

Test Report

Report No.: MTi230322001-05E3

Date of issue: 2023-07-25

Applicant: Dong guan Rong Kai New Material Co., Ltd

Product: Intelligent Cloud Film Cutting Machine

Model(s): BSJ-290GB

FCC ID: 2BBNZ-BSJ-290GB

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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Test Result Certification	
Applicant:	Dong guan Rong Kai New Material Co., Ltd
Address:	Room 101, Building 5, No. 142 Tangxialing South Road, Tangxia Town, Dongguan City, Guangdong Province, China
Manufacturer:	Dong guan Rong Kai New Material Co., Ltd
Address:	Room 101, Building 5, No. 142 Tangxialing South Road, Tangxia Town, Dongguan City, Guangdong Province, China
Factory:	Dong guan Rong Kai New Material Co., Ltd
Address:	Room 101, Building 5, No. 142 Tangxialing South Road, Tangxia Town, Dongguan City, Guangdong Province, China
Product description	
Product name:	Intelligent Cloud Film Cutting Machine
Trademark:	ROKECUT
Model name:	BSJ-290GB
Series Model:	N/A
Standards:	FCC 47 CFR Part 15 Subpart C
Test method:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02
Date of Test	
Date of test:	2023-06-14 to 2023-07-25
Test result:	Pass

Test Engineer	:	
		(Maleah Deng)
Reviewed By	:	
		(Leon Chen)
Approved By	:	
		(Tom Xue)

1 General Description

1.1 Description of the EUT

Product name:	Intelligent Cloud Film Cutting Machine
Model name:	BSJ-290GB
Series Model:	N/A
Model difference:	N/A
Electrical rating:	Input: DC 24V 1.75A
Accessories:	Adaptor: Model: GM42-240175-D INPUT: AC 100-240V 50/60Hz 1.5A OUTPUT: DC 24V 1.75A
Hardware version:	VER306
Software version:	VER161
Test sample(s) number:	MTi230322001-05S1001
RF specification	
Operating frequency range:	802.11b/g/n20:2412~2462 MHz 802.11n40:2422~2452 MHz
Modulation type:	IEEE 802.11b: DSSS (DBPSK, DQPSK, CCK) IEEE 802.11g/n (HT20/HT40) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna(s) type:	FPC Antenna
Antenna(s) gain:	3.06 dBi

1.2 Description of test modes

No.	Emission test modes
Mode1	TX-802.11b
Mode2	TX-802.11g
Mode3	TX-802.11n(HT20)
Mode4	TX-802.11n(HT40)

1.2.1 Operation channel list

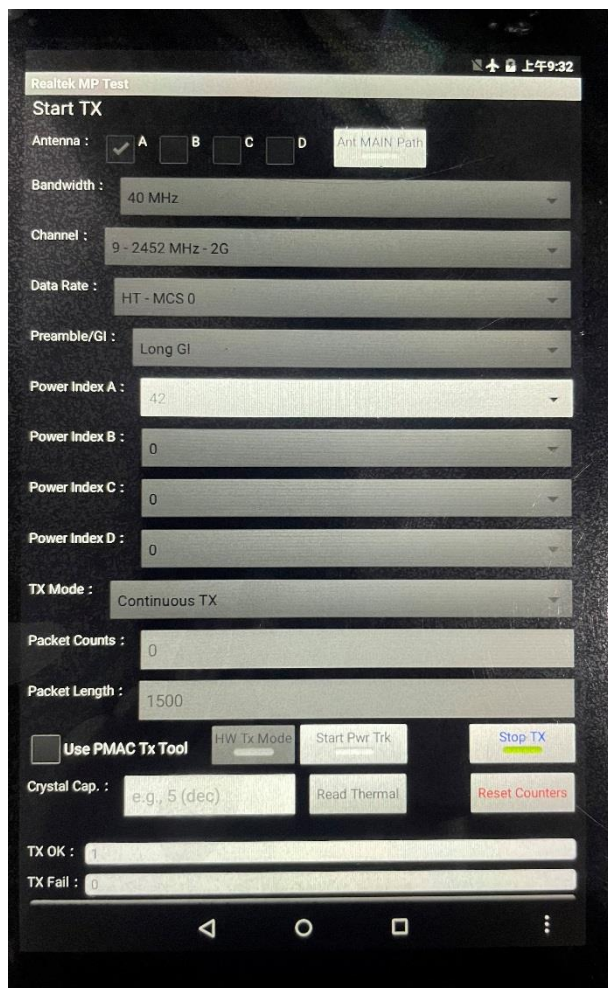
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447	/	/

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

Test Software:

For power setting, refer to below table.

Test Software:		Realtek MP Test	
802.11b		802.11g	
Channel	Power setting	Channel	Power setting
1	35	1	42
6	40	6	42
11	40	11	42
802.11n (HT20)		802.11n (HT40)	
Channel	Power setting	Channel	Power setting
1	42	3	42
6	42	6	42
11	42	9	42



1.3 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH
Atmospheric pressure:	98 kPa ~ 101 kPa

1.4 Description of support units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support equipment list			
Description	Model	Serial No.	Manufacturer
/	/	/	/

Support cable list			
Description	Length (m)	From	To
/	/	/	/

1.5 Measurement uncertainty

Measurement	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	3.1dB
Occupied channel bandwidth	±3 %
RF output power, conducted	±1 dB
Power Spectral Density, conducted	±1 dB
Unwanted Emissions, conducted	±1 dB
Radiated spurious emissions (1GHz~25GHz)	5.3dB
Radiated spurious emissions (9kHz~30MHz)	4.3dB
Radiated spurious emissions (30MHz~1GHz)	4.7dB
Temperature	±1 °C
Humidity	± 5 %

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2 Summary of Test Result

No.	Item	Standard	Requirement	Result
1	Antenna requirement	47 CFR Part 15.247	47 CFR 15.203	Pass
2	Conducted Emission at AC power line	47 CFR Part 15.247	47 CFR 15.207(a)	Pass
3	Occupied Bandwidth	47 CFR Part 15.247	47 CFR 15.247(a)(2)	Pass
4	Maximum Conducted Output Power	47 CFR Part 15.247	47 CFR 15.247(b)(3)	Pass
5	Power Spectral Density	47 CFR Part 15.247	47 CFR 15.247(e)	Pass
6	Emissions in frequency bands	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
7	Band edge emissions (Radiated)	47 CFR Part 15.247	47 CFR 15.247(d) 15.209,15.205	Pass
8	Emissions in frequency bands (below 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d) 15.209,15.205	Pass
9	Emissions in frequency bands (above 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d) 15.209,15.205	Pass

3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573

4 List of test equipment

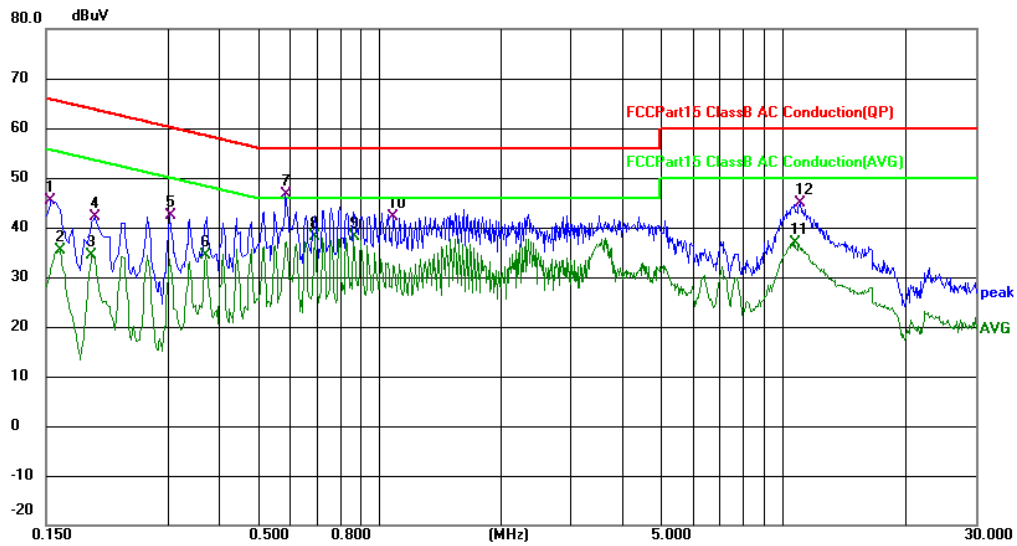
No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Conducted Emission at AC power line						
1	EMI Test Receiver	Rohde&schwarz	ESCI3	101368	2023-04-26	2024-04-25
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2023-05-05	2024-05-04
3	Artificial Mains Network	Schwarzbeck	NSLK 8127	1001	2023-05-06	2024-05-05
Occupied Bandwidth						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Maximum Conducted Output Power						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Power Spectral Density						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Emissions in frequency bands						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Band edge emissions (Radiated)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-05-26	2024-05-25
3	Amplifier	Agilent	8449B	3008A01120	2023-05-26	2024-05-25
4	Multi-device Controller	TuoPu	TPMDC	/	2023-05-04	2024-05-03
5	MXA signal analyzer	Agilent	N9020A	MY54440859	2023-05-05	2024-05-04
Emissions in frequency bands (below 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10
3	Amplifier	Hewlett-Packard	8447F	3113A06184	2023-04-26	2024-04-25
4	Multi-device Controller	TuoPu	TPMDC	/	2023-05-04	2024-05-03
5	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2023-06-11	2025-06-10
Emissions in frequency bands (above 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-05-26	2024-05-25

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
3	Amplifier	Agilent	8449B	3008A01120	2023-05-26	2024-05-25
4	Multi-device Controller	TuoPu	TPMDC	/	2023-05-04	2024-05-03
5	MXA signal analyzer	Agilent	N9020A	MY54440859	2023-05-05	2024-05-04

6.1.3 Test Data:

Mode1(AC 120/60Hz) / Line: Line / Band: 2.4G / BW: 20 / CH: 11

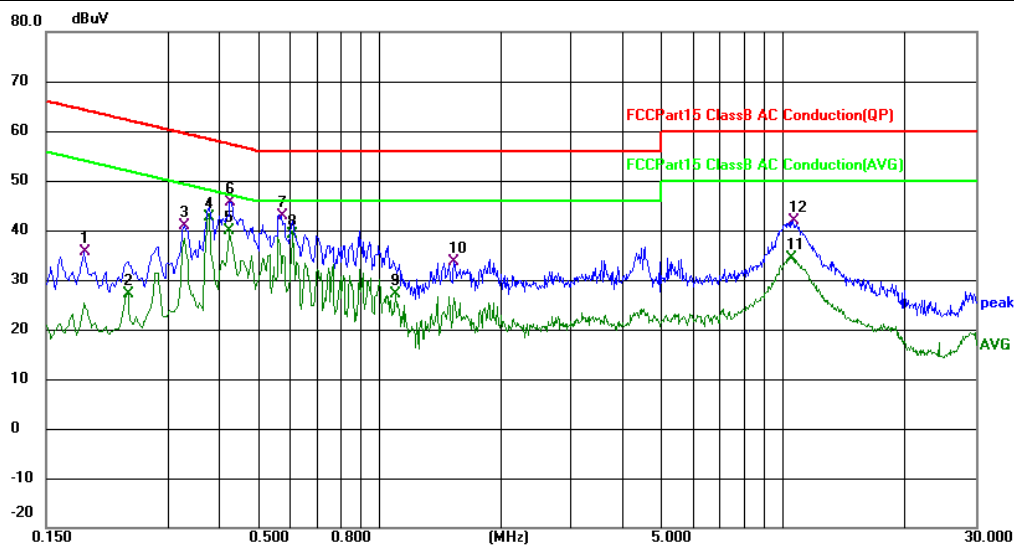


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1539	35.06	10.28	45.34	65.79	-20.45	QP	
2		0.1620	24.98	10.28	35.26	55.36	-20.10	AVG	
3		0.1940	23.73	10.66	34.39	53.86	-19.47	AVG	
4		0.1980	31.47	10.68	42.15	63.69	-21.54	QP	
5		0.3020	31.45	10.87	42.32	60.19	-17.87	QP	
6		0.3700	23.24	11.03	34.27	48.50	-14.23	AVG	
7		0.5860	35.02	11.52	46.54	56.00	-9.46	QP	
8		0.6900	26.27	11.75	38.02	46.00	-7.98	AVG	
9	*	0.8660	26.01	12.13	38.14	46.00	-7.86	AVG	
10		1.0859	29.50	12.56	42.06	56.00	-13.94	QP	
11		10.6820	26.45	10.43	36.88	50.00	-13.12	AVG	
12		11.0500	34.39	10.43	44.82	60.00	-15.18	QP	

*:Maximum data x:Over limit !:over margin

<Reference Only

Mode1(AC 120/60Hz) / Line: Neutral / Band: 2.4G / BW: 20 / CH: 11

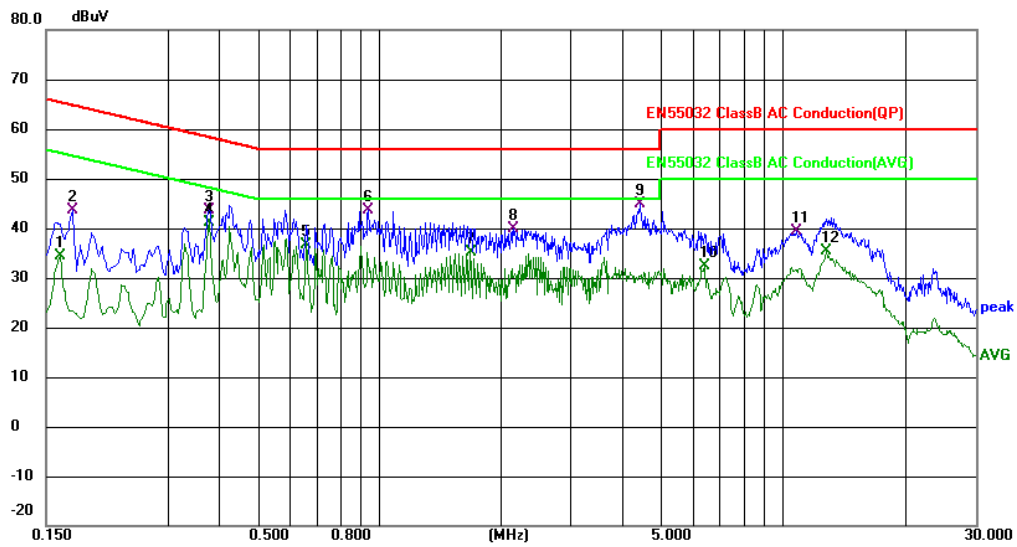


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1860	25.06	10.60	35.66	64.21	-28.55	QP	
2		0.2380	16.39	10.69	27.08	52.17	-25.09	AVG	
3		0.3300	29.90	10.90	40.80	59.45	-18.65	QP	
4	*	0.3780	31.59	11.00	42.59	48.32	-5.73	AVG	
5		0.4259	28.85	11.13	39.98	47.33	-7.35	AVG	
6		0.4260	34.61	11.13	45.74	57.33	-11.59	QP	
7		0.5740	31.34	11.49	42.83	56.00	-13.17	QP	
8		0.6100	27.59	11.58	39.17	46.00	-6.83	AVG	
9		1.0980	14.68	12.55	27.23	46.00	-18.77	AVG	
10		1.5339	20.11	13.47	33.58	56.00	-22.42	QP	
11		10.4980	24.13	10.32	34.45	50.00	-15.55	AVG	
12		10.6140	31.53	10.34	41.87	60.00	-18.13	QP	

*:Maximum data x:Over limit !:over margin

(Reference Only)

Mode1(AC 240/60Hz) / Line: Line / Band: 2.4G / BW: 20 / CH: 11

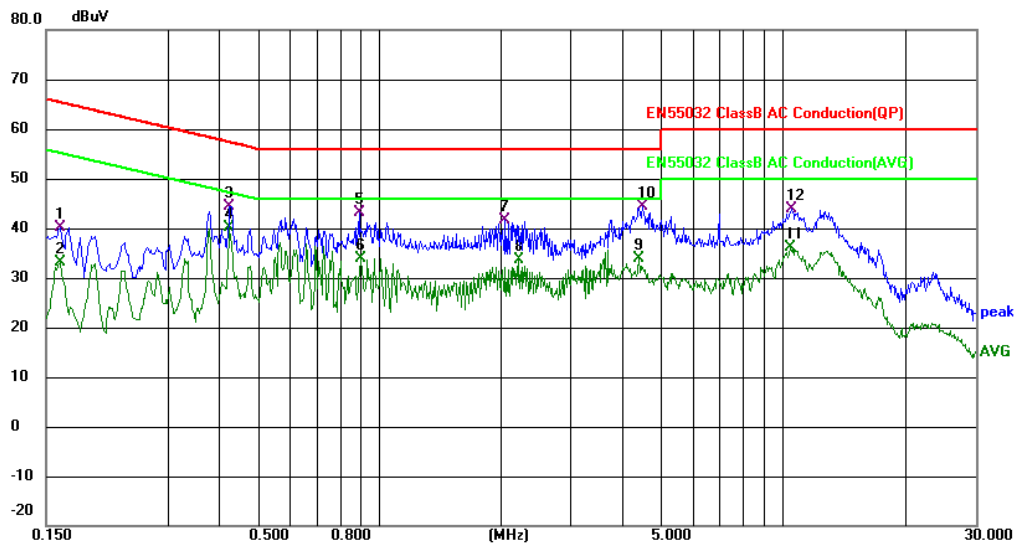


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	dBuV	Factor	ment	dBuV	dB	Detector	Comment
1		0.1620	24.01	10.27	34.28	55.36	-21.08	AVG	
2		0.1737	33.46	10.25	43.71	64.78	-21.07	QP	
3		0.3780	32.71	11.00	43.71	58.32	-14.61	QP	
4	*	0.3780	30.10	11.00	41.10	48.32	-7.22	AVG	
5		0.6580	25.02	11.69	36.71	46.00	-9.29	AVG	
6		0.9415	31.37	12.23	43.60	56.00	-12.40	QP	
7		1.6775	21.25	13.78	35.03	46.00	-10.97	AVG	
8		2.1538	29.38	10.45	39.83	56.00	-16.17	QP	
9		4.4378	34.49	10.28	44.77	56.00	-11.23	QP	
10		6.4138	22.06	10.28	32.34	50.00	-17.66	AVG	
11		10.8139	29.03	10.34	39.37	60.00	-20.63	QP	
12		12.8459	24.88	10.41	35.29	50.00	-14.71	AVG	

*:Maximum data x:Over limit !:over margin

(Reference Only)

Mode1(AC 240/60Hz) / Line: Neutral / Band: 2.4G / BW: 20 / CH: 11



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	dBuV	Factor	ment	dBuV	dB	Detector	Comment
1		0.1620	29.97	10.28	40.25	65.36	-25.11	QP	
2		0.1620	22.79	10.28	33.07	55.36	-22.29	AVG	
3		0.4259	33.27	11.17	44.44	57.33	-12.89	QP	
4	*	0.4259	28.91	11.17	40.08	47.33	-7.25	AVG	
5		0.8900	30.93	12.17	43.10	56.00	-12.90	QP	
6		0.9020	21.81	12.19	34.00	46.00	-12.00	AVG	
7		2.0500	31.70	10.01	41.71	56.00	-14.29	QP	
8		2.2259	23.51	10.07	33.58	46.00	-12.42	AVG	
9		4.4179	23.66	10.26	33.92	46.00	-12.08	AVG	
10		4.5217	34.21	10.27	44.48	56.00	-11.52	QP	
11		10.4379	25.70	10.41	36.11	50.00	-13.89	AVG	
12		10.5616	33.39	10.43	43.82	60.00	-16.18	QP	

*:Maximum data x:Over limit !:over margin

(Reference Only)

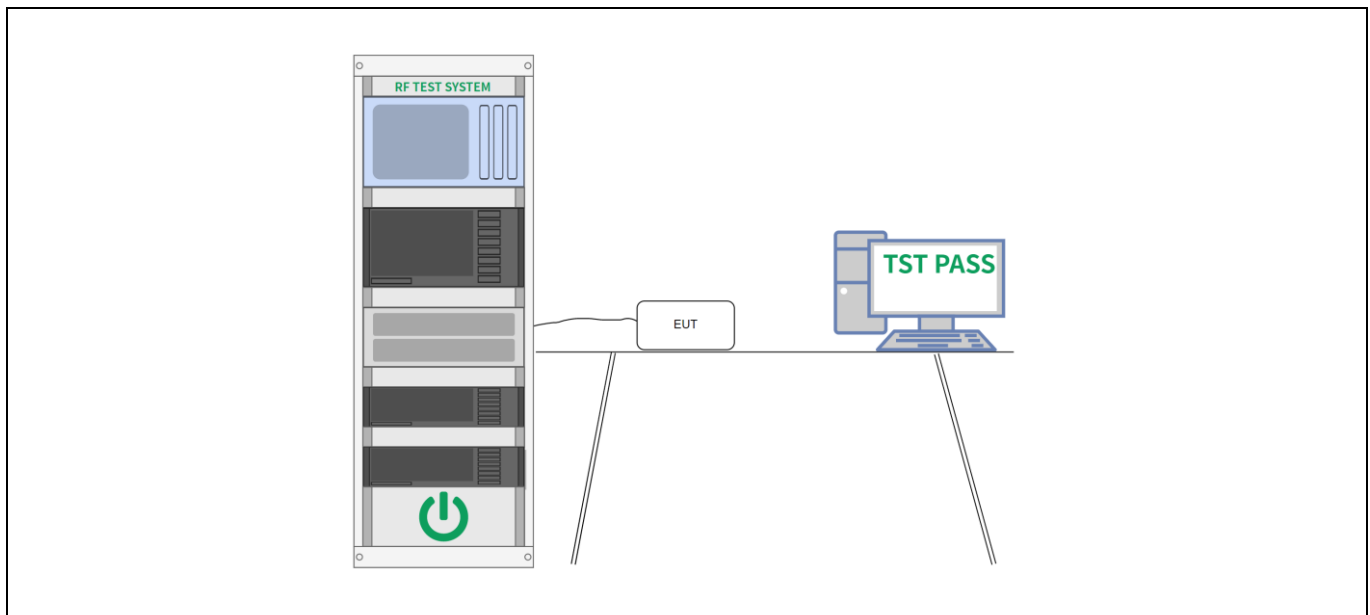
6.2 Occupied Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)
Test Limit:	Refer to 47 CFR 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Method:	ANSI C63.10-2013, section 11.8 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	a) Set RBW = 100 kHz. b) Set the VBW \geq [3 × RBW]. c) Detector = peak. d) Trace mode = max hold. e) Sweep = auto couple. f) Allow the trace to stabilize. g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	61 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	Mode1, Mode2, Mode3, Mode4				

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

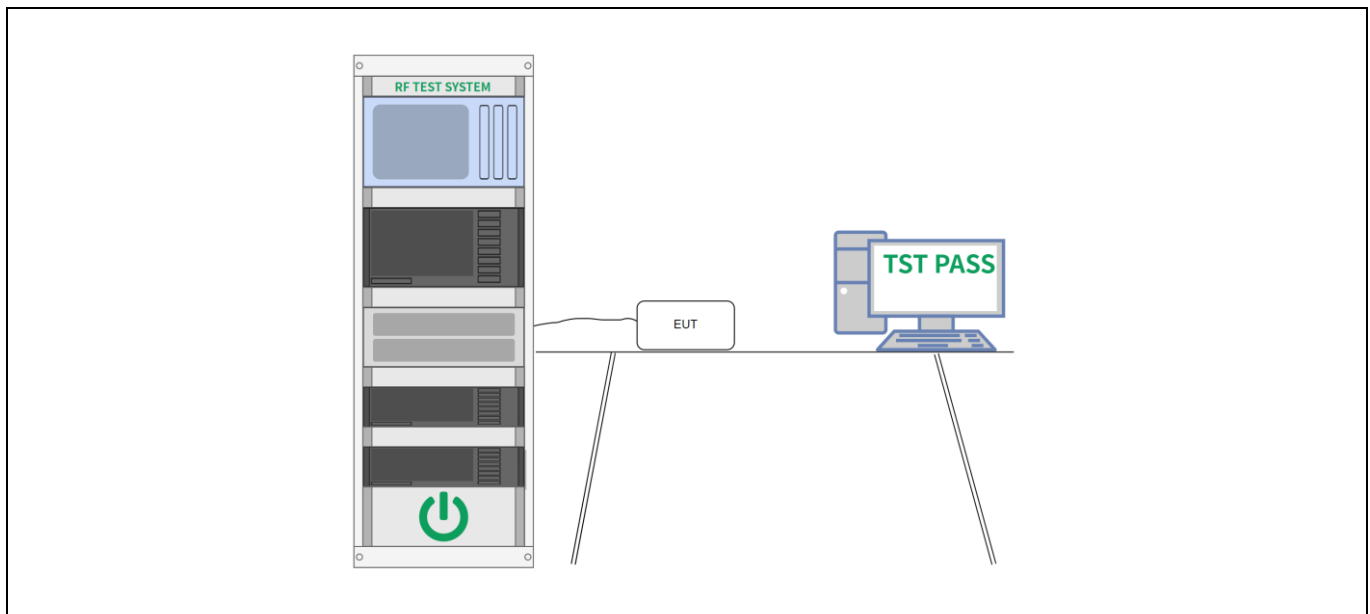
6.3 Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(3)
Test Limit:	Refer to 47 CFR 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Test Method:	ANSI C63.10-2013, section 11.9.1 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013, section 11.9.1 Maximum peak conducted output power

6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	61 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	Mode1, Mode2, Mode3, Mode4				

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Please Refer to Appendix for Details.

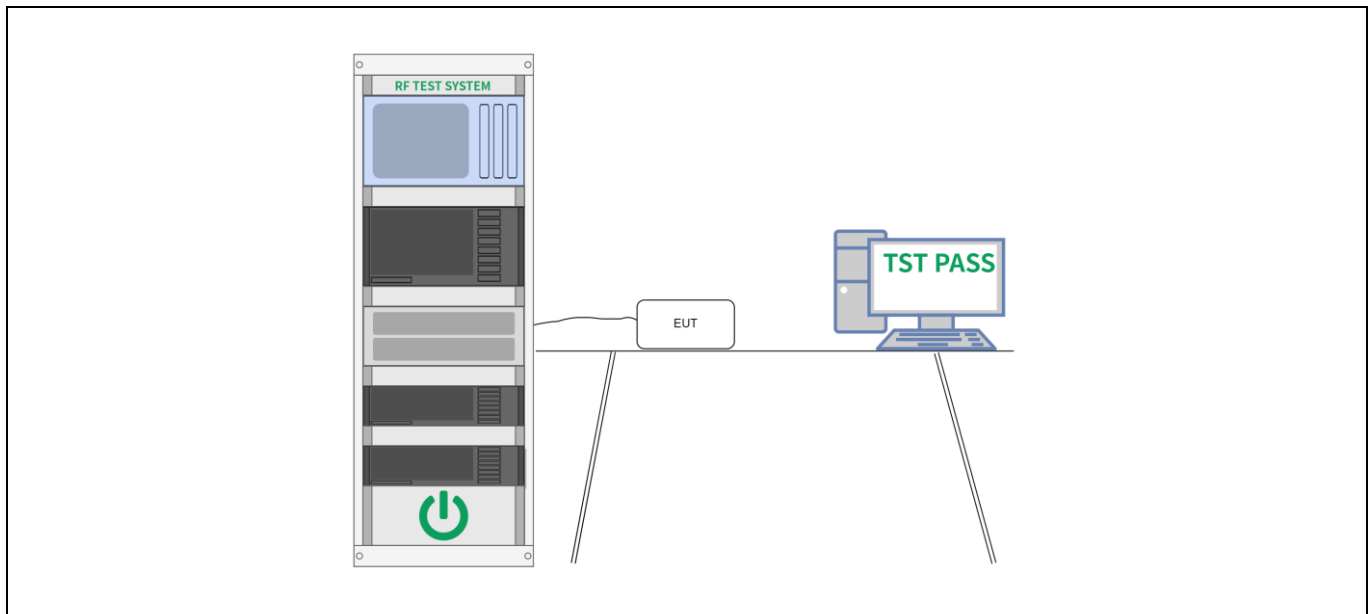
6.4 Power Spectral Density

Test Requirement:	47 CFR 15.247(e)
Test Limit:	Refer to 47 CFR 15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Test Method:	ANSI C63.10-2013, section 11.10 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013, section 11.10, Maximum power spectral density level in the fundamental emission

6.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	61 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	Mode1, Mode2, Mode3, Mode4				

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

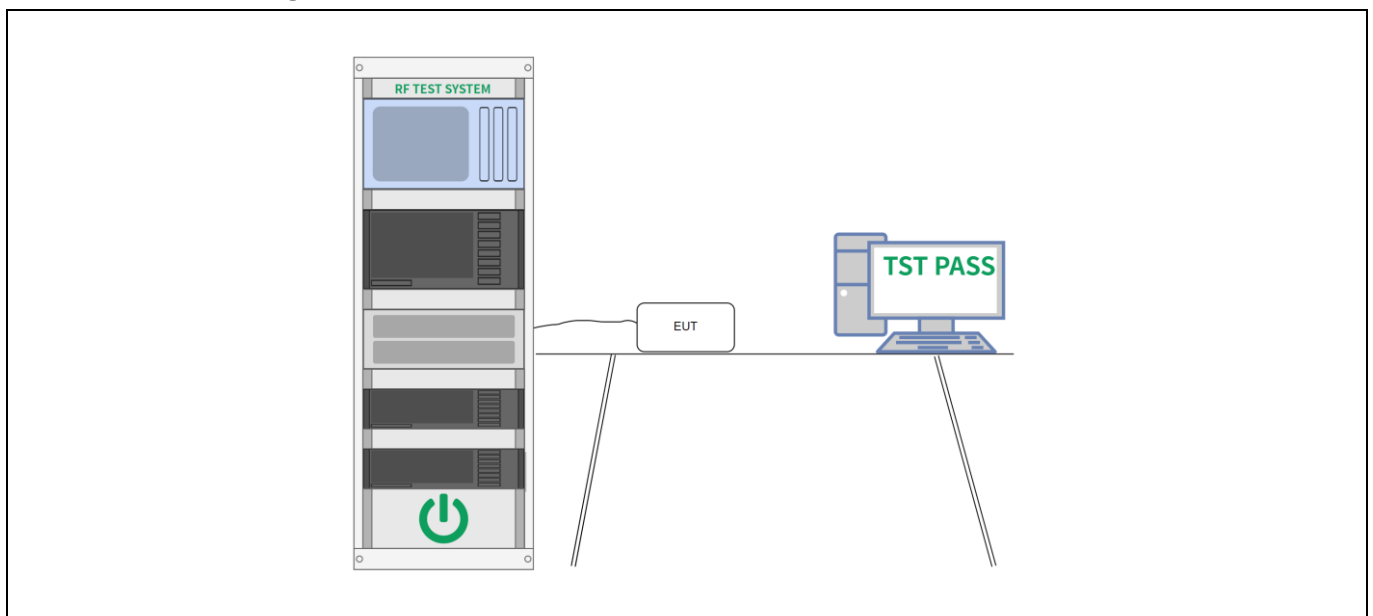
6.5 Emissions in frequency bands

Test Requirement:	47 CFR 15.247(d)
Test Limit:	Refer to 47 CFR 15.247(d), 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.
Test Method:	ANSI C63.10-2013 section 11.11 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013 Section 11.11.1, Section 11.11.2, Section 11.11.3

6.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	61 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4				
Final test mode:	Mode1, Mode2, Mode3, Mode4				

6.5.2 Test Setup Diagram:



6.5.3 Test Data:

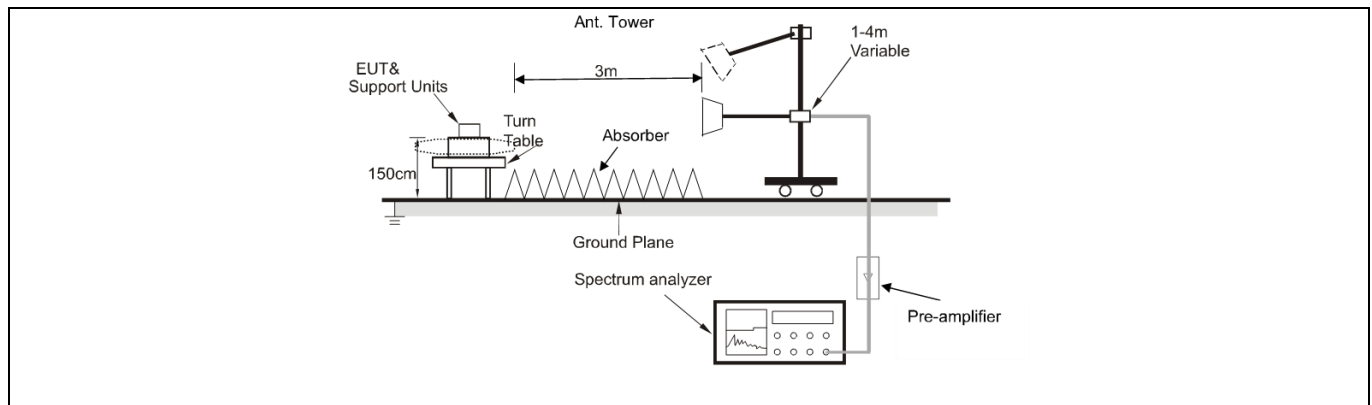
Please Refer to Appendix for Details.

6.6 Band edge emissions (Radiated)

Test Requirement:	Refer to 47 CFR 15.247(d), 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)).`		
Test Limit:	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
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.		
Test Method:	ANSI C63.10-2013 section 6.10 KDB 558074 D01 15.247 Meas Guidance v05r02		
Procedure:	ANSI C63.10-2013 section 6.10.5.2		

6.6.1 E.U.T. Operation:

Operating Environment:			
Temperature:	28.1 °C	Humidity:	74.3 %
		Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4		
Final test mode:	Mode1, Mode2, Mode3, Mode4		
Note: All other emissions are attenuated 20dB below the limit, so does not recorded.			

6.6.2 Test Setup Diagram:


6.6.3 Test Data:

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: 1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2310.000	46.28	-8.08	38.20	74.00	-35.80	peak
2		2310.000	37.11	-8.08	29.03	54.00	-24.97	AVG
3		2390.000	54.41	-7.71	46.70	74.00	-27.30	peak
4	*	2390.000	37.90	-7.71	30.19	54.00	-23.81	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: 1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2310.000	47.16	-8.08	39.08	74.00	-34.92	peak
2		2310.000	37.16	-8.08	29.08	54.00	-24.92	AVG
3		2390.000	48.75	-7.71	41.04	74.00	-32.96	peak
4	*	2390.000	37.46	-7.71	29.75	54.00	-24.25	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: 11

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2483.500	50.88	-7.24	43.64	74.00	-30.36	peak
2	*	2483.500	40.86	-7.24	33.62	54.00	-20.38	AVG
3		2500.000	47.99	-7.17	40.82	74.00	-33.18	peak
4		2500.000	39.09	-7.17	31.92	54.00	-22.08	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: 11

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2483.500	47.62	-7.24	40.38	74.00	-33.62	peak
2	*	2483.500	38.82	-7.24	31.58	54.00	-22.42	AVG
3		2500.000	48.28	-7.17	41.11	74.00	-32.89	peak
4		2500.000	38.36	-7.17	31.19	54.00	-22.81	AVG

Mode2 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: 1

No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	2310.000	43.43	-8.08	35.35	74.00	-38.65	peak	
2	2310.000	34.34	-8.08	26.26	54.00	-27.74	AVG	
3	2390.000	74.12	-7.71	66.41	74.00	-7.59	peak	
4 *	2390.000	59.08	-7.71	51.37	54.00	-2.63	AVG	

Mode2 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: 1

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	2310.000	43.32	-8.08	35.24	74.00	-38.76	peak	
2	2310.000	33.36	-8.08	25.28	54.00	-28.72	AVG	
3	2390.000	60.77	-7.71	53.06	74.00	-20.94	peak	
4 *	2390.000	46.02	-7.71	38.31	54.00	-15.69	AVG	

Mode2 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: 11

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2483.500	55.79	-7.24	48.55	74.00	-25.45	peak	
2	*	2483.500	43.81	-7.24	36.57	54.00	-17.43	AVG	
3		2500.000	48.51	-7.17	41.34	74.00	-32.66	peak	
4		2500.000	39.94	-7.17	32.77	54.00	-21.23	AVG	

Mode2 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: 11

No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	2483.500	49.00	-7.24	41.76	74.00	-32.24	peak	
2 *	2483.500	39.65	-7.24	32.41	54.00	-21.59	AVG	
3	2500.000	47.69	-7.17	40.52	74.00	-33.48	peak	
4	2500.000	38.27	-7.17	31.10	54.00	-22.90	AVG	

Mode3 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: 1

No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	2310.000	44.72	-8.08	36.64	74.00	-37.36	peak	
2	2310.000	34.39	-8.08	26.31	54.00	-27.69	AVG	
3	2390.000	77.20	-7.71	69.49	74.00	-4.51	peak	
4 *	2390.000	59.10	-7.71	51.39	54.00	-2.61	AVG	

Mode3 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: 1

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	2310.000	41.05	-8.08	32.97	74.00	-41.03	peak	
2	2310.000	32.82	-8.08	24.74	54.00	-29.26	AVG	
3	2390.000	64.66	-7.71	56.95	74.00	-17.05	peak	
4 *	2390.000	50.64	-7.71	42.93	54.00	-11.07	AVG	

Mode3 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: 11

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	2483.500	59.58	-7.24	52.34	74.00	-21.66	peak	
2 *	2483.500	46.01	-7.24	38.77	54.00	-15.23	AVG	
3	2500.000	50.16	-7.17	42.99	74.00	-31.01	peak	
4	2500.000	40.18	-7.17	33.01	54.00	-20.99	AVG	

Mode3 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: 11

No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	2483.500	51.04	-7.24	43.80	74.00	-30.20	peak	
2 *	2483.500	40.28	-7.24	33.04	54.00	-20.96	AVG	
3	2500.000	48.03	-7.17	40.86	74.00	-33.14	peak	
4	2500.000	38.26	-7.17	31.09	54.00	-22.91	AVG	

Mode4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: 3

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		2310.000	41.80	-8.08	33.72	74.00	-40.28	peak
2		2310.000	32.75	-8.08	24.67	54.00	-29.33	AVG
3		2390.000	61.68	-7.71	53.97	74.00	-20.03	peak
4	*	2390.000	52.06	-7.71	44.35	54.00	-9.65	AVG

Mode4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: 3

No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	2310.000	41.80	-8.08	33.72	74.00	-40.28	peak	
2	2310.000	32.75	-8.08	24.67	54.00	-29.33	AVG	
3	2390.000	63.18	-7.71	55.47	74.00	-18.53	peak	
4 *	2390.000	53.86	-7.71	46.15	54.00	-7.85	AVG	

Mode4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: 9

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	2483.500	61.99	-7.24	54.75	74.00	-19.25	peak	
2 *	2483.500	51.86	-7.24	44.62	54.00	-9.38	AVG	
3	2500.000	51.68	-7.17	44.51	74.00	-29.49	peak	
4	2500.000	41.64	-7.17	34.47	54.00	-19.53	AVG	

Mode4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: 9

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2483.500	54.37	-7.24	47.13	74.00	-26.87	peak	
2	*	2483.500	45.20	-7.24	37.96	54.00	-16.04	AVG	
3		2500.000	48.52	-7.17	41.35	74.00	-32.65	peak	
4		2500.000	38.93	-7.17	31.76	54.00	-22.24	AVG	

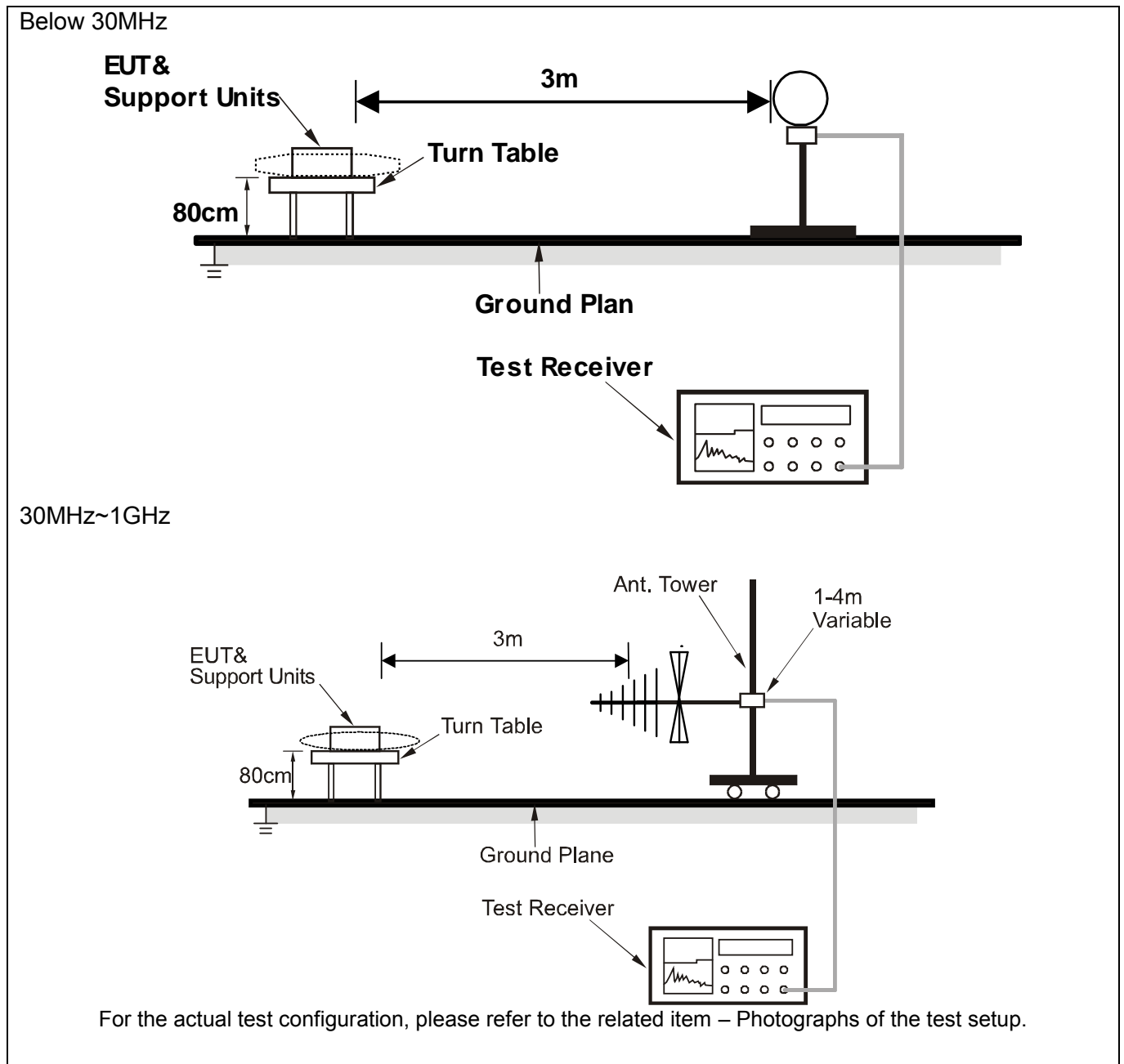
6.7 Emissions in frequency bands (below 1GHz)

Test Requirement:	Refer to 47 CFR 15.247(d), 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)).`		
Test Limit:	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
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.		
Test Method:	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02		
Procedure:	ANSI C63.10-2013 section 6.6.4		

6.7.1 E.U.T. Operation:

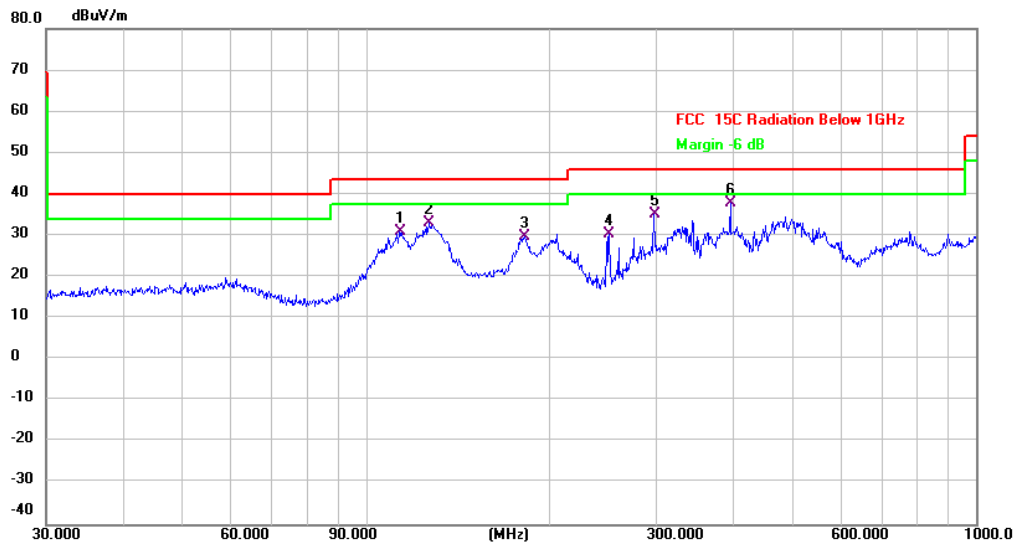
Operating Environment:			
Temperature:	26 °C	Humidity:	54 %
		Atmospheric Pressure:	983 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4		
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report		
Note:			
The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.			
All modes of operation of the EUT were investigated, and only the worst-case results are reported. There were no emissions found below 30MHz within 20dB of the limit.			

6.7.2 Test Setup Diagram:



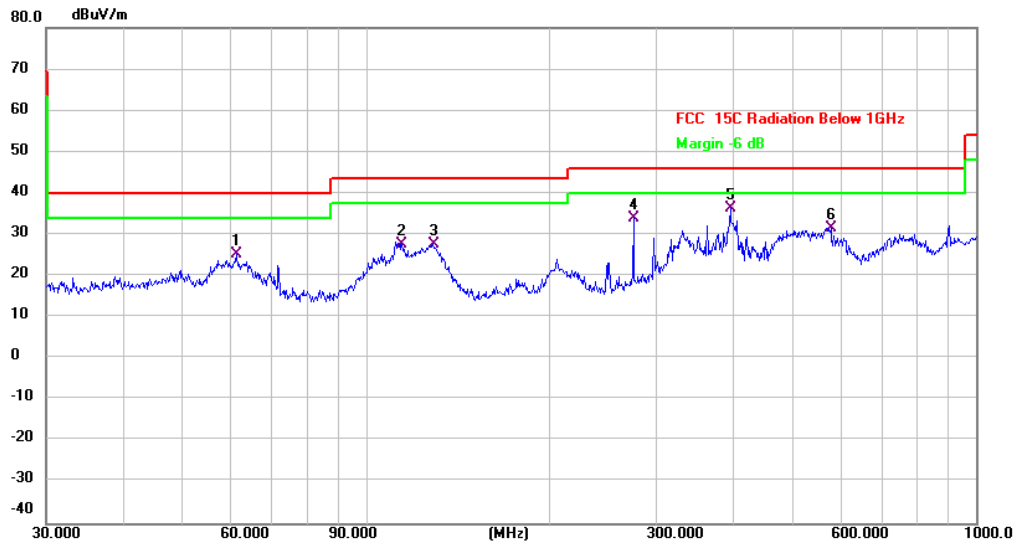
6.7.3 Test Data:

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: 11



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		113.3163	40.24	-9.23	31.01	43.50	-12.49	QP	
2		126.7723	45.17	-11.98	33.19	43.50	-10.31	QP	
3		182.5592	38.75	-9.02	29.73	43.50	-13.77	QP	
4		251.1804	38.10	-7.89	30.21	46.00	-15.79	QP	
5		297.2241	41.09	-5.94	35.15	46.00	-10.85	QP	
6	*	396.2415	41.98	-4.24	37.74	46.00	-8.26	QP	

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: 11



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	61.3463	32.49	-7.12	25.37	40.00	-14.63	QP	
2	114.5146	37.02	-9.41	27.61	43.50	-15.89	QP	
3	128.5630	39.95	-12.44	27.51	43.50	-15.99	QP	
4	275.1570	41.73	-7.69	34.04	46.00	-11.96	QP	
5 *	396.2415	40.51	-4.24	36.27	46.00	-9.73	QP	
6	578.6699	31.27	0.36	31.63	46.00	-14.37	QP	

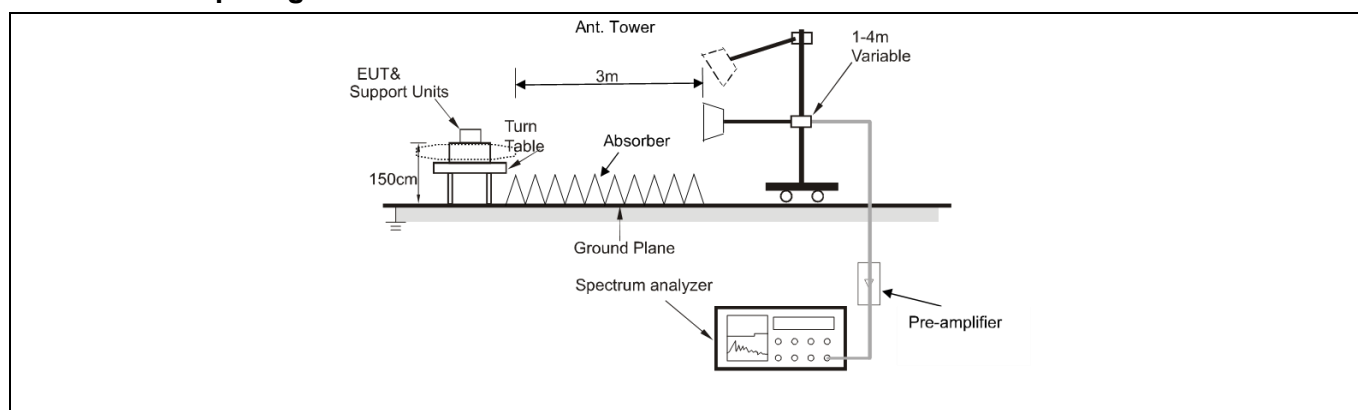
6.8 Emissions in frequency bands (above 1GHz)

Test Requirement:	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)).`		
Test Limit:	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
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.		
Test Method:	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02		
Procedure:	ANSI C63.10-2013 section 6.6.4		

6.8.1 E.U.T. Operation:

Operating Environment:			
Temperature:	28.1 °C	Humidity:	74.3 %
		Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4		
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report		
Note: Test frequency are from 1GHz to 25GHz, the amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported. All modes of operation of the EUT were investigated, and only the worst-case results are reported.			

6.8.2 Test Setup Diagram:



6.8.3 Test Data:

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: 1

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4824.000	52.80	0.82	53.62	74.00	-20.38	peak
2	*	4824.000	46.69	0.82	47.51	54.00	-6.49	AVG
3		7236.000	42.87	6.00	48.87	74.00	-25.13	peak
4		7236.000	36.62	6.00	42.62	54.00	-11.38	AVG
5		9648.000	42.04	6.17	48.21	74.00	-25.79	peak
6		9648.000	36.61	6.17	42.78	54.00	-11.22	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: 1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		4824.000	49.11	0.82	49.93	74.00	-24.07	peak
2		4824.000	41.69	0.82	42.51	54.00	-11.49	AVG
3		7236.000	41.69	6.00	47.69	74.00	-26.31	peak
4		7236.000	35.68	6.00	41.68	54.00	-12.32	AVG
5		9648.000	44.16	6.17	50.33	74.00	-23.67	peak
6	*	9648.000	38.04	6.17	44.21	54.00	-9.79	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: 6

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		4874.000	50.66	1.01	51.67	74.00	-22.33	peak
2	*	4874.000	44.86	1.01	45.87	54.00	-8.13	AVG
3		7311.000	40.55	5.94	46.49	74.00	-27.51	peak
4		7311.000	35.01	5.94	40.95	54.00	-13.05	AVG
5		9748.000	41.81	6.54	48.35	74.00	-25.65	peak
6		9748.000	36.07	6.54	42.61	54.00	-11.39	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: 6

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		4874.000	48.29	1.01	49.30	74.00	-24.70	peak
2		4874.000	41.57	1.01	42.58	54.00	-11.42	AVG
3		7311.000	40.57	5.94	46.51	74.00	-27.49	peak
4		7311.000	34.67	5.94	40.61	54.00	-13.39	AVG
5		9748.000	44.06	6.54	50.60	74.00	-23.40	peak
6	*	9748.000	38.04	6.54	44.58	54.00	-9.42	AVG

Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: 11

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4924.000	48.28	1.27	49.55	74.00	-24.45	peak
2	*	4924.000	42.24	1.27	43.51	54.00	-10.49	AVG
3		7386.000	41.74	5.86	47.60	74.00	-26.40	peak
4		7386.000	35.99	5.86	41.85	54.00	-12.15	AVG
5		9848.000	40.58	6.31	46.89	74.00	-27.11	peak
6		9848.000	34.26	6.31	40.57	54.00	-13.43	AVG

Mode1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: 11

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		4924.000	48.34	1.27	49.61	74.00	-24.39	peak
2	*	4924.000	41.54	1.27	42.81	54.00	-11.19	AVG
3		7386.000	42.66	5.86	48.52	74.00	-25.48	peak
4		7386.000	36.71	5.86	42.57	54.00	-11.43	AVG
5		9848.000	40.73	6.31	47.04	74.00	-26.96	peak
6		9848.000	35.64	6.31	41.95	54.00	-12.05	AVG

Photographs of the test setup

Refer to Appendix - Test Setup Photos

Photographs of the EUT

Refer to Appendix - EUT Photos

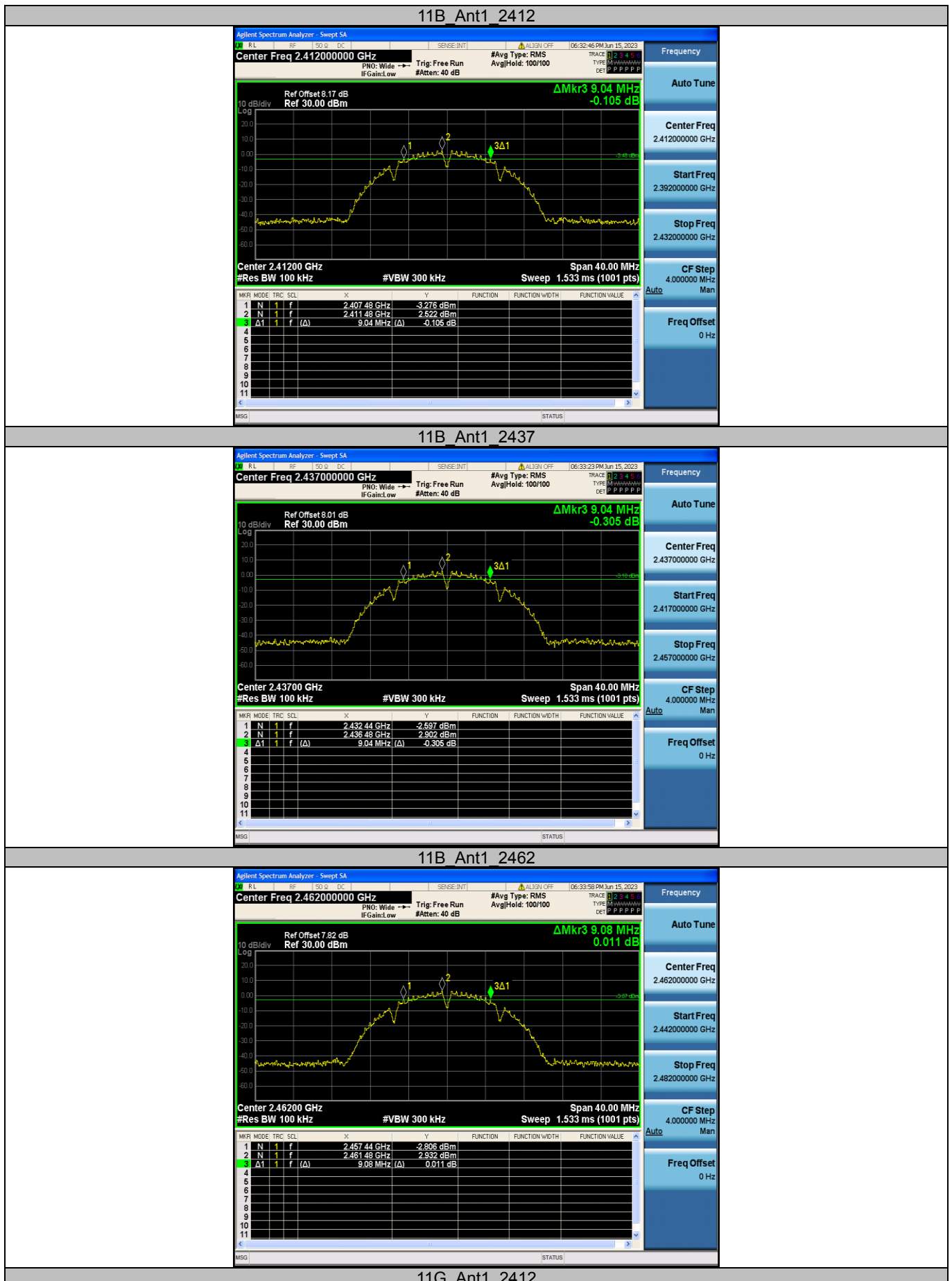
Appendix

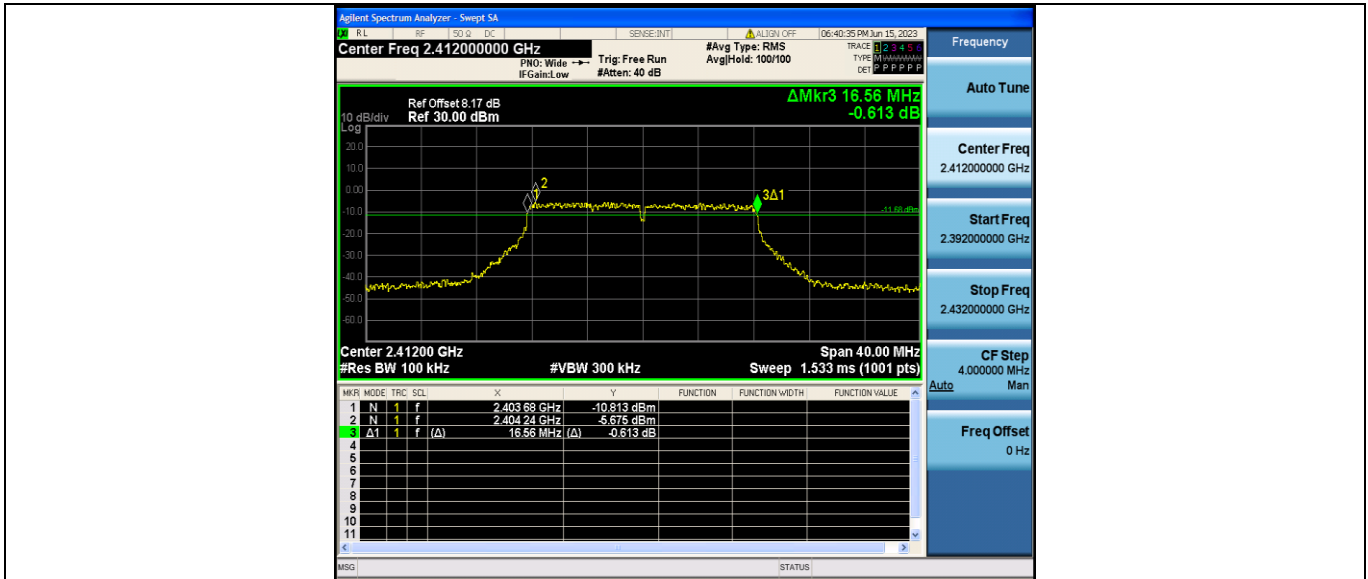
Appendix A: DTS Bandwidth

Test Result

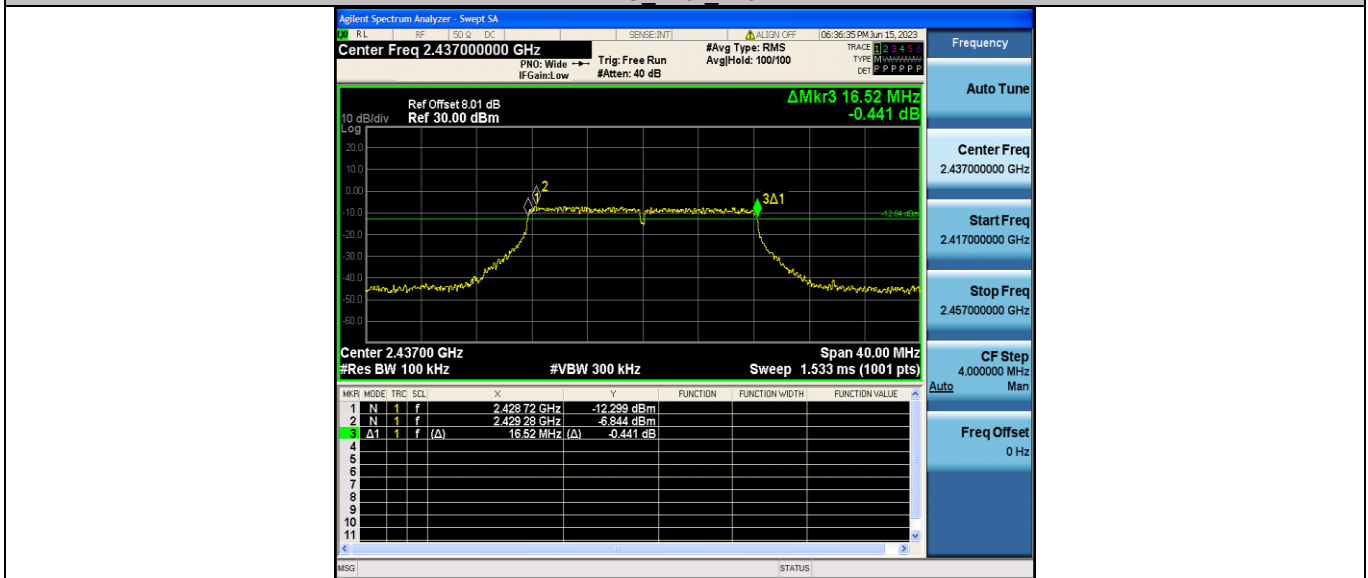
Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	9.040	0.5	PASS
		2437	9.040	0.5	PASS
		2462	9.080	0.5	PASS
11G	Ant1	2412	16.560	0.5	PASS
		2437	16.520	0.5	PASS
		2462	16.520	0.5	PASS
11N20SISO	Ant1	2412	17.760	0.5	PASS
		2437	17.720	0.5	PASS
		2462	17.640	0.5	PASS
11N40SISO	Ant1	2422	36.480	0.5	PASS
		2437	36.400	0.5	PASS
		2452	36.400	0.5	PASS

Test Graphs

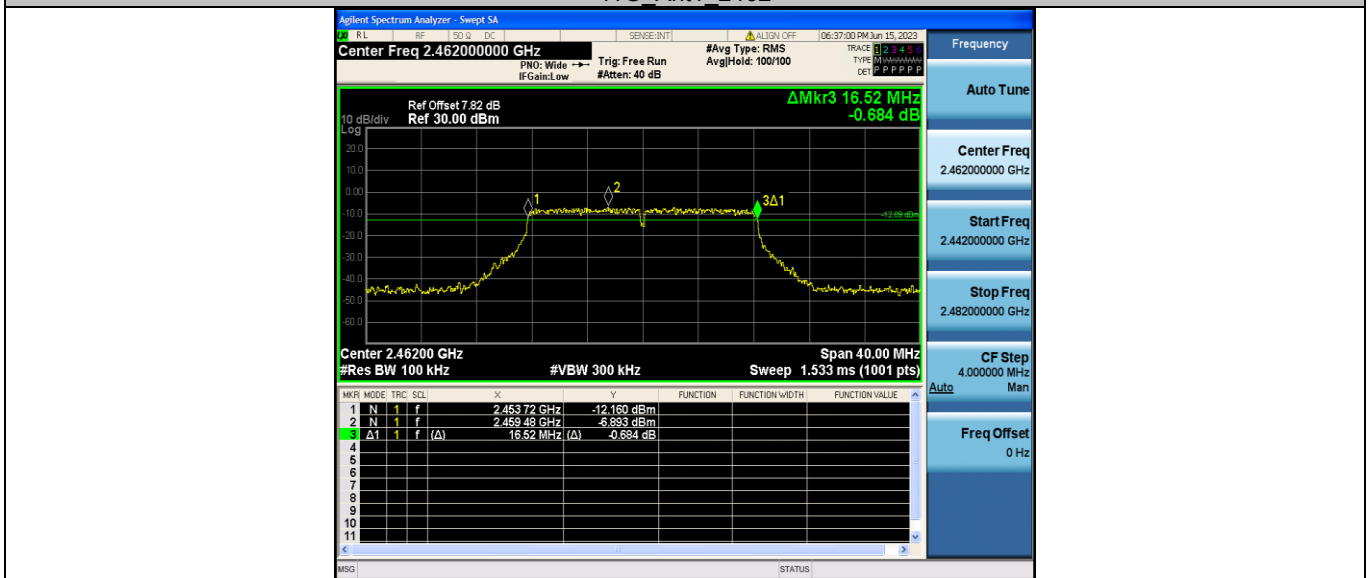




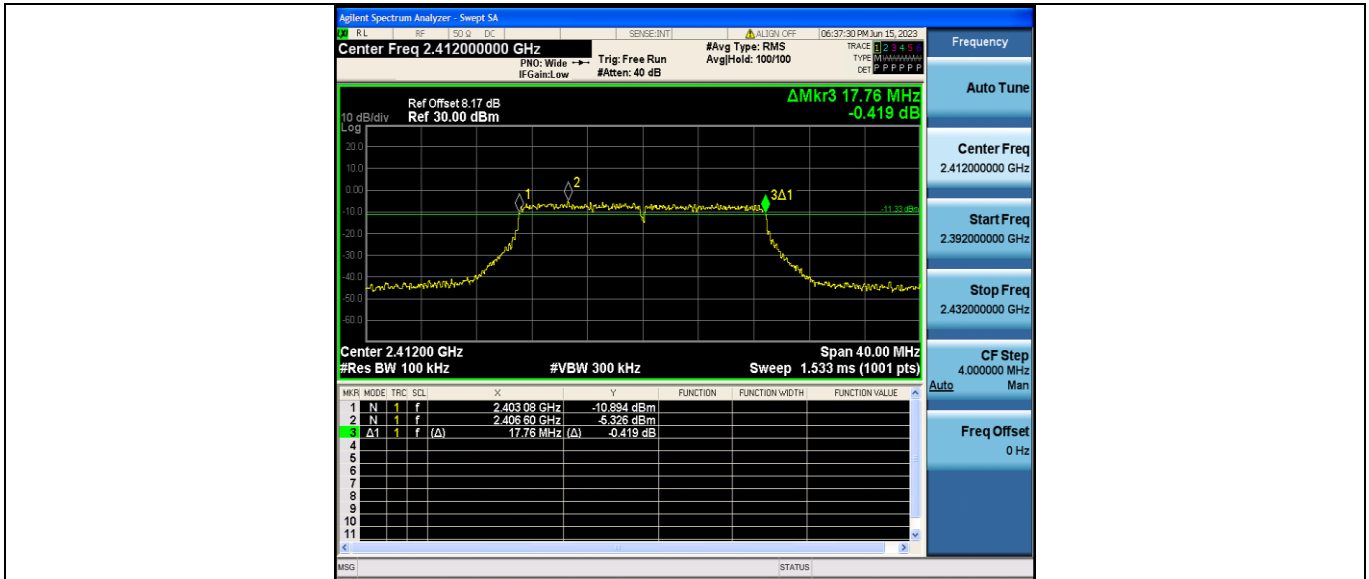
11G_Ant1_2437



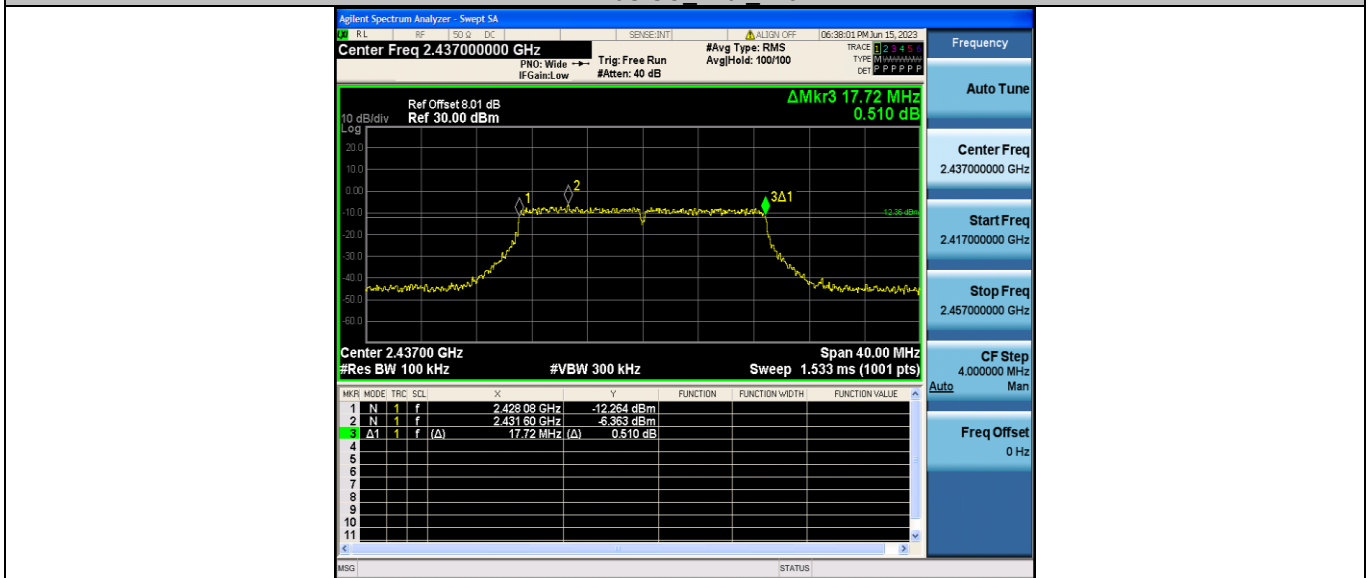
11G_Ant1_2462



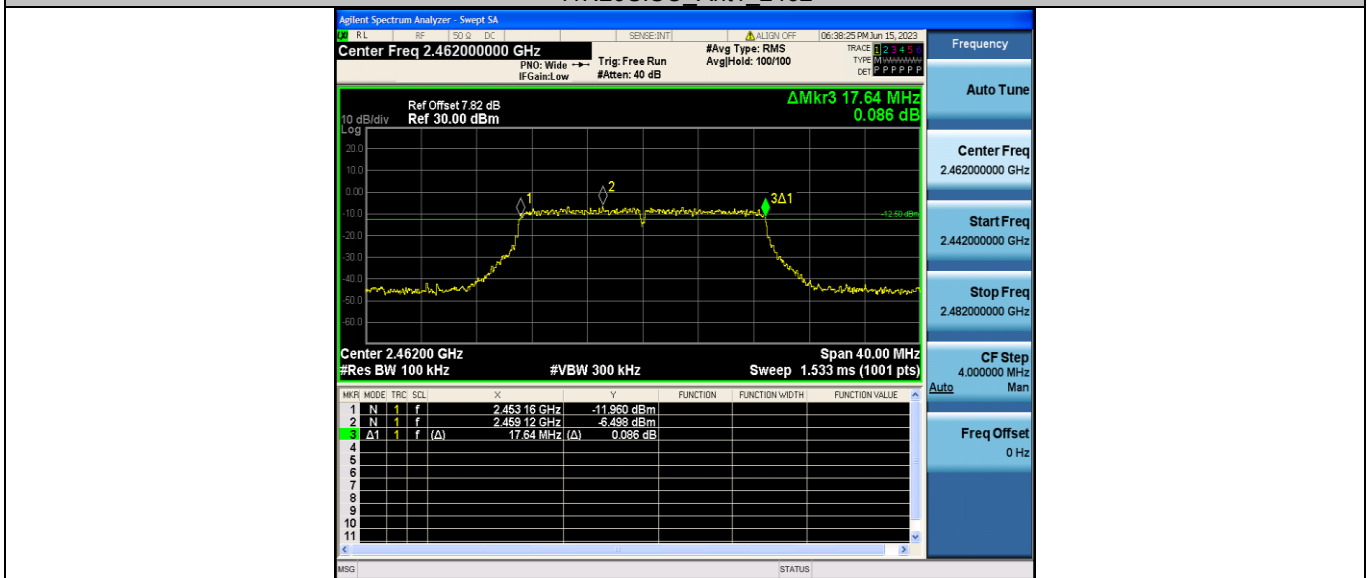
11N20SISO_Ant1_2412



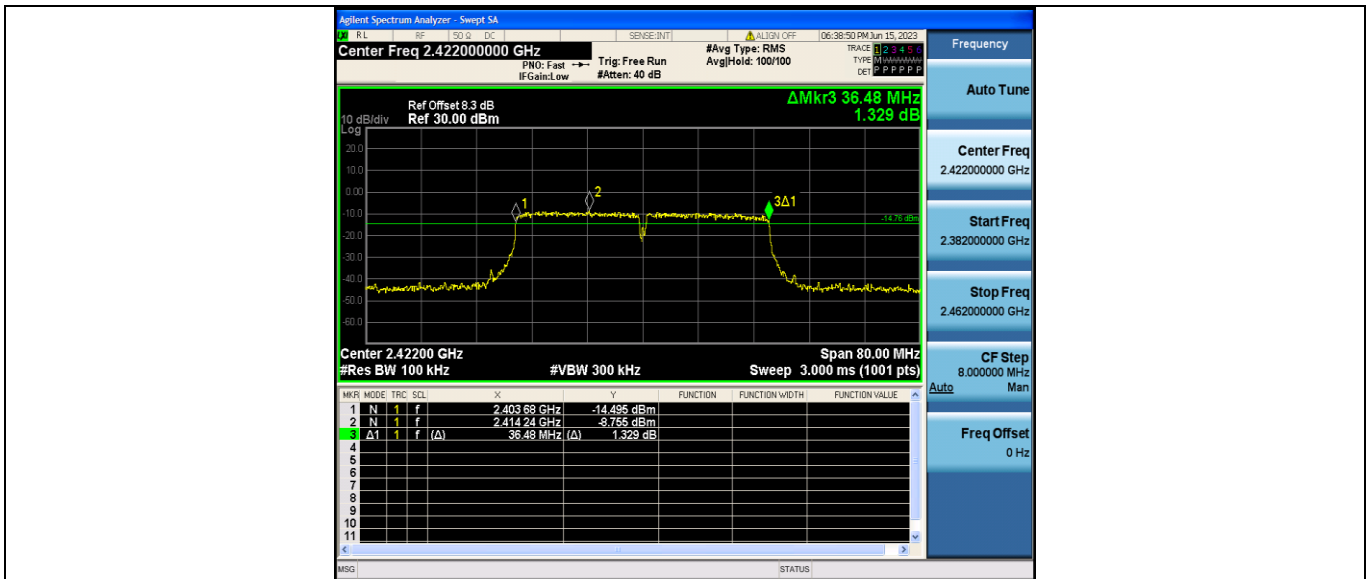
11N20SISO_Ant1_2437



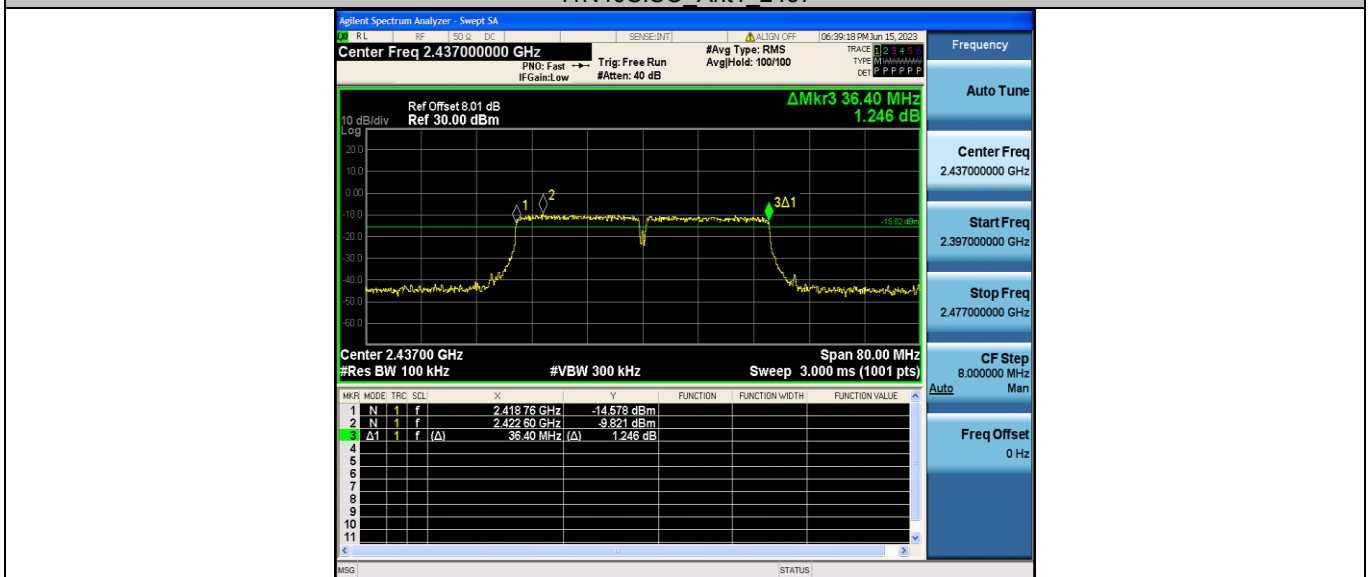
11N20SISO_Ant1_2462



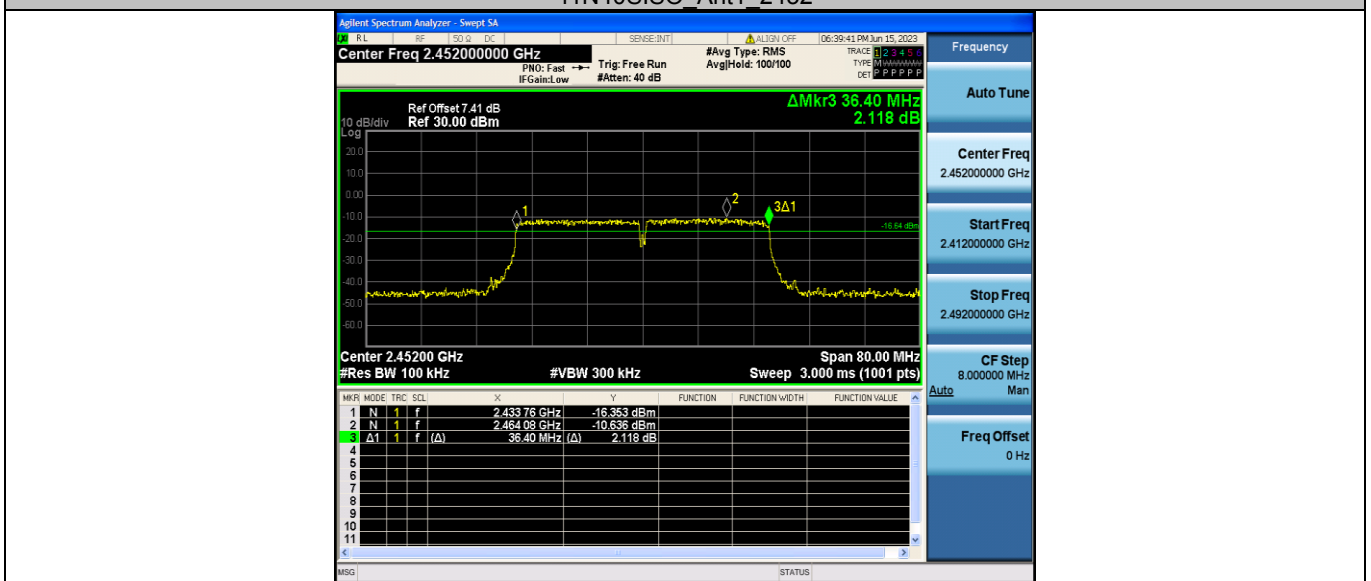
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



Appendix B: Maximum conducted output power

Test Result Peak

Test Mode	Antenna	Frequency [MHz]	Peak Power [dBm]	Conducted Limit [dBm]	Verdict
11B	Ant1	2412	14.67	≤30.00	PASS
		2437	14.99	≤30.00	PASS
		2462	15.14	≤30.00	PASS
11G	Ant1	2412	15.81	≤30.00	PASS
		2437	14.53	≤30.00	PASS
		2462	14.49	≤30.00	PASS
11N20SISO	Ant1	2412	16.06	≤30.00	PASS
		2437	14.78	≤30.00	PASS
		2462	14.70	≤30.00	PASS
11N40SISO	Ant1	2422	15.72	≤30.00	PASS
		2437	14.75	≤30.00	PASS
		2452	14.03	≤30.00	PASS

Appendix C: Maximum power spectral density

Test Result

Test Mode	Antenna	Frequency [MHz]	Result [dBm/3-100kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-17.56	≤8.00	PASS
		2437	-17.55	≤8.00	PASS
		2462	-17.35	≤8.00	PASS
11G	Ant1	2412	-19.12	≤8.00	PASS
		2437	-20.58	≤8.00	PASS
		2462	-20.48	≤8.00	PASS
11N20SISO	Ant1	2412	-18.71	≤8.00	PASS
		2437	-20.09	≤8.00	PASS
		2462	-20.52	≤8.00	PASS
11N40SISO	Ant1	2422	-19.69	≤8.00	PASS
		2437	-20.63	≤8.00	PASS
		2452	-21.35	≤8.00	PASS