TEST REPORT

Product Name	:	WIFI/BT module
Brand Mark	:	FN-LINK
Model No.	:	6223C-PUD
FCC ID	:	2AATL-6223C-PUD
Report Number	:	BLA-EMC-202107-A8404
Date of Sample Receipt	:	2021/7/22
Date of Test	:	2021/7/22 to 2021/8/12
Date of Issue	:	2021/8/12
Test Standard	:	47 CFR Part 15, Subpart C 15.247
Test Result	:	Pass

Prepared for:

HUNAN FN-LINK TECHNOLOGY LIMITED
No. 8, Litong Road, Liuyang Economic Development Zone, Liuyang China

Prepared by:

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.
Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China
TEL: +86-755-23059481

Compiled by: Jozu. Review by: Sweely

Approved by: BlueZhong Date: 2021/8/12

BlueAsia of Technical Services(Shenzhen) Co., Ltd. BLA

REPORT REVISE RECORD

Version No.	Date	Description
00	2021/8/12	Original

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1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.5 & Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(1) & 15.247(b)(3)	Pass
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass

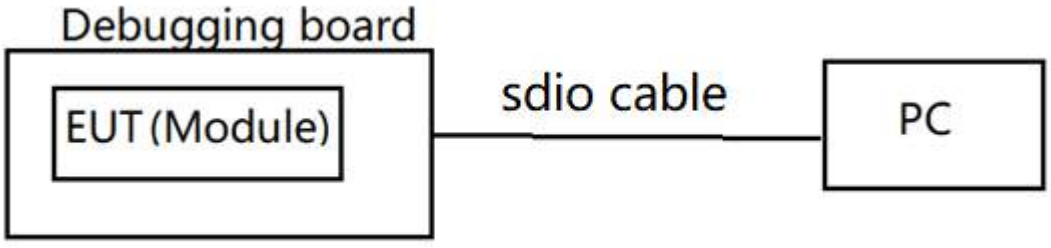
2 GENERAL INFORMATION

Applicant	HUNAN FN-LINK TECHNOLOGY LIMITED
Address	No. 8, Litong Road, Liuyang Economic Development Zone,Liuyang China
Manufacturer	HUNAN FN-LINK TECHNOLOGY LIMITED
Address	No. 8, Litong Road, Liuyang Economic Development Zone,Liuyang China
Factory	HUNAN FN-LINK TECHNOLOGY LIMITED
Address	No. 8, Litong Road, Liuyang Economic Development Zone,Liuyang China
Product Name	WIFI/BT module
Test Model No.	6223C-PUD

3 GENERAL DESCRIPTION OF E.U.T.

Hardware Version	V1.4
Software Version	V1.4
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Channel Spacing:	5MHz
Number of Channels:	802.11b/g/n(HT20):11 802.11n(HT40):7
Antenna Type:	FPC Antenna
Antenna Gain:	2dBi(Provided by the applicant)

4 BLOCK DIAGRAM OF EUT CONNECTION



5 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	25℃	DC3.3V

6 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
Transmitting mode	Keep the EUT in continuously transmitting mode with modulation. (Duty cycle>=98%)
Remark:Only the data of the worst mode would be recorded in this report.	

7 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission(9kHz-30MHz)	±4.34dB
Radiated Emission(30Mz-1000MHz)	±4.24dB
Radiated Emission(1GHz-18GHz)	±4.68dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB

8 DESCRIPTION OF SUPPORT UNIT

Device Type	Manufacturer	Model Name	Serial No.	Remark
PC	HASEE	K610D	N/A	N/A

9 LABORATORY LOCATION

All tests were performed at:
BlueAsia of Technical Services(Shenzhen) Co., Ltd.
Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673
No tests were sub-contracted.

10 TEST INSTRUMENTS LIST

Test Equipment Of Radiated Spurious Emissions					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Chamber	SKET	966	N/A	2020/11/10	2023/11/9
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Receiver	R&S	ESR7	101199	2020/10/12	2021/10/11
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2020/9/26	2022/9/25
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	2020/9/26	2022/9/25
Amplifier	SKET	PA-000318G-45	N/A	2020/10/16	2021/10/15
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2020/9/26	2022/9/25
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

Test Equipment Of Radiated Emissions which fall in the restricted bands					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Chamber	SKET	966	N/A	2020/11/10	2023/11/9
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Receiver	R&S	ESR7	101199	2020/10/12	2021/10/11
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2020/9/26	2022/9/25
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	2020/9/26	2022/9/25

Amplifier	SKET	PA-000318G-45	N/A	2020/10/16	2021/10/15
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2020/9/26	2022/9/25
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

Test Equipment Of Power Spectrum Density					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

Test Equipment Of Conducted Spurious Emissions					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

Test Equipment Of Conducted Band Edges Measurement					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11

Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

Test Equipment Of Minimum 6dB Bandwidth					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

Test Equipment Of Conducted Peak Output Power					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Shield room	SKET	833	N/A	2020/11/25	2023/11/24
Receiver	R&S	ESPI3	101082	2020/10/12	2021/10/11
LISN	R&S	ENV216	3560.6550.15	2020/10/12	2021/10/11
LISN	AT	AT166-2	AKK1806000003	2020/10/12	2021/10/11
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A

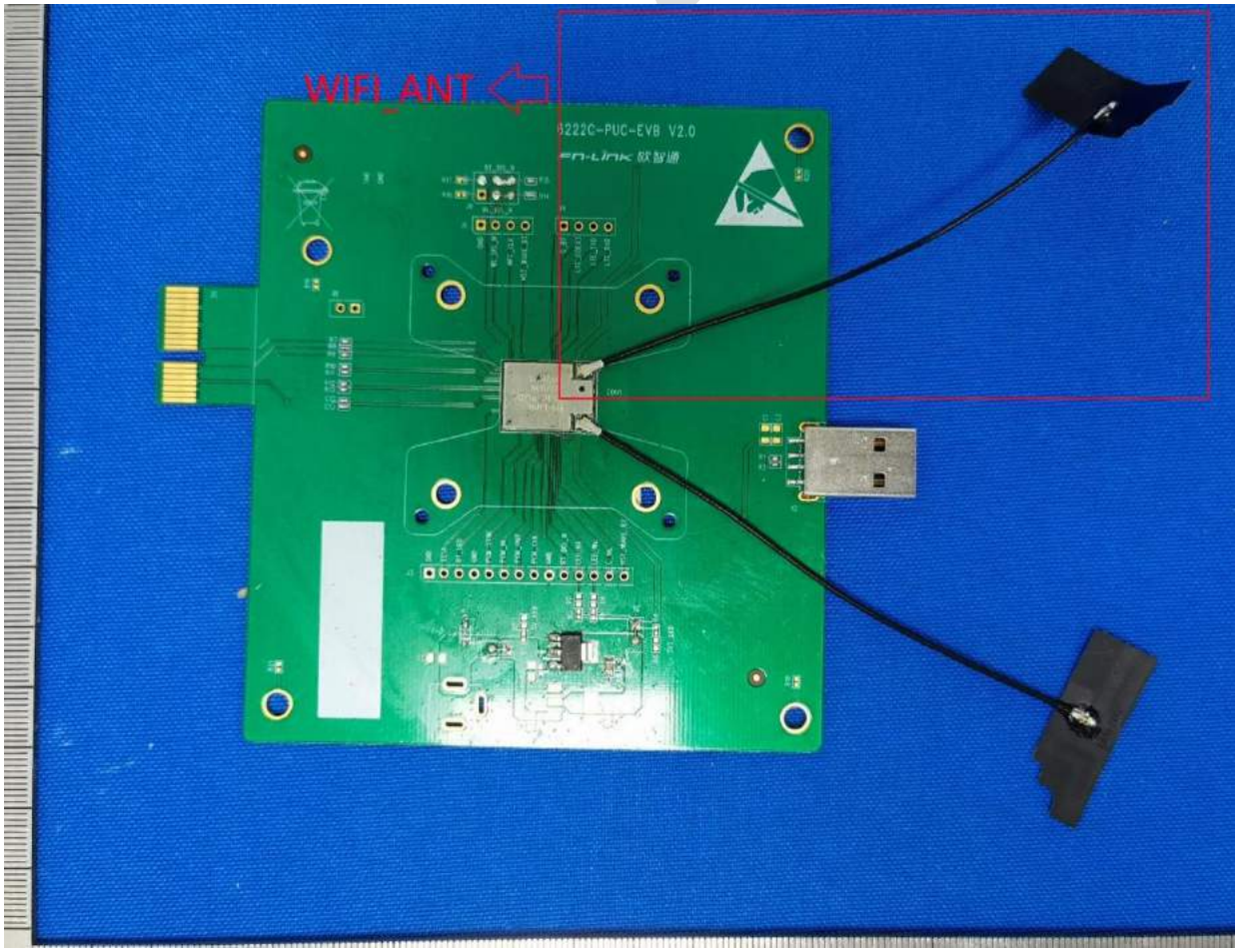
11 ANTENNA REQUIREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

11.1 CONCLUSION

Standard Requirement:
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. The use of a antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.



12 RADIATED SPURIOUS EMISSIONS

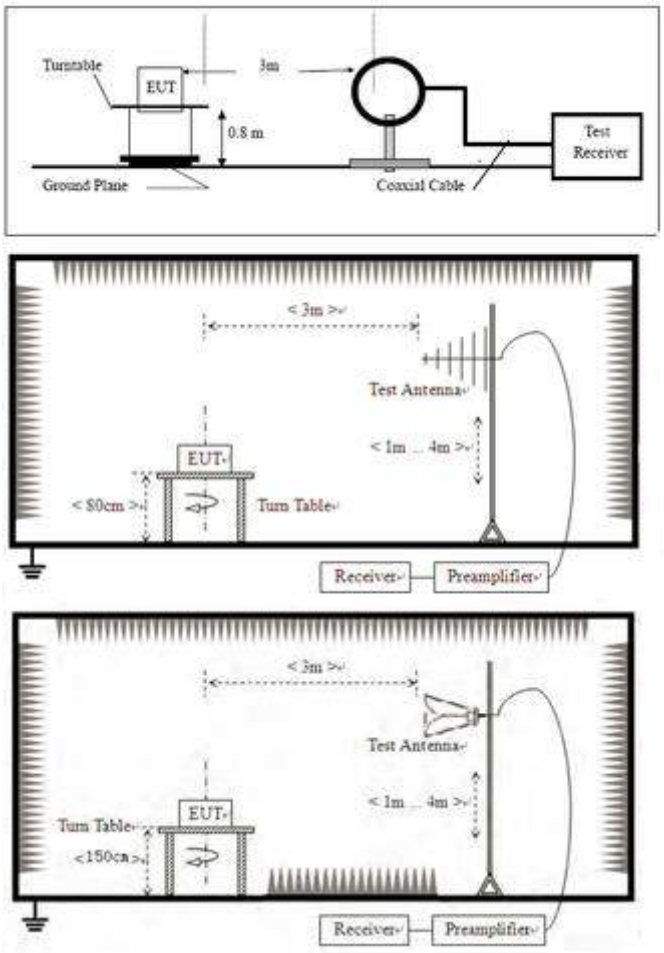
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.4,6.5,6.6
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

12.1 LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

12.2 BLOCK DIAGRAM OF TEST SETUP



12.3 PROCEDURE

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

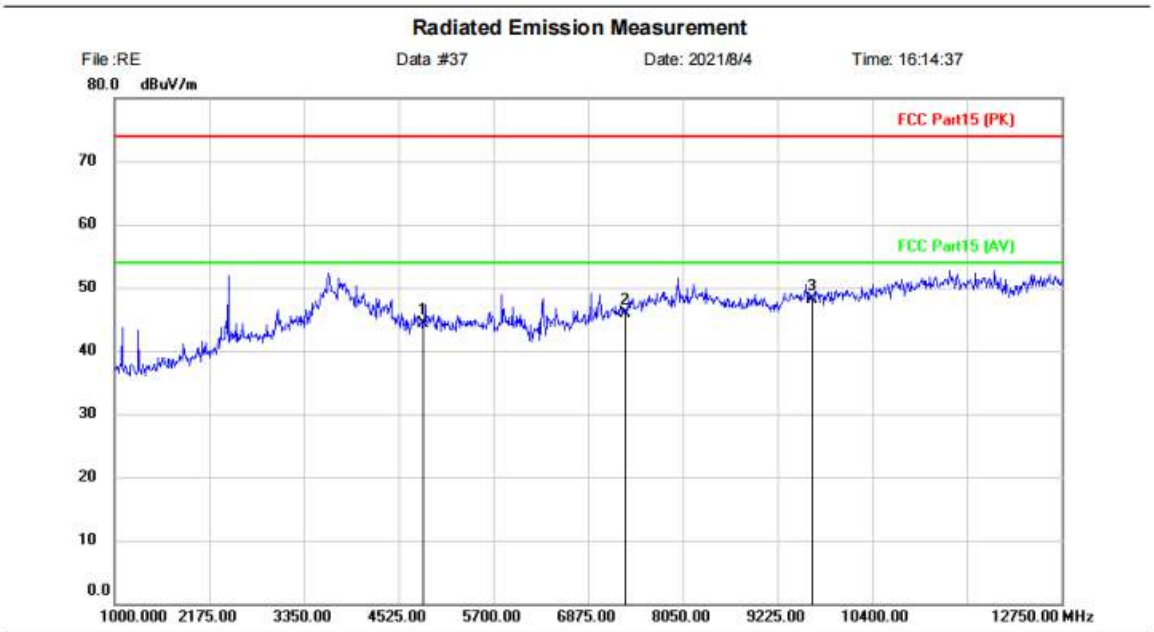
h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
j. Repeat above procedures until all frequencies measured was complete.

Remark:
1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. fundamental frequency is blocked by filter, and only spurious emission is shown.
4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

12.4 TEST DATA

Remark: During the test, pre-scan the 802.11b/g/n mode, and found the 802.11b mode which it is worse case.

[TestMode: TX 11B low channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-B-TX-L
Note:

Polarization: ***Horizontal***
Power:
Distance:

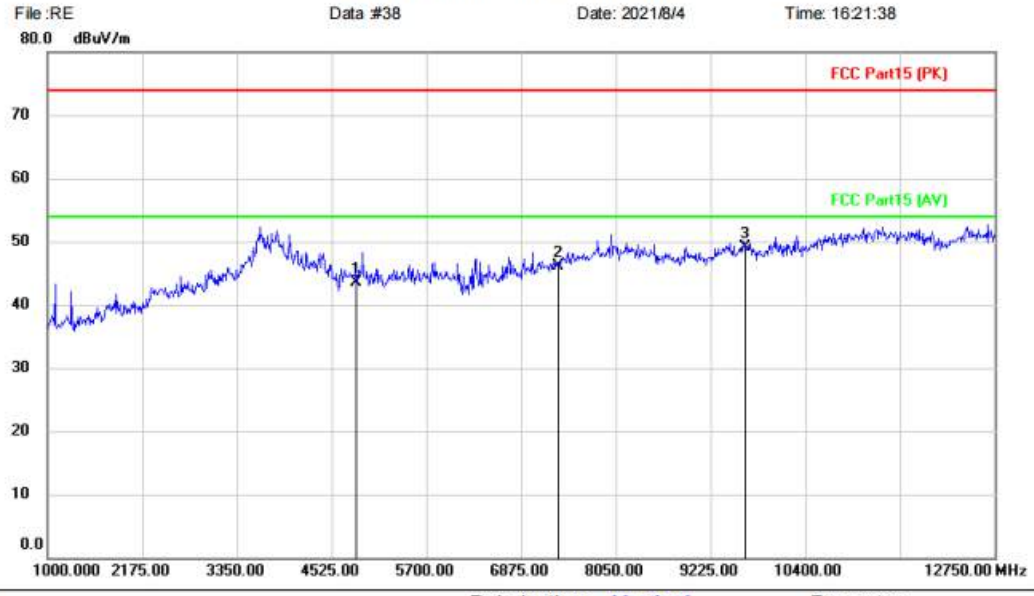
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4824.000	40.78	3.62	44.40	74.00	-29.60	peak			
2		7326.000	39.56	6.44	46.00	74.00	-28.00	peak			
3	*	9648.000	38.72	9.37	48.09	74.00	-25.91	peak			

*:Maximum data x:Over limit !:over margin (Reference Only

Test Result: Pass

[TestMode: TX 11B low channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-B-TX-L
Note:

Polarization: *Vertical*
Power:
Distance:

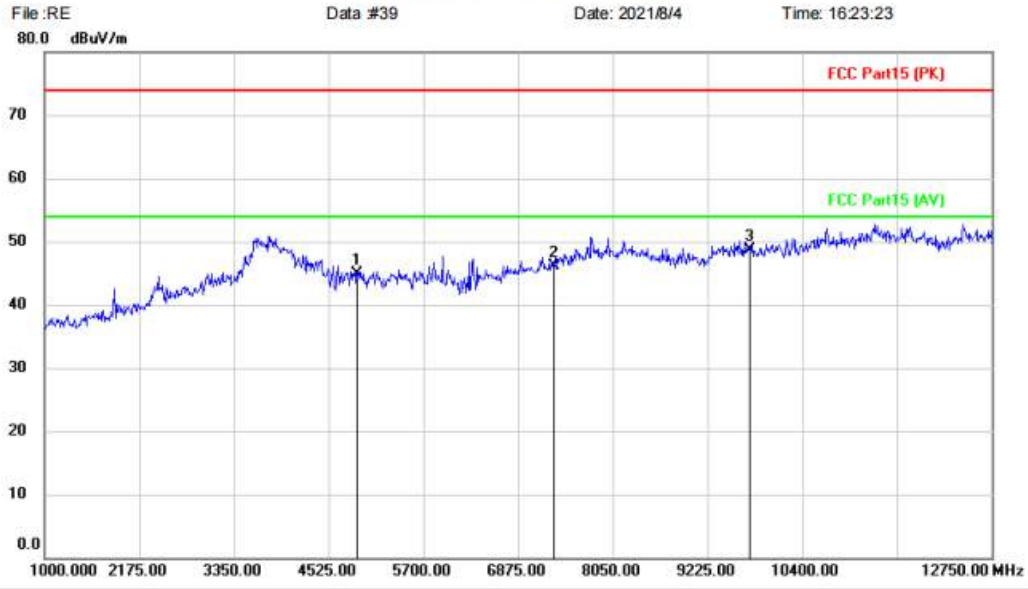
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4824.000	39.83	3.62	43.45	74.00	-30.55	peak			
2		7326.000	39.58	6.44	46.02	74.00	-27.98	peak			
3	*	9648.000	39.81	9.37	49.18	74.00	-24.82	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11B mid channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-B-TX-M
Note:

Polarization: *Horizontal*
Power:
Distance:

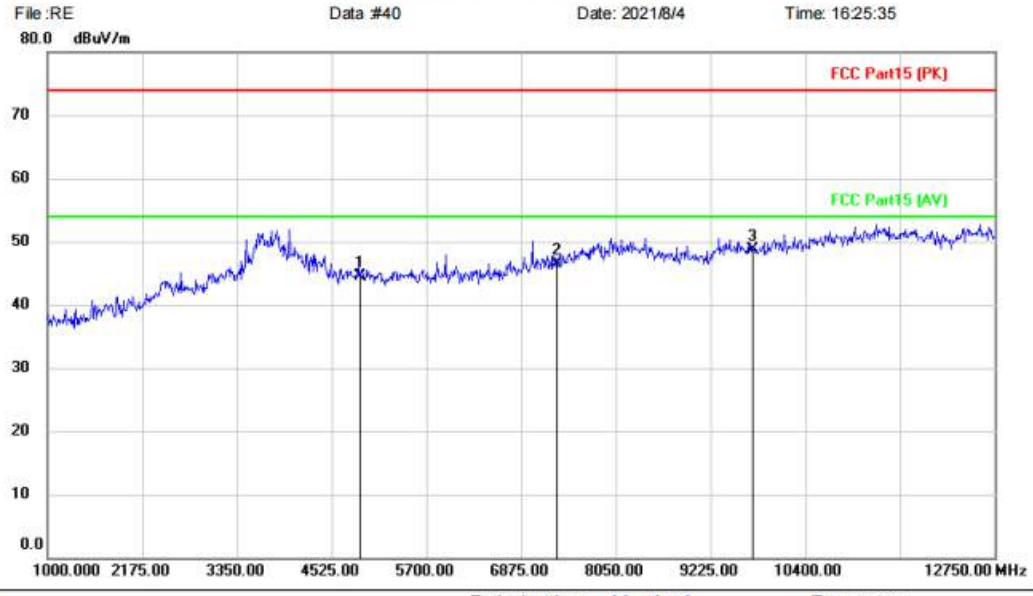
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4874.000	41.45	3.39	44.84	74.00	-29.16	peak			
2		7311.000	39.80	6.37	46.17	74.00	-27.83	peak			
3	*	9748.000	39.04	9.59	48.63	74.00	-25.37	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11B mid channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-B-TX-M
Note:

Polarization: *Vertical*
Power:
Distance:

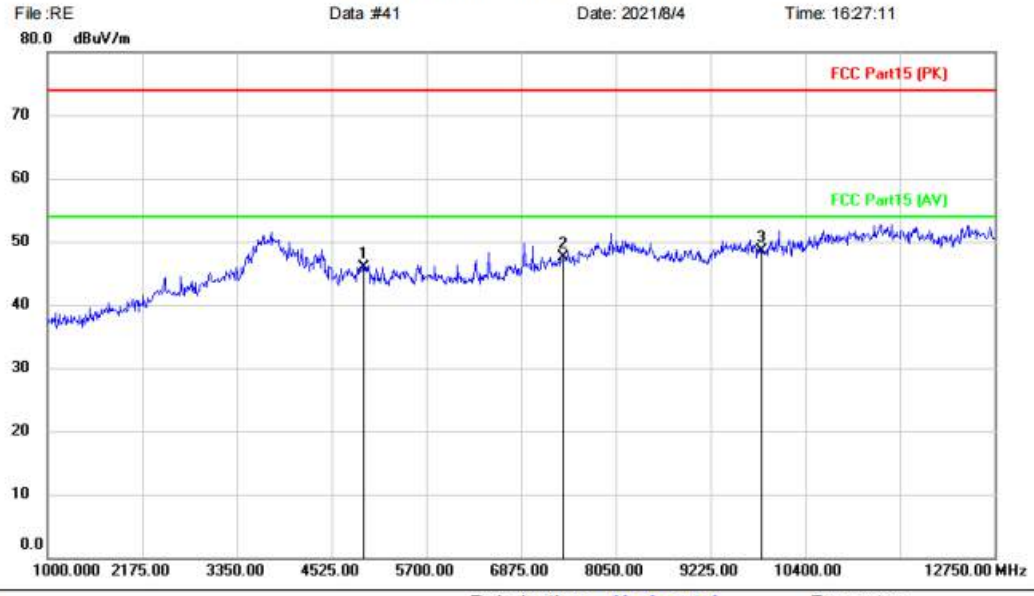
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4874.000	41.06	3.39	44.45	74.00	-29.55	peak			
2		7311.000	40.06	6.37	46.43	74.00	-27.57	peak			
3	*	9748.000	39.05	9.59	48.64	74.00	-25.36	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11B high channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-B-TX-H
Note:

Polarization: *Horizontal*
Power:
Distance:

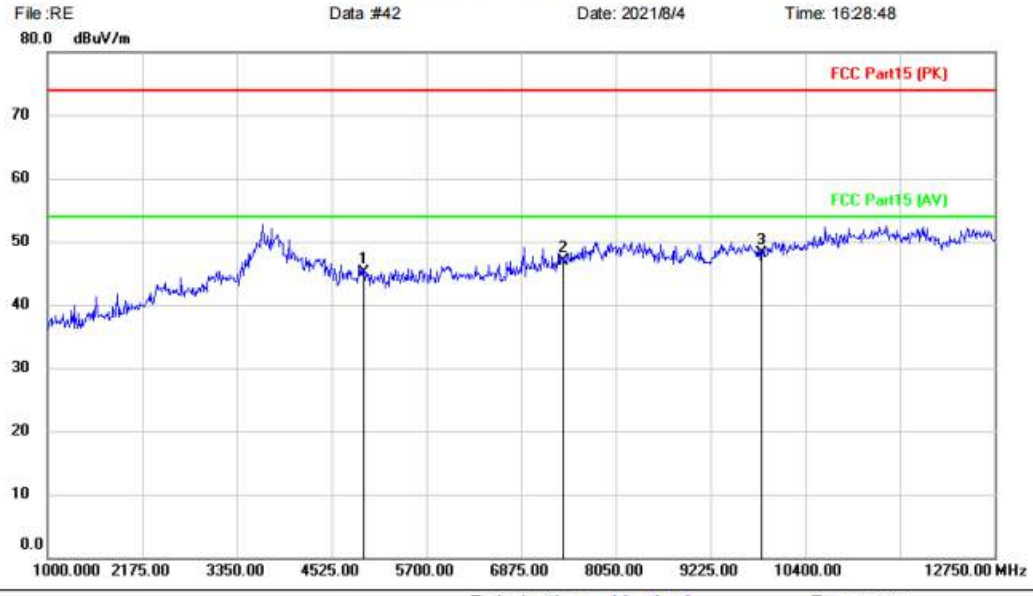
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4924.000	42.45	3.46	45.91	74.00	-28.09	peak			
2		7386.000	40.73	6.68	47.41	74.00	-26.59	peak			
3	*	9848.000	38.70	9.88	48.58	74.00	-25.42	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11B high channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-B-TX-H
Note:

Polarization: *Vertical*
Power:
Distance:

Temperature:
Humidity: %

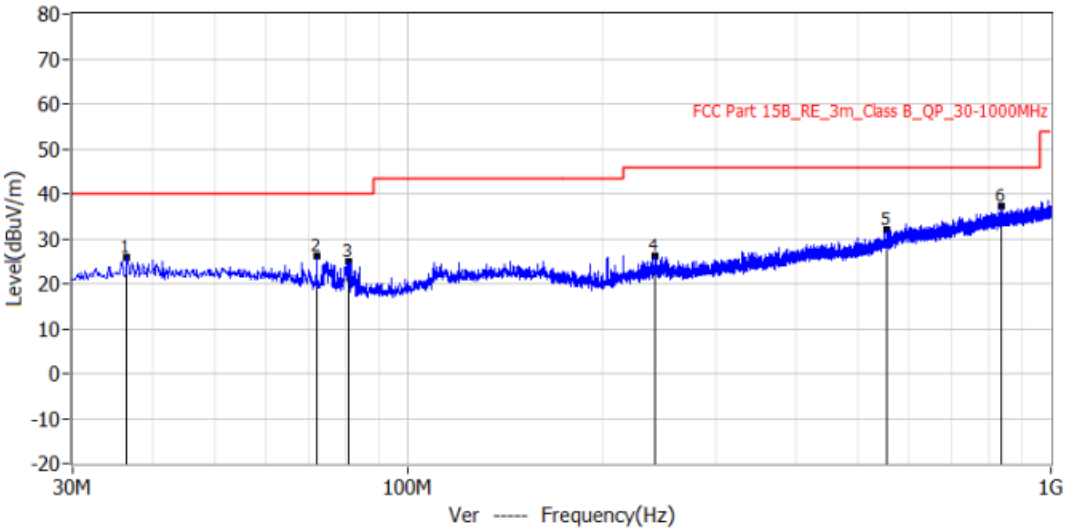
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4924.000	41.74	3.46	45.20	74.00	-28.80	peak			
2		7386.000	40.13	6.68	46.81	74.00	-27.19	peak			
3	*	9848.000	38.27	9.88	48.15	74.00	-25.85	peak			

*:Maximum data x:Over limit !:over margin ⟨Reference Only

Test Result: Pass

[TestMode: TX mode (SE) below 1G]; [Polarity: Vertical]

Test Lab: BlueAsia EMC Lab（RE #1）	Project: 202107-A84
EUT: 6223C-PUD	Test Engineer: Charlie
M/N: 6223C-PUD	Temperature: 25℃
S/N:	Humidity: 52%RH
Test Mode: 2.4G mode	Test Voltage:
Note:	Test Data: 2021-08-05 14:00:42

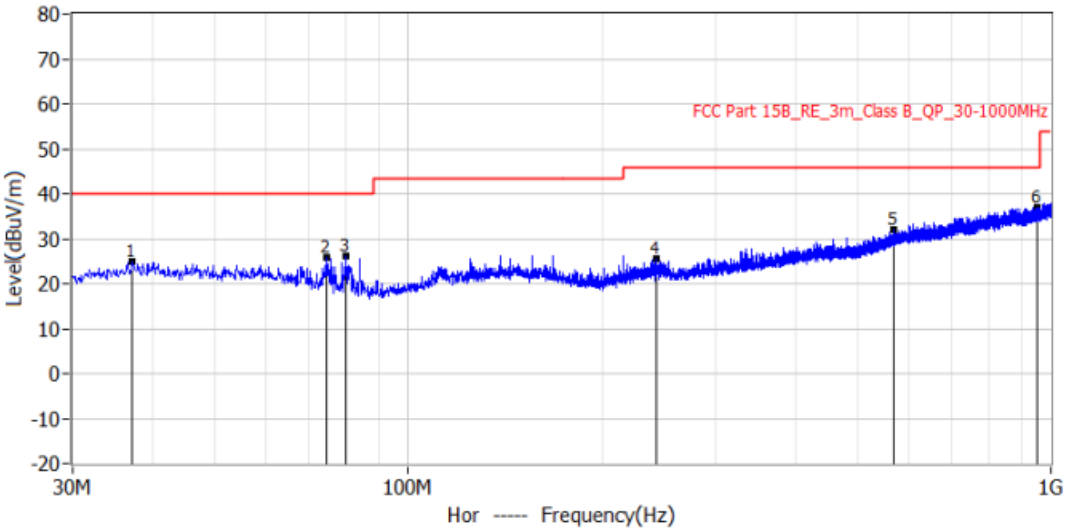


No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1*	36.426MHz	40.0	25.9	-14.1	2.2	23.7	QP	Ver	100.0	269.0
2*	71.953MHz	40.0	26.2	-13.8	5.1	21.1	QP	Ver	100.0	22.0
3*	80.561MHz	40.0	24.9	-15.1	5.1	19.8	QP	Ver	100.0	0.0
4*	242.066MHz	46.0	26.2	-19.8	3.4	22.8	QP	Ver	100.0	282.0
5*	554.770MHz	46.0	32.0	-14.0	2.0	30.0	QP	Ver	100.0	100.0
6*	837.889MHz	46.0	37.2	-8.8	2.7	34.5	QP	Ver	100.0	257.0

Test Result: Pass

[TestMode: TX mode (SE) below 1G]; [Polarity: Horizontal]

Test Lab: BlueAsia EMC Lab（RE #1）	Project: 202107-A84
EUT: 6223C-PUD	Test Engineer: Charlie
M/N: 6223C-PUD	Temperature: 25℃
S/N:	Humidity: 52%RH
Test Mode: 2.4G mode	Test Voltage:
Note:	Test Data: 2021-08-05 14:03:14



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1*	37.154MHz	40.0	25.0	-15.0	1.2	23.8	QP	Hor	100.0	240.0
2*	74.499MHz	40.0	25.8	-14.2	5.1	20.7	QP	Hor	100.0	0.0
3*	79.713MHz	40.0	26.2	-13.8	6.4	19.8	QP	Hor	100.0	0.0
4*	243.400MHz	46.0	25.5	-20.5	2.7	22.8	QP	Hor	100.0	0.0
5*	569.441MHz	46.0	31.9	-14.1	1.5	30.4	QP	Hor	100.0	146.0
6*	952.349MHz	46.0	36.9	-9.1	1.3	35.6	QP	Hor	100.0	54.0

Test Result: Pass

13 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

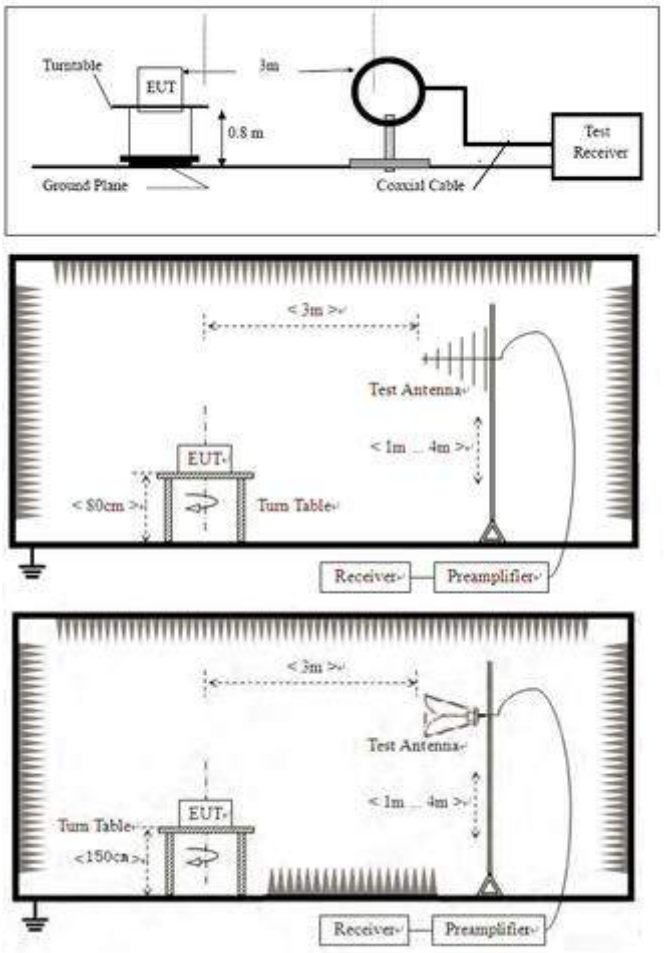
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

13.1 LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

13.2 BLOCK DIAGRAM OF TEST SETUP



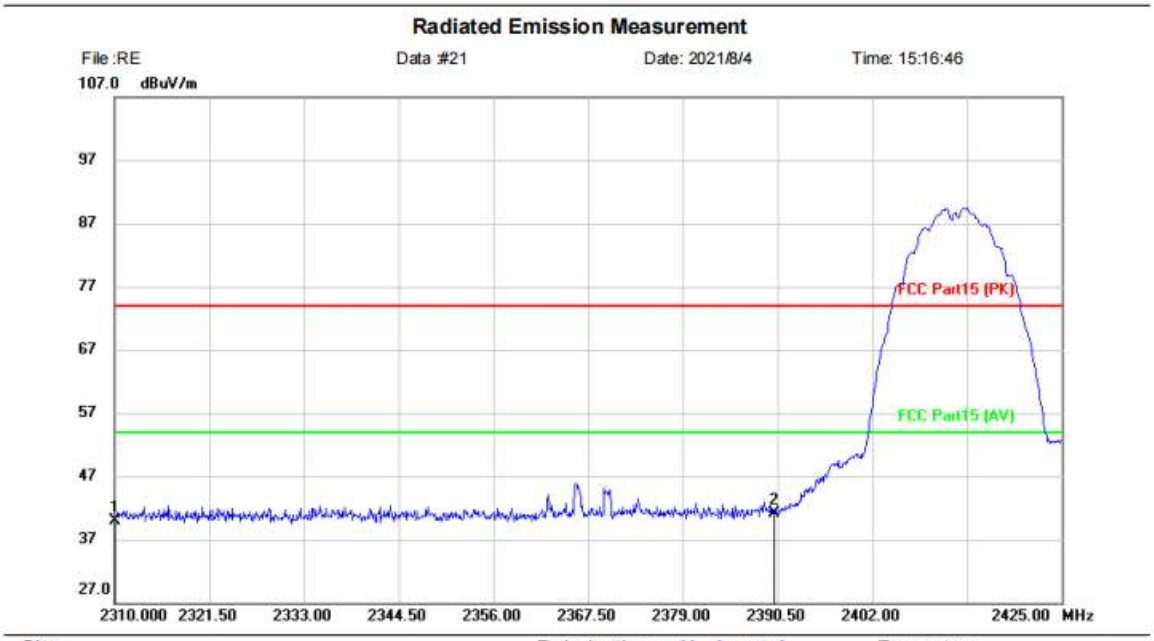
13.3 PROCEDURE

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
j. Repeat above procedures until all frequencies measured was complete.
Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

13.4 TEST DATA

[TestMode: TX 11B low channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-B-TX-L
Note:

Polarization: *Horizontal*
Power:
Distance:

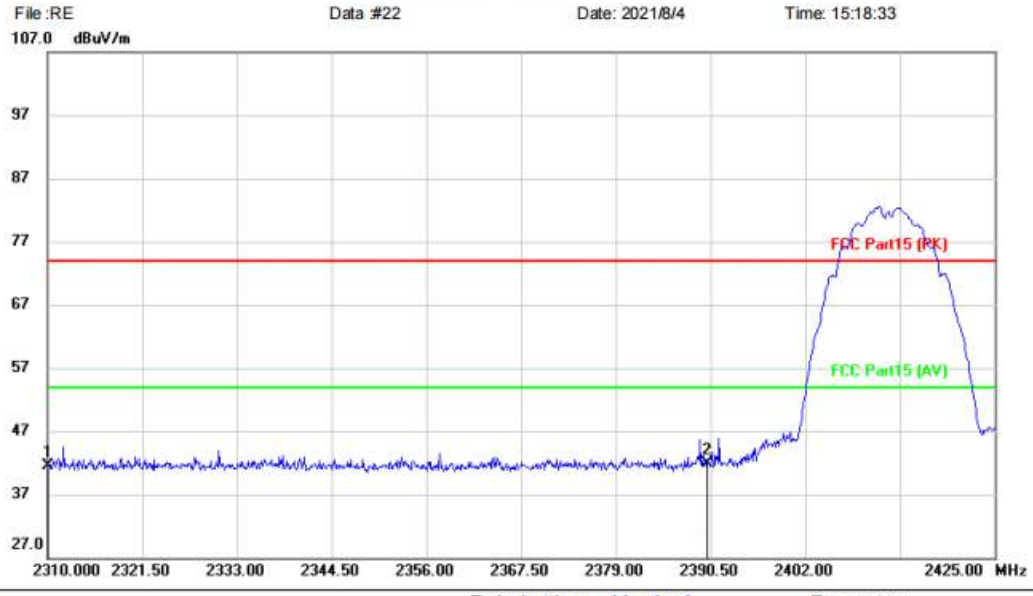
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	44.59	-4.61	39.98	74.00	-34.02	peak			
2	*	2390.000	45.45	-4.27	41.18	74.00	-32.82	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11B low channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-B-TX-L
Note:

Polarization: *Vertical*
Power:
Distance:

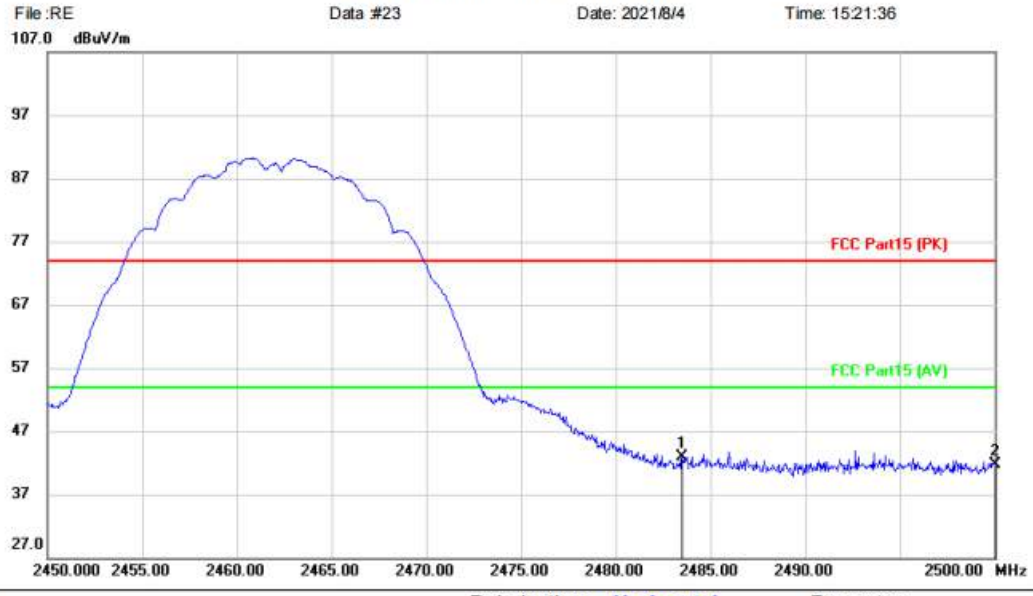
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	46.10	-4.61	41.49	74.00	-32.51	peak			
2	*	2390.000	46.15	-4.27	41.88	74.00	-32.12	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11B high channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-B-TX-H
Note:

Polarization: ***Horizontal***
Power:
Distance:

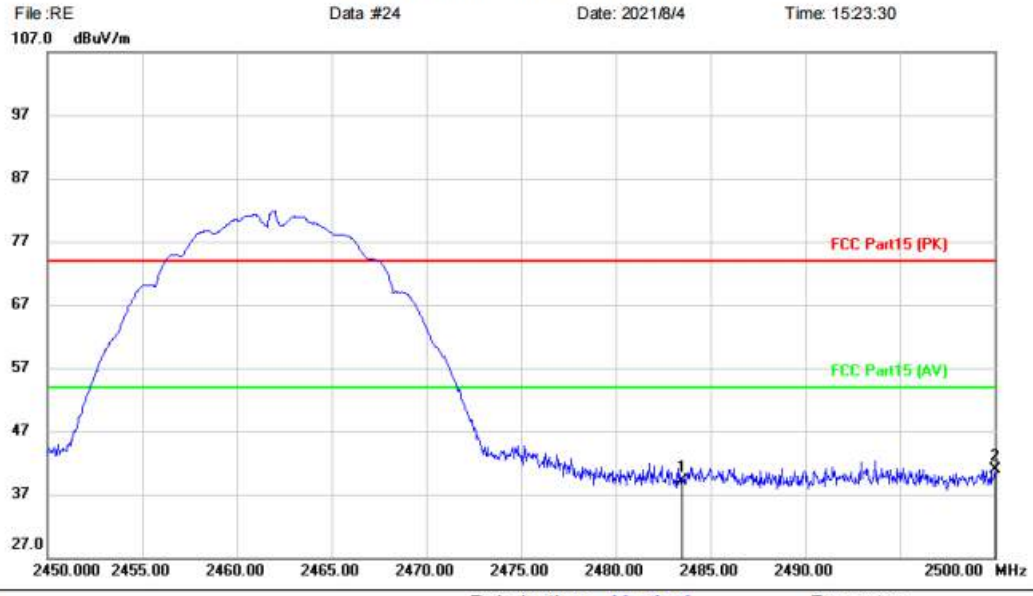
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2483.500	46.82	-3.84	42.98	74.00	-31.02	peak			
2		2500.000	45.41	-3.78	41.63	74.00	-32.37	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11B high channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-B-TX-H
Note:

Polarization: *Vertical*
Power:
Distance:

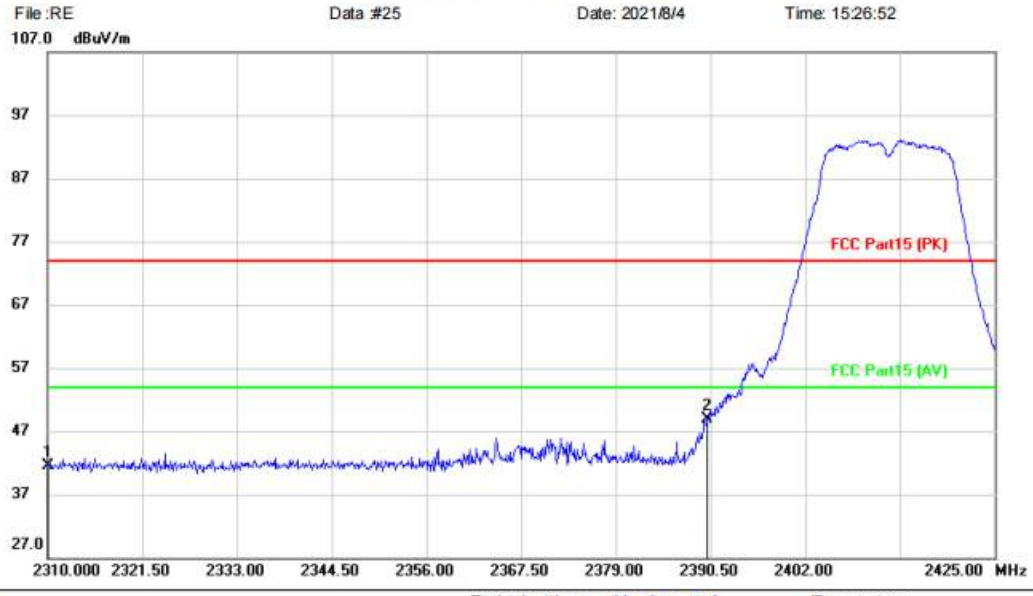
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.500	43.02	-3.84	39.18	74.00	-34.82	peak			
2	*	2500.000	44.69	-3.78	40.91	74.00	-33.09	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11G low channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-G-TX-L
Note:

Polarization: *Horizontal*
Power:
Distance:

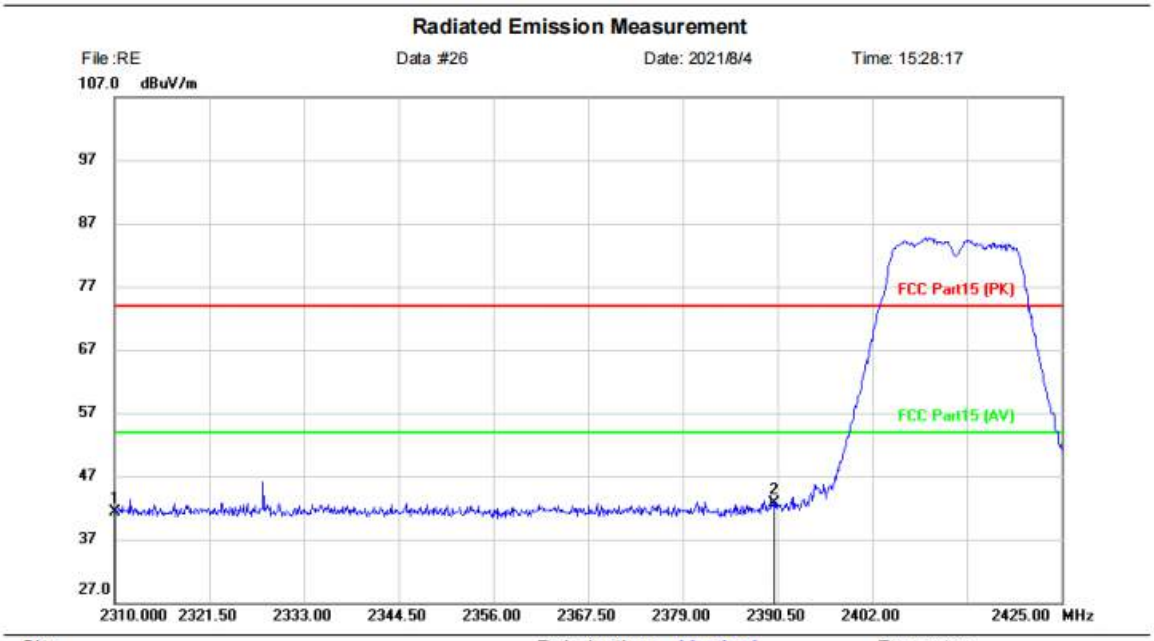
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	46.21	-4.61	41.60	74.00	-32.40	peak			
2	*	2390.000	53.20	-4.27	48.93	74.00	-25.07	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11G low channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-G-TX-L
Note:

Polarization: *Vertical*
Power:
Distance:

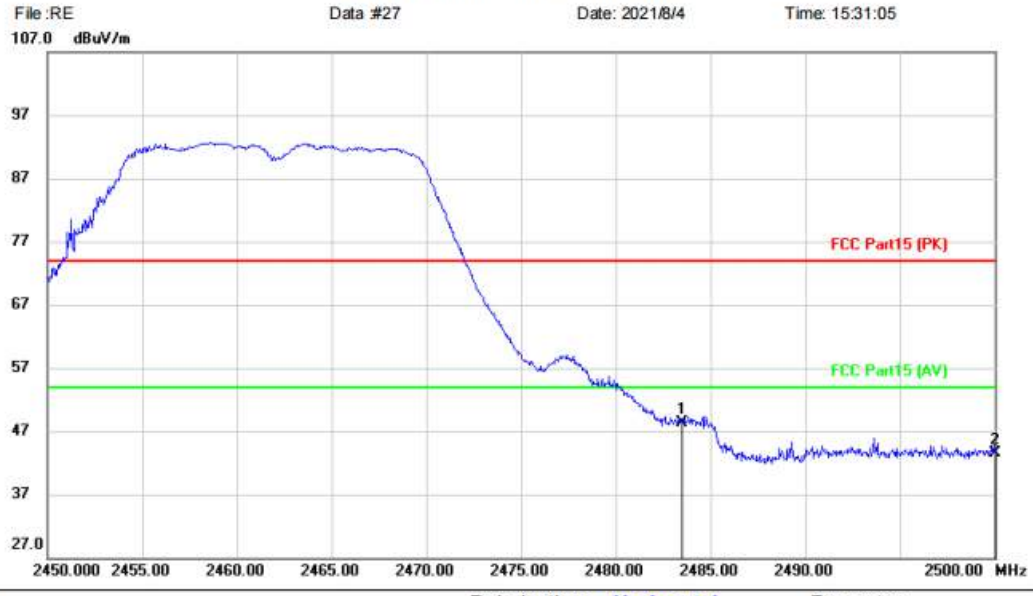
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	45.88	-4.61	41.27	74.00	-32.73	peak			
2	*	2390.000	46.94	-4.27	42.67	74.00	-31.33	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11G high channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-G-TX-H
Note:

Polarization: ***Horizontal***
Power:
Distance:

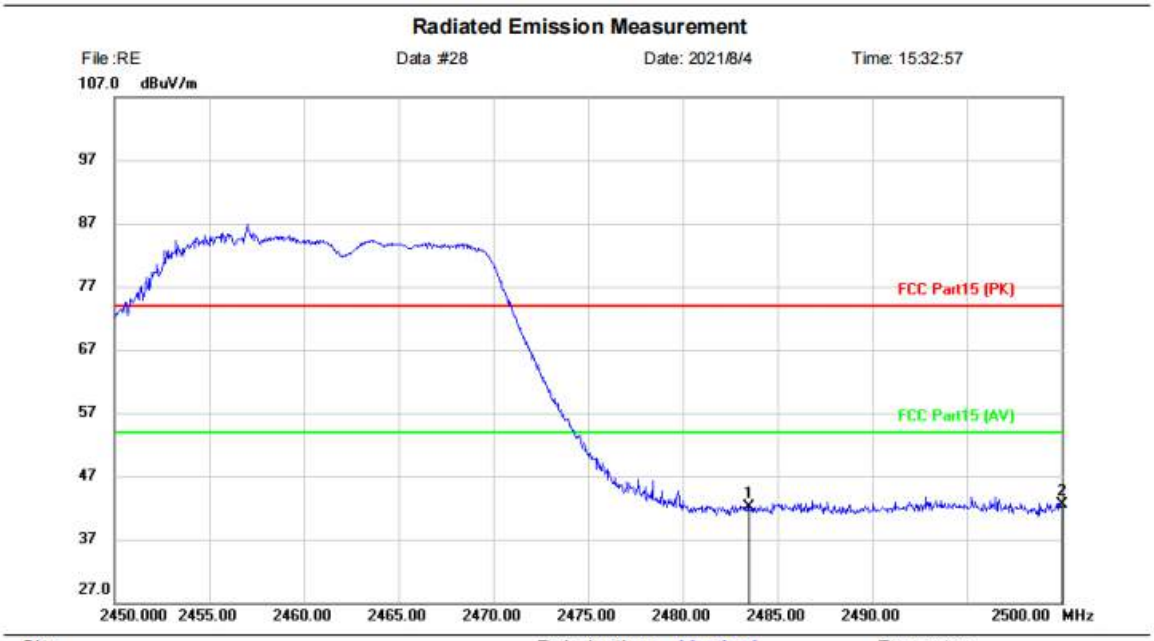
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2483.500	52.18	-3.84	48.34	74.00	-25.66	peak			
2		2500.000	47.36	-3.78	43.58	74.00	-30.42	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11G high channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-G-TX-H
Note:

Polarization: *Vertical*
Power:
Distance:

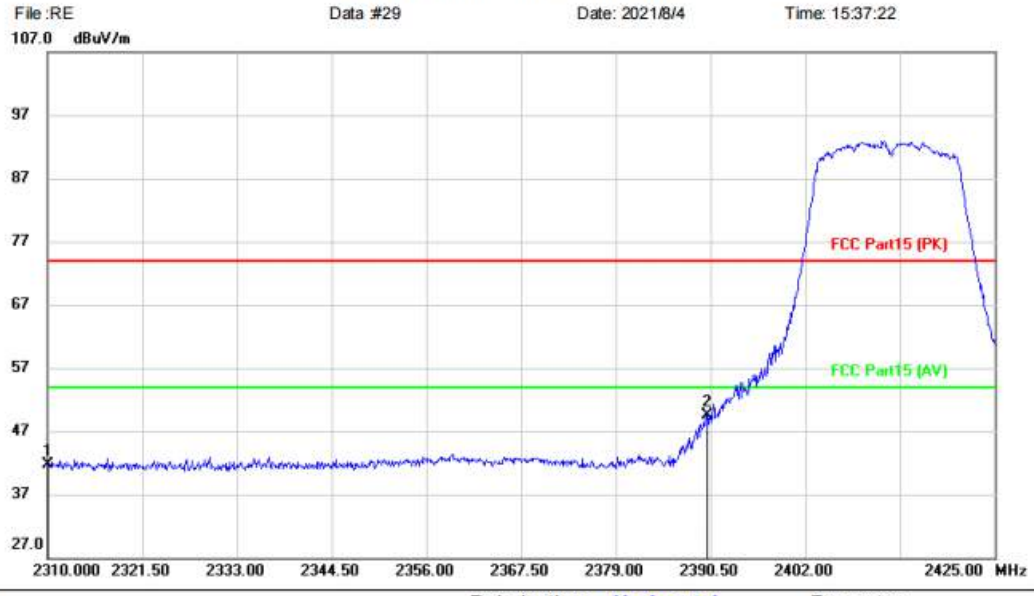
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.500	46.00	-3.84	42.16	74.00	-31.84	peak			
2	*	2500.000	46.28	-3.78	42.50	74.00	-31.50	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11N20M low channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-N20-TX-L
Note:

Polarization: *Horizontal*
Power:
Distance:

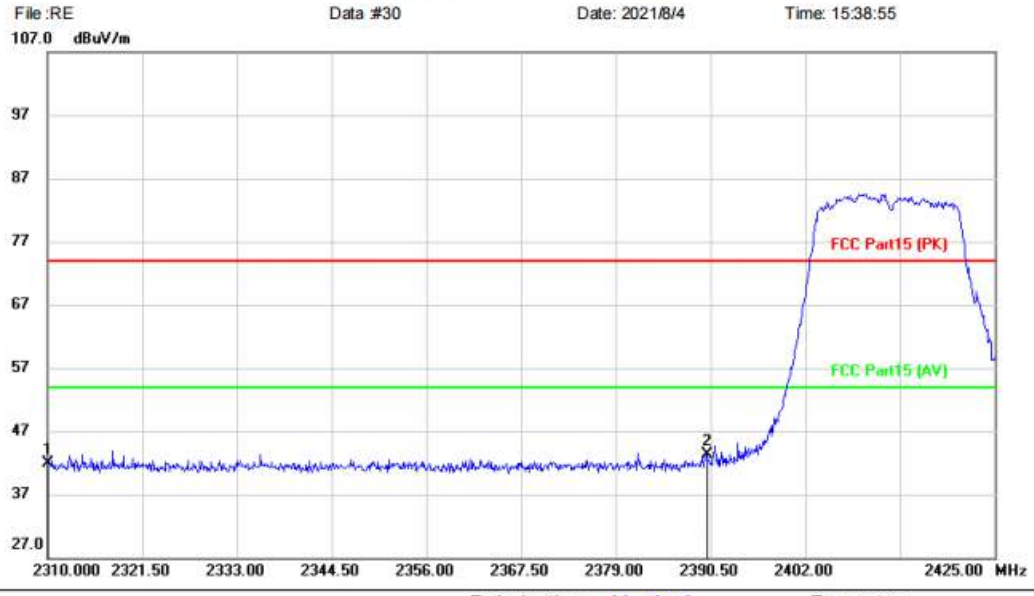
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	46.40	-4.61	41.79	74.00	-32.21	peak			
2	*	2390.000	53.81	-4.27	49.54	74.00	-24.46	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11N20M low channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-N20-TX-L
Note:

Polarization: *Vertical*
Power:
Distance:

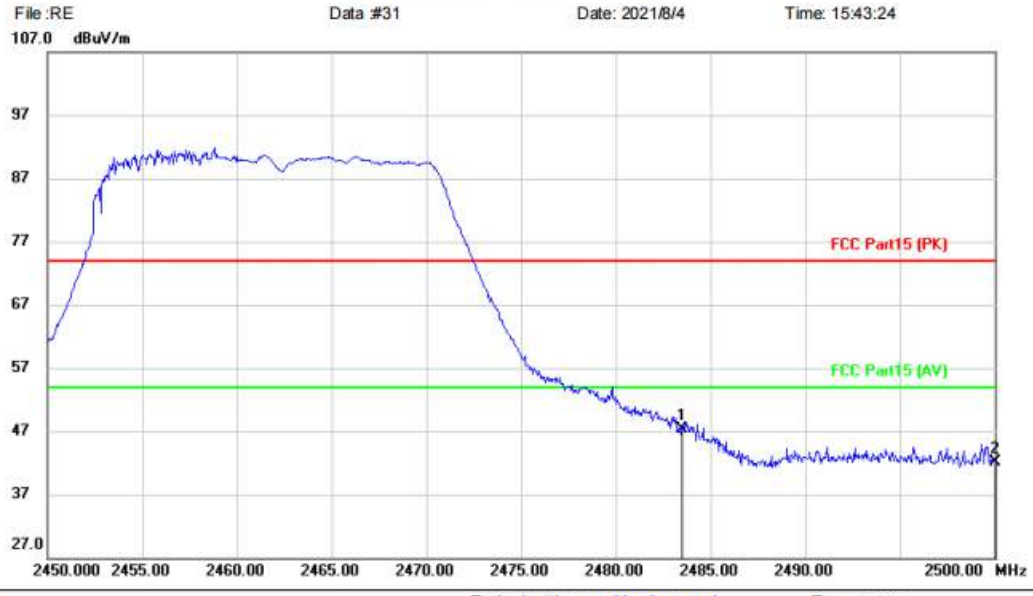
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	46.59	-4.61	41.98	74.00	-32.02	peak			
2	*	2390.000	47.57	-4.27	43.30	74.00	-30.70	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11N20M high channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-N20-TX-H
Note:

Polarization: ***Horizontal***
Power:
Distance:

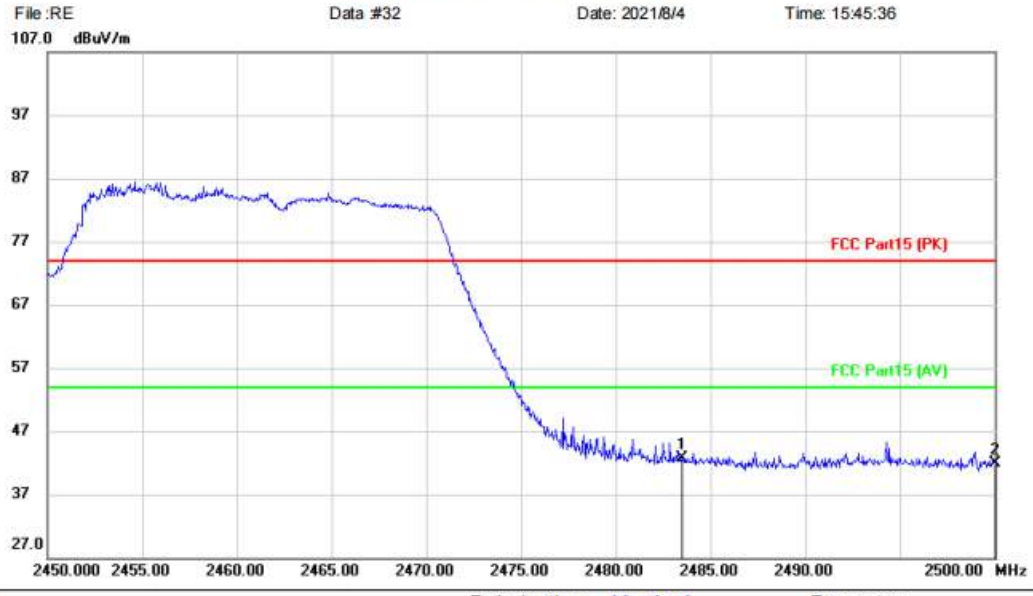
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2483.500	51.20	-3.84	47.36	74.00	-26.64	peak			
2		2500.000	45.96	-3.78	42.18	74.00	-31.82	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11N20M high channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-N20-TX-H
Note:

Polarization: *Vertical*
Power:
Distance:

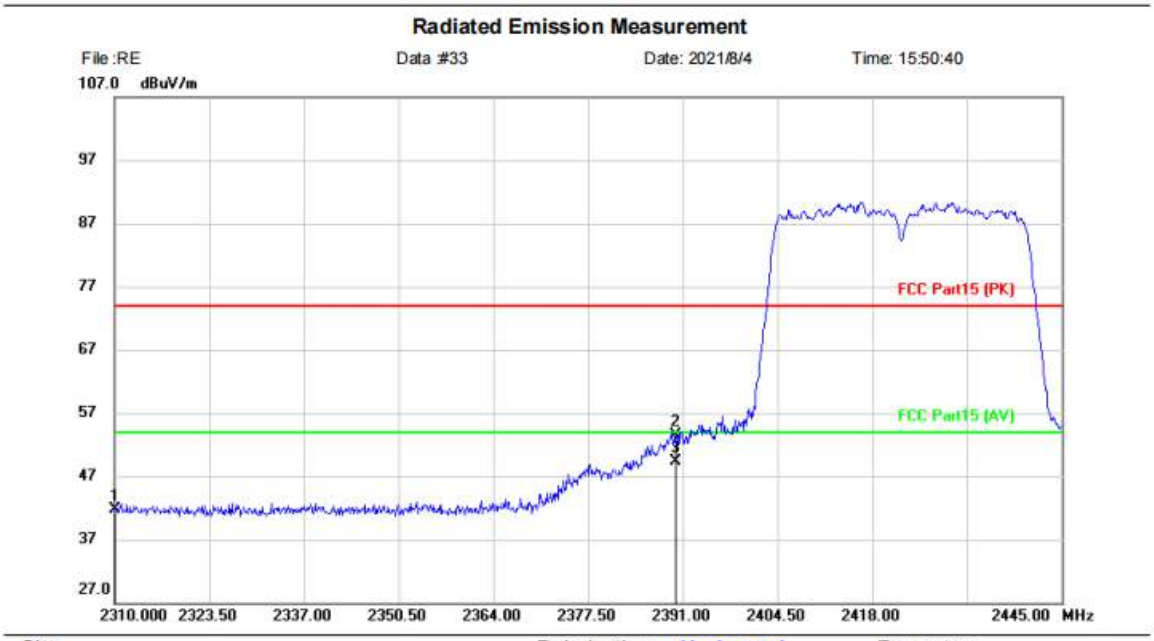
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2483.500	46.64	-3.84	42.80	74.00	-31.20	peak			
2		2500.000	45.66	-3.78	41.88	74.00	-32.12	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11N40M low channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-N40-TX-L
Note:

Polarization: *Horizontal*
Power:
Distance:

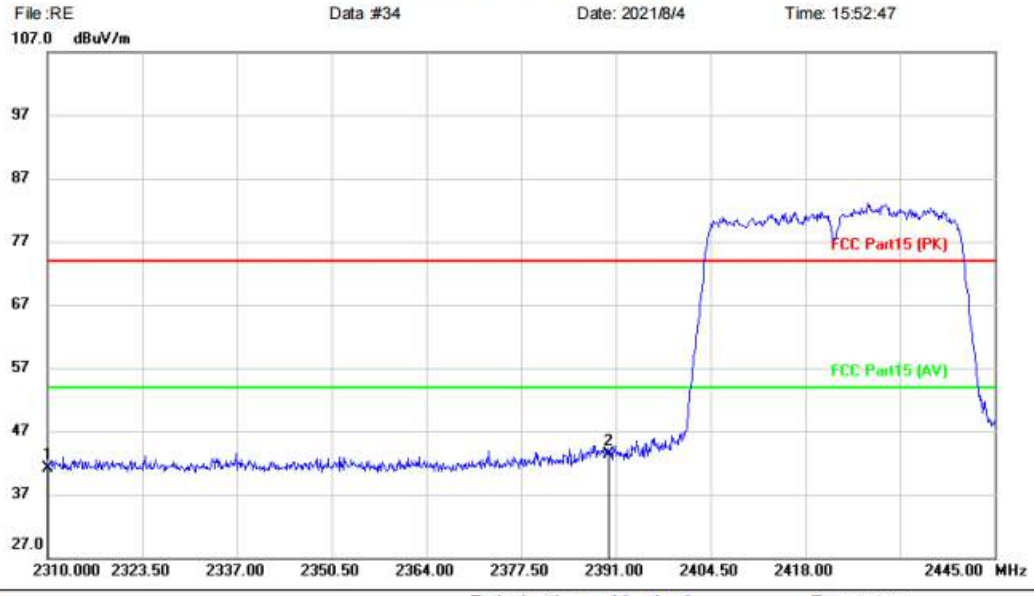
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	46.41	-4.61	41.80	74.00	-32.20	peak			
2		2390.000	57.83	-4.27	53.56	74.00	-20.44	peak			
3	*	2390.000	53.60	-4.27	49.33	54.00	-4.67	AVG			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11N40M low channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-N40-TX-L
Note:

Polarization: *Vertical*
Power:
Distance:

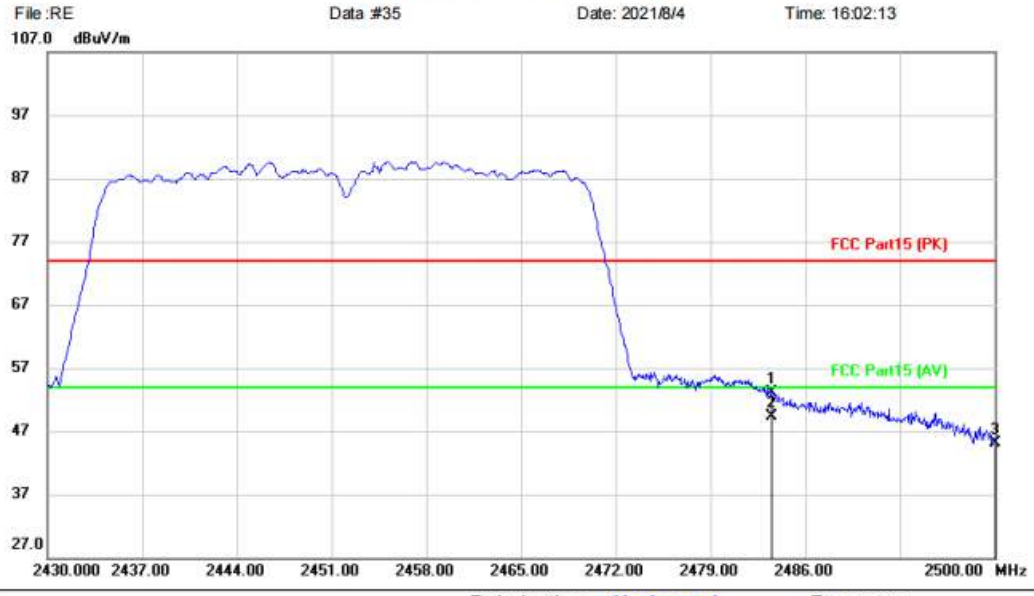
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	45.75	-4.61	41.14	74.00	-32.86	peak			
2	*	2390.000	47.66	-4.27	43.39	74.00	-30.61	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11N40M high channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-N40-TX-H
Note:

Polarization: *Horizontal*
Power:
Distance:

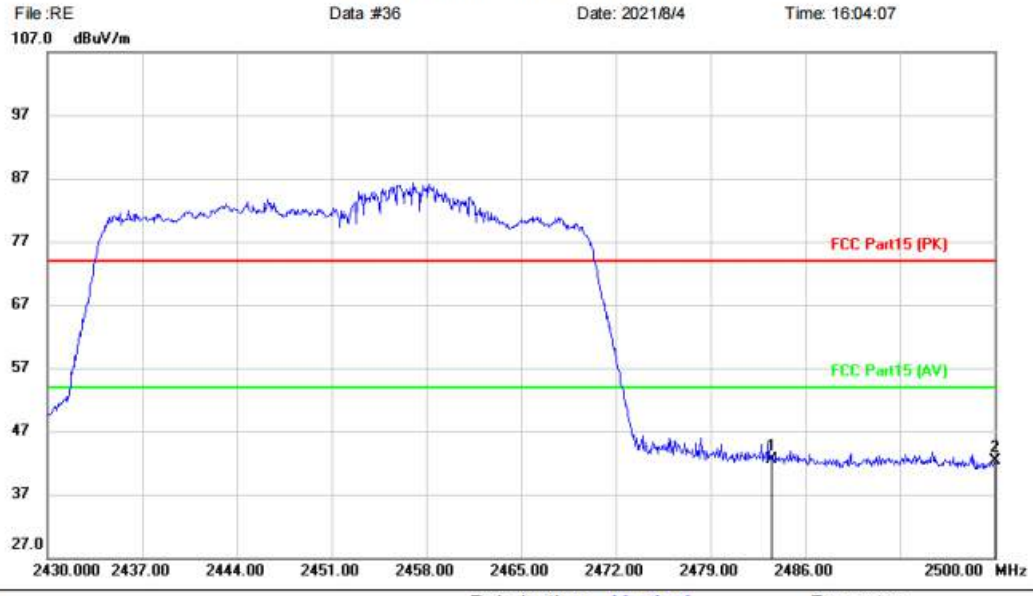
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.500	56.93	-3.84	53.09	74.00	-20.91	peak			
2	*	2483.500	53.15	-3.84	49.31	54.00	-4.69	AVG			
3		2500.000	48.90	-3.78	45.12	74.00	-28.88	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: TX 11N40M high channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G-N40-TX-H
Note:

Polarization: *Vertical*
Power:
Distance:

Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2483.500	46.27	-3.84	42.43	74.00	-31.57	peak			
2		2500.000	46.00	-3.78	42.22	74.00	-31.78	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

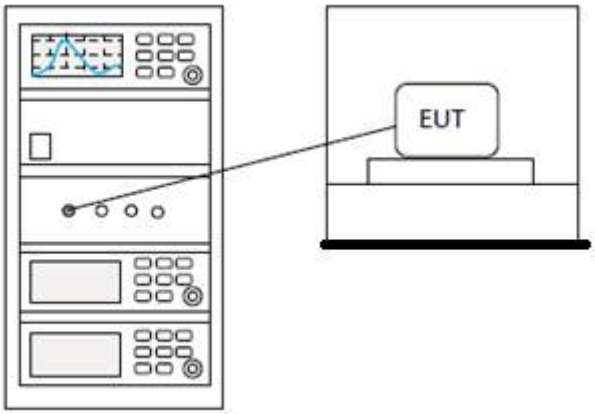
14 POWER SPECTRUM DENSITY

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 11.10.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

14.1 LIMITS

Limit:	≤8dBm in any 3 kHz band during any time interval of continuous transmission

14.2 BLOCK DIAGRAM OF TEST SETUP



14.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

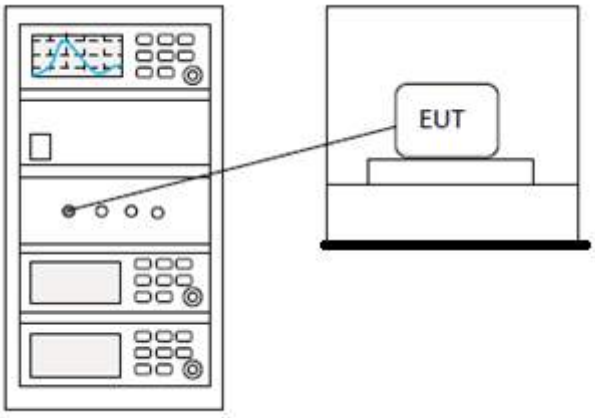
15 CONDUCTED SPURIOUS EMISSIONS

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

15.1 LIMITS

Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

15.2 BLOCK DIAGRAM OF TEST SETUP



15.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

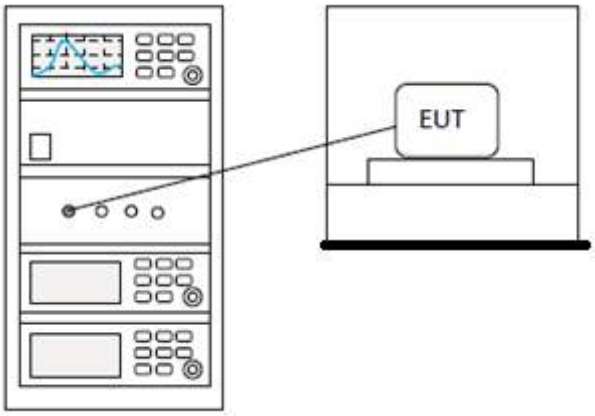
16 CONDUCTED BAND EDGES MEASUREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

16.1 LIMITS

Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

16.2 BLOCK DIAGRAM OF TEST SETUP



16.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

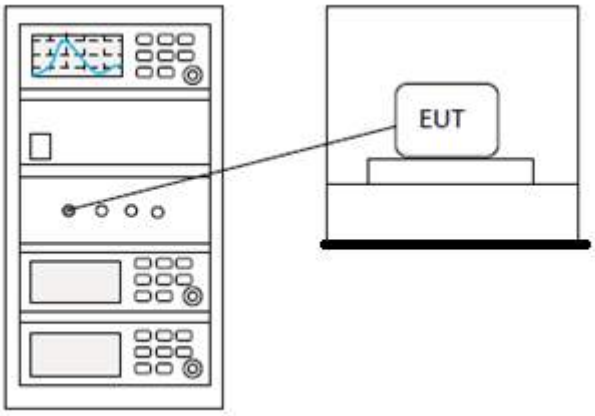
17 MINIMUM 6DB BANDWIDTH

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 11.8.1
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

17.1 LIMITS

Limit:	≥500 kHz

17.2 BLOCK DIAGRAM OF TEST SETUP



17.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

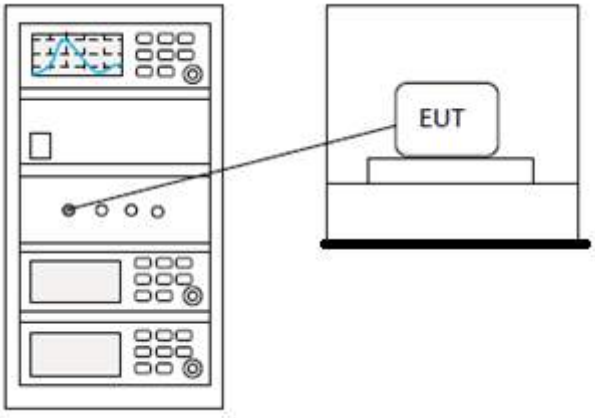
18 CONDUCTED PEAK OUTPUT POWER

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.5 & Section 11.9.1
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

18.1 LIMITS

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥50 hopping channels
	0.25 for 25≤ hopping channels <50
	1 for digital modulation
2400-2483.5	1 for ≥75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

18.2 BLOCK DIAGRAM OF TEST SETUP



18.3 EST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

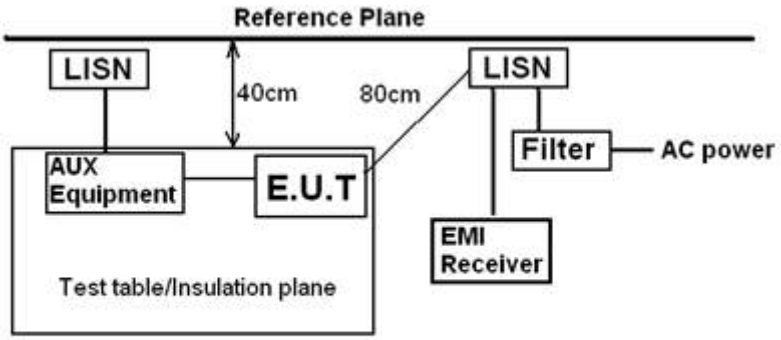
19 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.2
Test Mode (Pre-Scan)	Transmitting mode
Test Mode (Final Test)	Transmitting mode
Tester	Jozu
Temperature	25℃
Humidity	60%

19.1 LIMITS

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency.		

19.2 BLOCK DIAGRAM OF TEST SETUP



Remark
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

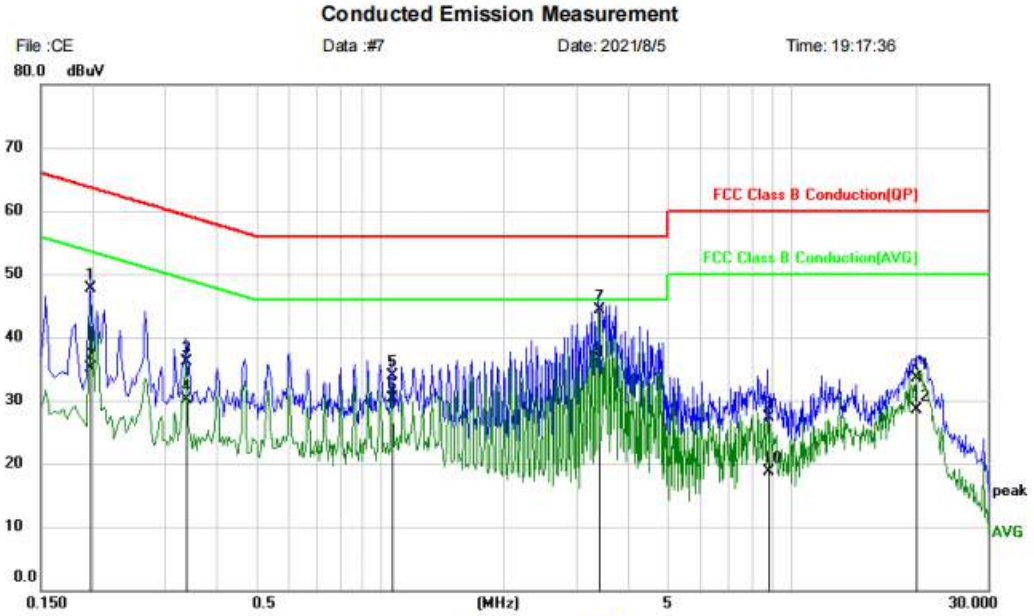
19.3 PROCEDURE

1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
Remark: LISN=Read Level+ Cable Loss+ LISN Factor

19.4 TEST DATA

[TestMode: Transmitting mode]; [Line: Line];[Power:AC120V/60Hz]



Site
Limit: FCC Class B Conduction(QP)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G mode
Note:

Phase: *L1*
Power:

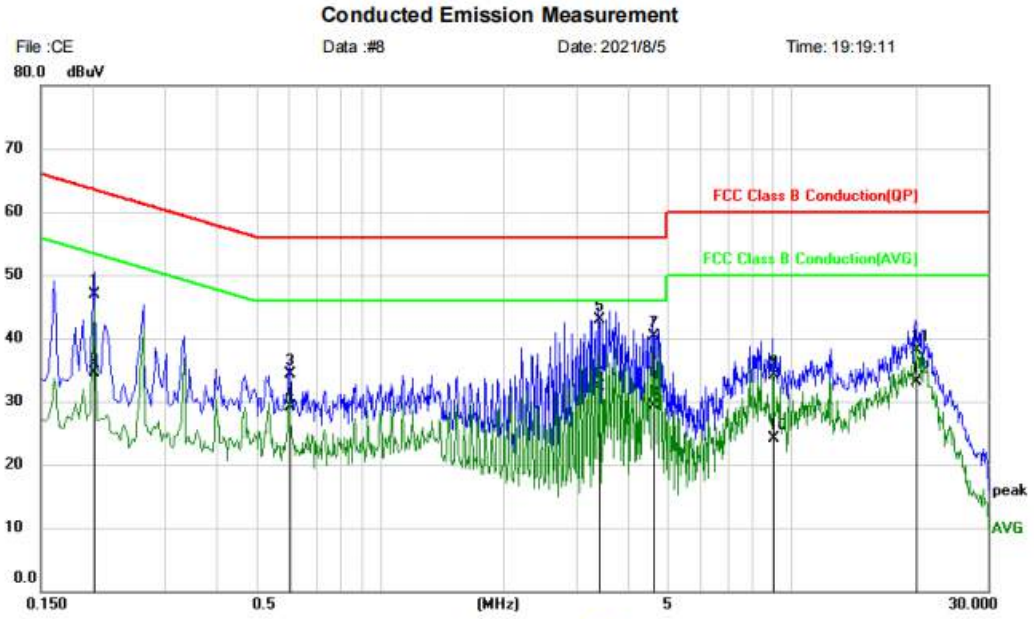
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1980	37.86	9.87	47.73	63.69	-15.96	QP	
2		0.1980	25.17	9.87	35.04	53.69	-18.65	AVG	
3		0.3379	26.40	9.79	36.19	59.25	-23.06	QP	
4		0.3379	20.40	9.79	30.19	49.25	-19.06	AVG	
5		1.0700	24.09	9.86	33.95	56.00	-22.05	QP	
6		1.0700	20.45	9.86	30.31	46.00	-15.69	AVG	
7		3.4100	34.51	9.85	44.36	56.00	-11.64	QP	
8	*	3.4100	25.60	9.85	35.45	46.00	-10.55	AVG	
9		8.7620	17.44	9.90	27.34	60.00	-32.66	QP	
10		8.7620	8.72	9.90	18.62	50.00	-31.38	AVG	
11		20.0580	23.51	10.04	33.55	60.00	-26.45	QP	
12		20.0580	18.37	10.04	28.41	50.00	-21.59	AVG	

*:Maximum data x:Over limit !:over margin (Reference Only

Test Result: Pass

[TestMode: Transmitting mode]; [Line: Neutral] ;[Power:AC120V/60Hz]



Site
Limit: FCC Class B Conduction(QP)
EUT: 6223C-PUD
M/N: 6223C-PUD
Mode: 2.4G mode
Note:

Phase: N
Power:

Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2020	37.10	9.89	46.99	63.53	-16.54	QP	
2		0.2020	24.52	9.89	34.41	53.53	-19.12	AVG	
3		0.6020	24.49	9.74	34.23	56.00	-21.77	QP	
4		0.6020	19.40	9.74	29.14	46.00	-16.86	AVG	
5	*	3.4100	33.07	9.86	42.93	56.00	-13.07	QP	
6		3.4100	22.46	9.86	32.32	46.00	-13.68	AVG	
7		4.6180	30.36	9.88	40.24	56.00	-15.76	QP	
8		4.6180	19.47	9.88	29.35	46.00	-16.65	AVG	
9		9.0300	24.25	9.92	34.17	60.00	-25.83	QP	
10		9.0300	14.19	9.92	24.11	50.00	-25.89	AVG	
11		19.9980	28.05	10.09	38.14	60.00	-21.86	QP	
12		19.9980	22.98	10.09	33.07	50.00	-16.93	AVG	

*:Maximum data x:Over limit !:over margin (Reference Only

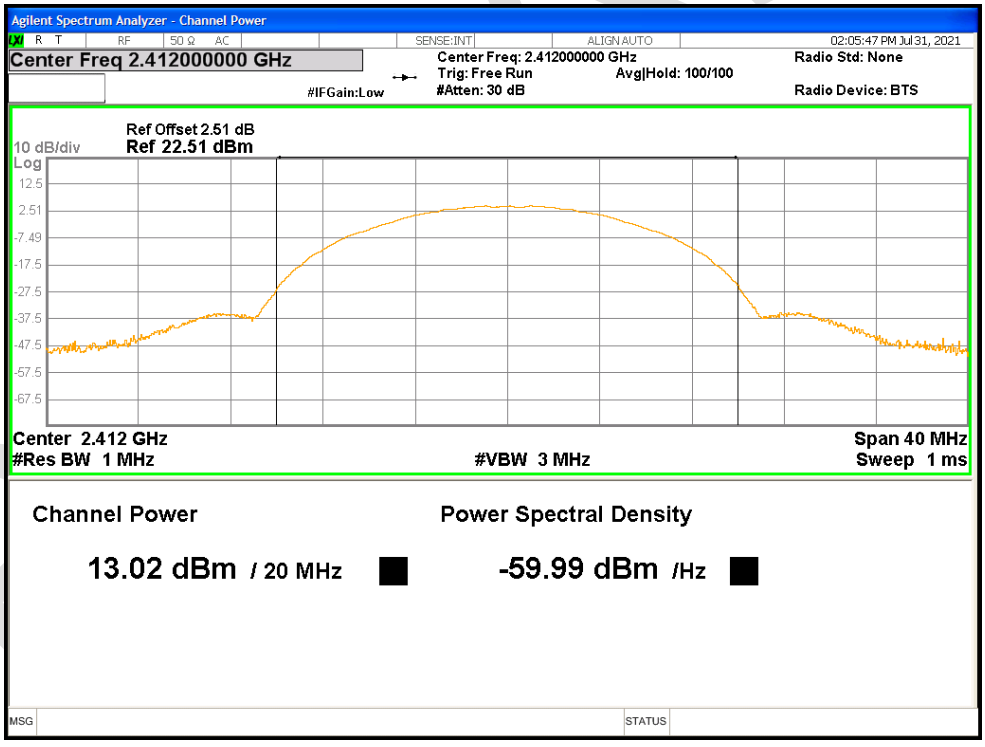
Test Result: Pass

20 APPENDIX

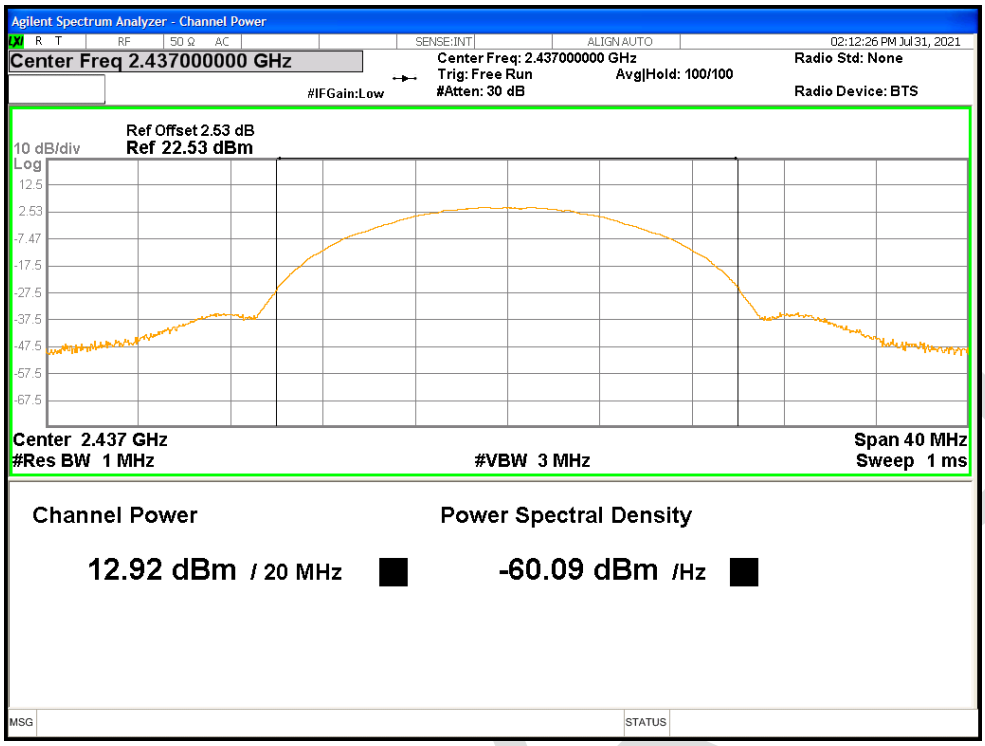
20.1 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	13.02	30	Pass
NVNT	b	2437	Ant1	12.92	30	Pass
NVNT	b	2462	Ant1	12.625	30	Pass
NVNT	g	2412	Ant1	11.395	30	Pass
NVNT	g	2437	Ant1	11.142	30	Pass
NVNT	g	2462	Ant1	10.836	30	Pass
NVNT	n20	2412	Ant1	11.575	30	Pass
NVNT	n20	2437	Ant1	11.409	30	Pass
NVNT	n20	2462	Ant1	11.189	30	Pass
NVNT	n40	2422	Ant1	11.862	30	Pass
NVNT	n40	2437	Ant1	11.724	30	Pass
NVNT	n40	2452	Ant1	11.531	30	Pass

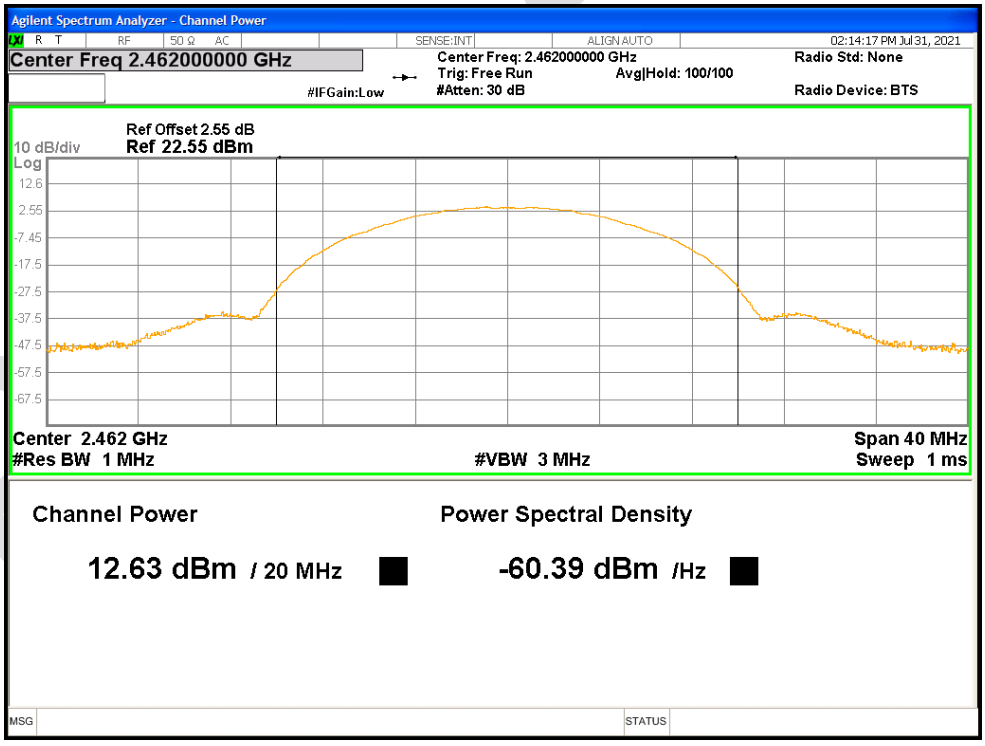
Power NVNT b 2412MHz Ant1



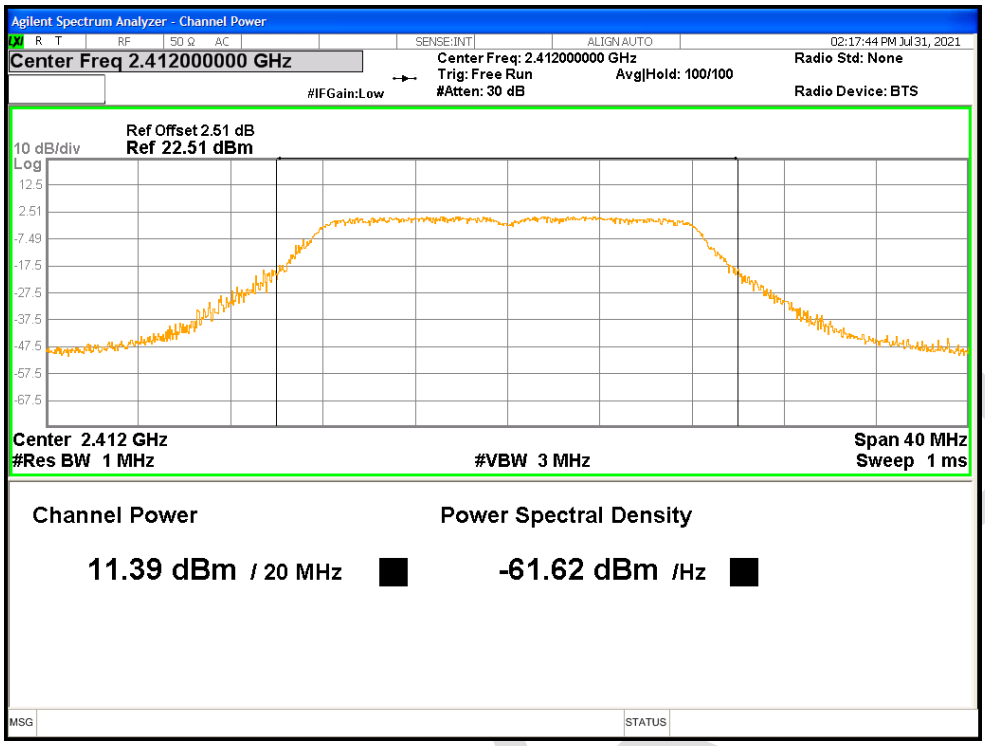
Power NVNT b 2437MHz Ant1



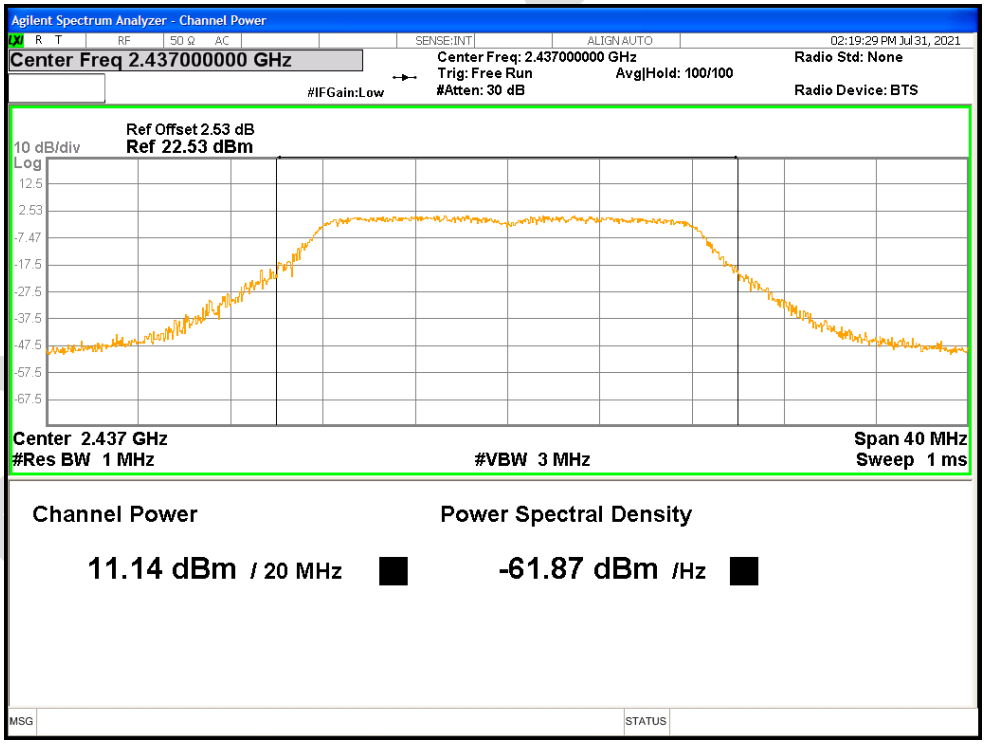
Power NVNT b 2462MHz Ant1



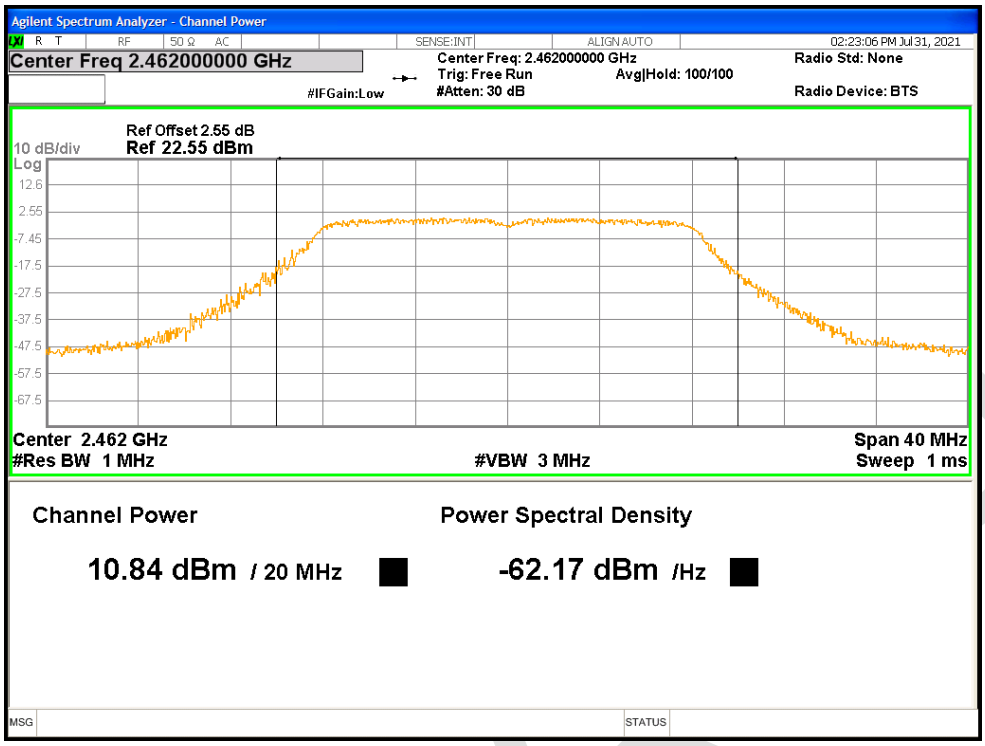
Power NVNT g 2412MHz Ant1



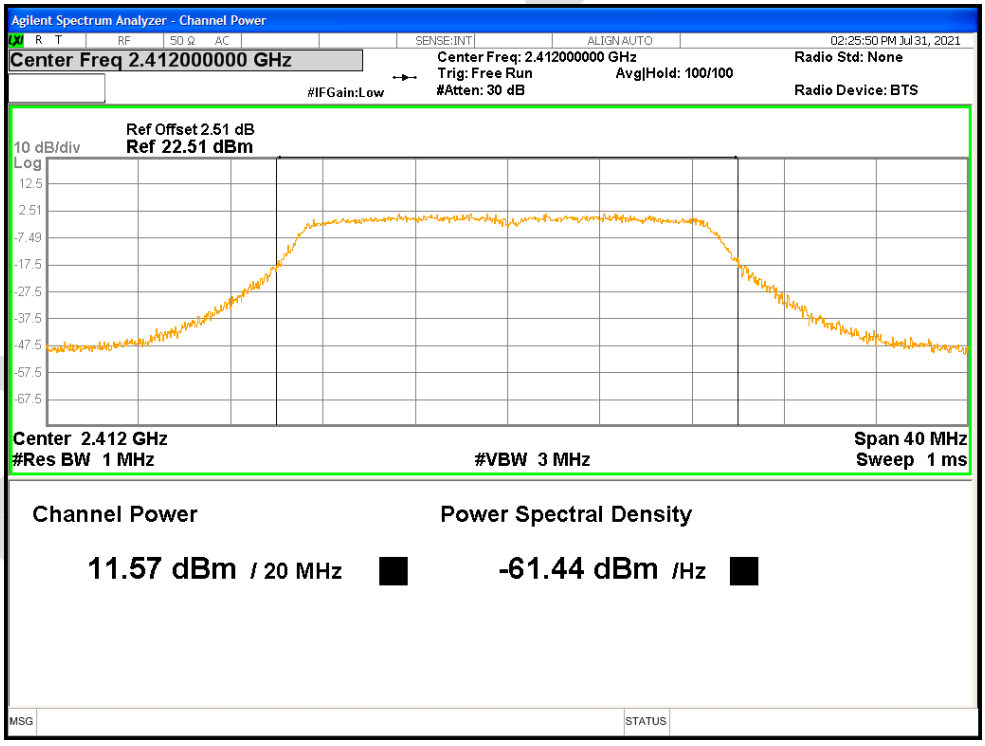
Power NVNT g 2437MHz Ant1



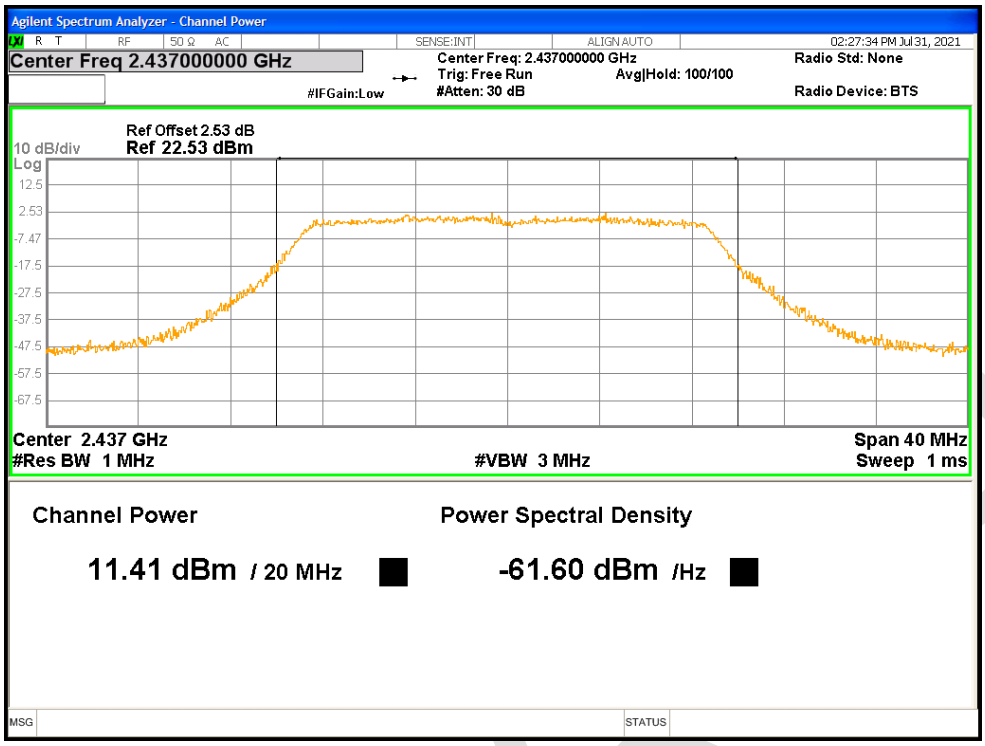
Power NVNT g 2462MHz Ant1



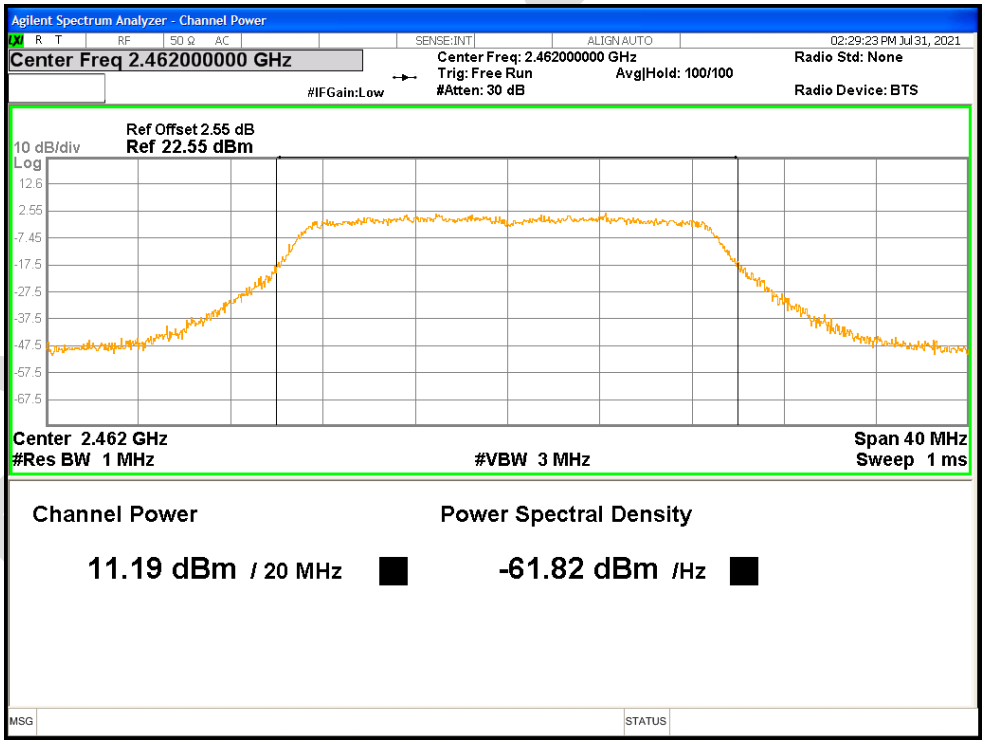
Power NVNT n20 2412MHz Ant1



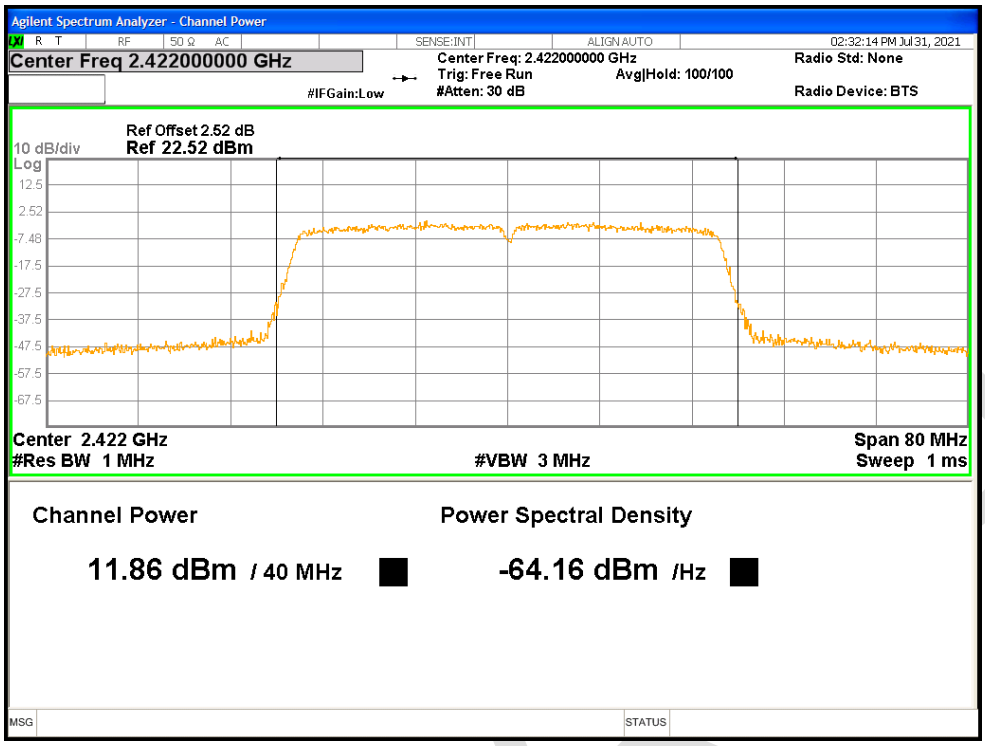
Power NVNT n20 2437MHz Ant1



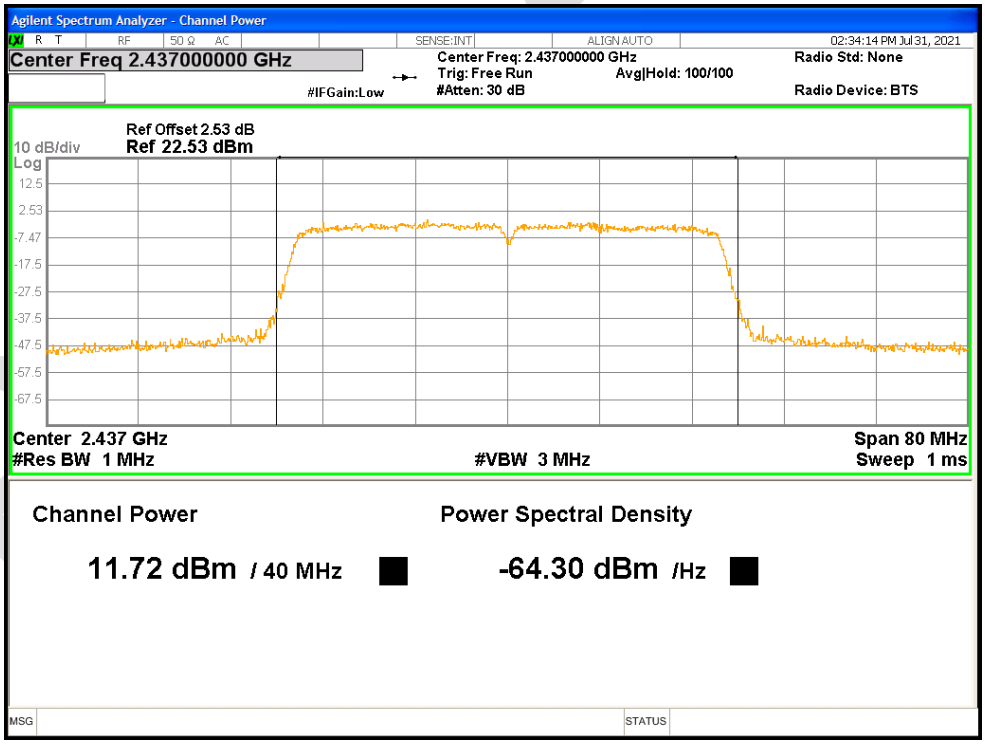
Power NVNT n20 2462MHz Ant1



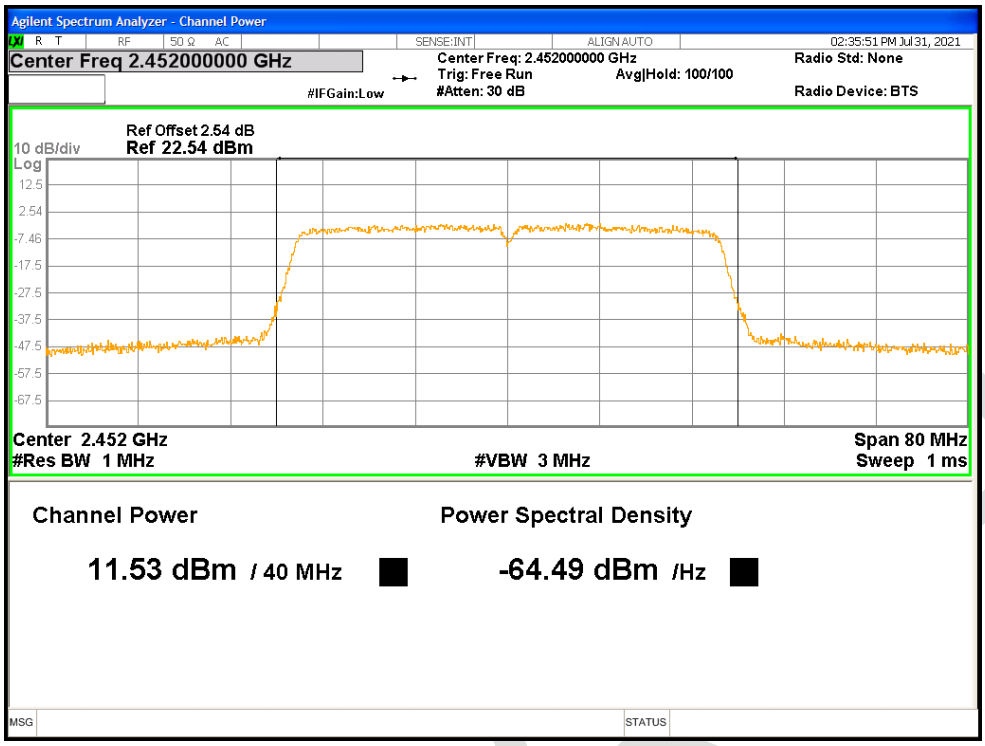
Power NVNT n40 2422MHz Ant1



Power NVNT n40 2437MHz Ant1



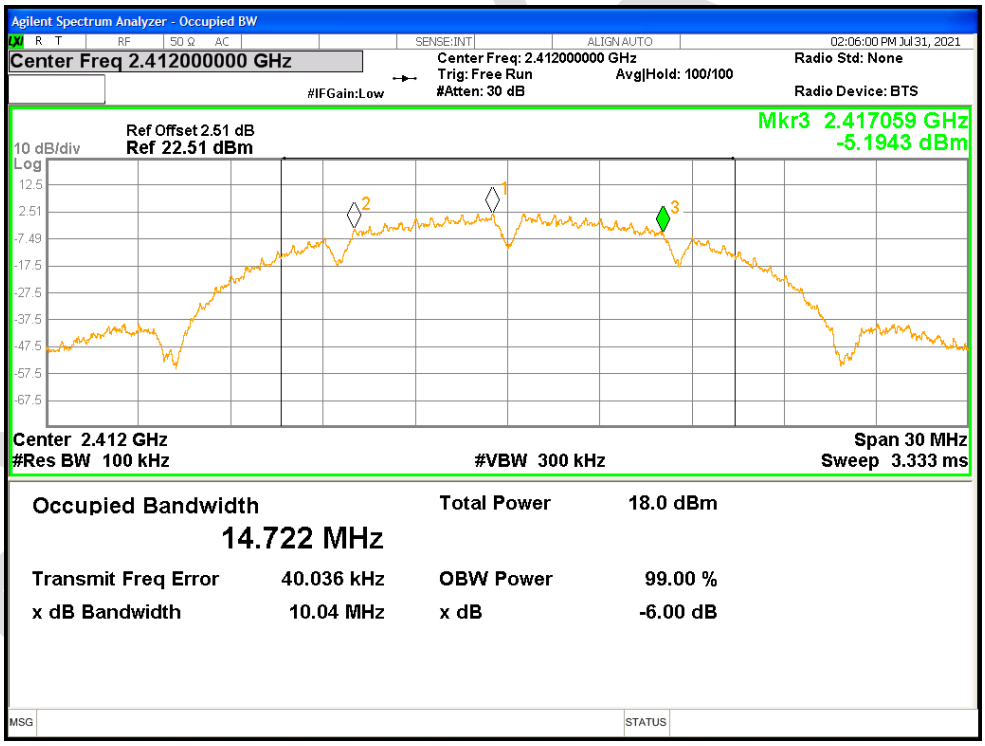
Power NVNT n40 2452MHz Ant1


Agilent Spectrum Analyzer - Channel Power
RT
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
02:35:51 PM Jul 31, 2021
Center Freq 2.452000000 GHz
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 2.54 dB
10 dB/div
Ref 22.54 dBm
Log
12.5
2.54
-7.46
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
Center 2.452 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 80 MHz
Sweep 1 ms
Channel Power
11.53 dBm / 40 MHz
Power Spectral Density
-64.49 dBm /Hz
MSG
STATUS

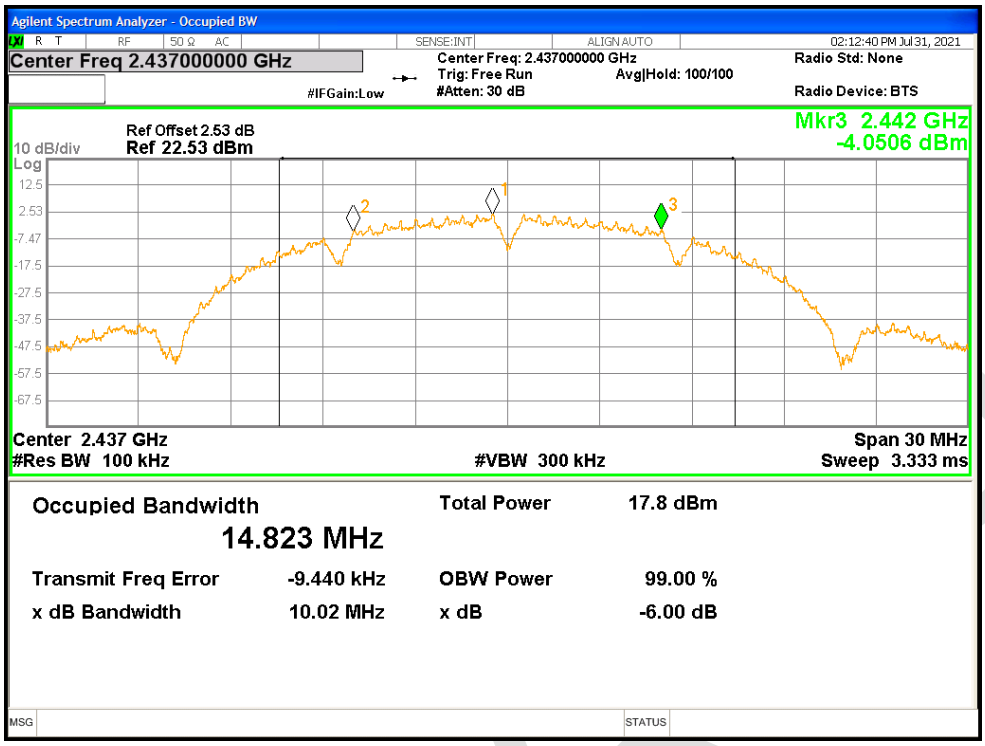
20.2 -6DB BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	10.037	0.5	Pass
NVNT	b	2437	Ant1	10.018	0.5	Pass
NVNT	b	2462	Ant1	10.021	0.5	Pass
NVNT	g	2412	Ant1	16.456	0.5	Pass
NVNT	g	2437	Ant1	16.483	0.5	Pass
NVNT	g	2462	Ant1	16.426	0.5	Pass
NVNT	n20	2412	Ant1	17.708	0.5	Pass
NVNT	n20	2437	Ant1	17.676	0.5	Pass
NVNT	n20	2462	Ant1	17.684	0.5	Pass
NVNT	n40	2422	Ant1	36.389	0.5	Pass
NVNT	n40	2437	Ant1	36.397	0.5	Pass
NVNT	n40	2452	Ant1	36.409	0.5	Pass

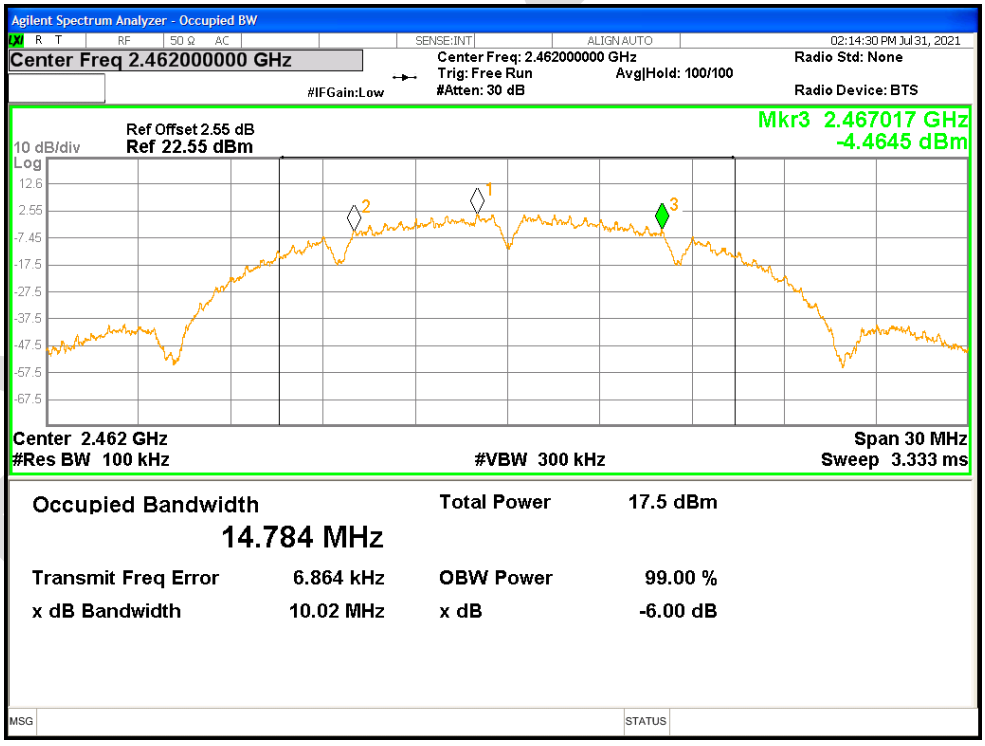
-6dB Bandwidth NVNT b 2412MHz Ant1



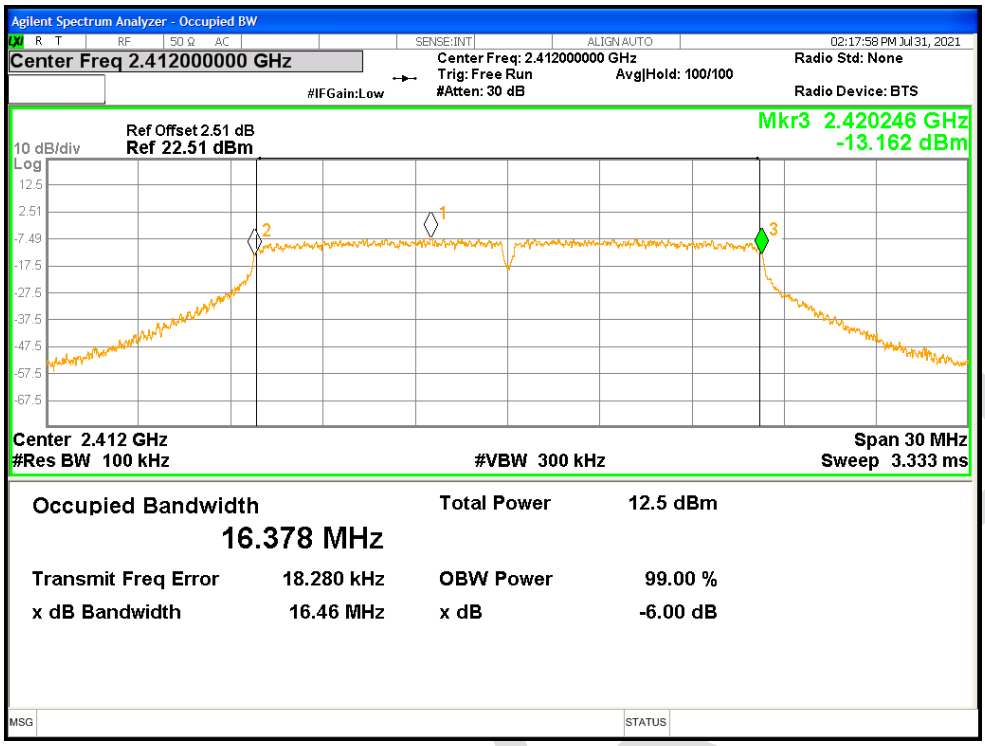
-6dB Bandwidth NVNT b 2437MHz Ant1



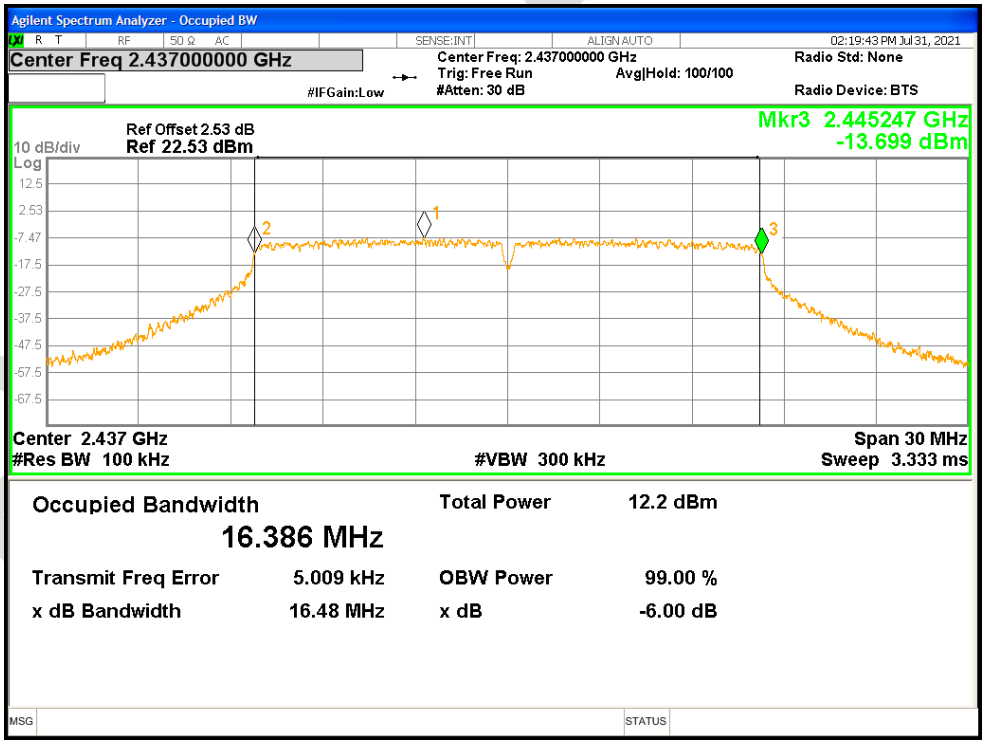
-6dB Bandwidth NVNT b 2462MHz Ant1



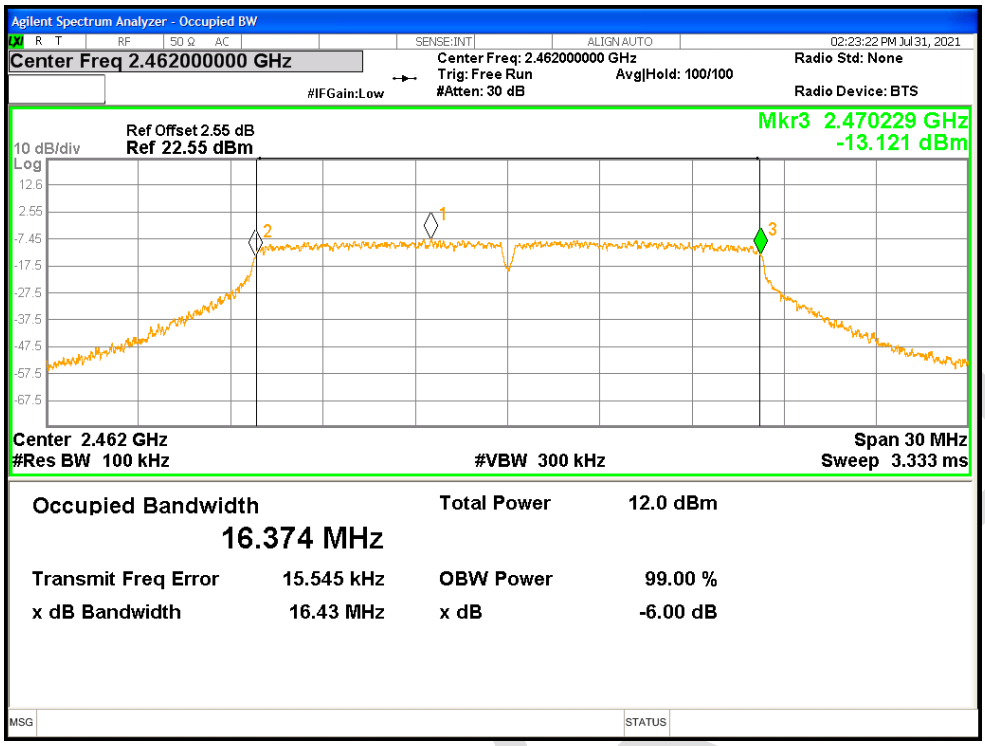
-6dB Bandwidth NVNT g 2412MHz Ant1



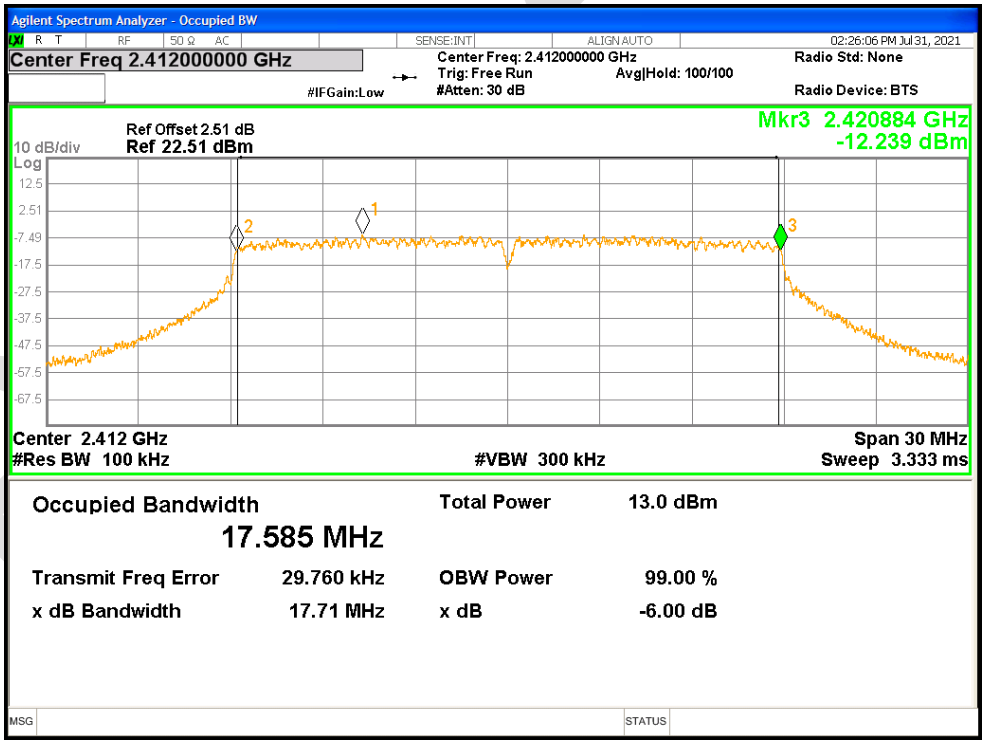
-6dB Bandwidth NVNT g 2437MHz Ant1



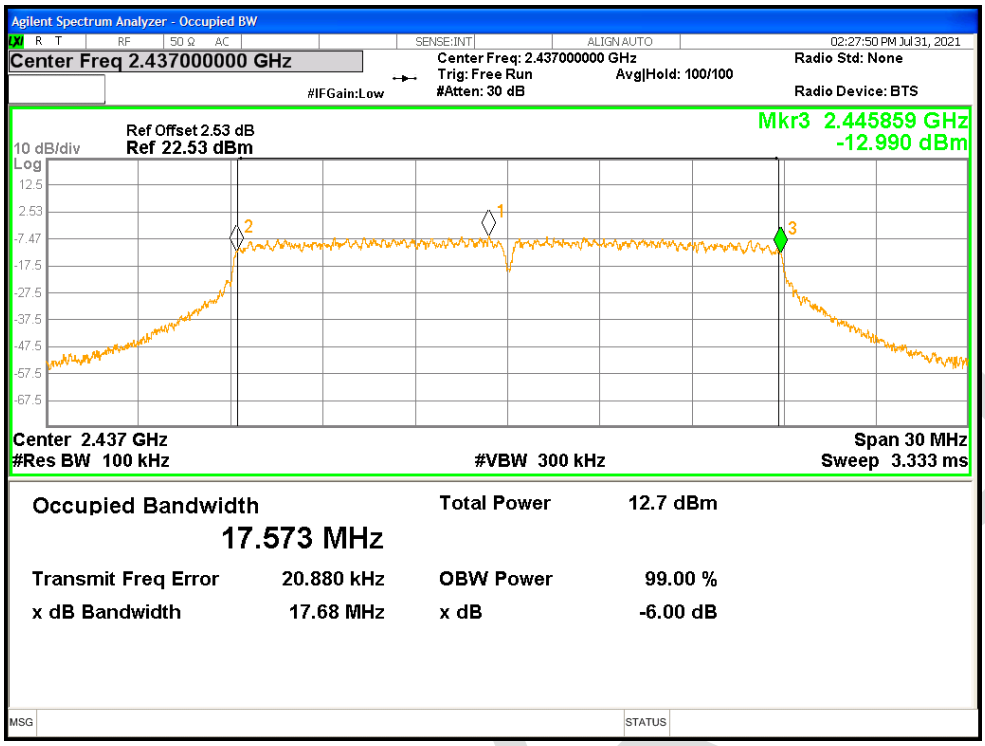
-6dB Bandwidth NVNT g 2462MHz Ant1



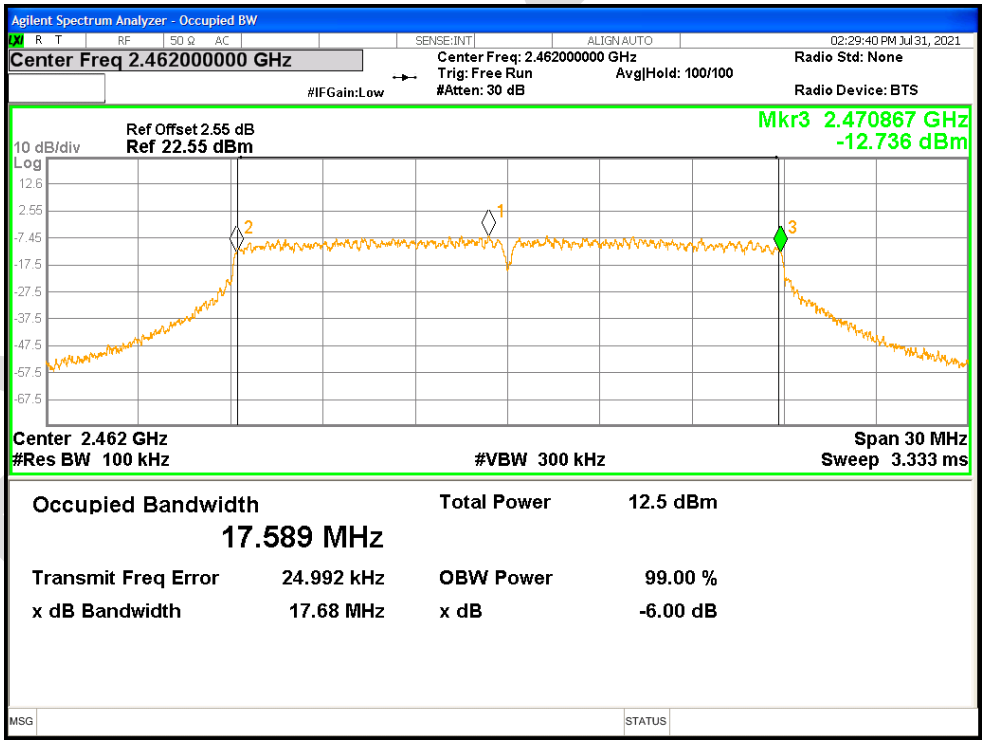
-6dB Bandwidth NVNT n20 2412MHz Ant1



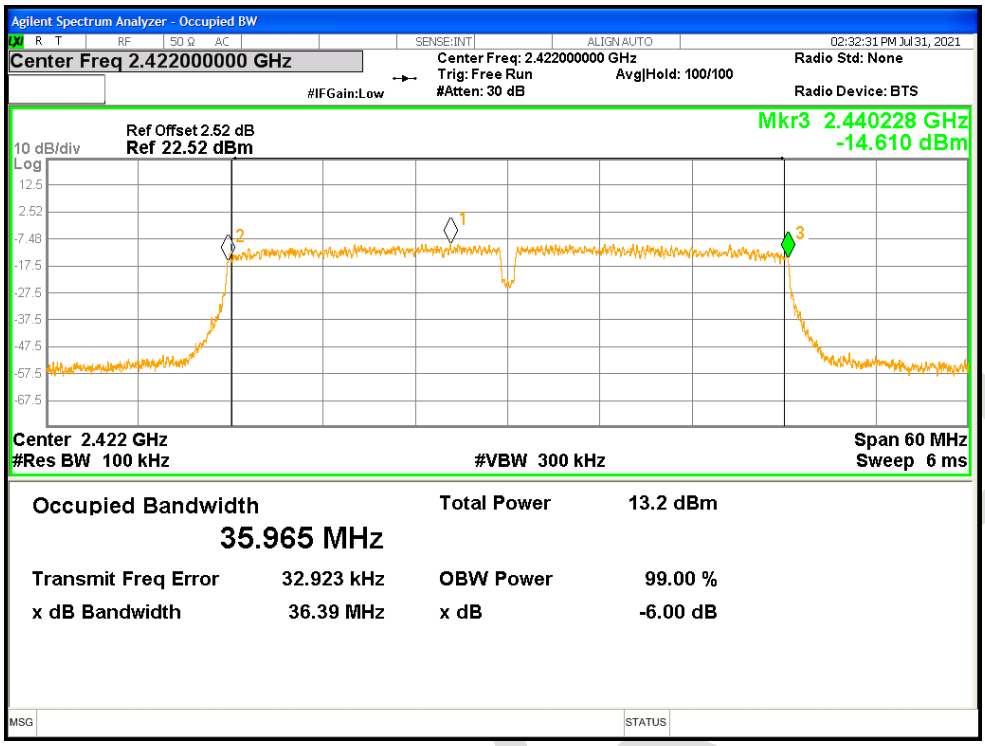
-6dB Bandwidth NVNT n20 2437MHz Ant1



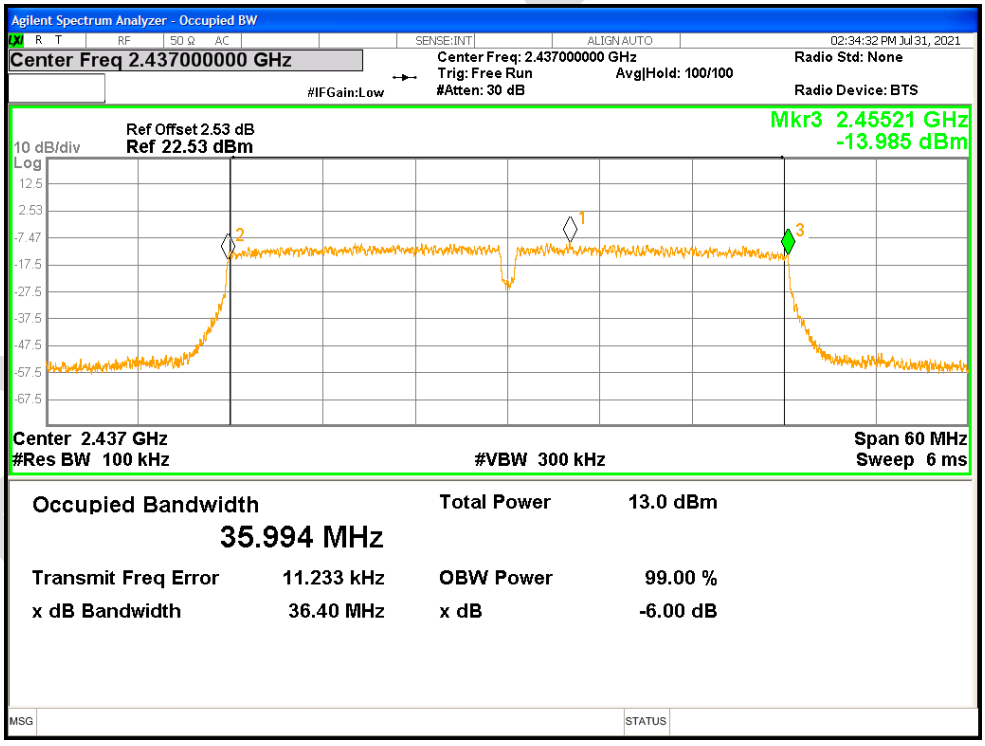
-6dB Bandwidth NVNT n20 2462MHz Ant1



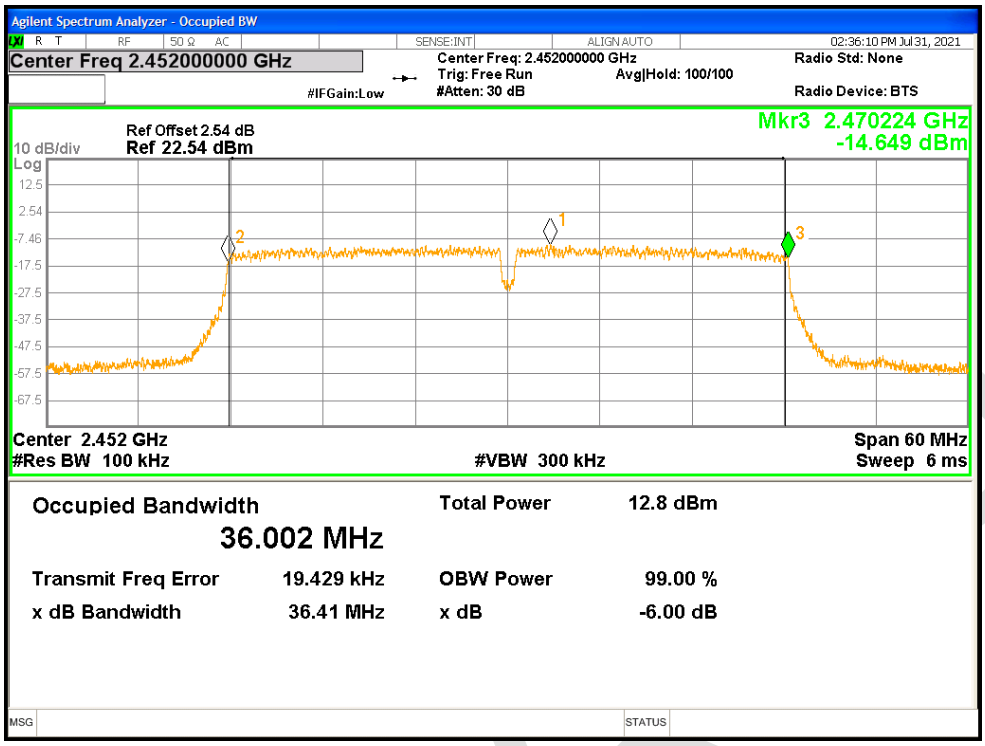
-6dB Bandwidth NVNT n40 2422MHz Ant1



-6dB Bandwidth NVNT n40 2437MHz Ant1



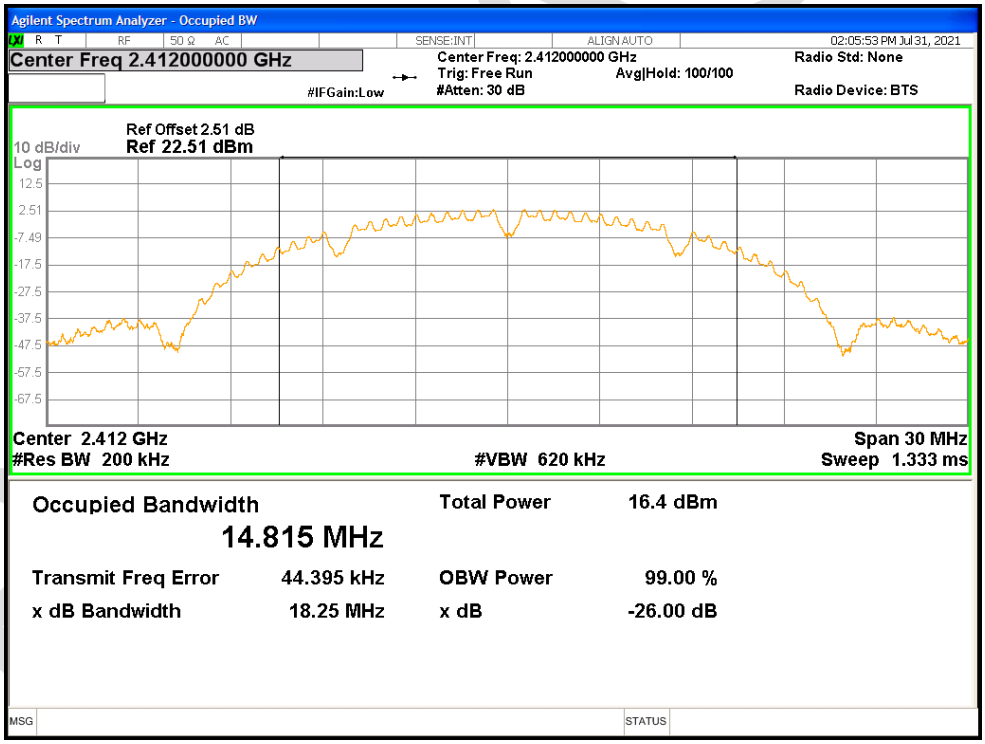
-6dB Bandwidth NVNT n40 2452MHz Ant1


Agilent Spectrum Analyzer - Occupied BW
RT
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
02:36:10 PM Jul 31, 2021
Center Freq 2.452000000 GHz
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 2.54 dB
10 dB/div
Ref 22.54 dBm
Log
12.5
2.54
-7.46
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
Mkr3 2.470224 GHz
-14.649 dBm
Center 2.452 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 6 ms
Occupied Bandwidth
36.002 MHz
Total Power 12.8 dBm
Transmit Freq Error 19.429 kHz
OBW Power 99.00 %
x dB Bandwidth 36.41 MHz
x dB -6.00 dB
MSG
STATUS

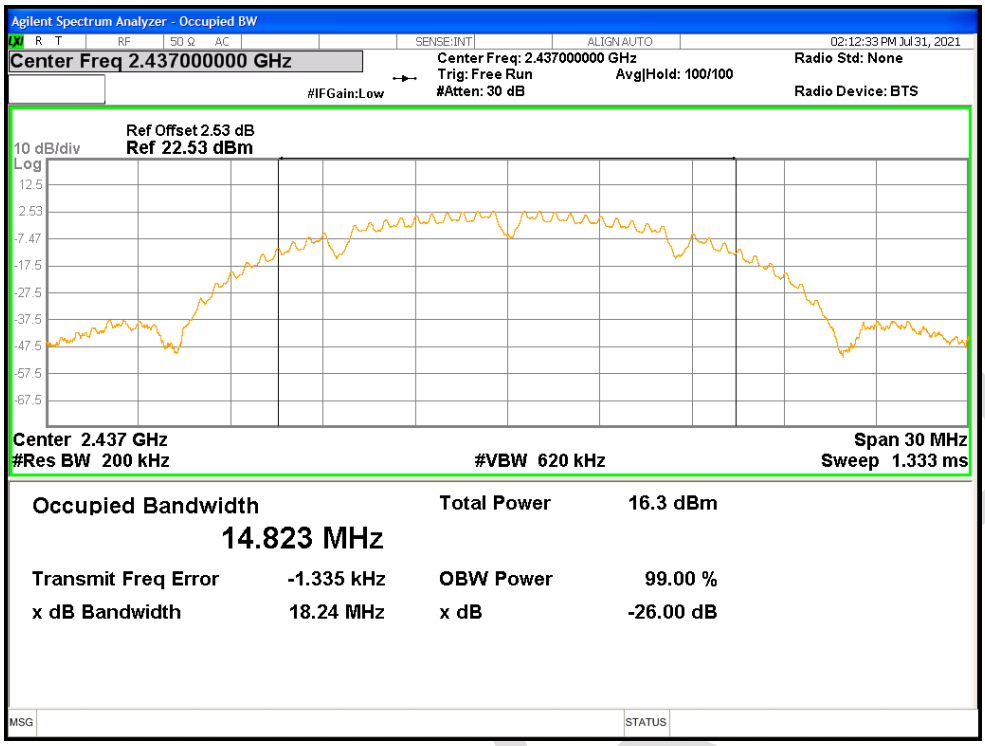
20.3 OCCUPIED CHANNEL BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	b	2412	Ant1	14.81544625
NVNT	b	2437	Ant1	14.82329802
NVNT	b	2462	Ant1	14.80290038
NVNT	g	2412	Ant1	16.43664494
NVNT	g	2437	Ant1	16.4591631
NVNT	g	2462	Ant1	16.40059507
NVNT	n20	2412	Ant1	17.61279083
NVNT	n20	2437	Ant1	17.57931775
NVNT	n20	2462	Ant1	17.59963765
NVNT	n40	2422	Ant1	35.9424633
NVNT	n40	2437	Ant1	35.98757375
NVNT	n40	2452	Ant1	36.01141343

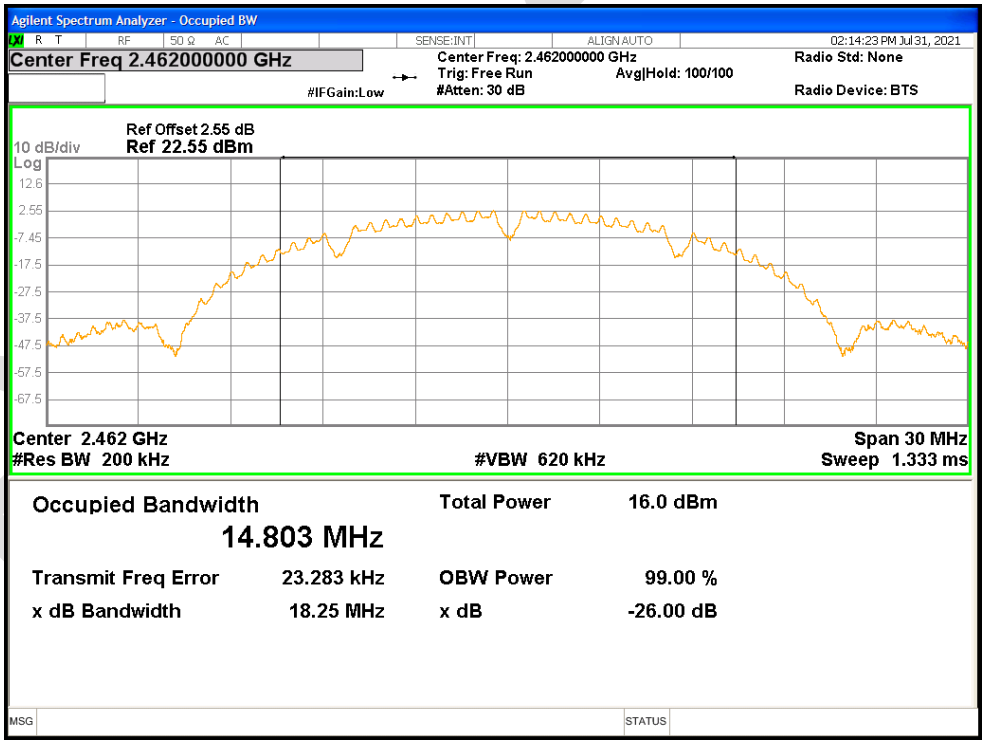
OBW NVNT b 2412MHz Ant1



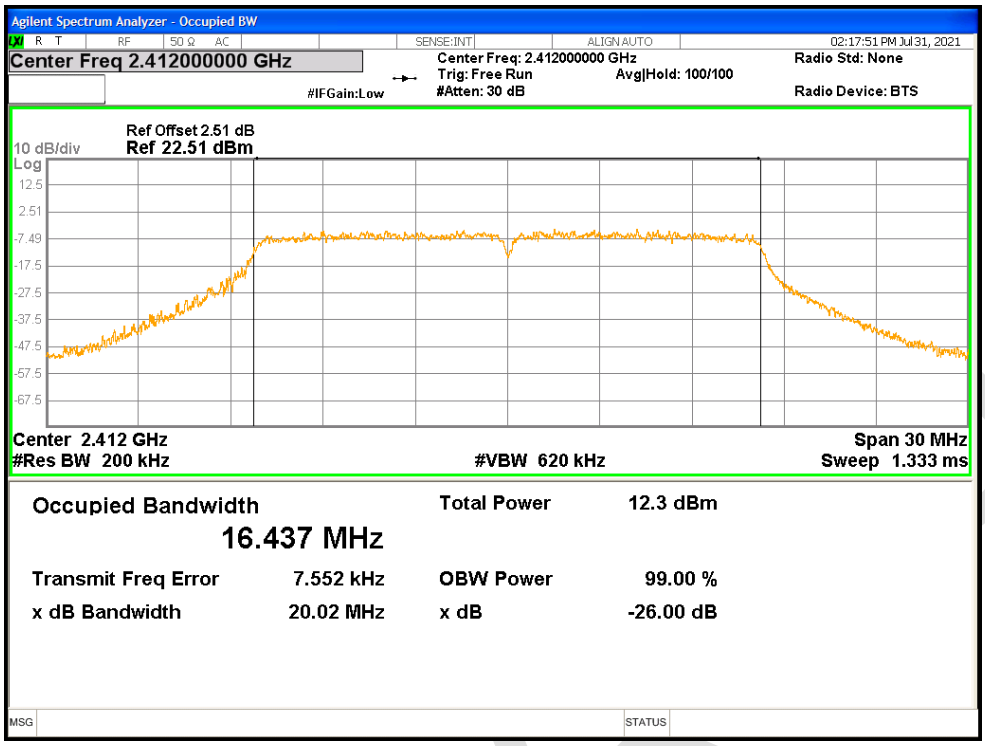
OBW NVNT b 2437MHz Ant1



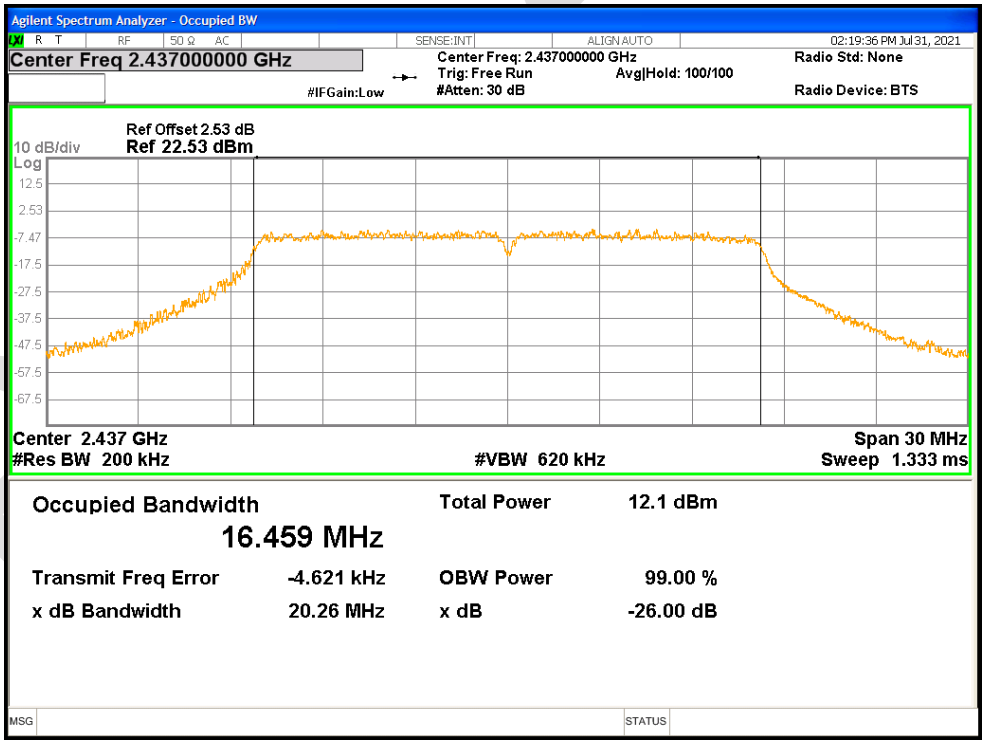
OBW NVNT b 2462MHz Ant1



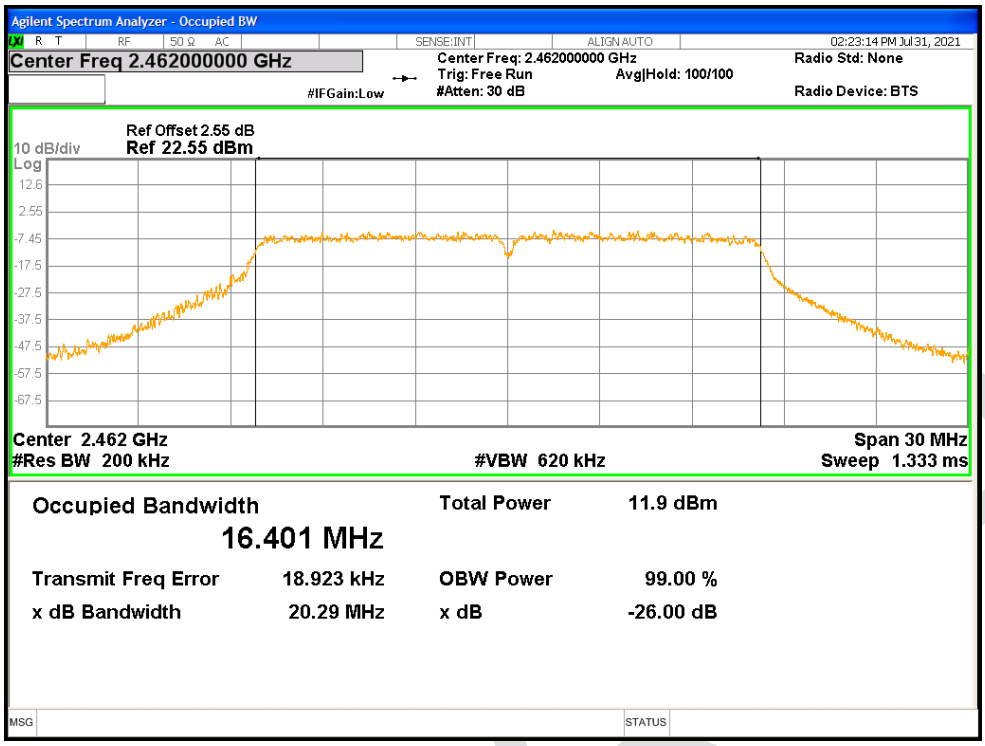
OBW NVNT g 2412MHz Ant1



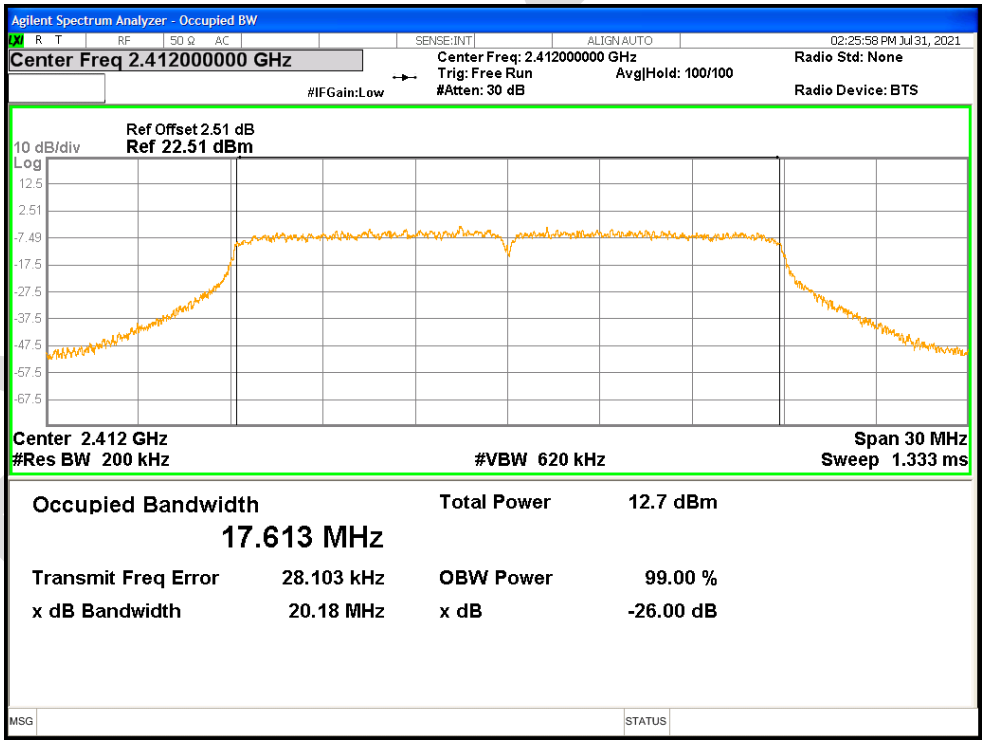
OBW NVNT g 2437MHz Ant1



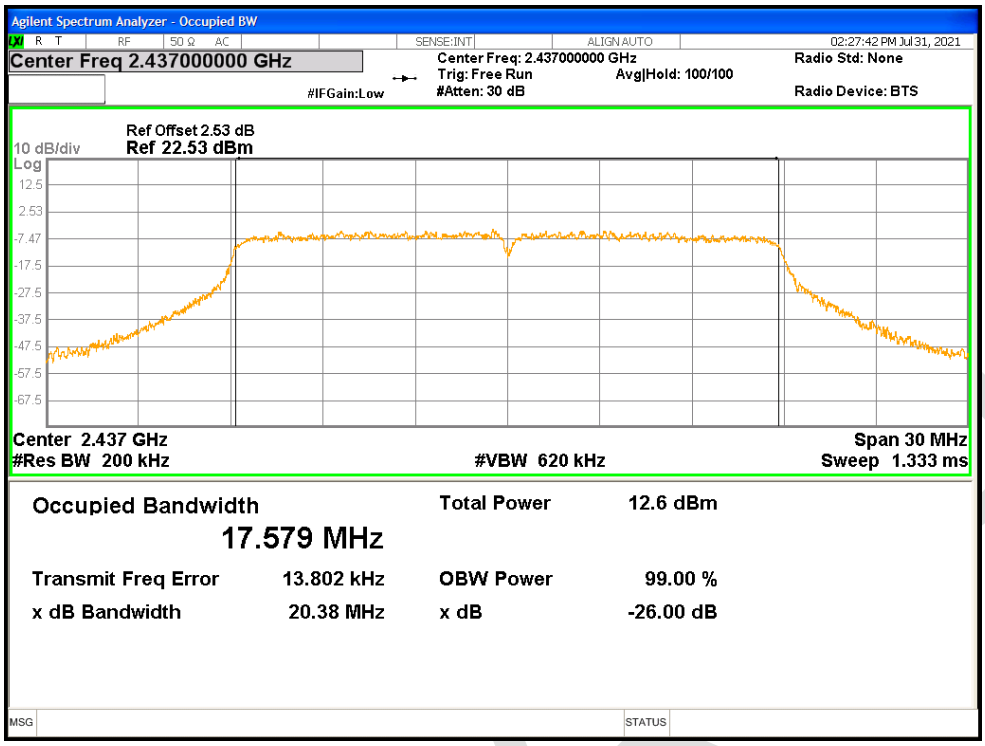
OBW NVNT g 2462MHz Ant1



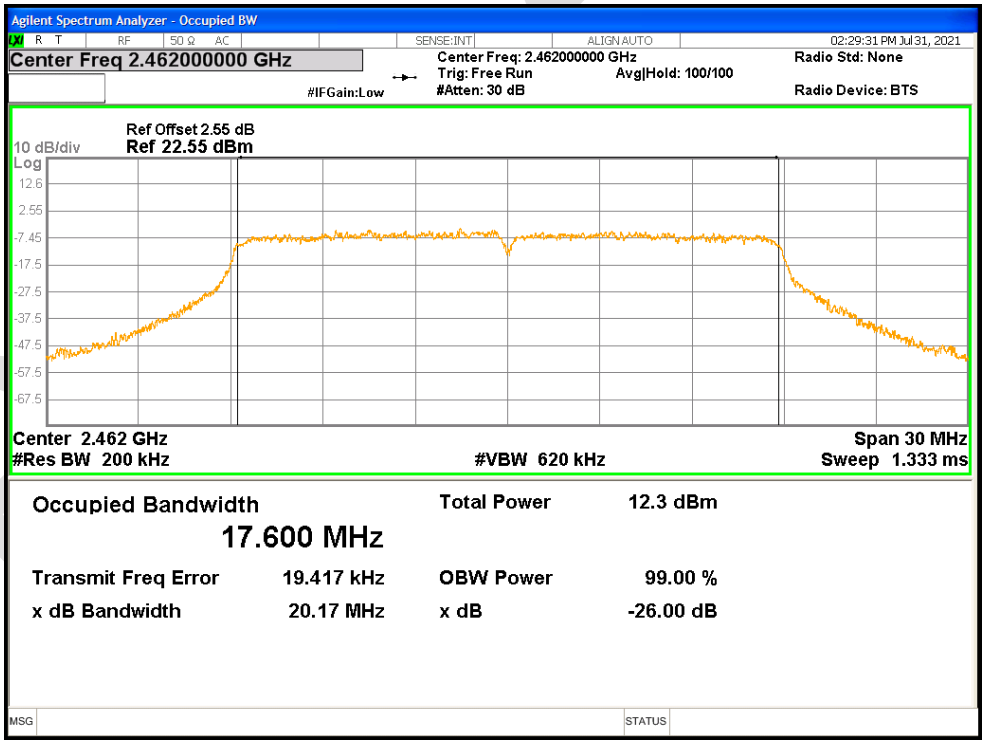
OBW NVNT n20 2412MHz Ant1



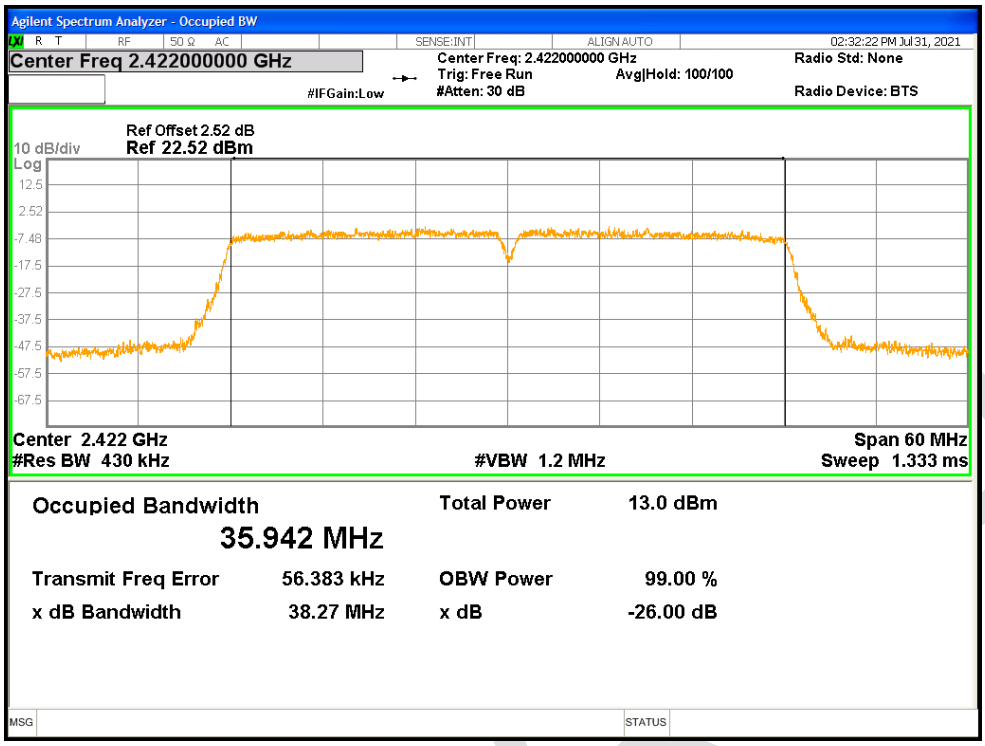
OBW NVNT n20 2437MHz Ant1



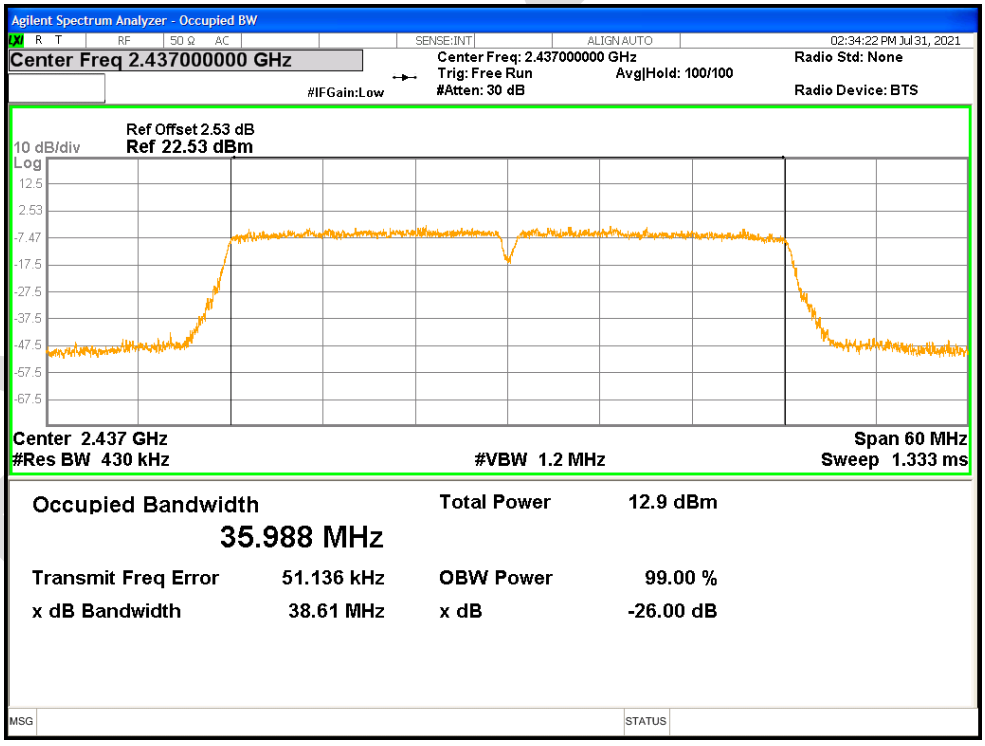
OBW NVNT n20 2462MHz Ant1



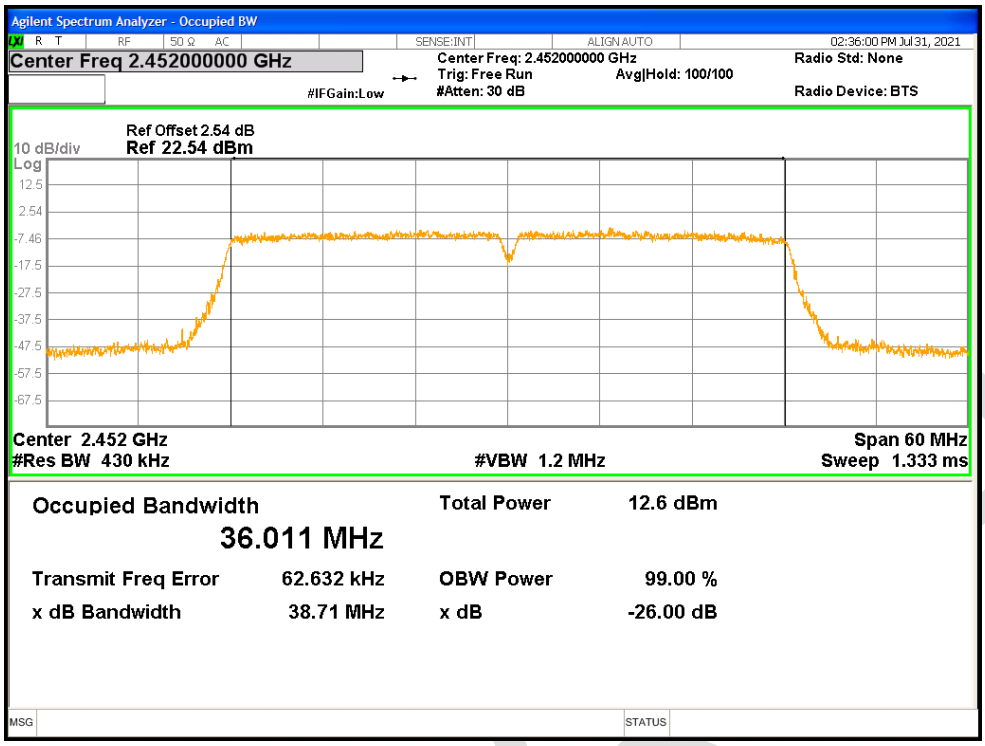
OBW NVNT n40 2422MHz Ant1



OBW NVNT n40 2437MHz Ant1



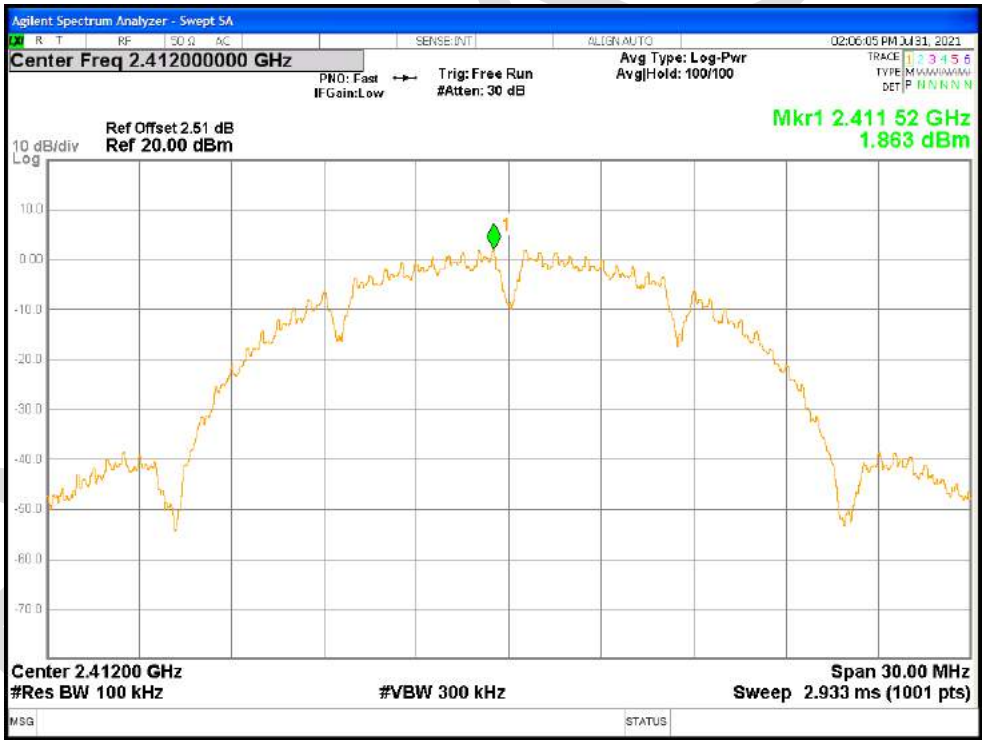
OBW NVNT n40 2452MHz Ant1


Agilent Spectrum Analyzer - Occupied BW
RT
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
02:36:00 PM Jul 31, 2021
Center Freq 2.452000000 GHz
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 2.54 dB
10 dB/div
Ref 22.54 dBm
Log
12.5
2.54
-7.46
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
Center 2.452 GHz
#Res BW 430 kHz
#VBW 1.2 MHz
Span 60 MHz
Sweep 1.333 ms
Occupied Bandwidth
36.011 MHz
Total Power 12.6 dBm
Transmit Freq Error 62.632 kHz
OBW Power 99.00 %
x dB Bandwidth 38.71 MHz
x dB -26.00 dB
MSG
STATUS

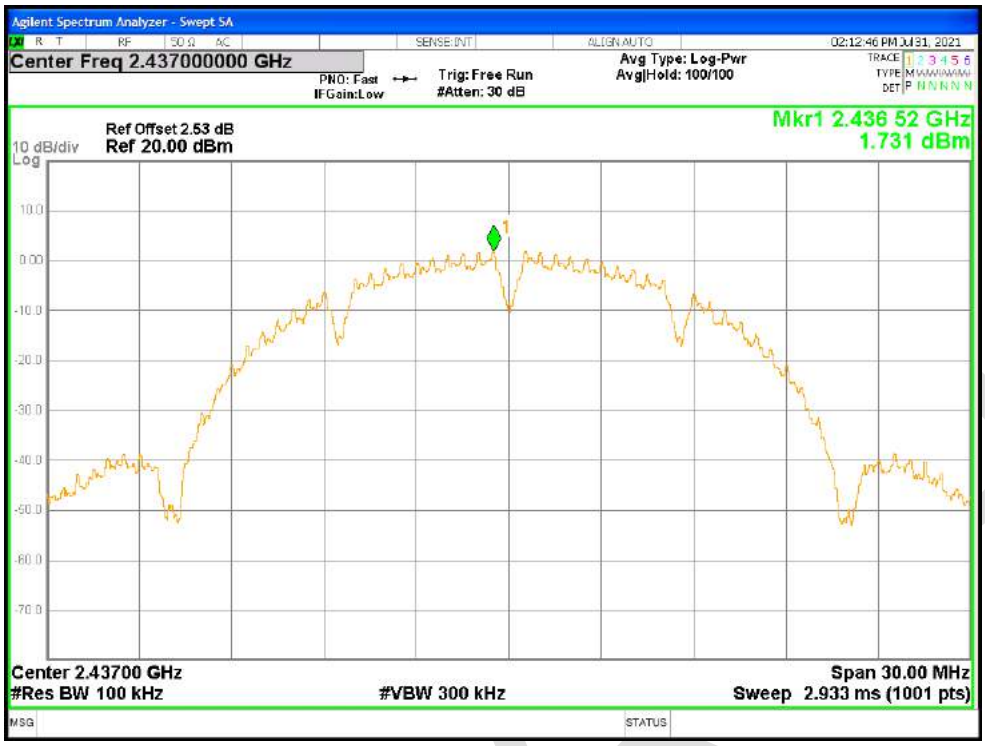
20.4 MAXIMUM POWER SPECTRAL DENSITY LEVEL

Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	1.863	8	Pass
NVNT	b	2437	Ant1	1.731	8	Pass
NVNT	b	2462	Ant1	1.45	8	Pass
NVNT	g	2412	Ant1	-7.341	8	Pass
NVNT	g	2437	Ant1	-7.293	8	Pass
NVNT	g	2462	Ant1	-7.453	8	Pass
NVNT	n20	2412	Ant1	-6.3	8	Pass
NVNT	n20	2437	Ant1	-6.425	8	Pass
NVNT	n20	2462	Ant1	-6.727	8	Pass
NVNT	n40	2422	Ant1	-8.491	8	Pass
NVNT	n40	2437	Ant1	-9.256	8	Pass
NVNT	n40	2452	Ant1	-9.376	8	Pass

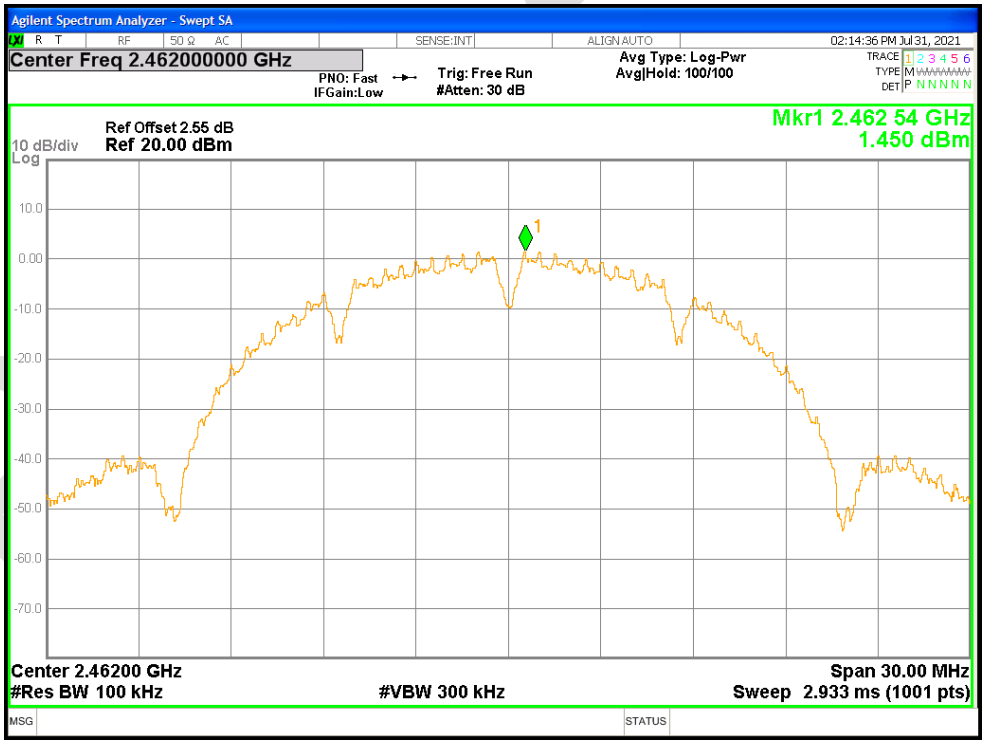
PSD NVNT b 2412MHz Ant1



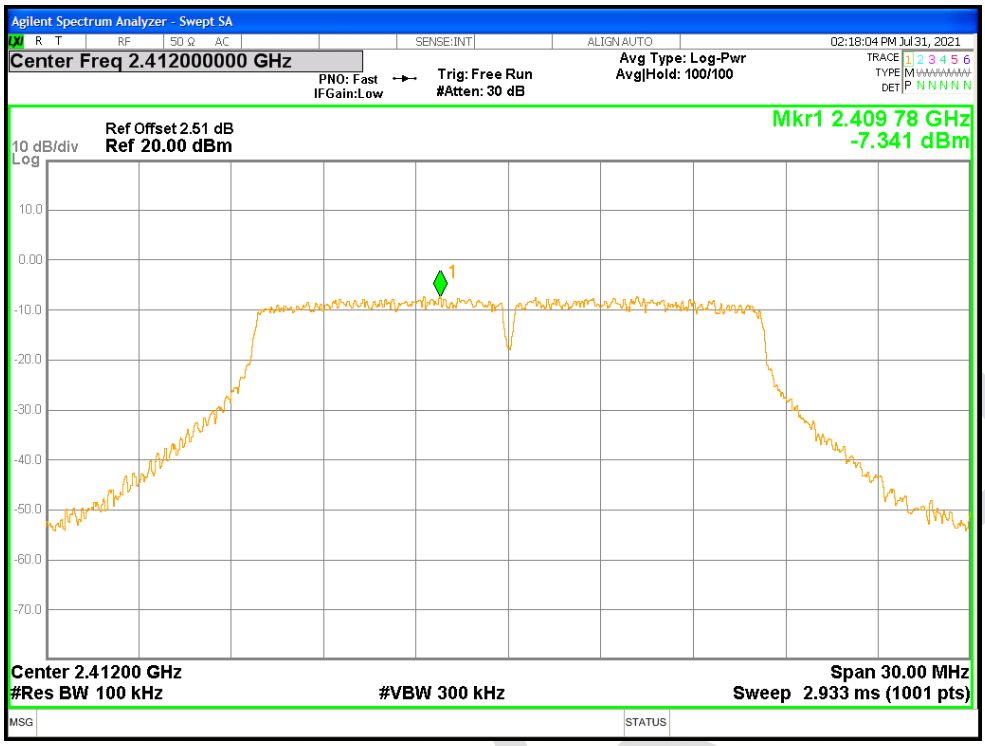
PSD NVNT b 2437MHz Ant1



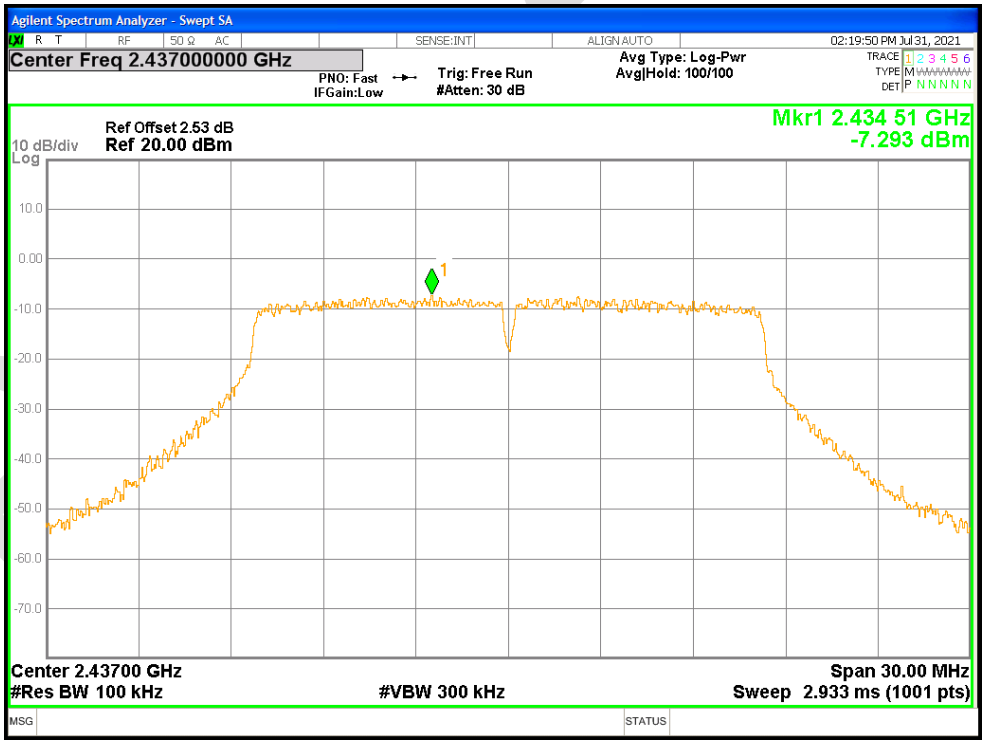
PSD NVNT b 2462MHz Ant1



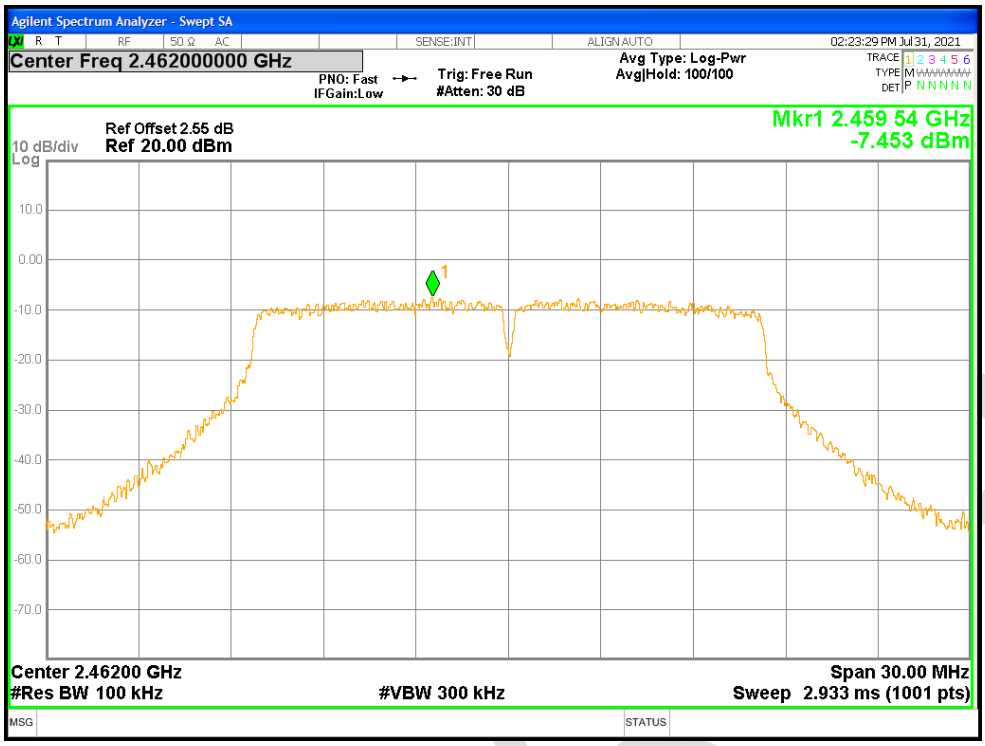
PSD NVNT g 2412MHz Ant1



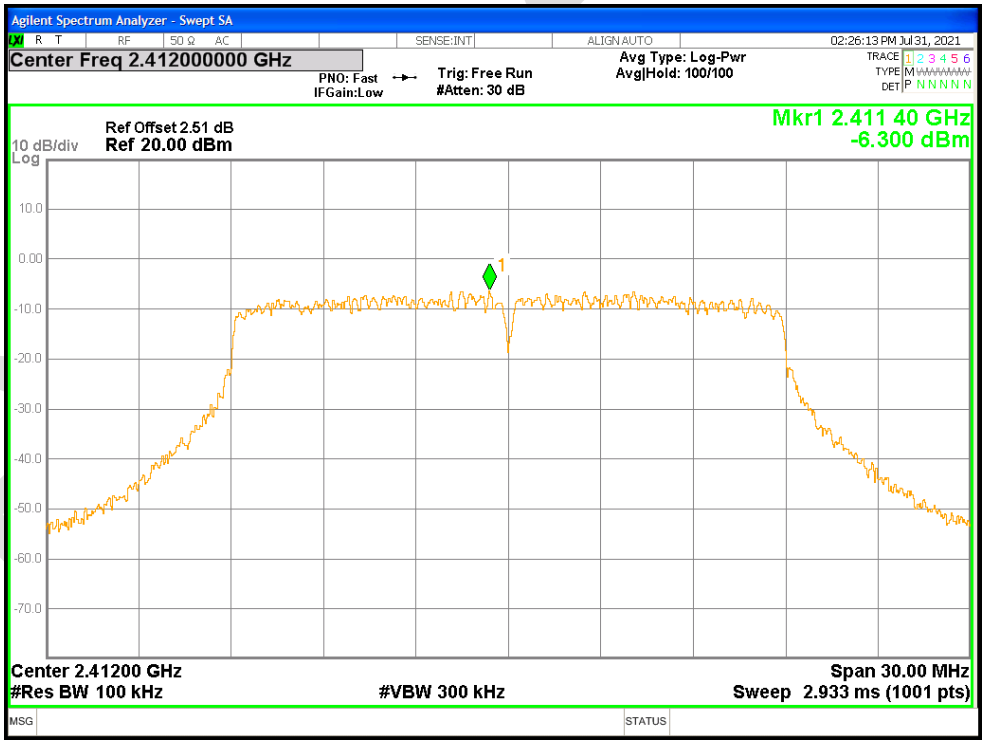
PSD NVNT g 2437MHz Ant1



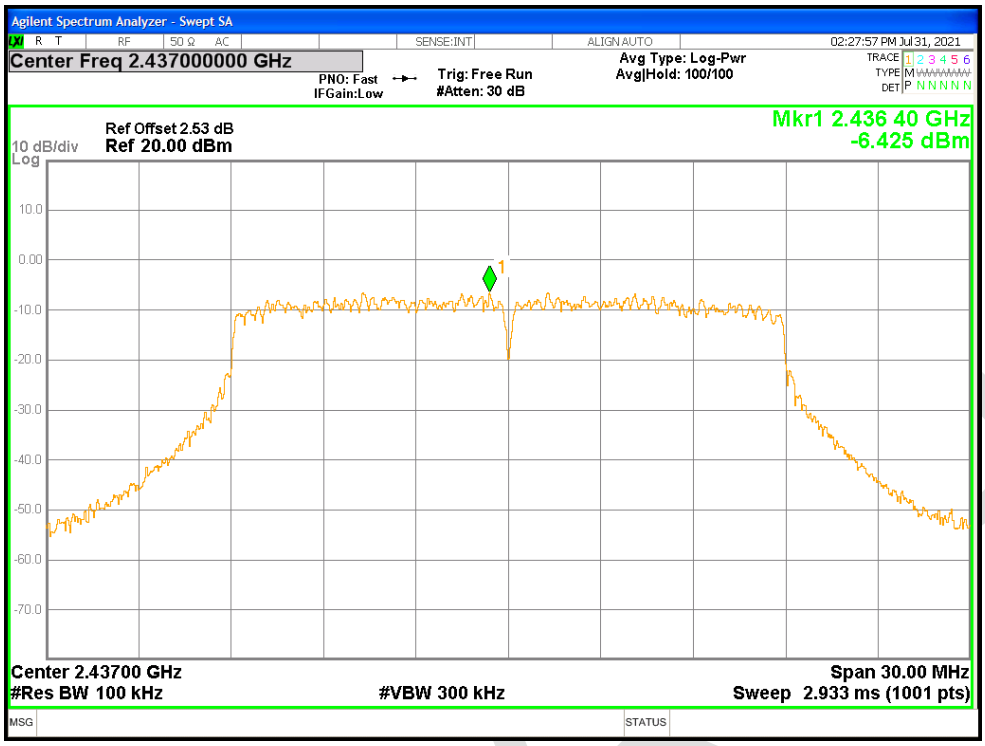
PSD NVNT g 2462MHz Ant1



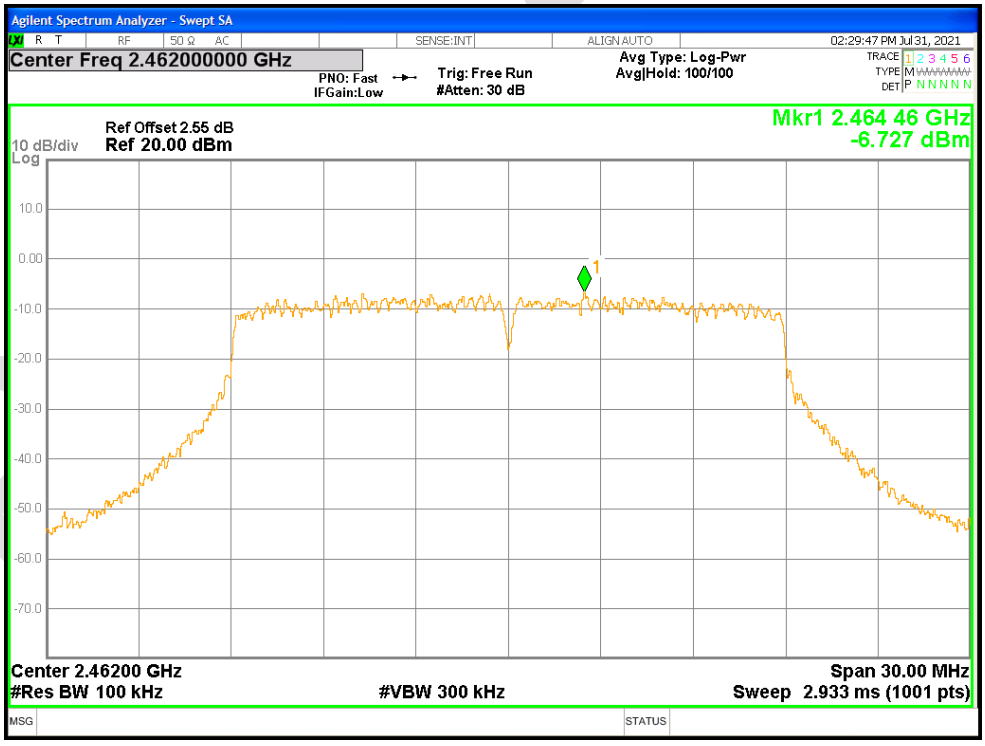
PSD NVNT n20 2412MHz Ant1



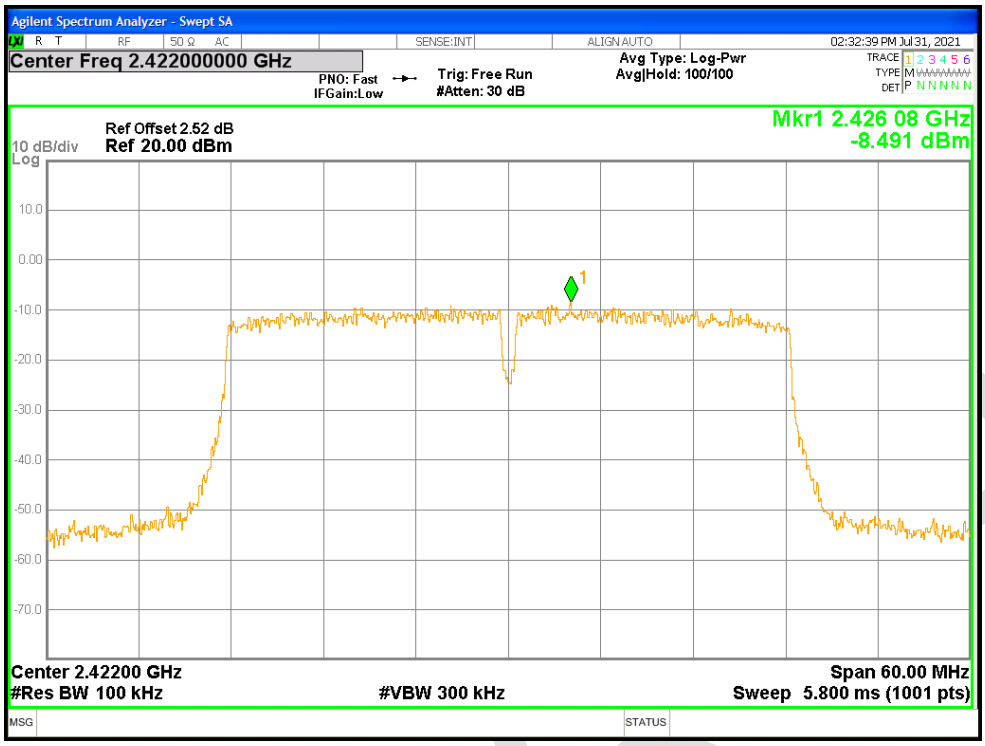
PSD NVNT n20 2437MHz Ant1



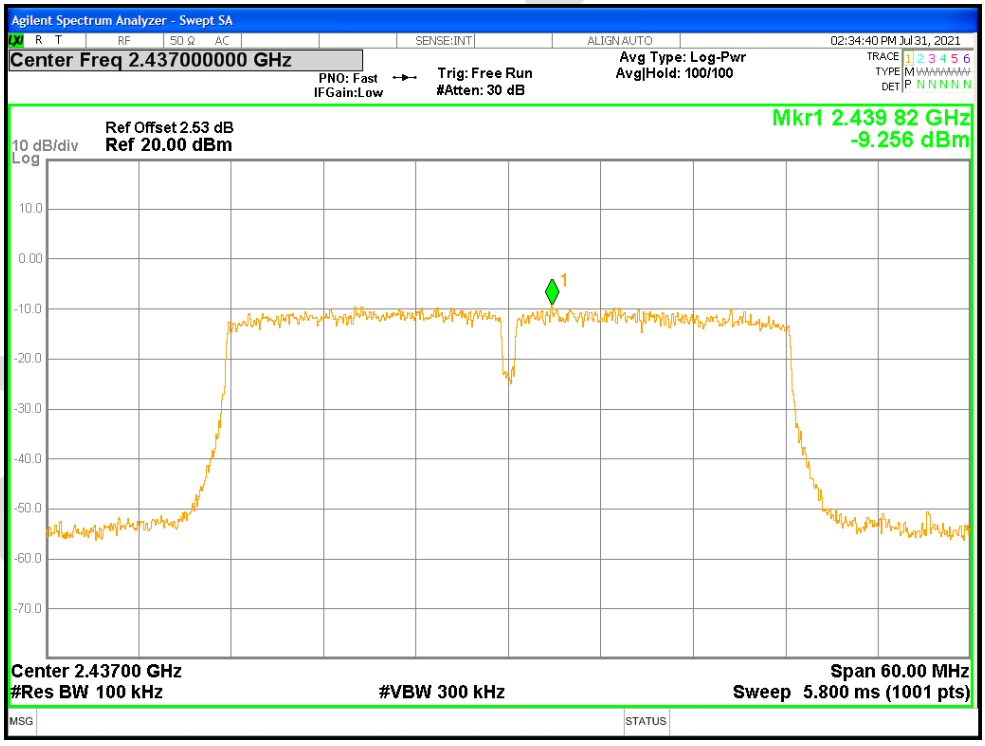
PSD NVNT n20 2462MHz Ant1



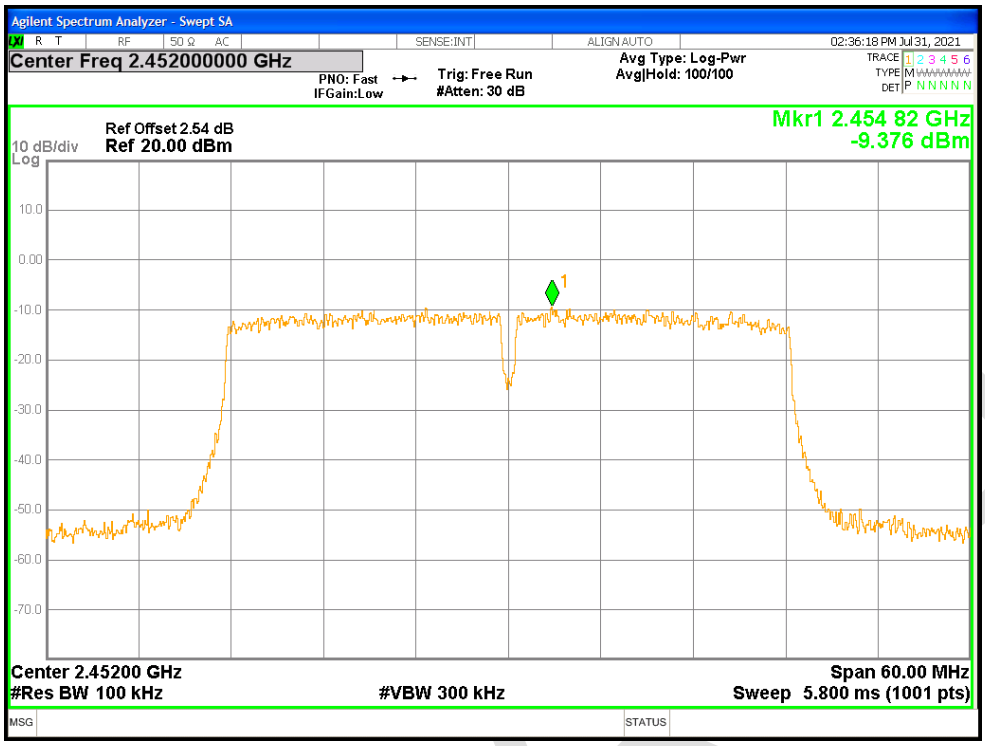
PSD NVNT n40 2422MHz Ant1



PSD NVNT n40 2437MHz Ant1



PSD NVNT n40 2452MHz Ant1

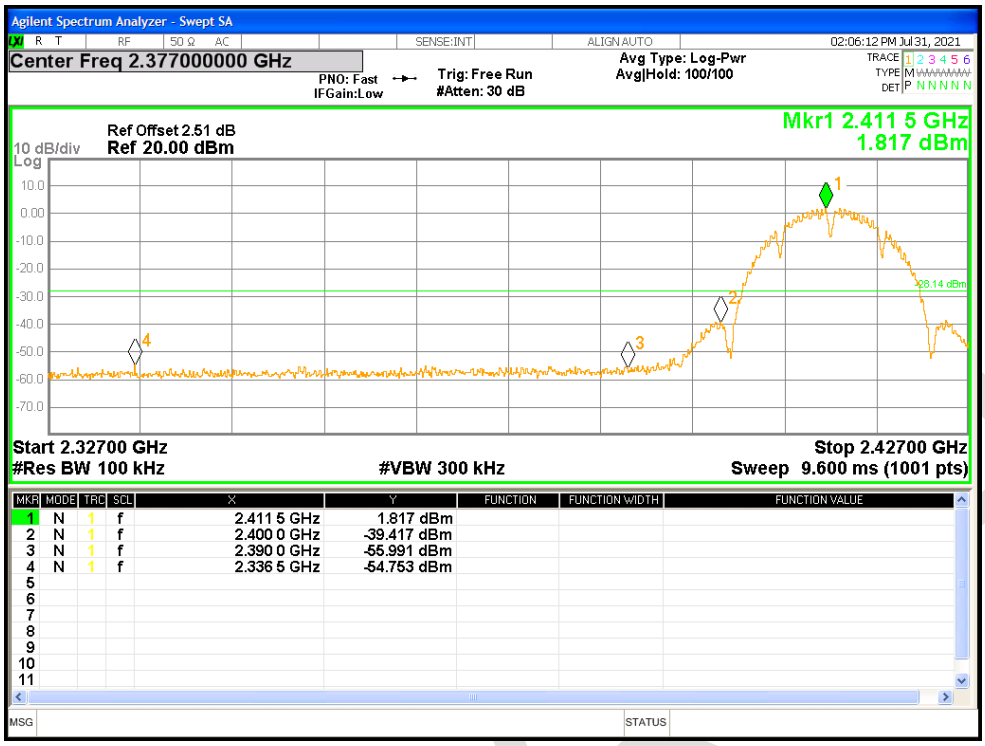

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.452000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 100/100
02:36:18 PM Jul 31, 2021
Ref Offset 2.54 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.454 82 GHz
-9.376 dBm
Center 2.45200 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60.00 MHz
Sweep 5.800 ms (1001 pts)

20.5 BAND EDGE

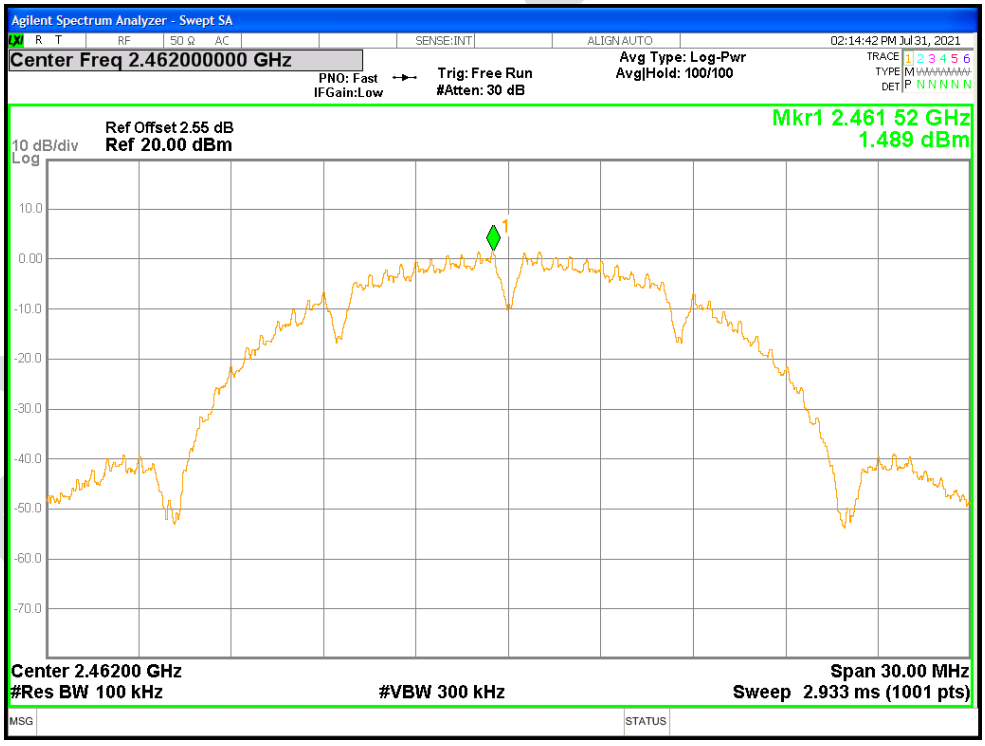
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-56.61	-30	Pass
NVNT	b	2462	Ant1	-56.31	-30	Pass
NVNT	g	2412	Ant1	-47.8	-30	Pass
NVNT	g	2462	Ant1	-46.09	-30	Pass
NVNT	n20	2412	Ant1	-48.26	-30	Pass
NVNT	n20	2462	Ant1	-47.81	-30	Pass
NVNT	n40	2422	Ant1	-44.56	-30	Pass
NVNT	n40	2452	Ant1	-43.59	-30	Pass

Band Edge NVNT b 2412MHz Ant1 Ref

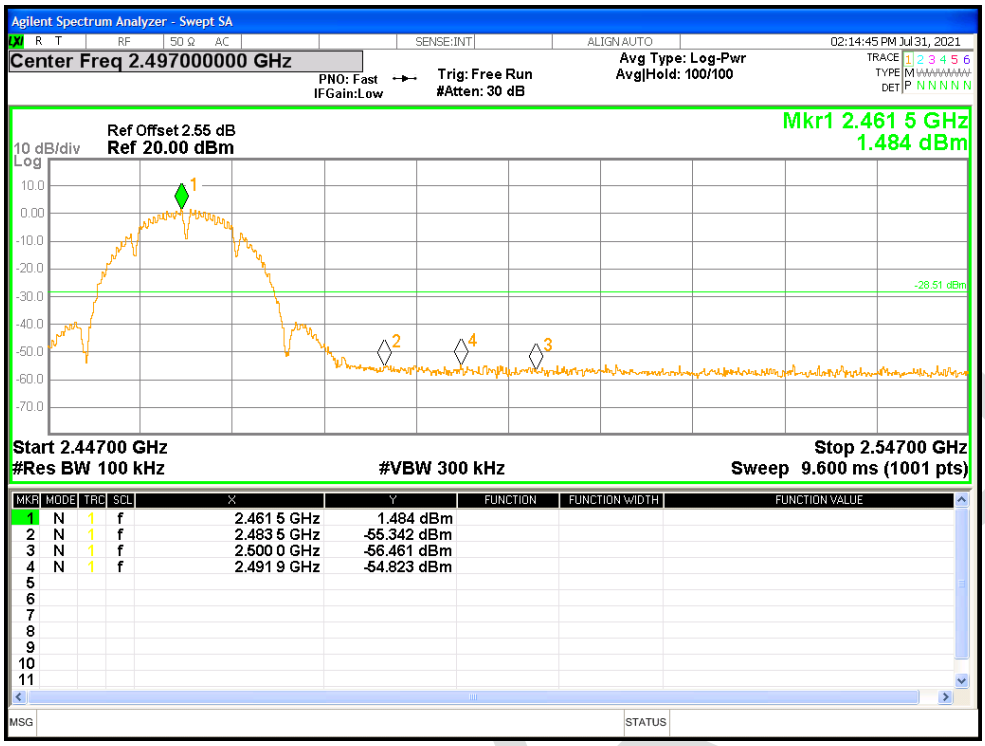
Band Edge NVNT b 2412MHz Ant1 Emission



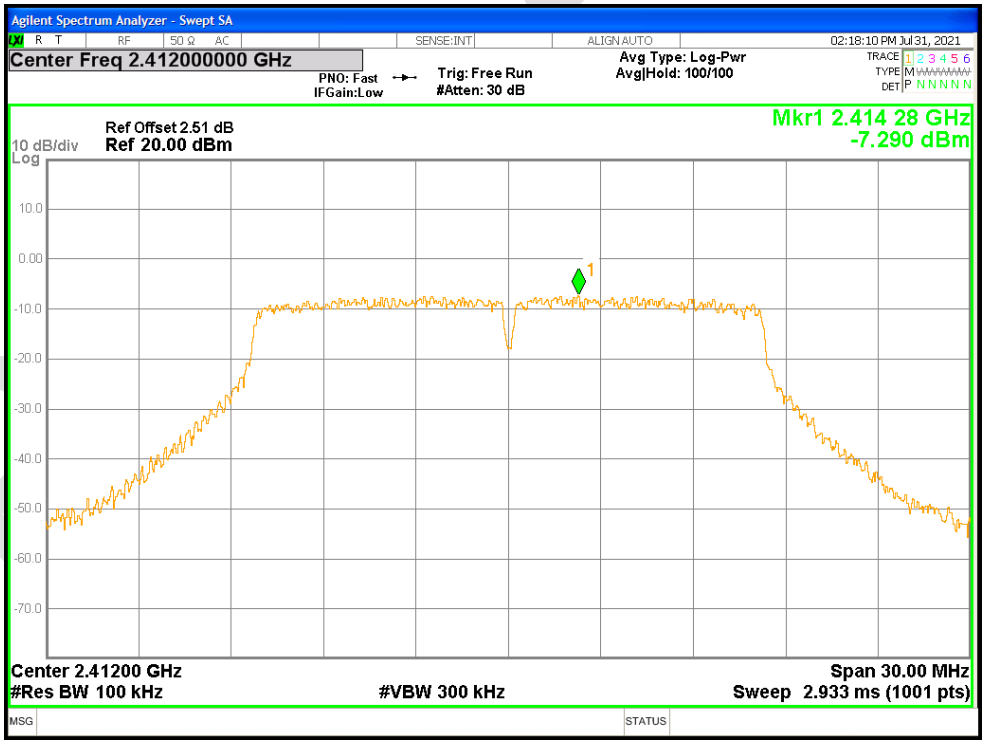
Band Edge NVNT b 2462MHz Ant1 Ref



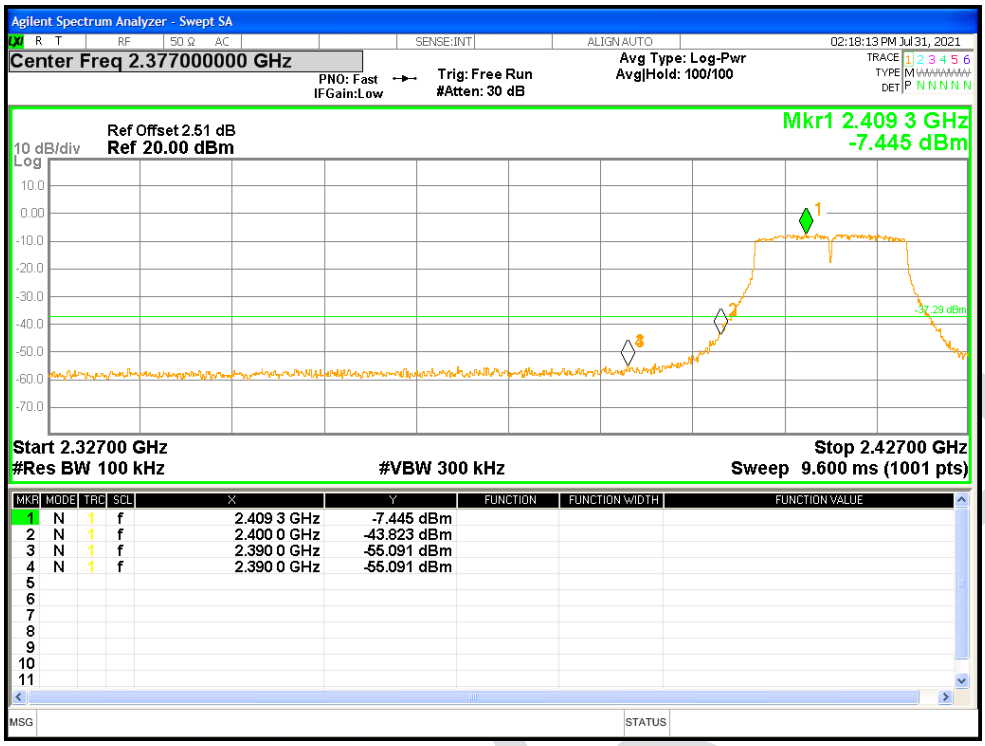
Band Edge NVNT b 2462MHz Ant1 Emission



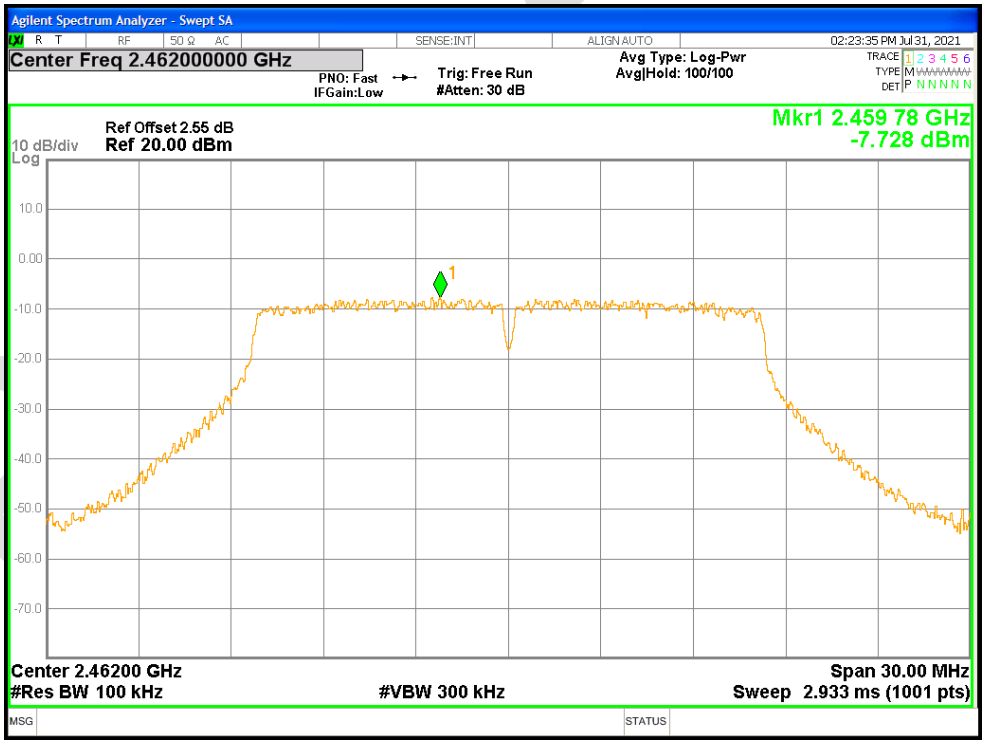
Band Edge NVNT g 2412MHz Ant1 Ref



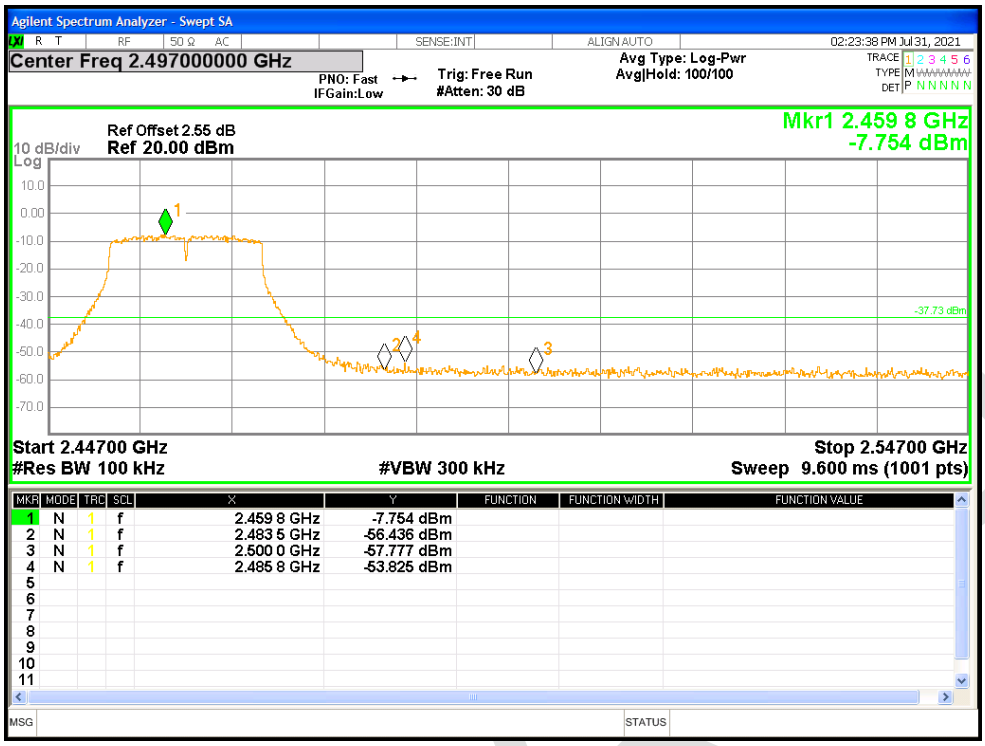
Band Edge NVNT g 2412MHz Ant1 Emission



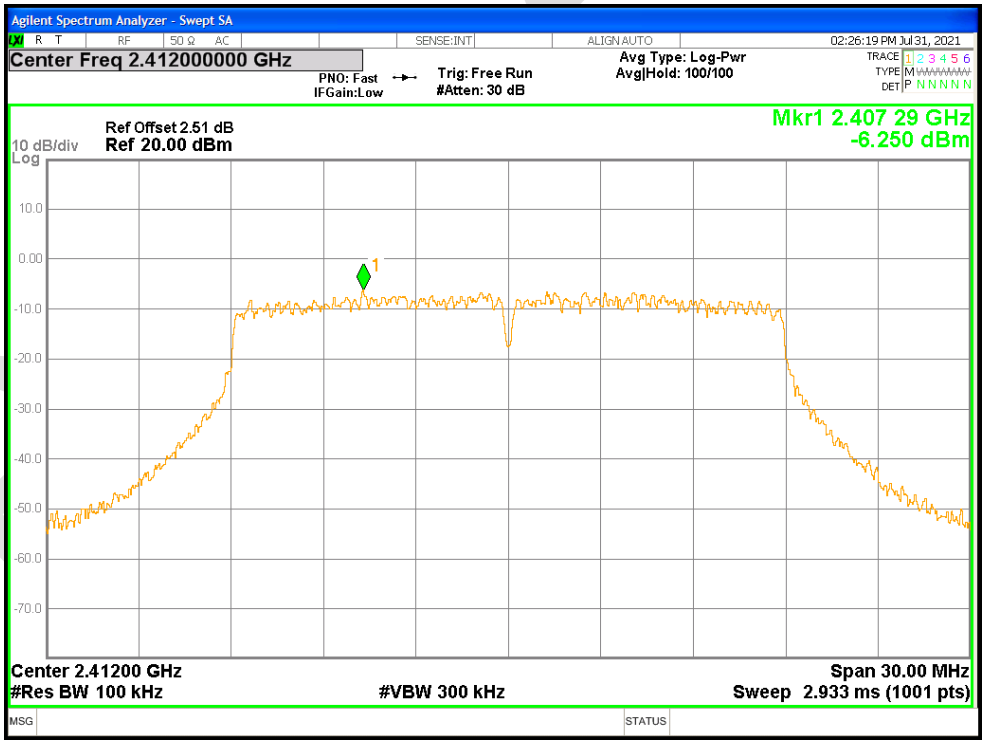
Band Edge NVNT g 2462MHz Ant1 Ref



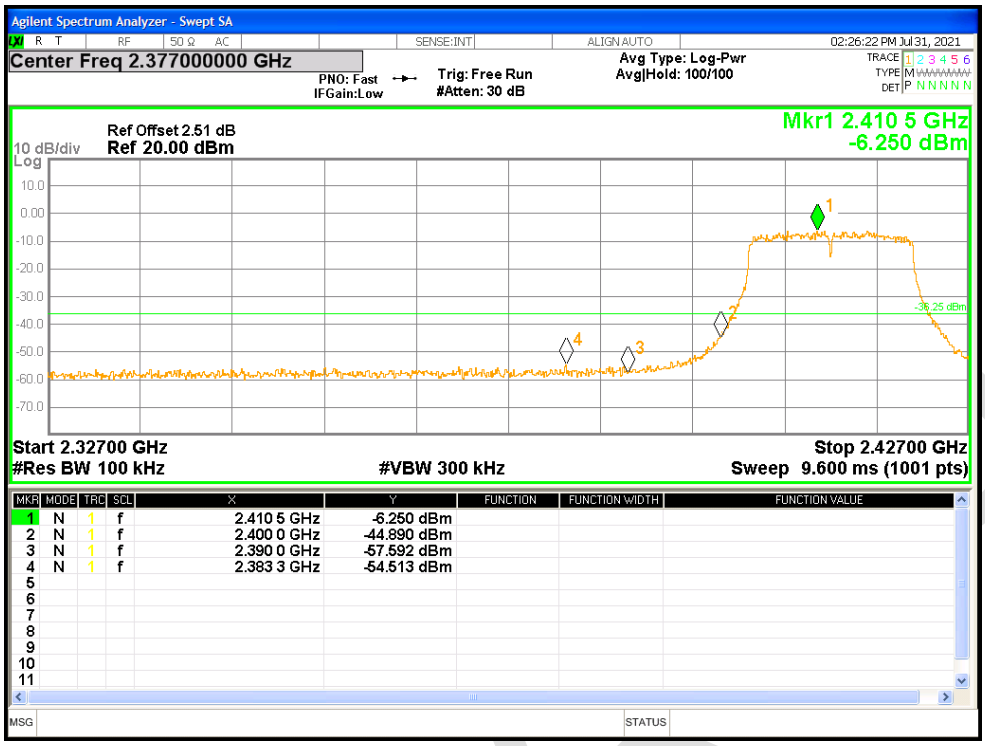
Band Edge NVNT g 2462MHz Ant1 Emission



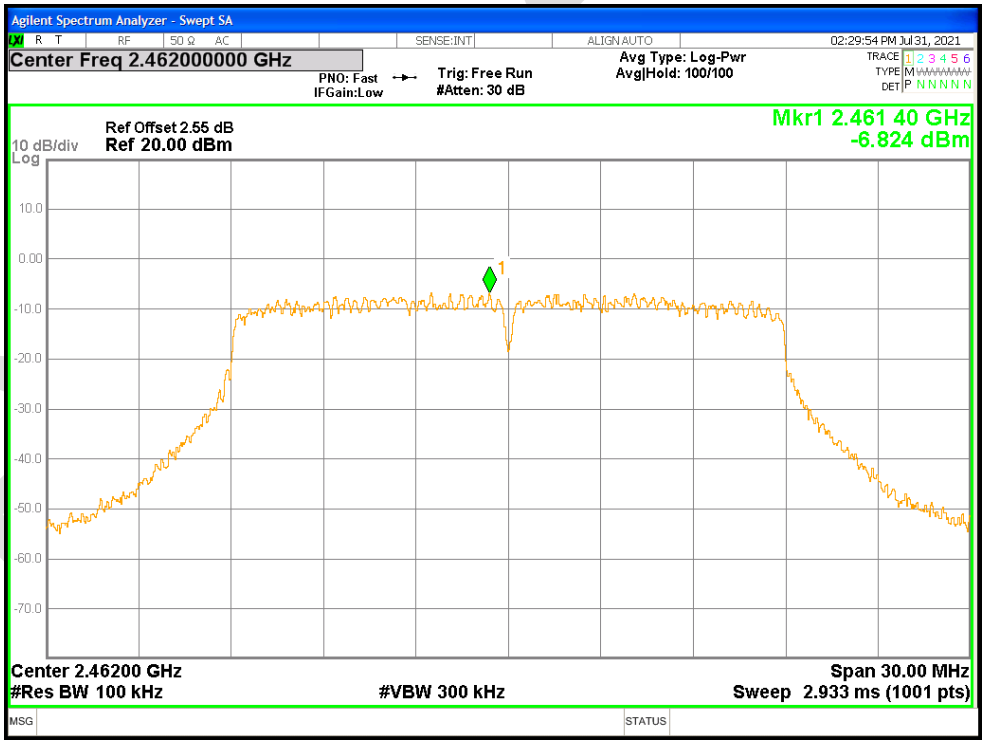
Band Edge NVNT n20 2412MHz Ant1 Ref



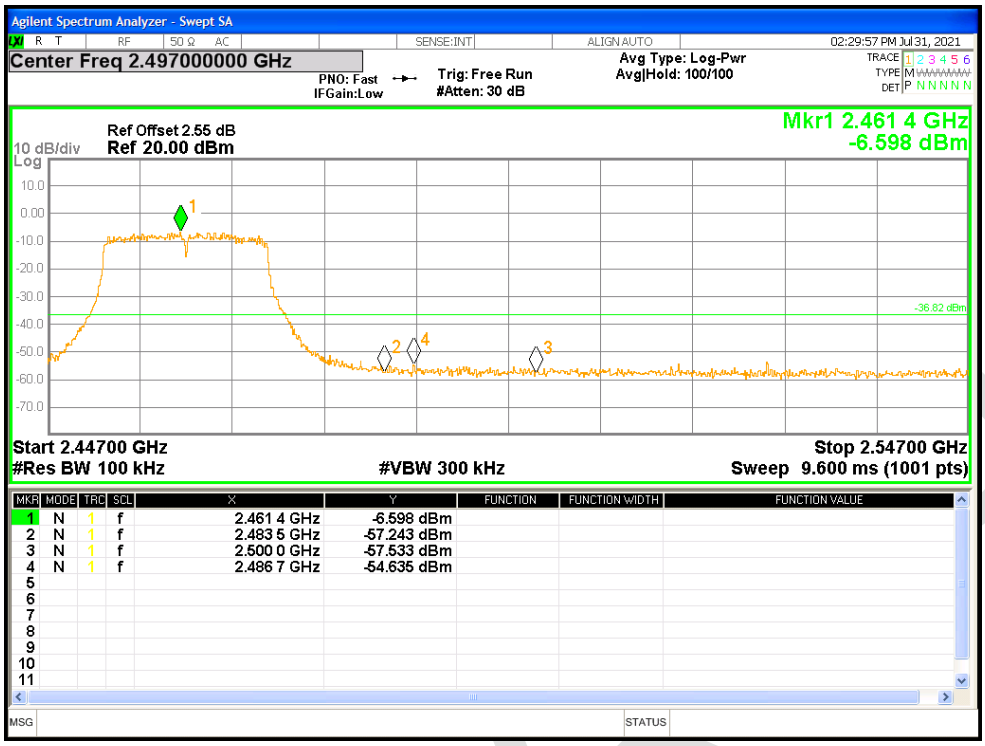
Band Edge NVNT n20 2412MHz Ant1 Emission



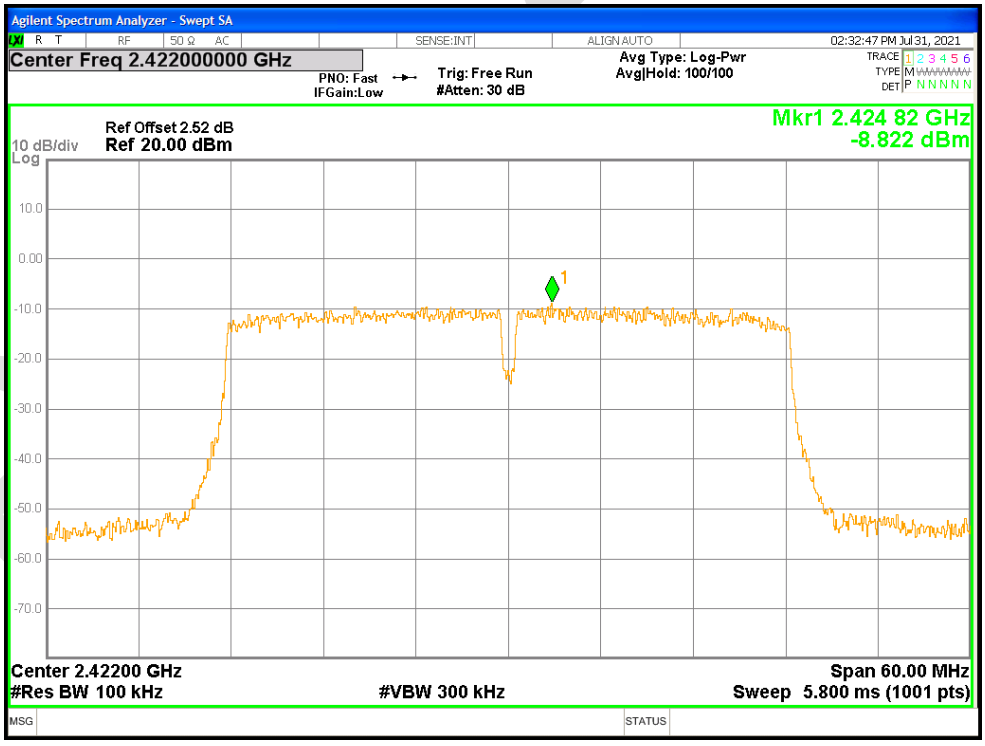
Band Edge NVNT n20 2462MHz Ant1 Ref



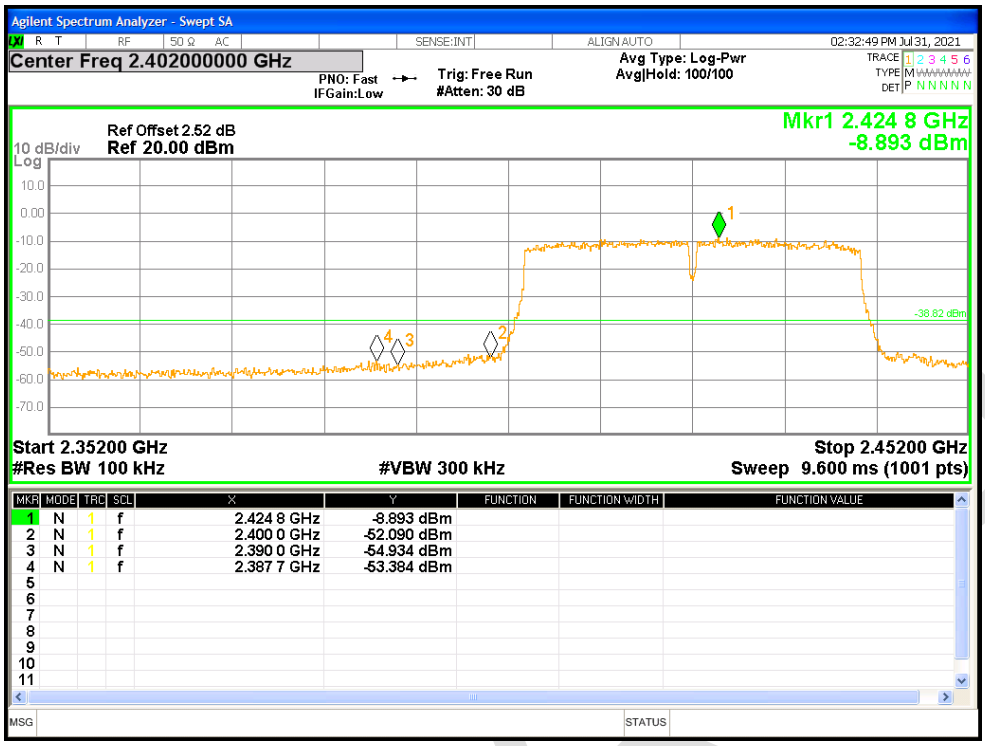
Band Edge NVNT n20 2462MHz Ant1 Emission



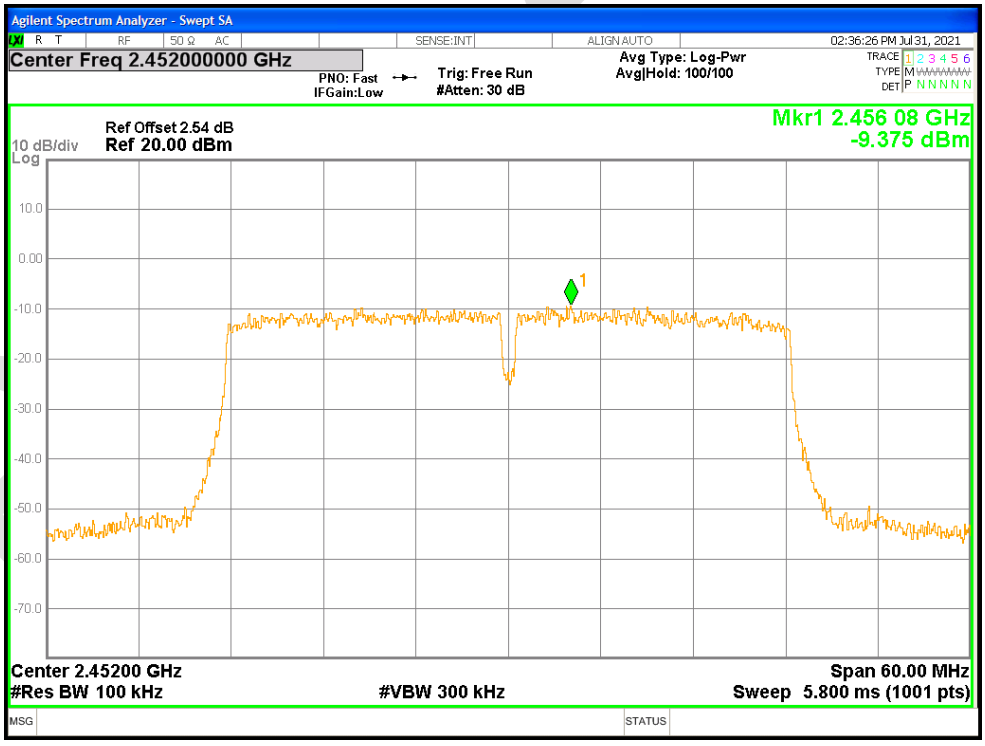
Band Edge NVNT n40 2422MHz Ant1 Ref



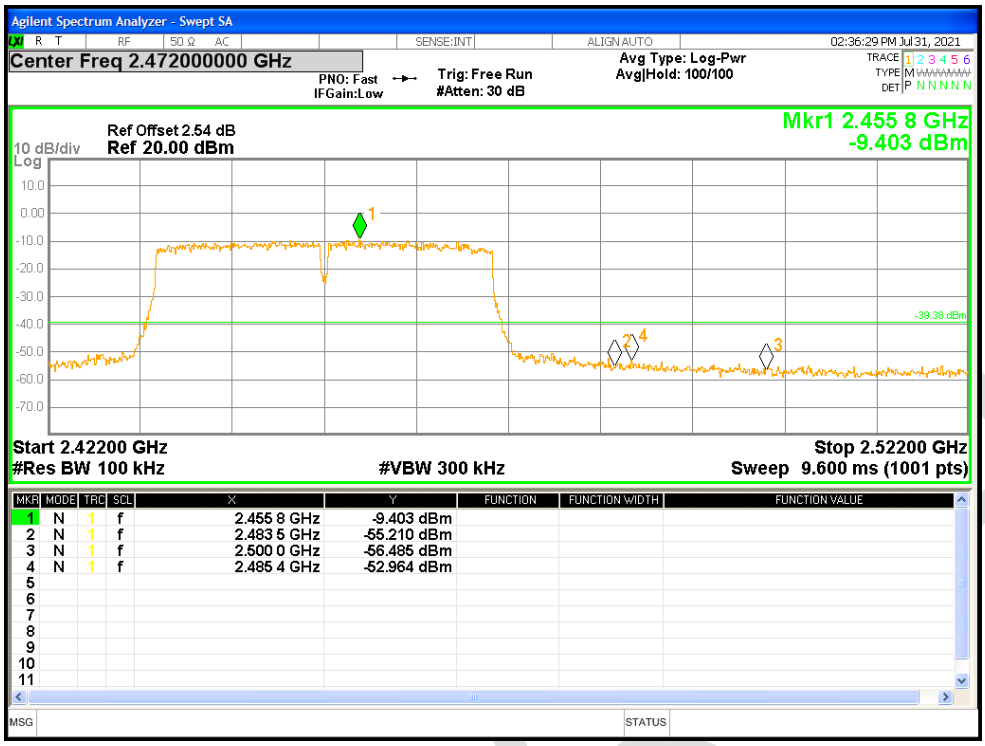
Band Edge NVNT n40 2422MHz Ant1 Emission



Band Edge NVNT n40 2452MHz Ant1 Ref



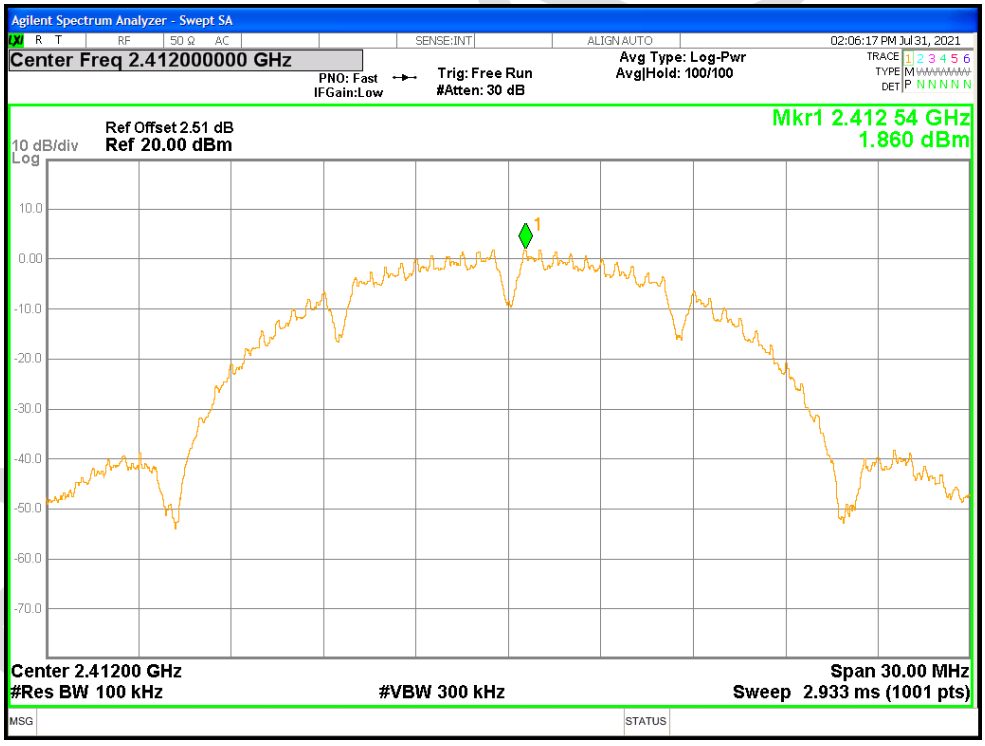
Band Edge NVNT n40 2452MHz Ant1 Emission


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.472000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 100/100
02:36:29 PM Jul 31, 2021
Ref Offset 2.54 dB
10 dB/div
Ref 20.00 dBm
Mkr1 2.455 8 GHz
-9.403 dBm
-39.38 dBm
Start 2.42200 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.52200 GHz
Sweep 9.600 ms (1001 pts)
1 N 1 f 2.455 8 GHz -9.403 dBm
2 N 1 f 2.483 5 GHz -55.210 dBm
3 N 1 f 2.500 0 GHz -56.485 dBm
4 N 1 f 2.485 4 GHz -52.964 dBm

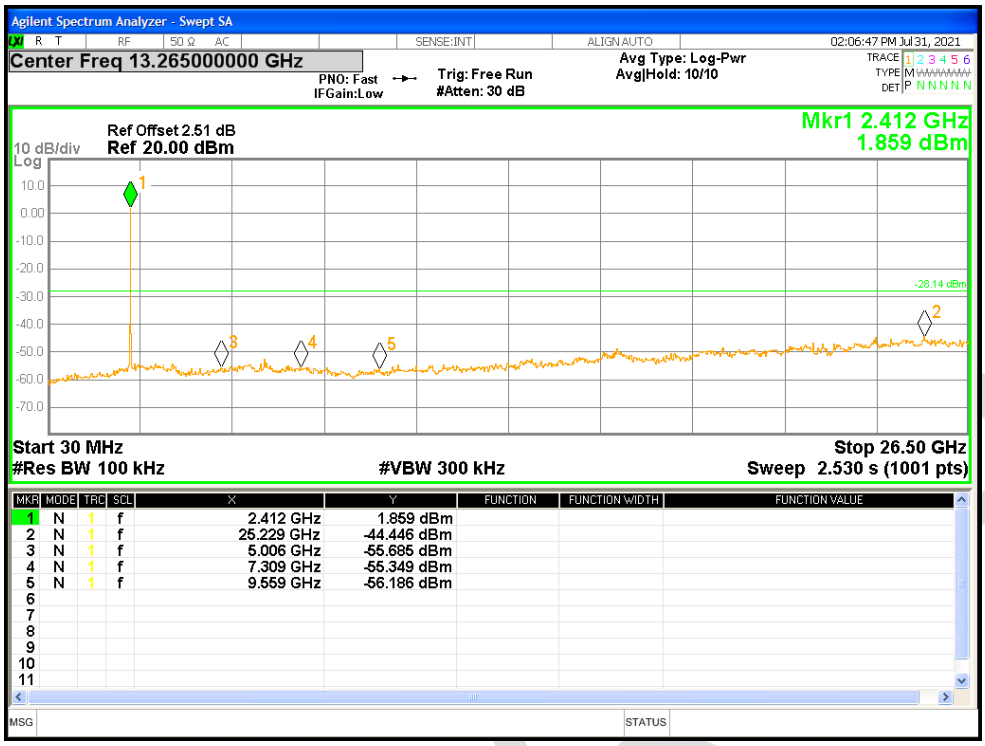
20.6 CONDUCTED RF SPURIOUS EMISSION

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-46.3	-30	Pass
NVNT	b	2437	Ant1	-46.69	-30	Pass
NVNT	b	2462	Ant1	-46.71	-30	Pass
NVNT	g	2412	Ant1	-37.4	-30	Pass
NVNT	g	2437	Ant1	-37.08	-30	Pass
NVNT	g	2462	Ant1	-37.07	-30	Pass
NVNT	n20	2412	Ant1	-38.74	-30	Pass
NVNT	n20	2437	Ant1	-38.75	-30	Pass
NVNT	n20	2462	Ant1	-38.26	-30	Pass
NVNT	n40	2422	Ant1	-34.66	-30	Pass
NVNT	n40	2437	Ant1	-36.08	-30	Pass
NVNT	n40	2452	Ant1	-35.46	-30	Pass

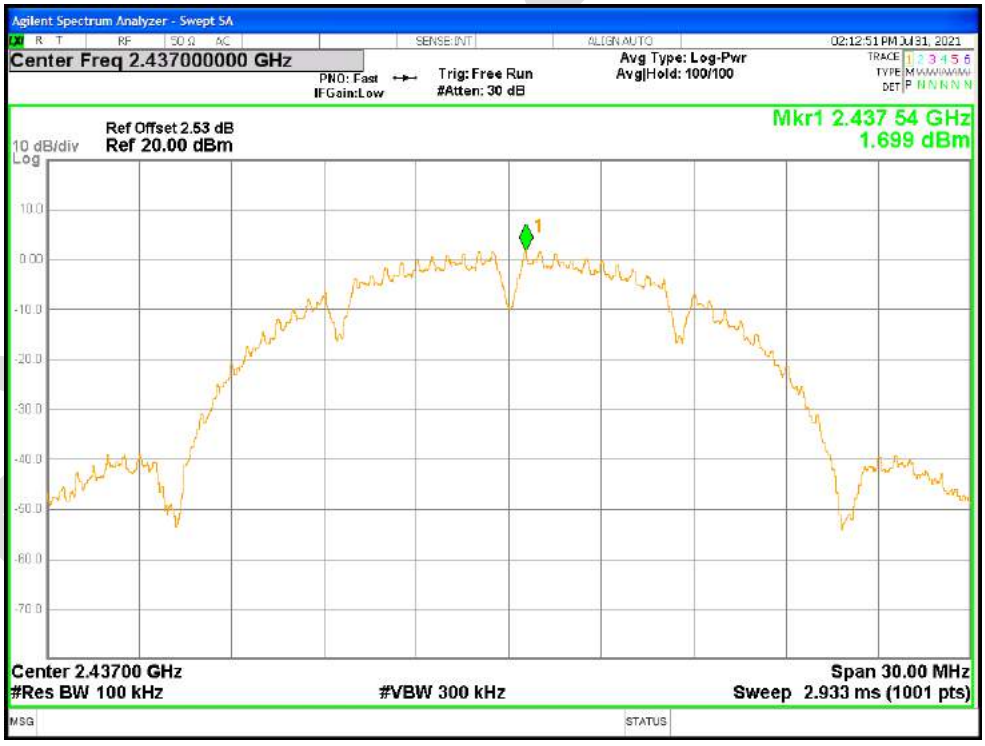
Tx. Spurious NVNT b 2412MHz Ant1 Ref



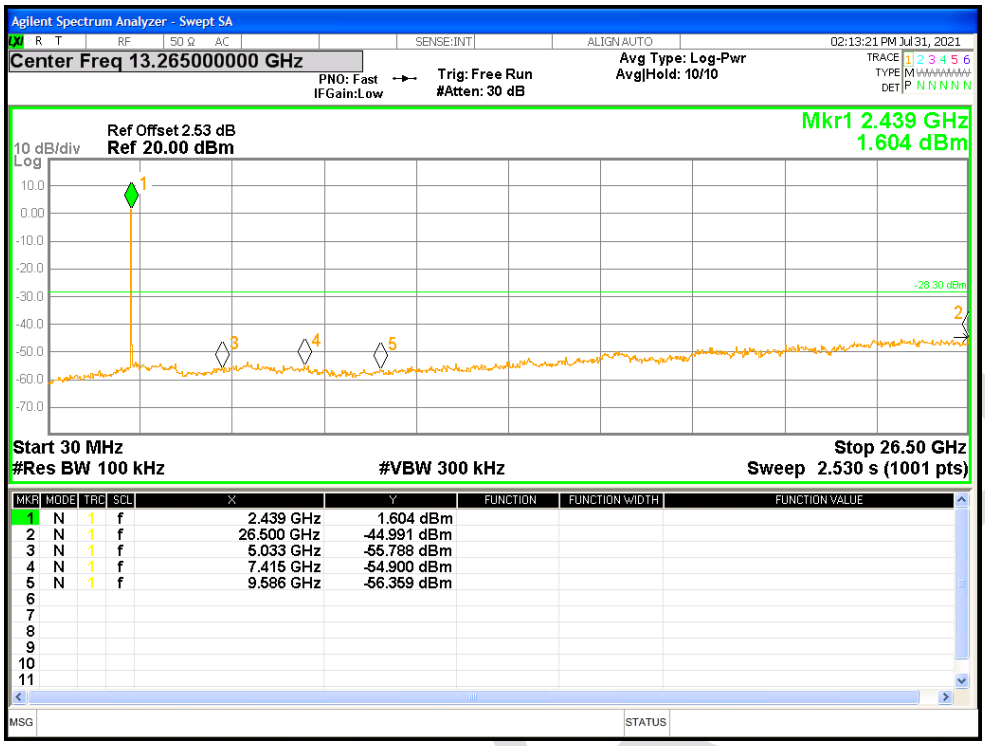
Tx. Spurious NVNT b 2412MHz Ant1 Emission



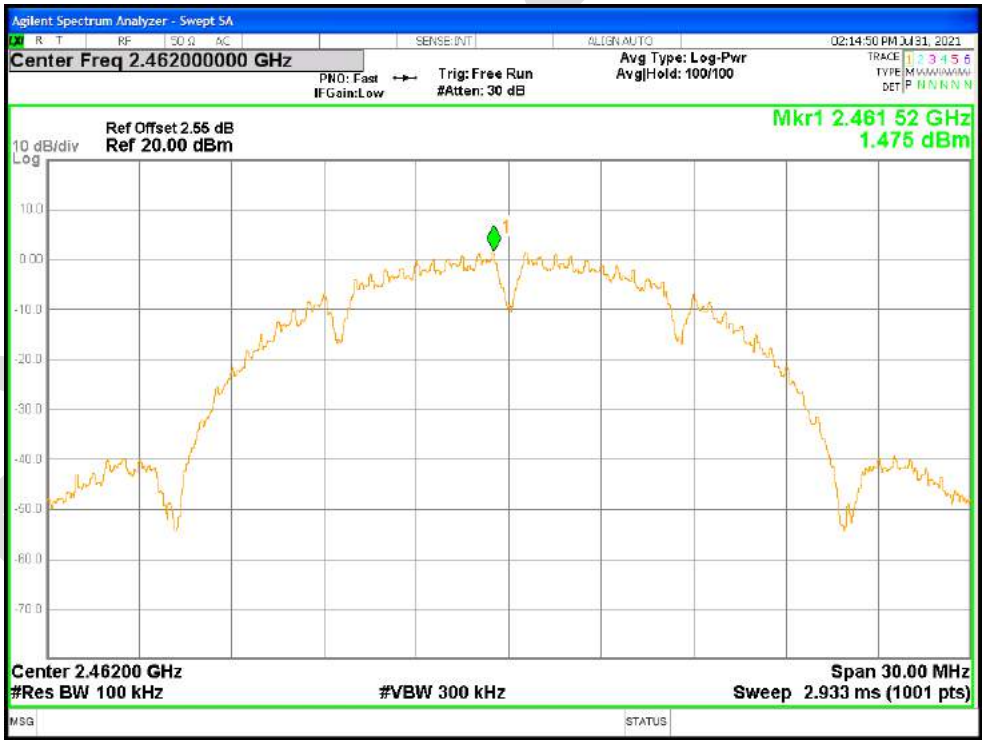
Tx. Spurious NVNT b 2437MHz Ant1 Ref



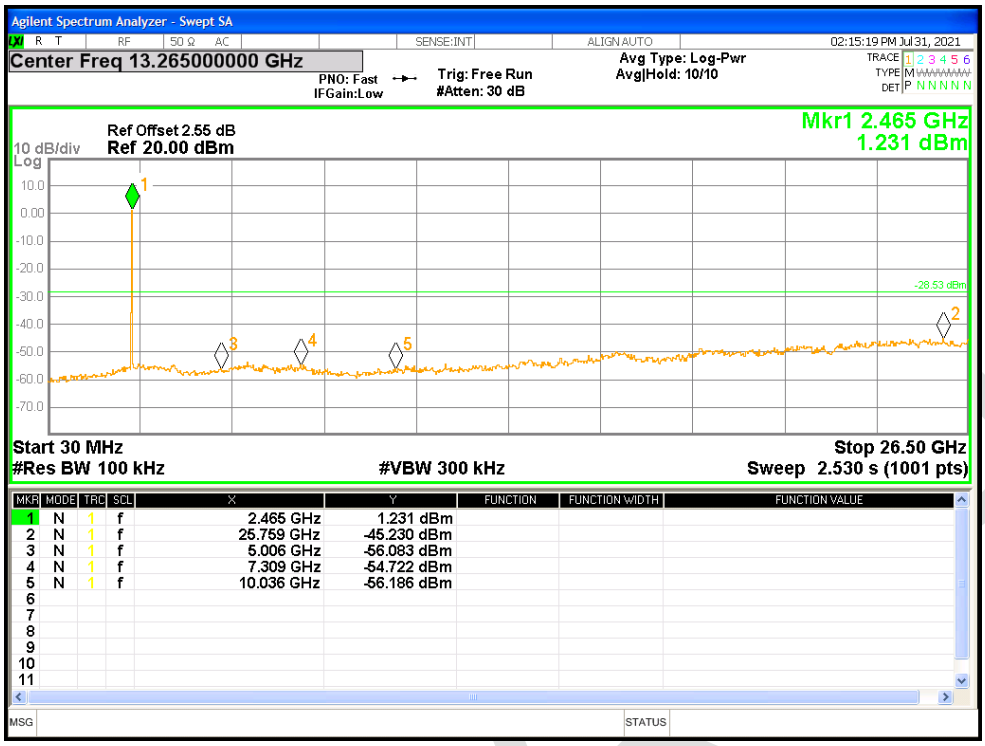
Tx. Spurious NVNT b 2437MHz Ant1 Emission



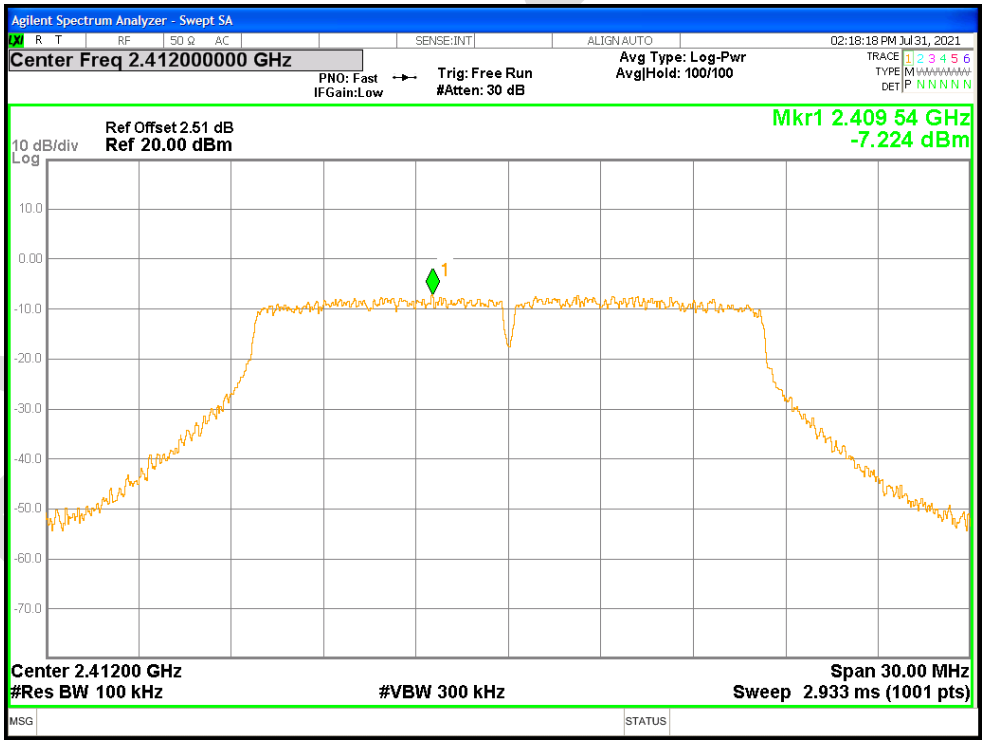
Tx. Spurious NVNT b 2462MHz Ant1 Ref



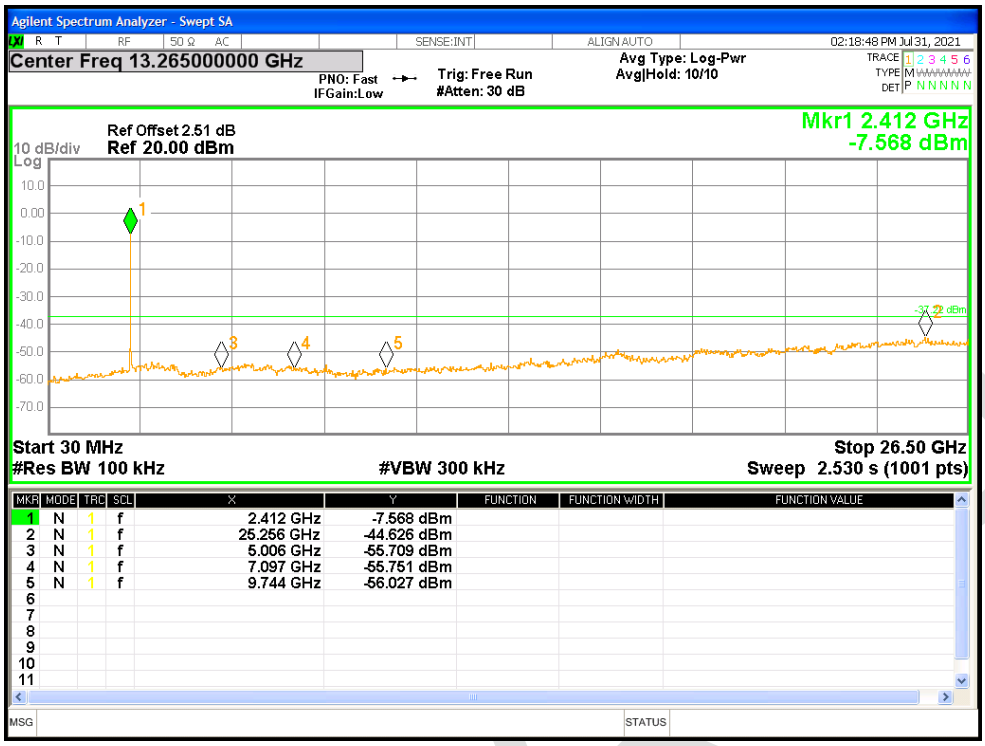
Tx. Spurious NVNT b 2462MHz Ant1 Emission



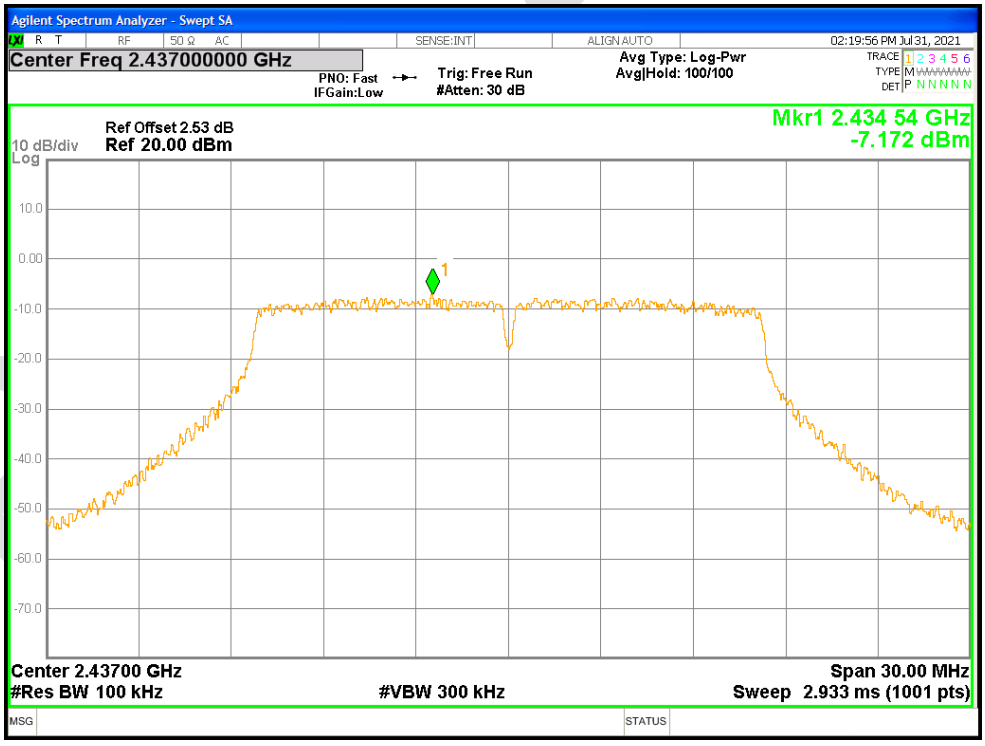
Tx. Spurious NVNT g 2412MHz Ant1 Ref



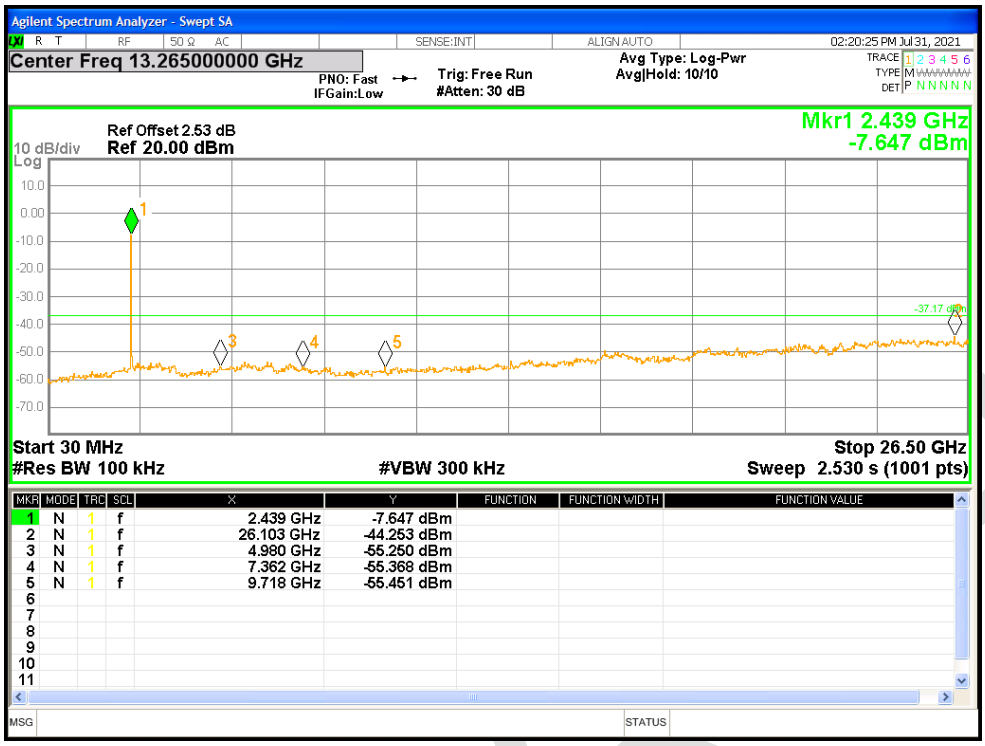
Tx. Spurious NVNT g 2412MHz Ant1 Emission



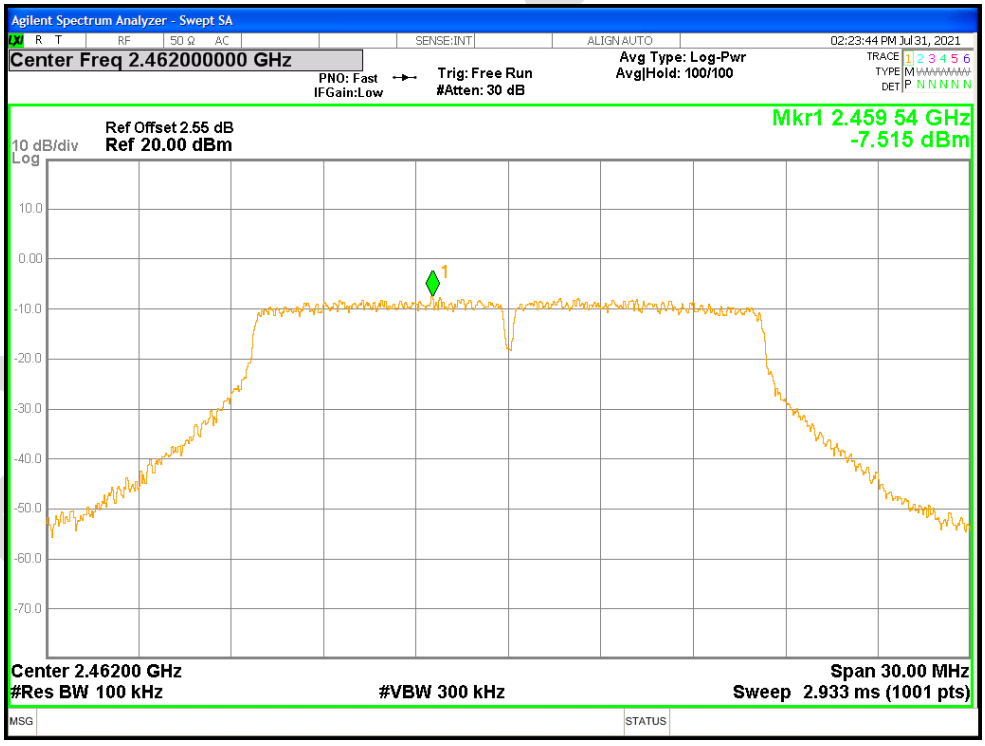
Tx. Spurious NVNT g 2437MHz Ant1 Ref



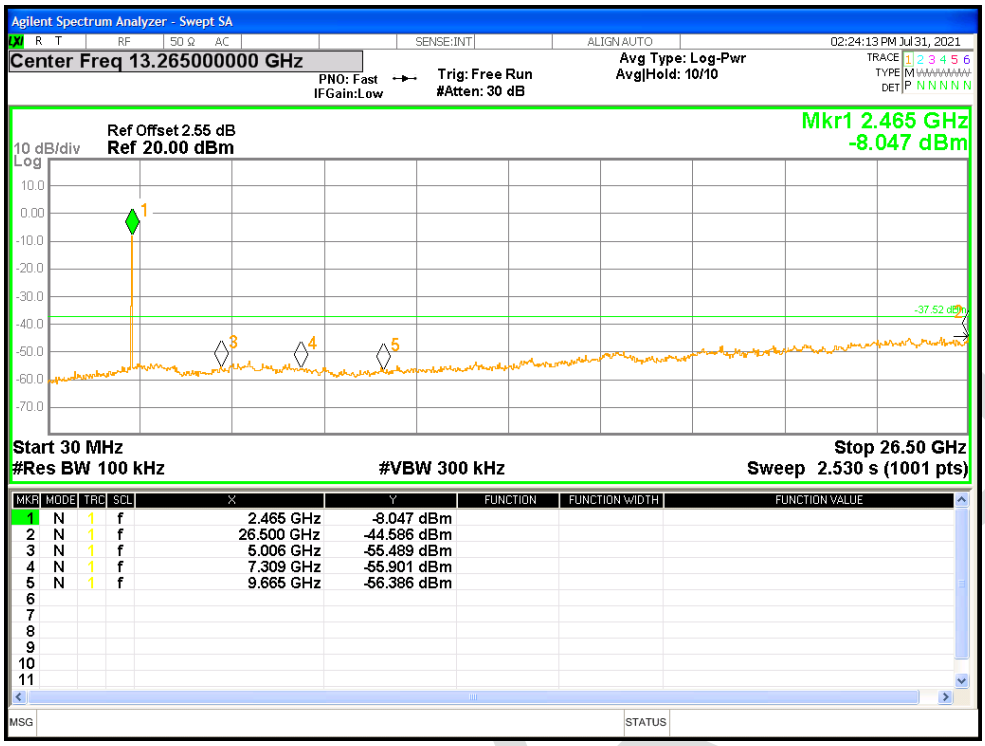
Tx. Spurious NVNT g 2437MHz Ant1 Emission



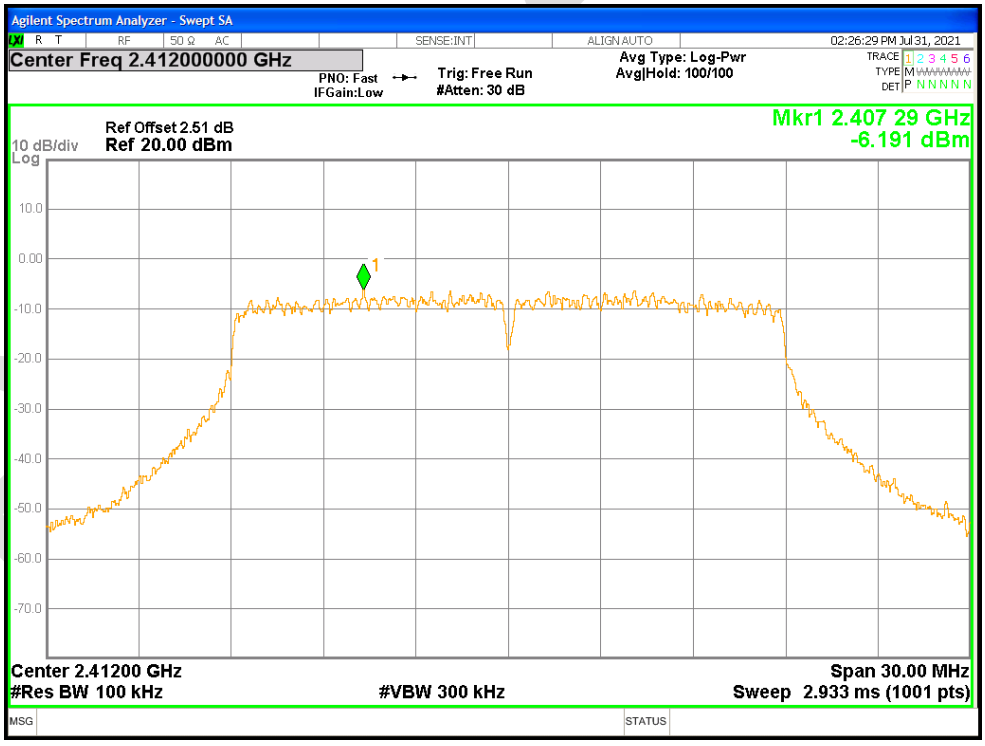
Tx. Spurious NVNT g 2462MHz Ant1 Ref



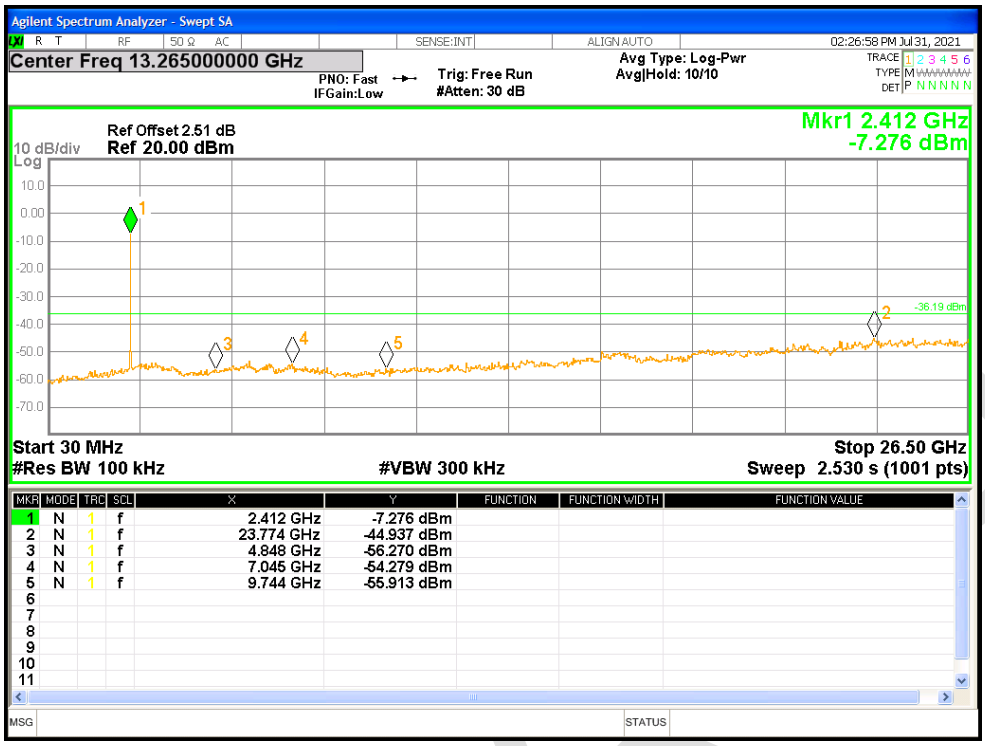
Tx. Spurious NVNT g 2462MHz Ant1 Emission



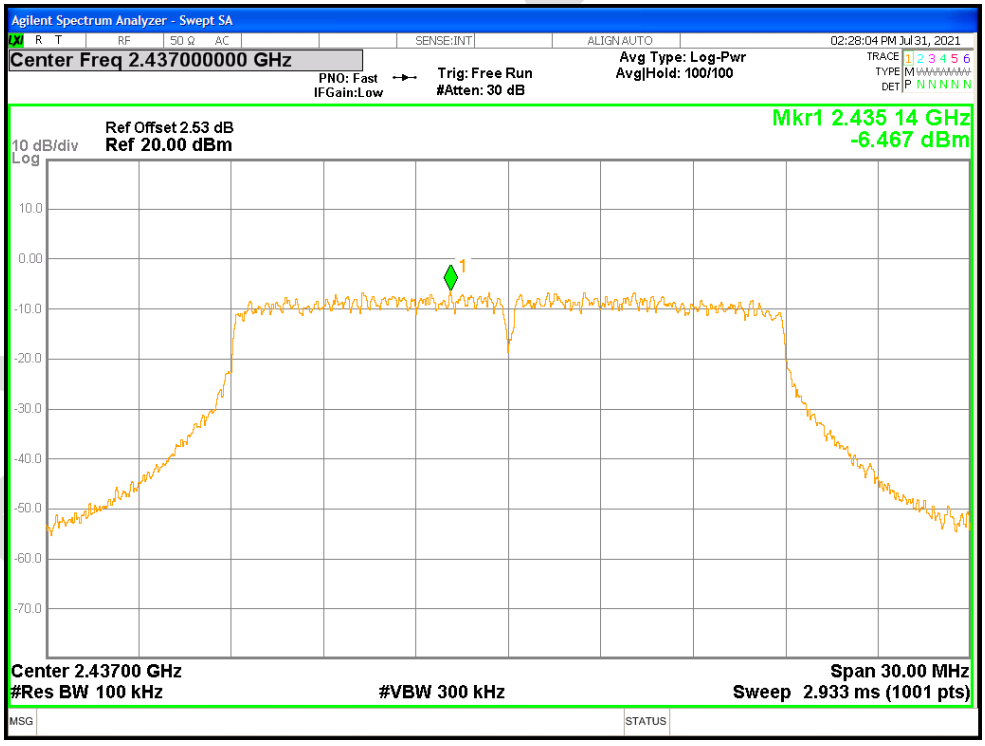
Tx. Spurious NVNT n20 2412MHz Ant1 Ref



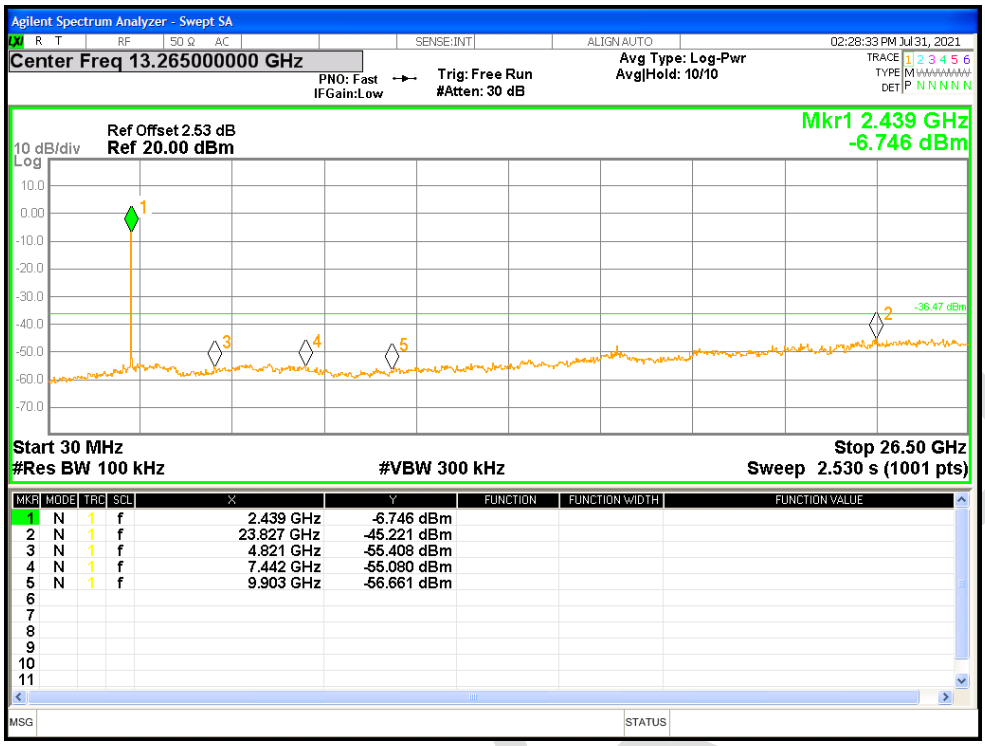
Tx. Spurious NVNT n20 2412MHz Ant1 Emission



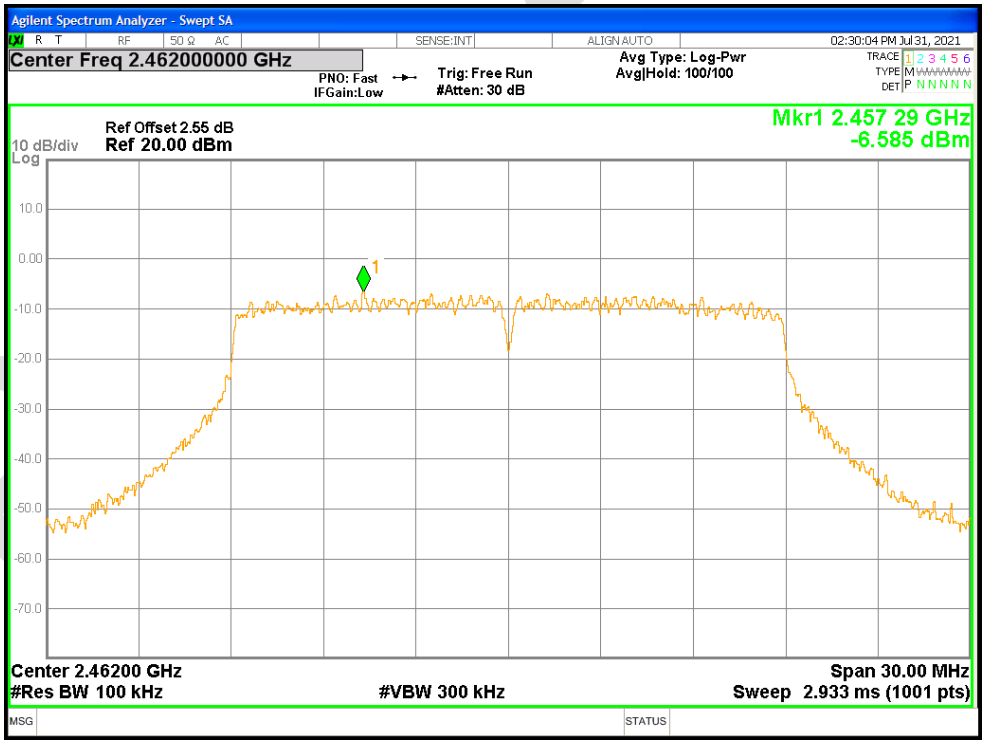
Tx. Spurious NVNT n20 2437MHz Ant1 Ref



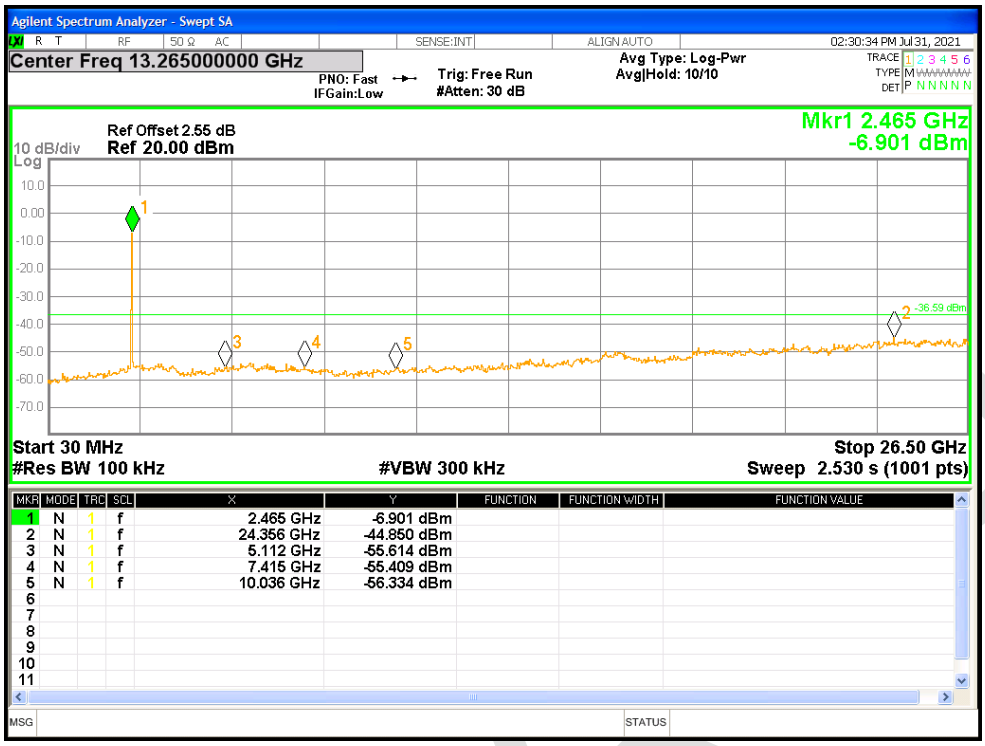
Tx. Spurious NVNT n20 2437MHz Ant1 Emission



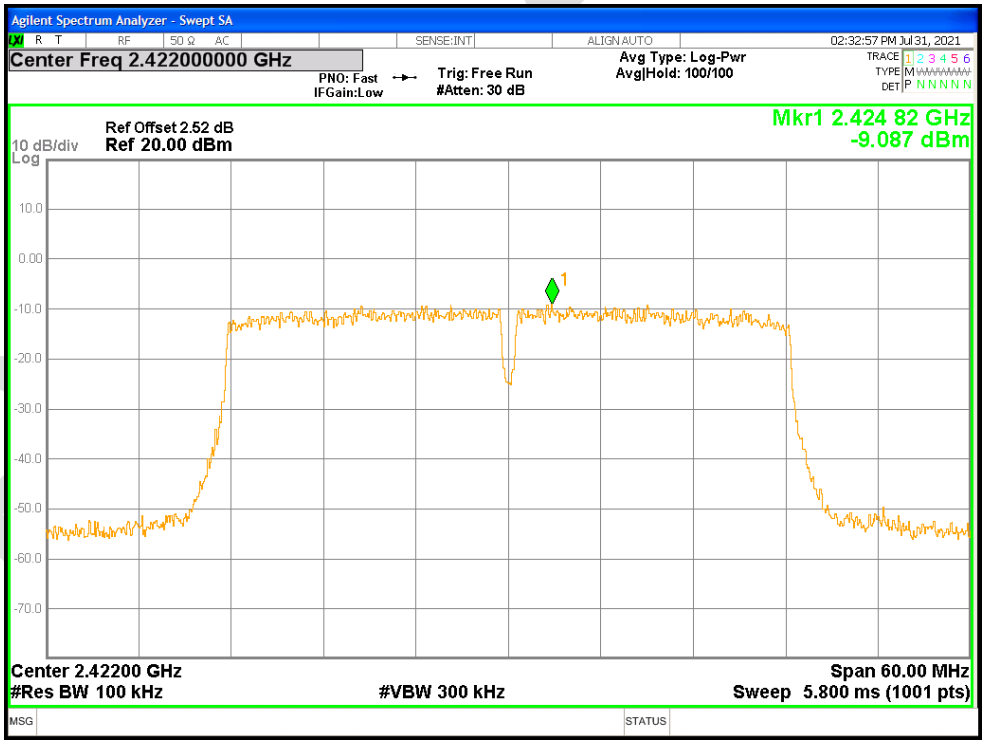
Tx. Spurious NVNT n20 2462MHz Ant1 Ref



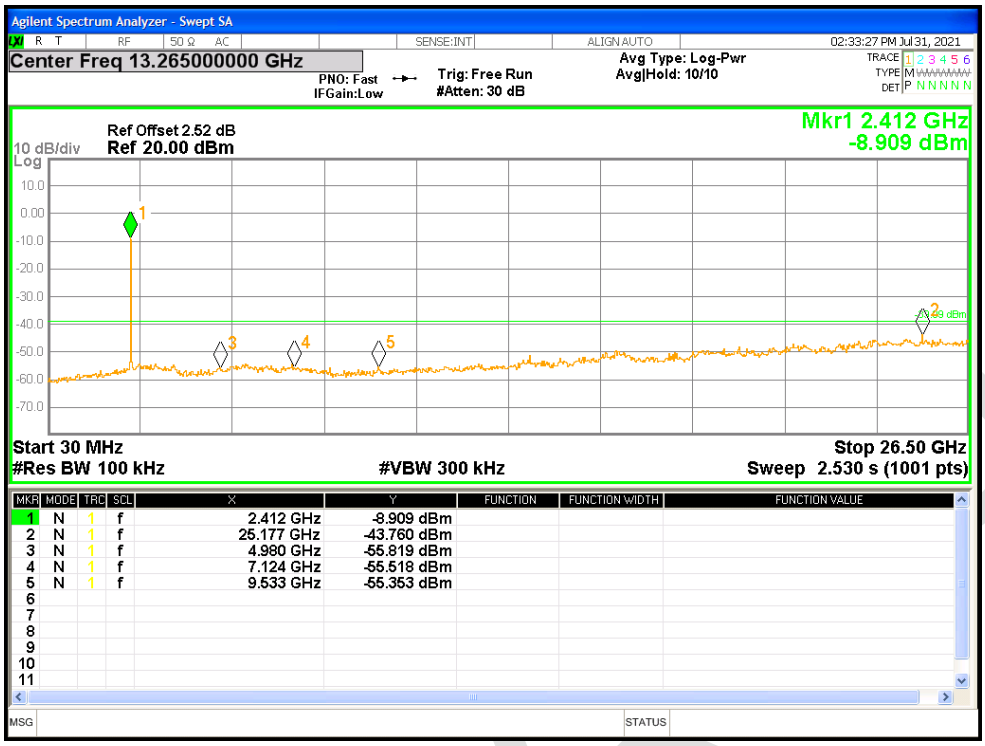
Tx. Spurious NVNT n20 2462MHz Ant1 Emission



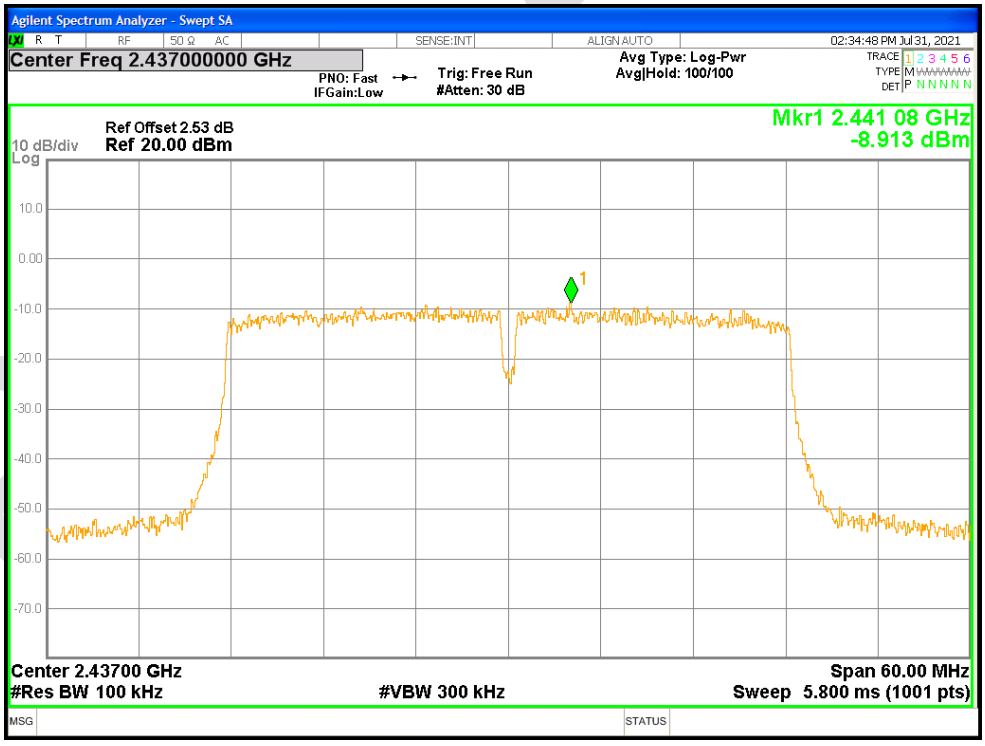
Tx. Spurious NVNT n40 2422MHz Ant1 Ref



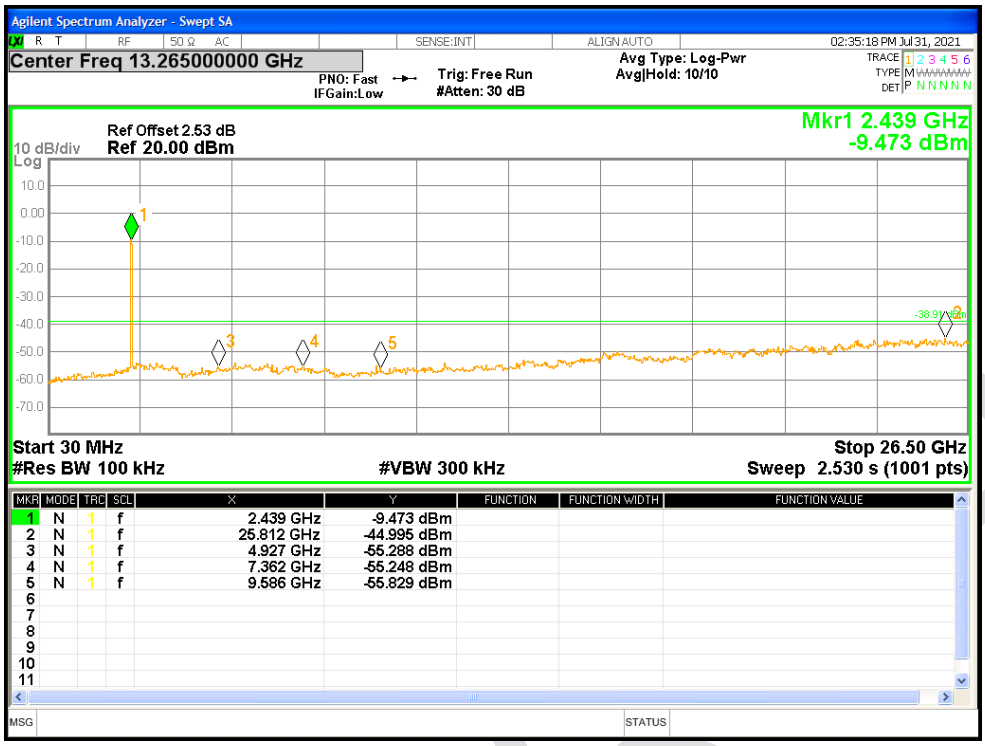
Tx. Spurious NVNT n40 2422MHz Ant1 Emission



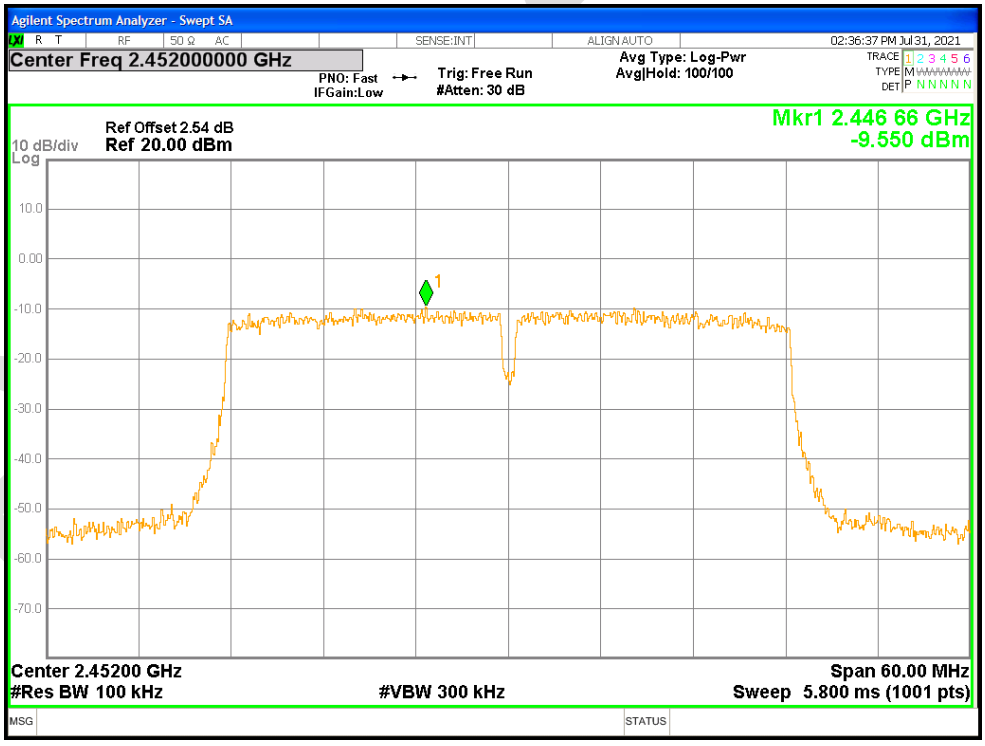
Tx. Spurious NVNT n40 2437MHz Ant1 Ref



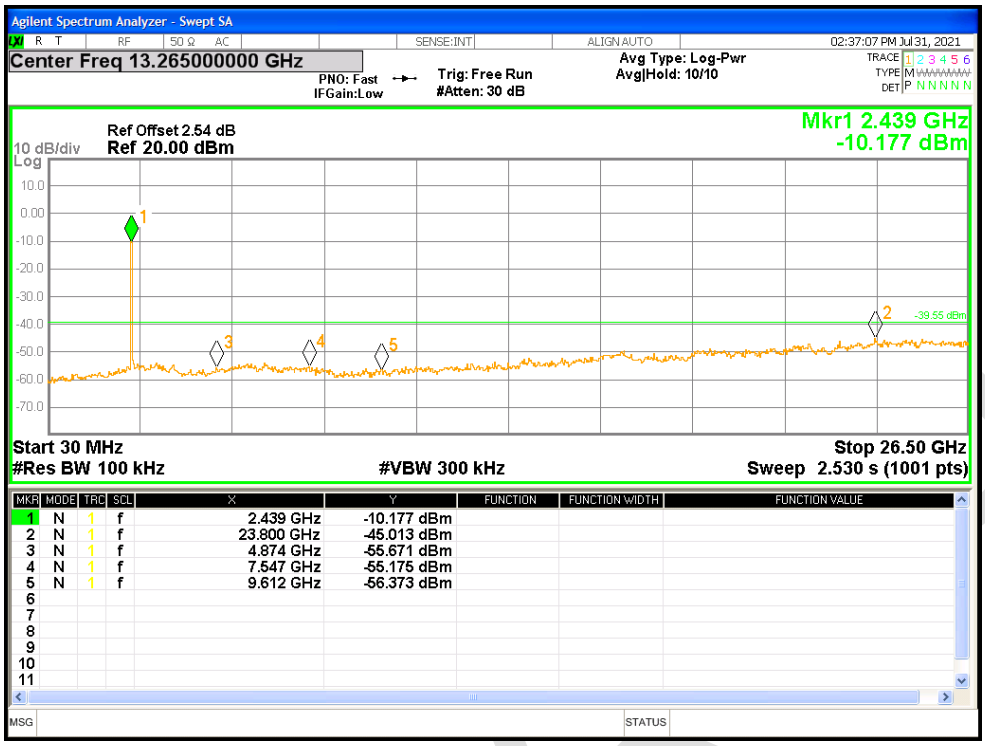
Tx. Spurious NVNT n40 2437MHz Ant1 Emission



Tx. Spurious NVNT n40 2452MHz Ant1 Ref

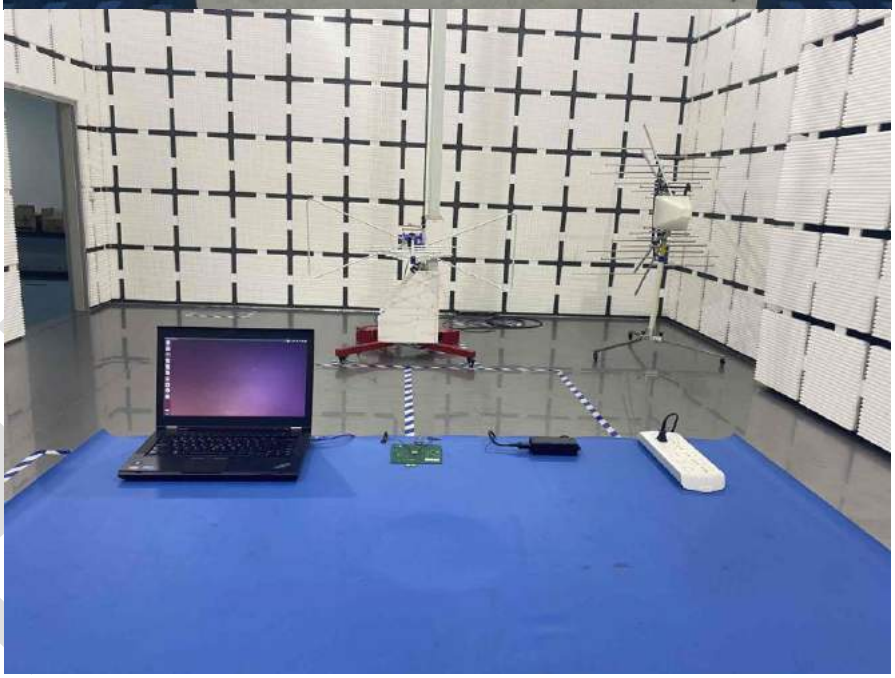


Tx. Spurious NVNT n40 2452MHz Ant1 Emission


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.265000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
02:37:07 PM Jul 31, 2021
Ref Offset 2.54 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.439 GHz
-10.177 dBm
-39.55 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.530 s (1001 pts)
1 N 1 f 2.439 GHz -10.177 dBm
2 N 1 f 23.800 GHz -45.013 dBm
3 N 1 f 4.874 GHz -55.671 dBm
4 N 1 f 7.547 GHz -55.175 dBm
5 N 1 f 9.612 GHz -56.373 dBm

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Radiated Spurious Emissions



Conducted Emissions at AC Power Line (150kHz-30MHz)

APPENDIX B: PHOTOGRAPHS OF EUT

Reference to the test report No. BLA-EMC-202107-A8401

----END OF REPORT----