TEST REPORT

Product Name	:	WIFI/BT module
Brand Mark	:	Fn-link
Model No.	:	H158A-SM
FCC ID	:	2AATL-H158ASM
Report Number	:	BLA-EMC-202203-A9202
Date of Sample Receipt	:	2022/3/23
Date of Test	:	2022/4/1 to 2022/5/9
Date of Issue	:	2022/5/9
Test Standard	:	47 CFR Part 15, Subpart C 15.247
Test Result	:	Pass

Prepared for:

FN-LINK TECHNOLOGY LIMITED

No.8, Litong Road, Liuyang Economic & Technical Development Zone, Changsha, Hunan,CHINA

Prepared by:

BlueAsia of Technical Services (Shenzhen) Co.,Ltd.
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Compiled by: Review by:

Approved by: Date: 2022/5/9

REPORT REVISE RECORD

Version No.	Date	Description
00	2022/5/9	Original

TABLE OF CONTENTS

1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
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
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
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 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
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 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
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

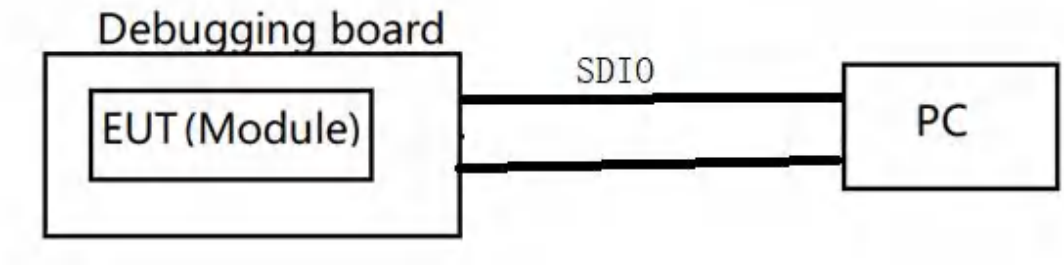
2 GENERAL INFORMATION

Applicant	FN-LINK TECHNOLOGY LIMITED
Address	No.8, Litong Road, Liuyang Economic & Technical Development Zone, Changsha, Hunan, CHINA
Manufacturer	FN-LINK TECHNOLOGY LIMITED
Address	No.8, Litong Road, Liuyang Economic & Technical Development Zone, Changsha, Hunan,CHINA
Factory	FN-LINK TECHNOLOGY LIMITED
Address	No.8, Litong Road, Liuyang Economic & Technical Development Zone, Changsha, Hunan, CHINA
Product Name	WIFI/BT module
Test Model No.	H158A-SM

3 GENERAL DESCRIPTION OF E.U.T.

Hardware Version	1.0
Software Version	1.0
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:	External Antenna
Antenna Gain:	2dBi (Provided by the customer)

4 BLOCK DIAGRAM OF EUT CONNECTION



5 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	25	DC3.3V

6 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
TX	Keep the EUT in transmitting mode with modulation(dutycycle >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 Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Shield room	SKET	833	N/A	25/11/2020	24/11/2023
Receiver	R&S	ESPI3	101082	24/9/2021	23/9/2022
LISN	R&S	ENV216	3560.6550.15	24/9/2021	23/9/2022
LISN	安泰信	AT166-2	AKK1806000003	26/9/2021	25/9/2022
EMI software	EZ	EZ-EMC	N/A	N/A	N/A

Test Equipment Of Radiated Spurious Emissions					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Chamber	SKET	966	N/A	10/11/2020	9/11/2023
Spectrum	R&S	FSP40	100817	24/9/2021	23/9/2022
Receiver	R&S	ESR7	101199	24/9/2021	23/9/2022
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	26/9/2020	25/9/2022
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	26/9/2020	25/9/2022
Amplifier	SKET	LNPA-0118-45	N/A	24/9/2021	23/9/2022
EMI software	EZ	EZ-EMC	N/A	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	26/9/2020	25/9/2022

Test Equipment Of Power Spectrum Density					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	24/9/2021	23/9/2022

Spectrum	Agilent	N9020A	MY49100060	24/9/2021	23/9/2022
Signal Generator	Agilent	N5182A	MY49060650	24/9/2021	23/9/2022
Signal Generator	Agilent	E8257D	MY44320250	24/9/2021	23/9/2022

Test Equipment Of Conducted Peak Output Power					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	24/9/2021	23/9/2022
Spectrum	Agilent	N9020A	MY49100060	24/9/2021	23/9/2022
Signal Generator	Agilent	N5182A	MY49060650	24/9/2021	23/9/2022
Signal Generator	Agilent	E8257D	MY44320250	24/9/2021	23/9/2022

Test Equipment Of Antenna Requirement					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**

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	10/11/2020	9/11/2023
Spectrum	R&S	FSP40	100817	24/9/2021	23/9/2022
Receiver	R&S	ESR7	101199	24/9/2021	23/9/2022
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	26/9/2020	25/9/2022
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	26/9/2020	25/9/2022
Amplifier	SKET	LNPA-0118-45	N/A	24/9/2021	23/9/2022
EMI software	EZ	EZ-EMC	N/A	N/A	N/A

Loop antenna	SCHNARZBECK	FMZB1519B	00102	26/9/2020	25/9/2022

Test Equipment Of Conducted Spurious Emissions					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	24/9/2021	23/9/2022
Spectrum	Agilent	N9020A	MY49100060	24/9/2021	23/9/2022
Signal Generator	Agilent	N5182A	MY49060650	24/9/2021	23/9/2022
Signal Generator	Agilent	E8257D	MY44320250	24/9/2021	23/9/2022

Test Equipment Of Conducted Band Edges Measurement					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	24/9/2021	23/9/2022
Spectrum	Agilent	N9020A	MY49100060	24/9/2021	23/9/2022
Signal Generator	Agilent	N5182A	MY49060650	24/9/2021	23/9/2022
Signal Generator	Agilent	E8257D	MY44320250	24/9/2021	23/9/2022

Test Equipment Of Minimum 6dB Bandwidth					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	24/9/2021	23/9/2022
Spectrum	Agilent	N9020A	MY49100060	24/9/2021	23/9/2022
Signal Generator	Agilent	N5182A	MY49060650	24/9/2021	23/9/2022
Signal Generator	Agilent	E8257D	MY44320250	24/9/2021	23/9/2022

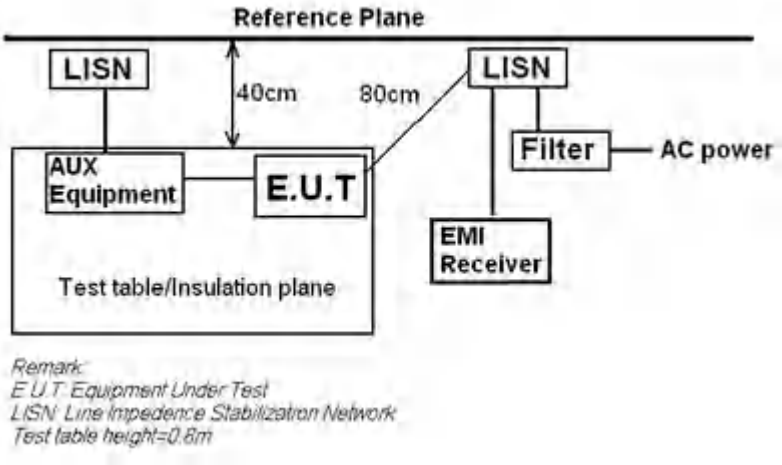
11 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

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

11.1 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.		

11.2 BLOCK DIAGRAM OF TEST SETUP



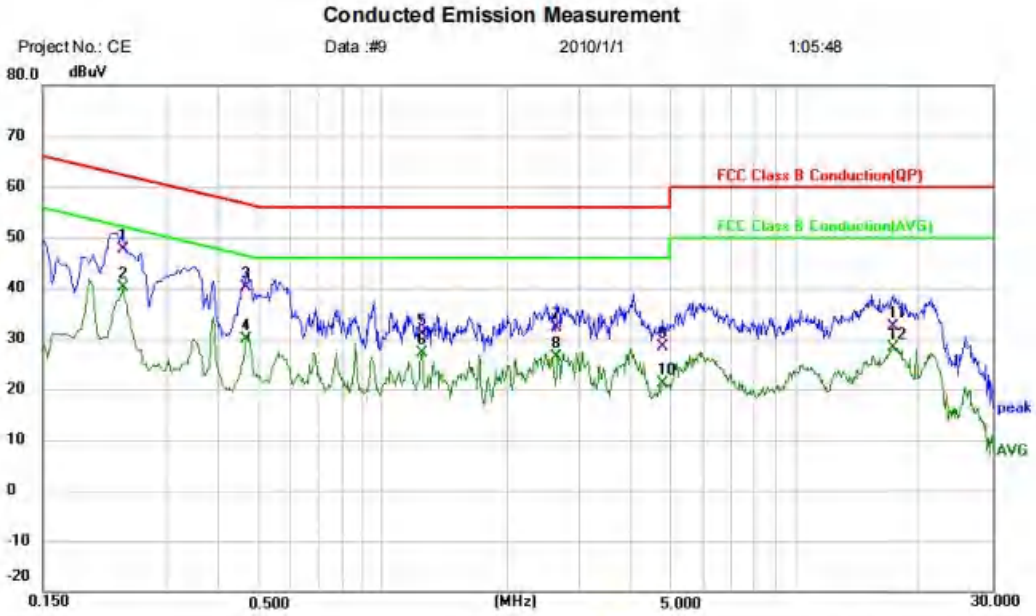
11.3 PROCEDURE

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

11.4 TEST DATA

[TestMode: TX]; [Line: Line]



Site
Limit: FCC Class B Conduction(QP)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI mode
Note:

Phase: L1
Power:

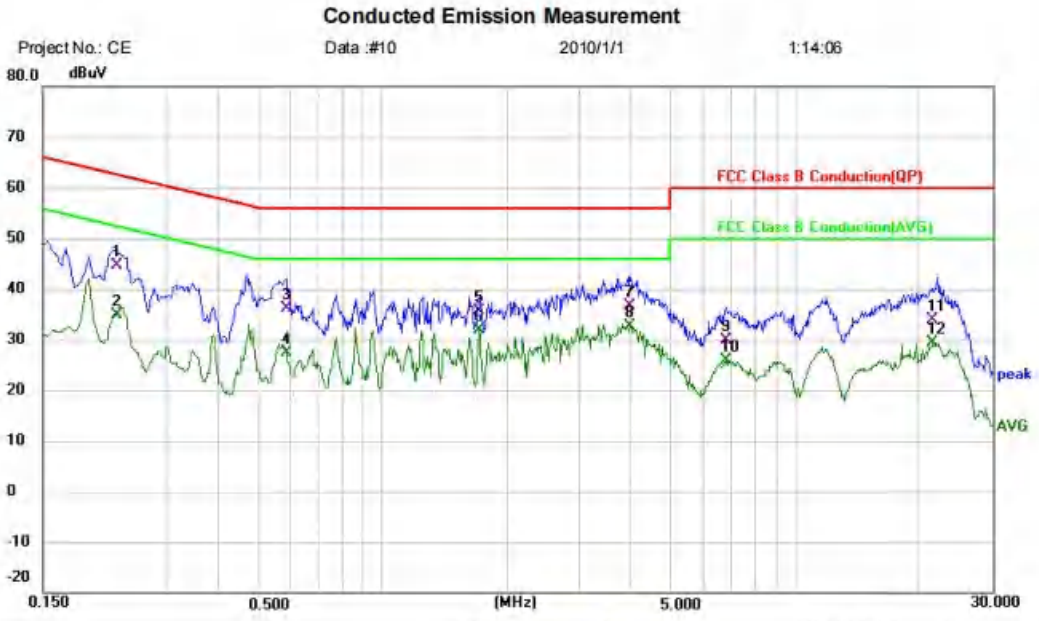
Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2340	37.25	10.30	47.55	62.31	-14.76	QP	
2	*	0.2340	29.73	10.30	40.03	52.31	-12.28	AVG	
3		0.4660	30.37	9.87	40.24	56.58	-16.34	QP	
4		0.4660	19.95	9.87	29.82	46.58	-16.76	AVG	
5		1.2460	21.07	9.92	30.99	56.00	-25.01	QP	
6		1.2460	17.22	9.92	27.14	46.00	-18.86	AVG	
7		2.6500	22.09	9.96	32.05	56.00	-23.95	QP	
8		2.6500	16.33	9.96	26.29	46.00	-19.71	AVG	
9		4.7740	18.33	9.99	28.32	56.00	-27.68	QP	
10		4.7740	11.04	9.99	21.03	46.00	-24.97	AVG	
11		17.2660	22.04	10.39	32.43	60.00	-27.57	QP	
12		17.2660	17.73	10.39	28.12	50.00	-21.88	AVG	

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

Test Result: Pass

[TestMode: TX]; [Line: Nutral]



Site
Limit: FCC Class B Conduction(QP)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI mode
Note:

Phase: N
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2260	34.44	10.22	44.66	62.60	-17.94	QP	
2		0.2260	24.72	10.22	34.94	52.60	-17.66	AVG	
3		0.5820	26.26	9.80	36.06	56.00	-19.94	QP	
4		0.5820	17.61	9.80	27.41	46.00	-18.59	AVG	
5		1.7140	25.79	9.85	35.64	56.00	-20.36	QP	
6		1.7140	22.07	9.85	31.92	46.00	-14.08	AVG	
7		3.9740	26.68	9.91	36.59	56.00	-19.41	QP	
8	*	3.9740	22.74	9.91	32.65	46.00	-13.35	AVG	
9		6.7820	19.95	10.02	29.97	60.00	-30.03	QP	
10		6.7820	15.93	10.02	25.95	50.00	-24.05	AVG	
11		21.5980	23.43	10.41	33.84	60.00	-26.16	QP	
12		21.5980	18.98	10.41	29.39	50.00	-20.61	AVG	

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

Test Result: Pass

12 RADIATED SPURIOUS EMISSIONS

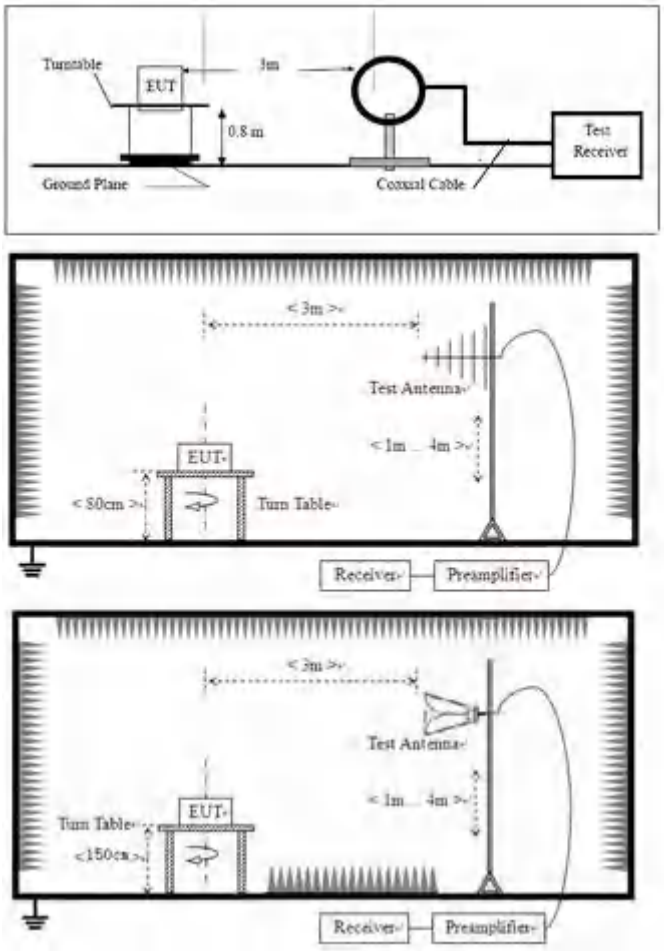
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.4,6.5,6.6
Test Mode (Pre-Scan)	TX mode (SE) below 1G;TX mode (SE) Above 1G
Test Mode (Final Test)	TX mode (SE) below 1G;TX mode (SE) Above 1G
Tester	Jozu
Temperature	25℃
Humidity	60%

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.

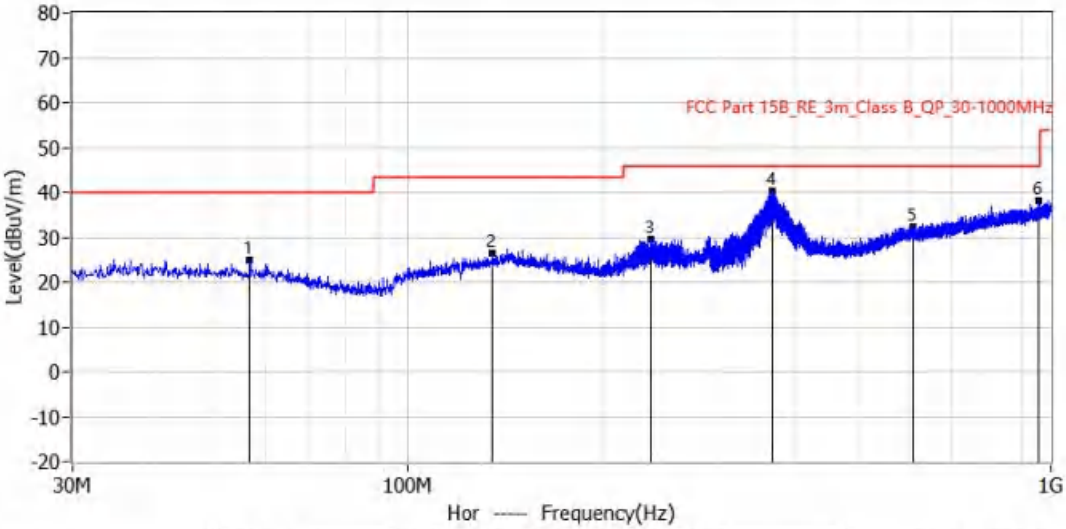
h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
j. Repeat above procedures until all frequencies measured was complete.

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 18GHz 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.
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

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

Test Lab: BlueAsia EMC Lab（RE #1）	Project: BLA-EMC-202203-A92
EUT: WIFI/BT module	Test Engineer: York
M/N: H158A-SM	Temperature:
S/N:	Humidity:
Test Mode: 2.4Gwifi mode	Test Voltage:
Note:	Test Data: 2022-04-25 16:53:19

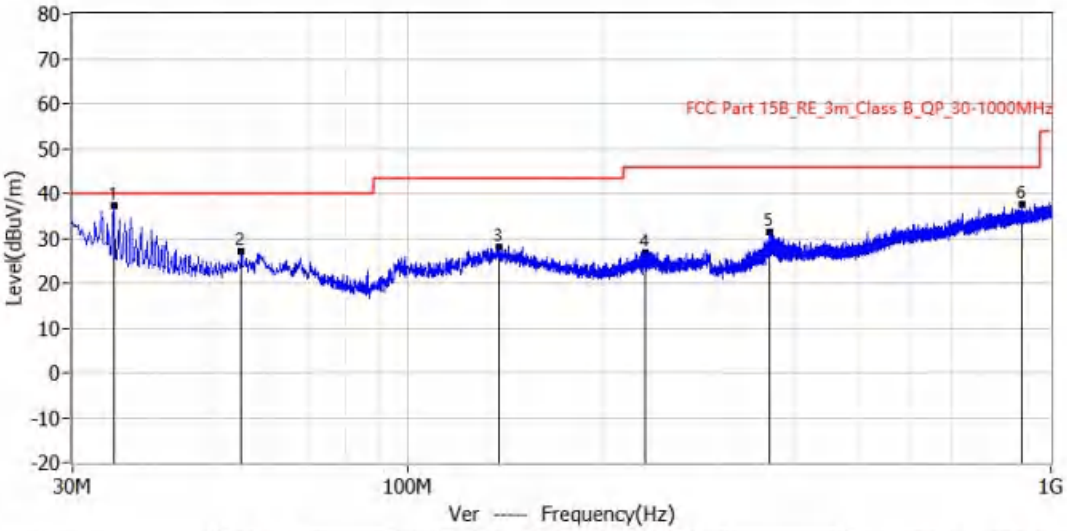


No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1*	56.554MHz	40.0	24.9	-15.1	1.3	23.6	QP	Hor	100.0	119.0
2*	135.245MHz	43.5	26.6	-16.9	3.1	23.5	QP	Hor	100.0	240.0
3*	237.823MHz	46.0	29.6	-16.4	6.9	22.7	QP	Hor	100.0	266.0
4*	367.681MHz	46.0	40.3	-5.7	14.1	26.2	QP	Hor	100.0	137.0
5*	610.545MHz	46.0	32.3	-13.7	1.0	31.3	QP	Hor	100.0	0.0
6*	958.533MHz	46.0	38.3	-7.7	2.6	35.7	QP	Hor	100.0	215.0

Test Result: Pass

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

Test Lab: BlueAsia EMC Lab（RE #1）	Project: BLA-EMC-202203-A92
EUT: WIFI/BT module	Test Engineer: York
M/N: H158A-SM	Temperature:
S/N:	Humidity:
Test Mode: 2.4Gwifi mode	Test Voltage:
Note:	Test Data: 2022-04-25 16:55:06

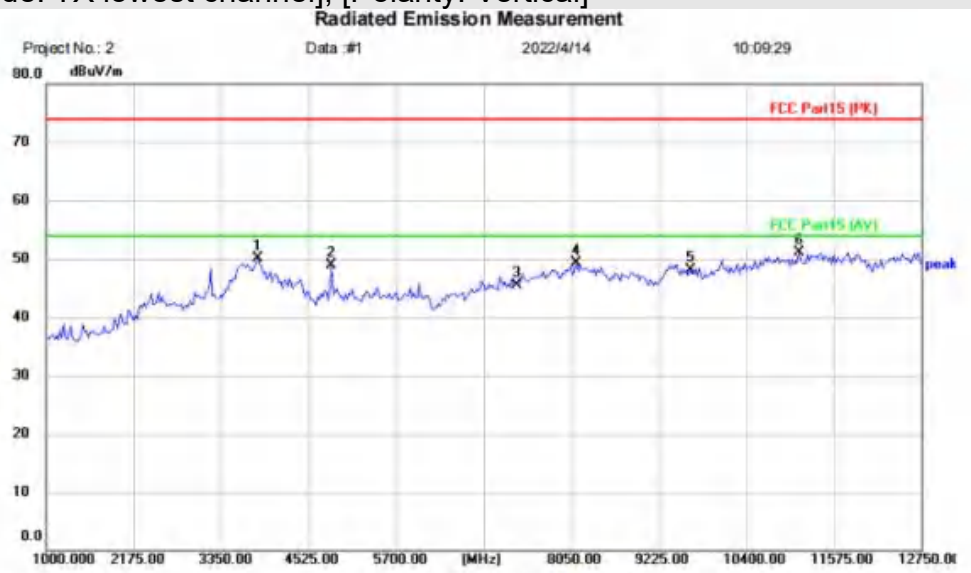


No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1*	34.729MHz	40.0	37.2	-2.8	13.7	23.5	QP	Ver	100.0	45.0
2*	54.856MHz	40.0	27.0	-13.0	3.3	23.7	QP	Ver	100.0	104.0
3*	138.398MHz	43.5	27.9	-15.6	4.3	23.6	QP	Ver	100.0	135.0
4*	234.185MHz	46.0	26.9	-19.1	4.4	22.5	QP	Ver	100.0	76.0
5*	363.923MHz	46.0	31.4	-14.6	5.3	26.1	QP	Ver	100.0	344.0
6*	899.484MHz	46.0	37.5	-8.5	2.5	35.0	QP	Ver	100.0	217.0

Test Result: Pass

Above 1GHz:

[TestMode: TX lowest channel]; [Polarity: Vertical]



Site
Polarization: *Vertical*
Temperature: (C)
Limit: FCC Part15 (PK)
Power:
Humidity: %RH
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11B-TX-L
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3843.500	43.04	7.12	50.16	74.00	-23.84	peak	
2		4830.500	45.32	3.58	48.90	74.00	-25.10	peak	
3		7326.000	39.15	6.44	45.59	74.00	-28.41	peak	
4		8120.500	41.14	8.11	49.25	74.00	-24.75	peak	
5		9648.000	38.80	9.37	48.17	74.00	-25.83	peak	
6	*	11105.000	39.06	12.02	51.08	74.00	-22.92	peak	

Test Result: Pass

[TestMode: TX lowest channel]; [Polarity: Horizontal]

Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11B-TX-L
Note:

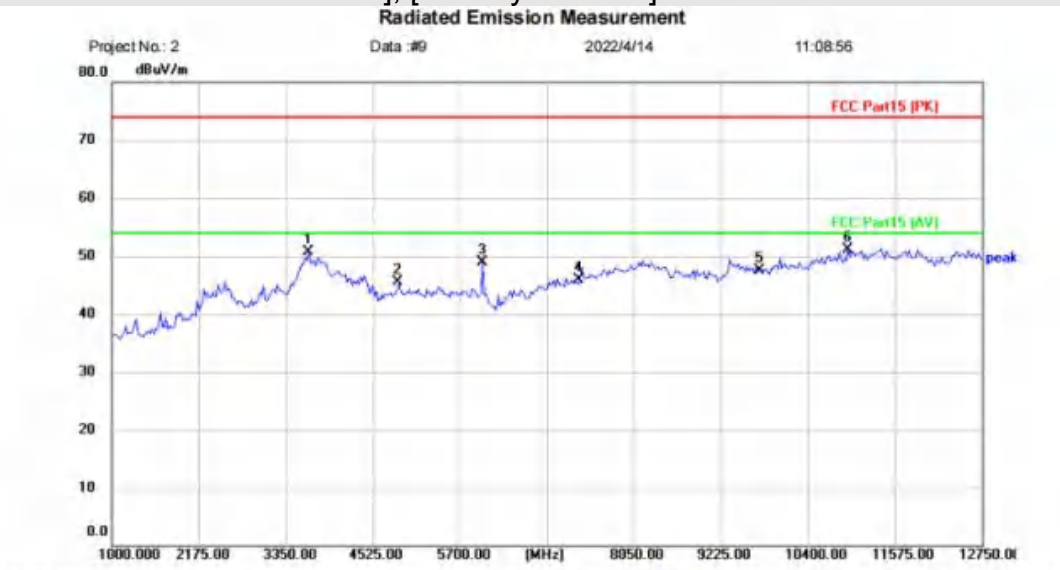
Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3632.000	41.93	7.77	49.70	74.00	-24.30	peak	
2		4824.000	39.99	3.62	43.61	74.00	-30.39	peak	
3		7326.000	40.12	6.44	46.56	74.00	-27.44	peak	
4		8167.500	41.22	8.17	49.39	74.00	-24.61	peak	
5		9648.000	39.35	9.37	48.72	74.00	-25.28	peak	
6	*	11387.000	39.79	11.78	51.57	74.00	-22.43	peak	

Test Result: Pass

[TestMode: TX middle channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11B-TX-M
Note:

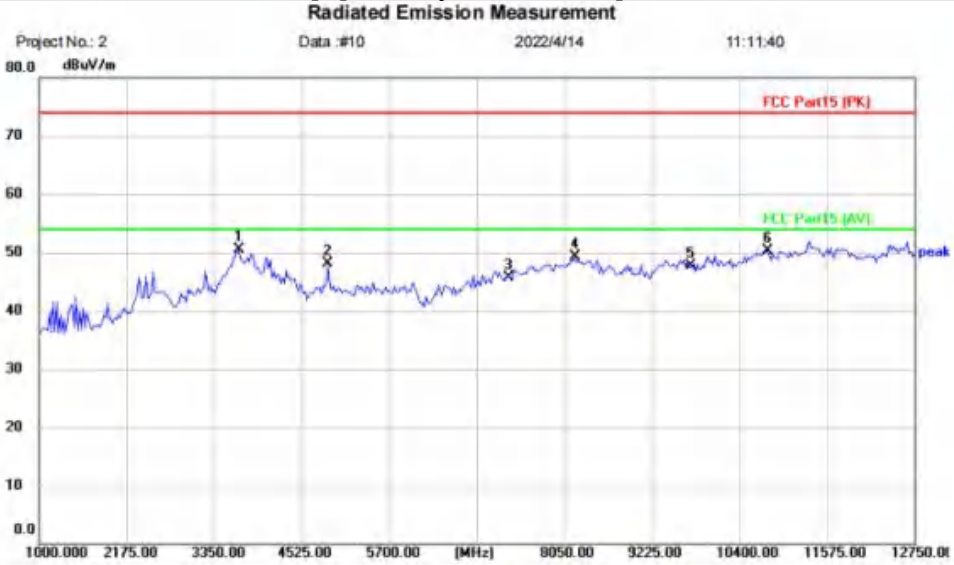
Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3655.500	42.90	7.76	50.66	74.00	-23.34	peak	
2		4874.000	42.16	3.39	45.55	74.00	-28.45	peak	
3		6005.500	47.92	0.98	48.90	74.00	-25.10	peak	
4		7311.000	39.56	6.37	45.93	74.00	-28.07	peak	
5		9748.000	37.97	9.59	47.56	74.00	-26.44	peak	
6	*	10940.500	39.11	11.93	51.04	74.00	-22.96	peak	

Test Result: Pass

[TestMode: TX middle channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11B-TX-M
Note:

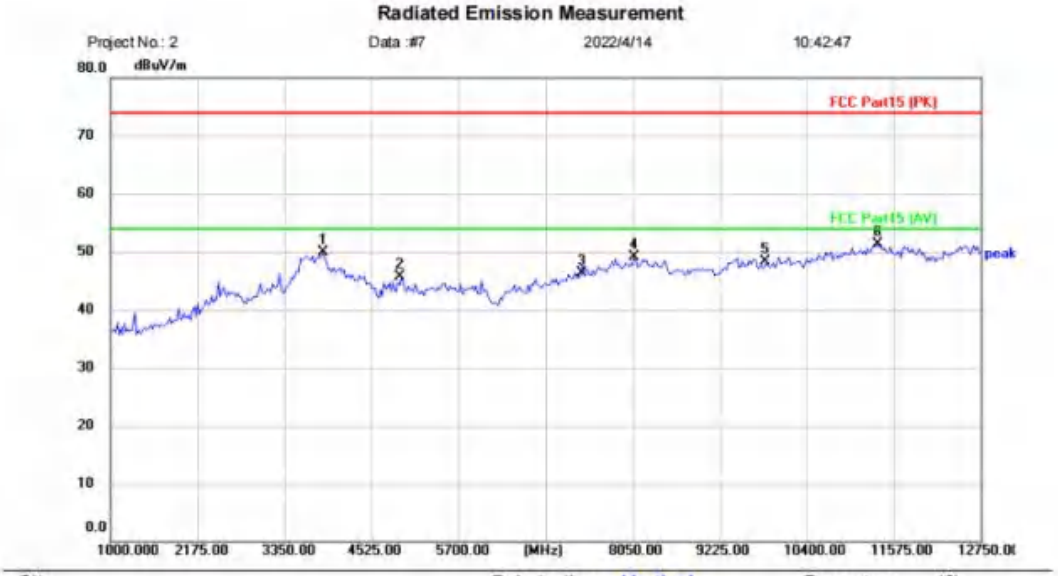
Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	3679.000	42.81	7.73	50.54	74.00	-23.46	peak	
2		4877.500	44.71	3.37	48.08	74.00	-25.92	peak	
3		7311.000	39.43	6.37	45.80	74.00	-28.20	peak	
4		8191.000	41.08	8.20	49.28	74.00	-24.72	peak	
5		9748.000	38.16	9.59	47.75	74.00	-26.25	peak	
6		10776.000	38.54	11.70	50.24	74.00	-23.76	peak	

Test Result: Pass

[TestMode: TX highest channl]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11B-TX-H
Note:

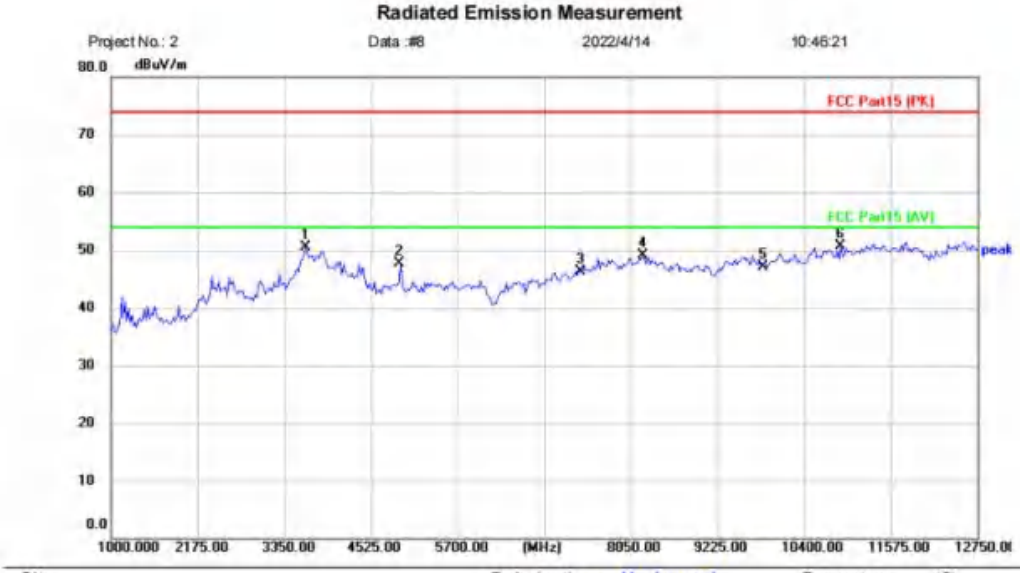
Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3867.000	43.09	6.82	49.91	74.00	-24.09	peak	
2		4924.000	42.23	3.46	45.69	74.00	-28.31	peak	
3		7386.000	39.54	6.68	46.22	74.00	-27.78	peak	
4		8073.500	41.00	8.04	49.04	74.00	-24.96	peak	
5		9848.000	38.45	9.88	48.33	74.00	-25.67	peak	
6	*	11363.500	39.47	11.81	51.28	74.00	-22.72	peak	

Test Result: Pass

[TestMode: TX highest channl]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11B-TX-H
Note:

Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3632.000	42.76	7.77	50.53	74.00	-23.47	peak	
2		4924.000	44.15	3.46	47.61	74.00	-26.39	peak	
3		7386.000	39.68	6.68	46.36	74.00	-27.64	peak	
4		8214.500	40.81	8.21	49.02	74.00	-24.98	peak	
5		9848.000	37.24	9.88	47.12	74.00	-26.88	peak	
6	*	10893.500	38.84	11.87	50.71	74.00	-23.29	peak	

Test Result: Pass

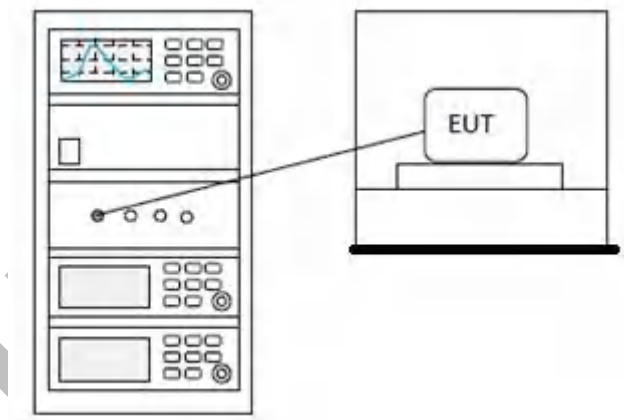
13 POWER SPECTRUM DENSITY

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%

13.1 LIMITS

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

13.2 BLOCK DIAGRAM OF TEST SETUP



13.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

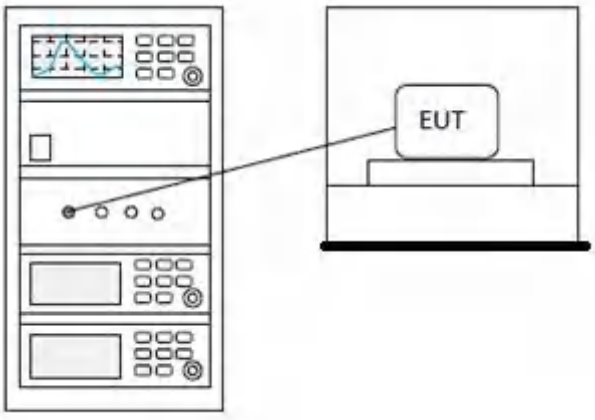
14 CONDUCTED PEAK OUTPUT POWER

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%

14.1 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

14.2 BLOCK DIAGRAM OF TEST SETUP



14.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

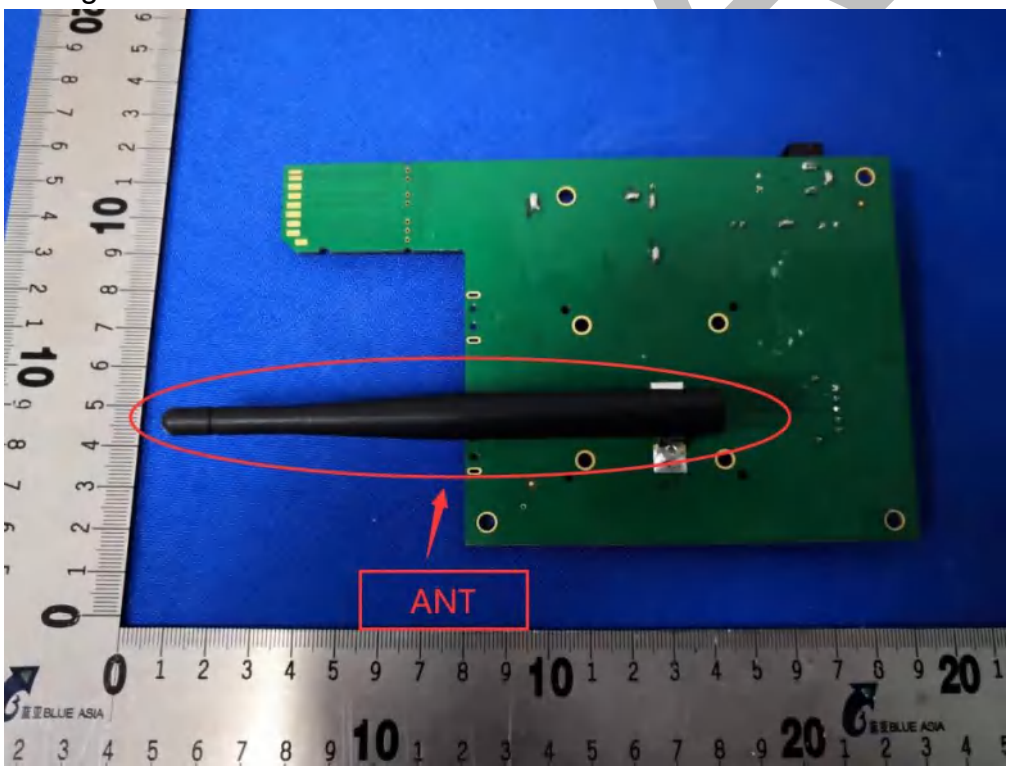
15 ANTENNA REQUIREMENT

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

15.1 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.



16 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

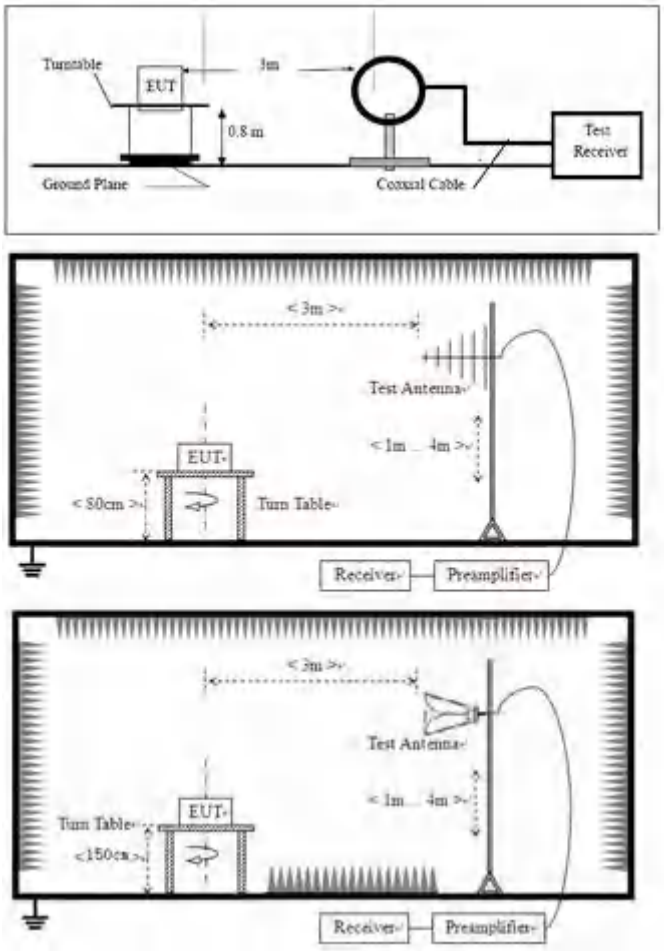
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

16.1 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.

16.2 BLOCK DIAGRAM OF TEST SETUP



16.3 PROCEDURE

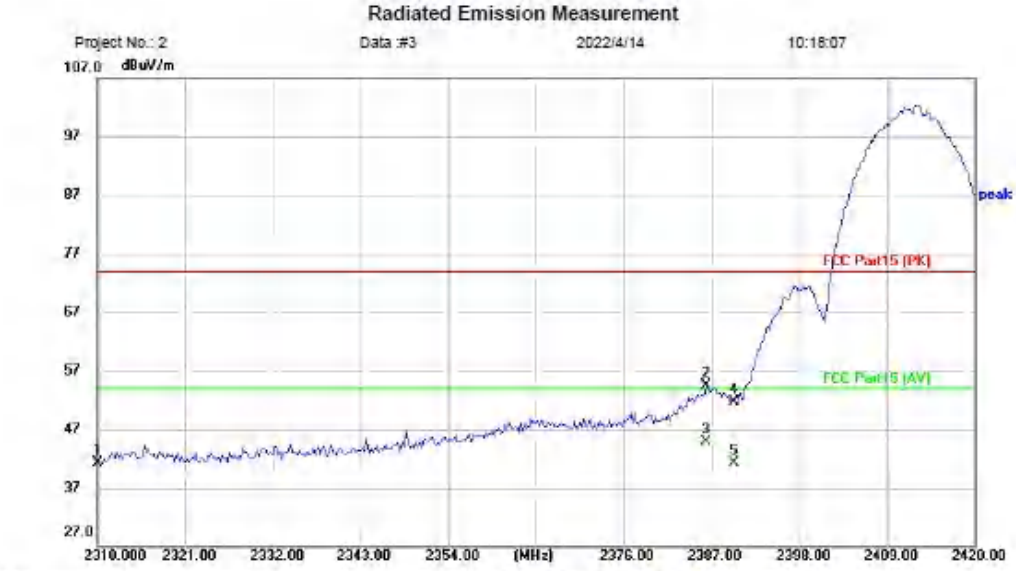
a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters 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.

16.4 TEST DATA

802.11b:

[TestMode: TX lowest chanenl]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11B-TX-L
Note:

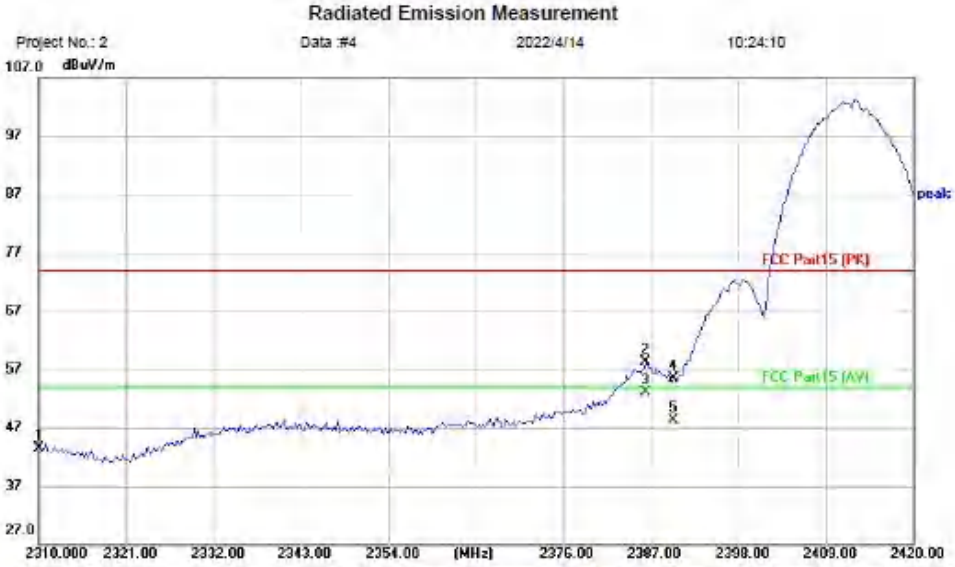
Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	45.19	-3.93	41.26	74.00	-32.74	peak	
2		2386.340	58.20	-3.60	54.60	74.00	-19.40	peak	
3	*	2386.340	48.43	-3.60	44.83	54.00	-9.17	AVG	
4		2390.000	55.32	-3.58	51.74	74.00	-22.26	peak	
5		2390.000	44.94	-3.58	41.36	54.00	-12.64	AVG	

Test Result: Pass

[TestMode: TX lowest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11B-TX-L
Note:

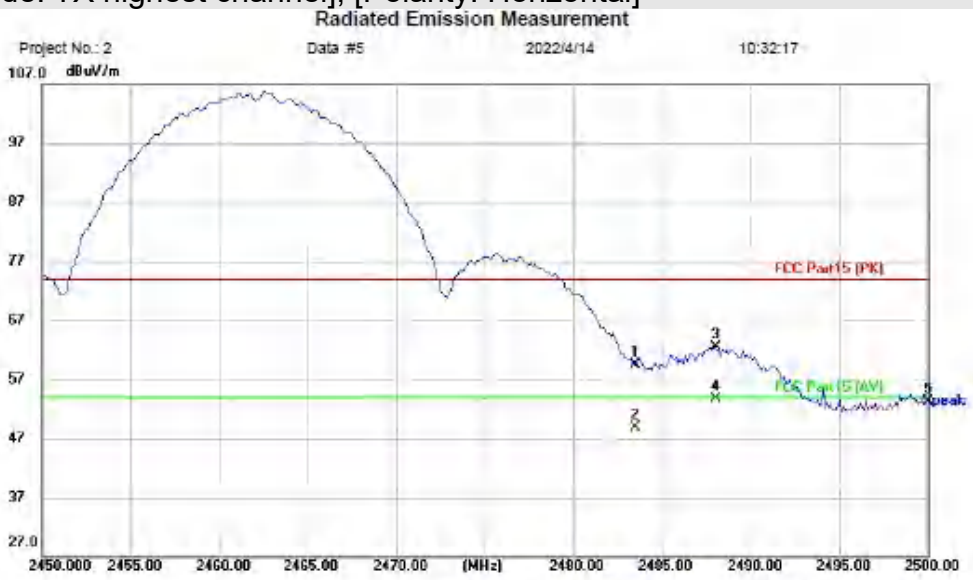
Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	47.51	-3.93	43.58	74.00	-30.42	peak	
2		2386.340	61.89	-3.60	58.29	74.00	-15.71	peak	
3	*	2386.340	56.72	-3.60	53.12	54.00	-0.88	AVG	
4		2390.000	59.07	-3.58	55.49	74.00	-18.51	peak	
5		2390.000	51.93	-3.58	48.35	54.00	-5.65	AVG	

Test Result: Pass

[TestMode: TX highest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11B-TX-H
Note:

Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	62.58	-3.14	59.44	74.00	-14.56	peak	
2		2483.500	52.07	-3.14	48.93	54.00	-5.07	AVG	
3		2488.000	65.60	-3.13	62.47	74.00	-11.53	peak	
4	*	2488.000	56.82	-3.13	53.69	54.00	-0.31	AVG	
5		2500.000	56.40	-3.08	53.32	74.00	-20.68	peak	

Test Result: Pass

[TestMode: TX highest channel]; [Polarity: Vertical]

Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11B-TX-H
Note:

Polarization: *Vertical*
Power:

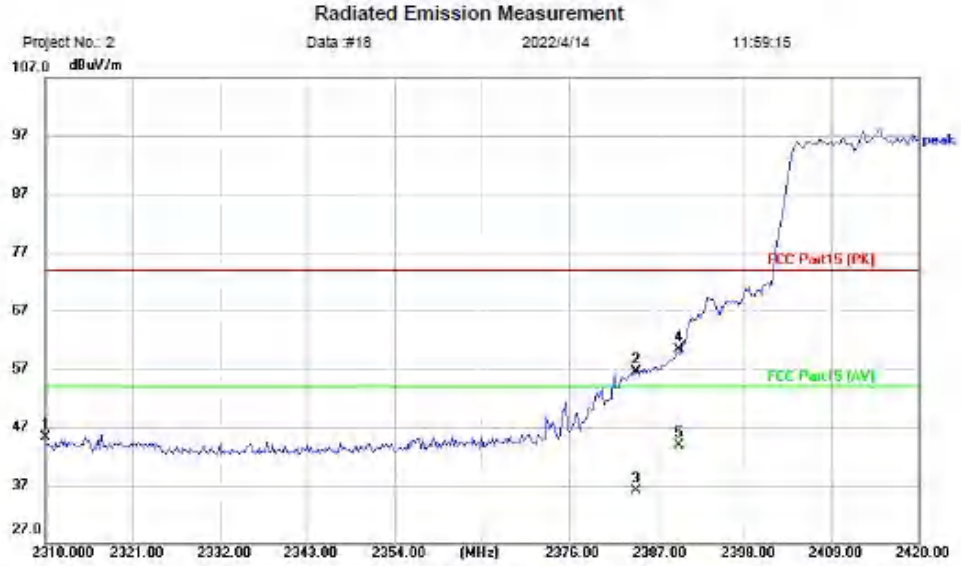
Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	59.17	-3.14	56.03	74.00	-17.97	peak	
2		2483.500	51.92	-3.14	48.78	54.00	-5.22	AVG	
3		2487.600	59.80	-3.14	56.66	74.00	-17.34	peak	
4	*	2487.600	56.53	-3.14	53.39	54.00	-0.61	AVG	
5		2500.000	51.41	-3.08	48.33	74.00	-25.67	peak	

Test Result: Pass

802.11g

[TestMode: TX lowest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11G-TX-L
Note:

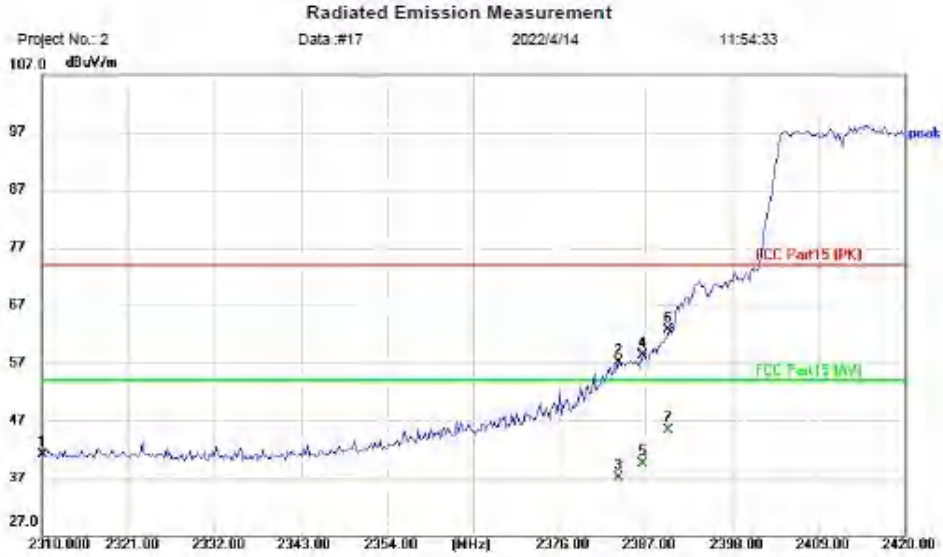
Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	49.17	-3.93	45.24	74.00	-28.76	peak	
2		2384.360	60.05	-3.60	56.45	74.00	-17.55	peak	
3		2384.360	39.64	-3.60	36.04	54.00	-17.96	AVG	
4		2390.000	63.86	-3.58	60.28	74.00	-13.72	peak	
5	*	2390.000	47.51	-3.58	43.93	54.00	-10.07	AVG	

Test Result: Pass

[TestMode: TX lowest channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11G-TX-L
Note:

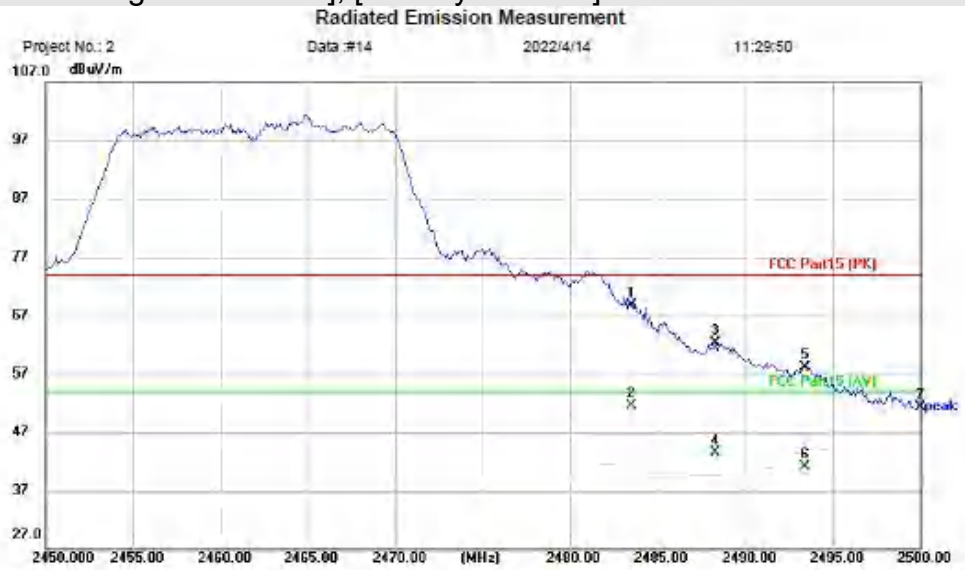
Polarization: Vertical
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	45.02	-3.93	41.09	74.00	-32.91	peak	
2		2383.480	60.78	-3.60	57.18	74.00	-16.82	peak	
3		2383.480	40.69	-3.60	37.09	54.00	-16.91	AVG	
4		2386.560	61.97	-3.60	58.37	74.00	-15.63	peak	
5		2386.560	43.15	-3.60	39.55	54.00	-14.45	AVG	
6		2390.000	66.24	-3.58	62.66	74.00	-11.34	peak	
7	*	2390.000	48.83	-3.58	45.25	54.00	-8.75	AVG	

Test Result: Pass

[TestMode: TX highest channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11G-TX-H
Note:

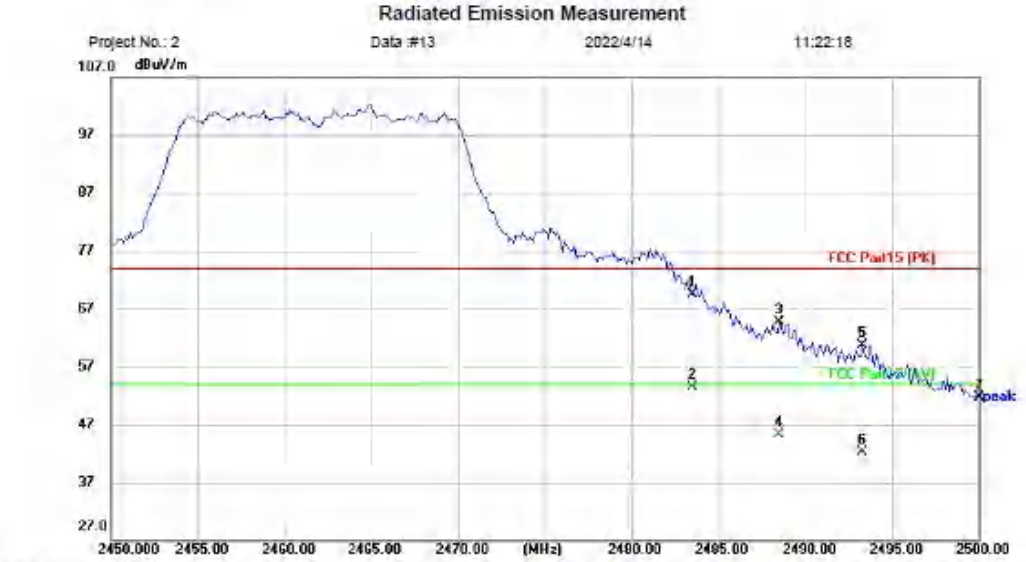
Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	71.83	-3.14	68.69	74.00	-5.31	peak	
2	*	2483.500	54.66	-3.14	51.52	54.00	-2.48	AVG	
3		2488.300	65.53	-3.13	62.40	74.00	-11.60	peak	
4		2488.300	46.68	-3.13	43.55	54.00	-10.45	AVG	
5		2493.400	61.29	-3.11	58.18	74.00	-15.82	peak	
6		2493.400	44.15	-3.11	41.04	54.00	-12.96	AVG	
7		2500.000	54.34	-3.08	51.26	74.00	-22.74	peak	

Test Result: Pass

[TestMode: TX highest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11G-TX-H
Note:

Polarization: *Horizontal*
Power:

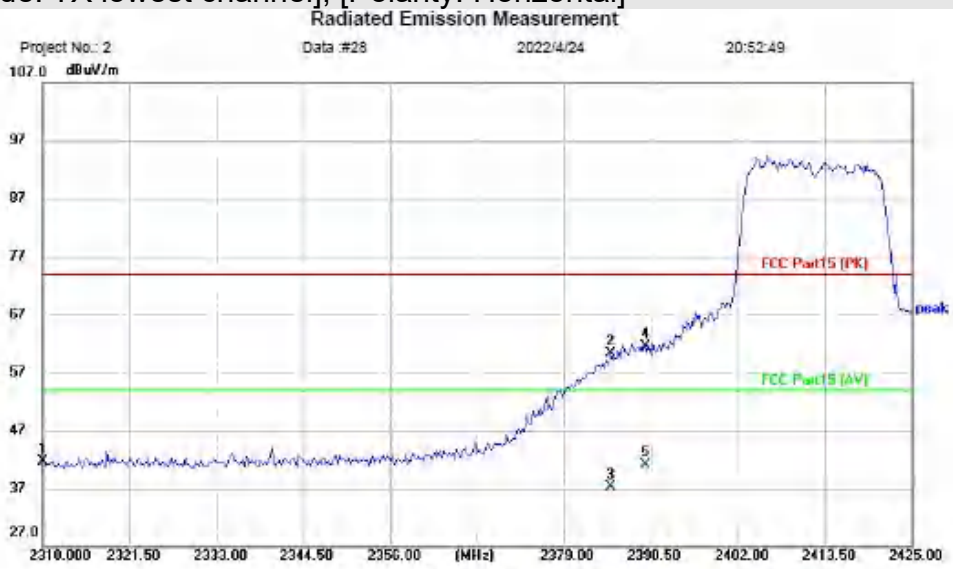
Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	72.61	-3.14	69.47	74.00	-4.53	peak	
2	*	2483.500	56.70	-3.14	53.56	54.00	-0.44	AVG	
3		2488.500	67.86	-3.13	64.73	74.00	-9.27	peak	
4		2488.500	48.35	-3.13	45.22	54.00	-8.78	AVG	
5		2493.300	63.88	-3.11	60.77	74.00	-13.23	peak	
6		2493.300	45.33	-3.11	42.22	54.00	-11.78	AVG	
7		2500.000	54.72	-3.08	51.64	74.00	-22.36	peak	

Test Result: Pass

802.11n20

[TestMode: TX lowest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11N20-TX-L
Note:

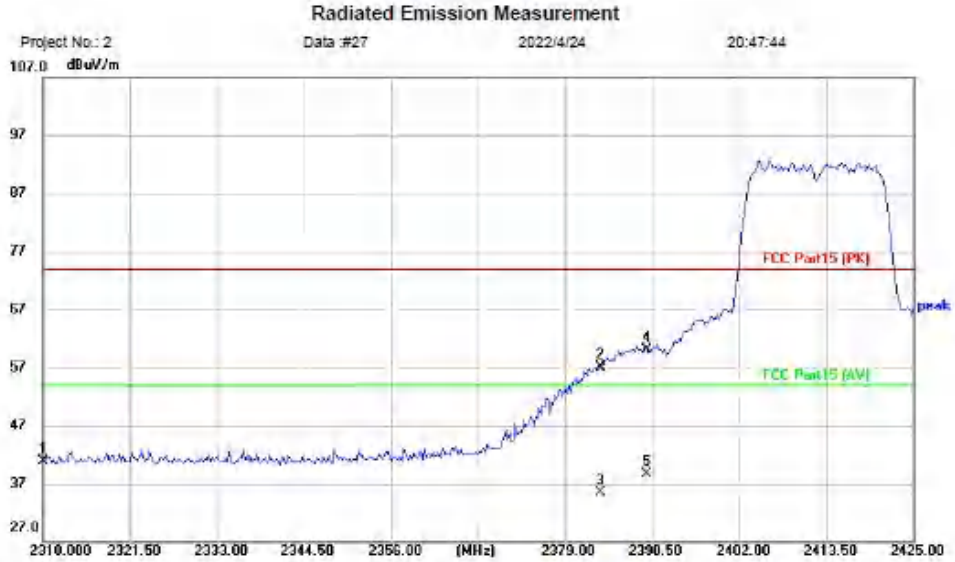
Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	45.63	-3.93	41.70	74.00	-32.30	peak	
2		2385.210	63.85	-3.60	60.25	74.00	-13.75	peak	
3		2385.210	40.81	-3.60	37.21	54.00	-16.79	AVG	
4	*	2390.000	65.17	-3.58	61.59	74.00	-12.41	peak	
5		2390.000	44.64	-3.58	41.06	54.00	-12.94	AVG	

Test Result: Pass

[TestMode: TX lowest channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11N20-TX-L
Note:

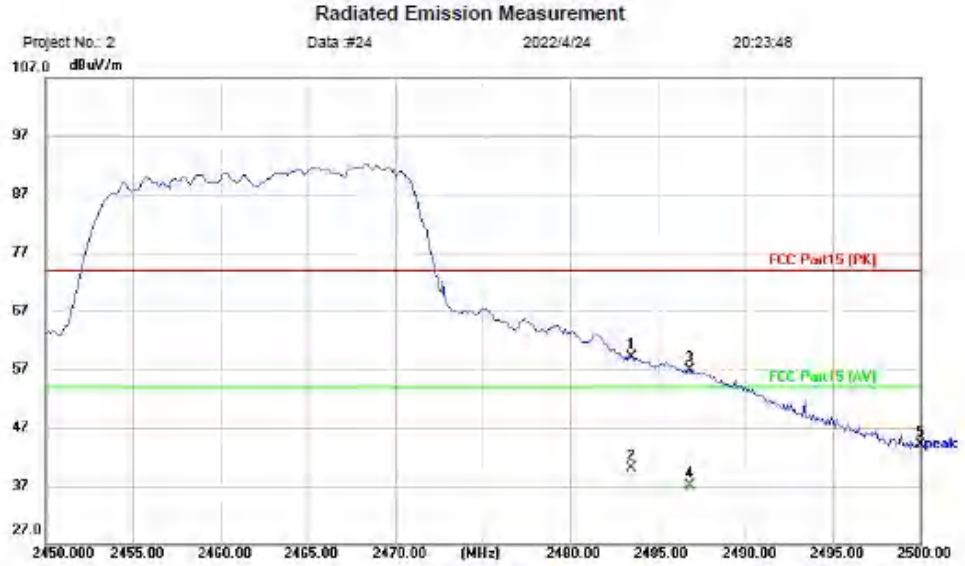
Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	44.90	-3.93	40.97	74.00	-33.03	peak	
2		2383.600	60.76	-3.60	57.16	74.00	-16.84	peak	
3		2383.600	39.06	-3.60	35.46	54.00	-18.54	AVG	
4	*	2390.000	63.66	-3.58	60.08	74.00	-13.92	peak	
5		2390.000	42.18	-3.58	38.60	54.00	-15.40	AVG	

Test Result: Pass

[TestMode: TX highest channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11N20-TX-H
Note:

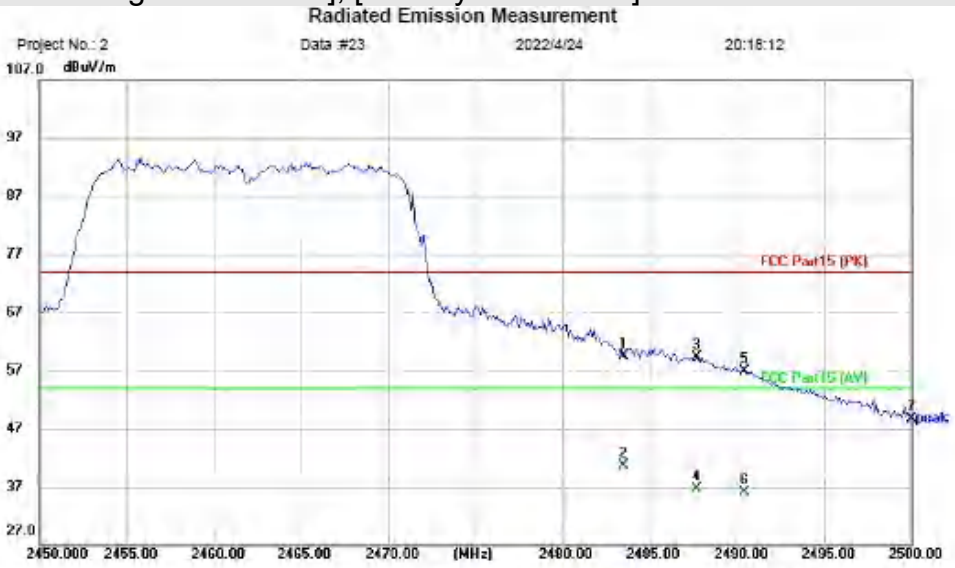
Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	62.19	-3.14	59.05	74.00	-14.95	peak	
2	*	2483.500	43.19	-3.14	40.05	54.00	-13.95	AVG	
3		2486.800	59.97	-3.14	56.83	74.00	-17.17	peak	
4		2486.800	40.21	-3.14	37.07	54.00	-16.93	AVG	
5		2500.000	47.10	-3.08	44.02	74.00	-29.98	peak	

Test Result: Pass

[TestMode: TX highest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11N20-TX-H
Note:

Polarization: *Horizontal*
Power:

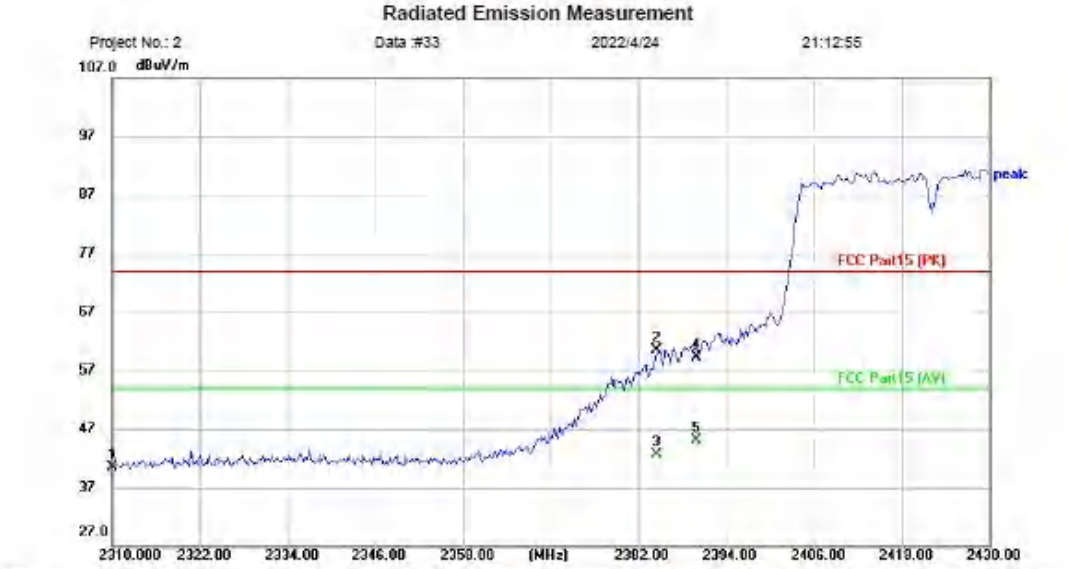
Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	62.69	-3.14	59.55	74.00	-14.45	peak	
2	*	2483.500	43.91	-3.14	40.77	54.00	-13.23	AVG	
3		2487.700	62.41	-3.14	59.27	74.00	-14.73	peak	
4		2487.700	39.92	-3.14	36.78	54.00	-17.22	AVG	
5		2490.400	60.09	-3.11	56.98	74.00	-17.02	peak	
6		2490.400	39.13	-3.11	36.02	54.00	-17.98	AVG	
7		2500.000	51.75	-3.08	48.67	74.00	-25.33	peak	

Test Result: Pass

802.11n40

[TestMode: TX lowest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11N40-TX-L
Note:

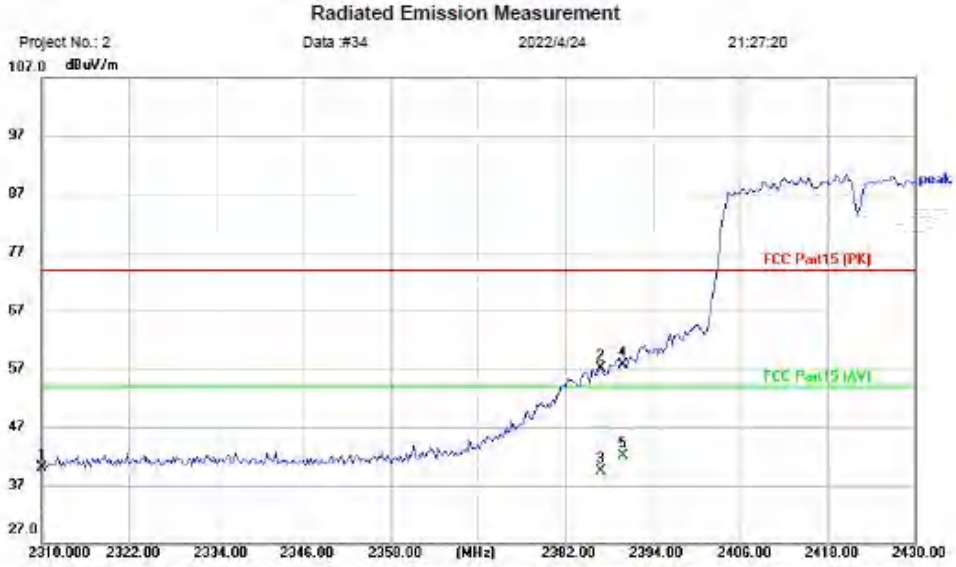
Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	44.46	-3.93	40.53	74.00	-33.47	peak	
2		2384.640	64.15	-3.60	60.55	74.00	-13.45	peak	
3		2384.640	46.25	-3.60	42.65	54.00	-11.35	AVG	
4		2390.000	62.93	-3.58	59.35	74.00	-14.65	peak	
5	*	2390.000	48.61	-3.58	45.03	54.00	-8.97	AVG	

Test Result: Pass

[TestMode: TX lowest channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11N40-TX-L
Note:

Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	44.09	-3.93	40.16	74.00	-33.84	peak	
2		2386.800	60.70	-3.60	57.10	74.00	-16.90	peak	
3		2386.800	43.16	-3.60	39.56	54.00	-14.44	AVG	
4		2390.000	61.37	-3.58	57.79	74.00	-16.21	peak	
5	*	2390.000	45.77	-3.58	42.19	54.00	-11.81	AVG	

Test Result: Pass

[TestMode: TX highest channel]; [Polarity: Vertical]

Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11N40-TX-H
Note:

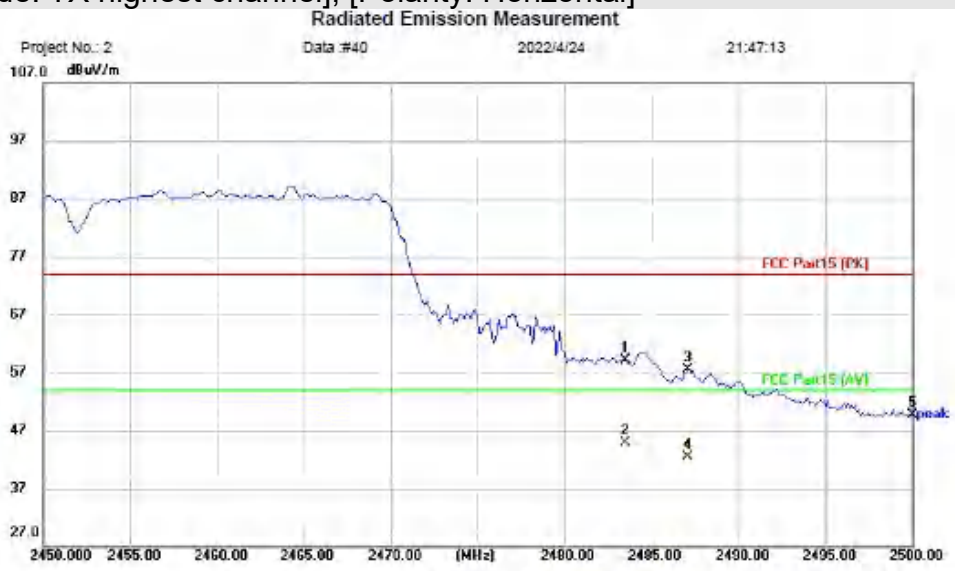
Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	62.88	-3.14	59.74	74.00	-14.26	peak	
2	*	2483.500	45.77	-3.14	42.63	54.00	-11.37	AVG	
3		2487.200	61.52	-3.14	58.38	74.00	-15.62	peak	
4		2487.200	43.57	-3.14	40.43	54.00	-13.57	AVG	
5		2491.300	58.32	-3.11	55.21	74.00	-18.79	peak	
6		2491.300	40.84	-3.11	37.73	54.00	-16.27	AVG	
7		2500.000	53.77	-3.08	50.69	74.00	-23.31	peak	

Test Result: Pass

[TestMode: TX highest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: WIFI/BT module
M/N: H158A-SM
Mode: 2.4GWIFI-11N40-TX-H
Note:

Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	62.24	-3.14	59.10	74.00	-14.90	peak	
2	*	2483.500	48.12	-3.14	44.98	54.00	-9.02	AVG	
3		2487.100	60.56	-3.14	57.42	74.00	-16.58	peak	
4		2487.100	45.72	-3.14	42.58	54.00	-11.42	AVG	
5		2500.000	52.80	-3.08	49.72	74.00	-24.28	peak	

Test Result: Pass

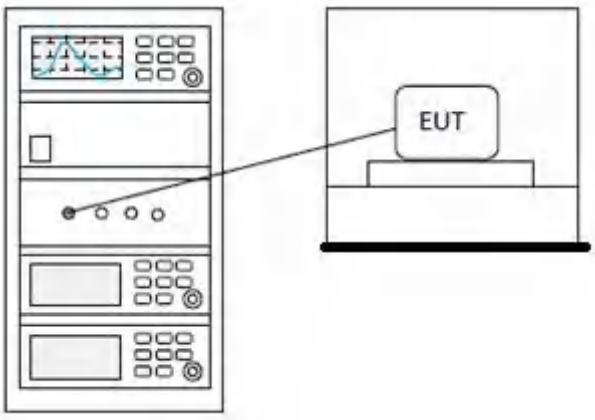
17 CONDUCTED SPURIOUS EMISSIONS

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%

17.1 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)).

17.2 BLOCK DIAGRAM OF TEST SETUP



17.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

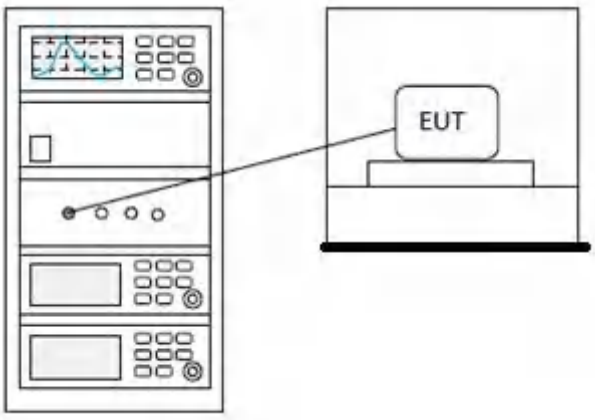
18 CONDUCTED BAND EDGES MEASUREMENT

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%

18.1 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)).

18.2 BLOCK DIAGRAM OF TEST SETUP



18.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

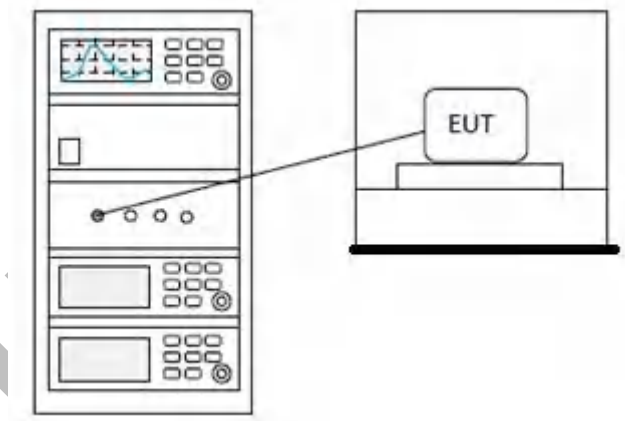
19 MINIMUM 6DB BANDWIDTH

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%

19.1 LIMITS

Limit:	≥500 kHz

19.2 BLOCK DIAGRAM OF TEST SETUP



19.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

20 APPENDIX

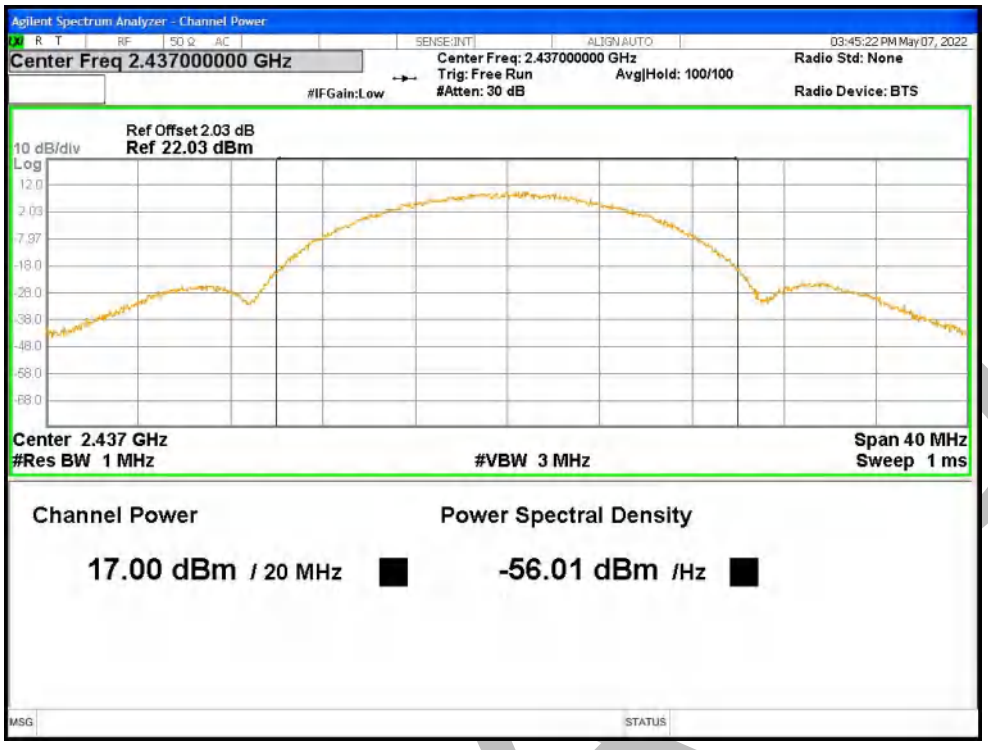
Appendix1

Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	17.285	30	Pass
NVNT	b	2437	Ant1	16.997	30	Pass
NVNT	b	2462	Ant1	17.2	30	Pass
NVNT	g	2412	Ant1	14.777	30	Pass
NVNT	g	2437	Ant1	14.618	30	Pass
NVNT	g	2462	Ant1	14.853	30	Pass
NVNT	n20	2412	Ant1	14.909	30	Pass
NVNT	n20	2437	Ant1	14.702	30	Pass
NVNT	n20	2462	Ant1	14.847	30	Pass
NVNT	n40	2422	Ant1	15.136	30	Pass
NVNT	n40	2437	Ant1	15.026	30	Pass
NVNT	n40	2452	Ant1	15.138	30	Pass

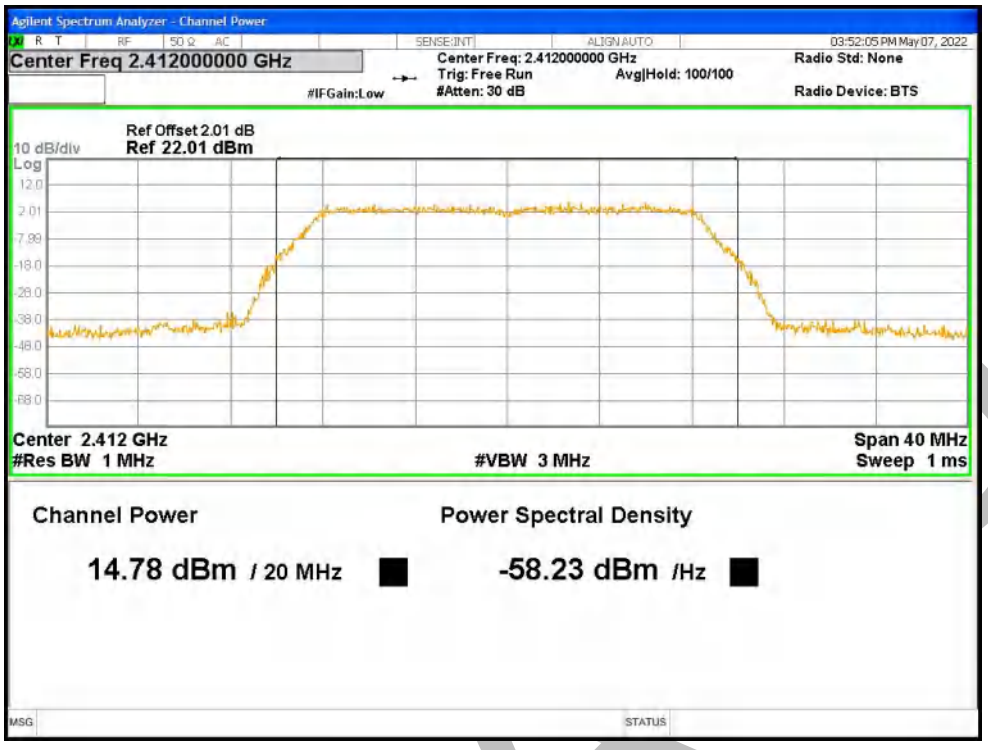
Power NVNT b 2412MHz Ant1

Power NVNT b 2437MHz Ant1

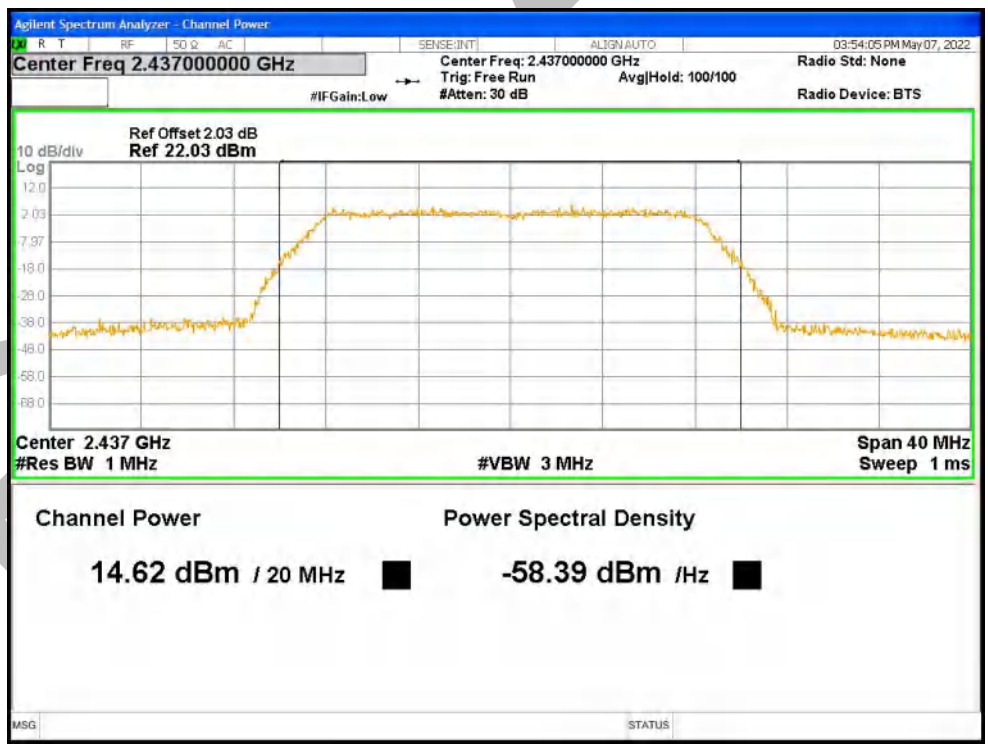


Power NVNT b 2462MHz Ant1

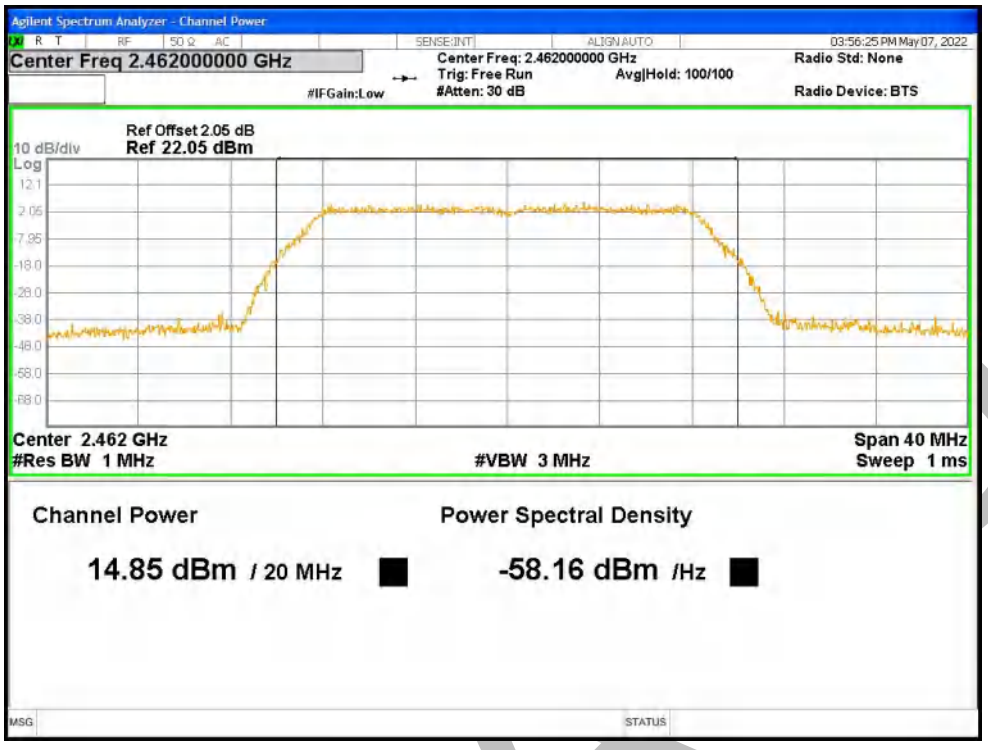
Power NVNT g 2412MHz Ant1



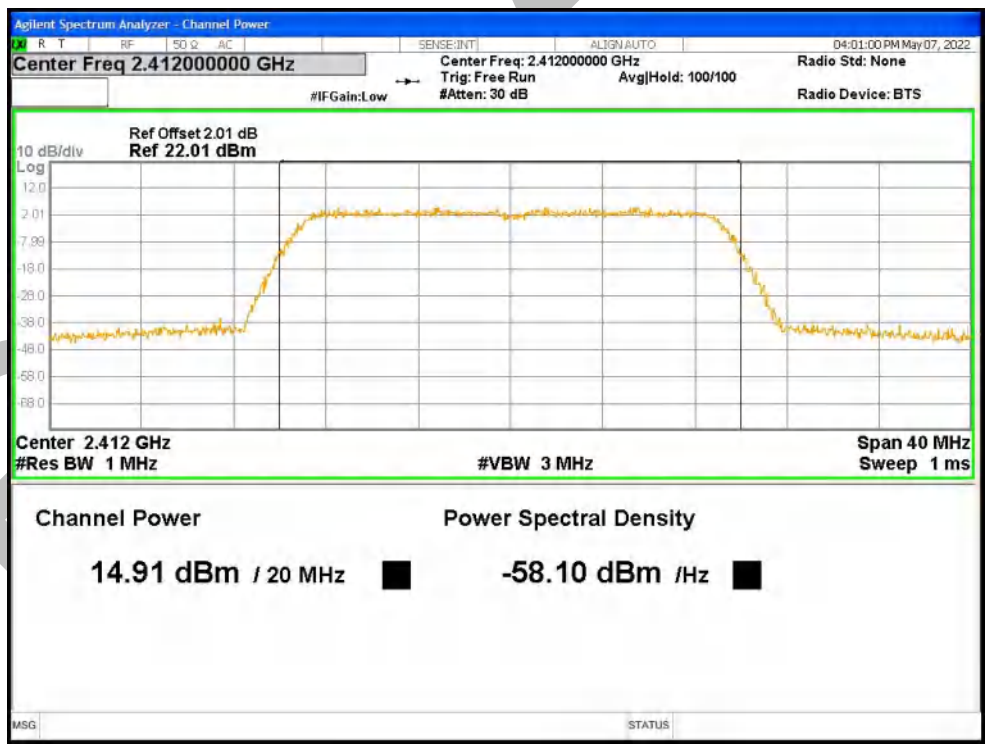
Power NVNT g 2437MHz Ant1



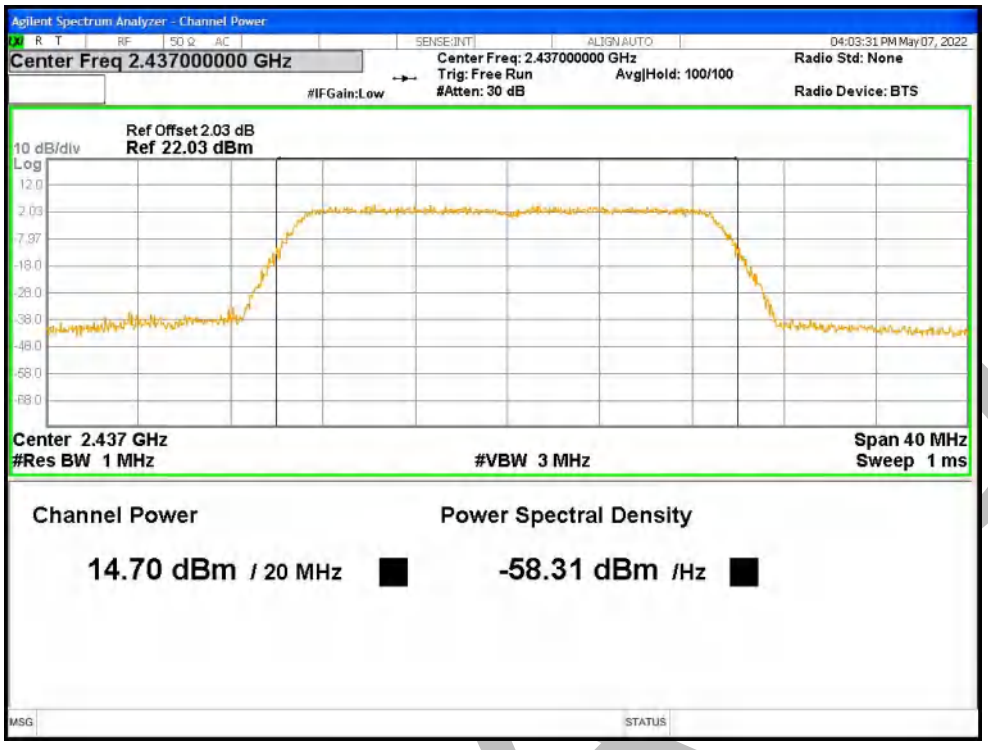
Power NVNT g 2462MHz Ant1



Power NVNT n20 2412MHz Ant1

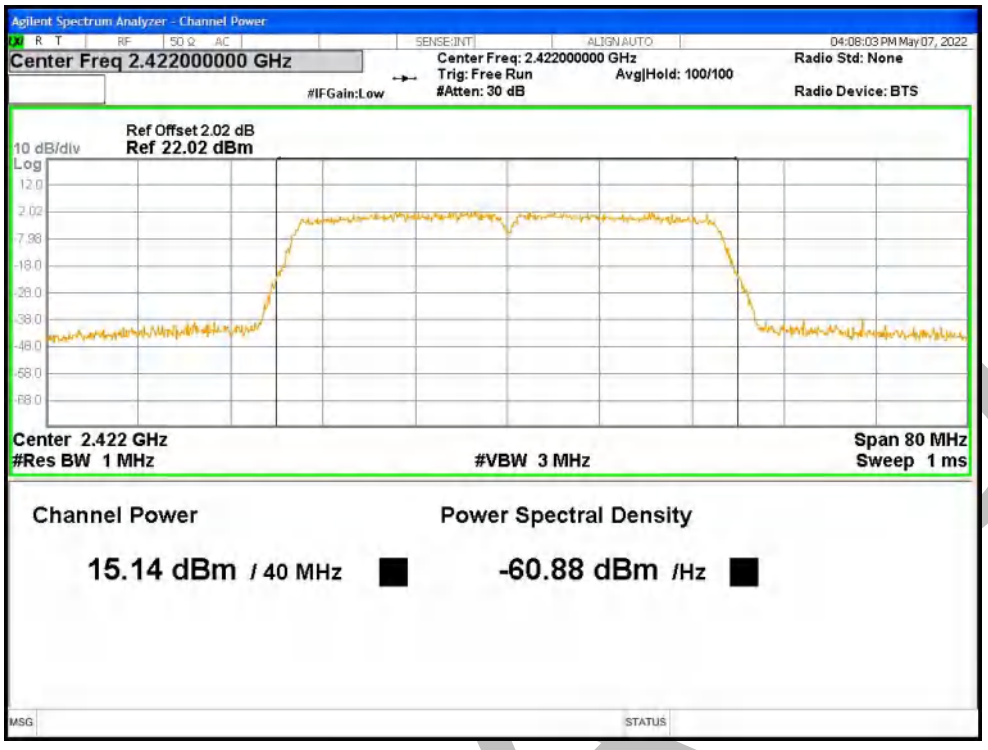


Power NVNT n20 2437MHz Ant1



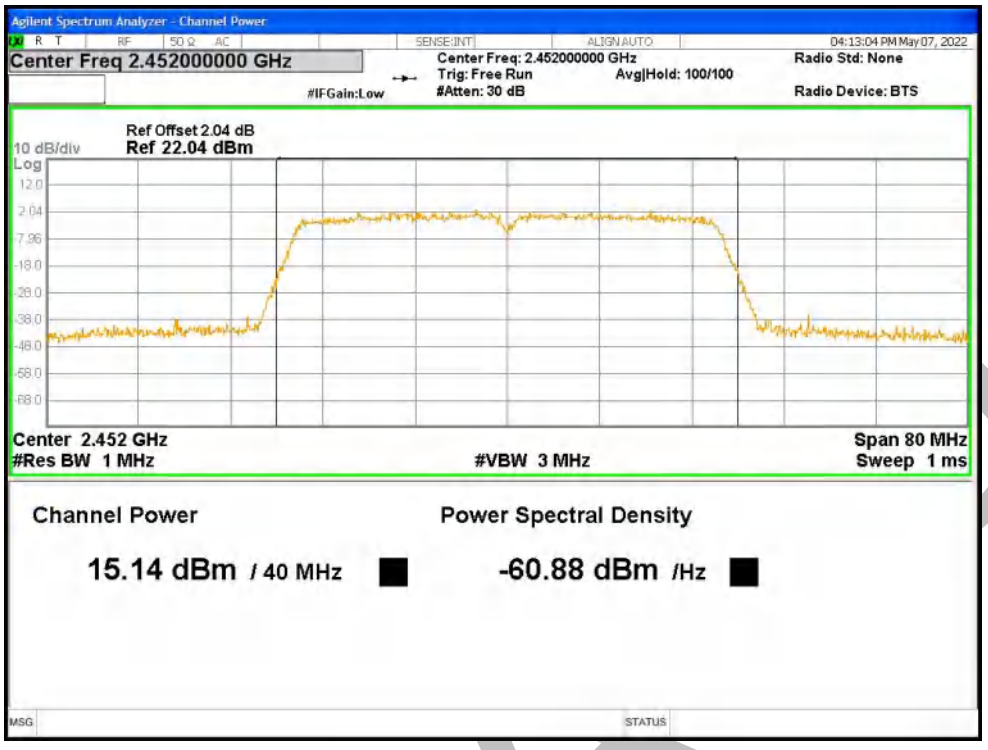
Power NVNT n20 2462MHz Ant1

Power NVNT n40 2422MHz Ant1



Power NVNT n40 2437MHz Ant1

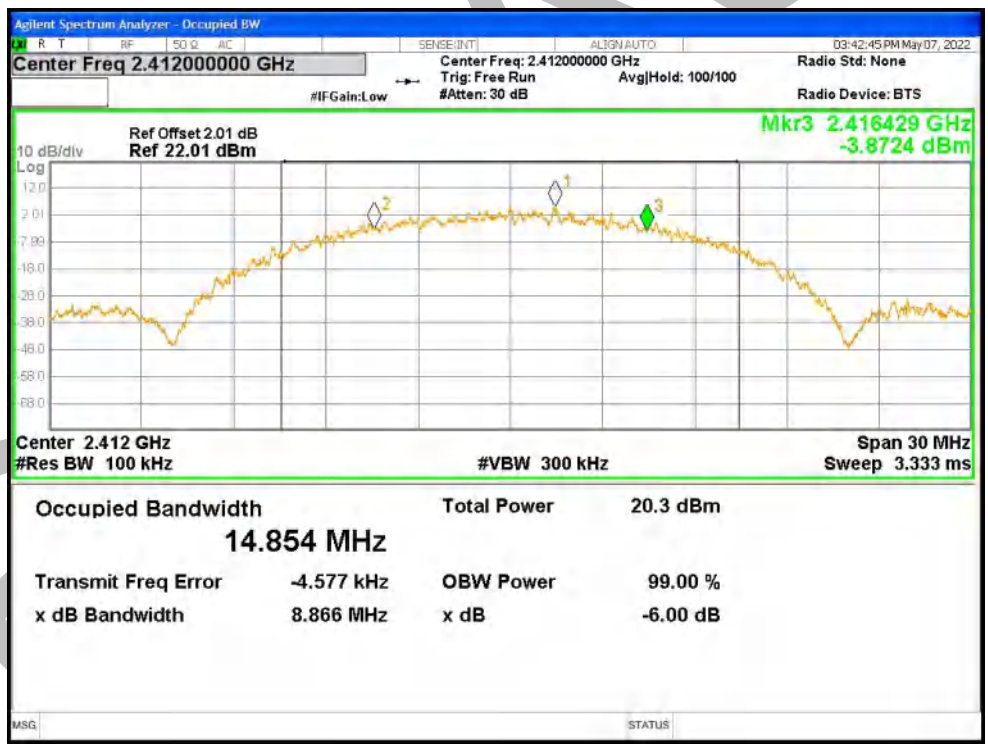
Power NVNT n40 2452MHz Ant1


Agilent Spectrum Analyzer - Channel Power
Center Freq 2.452000000 GHz
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Ref Offset 2.04 dB
10 dB/div
Ref 22.04 dBm
Log
Center 2.452 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 80 MHz
Sweep 1 ms
Channel Power
15.14 dBm / 40 MHz
Power Spectral Density
-60.88 dBm /Hz
MSG
STATUS

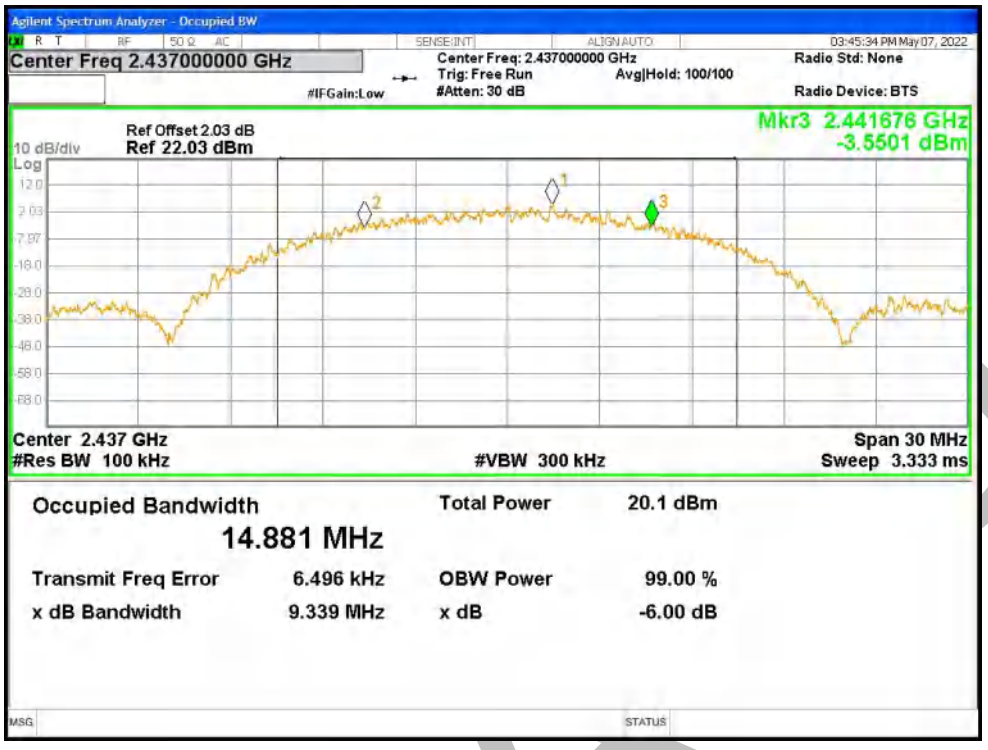
-6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	8.866	0.5	Pass
NVNT	b	2437	Ant1	9.339	0.5	Pass
NVNT	b	2462	Ant1	8.864	0.5	Pass
NVNT	g	2412	Ant1	16.448	0.5	Pass
NVNT	g	2437	Ant1	16.471	0.5	Pass
NVNT	g	2462	Ant1	16.455	0.5	Pass
NVNT	n20	2412	Ant1	17.733	0.5	Pass
NVNT	n20	2437	Ant1	17.738	0.5	Pass
NVNT	n20	2462	Ant1	17.723	0.5	Pass
NVNT	n40	2422	Ant1	35.641	0.5	Pass
NVNT	n40	2437	Ant1	36.318	0.5	Pass
NVNT	n40	2452	Ant1	36.043	0.5	Pass

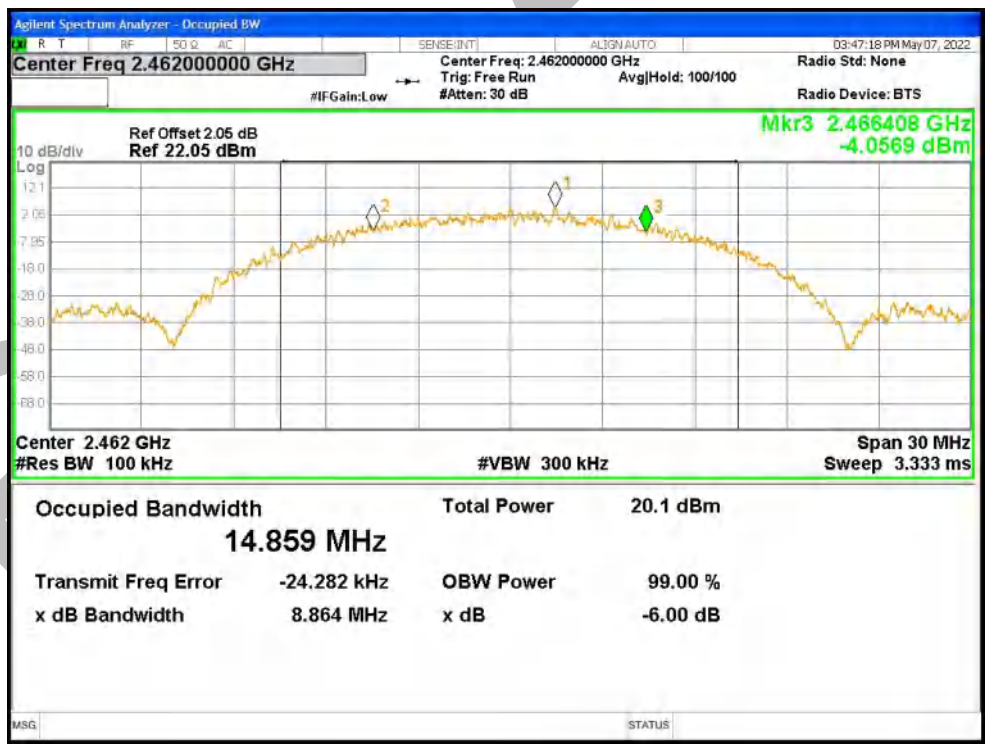
-6dB Bandwidth NVNT b 2412MHz Ant1



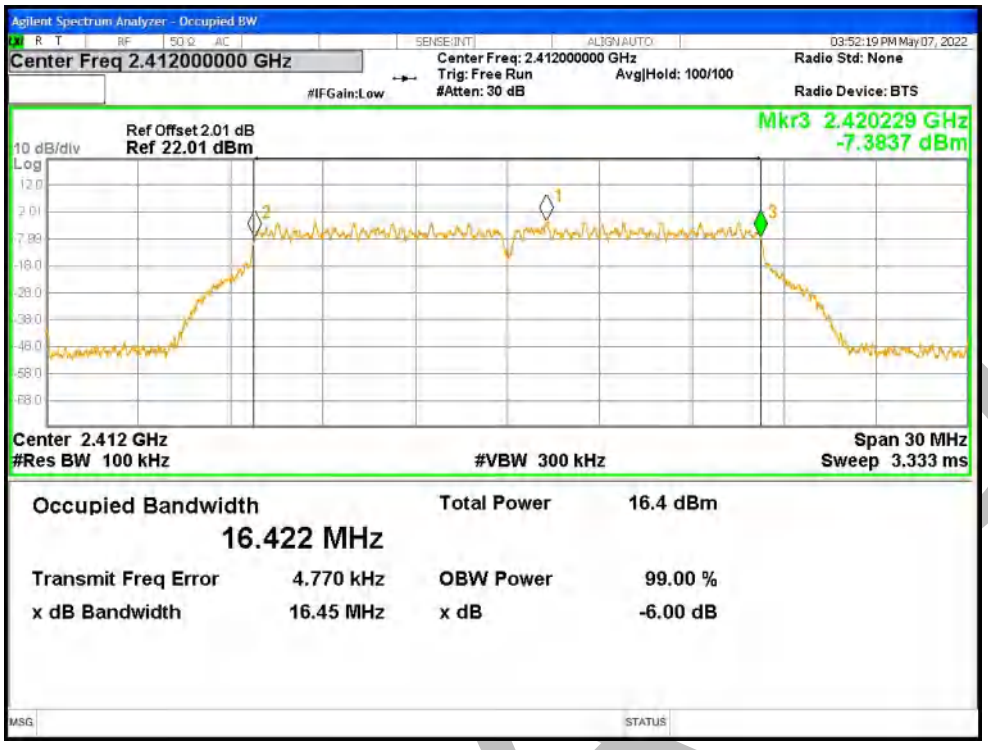
-6dB Bandwidth NVNT b 2437MHz Ant1



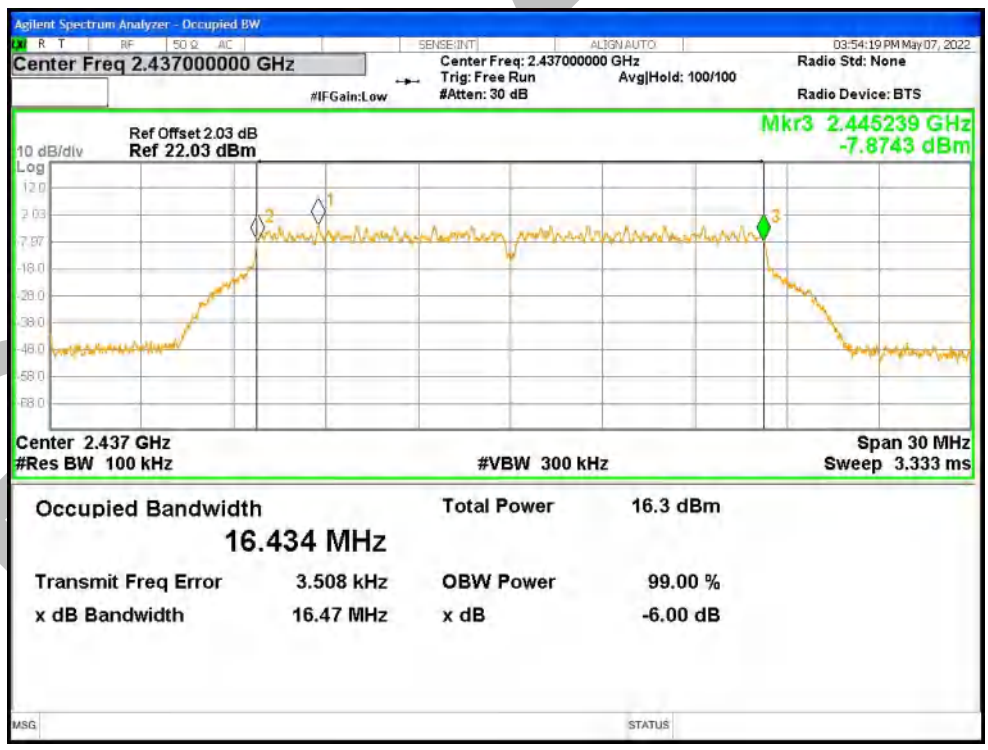
-6dB Bandwidth NVNT b 2462MHz Ant1



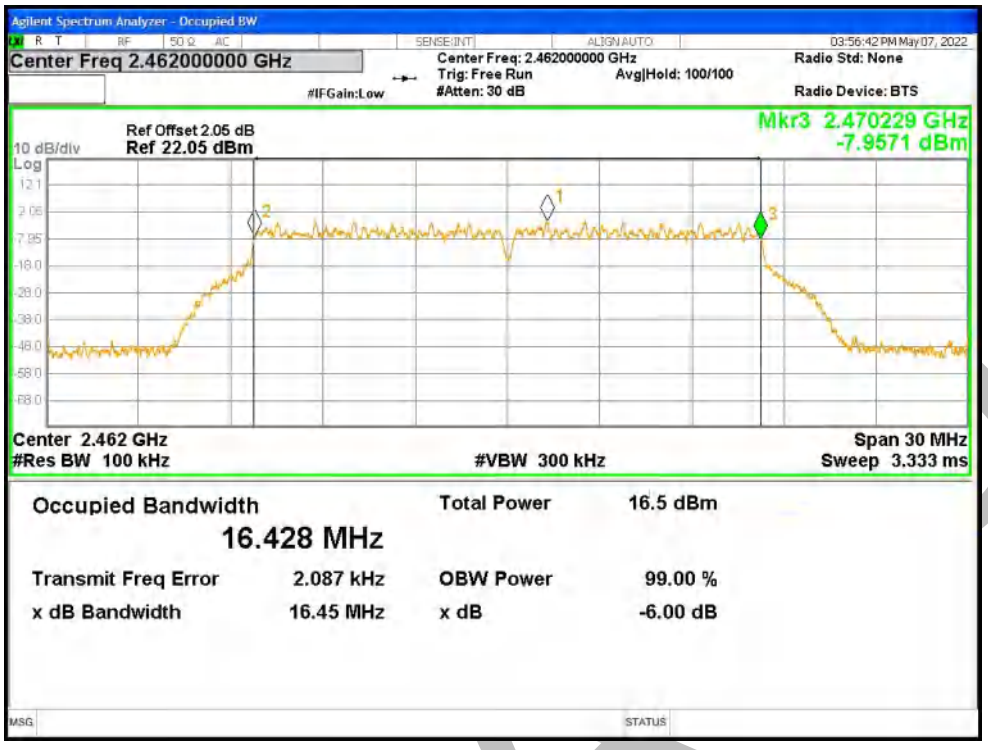
-6dB Bandwidth NVNT g 2412MHz Ant1



-6dB Bandwidth NVNT g 2437MHz Ant1

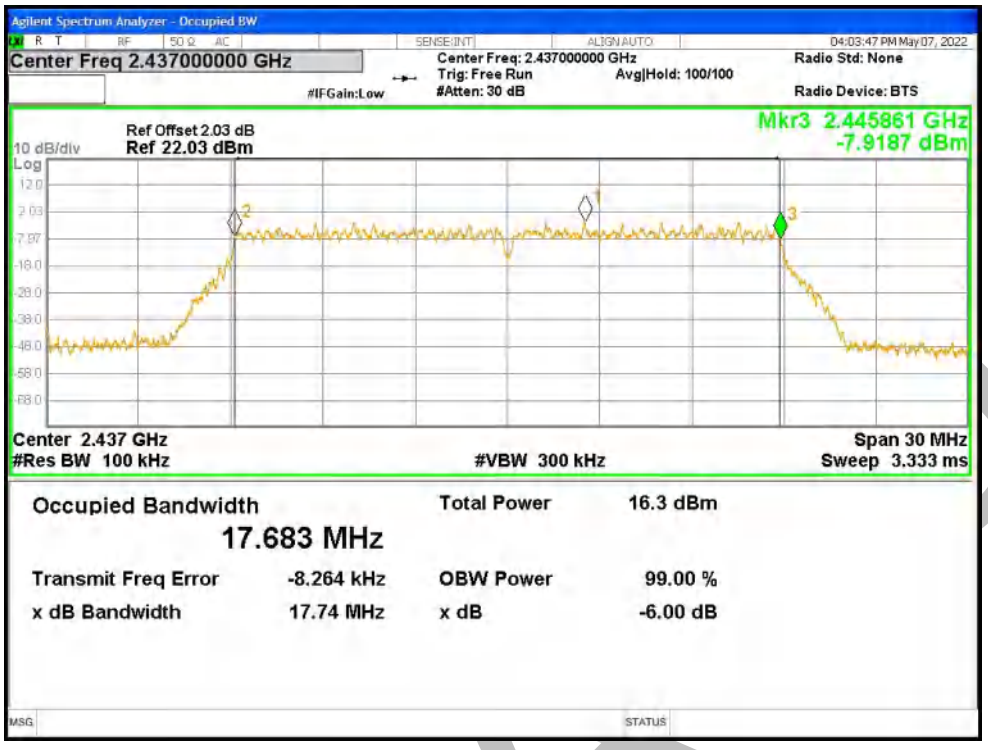


-6dB Bandwidth NVNT g 2462MHz Ant1

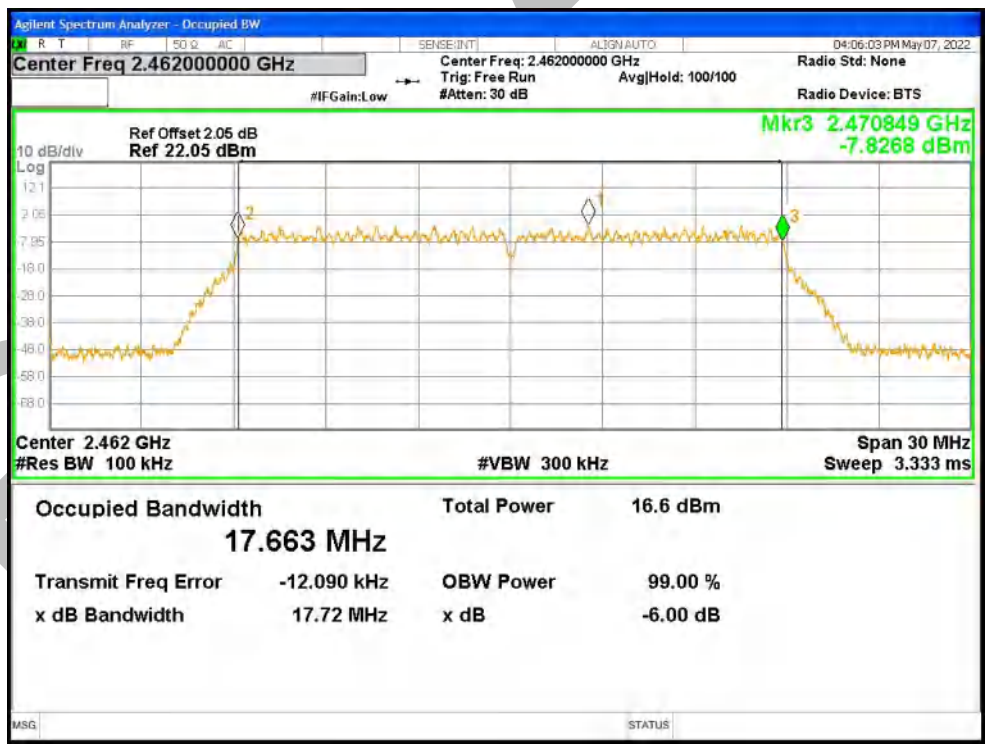


-6dB Bandwidth NVNT n20 2412MHz Ant1

-6dB Bandwidth NVNT n20 2437MHz Ant1

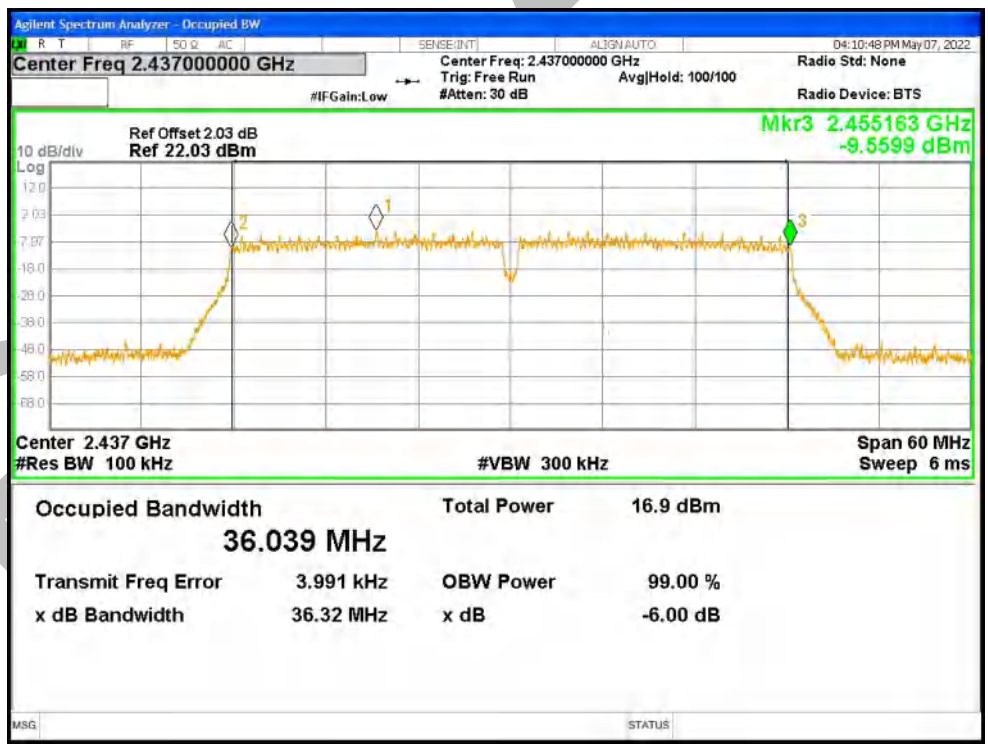


-6dB Bandwidth NVNT n20 2462MHz Ant1

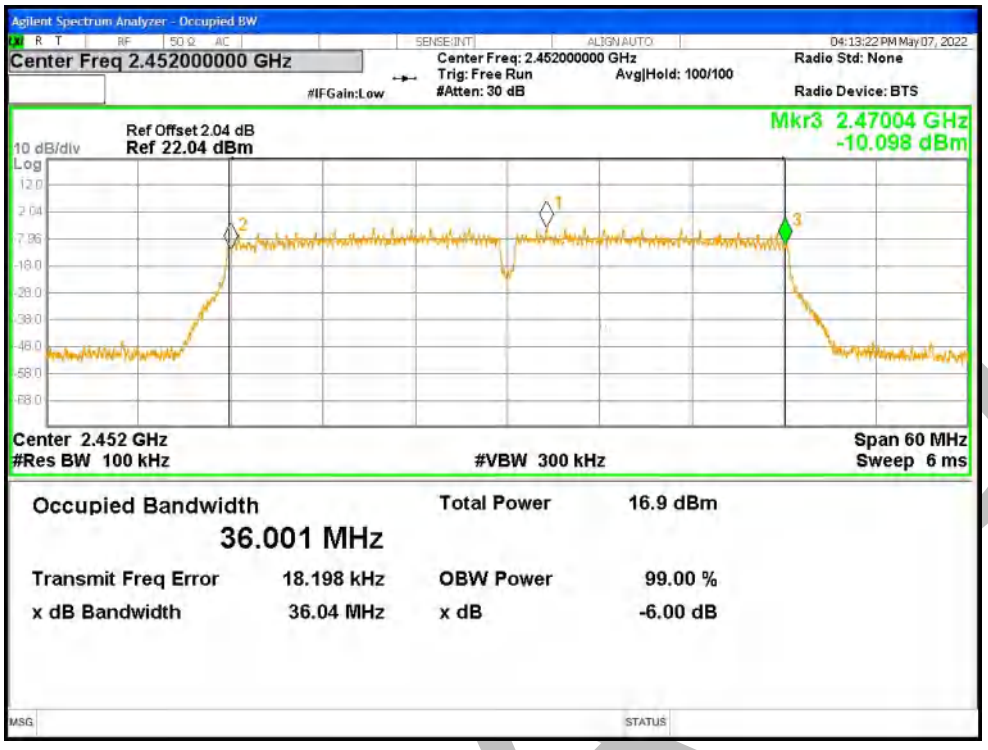


-6dB Bandwidth NVNT n40 2422MHz Ant1

-6dB Bandwidth NVNT n40 2437MHz Ant1



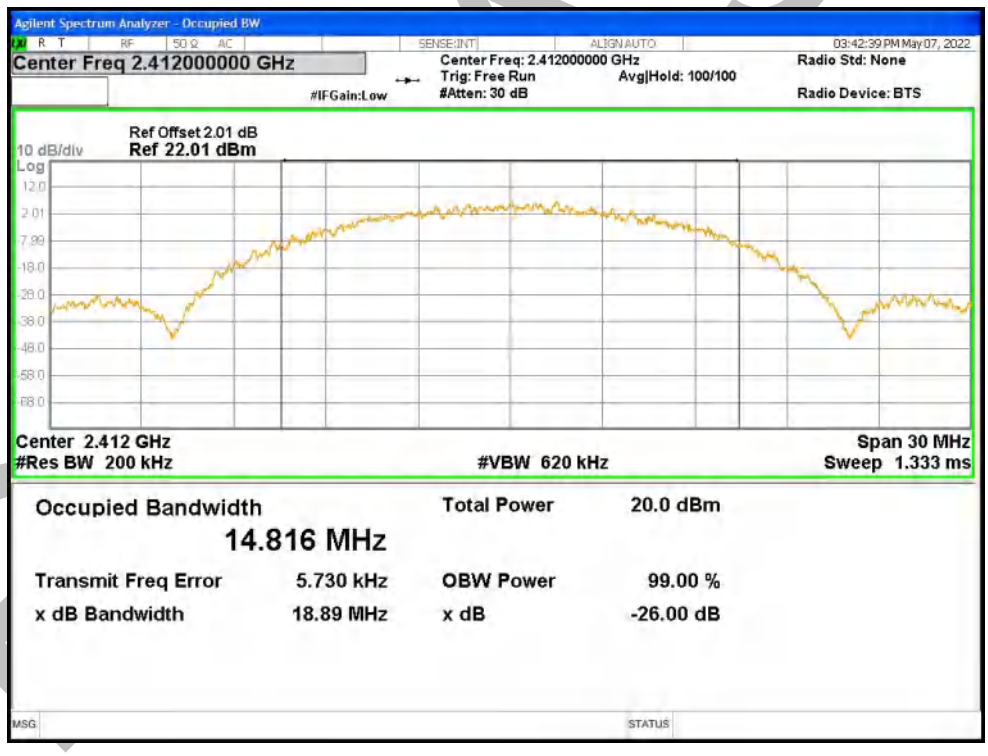
-6dB Bandwidth NVNT n40 2452MHz Ant1


Agilent Spectrum Analyzer - Occupied BW
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
04:13:22 PM May 07, 2022
Mkr3 2.47004 GHz
-10.098 dBm
Ref Offset 2.04 dB
10 dB/div
Ref 22.04 dBm
Log
Center 2.452 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 6 ms
Occupied Bandwidth
36.001 MHz
Total Power 16.9 dBm
Transmit Freq Error 18.198 kHz
OBW Power 99.00 %
x dB Bandwidth 36.04 MHz
x dB -6.00 dB
MSG
STATUS

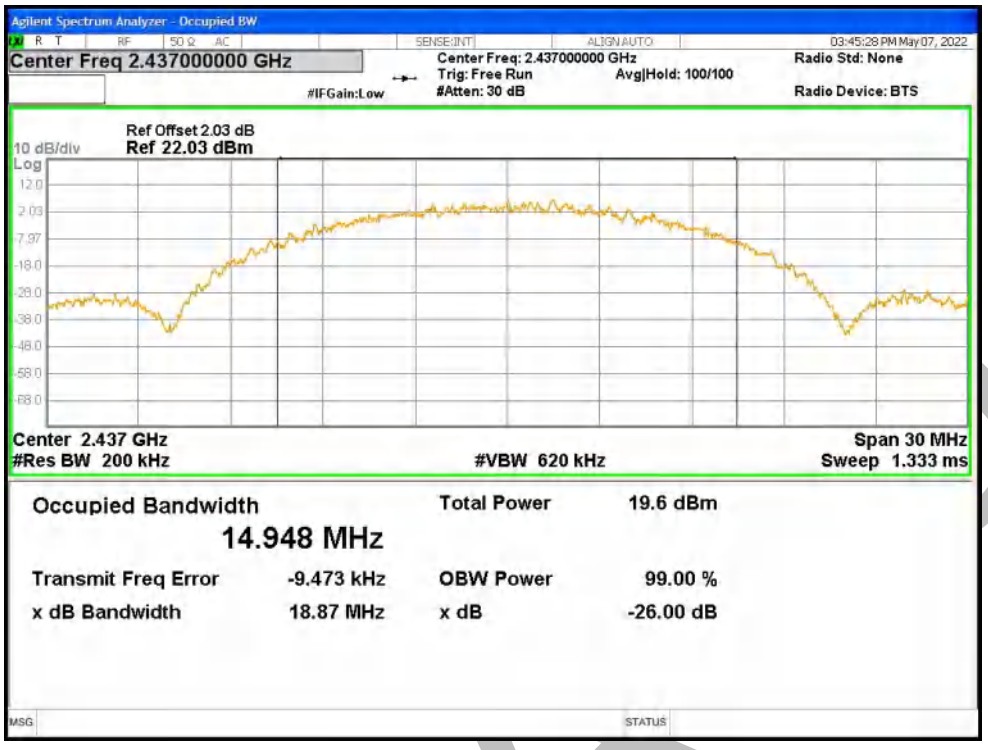
Occupied Channel Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	b	2412	Ant1	14.81601071
NVNT	b	2437	Ant1	14.94761543
NVNT	b	2462	Ant1	14.77618509
NVNT	g	2412	Ant1	16.51375992
NVNT	g	2437	Ant1	16.55864222
NVNT	g	2462	Ant1	16.52445644
NVNT	n20	2412	Ant1	17.72440726
NVNT	n20	2437	Ant1	17.7413193
NVNT	n20	2462	Ant1	17.71314062
NVNT	n40	2422	Ant1	36.13378888
NVNT	n40	2437	Ant1	36.16718971
NVNT	n40	2452	Ant1	36.13378847

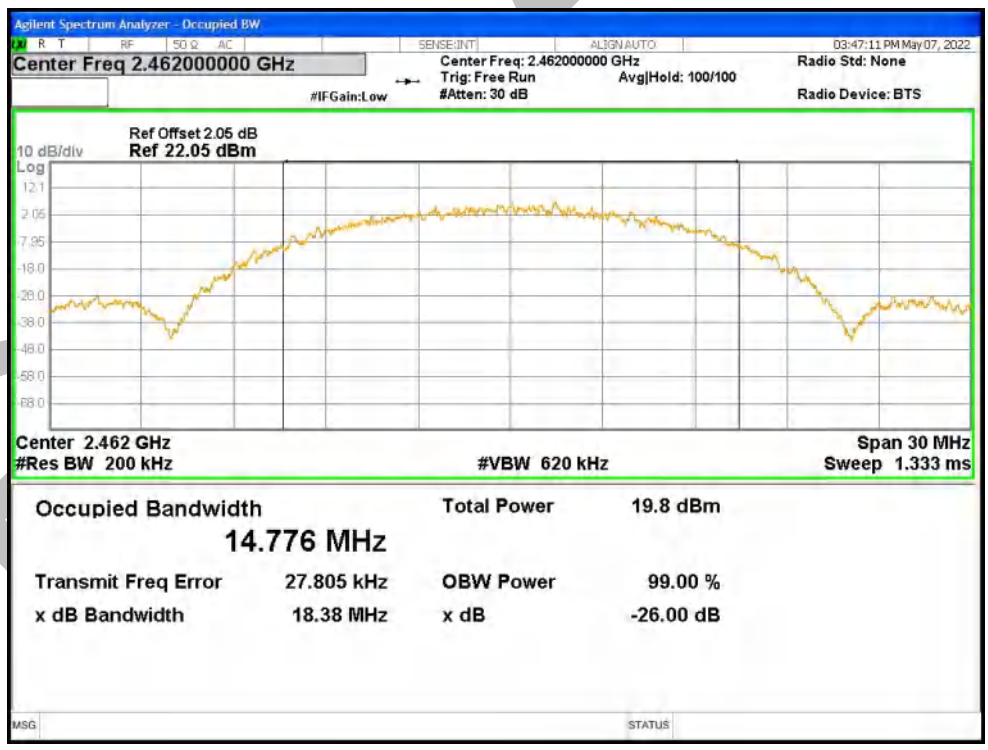
OBW NVNT b 2412MHz Ant1



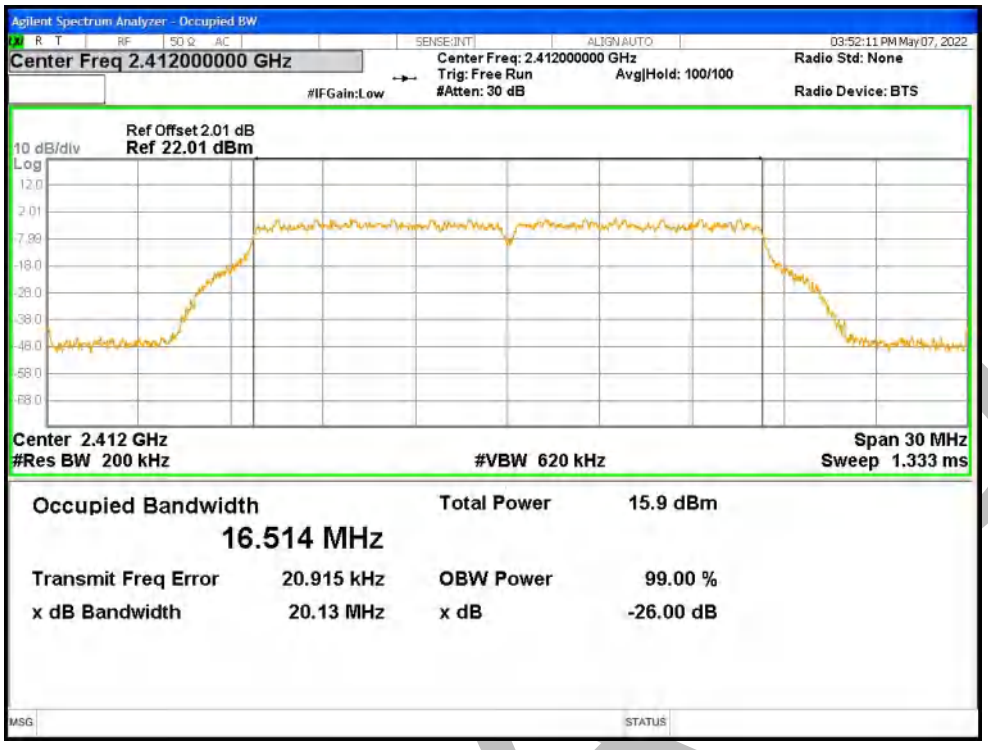
OBW NVNT b 2437MHz Ant1



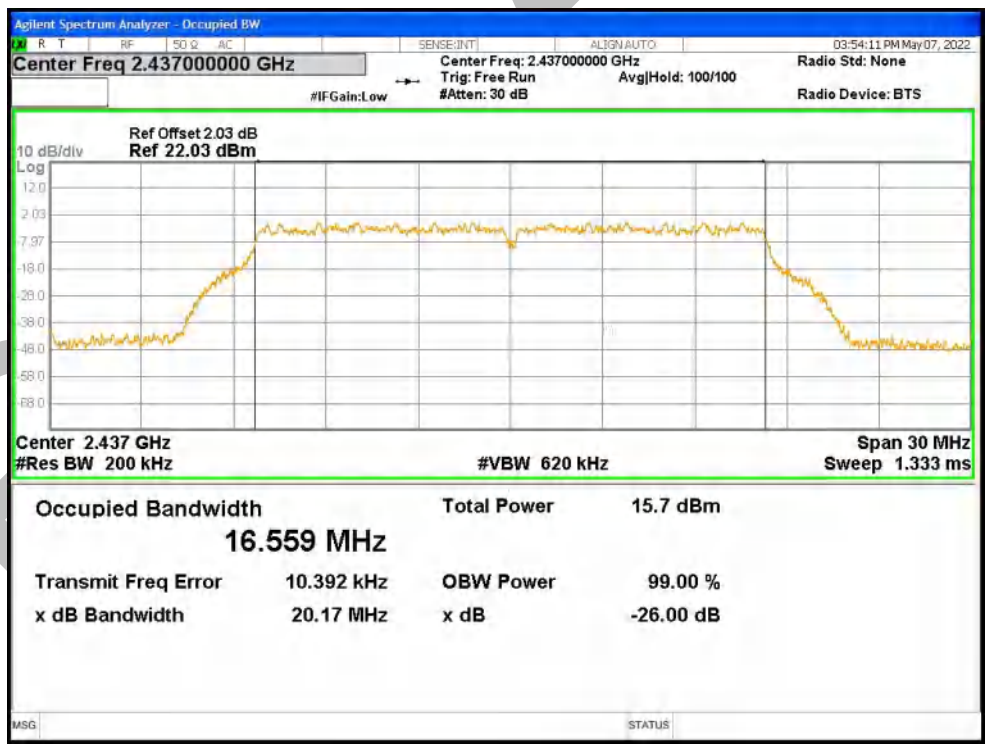
OBW NVNT b 2462MHz Ant1



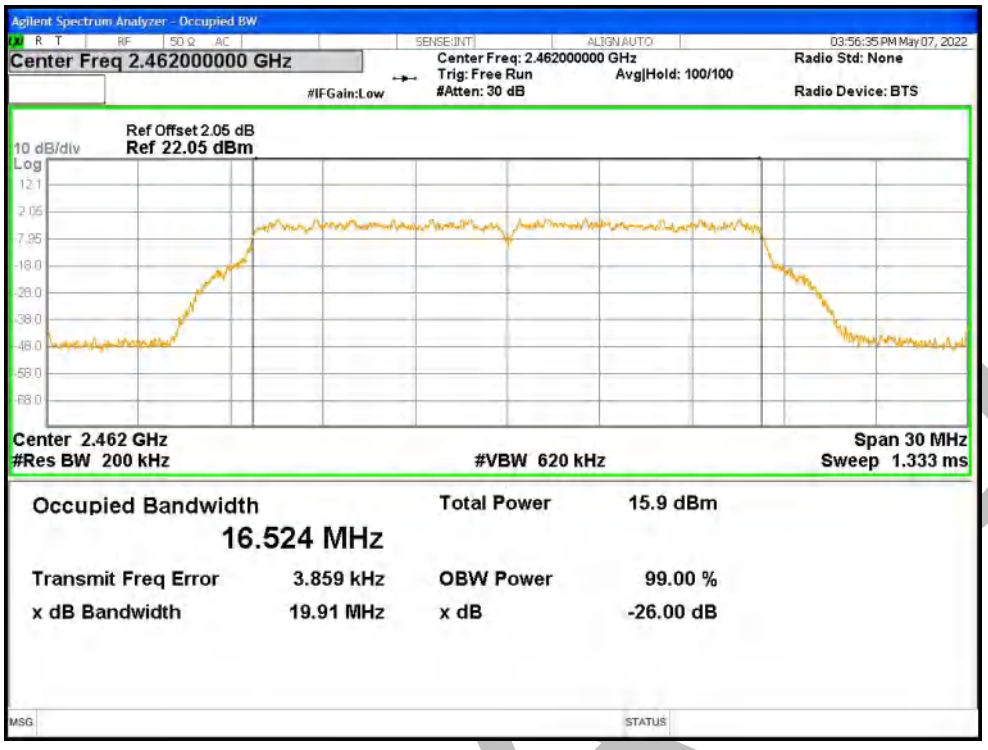
OBW NVNT g 2412MHz Ant1



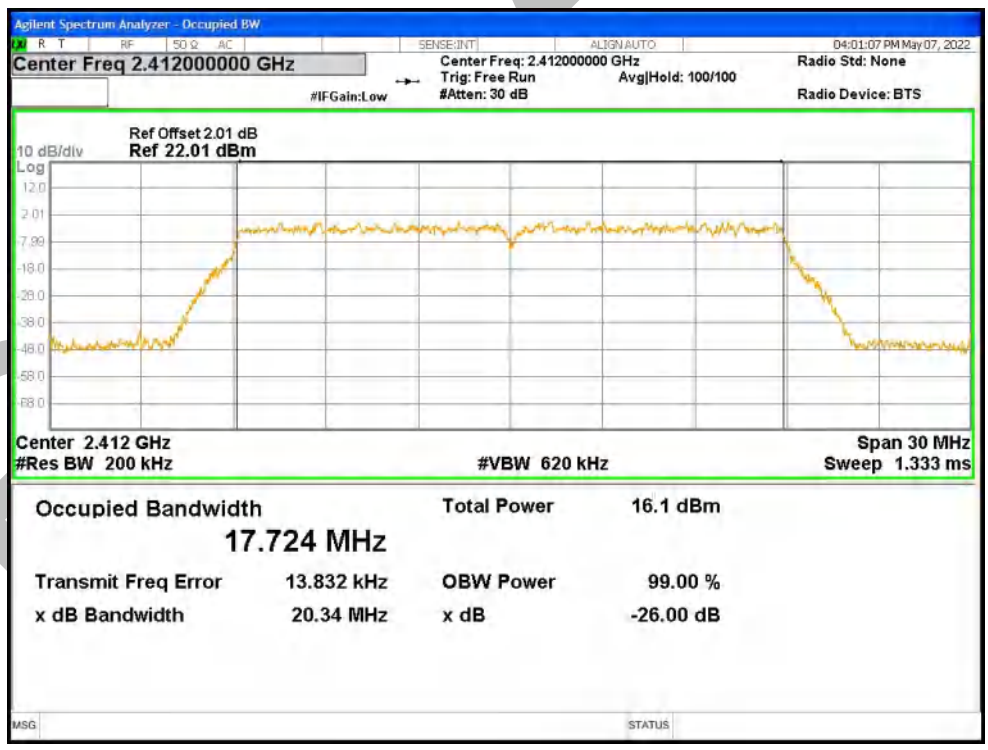
OBW NVNT g 2437MHz Ant1



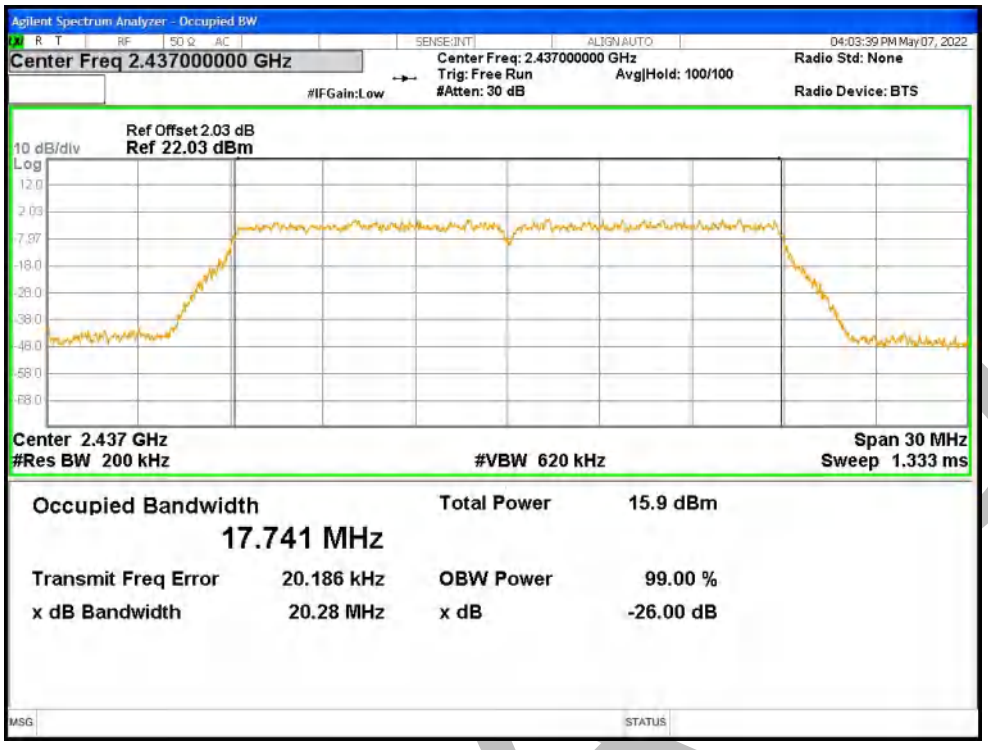
OBW NVNT g 2462MHz Ant1



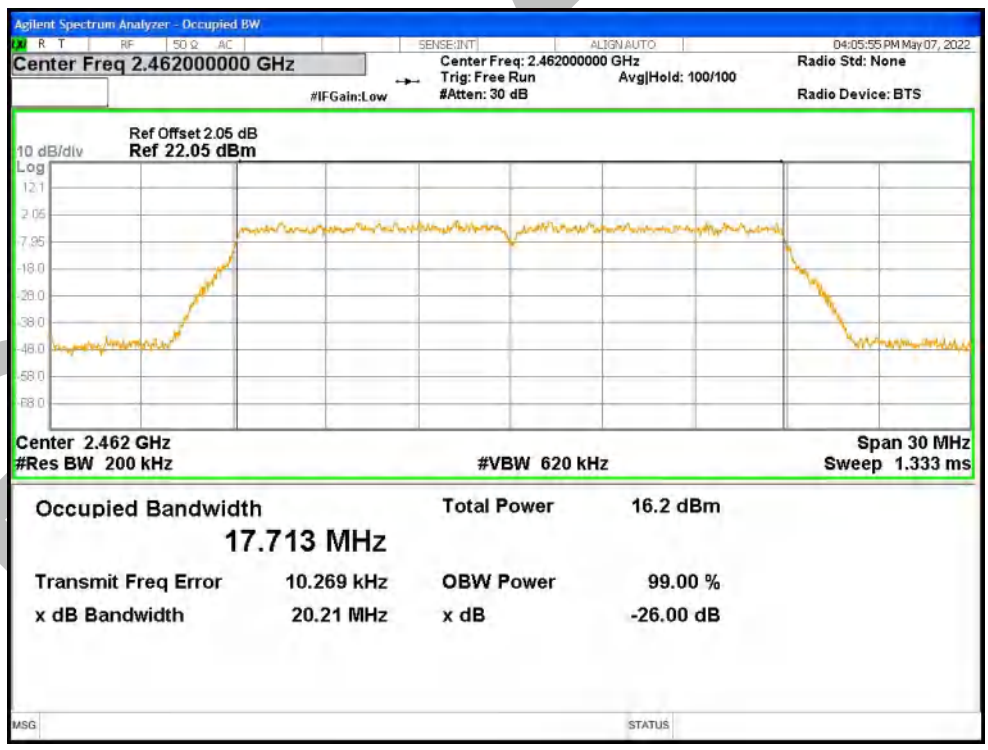
OBW NVNT n20 2412MHz Ant1



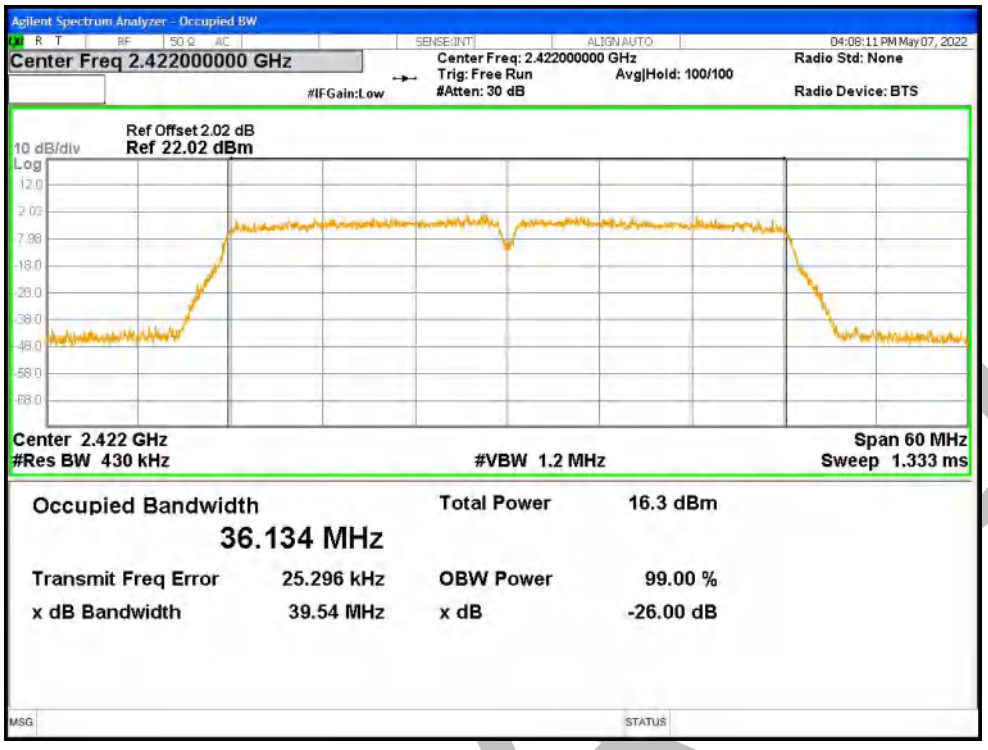
OBW NVNT n20 2437MHz Ant1



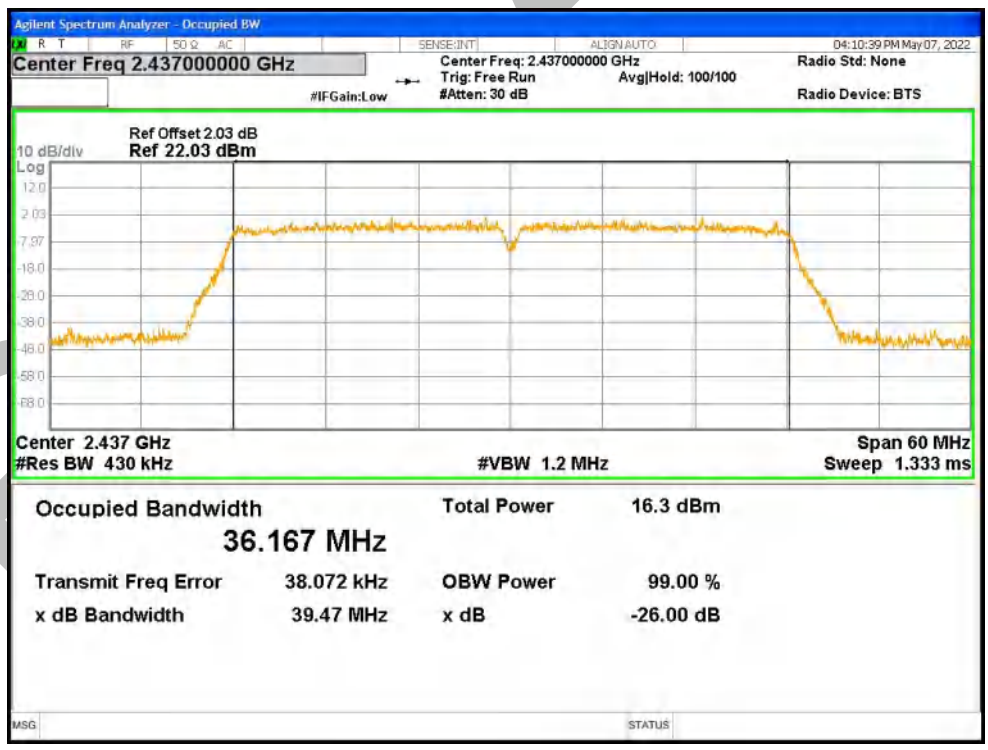
OBW NVNT n20 2462MHz Ant1



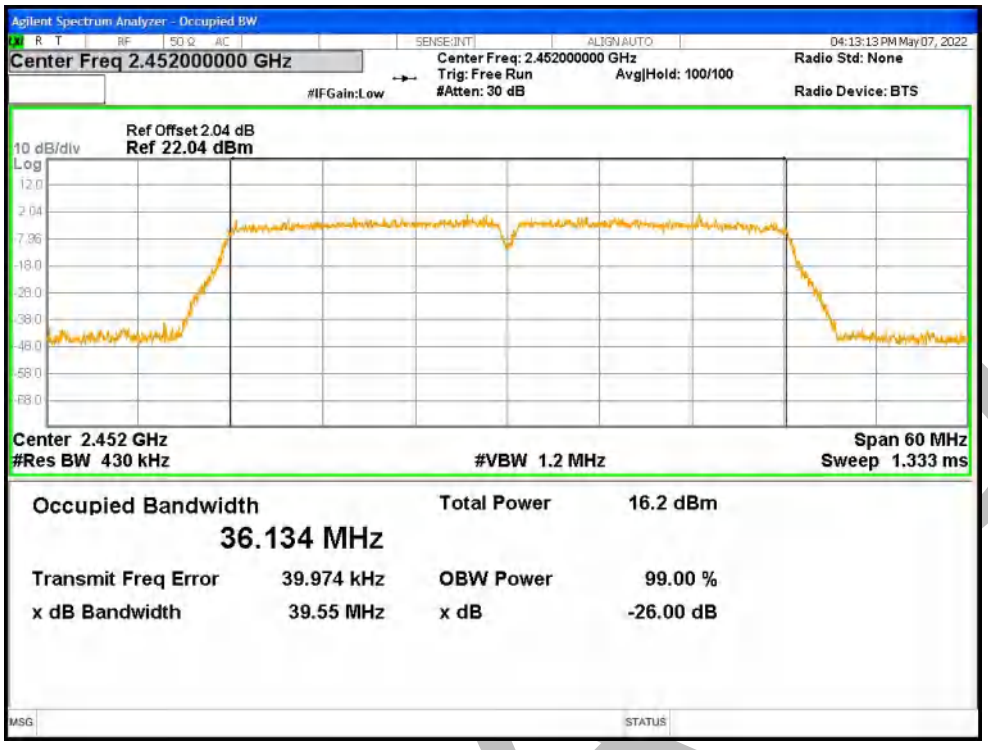
OBW NVNT n40 2422MHz Ant1



OBW NVNT n40 2437MHz Ant1



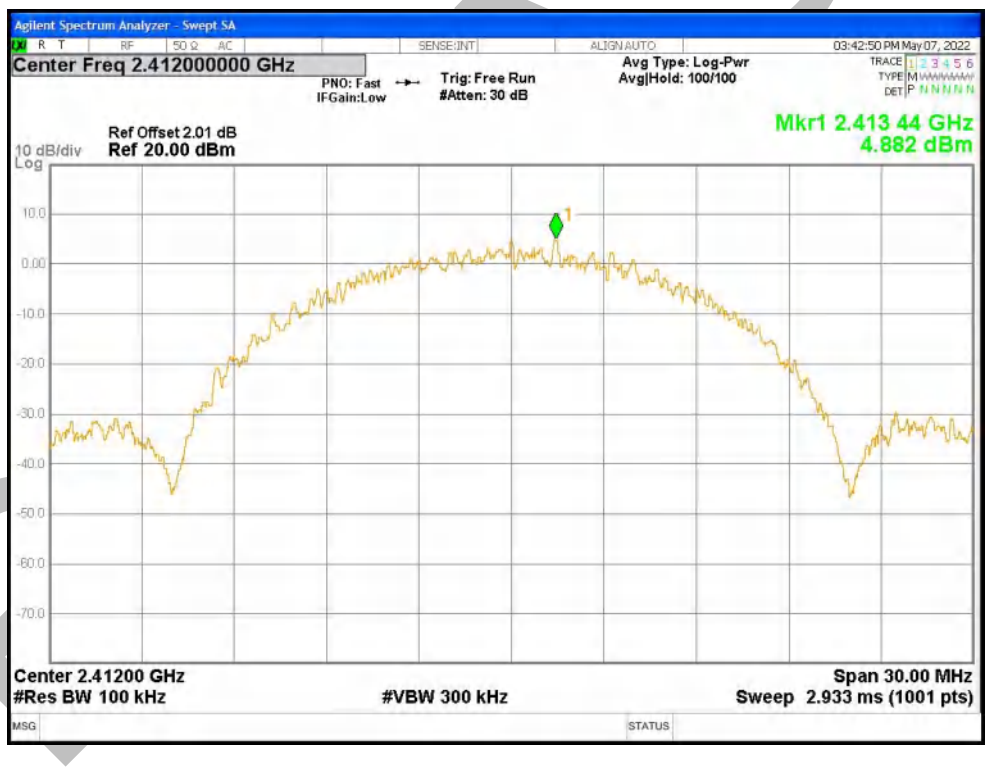
OBW NVNT n40 2452MHz Ant1


Agilent Spectrum Analyzer - Occupied BW
RT
RF
SENSE:INT
ALIGN AUTO
04:13:13 PM May 07, 2022
Center Freq 2.452000000 GHz
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Ref Offset 2.04 dB
10 dB/div
Ref 22.04 dBm
Log
12.0
2.04
-7.96
-18.0
-28.0
-38.0
-48.0
-58.0
-68.0
Center 2.452 GHz
#Res BW 430 kHz
#VBW 1.2 MHz
Span 60 MHz
Sweep 1.333 ms
Occupied Bandwidth
36.134 MHz
Total Power
16.2 dBm
Transmit Freq Error
39.974 kHz
OBW Power
99.00 %
x dB Bandwidth
39.55 MHz
x dB
-26.00 dB
MSG
STATUS

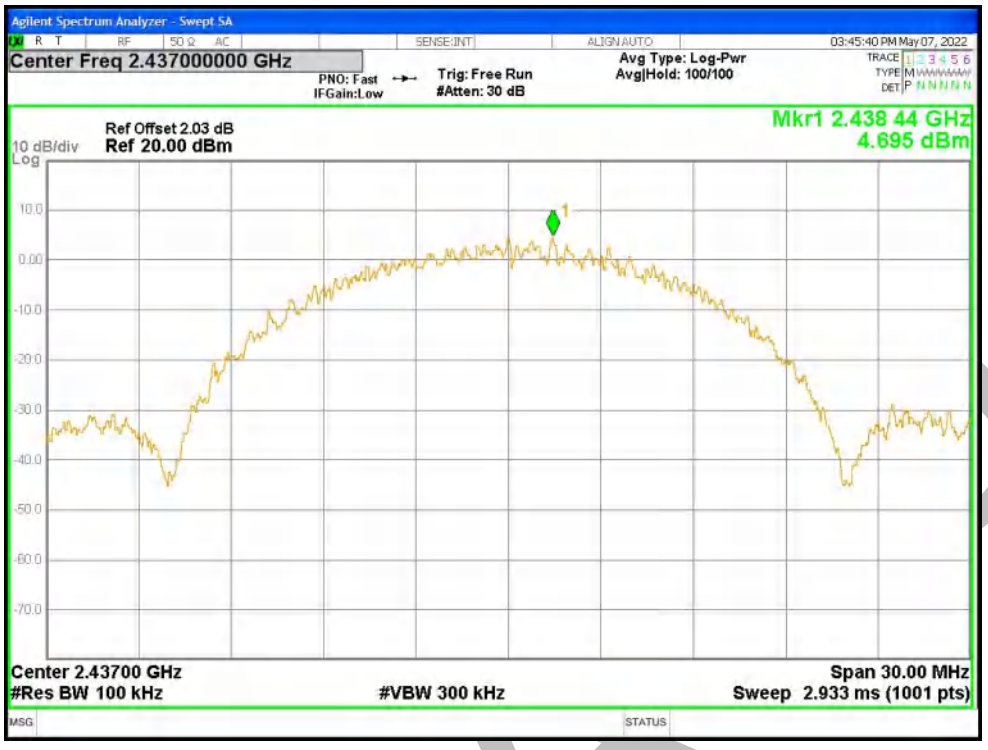
Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	4.882	8	Pass
NVNT	b	2437	Ant1	4.695	8	Pass
NVNT	b	2462	Ant1	4.837	8	Pass
NVNT	g	2412	Ant1	-1.38	8	Pass
NVNT	g	2437	Ant1	-1.756	8	Pass
NVNT	g	2462	Ant1	-1.321	8	Pass
NVNT	n20	2412	Ant1	-1.299	8	Pass
NVNT	n20	2437	Ant1	-1.736	8	Pass
NVNT	n20	2462	Ant1	-1.284	8	Pass
NVNT	n40	2422	Ant1	-3.71	8	Pass
NVNT	n40	2437	Ant1	-4.01	8	Pass
NVNT	n40	2452	Ant1	-3.959	8	Pass

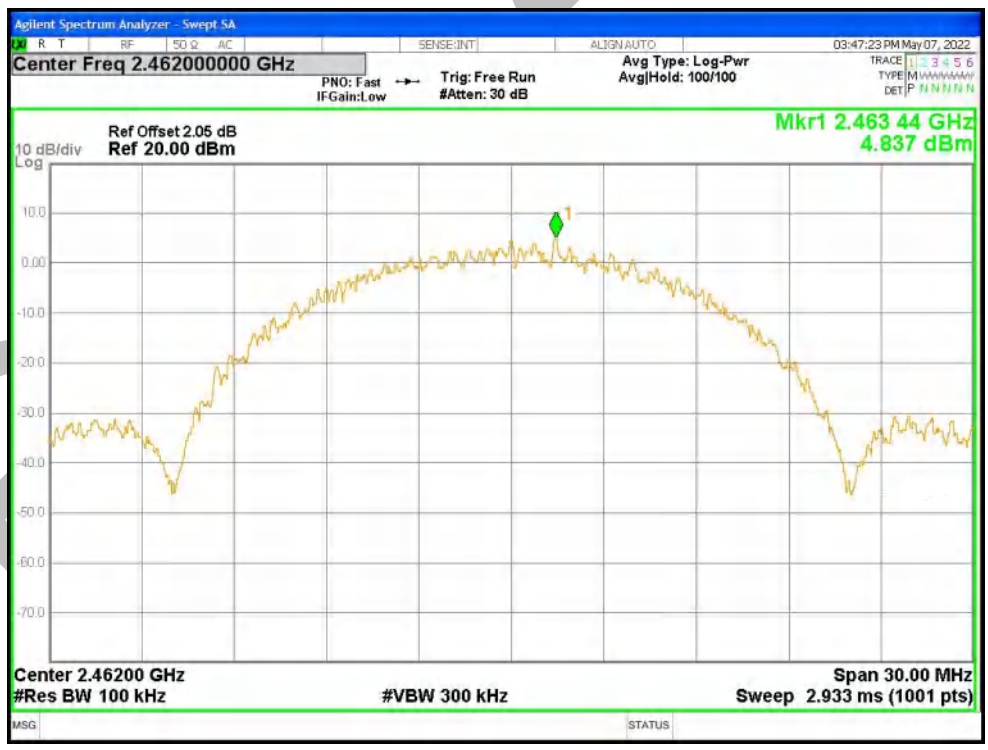
PSD NVNT b 2412MHz Ant1



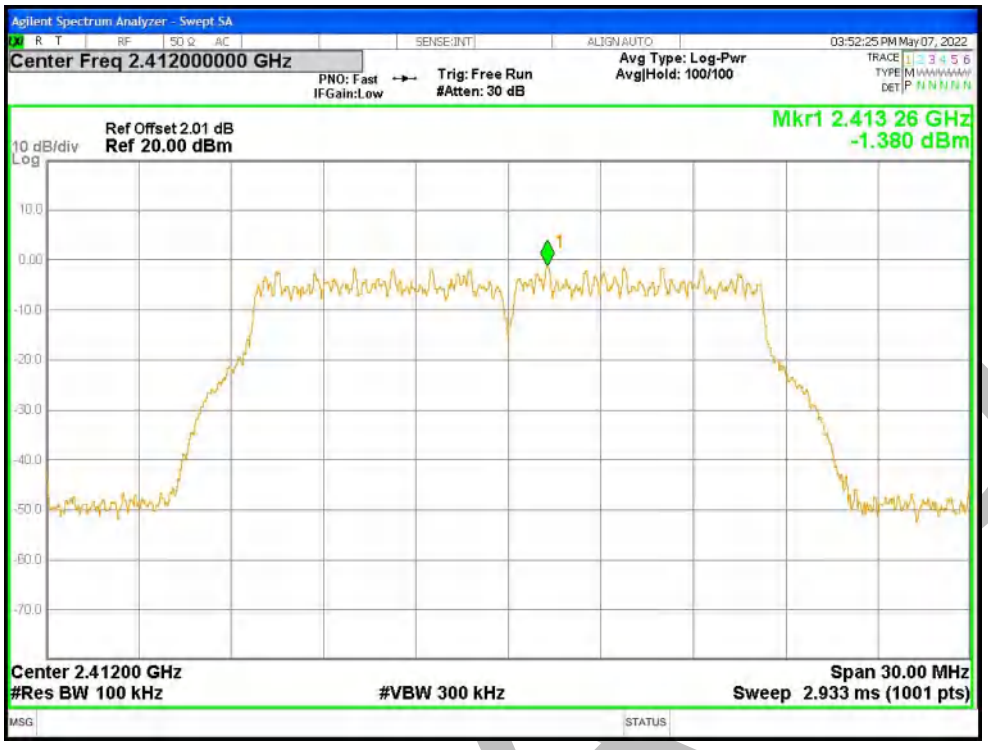
PSD NVNT b 2437MHz Ant1



PSD NVNT b 2462MHz Ant1

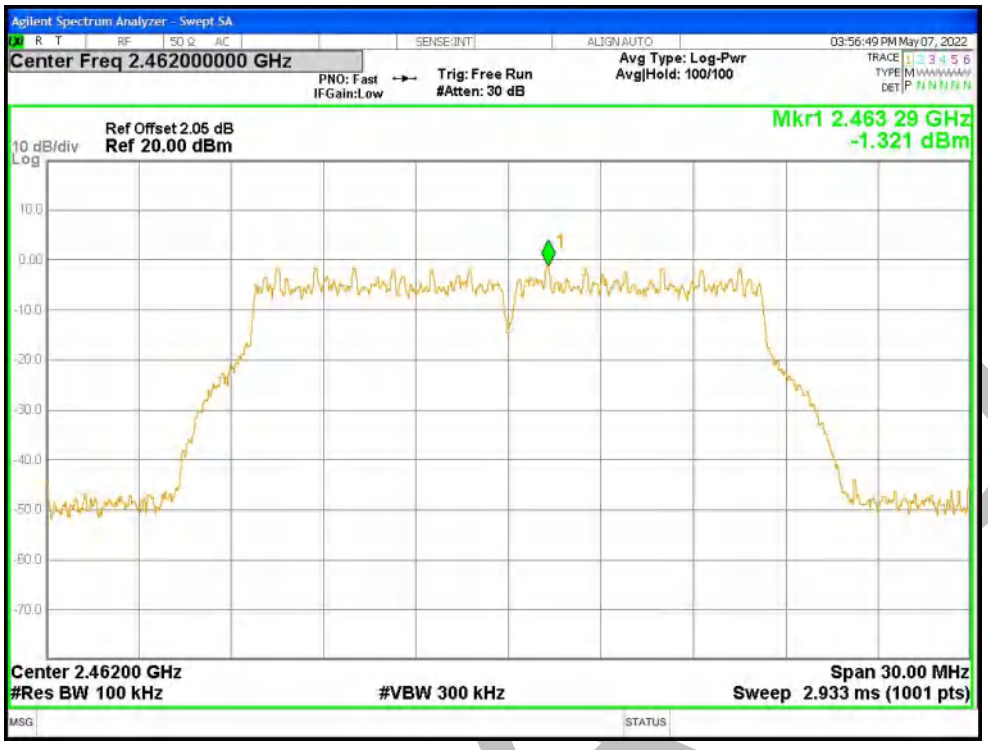


PSD NVNT g 2412MHz Ant1

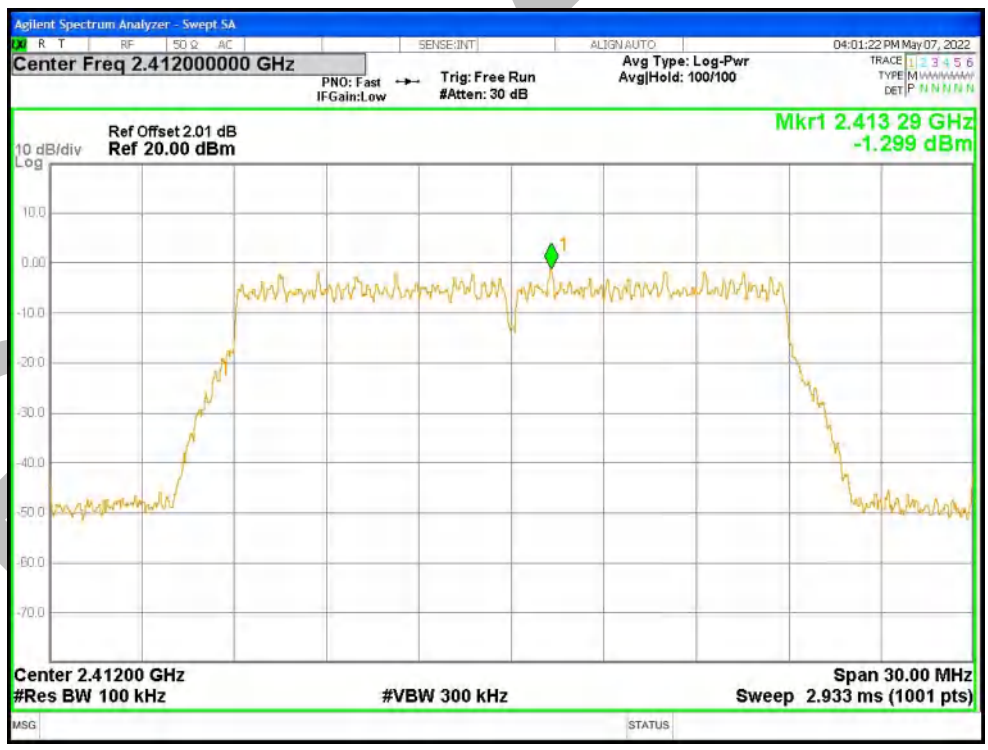


PSD NVNT g 2437MHz Ant1

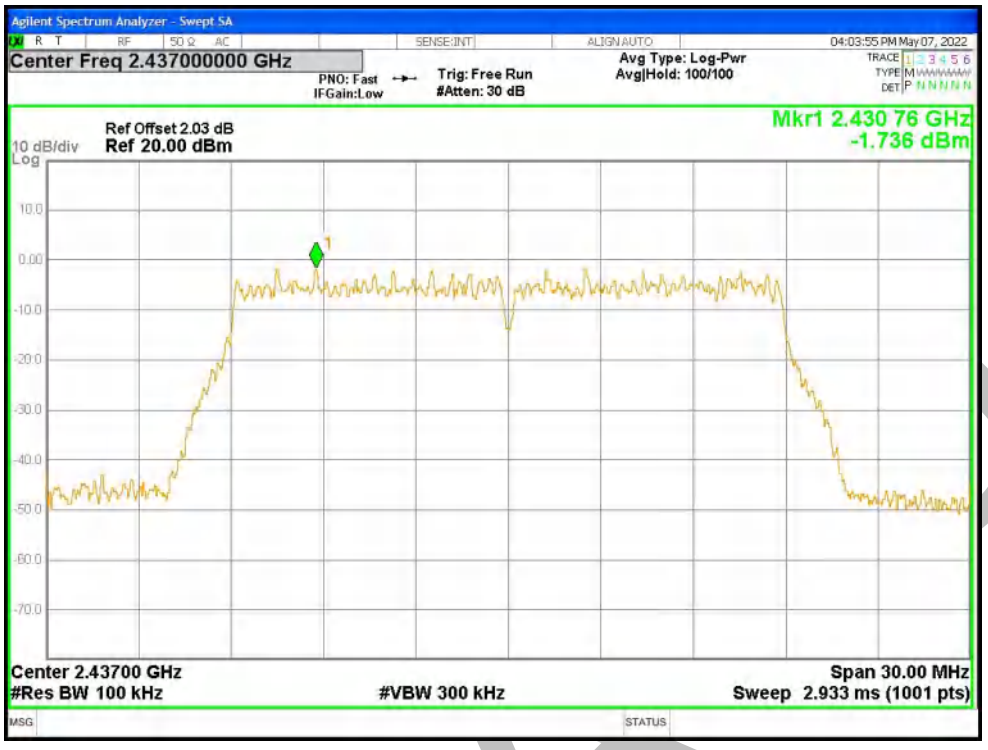
PSD NVNT g 2462MHz Ant1



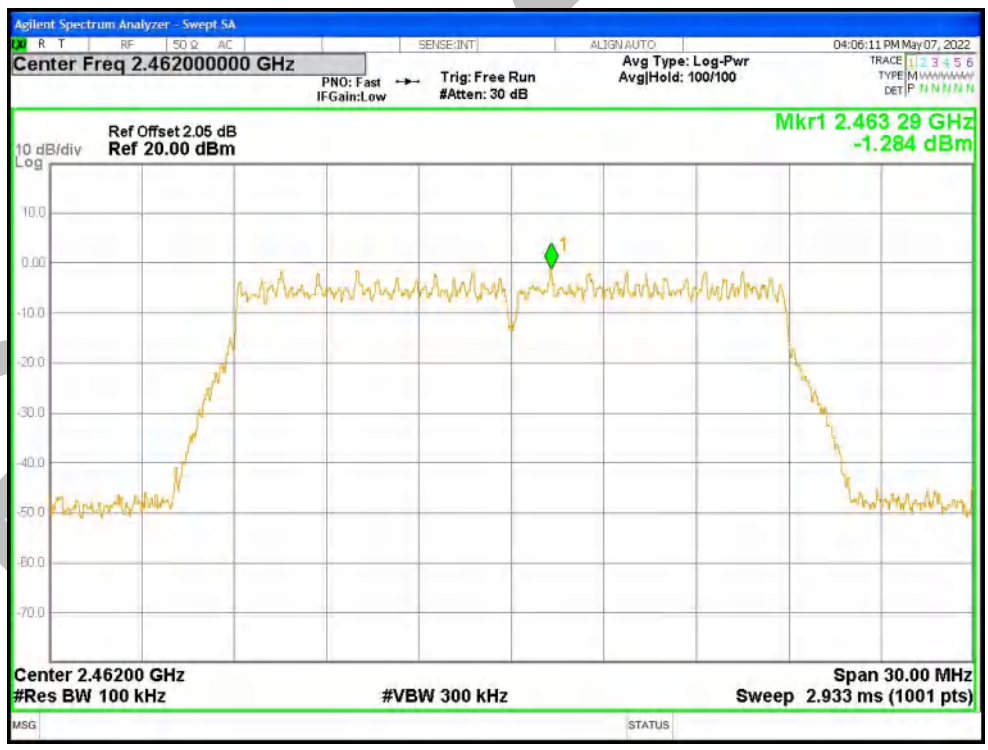
PSD NVNT n20 2412MHz Ant1



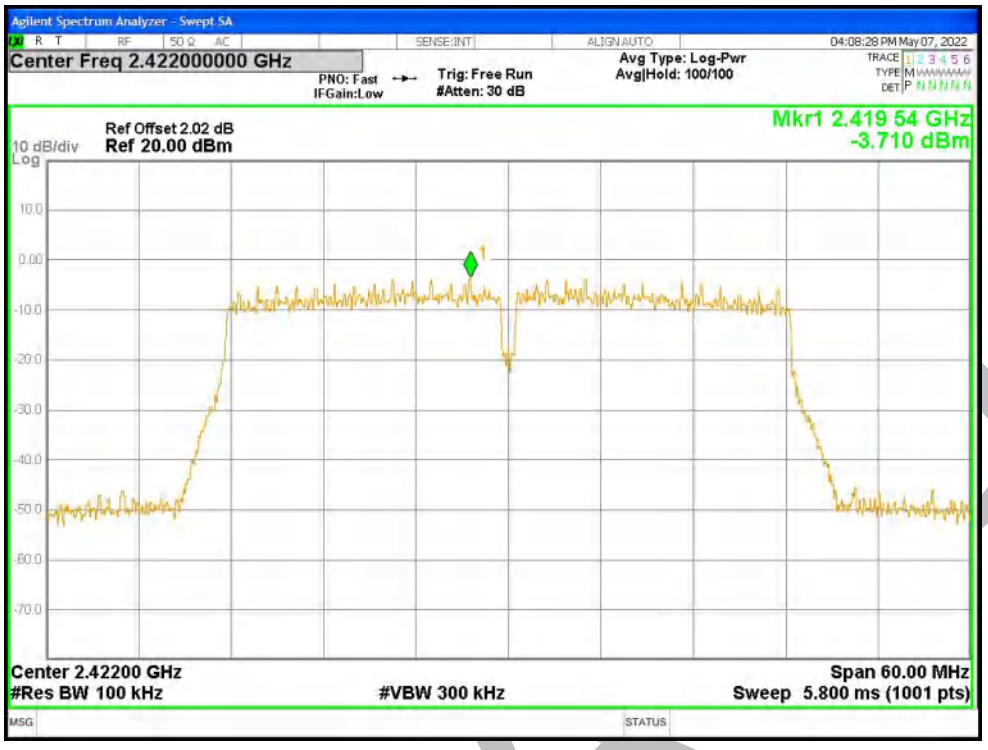
PSD NVNT n20 2437MHz Ant1



PSD NVNT n20 2462MHz Ant1

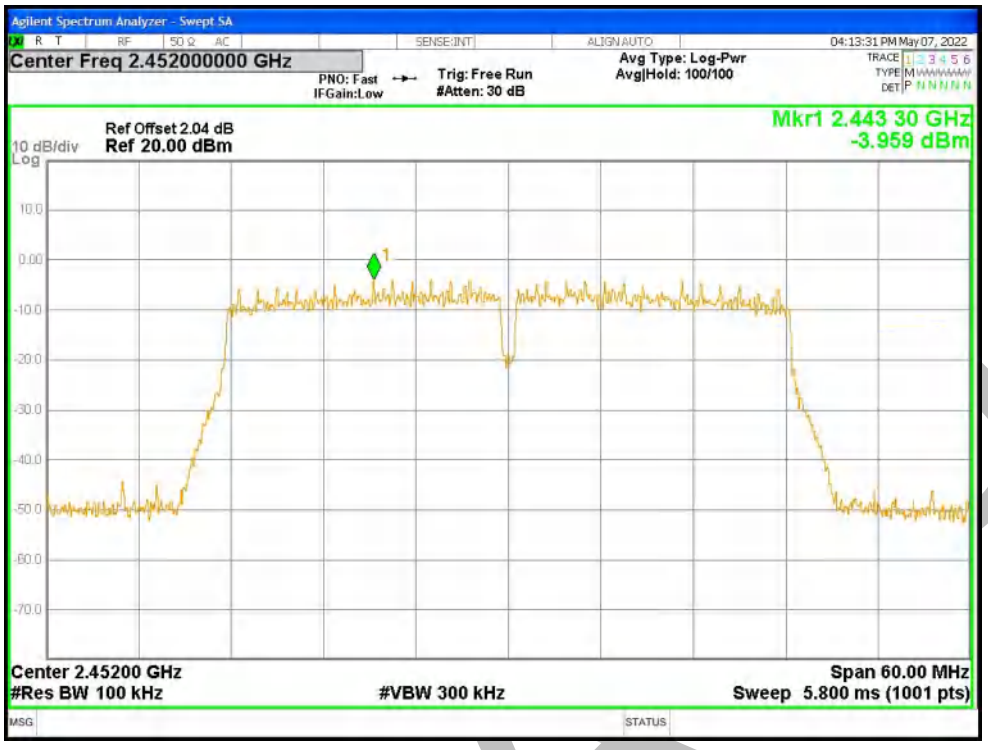


PSD NVNT n40 2422MHz Ant1



PSD NVNT n40 2437MHz Ant1

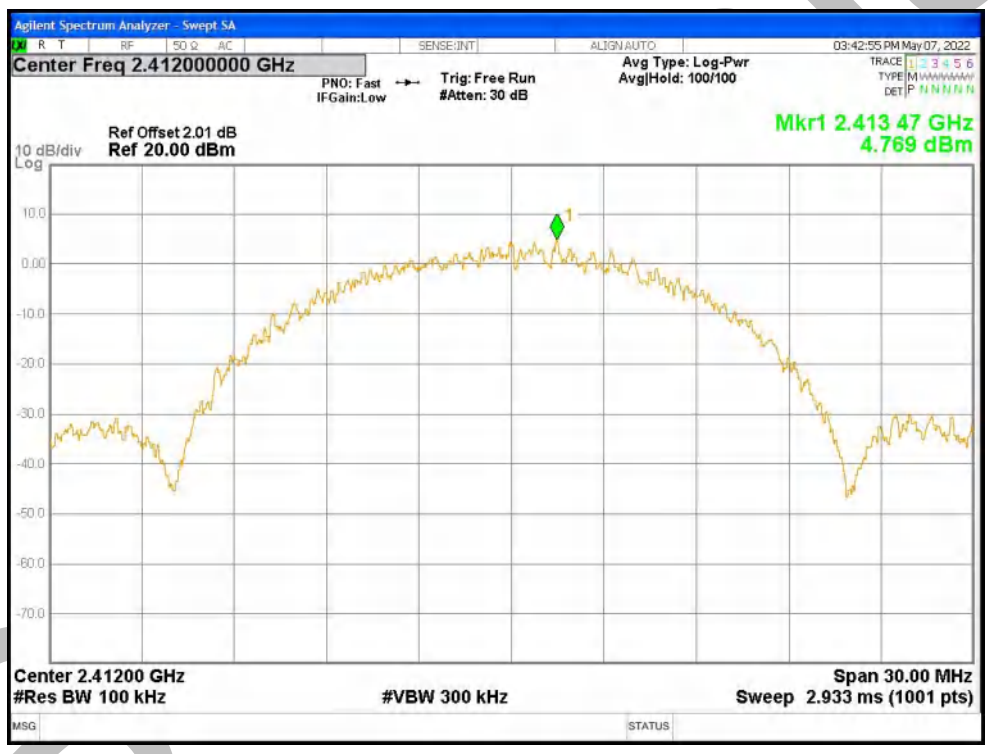
PSD NVNT n40 2452MHz Ant1


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
04:13:31 PM May 07, 2022
Ref Offset 2.04 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.443 30 GHz
-3.959 dBm
Center 2.45200 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60.00 MHz
Sweep 5.800 ms (1001 pts)

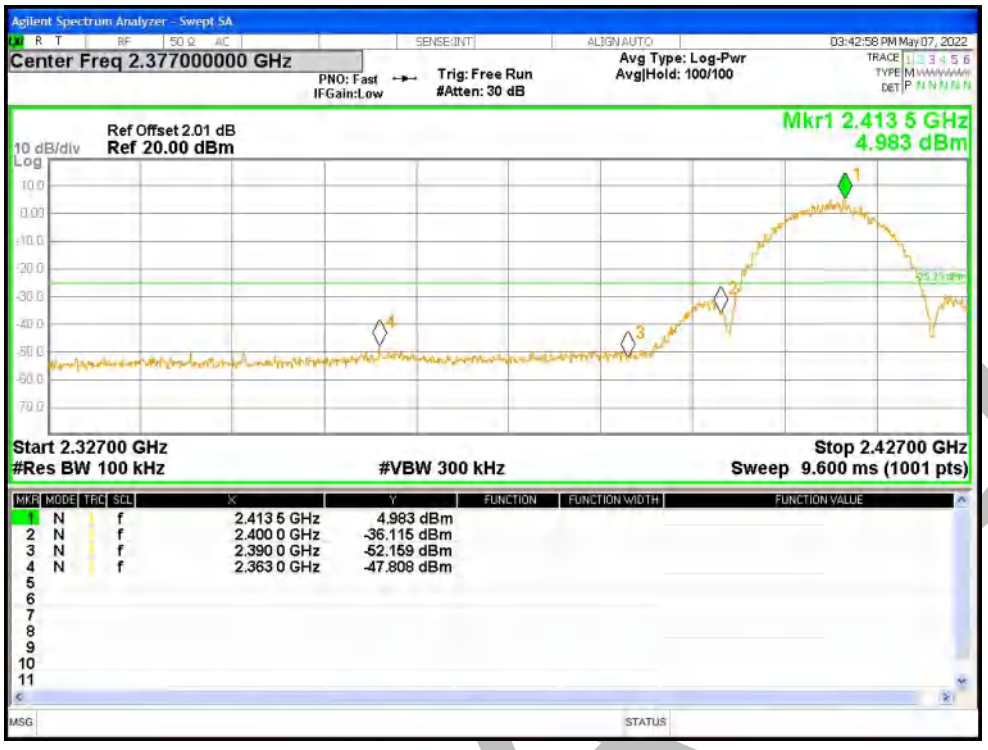
Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-52.57	-30	Pass
NVNT	b	2462	Ant1	-53.59	-30	Pass
NVNT	g	2412	Ant1	-48.64	-30	Pass
NVNT	g	2462	Ant1	-48.83	-30	Pass
NVNT	n20	2412	Ant1	-48.47	-30	Pass
NVNT	n20	2462	Ant1	-48.3	-30	Pass
NVNT	n40	2422	Ant1	-43.58	-30	Pass
NVNT	n40	2452	Ant1	-44.04	-30	Pass

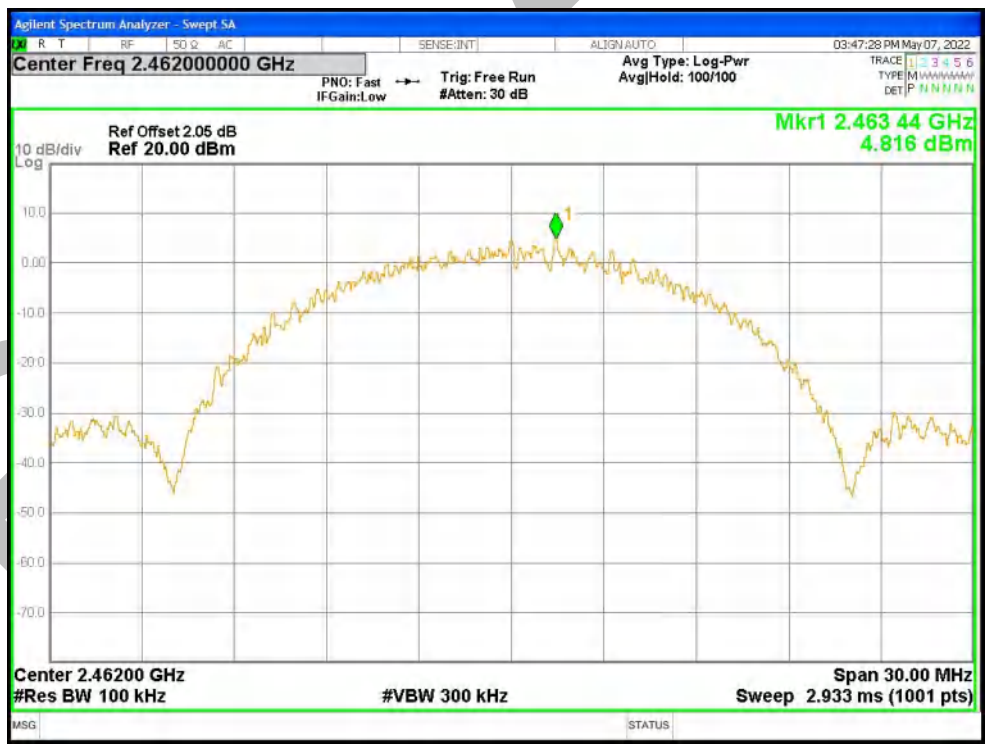
Band Edge NVNT b 2412MHz Ant1 Ref



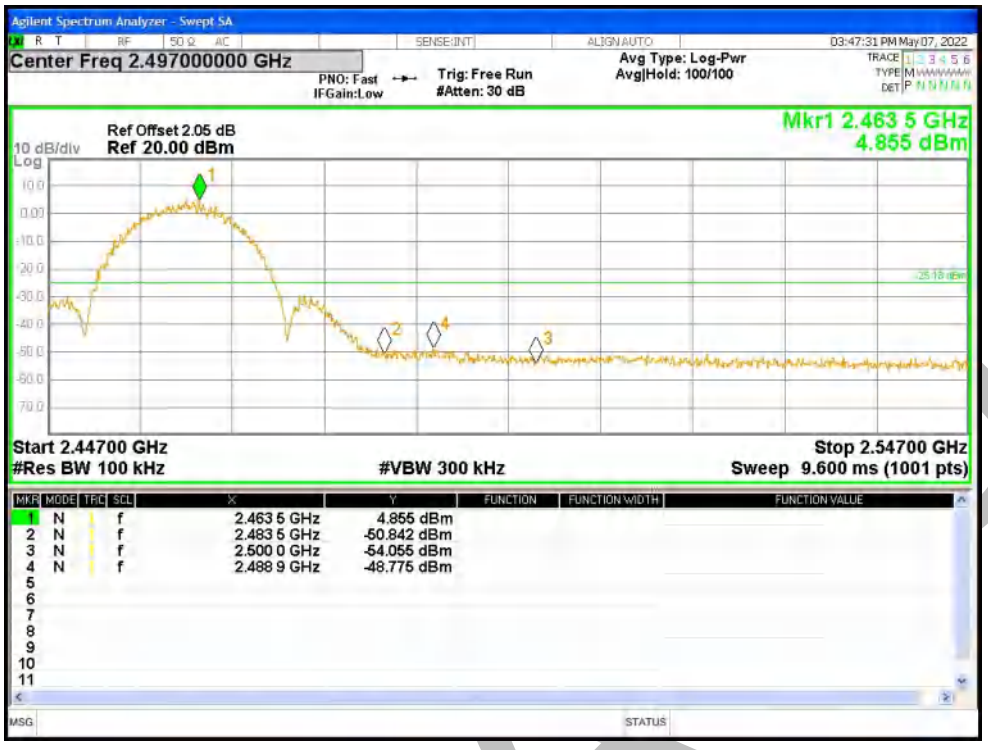
Band Edge NVNT b 2412MHz Ant1 Emission



Band Edge NVNT b 2462MHz Ant1 Ref

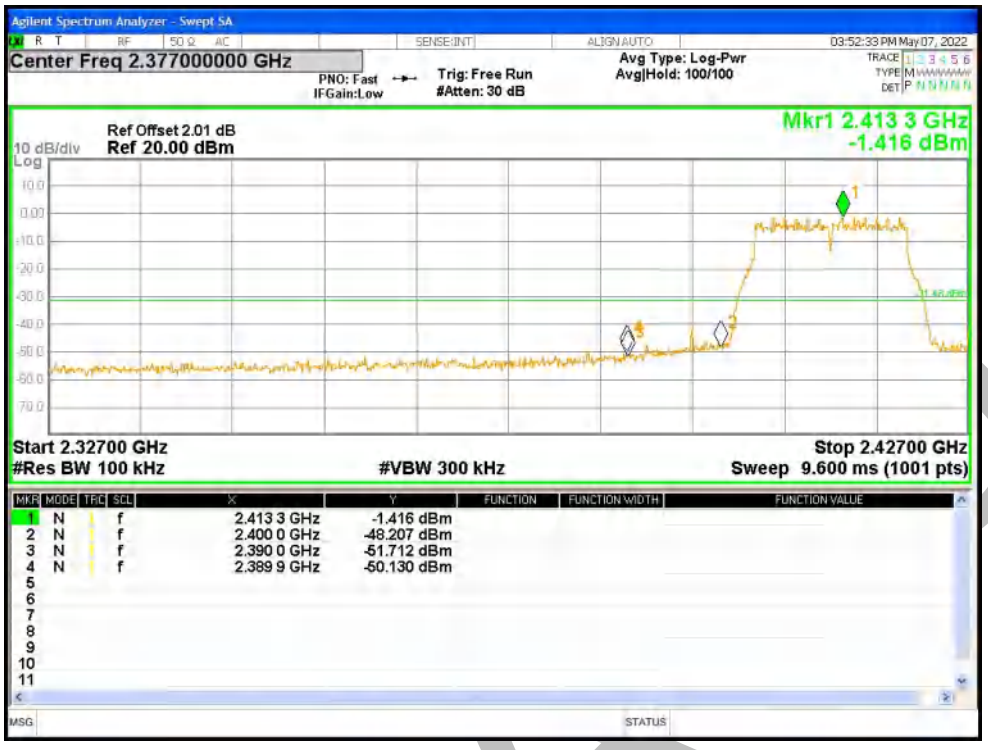


Band Edge NVNT b 2462MHz Ant1 Emission

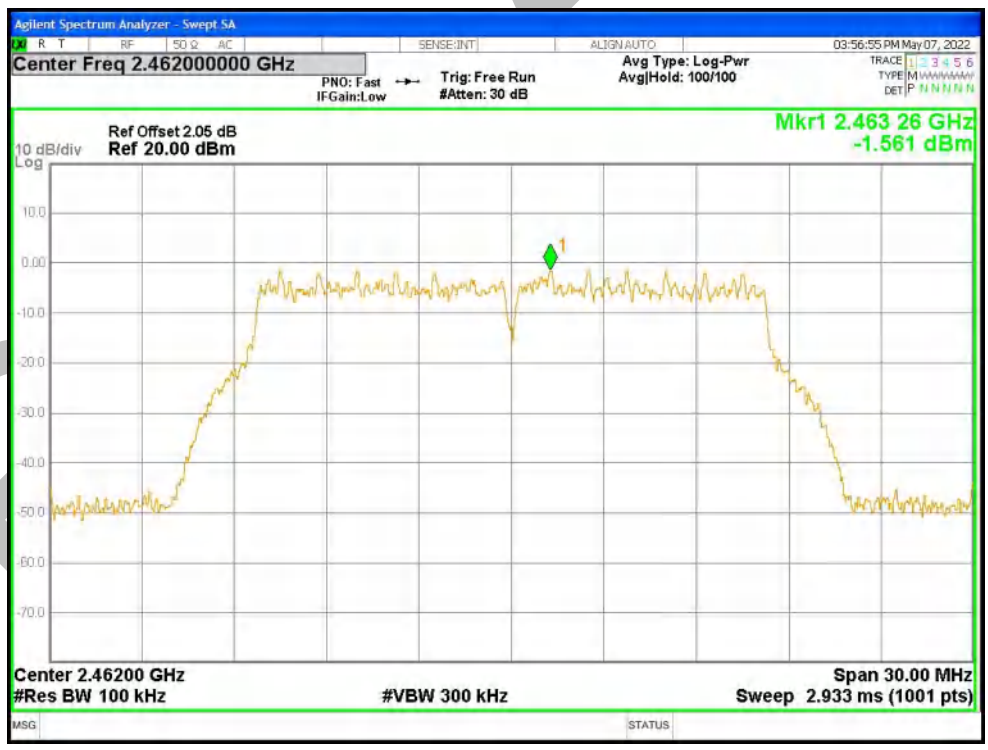


Band Edge NVNT g 2412MHz Ant1 Ref

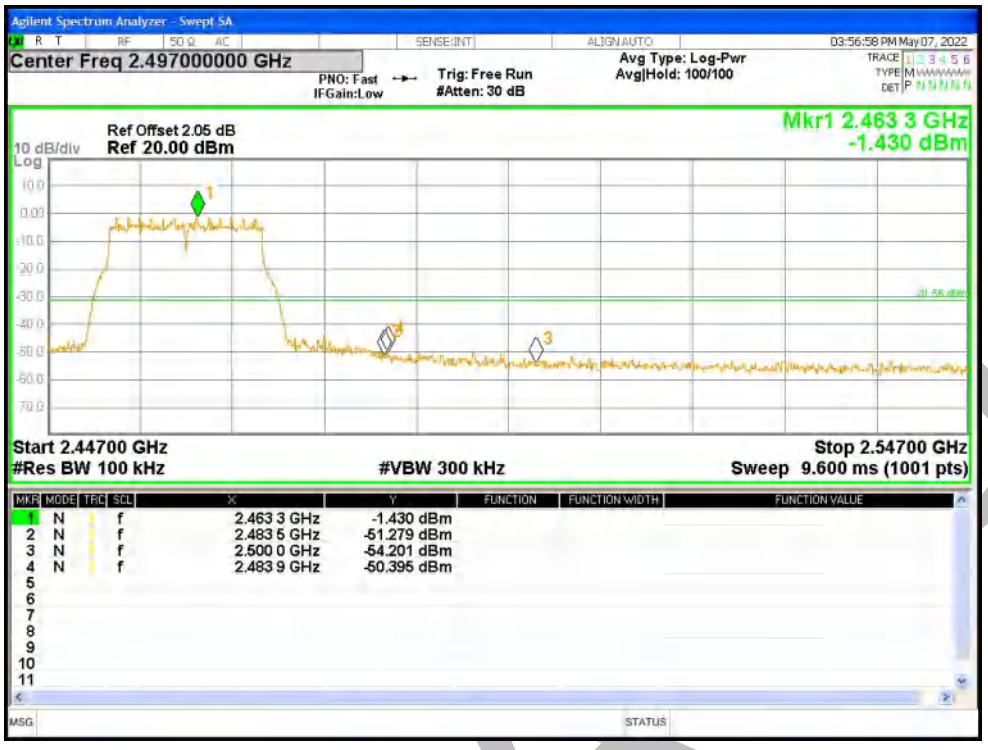
Band Edge NVNT g 2412MHz Ant1 Emission



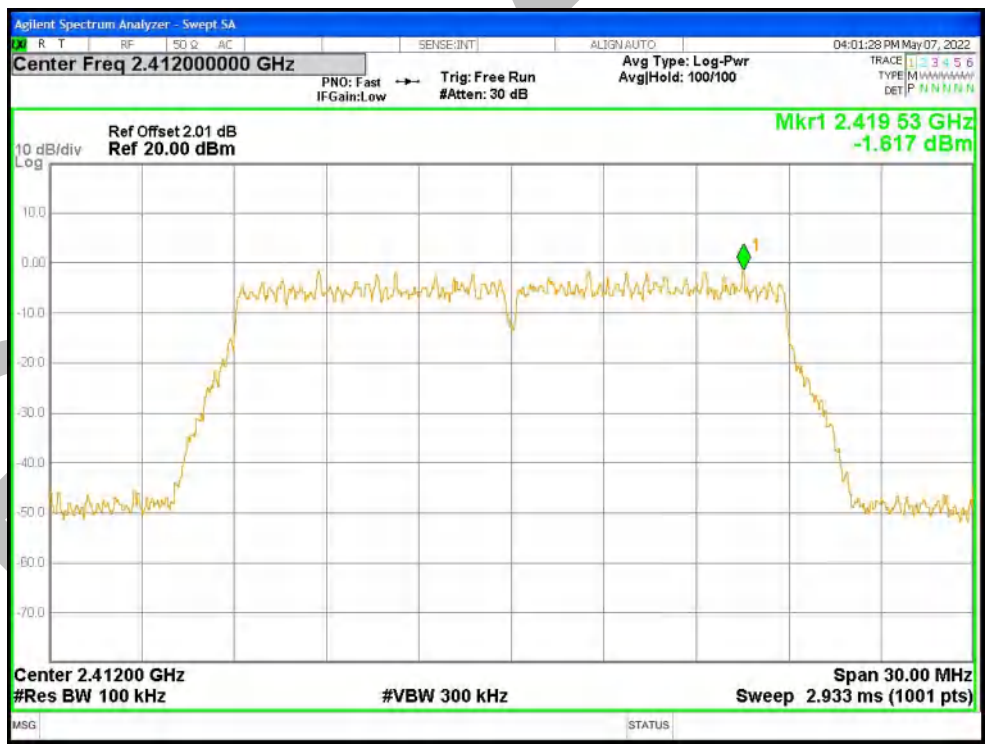
Band Edge NVNT g 2462MHz Ant1 Ref



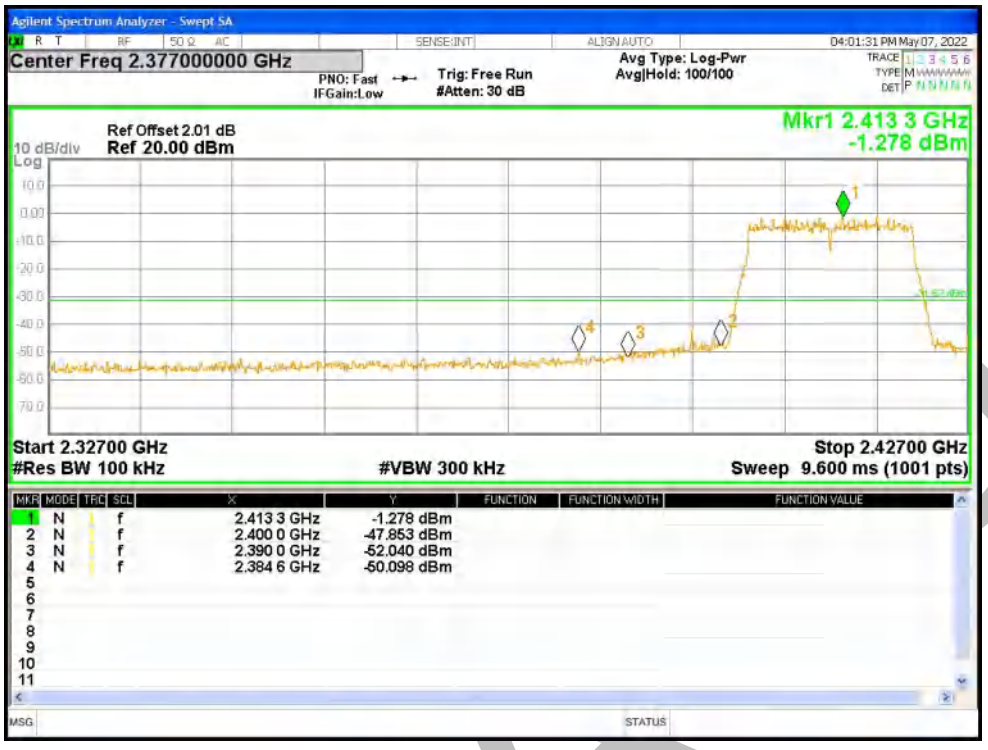
Band Edge NVNT g 2462MHz Ant1 Emission



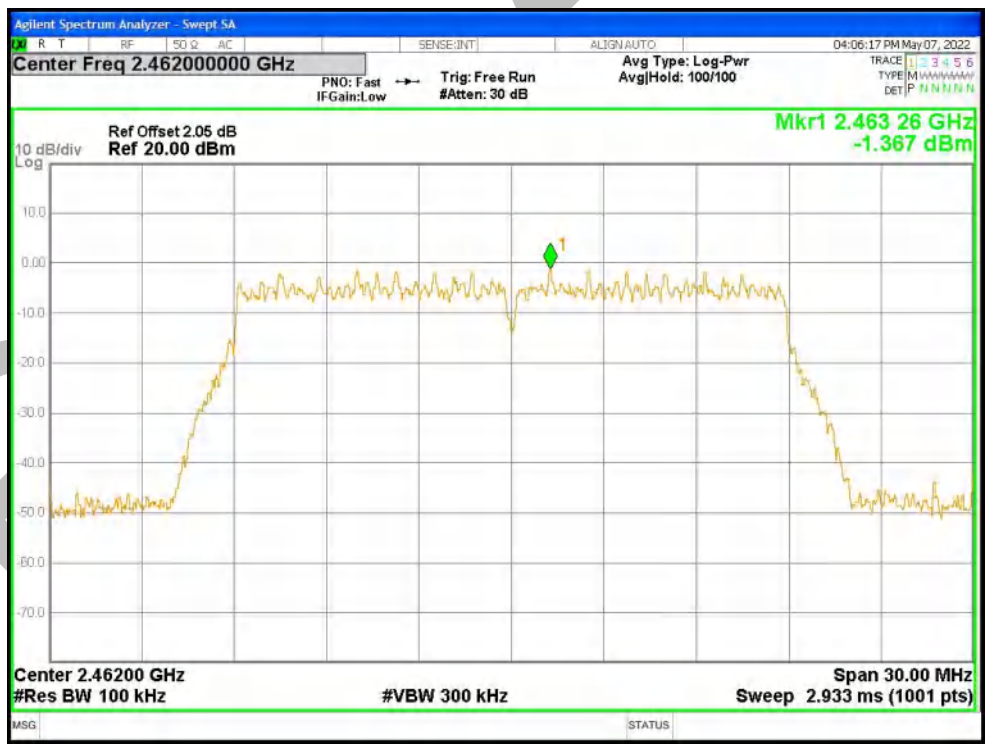
Band Edge NVNT n20 2412MHz Ant1 Ref



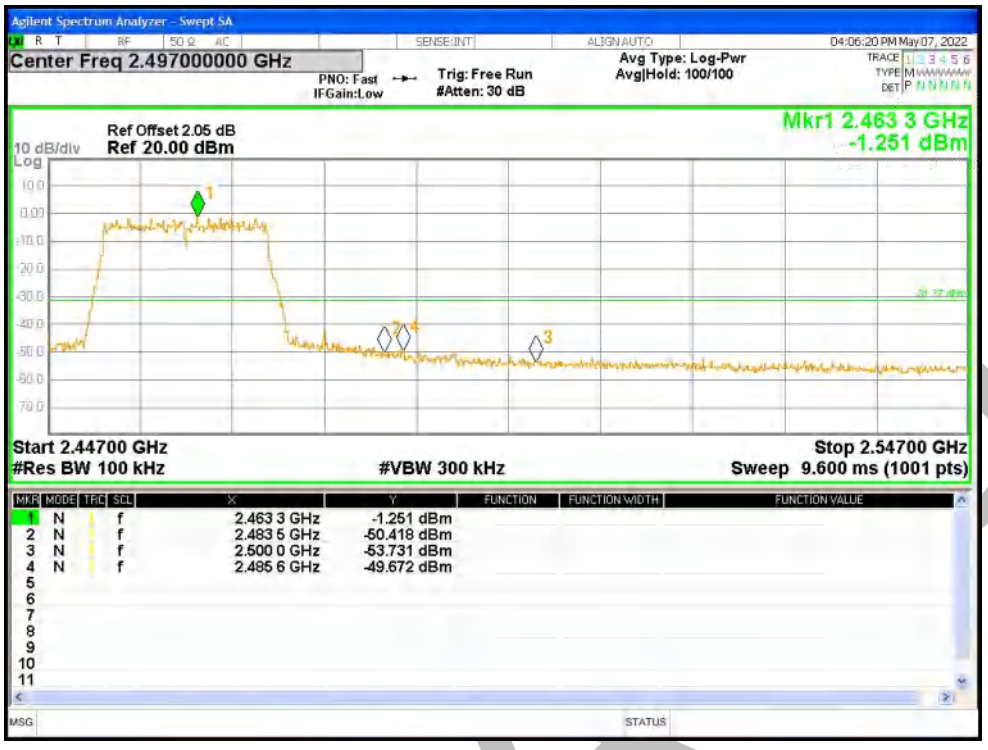
Band Edge NVNT n20 2412MHz Ant1 Emission



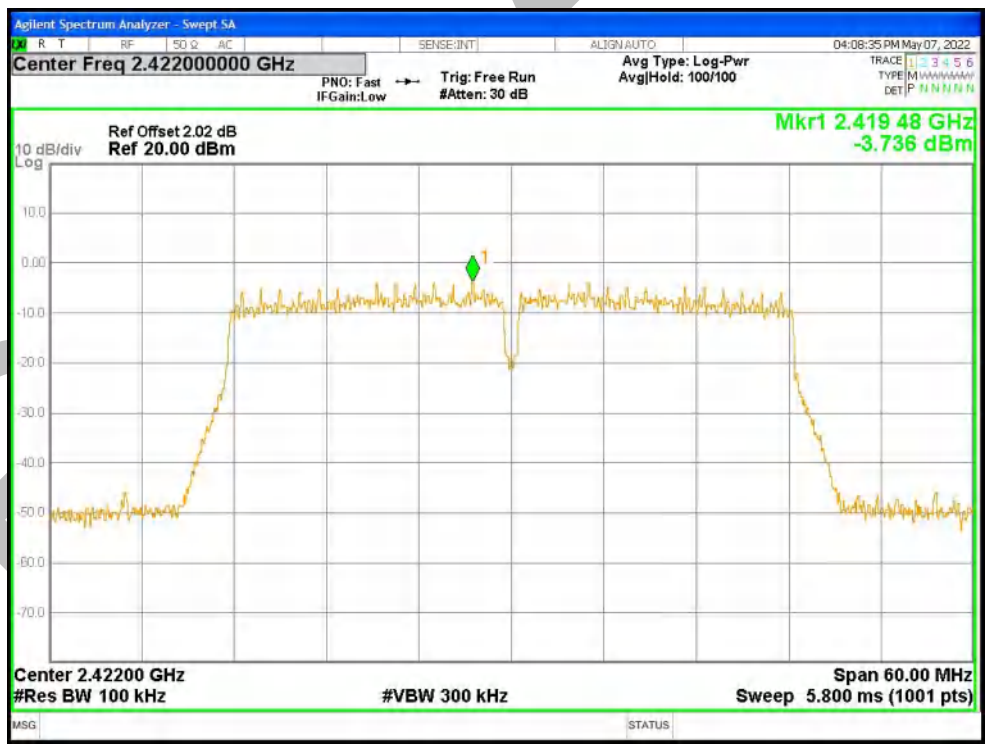
Band Edge NVNT n20 2462MHz Ant1 Ref



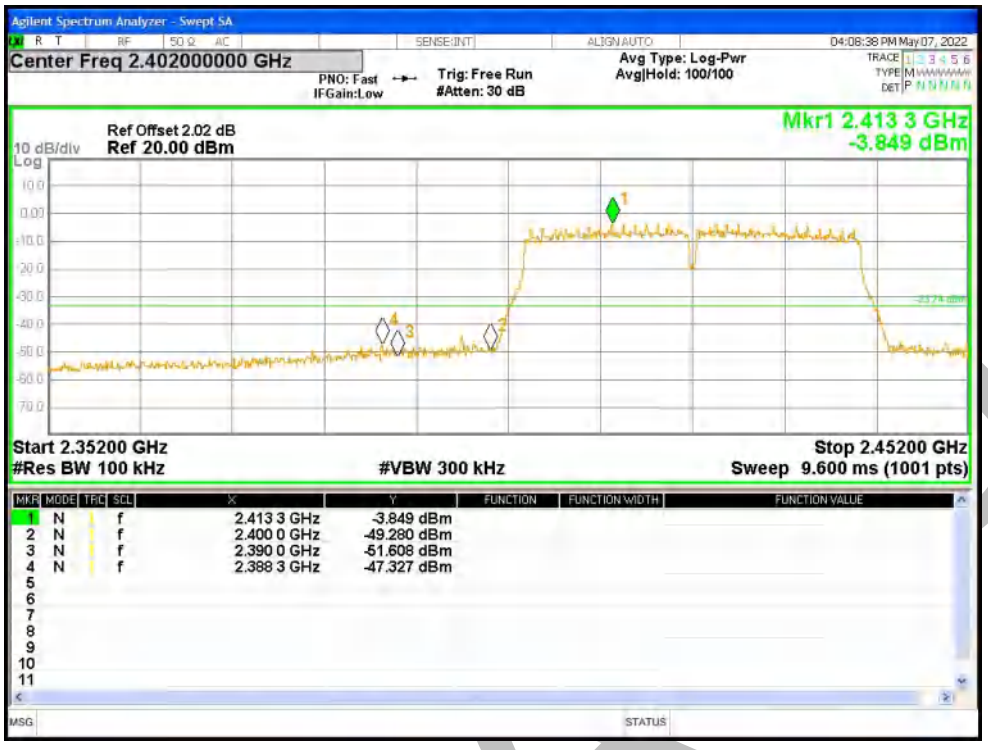
Band Edge NVNT n20 2462MHz Ant1 Emission



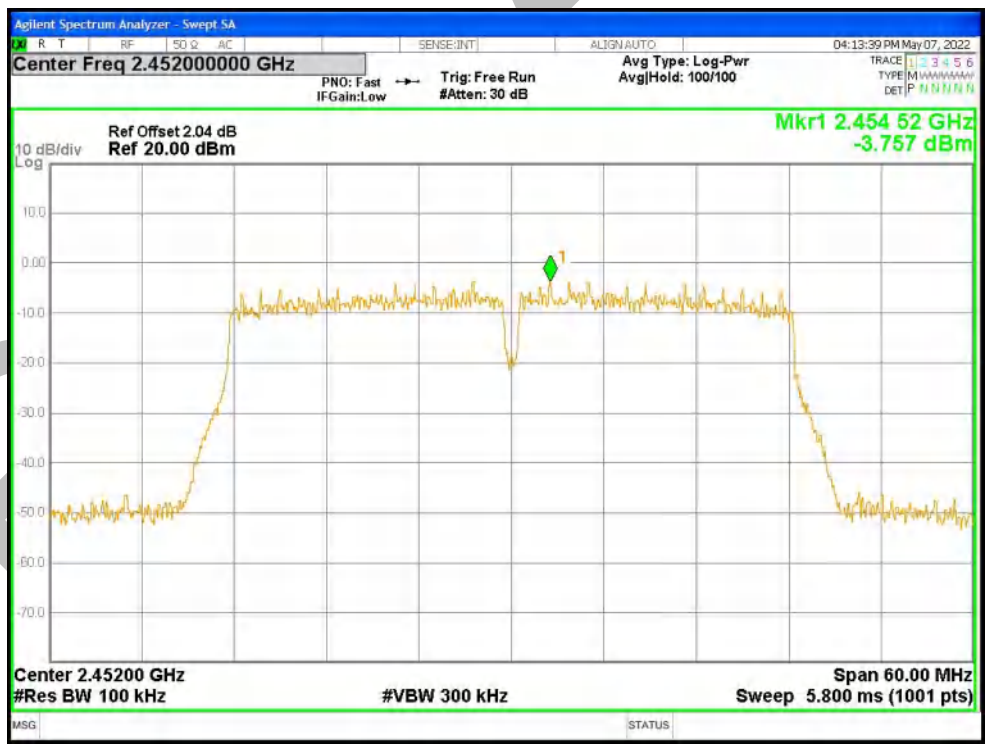
Band Edge NVNT n40 2422MHz Ant1 Ref



Band Edge NVNT n40 2422MHz Ant1 Emission



Band Edge NVNT n40 2452MHz Ant1 Ref



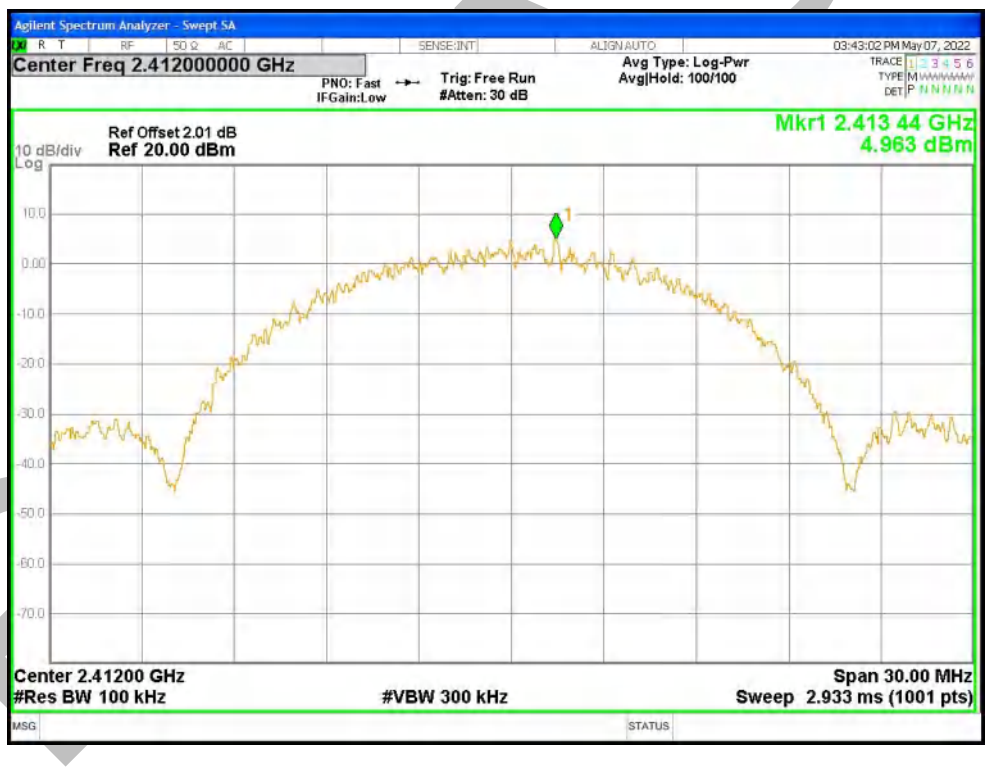
Band Edge NVNT n40 2452MHz Ant1 Emission


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
04:13:41 PM May 07, 2022
Ref Offset 2.04 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.454 5 GHz
-3.741 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 2.454 5 GHz -3.741 dBm
2 N 1 f 2.483 5 GHz -51.809 dBm
3 N 1 f 2.500 0 GHz -54.993 dBm
4 N 1 f 2.485 8 GHz -47.807 dBm

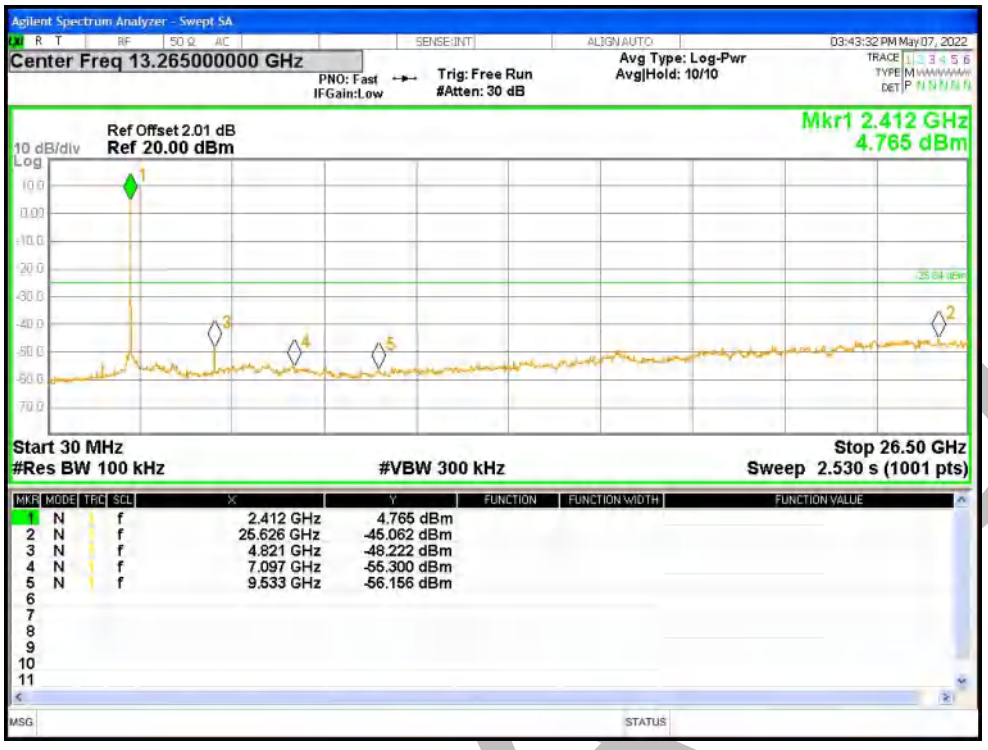
Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-50.02	-30	Pass
NVNT	b	2437	Ant1	-50.26	-30	Pass
NVNT	b	2462	Ant1	-49.4	-30	Pass
NVNT	g	2412	Ant1	-43.92	-30	Pass
NVNT	g	2437	Ant1	-43.71	-30	Pass
NVNT	g	2462	Ant1	-44.44	-30	Pass
NVNT	n20	2412	Ant1	-43.46	-30	Pass
NVNT	n20	2437	Ant1	-43.18	-30	Pass
NVNT	n20	2462	Ant1	-43.37	-30	Pass
NVNT	n40	2422	Ant1	-41.44	-30	Pass
NVNT	n40	2437	Ant1	-40.88	-30	Pass
NVNT	n40	2452	Ant1	-42.17	-30	Pass

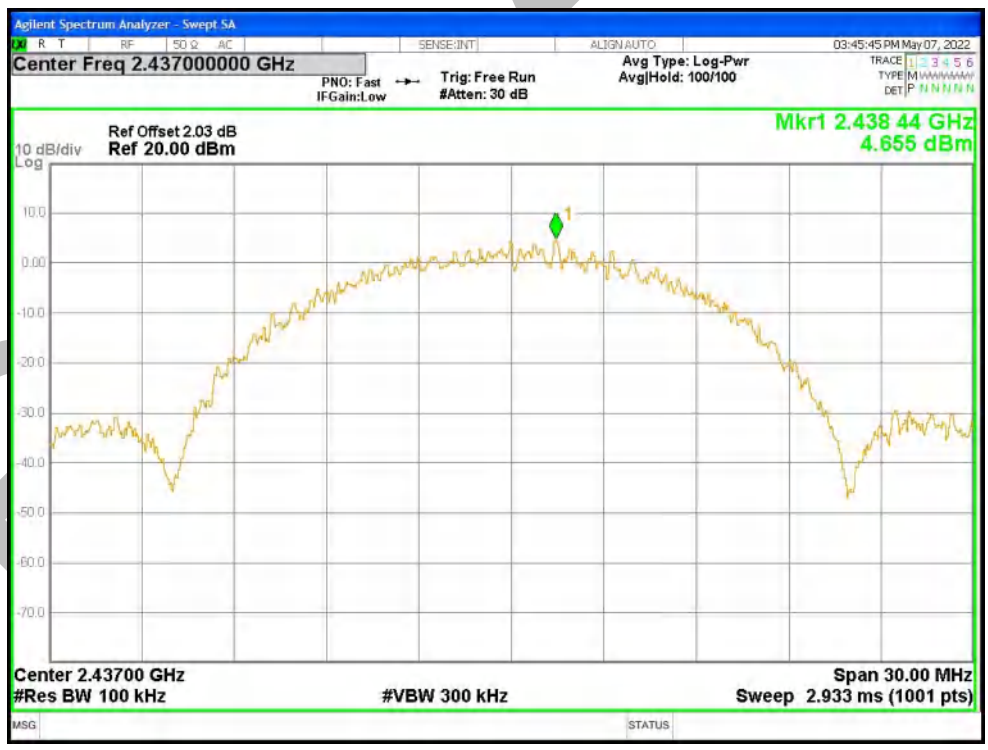
Tx. Spurious NVNT b 2412MHz Ant1 Ref



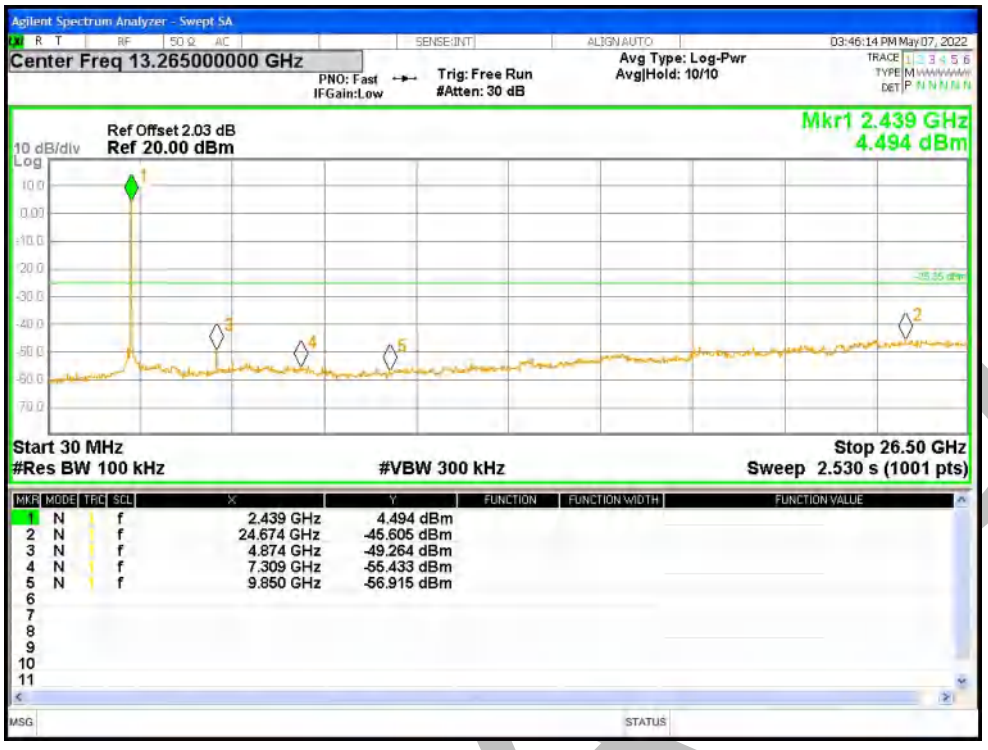
Tx. Spurious NVNT b 2412MHz Ant1 Emission



Tx. Spurious NVNT b 2437MHz Ant1 Ref



Tx. Spurious NVNT b 2437MHz Ant1 Emission



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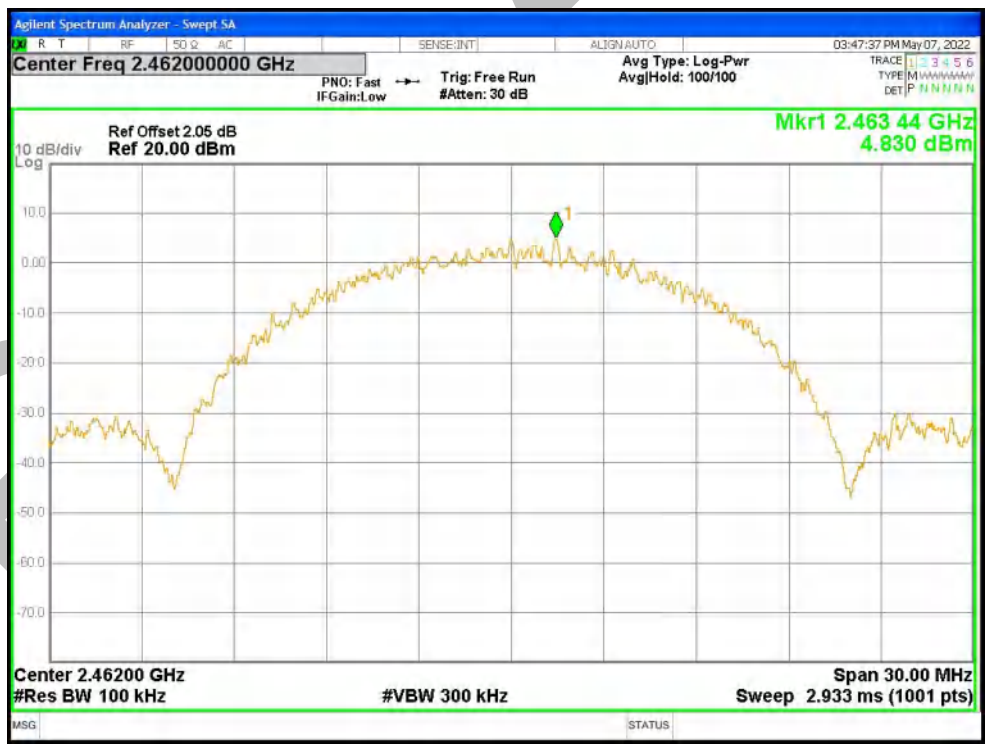
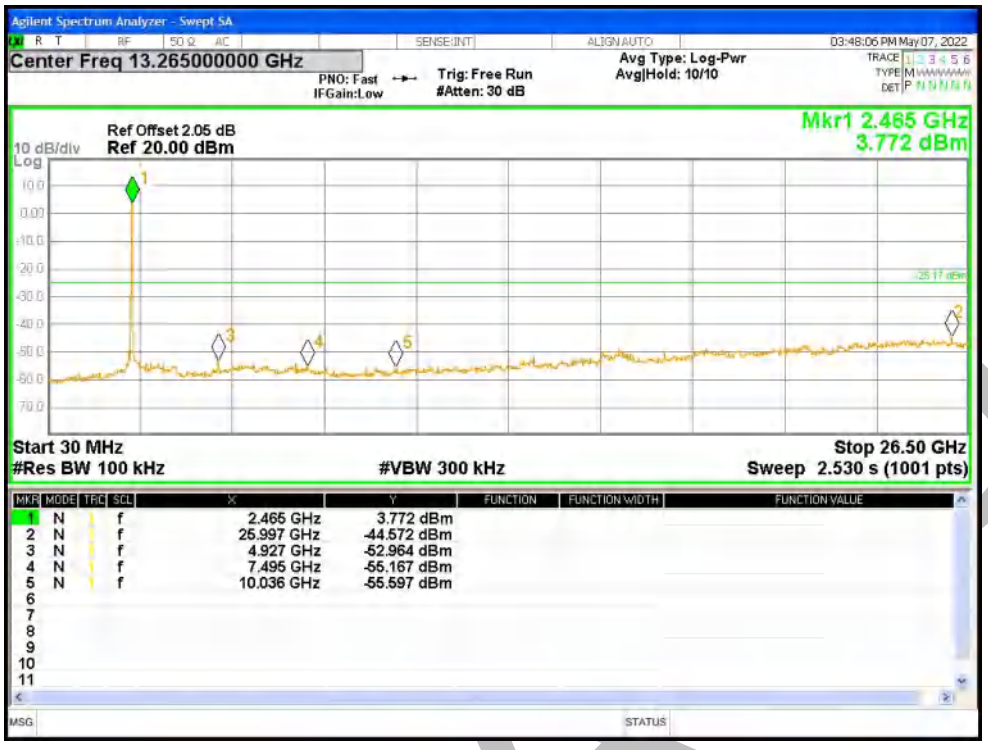


Tx. Spurious NVNT b 2462MHz Ant1 Emission



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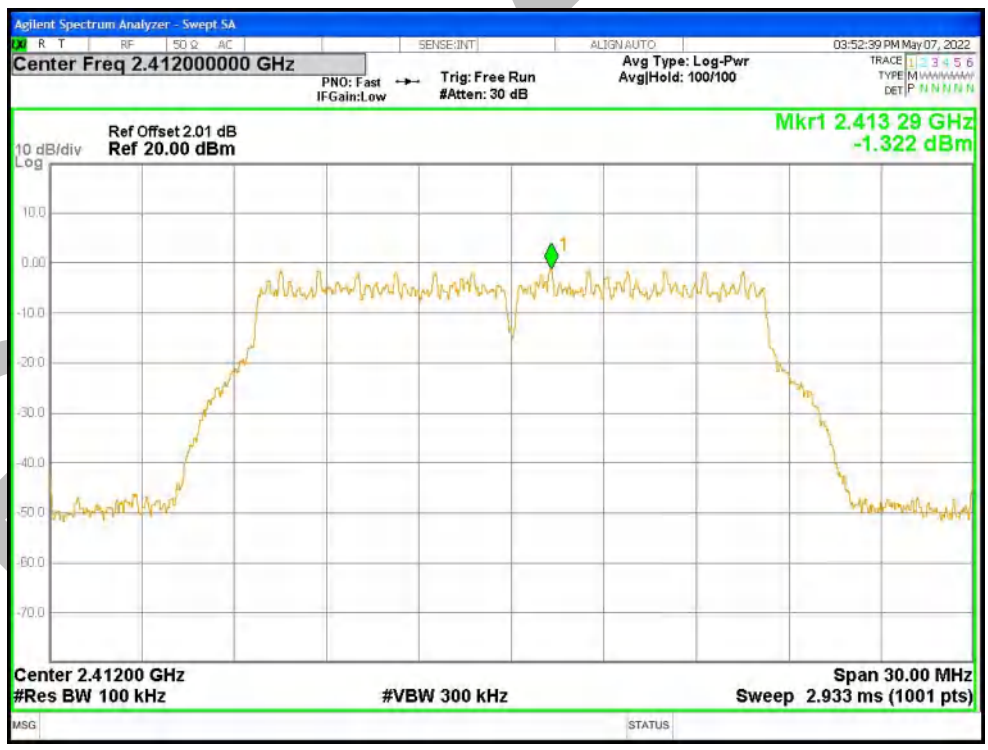

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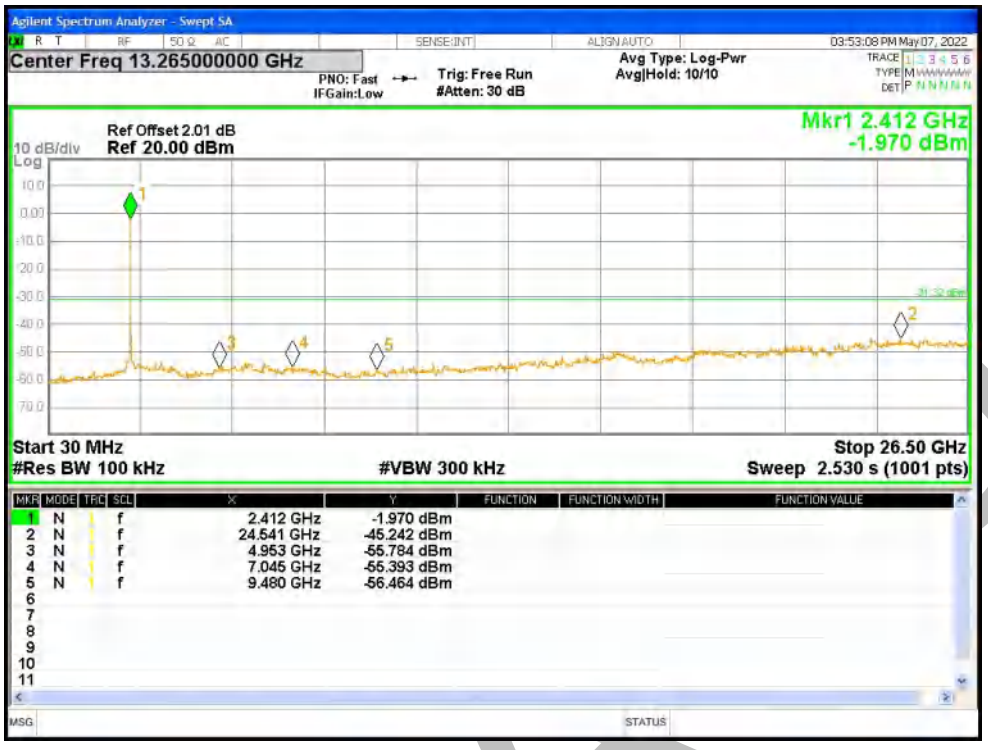
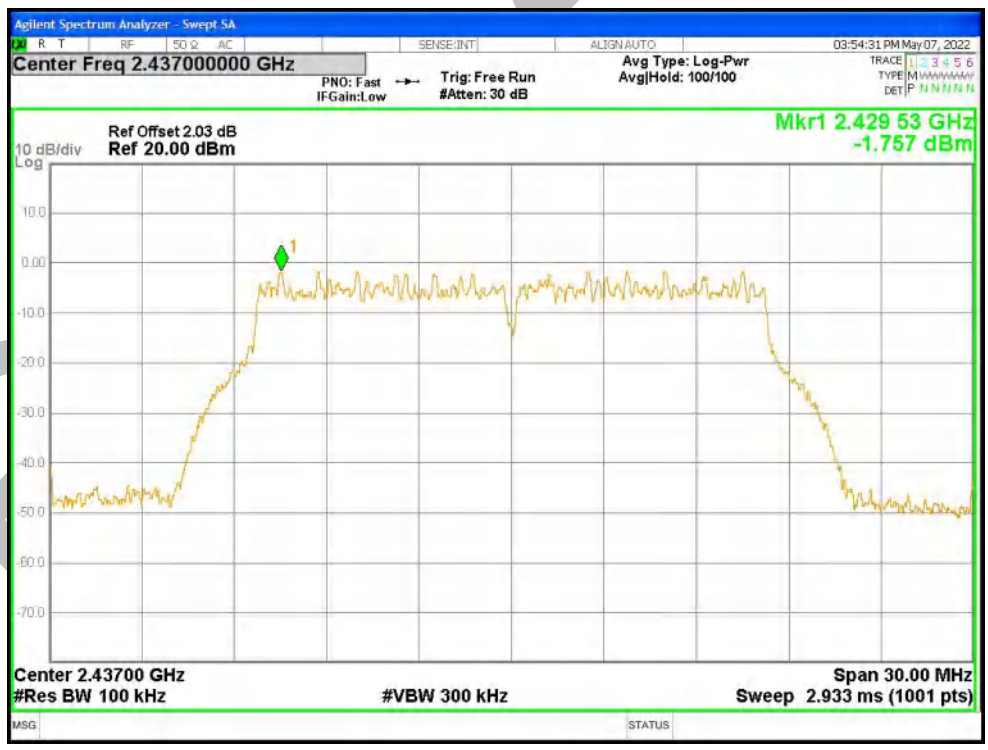
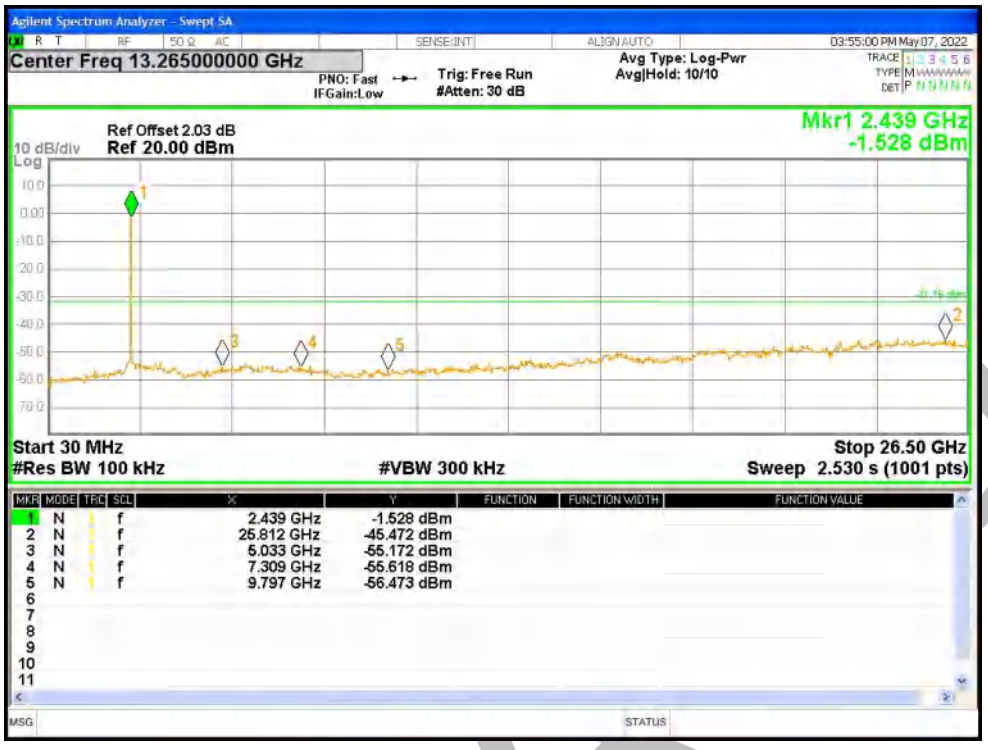


Tx. Spurious NVNT g 2437MHz Ant1 Ref

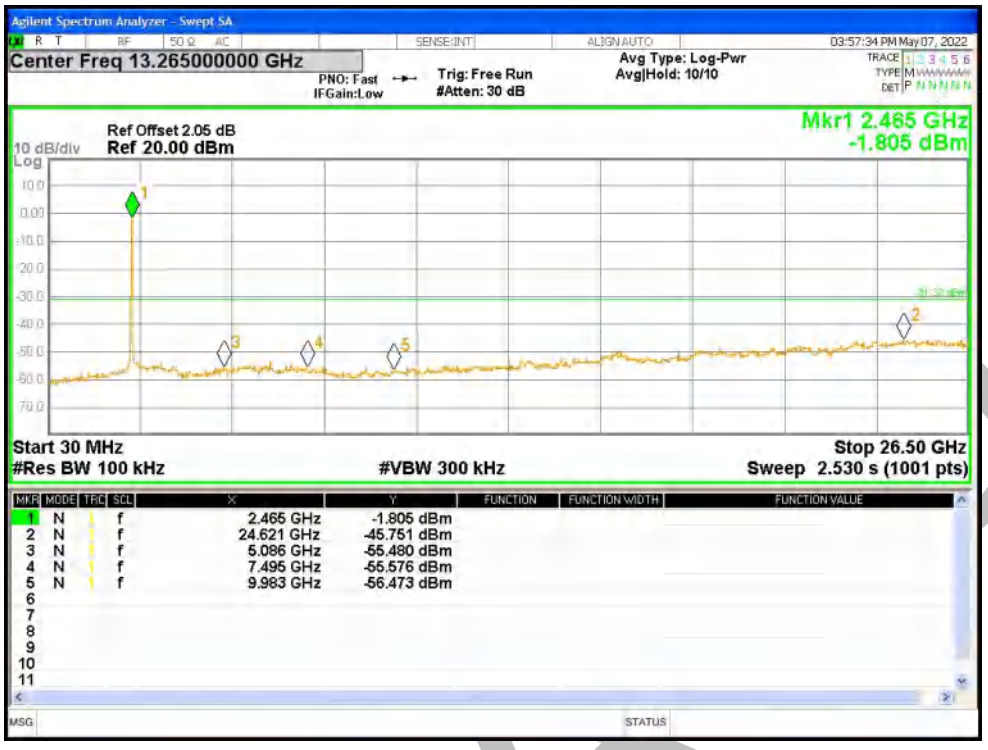


Tx. Spurious NVNT g 2437MHz Ant1 Emission



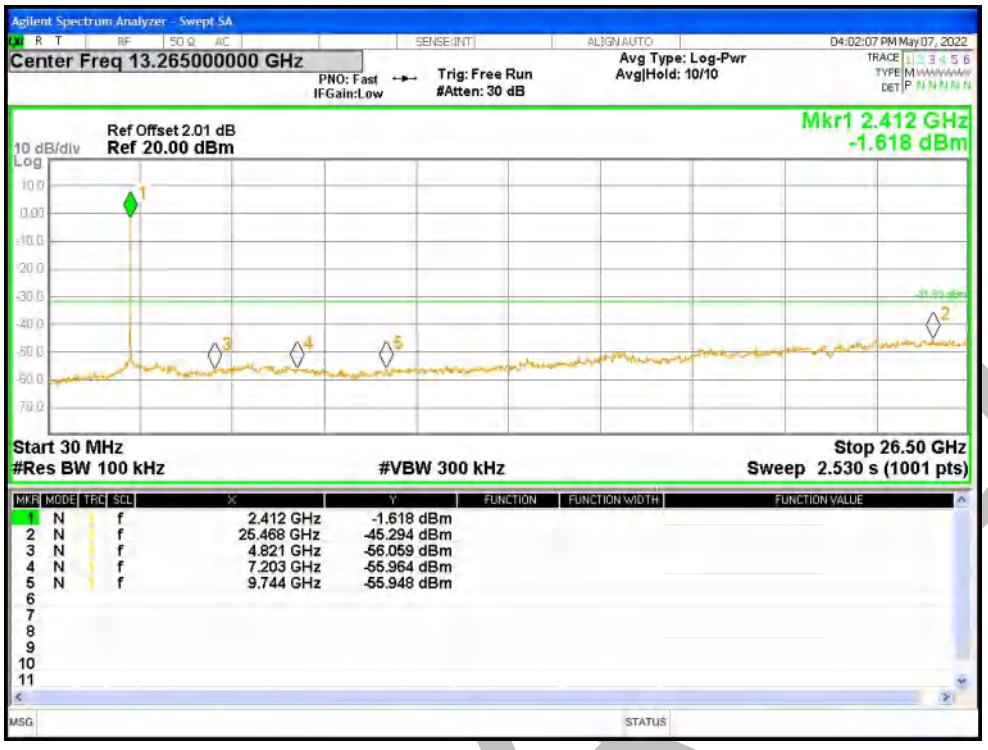
Tx. Spurious NVNT g 2462MHz Ant1 Ref

Tx. Spurious NVNT g 2462MHz Ant1 Emission



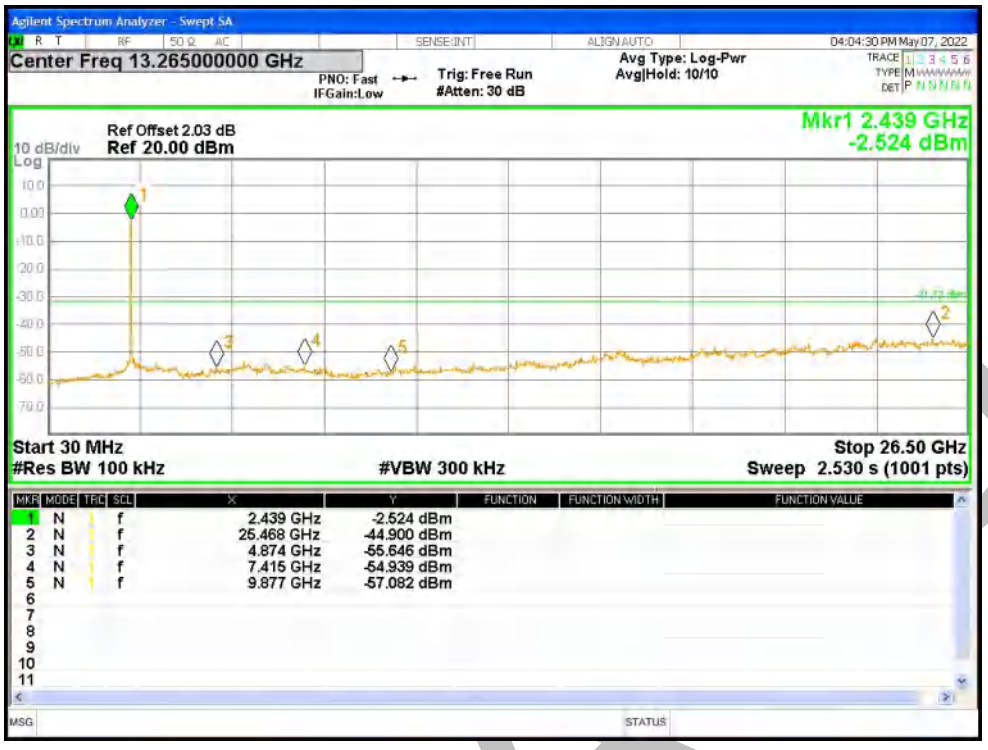
Tx. Spurious NVNT n20 2412MHz Ant1 Ref

Tx. Spurious NVNT n20 2412MHz Ant1 Emission

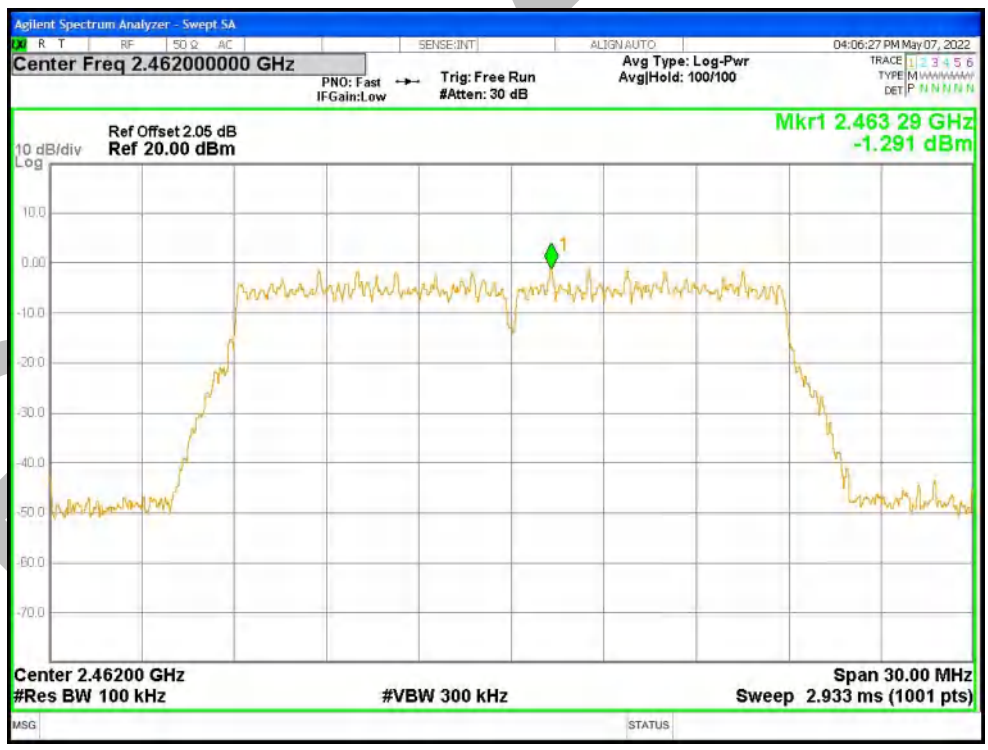


Tx. Spurious NVNT n20 2437MHz Ant1 Ref

Tx. Spurious NVNT n20 2437MHz Ant1 Emission

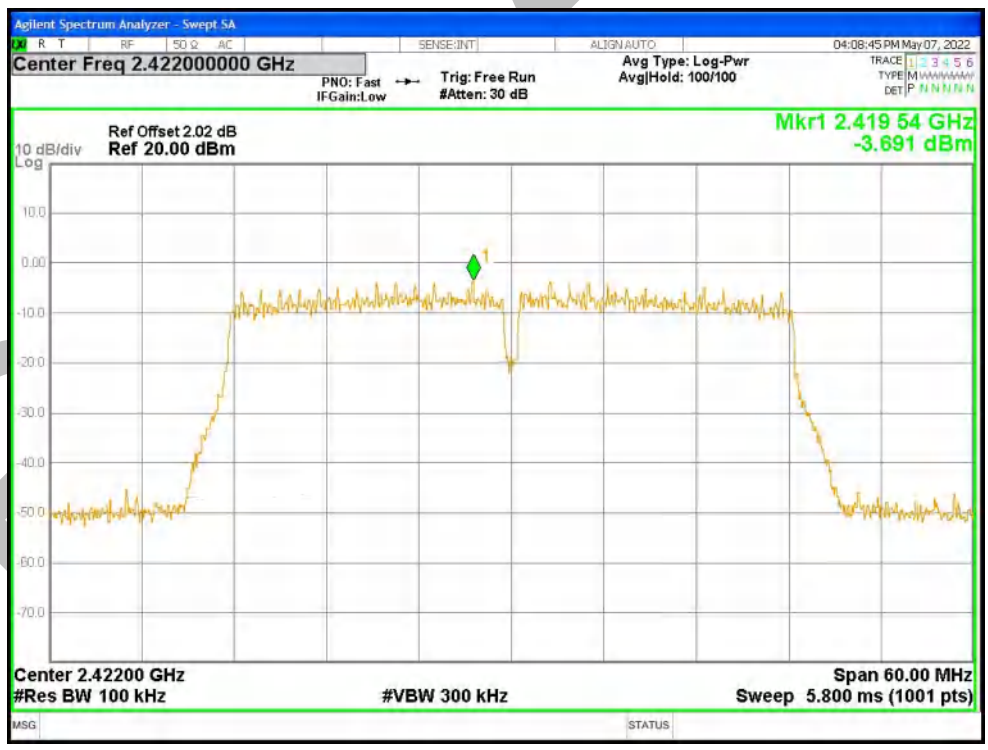


Tx. Spurious NVNT n20 2462MHz Ant1 Ref

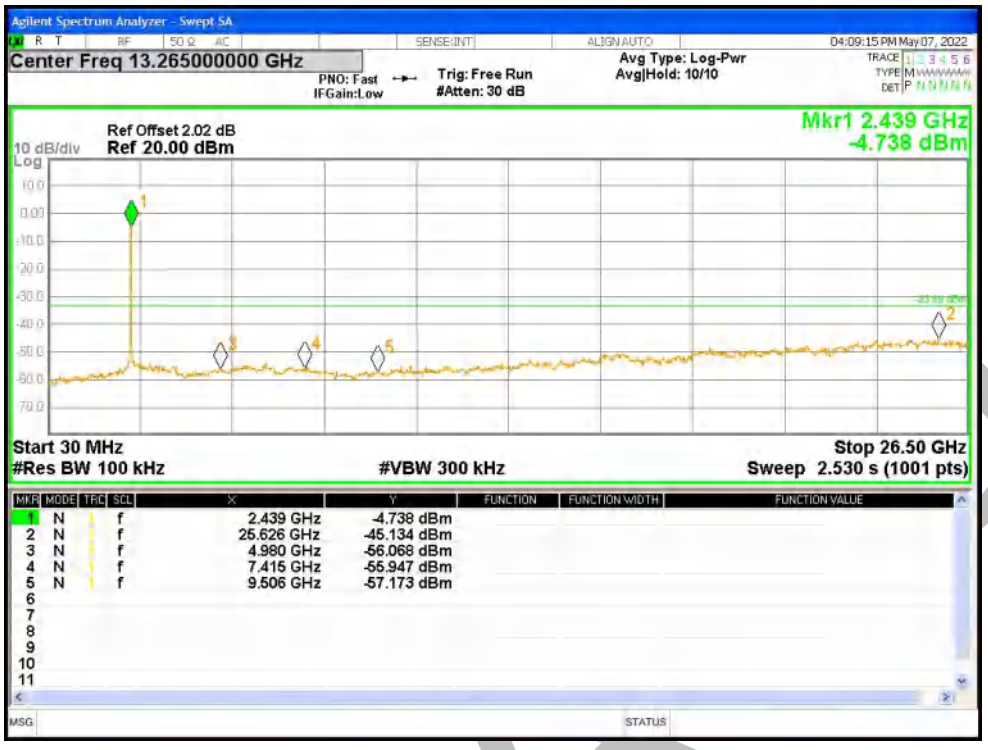


Tx. Spurious NVNT n20 2462MHz Ant1 Emission

Tx. Spurious NVNT n40 2422MHz Ant1 Ref



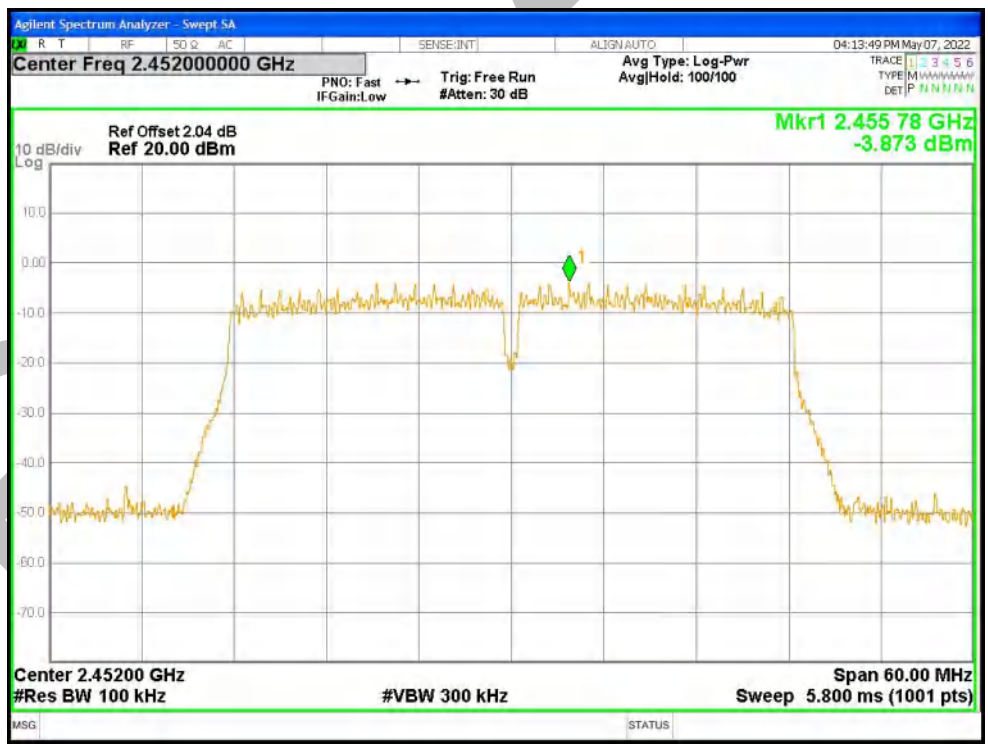
Tx. Spurious NVNT n40 2422MHz Ant1 Emission



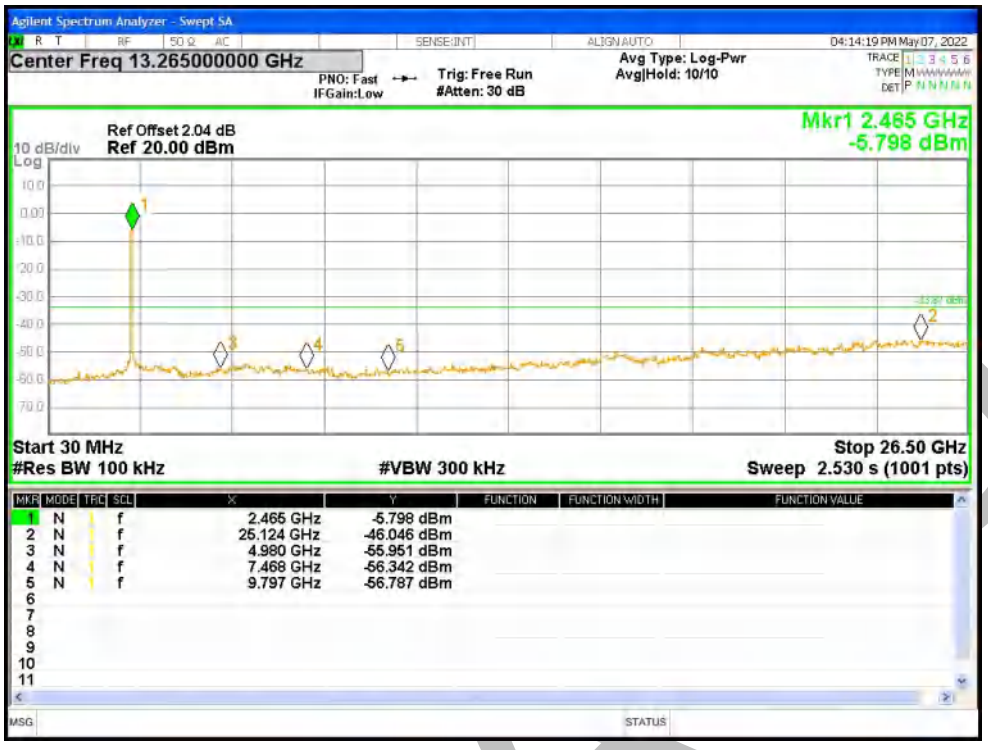
Tx. Spurious NVNT n40 2437MHz Ant1 Ref

Tx. Spurious NVNT n40 2437MHz Ant1 Emission

Tx. Spurious NVNT n40 2452MHz Ant1 Ref



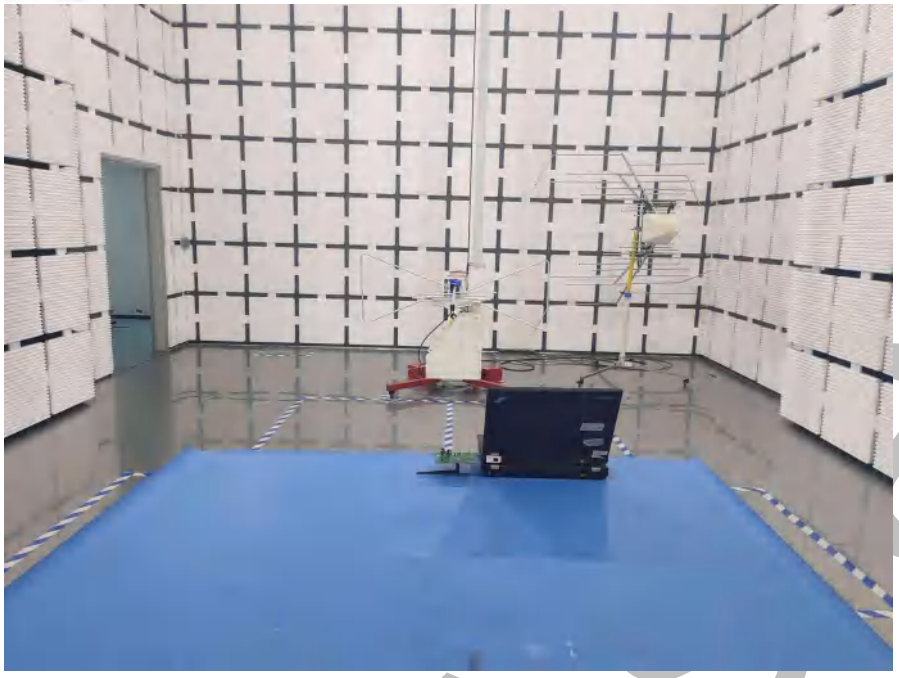
Tx. Spurious NVNT n40 2452MHz Ant1 Emission


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
04:14:19 PM May 07, 2022
Ref Offset 2.04 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.465 GHz
-5.798 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 2.465 GHz -5.798 dBm
2 N 1 f 25.124 GHz -46.046 dBm
3 N 1 f 4.980 GHz -55.951 dBm
4 N 1 f 7.468 GHz -56.342 dBm
5 N 1 f 9.797 GHz -56.787 dBm

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

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

Radiated Spurious Emissions



----END OF REPORT----

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