Microtest
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Test Report

Report No.: MTi230805003-06E4

Date of issue: 2023-08-22

Applicant: Beijing Cozyla Technology ltd.

Product: Cozyla Canvas

Model(s): Cozyla CD-3M341F

FCC ID: 2BCES-CD3M341F

Shenzhen Microtest Co., Ltd.

http://www.mtitest.com

Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
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Instructions

1. This test report shall not be partially reproduced without the written consent of the laboratory.

2. The test results in this test report are only responsible for the samples submitted

3. This test report is invalid without the seal and signature of the laboratory.

4. This test report is invalid if transferred, altered, or tampered with in any form without authorization.

5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

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Test Result Certification	
Applicant:	Beijing Cozyla Technology ltd.
Address:	Room A419 Building1, No. 12 Shangdi Information Road, Haidian District, Beijing PRC 100080
Manufacturer:	Beijing Cozyla Technology ltd.
Address:	Room A419 Building1, No. 12 Shangdi Information Road, Haidian District, Beijing PRC 100080
Product description	
Product name:	Cozyla Canvas
Trademark:	Cozyla
Model name:	Cozyla CD-3M341F
Series Model:	N/A
Standards:	FCC 47 CFR Part 15.407
Test method:	ANSI C63.10-2013 KDB 789033 D02 v02r01
Date of Test	
Date of test:	2023-08-16 to 2023-08-22
Test result:	Pass

Test Engineer	:	Letter. Lan.
		(Letter Lan)
Reviewed By	:	Leon chen
		(Leon Chen)
Approved By	:	Tom Xue
		(Tom Xue)

1 General Description

1.1 Description of the EUT

Product name:	Cozyla Canvas
Model name:	Cozyla CD-3M341F
Series Model:	N/A
Model difference:	N/A
Electrical rating:	Input: DC 12V2A
Accessories:	Adaptor: Model: KA24D-1202000US Input: 100-240V~ 50/60Hz 0.6A Max Output: 12V⎓2000mA
Hardware version:	JHA133-DDR3-AI-C V1.0
Software version:	20230818
Test sample(s) number:	MTi230805003-06S1001
RF specification	
Bluetooth version:	V5.0
Operating frequency range:	802.11a/n(HT20)/ac(HT20)/ax(HE20): U-NII Band 1: 5180MHz to 5240MHz; U-NII Band 3: 5745MHz to 5825MHz; 802.11n(HT40)/ac(HT40)/ax(HE40): U-NII Band 1: 5190MHz to 5230MHz; U-NII Band 3: 5755MHz to 5795MHz;
Channel number:	802.11a/n(HT20)/ac(HT20)/ax(HE20): U-NII Band 1: 4; U-NII Band 3: 5; 802.11n(HT40)/ac(HT40)/ax(HE40): U-NII Band 1: 2; U-NII Band 3: 2;
Modulation type:	802.11a: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM); 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Antenna(s) type:	FPC Antenna
Antenna(s) gain:	3.02dBi

1.2 Description of test modes

No.	Emission test modes
Mode1	802.11a mode
Mode2	802.11n20 mode
Mode3	802.11n40 mode
Mode4	802.11ac20 mode
Mode5	802.11ac40 mode
Mode6	802.11ax20 mode
Mode7	802.11ax40 mode

Note:
802.11ax mode only support full resource unit size.

1.2.1 Operation channel list

1.1.1 Operation channel list

20 MHz bandwidth		40 MHz bandwidth	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
36	5180	38	5190
40	5200	46	5230
44	5220	--	--
48	5240	--	--

20 MHz bandwidth		40 MHz bandwidth	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
149	5745	151	5755
153	5765	159	5795
157	5785	--	--
161	5805	--	--
165	5825	--	--

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.

The test software has been used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

Test Software:	CMD

For U-NII-1 band:			
802.11a		**802.11n20**	
Channel	Power setting	Channel	Power setting
36	4	36	2
40	5	40	4
48	5	48	4
802.11n40		**802.11ac20**	
Channel	Power setting	Channel	Power setting
38	5	36	3
46	6	40	4
--	--	48	5
802.11ac40		**802.11ax20**	
Channel	Power setting	Channel	Power setting
38	5	149	**2**
46	6	157	3
--	--	165	3
802.11ax40			
Channel	Power setting	Channel	Power setting
151	4		
159	4		
--			

For U-NII-3 band:			
802.11a		**802.11n20**	
Channel	Power setting	Channel	Power setting
149	9	149	9
157	9	157	9
165	9	165	9
802.11n40		**802.11ac20**	
Channel	Power setting	Channel	Power setting
151	9	149	9
159	9	157	9
--	--	165	9
802.11ac40		**802.11ax20**	
Channel	Power setting	Channel	Power setting
151	9	149	9

159	9	157	9
--	--	165	9
802.11ax40			
Channel	Power setting	Channel	Power setting
151	9		
159	9		
--			

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

Support equipment list			
Description	Model	Serial No.	Manufacturer
/	/	/	/
Support cable list			
Description	Length (m)	From	To
/	/	/	/

1.5 Measurement uncertainty

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

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 15E	Part 15.203	Pass
2	Conducted Emission at AC power line	47 CFR Part 15E	47 CFR Part 15.207(a)	Pass
3	Duty Cycle	47 CFR Part 15E		Pass
4	Maximum conducted output power	47 CFR Part 15E	47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(3)(i)	Pass
5	Power spectral density	47 CFR Part 15E	47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 47 CFR Part 15.407(a)(3)(i)	Pass
6	Emission bandwidth and occupied bandwidth 6dB bandwidth	47 CFR Part 15E	U-NII 1 U-NII 3: No limits, only for report use. 47 CFR Part 15.407(e)	Pass
7	Band edge emissions (Radiated)	47 CFR Part 15E	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)	Pass
8	Undesirable emission limits (below 1GHz)	47 CFR Part 15E	47 CFR Part 15.407(b)(9)	Pass
9	Undesirable emission limits (above 1GHz)	47 CFR Part 15E	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)	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
IC Registration No.:	21760
CABID:	CN0093

4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Duty Cycle Maximum conducted output power Power spectral density Emission bandwidth and 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
Band edge emissions (Radiated) Undesirable emission limits (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
3	Amplifier	Agilent	8449B	3008A01120	2023-06-26	2024-06-25
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
Undesirable emission limits (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	2023-06-26	2024-06-25
4	Multi-device Controller	TuoPu	TPMDC	/	2023-05-04	2024-05-03
5	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2021/05/30	2024/05/29

5 Evaluation Results (Evaluation)

5.1 Antenna requirement

Test 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 permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.
Description of the antenna of EUT:	The antenna of the EUT is permanently attached.
Conclusion:	The EUT complies with the requirement of FCC PART 15.203.

6 Radio Spectrum Matter Test Results (RF)

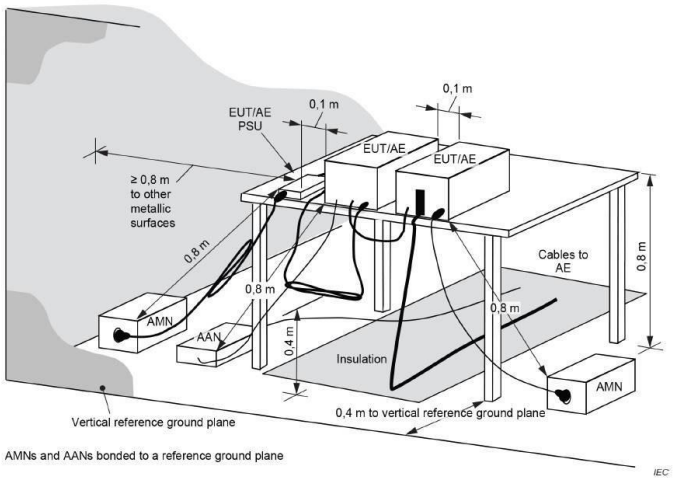
6.1 Conducted Emission at AC power line

Test Requirement:	47 CFR Part 15.207(a)
Test Limit:	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.
Test Method:	Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices

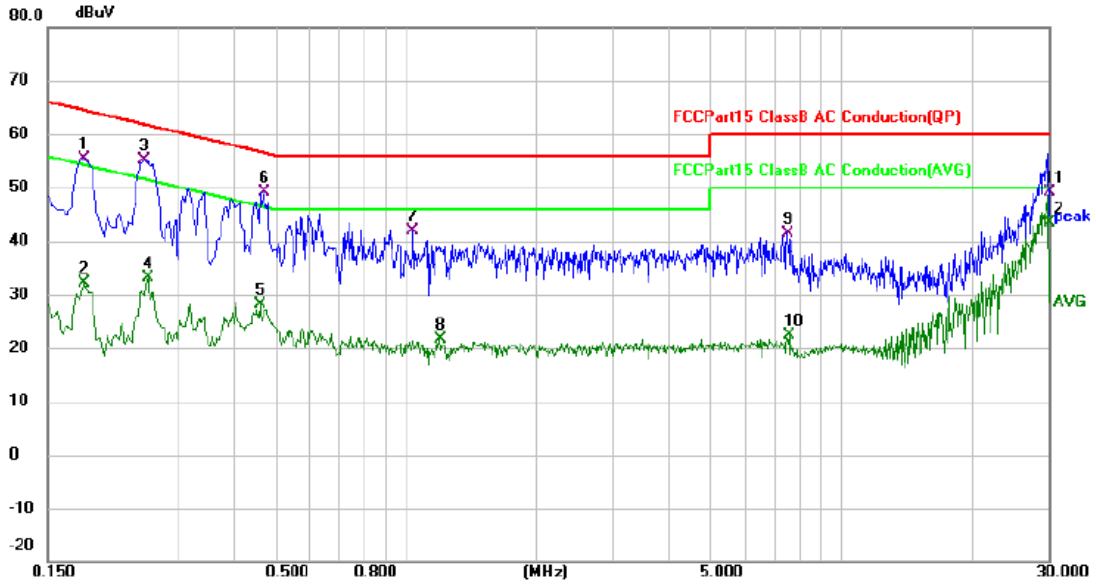
6.1.1 E.U.T. Operation:

Operating Environment:					
Temperature:	28.7 °C	Humidity:	72.9 %	Atmospheric Pressure:	101 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7				

6.1.2 Test Setup Diagram:

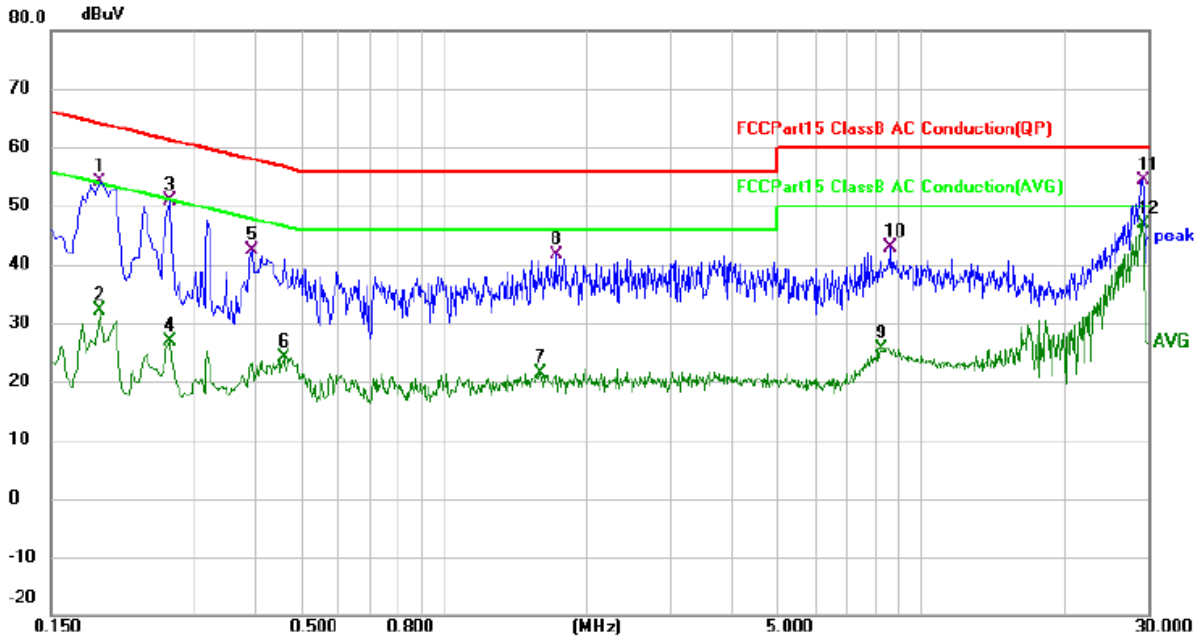


Mode1(AC120V/60Hz) / Line: Line



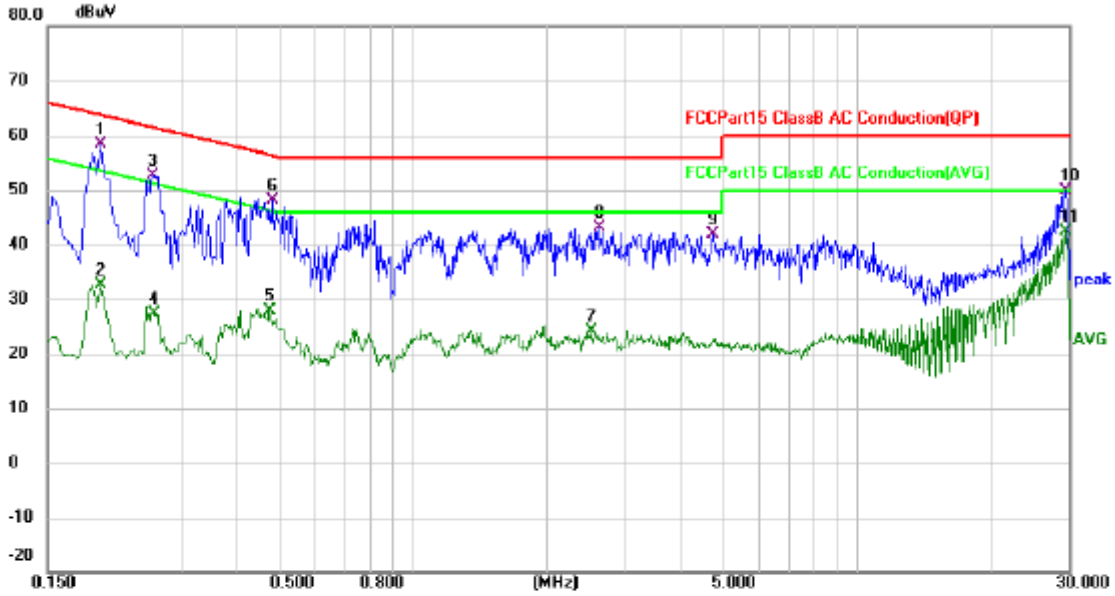
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1819	45.31	10.17	55.48	64.40	-8.92	QP	
2		0.1819	21.94	10.17	32.11	54.40	-22.29	AVG	
3		0.2500	44.92	10.15	55.07	61.76	-6.69	QP	
4		0.2540	22.90	10.15	33.05	51.63	-18.58	AVG	
5		0.4620	17.83	10.22	28.05	46.66	-18.61	AVG	
6		0.4700	38.90	10.23	49.13	56.51	-7.38	QP	
7		1.0380	31.86	10.10	41.96	56.00	-14.04	QP	
8		1.1940	11.38	10.14	21.52	46.00	-24.48	AVG	
9		7.5220	30.47	10.80	41.27	60.00	-18.73	QP	
10		7.5900	11.46	10.80	22.26	50.00	-27.74	AVG	
11		29.8420	38.33	10.77	49.10	60.00	-10.90	QP	
12	*	29.8420	32.73	10.77	43.50	50.00	-6.50	AVG	

Mode1(AC120V/60Hz) / Line: Neutral



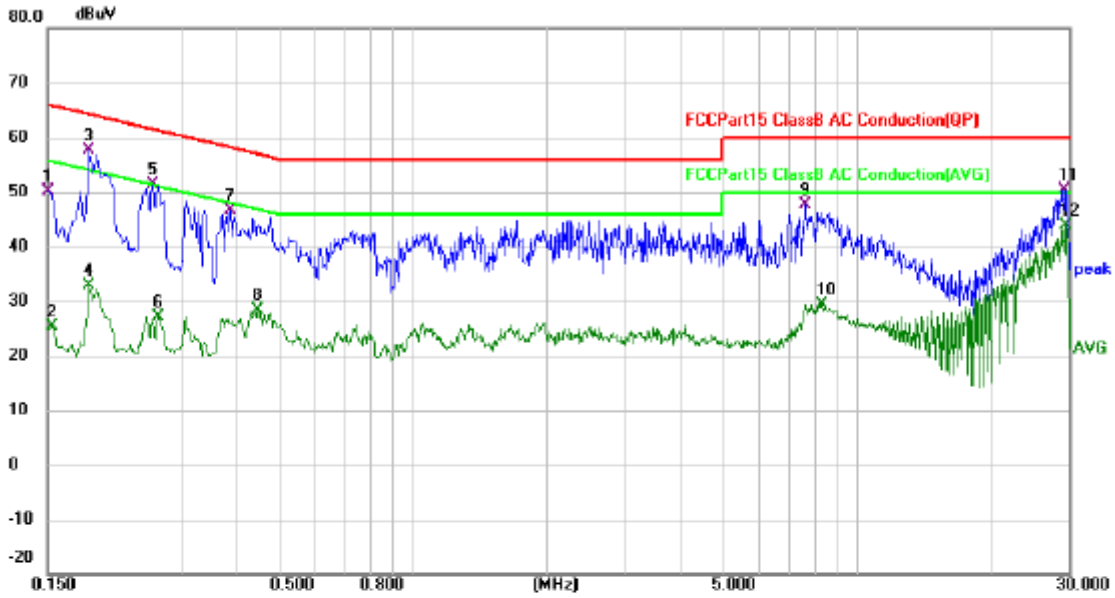
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1900	44.12	10.09	54.21	64.04	-9.83	QP	
2		0.1900	21.98	10.09	32.07	54.04	-21.97	AVG	
3		0.2660	40.80	10.05	50.85	61.24	-10.39	QP	
4		0.2660	16.77	10.05	26.82	51.24	-24.42	AVG	
5		0.3940	32.42	10.05	42.47	57.98	-15.51	QP	
6		0.4620	14.08	10.05	24.13	46.66	-22.53	AVG	
7		1.5940	11.23	10.24	21.47	46.00	-24.53	AVG	
8		1.7180	31.40	10.28	41.68	56.00	-14.32	QP	
9		8.2060	15.04	10.69	25.73	50.00	-24.27	AVG	
10		8.6500	32.27	10.71	42.98	60.00	-17.02	QP	
11		29.1940	43.61	10.73	54.34	60.00	-5.66	QP	
12	*	29.1940	36.07	10.73	46.80	50.00	-3.20	AVG	

Mode1(AC240V/60Hz) / Line: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1980	48.29	10.16	58.45	63.69	-5.24	QP	
2		0.1980	22.59	10.16	32.75	53.69	-20.94	AVG	
3		0.2580	42.48	10.15	52.63	61.50	-8.87	QP	
4		0.2601	17.20	10.15	27.35	51.43	-24.08	AVG	
5		0.4739	17.77	10.23	28.00	46.45	-18.45	AVG	
6		0.4819	37.94	10.24	48.18	56.31	-8.13	QP	
7		2.5139	13.79	10.36	24.15	46.00	-21.85	AVG	
8		2.6259	32.68	10.37	43.05	56.00	-12.95	QP	
9		4.7339	31.27	10.61	41.88	56.00	-14.12	QP	
10		29.6460	39.03	10.77	49.80	60.00	-10.20	QP	
11		29.6460	31.65	10.77	42.42	50.00	-7.58	AVG	

Mode1(AC240V/60Hz) / Line: Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	40.09	10.14	50.23	66.00	-15.77	QP	
2		0.1539	15.20	10.14	25.34	55.79	-30.45	AVG	
3		0.1859	47.45	10.10	57.55	64.22	-6.67	QP	
4		0.1859	22.81	10.10	32.91	54.22	-21.31	AVG	
5		0.2580	41.28	10.05	51.33	61.50	-10.17	QP	
6		0.2660	17.14	10.05	27.19	51.24	-24.05	AVG	
7		0.3860	36.62	10.05	46.67	58.15	-11.48	QP	
8		0.4460	18.36	10.05	28.41	46.95	-18.54	AVG	
9		7.6737	36.93	10.68	47.61	60.00	-12.39	QP	
10		8.3459	18.80	10.69	29.49	50.00	-20.51	AVG	
11		29.2220	39.72	10.73	50.45	60.00	-9.55	QP	
12	*	29.6340	33.24	10.74	43.98	50.00	-6.02	AVG	

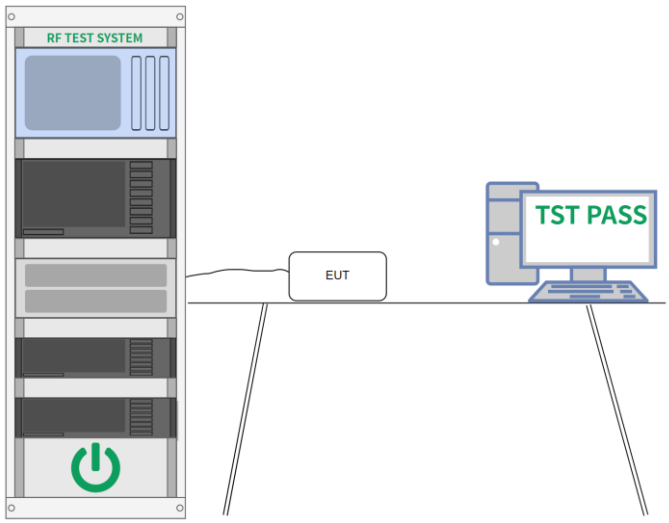
6.2 Duty Cycle

Test Requirement:	All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum-power transmission duration, T, are required for each tested mode of operation.
Test Limit:	No limits, only for report use.
Test Method:	ANSI C63.10-2013 section 12.2 (b)
Procedure:	i) Set the center frequency of the instrument to the center frequency of the transmission. ii) Set RBW >= EBW if possible; otherwise, set RBW to the largest available value. iii) Set VBW >= RBW. iv) Set detector = peak. v) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in item a1) of 12.2, and the number of sweep points across duration T exceeds 100.

6.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	59 %	Atmospheric Pressure:	101 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode5, Mode6, Mode7				

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

6.3 Maximum conducted output power

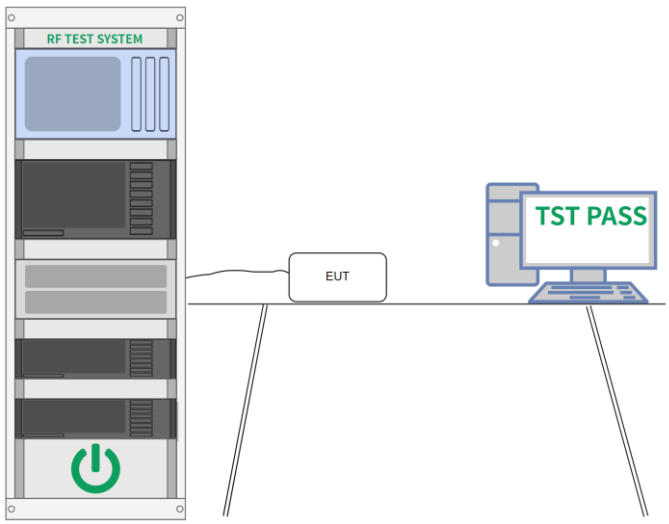
Test Requirement:	47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(3)(i)
Test Limit:	For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations. For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
Test Method:	ANSI C63.10-2013, section 12.3
Procedure:	Method SA-1 a) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal. b) Set RBW = 1 MHz. c) Set VBW >= 3 MHz. d) Number of points in sweep >= [2 × span / RBW]. (This gives bin-to-bin spacing <= RBW / 2, so that narrowband signals are not lost between frequency bins.) e) Sweep time = auto.

	f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode. g) If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle >= 98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run.” h) Trace average at least 100 traces in power averaging (rms) mode. i) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function, with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.

6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	59 %	Atmospheric Pressure:	101 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode5, Mode6, Mode7				

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Please Refer to Appendix for Details.

6.4 Power spectral density

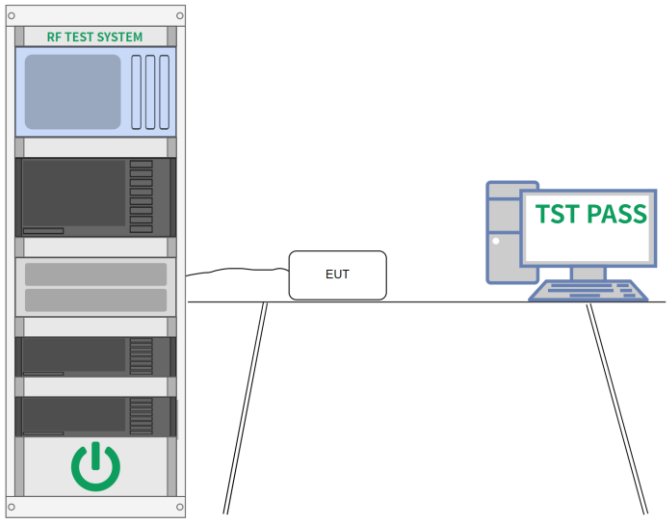
Test Requirement:	47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(3)(i)
Test Limit:	For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations. For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the band 5.725-5.850 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
Test Method:	ANSI C63.10-2013, section 12.5
Procedure:	a) Create an average power spectrum for the EUT operating mode being tested by following the instructions in 12.3.2 for measuring maximum conducted output power using a spectrum analyzer or EMI receiver; that is, select the appropriate test method (SA-1, SA-2, SA-3, or their respective alternatives) and apply it up to, but not including, the step labeled, “Compute power….” (This procedure is required even if the maximum conducted output power

	measurement was performed using the power meter method PM.) b) Use the peak search function on the instrument to find the peak of the spectrum. c) Make the following adjustments to the peak value of the spectrum, if applicable: 1) If method SA-2 or SA-2A was used, then add [10 log (1 / D)], where D is the duty cycle, to the peak of the spectrum. 2) If method SA-3A was used and the linear mode was used in step h) of 12.3.2.7, add 1 dB to the final result to compensate for the difference between linear averaging and power averaging. d) The result is the PPSD. e) The procedure in item a) through item c) requires the use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified by some regulatory authorities.This requirement also permits use of resolution bandwidths less than 1 MHz “provided that the measured power is integrated to show the total power over the measurement bandwidth” (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth, the following adjustments to the procedures apply: 1) Set RBW >= 1 / T, where T is defined in 12.2 a). 2) Set VBW >= [3 × RBW]. 3) Care shall be taken such that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

6.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	59 %	Atmospheric Pressure:	101 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode5, Mode6, Mode7				

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

6.5 Emission bandwidth and occupied bandwidth

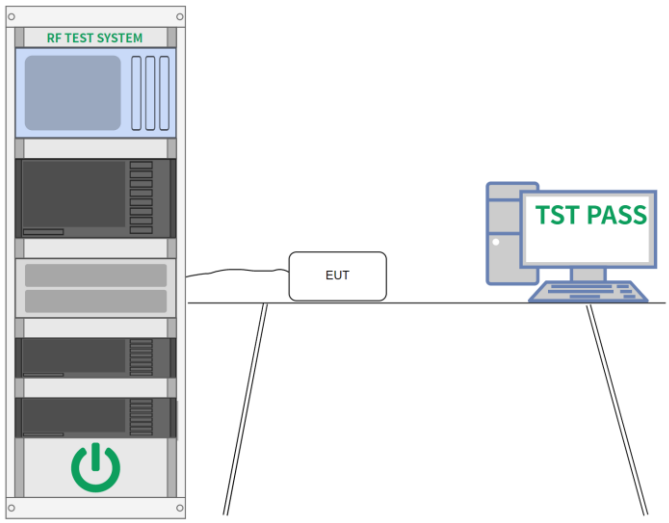
Test Requirement:	U-NII 1: No limits, only for report use. U-NII 3: 47 CFR Part 15.407(e)
Test Limit:	U-NII 1: No limits, only for report use. U-NII 3: Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.
Test Method:	ANSI C63.10-2013, section 6.9.3 & 12.4 KDB 789033 D02, Clause C.2
Procedure:	Emission bandwidth: a) Set RBW = approximately 1% of the emission bandwidth. b) Set the VBW > RBW. c) Detector = peak. d) Trace mode = max hold. e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%. Occupied bandwidth: a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2. d) Step a) through step c) might require iteration to adjust within the specified range. e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used. f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth. g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the

	total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies. h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s). 6 dB emission bandwidth: a) Set RBW = 100 kHz. b) Set the video bandwidth (VBW) ≥ 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.

6.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	59 %	Atmospheric Pressure:	101 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode5, Mode6, Mode7				

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:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating solely in the 5.725-5.850 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2]Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35apply to these measurements.

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

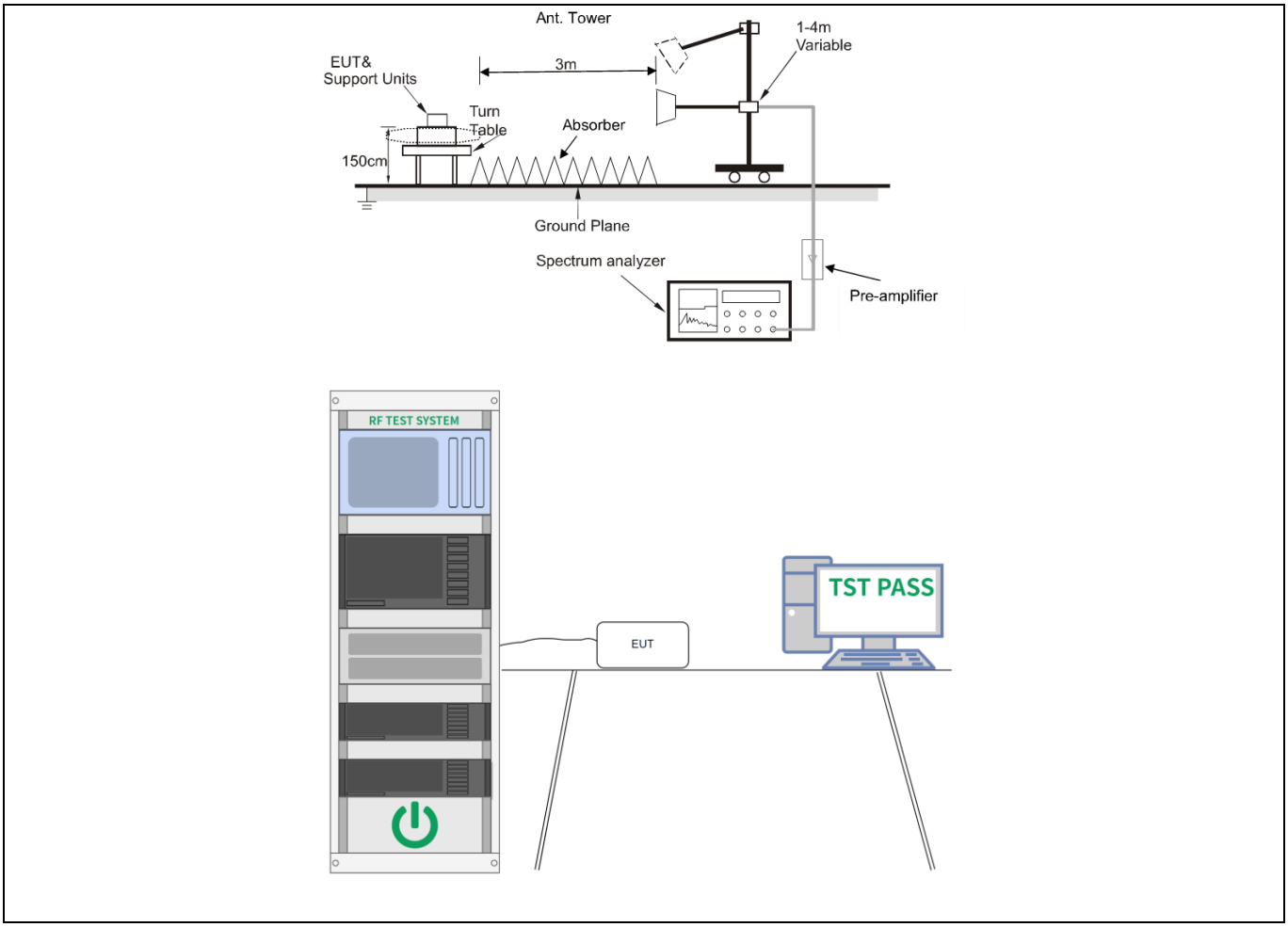
	<table><tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr><tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr><tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr><tr><td>1.705-30.0</td><td>30</td><td>30</td></tr><tr><td>30-88</td><td>100 **</td><td>3</td></tr><tr><td>88-216</td><td>150 **</td><td>3</td></tr><tr><td>216-960</td><td>200 **</td><td>3</td></tr><tr><td>Above 960</td><td>500</td><td>3</td></tr></table>
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.5, 12.7.6
Procedure:	Above 1GHz: a. 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. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. 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. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz 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. 3. As shown in this section, 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. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

6.6.1 E.U.T. Operation:

Operating Environment:

Temperature:	25.7 °C	Humidity:	55.5 %	Atmospheric Pressure:	99 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7				
Final test mode:	Mode1				
Note: All other emissions are attenuated 20dB below the limit, so does not recorded.					

6.6.2 Test Setup Diagram:



Note:

（1） All patterns are tested, and the data only shows the worst pattern A.

（2） Note: The antenna gain and cable loss is compensated in the test plot.

6.6.3 Test Data:

Mode1 / Polarization: Horizontal / Band: 5G / BW: 20 / CH: 36 / U-NII-1

		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4500.000	45.81	1.99	47.80	74.00	-26.20	peak
2		4500.000	37.14	1.99	39.13	54.00	-14.87	AVG
3		5150.000	56.92	5.36	62.28	74.00	-11.72	peak
4	*	5150.000	40.48	5.36	45.84	54.00	-8.16	AVG

Mode1 / Polarization: Vertical / Band: 5G / BW: 20 / CH: 36 / U-NII-1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4500.000	46.28	1.99	48.27	74.00	-25.73	peak
2		4500.000	36.41	1.99	38.40	54.00	-15.60	AVG
3		5150.000	47.36	5.36	52.72	74.00	-21.28	peak
4	*	5150.000	37.84	5.36	43.20	54.00	-10.80	AVG

Mode1 / Polarization: Horizontal / Band: 5G / BW: 20 / CH: 48 / U-NII-1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		5350.000	46.35	6.35	52.70	74.00	-21.30	peak
2		5350.000	36.60	6.35	42.95	54.00	-11.05	AVG
3		5460.000	46.37	6.24	52.61	74.00	-21.39	peak
4	*	5460.000	37.71	6.24	43.95	54.00	-10.05	AVG

Mode1 / Polarization: Vertical / Band: 5G / BW: 20 / CH: 48 / U-NII-1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		5350.000	48.81	6.35	55.16	74.00	-18.84	peak
2		5350.000	38.87	6.35	45.22	54.00	-8.78	AVG
3		5460.000	48.52	6.24	54.76	74.00	-19.24	peak
4	*	5460.000	39.46	6.24	45.70	54.00	-8.30	AVG

Mode1 / Polarization: Horizontal / Band: 5G / BW: 20 / CH: 149 / U-NII-3

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	5650.000	48.03	6.59	54.62	68.20	-13.58	peak
2		5700.000	47.55	6.68	54.23	105.20	-50.97	peak
3		5720.000	53.88	6.45	60.33	110.80	-50.47	peak
4		5725.000	58.11	6.40	64.51	122.20	-57.69	peak

Mode1 / Polarization: Vertical / Band: 5G / BW: 20 / CH: 149 / U-NII-3

		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	5650.000	48.06	6.59	54.65	68.20	-13.55	peak
2		5700.000	47.52	6.68	54.20	105.20	-51.00	peak
3		5720.000	47.80	6.45	54.25	110.80	-56.55	peak
4		5725.000	49.80	6.40	56.20	122.20	-66.00	peak

Mode1 / Polarization: Horizontal / Band: 5G / BW: 20 / CH: 165 / U-NII-3

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		5850.000	47.66	5.69	53.35	122.20	-68.85	peak
2		5855.000	48.42	5.72	54.14	110.80	-56.66	peak
3		5875.000	47.87	5.86	53.73	105.20	-51.47	peak
4	*	5925.000	48.20	5.99	54.19	68.20	-14.01	peak

Mode1 / Polarization: Vertical / Band: 5G / BW: 20 / CH: 165 / U-NII-3

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		5850.000	49.70	5.69	55.39	122.20	-66.81	peak
2		5855.000	47.40	5.72	53.12	110.80	-57.68	peak
3		5875.000	48.00	5.86	53.86	105.20	-51.34	peak
4	*	5925.000	48.54	5.99	54.53	68.20	-13.67	peak

6.7 Undesirable emission limits (below 1GHz)

<table>
<tr><td>Test Requirement:</td><td>47 CFR Part 15.407(b)(9)</td></tr>
<tr><td>Test Limit:</td><td>Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.

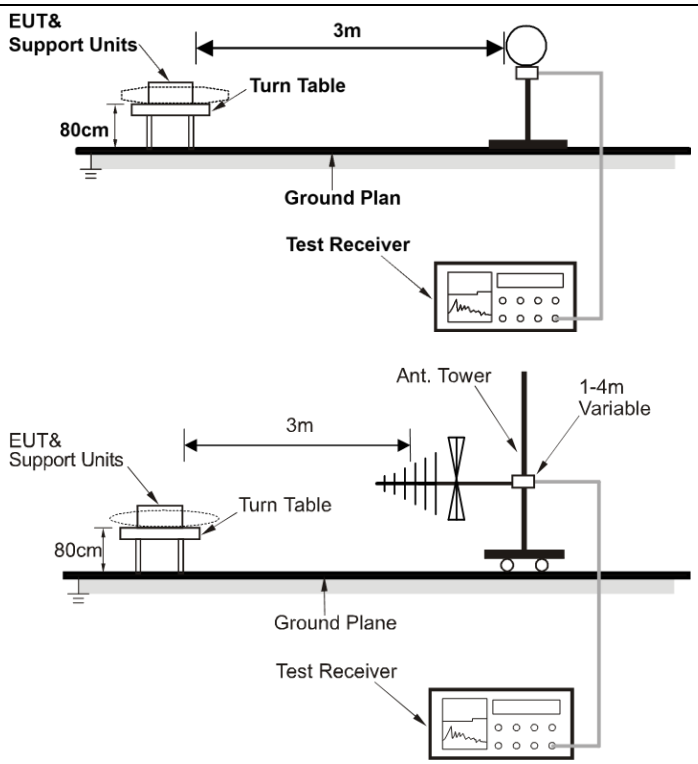
Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:
<table>
<tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table></td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10-2013, section 12.7.4, 12.7.5, 12.7.6</td></tr>
<tr><td>Procedure:</td><td>Below 1GHz:
a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. 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.
c. 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.
d. 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.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. 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 quasi-peak method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
h. 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.
i. Repeat above procedures until all frequencies measured was complete.
Remark:
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 9kHz to 30MHz, the disturbance 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.</td></tr>
</table>

	3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. Above 1GHz: a. 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. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. 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. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz 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. 3. As shown in this section, 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. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

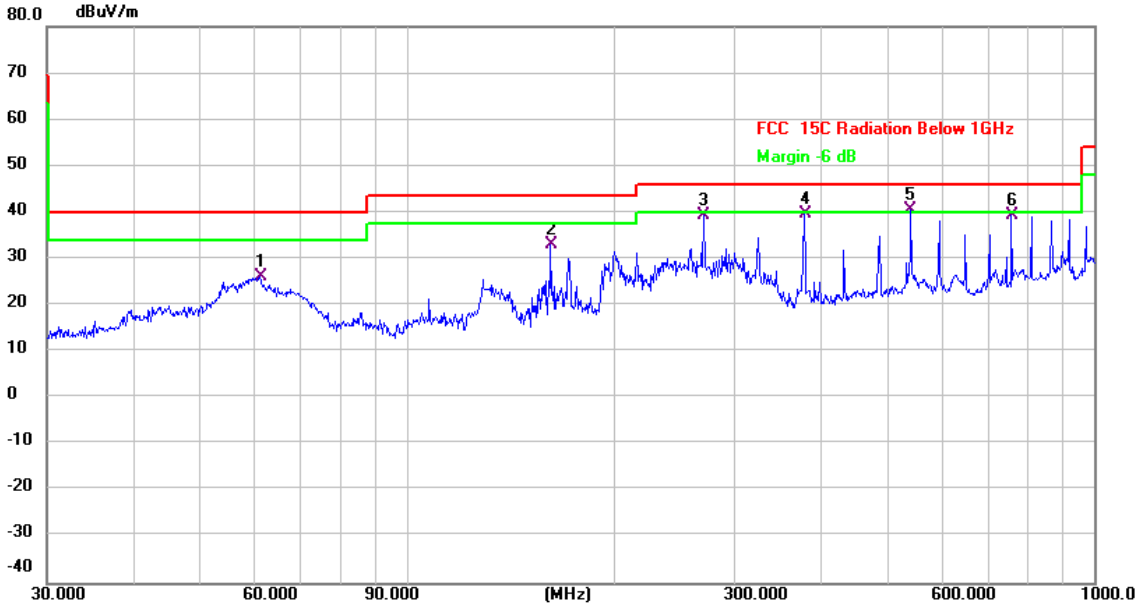
6.7.1 E.U.T. Operation:

Operating Environment:					
Temperature:	15.7 °C	Humidity:	25.5 %	Atmospheric Pressure:	99 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode5, Mode6, Mode7				
Final test mode:	Mode1				

6.7.2 Test Setup Diagram:



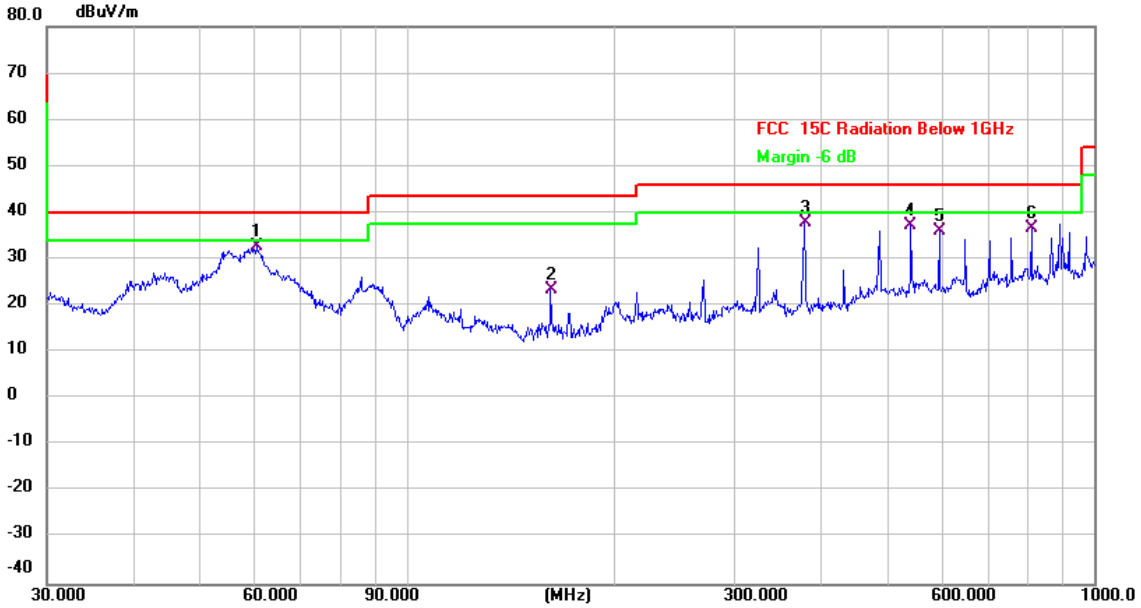
Test mode:	TX U-NII-1-802.11a-5240	Polarization:	Horizontal
Power supply:	120V/60Hz	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		61.1316	35.12	-9.08	26.04	40.00	-13.96	QP
2		162.0414	44.29	-11.14	33.15	43.50	-10.35	QP
3		270.3748	46.71	-7.28	39.43	46.00	-6.57	QP
4		378.5843	44.24	-4.69	39.55	46.00	-6.45	QP
5	*	541.3725	43.85	-3.17	40.68	46.00	-5.32	QP
6		758.0408	39.98	-0.65	39.33	46.00	-6.67	QP

Radiated emissions between 30MHz – 1GHz

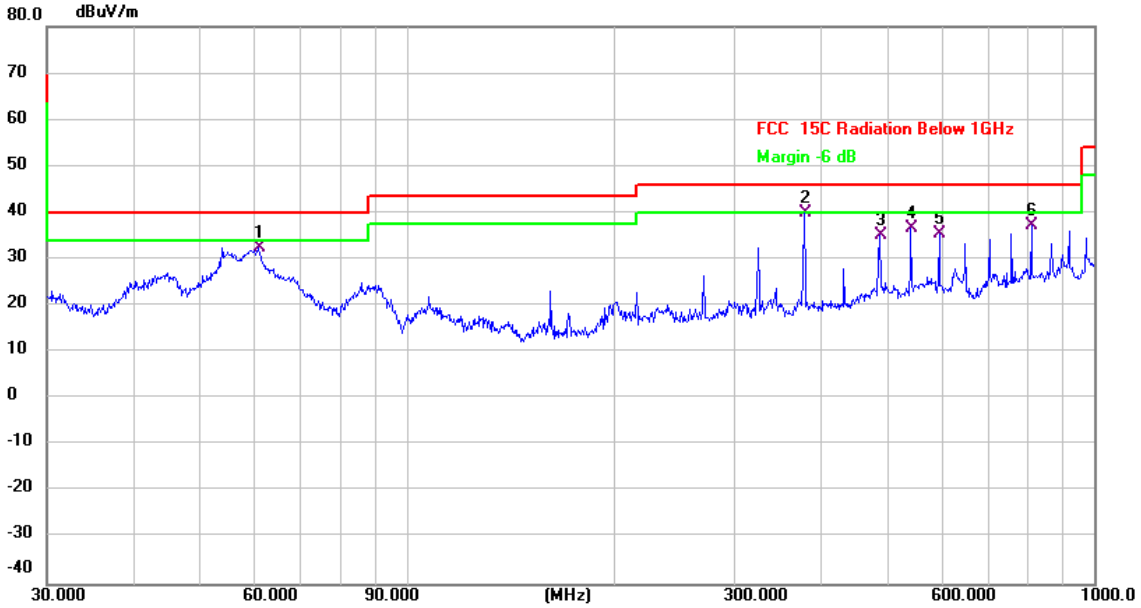
Test mode:	TX U-NII-1-802.11a-5240	Polarization:	Vertical
Power supply:	120V/60Hz	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detecto
1	*	60.4919	42.12	-9.43	32.69	40.00	-7.31	QP
2		162.0414	34.72	-11.14	23.58	43.50	-19.92	QP
3		378.5843	42.40	-4.69	37.71	46.00	-8.29	QP
4		541.3725	40.43	-3.17	37.26	46.00	-8.74	QP
5		595.1329	38.93	-2.97	35.96	46.00	-10.04	QP
6		810.2654	36.76	-0.02	36.74	46.00	-9.26	QP

Radiated emissions between 30MHz – 1GHz

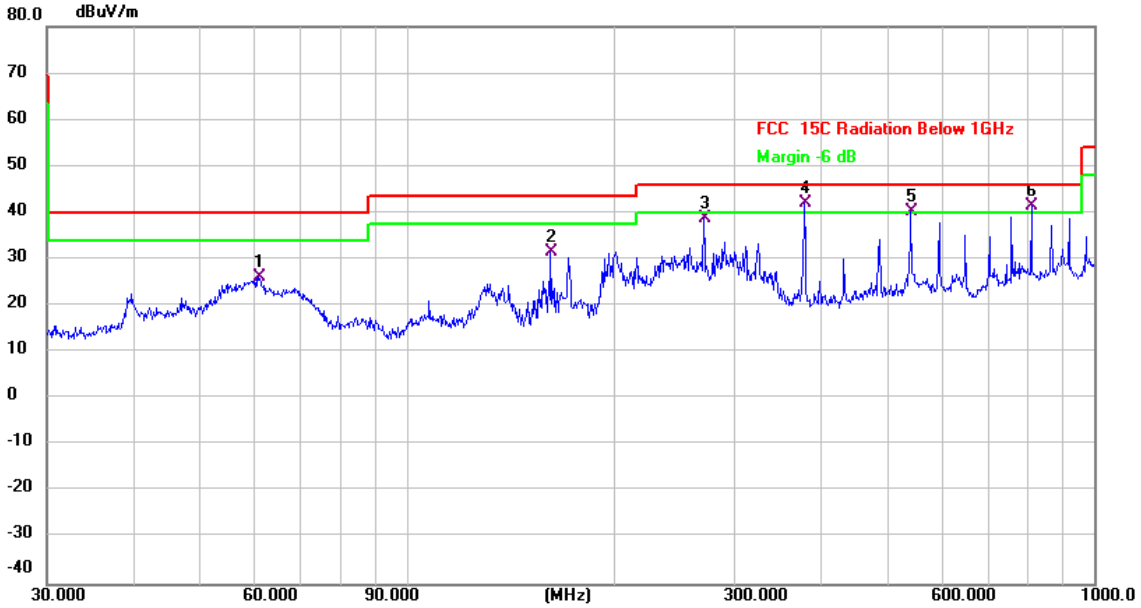
Test mode:	TX U-NII-3-802.11a-5825	Polarization:	Horizontal
Power supply:	120V/60Hz	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		60.9176	41.59	-9.09	32.50	40.00	-7.50	QP
2	*	378.5843	44.65	-4.69	39.96	46.00	-6.04	QP
3		487.3151	38.72	-3.70	35.02	46.00	-10.98	QP
4		541.3725	39.95	-3.17	36.78	46.00	-9.22	QP
5		595.1329	38.42	-2.97	35.45	46.00	-10.55	QP
6		810.2654	37.27	-0.02	37.25	46.00	-8.75	QP

Radiated emissions between 30MHz – 1GHz

Test mode:	TX U-NII-3-802.11a-5825	Polarization:	Vertical
Power supply:	120V/60Hz	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		60.9176	35.32	-9.09	26.23	40.00	-13.77	QP
2		162.0414	42.70	-11.14	31.56	43.50	-11.94	QP
3		270.3748	46.15	-7.29	38.86	46.00	-7.14	QP
4	*	378.5843	46.80	-4.69	42.11	46.00	-3.89	QP
5	!	541.3725	43.44	-3.17	40.27	46.00	-5.73	QP
6	!	810.2654	41.50	-0.02	41.48	46.00	-4.52	QP

6.8 Undesirable emission limits (above 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating solely in the 5.725-5.850 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2]Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35apply to these measurements.

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the

following table:

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

Test Method: ANSI C63.10-2013, section 12.7.4, 12.7.5, 12.7.6

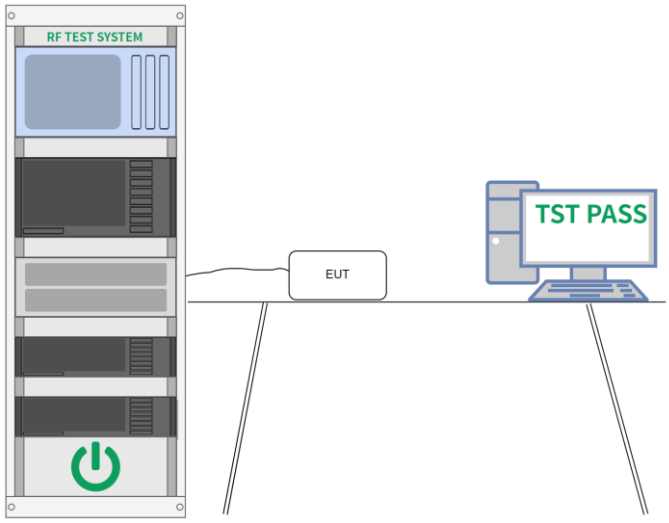
Procedure:

Above 1GHz:
a. 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.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. 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.
d. 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.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. 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 or average method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
h. 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.
i. Repeat above procedures until all frequencies measured was complete.
Remark:
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 18GHz to 40GHz, the disturbance above 18GHz 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.
3. As shown in this section, 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.
4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
5 Note: The antenna gain and cable loss is compensated in the test plot.

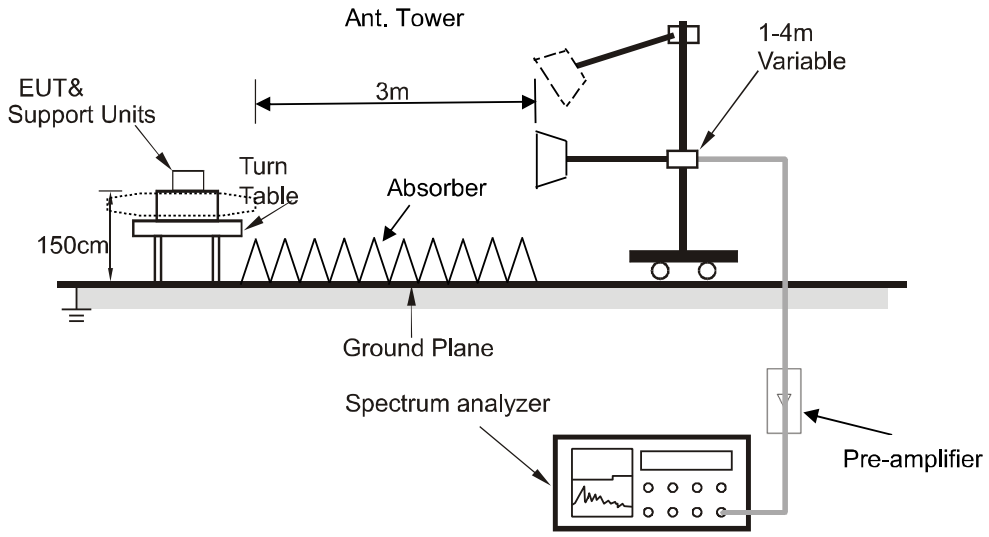
6.8.1 E.U.T. Operation:

Operating Environment:					
Temperature:	15.7 °C	Humidity:	25.5 %	Atmospheric Pressure:	99 kPa
Test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode5, Mode6, Mode7				
Final test mode:	Mode1				
Note: Note: Test frequency are from 1GHz to 40GHz, 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 Setup Diagram:



Mode1 / Polarization: Horizontal / Band: 5G / BW: 20 / CH: 36 / U-NII 1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10360.000	43.05	13.10	56.15	68.20	-12.05	peak
2		10360.000	32.26	13.10	45.36	54.00	-8.64	AVG
3		15540.000	11.36	47.56	58.92	74.00	-15.08	peak
4	*	15540.000	-0.14	47.56	47.42	54.00	-6.58	AVG

Mode1 / Polarization: Vertical / Band: 5G / BW: 20 / CH: 36 / U-NII 1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10360.000	43.53	13.10	56.63	68.20	-11.57	peak
2		10360.000	32.18	13.10	45.28	54.00	-8.72	AVG
3		15540.000	12.69	47.56	60.25	74.00	-13.75	peak
4	*	15540.000	2.53	47.56	50.09	54.00	-3.91	AVG

Mode1 / Polarization: Horizontal / Band: 5G / BW: 20 / CH: 44 / U-NII 1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10440.000	43.07	13.04	56.11	68.20	-11.89	peak
2		10440.000	32.24	13.04	45.28	54.00	-8.72	AVG
3		15660.000	11.38	46.87	58.25	74.00	-15.75	peak
4	*	15660.000	0.94	46.87	47.81	54.00	-6.19	AVG

Mode1 / Polarization: Vertical / Band: 5G / BW: 20 / CH: 44/ U-NII 1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10440.000	42.23	13.04	55.27	68.20	-12.93	peak
2		10440.000	31.82	13.04	44.86	54.00	-9.14	AVG
3		15660.000	11.77	46.87	58.64	74.00	-15.36	peak
4	*	15660.000	1.42	46.87	48.29	54.00	-5.71	AVG

Mode1 / Polarization: Horizontal / Band: 5G / BW: 20 / CH: 48 / U-NII 1

		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10480.000	42.89	12.94	55.83	68.20	-12.37	peak
2		10480.000	32.67	12.94	45.61	54.00	-8.39	AVG
3		15720.000	11.53	46.86	58.39	74.00	-15.61	peak
4	*	15720.000	0.99	46.86	47.85	54.00	-6.15	AVG

Mode1 / Polarization: Vertical / Band: 5G / BW: 20 / CH: 48 / U-NII 1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10480.000	42.40	12.94	55.34	68.20	-12.86	peak
2		10480.000	32.38	12.94	45.32	54.00	-8.68	AVG
3		15720.000	11.39	46.86	58.25	74.00	-15.75	peak
4	*	15720.000	0.96	46.86	47.82	54.00	-6.18	AVG

Mode1 / Polarization: Horizontal / Band: 5G / BW: 20 / CH: 149 / U-NII 3

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11490.000	10.00	48.62	58.62	74.00	-15.38	peak
2		11490.000	-1.37	48.62	47.25	54.00	-6.75	AVG
3		17235.000	12.49	48.39	60.88	74.00	-13.12	peak
4	*	17235.000	2.25	48.39	50.64	54.00	-3.36	AVG

Mode1 / Polarization: Vertical / Band: 5G / BW: 20 / CH: 149 / U-NII 3

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11490.000	9.42	48.62	58.04	74.00	-15.96	peak
2		11490.000	-0.98	48.62	47.64	54.00	-6.36	AVG
3		17235.000	12.32	48.39	60.71	74.00	-13.29	peak
4	*	17235.000	1.88	48.39	50.27	54.00	-3.73	AVG

Mode1 / Polarization: Horizontal / Band: 5G / BW: 20 / CH: 157 / U-NII 3

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11568.000	10.28	48.34	58.62	74.00	-15.38	peak
2		11568.000	-1.09	48.34	47.25	54.00	-6.75	AVG
3		17355.000	12.56	48.58	61.14	74.00	-12.86	peak
4	*	17355.000	2.08	48.58	50.66	54.00	-3.34	AVG

Mode1 / Polarization: Vertical / Band: 5G / BW: 20 / CH: 157 / U-NII 3

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11568.000	9.62	48.34	57.96	74.00	-16.04	peak
2		11568.000	-1.09	48.34	47.25	54.00	-6.75	AVG
3		17355.000	13.63	48.58	62.21	74.00	-11.79	peak
4	*	17355.000	2.16	48.58	50.74	54.00	-3.26	AVG

Mode1 / Polarization: Horizontal / Band: 5G / BW: 20 / CH: 165 / U-NII 3

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11650.000	9.87	47.96	57.83	74.00	-16.17	peak
2		11650.000	-1.71	47.96	46.25	54.00	-7.75	AVG
3		17475.000	12.00	48.95	60.95	74.00	-13.05	peak
4	*	17475.000	1.46	48.95	50.41	54.00	-3.59	AVG

Mode1 / Polarization: Vertical / Band: 5G / BW: 20 / CH: 165 / U-NII 3

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11650.000	9.98	47.96	57.94	74.00	-16.06	peak
2		11650.000	-1.60	47.96	46.36	54.00	-7.64	AVG
3		17475.000	11.56	48.95	60.51	74.00	-13.49	peak
4	*	17475.000	0.81	48.95	49.76	54.00	-4.24	AVG

Photographs of the test setup

Refer to Appendix - Test Setup Photos

Photographs of the EUT

Refer to Appendix – EUT Photos

Appendix

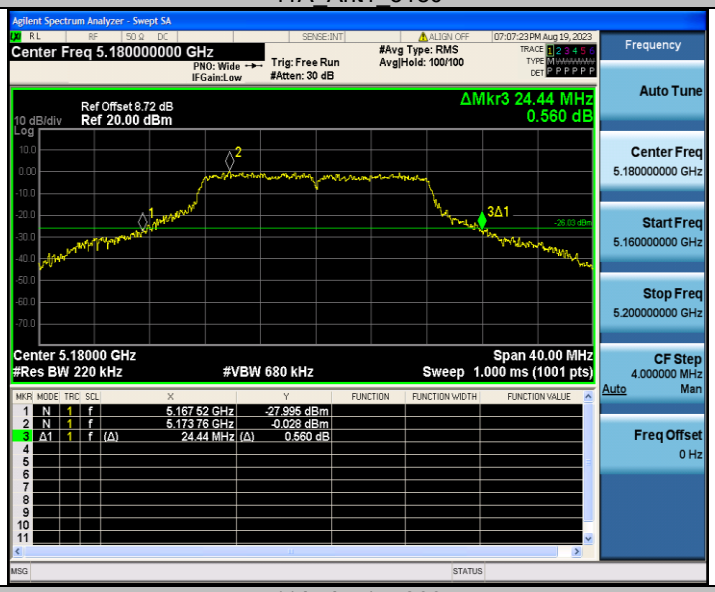
6.9 Appendix A1: Emission Bandwidth

6.9.1 Test Result

TestMode	Antenna	Freq(MHz)	26db EBW [MHz]
11A	Ant1	5180	24.440
		5200	23.720
		5240	24.800
		5745	24.680
		5785	24.040
		5825	23.800
11N20SISO	Ant1	5180	25.560
		5200	25.160
		5240	25.760
		5745	25.280
		5785	25.080
		5825	24.800
11N40SISO	Ant1	5190	47.520
		5230	48.080
		5755	47.600
		5795	47.280
11AC20SISO	Ant1	5180	24.960
		5200	24.200
		5240	25.400
		5745	25.760
		5785	25.280
		5825	24.920
11AC40SISO	Ant1	5190	47.920
		5230	46.960
		5755	47.040
		5795	49.360
11AX20SISO	Ant1	5180	24.840
		5200	24.400
		5240	25.880
		5745	24.280
		5785	23.840
		5825	24.600
11AX40SISO	Ant1	5190	45.840
		5230	45.680
		5755	45.200
		5795	45.760

6.9.2 Test Graphs

11A_Ant1_5180



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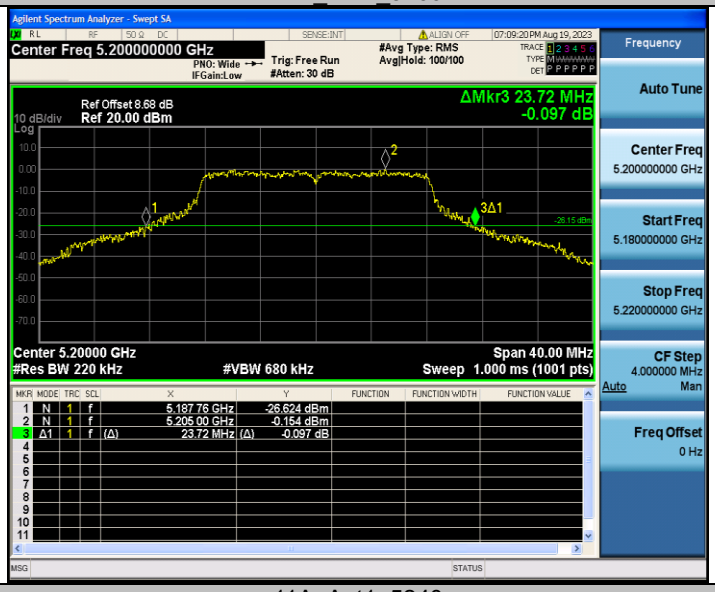

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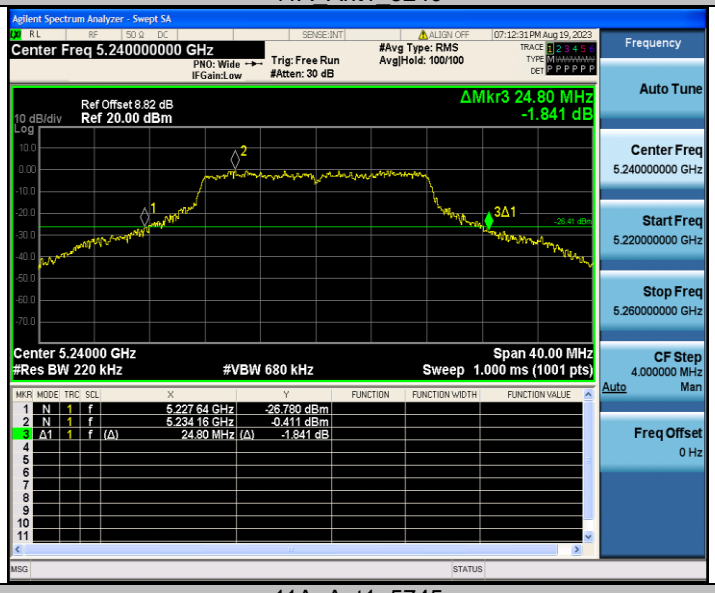

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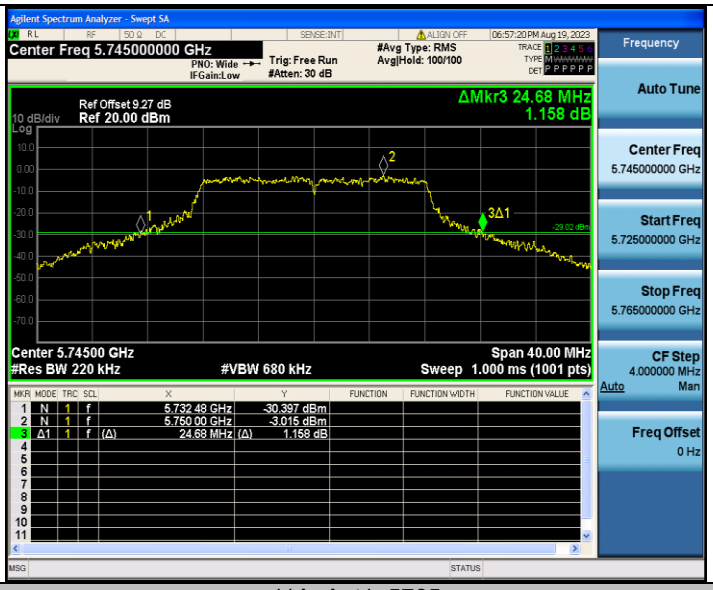

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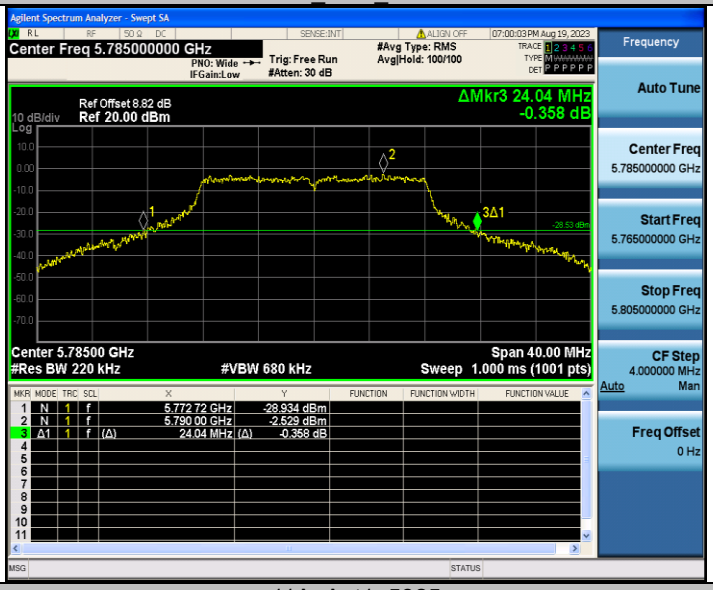

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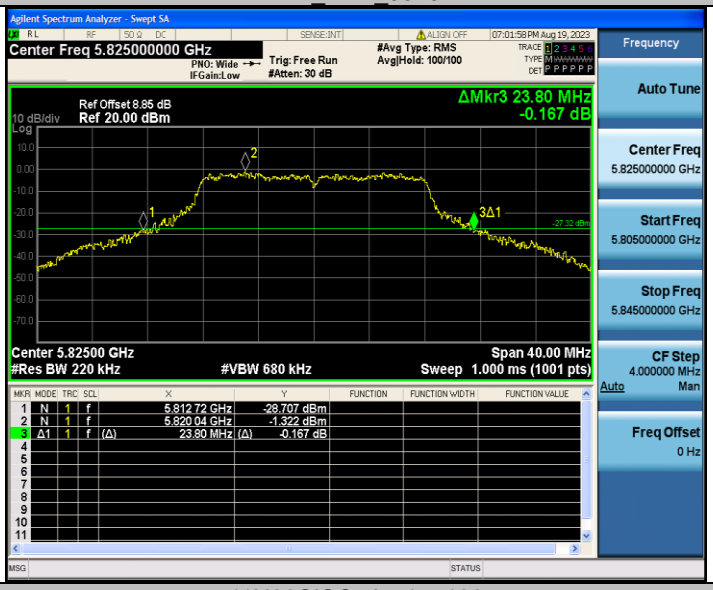

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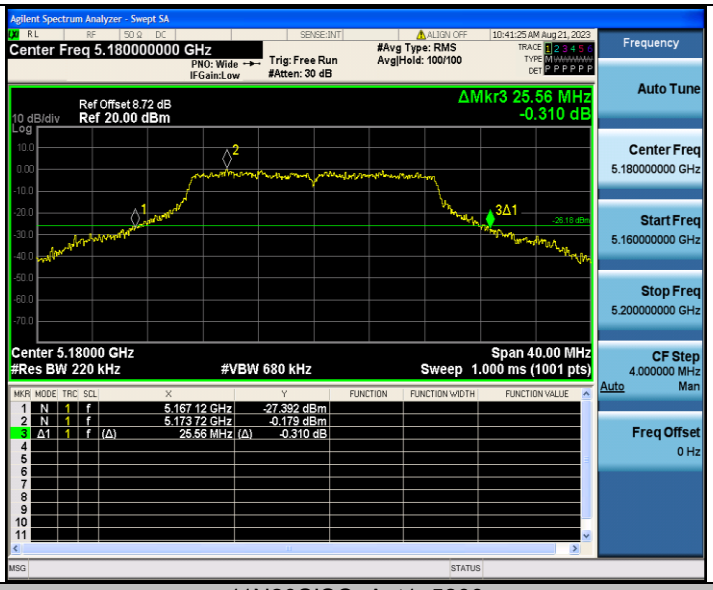

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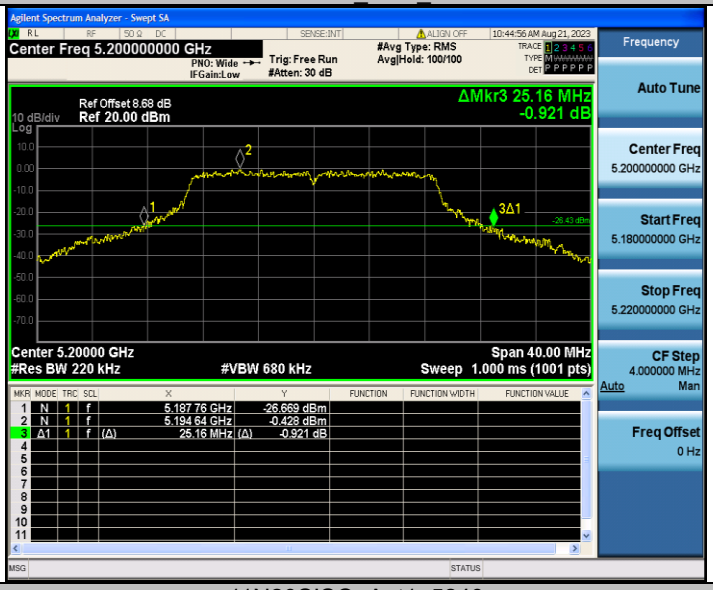

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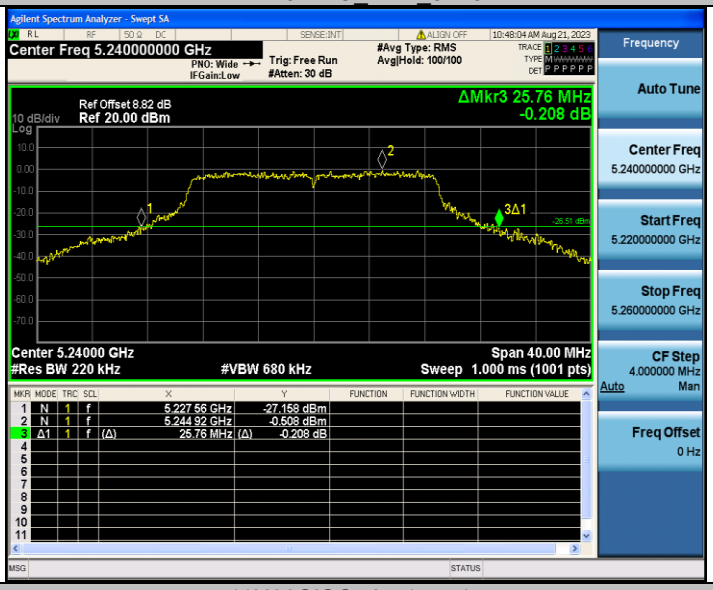

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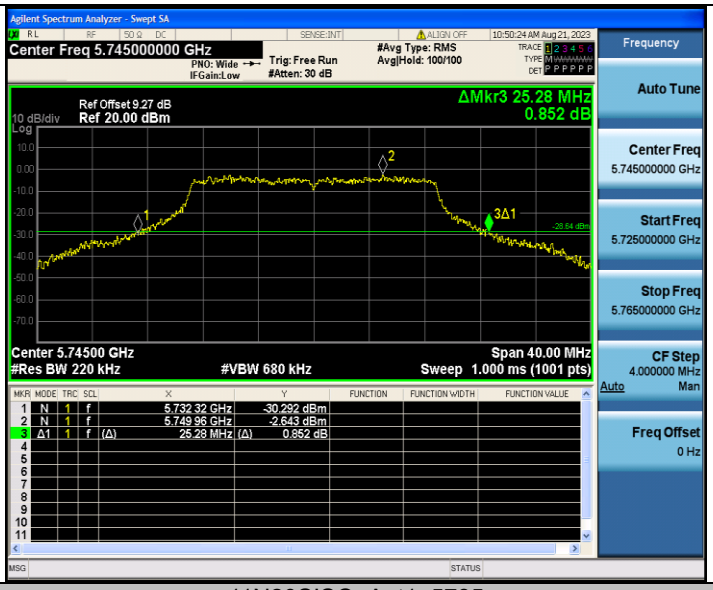

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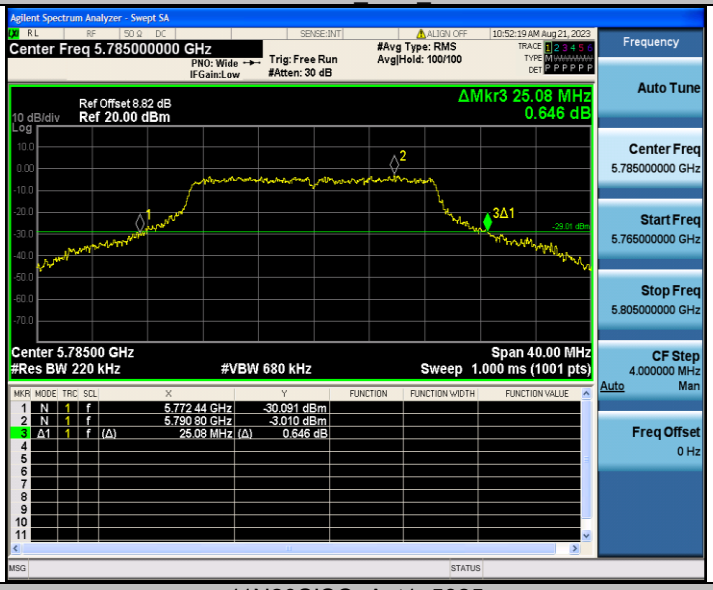
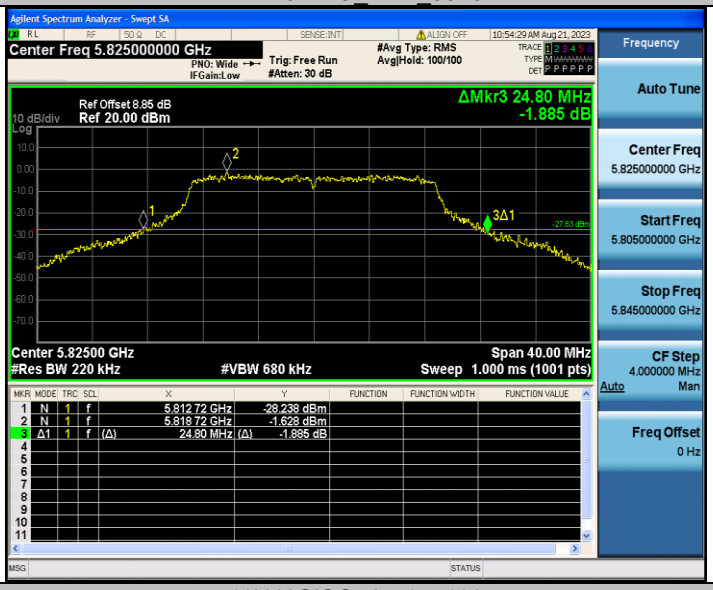
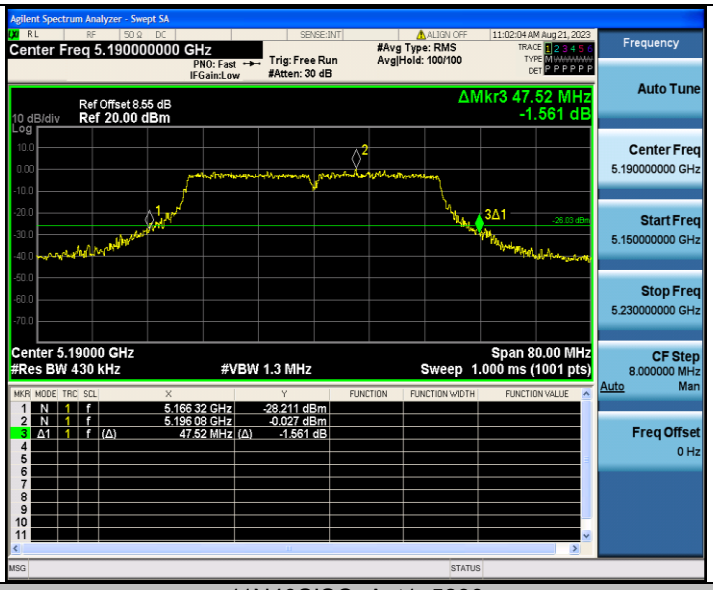


11N20SISO_Ant1_5825



11N40SISO_Ant1_5190



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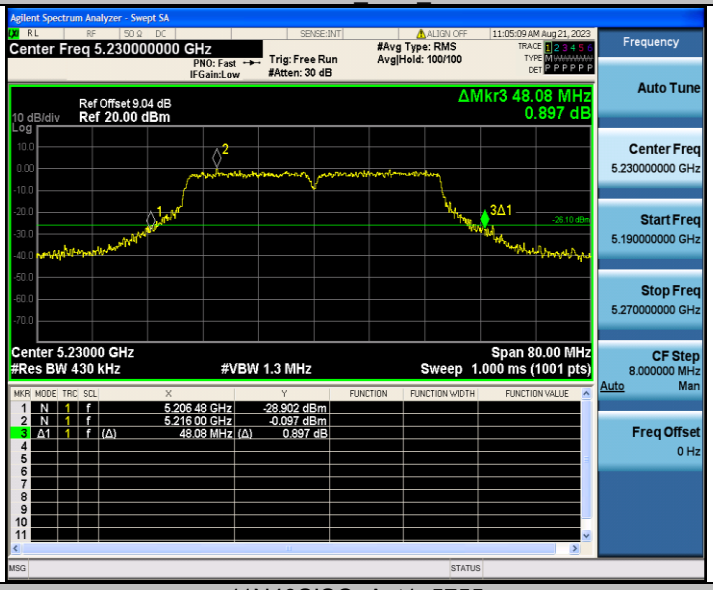

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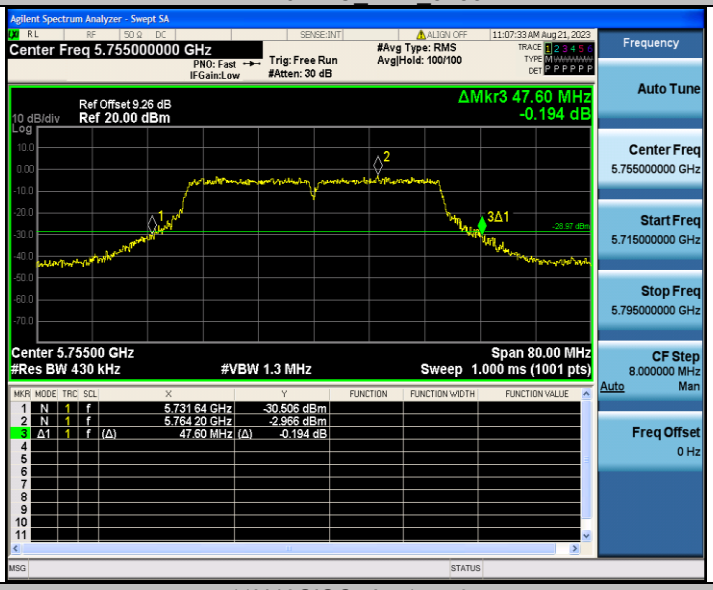
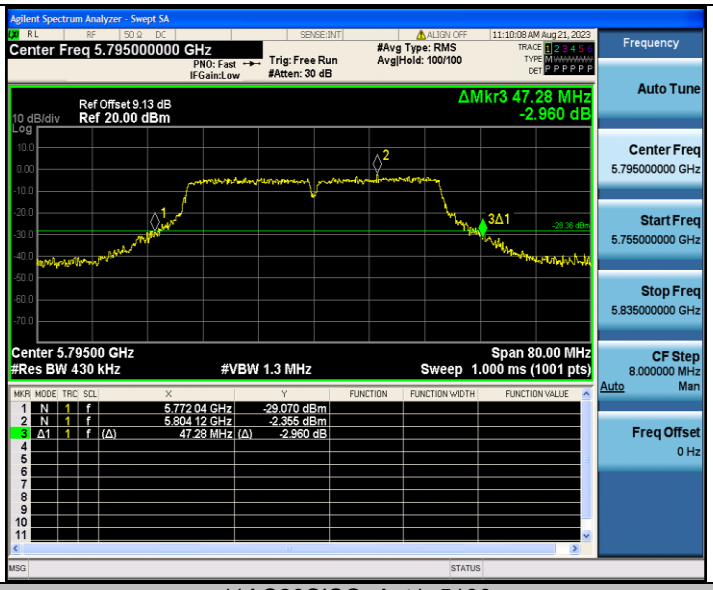


11N40SISO_Ant1_5795



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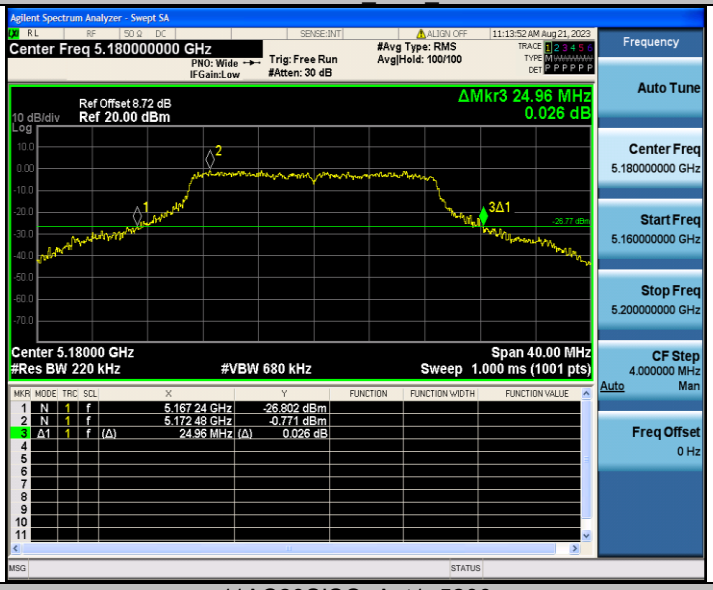

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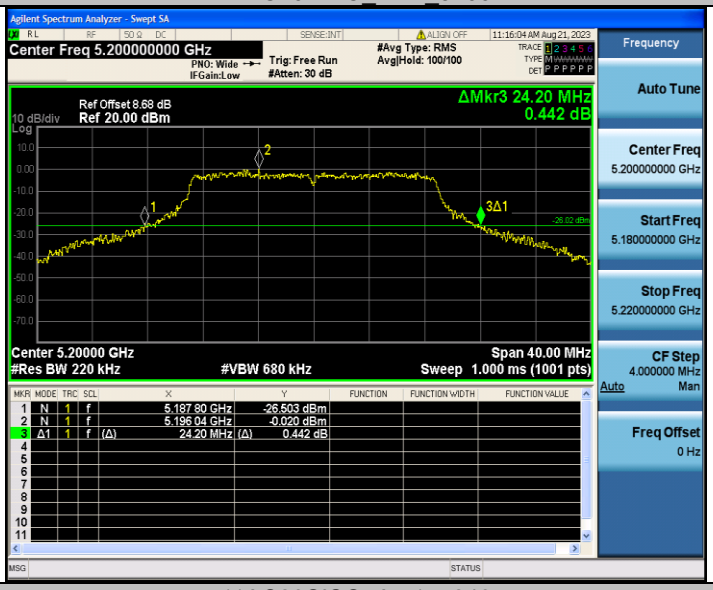

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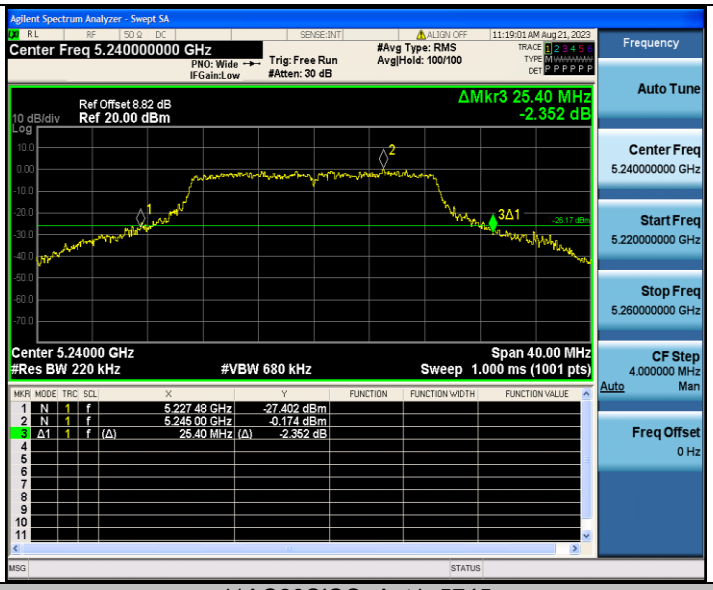

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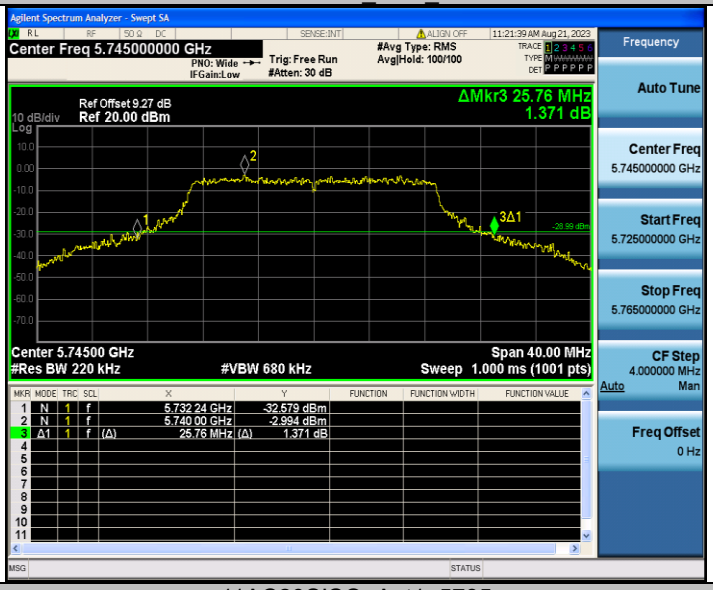

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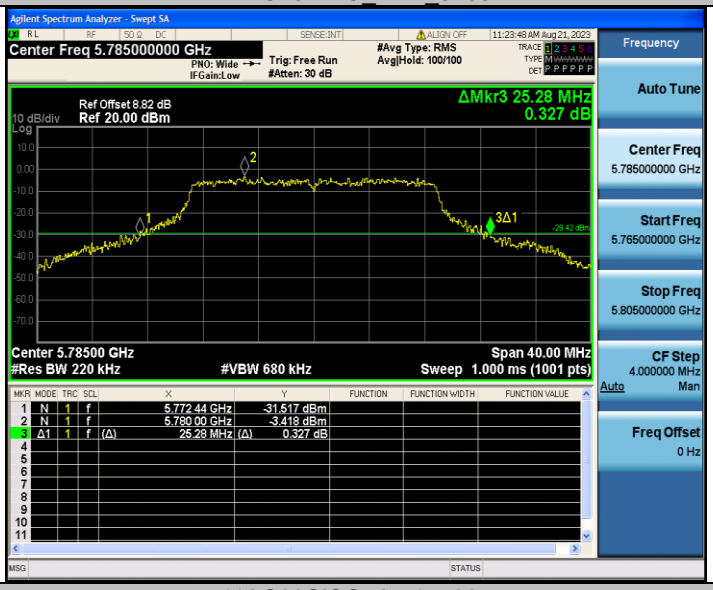

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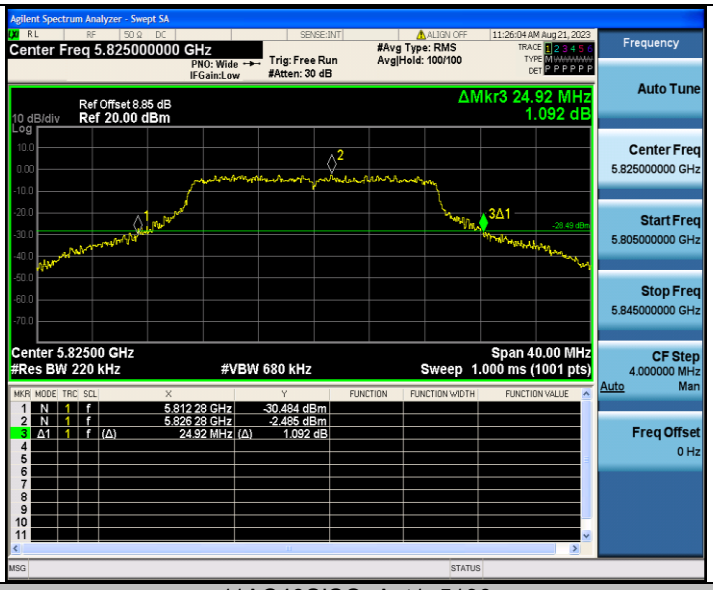

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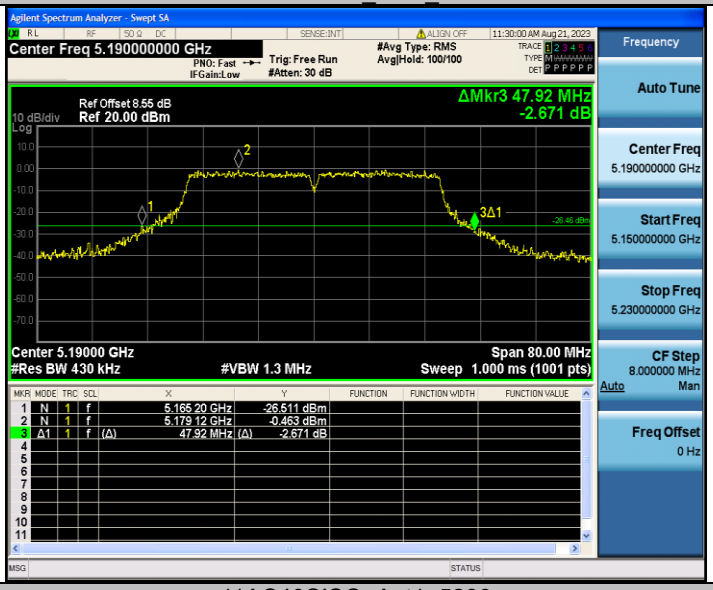

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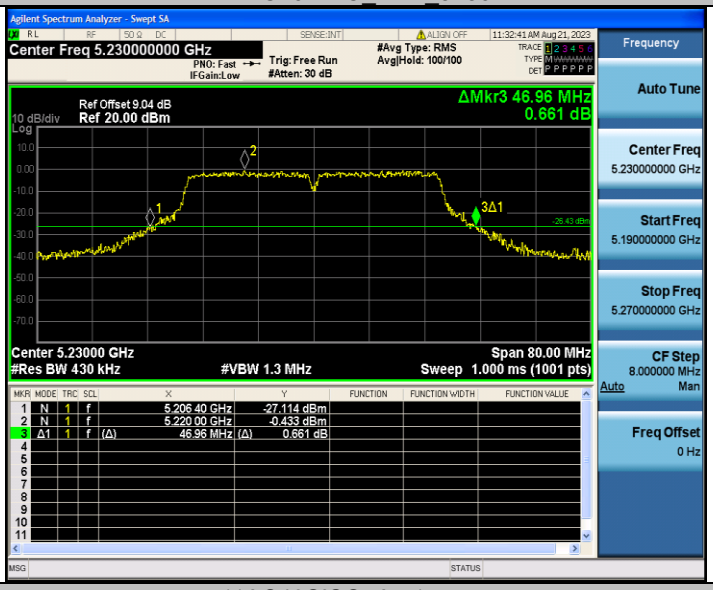

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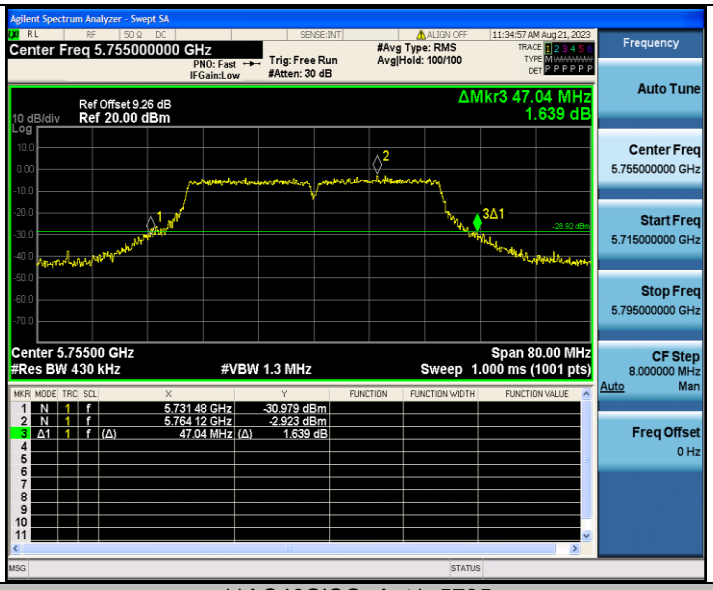

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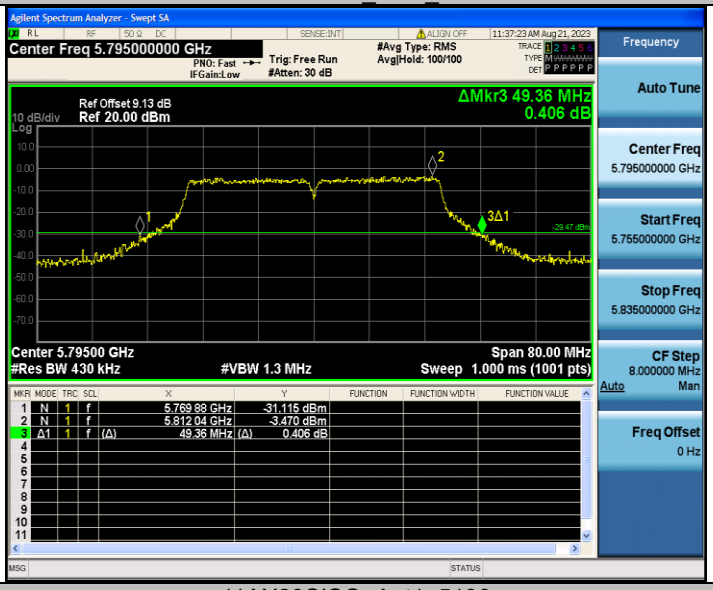
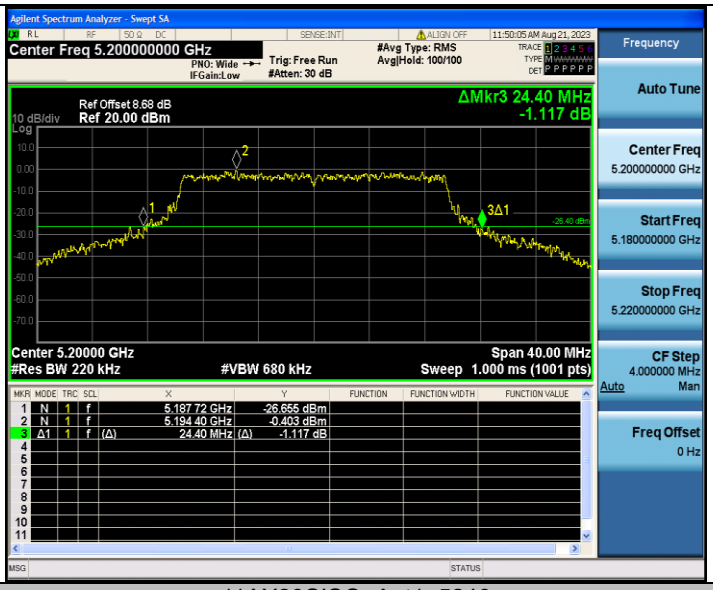


11AX20SISO_Ant1_5180

11AX20SISO_Ant1_5200



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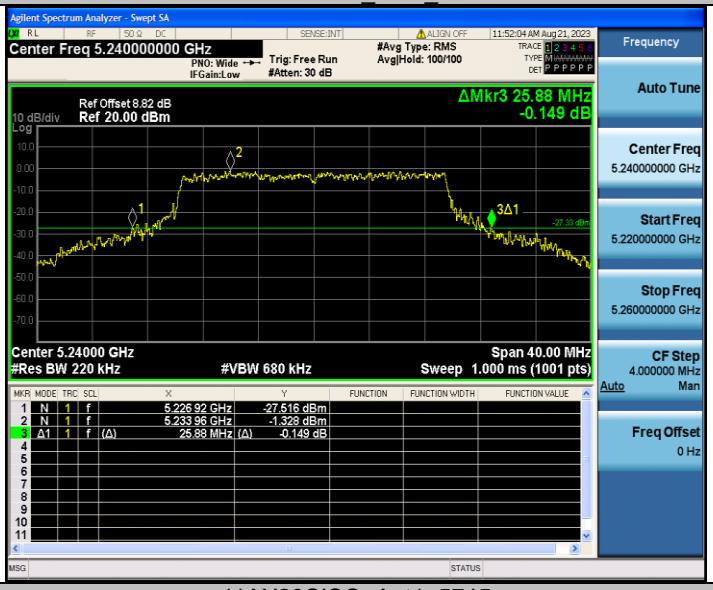

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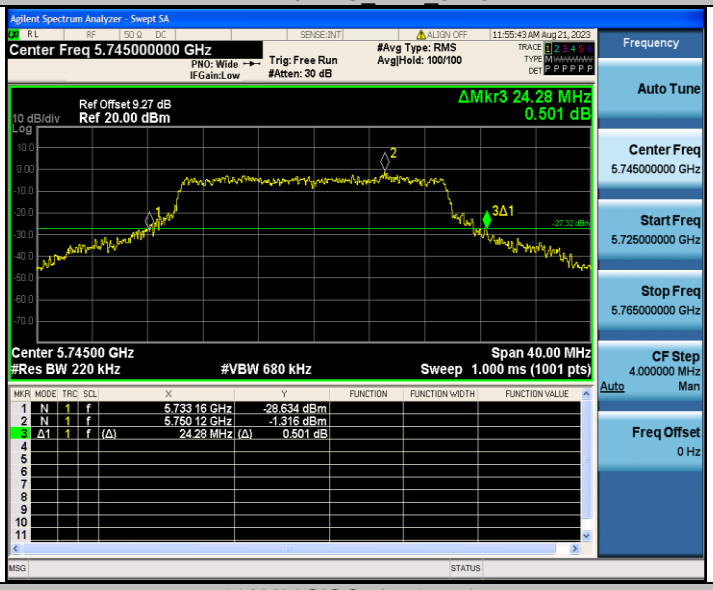

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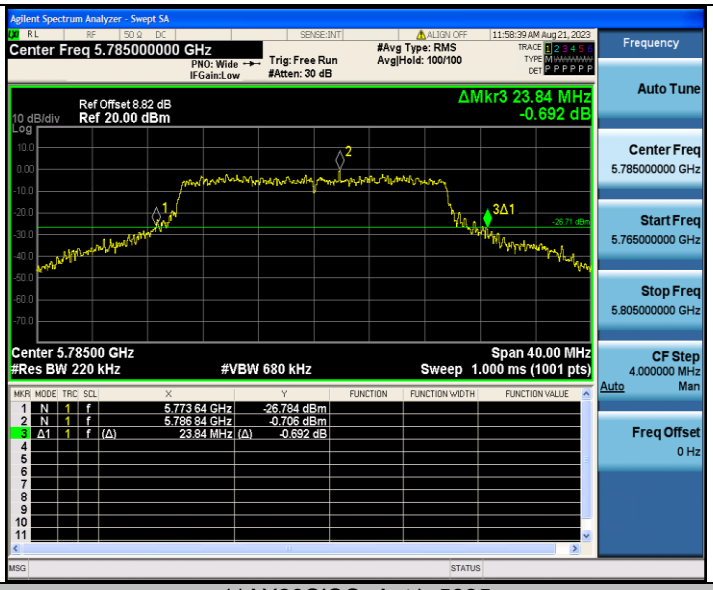

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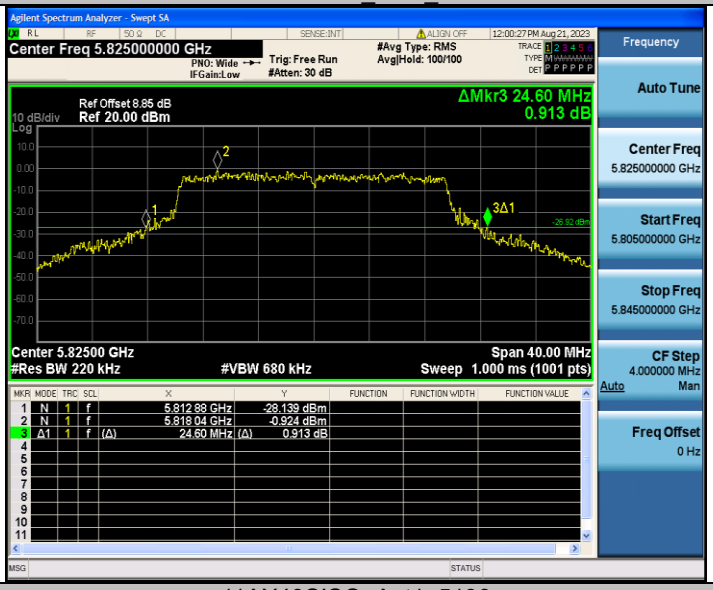

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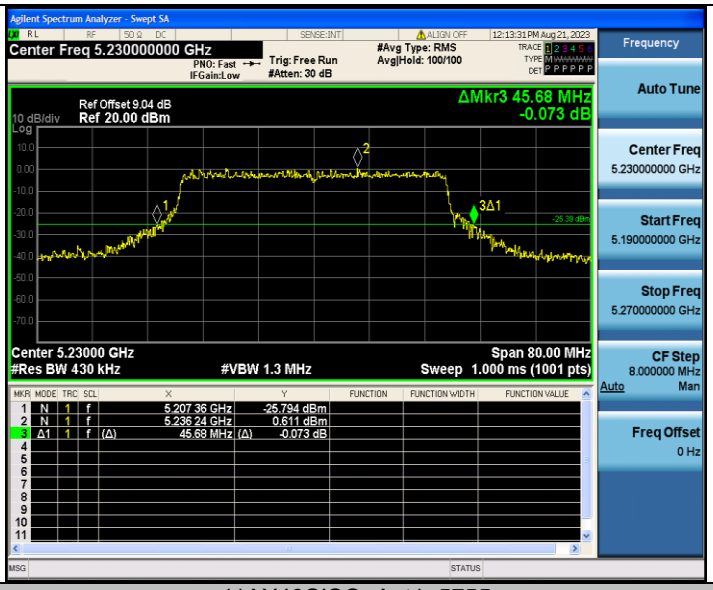

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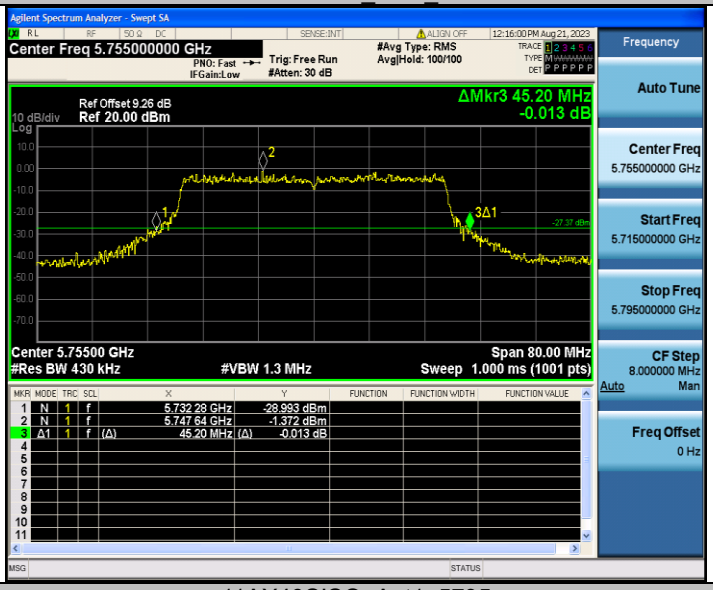

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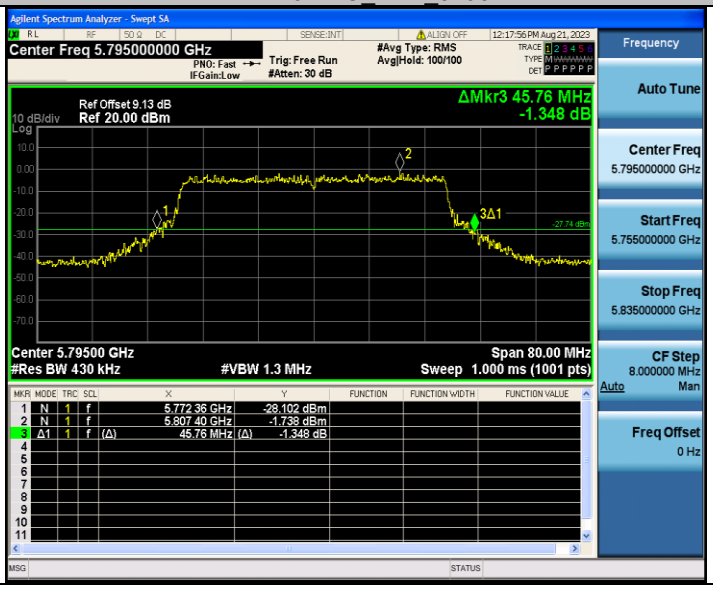


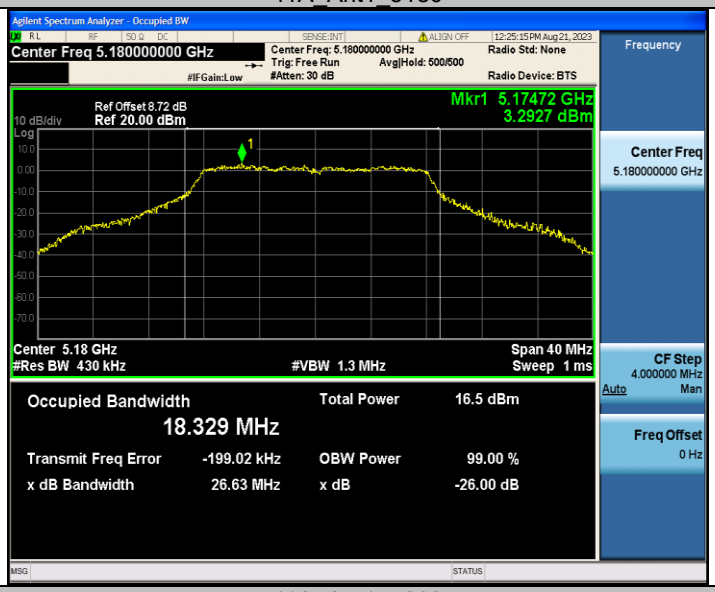
6.10 Appendix A2: Occupied channel bandwidth

6.10.1 Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
11A	Ant1	5180	18.329	5170.6365	5188.9655
		5200	18.156	5190.8427	5208.9987
		5240	18.291	5230.9539	5249.2449
		5745	18.305	5735.7286	5754.0336
		5785	18.115	5775.9194	5794.0344
		5825	17.889	5815.9495	5833.8385
11N20SISO	Ant1	5180	19.259	5170.2845	5189.5435
		5200	19.143	5190.4413	5209.5843
		5240	19.330	5230.4801	5249.8101
		5745	19.226	5735.4438	5754.6698
		5785	19.184	5775.4779	5794.6619
		5825	19.098	5815.4352	5834.5332
11N40SISO	Ant1	5190	37.540	5171.1840	5208.7240
		5230	37.623	5211.3141	5248.9371
		5755	37.597	5736.2111	5773.8081
		5795	37.629	5776.3166	5813.9456
11AC20SISO	Ant1	5180	19.295	5170.2605	5189.5555
		5200	19.116	5190.4380	5209.5540
		5240	19.248	5230.5297	5249.7777
		5745	19.268	5735.3525	5754.6205
		5785	19.158	5775.4479	5794.6059
		5825	19.100	5815.3955	5834.4955
11AC40SISO	Ant1	5190	37.612	5171.1033	5208.7153
		5230	37.609	5211.2429	5248.8519
		5755	37.678	5736.1773	5773.8553
		5795	37.658	5776.3277	5813.9857
11AX20SISO	Ant1	5180	19.697	5170.1313	5189.8283
		5200	19.637	5190.2303	5209.8673
		5240	19.720	5230.2638	5249.9838
		5745	19.658	5735.1907	5754.8487
		5785	19.594	5775.2528	5794.8468
		5825	19.632	5815.1975	5834.8295
11AX40SISO	Ant1	5190	38.364	5170.7006	5209.0646
		5230	38.401	5210.8234	5249.2244
		5755	38.376	5735.8088	5774.1848
		5795	38.391	5775.8325	5814.2235

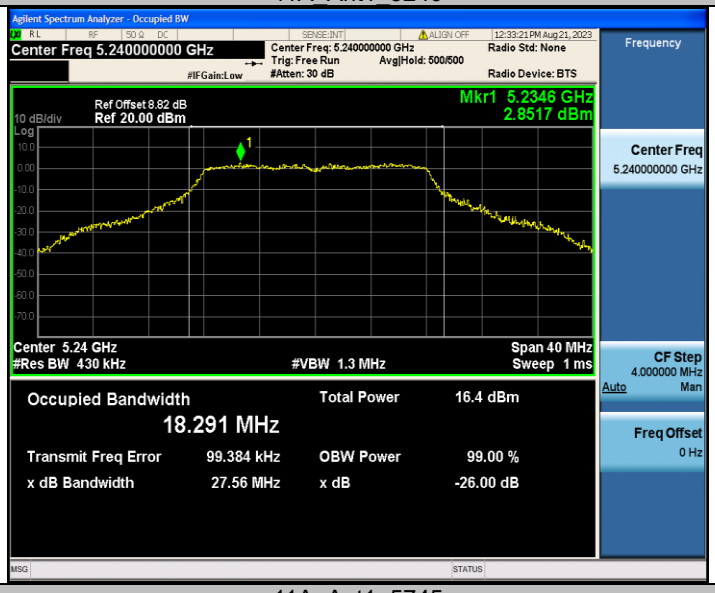
6.10.2 Test Graphs

11A_Ant1_5180



11A_Ant1_5200

11A_Ant1_5240



11A_Ant1_5745