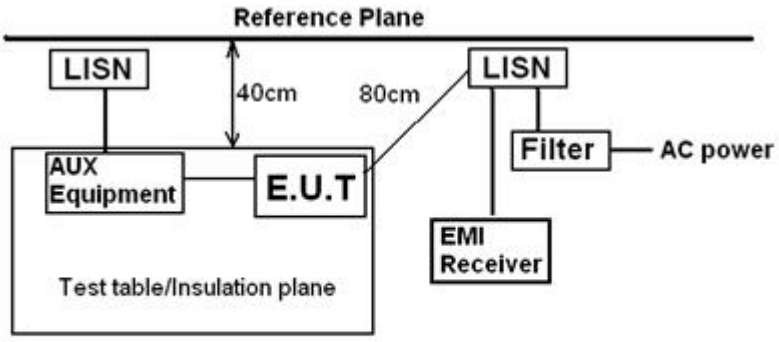
19 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Leo
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

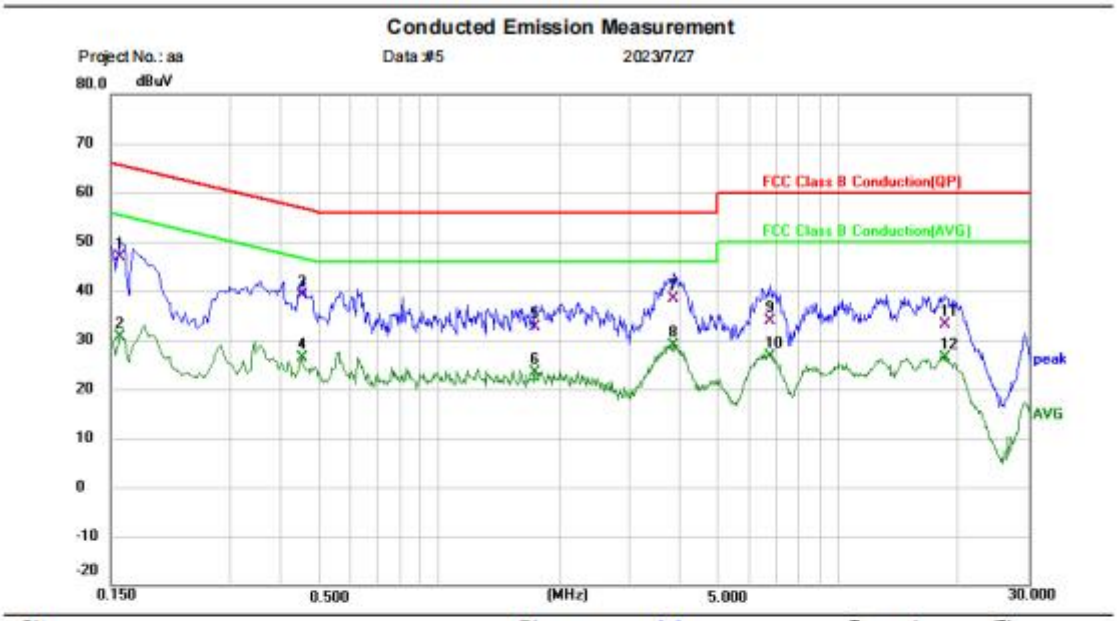
19.3 PROCEDURE

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: TX]; [Line: Line]; [Power:AC120V/60Hz]



Site
Limit: FCC Class B Conduction(QP)
EUT: LED fixed luminaire
M/N: 17000214
Mode: TX mode
Note:

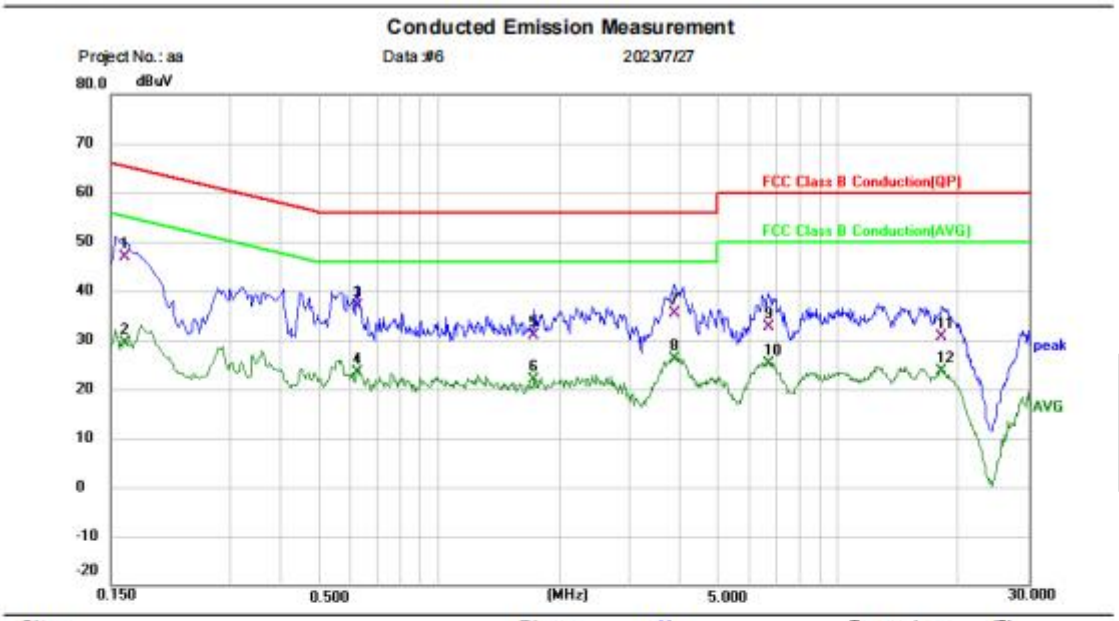
Phase: L1
Power:
Distance:
RBW: 9 KHz
VBW: 30 KHz

Temperature: (C)
Humidity: %RH
Sweep Time: 10 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		0.1580	36.38	10.48	46.86	65.57	-18.71	QP			
2		0.1580	20.22	10.48	30.70	55.57	-24.87	AVG			
3		0.4500	29.03	10.08	39.11	56.88	-17.77	QP			
4		0.4500	16.31	10.08	26.39	46.88	-20.49	AVG			
5		1.7380	22.47	10.26	32.73	56.00	-23.27	QP			
6		1.7380	13.07	10.26	23.33	46.00	-22.67	AVG			
7		3.8780	28.29	10.11	38.40	56.00	-17.60	QP			
8	*	3.8780	18.72	10.11	28.83	46.00	-17.17	AVG			
9		6.7380	23.83	10.06	33.89	60.00	-26.11	QP			
10		6.7380	16.57	10.06	26.63	50.00	-23.37	AVG			
11		18.5620	23.11	10.00	33.11	60.00	-26.89	QP			
12		18.5620	16.50	10.00	26.50	50.00	-23.50	AVG			

Test Result: Pass

[TestMode: TX]; [Line: Nutral] ;[Power:AC120V/60Hz]



Site
Limit: FCC Class B Conduction(QP)
EUT: LED fixed luminaire
M/N: 17000214
Mode: TX mode
Note:

Phase: N
Power:
Distance:
RBW: 9 KHz
VBW: 30 KHz

Temperature: (C)
Humidity: %RH
Sweep Time: 10 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	0.1620	36.45	10.39	46.84	65.36	-18.52	QP			
2		0.1620	18.89	10.39	29.28	55.36	-26.08	AVG			
3		0.6220	26.96	10.03	36.99	56.00	-19.01	QP			
4		0.6220	13.47	10.03	23.50	46.00	-22.50	AVG			
5		1.7300	20.82	10.08	30.90	56.00	-25.10	QP			
6		1.7300	11.87	10.08	21.95	46.00	-24.05	AVG			
7		3.8940	25.39	9.91	35.30	56.00	-20.70	QP			
8		3.8940	16.14	9.91	26.05	46.00	-19.95	AVG			
9		6.7140	22.76	9.86	32.62	60.00	-27.38	QP			
10		6.7140	15.23	9.86	25.09	50.00	-24.91	AVG			
11		18.2139	20.58	10.03	30.61	60.00	-29.39	QP			
12		18.2139	13.67	10.03	23.70	50.00	-26.30	AVG			

Test Result: Pass

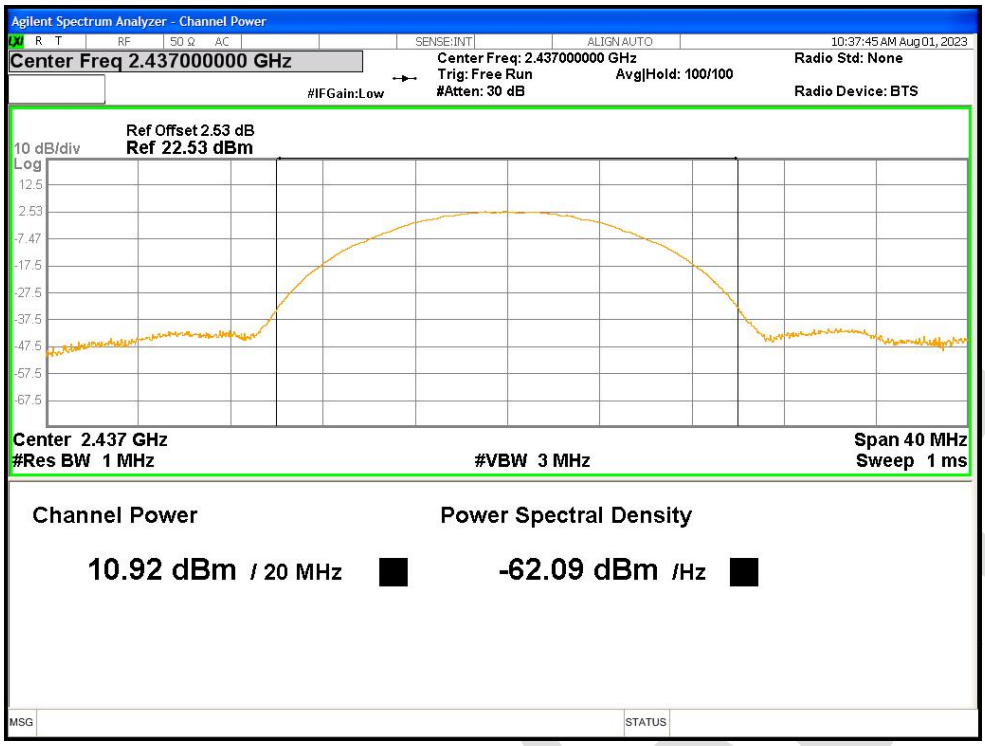
20 APPENDIX

20.1 MAXIMUM CONDUCTED OUTPUT POWER

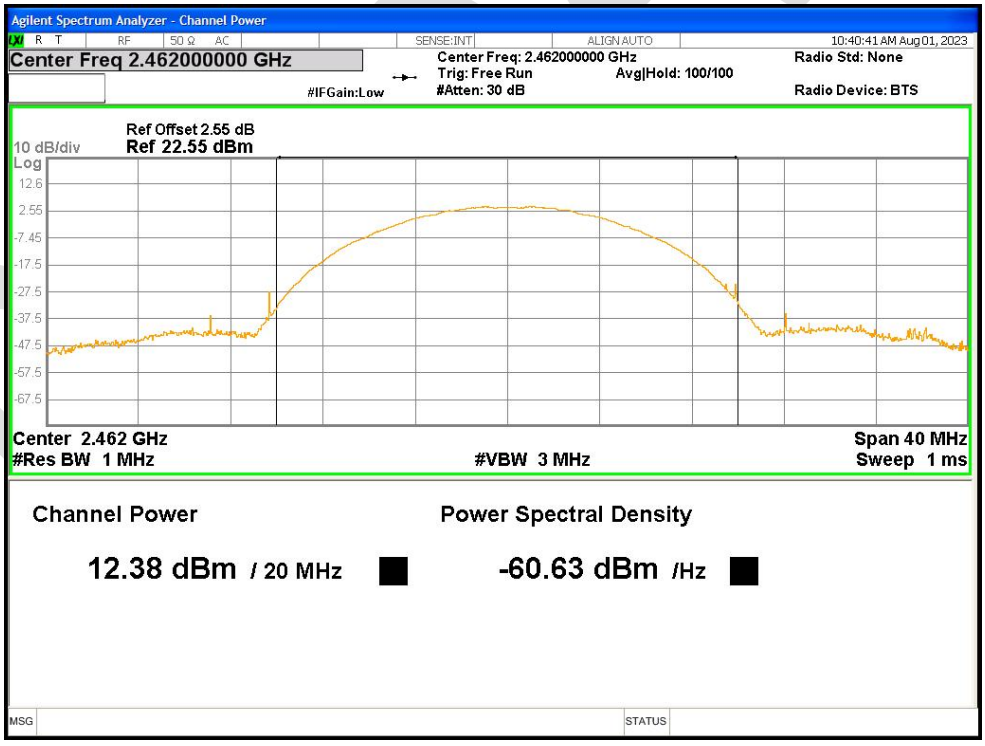
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	12.714	30	Pass
NVNT	b	2437	Ant1	10.917	30	Pass
NVNT	b	2462	Ant1	12.383	30	Pass
NVNT	g	2412	Ant1	7.887	30	Pass
NVNT	g	2437	Ant1	8.46	30	Pass
NVNT	g	2462	Ant1	9.522	30	Pass
NVNT	n20	2412	Ant1	7.869	30	Pass
NVNT	n20	2437	Ant1	8.288	30	Pass
NVNT	n20	2462	Ant1	9.722	30	Pass
NVNT	n40	2422	Ant1	7.734	30	Pass
NVNT	n40	2437	Ant1	8.241	30	Pass
NVNT	n40	2452	Ant1	8.849	30	Pass

Power NVNT b 2412MHz Ant1

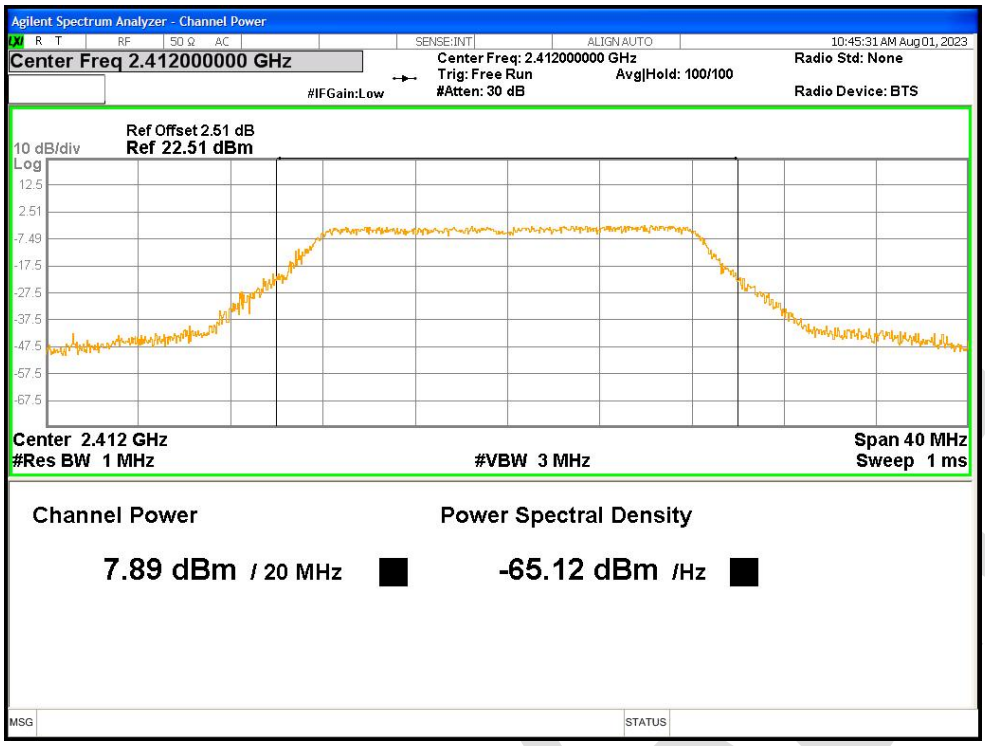
Power NVNT b 2437MHz Ant1



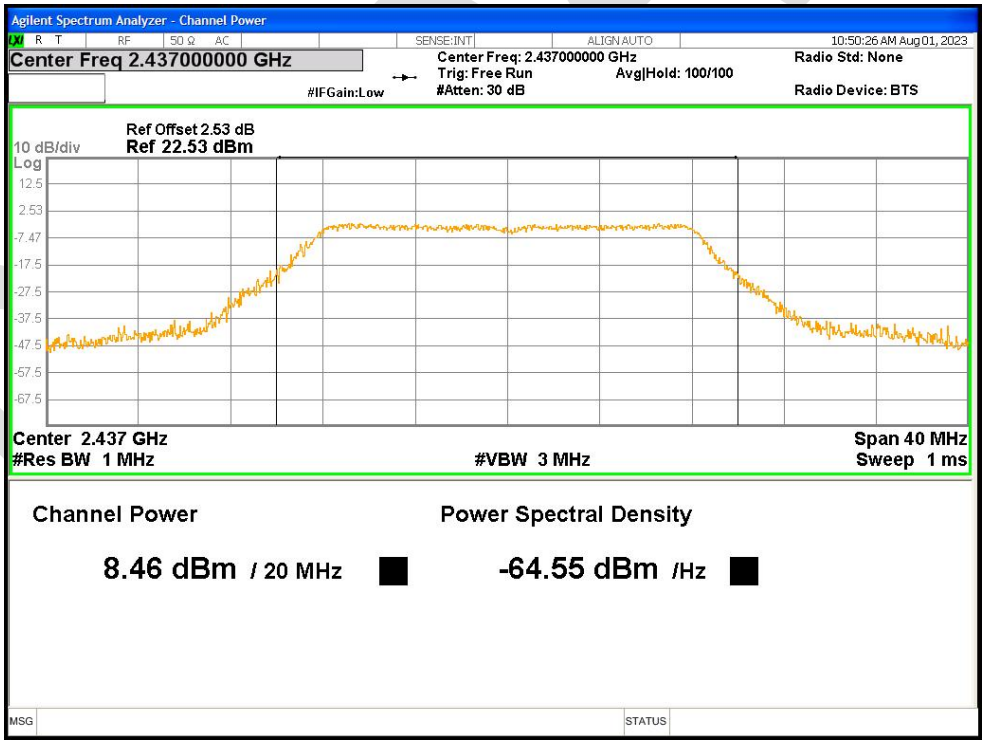
Power NVNT b 2462MHz Ant1



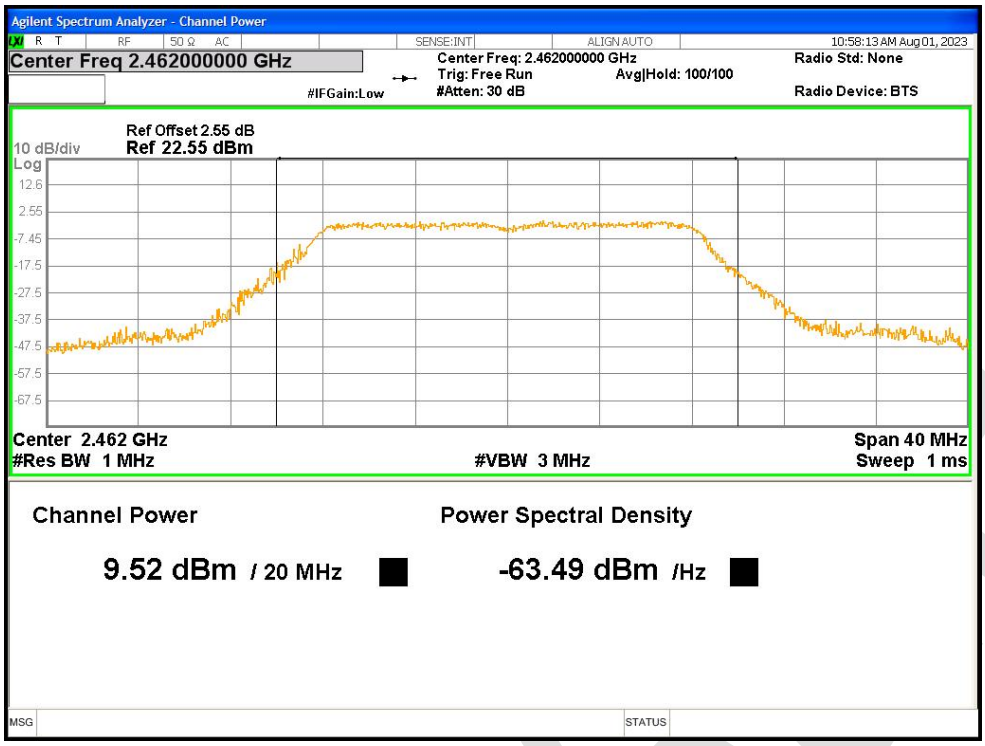
Power NVNT g 2412MHz Ant1



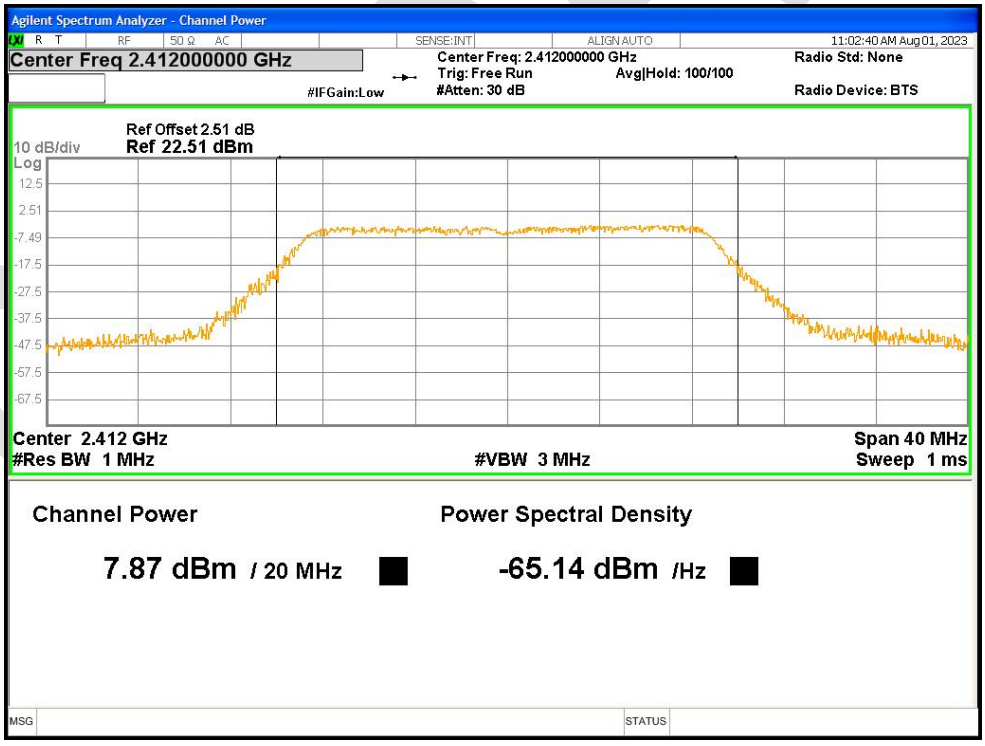
Power NVNT g 2437MHz Ant1



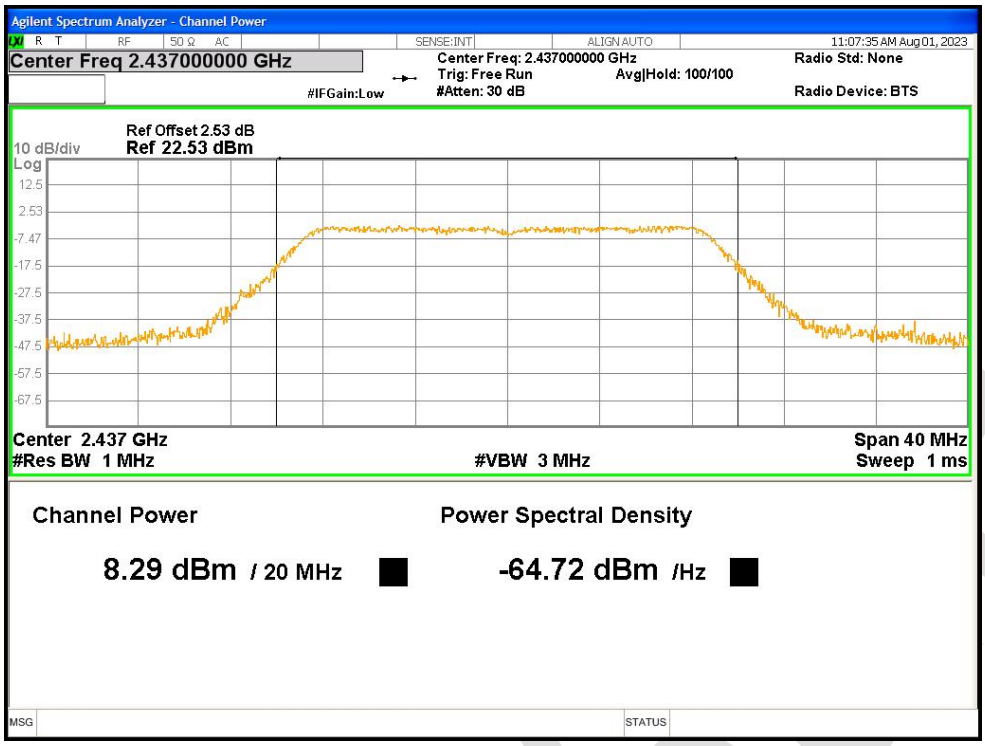
Power NVNT g 2462MHz Ant1



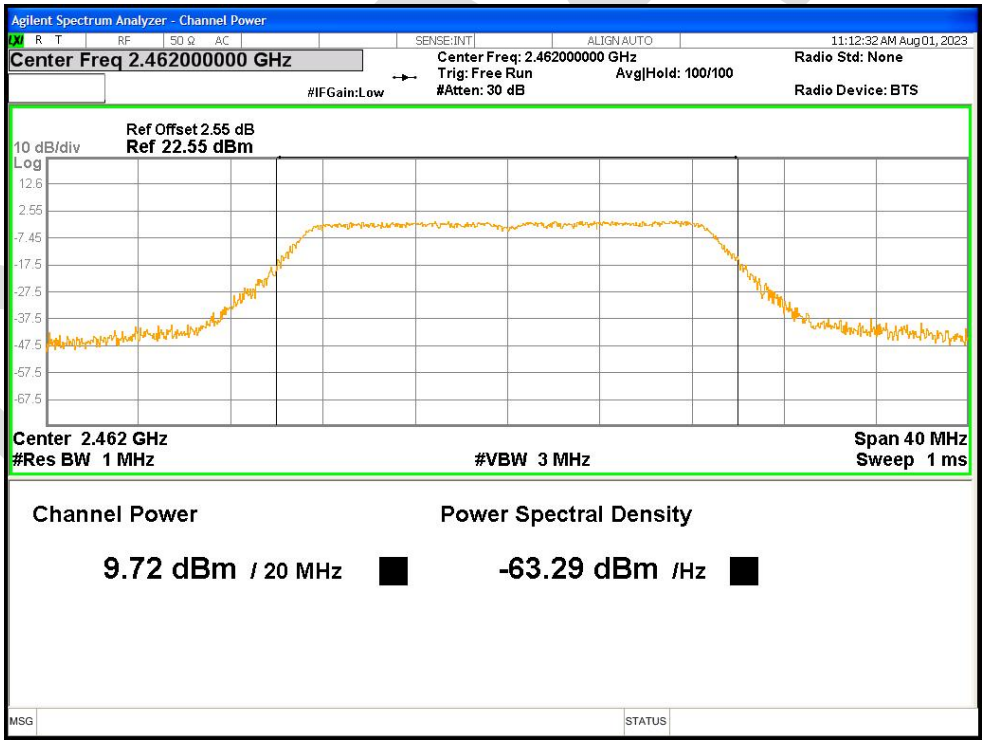
Power NVNT n20 2412MHz Ant1



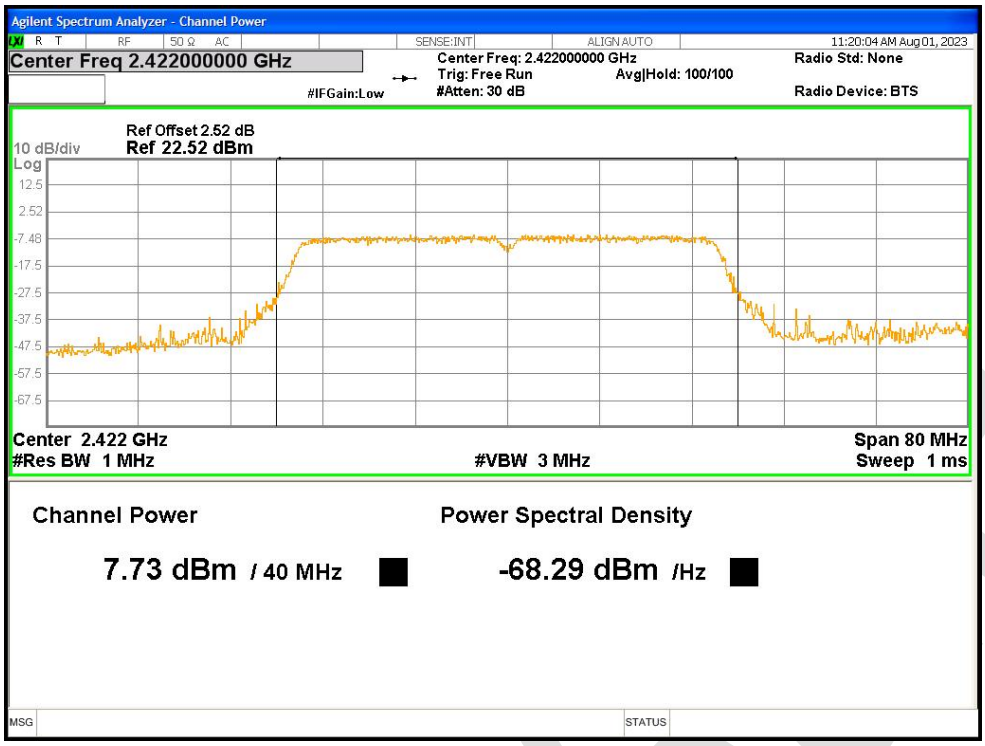
Power NVNT n20 2437MHz Ant1



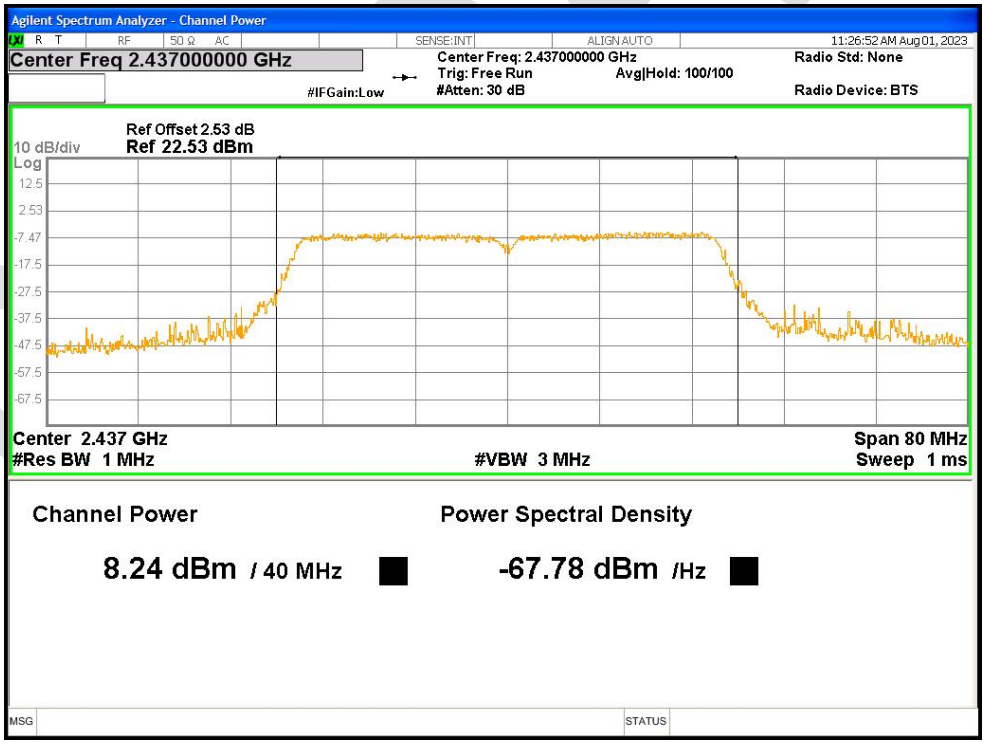
Power NVNT n20 2462MHz Ant1



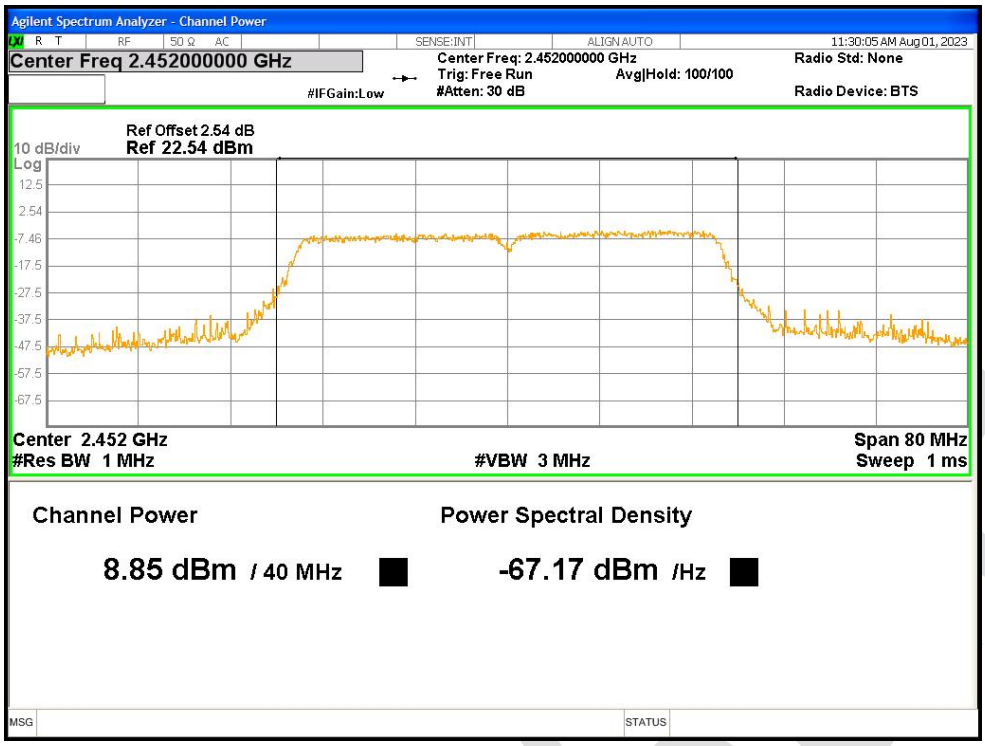
Power NVNT n40 2422MHz Ant1



Power NVNT n40 2437MHz Ant1



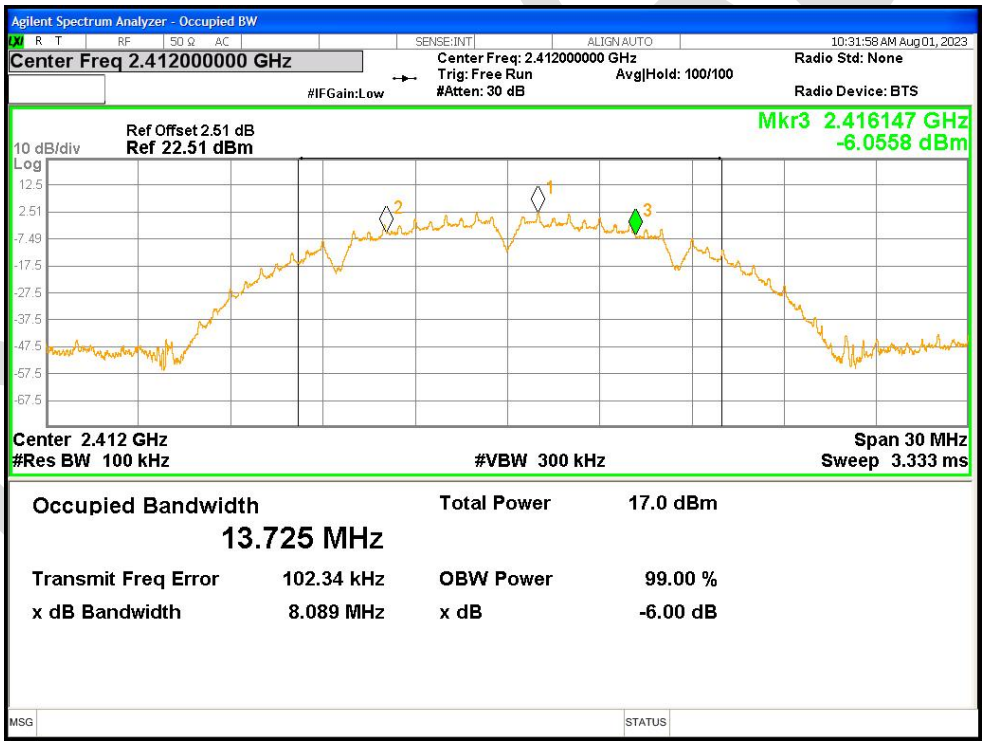
Power NVNT n40 2452MHz Ant1


Agilent Spectrum Analyzer - Channel Power
RT RF 50 Ω AC SENSE:INT ALIGN AUTO 11:30:05 AM Aug 01, 2023
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
8.85 dBm / 40 MHz
Power Spectral Density
-67.17 dBm /Hz
MSG
STATUS

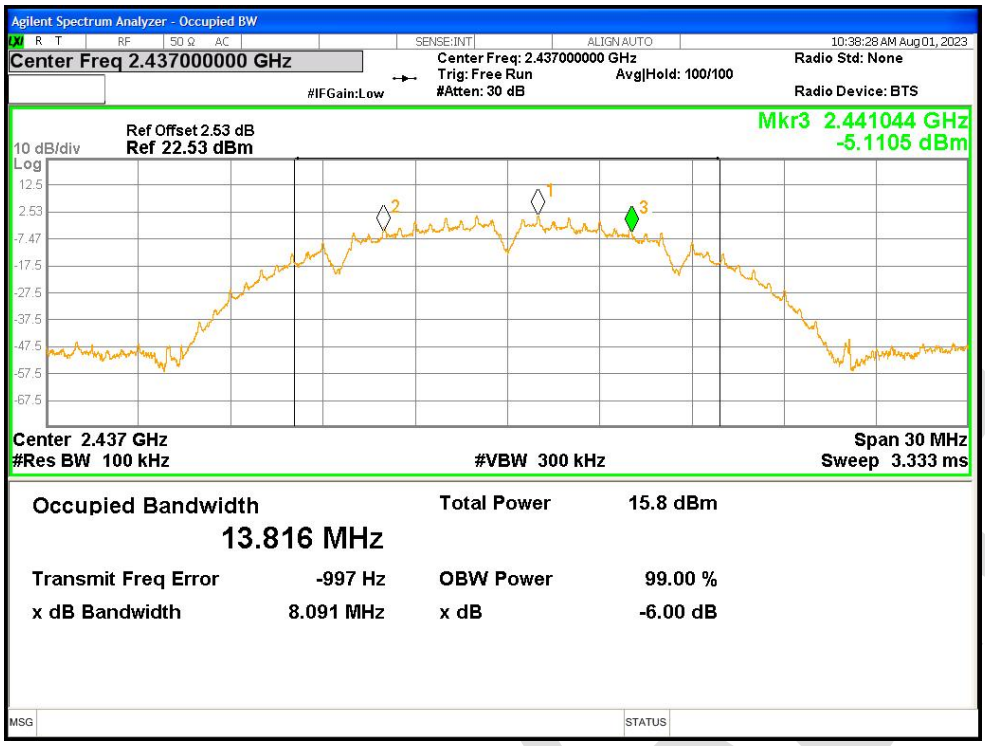
20.2 -6DB BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	8.089	0.5	Pass
NVNT	b	2437	Ant1	8.091	0.5	Pass
NVNT	b	2462	Ant1	8.088	0.5	Pass
NVNT	g	2412	Ant1	16.371	0.5	Pass
NVNT	g	2437	Ant1	16.338	0.5	Pass
NVNT	g	2462	Ant1	16.356	0.5	Pass
NVNT	n20	2412	Ant1	17.58	0.5	Pass
NVNT	n20	2437	Ant1	17.572	0.5	Pass
NVNT	n20	2462	Ant1	17.554	0.5	Pass
NVNT	n40	2422	Ant1	35.934	0.5	Pass
NVNT	n40	2437	Ant1	35.903	0.5	Pass
NVNT	n40	2452	Ant1	35.708	0.5	Pass

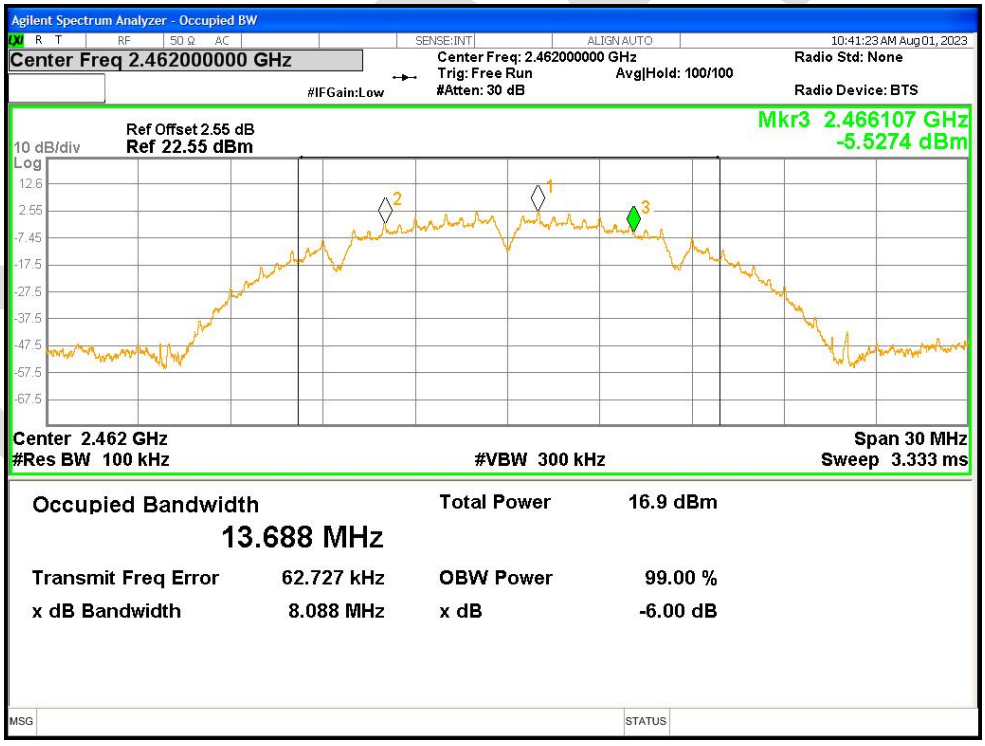
-6dB Bandwidth NVNT b 2412MHz Ant1



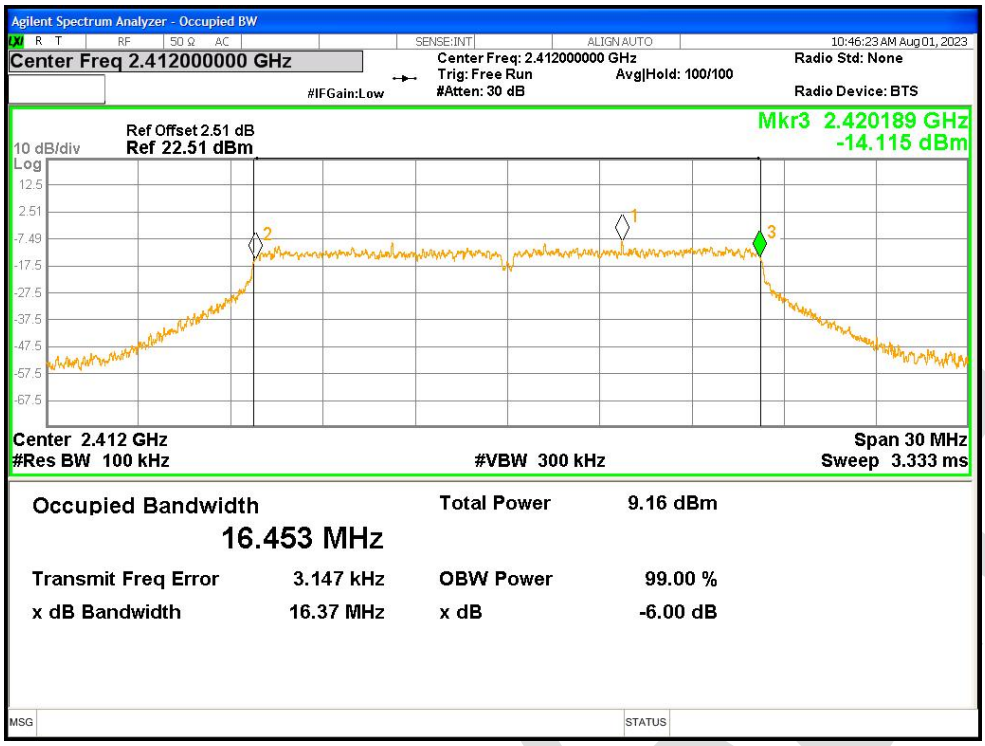
-6dB Bandwidth NVNT b 2437MHz Ant1



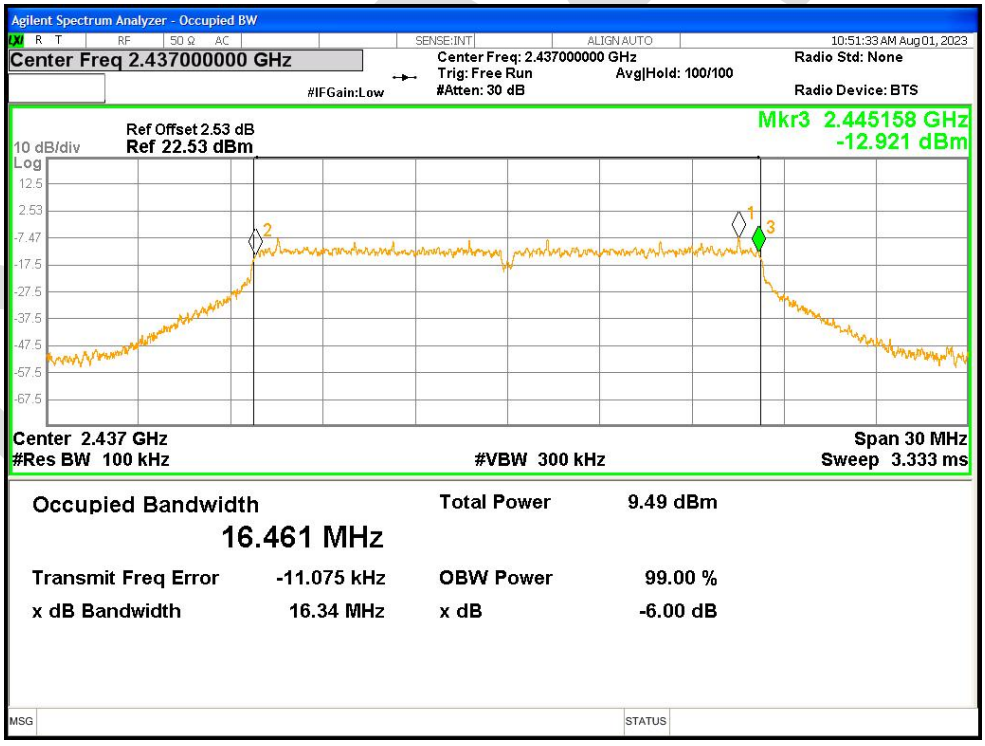
-6dB Bandwidth NVNT b 2462MHz Ant1



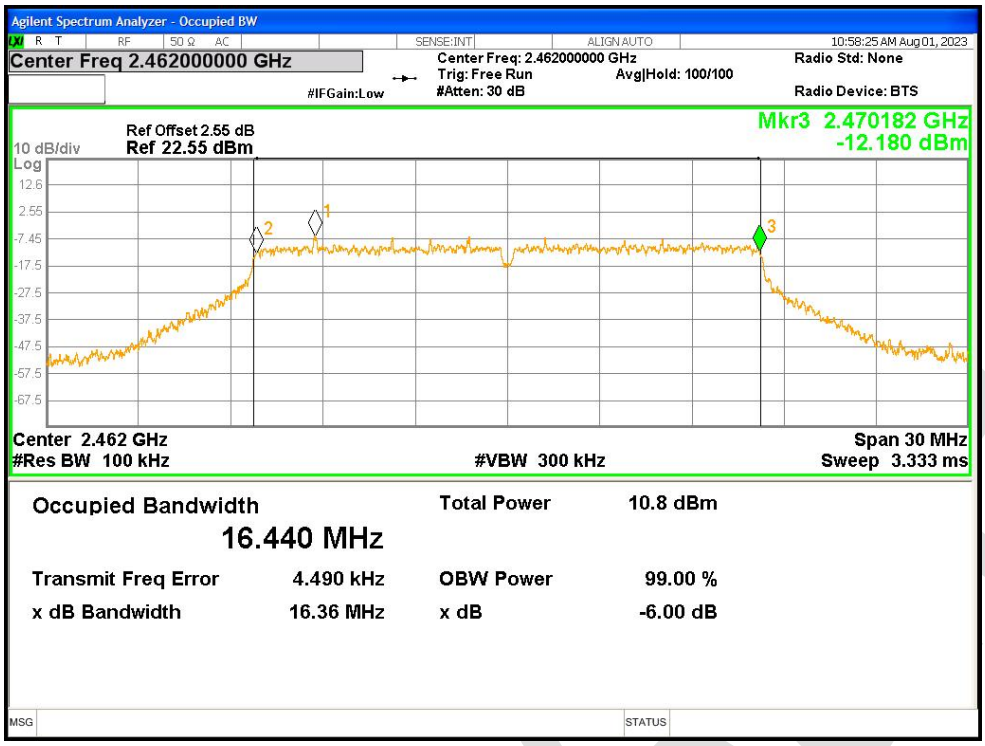
-6dB Bandwidth NVNT g 2412MHz Ant1



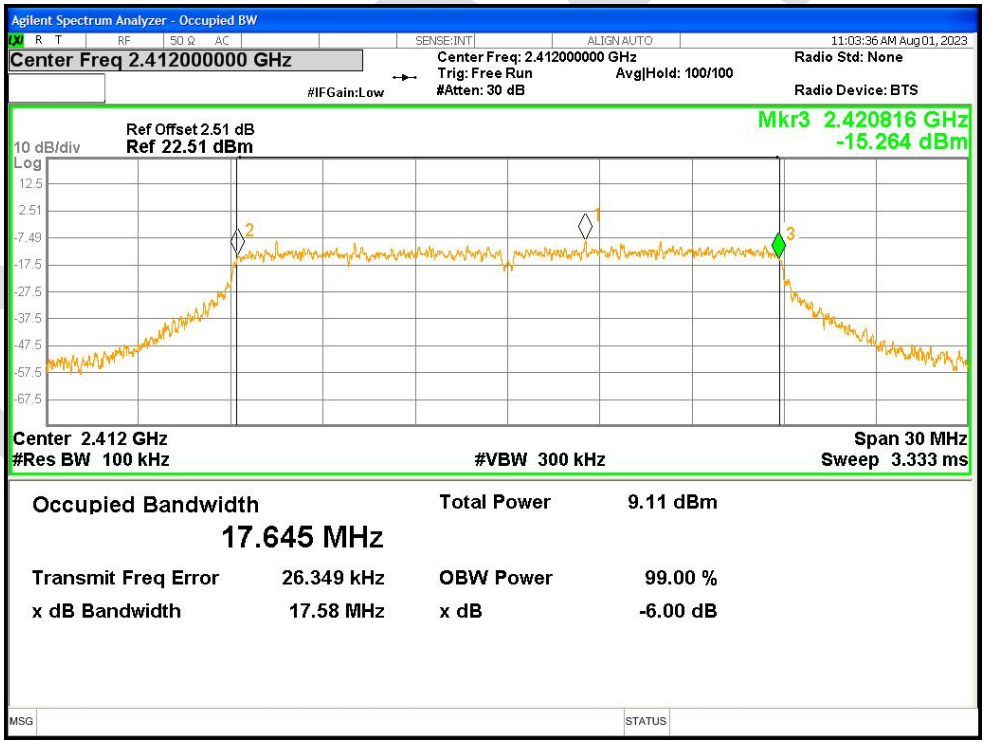
-6dB Bandwidth NVNT g 2437MHz Ant1



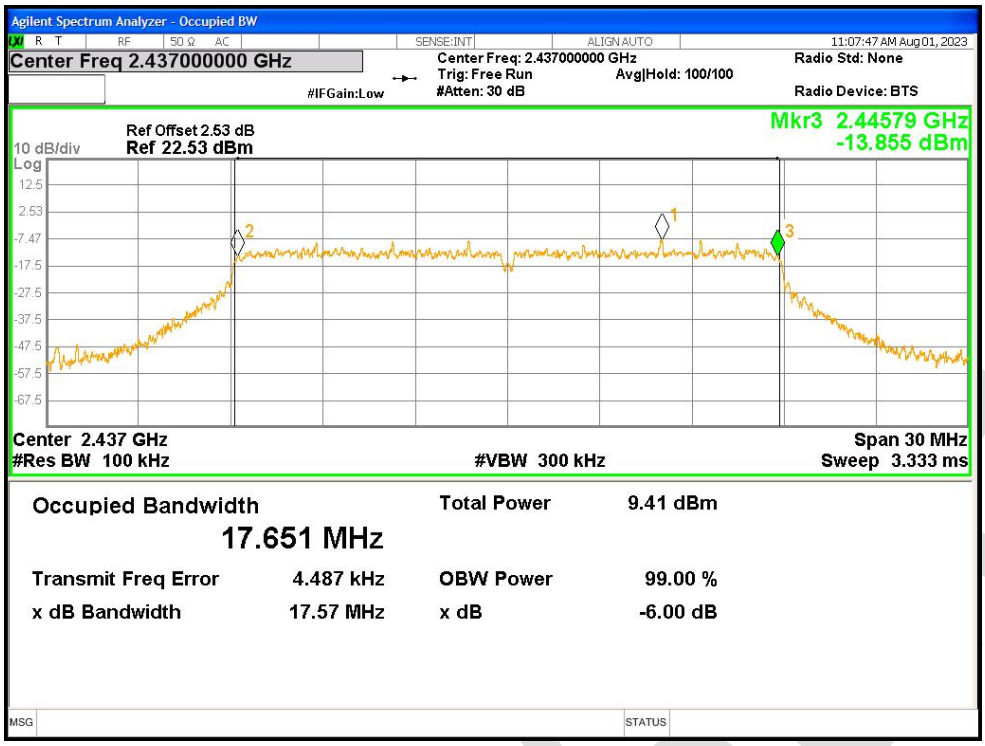
-6dB Bandwidth NVNT g 2462MHz Ant1



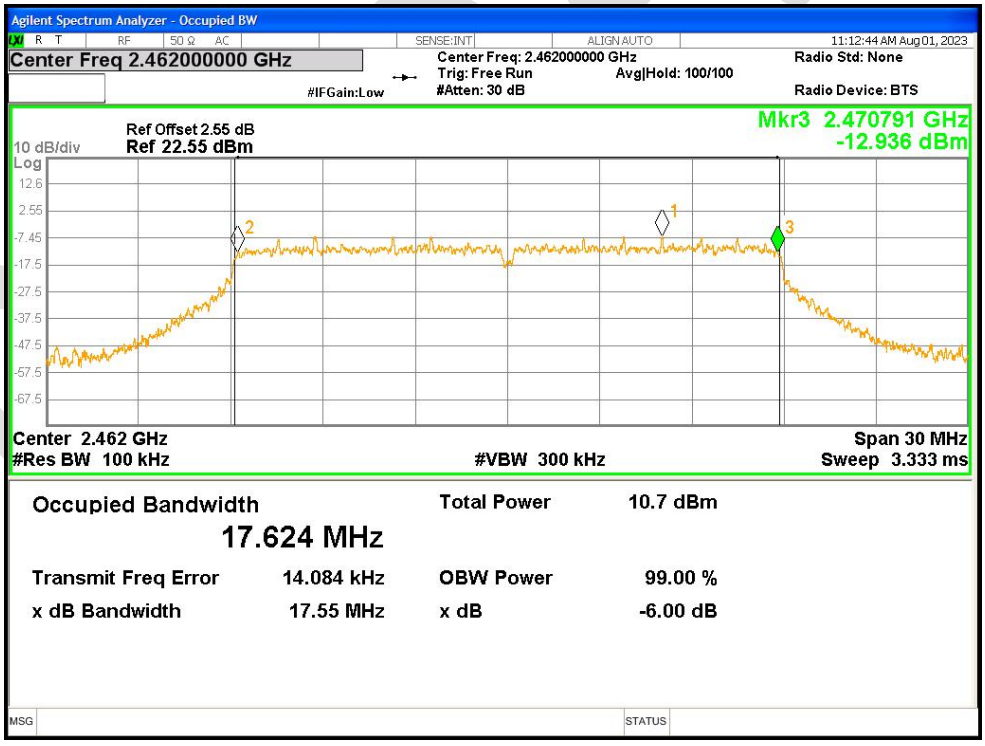
-6dB Bandwidth NVNT n20 2412MHz Ant1



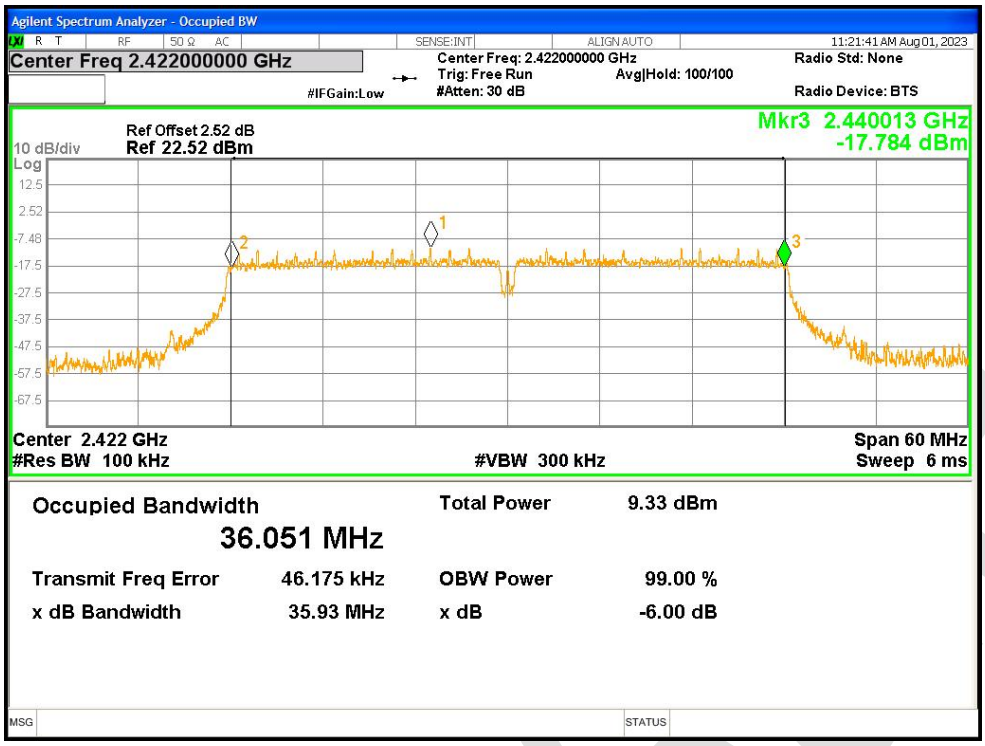
-6dB Bandwidth NVNT n20 2437MHz Ant1



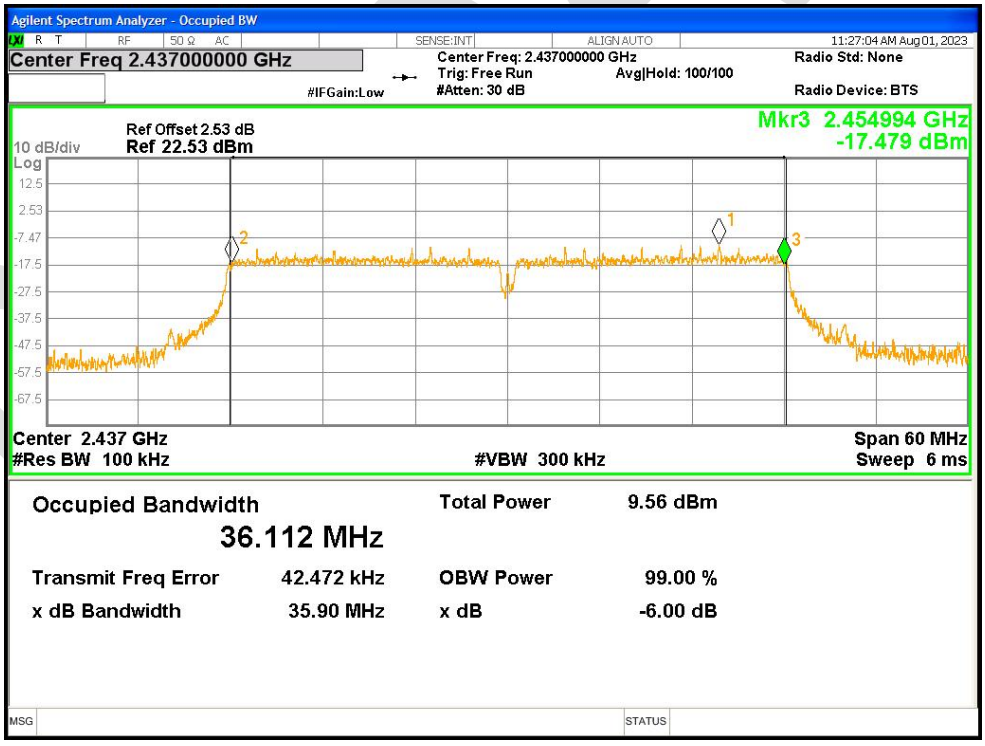
-6dB Bandwidth NVNT n20 2462MHz Ant1



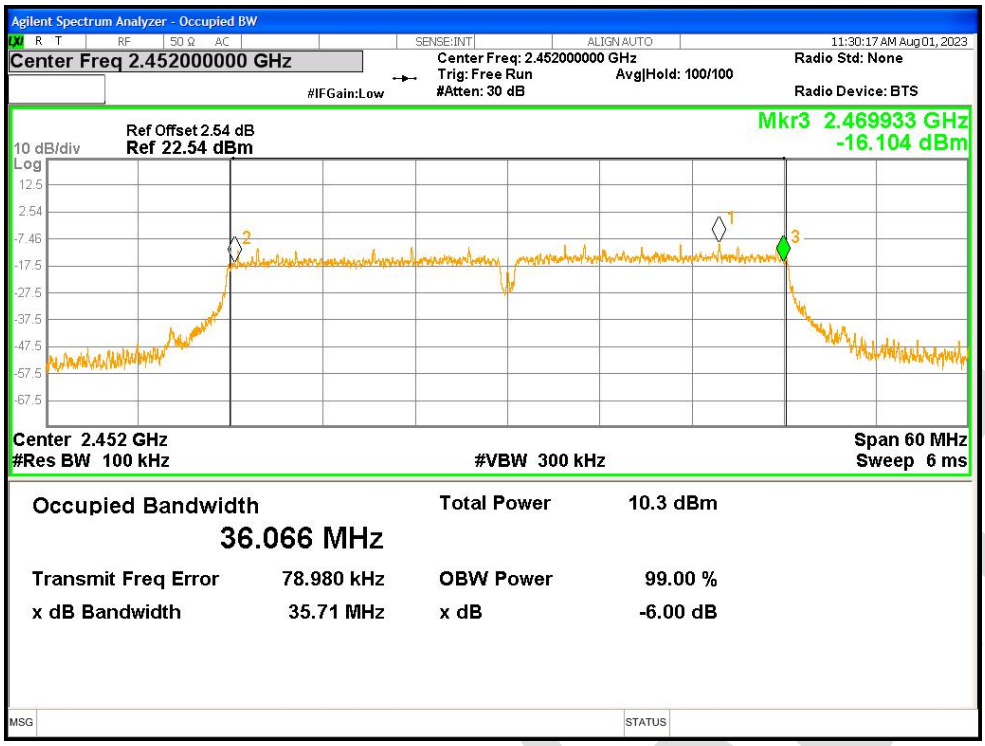
-6dB Bandwidth NVNT n40 2422MHz Ant1



-6dB Bandwidth NVNT n40 2437MHz Ant1



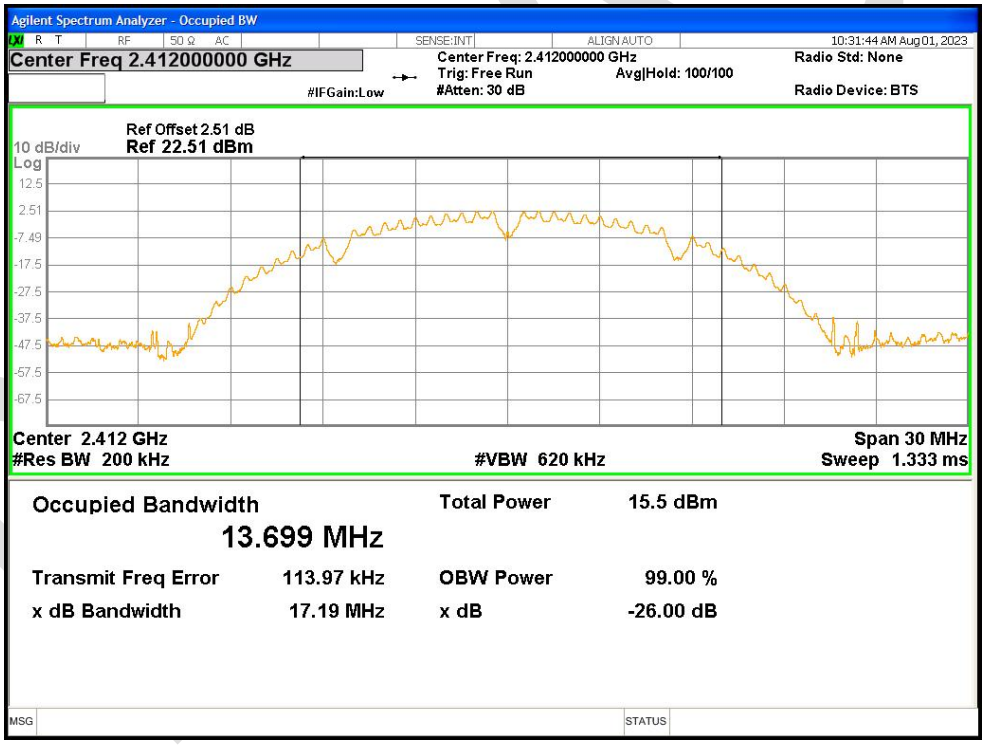
-6dB Bandwidth NVNT n40 2452MHz Ant1


Agilent Spectrum Analyzer - Occupied BW
RT
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
11:30:17 AM Aug 01, 2023
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 2.469933 GHz
-16.104 dBm
Center 2.452 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 6 ms
Occupied Bandwidth
36.066 MHz
Total Power 10.3 dBm
Transmit Freq Error 78.980 kHz
OBW Power 99.00 %
x dB Bandwidth 35.71 MHz
x dB -6.00 dB
MSG
STATUS

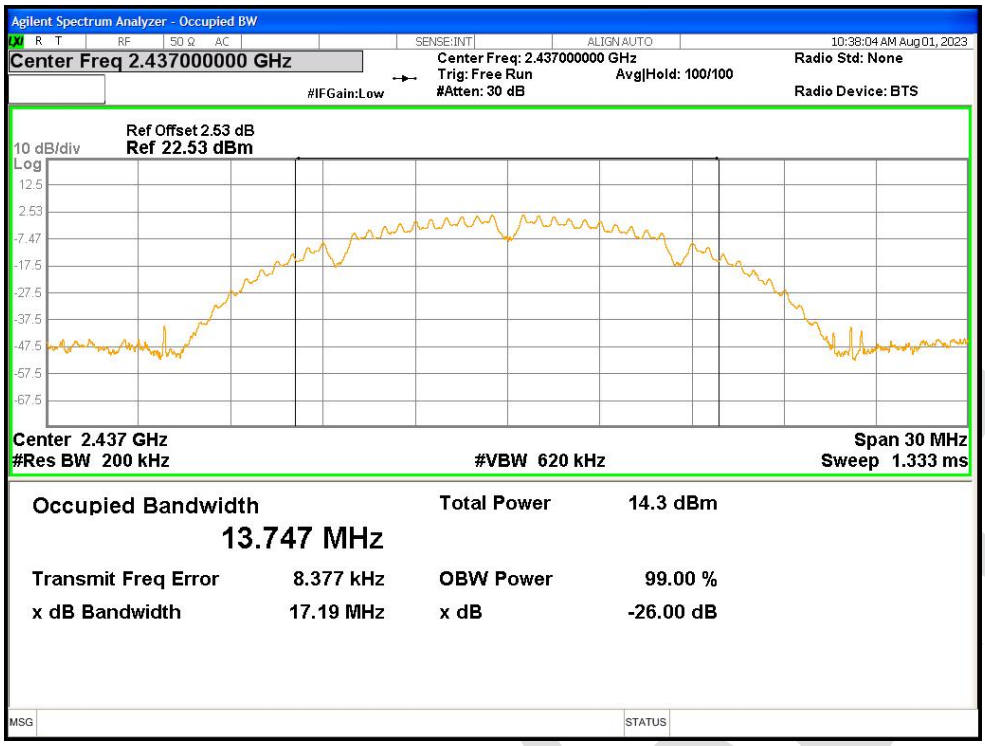
20.3 OCCUPIED CHANNEL BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	b	2412	Ant1	13.699
NVNT	b	2437	Ant1	13.747
NVNT	b	2462	Ant1	13.617
NVNT	g	2412	Ant1	16.554
NVNT	g	2437	Ant1	16.554
NVNT	g	2462	Ant1	16.542
NVNT	n20	2412	Ant1	17.728
NVNT	n20	2437	Ant1	17.755
NVNT	n20	2462	Ant1	17.691
NVNT	n40	2422	Ant1	36.128
NVNT	n40	2437	Ant1	36.246
NVNT	n40	2452	Ant1	36.164

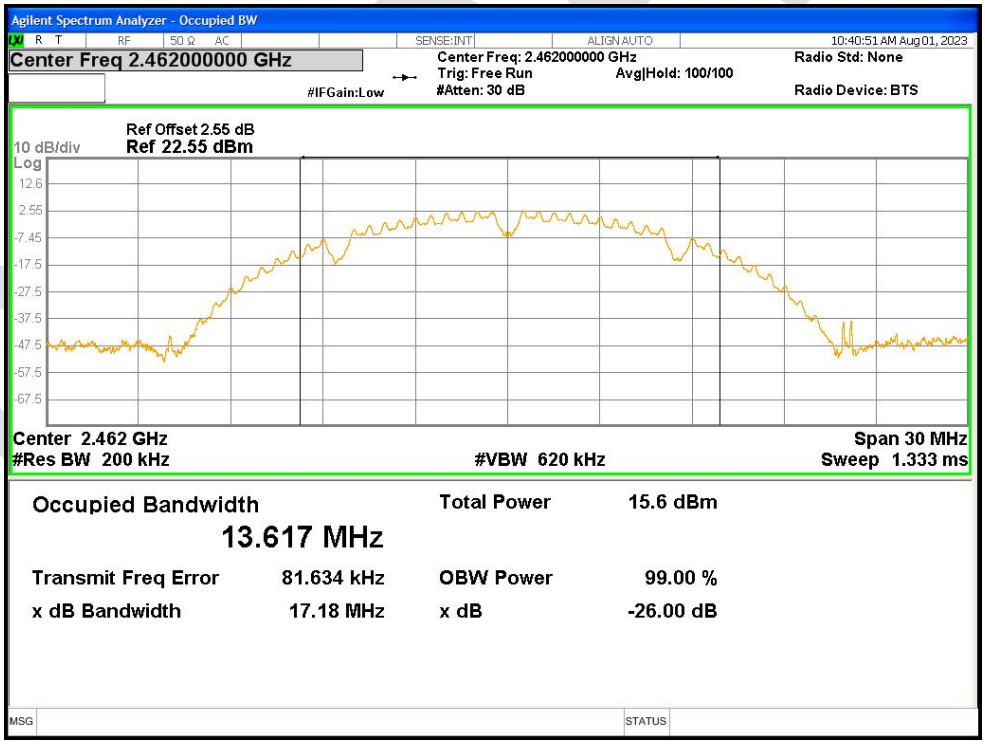
OBW NVNT b 2412MHz Ant1



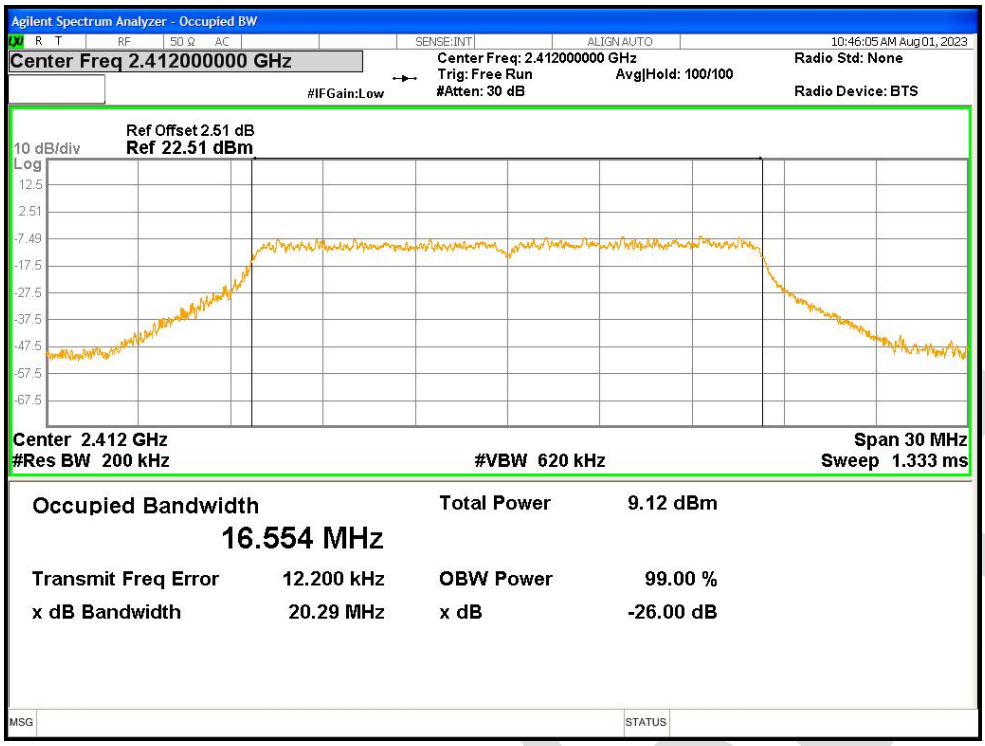
OBW NVNT b 2437MHz Ant1



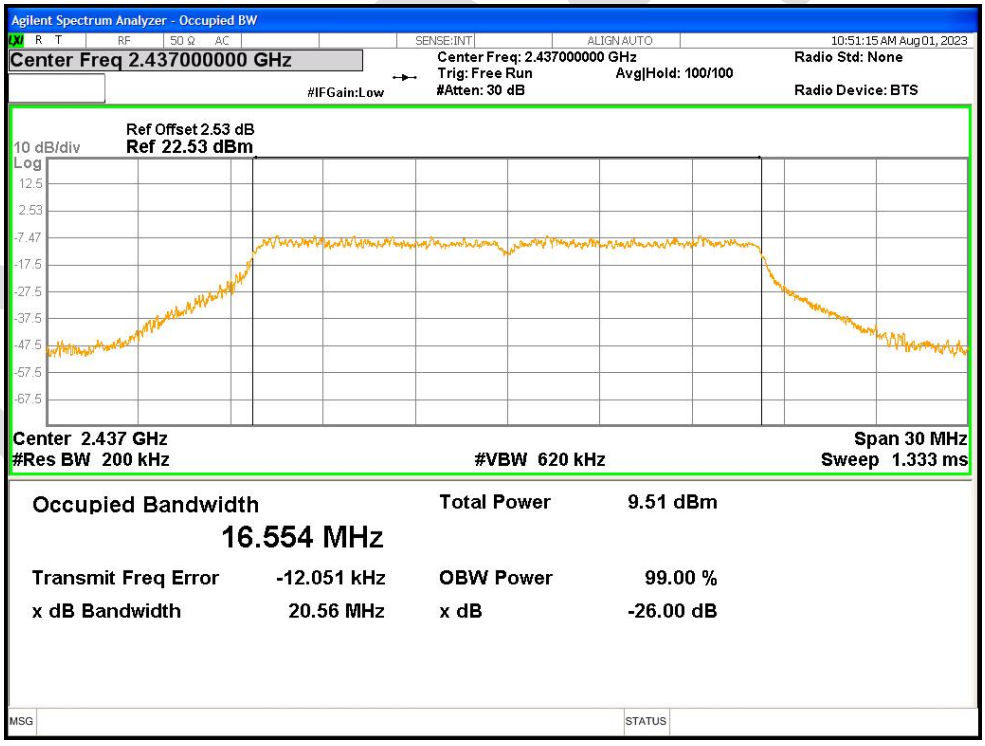
OBW NVNT b 2462MHz Ant1



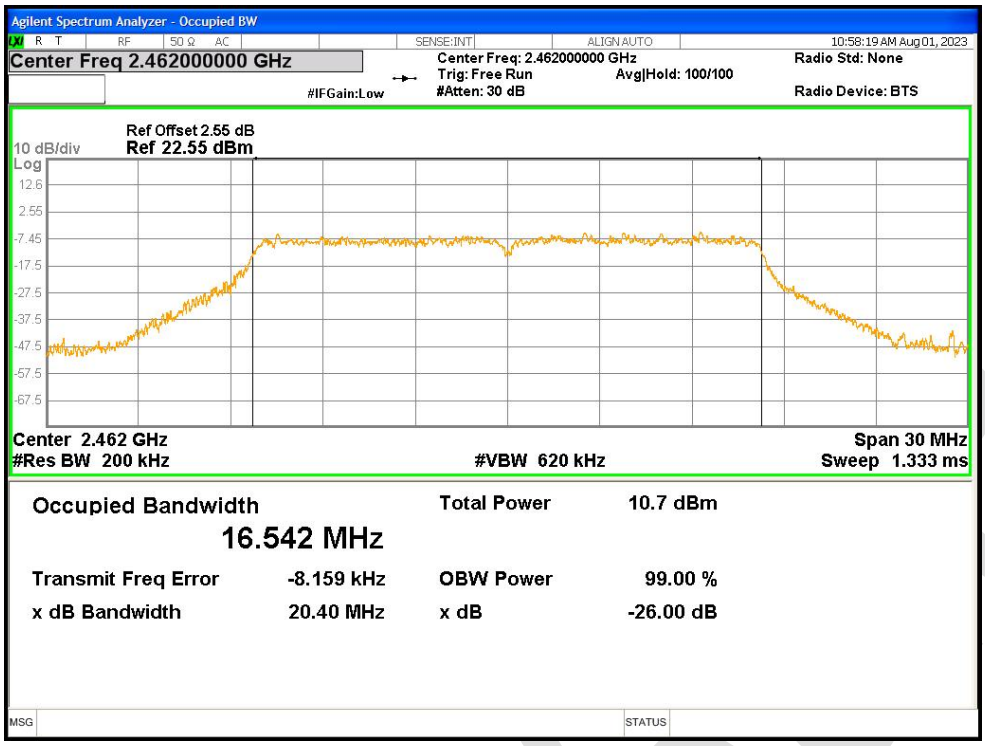
OBW NVNT g 2412MHz Ant1



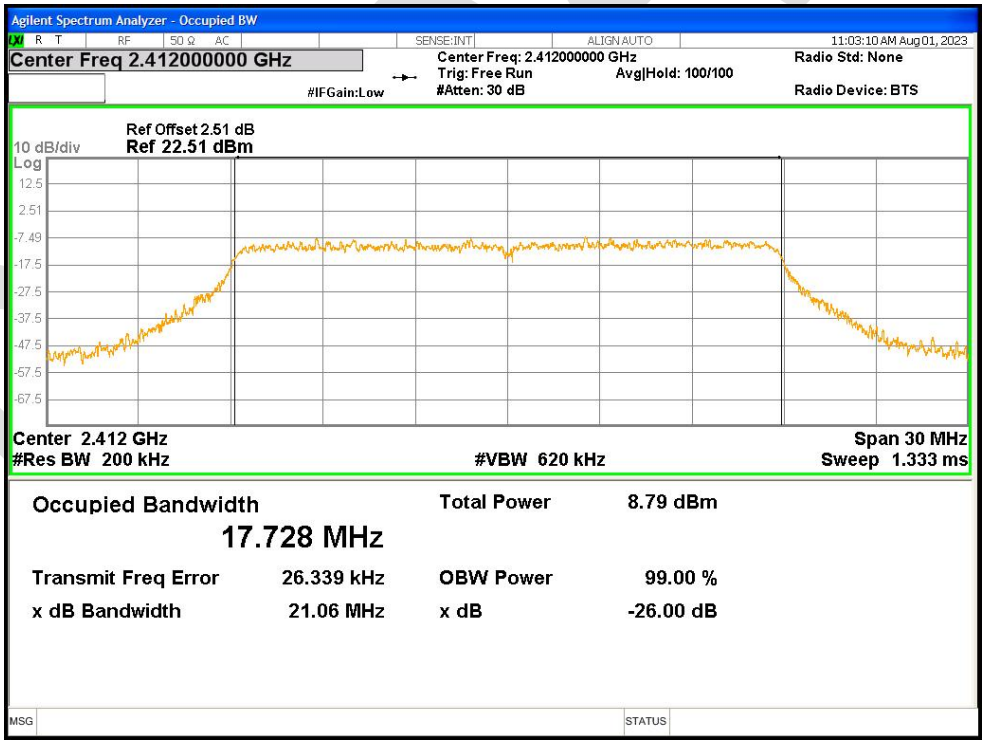
OBW NVNT g 2437MHz Ant1



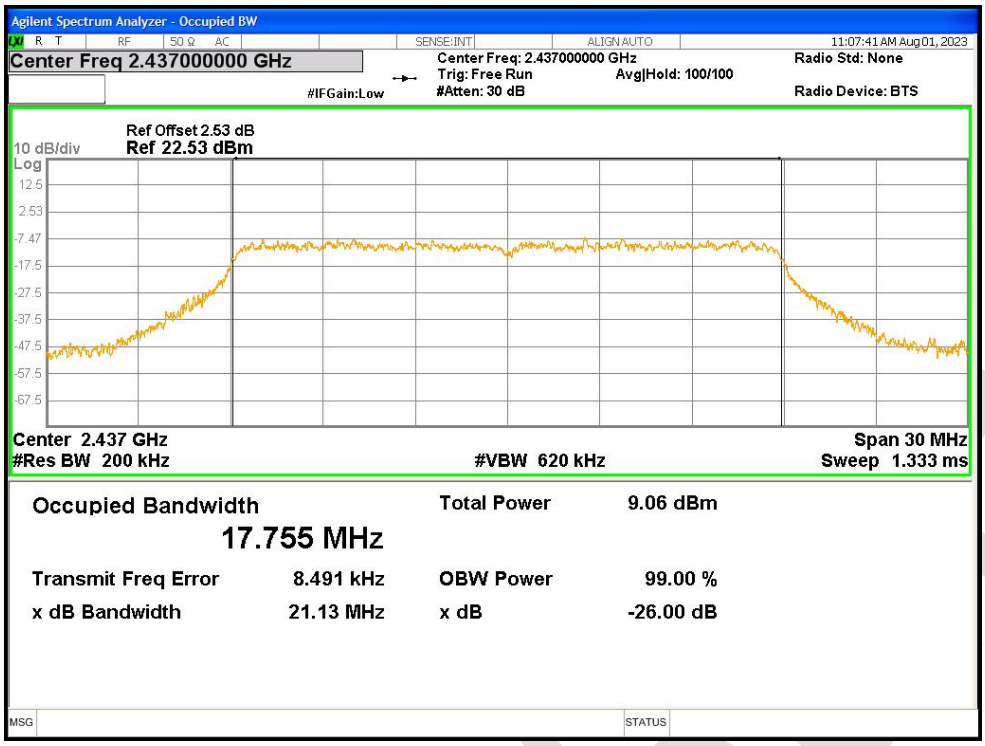
OBW NVNT g 2462MHz Ant1



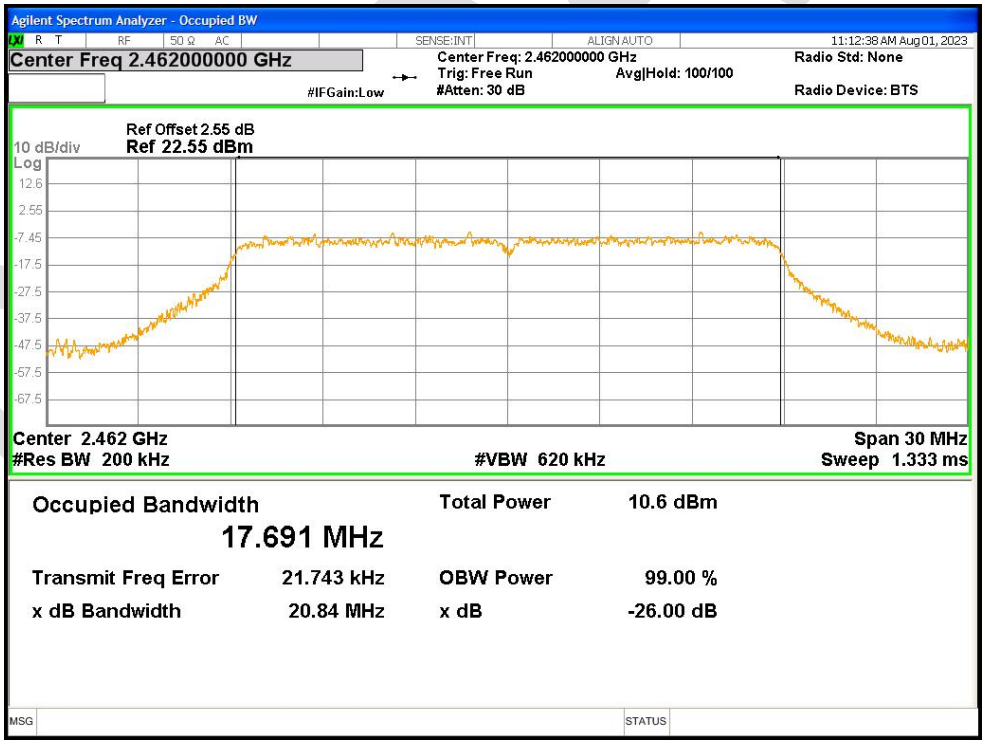
OBW NVNT n20 2412MHz Ant1



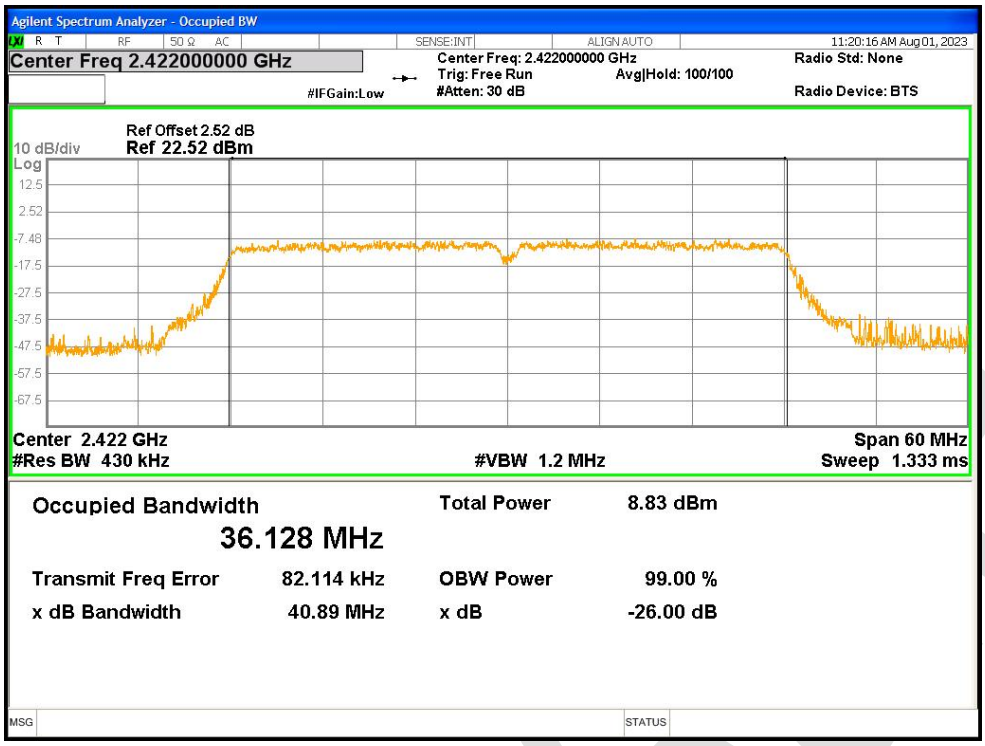
OBW NVNT n20 2437MHz Ant1



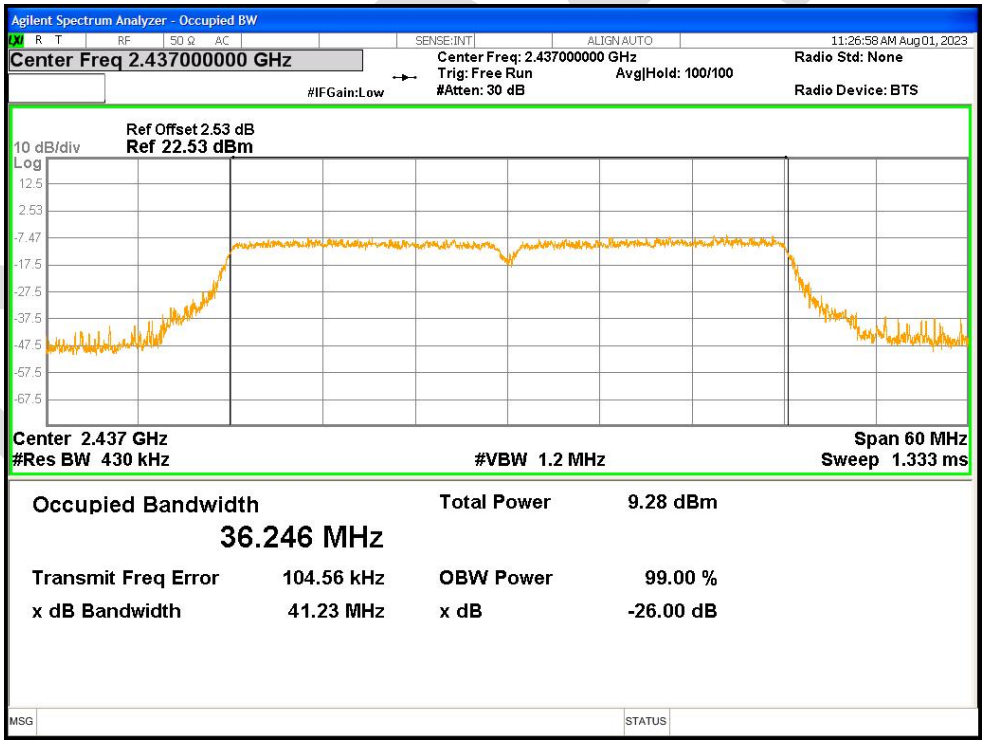
OBW NVNT n20 2462MHz Ant1



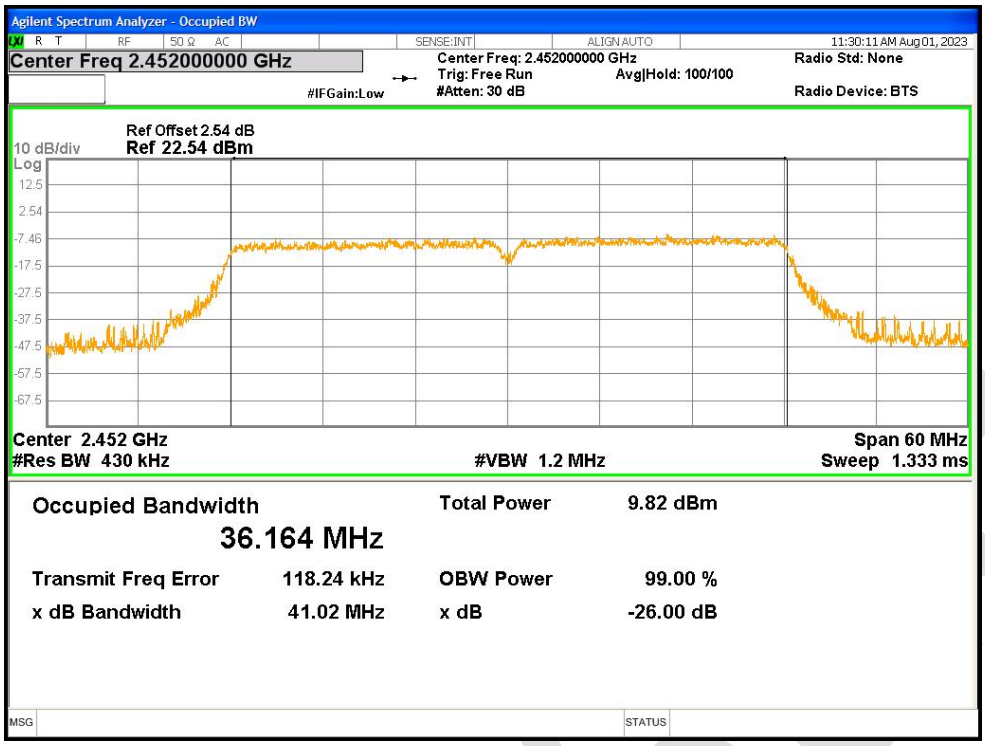
OBW NVNT n40 2422MHz Ant1



OBW NVNT n40 2437MHz Ant1



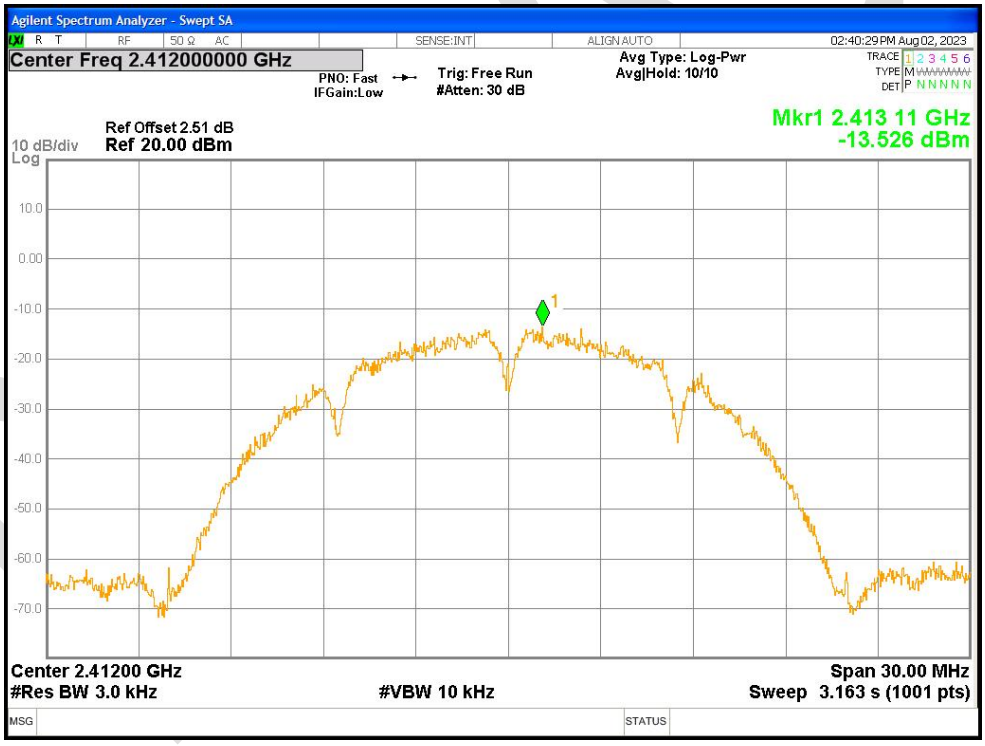
OBW NVNT n40 2452MHz Ant1


Agilent Spectrum Analyzer - Occupied BW
RT RF 50 Ω AC SENSE:INT ALIGN AUTO 11:30:11 AM Aug 01, 2023
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
36.164 MHz
Total Power 9.82 dBm
Transmit Freq Error 118.24 kHz
OBW Power 99.00 %
x dB Bandwidth 41.02 MHz
x dB -26.00 dB
MSG
STATUS

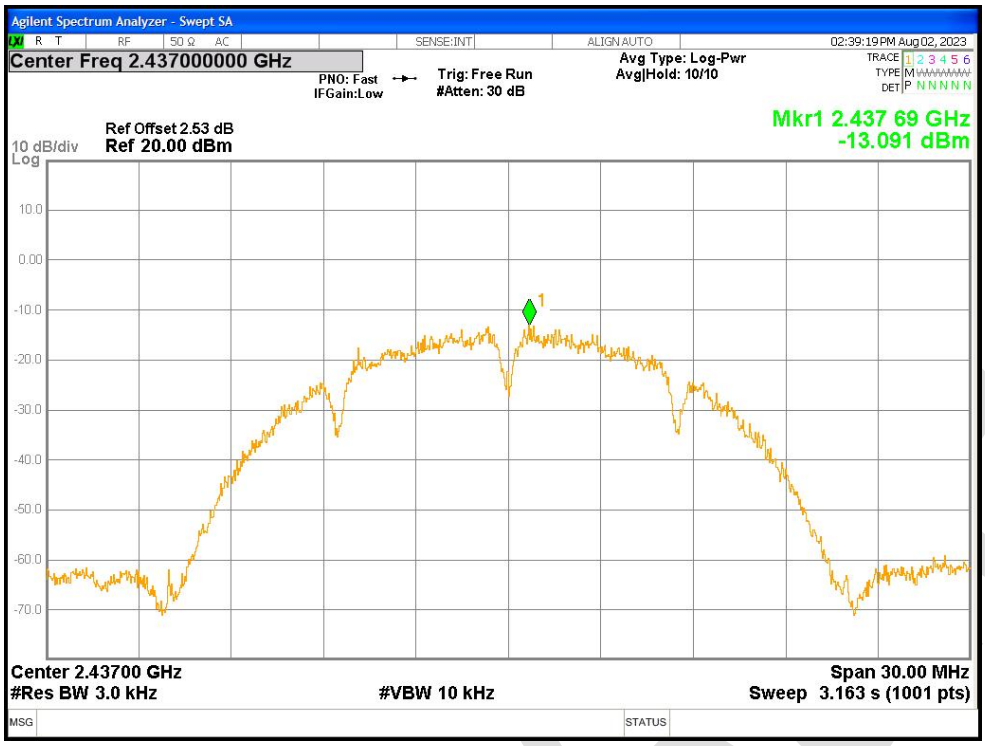
20.4 MAXIMUM POWER SPECTRAL DENSITY LEVEL

Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	-13.526	8	Pass
NVNT	b	2437	Ant1	-13.091	8	Pass
NVNT	b	2462	Ant1	-10.745	8	Pass
NVNT	g	2412	Ant1	-20.468	8	Pass
NVNT	g	2437	Ant1	-20.99	8	Pass
NVNT	g	2462	Ant1	-19.345	8	Pass
NVNT	n20	2412	Ant1	-20.437	8	Pass
NVNT	n20	2437	Ant1	-20.283	8	Pass
NVNT	n20	2462	Ant1	-18.582	8	Pass
NVNT	n40	2422	Ant1	-20.761	8	Pass
NVNT	n40	2437	Ant1	-22.234	8	Pass
NVNT	n40	2452	Ant1	-21.391	8	Pass

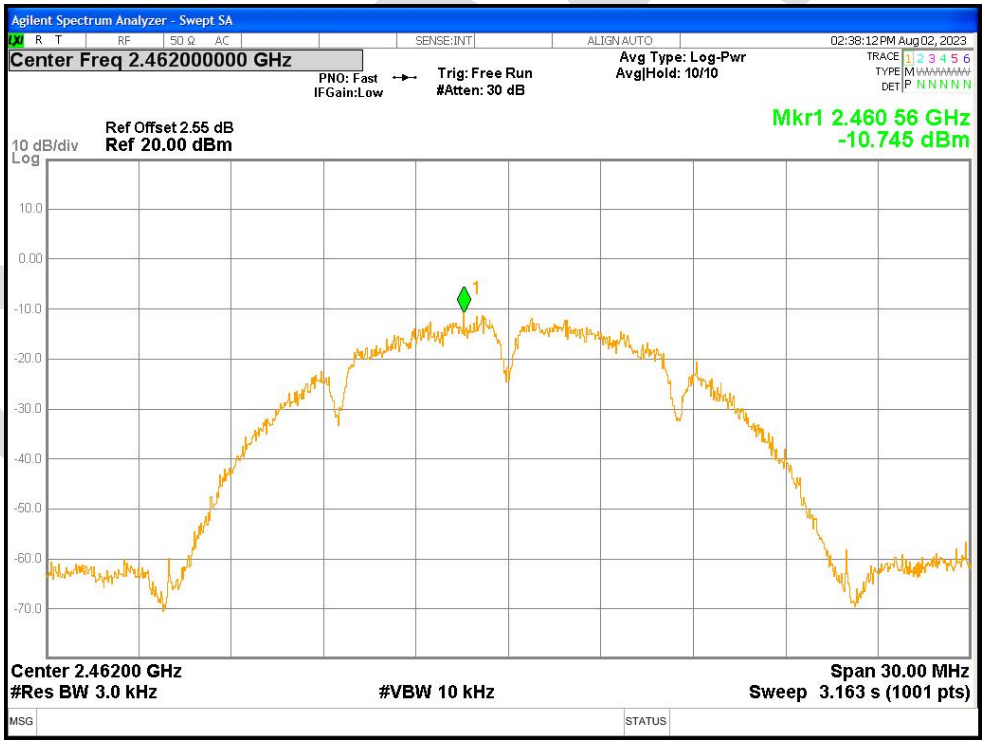
PSD NVNT b 2412MHz Ant1



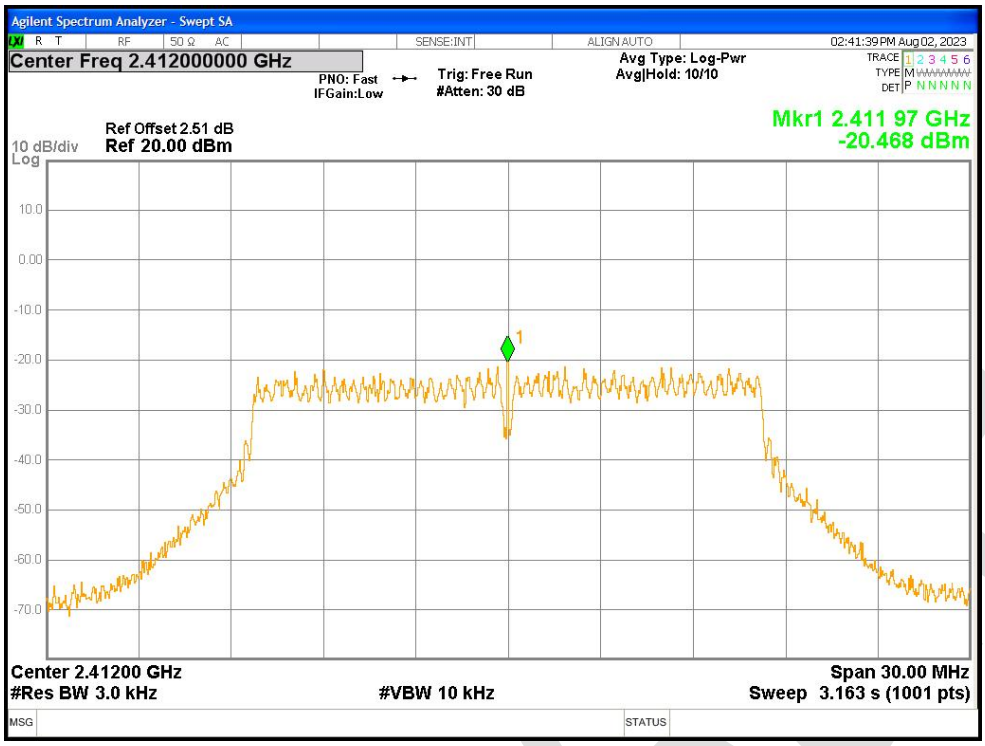
PSD NVNT b 2437MHz Ant1



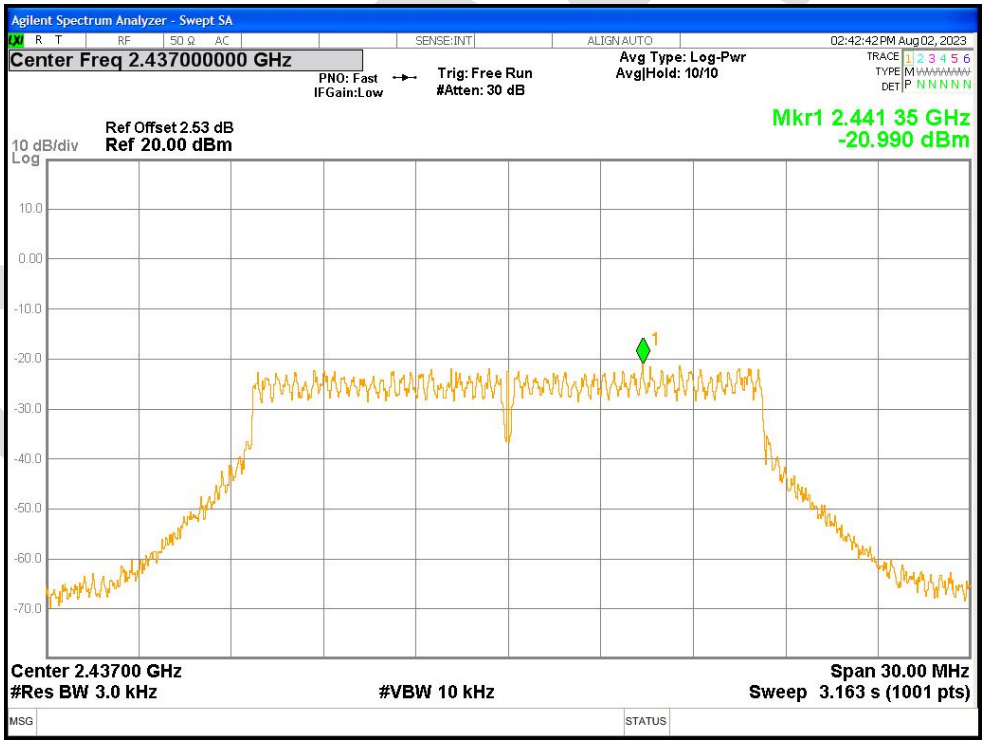
PSD NVNT b 2462MHz Ant1



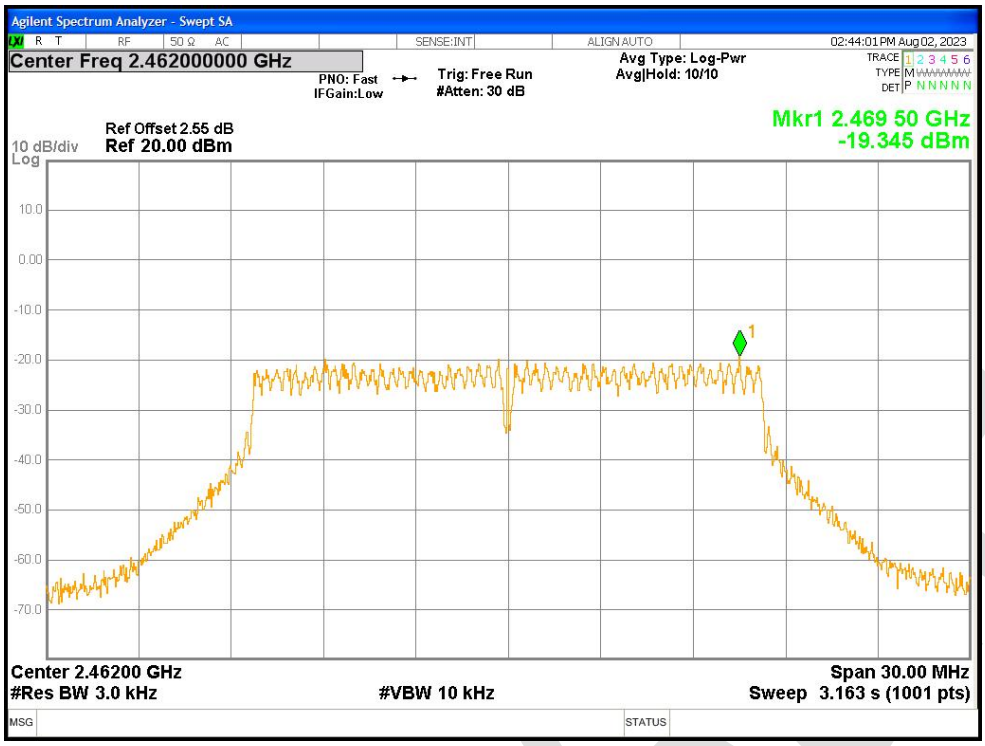
PSD NVNT g 2412MHz Ant1



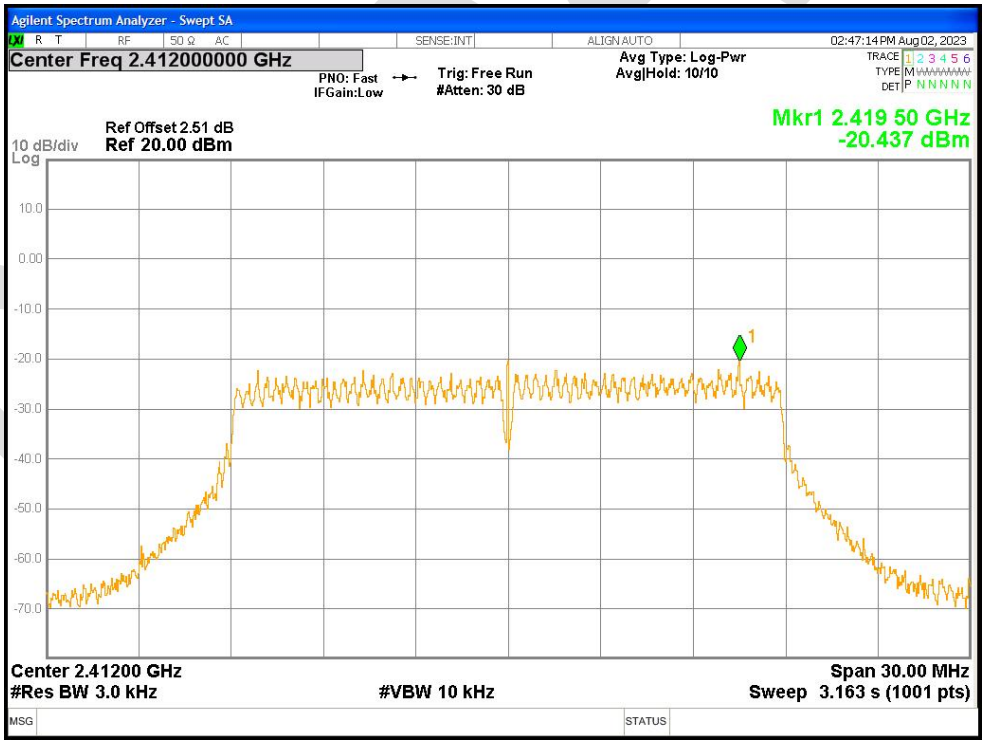
PSD NVNT g 2437MHz Ant1



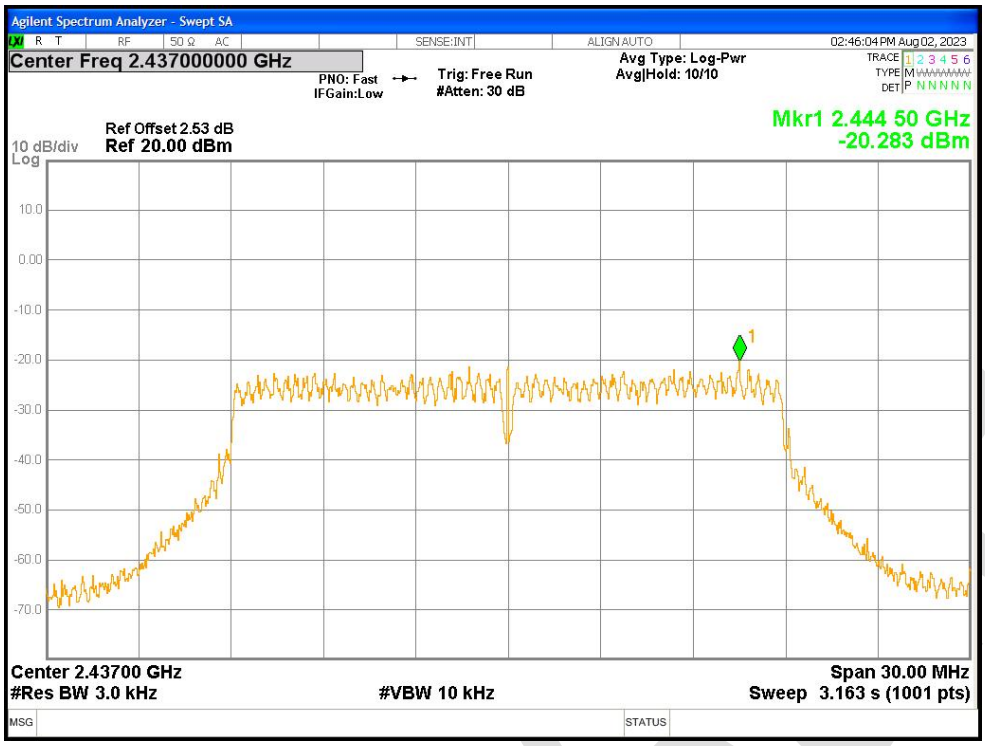
PSD NVNT g 2462MHz Ant1



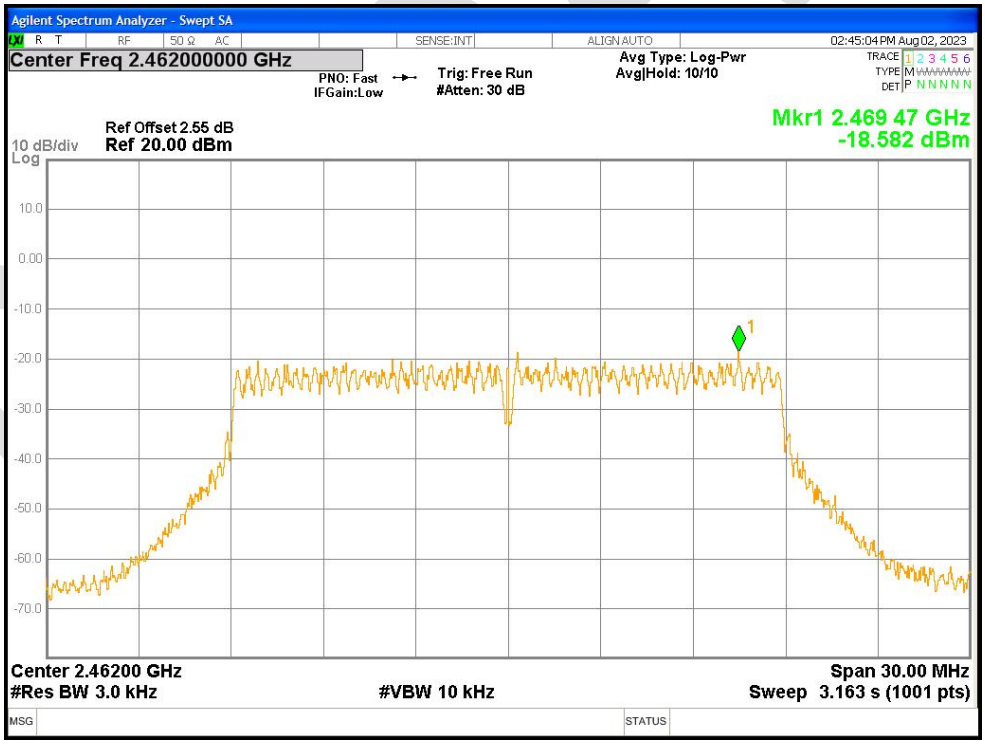
PSD NVNT n20 2412MHz Ant1



PSD NVNT n20 2437MHz Ant1



PSD NVNT n20 2462MHz Ant1



PSD NVNT n40 2422MHz Ant1