

Test Report

Report No.: MTi221111004-01E1

Date of issue: 2024-04-29

Applicant: Cherub Technology Co., Ltd

Product: Wireless In-ear Monitoring System

Model(s): B-7PSM

FCC ID: 2AOAA-B-7PSMRX

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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Test Result Certification	
Applicant:	Cherub Technology Co., Ltd
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Manufacturer:	Cherub Technology Co., Ltd
Address:	Room507, Block 1, Nanhai E-Cool, No. 6 Xinghua Road, Shekou, Nanshan District, Shenzhen City, Guangdong Province, China, 518067
Factory:	Cherub Technology Co., Ltd (Zhuhai High-tech Park)
Address:	No.10, Keji No.9 Rd, Tangjiawan Town, Zhuhai National Hi-tech Industrial Development Zone, Zhuhai City, Guangdong Province, China, 519080
Product description	
Product name:	Wireless In-ear Monitoring System
Trade mark:	NUX
Model name:	B-7PSM
Series Model(s):	N/A
Standards:	47 CFR Part 15E
Test Method:	ANSI C63.10-2013 KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Date of Test	
Date of test:	2024-04-16 to 2024-04-28
Test result:	Pass

Test Engineer	:	<i>James Qin</i>
		(James Qin)
Reviewed By	:	<i>David. Lee</i>
		(David Lee)
Approved By	:	<i>Leon Chen</i>
		(Leon Chen)

1 General Description

1.1 Description of the EUT

Product name:	Wireless In-ear Monitoring System
Model name:	B-7PSM
Series Model(s):	N/A
Model difference:	N/A
Electrical rating:	Input: Charging box: DC 5V/2A Battery: Charging box: DC 3.7V 3000mAh; TX: DC 3.7V 450mAh; RX: DC 3.7V 450mAh
Accessories:	Cable: USB-A to USB-C cable 0.53m
Hardware version:	V1.0
Software version:	V3
Test sample(s) number:	MTi221111004-01S1001
RF specification	
Operating frequency range:	5729 MHz ~ 5846 MHz
Modulation type:	FSK
Antenna(s) type:	PCB Antenna
Antenna(s) gain:	2.68 dBi

1.2 Description of test modes

No.	Emission test modes
Mode1	TX-FSK

1.2.1 Operation channel list

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	5729	11	5759	21	5789	31	5819
2	5732	12	5762	22	5792	32	5822
3	5735	13	5765	23	5795	33	5846
4	5738	14	5768	24	5798	34	5828
5	5741	15	5771	25	5801	35	5831
6	5744	16	5774	26	5804	36	5834
7	5747	17	5777	27	5807	37	5837
8	5750	18	5780	28	5810	38	5840
9	5753	19	5783	29	5813	39	5843
10	5756	20	5786	30	5816	40	5846

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

Mode	Test Software	User-defined		
	Channel	5729MHz	5786MHz	5846MHz
TX	Power setting	DEF	DEF	DEF

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

ENV	Temperature (°C)	Voltage (V)
LTLV	0	3.33
NTNV	25	3.7
HTHV	35	4.07

1.4 Description of support units

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

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

1.5 Measurement uncertainty

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

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

2 Summary of Test Result

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

3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573
IC Registration No.:	21760
CABID:	CN0093

4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Conducted Emission at AC power line						
1	EMI Test Receiver	Rohde&schwarz	ESCI3	101368	2024-03-11	2025-03-10
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2024-03-11	2025-03-10
3	Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	100263	2024-03-11	2025-03-10
Duty Cycle Maximum conducted output power Power spectral density Emission bandwidth and occupied bandwidth						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2024-03-11	2025-03-10
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2024-03-11	2025-03-10
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2024-03-11	2025-03-10
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2024-03-11	2025-03-10
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2024-03-11	2025-03-10
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2024-03-11	2025-03-10
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2024-03-11	2025-03-10
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2024-03-11	2025-03-10
9	DC Power Supply	Agilent	E3632A	MY40027695	2024-03-11	2025-03-10
Band edge emissions (Radiated) Undesirable emission limits (above 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2024-03-11	2025-03-10
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-06-17	2025-06-16
3	Amplifier	Agilent	8449B	3008A01120	2024-03-10	2025-03-09
4	Multi-device Controller	TuoPu	TPMDC	/	2024-03-11	2025-03-10
5	MXA signal analyzer	Agilent	N9020A	MY54440859	2023-06-01	2024-05-31
6	Horn antenna	Schwarzbeck	BBHA 9170	00987	2023-06-17	2025-06-16
7	Pre-amplifier	Space-Dtronics	EWLAN1840 G	210405001	2023-05-04	2024-05-03
8	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2024-03-11	2025-03-10
Undesirable emission limits (below 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2024-03-11	2025-03-10
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10
3	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2023-06-11	2025-06-10
4	Amplifier	Hewlett-Packard	8447F	3113A06184	2024-03-11	2025-03-10
5	Multi-device Controller	TuoPu	TPMDC	/	2024-03-11	2025-03-10

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.
Description of the antenna of EUT	The antenna of the EUT is permanently attached. There are no provisions for connection to an external antenna.
Conclusion:	The EUT complies with the requirement of § 15.203.

6 Radio Spectrum Matter Test Results (RF)

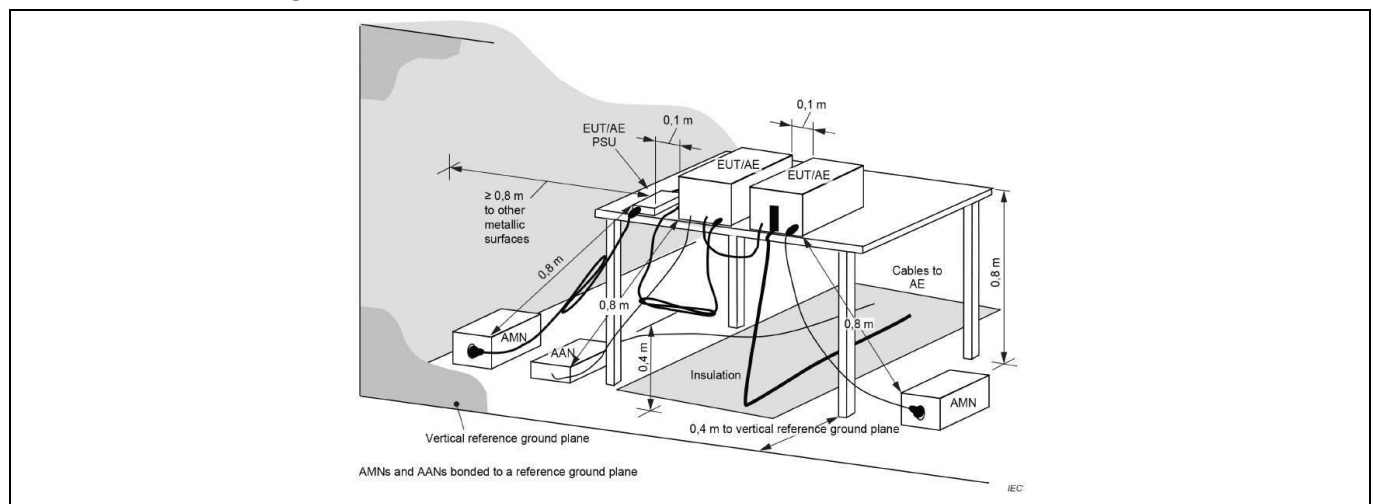
6.1 Conducted Emission at AC power line

Test Requirement:	Refer to 47 CFR 15.207(a), Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).		
Test Limit:	Frequency of emission (MHz)	Conducted limit (dB μ V)	
		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		
Procedure:	Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices		

6.1.1 E.U.T. Operation:

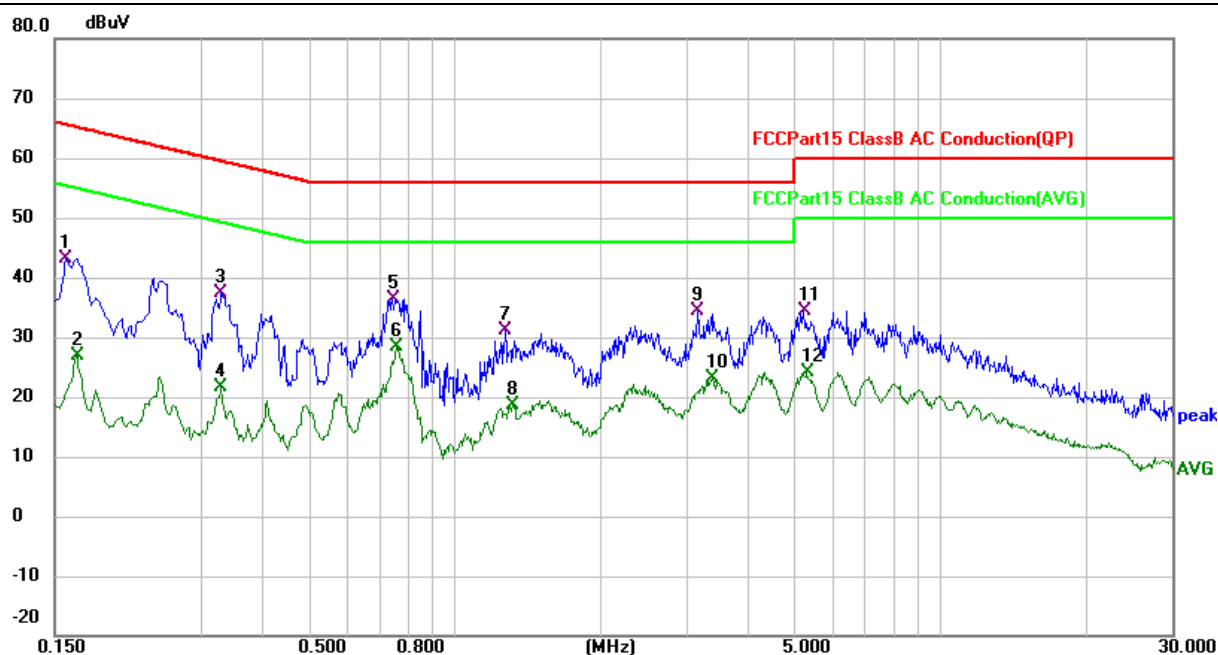
Operating Environment:					
Temperature:	23.6 °C	Humidity:	55 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report				

6.1.2 Test Setup Diagram:



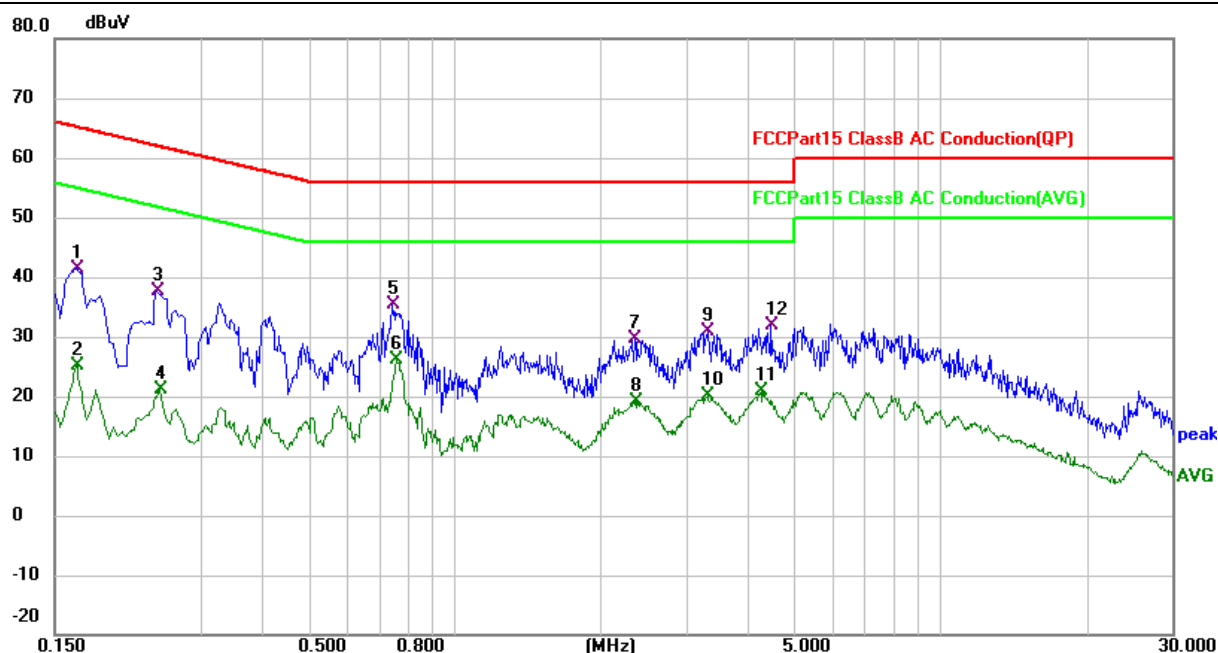
6.1.3 Test Data:

Mode1 / Line: Line



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBuV	dB	dBuV	dBuV	dB	
1		0.1580	33.01	10.18	43.19	65.57	-22.38	QP
2		0.1660	16.73	10.18	26.91	55.16	-28.25	AVG
3		0.3300	27.21	10.15	37.36	59.45	-22.09	QP
4		0.3300	11.37	10.15	21.52	49.45	-27.93	AVG
5		0.7460	26.15	10.15	36.30	56.00	-19.70	QP
6	*	0.7620	18.17	10.15	28.32	46.00	-17.68	AVG
7		1.2700	21.03	10.15	31.18	56.00	-24.82	QP
8		1.3220	8.56	10.17	18.73	46.00	-27.27	AVG
9		3.1619	24.02	10.42	34.44	56.00	-21.56	QP
10		3.4060	12.75	10.45	23.20	46.00	-22.80	AVG
11		5.2260	23.67	10.66	34.33	60.00	-25.67	QP
12		5.3140	13.37	10.67	24.04	50.00	-25.96	AVG

Mode1 / Line: Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1660	31.33	10.12	41.45	65.16	-23.71	QP
2		0.1660	15.10	10.12	25.22	55.16	-29.94	AVG
3		0.2420	27.53	10.06	37.59	62.03	-24.44	QP
4		0.2460	10.96	10.06	21.02	51.89	-30.87	AVG
5		0.7460	25.24	10.12	35.36	56.00	-20.64	QP
6	*	0.7620	15.93	10.12	26.05	46.00	-19.95	AVG
7		2.3500	19.25	10.38	29.63	56.00	-26.37	QP
8		2.3780	8.80	10.39	19.19	46.00	-26.81	AVG
9		3.3140	20.48	10.45	30.93	56.00	-25.07	QP
10		3.3140	9.63	10.45	20.08	46.00	-25.92	AVG
11		4.2860	10.46	10.53	20.99	46.00	-25.01	AVG
12		4.4860	21.31	10.55	31.86	56.00	-24.14	QP

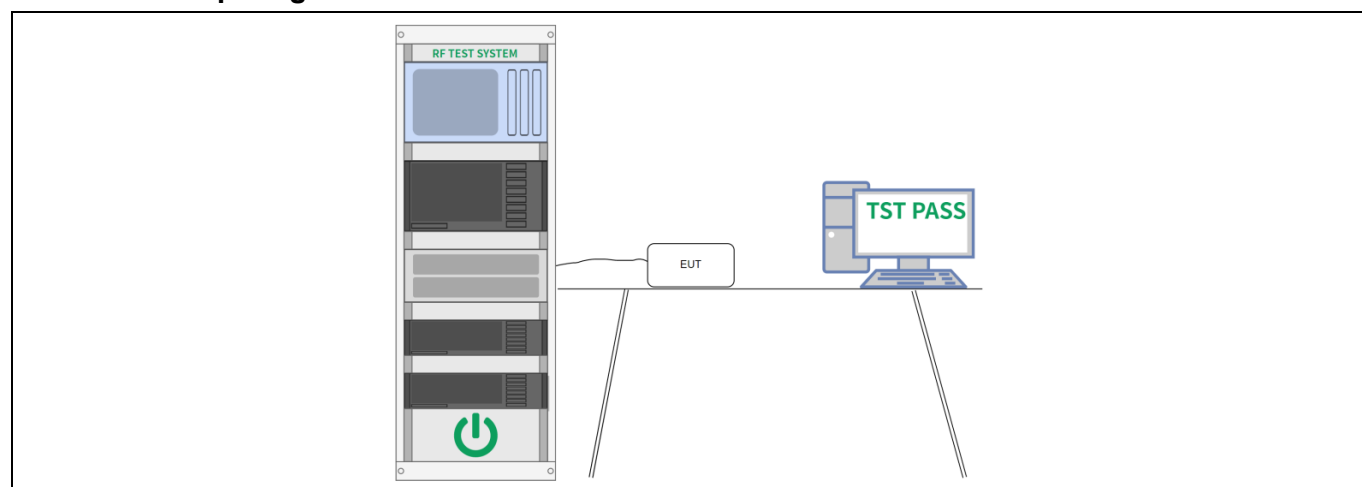
6.2 Duty Cycle

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 \geq EBW if possible; otherwise, set RBW to the largest available value. iii) Set VBW \geq 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:	56 %
Atmospheric Pressure:	99 kPa		
Pre test mode:	Mode1		
Final test mode:	Mode1		

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

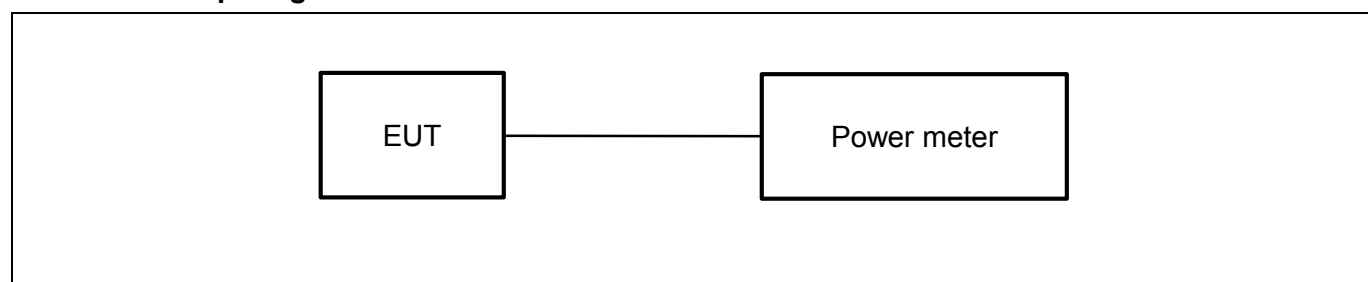
6.3 Maximum conducted output power

Test Requirement:	47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(3)(i)
Test Limit:	<p>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.</p> <p>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.</p>
Test Method:	ANSI C63.10-2013, section 12.3
Procedure:	ANSI C63.10-2013, section 12.3.3

6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	56 %	Atmospheric Pressure:	99 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Please Refer to Appendix for Details.

6.4 Power spectral density

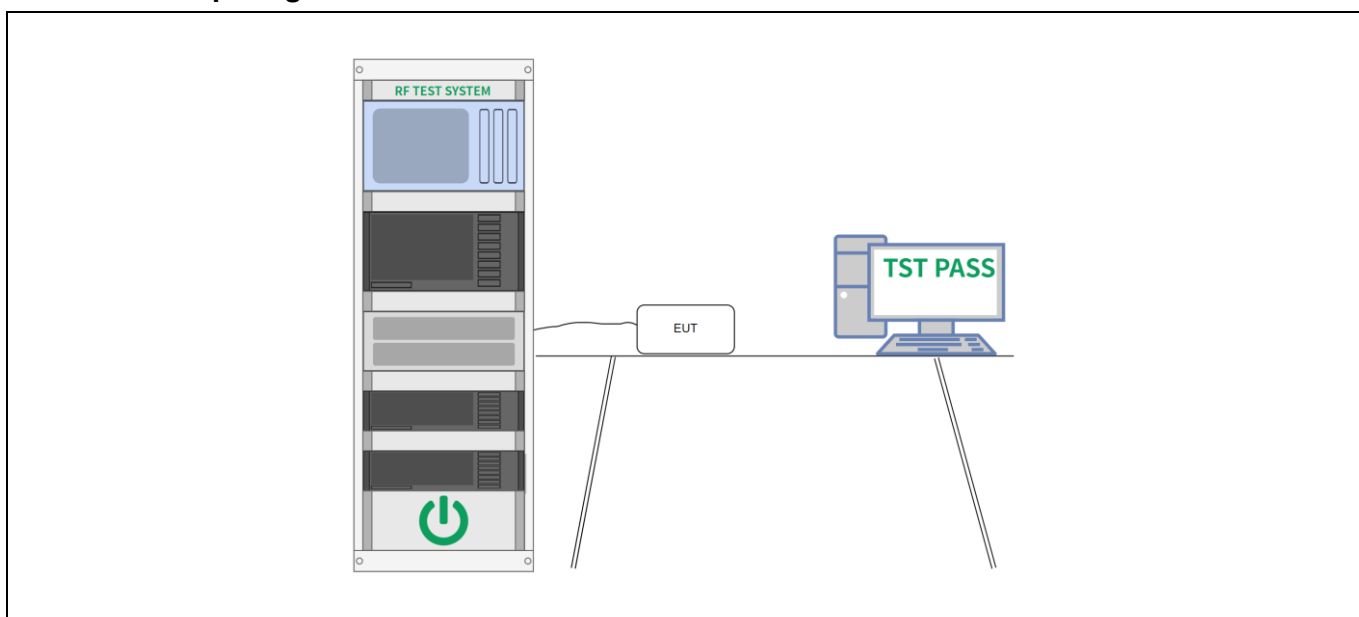
Test Requirement:	47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(3)(i)
Test Limit:	<p>For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p> <p>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.</p>
Test Method:	ANSI C63.10-2013, section 12.5
Procedure:	<p>a) Create an average power spectrum for the EUT operating mode being tested by following the instructions in 12.3.2 for measuring maximum conducted output power using a spectrum analyzer or EMI receiver; that is, select the appropriate test method (SA-1, SA-2, SA-3, or their respective alternatives) and apply it up to, but not including, the step labeled, "Compute power...." (This procedure is required even if the maximum conducted output power measurement was performed using the power meter method PM.)</p> <p>b) Use the peak search function on the instrument to find the peak of the spectrum.</p> <p>c) Make the following adjustments to the peak value of the spectrum, if applicable:</p> <ol style="list-style-type: none"> 1) If method SA-2 or SA-2A was used, then add $[10 \log (1 / D)]$, where D is the duty cycle, to the peak of the spectrum. 2) If method SA-3A was used and the linear mode was used in step h) of 12.3.2.7, add 1 dB to the final result to compensate for the difference between linear averaging and power averaging. <p>d) The result is the PPSD.</p> <p>e) The procedure in item a) through item c) requires the use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified by some regulatory authorities. This requirement also permits use of resolution bandwidths less than 1 MHz "provided that the measured power is integrated to show the total power over the measurement bandwidth" (i.e.,</p>

	1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth, the following adjustments to the procedures apply: 1) Set RBW $\geq 1 / T$, where T is defined in 12.2 a). 2) Set VBW $\geq [3 \times \text{RBW}]$. 3) Care shall be taken such that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.
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6.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	56 %	Atmospheric Pressure:	99 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

6.5 Emission bandwidth and occupied bandwidth

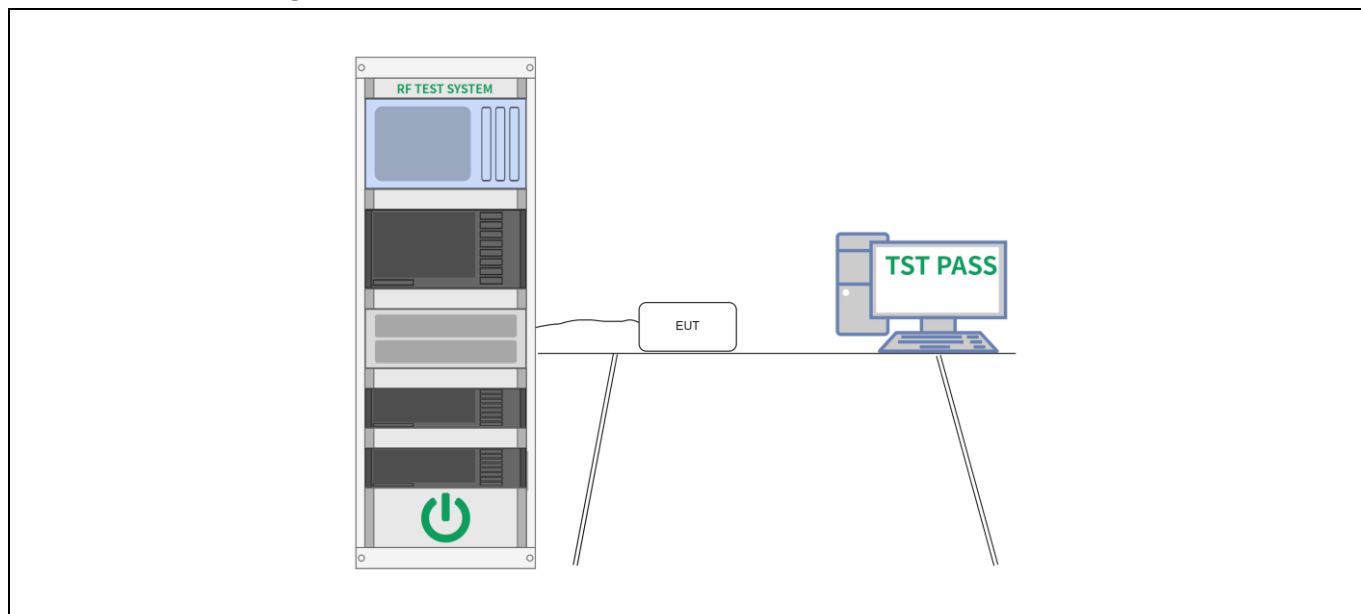
Test Requirement:	U-NII 1: No limits, only for report use. U-NII 3: 47 CFR Part 15.407(e)
Test Limit:	U-NII 1: No limits, only for report use. U-NII 3: Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.
Test Method:	ANSI C63.10-2013, section 6.9 & 12.4 KDB 789033 D02, Clause C.2
Procedure:	<p>Emission bandwidth:</p> <ol style="list-style-type: none"> Set RBW = approximately 1% of the emission bandwidth. Set the VBW > RBW. Detector = peak. Trace mode = max hold. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. <p>Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.</p> <p>Occupied bandwidth:</p> <ol style="list-style-type: none"> 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. 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. 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. Step a) through step c) might require iteration to adjust within the specified range. 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. Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth. 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

	<p>total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.</p> <p>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).</p> <p>6 dB emission bandwidth:</p> <p>a) Set RBW = 100 kHz.</p> <p>b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.</p> <p>c) Detector = Peak.</p> <p>d) Trace mode = max hold.</p> <p>e) Sweep = auto couple.</p> <p>f) Allow the trace to stabilize.</p> <p>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.</p>
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6.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	56 %	Atmospheric Pressure:	99 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

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:	<p>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.</p> <p>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.</p> <table border="1"> <thead> <tr> <th>MHz</th><th>MHz</th><th>MHz</th><th>GHz</th></tr> </thead> <tbody> <tr> <td>0.090-0.110</td><td>16.42-16.423</td><td>399.9-410</td><td>4.5-5.15</td></tr> <tr> <td>¹0.495-0.505</td><td>16.69475-16.69525</td><td>608-614</td><td>5.35-5.46</td></tr> <tr> <td>2.1735-2.1905</td><td>16.80425-16.80475</td><td>960-1240</td><td>7.25-7.75</td></tr> <tr> <td>4.125-4.128</td><td>25.5-25.67</td><td>1300-1427</td><td>8.025-8.5</td></tr> <tr> <td>4.17725-4.17775</td><td>37.5-38.25</td><td>1435-1626.5</td><td>9.0-9.2</td></tr> <tr> <td>4.20725-4.20775</td><td>73-74.6</td><td>1645.5-1646.5</td><td>9.3-9.5</td></tr> <tr> <td>6.215-6.218</td><td>74.8-75.2</td><td>1660-1710</td><td>10.6-12.7</td></tr> <tr> <td>6.26775-6.26825</td><td>108-121.94</td><td>1718.8-1722.2</td><td>13.25-13.4</td></tr> <tr> <td>6.31175-6.31225</td><td>123-138</td><td>2200-2300</td><td>14.47-14.5</td></tr> <tr> <td>8.291-8.294</td><td>149.9-150.05</td><td>2310-2390</td><td>15.35-16.2</td></tr> <tr> <td>8.362-8.366</td><td>156.52475-156.52525</td><td>2483.5-2500</td><td>17.7-21.4</td></tr> <tr> <td>8.37625-8.38675</td><td>156.7-156.9</td><td>2690-2900</td><td>22.01-23.12</td></tr> <tr> <td>8.41425-8.41475</td><td>162.0125-167.17</td><td>3260-3267</td><td>23.6-24.0</td></tr> <tr> <td>12.29-12.293</td><td>167.72-173.2</td><td>3332-3339</td><td>31.2-31.8</td></tr> <tr> <td>12.51975-12.52025</td><td>240-285</td><td>3345.8-3358</td><td>36.43-36.5</td></tr> <tr> <td>12.57675-12.57725</td><td>322-335.4</td><td>3600-4400</td><td>(²)</td></tr> <tr> <td>13.36-13.41</td><td></td><td></td><td></td></tr> </tbody> </table> <p>¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.</p> <p>²Above 38.6</p> <p>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 § 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35 apply to these measurements.</p> <p>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:</p>			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			
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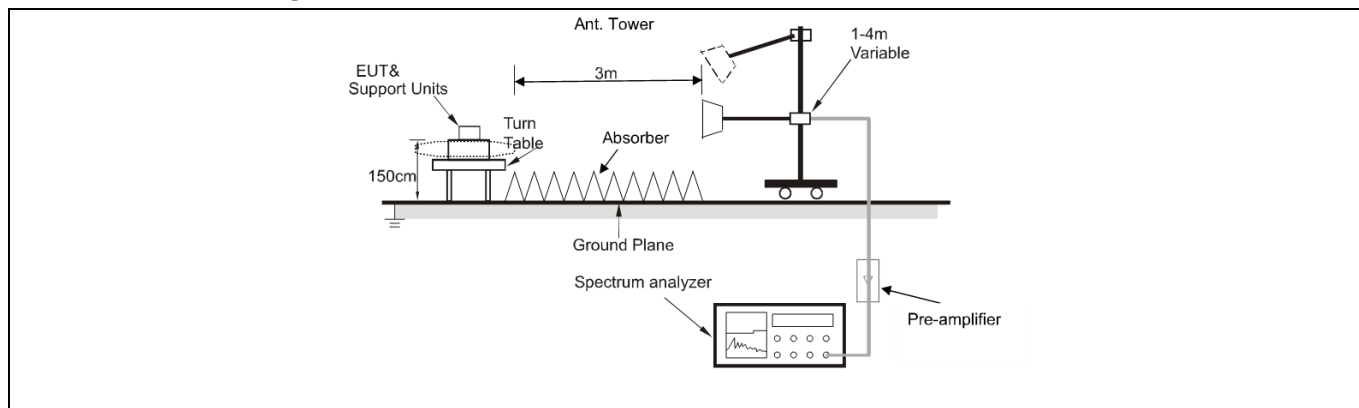
	<table><tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr><tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr><tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr><tr><td>1.705-30.0</td><td>30</td><td>30</td></tr><tr><td>30-88</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> <p>** 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.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>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.</p>	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
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)																							
0.009-0.490	2400/F(kHz)	300																							
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1.705-30.0	30	30																							
30-88	100 **	3																							
88-216	150 **	3																							
216-960	200 **	3																							
Above 960	500	3																							
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7																								
Procedure:	<p>Above 1GHz:</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>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.</p> <p>g. Test the EUT in the lowest channel, the middle channel, the Highest channel.</p> <p>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.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>Remark:</p> <p>1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</p> <p>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.</p> <p>3. As shown in this section, for frequencies above 1GHz, the field strength</p>																								

	<p>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.</p> <p>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.</p>
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6.6.1 E.U.T. Operation:

Operating Environment:					
Temperature:	30.4 °C	Humidity:	49.9 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1				
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				

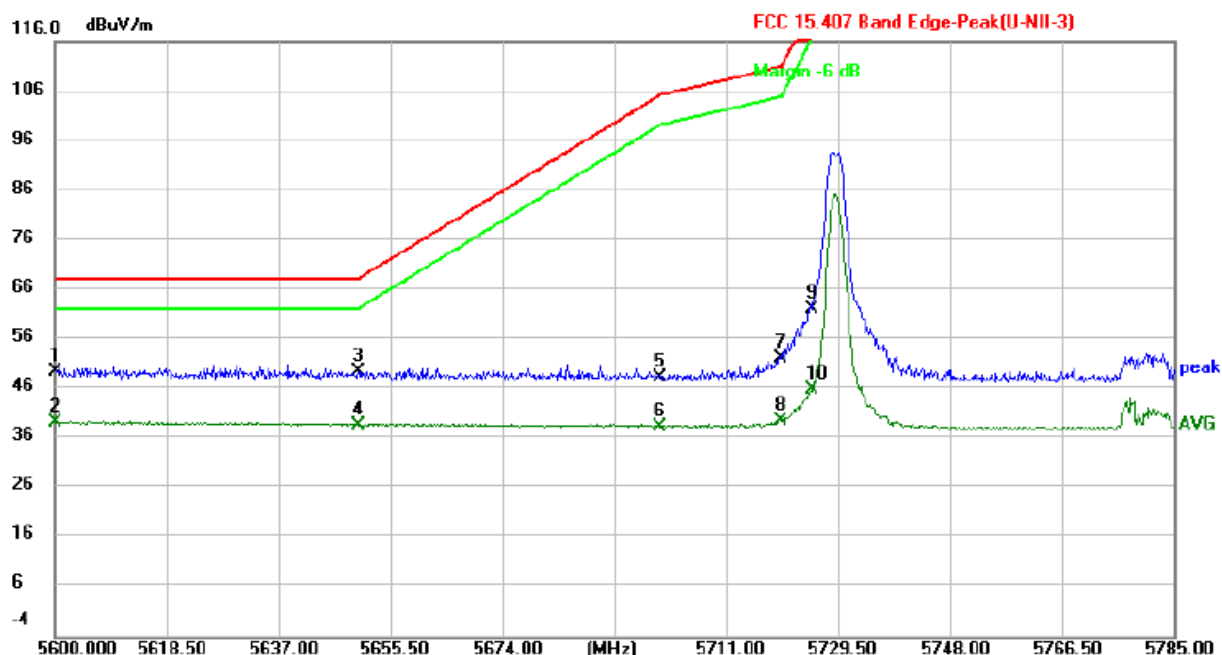
6.6.2 Test Setup Diagram:



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

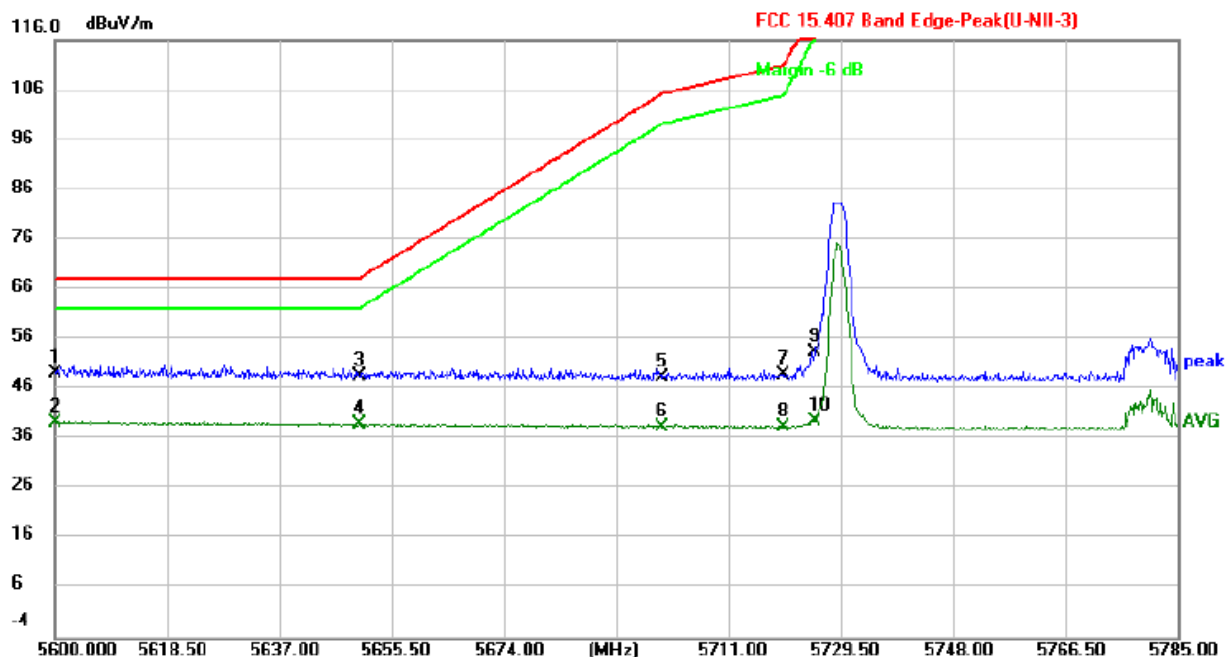
6.6.3 Test Data:

Mode1 / Polarization: Horizontal / CH: L



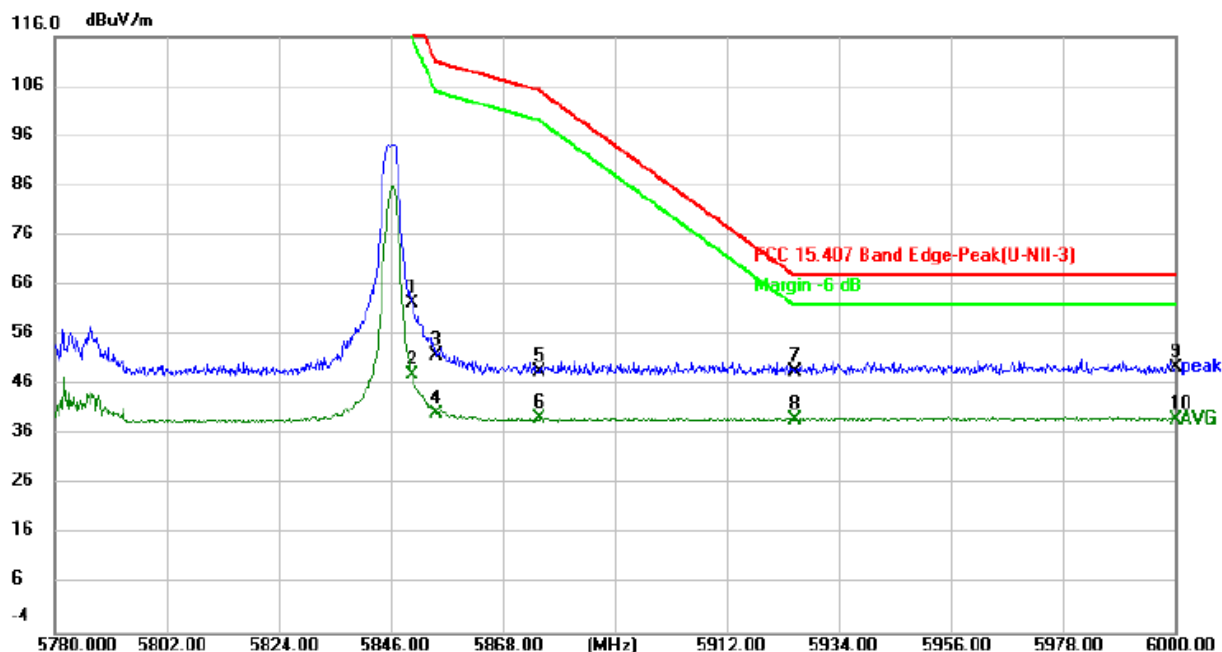
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	5600.000	47.32	2.19	49.51	68.20	-18.69	peak	
2	X	5600.000	37.20	2.19	39.39	68.20	-28.81	AVG	
3		5650.000	47.33	2.12	49.45	68.20	-18.75	peak	
4	X	5650.000	36.67	2.12	38.79	68.20	-29.41	AVG	
5		5700.000	46.45	2.04	48.49	105.20	-56.71	peak	
6	X	5700.000	36.56	2.04	38.60	105.20	-66.60	AVG	
7		5720.000	50.28	2.02	52.30	110.80	-58.50	peak	
8	X	5720.000	37.78	2.02	39.80	110.80	-71.00	AVG	
9		5725.000	60.20	2.00	62.20	122.20	-60.00	peak	
10	X	5725.000	43.82	2.00	45.82	122.20	-76.38	AVG	

Mode1 / Polarization: Vertical / CH: L



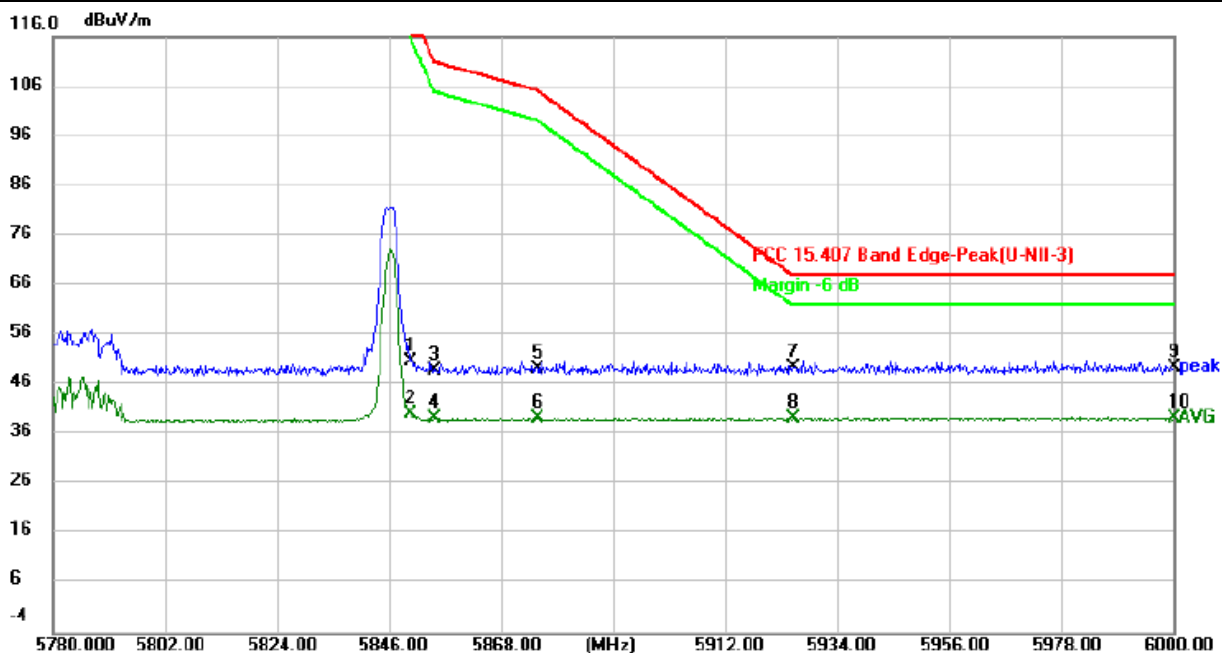
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	5600.000	47.13	2.19	49.32	68.20	-18.88	peak	
2	X	5600.000	37.15	2.19	39.34	68.20	-28.86	AVG	
3		5650.000	46.54	2.12	48.66	68.20	-19.54	peak	
4	X	5650.000	36.91	2.12	39.03	68.20	-29.17	AVG	
5		5700.000	46.29	2.04	48.33	105.20	-56.87	peak	
6	X	5700.000	36.54	2.04	38.58	105.20	-66.62	AVG	
7		5720.000	46.99	2.02	49.01	110.80	-61.79	peak	
8	X	5720.000	36.58	2.02	38.60	110.80	-72.20	AVG	
9		5725.000	51.46	2.00	53.46	122.20	-68.74	peak	
10	X	5725.000	37.77	2.00	39.77	122.20	-82.43	AVG	

Mode1 / Polarization: Horizontal / CH: H



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		5850.000	60.57	1.82	62.39	122.20	-59.81	peak	
2	X	5850.000	46.19	1.82	48.01	122.20	-74.19	AVG	
3		5855.000	50.08	1.81	51.89	110.80	-58.91	peak	
4	X	5855.000	38.54	1.81	40.35	110.80	-70.45	AVG	
5		5875.000	46.93	1.77	48.70	105.20	-56.50	peak	
6	X	5875.000	37.49	1.77	39.26	105.20	-65.94	AVG	
7		5925.000	46.98	1.70	48.68	68.20	-19.52	peak	
8	X	5925.000	37.46	1.70	39.16	68.20	-29.04	AVG	
9	*	6000.000	48.04	1.59	49.63	68.20	-18.57	peak	
10	X	6000.000	37.57	1.59	39.16	68.20	-29.04	AVG	

Mode1 / Polarization: Vertical / CH: H



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		5850.000	49.05	1.82	50.87	122.20	-71.33	peak	
2	X	5850.000	38.57	1.82	40.39	122.20	-81.81	AVG	
3		5855.000	47.07	1.81	48.88	110.80	-61.92	peak	
4	X	5855.000	37.67	1.81	39.48	110.80	-71.32	AVG	
5		5875.000	47.41	1.77	49.18	105.20	-56.02	peak	
6	X	5875.000	37.45	1.77	39.22	105.20	-65.98	AVG	
7	*	5925.000	47.93	1.70	49.63	68.20	-18.57	peak	
8	X	5925.000	37.66	1.70	39.36	68.20	-28.84	AVG	
9		6000.000	48.04	1.59	49.63	68.20	-18.57	peak	
10	X	6000.000	37.62	1.59	39.21	68.20	-28.99	AVG	

6.7 Undesirable emission limits (below 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(9)																								
Test Limit:	<p>Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.</p> <p>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:</p> <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> <p>** 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.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>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.</p>	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
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)																							
0.009-0.490	2400/F(kHz)	300																							
0.490-1.705	24000/F(kHz)	30																							
1.705-30.0	30	30																							
30-88	100 **	3																							
88-216	150 **	3																							
216-960	200 **	3																							
Above 960	500	3																							
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.5																								
Procedure:	<p>Below 1GHz:</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>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.</p> <p>g. Test the EUT in the lowest channel, the middle channel, the Highest channel.</p> <p>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.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p>																								

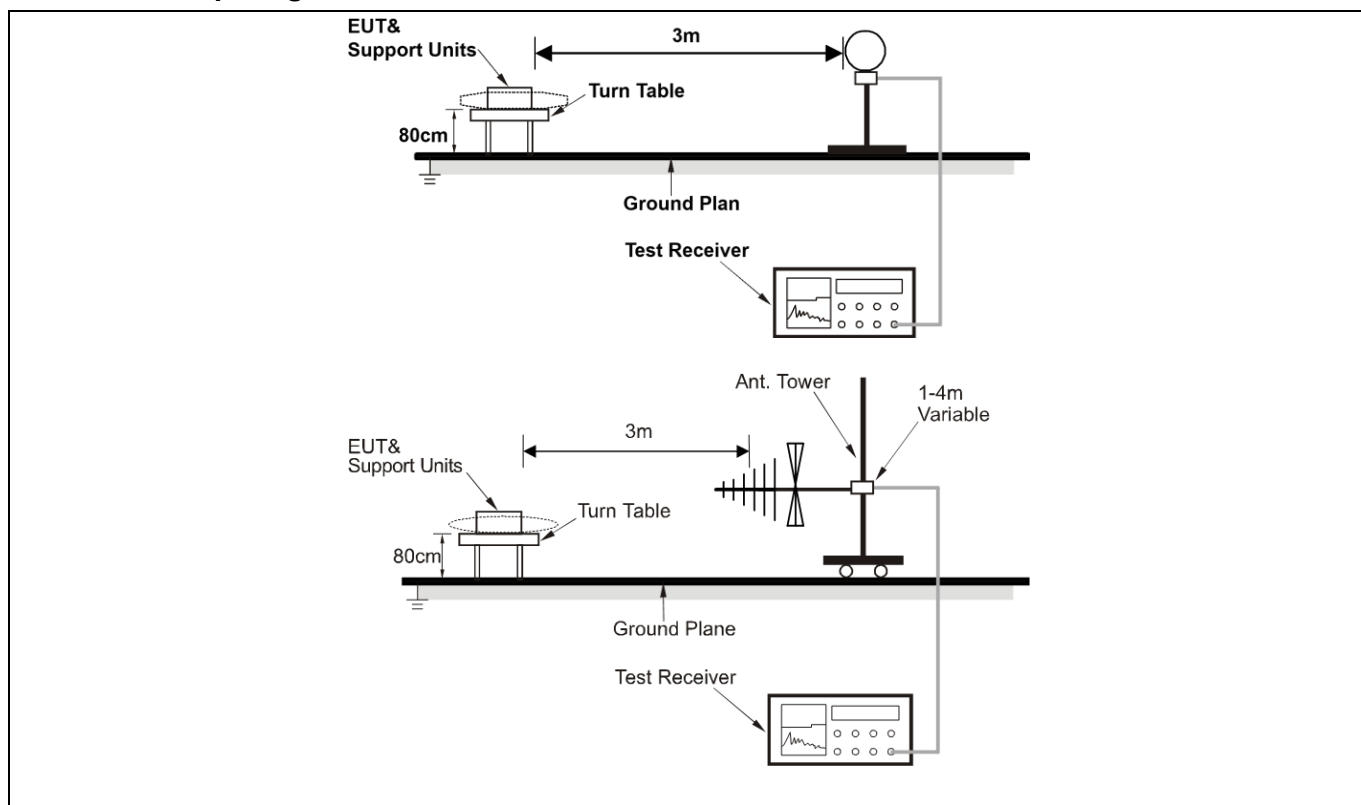
	<p>Remark:</p> <ol style="list-style-type: none"> 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been 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. <p>Above 1GHz:</p> <ol style="list-style-type: none"> 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. <p>Remark:</p> <ol style="list-style-type: none"> 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.
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6.7.1 E.U.T. Operation:

Operating Environment:

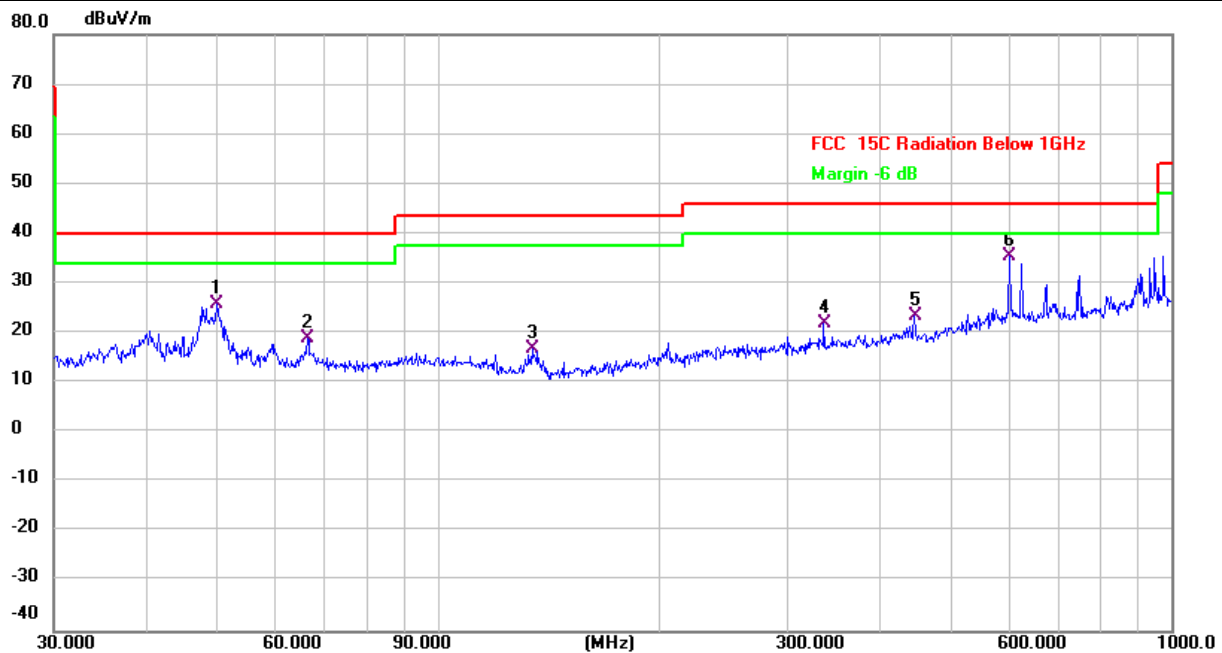
Temperature:	30.4 °C	Humidity:	49.9 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1				
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode1, High channel) is recorded in the report				
Note: The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported. There were no emissions found below 30MHz within 20dB of the limit.					

6.7.2 Test Setup Diagram:



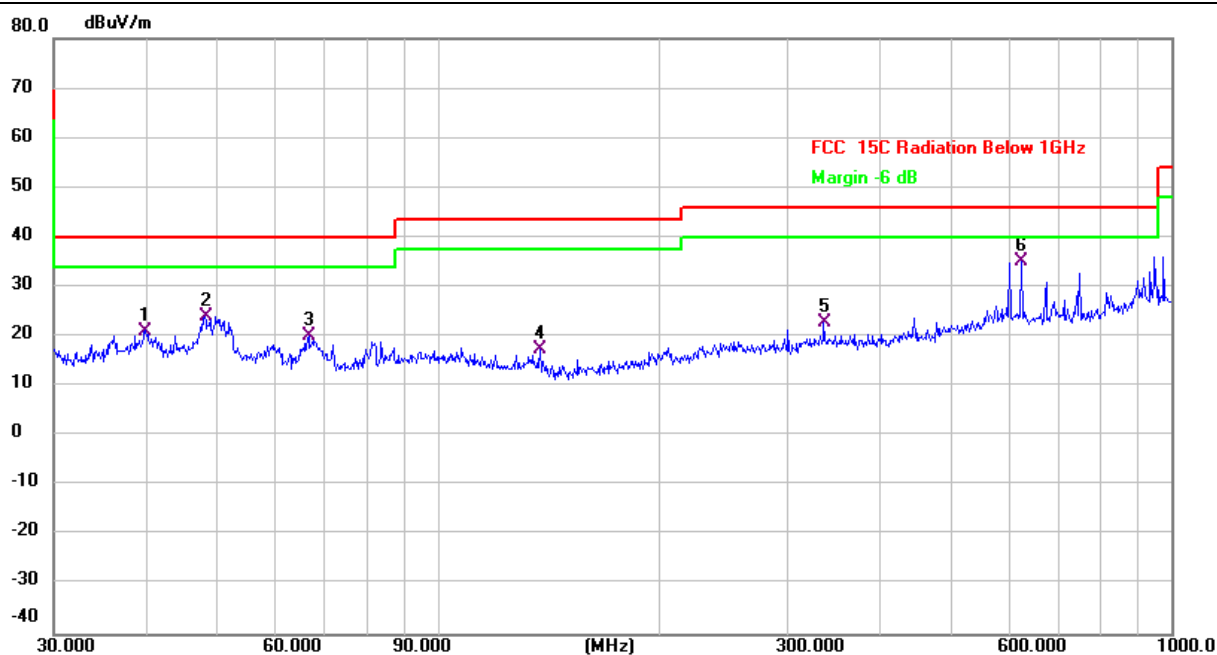
6.7.3 Test Data:

Mode1 / Polarization: Horizontal / CH: H



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		50.0566	35.23	-9.35	25.88	40.00	-14.12	QP
2		66.4989	30.31	-11.41	18.90	40.00	-21.10	QP
3		134.5592	29.57	-12.82	16.75	43.50	-26.75	QP
4		336.0352	29.09	-7.01	22.08	46.00	-23.92	QP
5		446.4141	29.59	-6.15	23.44	46.00	-22.56	QP
6	*	601.4265	38.11	-2.73	35.38	46.00	-10.62	QP

Mode1 / Polarization: Vertical / CH: H



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			
			dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		39.9942	31.20	-10.00	21.20	40.00	-18.80	QP
2		48.1626	33.28	-9.24	24.04	40.00	-15.96	QP
3		66.7325	31.44	-11.43	20.01	40.00	-19.99	QP
4		137.9028	30.23	-12.86	17.37	43.50	-26.13	QP
5		336.0352	29.97	-7.01	22.96	46.00	-23.04	QP
6	*	625.0780	38.31	-3.03	35.28	46.00	-10.72	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:	<p>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.</p> <p>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.</p> <table border="1"> <thead> <tr> <th>MHz</th><th>MHz</th><th>MHz</th><th>GHz</th></tr> </thead> <tbody> <tr> <td>0.090-0.110</td><td>16.42-16.423</td><td>399.9-410</td><td>4.5-5.15</td></tr> <tr> <td>¹0.495-0.505</td><td>16.69475-16.69525</td><td>608-614</td><td>5.35-5.46</td></tr> <tr> <td>2.1735-2.1905</td><td>16.80425-16.80475</td><td>960-1240</td><td>7.25-7.75</td></tr> <tr> <td>4.125-4.128</td><td>25.5-25.67</td><td>1300-1427</td><td>8.025-8.5</td></tr> <tr> <td>4.17725-4.17775</td><td>37.5-38.25</td><td>1435-1626.5</td><td>9.0-9.2</td></tr> <tr> <td>4.20725-4.20775</td><td>73-74.6</td><td>1645.5-1646.5</td><td>9.3-9.5</td></tr> <tr> <td>6.215-6.218</td><td>74.8-75.2</td><td>1660-1710</td><td>10.6-12.7</td></tr> <tr> <td>6.26775-6.26825</td><td>108-121.94</td><td>1718.8-1722.2</td><td>13.25-13.4</td></tr> <tr> <td>6.31175-6.31225</td><td>123-138</td><td>2200-2300</td><td>14.47-14.5</td></tr> <tr> <td>8.291-8.294</td><td>149.9-150.05</td><td>2310-2390</td><td>15.35-16.2</td></tr> <tr> <td>8.362-8.366</td><td>156.52475-156.52525</td><td>2483.5-2500</td><td>17.7-21.4</td></tr> <tr> <td>8.37625-8.38675</td><td>156.7-156.9</td><td>2690-2900</td><td>22.01-23.12</td></tr> <tr> <td>8.41425-8.41475</td><td>162.0125-167.17</td><td>3260-3267</td><td>23.6-24.0</td></tr> <tr> <td>12.29-12.293</td><td>167.72-173.2</td><td>3332-3339</td><td>31.2-31.8</td></tr> <tr> <td>12.51975-12.52025</td><td>240-285</td><td>3345.8-3358</td><td>36.43-36.5</td></tr> <tr> <td>12.57675-12.57725</td><td>322-335.4</td><td>3600-4400</td><td>(²)</td></tr> <tr> <td>13.36-13.41</td><td></td><td></td><td></td></tr> </tbody> </table> <p>¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.</p> <p>²Above 38.6</p> <p>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 § 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35 apply to these measurements.</p> <p>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:</p>			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			
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0.090-0.110	16.42-16.423	399.9-410	4.5-5.15																																																																								
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	<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> <p>** 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.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>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.</p>	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
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)																							
0.009-0.490	2400/F(kHz)	300																							
0.490-1.705	24000/F(kHz)	30																							
1.705-30.0	30	30																							
30-88	100 **	3																							
88-216	150 **	3																							
216-960	200 **	3																							
Above 960	500	3																							
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7																								
Procedure:	<p>Above 1GHz:</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>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.</p> <p>g. Test the EUT in the lowest channel, the middle channel, the Highest channel.</p> <p>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.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>Remark:</p> <p>1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</p> <p>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.</p> <p>3. As shown in this section, for frequencies above 1GHz, the field strength</p>																								

	<p>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.</p> <p>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.</p> <p>5. Note: The antenna gain and cable loss is compensated in the test plot.</p>
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6.8.1 E.U.T. Operation:

Operating Environment:					
Temperature:	30.4 °C	Humidity:	49.9 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1				
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:

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
TX mode-CH01							
11458.00	48.49	8.71	57.20	68.20	-11.00	Peak	V
11458.00	40.41	8.71	49.12	54.00	-4.88	AVG	V
17187.00	44.36	13.67	58.03	68.20	-10.17	Peak	V
17187.00	36.43	13.67	50.10	54.00	-3.90	AVG	V
11458.00	43.25	8.71	51.96	68.20	-16.24	Peak	H
11458.00	34.64	8.71	43.35	54.00	-10.65	AVG	H
17187.00	44.29	13.67	57.96	68.20	-10.24	Peak	H
17187.00	35.61	13.67	49.28	54.00	-4.72	AVG	H
TX mode-CH20							
11572.00	45.93	9.03	54.96	68.20	-13.24	Peak	V
11572.00	37.35	9.03	46.38	54.00	-7.62	AVG	V
17358.00	44.14	13.83	57.97	68.20	-10.23	Peak	V
17358.00	35.64	13.83	49.47	54.00	-4.53	AVG	V
11572.00	48.38	9.03	57.41	68.20	-10.79	Peak	H
11572.00	40.29	9.03	49.32	54.00	-4.68	AVG	H
17358.00	43.86	13.83	57.69	68.20	-10.51	Peak	H
17358.00	35.33	13.83	49.16	54.00	-4.84	AVG	H
TX mode-CH40							
11692.00	48.53	9.35	57.88	68.20	-10.32	Peak	V
11692.00	39.97	9.35	49.32	54.00	-4.68	AVG	V
17538.00	44.24	13.99	58.23	68.20	-9.97	Peak	V
17538.00	36.17	13.99	50.16	54.00	-3.84	AVG	V
11692.00	46.51	9.35	55.86	68.20	-12.34	Peak	H
11692.00	37.88	9.35	47.23	54.00	-6.77	AVG	H
17538.00	44.99	13.99	58.98	68.20	-9.22	Peak	H
17538.00	36.60	13.99	50.59	54.00	-3.41	AVG	H

Photographs of the test setup

Refer to Appendix - Test Setup Photos

Photographs of the EUT

Refer to Appendix - EUT Photos

Appendix

6.9 Appendix A1: Emission Bandwidth

Test Result

Test Mode	Antenna	Frequency [MHz]	26db EBW [MHz]
FSK	Ant1	5729	2.164
		5786	2.385
		5846	2.379

Test Graphs



6.10 Appendix A2: Occupied channel bandwidth

6.10.1 Test Result

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
FSK	Ant1	5729	1.8537	5728.0524	5729.9065
		5786	2.0432	5784.9601	5787.0033
		5846	1.9717	5845.0351	5847.0068

6.10.2 Test Graphs



6.11 Appendix A3: Min emission bandwidth**6.11.1 Test Result**

TestMode	Antenna	Freq(MHz)	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
FSK	Ant1	5729	0.884	5728.296	5729.180	0.5	PASS
		5786	1.044	5785.584	5786.628	0.5	PASS
		5846	0.772	5845.732	5846.504	0.5	PASS

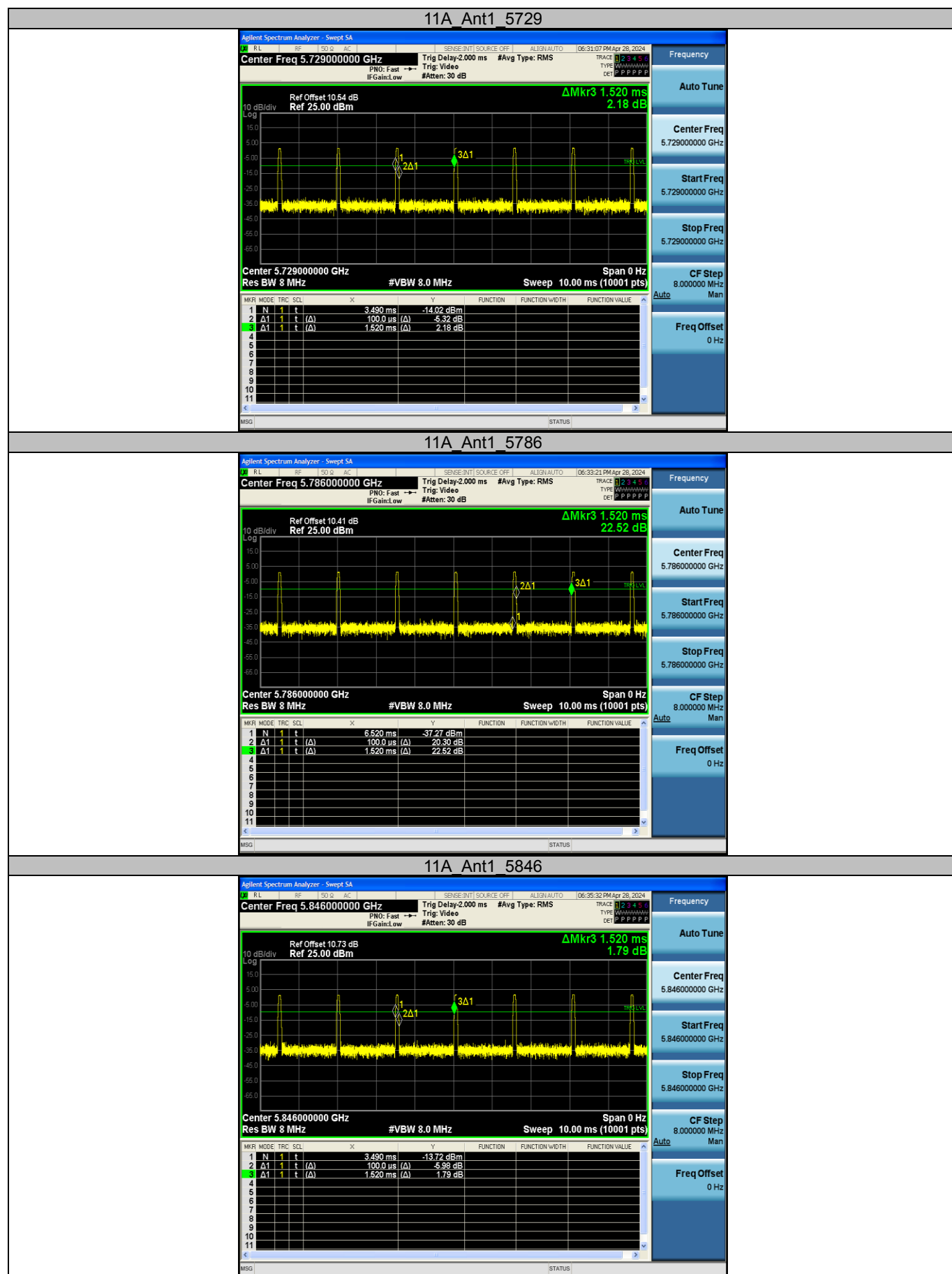
6.11.2 Test Graphs



6.12 Appendix B: Duty Cycle**6.12.1 Test Result**

Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
FSK	Ant1	5729	0.10	1.52	6.58	11.82
		5786	0.10	1.52	6.58	11.82
		5846	0.10	1.52	6.58	11.82

6.12.2 Test Graphs



6.13 Appendix C: Maximum conducted output power**6.13.1 Test Result**

Test Mode	Antenna	Frequency [MHz]	Conducted Power [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	EIRP [dBm]	Verdict
11A	Ant1	5729	-12.59	6.58	11.82	-0.77	≤30.00	1.91	PASS
		5786	-12.34	6.58	11.82	-0.52	≤30.00	2.16	PASS
		5846	-12.32	6.58	11.82	-0.50	≤30.00	2.18	PASS

6.14 Appendix D: Maximum power spectral density**6.14.1 Test Result**

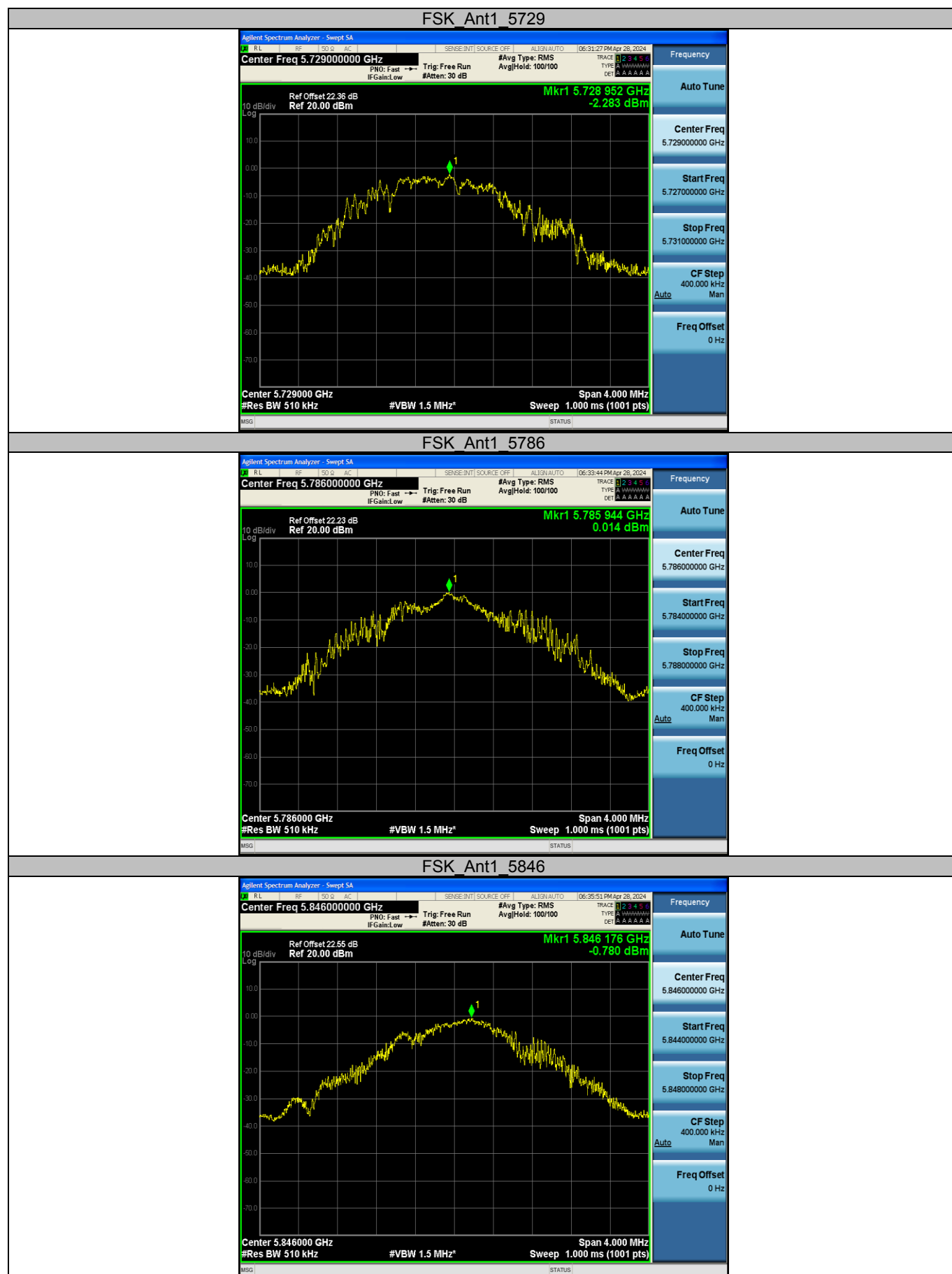
Test Result

Test Mode	Antenna	Frequency [MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Verdict
FSK	Ant1	5729	-2.28	≤29.97	PASS
		5786	0.01	≤29.97	PASS
		5846	-0.78	≤29.97	PASS

Note: 1.The Result and Limit Unit is dBm/500 kHz in the band 5.725–5.85 GHz.

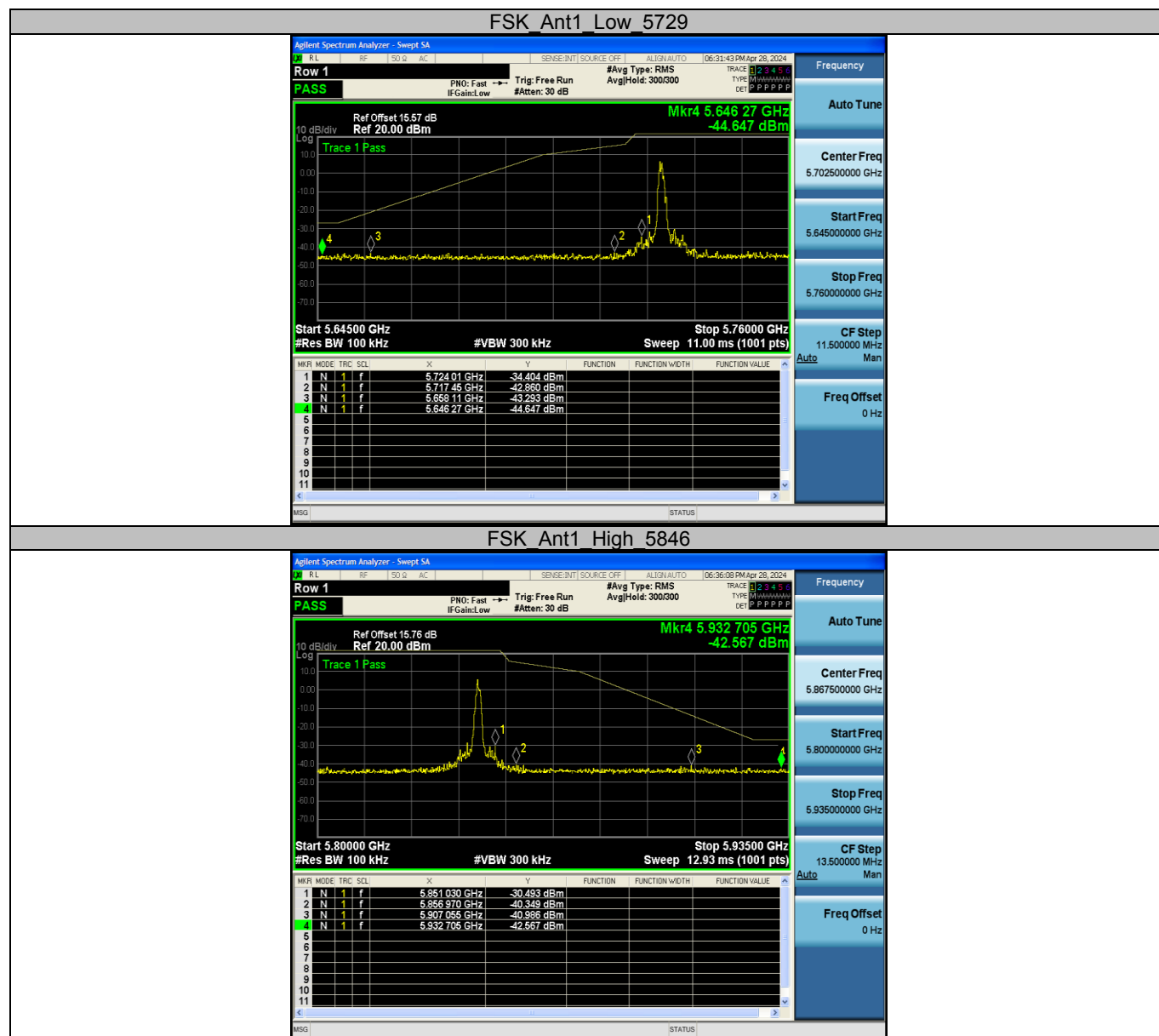
2.The Duty Cycle Factor and RBW Factor is compensated in the graph.

6.14.2 Test Graphs



6.15 Appendix E: Band edge measurements

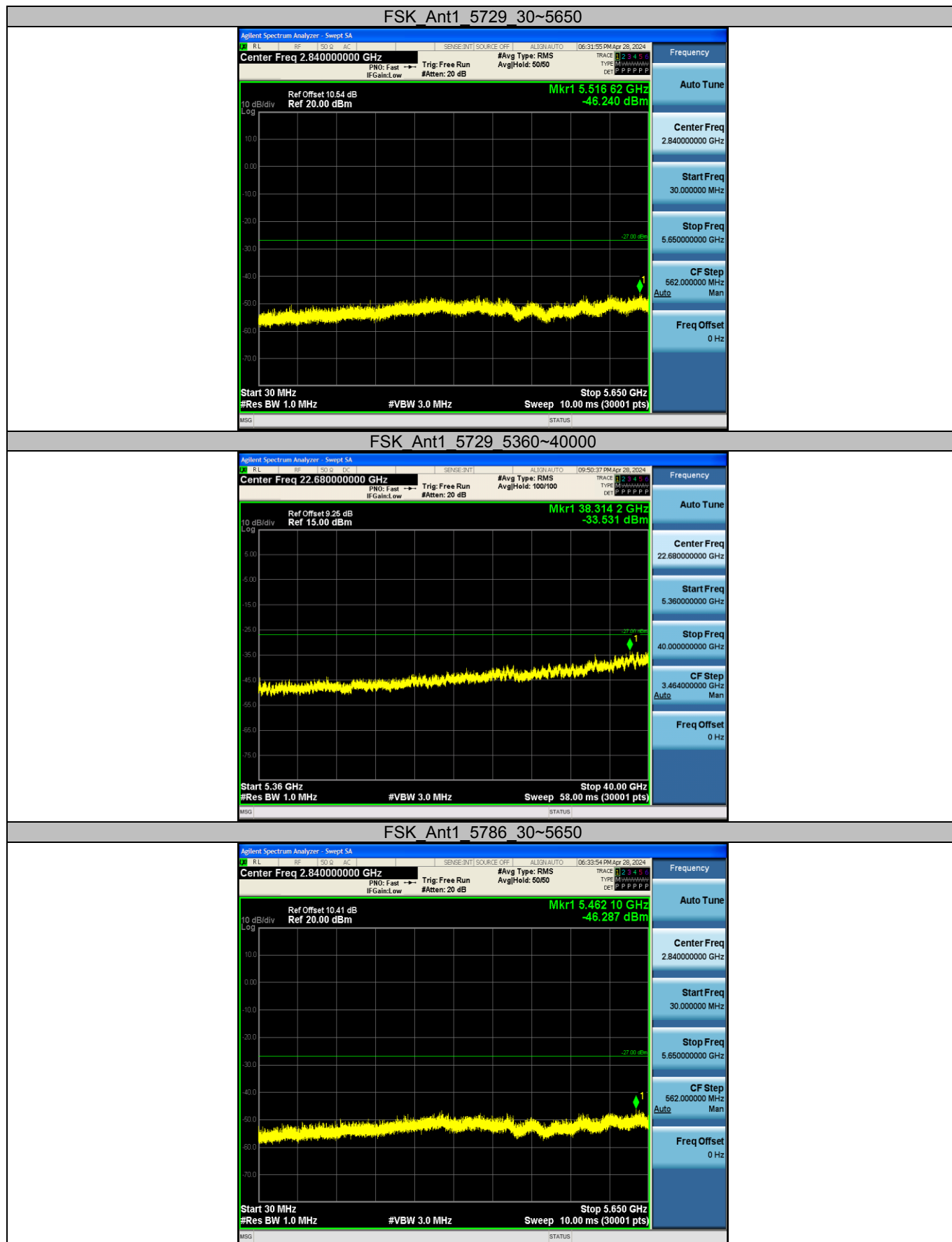
6.15.1 Test Graphs

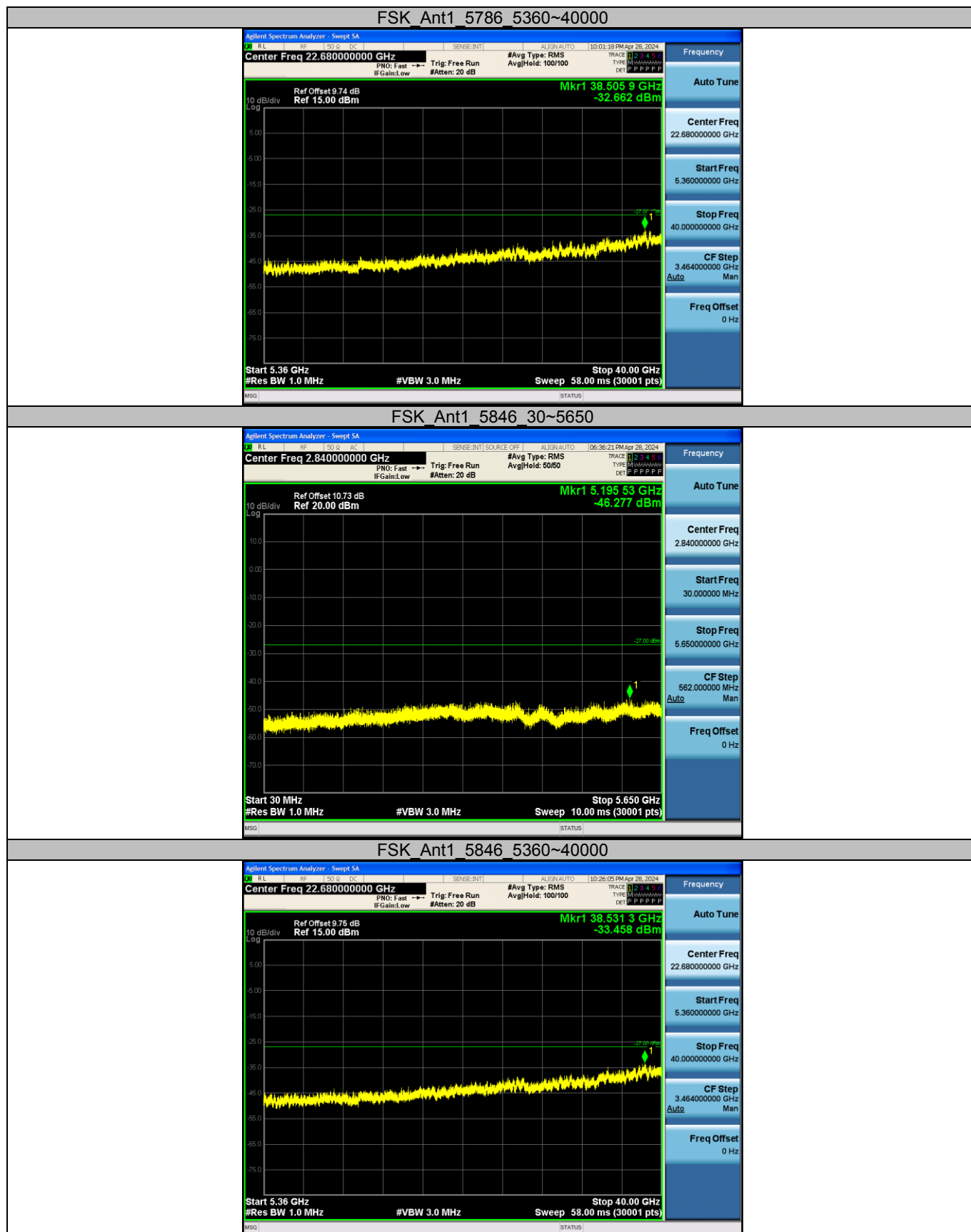


Note: The antenna gain and cable loss is compensated in the test plot.

6.16 Appendix F: Conducted Spurious Emission

6.16.1 Test Graphs





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

----End of Report----