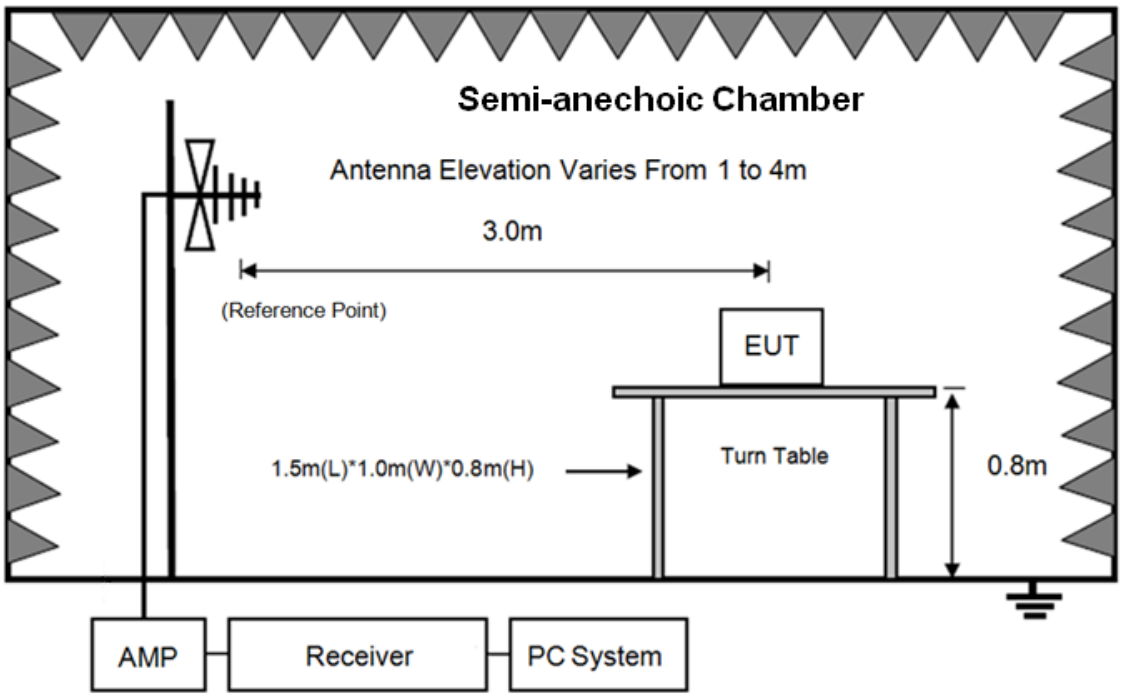
Test date	2021/12/21 ~ 2022/01/10	Test engineer	Sunny Zhang
Test place	10m Chamber		

8.2. Block diagram of test setup

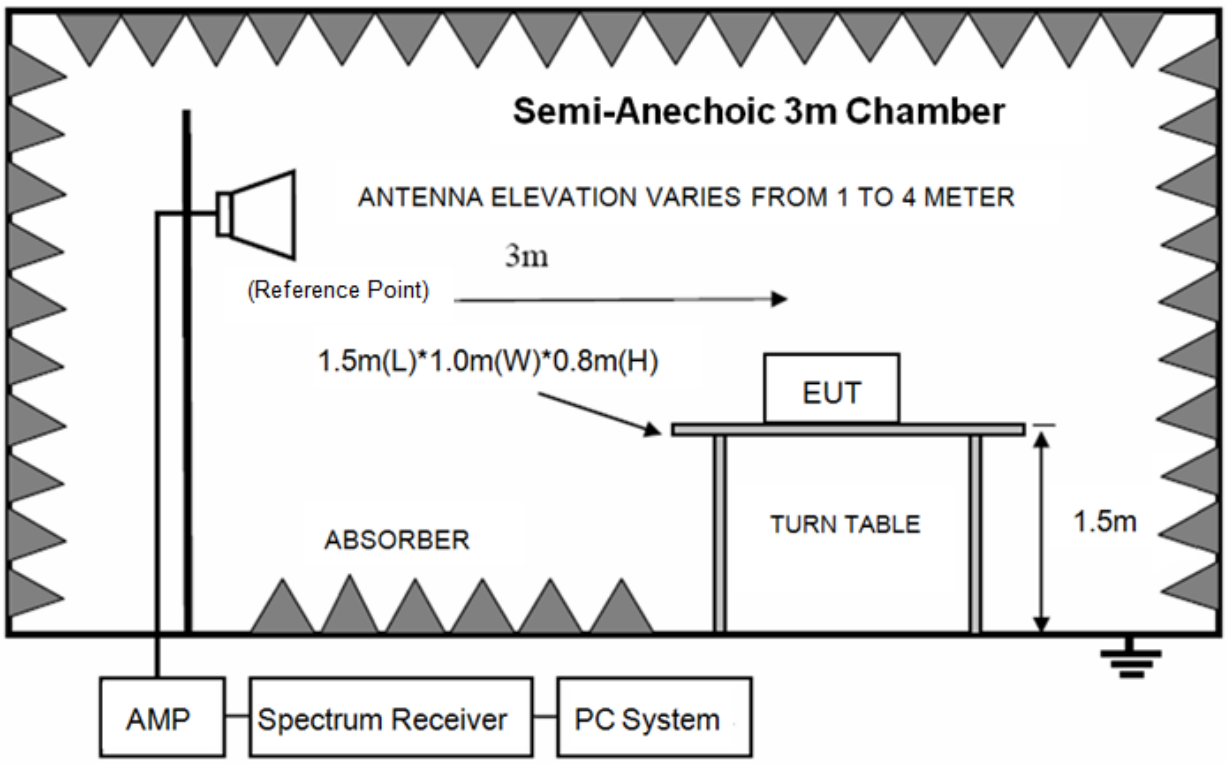
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



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.

8.3. 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			

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

[2]Above 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	
		μV/m	dB(μV)/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:

$$Limit_{3m}(dBuV/m) = Limit_{30m}(dBuV/m) + 40Log(30m/3m)$$

(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.

8.4. 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.

8.5. 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)

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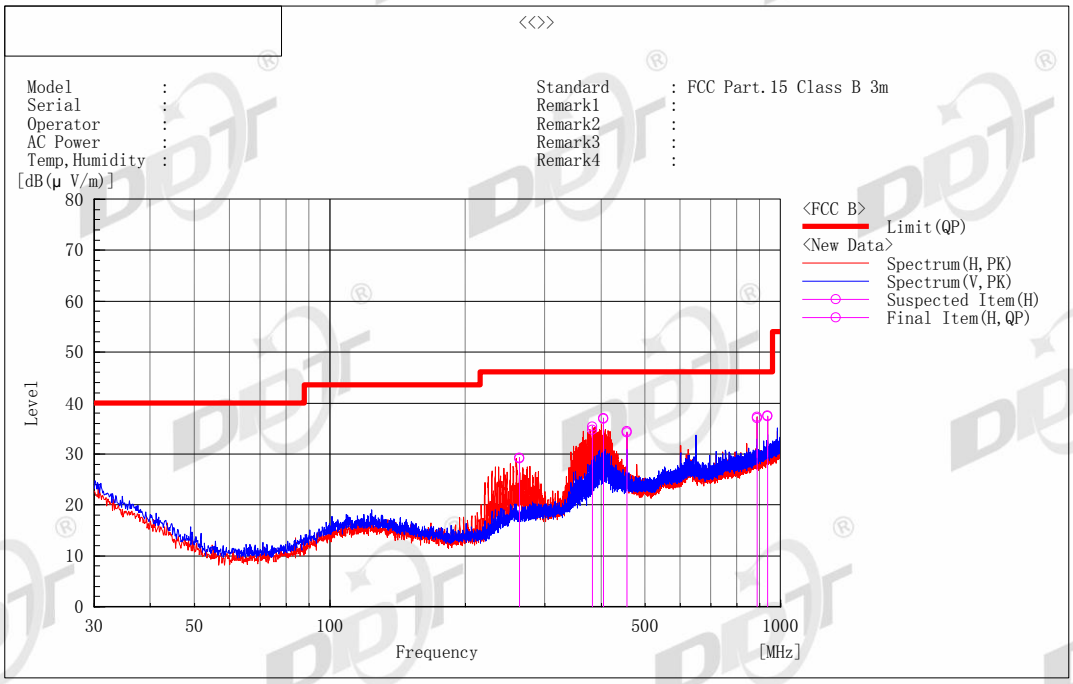


Final Result

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	404.420	H	41.2	-4.3	36.9	46.0	9.1	105.0	286.3	1	
2	888.086	H	33.8	3.2	37.0	46.0	9.0	112.0	276.4	1	
3	936.101	H	33.4	4.1	37.5	46.0	8.5	109.0	281.7	1	
4	263.406	H	38.0	-8.9	29.1	46.0	16.9	124.0	296.2	1	
5	381.989	H	40.2	-5.5	34.7	46.0	11.3	117.0	286.3	1	
6	456.073	H	37.5	-3.1	34.4	46.0	11.6	208.0	164.8	1	

Note) Receiving 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 1M 2412 MHz								
4824.00	42.30	32.55	-31.72	43.13	74.00	-30.87	Peak	HORIZONTAL
7236.00	40.03	36.98	-30.79	46.22	74.00	-27.78	Peak	HORIZONTAL
9795.00	38.45	38.18	-30.07	46.56	74.00	-27.44	Peak	HORIZONTAL
11775.00	37.96	38.65	-28.62	47.99	74.00	-26.01	Peak	HORIZONTAL
14250.00	37.45	41.05	-27.59	50.91	74.00	-23.09	Peak	HORIZONTAL
16875.00	35.72	41.60	-26.58	50.74	74.00	-23.26	Peak	HORIZONTAL
4824.00	42.08	32.55	-31.72	42.91	74.00	-31.09	Peak	VERTICAL
7236.00	40.77	36.98	-30.79	46.96	74.00	-27.04	Peak	VERTICAL
9645.00	39.89	38.09	-30.01	47.97	74.00	-26.03	Peak	VERTICAL
11325.00	38.29	38.70	-28.62	48.37	74.00	-25.63	Peak	VERTICAL
14205.00	37.58	41.11	-27.10	51.59	74.00	-22.41	Peak	VERTICAL
17490.00	37.21	42.89	-27.29	52.81	74.00	-21.19	Peak	VERTICAL
Tx mode 11b 1M 2437 MHz								
4874.00	44.66	32.65	-31.73	45.58	74.00	-28.42	Peak	HORIZONTAL
7311.00	41.15	37.10	-30.76	47.49	74.00	-26.51	Peak	HORIZONTAL
9750.00	39.18	38.15	-30.06	47.27	74.00	-26.73	Peak	HORIZONTAL
11220.00	38.70	38.70	-28.36	49.04	74.00	-24.96	Peak	HORIZONTAL
14115.00	38.91	41.24	-28.02	52.13	74.00	-21.87	Peak	HORIZONTAL
17250.00	35.87	42.55	-26.86	51.56	74.00	-22.44	Peak	HORIZONTAL
4874.00	44.23	32.65	-31.73	45.15	74.00	-28.85	Peak	VERTICAL
7311.00	41.20	37.10	-30.76	47.54	74.00	-26.46	Peak	VERTICAL
10410.00	38.51	38.46	-29.62	47.35	74.00	-26.65	Peak	VERTICAL
11925.00	38.15	38.61	-28.65	48.11	74.00	-25.89	Peak	VERTICAL
14235.00	37.96	41.07	-27.43	51.60	74.00	-22.40	Peak	VERTICAL
16785.00	35.37	41.17	-25.91	50.63	74.00	-23.37	Peak	VERTICAL
Tx mode 11b 1M 2462 MHz								
4924.00	43.13	32.75	-31.68	44.20	74.00	-29.80	Peak	HORIZONTAL
7386.00	40.12	37.22	-30.98	46.36	74.00	-27.64	Peak	HORIZONTAL
9690.00	38.51	38.11	-30.04	46.58	74.00	-27.42	Peak	HORIZONTAL
12540.00	37.54	38.67	-29.26	46.95	74.00	-27.05	Peak	HORIZONTAL
13770.00	38.72	40.94	-28.96	50.70	74.00	-23.30	Peak	HORIZONTAL
17070.00	35.76	42.30	-26.51	51.55	74.00	-22.45	Peak	HORIZONTAL
4924.00	45.01	32.75	-31.68	46.08	74.00	-27.92	Peak	VERTICAL
7386.00	42.78	37.22	-30.98	49.02	74.00	-24.98	Peak	VERTICAL
9240.00	39.84	37.84	-30.41	47.27	74.00	-26.73	Peak	VERTICAL
12030.00	38.38	38.60	-28.77	48.21	74.00	-25.79	Peak	VERTICAL
14145.00	37.73	41.20	-27.68	51.25	74.00	-22.75	Peak	VERTICAL
17160.00	35.97	42.42	-26.87	51.52	74.00	-22.48	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 11g 6M 2412 MHz								
4824.00	39.32	32.55	-31.72	40.15	74.00	-33.85	Peak	HORIZONTAL
7236.00	38.87	36.98	-30.79	45.06	74.00	-28.94	Peak	HORIZONTAL
9645.00	40.18	38.09	-30.01	48.26	74.00	-25.74	Peak	HORIZONTAL
11220.00	38.47	38.70	-28.36	48.81	74.00	-25.19	Peak	HORIZONTAL
12750.00	40.22	39.05	-29.31	49.96	74.00	-24.04	Peak	HORIZONTAL
17490.00	35.59	42.89	-27.29	51.19	74.00	-22.81	Peak	HORIZONTAL
4824.00	38.82	32.55	-31.72	39.65	74.00	-34.35	Peak	VERTICAL
7236.00	39.27	36.98	-30.79	45.46	74.00	-28.54	Peak	VERTICAL
9390.00	39.92	37.93	-29.80	48.05	74.00	-25.95	Peak	VERTICAL
12735.00	38.66	39.02	-29.24	48.44	74.00	-25.56	Peak	VERTICAL
14280.00	38.10	41.01	-27.91	51.20	74.00	-22.80	Peak	VERTICAL
17115.00	36.48	42.36	-26.80	52.04	74.00	-21.96	Peak	VERTICAL
Tx mode 11g 6M 2437 MHz								
4874.00	39.54	32.65	-31.73	40.46	74.00	-33.54	Peak	HORIZONTAL
7311.00	40.44	37.10	-30.76	46.78	74.00	-27.22	Peak	HORIZONTAL
10110.00	37.79	38.34	-29.69	46.44	74.00	-27.56	Peak	HORIZONTAL
11175.00	37.57	38.70	-28.40	47.87	74.00	-26.13	Peak	HORIZONTAL
14220.00	37.66	41.09	-27.27	51.48	74.00	-22.52	Peak	HORIZONTAL
17175.00	35.96	42.44	-26.89	51.51	74.00	-22.49	Peak	HORIZONTAL
4874.00	39.83	32.65	-31.73	40.75	74.00	-33.25	Peak	VERTICAL
7311.00	39.74	37.10	-30.76	46.08	74.00	-27.92	Peak	VERTICAL
10650.00	38.18	38.56	-29.43	47.31	74.00	-26.69	Peak	VERTICAL
12285.00	38.94	38.60	-29.28	48.26	74.00	-25.74	Peak	VERTICAL
13980.00	39.41	41.36	-28.44	52.33	74.00	-21.67	Peak	VERTICAL
16800.00	36.05	41.24	-25.80	51.49	74.00	-22.51	Peak	VERTICAL
Tx mode 11g 6M 2462 MHz								
4924.00	37.56	32.75	-31.68	38.63	74.00	-35.37	Peak	HORIZONTAL
7386.00	39.14	37.22	-30.98	45.38	74.00	-28.62	Peak	HORIZONTAL
9750.00	38.48	38.15	-30.06	46.57	74.00	-27.43	Peak	HORIZONTAL
11190.00	37.43	38.70	-28.34	47.79	74.00	-26.21	Peak	HORIZONTAL
14430.00	38.36	40.80	-27.26	51.90	74.00	-22.10	Peak	HORIZONTAL
16755.00	36.95	41.02	-26.14	51.83	74.00	-22.17	Peak	HORIZONTAL
4924.00	37.03	32.75	-31.68	38.10	74.00	-35.90	Peak	VERTICAL
7386.00	38.32	37.22	-30.98	44.56	74.00	-29.44	Peak	VERTICAL
9450.00	38.67	37.97	-29.99	46.65	74.00	-27.35	Peak	VERTICAL
10935.00	37.97	38.67	-29.05	47.59	74.00	-26.41	Peak	VERTICAL
13725.00	39.54	40.85	-28.92	51.47	74.00	-22.53	Peak	VERTICAL
16680.00	37.76	40.66	-26.49	51.93	74.00	-22.07	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 11 n20 MCS0 2412 MHz								
4824.00	37.97	32.55	-31.72	38.80	74.00	-35.20	Peak	HORIZONTAL
7236.00	38.09	36.98	-30.79	44.28	74.00	-29.72	Peak	HORIZONTAL
9645.00	40.20	38.09	-30.01	48.28	74.00	-25.72	Peak	HORIZONTAL
11070.00	38.00	38.70	-28.74	47.96	74.00	-26.04	Peak	HORIZONTAL
14190.00	37.69	41.13	-27.16	51.66	74.00	-22.34	Peak	HORIZONTAL
17055.00	34.85	42.28	-26.38	50.75	74.00	-23.25	Peak	HORIZONTAL
4824.00	38.07	32.55	-31.72	38.90	74.00	-35.10	Peak	VERTICAL
7236.00	38.53	36.98	-30.79	44.72	74.00	-29.28	Peak	VERTICAL
9645.00	39.96	38.09	-30.01	48.04	74.00	-25.96	Peak	VERTICAL
12795.00	38.61	39.13	-29.51	48.23	74.00	-25.77	Peak	VERTICAL
14265.00	38.52	41.03	-27.75	51.80	74.00	-22.20	Peak	VERTICAL
16965.00	36.02	42.03	-26.22	51.83	74.00	-22.17	Peak	VERTICAL
Tx mode 11 n20 MCS0 2437 MHz								
4874.00	40.20	32.65	-31.73	41.12	74.00	-32.88	Peak	HORIZONTAL
7311.00	41.55	37.10	-30.76	47.89	74.00	-26.11	Peak	HORIZONTAL
10335.00	38.21	38.43	-29.73	46.91	74.00	-27.09	Peak	HORIZONTAL
10965.00	38.00	38.69	-28.95	47.74	74.00	-26.26	Peak	HORIZONTAL
14205.00	37.29	41.11	-27.10	51.30	74.00	-22.70	Peak	HORIZONTAL
17340.00	35.79	42.68	-26.94	51.53	74.00	-22.47	Peak	HORIZONTAL
4874.00	38.67	32.65	-31.73	39.59	74.00	-34.41	Peak	VERTICAL
7311.00	38.43	37.10	-30.76	44.77	74.00	-29.23	Peak	VERTICAL
9750.00	39.23	38.15	-30.06	47.32	74.00	-26.68	Peak	VERTICAL
13245.00	38.67	39.94	-29.39	49.22	74.00	-24.78	Peak	VERTICAL
13755.00	39.39	40.91	-28.95	51.35	74.00	-22.65	Peak	VERTICAL
17220.00	35.51	42.51	-26.90	51.12	74.00	-22.88	Peak	VERTICAL
Tx mode 11n20 MCS0 2462 MHz								
4924.00	39.26	32.75	-31.68	40.33	74.00	-33.67	Peak	HORIZONTAL
7386.00	39.87	37.22	-30.98	46.11	74.00	-27.89	Peak	HORIZONTAL
9225.00	39.64	37.83	-30.46	47.01	74.00	-26.99	Peak	HORIZONTAL
11670.00	37.94	38.67	-28.63	47.98	74.00	-26.02	Peak	HORIZONTAL
14205.00	37.36	41.11	-27.10	51.37	74.00	-22.63	Peak	HORIZONTAL
17115.00	36.89	42.36	-26.80	52.45	74.00	-21.55	Peak	HORIZONTAL
4924.00	39.32	32.75	-31.68	40.39	74.00	-33.61	Peak	VERTICAL
7386.00	40.43	37.22	-30.98	46.67	74.00	-27.33	Peak	VERTICAL
9225.00	39.39	37.83	-30.46	46.76	74.00	-27.24	Peak	VERTICAL
11970.00	37.81	38.61	-28.73	47.69	74.00	-26.31	Peak	VERTICAL
14265.00	37.81	41.03	-27.75	51.09	74.00	-22.91	Peak	VERTICAL
17265.00	36.93	42.57	-26.84	52.66	74.00	-21.34	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.

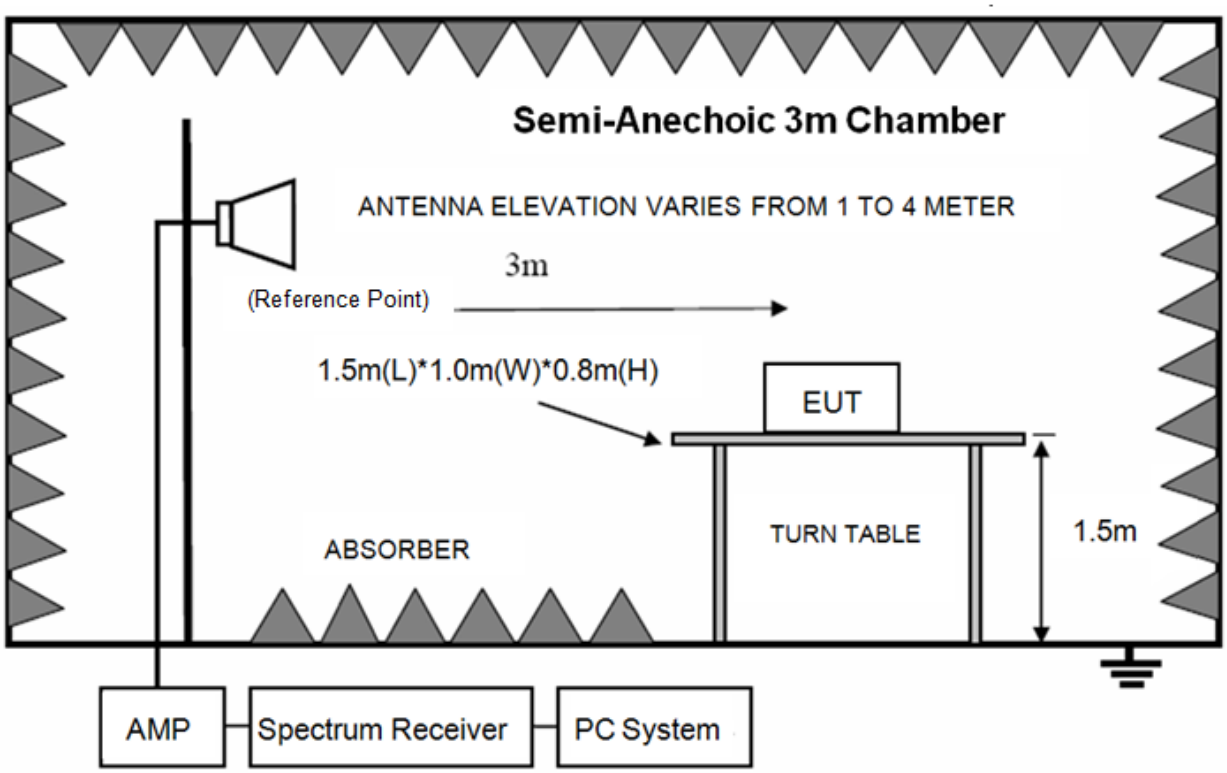
4. Scan with all modes, the worst case was recorded in this report.

9. Radiated Band Edge Compliance

9.1. General information

Test date	2021/12/21 ~ 2022/01/10	Test engineer	Sunny Zhang
Test place	10m Chamber		

9.2. Block diagram of test setup



9.3. 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.

9.4. Test procedure

Same with clause 8.3 except change investigated frequency range.

Remark: All restriction band have been tested, and shown in report.

9.5. 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

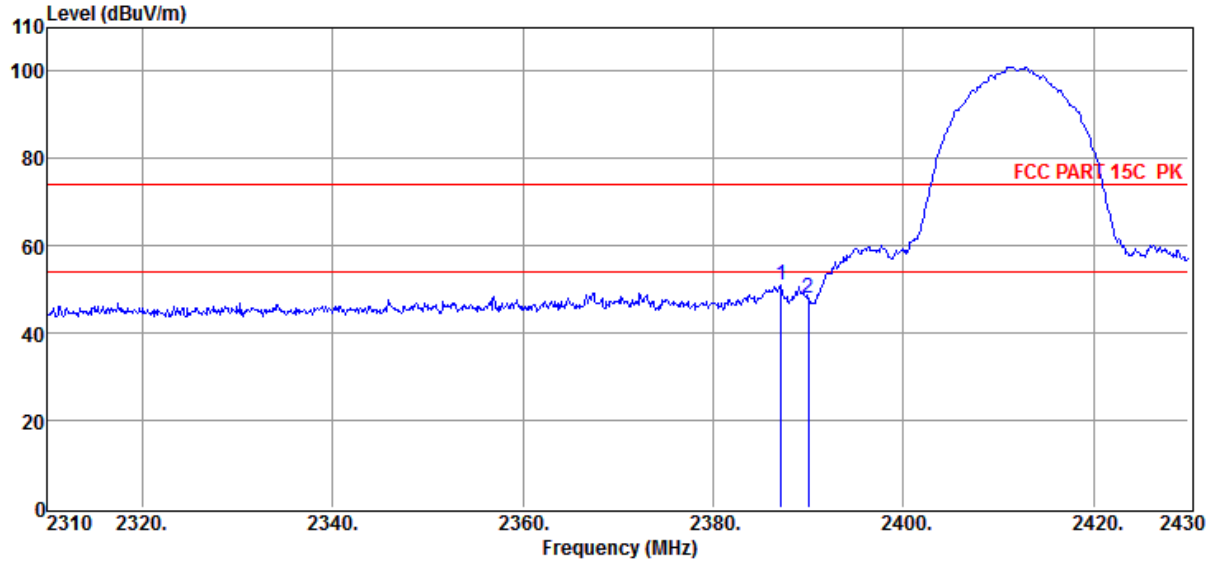
Test Date : 01-06-2022 **Tested By** : Sunny

EUT : Wyze Outdoor Cam V2 **Model Number** : WVOD2

Power Supply : Battery **Test Mode** : Tx mode

Memo : 11B 1M 2412MHz

Data: 1



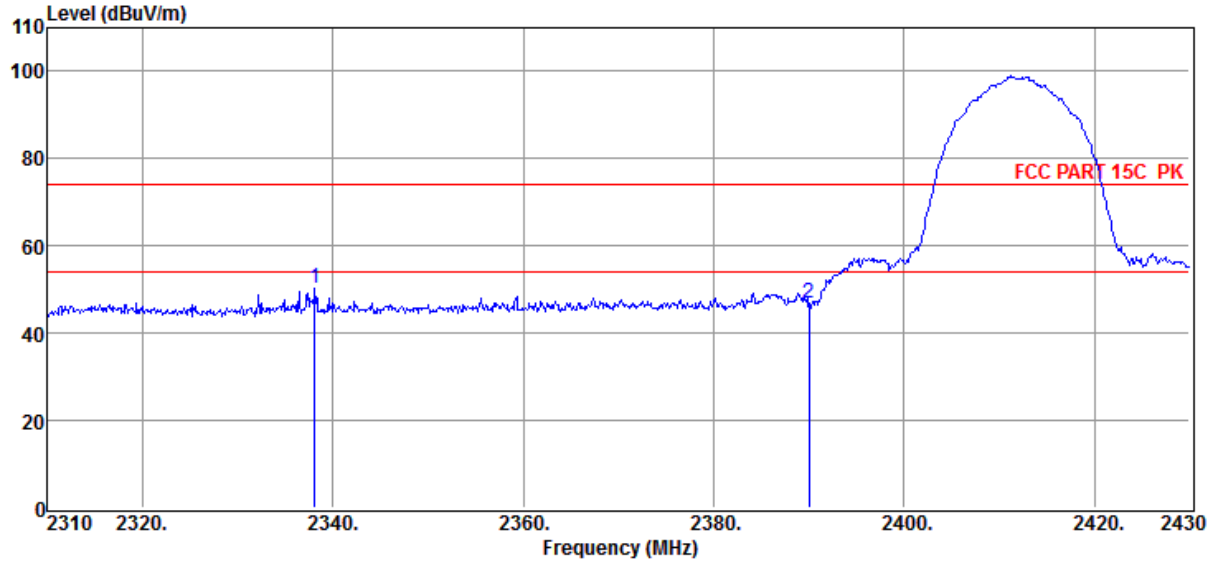
Item (Mark)	Freq. (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
1	2387.16	47.80	34.97	-31.68	51.09	74.00	-22.91	Peak	VERTICAL
2	2390.00	44.70	35.00	-31.70	48.00	74.00	-26.00	Peak	VERTICAL

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	: 01-06-2022	**Tested By**	: Sunny
EUT	: Wyze Outdoor Cam V2	**Model Number**	: WVOD2
Power Supply	: Battery	**Test Mode**	: Tx mode
Memo	: 11B 1M 2412MHz		

Data: 2



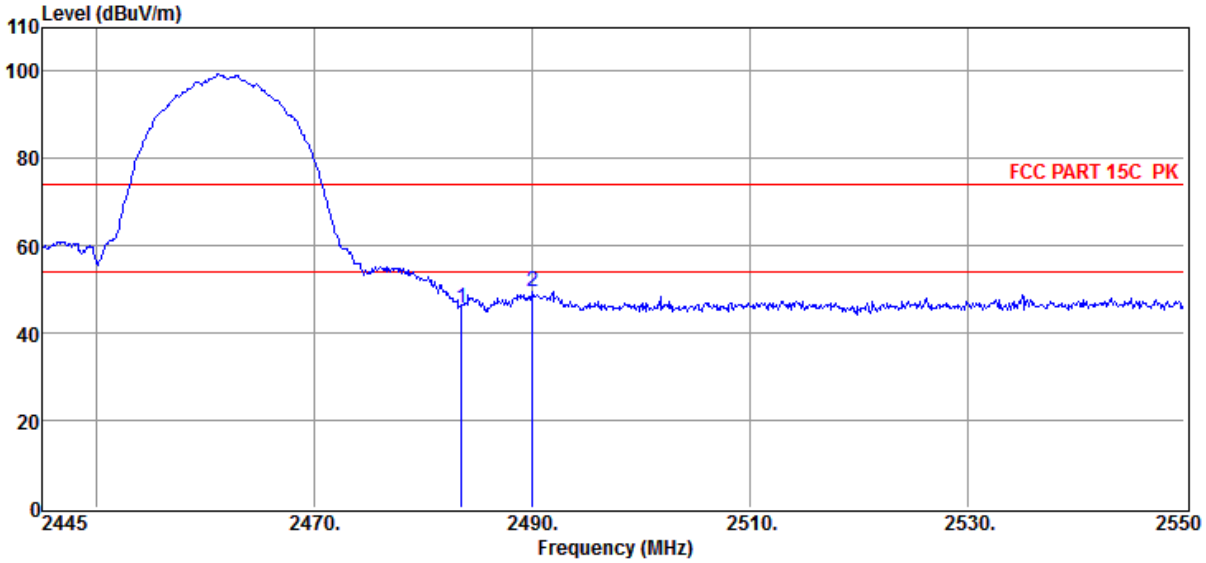
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2338.08	47.46	34.43	-31.55	50.34	74.00	-23.66	Peak	HORIZONTAL
2	2390.00	43.50	35.00	-31.70	46.80	74.00	-27.20	Peak	HORIZONTAL

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	: 01-06-2022	**Tested By**	: Sunny
EUT	: Wyze Outdoor Cam V2	**Model Number**	: WVOD2
Power Supply	: Battery	**Test Mode**	: Tx mode
Memo	: 11B 1M 2462MHz		

Data: 3



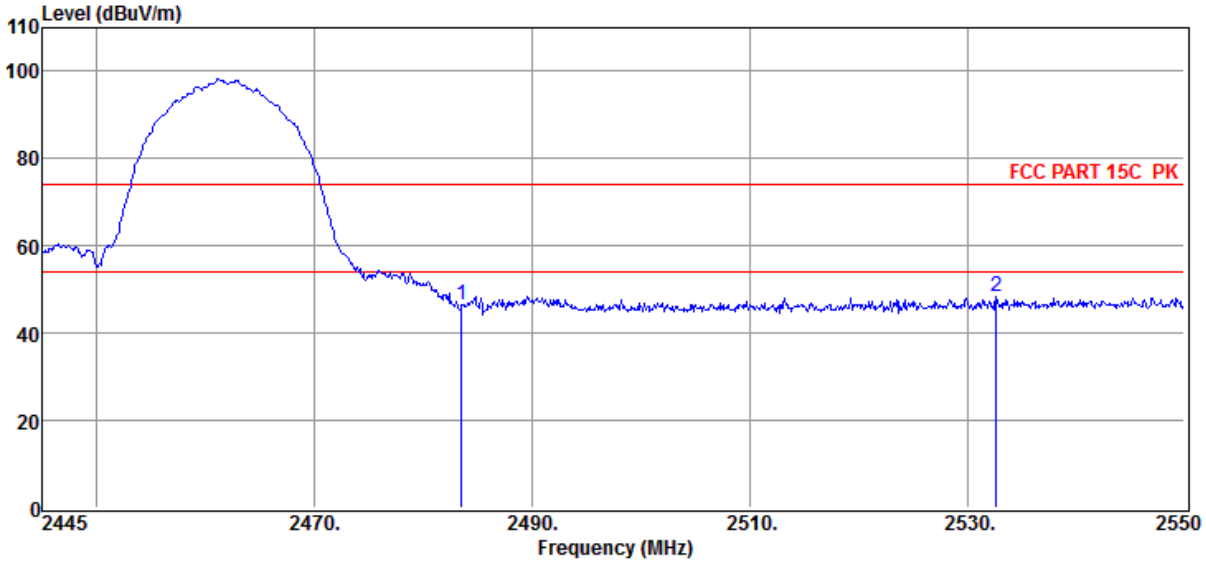
Item (Mark)	Freq. (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	42.35	35.10	-31.58	45.87	74.00	-28.13	Peak	VERTICAL
2	2490.05	46.11	35.14	-31.57	49.68	74.00	-24.32	Peak	VERTICAL

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	: 01-06-2022	**Tested By**	: Sunny
EUT	: Wyze Outdoor Cam V2	**Model Number**	: WVOD2
Power Supply	: Battery	**Test Mode**	: Tx mode
Memo	: 11B 1M 2462MHz		

Data: 4



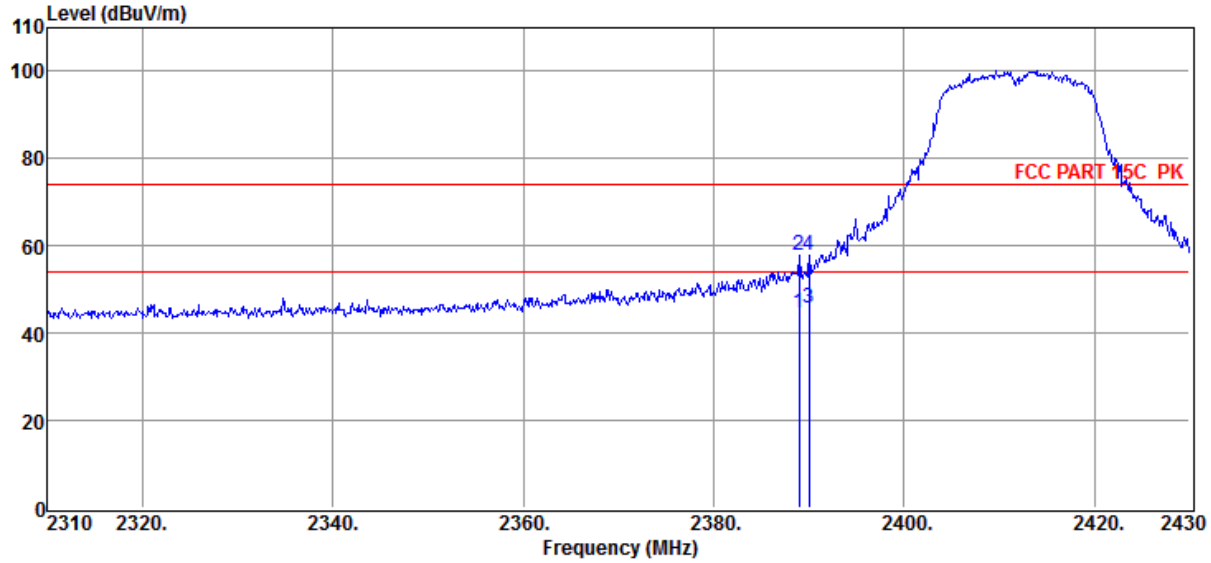
Item (Mark)	Freq. (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	42.87	35.10	-31.58	46.39	74.00	-27.61	Peak	HORIZONTAL
2	2532.68	44.12	35.72	-31.33	48.51	74.00	-25.49	Peak	HORIZONTAL

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	: 01-06-2022	**Tested By**	: Sunny
EUT	: Wyze Outdoor Cam V2	**Model Number**	: WVOD2
Power Supply	: Battery	**Test Mode**	: Tx mode
Memo	: 11G 6M 2412MHz		

Data: 5



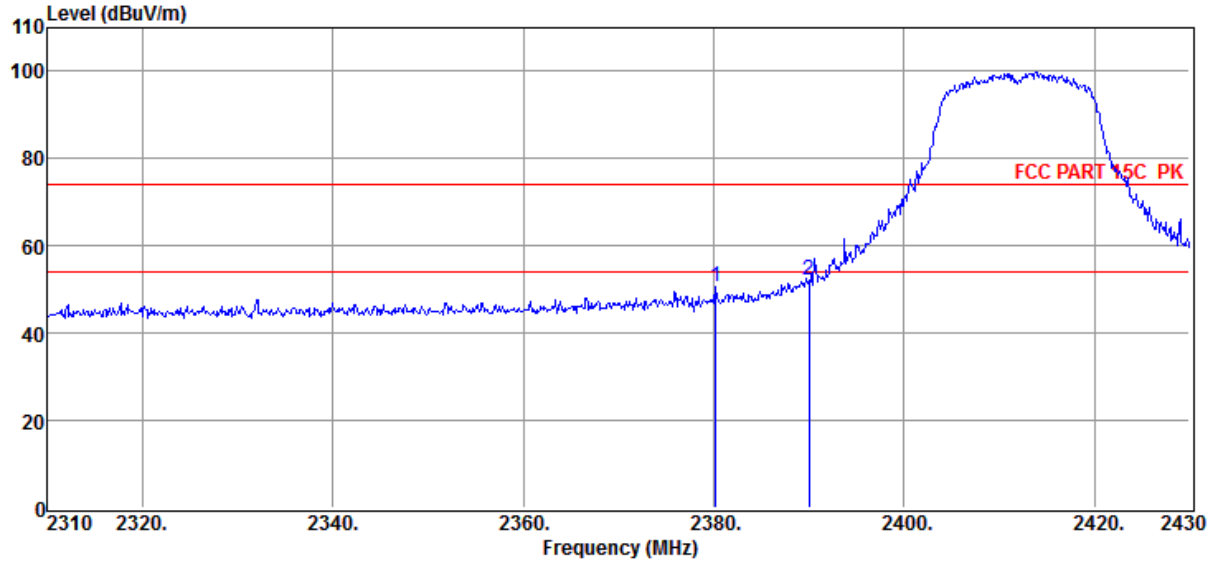
Item (Mark)	Freq. (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
1	2388.96	41.34	34.99	-31.69	44.64	54.00	-9.36	Average	VERTICAL
2	2388.96	54.54	34.99	-31.69	57.84	74.00	-16.16	Peak	VERTICAL
3	2390.00	42.47	35.00	-31.70	45.77	54.00	-8.23	Average	VERTICAL
4	2390.00	54.37	35.00	-31.70	57.67	74.00	-16.33	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	: 01-06-2022	**Tested By**	: Sunny
EUT	: Wyze Outdoor Cam V2	**Model Number**	: WVOD2
Power Supply	: Battery	**Test Mode**	: Tx mode
Memo	: 11G 6M 2412MHz		

Data: 6



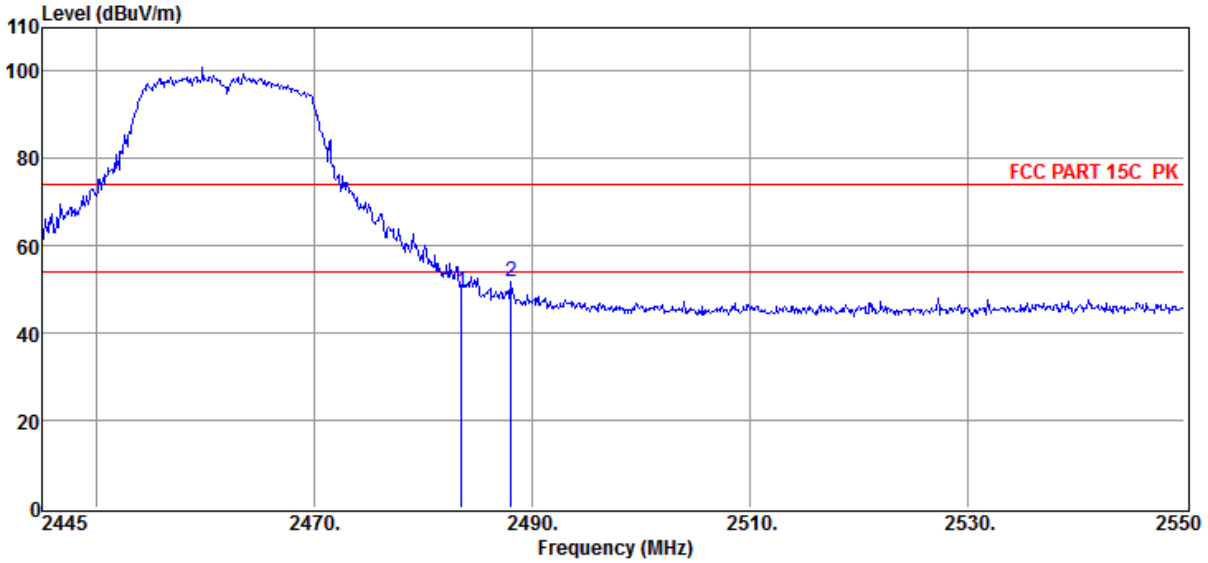
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2380.20	47.49	34.90	-31.63	50.76	74.00	-23.24	Peak	HORIZONTAL
2	2390.00	49.01	35.00	-31.70	52.31	74.00	-21.69	Peak	HORIZONTAL

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	:	01-06-2022	**Tested By**	:	Sunny
EUT	:	Wyze Outdoor Cam V2	**Model Number**	:	WVOD2
Power Supply	:	Battery	**Test Mode**	:	Tx mode
Memo	:	11G 6M 2462MHz			

Data: 7



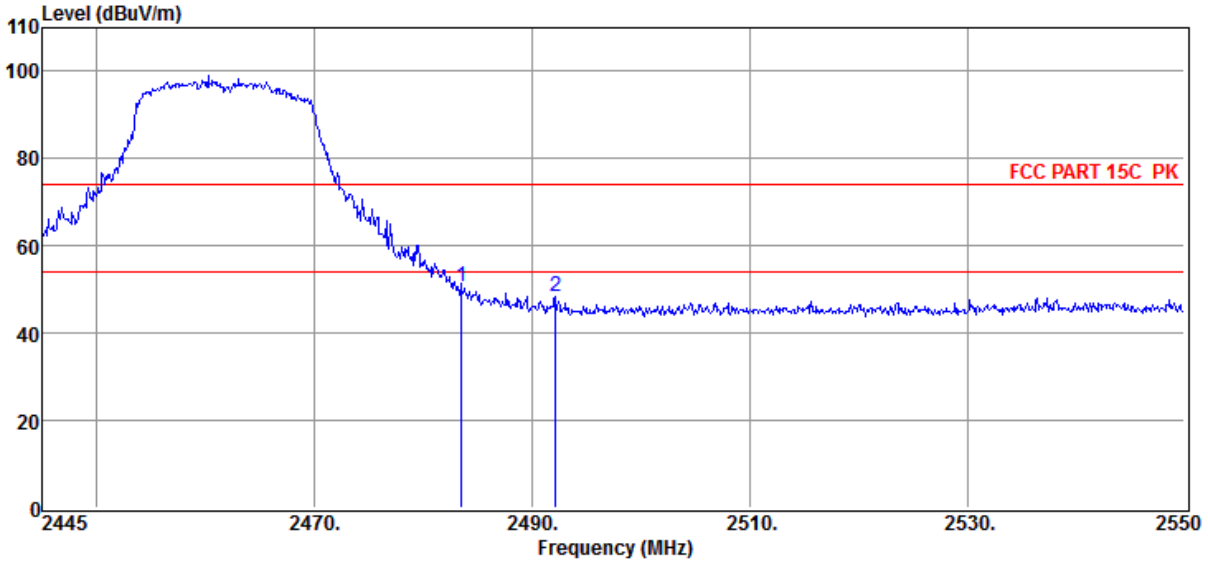
Item (Mark)	Freq. (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	46.17	35.10	-31.58	49.69	74.00	-24.31	Peak	VERTICAL
2	2488.05	48.33	35.13	-31.57	51.89	74.00	-22.11	Peak	VERTICAL

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	: 01-06-2022	**Tested By**	: Sunny
EUT	: Wyze Outdoor Cam V2	**Model Number**	: WVOD2
Power Supply	: Battery	**Test Mode**	: Tx mode
Memo	: 11G 6M 2462MHz		

Data: 8



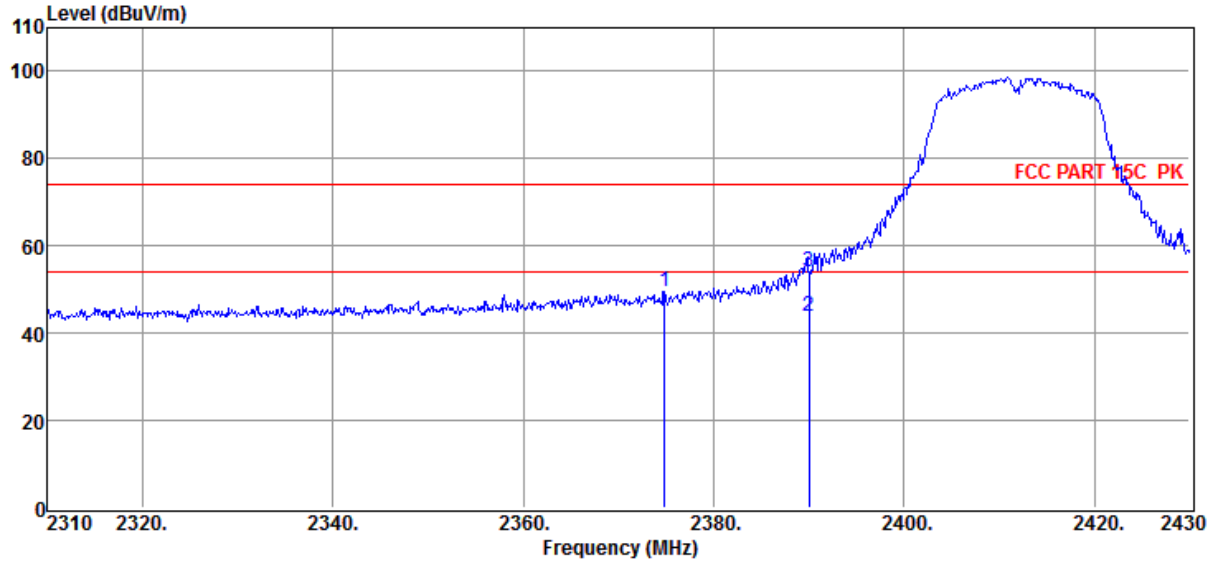
Item (Mark)	Freq. (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	47.06	35.10	-31.58	50.58	74.00	-23.42	Peak	HORIZONTAL
2	2492.15	44.75	35.15	-31.57	48.33	74.00	-25.67	Peak	HORIZONTAL

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	: 01-06-2022	**Tested By**	: Sunny
EUT	: Wyze Outdoor Cam V2	**Model Number**	: WVOD2
Power Supply	: Battery	**Test Mode**	: Tx mode
Memo	: 11N20 MCS0 2412MHz		

Data: 9



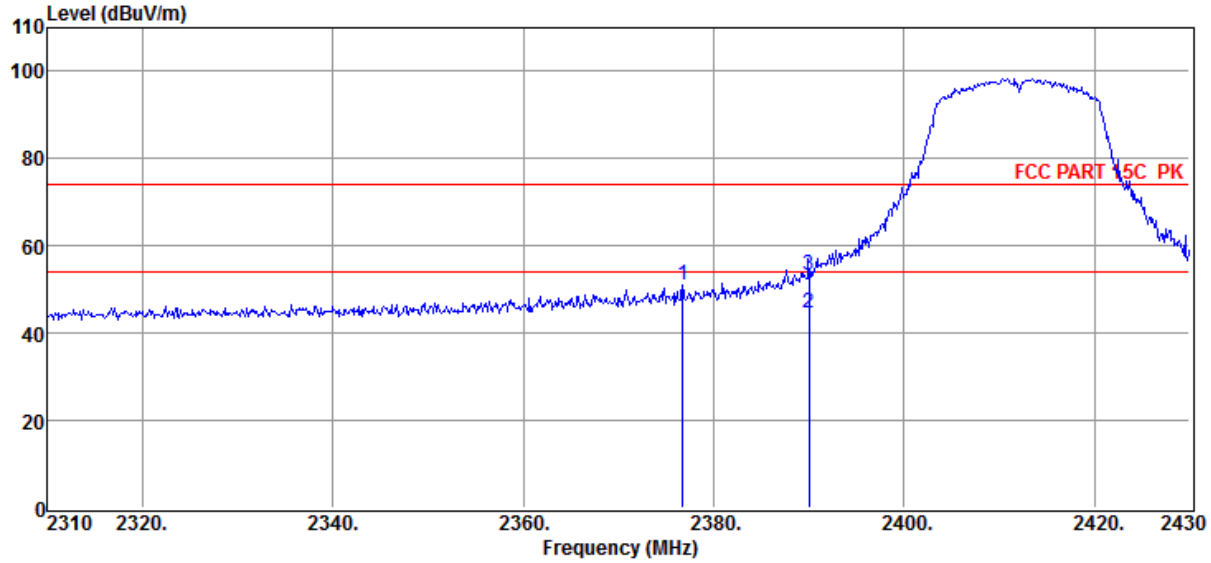
Item (Mark)	Freq. (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
1	2374.80	46.41	34.85	-31.59	49.67	74.00	-24.33	Peak	VERTICAL
2	2390.00	40.39	35.00	-31.70	43.69	54.00	-10.31	Average	VERTICAL
3	2390.00	50.60	35.00	-31.70	53.90	74.00	-20.10	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	: 01-06-2022	**Tested By**	: Sunny
EUT	: Wyze Outdoor Cam V2	**Model Number**	: WVOD2
Power Supply	: Battery	**Test Mode**	: Tx mode
Memo	: 11N20 MCS0 2412MHz		

Data: 10



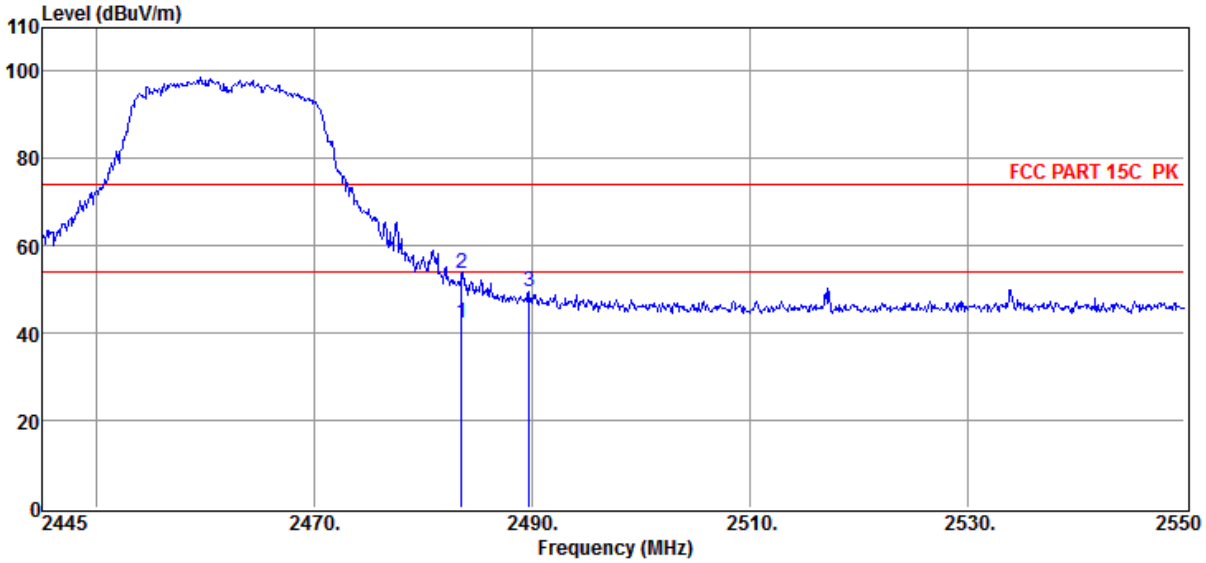
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2376.72	47.76	34.87	-31.60	51.03	74.00	-22.97	Peak	HORIZONTAL
2	2390.00	41.43	35.00	-31.70	44.73	54.00	-9.27	Average	HORIZONTAL
3	2390.00	49.89	35.00	-31.70	53.19	74.00	-20.81	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	: 01-06-2022	**Tested By**	: Sunny
EUT	: Wyze Outdoor Cam V2	**Model Number**	: WVOD2
Power Supply	: Battery	**Test Mode**	: Tx mode
Memo	: 11N20 MCS0 2462MHz		

Data: 11



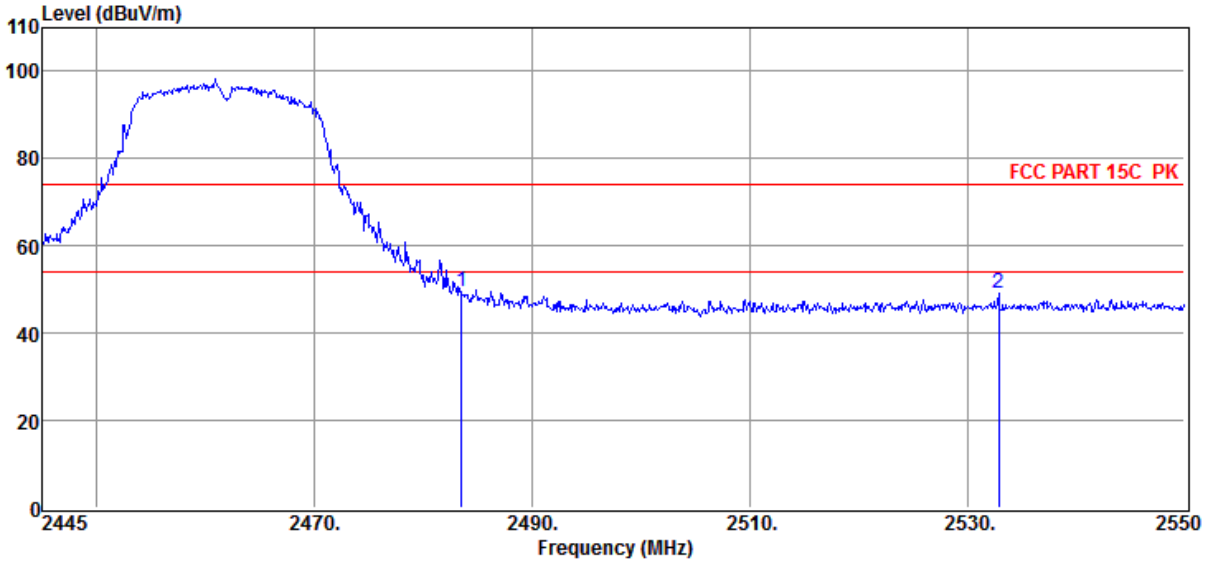
Item (Mark)	Freq. (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	38.88	35.10	-31.58	42.40	54.00	-11.60	Average	VERTICAL
2	2483.50	50.22	35.10	-31.58	53.74	74.00	-20.26	Peak	VERTICAL
3	2489.73	46.00	35.14	-31.57	49.57	74.00	-24.43	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	:	01-06-2022	**Tested By**	:	Sunny
EUT	:	Wyze Outdoor Cam V2	**Model Number**	:	WVOD2
Power Supply	:	Battery	**Test Mode**	:	Tx mode
Memo	:	11N20 MCS0 2462MHz			

Data: 12



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	46.06	35.10	-31.58	49.58	74.00	-24.42	Peak	HORIZONTAL
2	2532.89	44.55	35.73	-31.33	48.95	74.00	-25.05	Peak	HORIZONTAL

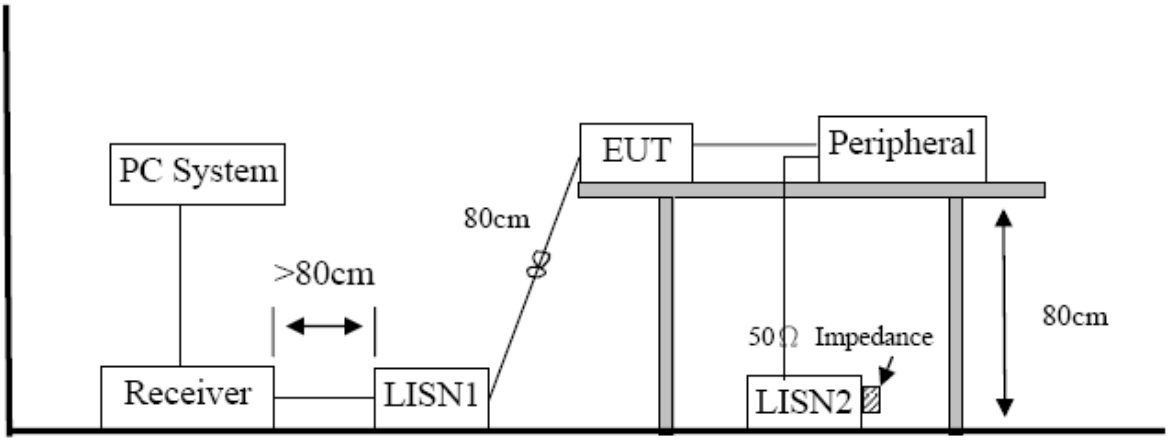
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
4. Margin = Result Level - Limit.

10. Power Line Conducted Emission

10.1. General information

Test date	2021/12/21 ~ 2022/01/10	Test engineer	Sunny Zhang
Test place	Shield Room 2#		

10.2. Block diagram of test setup



10.3. 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.

10.4. 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.

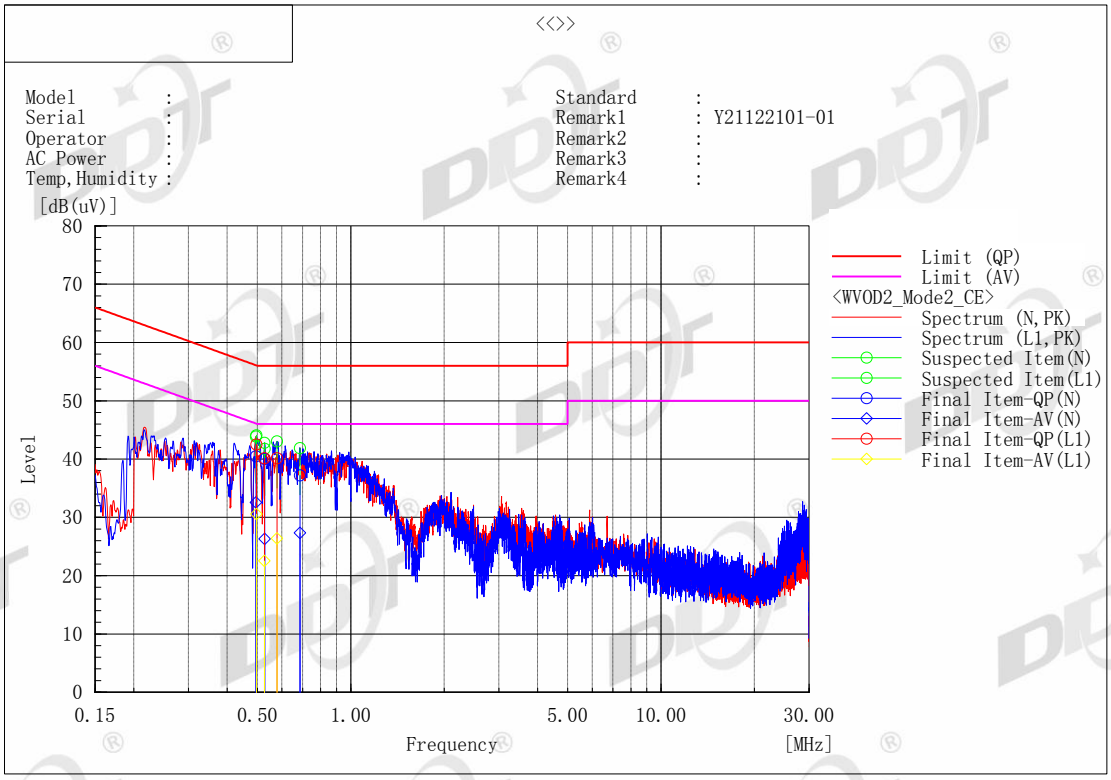
The bandwidth of test receiver is set at 9 kHz.

10.5. 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 both voltage AC 120V/60Hz and AC 240V/50Hz, only the worst case was recorded in this report.

Test Data



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	0.49492	30.8	22.8	9.7	40.5	32.5	56.1	46.1	15.6	13.6
2	0.68641	27.5	17.6	9.7	37.2	27.3	56.0	46.0	18.8	18.7
3	0.52799	30.3	16.6	9.7	40.0	26.3	56.0	46.0	16.0	19.7

--- 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	0.49654	32.8	20.9	9.7	42.5	30.6	56.1	46.1	13.6	15.5
2	0.57841	30.4	16.7	9.7	40.1	26.4	56.0	46.0	15.9	19.6
3	0.52722	30.4	12.8	9.7	40.1	22.5	56.0	46.0	15.9	23.5

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 antenna used for this product is FPC antenna and no antenna other than that furnished by the responsible party shall be used with the device, maximum antenna gain is 4.78 dBi.