Microtest
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Test Report

Report No.: MTi240809004-01E2

Date of issue: 2024-09-12

Applicant: Shenzhen Mingda Tongda Technology Co., Ltd

Product name: Wireless Carplay

Model(s): A1

FCC ID: 2BKT5-A1

Shenzhen Microtest Co., Ltd.

http://www.mtitest.cn

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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.

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Test Result Certification	
Applicant:	Shenzhen Mingda Tongda Technology Co., Ltd
Address:	508, Building D, Shunxing Industrial Zone, No. 140 Zhongxing Road, Bantian Street, Longgang District, Shenzhen
Manufacturer:	Shenzhen Mingda Tongda Technology Co., Ltd
Address:	508, Building D, Shunxing Industrial Zone, No. 140 Zhongxing Road, Bantian Street, Longgang District, Shenzhen
Product description	
Product name:	Wireless Carplay
Trademark:	ikos
Model name:	A1
Series Model(s):	N/A
Standards:	47 CFR Part 15E
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v02r01 ANSI C63.10-2013
Date of Test	
Date of test:	2024-09-05 to 2024-09-12
Test result:	Pass

Test Engineer	:	James Qin
		(James Qin)
Reviewed By	:	David. Lee
		(David Lee)
Approved By	:	Leon chen
		(Leon Chen)

1 General Description

1.1 Description of the EUT

Product name:	Wireless Carplay
Model name:	A1
Series Model(s):	N/A
Model difference:	N/A
Electrical rating:	Input: DC 5V
Accessories:	N/A
Hardware version:	C08
Software version:	V1.0
Test sample(s) number:	MTi240809004-01S1001
RF specification	
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:	PCB
Antenna(s) gain:	Band1: -1.58dBi Band4: 1.22dBi

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: The EUT only support full RU mode.	

1.2.1 Operation channel list

U-NII Band 1

Bandwidth:	20MHz	Bandwidth:	40MHz	Bandwidth:	80MHz
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230	/	/
44	5220	/	/	/	/
48	5240	/	/	/	/

U-NII Band 3

Bandwidth:	20MHz	Bandwidth:	40MHz	Bandwidth:	80MHz
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
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.

Test Channel List

Operation Band: 5150-5250 MHz

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
20	5180	5200	5240
40	5190	/	5230

Operation Band: 5725-5850 MHz

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
20	5180	5200	5240
40	5190	/	5230

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: Putty

For power setting, refer to below table.

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

For U-NII-3 band:			
802.11a		**802.11n20**	
Channel	Power setting	Channel	Power setting
149	default	149	default
157	default	157	default
165	default	165	default
802.11n40		**802.11ac20**	
Channel	Power setting	Channel	Power setting
151	default	149	default
159	default	157	default
--	--	165	default
802.11ac40		**802.11ax20**	
Channel	Power setting	Channel	Power setting
151	default	149	default
159	default	157	default
--	--	165	default
802.11ax40			
Channel	Power setting	Channel	Power setting
151	default		
159	default		
--			

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
Adapter	HW-200200ZP1	/	HUAWEI
Support cable list			
Description	Length (m)	From	To
/	/	/	/

1.5 Measurement uncertainty

Measurement	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	±3.1dB
Time	±1 %
Occupied channel bandwidth	±3 %
RF output power, conducted	±1 dB
Power Spectral Density, conducted	±1 dB
Unwanted Emissions, conducted	±1 dB
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 %

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	Emission bandwidth and occupied bandwidth	47 CFR Part 15E	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use. 47 CFR Part 15.407(e)	Pass
5	Maximum conducted output power	47 CFR Part 15E	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(3)(i)	Pass
6	Power spectral density	47 CFR Part 15E	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(3)(i)	Pass
7	Band edge emissions (Conducted)	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	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
9	Undesirable emission limits (below 1GHz)	47 CFR Part 15E	47 CFR Part 15.407(b)(9)	Pass
10	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
Conducted Emission at AC power line						
1	EMI Test Receiver	Rohde&schwarz	ESCI3	101368	2024-03-20	2025-03-19
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2024-03-21	2025-03-20
3	Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	100263	2024-03-20	2025-03-19
Duty Cycle Emission bandwidth and occupied bandwidth Maximum conducted output power Power spectral density Band edge emissions (Conducted)						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2024-03-20	2025-03-19
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2024-03-21	2025-03-20
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2024-03-21	2025-03-20
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2024-03-21	2025-03-20
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2024-03-21	2025-03-20
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2024-03-21	2025-03-20
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2024-03-21	2025-03-20
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2024-03-20	2025-03-19
9	DC Power Supply	Agilent	E3632A	MY40027695	2024-03-21	2025-03-20
Undesirable emission limits (above 1GHz) Band edge emissions (Radiated)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2024-03-20	2025-03-19
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-06-17	2025-06-16
3	Amplifier	Agilent	8449B	3008A01120	2024-03-20	2025-03-19
4	MXA signal analyzer	Agilent	N9020A	MY54440859	2024-03-21	2025-03-20
5	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2024-03-21	2025-03-20
6	Horn antenna	Schwarzbeck	BBHA 9170	00987	2023-06-17	2025-06-16
7	Pre-amplifier	Space-Dtronics	EWLAN1840 G	210405001	2024-03-21	2025-03-20
Undesirable emission limits (below 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2024-03-20	2025-03-19
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10
3	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2024-03-23	2025-03-22
4	Amplifier	Hewlett-Packard	8447F	3113A06184	2024-03-20	2025-03-19

5 Evaluation Results (Evaluation)

5.1 Antenna requirement

Test Requirement:	Refer to 47 CFR Part 15.203, 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.

6 Radio Spectrum Matter Test Results (RF)

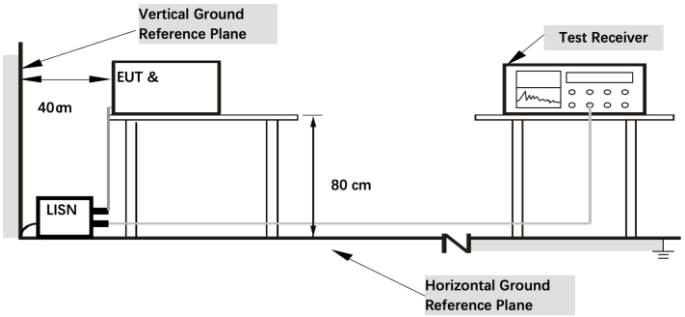
6.1 Conducted Emission at AC power line

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:	ANSI C63.10-2013 section 6.2		

6.1.1 E.U.T. Operation:

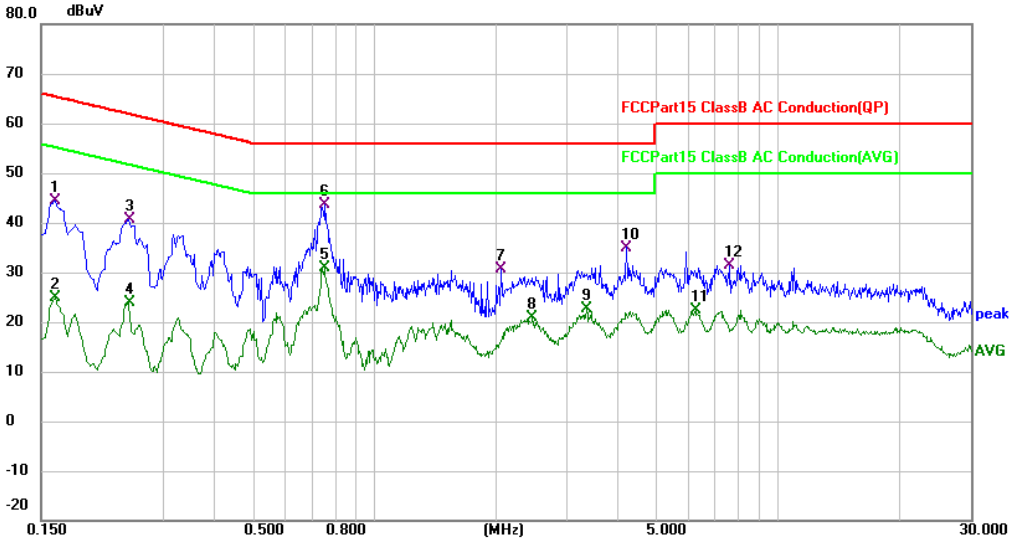
Operating Environment:					
Temperature:	24.6 °C	Humidity:	56 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report				

6.1.2 Test Setup Diagram:



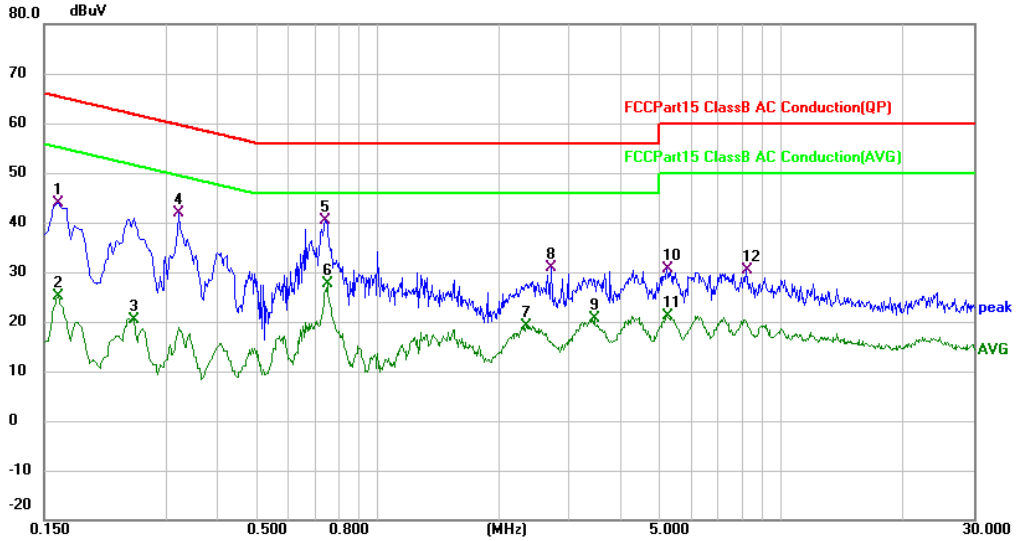
6.1.3 Test Data:

Mode1 / Line: Line / TX U-NII-1-802.11a / CH: H



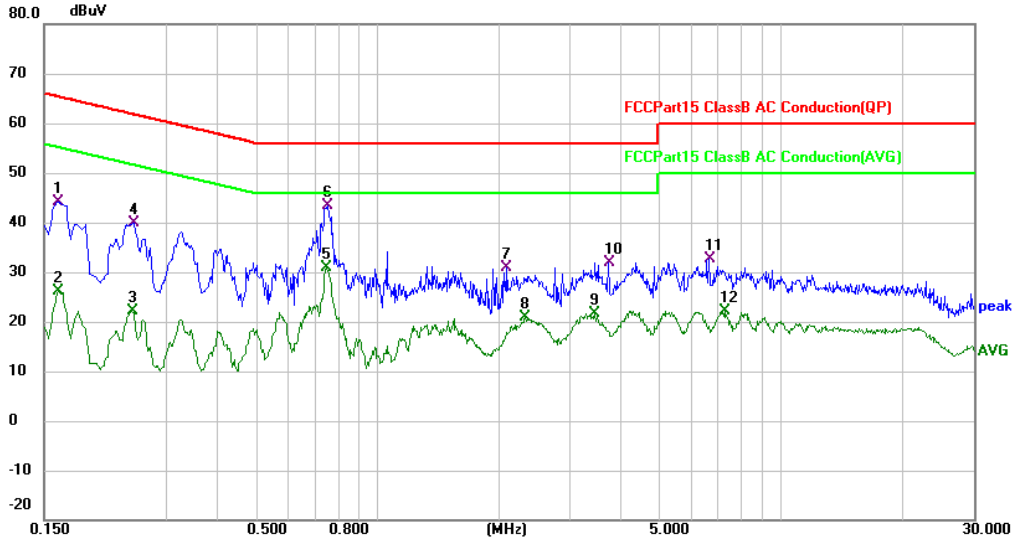
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	34.03	10.30	44.33	65.36	-21.03	QP	
2		0.1620	14.53	10.30	24.83	55.36	-30.53	AVG	
3		0.2460	30.37	10.32	40.69	61.89	-21.20	QP	
4		0.2460	13.44	10.32	23.76	51.89	-28.13	AVG	
5		0.7539	20.32	10.49	30.81	46.00	-15.19	AVG	
6	*	0.7580	33.13	10.49	43.62	56.00	-12.38	QP	
7		2.0579	20.13	10.55	30.68	56.00	-25.32	QP	
8		2.4780	10.34	10.55	20.89	46.00	-25.11	AVG	
9		3.3780	12.02	10.57	22.59	46.00	-23.41	AVG	
10		4.2300	24.44	10.56	35.00	56.00	-21.00	QP	
11		6.2819	11.76	10.60	22.36	50.00	-27.64	AVG	
12		7.6300	20.82	10.63	31.45	60.00	-28.55	QP	

Mode1 / Line: Neutral / TX U-NII-1-802.11a / CH: H



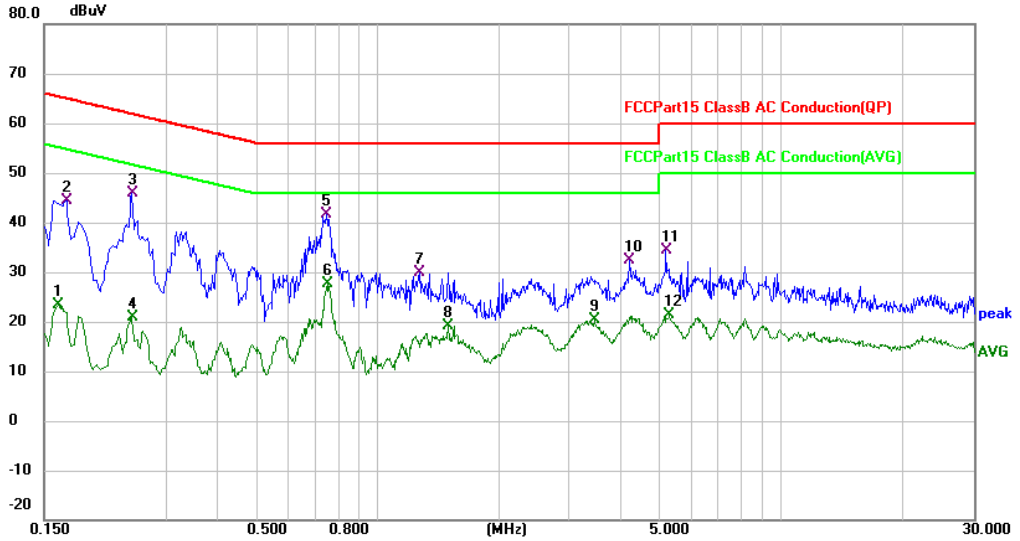
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	33.66	10.30	43.96	65.36	-21.40	QP	
2		0.1620	14.74	10.30	25.04	55.36	-30.32	AVG	
3		0.2500	10.15	10.32	20.47	51.76	-31.29	AVG	
4		0.3220	31.41	10.37	41.78	59.66	-17.88	QP	
5	*	0.7460	29.77	10.49	40.26	56.00	-15.74	QP	
6		0.7539	17.09	10.49	27.58	46.00	-18.42	AVG	
7		2.3500	8.48	10.55	19.03	46.00	-26.97	AVG	
8		2.7100	20.31	10.56	30.87	56.00	-25.13	QP	
9		3.4660	10.05	10.57	20.62	46.00	-25.38	AVG	
10		5.2260	20.03	10.58	30.61	60.00	-29.39	QP	
11		5.2260	10.53	10.58	21.11	50.00	-28.89	AVG	
12		8.2260	19.79	10.64	30.43	60.00	-29.57	QP	

Mode1 / Line: Line / TX U-NII-3-802.11a / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	33.93	10.30	44.23	65.36	-21.13	QP	
2		0.1620	15.77	10.30	26.07	55.36	-29.29	AVG	
3		0.2460	11.81	10.32	22.13	51.89	-29.76	AVG	
4		0.2500	29.55	10.32	39.87	61.76	-21.89	QP	
5		0.7500	20.40	10.49	30.89	46.00	-15.11	AVG	
6	*	0.7539	32.88	10.49	43.37	56.00	-12.63	QP	
7		2.0900	20.42	10.55	30.97	56.00	-25.03	QP	
8		2.3380	10.24	10.55	20.79	46.00	-25.21	AVG	
9		3.4540	11.14	10.57	21.71	46.00	-24.29	AVG	
10		3.7460	21.32	10.56	31.88	56.00	-24.12	QP	
11		6.6339	22.08	10.62	32.70	60.00	-27.30	QP	
12		7.2579	11.42	10.63	22.05	50.00	-27.95	AVG	

Mode1 / Line: Neutral / TX U-NII-3-802.11a / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	13.02	10.30	23.32	55.36	-32.04	AVG	
2		0.1700	34.16	10.30	44.46	64.96	-20.50	QP	
3		0.2460	35.50	10.32	45.82	61.89	-16.07	QP	
4		0.2460	10.46	10.32	20.78	51.89	-31.11	AVG	
5	*	0.7500	31.09	10.49	41.58	56.00	-14.42	QP	
6		0.7580	17.25	10.49	27.74	46.00	-18.26	AVG	
7		1.2740	19.30	10.54	29.84	56.00	-26.16	QP	
8		1.5020	8.70	10.54	19.24	46.00	-26.76	AVG	
9		3.4700	9.87	10.57	20.44	46.00	-25.56	AVG	
10		4.2300	21.88	10.56	32.44	56.00	-23.56	QP	
11		5.2139	23.90	10.58	34.48	60.00	-25.52	QP	
12		5.3139	10.72	10.58	21.30	50.00	-28.70	AVG	

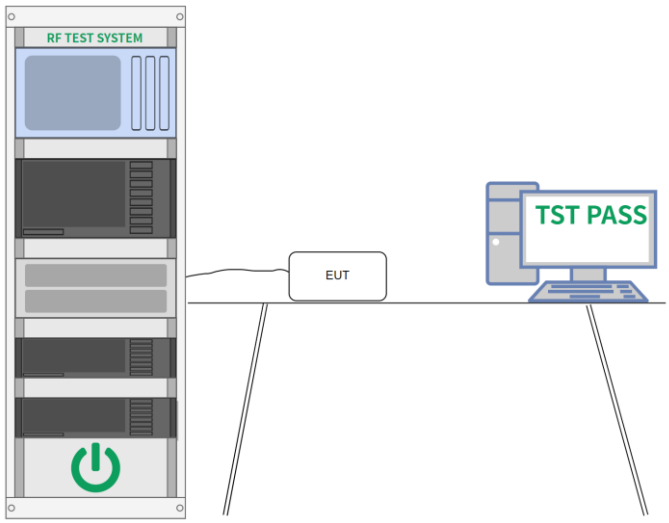
6.2 Duty Cycle

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
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7				
Final test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7				

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

6.3 Emission bandwidth and occupied bandwidth

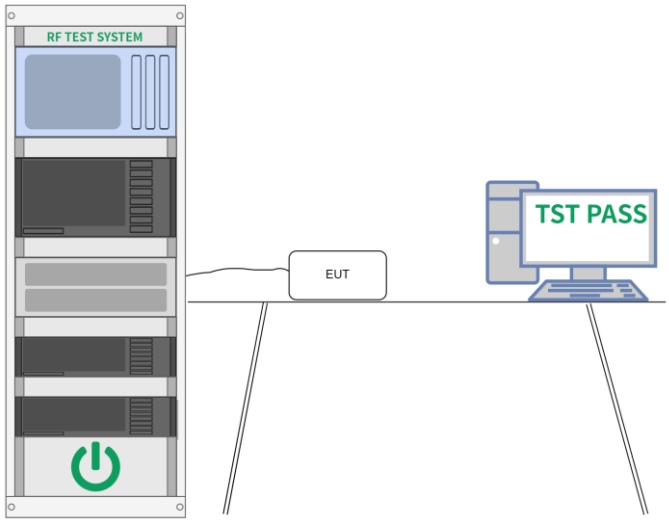
Test Requirement:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use. U-NII 3, U-NII 4: 47 CFR Part 15.407(e)
Test Limit:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use. U-NII 3, U-NII 4: Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.
Test Method:	ANSI C63.10-2013, section 6.9 & 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.

6.3.1 E.U.T. Operation:

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

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Please Refer to Appendix for Details.

6.4 Maximum conducted output power

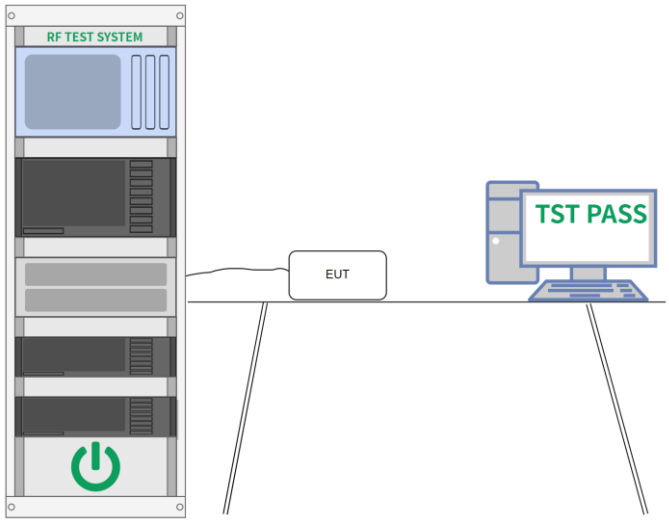
Test Requirement:	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(3)(i)
Test Limit:	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm). 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:	Refer to ANSI C63.10-2013 section 12.3

6.4.1 E.U.T. Operation:

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

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

6.5 Power spectral density

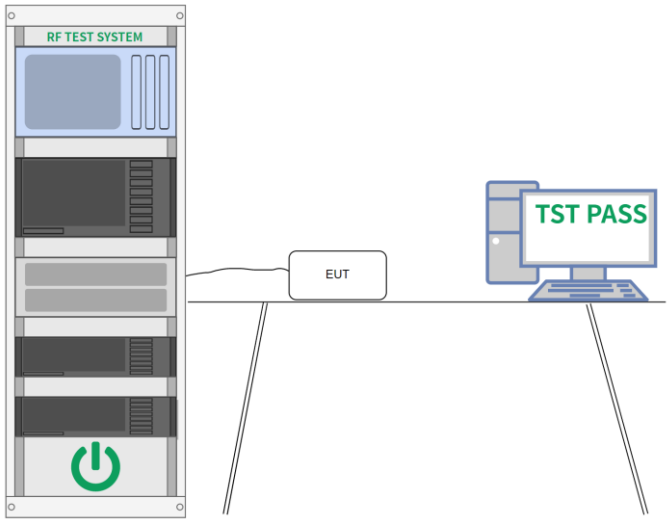
Test Requirement:	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(3)(i)
Test Limit:	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in 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 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:	Refer to ANSI C63.10-2013, section 12.5

6.5.1 E.U.T. Operation:

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

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.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Method: ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7

Procedure:

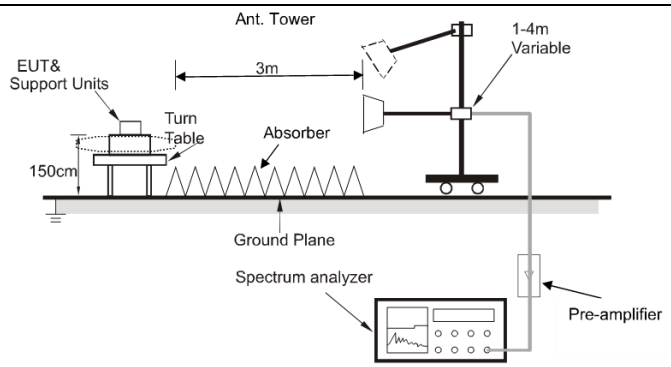
Above 1GHz:
a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, 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:

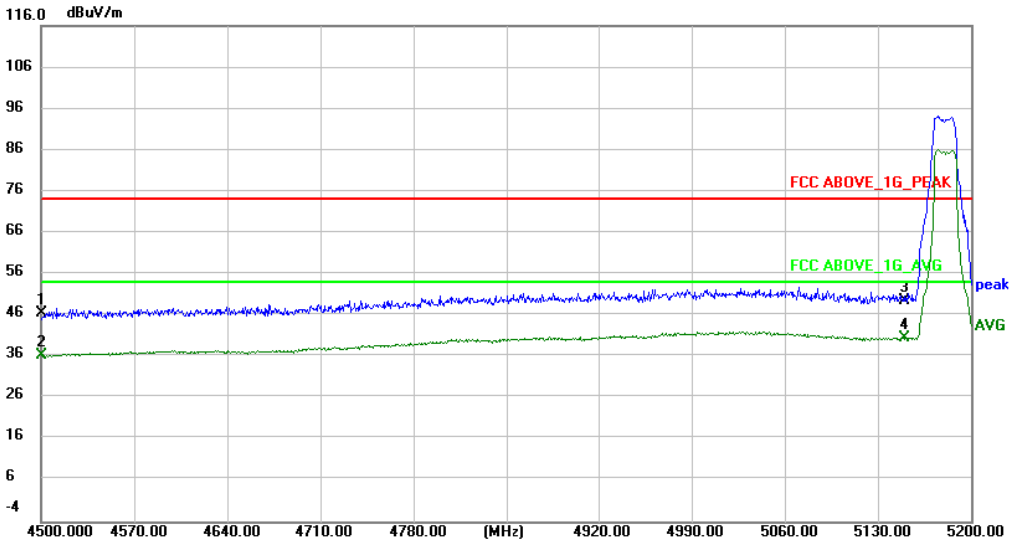
Operating Environment:					
Temperature:	19.6 °C	Humidity:	45.6 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7				
Final test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7				

6.6.2 Test Setup Diagram:



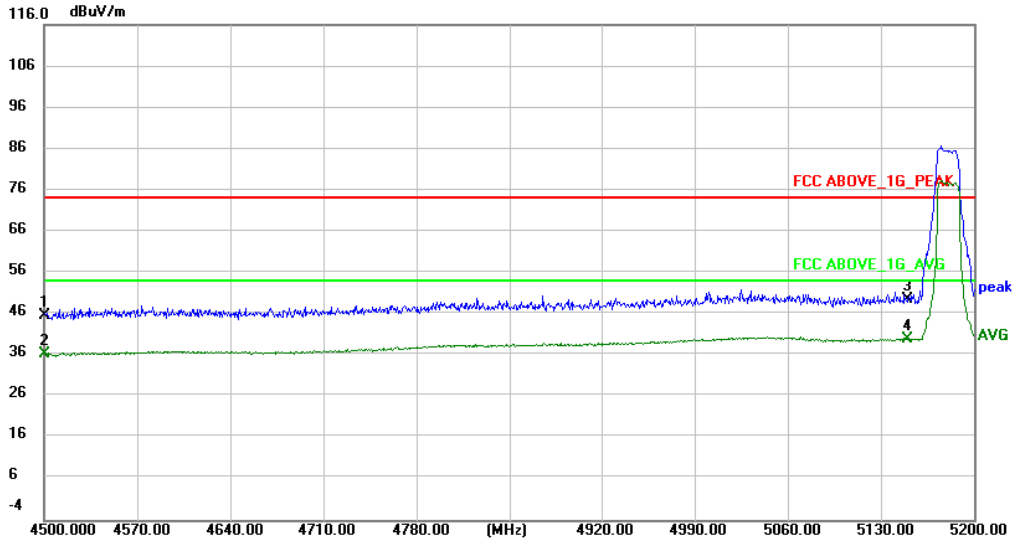
6.6.3 Test Data:

Mode1 / Polarization: Horizontal / CH: L



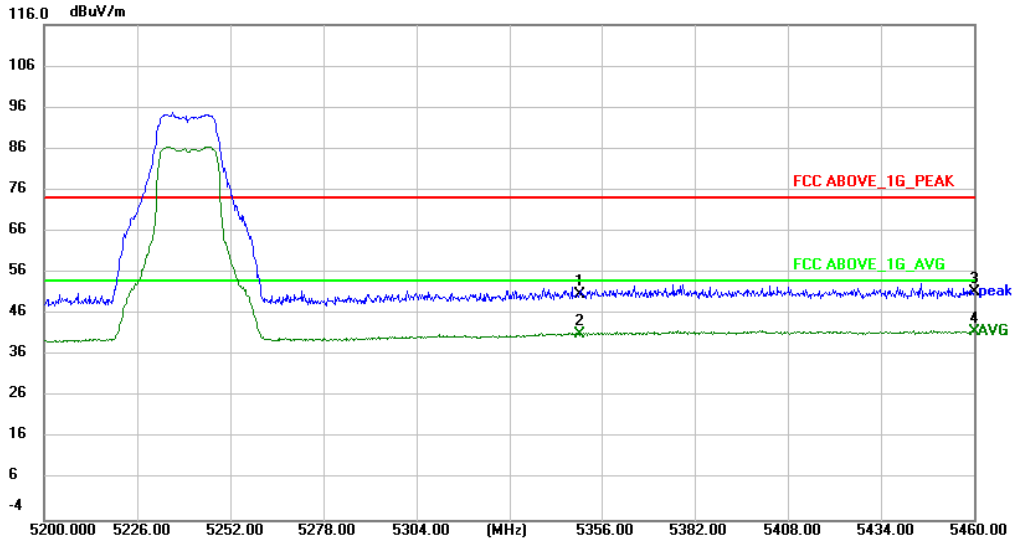
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	47.69	-1.08	46.61	74.00	-27.39	peak	
2		4500.000	37.28	-1.08	36.20	54.00	-17.80	AVG	
3		5150.000	47.68	1.85	49.53	74.00	-24.47	peak	
4	*	5150.000	38.67	1.85	40.52	54.00	-13.48	AVG	

Mode1 / Polarization: Vertical / CH: L



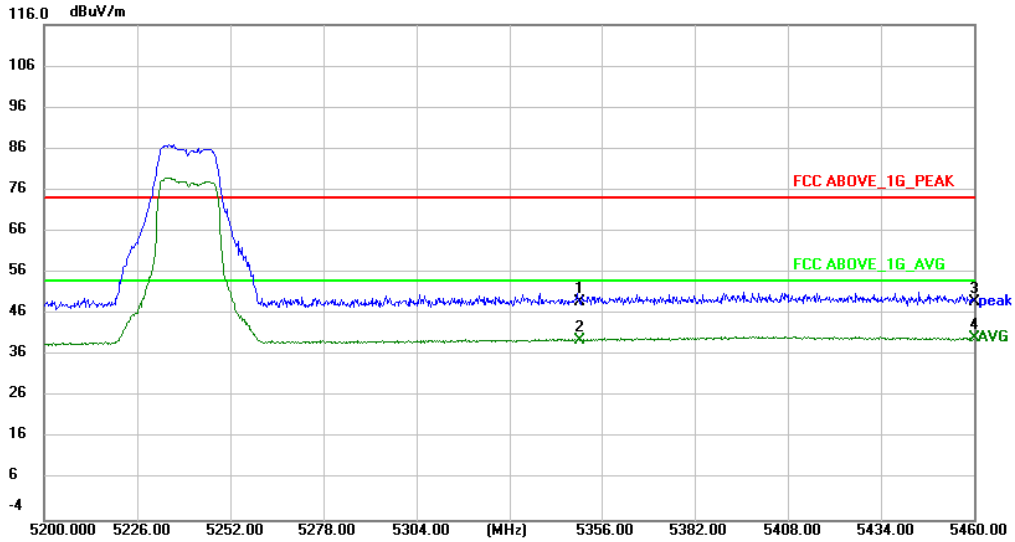
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.69	-1.08	45.61	74.00	-28.39	peak	
2		4500.000	37.44	-1.08	36.36	54.00	-17.64	AVG	
3		5150.000	47.63	1.85	49.48	74.00	-24.52	peak	
4	*	5150.000	38.05	1.85	39.90	54.00	-14.10	AVG	

Mode1 / Polarization: Horizontal / CH: H



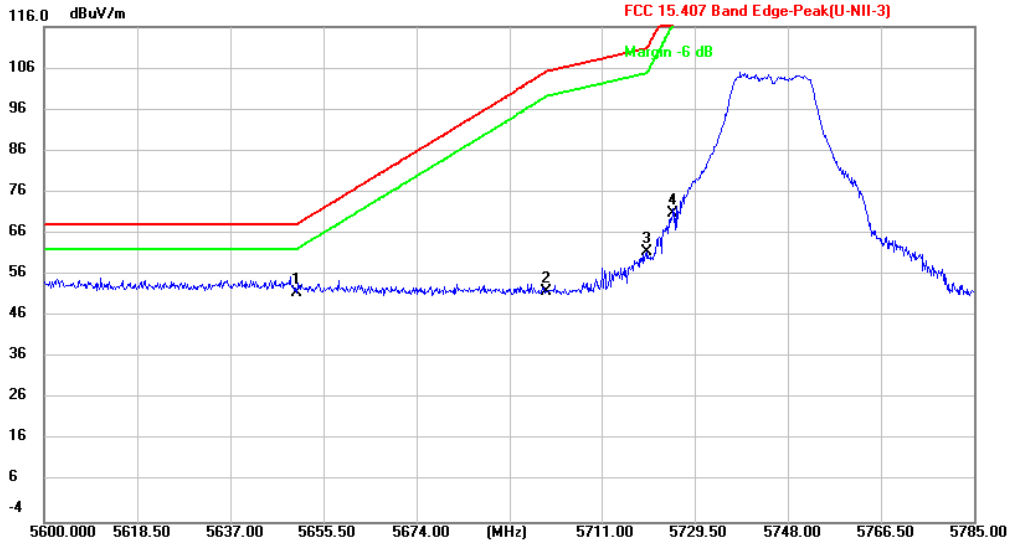
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	48.51	2.30	50.81	74.00	-23.19	peak	
2		5350.000	38.86	2.30	41.16	54.00	-12.84	AVG	
3		5460.000	49.17	2.24	51.41	74.00	-22.59	peak	
4	*	5460.000	39.51	2.24	41.75	54.00	-12.25	AVG	

Mode1 / Polarization: Vertical / CH: H



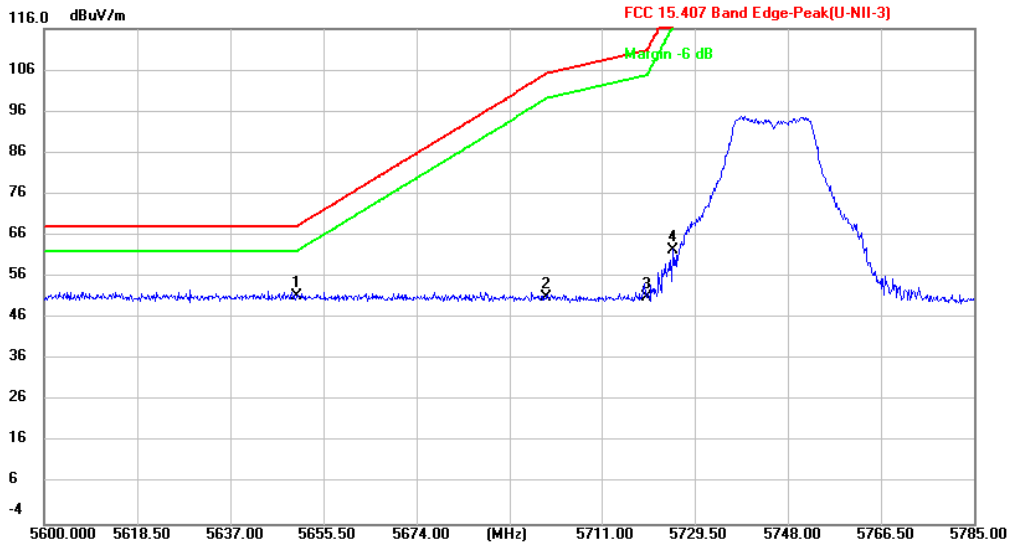
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	46.79	2.30	49.09	74.00	-24.91	peak	
2		5350.000	37.40	2.30	39.70	54.00	-14.30	AVG	
3		5460.000	46.78	2.24	49.02	74.00	-24.98	peak	
4	*	5460.000	37.96	2.24	40.20	54.00	-13.80	AVG	

Mode1 / Polarization: Horizontal / CH: L



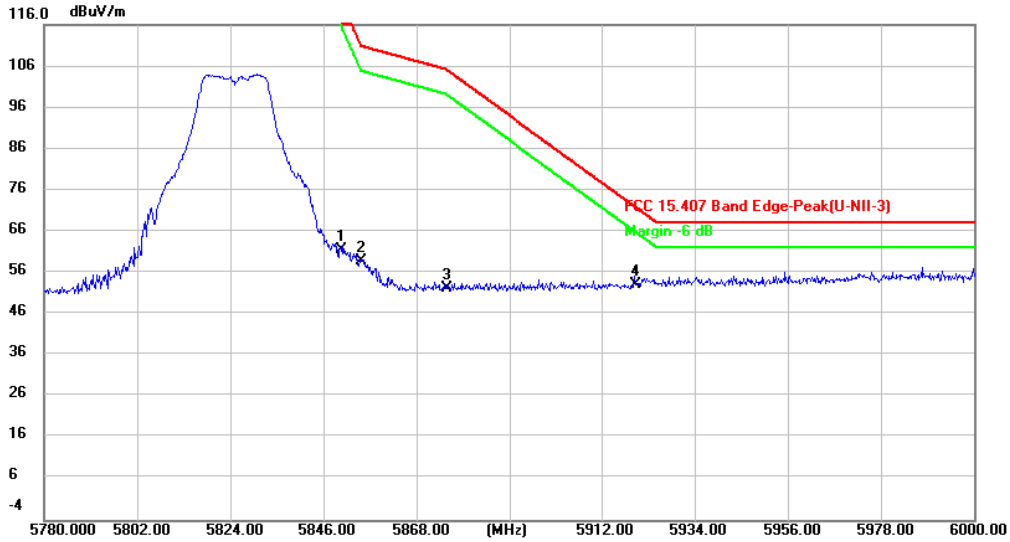
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	48.91	2.79	51.70	68.20	-16.50	peak	
2		5700.000	48.97	2.86	51.83	105.20	-53.37	peak	
3		5720.000	58.74	2.77	61.51	110.80	-49.29	peak	
4		5725.000	67.97	2.75	70.72	122.20	-51.48	peak	

Mode1 / Polarization: Vertical / CH: L



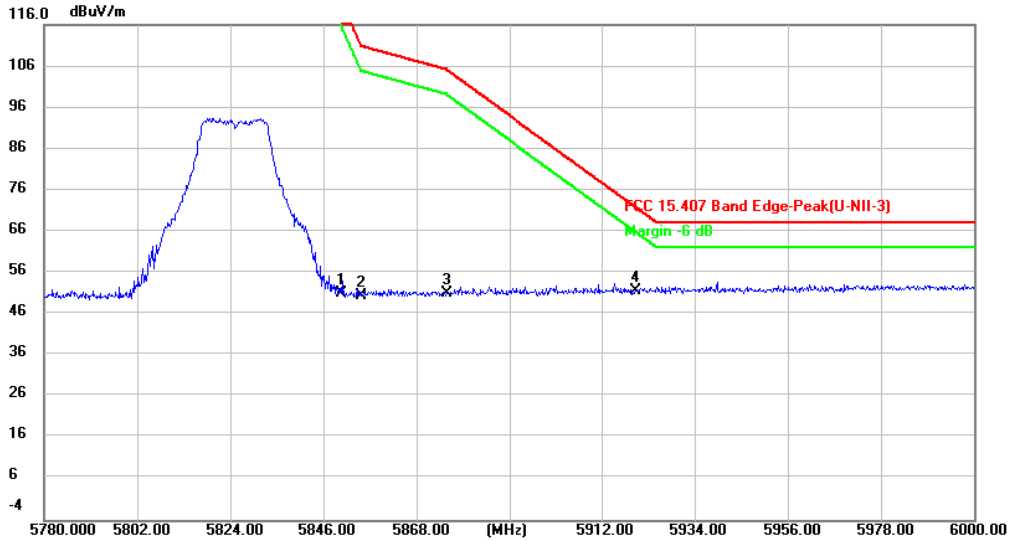
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	48.57	2.79	51.36	68.20	-16.84	peak	
2		5700.000	48.12	2.86	50.98	105.20	-54.22	peak	
3		5720.000	48.24	2.77	51.01	110.80	-59.79	peak	
4		5725.000	59.69	2.75	62.44	122.20	-59.76	peak	

Mode1 / Polarization: Horizontal / CH: H



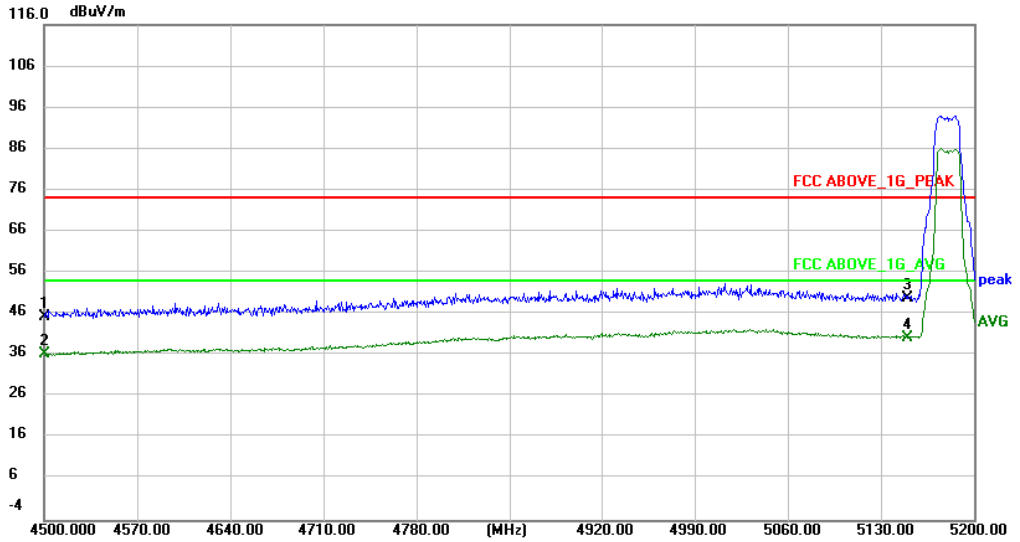
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	58.75	2.67	61.42	122.20	-60.78	peak	
2		5855.000	56.08	2.72	58.80	110.80	-52.00	peak	
3		5875.000	49.20	2.91	52.11	105.20	-53.09	peak	
4	*	5920.000	50.06	3.22	53.28	71.90	-18.62	peak	

Mode1 / Polarization: Vertical / CH: H



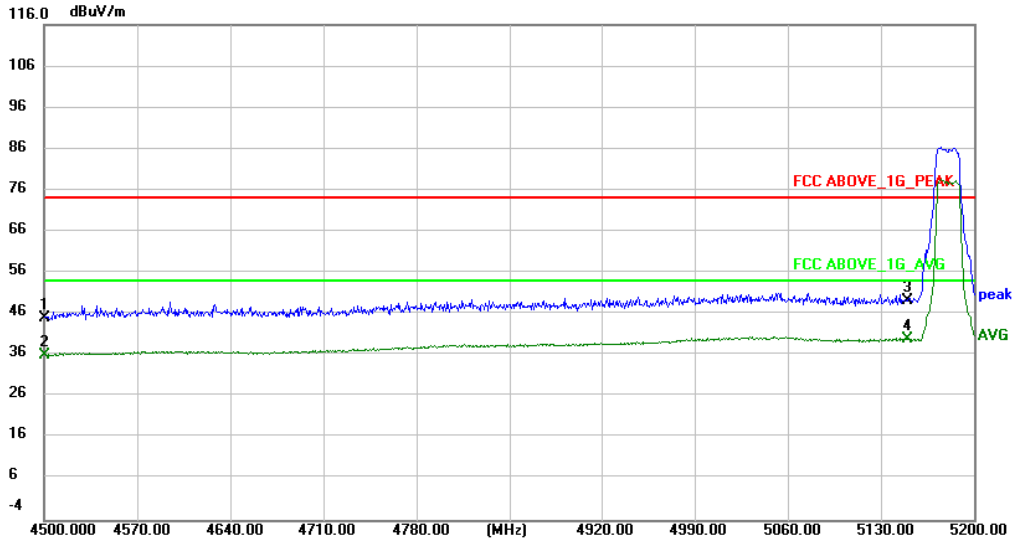
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	48.35	2.67	51.02	122.20	-71.18	peak	
2		5855.000	47.67	2.72	50.39	110.80	-60.41	peak	
3		5875.000	48.24	2.91	51.15	105.20	-54.05	peak	
4	*	5920.000	48.34	3.22	51.56	71.90	-20.34	peak	

Mode2 / Polarization: Horizontal / CH: L



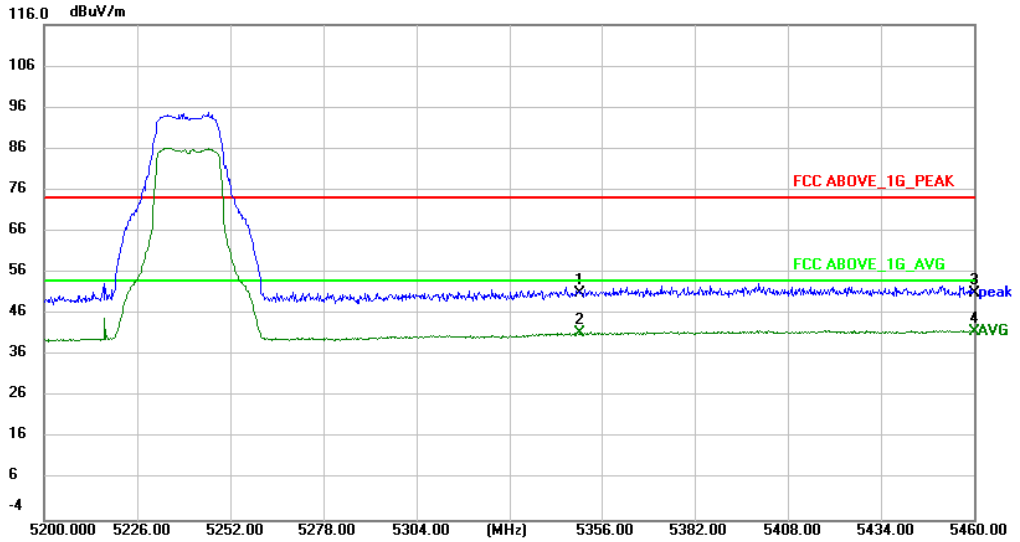
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.42	-1.08	45.34	74.00	-28.66	peak	
2		4500.000	37.42	-1.08	36.34	54.00	-17.66	AVG	
3		5150.000	47.97	1.85	49.82	74.00	-24.18	peak	
4	*	5150.000	38.54	1.85	40.39	54.00	-13.61	AVG	

Mode2 / Polarization: Vertical / CH: L



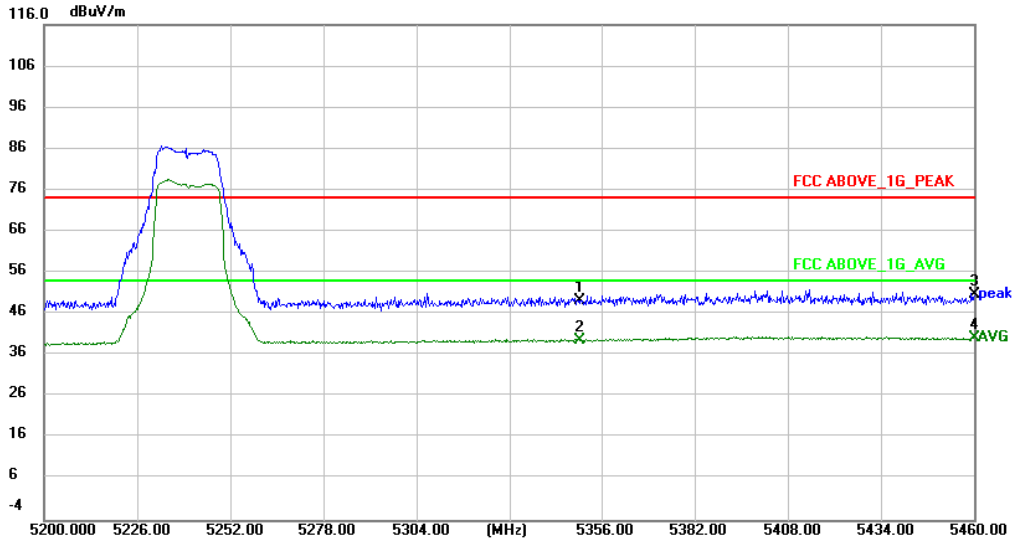
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.25	-1.08	45.17	74.00	-28.83	peak	
2		4500.000	37.13	-1.08	36.05	54.00	-17.95	AVG	
3		5150.000	47.35	1.85	49.20	74.00	-24.80	peak	
4	*	5150.000	38.02	1.85	39.87	54.00	-14.13	AVG	

Mode2 / Polarization: Horizontal / CH: H



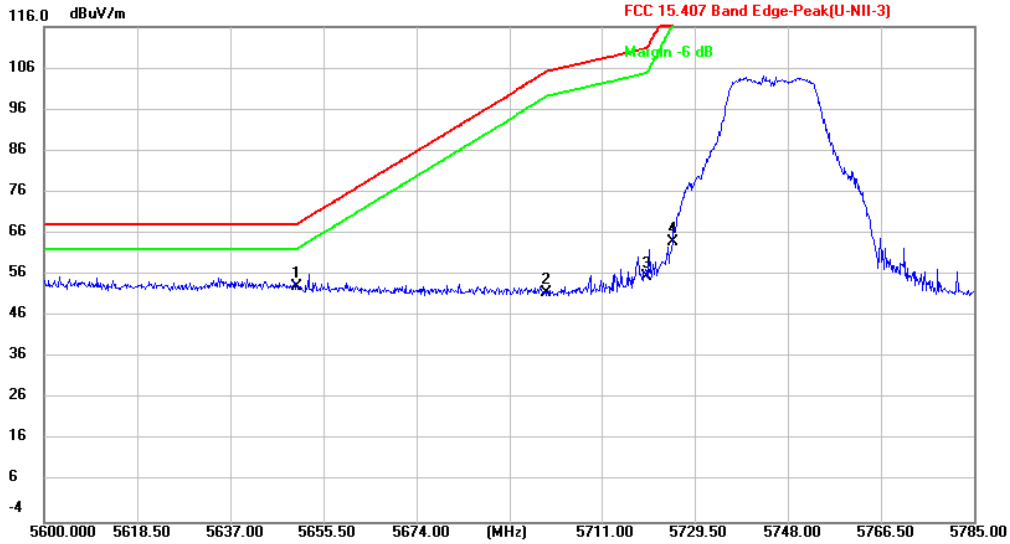
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	48.70	2.30	51.00	74.00	-23.00	peak	
2		5350.000	39.03	2.30	41.33	54.00	-12.67	AVG	
3		5460.000	48.86	2.24	51.10	74.00	-22.90	peak	
4	*	5460.000	39.58	2.24	41.82	54.00	-12.18	AVG	

Mode2 / Polarization: Vertical / CH: H



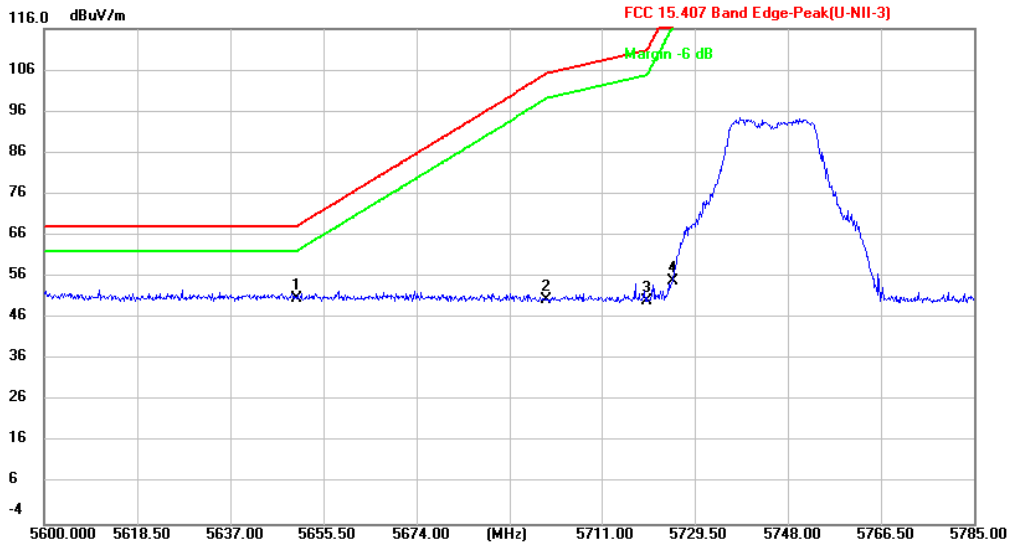
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	46.85	2.30	49.15	74.00	-24.85	peak	
2		5350.000	37.27	2.30	39.57	54.00	-14.43	AVG	
3		5460.000	48.64	2.24	50.88	74.00	-23.12	peak	
4	*	5460.000	37.89	2.24	40.13	54.00	-13.87	AVG	

Mode2 / Polarization: Horizontal / CH: L



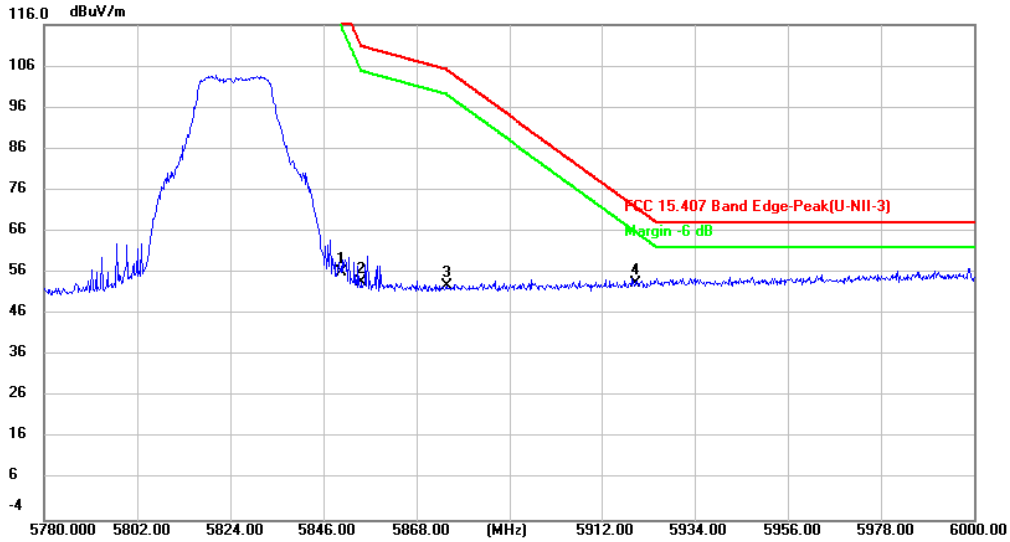
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	50.22	2.79	53.01	68.20	-15.19	peak	
2		5700.000	48.67	2.86	51.53	105.20	-53.67	peak	
3		5720.000	52.73	2.77	55.50	110.80	-55.30	peak	
4		5725.000	61.11	2.75	63.86	122.20	-58.34	peak	

Mode2 / Polarization: Vertical / CH: L



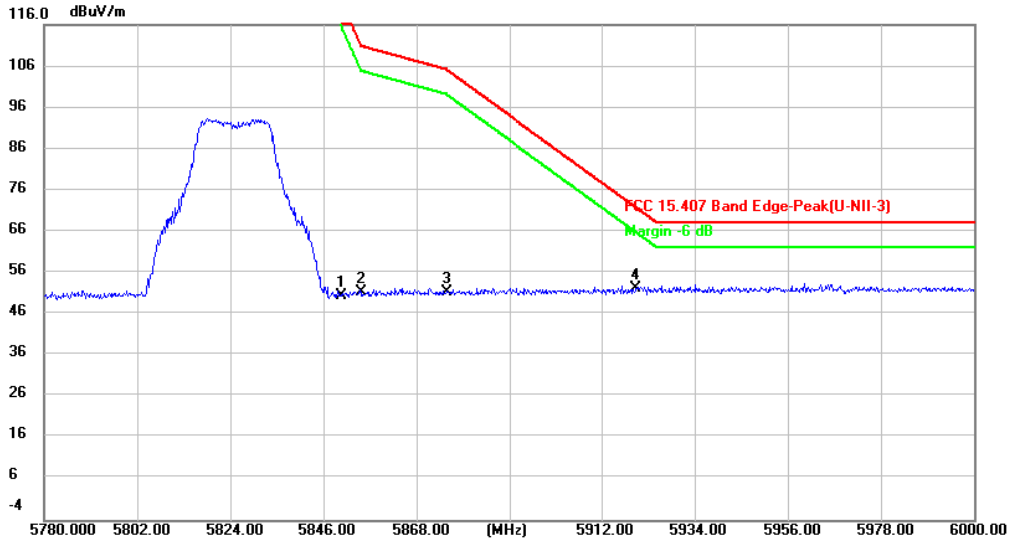
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	48.02	2.79	50.81	68.20	-17.39	peak	
2		5700.000	47.69	2.86	50.55	105.20	-54.65	peak	
3		5720.000	47.39	2.77	50.16	110.80	-60.64	peak	
4		5725.000	52.23	2.75	54.98	122.20	-67.22	peak	

Mode2 / Polarization: Horizontal / CH: H



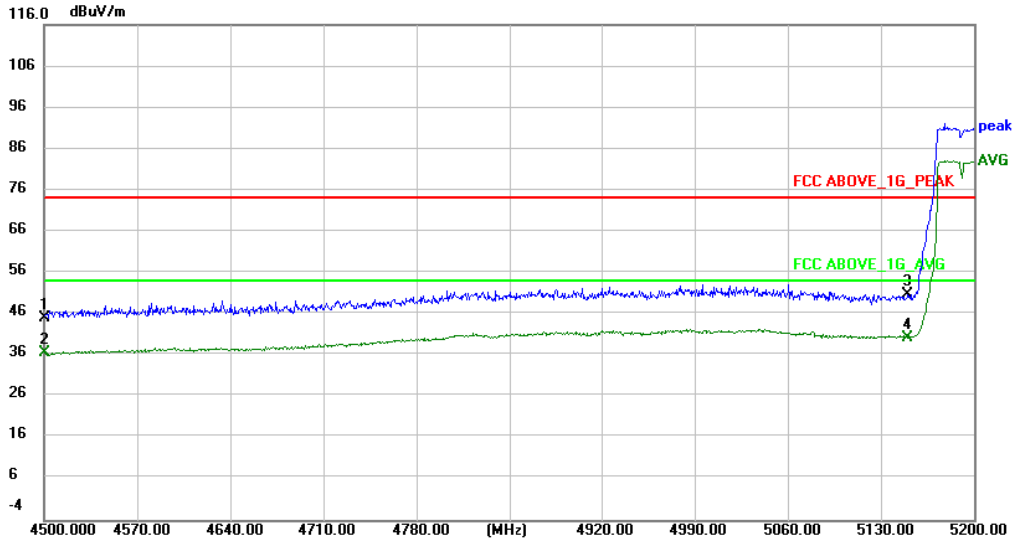
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	53.56	2.67	56.23	122.20	-65.97	peak	
2		5855.000	51.01	2.72	53.73	110.80	-57.07	peak	
3		5875.000	50.03	2.91	52.94	105.20	-52.26	peak	
4	*	5920.000	50.18	3.22	53.40	71.90	-18.50	peak	

Mode2 / Polarization: Vertical / CH: H



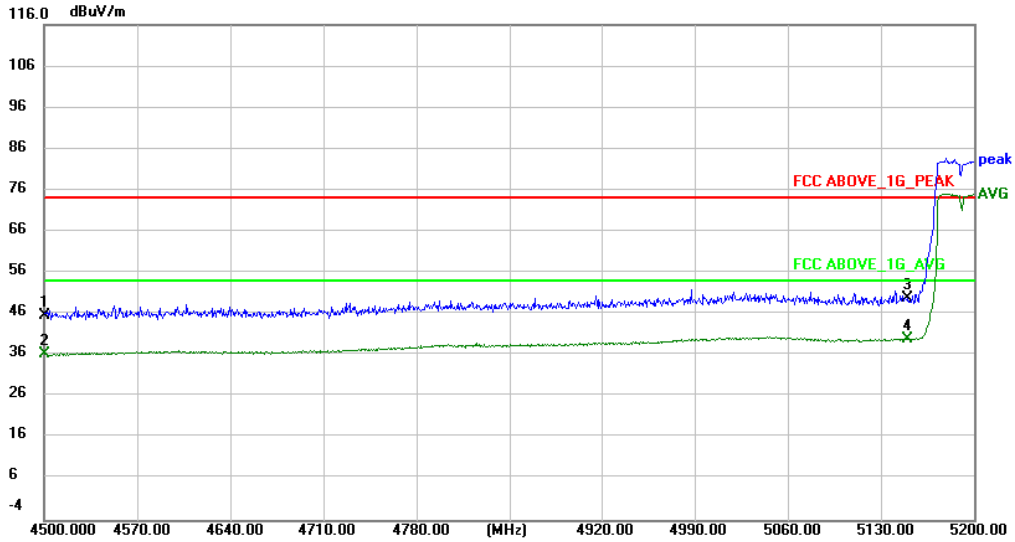
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	47.68	2.67	50.35	122.20	-71.85	peak	
2		5855.000	48.55	2.72	51.27	110.80	-59.53	peak	
3		5875.000	48.42	2.91	51.33	105.20	-53.87	peak	
4	*	5920.000	49.03	3.22	52.25	71.90	-19.65	peak	

Mode3 / Polarization: Horizontal / CH: L



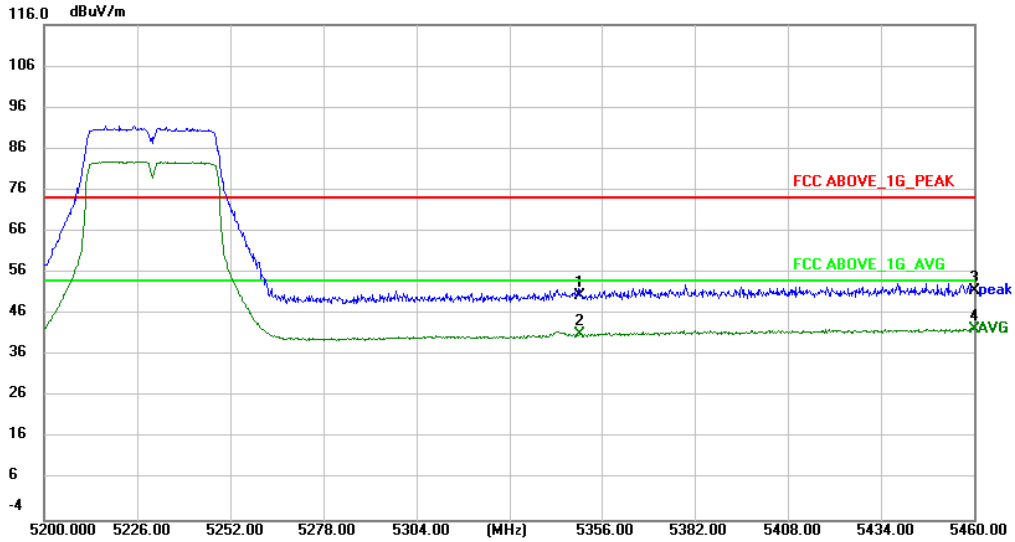
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.26	-1.08	45.18	74.00	-28.82	peak	
2		4500.000	37.61	-1.08	36.53	54.00	-17.47	AVG	
3		5150.000	48.84	1.85	50.69	74.00	-23.31	peak	
4	*	5150.000	38.54	1.85	40.39	54.00	-13.61	AVG	

Mode3 / Polarization: Vertical / CH: L



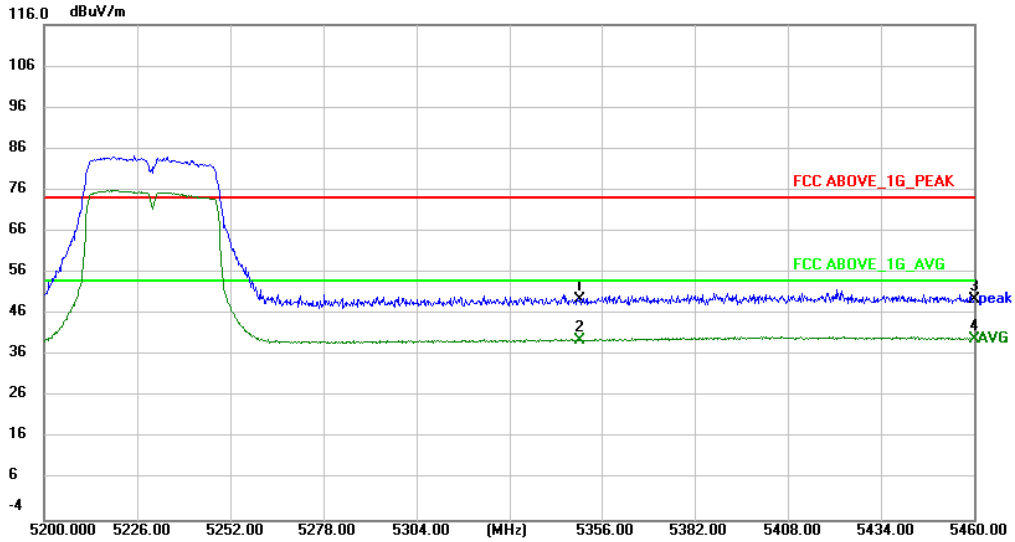
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.64	-1.08	45.56	74.00	-28.44	peak	
2		4500.000	37.44	-1.08	36.36	54.00	-17.64	AVG	
3		5150.000	47.95	1.85	49.80	74.00	-24.20	peak	
4	*	5150.000	38.04	1.85	39.89	54.00	-14.11	AVG	

Mode3 / Polarization: Horizontal / CH: H



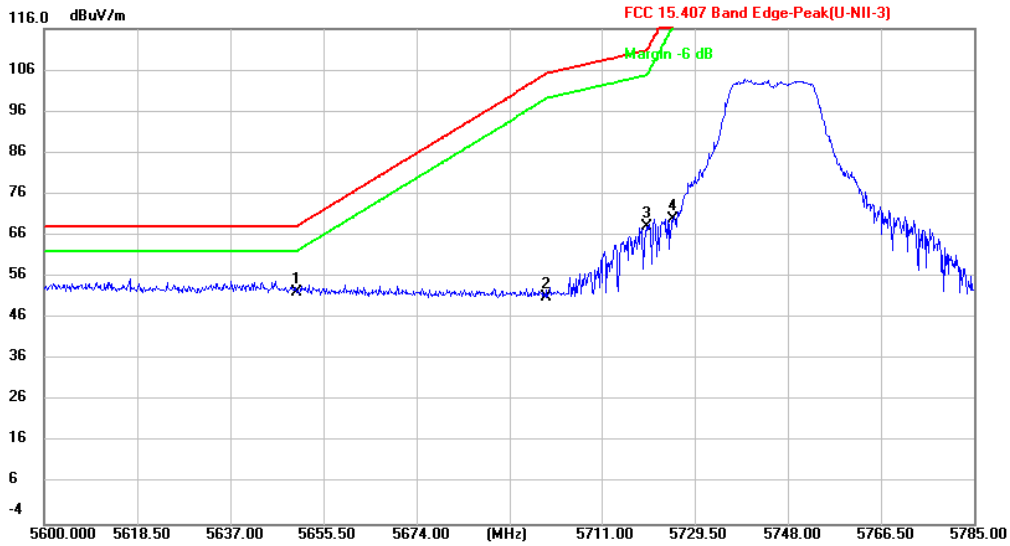
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	48.22	2.30	50.52	74.00	-23.48	peak	
2		5350.000	38.87	2.30	41.17	54.00	-12.83	AVG	
3		5460.000	49.52	2.24	51.76	74.00	-22.24	peak	
4	*	5460.000	39.96	2.24	42.20	54.00	-11.80	AVG	

Mode3 / Polarization: Vertical / CH: H



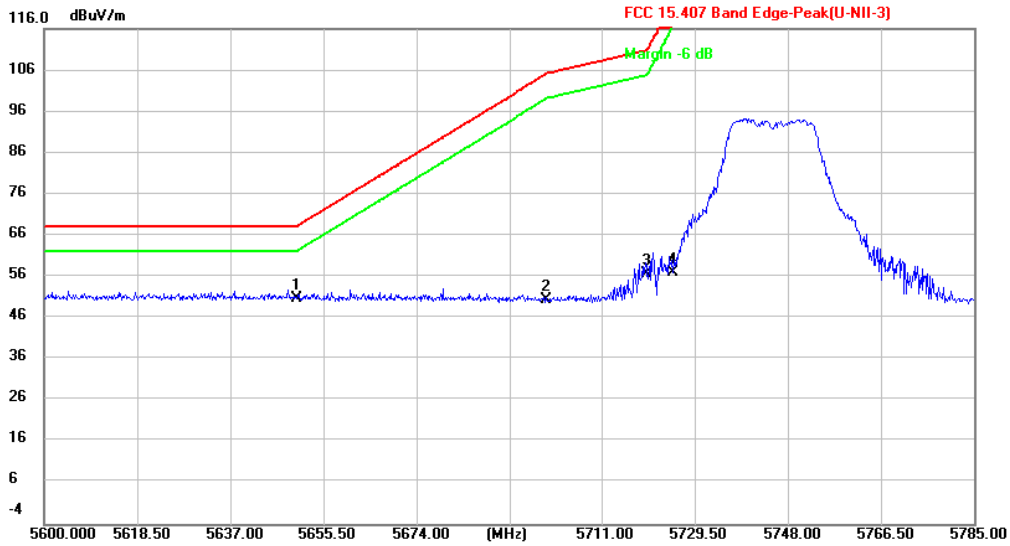
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	47.23	2.30	49.53	74.00	-24.47	peak	
2		5350.000	37.50	2.30	39.80	54.00	-14.20	AVG	
3		5460.000	47.24	2.24	49.48	74.00	-24.52	peak	
4	*	5460.000	37.79	2.24	40.03	54.00	-13.97	AVG	

Mode3 / Polarization: Horizontal / CH: L



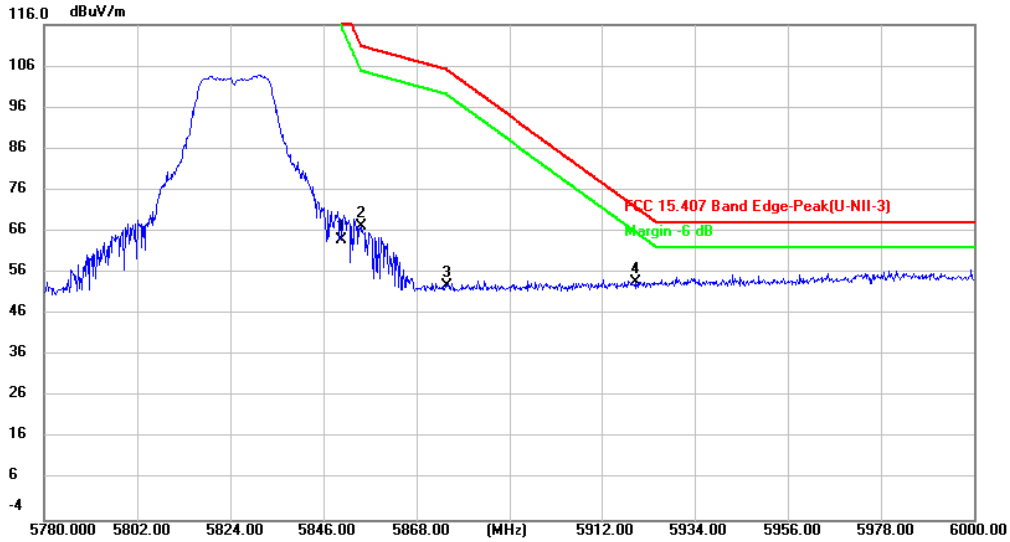
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	49.54	2.79	52.33	68.20	-15.87	peak	
2		5700.000	48.11	2.86	50.97	105.20	-54.23	peak	
3		5720.000	65.44	2.77	68.21	110.80	-42.59	peak	
4		5725.000	67.26	2.75	70.01	122.20	-52.19	peak	

Mode3 / Polarization: Vertical / CH: L



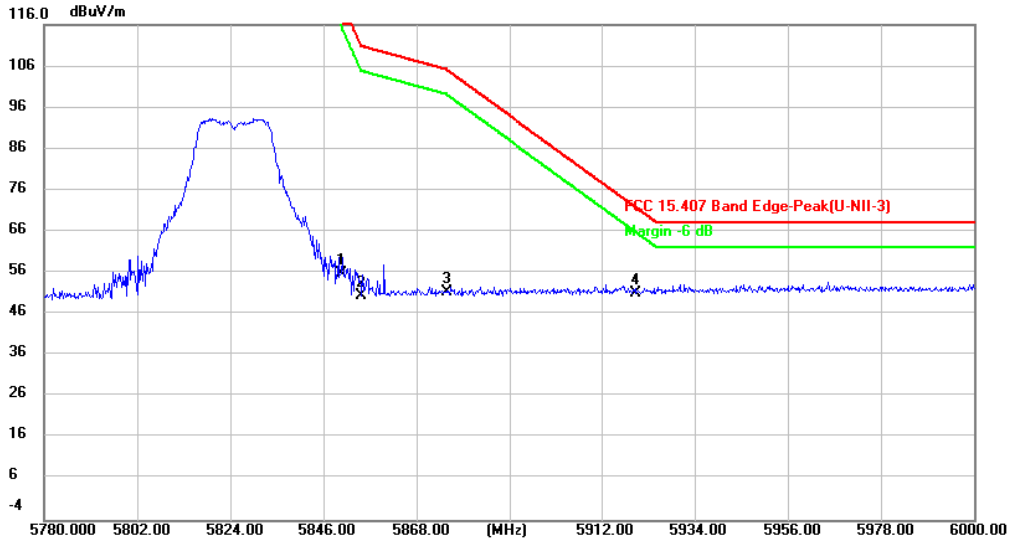
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	48.06	2.79	50.85	68.20	-17.35	peak	
2		5700.000	47.69	2.86	50.55	105.20	-54.65	peak	
3		5720.000	54.10	2.77	56.87	110.80	-53.93	peak	
4		5725.000	54.20	2.75	56.95	122.20	-65.25	peak	

Mode3 / Polarization: Horizontal / CH: H



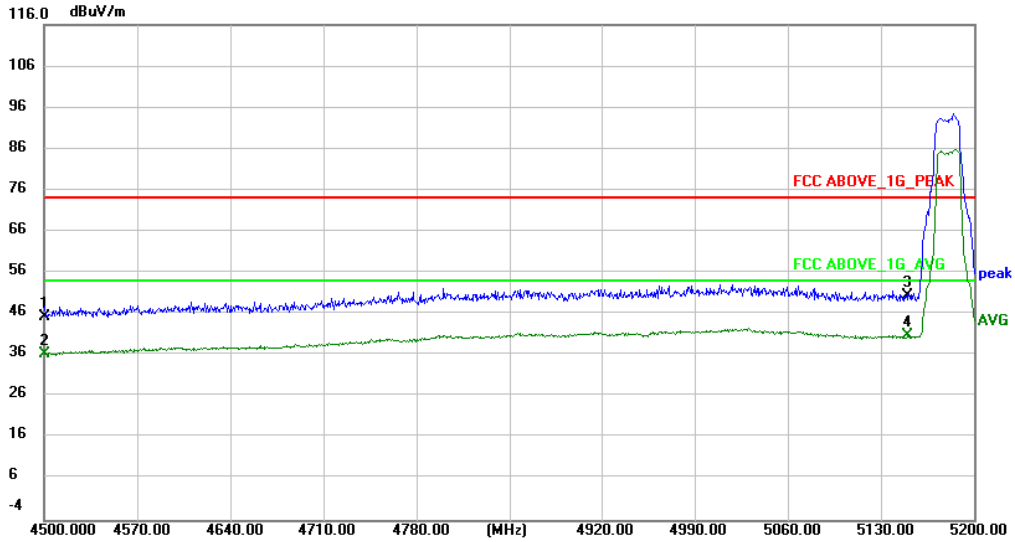
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	61.21	2.67	63.88	122.20	-58.32	peak	
2		5855.000	64.59	2.72	67.31	110.80	-43.49	peak	
3		5875.000	50.08	2.91	52.99	105.20	-52.21	peak	
4	*	5920.000	50.44	3.22	53.66	71.90	-18.24	peak	

Mode3 / Polarization: Vertical / CH: H



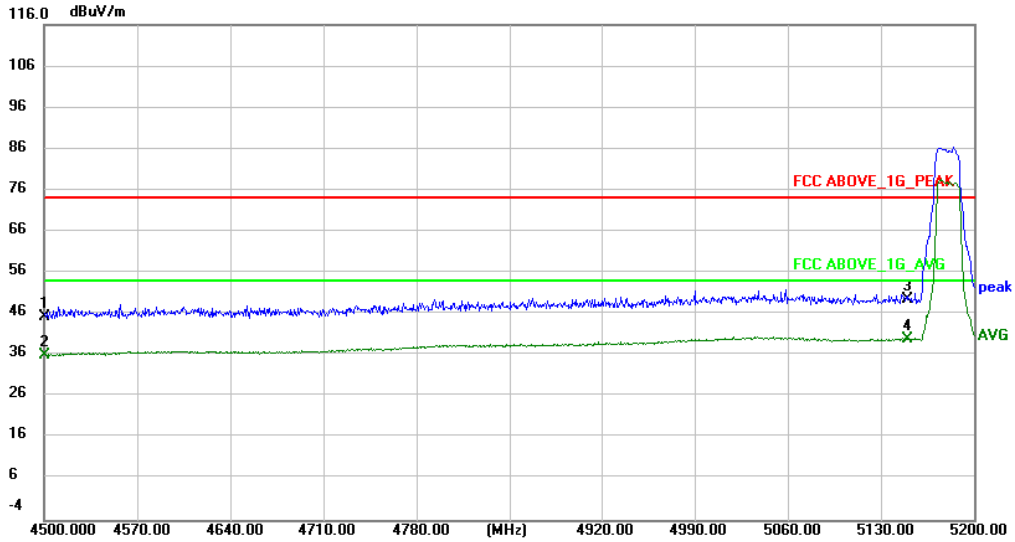
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	53.14	2.67	55.81	122.20	-66.39	peak	
2		5855.000	47.76	2.72	50.48	110.80	-60.32	peak	
3		5875.000	48.57	2.91	51.48	105.20	-53.72	peak	
4	*	5920.000	47.76	3.22	50.98	71.90	-20.92	peak	

Mode4 / Polarization: Horizontal / CH: L



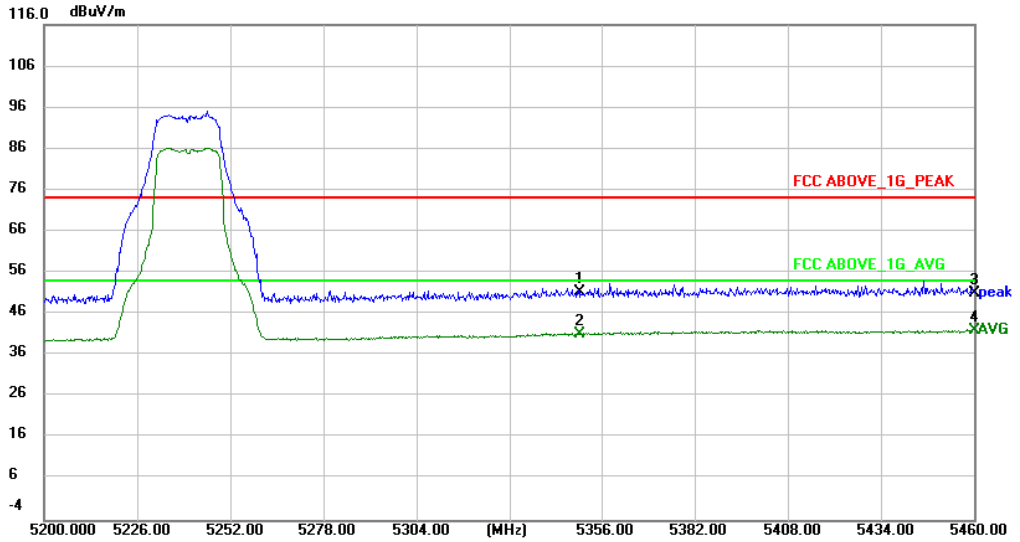
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.43	-1.08	45.35	74.00	-28.65	peak	
2		4500.000	37.46	-1.08	36.38	54.00	-17.62	AVG	
3		5150.000	48.51	1.85	50.36	74.00	-23.64	peak	
4	*	5150.000	38.96	1.85	40.81	54.00	-13.19	AVG	

Mode4 / Polarization: Vertical / CH: L



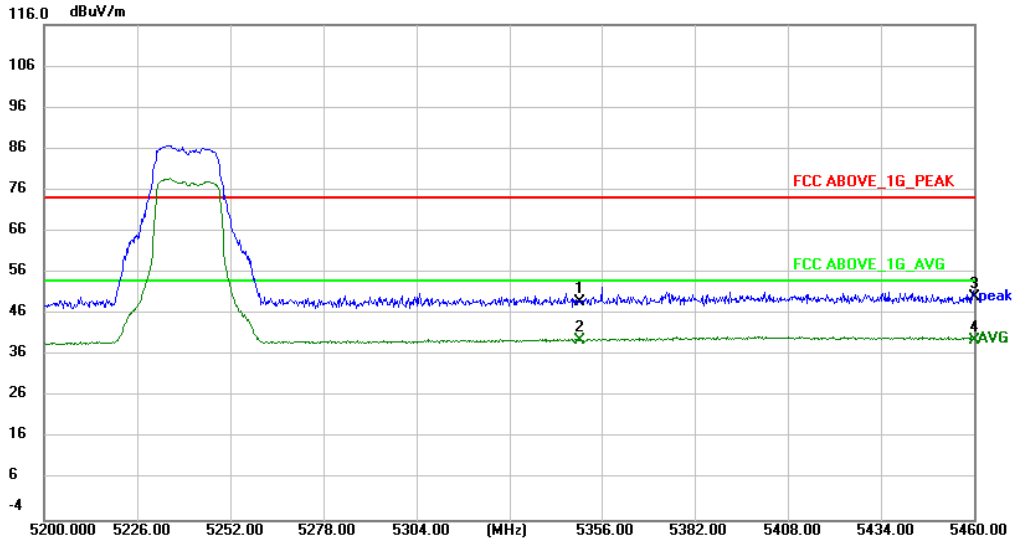
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.54	-1.08	45.46	74.00	-28.54	peak	
2		4500.000	37.23	-1.08	36.15	54.00	-17.85	AVG	
3		5150.000	47.75	1.85	49.60	74.00	-24.40	peak	
4	*	5150.000	38.07	1.85	39.92	54.00	-14.08	AVG	

Mode4 / Polarization: Horizontal / CH: H



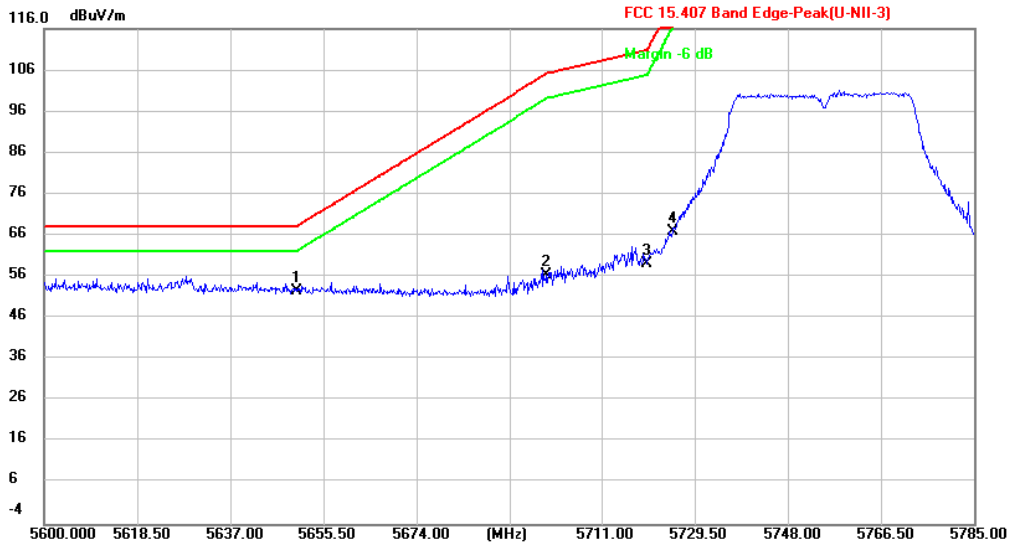
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	48.98	2.30	51.28	74.00	-22.72	peak	
2		5350.000	38.96	2.30	41.26	54.00	-12.74	AVG	
3		5460.000	48.72	2.24	50.96	74.00	-23.04	peak	
4	*	5460.000	39.78	2.24	42.02	54.00	-11.98	AVG	

Mode4 / Polarization: Vertical / CH: H



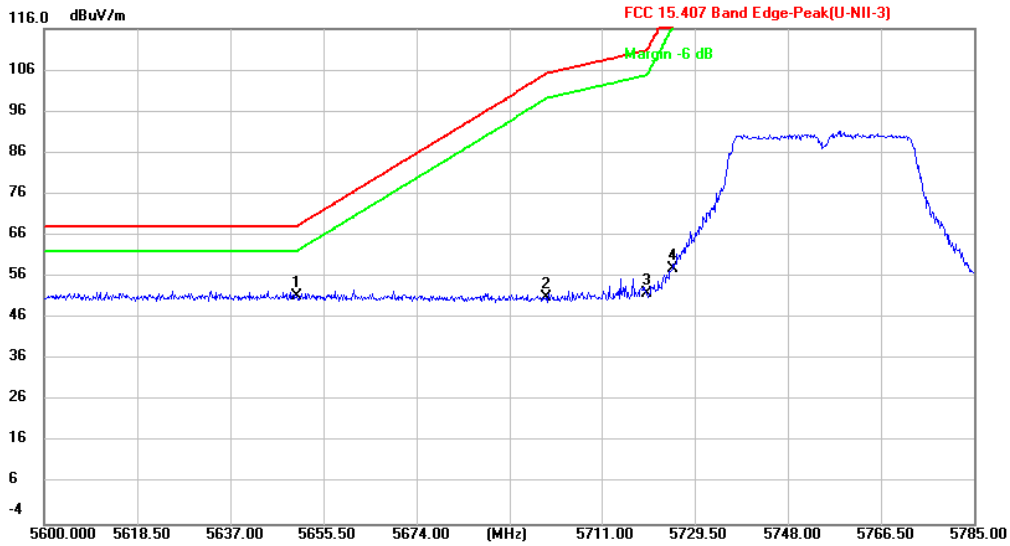
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	46.74	2.30	49.04	74.00	-24.96	peak	
2		5350.000	37.43	2.30	39.73	54.00	-14.27	AVG	
3		5460.000	47.81	2.24	50.05	74.00	-23.95	peak	
4	*	5460.000	37.56	2.24	39.80	54.00	-14.20	AVG	

Mode4 / Polarization: Horizontal / CH: L



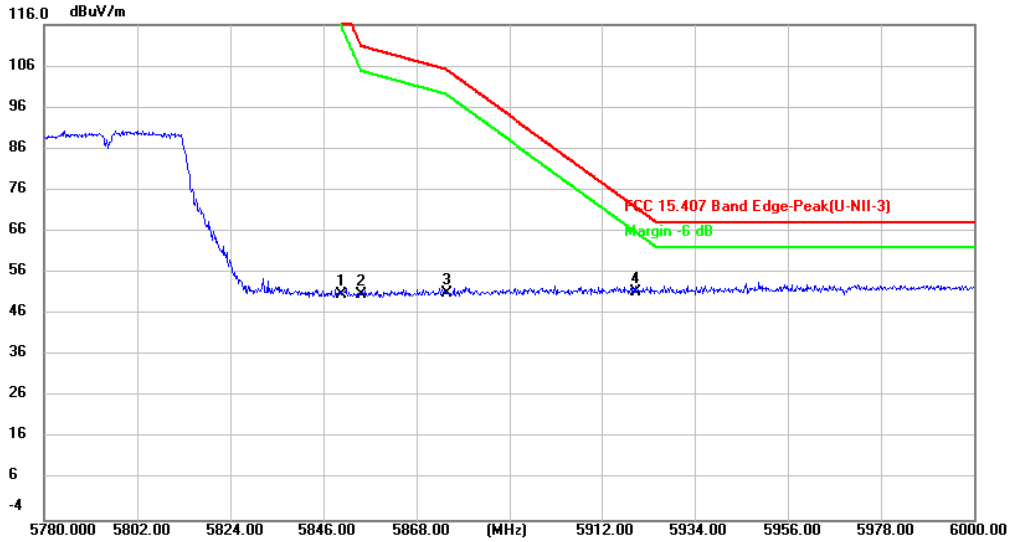
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	49.83	2.79	52.62	68.20	-15.58	peak	
2		5700.000	53.58	2.86	56.44	105.20	-48.76	peak	
3		5720.000	56.24	2.77	59.01	110.80	-51.79	peak	
4		5725.000	64.10	2.75	66.85	122.20	-55.35	peak	

Mode4 / Polarization: Vertical / CH: L



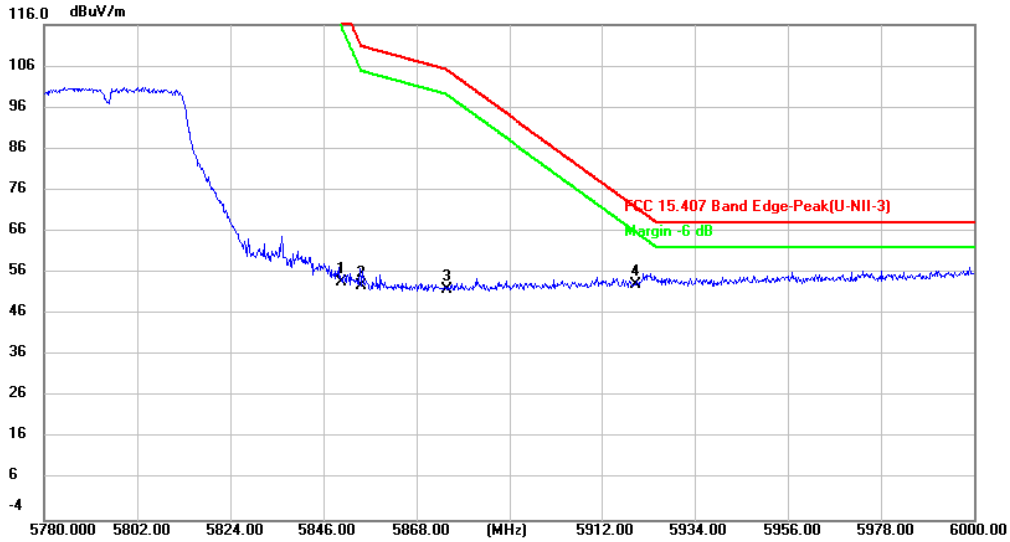
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	48.55	2.79	51.34	68.20	-16.86	peak	
2		5700.000	48.26	2.86	51.12	105.20	-54.08	peak	
3		5720.000	49.24	2.77	52.01	110.80	-58.79	peak	
4		5725.000	55.17	2.75	57.92	122.20	-64.28	peak	

Mode4 / Polarization: Horizontal / CH: H



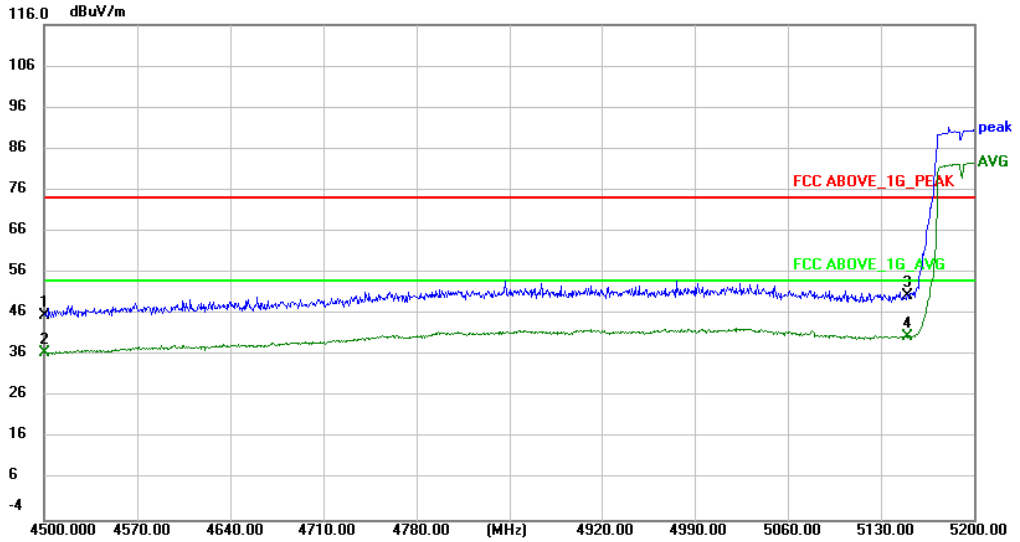
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	47.99	2.67	50.66	122.20	-71.54	peak	
2		5855.000	48.16	2.72	50.88	110.80	-59.92	peak	
3		5875.000	48.02	2.91	50.93	105.20	-54.27	peak	
4	*	5920.000	48.27	3.22	51.49	71.90	-20.41	peak	

Mode4 / Polarization: Vertical / CH: H



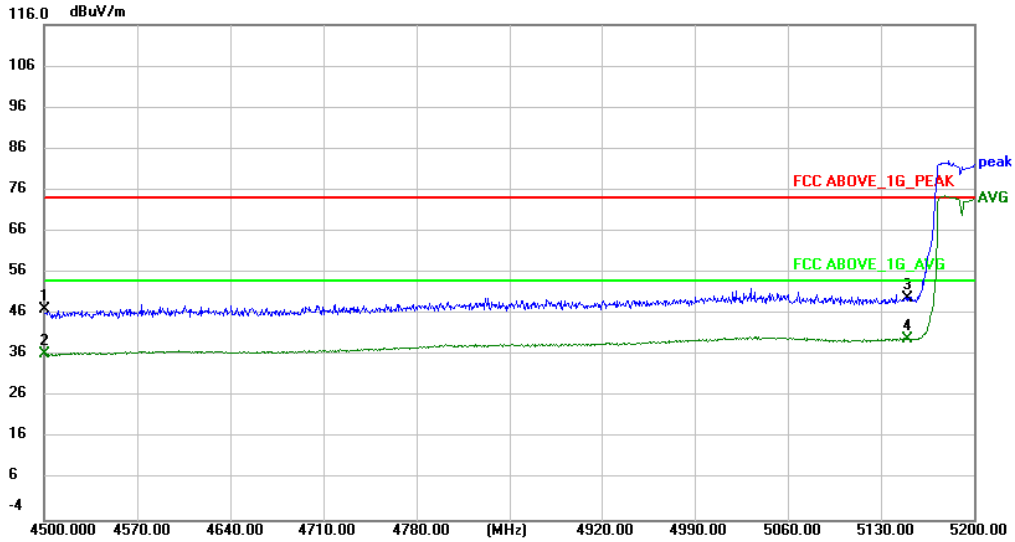
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	51.23	2.67	53.90	122.20	-68.30	peak	
2		5855.000	50.11	2.72	52.83	110.80	-57.97	peak	
3		5875.000	49.07	2.91	51.98	105.20	-53.22	peak	
4	*	5920.000	50.00	3.22	53.22	71.90	-18.68	peak	

Mode5 / Polarization: Horizontal / CH: L



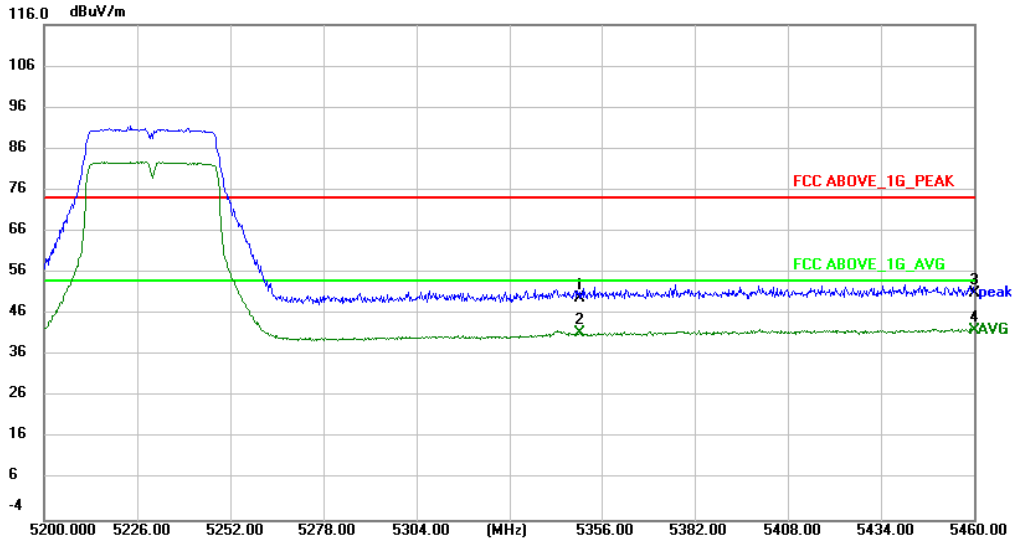
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.63	-1.08	45.55	74.00	-28.45	peak	
2		4500.000	37.67	-1.08	36.59	54.00	-17.41	AVG	
3		5150.000	48.75	1.85	50.60	74.00	-23.40	peak	
4	*	5150.000	38.67	1.85	40.52	54.00	-13.48	AVG	

Mode5 / Polarization: Vertical / CH: L



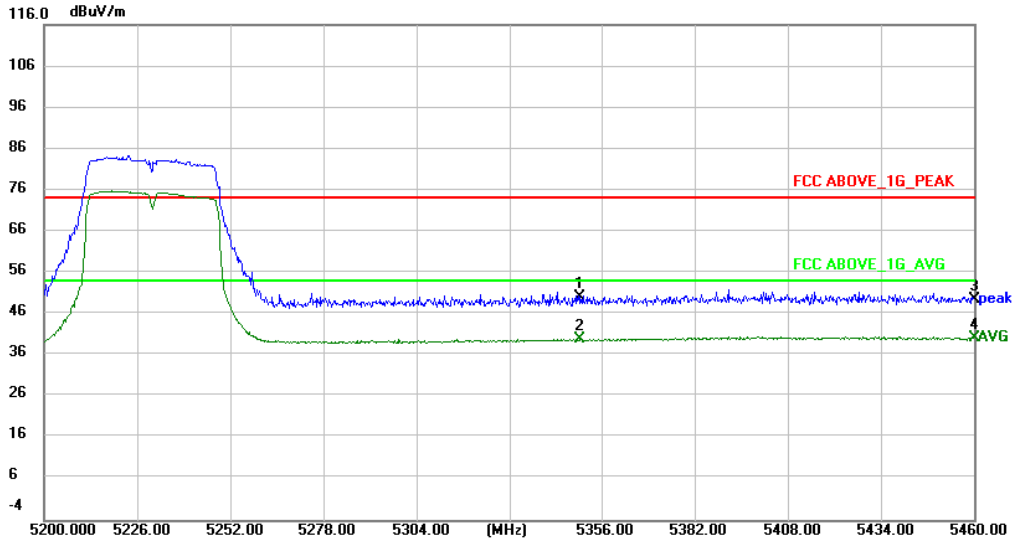
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	48.19	-1.08	47.11	74.00	-26.89	peak	
2		4500.000	37.44	-1.08	36.36	54.00	-17.64	AVG	
3		5150.000	47.92	1.85	49.77	74.00	-24.23	peak	
4	*	5150.000	38.12	1.85	39.97	54.00	-14.03	AVG	

Mode5 / Polarization: Horizontal / CH: H



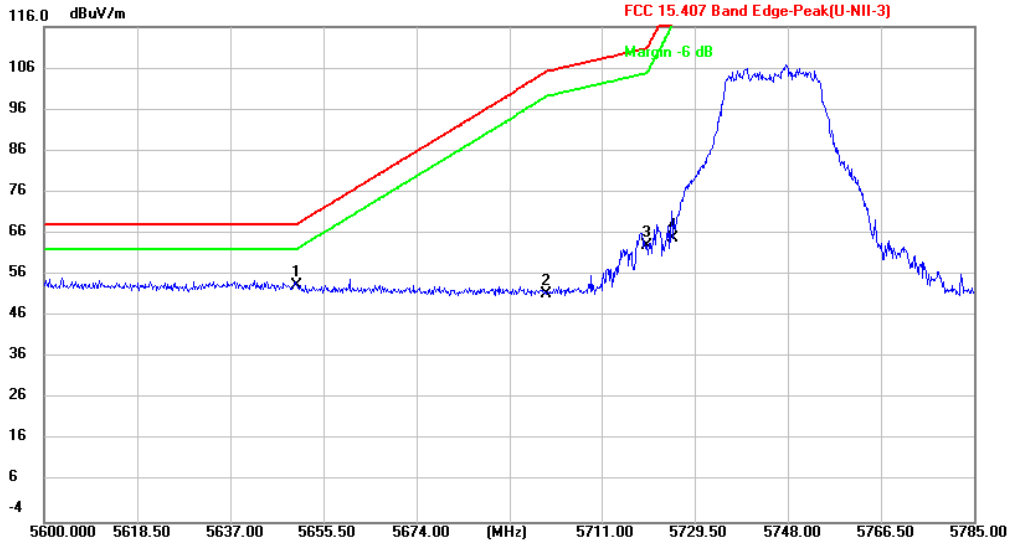
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	47.46	2.30	49.76	74.00	-24.24	peak	
2		5350.000	39.07	2.30	41.37	54.00	-12.63	AVG	
3		5460.000	48.83	2.24	51.07	74.00	-22.93	peak	
4	*	5460.000	39.93	2.24	42.17	54.00	-11.83	AVG	

Mode5 / Polarization: Vertical / CH: H



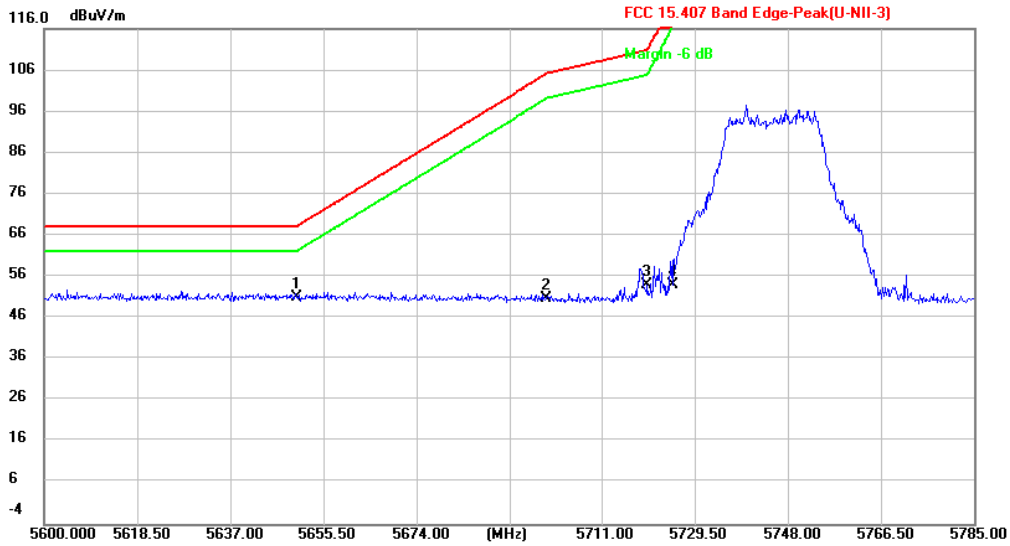
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	47.76	2.30	50.06	74.00	-23.94	peak	
2		5350.000	37.65	2.30	39.95	54.00	-14.05	AVG	
3		5460.000	47.18	2.24	49.42	74.00	-24.58	peak	
4	*	5460.000	37.92	2.24	40.16	54.00	-13.84	AVG	

Mode5 / Polarization: Horizontal / CH: L



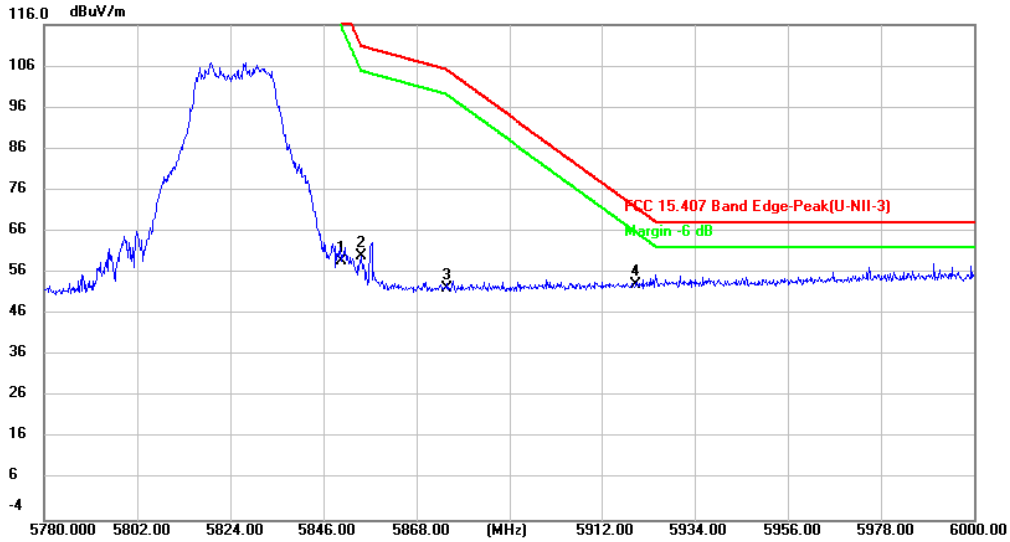
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	50.61	2.79	53.40	68.20	-14.80	peak	
2		5700.000	48.52	2.86	51.38	105.20	-53.82	peak	
3		5720.000	60.40	2.77	63.17	110.80	-47.63	peak	
4		5725.000	61.96	2.75	64.71	122.20	-57.49	peak	

Mode5 / Polarization: Vertical / CH: L



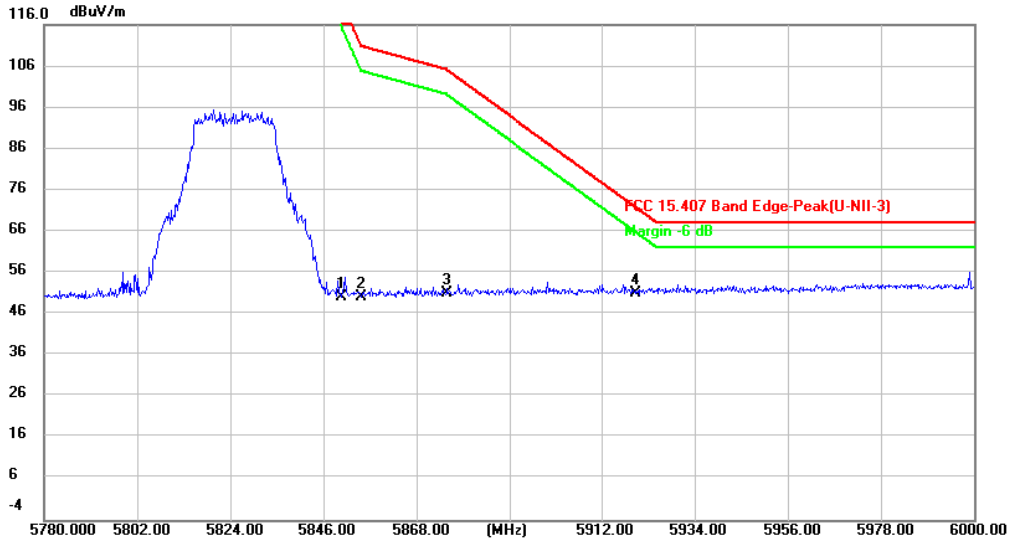
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	48.23	2.79	51.02	68.20	-17.18	peak	
2		5700.000	47.81	2.86	50.67	105.20	-54.53	peak	
3		5720.000	51.28	2.77	54.05	110.80	-56.75	peak	
4		5725.000	51.38	2.75	54.13	122.20	-68.07	peak	

Mode5 / Polarization: Horizontal / CH: H



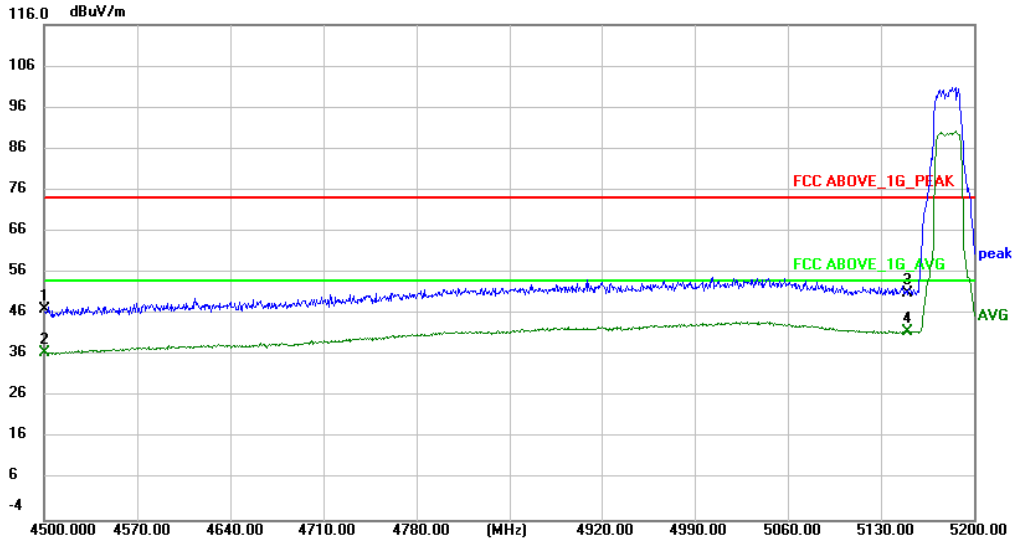
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	56.14	2.67	58.81	122.20	-63.39	peak	
2		5855.000	57.23	2.72	59.95	110.80	-50.85	peak	
3		5875.000	49.39	2.91	52.30	105.20	-52.90	peak	
4	*	5920.000	49.89	3.22	53.11	71.90	-18.79	peak	

Mode5 / Polarization: Vertical / CH: H



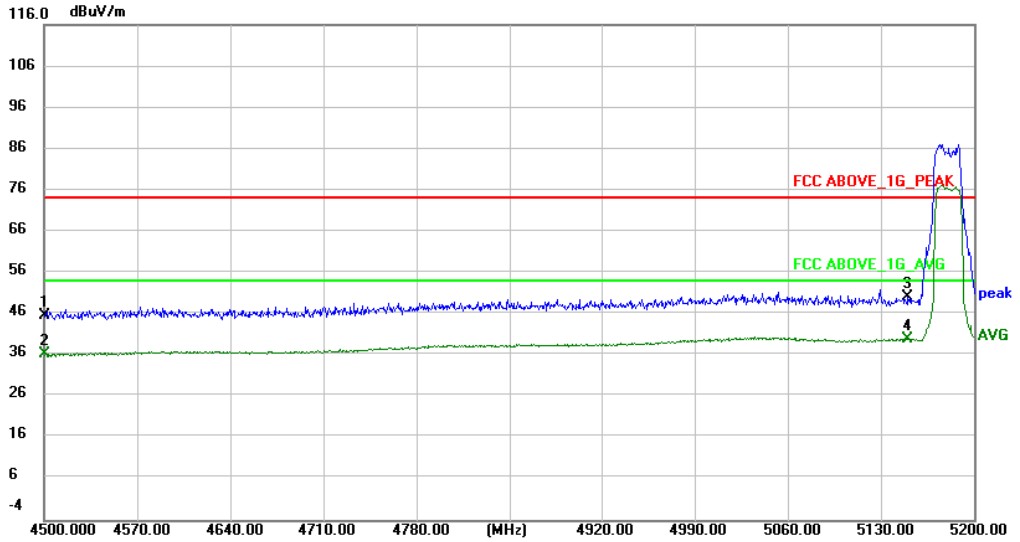
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	47.44	2.67	50.11	122.20	-72.09	peak	
2		5855.000	47.57	2.72	50.29	110.80	-60.51	peak	
3		5875.000	48.25	2.91	51.16	105.20	-54.04	peak	
4	*	5920.000	47.93	3.22	51.15	71.90	-20.75	peak	

Mode6 / Polarization: Horizontal / CH: L



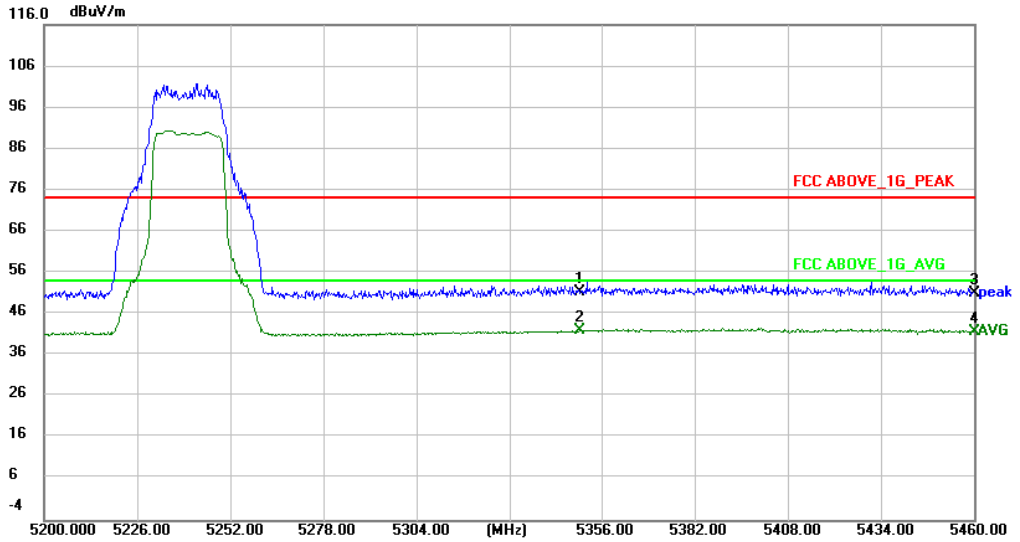
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	48.16	-1.08	47.08	74.00	-26.92	peak	
2		4500.000	37.76	-1.08	36.68	54.00	-17.32	AVG	
3		5150.000	49.10	1.85	50.95	74.00	-23.05	peak	
4	*	5150.000	39.95	1.85	41.80	54.00	-12.20	AVG	

Mode6 / Polarization: Vertical / CH: L



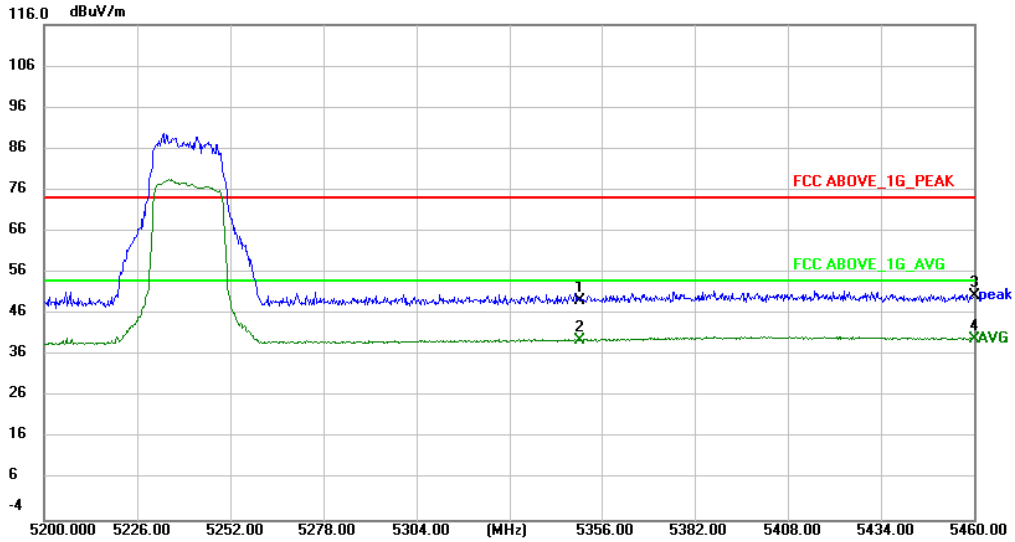
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.81	-1.08	45.73	74.00	-28.27	peak	
2		4500.000	37.40	-1.08	36.32	54.00	-17.68	AVG	
3		5150.000	48.16	1.85	50.01	74.00	-23.99	peak	
4	*	5150.000	37.97	1.85	39.82	54.00	-14.18	AVG	

Mode6 / Polarization: Horizontal / CH: H



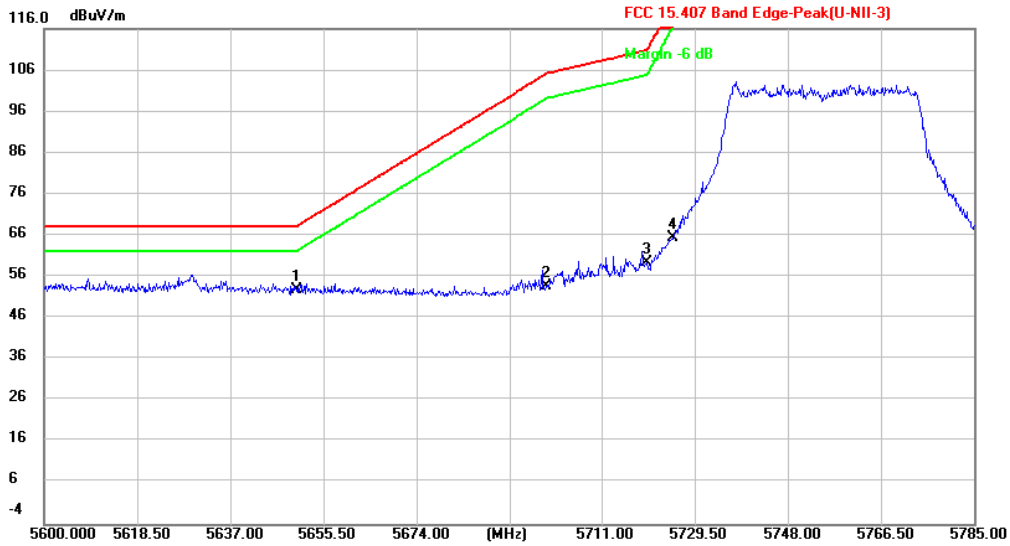
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	49.01	2.30	51.31	74.00	-22.69	peak	
2	*	5350.000	39.73	2.30	42.03	54.00	-11.97	AVG	
3		5460.000	48.88	2.24	51.12	74.00	-22.88	peak	
4		5460.000	39.57	2.24	41.81	54.00	-12.19	AVG	

Mode6 / Polarization: Vertical / CH: H



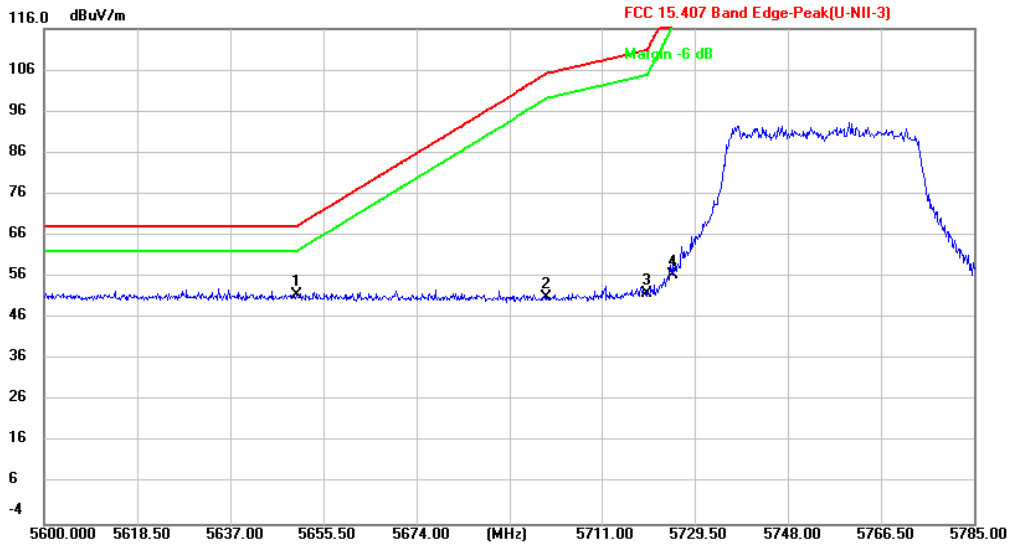
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	46.92	2.30	49.22	74.00	-24.78	peak	
2		5350.000	37.45	2.30	39.75	54.00	-14.25	AVG	
3		5460.000	48.22	2.24	50.46	74.00	-23.54	peak	
4	*	5460.000	37.71	2.24	39.95	54.00	-14.05	AVG	

Mode6 / Polarization: Horizontal / CH: L



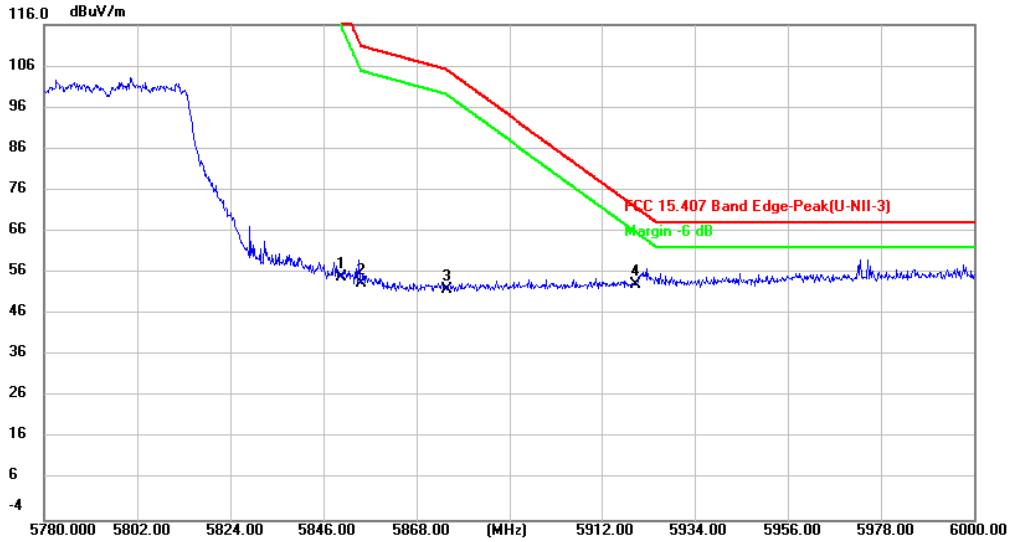
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	50.09	2.79	52.88	68.20	-15.32	peak	
2		5700.000	50.91	2.86	53.77	105.20	-51.43	peak	
3		5720.000	56.82	2.77	59.59	110.80	-51.21	peak	
4		5725.000	62.81	2.75	65.56	122.20	-56.64	peak	

Mode6 / Polarization: Vertical / CH: L



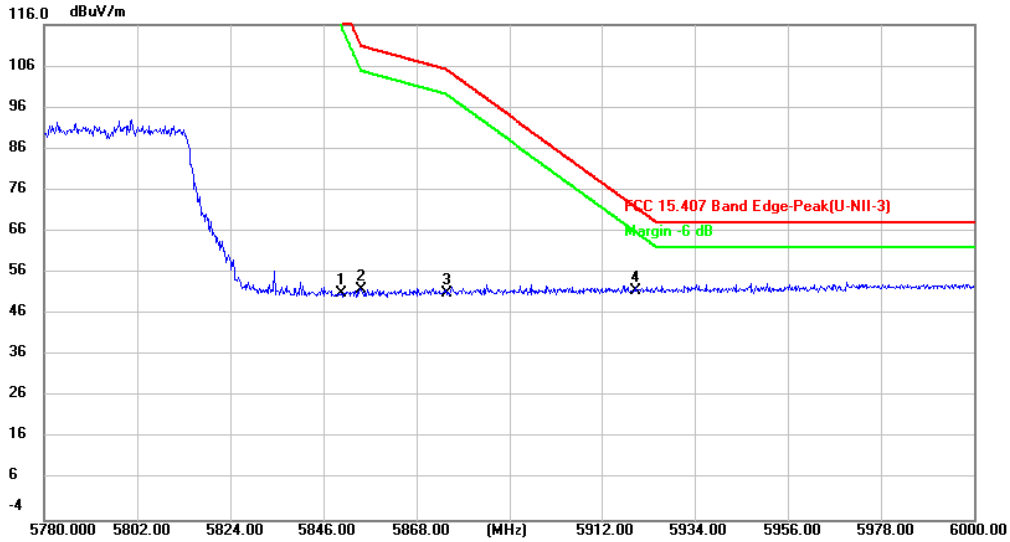
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	48.93	2.79	51.72	68.20	-16.48	peak	
2		5700.000	48.32	2.86	51.18	105.20	-54.02	peak	
3		5720.000	49.30	2.77	52.07	110.80	-58.73	peak	
4		5725.000	53.62	2.75	56.37	122.20	-65.83	peak	

Mode6 / Polarization: Horizontal / CH: H



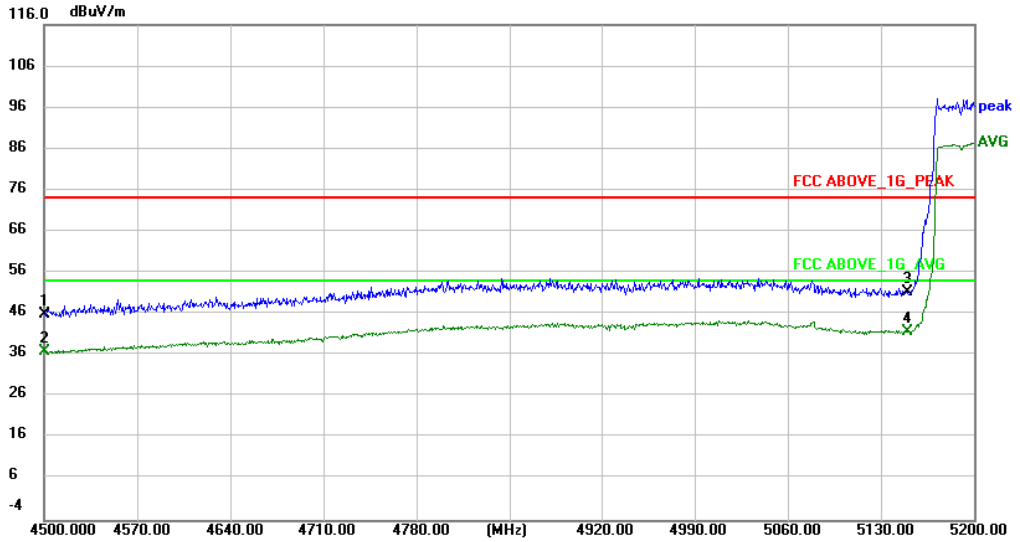
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	52.41	2.67	55.08	122.20	-67.12	peak	
2		5855.000	50.59	2.72	53.31	110.80	-57.49	peak	
3		5875.000	49.15	2.91	52.06	105.20	-53.14	peak	
4	*	5920.000	50.02	3.22	53.24	71.90	-18.66	peak	

Mode6 / Polarization: Vertical / CH: H



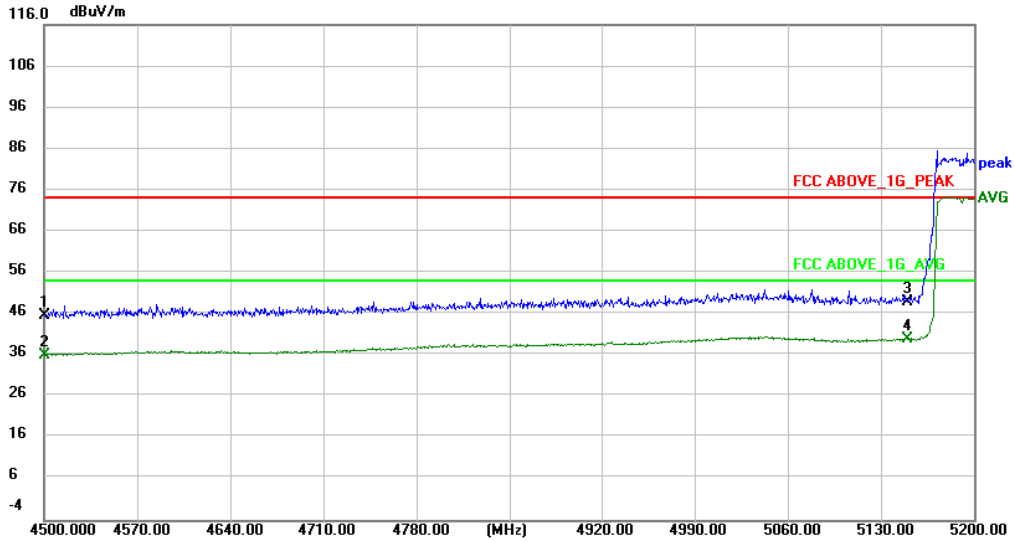
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	48.52	2.67	51.19	122.20	-71.01	peak	
2		5855.000	49.23	2.72	51.95	110.80	-58.85	peak	
3		5875.000	48.25	2.91	51.16	105.20	-54.04	peak	
4	*	5920.000	48.30	3.22	51.52	71.90	-20.38	peak	

Mode7 / Polarization: Horizontal / CH: L



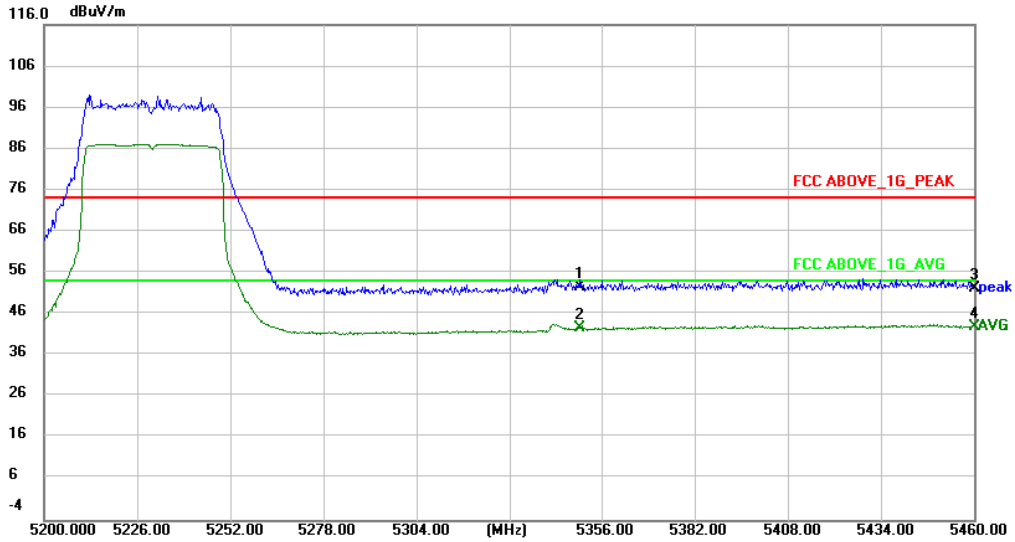
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.95	-1.08	45.87	74.00	-28.13	peak	
2		4500.000	37.90	-1.08	36.82	54.00	-17.18	AVG	
3		5150.000	49.39	1.85	51.24	74.00	-22.76	peak	
4	*	5150.000	40.02	1.85	41.87	54.00	-12.13	AVG	

Mode7 / Polarization: Vertical / CH: L



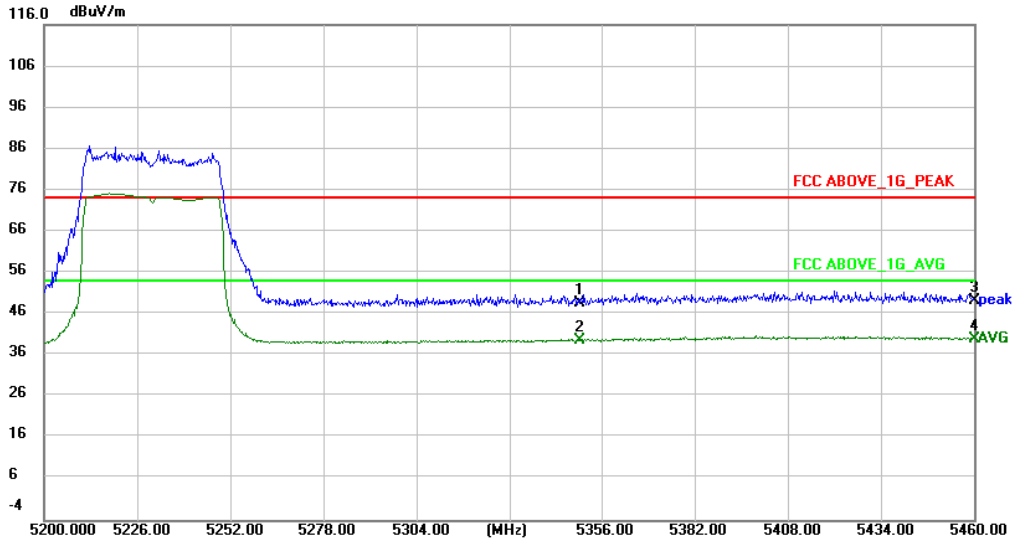
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4500.000	46.74	-1.08	45.66	74.00	-28.34	peak	
2		4500.000	37.23	-1.08	36.15	54.00	-17.85	AVG	
3		5150.000	47.22	1.85	49.07	74.00	-24.93	peak	
4	*	5150.000	38.25	1.85	40.10	54.00	-13.90	AVG	

Mode7 / Polarization: Horizontal / CH: H



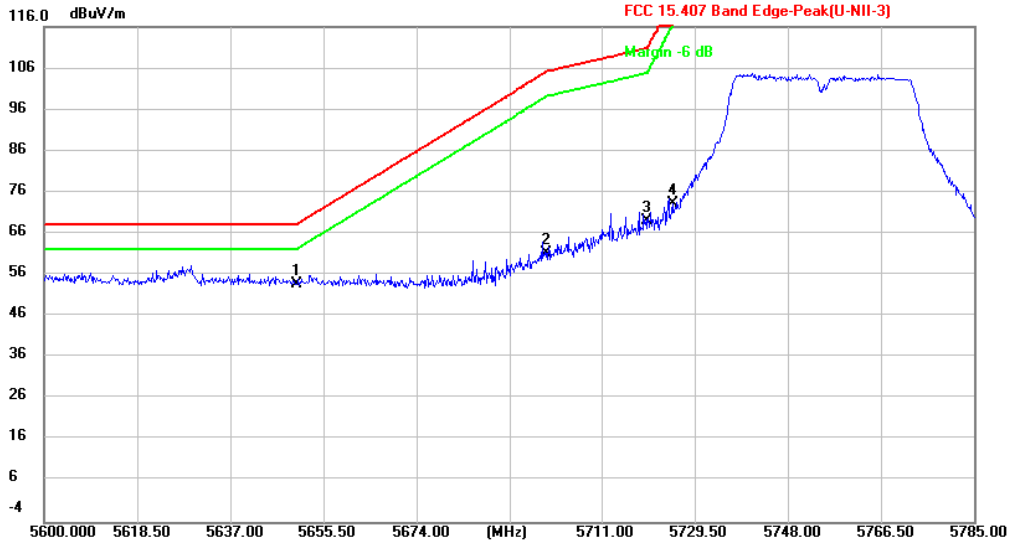
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	50.28	2.30	52.58	74.00	-21.42	peak	
2		5350.000	40.27	2.30	42.57	54.00	-11.43	AVG	
3		5460.000	49.98	2.24	52.22	74.00	-21.78	peak	
4	*	5460.000	40.76	2.24	43.00	54.00	-11.00	AVG	

Mode7 / Polarization: Vertical / CH: H



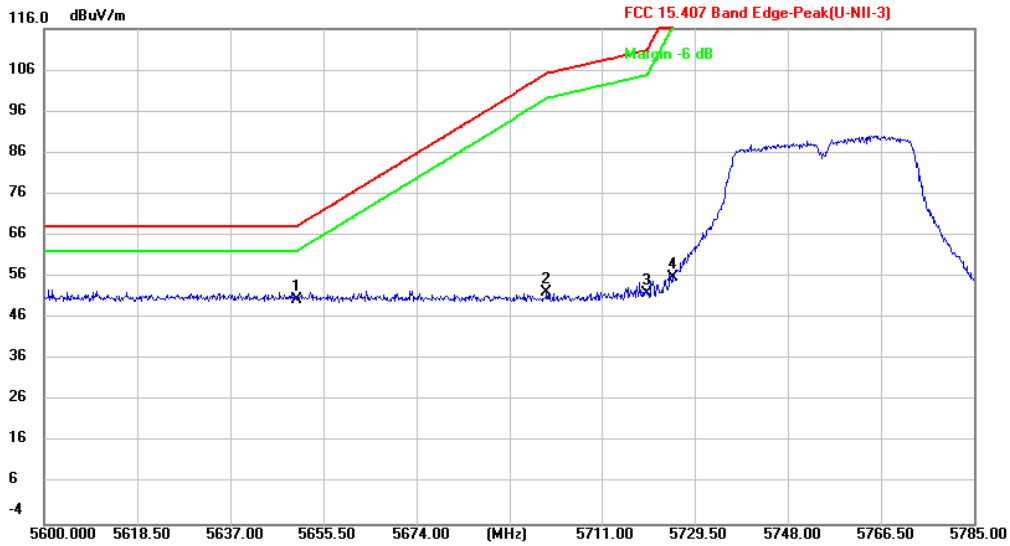
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	46.21	2.30	48.51	74.00	-25.49	peak	
2		5350.000	37.43	2.30	39.73	54.00	-14.27	AVG	
3		5460.000	46.95	2.24	49.19	74.00	-24.81	peak	
4	*	5460.000	37.81	2.24	40.05	54.00	-13.95	AVG	

Mode7 / Polarization: Horizontal / CH: L



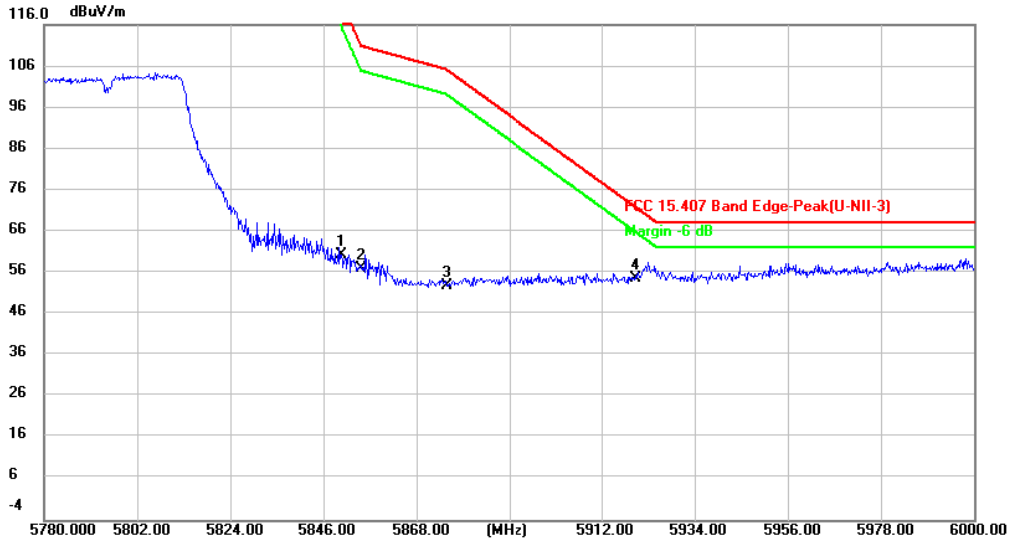
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	51.09	2.79	53.88	68.20	-14.32	peak	
2		5700.000	58.31	2.86	61.17	105.20	-44.03	peak	
3		5720.000	66.42	2.77	69.19	110.80	-41.61	peak	
4		5725.000	70.49	2.75	73.24	122.20	-48.96	peak	

Mode7 / Polarization: Vertical / CH: L



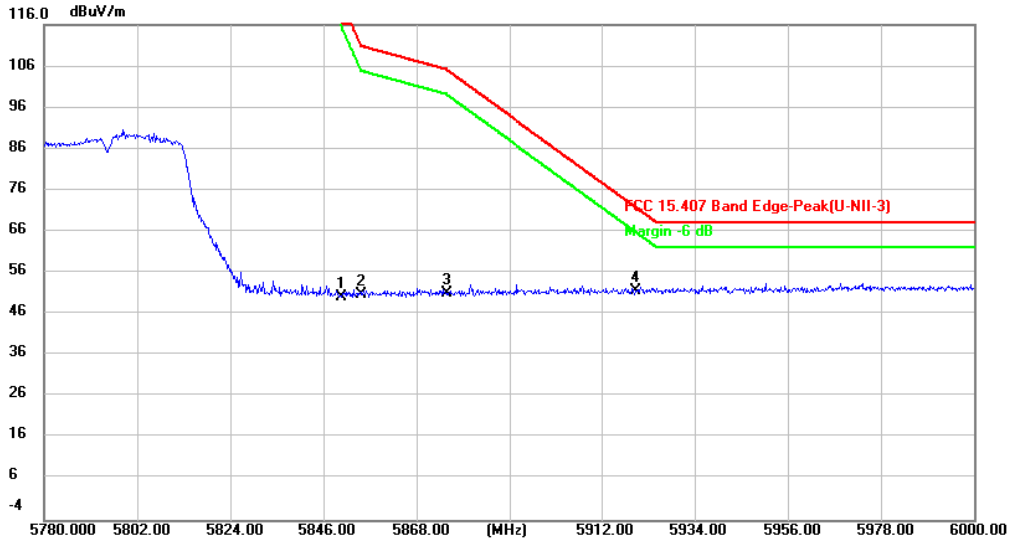
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	5650.000	47.74	2.79	50.53	68.20	-17.67	peak	
2		5700.000	49.30	2.86	52.16	105.20	-53.04	peak	
3		5720.000	49.16	2.77	51.93	110.80	-58.87	peak	
4		5725.000	53.06	2.75	55.81	122.20	-66.39	peak	

Mode7 / Polarization: Horizontal / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	57.77	2.67	60.44	122.20	-61.76	peak	
2		5855.000	54.45	2.72	57.17	110.80	-53.63	peak	
3		5875.000	50.02	2.91	52.93	105.20	-52.27	peak	
4	*	5920.000	51.56	3.22	54.78	71.90	-17.12	peak	

Mode7 / Polarization: Vertical / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5850.000	47.52	2.67	50.19	122.20	-72.01	peak	
2		5855.000	48.00	2.72	50.72	110.80	-60.08	peak	
3		5875.000	48.26	2.91	51.17	105.20	-54.03	peak	
4	*	5920.000	48.34	3.22	51.56	71.90	-20.34	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>
** 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.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10-2013, section 12.7.4, 12.7.5</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.</td></tr>
</table>

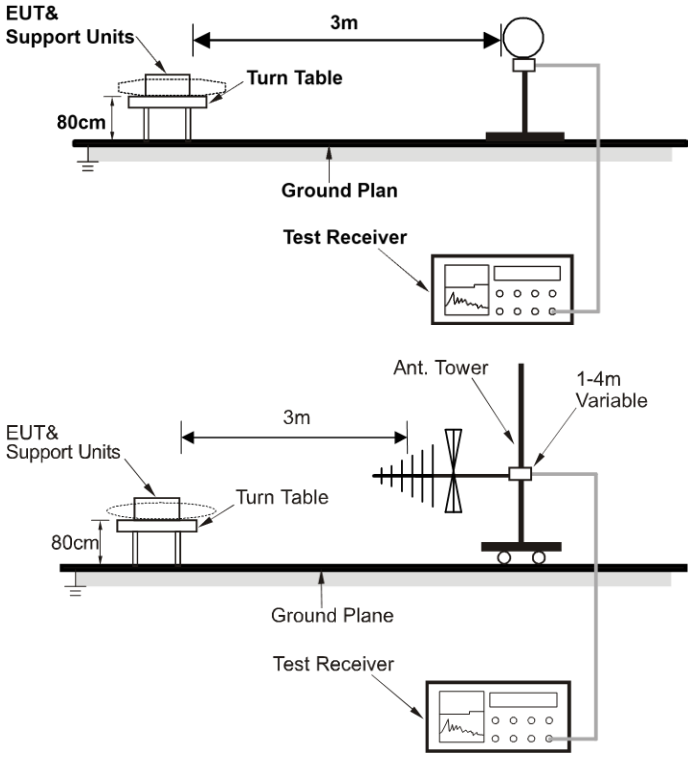
	Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 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:

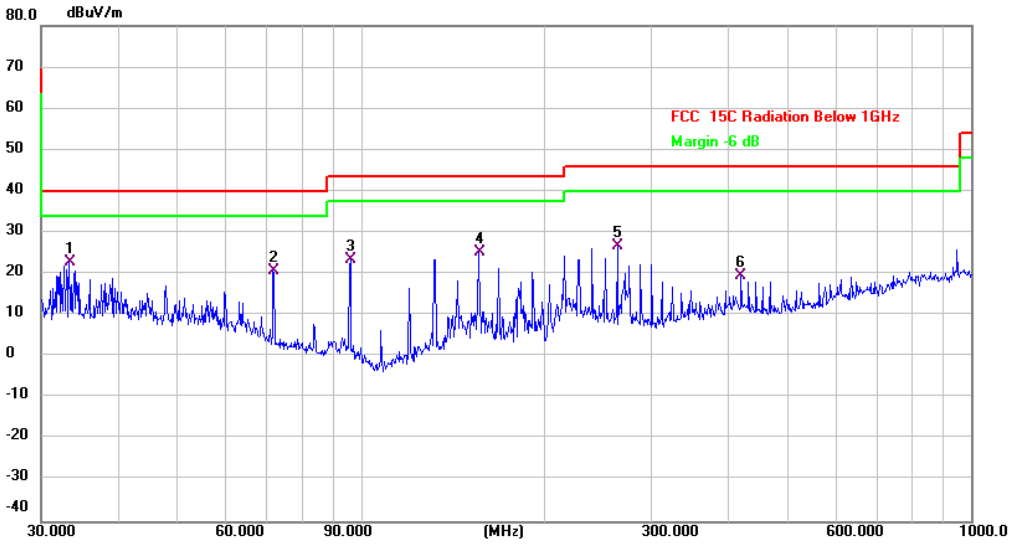
Temperature:	25 °C	Humidity:	59 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report				

6.7.2 Test Setup Diagram:



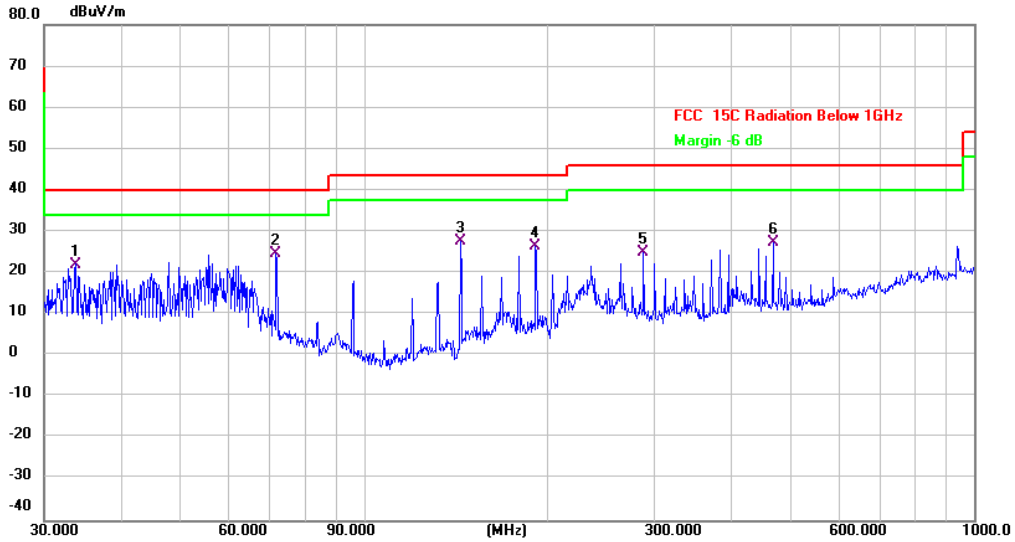
6.7.3 Test Data:

Mode1 / Polarization: Horizontal / TX U-NII-1-802.11a / CH: H



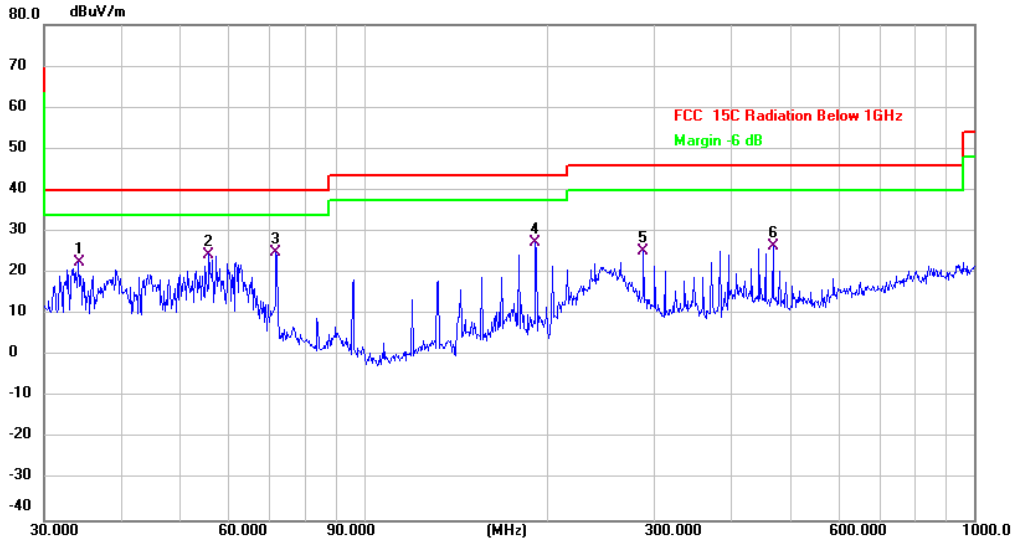
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	33.3279	37.23	-14.28	22.95	40.00	-17.05	QP	
2		71.8320	42.43	-21.68	20.75	40.00	-19.25	QP	
3		96.0986	48.02	-24.66	23.36	43.50	-20.14	QP	
4		155.9101	46.04	-20.88	25.16	43.50	-18.34	QP	
5		263.8190	43.21	-16.33	26.88	46.00	-19.12	QP	
6		420.5803	32.61	-13.17	19.44	46.00	-26.56	QP	

Mode1 / Polarization: Vertical / TX U-NII-1-802.11a / CH: H



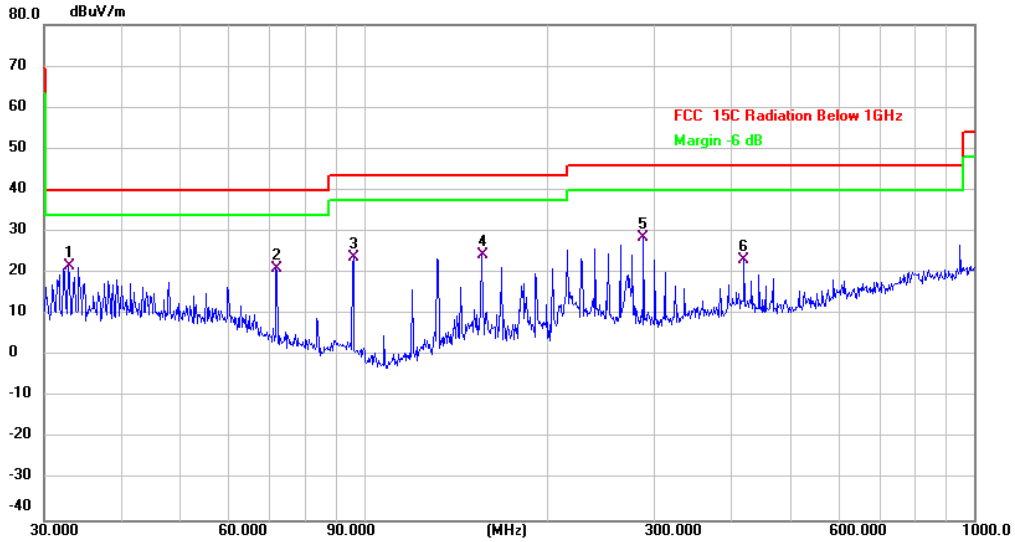
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		33.7986	47.10	-25.00	22.10	40.00	-17.90	QP	
2	*	71.8320	43.71	-18.92	24.79	40.00	-15.21	QP	
3		143.8295	45.36	-17.62	27.74	43.50	-15.76	QP	
4		191.7450	45.78	-19.21	26.57	43.50	-16.93	QP	
5		287.9904	41.07	-16.20	24.87	46.00	-21.13	QP	
6		468.8762	41.29	-13.88	27.41	46.00	-18.59	QP	

Mode1 / Polarization: Horizontal / TX U-NII-3-802.11a / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		34.1561	47.44	-24.94	22.50	40.00	-17.50	QP	
2		55.8047	46.26	-21.76	24.50	40.00	-15.50	QP	
3	*	71.8320	43.87	-18.92	24.95	40.00	-15.05	QP	
4		191.7450	46.44	-19.21	27.23	43.50	-16.27	QP	
5		287.9904	41.49	-16.20	25.29	46.00	-20.71	QP	
6		468.8762	40.35	-13.88	26.47	46.00	-19.53	QP	

Mode1 / Polarization: Vertical / TX U-NII-3-802.11a / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		32.8637	35.86	-14.28	21.58	40.00	-18.42	QP	
2		71.8320	42.65	-21.68	20.97	40.00	-19.03	QP	
3		96.0986	48.37	-24.66	23.71	43.50	-19.79	QP	
4		155.9101	45.36	-20.88	24.48	43.50	-19.02	QP	
5	*	287.9904	44.50	-15.96	28.54	46.00	-17.46	QP	
6		420.5803	36.23	-13.17	23.06	46.00	-22.94	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

** 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.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Method: ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7

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.

6.8.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	58 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7				
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				

6.8.2 Test Data:

Mode1 / Polarization: Horizontal / TX U-NII-1-802.11a / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10360.000	44.24	10.75	54.99	74.00	-19.01	peak
2		10360.000	33.61	10.75	44.36	54.00	-9.64	AVG
3		15540.000	47.10	13.16	60.26	74.00	-13.74	peak
4	*	15540.000	36.98	13.16	50.14	54.00	-3.86	AVG

Mode1 / Polarization: Vertical / TX U-NII-1-802.11a / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10360.000	45.04	10.75	55.79	74.00	-18.21	peak
2		10360.000	34.49	10.75	45.24	54.00	-8.76	AVG
3		15540.000	47.07	13.16	60.23	74.00	-13.77	peak
4	*	15540.000	37.16	13.16	50.32	54.00	-3.68	AVG

Mode1 / Polarization: Horizontal / TX U-NII-1-802.11a / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10400.000	44.36	10.85	55.21	74.00	-18.79	peak
2		10400.000	34.62	10.85	45.47	54.00	-8.53	AVG
3		15600.000	46.36	12.71	59.07	74.00	-14.93	peak
4	*	15600.000	36.61	12.71	49.32	54.00	-4.68	AVG

Mode1 / Polarization: Vertical / TX U-NII-1-802.11a / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10400.000	44.55	10.85	55.40	74.00	-18.60	peak
2		10400.000	34.51	10.85	45.36	54.00	-8.64	AVG
3		15600.000	46.62	12.71	59.33	74.00	-14.67	peak
4	*	15600.000	36.96	12.71	49.67	54.00	-4.33	AVG

Mode1 / Polarization: Horizontal / TX U-NII-1-802.11a / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10480.000	44.96	10.65	55.61	74.00	-18.39	peak
2		10480.000	34.61	10.65	45.26	54.00	-8.74	AVG
3		15720.000	47.05	12.68	59.73	74.00	-14.27	peak
4	*	15720.000	36.49	12.68	49.17	54.00	-4.83	AVG

Mode1 / Polarization: Vertical / TX U-NII-1-802.11a / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		10480.000	46.14	10.65	56.79	74.00	-17.21	peak
2		10480.000	35.67	10.65	46.32	54.00	-7.68	AVG
3		15720.000	47.46	12.68	60.14	74.00	-13.86	peak
4	*	15720.000	37.79	12.68	50.47	54.00	-3.53	AVG

Mode1 / Polarization: Horizontal / TX U-NII-3-802.11a / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11490.000	45.50	12.51	58.01	74.00	-15.99	peak
2		11490.000	35.85	12.51	48.36	54.00	-5.64	AVG
3		17235.000	45.61	14.54	60.15	74.00	-13.85	peak
4	*	17235.000	35.78	14.54	50.32	54.00	-3.68	AVG

Mode1 / Polarization: Vertical / TX U-NII-3-802.11a / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11490.000	45.24	12.51	57.75	74.00	-16.25	peak
2		11490.000	34.75	12.51	47.26	54.00	-6.74	AVG
3		17235.000	46.15	14.54	60.69	74.00	-13.31	peak
4	*	17235.000	35.94	14.54	50.48	54.00	-3.52	AVG

Mode1 / Polarization: Horizontal / TX U-NII-3-802.11a / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11570.000	46.51	12.37	58.88	74.00	-15.12	peak
2		11570.000	35.95	12.37	48.32	54.00	-5.68	AVG
3		17355.000	45.93	14.60	60.53	74.00	-13.47	peak
4	*	17355.000	35.74	14.60	50.34	54.00	-3.66	AVG

Mode1 / Polarization: Vertical / TX U-NII-3-802.11a / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11570.000	45.37	12.37	57.74	74.00	-16.26	peak
2		11570.000	34.95	12.37	47.32	54.00	-6.68	AVG
3		17355.000	45.51	14.60	60.11	74.00	-13.89	peak
4	*	17355.000	35.68	14.60	50.28	54.00	-3.72	AVG

Mode1 / Polarization: Horizontal / TX U-NII-3-802.11a / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11650.000	45.09	12.19	57.28	74.00	-16.72	peak
2		11650.000	35.07	12.19	47.26	54.00	-6.74	AVG
3		17475.000	46.36	14.88	61.24	74.00	-12.76	peak
4	*	17475.000	35.54	14.88	50.42	54.00	-3.58	AVG

Mode1 / Polarization: Vertical / TX U-NII-3-802.11a / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		11650.000	45.43	12.19	57.62	74.00	-16.38	peak
2		11650.000	34.19	12.19	46.38	54.00	-7.62	AVG
3		17475.000	46.16	14.88	61.04	74.00	-12.96	peak
4	*	17475.000	35.26	14.88	50.14	54.00	-3.86	AVG

Photographs of the test setup

Refer to Appendix - Test Setup Photos

Photographs of the EUT

Refer to Appendix - EUT Photos

Appendix

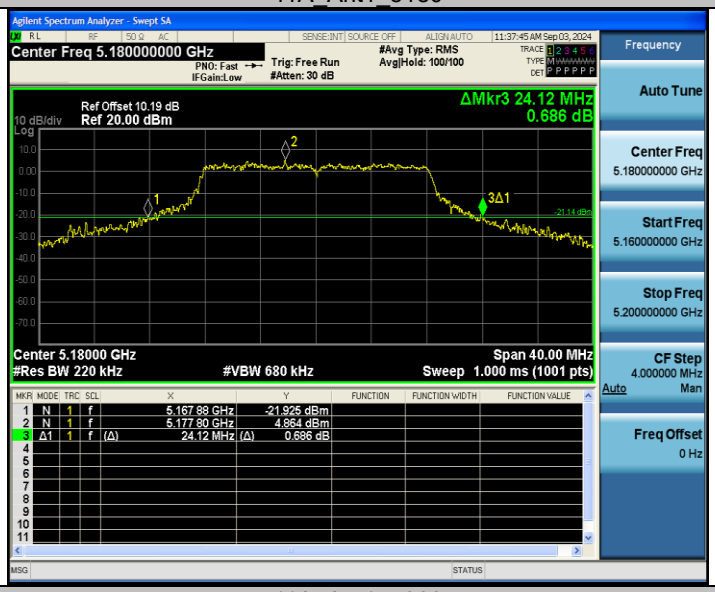
Appendix A1: Emission bandwidth (26dB bandwidth)

Test Result

Test Mode	Antenna	Frequency [MHz]	26db EBW [MHz]
11A	Ant1	5180	24.120
		5200	24.480
		5240	25.480
		5745	24.680
		5785	24.000
		5825	24.000
11N20SISO	Ant1	5180	24.640
		5200	25.480
		5240	25.120
		5745	24.400
		5785	25.680
		5825	24.880
11N40SISO	Ant1	5190	49.120
		5230	46.320
		5755	47.280
		5795	46.880
11AC20SISO	Ant1	5180	26.760
		5200	26.520
		5240	25.200
		5745	26.160
		5785	25.800
		5825	24.840
11AC40SISO	Ant1	5190	48.320
		5230	47.440
		5755	47.520
		5795	46.640
11AX20SISO	Ant1	5180	24.840
		5200	25.400
		5240	26.520
		5745	24.680
		5785	25.080
		5825	24.960
11AX40SISO	Ant1	5190	47.200
		5230	43.360
		5755	45.440
		5795	45.280

Test Graphs

11A_Ant1_5180



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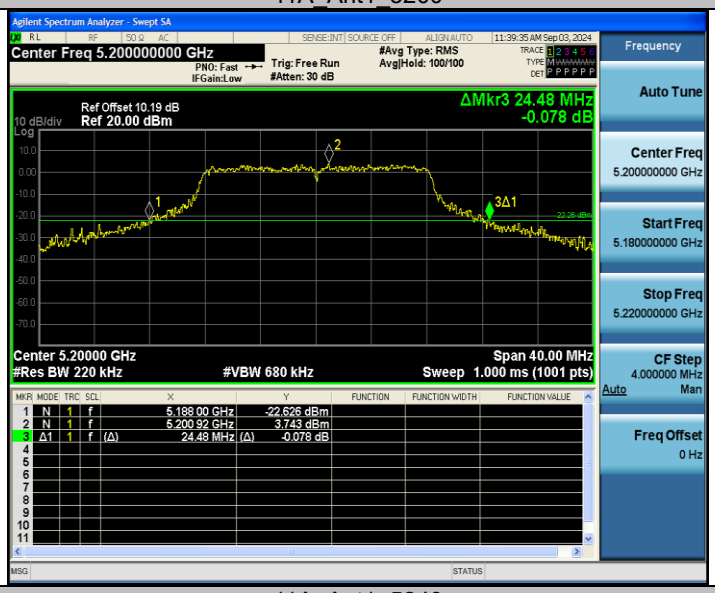

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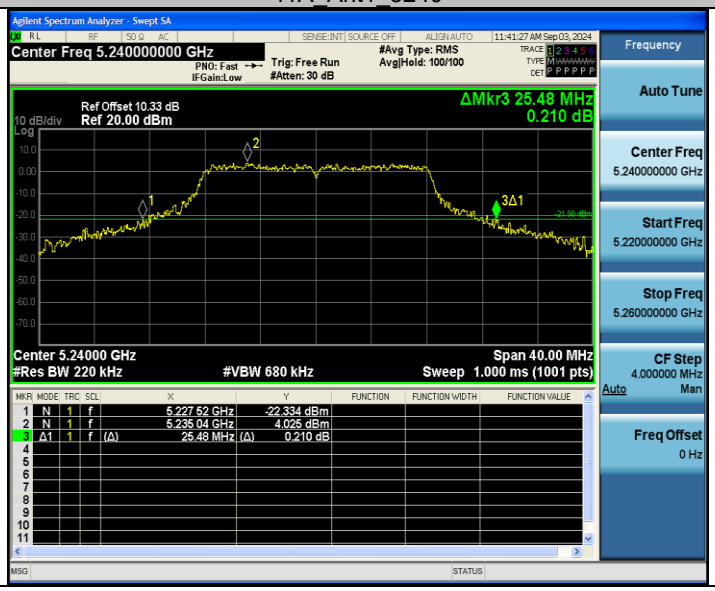

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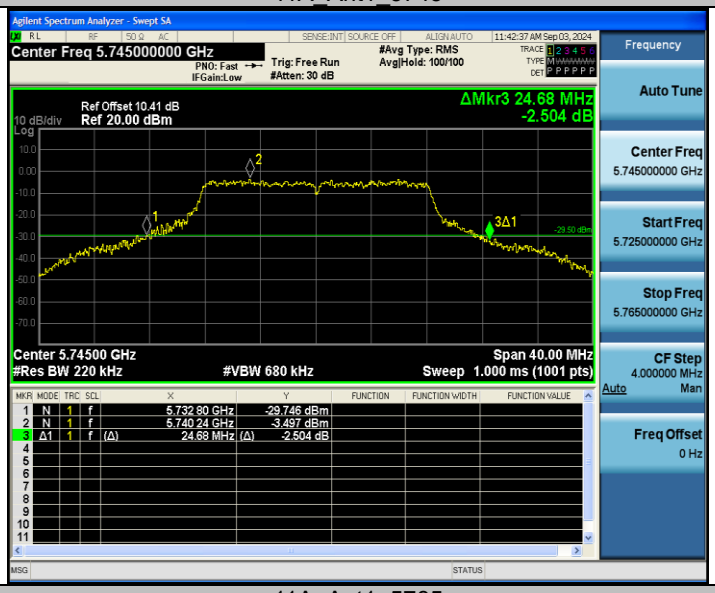

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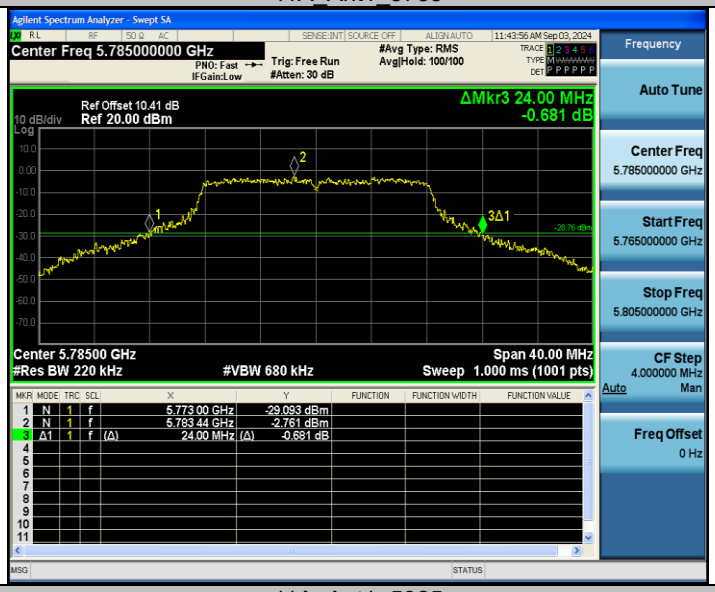

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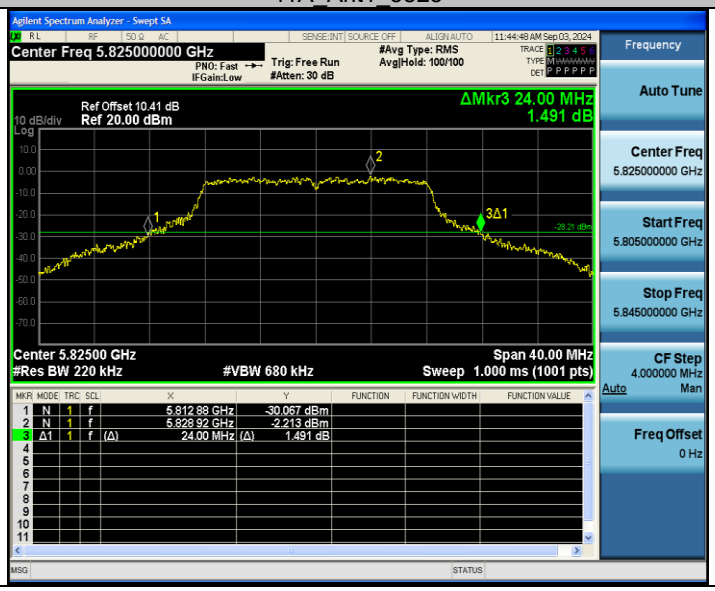

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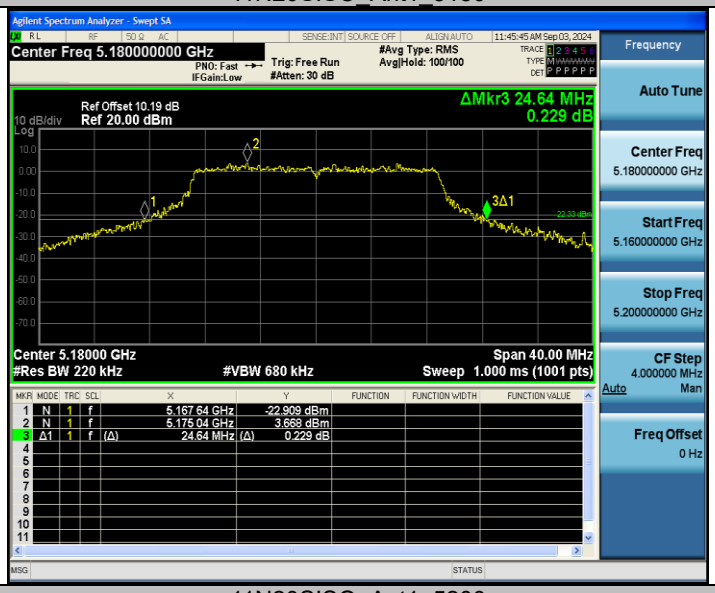

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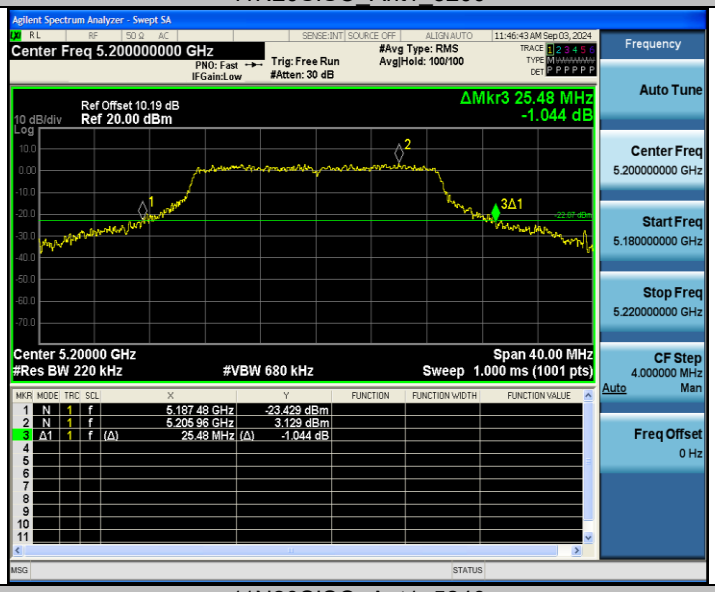

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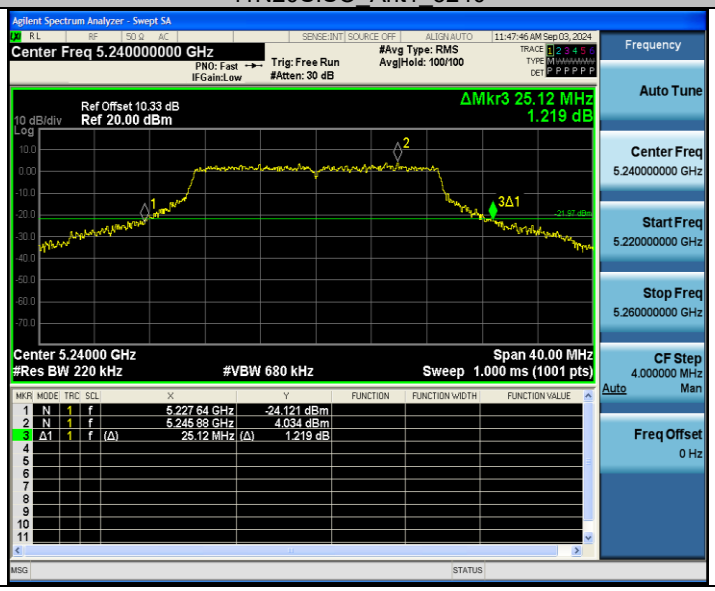

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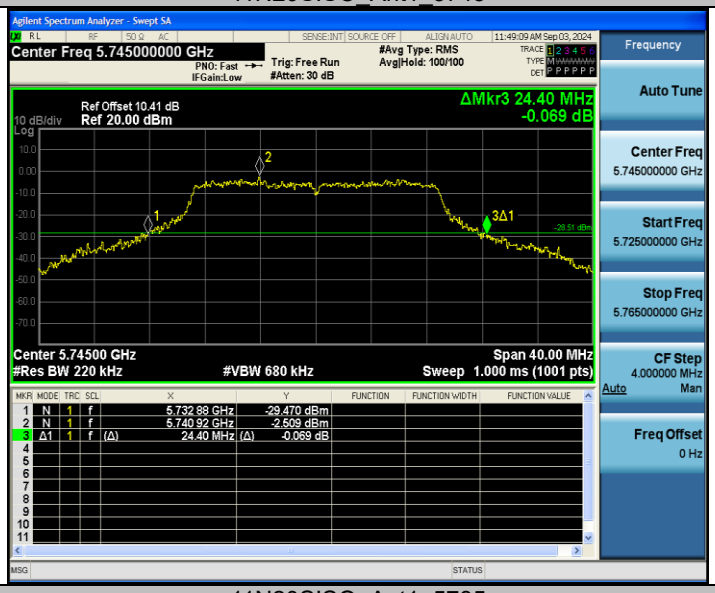

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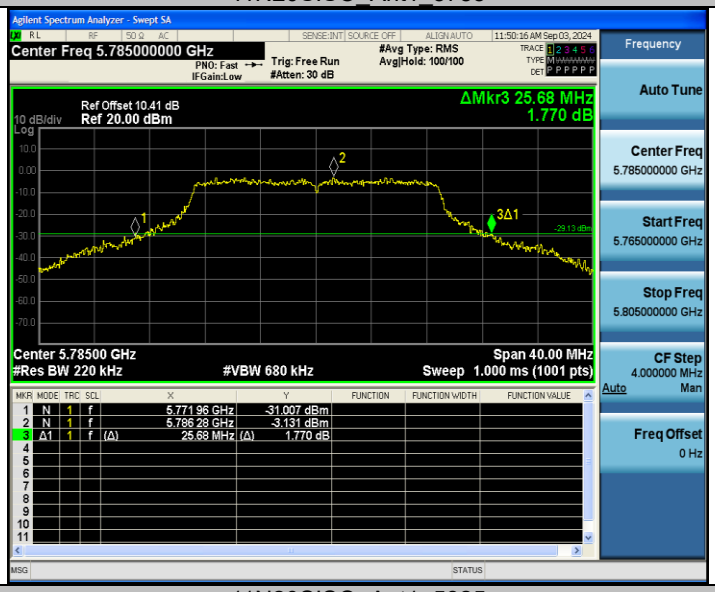

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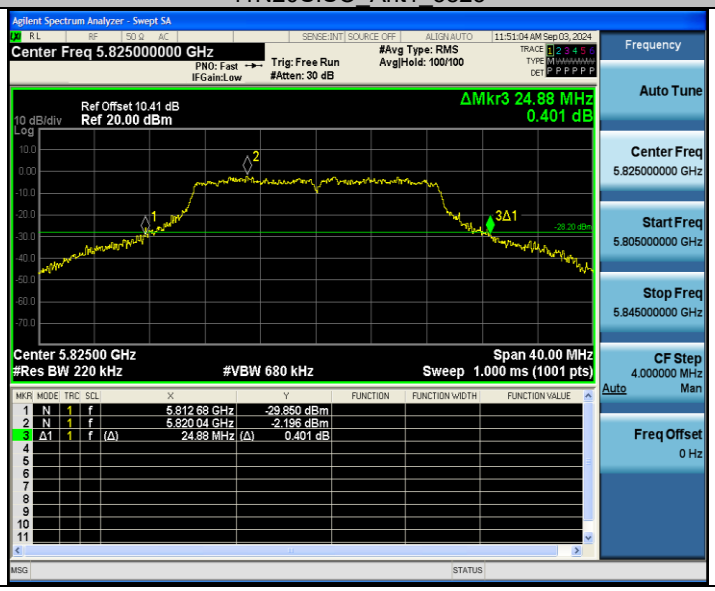

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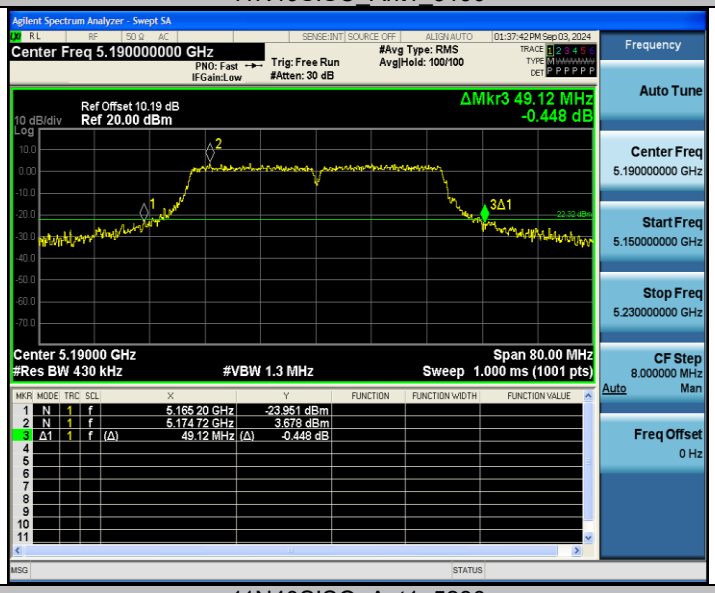

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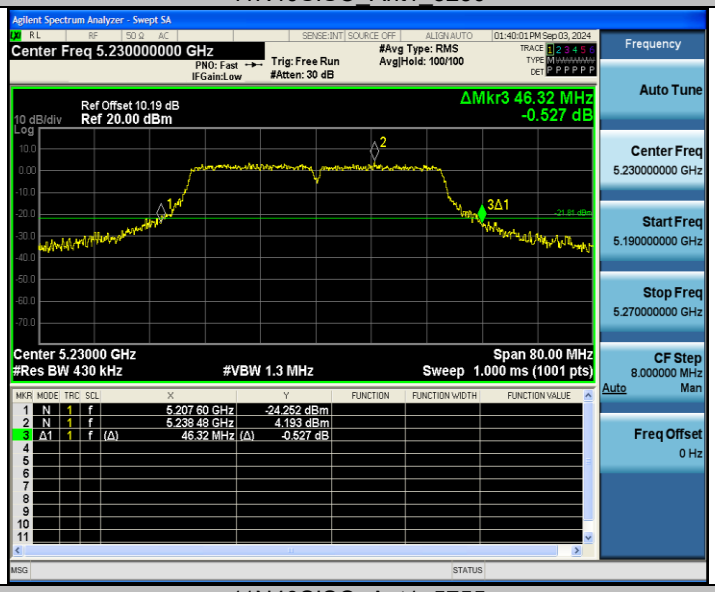

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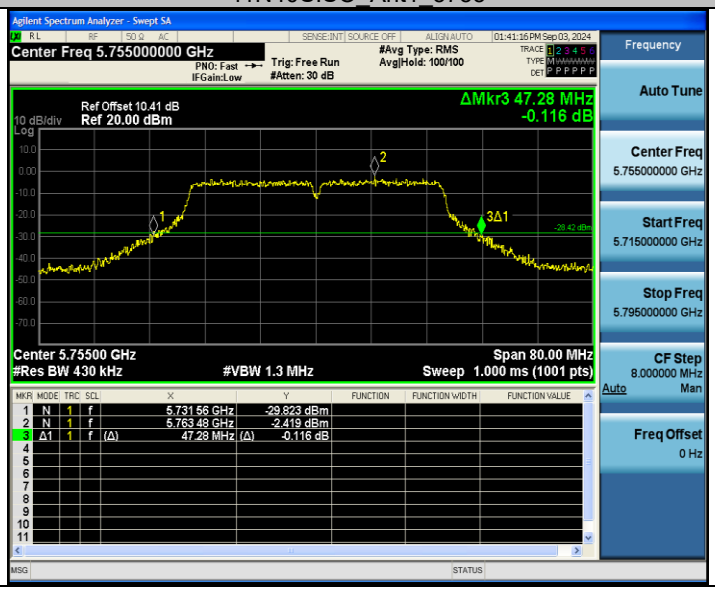

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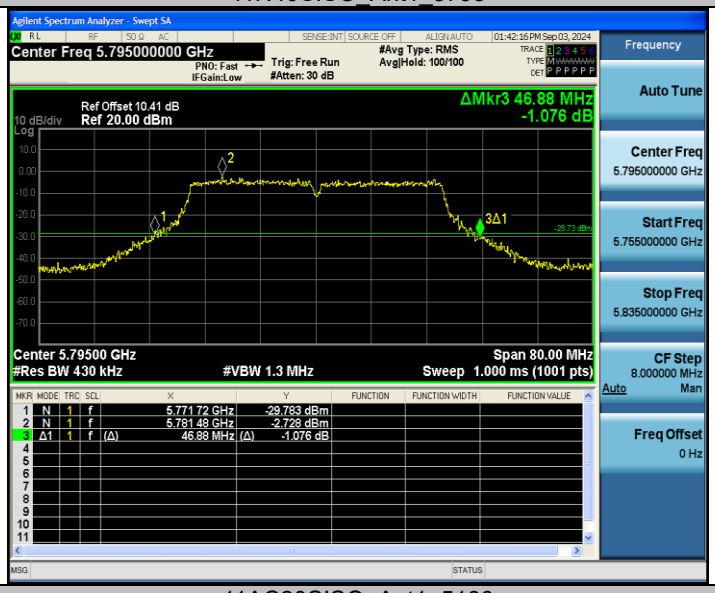

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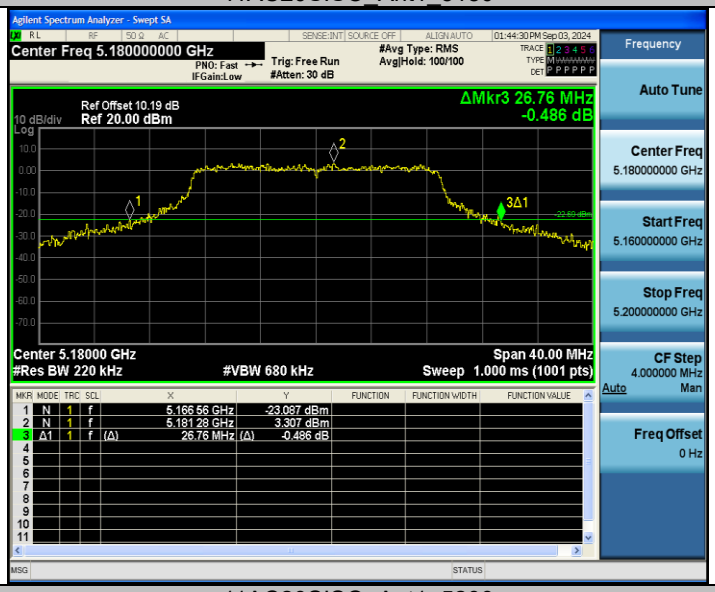

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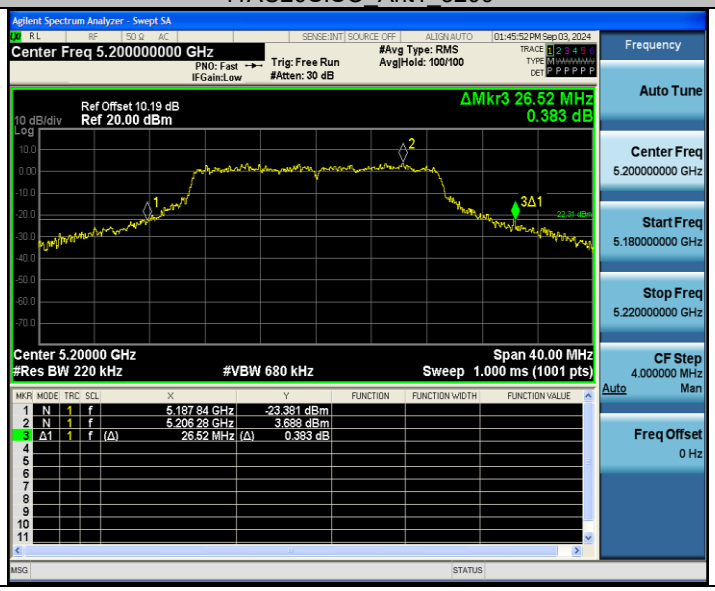

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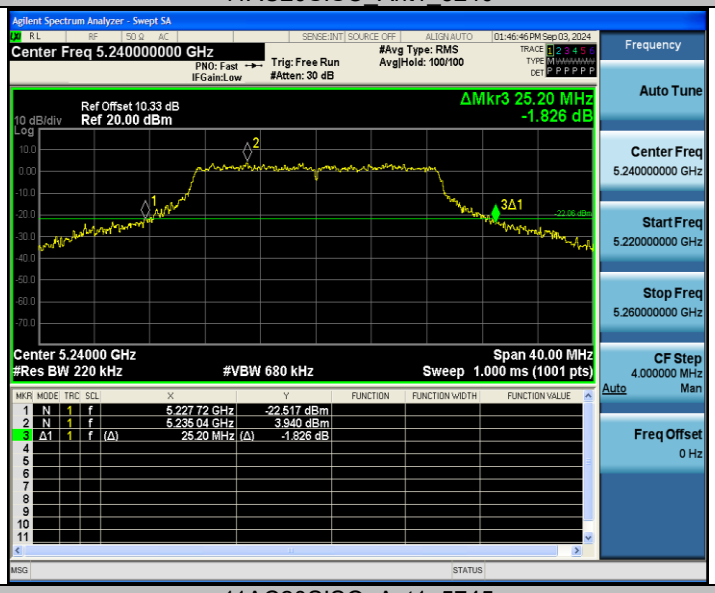

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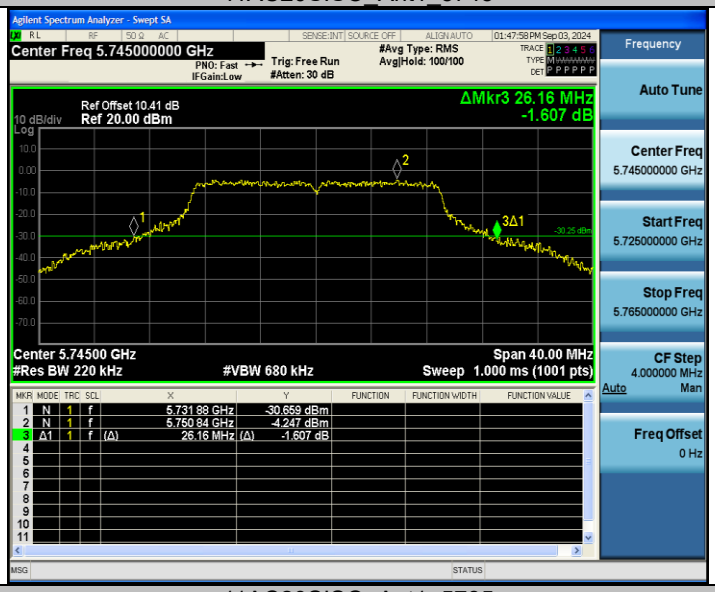
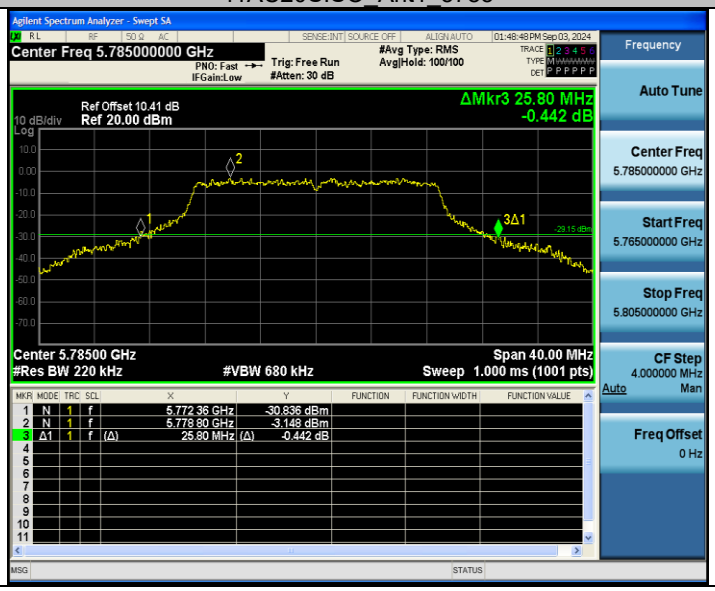
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