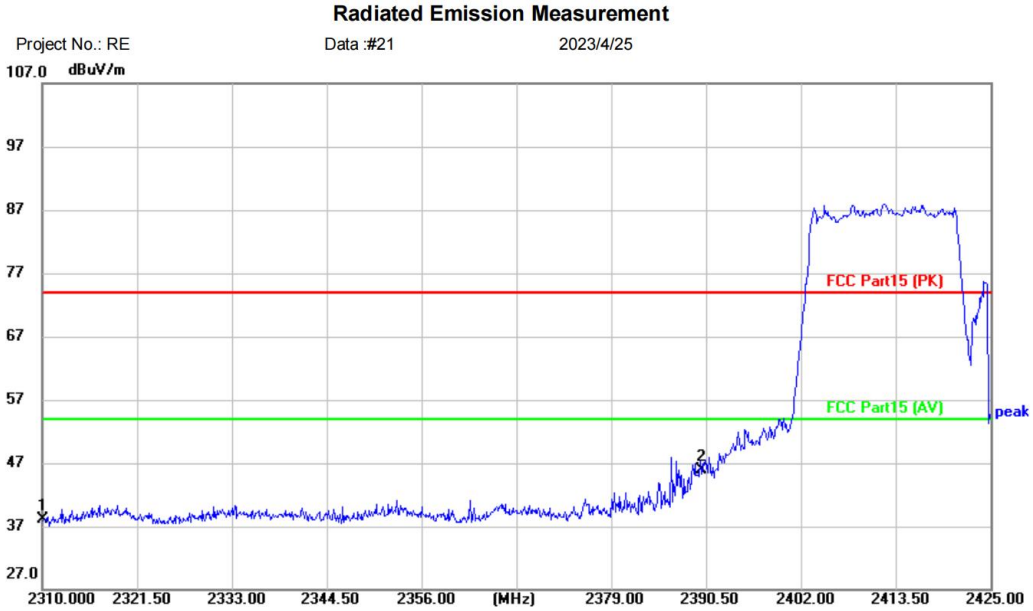
[TestMode: TX g low channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11G-TX-L
Note:

Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

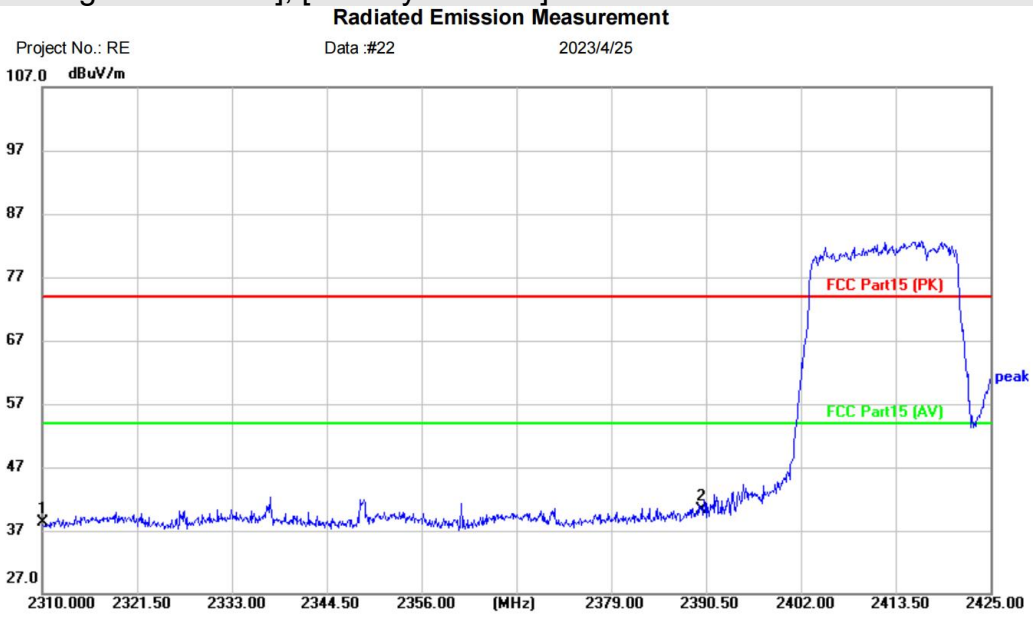
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	42.28	-4.27	38.01	74.00	-35.99	peak	
2	*	2390.000	49.79	-3.82	45.97	74.00	-28.03	peak	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX g low channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11G-TX-L
Note:

Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

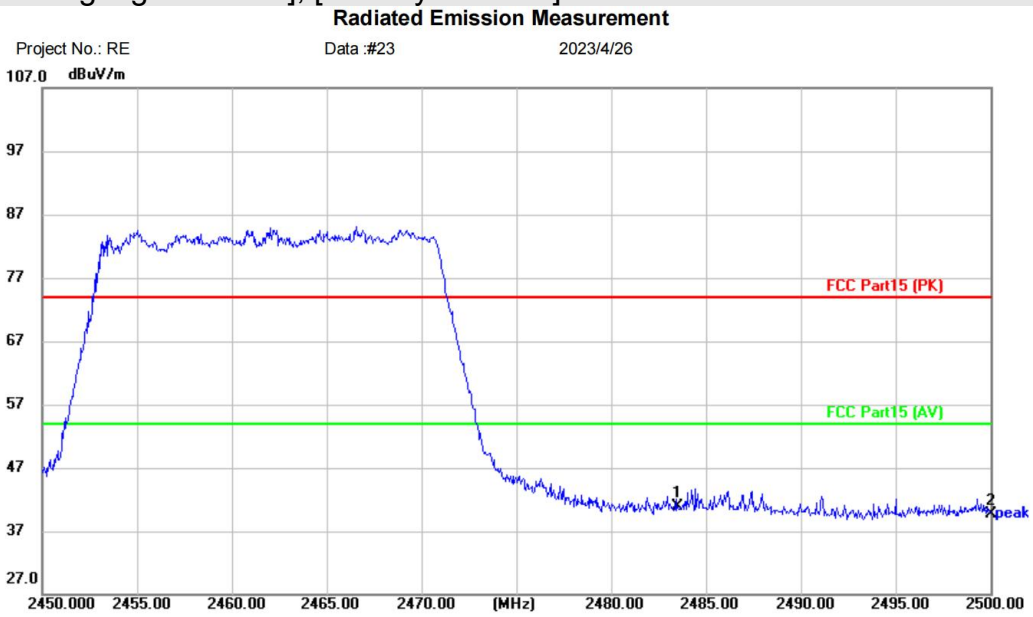
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	42.47	-4.27	38.20	74.00	-35.80	peak	
2	*	2390.000	44.19	-3.82	40.37	74.00	-33.63	peak	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX g high channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11G-TX-H
Note:

Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

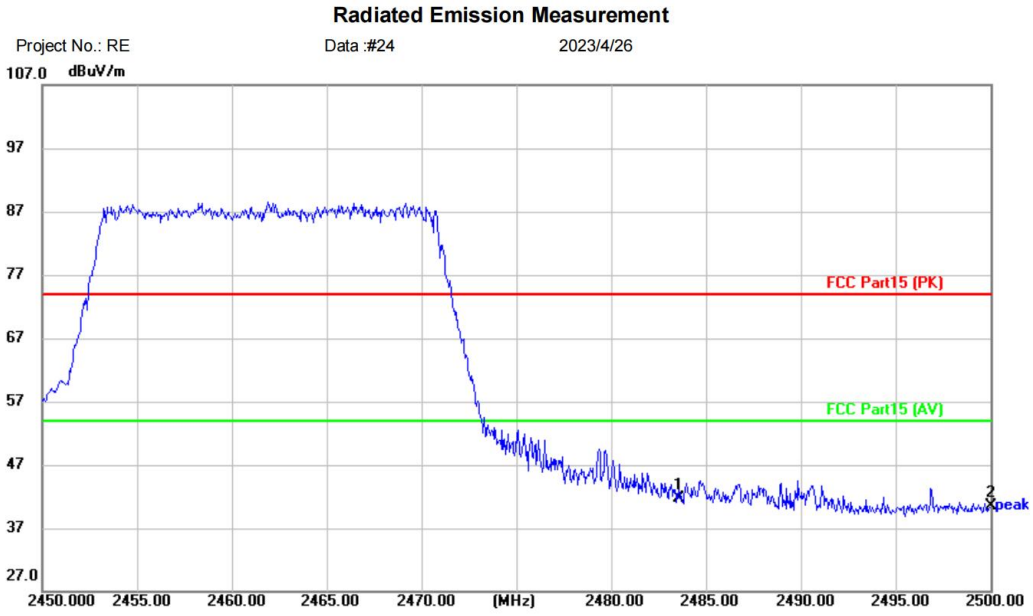
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	44.83	-3.96	40.87	74.00	-33.13	peak	
2		2500.000	43.76	-4.00	39.76	74.00	-34.24	peak	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX g high channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11G-TX-H
Note:

Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

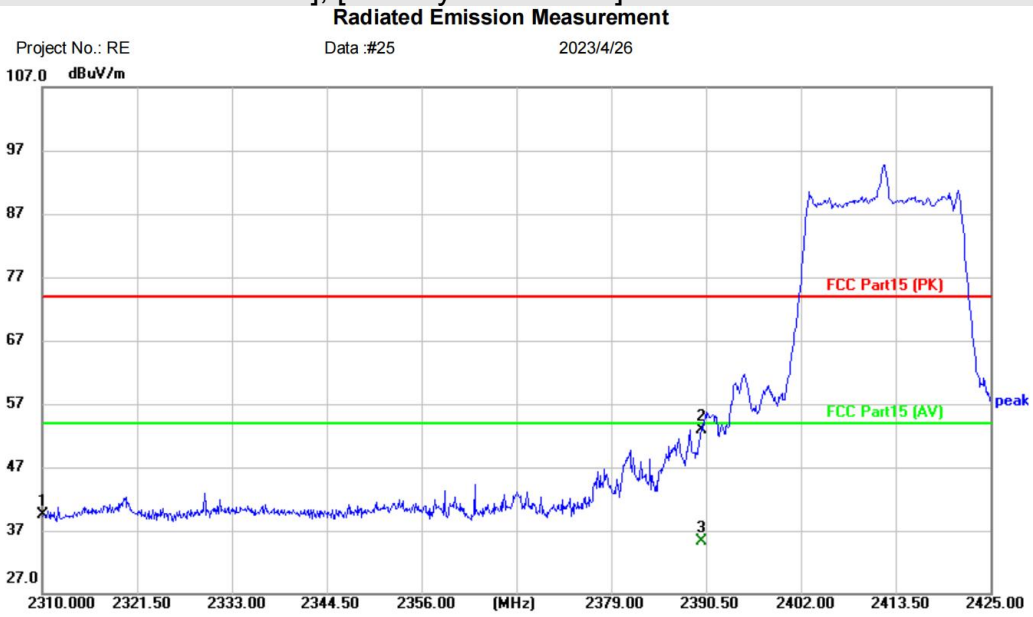
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.560	45.75	-3.96	41.79	74.00	-32.21	peak	
2		2500.000	44.46	-4.00	40.46	74.00	-33.54	peak	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX n20 low channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11N20-TX-L
Note:

Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

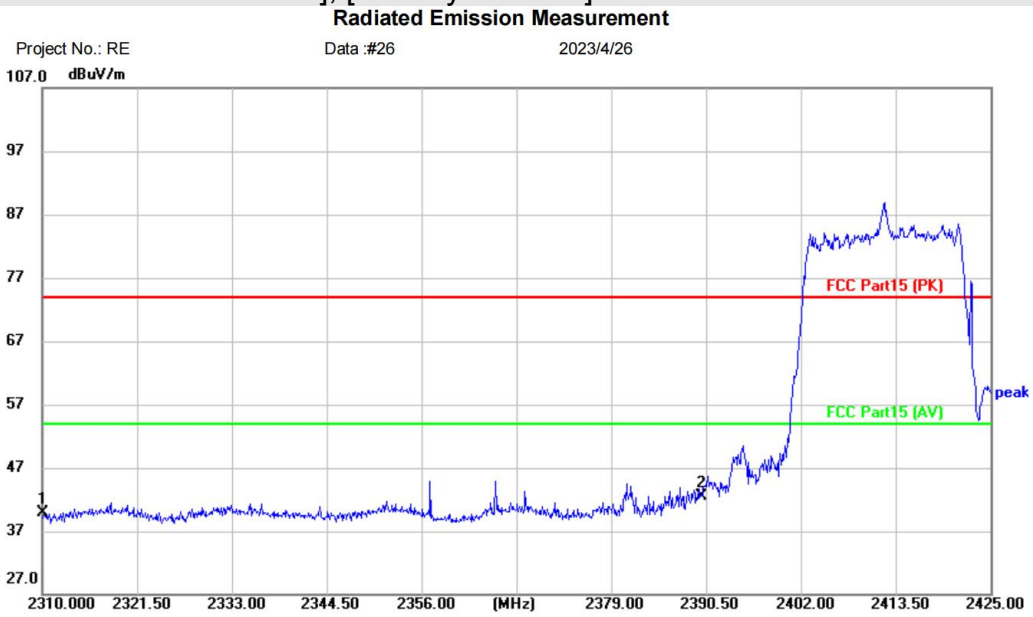
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	43.70	-4.27	39.43	74.00	-34.57	peak	
2		2390.000	56.66	-3.82	52.84	74.00	-21.16	peak	
3	*	2390.000	39.09	-3.82	35.27	54.00	-18.73	AVG	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX n20 low channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11N20-TX-L
Note:

Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

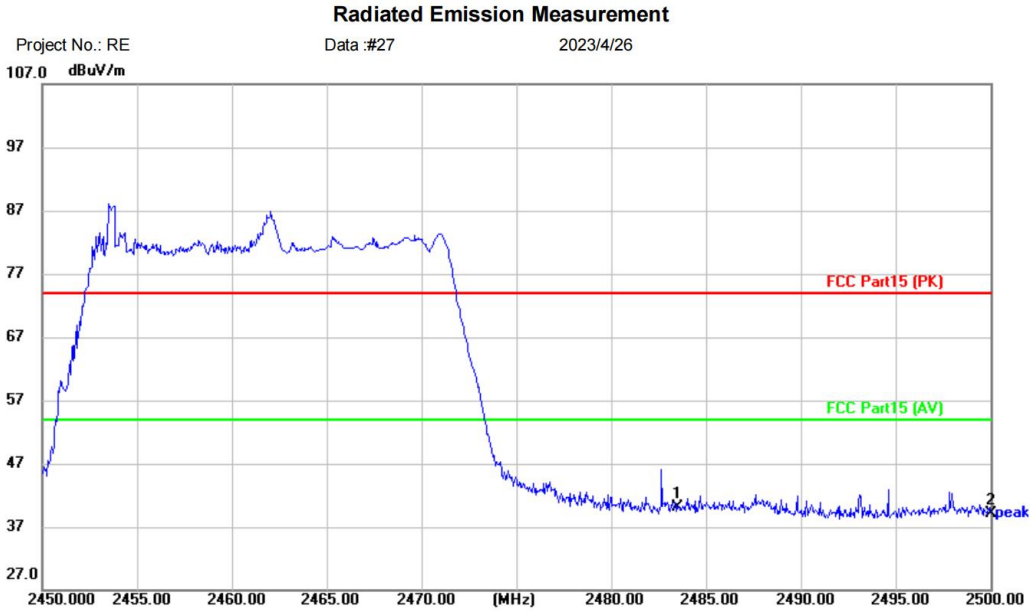
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	44.13	-4.27	39.86	74.00	-34.14	peak	
2	*	2390.000	46.34	-3.82	42.52	74.00	-31.48	peak	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX n20 high channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11N20-TX-H
Note:

Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

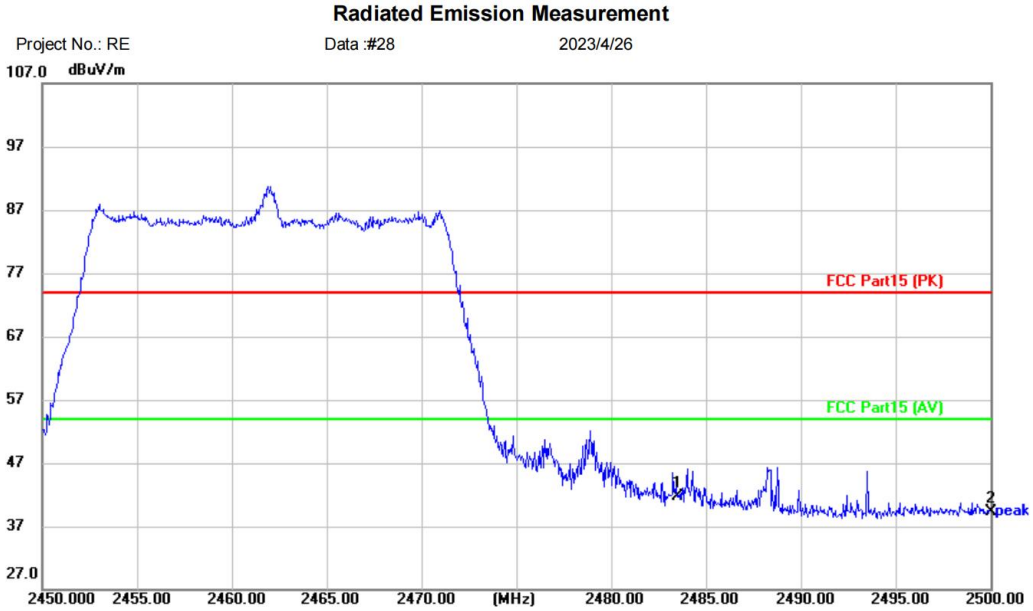
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	44.10	-3.96	40.14	74.00	-33.86	peak	
2		2500.000	43.08	-4.00	39.08	74.00	-34.92	peak	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX n20 high channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11N20-TX-H
Note:

Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

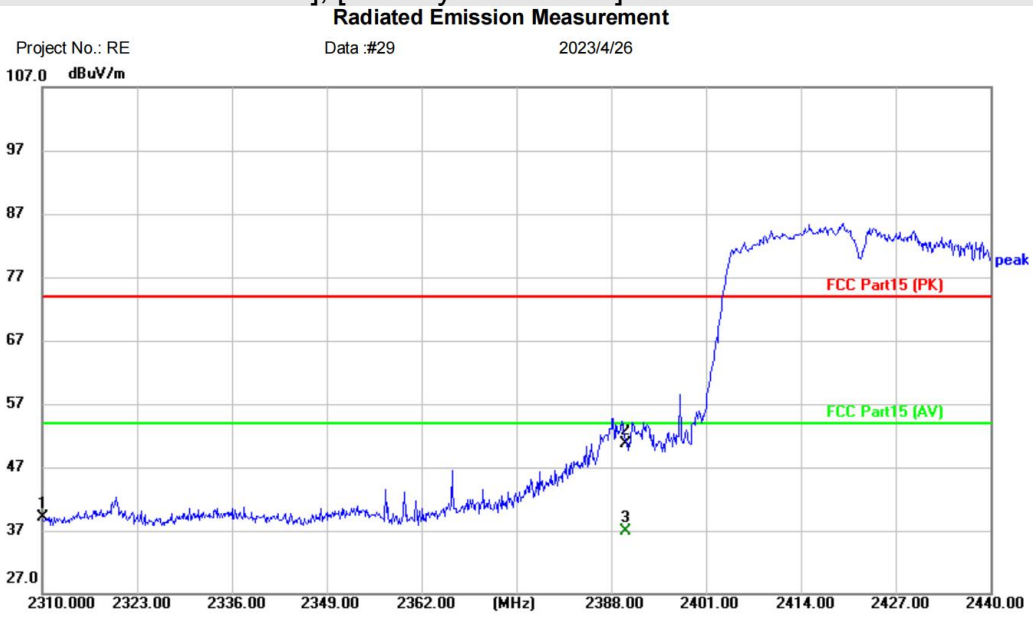
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	45.72	-3.96	41.76	74.00	-32.24	peak	
2		2500.000	43.40	-4.00	39.40	74.00	-34.60	peak	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX n40 low channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11N40-TX-L
Note:

Polarization: *Horizontal*
Power:

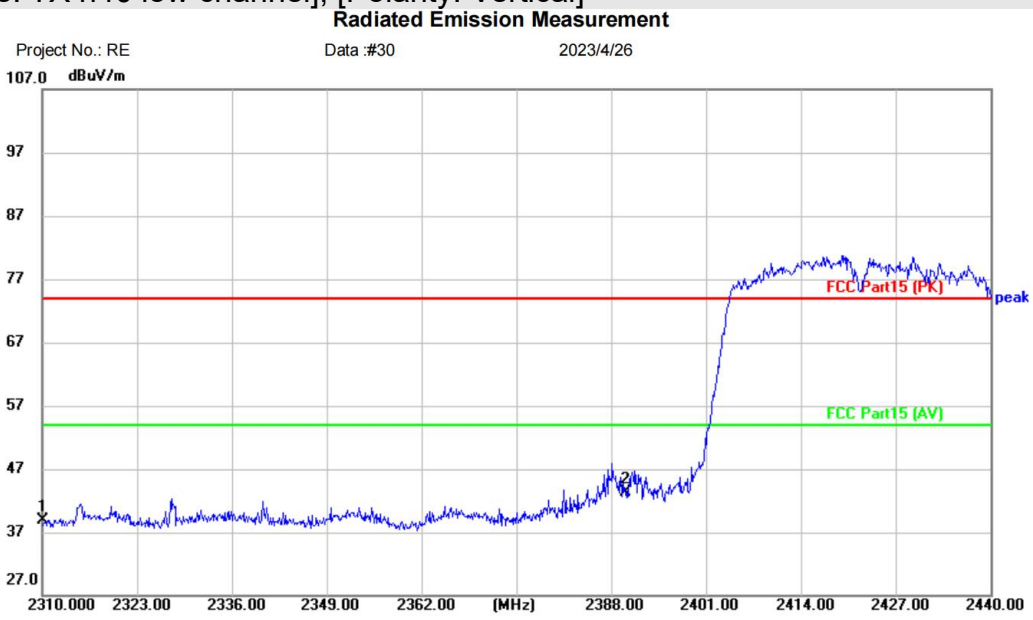
Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	43.40	-4.27	39.13	74.00	-34.87	peak	
2		2390.000	54.47	-3.82	50.65	74.00	-23.35	peak	
3	*	2390.000	40.82	-3.82	37.00	54.00	-17.00	AVG	

*:Maximum data x:Over limit !:over margin 〈Reference Only
Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX n40 low channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11N40-TX-L
Note:

Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

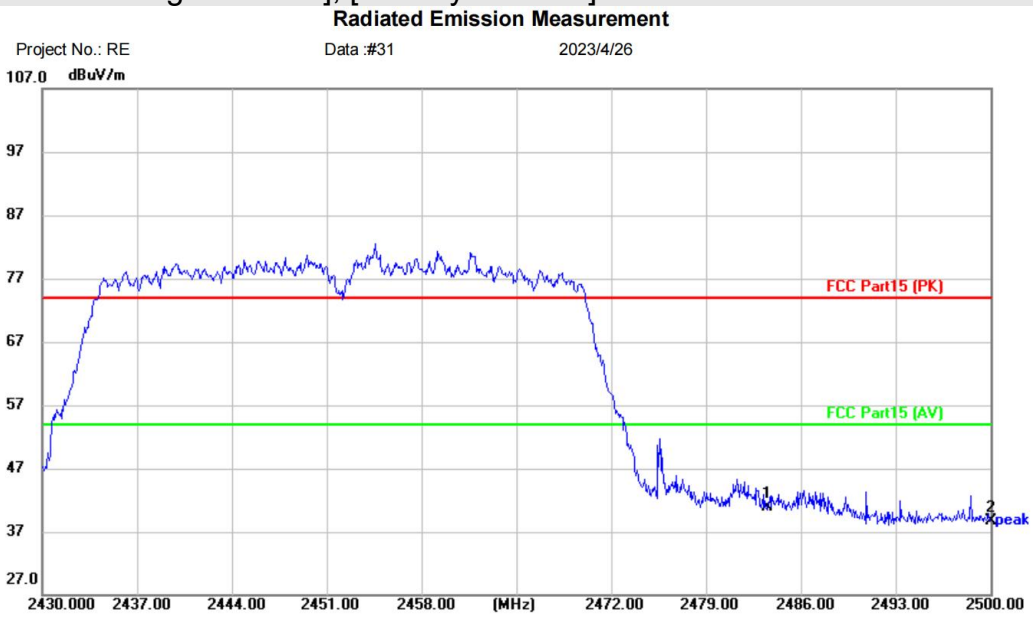
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	43.11	-4.27	38.84	74.00	-35.16	peak	
2	*	2390.000	47.12	-3.82	43.30	74.00	-30.70	peak	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX n40 high channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 11N40-TX-H
Note:

Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

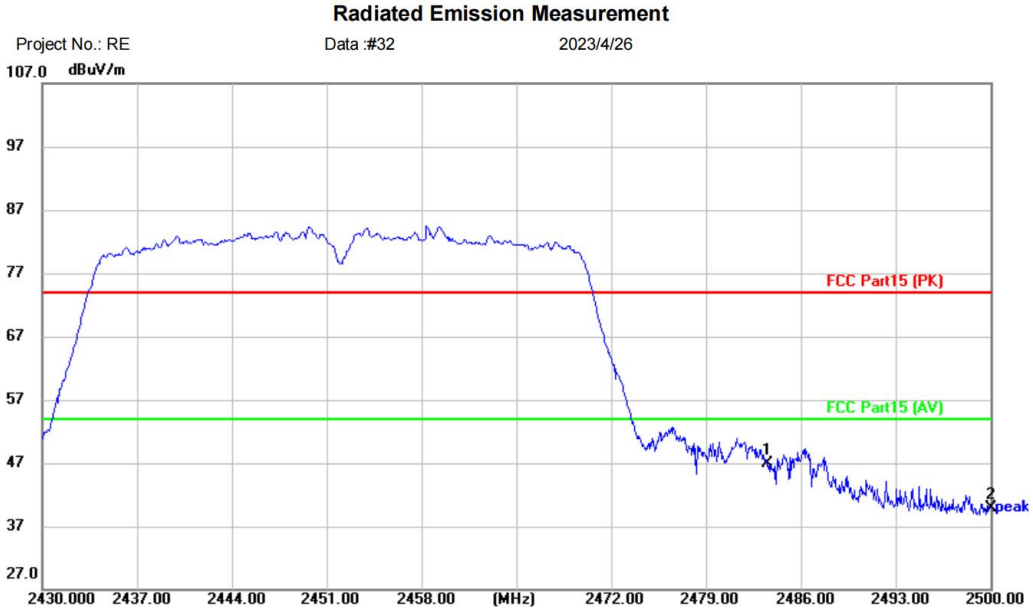
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	44.87	-3.96	40.91	74.00	-33.09	peak	
2		2500.000	42.70	-4.00	38.70	74.00	-35.30	peak	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

[TestMode: TX n40 high channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: LED lamp
M/N: 16000312
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	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	50.91	-3.96	46.95	74.00	-27.05	peak	
2		2500.000	43.85	-4.00	39.85	74.00	-34.15	peak	

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

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

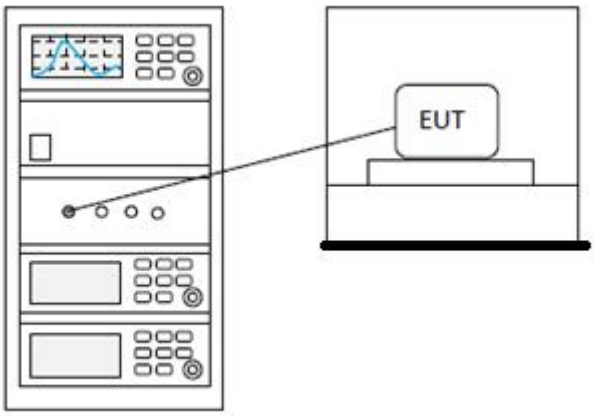
13 CONDUCTED SPURIOUS EMISSIONS

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%

13.1 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)).

13.2 BLOCK DIAGRAM OF TEST SETUP



13.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

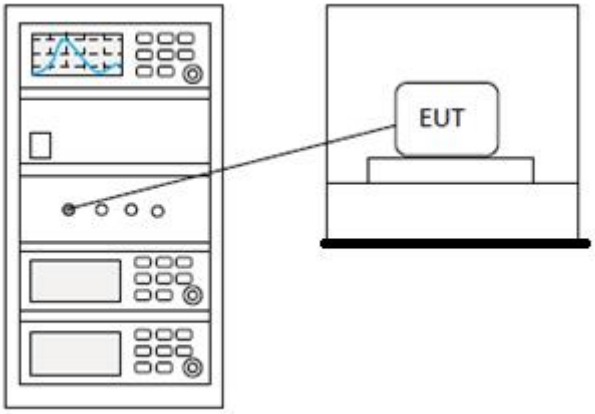
14 CONDUCTED BAND EDGES MEASUREMENT

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%

14.1 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)).

14.2 BLOCK DIAGRAM OF TEST SETUP



14.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

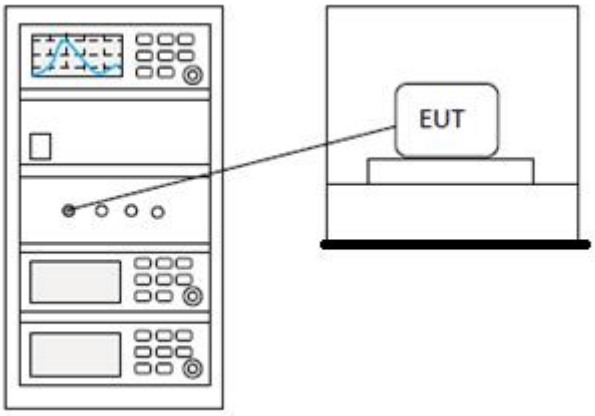
15 MINIMUM 6DB BANDWIDTH

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%

15.1 LIMITS

Limit:	≥500 kHz

15.2 BLOCK DIAGRAM OF TEST SETUP



15.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

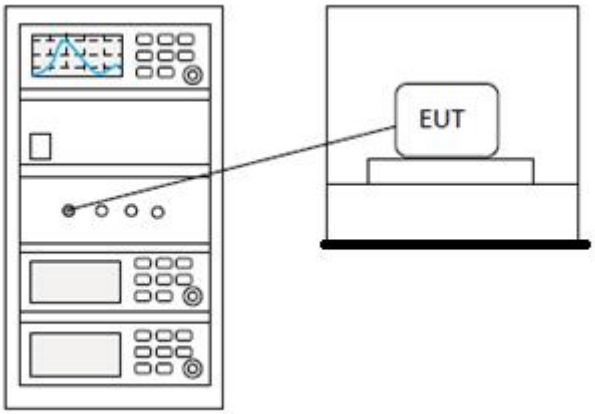
16 POWER SPECTRUM DENSITY

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%

16.1 LIMITS

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

16.2 BLOCK DIAGRAM OF TEST SETUP



16.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

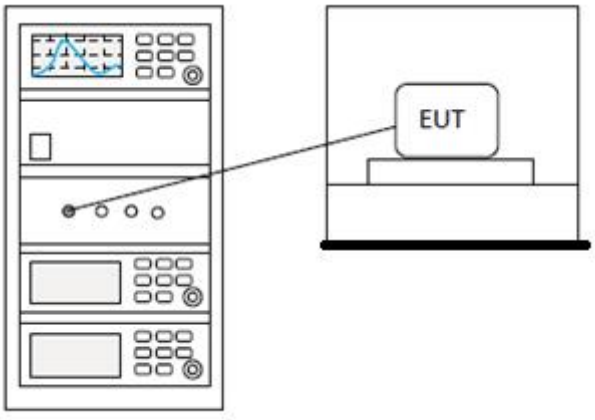
17 CONDUCTED PEAK OUTPUT POWER

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%

17.1 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

17.2 BLOCK DIAGRAM OF TEST SETUP



17.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

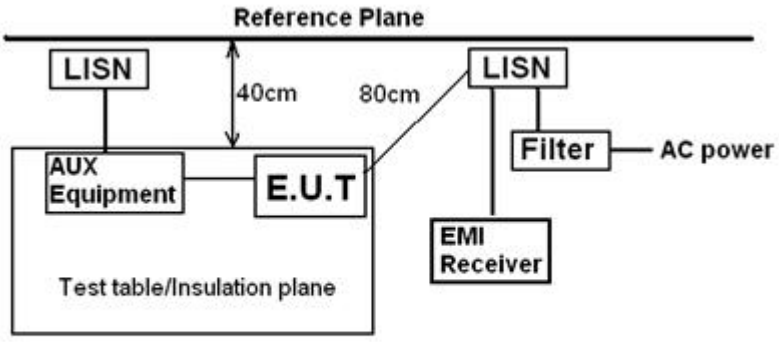
18 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

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%

18.1 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.		

18.2 BLOCK DIAGRAM OF TEST SETUP



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

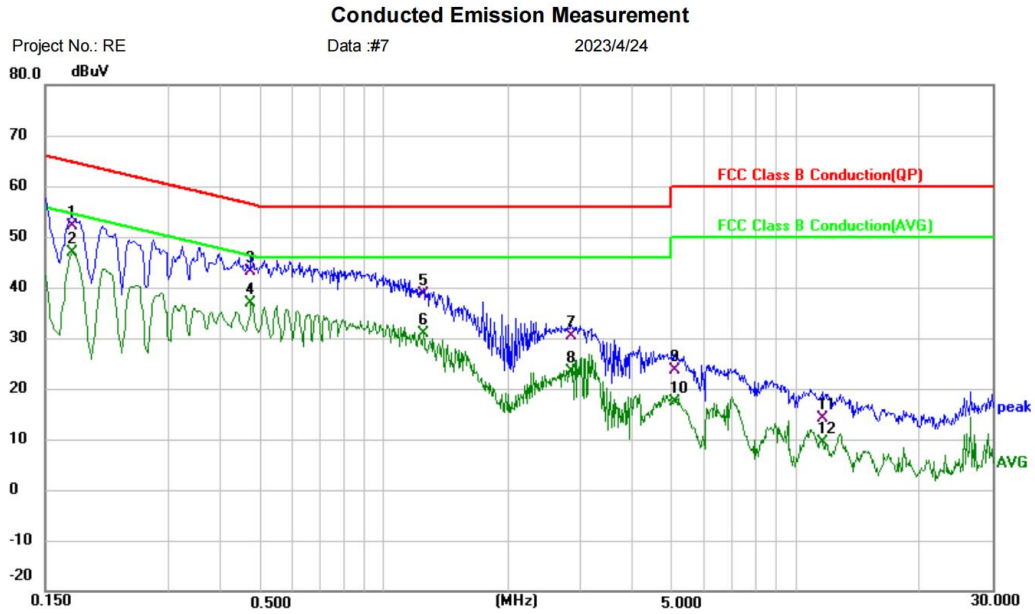
18.3 PROCEDURE

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

18.4 TEST DATA

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



Site
Limit: FCC Class B Conduction(QP)
EUT: LED lamp
M/N: 16000312
Mode: 2.4Gwifi 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		0.1740	41.68	10.49	52.17	64.77	-12.60	QP			
2	*	0.1740	36.40	10.49	46.89	54.77	-7.88	AVG			
3		0.4740	33.03	10.08	43.11	56.44	-13.33	QP			
4		0.4740	26.92	10.08	37.00	46.44	-9.44	AVG			
5		1.2460	28.38	10.16	38.54	56.00	-17.46	QP			
6		1.2460	20.68	10.16	30.84	46.00	-15.16	AVG			
7		2.8420	20.06	10.24	30.30	56.00	-25.70	QP			
8		2.8420	13.10	10.24	23.34	46.00	-22.66	AVG			
9		5.0700	13.68	10.01	23.69	60.00	-36.31	QP			
10		5.0700	7.41	10.01	17.42	50.00	-32.58	AVG			
11		11.6220	4.10	10.09	14.19	60.00	-45.81	QP			
12		11.6220	-0.70	10.09	9.39	50.00	-40.61	AVG			

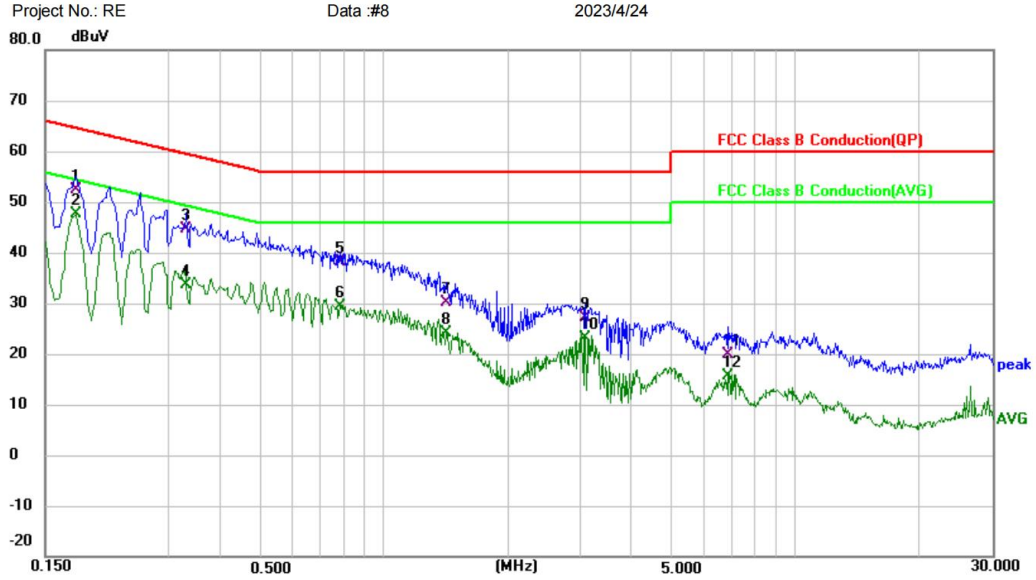
*:Maximum data x:Over limit !:over margin 〈Reference Only

Receiver: ESPI_1
L.I.S.N:
Spectrum Analyzer: ESPI
Engineer Signature:

Test Result: Pass

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

Conducted Emission Measurement



Site	Phase:	*N*	Temperature: (C)
Limit: FCC Class B Conduction(QP)	Power:		Humidity: %RH
EUT: LED lamp	Distance:	RBW: 9 KHz	
M/N: 16000312		VBW: 30 KHz	Sweep Time: 10 ms
Mode: 2.4Gwifi mode			
Note:			

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		0.1780	41.87	10.43	52.30	64.58	-12.28	QP			
2	*	0.1780	37.09	10.43	47.52	54.58	-7.06	AVG			
3		0.3300	34.52	10.07	44.59	59.45	-14.86	QP			
4		0.3300	23.57	10.07	33.64	49.45	-15.81	AVG			
5		0.7820	28.15	10.02	38.17	56.00	-17.83	QP			
6		0.7820	19.27	10.02	29.29	46.00	-16.71	AVG			
7		1.4180	20.05	10.05	30.10	56.00	-25.90	QP			
8		1.4180	13.97	10.05	24.02	46.00	-21.98	AVG			
9		3.0820	17.15	10.01	27.16	56.00	-28.84	QP			
10		3.0820	13.22	10.01	23.23	46.00	-22.77	AVG			
11		6.8220	9.97	9.87	19.84	60.00	-40.16	QP			
12		6.8220	5.87	9.87	15.74	50.00	-34.26	AVG			

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

Receiver: ESPI_1 Spectrum Analyzer: ESPI

L.I.S.N: Engineer Signature:

Test Result: Pass

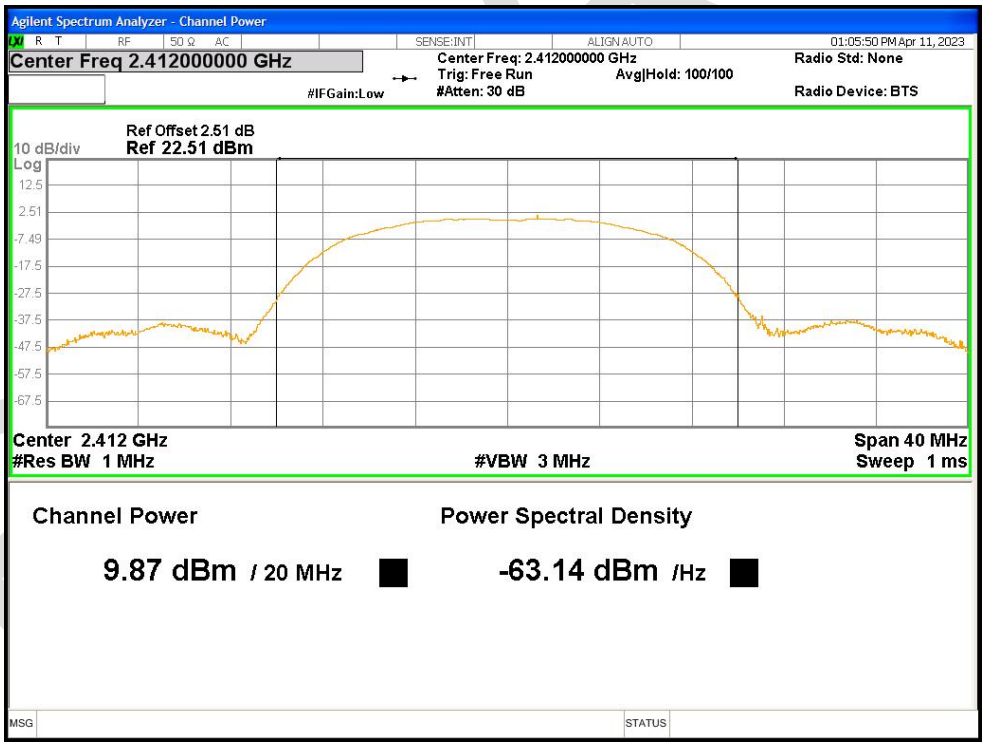
19 APPENDIX

Appendix1

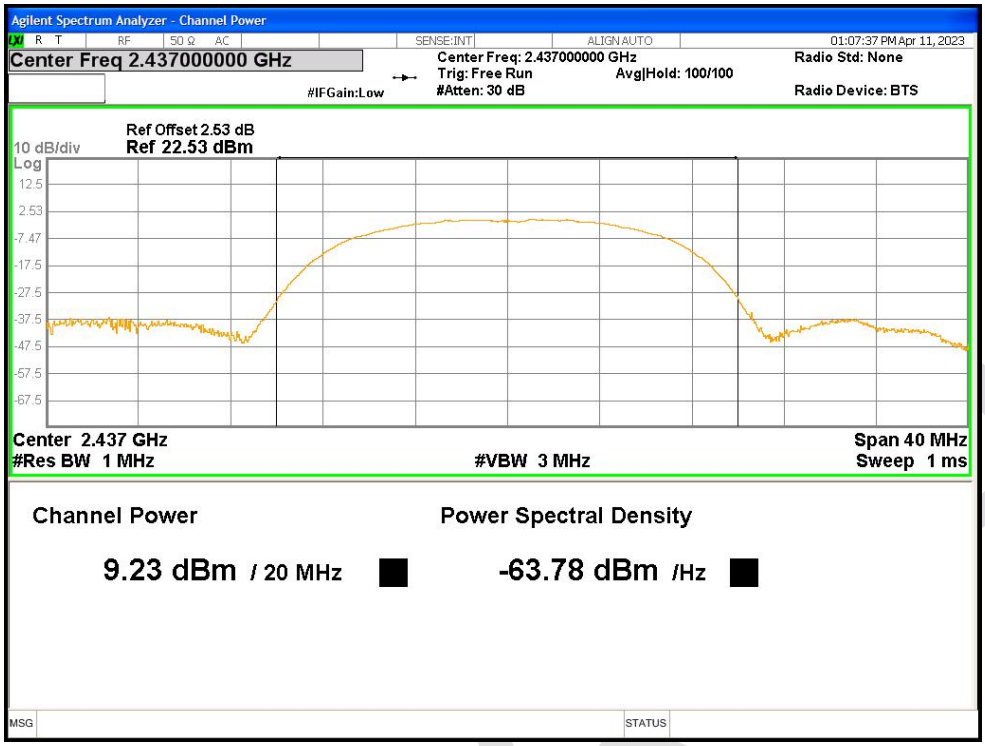
Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	9.87	30	Pass
NVNT	b	2437	Ant1	9.234	30	Pass
NVNT	b	2462	Ant1	10.187	30	Pass
NVNT	g	2412	Ant1	10.3	30	Pass
NVNT	g	2437	Ant1	10.05	30	Pass
NVNT	g	2462	Ant1	11.31	30	Pass
NVNT	n20	2412	Ant1	9.363	30	Pass
NVNT	n20	2437	Ant1	8.842	30	Pass
NVNT	n20	2462	Ant1	10.204	30	Pass
NVNT	n40	2422	Ant1	7.949	30	Pass
NVNT	n40	2437	Ant1	7.805	30	Pass
NVNT	n40	2452	Ant1	8.053	30	Pass

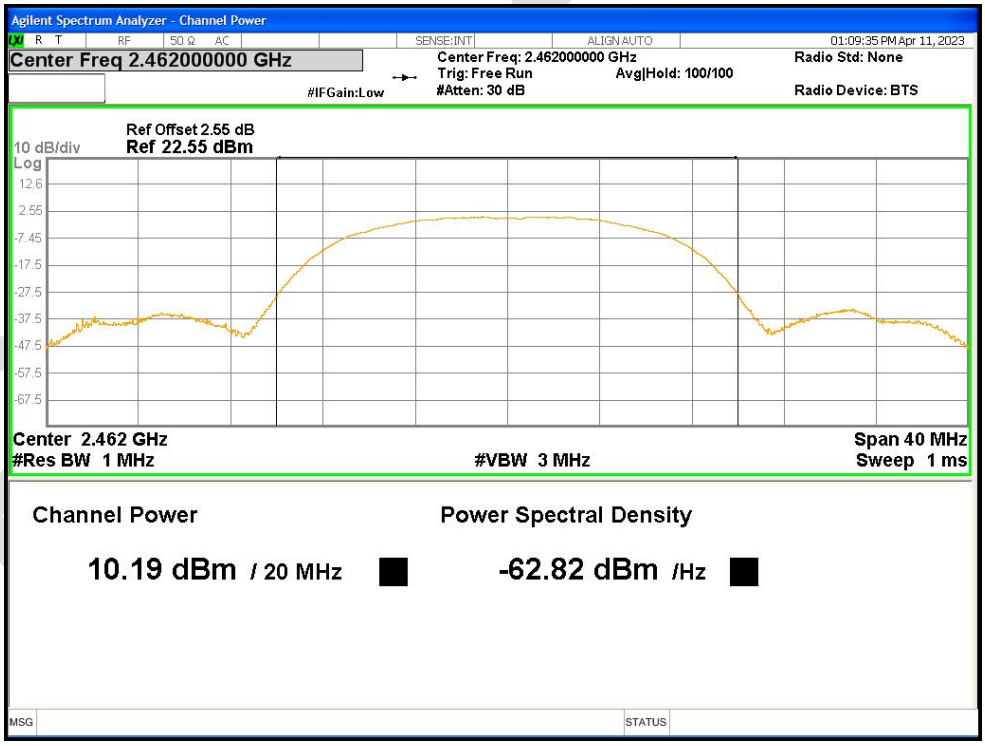
Power NVNT b 2412MHz Ant1



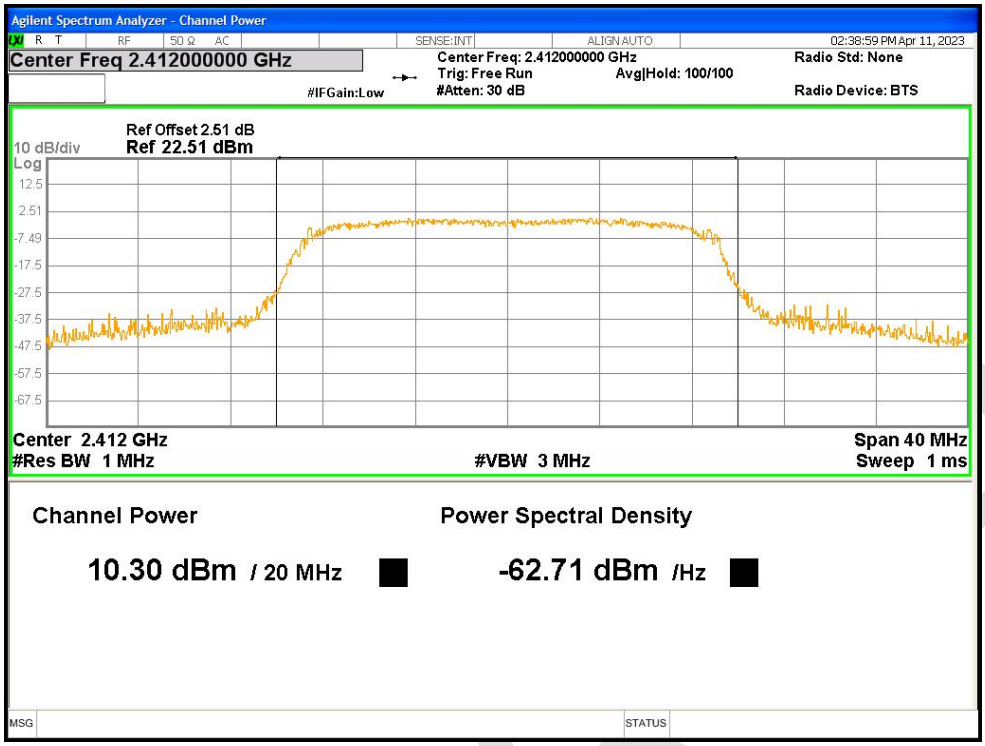
Power NVNT b 2437MHz Ant1



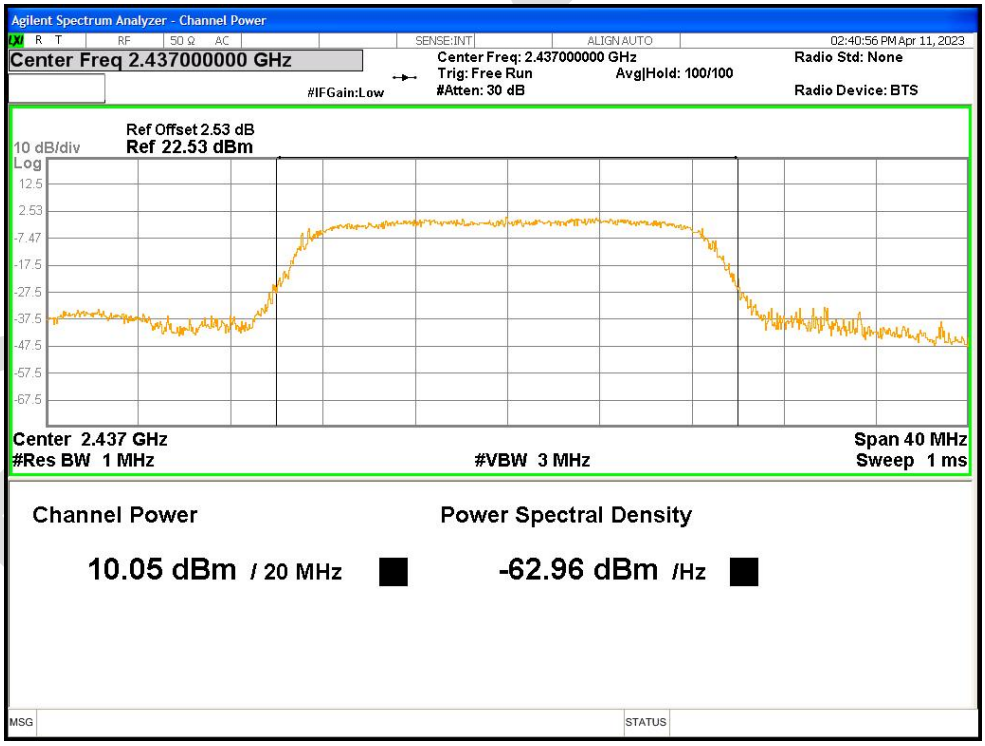
Power NVNT b 2462MHz Ant1



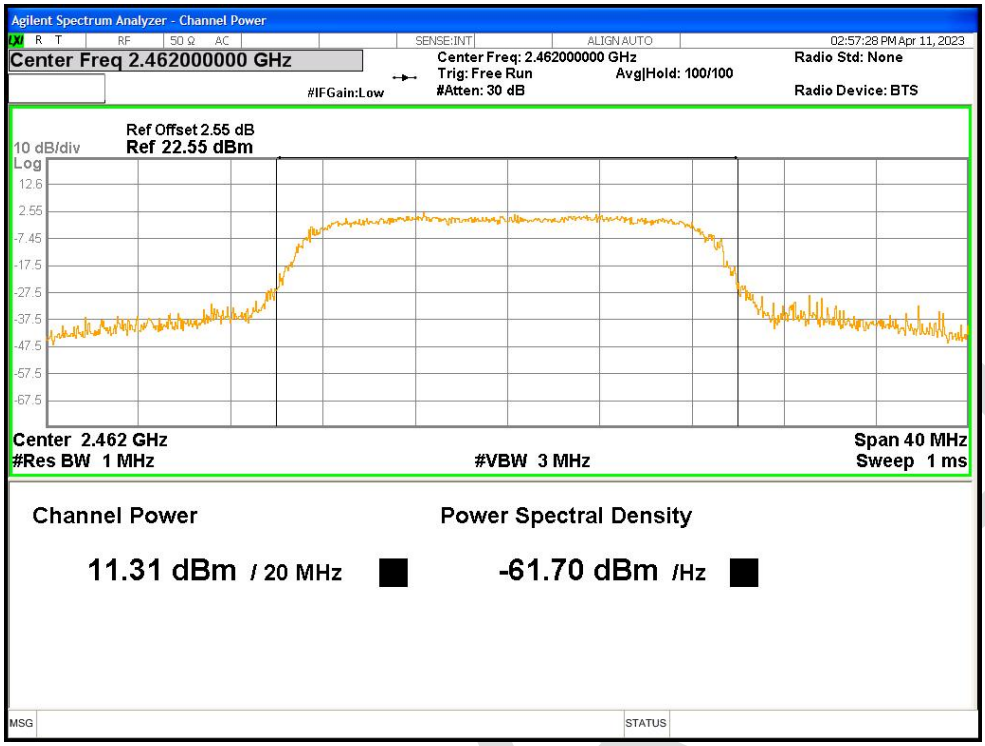
Power NVNT g 2412MHz Ant1



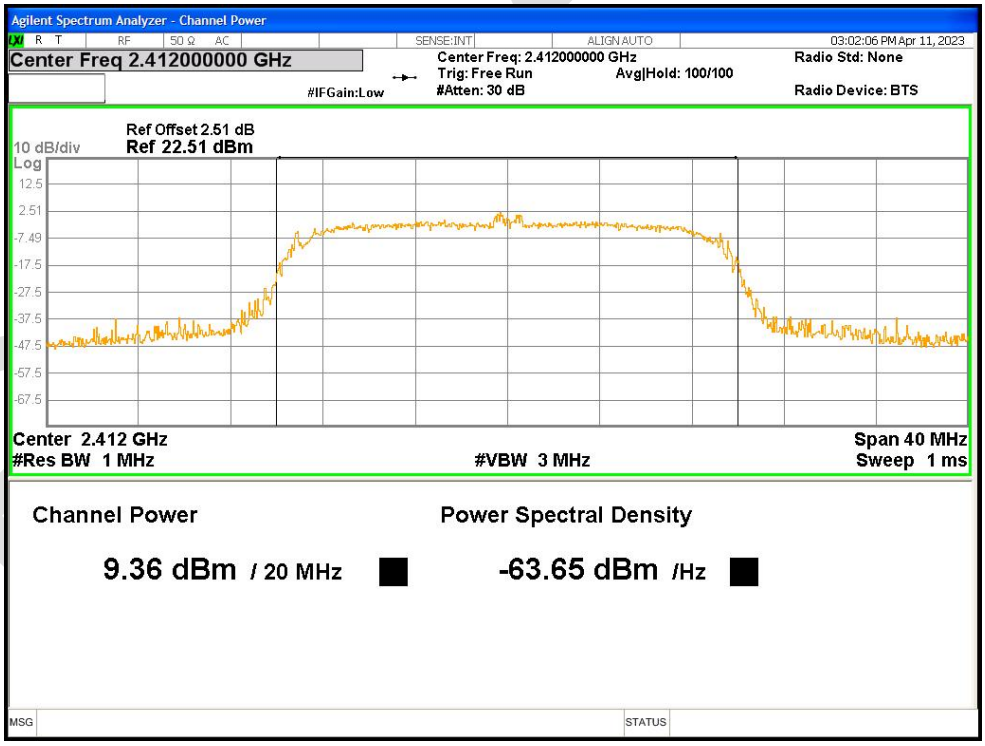
Power NVNT g 2437MHz Ant1



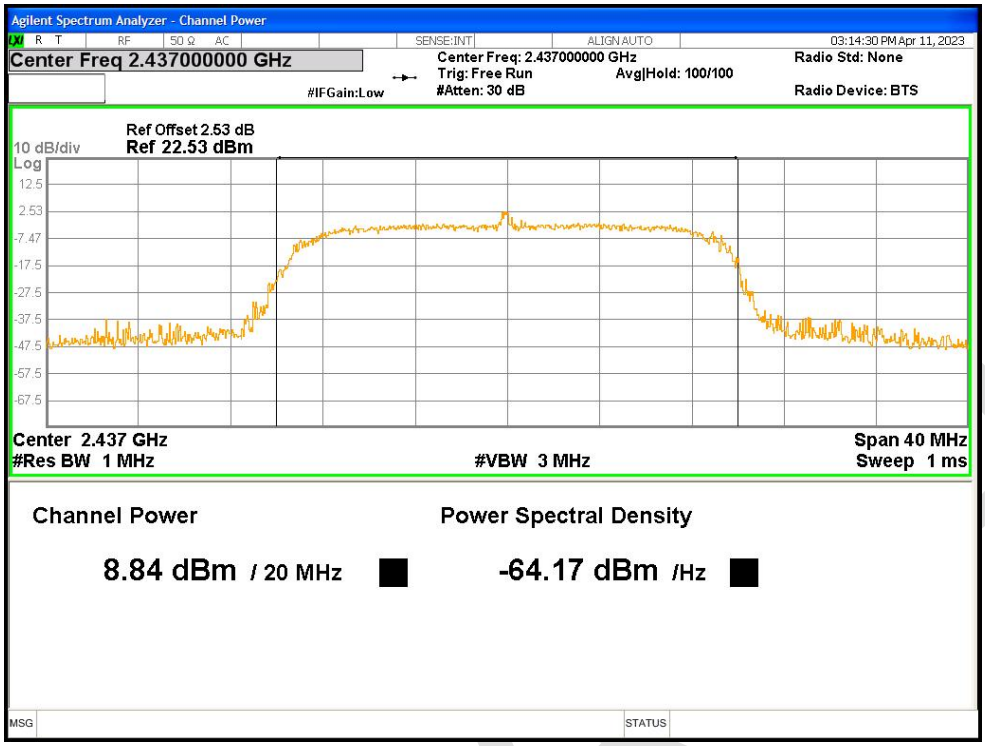
Power NVNT g 2462MHz Ant1



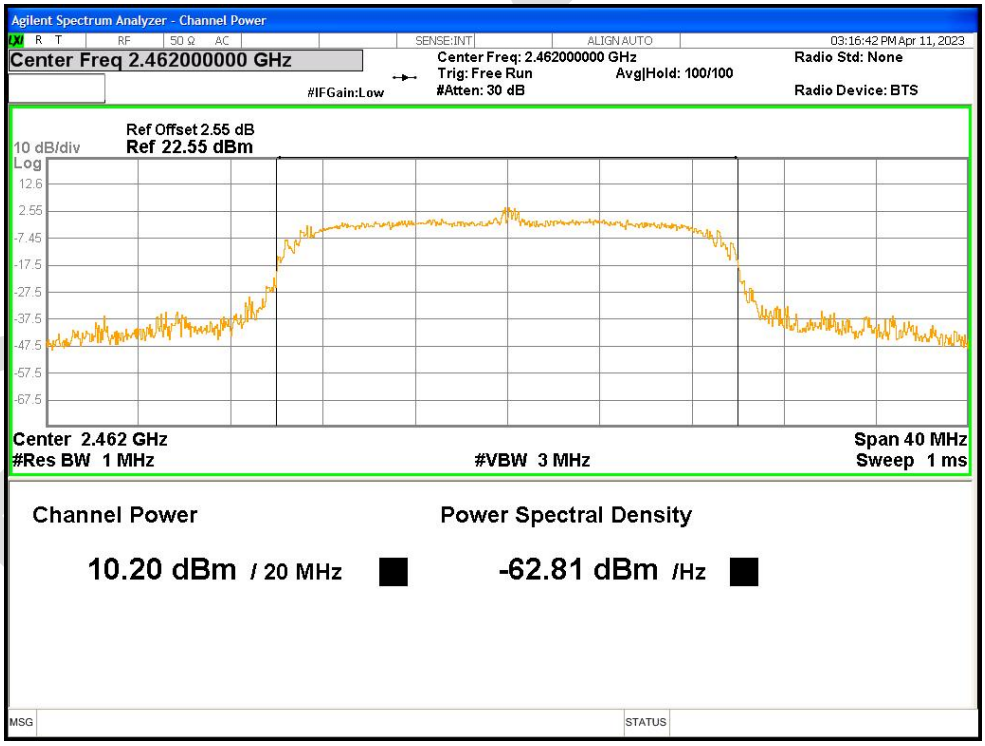
Power NVNT n20 2412MHz Ant1



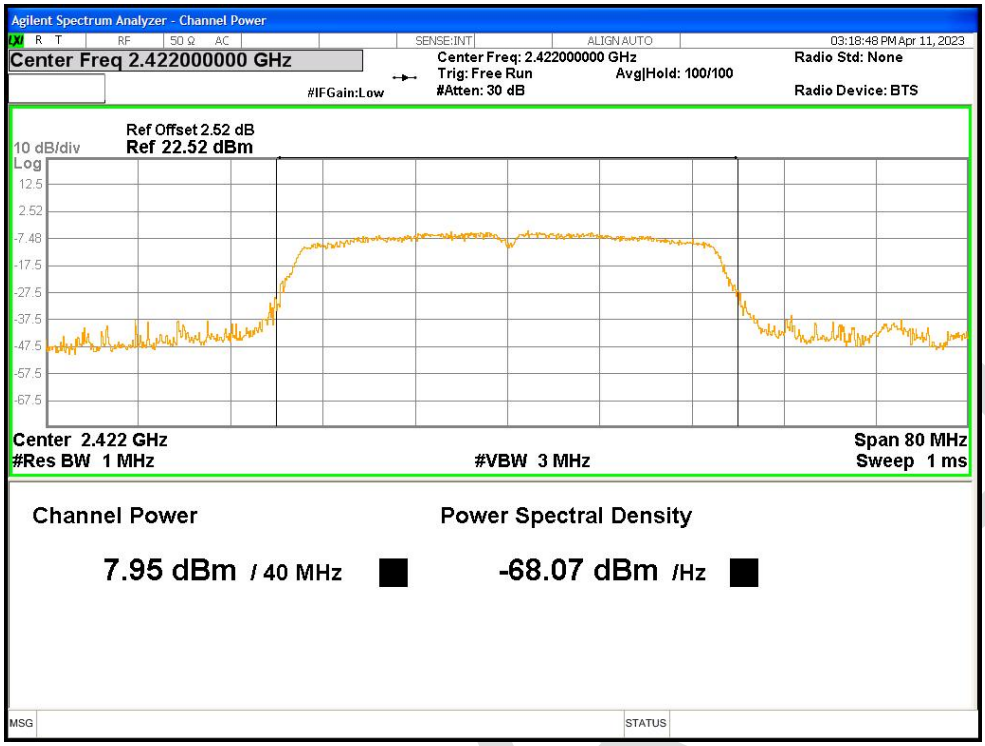
Power NVNT n20 2437MHz Ant1



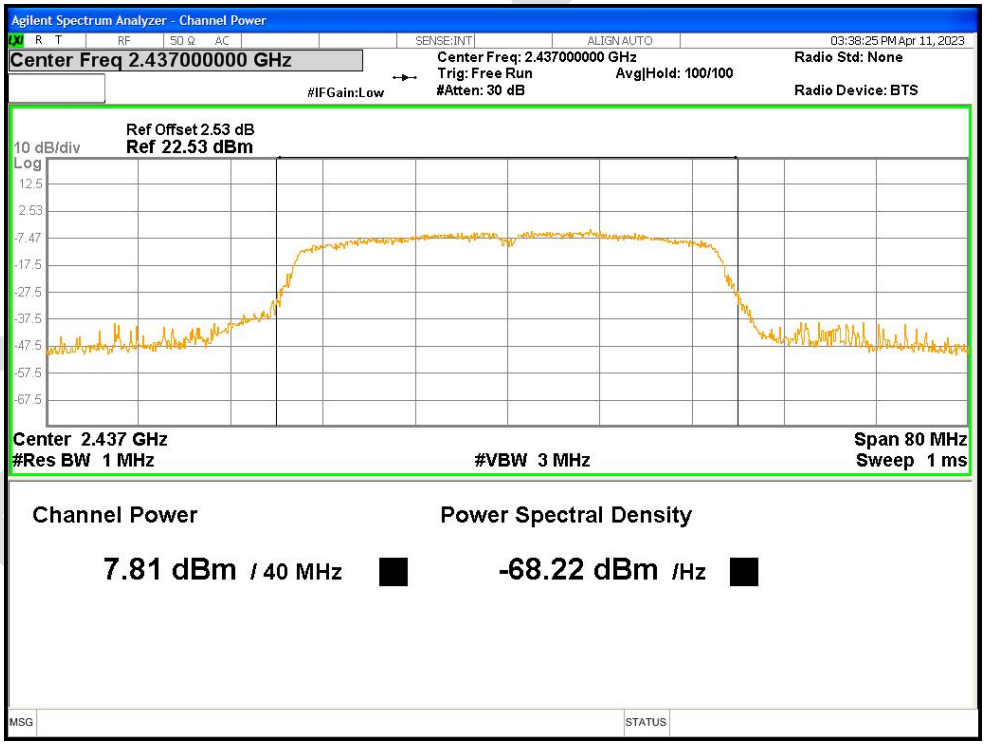
Power NVNT n20 2462MHz Ant1



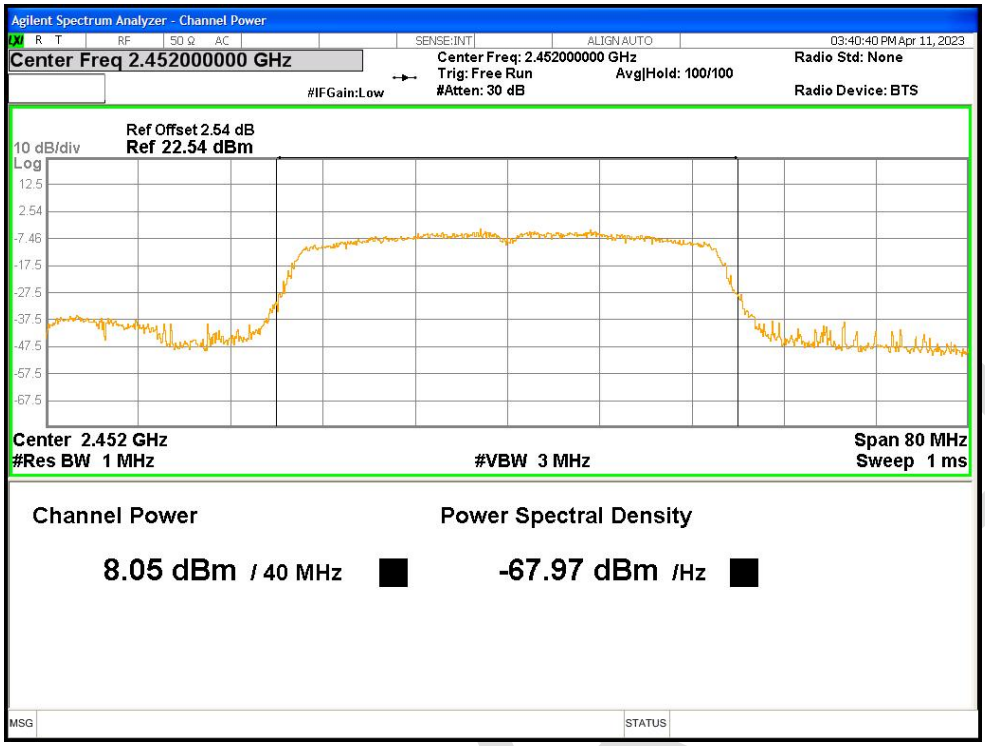
Power NVNT n40 2422MHz Ant1



Power NVNT n40 2437MHz Ant1



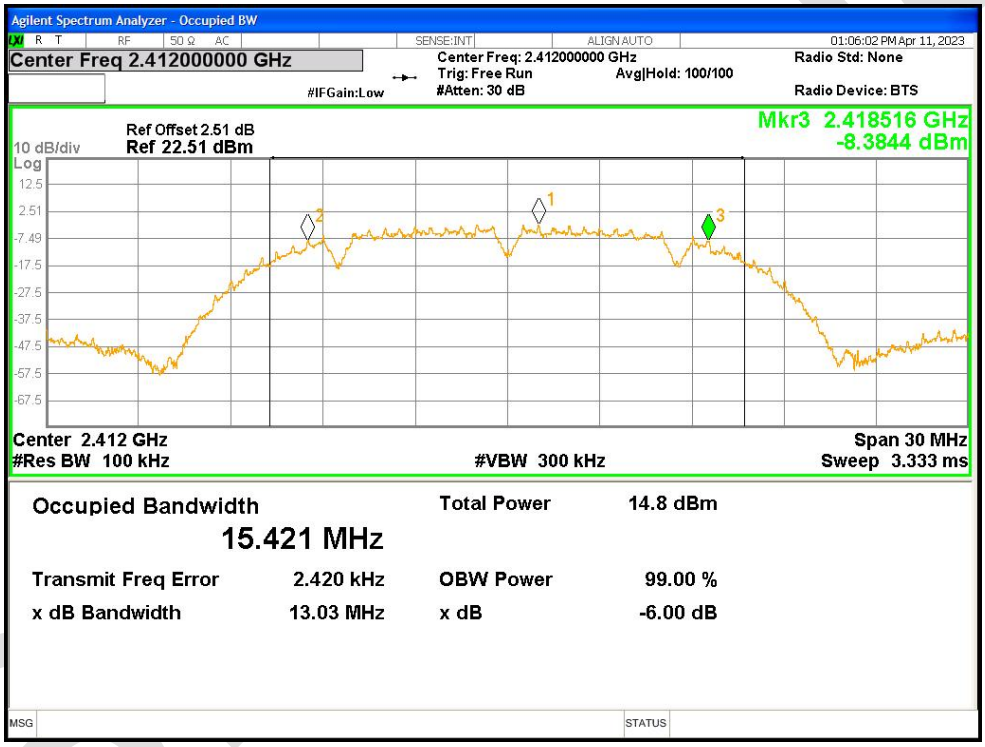
Power NVNT n40 2452MHz Ant1


Agilent Spectrum Analyzer - Channel Power
RT
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:40:40 PM Apr 11, 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
8.05 dBm / 40 MHz
Power Spectral Density
-67.97 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	13.028	0.5	Pass
NVNT	b	2437	Ant1	12.535	0.5	Pass
NVNT	b	2462	Ant1	12.572	0.5	Pass
NVNT	g	2412	Ant1	15.681	0.5	Pass
NVNT	g	2437	Ant1	15.357	0.5	Pass
NVNT	g	2462	Ant1	15.802	0.5	Pass
NVNT	n20	2412	Ant1	13.848	0.5	Pass
NVNT	n20	2437	Ant1	13.856	0.5	Pass
NVNT	n20	2462	Ant1	12.463	0.5	Pass
NVNT	n40	2422	Ant1	35.096	0.5	Pass
NVNT	n40	2437	Ant1	35.104	0.5	Pass
NVNT	n40	2452	Ant1	35.063	0.5	Pass

-6dB Bandwidth NVNT b 2412MHz Ant1



-6dB Bandwidth NVNT b 2437MHz Ant1