TEST REPORT

Product	:	Wearable watch
Trade mark	:	SenScan
Model/Type reference	:	SF-1xx, SF-110, SF-120, SF-130, SF-131
Serial Number	:	N/A
Report Number	:	EED32L00349804
FCC ID	:	2AVLV-SPS-20190001
Date of Issue	:	Aug.19, 2020
Test Standards	:	47 CFR Part 15 Subpart E
Test result	:	PASS

Prepared for:

SPS, Inc.

70, Techno 8-ro, Yuseong-gu, Daejeon, Korea (34028)

Prepared by:

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Date: Aug.19, 2020

Check No.: 4038852739

CENTRE TESTING INTERNATIONAL GROUP CO.,LTD. CTI Report Seal

2 Version

Version No.	Date	Description
00	Aug.19, 2020	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart E Section 15.407 (b)(6)	ANSI C63.10-2013	PASS
Conducted Output Power and transmit power control mechanism	47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(4)(h)(1)	ANSI C63.10-2013	PASS
26dB emission bandwidth	47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)	ANSI C63.10-2013	PASS
Peak Power Spectral Density	47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(5)	ANSI C63.10-2013	PASS
Peak power excursion	47 CFR Part 15 Subpart E Section 15.407 (a)(6)	ANSI C63.10-2013	PASS
Frequency stability	47 CFR Part 15 Subpart E Section 15.407 (g)	ANSI C63.10-2013	PASS
Conducted Band-edge Measurements	47 CFR Part 15 Subpart E Section 15.407(b)(1)to(6)	ANSI C63.10-2013	PASS
Dynamic Frequency Selection	47 CFR Part 15 Subpart E Section 15.407 (h)	KDB905462 D02	PASS
Operation in the absence of information to the transmit	47 CFR Part 15 Subpart E Section 15.407 (c)	47 CFR Part 15 Subpart E	PASS
Unwanted Emissions that fall Outside of the Restricted Bands	47 CFR Part 15 Subpart E Section 15.407 (b)(1)(2)(3)(5)	ANSI C63.10-2013	PASS
Unwanted Emissions in the Restricted Bands	47 CFR Part 15 Subpart E Section 15.407 (b)(6)(7)(8)	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15 Subpart E Section 15.407 (b)(6)(7)(8)	ANSI C63.10-2013	PASS
Duty cycle	47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(4)(h)(1)	ANSI C63.10-2013	PASS

Remark:
The tested sample(s) and the sample information are provided by the client.
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radiated Frequency.
CH: In this whole report CH means channel.
Volt: In this whole report Volt means Voltage.
Temp: In this whole report Temp means Temperature.
Humid: In this whole report Humid means humidity.
Press: In this whole report Press means Pressure.
N/A: In this whole report not application
Model No.:SF-1xx, SF-110, SF-120, SF-130, SF-131
Only the model SF-120 was tested, Their electrical circuit design, layout, components used and internal wiring are identical, only the model name and appearance color are different..

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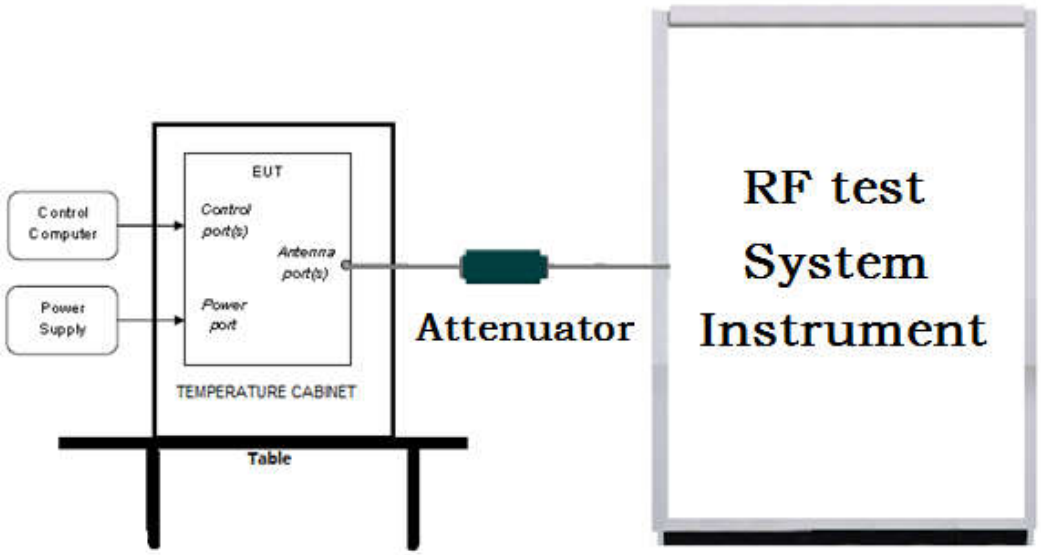
5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

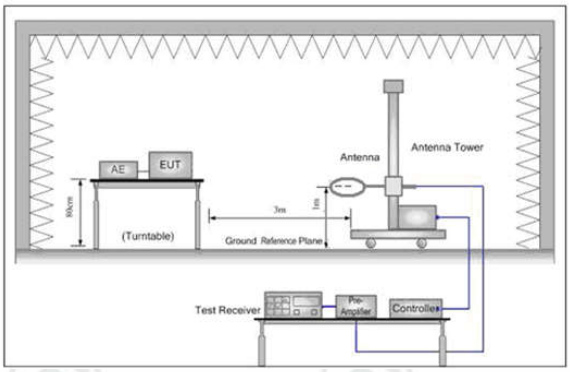


Figure 1. Below 30MHz

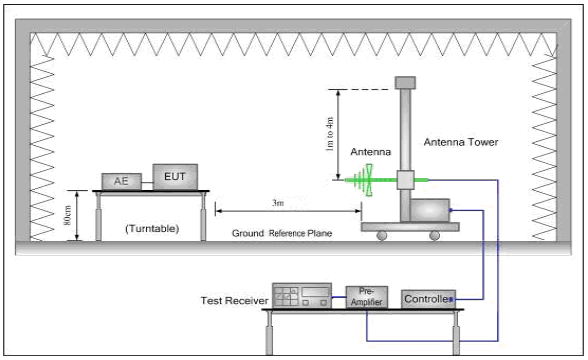


Figure 2. 30MHz to 1GHz

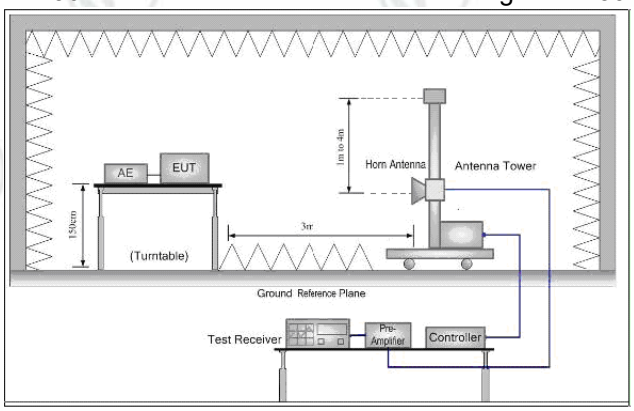
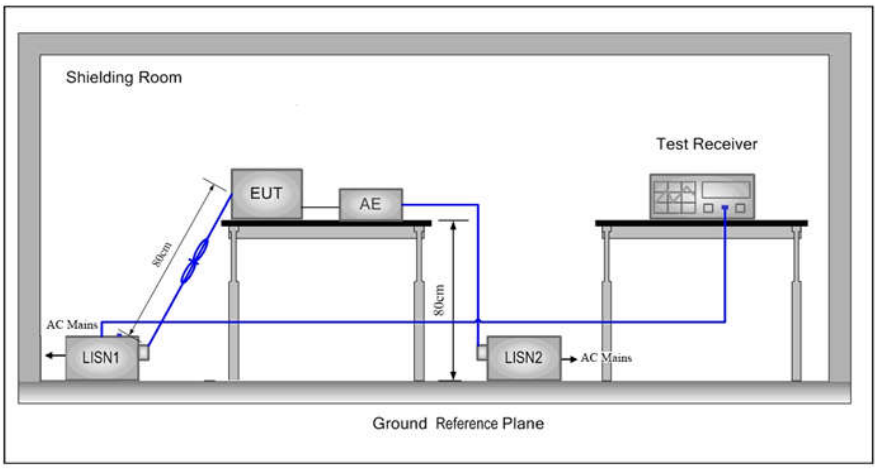


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:	
Temperature:	23.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(cm)	High(H)
802.11a/n/ac(HT20)	5150MHz ~5250 MHz	Channel 36	Channel 44	Channel 48
		5180MHz	5220MHz	5240MHz
802.11a/n/ac(HT20)	5250MHz ~5350 MHz	Channel 52	Channel 56	Channel 64
		5260MHz	5280MHz	5320MHz
802.11a/n/ac(HT20)	5470MHz ~5600 MHz	Channel 100	Channel108	Channel116
		5500MHz	5600MHz	5580MHz
802.11a/n/ac(HT20)	5650MHz ~5725 MHz	Channel 132	Channel136	Channel140
		5660MHz	5680MHz	5700MHz
802.11a/n/ac(HT20)	5725MHz ~5850 MHz	Channel 149	Channel157	Channel165
		5745MHz	5785MHz	5825MHz
802.11n/ac(HT40)	5150MHz ~5250 MHz	Channel 38	N/A	Channel 46
		5190MHz	N/A	5230MHz
802.11n/ac(HT40)	5250MHz ~5350 MHz	Channel54	N/A	Channel62
		5270MHz	N/A	5310MHz
802.11n/ac(HT40)	5470MHz ~5600 MHz	Channel 102	N/A	Channel 110
		5510MHz	N/A	5550MHz
802.11n/ac(HT40)	5650MHz ~5725 MHz	Channel 134	N/A	N/A
		5670MHz	N/A	N/A
802.11n/ac(HT40)	5725MHz ~5850 MHz	Channel 151	N/A	Channel 159
		5755MHz	N/A	5795MHz
802.11ac(HT80)	5150MHz ~5250 MHz	Channel 42	N/A	N/A
		5210MHz	N/A	N/A
802.11ac(HT80)	5250MHz ~5350 MHz	Channel58	N/A	N/A
		5290MHz	N/A	N/A
802.11ac(HT80)	5470MHz ~5600 MHz	Channel 106	N/A	N/A
		5530MHz	N/A	N/A
802.11ac(HT80)	5725MHz ~5850 MHz	Channel 155	N/A	N/A
		5775MHz	N/A	N/A

6 General Information

6.1 Client Information

Applicant:	SPS, Inc.
Address of Applicant:	70, Techno 8-ro, Yuseong-gu, Daejeon, Korea (34028)
Manufacturer:	Shenzhen Skinod Technology Co. Ltd
Address of Manufacturer:	Building 28, No.9, Chuangxin Road, Jiangyang District, Luzhou City, Sichuan Province, China
Factory:	Shenzhen Skinod Technology Co. Ltd
Address of Factory:	Building 28, No.9, Chuangxin Road, Jiangyang District, Luzhou City, Sichuan Province, China

6.2 General Description of EUT

Product Name:	Wearable watch	
Model No.(EUT):	SF-1xx, SF-110, SF-120, SF-130, SF-131	
Test Model No.:	SF-120	
Trade mark:	SenScan	
EUT Supports Radios application:	IEEE 802.11 a/n(HT20): 5150MHz to 5250MHz, 5250 MHz to 5350MHz	
Power Supply:	Battery	DC 3.8V 1500mAh
Sample Received Date:	Nov. 22, 2019	
Sample tested Date:	Nov. 22, 2019 to Dec. 25, 2019	

6.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11a/n(HT20): 5180MHz ~5240 MHz IEEE 802.11a/n(HT20): 5260MHz ~5320 MHz
Channel Numbers:	IEEE 802.11a/n(HT20): 5180MHz ~5240 MHz / 4 channel IEEE 802.11a/n(HT20): 5260MHz ~5320 MHz / 4 channel
Type of Modulation:	DSSS,OFDM
Test Power Grade:	IEEE 802.11a: 5180MHz: 13, 5200MHz: 13, 5240MHz: 14, 5260MHz: 14, 5280MHz: 14, 5320MHz: 13 IEEE 802.11n(HT20): 5180MHz: 14, 5200MHz: 13, 5240MHz: 13, 5260MHz: 13, 5280MHz: 13, 5320MHz: 13
Test Software of EUT:	Default
Antenna Type and Gain:	FPC antenna, Gain: 2.35dBi
Test Voltage:	DC 3.8V

Operation Frequency each of channel

For 802.11a/n(HT20) Operation in the 5180 ~ 5240 band							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz

For 802.11a/n(HT20) Operation in the 5260MHz ~5320 MHz MHz band							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
52	5260MHz	56	5280MHz	60	5300MHz	64	5320MHz

6.4 Description of Support Units

The EUT has been tested independently

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd
Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China
Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385
No tests were sub-contracted.
FCC Designation No.: CN1164

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

6.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

7 Equipment List

RF test system					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. Date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Spectrum Analyzer	Keysight	N9010A	MY54510339	03-01-2019	02-29-2020
Signal Generator	Keysight	N5182B	MY53051549	03-01-2019	02-29-2020
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	07-26-2019	07-25-2020
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-09-2019	01-08-2020
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-09-2019	01-08-2020
DC Power	Keysight	E3642A	MY56376072	03-01-2019	02-29-2020
PC-1	Lenovo	R4960d	---	03-01-2019	02-29-2020
BT&WI-FI Automatic control	R&S	OSP120	101374	03-01-2019	02-29-2020
RF control unit	JS Tonscend	JS0806-2	158060006	03-01-2019	02-29-2020
BT&WI-FI Automatic test software	JS Tonscend	JS1120-3	---	03-01-2019	02-29-2020

Conducted disturbance Test					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Receiver	R&S	ESCI	100435	05-20-2019	05-19-2020
Temperature/ Humidity Indicator	Defu	TH128	/	06-14-2019	06-13-2020
LISN	R&S	ENV216	100098	05-08-2019	05-07-2020
Barometer	changchun	DYM3	1188	06-20-2019	06-19-2020

3M Semi/full-anechoic Chamber					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05-24-2019	05-23-2022
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	07-26-2019	07-25-2020
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-25-2018	04-24-2021
Receiver	R&S	ESCI7	100938-003	10-21-2019	10-20-2020
Multi device Controller	maturo	NCD/070/107 11112	---	01-09-2019	01-08-2020
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	07-26-2019	07-25-2020
Cable line	Fulai(7M)	SF106	5219/6A	01-09-2019	01-08-2020
Cable line	Fulai(6M)	SF106	5220/6A	01-09-2019	01-08-2020
Cable line	Fulai(3M)	SF106	5216/6A	01-09-2019	01-08-2020
Cable line	Fulai(3M)	SF106	5217/6A	01-09-2019	01-08-2020

3M full-anechoic Chamber					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
RSE Automatic test software	JS Tonscend	JS36-RSE	10166	06-19-2019	06-18-2020
Receiver	Keysight	N9038A	MY57290136	03-27-2019	03-26-2020
Spectrum Analyzer	Keysight	N9020B	MY57111112	03-27-2019	03-26-2020
Spectrum Analyzer	Keysight	N9030B	MY57140871	03-27-2019	03-26-2020
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-25-2018	04-24-2021
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-25-2018	04-24-2021
Horn Antenna	ETS-LINDGREN	3117	00057407	07-10-2018	07-09-2021
Preamplifier	EMCI	EMC184055SE	980596	05-22-2019	5-21-2020
Preamplifier	EMCI	EMC001330	980563	05-08-2019	05-07-2020
Preamplifier	JS Tonscend	980380	EMC051845 SE	01-16-2019	01-15-2020
Temperature/ Humidity Indicator	biaozhi	GM1360	EE1186631	04-30-2019	04-29-2020
Fully Anechoic Chamber	TDK	FAC-3	---	01-17-2018	01-16-2021
Filter bank	JS Tonscend	JS0806-F	188060094	04-10-2018	04-09-2021
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	01-09-2019	01-08-2020
Cable line	Times	EMC104-NMNM-1000	SN160710	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	01-09-2019	01-08-2020
Cable line	Times	HF160-KMKM-3.00M	393493-0001	01-09-2019	01-08-2020

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15E	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicesed Wireless Devices
3	KDB789033 D02 General UNII Test Procedures New Rules v01	Guidelines for compliance testing of unlicensed national information infrastructure (U-NII) device part 15 subpart E

Test Results List:

Test Requirement	Test method	Test item	Verdict	Note
Part15E Section 15.407 (a)(1)(2)(4)(h)(1)	KDB789033 D02v01	Conducted Output Power and transmit power control mechanism	PASS	Appendix B)
Part15E Section 15.407 (a)(1)(2)	KDB789033 D02v01	26dB Occupied Bandwidth	PASS	Appendix A)
Part15E Section 15.407 (a)(1)(2)(5)	KDB789033 D02v01	Power Spectral Density	PASS	Appendix C)
Part15E Section 15.407 (a)(6)	KDB789033 D02v01	Peak power excursion	PASS	Appendix D)
Part15E Section 15.407 (g)	KDB789033 D02v01	Frequency stability	PASS	Appendix E)
Part15C Section 15.203	ANSI C63.10	Antenna Requirement	PASS	Appendix F)
Part15E Section 15.407 (c)	Section 15.407	Operation in the absence of information to the transmit	PASS	Appendix G)
Part15E Section 15.407 (b)(6)	ANSI C63.10	AC Power Line Conducted Emission	PASS	Appendix H)
Part15E Section 15.407 (b)(6)(7)(8)	KDB789033 D02v01	Restricted bands around fundamental frequency (Radiated Emission)	PASS	Appendix I)
Part15E Section 15.407 (b)(6)(7)(8)	KDB789033 D02v01	Unwanted Emissions in the Restricted Bands	PASS	Appendix J)
Part15E Section 15.407 (b)(1)(2)(3)(5)	KDB789033 D02v01	Unwanted Emissions that fall Outside of the Restricted Bands	PASS	Appendix K)
47 CFR Part 15 Subpart E Section 15.407 (h)	KDB905462 D02	Dynamic Frequency Selection	PASS	Appendix L)

Duty Cycle

Directional Antenna Gain

The TX chains are correlated, the antenna gain is equal among the chains.
Employs an antennathat operates simultaneously onmultiple directional beams using the same frequency channels. No carrier aggregation techniques.
The directional gainis:

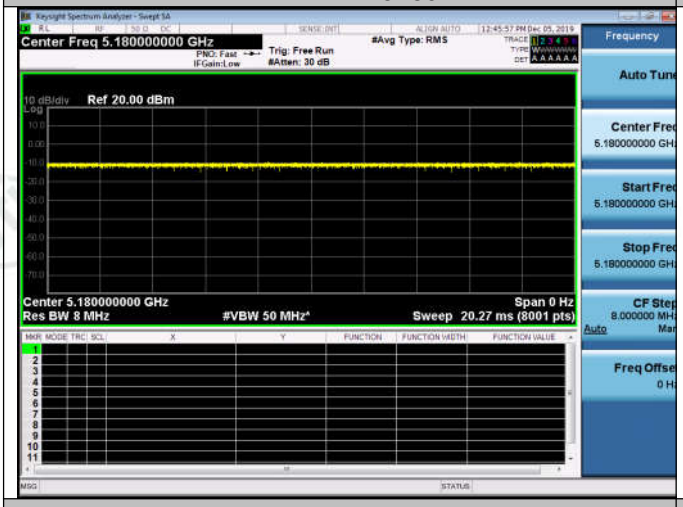
Antenna 0 Gain(dBi)	Antenna 0 Gain(dBi)	Correlated Chains DirectionalGain(dBi)
3	3	6.01

Duty Cycle

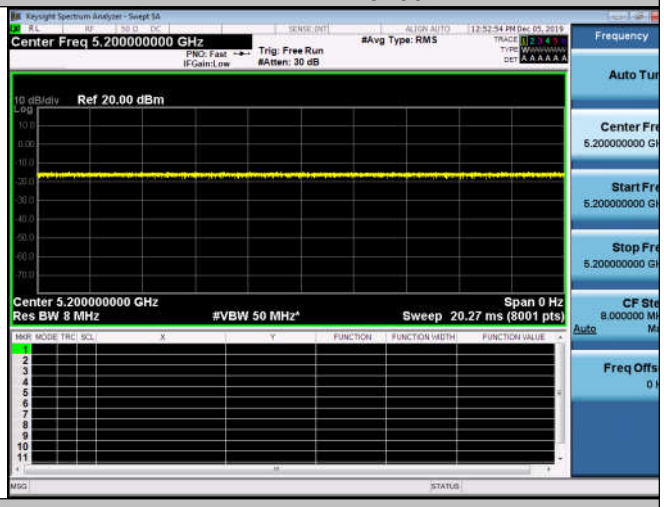
ANT1			
Test Mode	**Channel**	**Duty Cycle[%]**	**Verdict**
11A	5180	100	PASS
11A	5200	100	PASS
11A	5240	100	PASS
11A	5260	100	PASS
11A	5280	100	PASS
11A	5320	100	PASS
11N20SISO	5180	100	PASS
11N20SISO	5200	100	PASS
11N20SISO	5240	100	PASS
11N20SISO	5260	100	PASS
11N20SISO	5280	100	PASS
11N20SISO	5320	100	PASS

Duty Cycle Test Graph

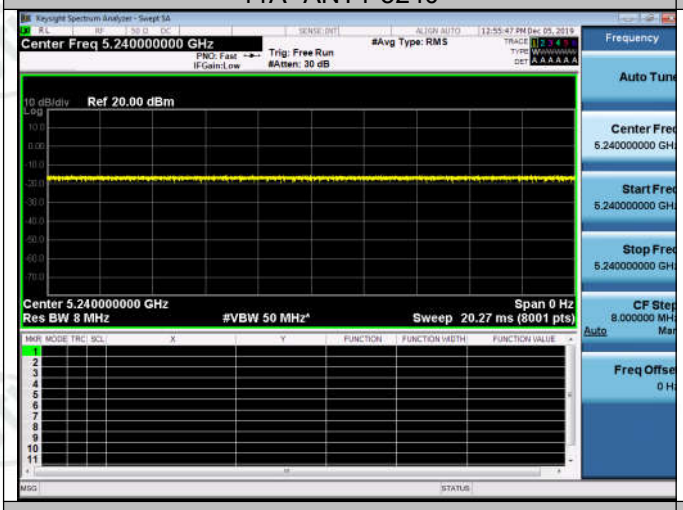
11A -ANT1-5180



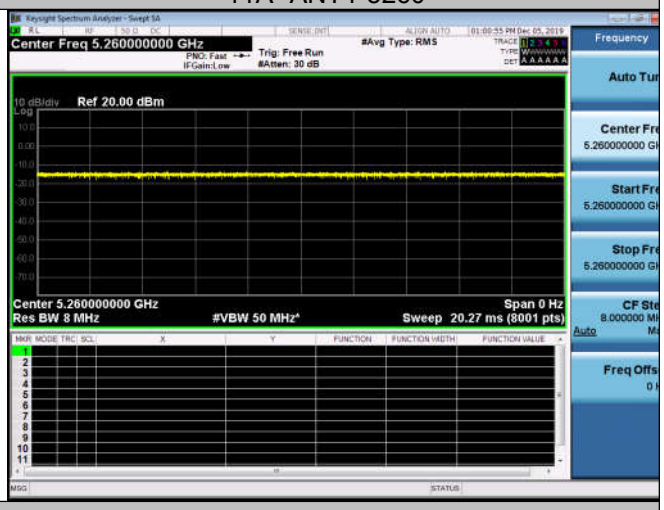
11A -ANT1-5200



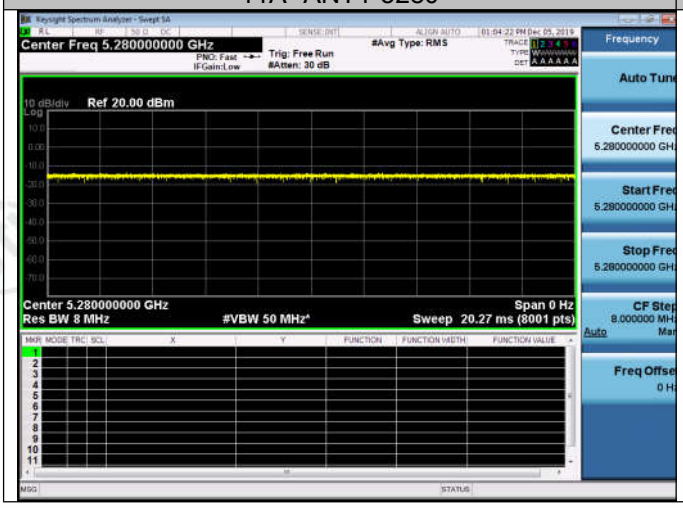
11A -ANT1-5240



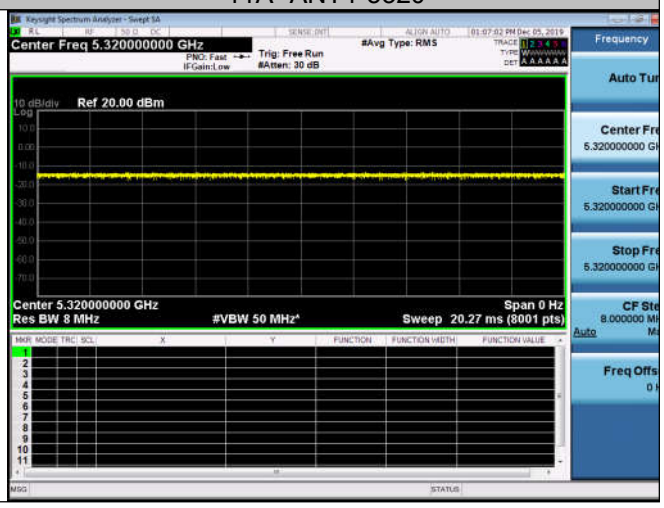
11A -ANT1-5260



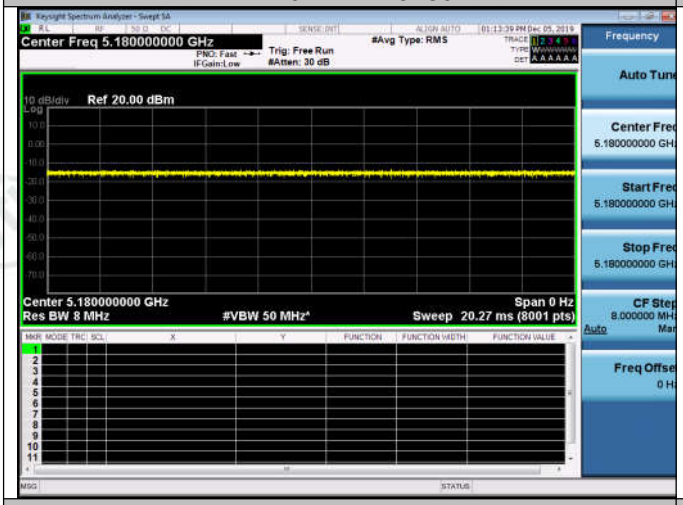
11A -ANT1-5280



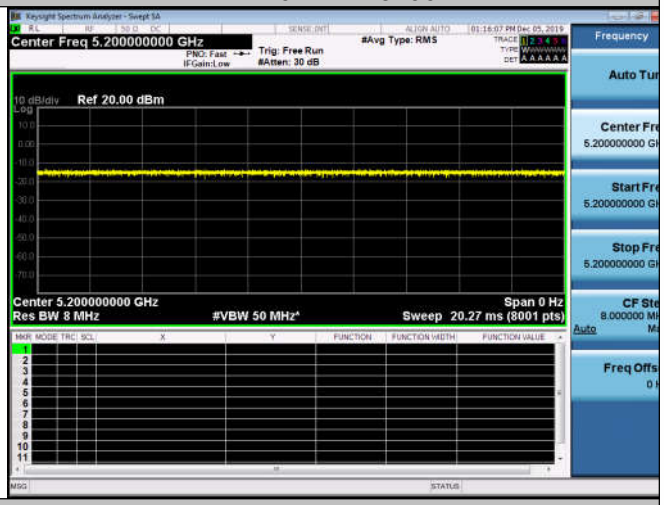
11A -ANT1-5320



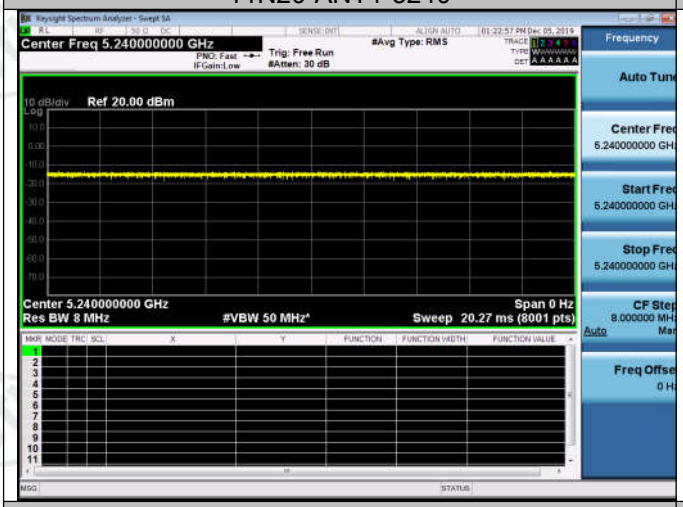
11N20 -ANT1-5180



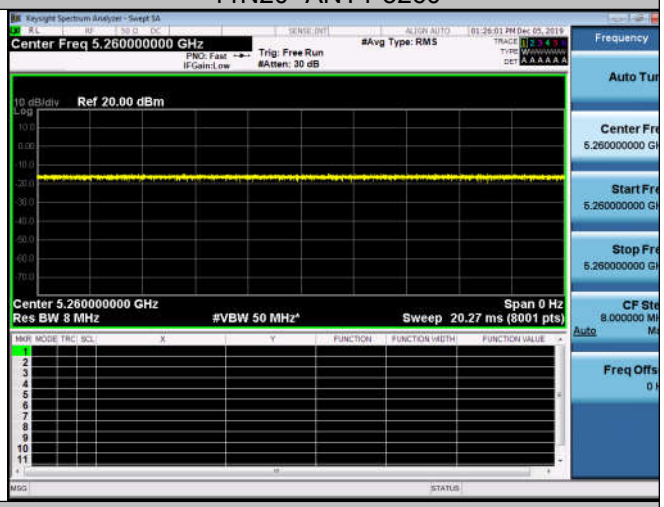
11N20-ANT1-5200



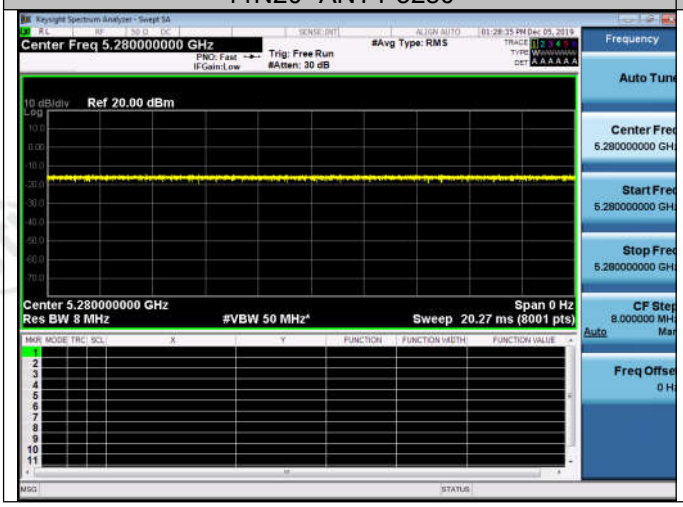
11N20-ANT1-5240



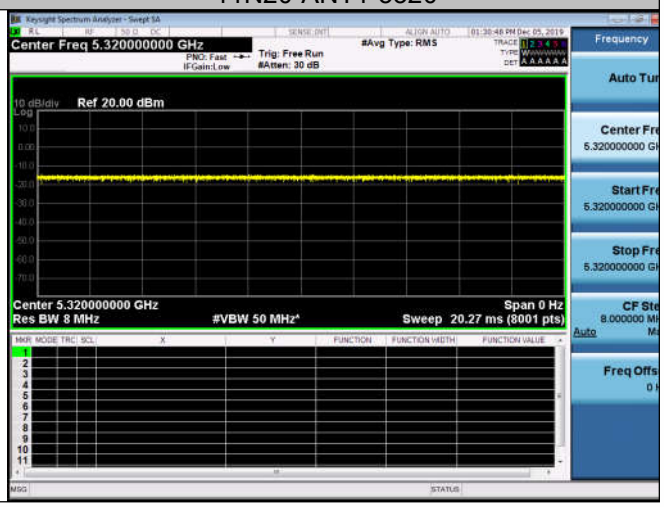
11N20 -ANT1-5260



11N20 -ANT1-5280



11N20-ANT1-5320



Appendix A): Emission Bandwidth

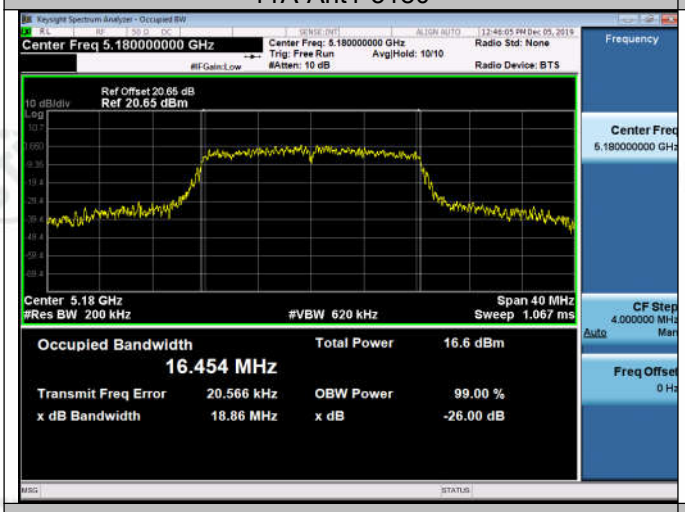
Result Table

99% bandwidth

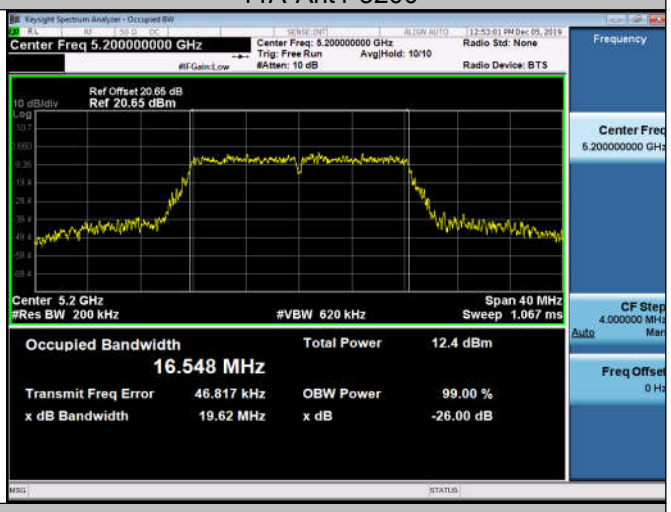
Test Mode	Antenna	Channel	OBW[MHz]	Verdict
11A	Ant1	5180	16.454	PASS
11A	Ant1	5200	16.548	PASS
11A	Ant1	5240	16.607	PASS
11A	Ant1	5260	16.414	PASS
11A	Ant1	5280	16.433	PASS
11A	Ant1	5320	16.429	PASS
11N20SISO	Ant1	5180	17.571	PASS
11N20SISO	Ant1	5200	17.598	PASS
11N20SISO	Ant1	5240	17.565	PASS
11N20SISO	Ant1	5260	17.727	PASS
11N20SISO	Ant1	5280	17.751	PASS
11N20SISO	Ant1	5320	17.685	PASS

Test Graph

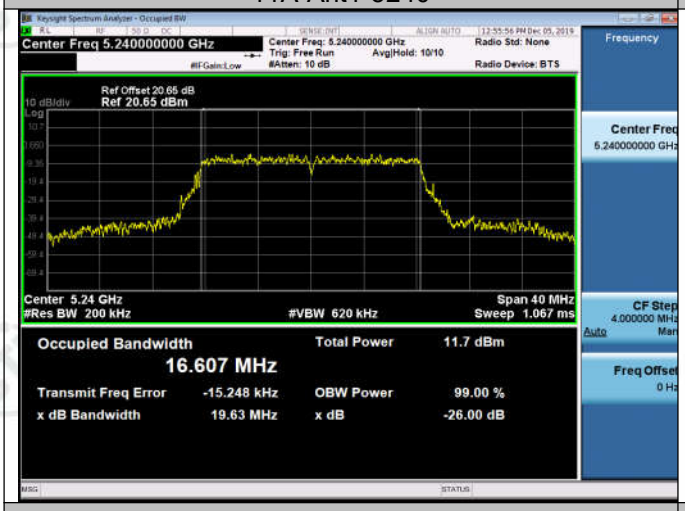
11A-Ant1-5180



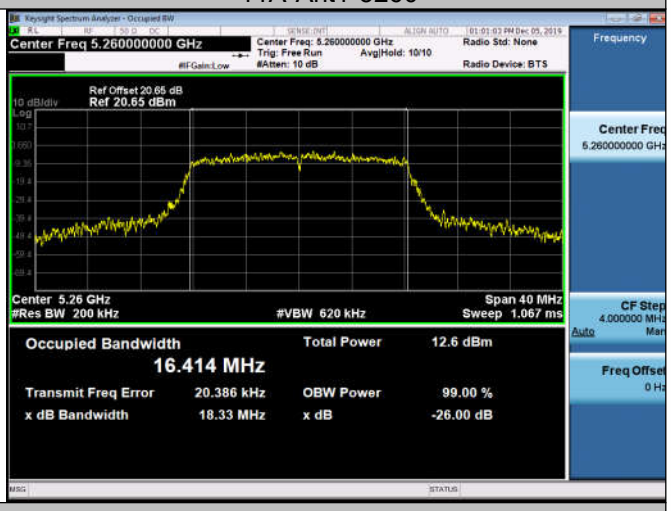
11A-Ant1-5200



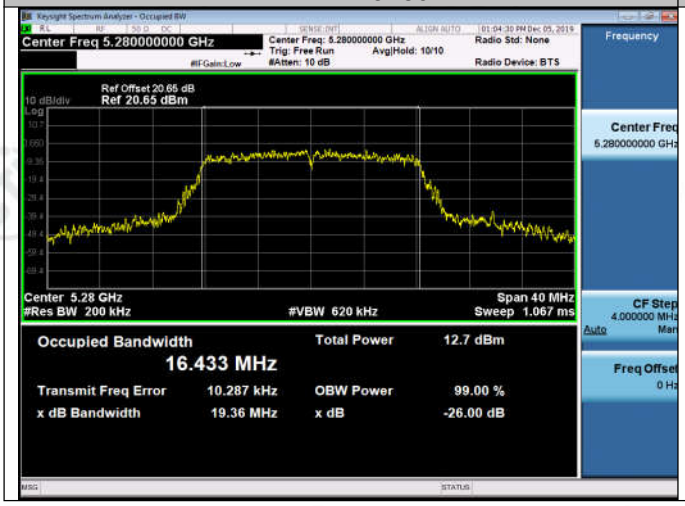
11A-Ant1-5240



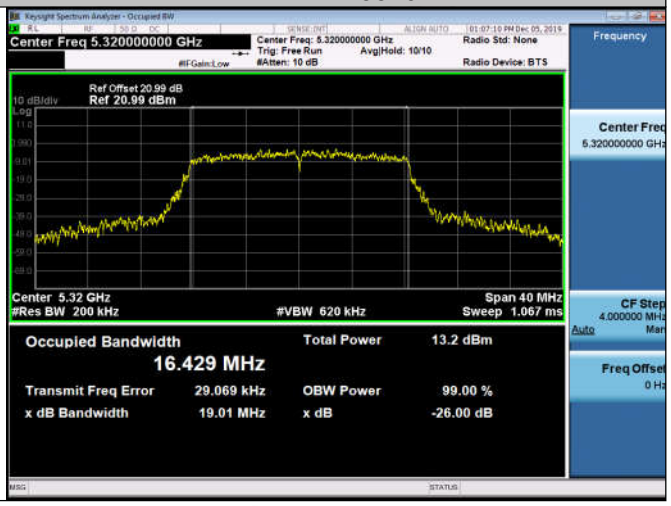
11A-Ant1-5260



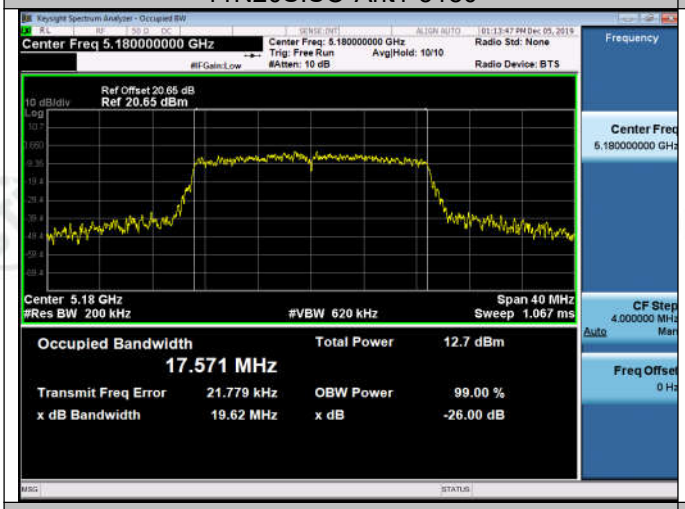
11A-Ant1-5280



11A-Ant1-5320



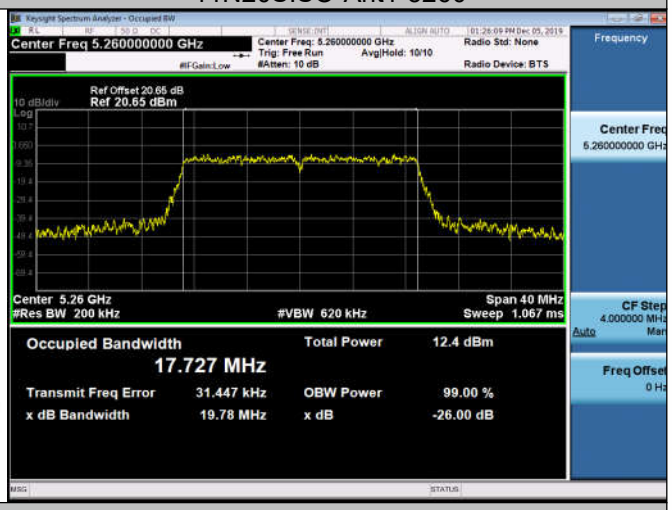
11N20SISO-Ant1-5180



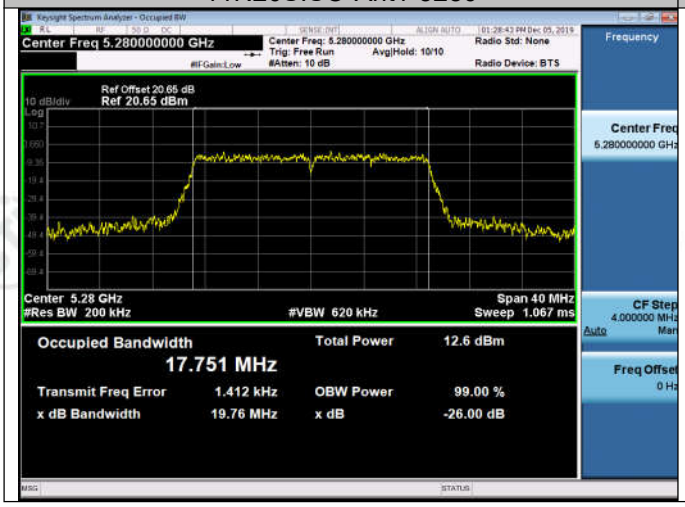
11N20SISO-Ant1-5200

11N20SISO-Ant1-5240

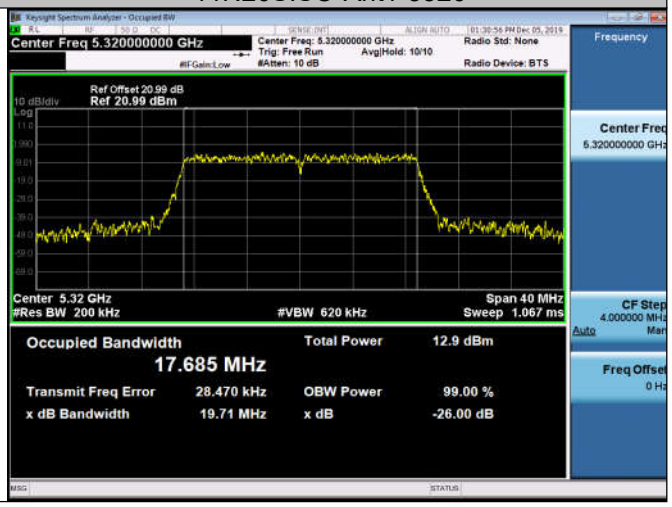
11N20SISO-Ant1-5260



11N20SISO-Ant1-5280



11N20SISO-Ant1-5320



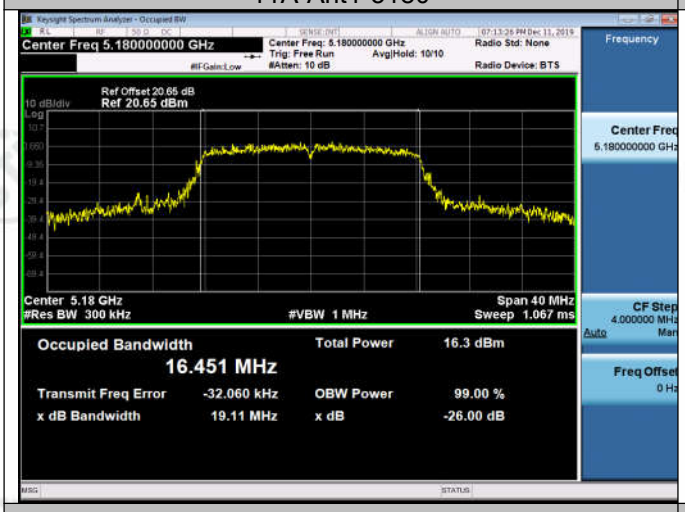
26db Down:

Result Table

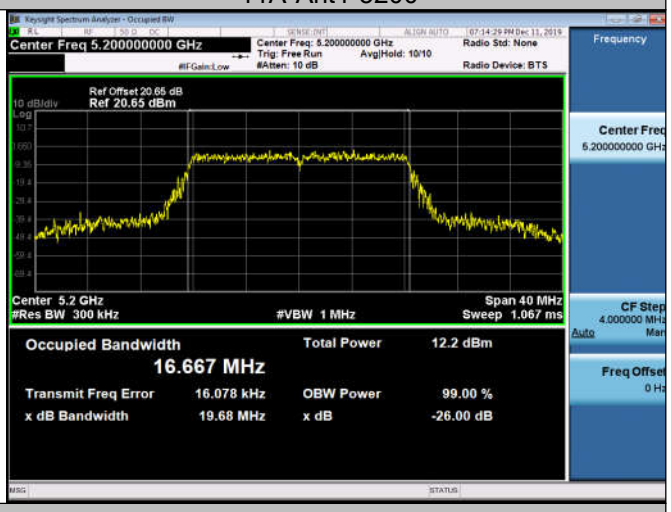
Test Mode	Antenna	Channel	EBW[MHz]	Verdict
11A	Ant1	5180	19.11	PASS
11A	Ant1	5200	19.68	PASS
11A	Ant1	5240	19.28	PASS
11A	Ant1	5260	19.52	PASS
11A	Ant1	5280	19.67	PASS
11A	Ant1	5320	19.59	PASS
11N20SISO	Ant1	5180	19.59	PASS
11N20SISO	Ant1	5200	19.57	PASS
11N20SISO	Ant1	5240	19.69	PASS
11N20SISO	Ant1	5260	19.60	PASS
11N20SISO	Ant1	5280	19.60	PASS
11N20SISO	Ant1	5320	19.47	PASS

Test Graph

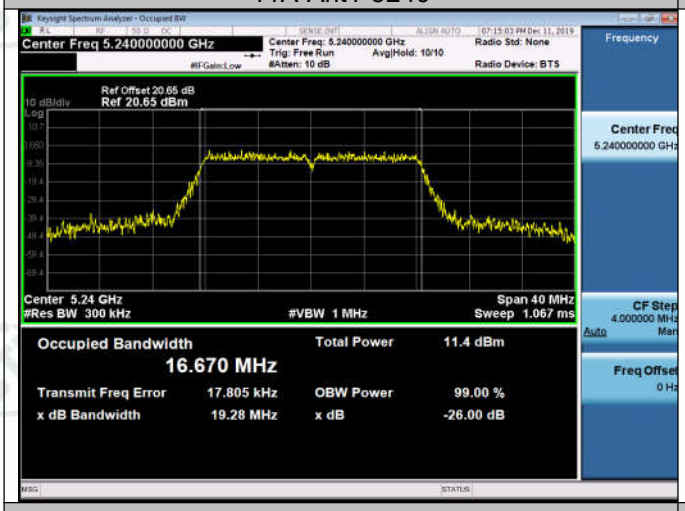
11A-Ant1-5180



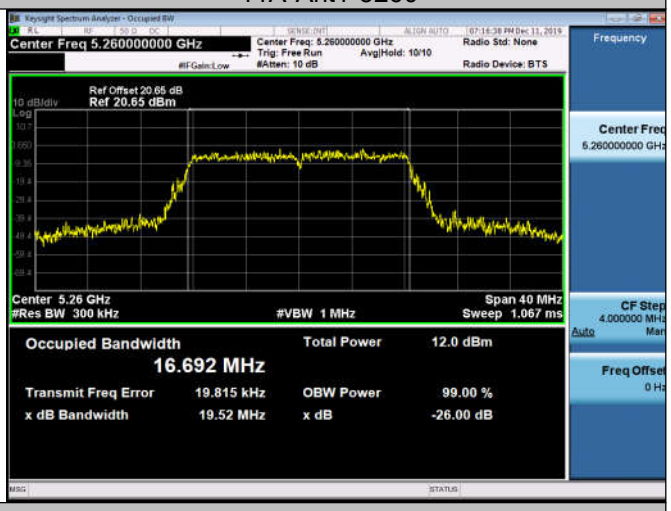
11A-Ant1-5200



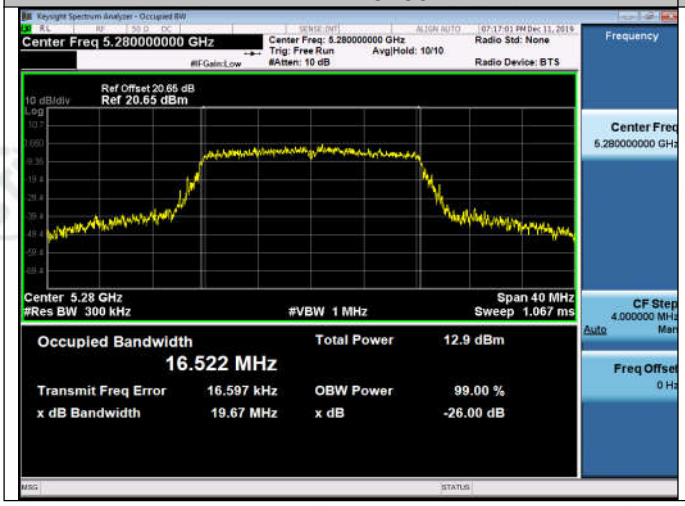
11A-Ant1-5240



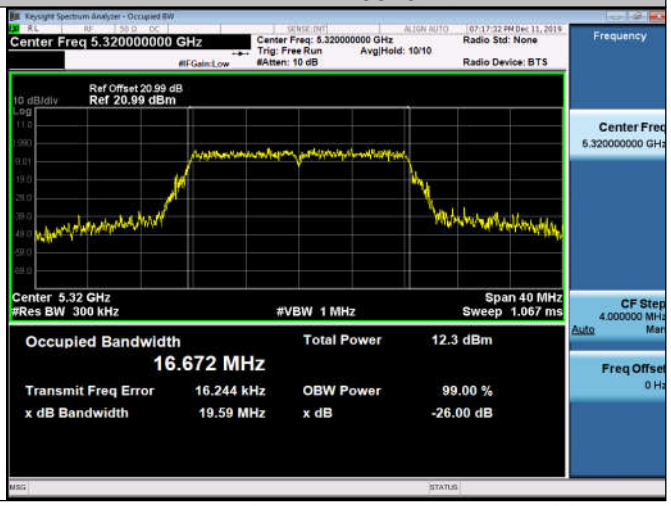
11A-Ant1-5260



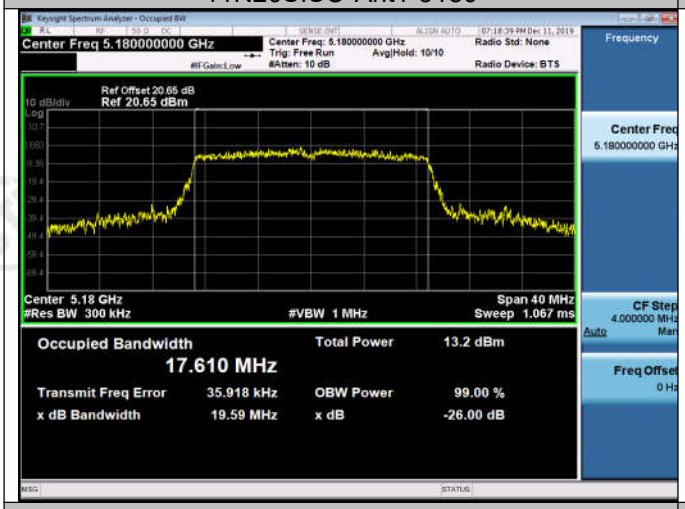
11A-Ant1-5280



11A-Ant1-5320

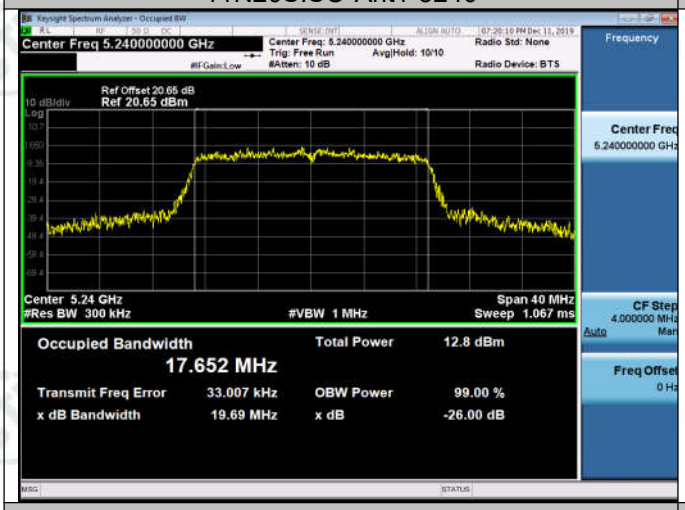


11N20SISO-Ant1-5180

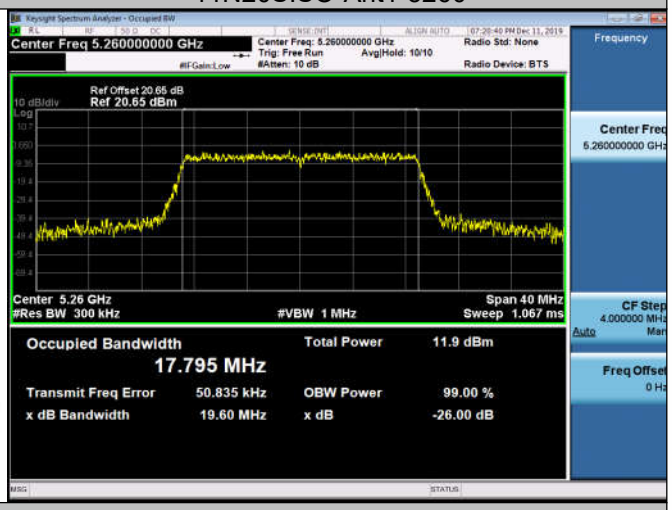


11N20SISO-Ant1-5200

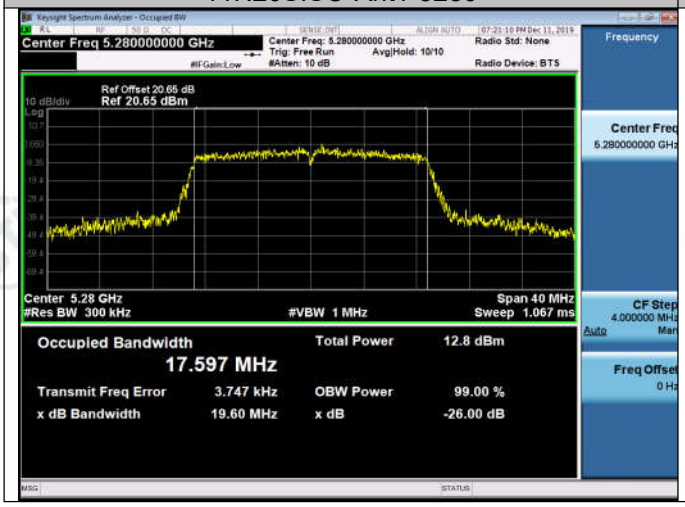
11N20SISO-Ant1-5240



11N20SISO-Ant1-5260



11N20SISO-Ant1-5280



11N20SISO-Ant1-5320

Appendix B): Maximum Conduct Output Power

Result Table

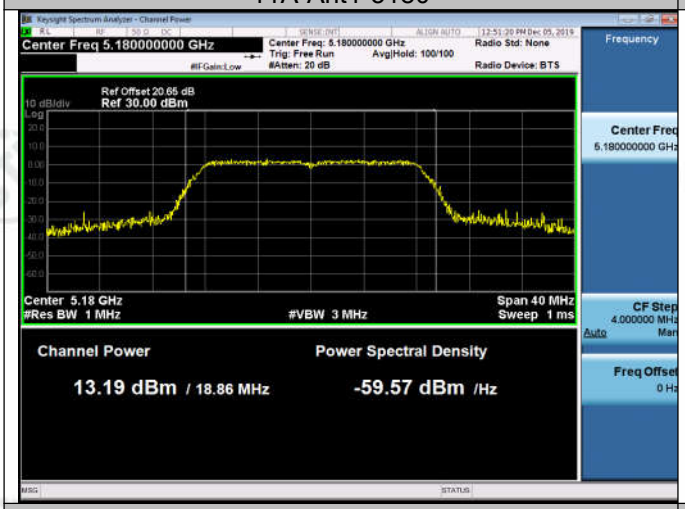
Test Mode	Antenna	Channel	Meas.Level [dBm]	Av.Power [dBm]	Verdict
11A	Ant1	5180	13.19	13.19	PASS
11A	Ant1	5200	13.19	13.19	PASS
11A	Ant1	5240	13.66	13.66	PASS
11A	Ant1	5260	13.79	13.79	PASS
11A	Ant1	5280	13.61	13.61	PASS
11A	Ant1	5320	13.21	13.21	PASS
11N20SISO	Ant1	5180	12.52	12.52	PASS
11N20SISO	Ant1	5200	13.03	13.03	PASS
11N20SISO	Ant1	5240	13.08	13.08	PASS
11N20SISO	Ant1	5260	13.69	13.69	PASS
11N20SISO	Ant1	5280	13.71	13.71	PASS
11N20SISO	Ant1	5320	13.16	13.16	PASS

Remark: Duty Factor(dB) = 10 * Log(1/Duty Cycle)

Av. Power(dBm) = Meas. Level(dBm) + Duty Factor(dB)

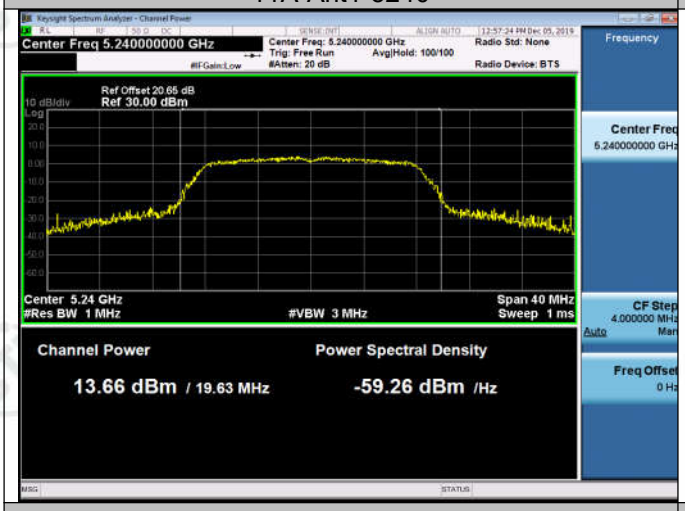
Test Graph

11A-Ant1-5180



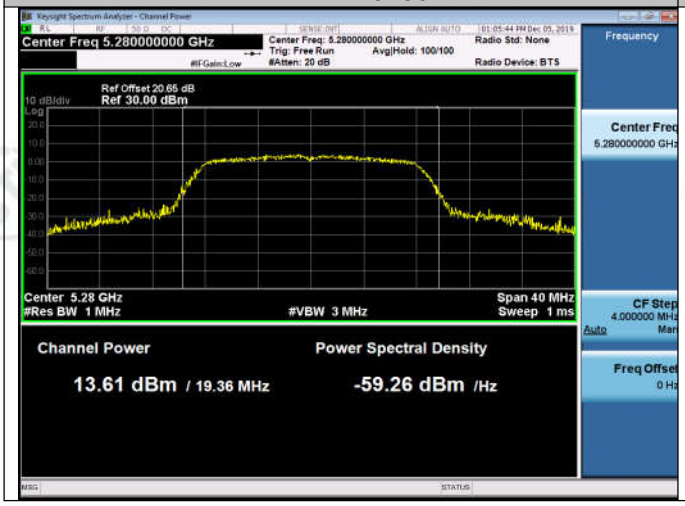
11A-Ant1-5200

11A-Ant1-5240

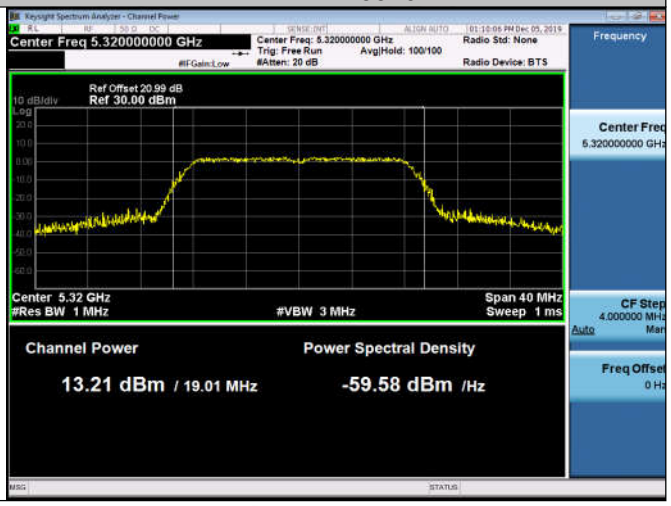


11A-Ant1-5260

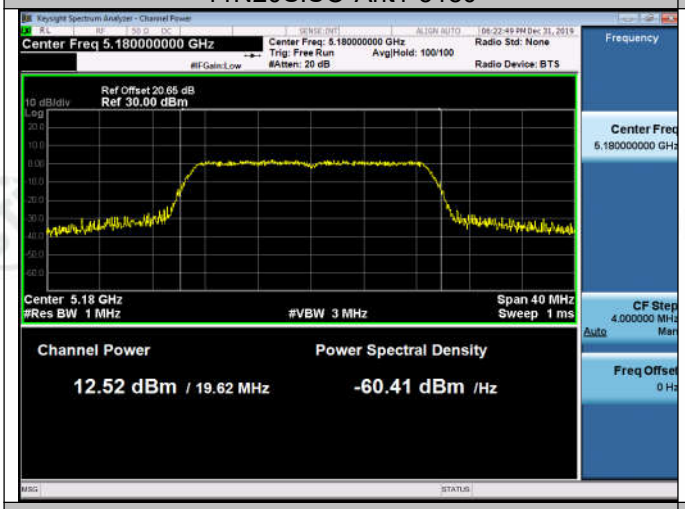
11A-Ant1-5280



11A-Ant1-5320

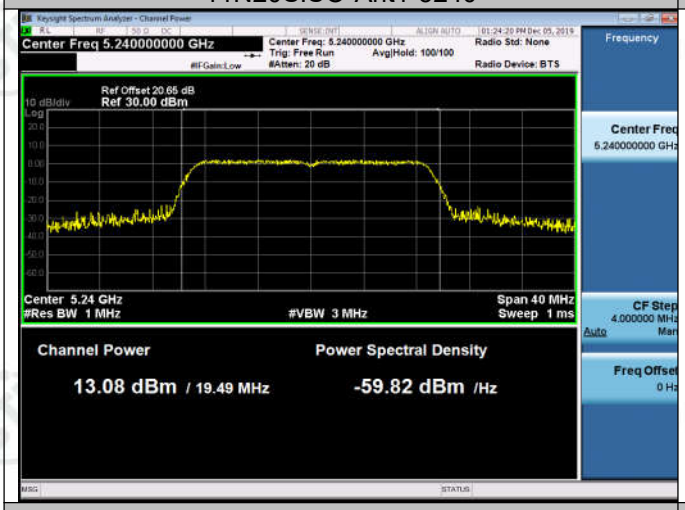


11N20SISO-Ant1-5180

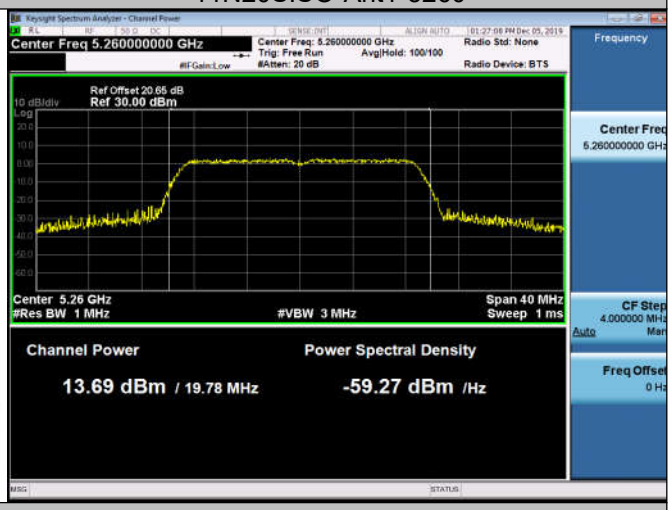


11N20SISO-Ant1-5200

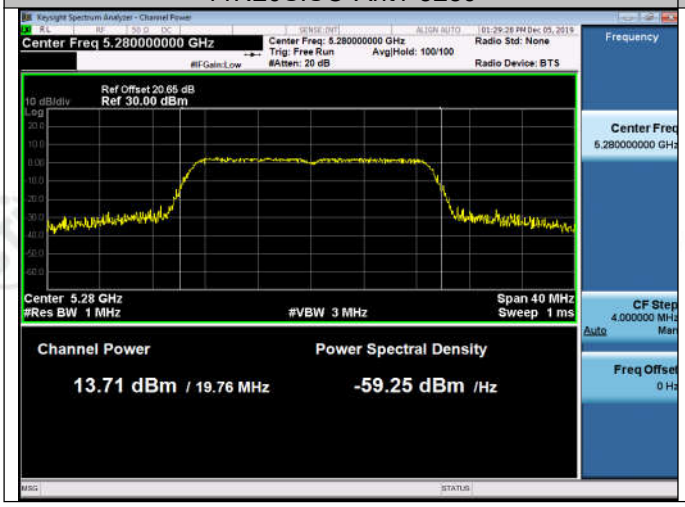
11N20SISO-Ant1-5240



11N20SISO-Ant1-5260



11N20SISO-Ant1-5280



11N20SISO-Ant1-5320

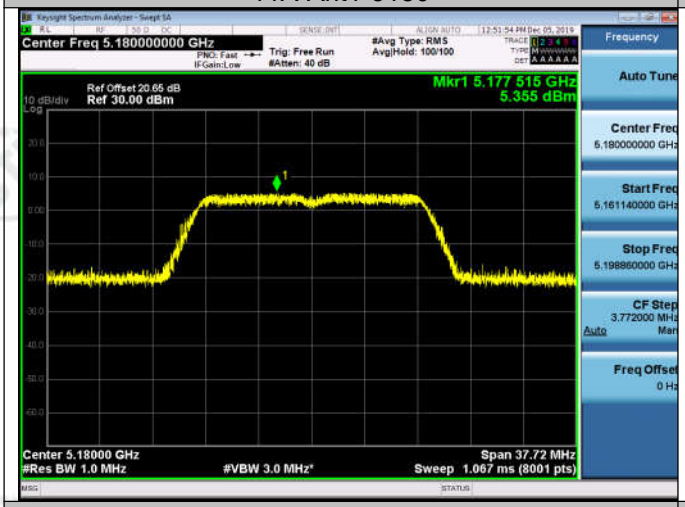
Appendix C): Power Spectral Density

Result Table

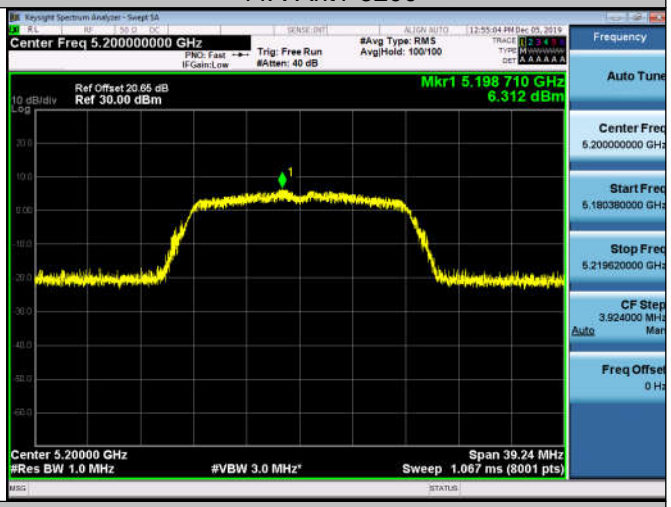
Test Mode	Antenna	Channel	Meas.Level [dBm]	PSD [dBm/MHz]	Verdict
11A	Ant1	5180	5.36	5.36	PASS
11A	Ant1	5200	6.31	6.31	PASS
11A	Ant1	5240	6.67	6.67	PASS
11A	Ant1	5260	7.91	7.91	PASS
11A	Ant1	5280	6.76	6.76	PASS
11A	Ant1	5320	5.73	5.73	PASS
Test Mode	**Antenna**	**Channel**	**Meas.Level [dBm]**	**PSD [dBm/MHz]**	**Verdict**
11N20SISO	Ant1	5180	3.48	3.48	PASS
11N20SISO	Ant1	5200	5.44	5.44	PASS
11N20SISO	Ant1	5240	5.26	5.26	PASS
11N20SISO	Ant1	5260	5.31	5.31	PASS
11N20SISO	Ant1	5280	5.77	5.77	PASS
11N20SISO	Ant1	5320	5.55	5.55	PASS

Test Graph

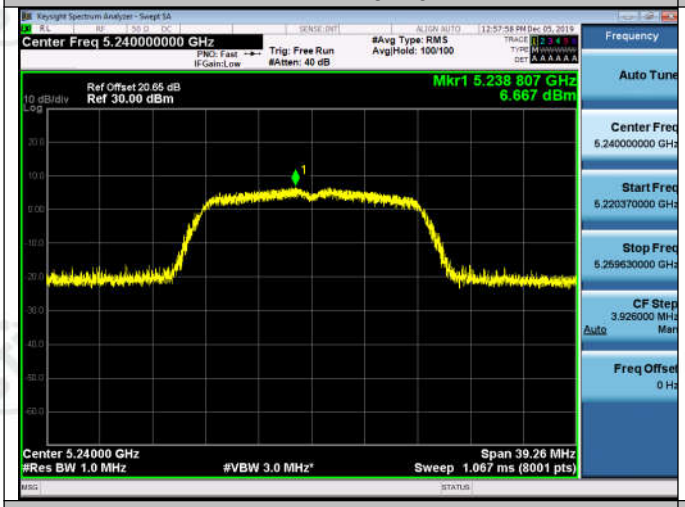
11A-Ant1-5180



11A-Ant1-5200

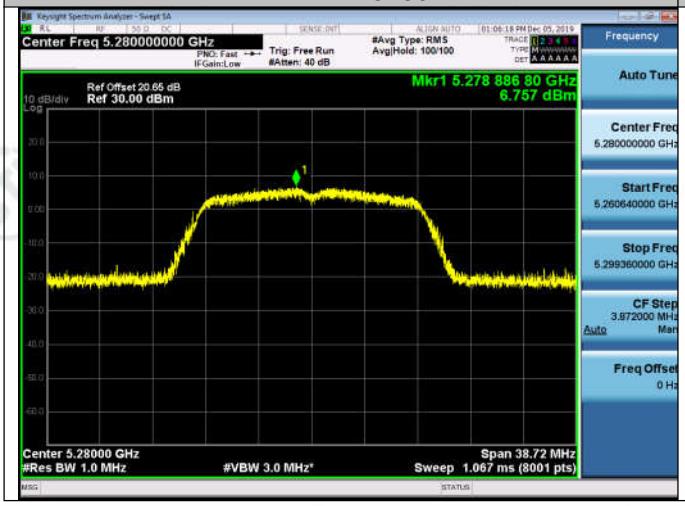


11A-Ant1-5240

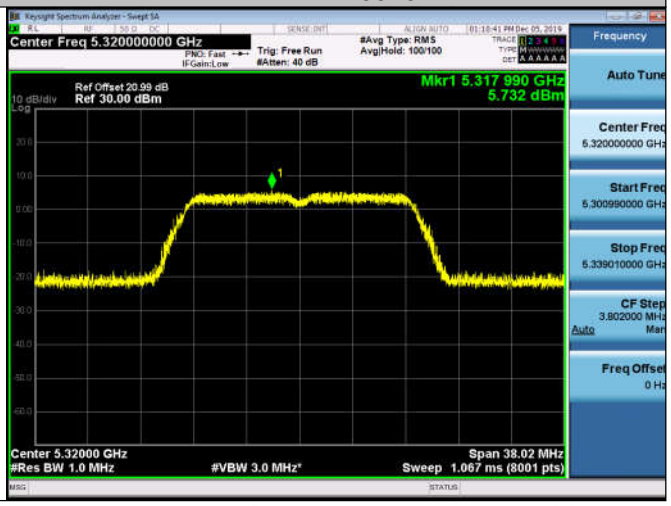


11A-Ant1-5260

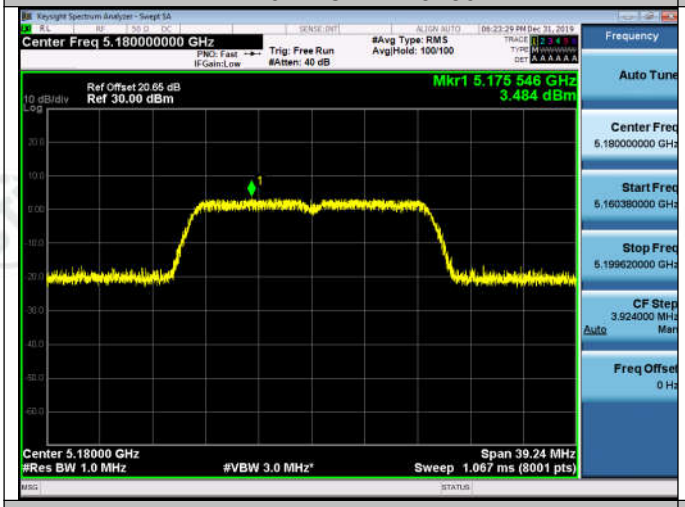
11A-Ant1-5280



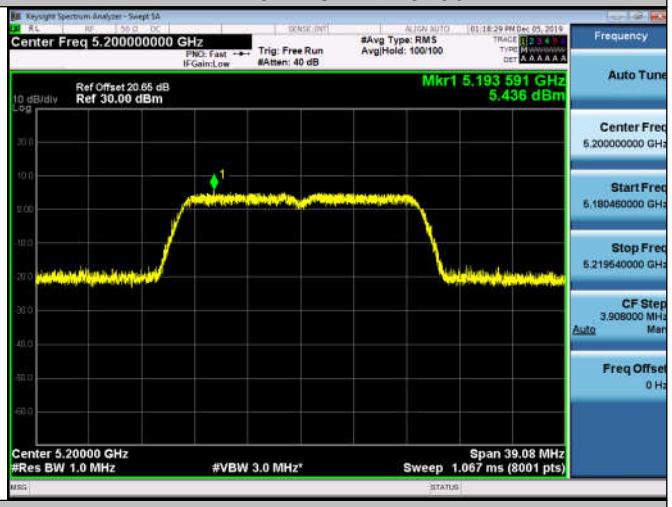
11A-Ant1-5320



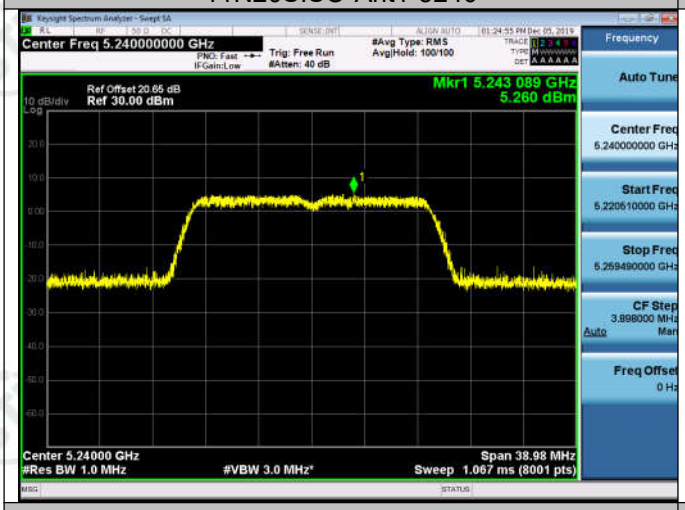
11N20SISO-Ant1-5180



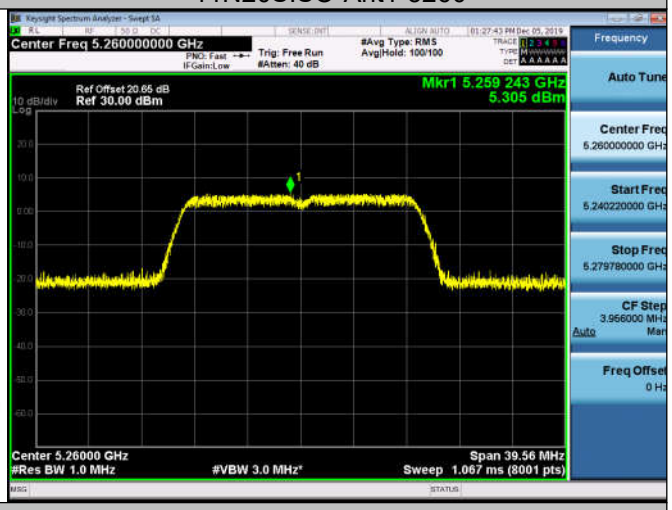
11N20SISO-Ant1-5200



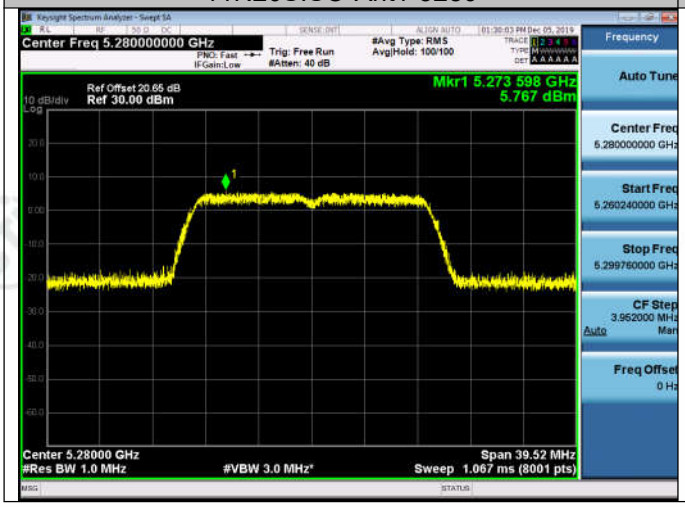
11N20SISO-Ant1-5240



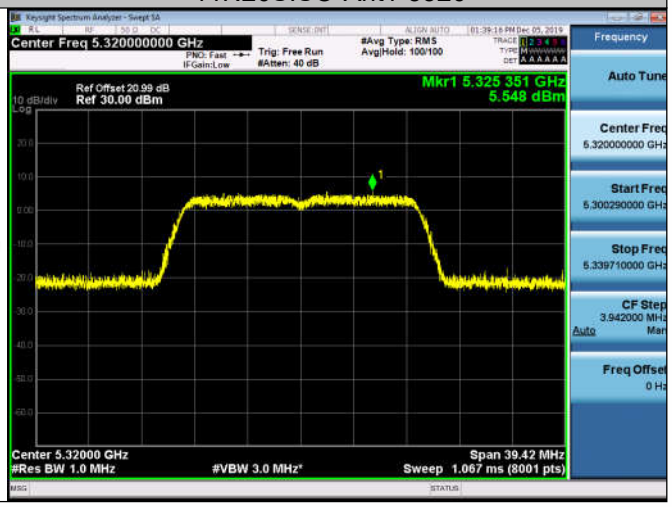
11N20SISO-Ant1-5260



11N20SISO-Ant1-5280



11N20SISO-Ant1-5320



Appendix D): Band Edge Measurements

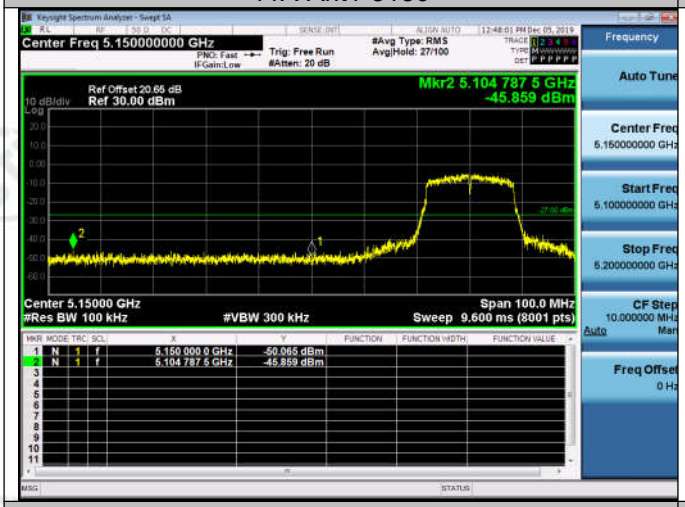
Result Table

Test Mode	Antenna	Channel	Max.Level [dBm]	Verdict
11A	Ant1	5180	-45.859	PASS
11A	Ant1	5240	-48.177	PASS
11A	Ant1	5260	-45.483	PASS
11A	Ant1	5320	-48.294	PASS

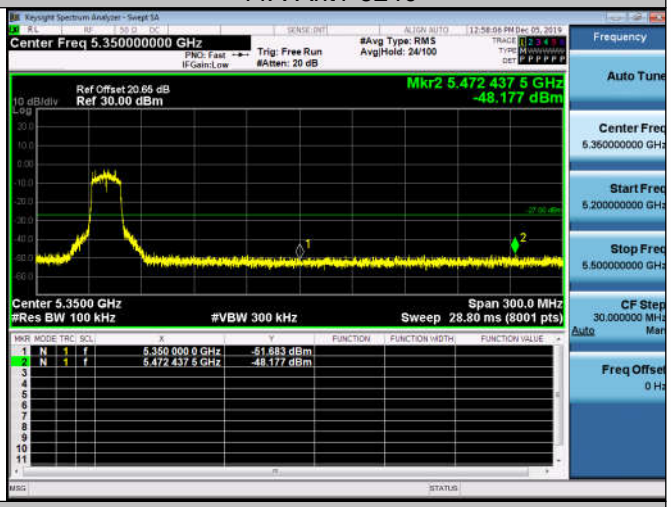
Test Mode	Antenna	Channel	Max.Level [dBm]	Verdict
11N20SISO	Ant1	5180	-45.327	PASS
11N20SISO	Ant1	5240	-47.893	PASS
11N20SISO	Ant1	5260	-45.771	PASS
11N20SISO	Ant1	5320	-47.717	PASS

Test Graph

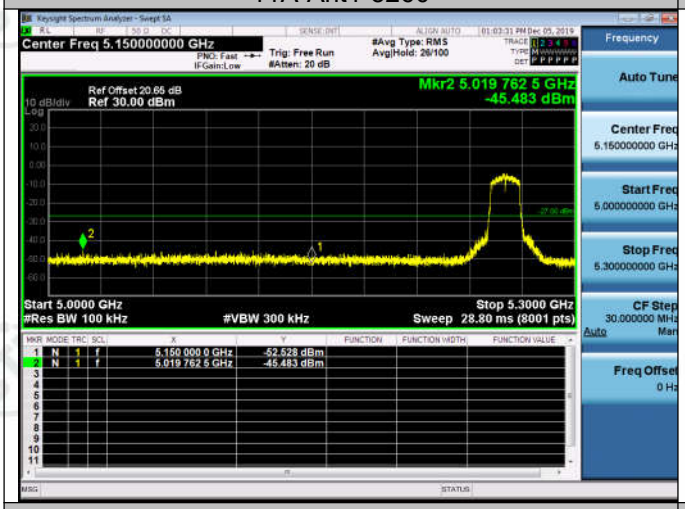
11A-Ant1-5180



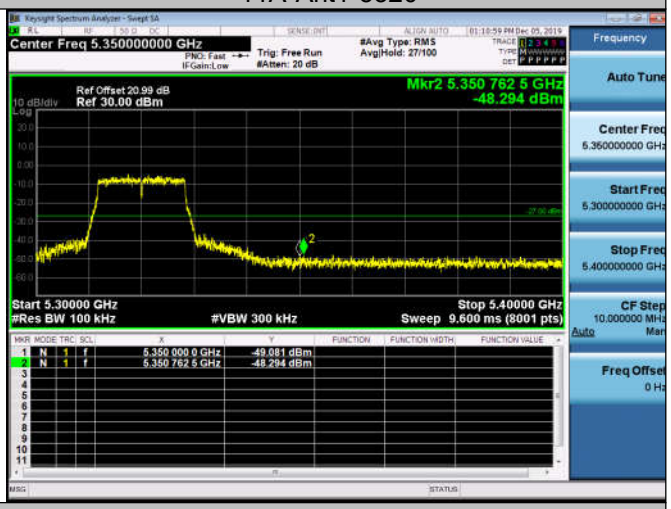
11A-Ant1-5240



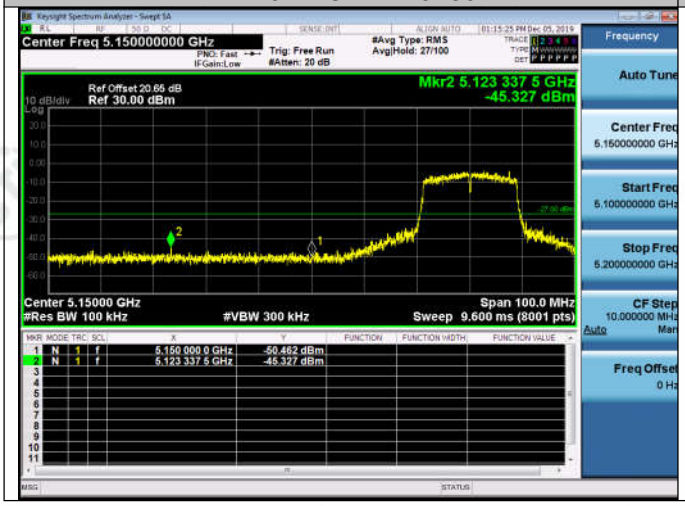
11A-Ant1-5260



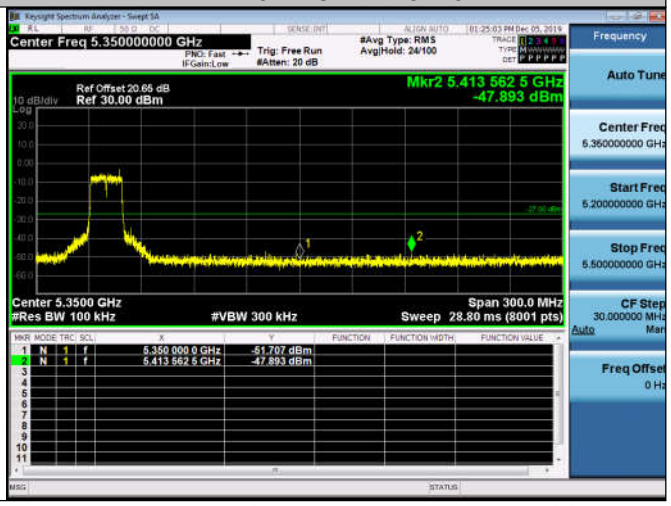
11A-Ant1-5320

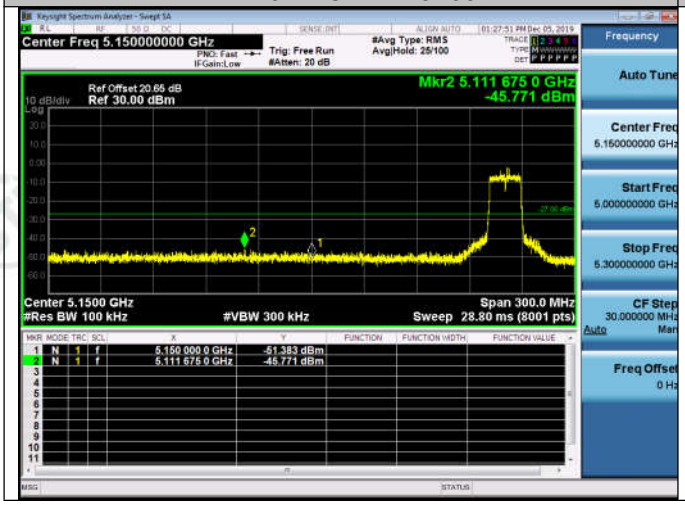
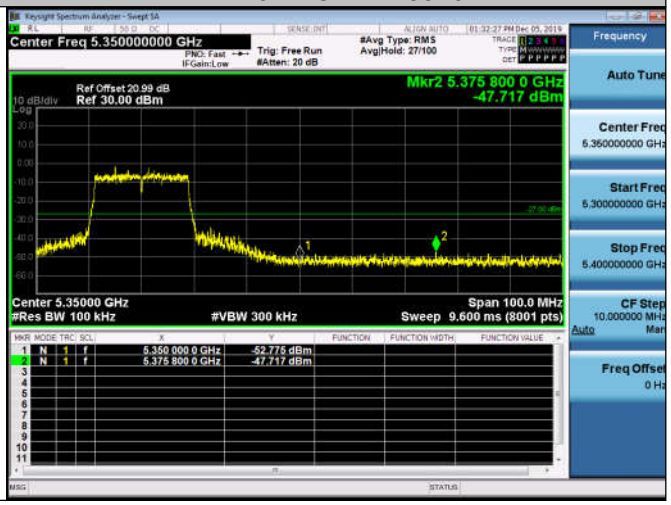


11N20SISO-Ant1-5180



11N20SISO-Ant1-5240



11N20SISO-Ant1-5260	11N20SISO-Ant1-5320
	

Appendix E): Frequency Stability

Frequency Error vs. Voltage:

Test Mode	Antenna	Channel	Temp.	Volt.	Freq.Error(MHz)	Freq.vs.rated(ppm)	Verdict
11A	Ant1	5180	TN	VL	5179.925	-14.478764	PASS
			TN	VN	5180.015	2.895753	PASS
			TN	VH	5180.015	2.895753	PASS
11A	Ant1	5200	TN	VL	5200	0	PASS
			TN	VN	5200.03	5.769231	PASS
			TN	VH	5200.03	5.769231	PASS
11A	Ant1	5240	TN	VL	5240.09	17.175573	PASS
			TN	VN	5240.045	8.587786	PASS
			TN	VH	5239.94	-11.450382	PASS
11A	Ant1	5260	TN	VL	5260	0	PASS
			TN	VN	5260.09	17.110266	PASS
			TN	VH	5260.015	2.851711	PASS
11A	Ant1	5280	TN	VL	5279.985	-2.840909	PASS
			TN	VN	5280.075	14.204545	PASS
			TN	VH	5279.94	-11.363636	PASS
11A	Ant1	5320	TN	VL	5319.955	-8.458647	PASS
			TN	VN	5319.97	-5.639098	PASS
			TN	VH	5320.015	2.819549	PASS

Test Mode	Antenna	Channel	Temp.	Volt.	Freq.Error(MHz)	Freq.vs.rated(ppm)	Verdict
11N20	Ant1	5180	TN	VL	5180	0	PASS
			TN	VN	5179.94	-11.583012	PASS
			TN	VH	5179.94	-11.583012	PASS
11N20	Ant1	5200	TN	VL	5200	0	PASS
			TN	VN	5200.015	2.884615	PASS
			TN	VH	5200.06	11.538462	PASS
11N20	Ant1	5240	TN	VL	5240	0	PASS
			TN	VN	5239.97	-5.725191	PASS
			TN	VH	5239.985	-2.862595	PASS
11N20	Ant1	5260	TN	VL	5260.09	17.110266	PASS
			TN	VN	5260.105	19.961977	PASS
			TN	VH	5259.97	-5.703422	PASS
11N20	Ant1	5280	TN	VL	5280.09	17.045455	PASS
			TN	VN	5280.045	8.522727	PASS
			TN	VH	5279.895	-19.886364	PASS
11N20	Ant1	5320	TN	VL	5320	0	PASS
			TN	VN	5320.075	14.097744	PASS
			TN	VH	5320.03	5.639098	PASS

Frequency Error vs. Temperature:

Test Mode	Antenna	Channel	Temp.	Volt.	Freq.Error(MHz)	Freq.vs.rated(ppm)	Verdict
11A	Ant1	5180	50	VN	5179.985	-2.895753	PASS
			40	VN	5180.06	11.583012	PASS
			30	VN	5180	0	PASS
			20	VN	5179.94	-11.583012	PASS
			10	VN	5180.03	5.791506	PASS
			0	VN	5179.94	-11.583012	PASS
			-10	VN	5180.03	5.791506	PASS
			-20	VN	5180.03	5.791506	PASS
			-30	VN	5180.03	5.791506	PASS
11A	Ant1	5200	50	VN	5200.045	8.653846	PASS
			40	VN	5199.97	-5.769231	PASS
			30	VN	5199.985	-2.884615	PASS
			20	VN	5199.97	-5.769231	PASS
			10	VN	5200.06	11.538462	PASS
			0	VN	5200.045	8.653846	PASS
			-10	VN	5200.06	11.538462	PASS
			-20	VN	5200.06	11.538462	PASS
			-30	VN	5200.06	11.538462	PASS
11A	Ant1	5240	50	VN	5240.045	8.587786	PASS
			40	VN	5240.09	17.175573	PASS
			30	VN	5240.06	11.450382	PASS
			20	VN	5239.97	-5.725191	PASS
			10	VN	5240	0	PASS
			0	VN	5239.985	-2.862595	PASS
			-10	VN	5239.97	-5.725191	PASS
			-20	VN	5239.97	-5.725191	PASS
			-30	VN	5239.97	-5.725191	PASS

11A	Ant1	5260	50	VN	5260.03	5.703422	PASS
			40	VN	5260.06	11.406844	PASS
			30	VN	5260.09	17.110266	PASS
			20	VN	5259.985	-2.851711	PASS
			10	VN	5260.105	19.961977	PASS
			0	VN	5259.985	-2.851711	PASS
			-10	VN	5260.105	19.961977	PASS
			-20	VN	5260.105	19.961977	PASS
			-30	VN	5260.105	19.961977	PASS
11A	Ant1	5280	50	VN	5279.925	-14.204545	PASS
			40	VN	5280.03	5.681818	PASS
			30	VN	5280.03	5.681818	PASS
			20	VN	5280.015	2.840909	PASS
			10	VN	5279.985	-2.840909	PASS
			0	VN	5279.955	-8.522727	PASS
			-10	VN	5279.985	-2.840909	PASS
			-20	VN	5279.985	-2.840909	PASS
			-30	VN	5279.985	-2.840909	PASS
11A	Ant1	5320	50	VN	5319.955	-8.458647	PASS
			40	VN	5320.09	16.917293	PASS
			30	VN	5320.06	11.278195	PASS
			20	VN	5319.985	-2.819549	PASS
			10	VN	5319.97	-5.639098	PASS
			0	VN	5320.045	8.458647	PASS
			-10	VN	5319.985	-2.819549	PASS
			-20	VN	5319.985	-2.819549	PASS
			-30	VN	5319.985	-2.819549	PASS

Test Mode	Antenna	Channel	Temp.	Volt.	Freq.Error(MHz)	Freq.vs.rated(ppm)	Verdict
11N20	Ant1	5180	50	VN	5179.97	-5.791506	PASS
			40	VN	5179.97	-5.791506	PASS
			30	VN	5180.015	2.895753	PASS
			20	VN	5180.03	5.791506	PASS
			10	VN	5180.015	2.895753	PASS
			0	VN	5180.015	2.895753	PASS
			-10	VN	5180.03	5.791506	PASS
			-20	VN	5180.03	5.791506	PASS
			-30	VN	5180.03	5.791506	PASS
11N20	Ant1	5200	50	VN	5200	0	PASS
			40	VN	5200.06	11.538462	PASS
			30	VN	5199.97	-5.769231	PASS
			20	VN	5200.015	2.884615	PASS
			10	VN	5200.06	11.538462	PASS
			0	VN	5200.03	5.769231	PASS
			-10	VN	5200.06	11.538462	PASS
			-20	VN	5200.06	11.538462	PASS
			-30	VN	5200.06	11.538462	PASS
11N20	Ant1	5240	50	VN	5240	0	PASS
			40	VN	5239.985	-2.862595	PASS
			30	VN	5240.06	11.450382	PASS
			20	VN	5240	0	PASS
			10	VN	5240	0	PASS
			0	VN	5240.03	5.725191	PASS
			-10	VN	5240.06	11.450382	PASS
			-20	VN	5240.06	11.450382	PASS
			-30	VN	5240.06	11.450382	PASS

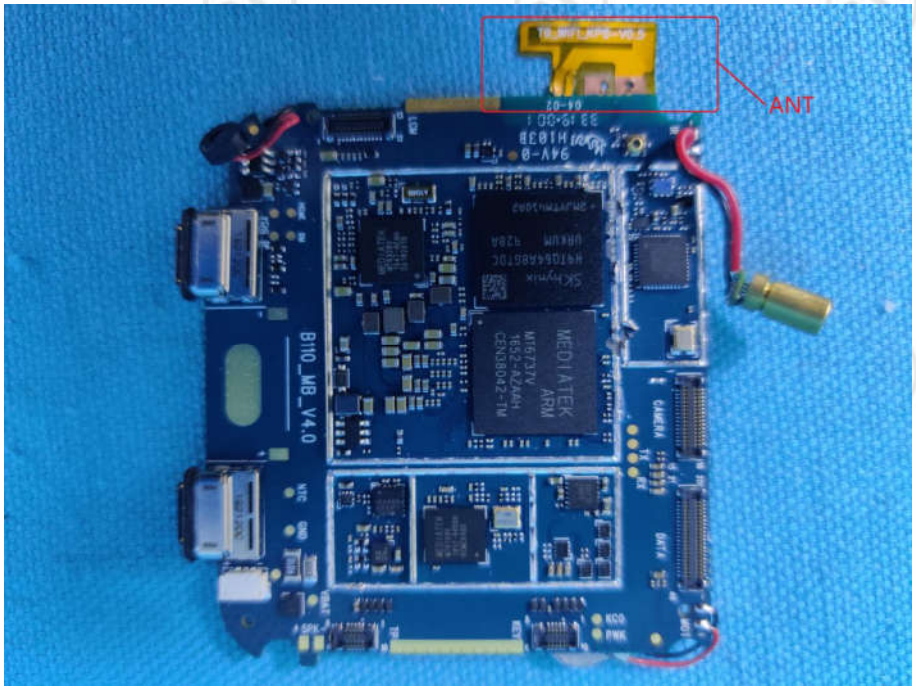
11N20	Ant1	5260	50	VN	5260.045	8.555133	PASS
			40	VN	5260.105	19.961977	PASS
			30	VN	5260.09	17.110266	PASS
			20	VN	5259.985	-2.851711	PASS
			10	VN	5260.03	5.703422	PASS
			0	VN	5260.03	5.703422	PASS
			-10	VN	5259.985	-2.851711	PASS
			-20	VN	5259.985	-2.851711	PASS
			-30	VN	5259.985	-2.851711	PASS
11N20	Ant1	5280	50	VN	5279.955	-8.522727	PASS
			40	VN	5280.075	14.204545	PASS
			30	VN	5280	0	PASS
			20	VN	5280.015	2.840909	PASS
			10	VN	5279.955	-8.522727	PASS
			0	VN	5280.03	5.681818	PASS
			-10	VN	5279.955	-8.522727	PASS
			-20	VN	5279.955	-8.522727	PASS
			-30	VN	5279.955	-8.522727	PASS
11N20	Ant1	5320	50	VN	5320.03	5.639098	PASS
			40	VN	5319.985	-2.819549	PASS
			30	VN	5320.09	16.917293	PASS
			20	VN	5319.97	-5.639098	PASS
			10	VN	5319.985	-2.819549	PASS
			0	VN	5319.985	-2.819549	PASS
			-10	VN	5320.09	16.917293	PASS
			-20	VN	5320.015	2.819549	PASS
			-30	VN	5320.015	2.819549	PASS

Appendix F) Antenna Requirement

15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.407(a)(1) (2) requirement:
The conducted output power limit specified in paragraph (a) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (a) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power and the peak power spectral density shall be reduced by the by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:



The antenna type is FPC with I-PEX connector, that is a unique connector and compliant with therequirement for 15.203. The best case gain of the antenna is 2.35dBi.

Appendix G) Operation in the absence of information to the transmit

15.407(c) requirement: The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signal ling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.
Operation in the absence of information to the transmit
Operation never ceases as information from cell town is always present. (manufacturer declare)

Appendix H) AC Power Line Conducted Emission

<table>
<tr><td>Test Procedure:</td><td>Test frequency range :150KHz-30MHz
1)The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3)The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBμV)</th></tr>
<tr><th>Quasi-peak</th><th>Average</th></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.
NOTE : The lower limit is applicable at the transition frequency</td></tr>
</table>

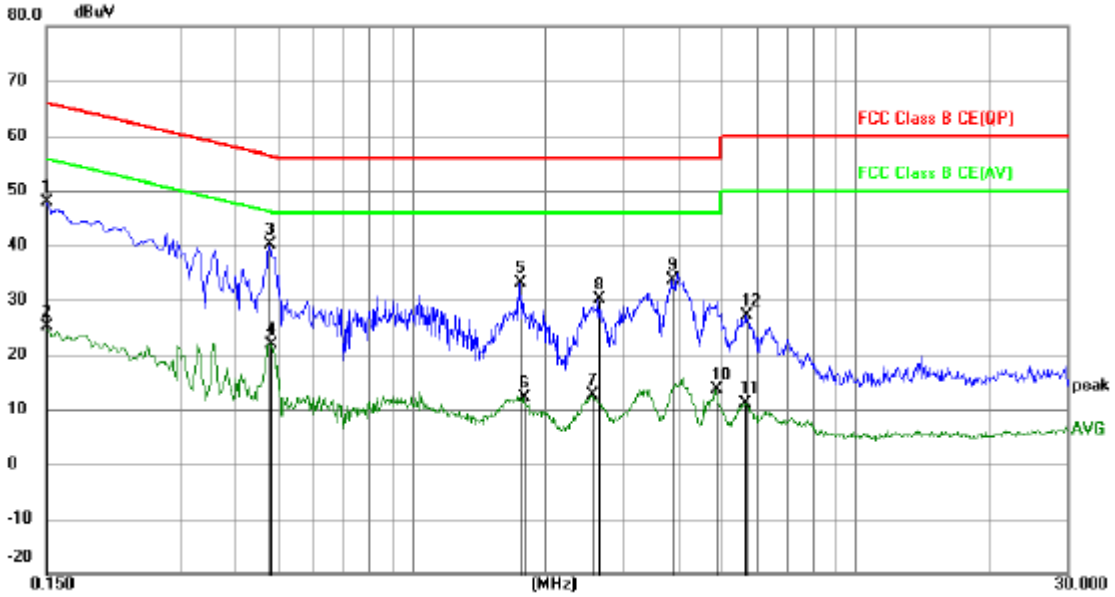
Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

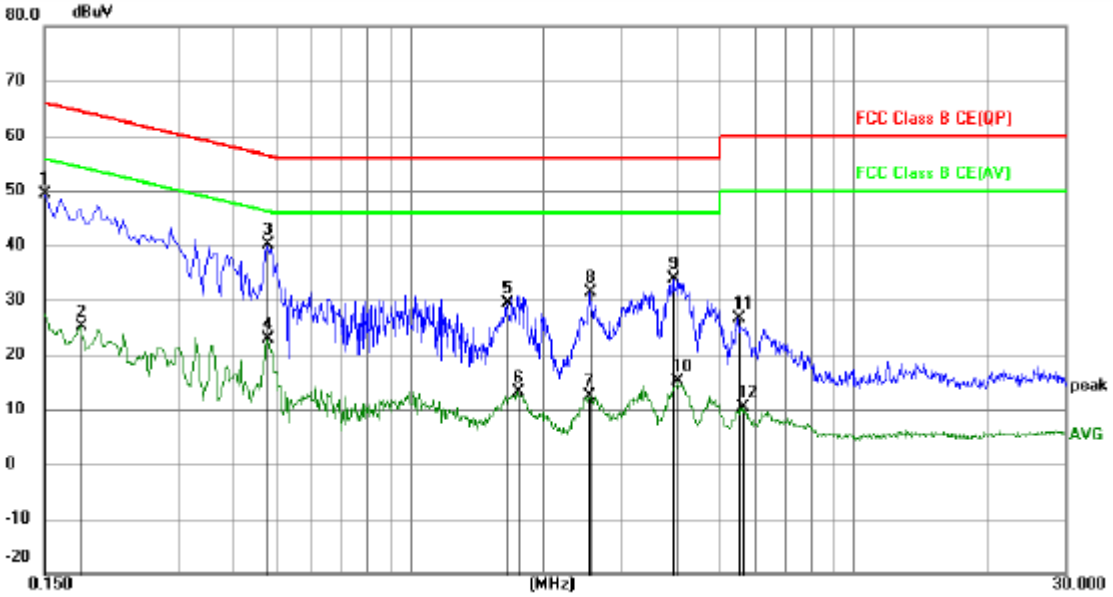
Product	:	Wearable watch	**Model/Type reference**	:	SF-120
Temperature	:	24℃	**Humidity**	:	52%

Live line:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	37.91	9.97	47.88	66.00	-18.12	QP	
2		0.1500	15.10	9.97	25.07	56.00	-30.93	AVG	
3	*	0.4785	30.21	10.00	40.21	56.37	-16.16	QP	
4		0.4830	11.98	10.00	21.98	46.29	-24.31	AVG	
5		1.7475	23.31	9.85	33.16	56.00	-22.84	QP	
6		1.7835	2.26	9.85	12.11	46.00	-33.89	AVG	
7		2.5485	2.89	9.83	12.72	46.00	-33.28	AVG	
8		2.6475	20.29	9.83	30.12	56.00	-25.88	QP	
9		3.8715	23.90	9.83	33.73	56.00	-22.27	QP	
10		4.8300	3.83	9.83	13.66	46.00	-32.34	AVG	
11		5.6400	1.31	9.84	11.15	50.00	-38.85	AVG	
12		5.6715	17.21	9.84	27.05	60.00	-32.95	QP	

Neutral line:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	39.53	9.97	49.50	66.00	-16.50	QP	
2		0.1815	15.04	10.00	25.04	54.42	-29.38	AVG	
3	*	0.4785	30.02	10.00	40.02	56.37	-16.35	QP	
4		0.4785	12.78	10.00	22.78	46.37	-23.59	AVG	
5		1.6620	19.47	9.86	29.33	56.00	-26.67	QP	
6		1.7475	3.18	9.85	13.03	46.00	-32.97	AVG	
7		2.5305	2.57	9.83	12.40	46.00	-33.60	AVG	
8		2.5530	21.45	9.83	31.28	56.00	-24.72	QP	
9		3.9255	23.97	9.83	33.80	56.00	-22.20	QP	
10		4.0155	5.35	9.83	15.18	46.00	-30.82	AVG	
11		5.4915	16.75	9.83	26.58	60.00	-33.42	QP	
12		5.6175	0.42	9.84	10.26	50.00	-39.74	AVG	

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

Appendix I) Restricted bands around fundamental frequency (Radiated Emission)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. 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 and the rotatable 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. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
h. Test the EUT in the lowest channel , the Highest channel
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.

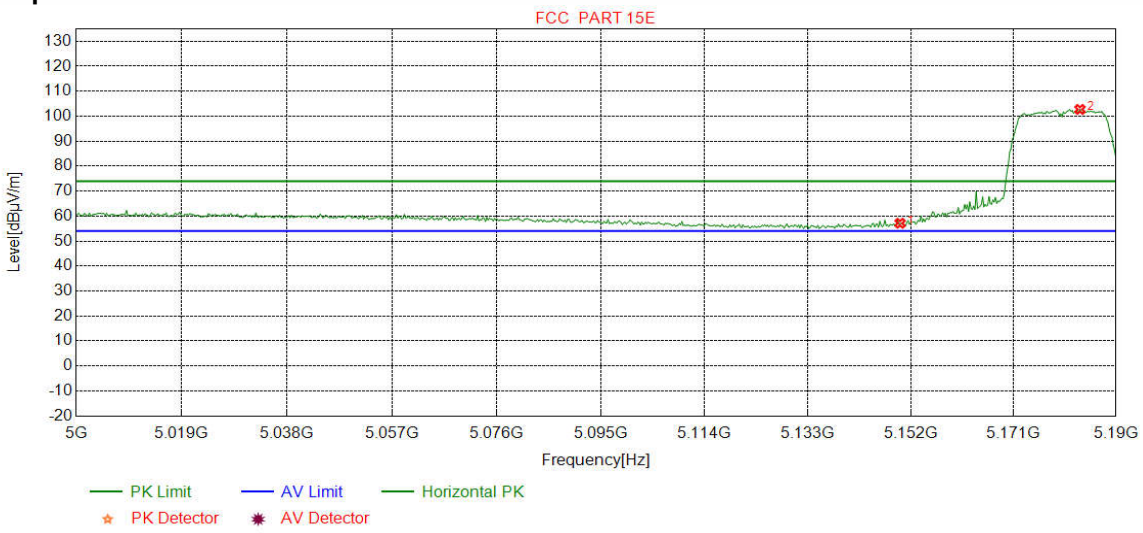
Limit:

Frequency	Limit (dBμV/m @3cm)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	74.0	Peak Value

Test plot as follows:

Mode:	802.11a Transmitting	Channel:	5180
Remark:	PK		

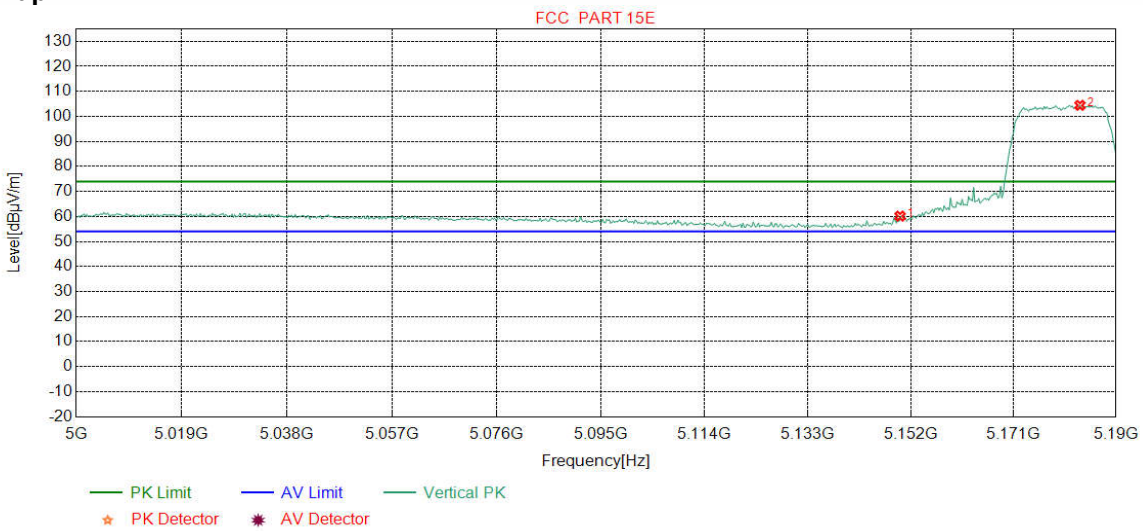
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	5150.0000	34.65	15.08	-40.54	47.94	57.13	74.00	16.87	Pass	Horizontal
2	5183.3417	34.68	15.41	-40.55	93.18	102.72	74.00	-28.72	Pass	Horizontal

Mode:	802.11a Transmitting	Channel:	5180
Remark:	PK		

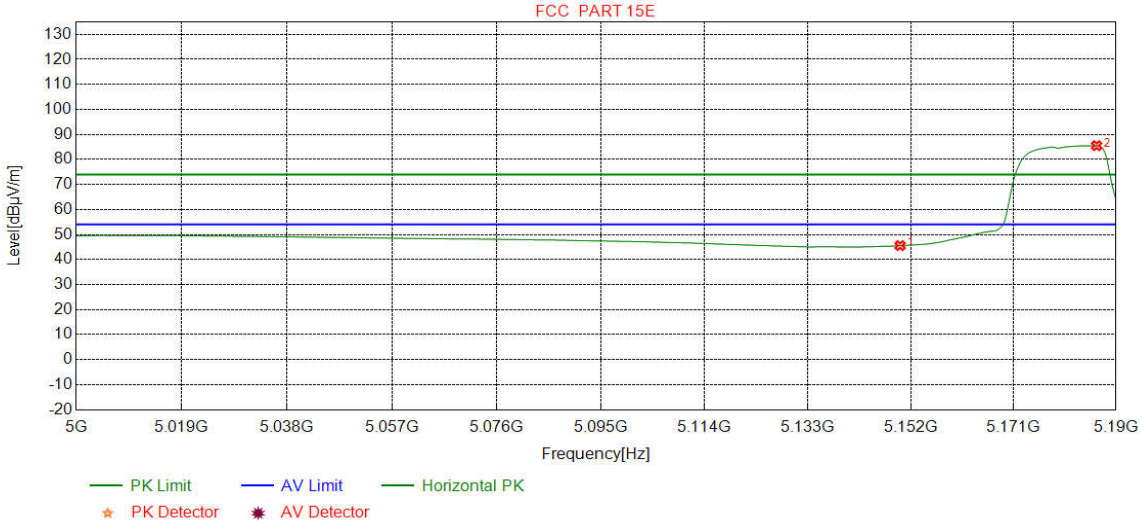
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5150.0000	34.65	15.08	-40.54	50.94	60.13	74.00	13.87	Pass	Vertical
2	5183.3417	34.68	15.41	-40.55	94.89	104.43	74.00	-30.43	Pass	Vertical

Mode:	802.11a Transmitting	Channel:	5180
Remark:	AV		

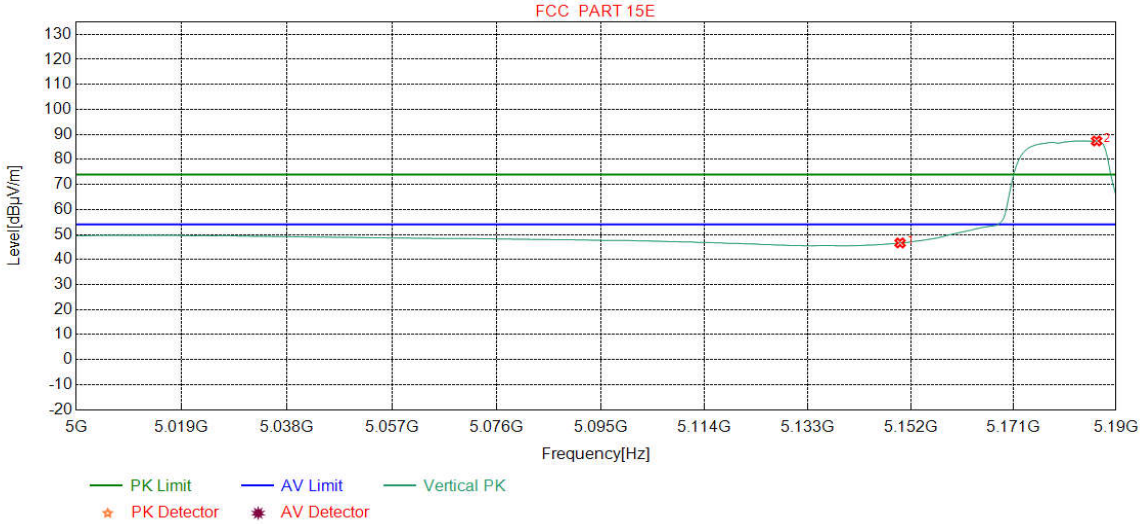
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	5150.0000	34.65	15.08	-40.54	36.37	45.56	54.00	8.44	Pass	Horizontal
2	5186.4330	34.69	15.44	-40.56	75.93	85.50	54.00	-31.50	Pass	Horizontal

Mode:	802.11a Transmitting	Channel:	5180
Remark:	AV		

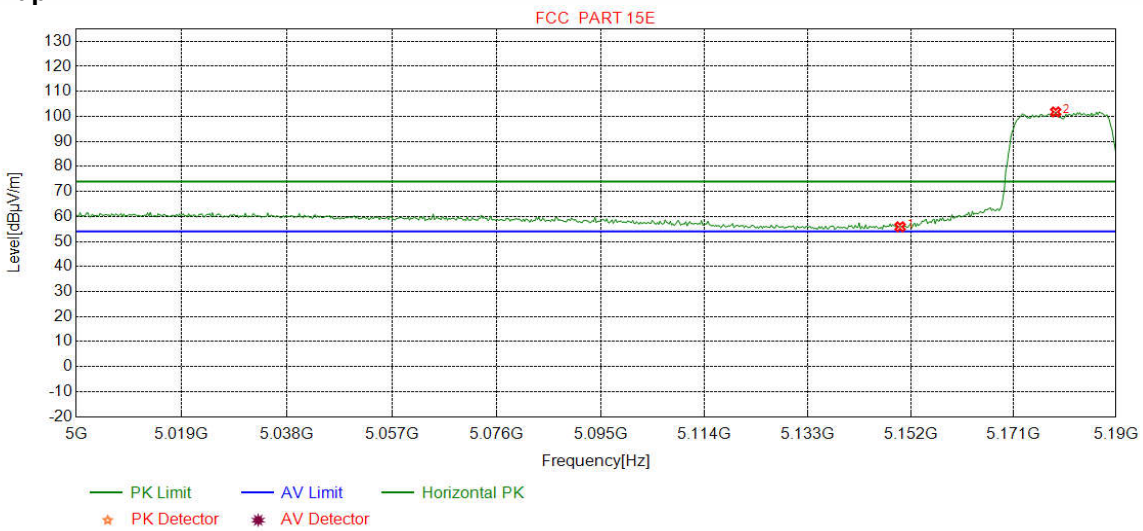
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5150.0000	34.65	15.08	-40.54	37.44	46.63	54.00	7.37	Pass	Vertical
2	5186.4330	34.69	15.44	-40.56	77.80	87.37	54.00	-33.37	Pass	Vertical

Mode:	802.11n HT 20 MHz Transmitting	Channel:	5180
Remark:	PK		

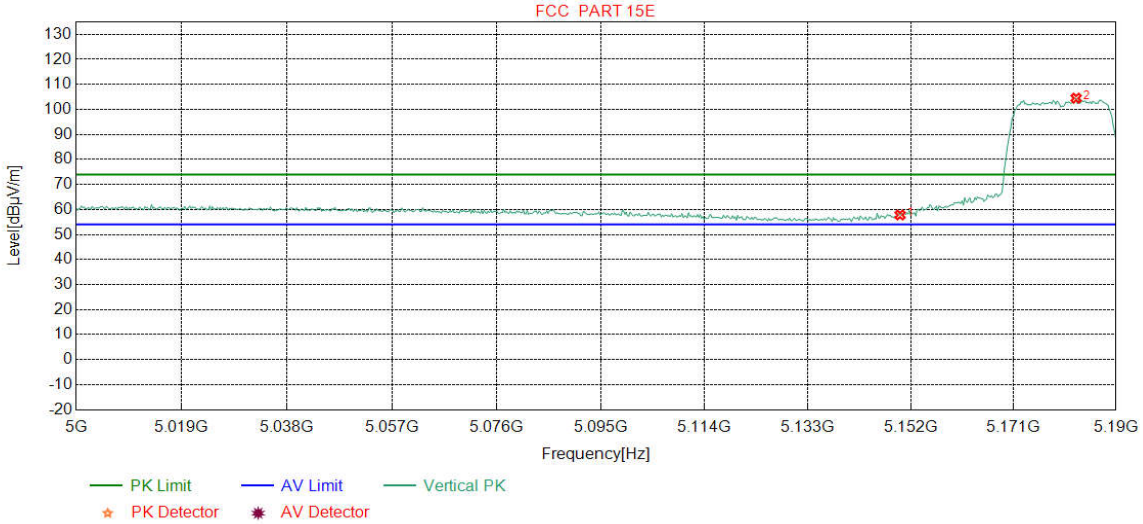
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5150.0000	34.65	15.08	-40.54	46.69	55.88	74.00	18.12	Pass	Horizontal
2	5178.8235	34.68	15.36	-40.55	92.30	101.79	74.00	-27.79	Pass	Horizontal

Mode:	802.11n HT 20 MHz Transmitting	Channel:	5180
Remark:	PK		

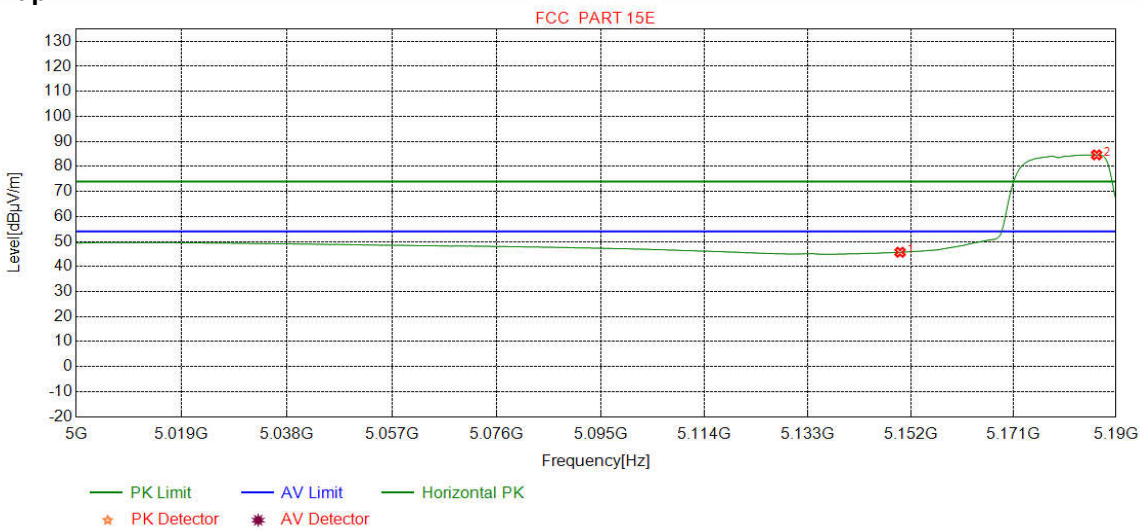
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5150.0000	34.65	15.08	-40.54	48.60	57.79	74.00	16.21	Pass	Vertical
2	5182.6283	34.68	15.40	-40.55	94.97	104.50	74.00	-30.50	Pass	Vertical

Mode:	802.11n HT 20 MHz Transmitting	Channel:	5180
Remark:	AV		

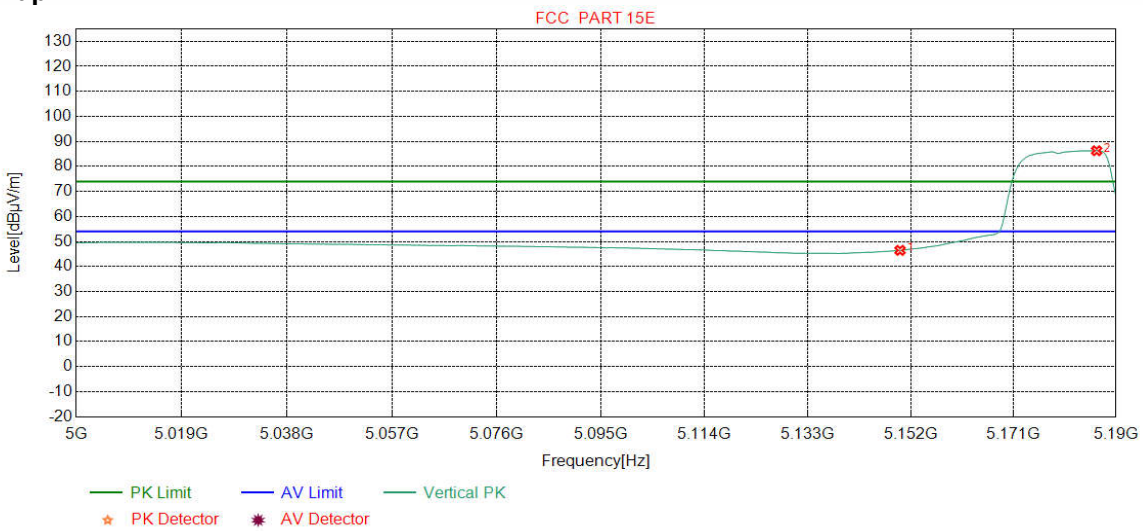
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	5150.0000	34.65	15.08	-40.54	36.51	45.70	54.00	8.30	Pass	Horizontal
2	5186.4330	34.69	15.44	-40.56	75.05	84.62	54.00	-30.62	Pass	Horizontal

Mode:	802.11n HT 20 MHz Transmitting	Channel:	5180
Remark:	AV		

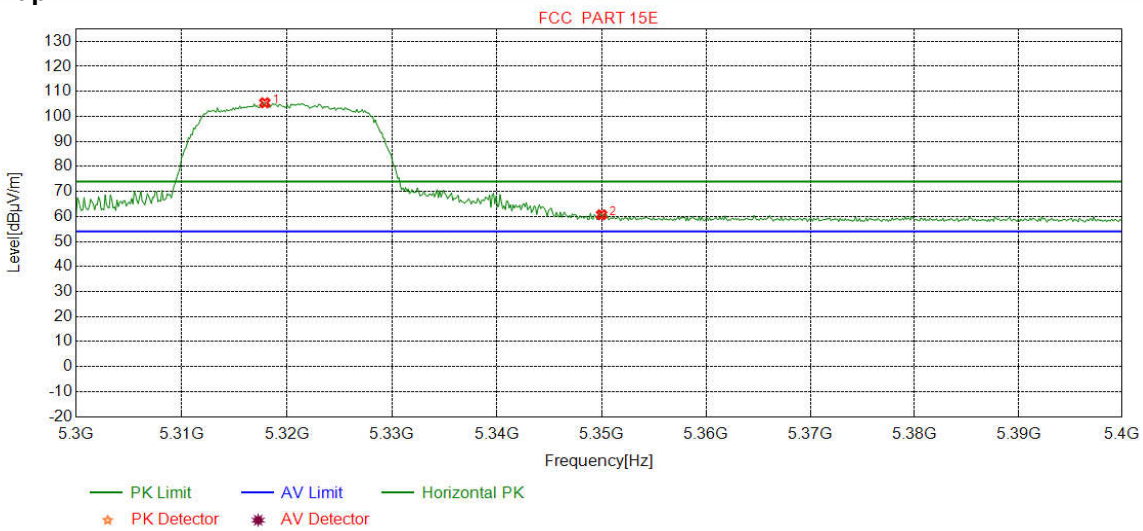
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity
1	5150.0000	34.65	15.08	-40.54	37.26	46.45	54.00	7.55	Pass	Vertical
2	5186.4330	34.69	15.44	-40.56	76.70	86.27	54.00	-32.27	Pass	Vertical

Mode:	802.11a Transmitting	Channel:	5320
Remark:	PK		

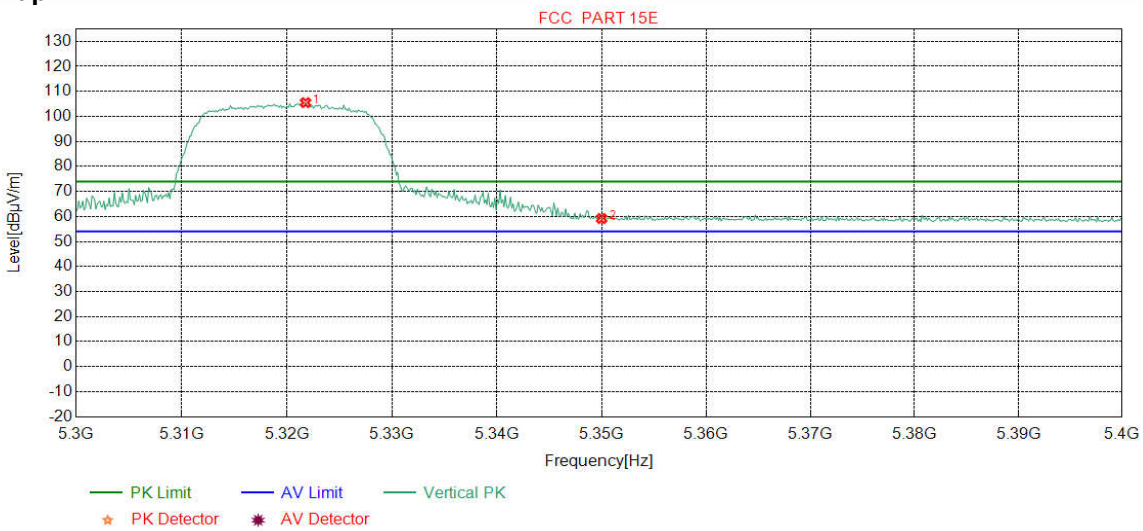
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5317.8974	34.82	15.63	-40.59	95.58	105.44	74.00	-31.44	Pass	Horizontal
2	5350.0000	34.85	15.92	-40.60	50.51	60.68	74.00	13.32	Pass	Horizontal

Mode:	802.11a Transmitting	Channel:	5320
Remark:	PK		

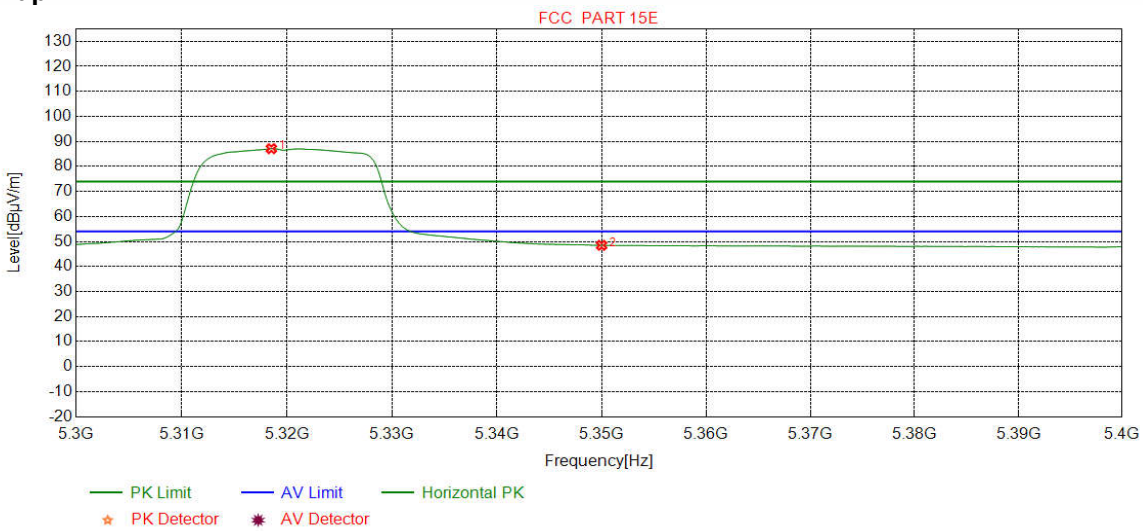
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5321.7772	34.82	15.67	-40.59	95.58	105.48	74.00	-31.48	Pass	Vertical
2	5350.0000	34.85	15.92	-40.60	49.03	59.20	74.00	14.80	Pass	Vertical

Mode:	802.11a Transmitting	Channel:	5320
Remark:	AV		

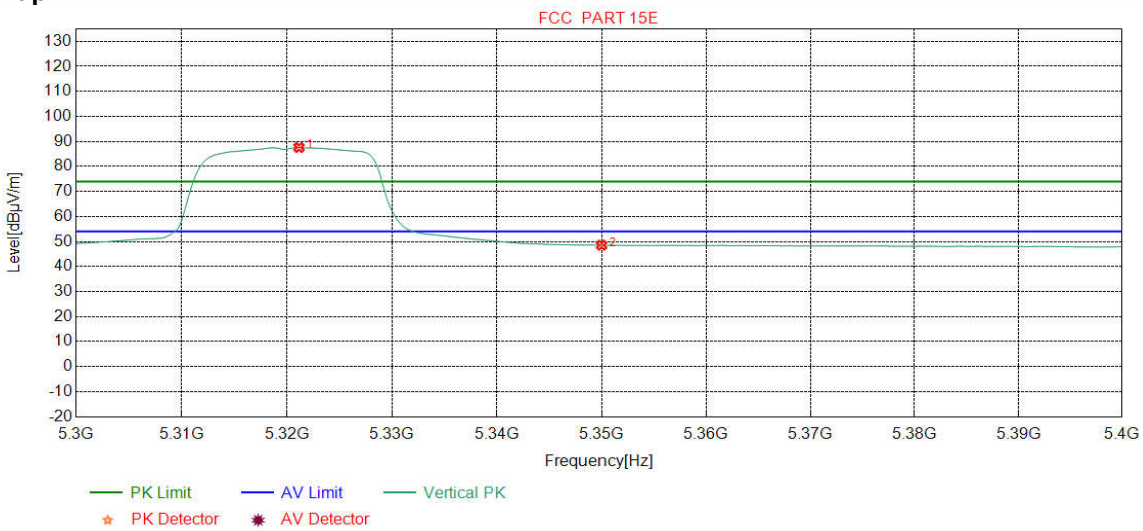
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5318.5232	34.82	15.64	-40.59	77.23	87.10	54.00	-33.10	Pass	Horizontal
2	5350.0000	34.85	15.92	-40.60	38.30	48.47	54.00	5.53	Pass	Horizontal

Mode:	802.11a Transmitting	Channel:	5320
Remark:	AV		

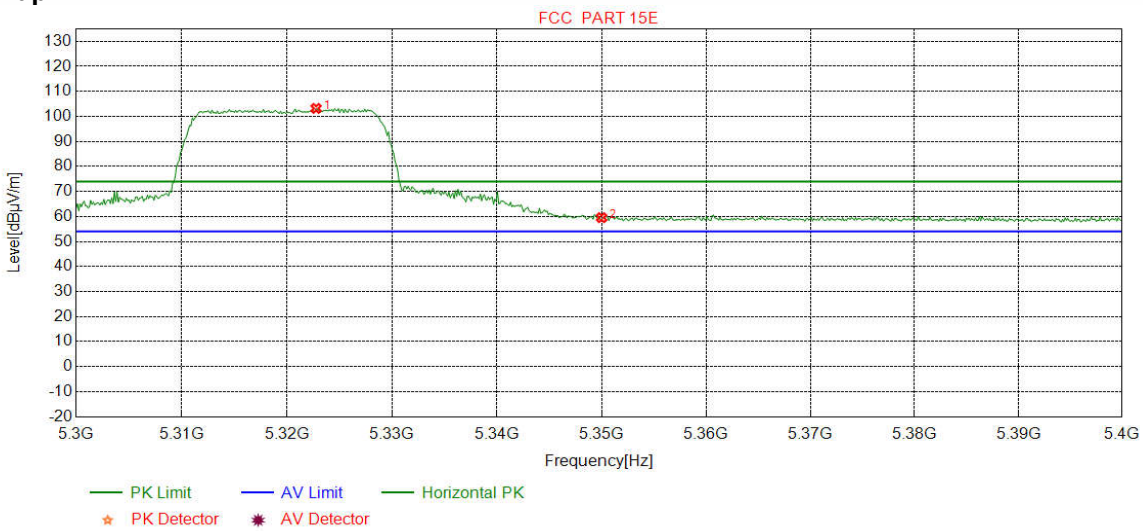
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5321.1514	34.82	15.66	-40.59	77.68	87.57	54.00	-33.57	Pass	Vertical
2	5350.0000	34.85	15.92	-40.60	38.34	48.51	54.00	5.49	Pass	Vertical

Mode:	802.11n HT 20 MHz Transmitting	Channel:	5320
Remark:	PK		

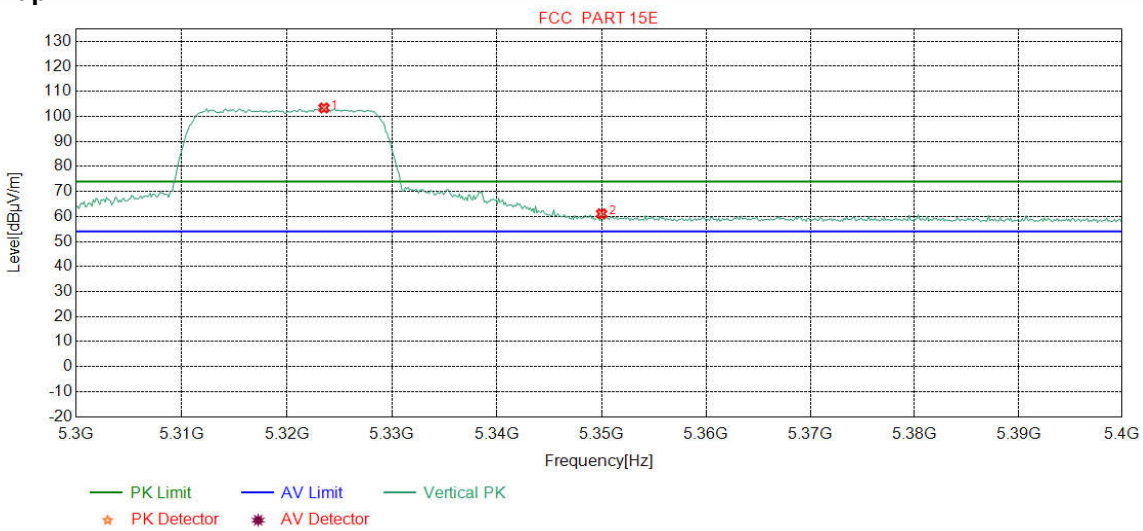
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5322.7785	34.82	15.68	-40.59	93.29	103.20	74.00	-29.20	Pass	Horizontal
2	5350.0000	34.85	15.92	-40.60	49.36	59.53	74.00	14.47	Pass	Horizontal

Mode:	802.11n HT 20 MHz Transmitting	Channel:	5320
Remark:	PK		

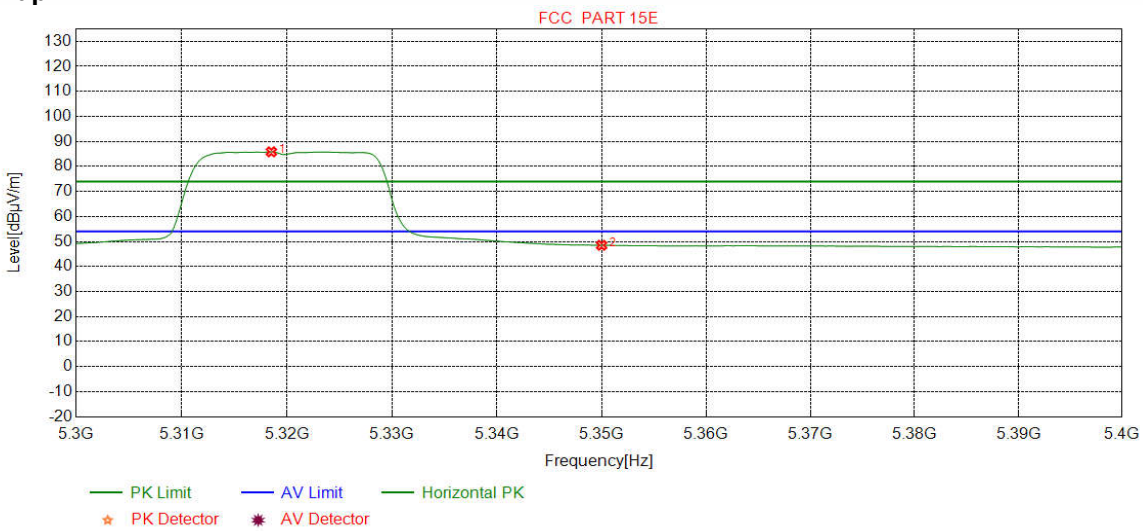
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5323.5294	34.82	15.68	-40.59	93.48	103.39	74.00	-29.39	Pass	Vertical
2	5350.0000	34.85	15.92	-40.60	50.90	61.07	74.00	12.93	Pass	Vertical

Mode:	802.11n HT 20 MHz Transmitting	Channel:	5320
Remark:	AV		

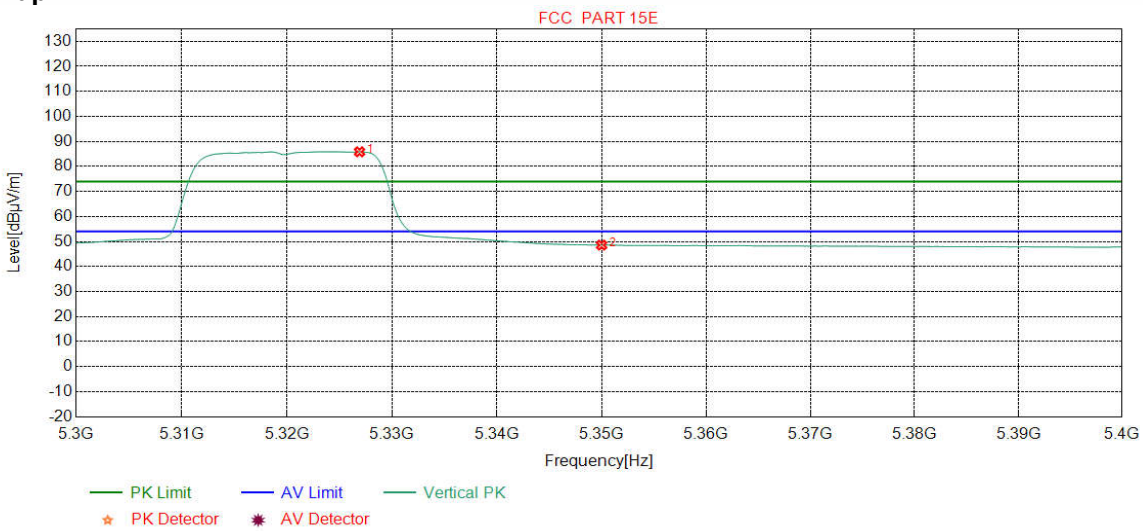
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5318.5232	34.82	15.64	-40.59	75.97	85.84	54.00	-31.84	Pass	Horizontal
2	5350.0000	34.85	15.92	-40.60	38.31	48.48	54.00	5.52	Pass	Horizontal

Mode:	802.11n HT 20 MHz Transmitting	Channel:	5320
Remark:	AV		

Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity
1	5326.9086	34.83	15.71	-40.59	75.90	85.85	54.00	-31.85	Pass	Vertical
2	5350.0000	34.85	15.92	-40.60	38.39	48.56	54.00	5.44	Pass	Vertical

Note:
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading - Correct Factor
Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

Appendix J) Unwanted Emissions in the Restricted Bands (Radiated Emission)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. 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 rota 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, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre)
h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.

Limit:

Frequency	Field strength (microvolt/meter)	Limit (dBμV/cm)	Remark	Measurement distance (cm)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Test result: PASS

Radiated Spurious Emissions test Data:

Radiated Emission below 1GHz

Mode:		802.11a Transmitting					Channel:		5280		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	111.9732	10.56	1.25	-32.06	38.93	18.68	43.50	24.82	Pass	H	PK
2	143.2103	7.31	1.41	-31.99	46.44	23.17	43.50	20.33	Pass	H	PK
3	200.8341	10.92	1.67	-31.93	42.68	23.34	43.50	20.16	Pass	H	PK
4	433.2693	15.93	2.46	-31.84	34.38	20.93	46.00	25.07	Pass	H	PK
5	649.9890	19.40	3.10	-32.07	41.82	32.25	46.00	13.75	Pass	H	PK
6	974.9715	22.55	3.75	-30.95	42.76	38.11	54.00	15.89	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5280		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	54.5435	12.47	0.84	-32.08	39.74	20.97	40.00	19.03	Pass	V	PK
2	144.1804	7.35	1.42	-32.01	43.30	20.06	43.50	23.44	Pass	V	PK
3	208.8859	11.13	1.71	-31.94	44.99	25.89	43.50	17.61	Pass	V	PK
4	411.4421	15.58	2.42	-31.83	38.82	24.99	46.00	21.01	Pass	V	PK
5	649.9890	19.40	3.10	-32.07	42.01	32.44	46.00	13.56	Pass	V	PK
6	974.9715	22.55	3.75	-30.95	42.85	38.20	54.00	15.80	Pass	V	PK

Radiated Emission above 1GHz:

Mode:		802.11a Transmitting					Channel:		5180		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1436.1936	28.34	3.40	-42.68	51.15	40.21	74.00	33.79	Pass	H	PK
2	2227.1727	32.02	4.44	-42.51	51.21	45.16	74.00	28.84	Pass	H	PK
3	2590.0000	32.54	4.79	-42.34	48.42	43.41	74.00	30.59	Pass	H	PK
4	3184.8185	33.27	5.66	-42.00	50.31	47.24	74.00	26.76	Pass	H	PK
5	10360.0000	38.30	7.29	-40.96	46.84	51.47	74.00	22.53	Pass	H	PK
6	15540.0000	40.98	10.09	-43.02	42.49	50.54	74.00	23.46	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5180		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1803.6304	30.40	3.86	-42.71	50.73	42.28	74.00	31.72	Pass	V	PK
2	2122.6623	31.87	4.46	-42.55	50.93	44.71	74.00	29.29	Pass	V	PK
3	2590.0000	32.54	4.79	-42.34	48.15	43.14	74.00	30.86	Pass	V	PK
4	3044.0044	33.22	5.46	-42.10	50.70	47.28	74.00	26.72	Pass	V	PK
5	10360.0000	38.30	7.29	-40.96	46.96	51.59	74.00	22.41	Pass	V	PK
6	15540.0000	40.98	10.09	-43.02	43.11	51.16	74.00	22.84	Pass	V	PK

Mode:		802.11a Transmitting					Channel:		5200		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1705.1705	29.75	3.89	-42.66	51.08	42.06	74.00	31.94	Pass	H	PK
2	2173.8174	31.94	4.36	-42.53	50.37	44.14	74.00	29.86	Pass	H	PK
3	2600.0000	32.56	4.77	-42.34	48.20	43.19	74.00	30.81	Pass	H	PK
4	3360.8361	33.34	5.62	-41.90	49.97	47.03	74.00	26.97	Pass	H	PK
5	10400.0000	38.36	7.54	-41.02	47.06	51.94	74.00	22.06	Pass	H	PK
6	15600.0000	41.10	9.81	-43.07	43.35	51.19	74.00	22.81	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5200		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1775.5776	30.22	3.87	-42.70	50.80	42.19	74.00	31.81	Pass	V	PK
2	2030.2530	31.74	4.22	-42.59	51.85	45.22	74.00	28.78	Pass	V	PK
3	2600.0000	32.56	4.77	-42.34	48.61	43.60	74.00	30.40	Pass	V	PK
4	3184.8185	33.27	5.66	-42.00	50.18	47.11	74.00	26.89	Pass	V	PK
5	10400.0000	38.36	7.54	-41.02	47.31	52.19	74.00	21.81	Pass	V	PK
6	15600.0000	41.10	9.81	-43.07	43.17	51.01	74.00	22.99	Pass	V	PK

Mode:		802.11a Transmitting					Channel:		5240		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1124.8625	28.02	2.96	-42.77	51.55	39.76	74.00	34.24	Pass	H	PK
2	2304.7305	32.13	4.68	-42.48	50.29	44.62	74.00	29.38	Pass	H	PK
3	2620.0000	32.59	4.80	-42.32	47.93	43.00	74.00	31.00	Pass	H	PK
4	3853.6854	33.68	6.31	-41.09	50.92	49.82	74.00	24.18	Pass	H	PK
5	10480.0000	38.47	7.45	-41.15	46.85	51.62	74.00	22.38	Pass	H	PK
6	15720.0000	41.34	10.45	-43.16	44.17	52.80	74.00	21.20	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5240		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1878.9879	30.90	4.09	-42.67	50.28	42.60	74.00	31.40	Pass	V	PK
2	2112.7613	31.86	4.50	-42.56	50.36	44.16	74.00	29.84	Pass	V	PK
3	2620.0000	32.59	4.80	-42.32	48.35	43.42	74.00	30.58	Pass	V	PK
4	3047.3047	33.22	5.47	-42.09	50.32	46.92	74.00	27.08	Pass	V	PK
5	10480.0000	38.47	7.45	-41.15	46.12	50.89	74.00	23.11	Pass	V	PK
6	15720.0000	41.34	10.45	-43.16	42.79	51.42	74.00	22.58	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5180		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1729.3729	29.91	3.89	-42.67	50.98	42.11	74.00	31.89	Pass	H	PK
2	1945.5446	31.34	4.13	-42.64	50.57	43.40	74.00	30.60	Pass	H	PK
3	2590.0000	32.54	4.79	-42.34	47.38	42.37	74.00	31.63	Pass	H	PK
4	3635.3135	33.51	5.93	-41.54	50.26	48.16	74.00	25.84	Pass	H	PK
5	10360.0000	38.30	7.29	-40.96	46.88	51.51	74.00	22.49	Pass	H	PK
6	15540.0000	40.98	10.09	-43.02	43.06	51.11	74.00	22.89	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5180		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1589.1089	28.99	3.58	-42.87	51.74	41.44	74.00	32.56	Pass	V	PK
2	1783.8284	30.27	3.86	-42.70	51.23	42.66	74.00	31.34	Pass	V	PK
3	2240.9241	32.04	4.46	-42.50	50.71	44.71	74.00	29.29	Pass	V	PK
4	2590.0000	32.54	4.79	-42.34	48.01	43.00	74.00	31.00	Pass	V	PK
5	10360.0000	38.30	7.29	-40.96	47.38	52.01	74.00	21.99	Pass	V	PK
6	15540.0000	40.98	10.09	-43.02	43.11	51.16	74.00	22.84	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5200		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1407.5908	28.31	3.35	-42.69	50.98	39.95	74.00	34.05	Pass	H	PK
2	1645.2145	29.36	3.81	-42.80	51.07	41.44	74.00	32.56	Pass	H	PK
3	2162.2662	31.93	4.35	-42.54	51.20	44.94	74.00	29.06	Pass	H	PK
4	2600.0000	32.56	4.77	-42.34	47.16	42.15	74.00	31.85	Pass	H	PK
5	10400.0000	38.36	7.54	-41.02	47.30	52.18	74.00	21.82	Pass	H	PK
6	15600.0000	41.10	9.81	-43.07	43.14	50.98	74.00	23.02	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5200		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1135.3135	28.04	2.98	-42.79	51.64	39.87	74.00	34.13	Pass	V	PK
2	2050.6051	31.77	4.28	-42.58	50.72	44.19	74.00	29.81	Pass	V	PK
3	2307.4807	32.13	4.68	-42.48	50.51	44.84	74.00	29.16	Pass	V	PK
4	2600.0000	32.56	4.77	-42.34	47.50	42.49	74.00	31.51	Pass	V	PK
5	10400.0000	38.36	7.54	-41.02	47.15	52.03	74.00	21.97	Pass	V	PK
6	15600.0000	41.10	9.81	-43.07	42.91	50.75	74.00	23.25	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5240		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1683.7184	29.61	3.87	-42.70	50.50	41.28	74.00	32.72	Pass	H	PK
2	2007.7008	31.71	4.15	-42.60	50.72	43.98	74.00	30.02	Pass	H	PK
3	2620.0000	32.59	4.80	-42.32	47.23	42.30	74.00	31.70	Pass	H	PK
4	3055.5556	33.22	5.49	-42.09	50.37	46.99	74.00	27.01	Pass	H	PK
5	10480.0000	38.47	7.45	-41.15	45.48	50.25	74.00	23.75	Pass	H	PK
6	15720.0000	41.34	10.45	-43.16	43.43	52.06	74.00	21.94	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5240		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1453.7954	28.35	3.44	-42.67	50.84	39.96	74.00	34.04	Pass	V	PK
2	2135.3135	31.89	4.40	-42.55	50.54	44.28	74.00	29.72	Pass	V	PK
3	2620.0000	32.59	4.80	-42.32	47.74	42.81	74.00	31.19	Pass	V	PK
4	3921.3421	33.74	6.26	-40.95	50.29	49.34	74.00	24.66	Pass	V	PK
5	10480.0000	38.47	7.45	-41.15	46.09	50.86	74.00	23.14	Pass	V	PK
6	15720.0000	41.34	10.45	-43.16	42.81	51.44	74.00	22.56	Pass	V	PK

Mode:		802.11a Transmitting					Channel:		5260		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1822.3322	30.53	3.89	-42.70	50.77	42.49	74.00	31.51	Pass	H	PK
2	2139.7140	31.90	4.39	-42.56	50.90	44.63	74.00	29.37	Pass	H	PK
3	2630.0000	32.61	4.81	-42.32	47.42	42.52	74.00	31.48	Pass	H	PK
4	4064.9065	33.89	6.31	-40.80	50.32	49.72	74.00	24.28	Pass	H	PK
5	10520.0000	38.50	7.37	-41.17	45.57	50.27	74.00	23.73	Pass	H	PK
6	15780.0000	41.46	10.17	-43.21	44.33	52.75	74.00	21.25	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5260		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1704.6205	29.75	3.89	-42.66	50.73	41.71	74.00	32.29	Pass	V	PK
2	2168.3168	31.94	4.36	-42.54	50.83	44.59	74.00	29.41	Pass	V	PK
3	2630.0000	32.61	4.81	-42.32	47.24	42.34	74.00	31.66	Pass	V	PK
4	3213.9714	33.29	5.69	-42.00	50.38	47.36	74.00	26.64	Pass	V	PK
5	10520.0000	38.50	7.37	-41.17	45.84	50.54	74.00	23.46	Pass	V	PK
6	15780.0000	41.46	10.17	-43.21	43.44	51.86	74.00	22.14	Pass	V	PK

Mode:		802.11a Transmitting					Channel:		5280		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1693.0693	29.67	3.88	-42.67	50.54	41.42	74.00	32.58	Pass	H	PK
2	2041.8042	31.76	4.26	-42.60	49.81	43.23	74.00	30.77	Pass	H	PK
3	2645.0000	32.63	4.83	-42.31	47.72	42.87	74.00	31.13	Pass	H	PK
4	3931.7932	33.75	6.25	-40.92	50.86	49.94	74.00	24.06	Pass	H	PK
5	10580.0000	38.52	7.28	-41.17	46.03	50.66	74.00	23.34	Pass	H	PK
6	15870.0000	41.64	10.94	-43.27	44.04	53.35	74.00	20.65	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5280		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1526.4026	28.57	3.52	-42.73	51.70	41.06	74.00	32.94	Pass	V	PK
2	1675.4675	29.56	3.86	-42.72	50.75	41.45	74.00	32.55	Pass	V	PK
3	2117.1617	31.86	4.48	-42.55	50.05	43.84	74.00	30.16	Pass	V	PK
4	2645.0000	32.63	4.83	-42.31	47.70	42.85	74.00	31.15	Pass	V	PK
5	10580.0000	38.52	7.28	-41.17	46.57	51.20	74.00	22.80	Pass	V	PK
6	15647.5574	41.20	10.77	-43.11	44.00	52.86	74.00	21.14	Pass	V	PK

Mode:		802.11a Transmitting					Channel:		5320		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1772.2772	30.20	3.87	-42.70	50.92	42.29	74.00	31.71	Pass	H	PK
2	2108.9109	31.85	4.52	-42.56	49.92	43.73	74.00	30.27	Pass	H	PK
3	2660.0000	32.66	4.85	-42.31	48.12	43.32	74.00	30.68	Pass	H	PK
4	3850.9351	33.68	6.31	-41.09	50.65	49.55	74.00	24.45	Pass	H	PK
5	10640.0000	38.53	7.28	-41.17	46.27	50.91	74.00	23.09	Pass	H	PK
6	15736.1118	41.37	10.45	-43.17	45.11	53.76	74.00	20.24	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5320		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1279.9780	28.18	3.26	-42.81	51.83	40.46	74.00	33.54	Pass	V	PK
2	2309.6810	32.13	4.68	-42.47	51.09	45.43	74.00	28.57	Pass	V	PK
3	2660.0000	32.66	4.85	-42.31	47.99	43.19	74.00	30.81	Pass	V	PK
4	3939.4939	33.75	6.25	-40.90	51.63	50.73	74.00	23.27	Pass	V	PK
5	10640.0000	38.53	7.28	-41.17	46.32	50.96	74.00	23.04	Pass	V	PK
6	15702.1851	41.30	10.46	-43.14	44.85	53.47	74.00	20.53	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5260		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1124.8625	28.02	2.96	-42.77	52.23	40.44	74.00	33.56	Pass	H	PK
2	1768.9769	30.18	3.87	-42.69	51.26	42.62	74.00	31.38	Pass	H	PK
3	2630.0000	32.61	4.81	-42.32	47.34	42.44	74.00	31.56	Pass	H	PK
4	3940.5941	33.75	6.25	-40.90	50.51	49.61	74.00	24.39	Pass	H	PK
5	10520.0000	38.50	7.37	-41.17	46.44	51.14	74.00	22.86	Pass	H	PK
6	15780.0000	41.46	10.17	-43.21	42.92	51.34	74.00	22.66	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5260		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
7	1391.6392	28.29	3.33	-42.69	51.39	40.32	74.00	33.68	Pass	V	PK
8	1841.5842	30.65	3.92	-42.68	50.24	42.13	74.00	31.87	Pass	V	PK
9	2169.4169	31.94	4.36	-42.54	50.47	44.23	74.00	29.77	Pass	V	PK
10	2630.0000	32.61	4.81	-42.32	48.04	43.14	74.00	30.86	Pass	V	PK
11	10520.0000	38.50	7.37	-41.17	45.28	49.98	74.00	24.02	Pass	V	PK
12	15780.0000	41.46	10.17	-43.21	43.32	51.74	74.00	22.26	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5280		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1815.7316	30.48	3.88	-42.70	50.81	42.47	74.00	31.53	Pass	H	PK
2	2074.2574	31.80	4.42	-42.58	50.37	44.01	74.00	29.99	Pass	H	PK
3	2645.0000	32.63	4.83	-42.31	48.08	43.23	74.00	30.77	Pass	H	PK
4	3188.1188	33.28	5.68	-42.01	50.34	47.29	74.00	26.71	Pass	H	PK
5	10580.0000	38.52	7.28	-41.17	46.86	51.49	74.00	22.51	Pass	H	PK
6	15870.0000	41.64	10.94	-43.27	44.11	53.42	74.00	20.58	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5280		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1512.1012	28.48	3.51	-42.69	50.97	40.27	74.00	33.73	Pass	V	PK
2	1770.0770	30.18	3.87	-42.69	51.30	42.66	74.00	31.34	Pass	V	PK
3	2645.0000	32.63	4.83	-42.31	47.40	42.55	74.00	31.45	Pass	V	PK
4	3152.9153	33.26	5.49	-42.03	50.67	47.39	74.00	26.61	Pass	V	PK
5	10580.0000	38.52	7.28	-41.17	47.03	51.66	74.00	22.34	Pass	V	PK
6	15870.0000	41.64	10.94	-43.27	43.84	53.15	74.00	20.85	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5320		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1303.6304	28.20	3.33	-42.78	51.39	40.14	74.00	33.86	Pass	H	PK
2	2129.8130	31.88	4.43	-42.55	50.17	43.93	74.00	30.07	Pass	H	PK
3	2660.0000	32.66	4.85	-42.31	48.75	43.95	74.00	30.05	Pass	H	PK
4	3108.3608	33.24	5.52	-42.05	50.11	46.82	74.00	27.18	Pass	H	PK
5	10640.0000	38.53	7.28	-41.17	47.25	51.89	74.00	22.11	Pass	H	PK
6	15768.8884	41.44	10.27	-43.20	45.44	53.95	74.00	20.05	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5320		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1284.3784	28.18	3.27	-42.79	51.19	39.85	74.00	34.15	Pass	V	PK
2	2151.2651	31.91	4.34	-42.54	50.87	44.58	74.00	29.42	Pass	V	PK
3	2660.0000	32.66	4.85	-42.31	47.46	42.66	74.00	31.34	Pass	V	PK
4	3185.3685	33.27	5.67	-42.01	50.24	47.17	74.00	26.83	Pass	V	PK
5	10640.0000	38.53	7.28	-41.17	47.01	51.65	74.00	22.35	Pass	V	PK
6	15737.8369	41.38	10.44	-43.17	44.66	53.31	74.00	20.69	Pass	V	PK

Appendix K) Unwanted Emissions that fall Outside of the Restricted Bands

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
Above 1GHz	Peak	1MHz	3MHz	Peak

Test Procedure:

a) The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. 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 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) Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel
j) Test the EUT in the lowest channel or/and 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 worse case.
i) Repeat above procedures until all frequencies measured was complete.

Limit:

Transmitter Operation Frequency(MHz)	Limit (EIRP)	Limit (dBμV/m)@3m	Measurement distance (cm)
5150-5350	-27dBm/MHz	68.2dBuV/m	3
5470-5725	-27dBm/MHz	68.2dBuV/m	3

Note:
(i) EIRP = ((E*d)^2) / 30
where:
• E is the field strength in V/m;
• d is the measurement distance in meters;
• EIRP is the equivalent isotropically radiated power in watts.
(ii) Working in dB units, the above equation is equivalent to:
EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
(iii) Or, if d is 3 meters:
EIRP[dBm] = E[dBμV/m] - 95.2

Test result: PASS

Mode:		802.11a Transmitting					Channel:		5180		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1469.7470	28.37	3.46	-42.97	51.03	39.89	68.20	28.31	Pass	H	PK
2	2013.7514	31.72	4.17	-43.20	50.45	43.14	68.20	25.06	Pass	H	PK
3	2590.0000	32.54	4.79	-43.10	48.08	42.31	68.20	25.89	Pass	H	PK
4	3194.7195	33.28	5.72	-43.10	50.07	45.97	68.20	22.23	Pass	H	PK
5	10360.0000	38.30	7.29	-42.03	47.16	50.72	68.20	17.48	Pass	H	PK
6	15540.0000	40.98	10.10	-42.10	43.40	52.38	68.20	15.82	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5180		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1777.7778	30.23	3.87	-42.70	50.82	42.22	68.20	25.98	Pass	V	PK
2	2188.1188	31.96	4.38	-43.16	50.52	43.70	68.20	24.50	Pass	V	PK
3	2590.0000	32.54	4.79	-43.10	48.76	42.99	68.20	25.21	Pass	V	PK
4	3949.9450	33.76	6.25	-43.01	50.22	47.22	68.20	20.98	Pass	V	PK
5	10360.0000	38.30	7.29	-42.03	47.84	51.40	68.20	16.80	Pass	V	PK
6	15540.0000	40.98	10.10	-42.10	43.85	52.83	68.20	15.37	Pass	V	PK

Mode:		802.11a Transmitting					Channel:		5200		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1441.6942	28.34	3.41	-42.85	51.01	39.91	68.20	28.29	Pass	H	PK
2	1741.4741	29.99	3.89	-42.68	49.94	41.14	68.20	27.06	Pass	H	PK
3	1922.9923	31.19	4.16	-43.01	50.25	42.59	68.20	25.61	Pass	H	PK
4	2600.0000	32.56	4.77	-43.10	48.04	42.27	68.20	25.93	Pass	H	PK
5	10400.0000	38.36	7.54	-42.02	47.57	51.45	68.20	16.75	Pass	H	PK
6	15600.0000	41.10	9.80	-42.10	43.80	52.60	68.20	15.60	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5200		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1470.2970	28.37	3.46	-42.97	51.16	40.02	68.20	28.18	Pass	V	PK
2	1857.5358	30.76	3.98	-42.85	50.79	42.68	68.20	25.52	Pass	V	PK
3	2084.1584	31.82	4.47	-43.18	50.15	43.26	68.20	24.94	Pass	V	PK
4	2600.0000	32.56	4.77	-43.10	49.04	43.27	68.20	24.93	Pass	V	PK
5	10400.0000	38.36	7.54	-42.02	47.65	51.53	68.20	16.67	Pass	V	PK
6	15600.0000	41.10	9.80	-42.10	43.87	52.67	68.20	15.53	Pass	V	PK

Mode:		802.11a Transmitting					Channel:		5240		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1697.4697	29.70	3.89	-42.67	51.23	42.15	68.20	26.05	Pass	H	PK
2	2109.4609	31.85	4.52	-43.18	51.20	44.39	68.20	23.81	Pass	H	PK
3	2620.0000	32.59	4.80	-43.10	48.18	42.47	68.20	25.73	Pass	H	PK
4	3890.5391	33.71	6.27	-43.02	50.35	47.31	68.20	20.89	Pass	H	PK
5	10480.0000	38.47	7.45	-42.00	46.55	50.47	68.20	17.73	Pass	H	PK
6	15720.0000	41.34	10.45	-42.10	44.41	54.10	68.20	14.10	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5240		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1154.5655	28.05	3.02	-42.93	51.99	40.13	68.20	28.07	Pass	V	PK
2	1969.7470	31.50	4.12	-43.12	50.52	43.02	68.20	25.18	Pass	V	PK
3	2084.1584	31.82	4.47	-43.18	50.34	43.45	68.20	24.75	Pass	V	PK
4	2620.0000	32.59	4.80	-43.10	47.52	41.81	68.20	26.39	Pass	V	PK
5	10480.0000	38.47	7.45	-42.00	46.97	50.89	68.20	17.31	Pass	V	PK
6	15720.0000	41.34	10.45	-42.10	43.85	53.54	68.20	14.66	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5180		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1125.4125	28.03	2.96	-42.97	52.13	40.15	68.20	28.05	Pass	H	PK
2	1709.0209	29.78	3.89	-42.66	50.66	41.67	68.20	26.53	Pass	H	PK
3	2590.0000	32.54	4.79	-43.10	47.80	42.03	68.20	26.17	Pass	H	PK
4	4372.9373	34.32	6.67	-42.85	49.82	47.96	68.20	20.24	Pass	H	PK
5	10360.0000	38.30	7.29	-42.03	47.34	50.90	68.20	17.30	Pass	H	PK
6	15540.0000	40.98	10.10	-42.10	45.36	54.34	68.20	13.86	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5180		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1410.8911	28.31	3.35	-42.72	51.57	40.51	68.20	27.69	Pass	V	PK
2	1940.0440	31.30	4.14	-43.05	51.31	43.70	68.20	24.50	Pass	V	PK
3	2590.0000	32.54	4.79	-43.10	47.96	42.19	68.20	26.01	Pass	V	PK
4	3213.9714	33.29	5.69	-43.11	50.27	46.14	68.20	22.06	Pass	V	PK
5	10360.0000	38.30	7.29	-42.03	47.24	50.80	68.20	17.40	Pass	V	PK
6	15540.0000	40.98	10.10	-42.10	43.80	52.78	68.20	15.42	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5200		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1286.5787	28.19	3.28	-42.80	51.11	39.78	68.20	28.42	Pass	H	PK
2	1931.2431	31.25	4.15	-43.04	50.54	42.90	68.20	25.30	Pass	H	PK
3	2600.0000	32.56	4.77	-43.10	47.87	42.10	68.20	26.10	Pass	H	PK
4	3057.2057	33.22	5.49	-43.10	50.93	46.54	68.20	21.66	Pass	H	PK
5	10400.0000	38.36	7.54	-42.02	47.11	50.99	68.20	17.21	Pass	H	PK
6	15600.0000	41.10	9.80	-42.10	42.91	51.71	68.20	16.49	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5200		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1189.2189	28.09	3.04	-42.91	51.21	39.43	68.20	28.77	Pass	V	PK
2	1742.5743	30.00	3.89	-42.68	51.25	42.46	68.20	25.74	Pass	V	PK
3	1962.5963	31.45	4.12	-43.10	51.46	43.93	68.20	24.27	Pass	V	PK
4	2600.0000	32.56	4.77	-43.10	48.86	43.09	68.20	25.11	Pass	V	PK
5	10400.0000	38.36	7.54	-42.02	47.16	51.04	68.20	17.16	Pass	V	PK
6	15600.0000	41.10	9.80	-42.10	43.25	52.05	68.20	16.15	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5240		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1770.0770	30.18	3.87	-42.69	50.23	41.59	68.20	26.61	Pass	H	PK
2	2100.1100	31.84	4.56	-43.18	50.38	43.60	68.20	24.60	Pass	H	PK
3	2620.0000	32.59	4.80	-43.10	47.97	42.26	68.20	25.94	Pass	H	PK
4	3183.7184	33.27	5.66	-43.10	50.48	46.31	68.20	21.89	Pass	H	PK
5	10480.0000	38.47	7.45	-42.00	46.26	50.18	68.20	18.02	Pass	H	PK
6	15720.0000	41.34	10.45	-42.10	44.23	53.92	68.20	14.28	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5240		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1621.0121	29.20	3.70	-42.85	51.01	41.06	68.20	27.14	Pass	V	PK
2	2201.3201	31.98	4.39	-43.16	50.40	43.61	68.20	24.59	Pass	V	PK
3	2620.0000	32.59	4.80	-43.10	47.83	42.12	68.20	26.08	Pass	V	PK
4	8496.5331	36.60	6.64	-42.00	49.95	51.19	68.20	17.01	Pass	V	PK
5	10480.0000	38.47	7.45	-42.00	47.13	51.05	68.20	17.15	Pass	V	PK
6	15720.0000	41.34	10.45	-42.10	43.65	53.34	68.20	14.86	Pass	V	PK

Mode:		802.11a Transmitting					Channel:		5260		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1345.4345	28.25	3.33	-42.74	50.87	39.71	68.20	28.49	Pass	H	PK
2	2097.9098	31.84	4.55	-43.19	50.08	43.28	68.20	24.92	Pass	H	PK
3	2630.0000	32.61	4.81	-43.10	47.71	42.03	68.20	26.17	Pass	H	PK
4	2916.9417	33.07	5.27	-43.11	51.11	46.34	68.20	21.86	Pass	H	PK
5	10520.0000	38.50	7.37	-41.99	46.25	50.13	68.20	18.07	Pass	H	PK
6	15780.0000	41.46	10.17	-42.10	44.59	54.12	68.20	14.08	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5260		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1520.9021	28.54	3.52	-43.06	51.91	40.91	68.20	27.29	Pass	V	PK
2	2034.1034	31.75	4.23	-43.19	50.80	43.59	68.20	24.61	Pass	V	PK
3	2630.0000	32.61	4.81	-43.10	46.84	41.16	68.20	27.04	Pass	V	PK
4	3928.4928	33.74	6.25	-43.01	50.42	47.40	68.20	20.80	Pass	V	PK
5	10520.0000	38.50	7.37	-41.99	45.35	49.23	68.20	18.97	Pass	V	PK
6	15780.0000	41.46	10.17	-42.10	44.33	53.86	68.20	14.34	Pass	V	PK

Mode:		802.11a Transmitting					Channel:		5280		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1852.5853	30.73	3.95	-42.84	50.55	42.39	68.20	25.81	Pass	H	PK
2	2136.9637	31.89	4.40	-43.17	50.48	43.60	68.20	24.60	Pass	H	PK
3	2645.0000	32.63	4.83	-43.09	49.43	43.80	68.20	24.40	Pass	H	PK
4	3188.1188	33.28	5.68	-43.10	50.35	46.21	68.20	21.99	Pass	H	PK
5	10580.0000	38.52	7.28	-42.00	46.91	50.71	68.20	17.49	Pass	H	PK
6	15870.0000	41.64	10.94	-42.10	45.08	55.56	68.20	12.64	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5280		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1693.6194	29.68	3.88	-42.68	50.89	41.77	68.20	26.43	Pass	V	PK
2	2171.6172	31.94	4.36	-43.16	50.30	43.44	68.20	24.76	Pass	V	PK
3	2645.0000	32.63	4.83	-43.09	48.93	43.30	68.20	24.90	Pass	V	PK
4	3035.2035	33.21	5.43	-43.09	50.51	46.06	68.20	22.14	Pass	V	PK
5	10580.0000	38.52	7.28	-42.00	47.00	50.80	68.20	17.40	Pass	V	PK
6	15870.0000	41.64	10.94	-42.10	44.84	55.32	68.20	12.88	Pass	V	PK

Mode:		802.11a Transmitting					Channel:		5320		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1187.0187	28.09	3.03	-42.90	51.95	40.17	68.20	28.03	Pass	H	PK
2	1800.3300	30.38	3.85	-42.71	50.65	42.17	68.20	26.03	Pass	H	PK
3	2365.7866	32.21	4.65	-43.12	50.78	44.52	68.20	23.68	Pass	H	PK
4	2660.0000	32.66	4.85	-43.10	47.41	41.82	68.20	26.38	Pass	H	PK
5	10640.0000	38.53	7.28	-42.01	46.11	49.91	68.20	18.29	Pass	H	PK
6	15960.0000	41.82	10.39	-42.10	46.26	56.37	68.20	11.83	Pass	H	PK

Mode:		802.11a Transmitting					Channel:		5320		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
7	1375.1375	28.28	3.33	-42.71	51.26	40.16	68.20	28.04	Pass	V	PK
8	2091.3091	31.83	4.51	-43.18	50.55	43.71	68.20	24.49	Pass	V	PK
9	2660.0000	32.66	4.85	-43.10	48.35	42.76	68.20	25.44	Pass	V	PK
10	3387.7888	33.36	5.72	-43.10	50.91	46.89	68.20	21.31	Pass	V	PK
11	10640.0000	38.53	7.28	-42.01	47.46	51.26	68.20	16.94	Pass	V	PK
12	15960.0000	41.82	10.39	-42.10	46.39	56.50	68.20	11.70	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5260		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1124.8625	28.02	2.96	-42.96	51.65	39.67	68.20	28.53	Pass	H	PK
2	1715.6216	29.82	3.89	-42.66	51.11	42.16	68.20	26.04	Pass	H	PK
3	2343.7844	32.18	4.66	-43.13	50.64	44.35	68.20	23.85	Pass	H	PK
4	2630.0000	32.61	4.81	-43.10	47.81	42.13	68.20	26.07	Pass	H	PK
5	10520.0000	38.50	7.37	-41.99	45.89	49.77	68.20	18.43	Pass	H	PK
6	15780.0000	41.46	10.17	-42.10	43.95	53.48	68.20	14.72	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5260		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1717.8218	29.84	3.89	-42.67	50.51	41.57	68.20	26.63	Pass	V	PK
2	1937.2937	31.29	4.14	-43.05	50.90	43.28	68.20	24.92	Pass	V	PK
3	2630.0000	32.61	4.81	-43.10	46.70	41.02	68.20	27.18	Pass	V	PK
4	3055.5556	33.22	5.49	-43.10	50.66	46.27	68.20	21.93	Pass	V	PK
5	10520.0000	38.50	7.37	-41.99	46.85	50.73	68.20	17.47	Pass	V	PK
6	15780.0000	41.46	10.17	-42.10	45.09	54.62	68.20	13.58	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5280		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1249.7250	28.15	3.15	-42.84	51.34	39.80	68.20	28.40	Pass	H	PK
2	1823.9824	30.54	3.89	-42.77	50.35	42.01	68.20	26.19	Pass	H	PK
3	2337.1837	32.17	4.67	-43.14	50.94	44.64	68.20	23.56	Pass	H	PK
4	2645.0000	32.63	4.83	-43.09	47.59	41.96	68.20	26.24	Pass	H	PK
5	10580.0000	38.52	7.28	-42.00	46.19	49.99	68.20	18.21	Pass	H	PK
6	15870.0000	41.64	10.94	-42.10	44.21	54.69	68.20	13.51	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5280		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1779.4279	30.24	3.87	-42.70	50.80	42.21	68.20	25.99	Pass	V	PK
2	2005.5006	31.71	4.15	-43.20	51.16	43.82	68.20	24.38	Pass	V	PK
3	2645.0000	32.63	4.83	-43.09	47.20	41.57	68.20	26.63	Pass	V	PK
4	2943.8944	33.11	5.26	-43.10	50.45	45.72	68.20	22.48	Pass	V	PK
5	10580.0000	38.52	7.28	-42.00	46.71	50.51	68.20	17.69	Pass	V	PK
6	15870.0000	41.64	10.94	-42.10	44.54	55.02	68.20	13.18	Pass	V	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5320		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1694.7195	29.69	3.88	-42.67	51.46	42.36	68.20	25.84	Pass	H	PK
2	2092.9593	31.83	4.52	-43.18	50.91	44.08	68.20	24.12	Pass	H	PK
3	2660.0000	32.66	4.85	-43.10	48.31	42.72	68.20	25.48	Pass	H	PK
4	3447.1947	33.38	5.74	-43.10	49.81	45.83	68.20	22.37	Pass	H	PK
5	10640.0000	38.53	7.28	-42.01	46.45	50.25	68.20	17.95	Pass	H	PK
6	15960.0000	41.82	10.39	-42.10	46.47	56.58	68.20	11.62	Pass	H	PK

Mode:		802.11n(HT20) Transmitting					Channel:		5320		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1451.5952	28.35	3.43	-42.89	51.02	39.91	68.20	28.29	Pass	V	PK
2	2138.0638	31.89	4.39	-43.17	50.65	43.76	68.20	24.44	Pass	V	PK
3	2660.0000	32.66	4.85	-43.10	48.05	42.46	68.20	25.74	Pass	V	PK
4	3218.3718	33.29	5.67	-43.11	51.12	46.97	68.20	21.23	Pass	V	PK
5	10640.0000	38.53	7.28	-42.01	46.65	50.45	68.20	17.75	Pass	V	PK
6	15960.0000	41.82	10.39	-42.10	46.37	56.48	68.20	11.72	Pass	V	PK

Test Data:

For the all emission,out-of-band emission that complies with both the peak and average limits of § 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz maximum emission limit. Refer to test item“Unwanted Emissions in the Restricted Bands (Radiated Emission)” test result.

Note:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading - Correct Factor

Final Test Level =Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

2) Scan from 1GHz to 25GHz, the disturbance above 13GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Appendix L) Dynamic Frequency Selection

Test Limit

FCC according to §15.407 (h), KDB 905462 D02 "compliance measurement procedures for unlicensed-national information infrastructure devices operating in the 5250-5350 MHz and 5470-5725 MHz bands incorporating dynamic frequency selection”. and KDB 905462 D03 " U-NII client devices without radar detection capability.

IC according RSS-247 section 6.3, and it harmonized with FCC Part 15 DFS rules.

The EIRP refer section 4.3 output power measurement in this report.

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client(with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth mods	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

Table 3: Interference Threshold values, Master or Client incorporating In-Service

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. **Note 2:** Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. **Note3:** EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **Note 2:** The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. **Note 3:** During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.

Table 6 – Long Pulse Radar Test Signal

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Signal

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

Test Procedure

Overview Of EUT With Respect To §15.407 (H) Requirements

The firmware installed in the EUT during testing was:

Firmware Rev: 1030.27.425.2018

The EUT operates over the 5250-5350 MHz range as a Client Device that does not have radar detection capability.

The EUT uses one transmitter connected to two 50-ohm coaxial antenna ports via a diversity switch. Only one antenna port is connected to the test system since the EUT has one antenna only.

The Slave device associated with the EUT during these tests does not have radar detection capability.

WLAN traffic is generated by streaming the video file TestFile.mp2 “6 ½ Magic Hours” from the Master to the Slave in full motion video mode using the media player with the V2.61 Codec package.

The EUT utilizes the 802.11a architecture, with a nominal channel bandwidth of 20 MHz.

The rated output power of the Master unit is < 23dBm (EIRP). Therefore the required interference threshold level is -62 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is –62 + 5 = -57dBm.

The calibrated conducted DFS Detection Threshold level is set to -57 dBm. The tested level is lower than the required level hence it provides margin to the limit.

Manufacturer’s Statement Regarding Uniform Channel Spreading

The end product implements an automatic channel selection feature at startup such that operation commences on channels distributed across the entire set of allowed 5GHz channels. This feature will ensure uniform spreading is achieved while avoiding non-allowed channels due to prior radar events.

TEST AND MEASUREMENT SYSTEM

System Overview

The measurement system is based on a conducted test method.

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

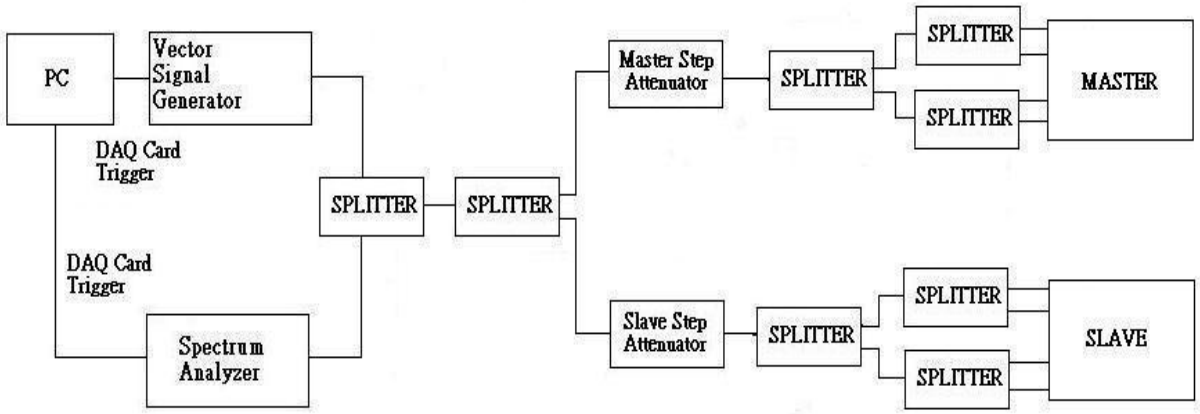
The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from FL to FH for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer set to display 8001 bins on the horizontal axis. The time-domain resolution is 2 msec / bin with a 16 second sweep time, meeting the 10 second short pulse reporting criteria. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold. The time-domain resolution is 3 msec / bin with a 24 second sweep time, meeting the 22 second long pulse reporting criteria and allowing a minimum of 10 seconds after the end of the long pulse waveform.

Should multiple RF ports be utilized for the Master and/or Slave devices (for example, for diversity or MIMO implementations), 50 ohm termination would be removed from the splitter so that connection can be established between splitter and the Master and/or Slave devices.

Conducted Method System Block Diagram



System Calibration

Connect the spectrum analyzer to the test system in place of the master device. Set the signal generator to CW mode. Adjust the amplitude of the signal generator to yield a measured level of –62 dBm on the spectrum analyzer.

Without changing any of the instrument settings, reconnect the spectrum analyzer to the Common port of the Spectrum Analyzer Combiner/Divider and connect a 50 ohm load to the Master Device port of the test system.

Measure the amplitude and calculate the difference from –62 dBm. Adjust the Reference Level Offset of the spectrum analyzer to this difference. Confirm that the signal is displayed at –62 dBm. Readjust the RBW and VBW to 3 MHz, set the span to 10 MHz, and confirm that the signal is still displayed at –62 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –62 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

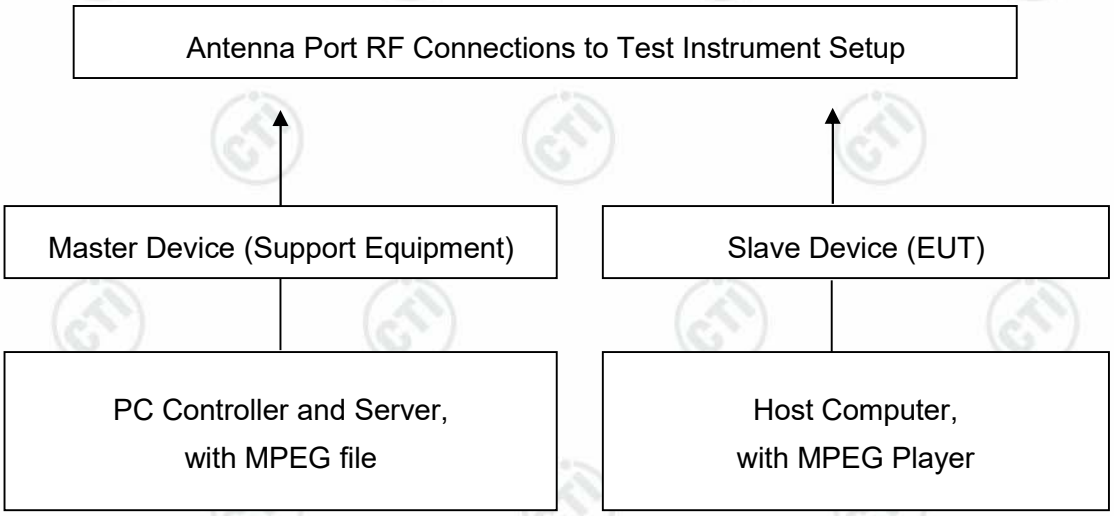
Set the signal generator to produce a radar waveform, trigger a burst manually and measure the level on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the waveform is at a displayed level equal to the required or desired interference detection threshold. Separate signal generator amplitude settings are determined as required for each radar type.

Adjustment Of Displayed Traffic Level

Establish a link between the Master and Slave, adjusting the Link Step Attenuator as needed to provide a suitable received level at the Master and Slave devices. Stream the video test file to generate WLAN traffic. Confirm that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold. Confirm that the displayed traffic is from the Master Device. For Master Device testing confirm that the displayed traffic does not include Slave Device traffic. For Slave Device testing confirm that the displayed traffic does not include Master Device traffic.

If a different setting of the Master Step Attenuator is required to meet the above conditions, perform a new System Calibration for the new Master Step Attenuator setting.

Test Setup


Antenna Port RF Connections to Test Instrument Setup
Master Device (Support Equipment)
Slave Device (EUT)
PC Controller and Server,
with MPEG file
Host Computer,
with MPEG Player

Test Result

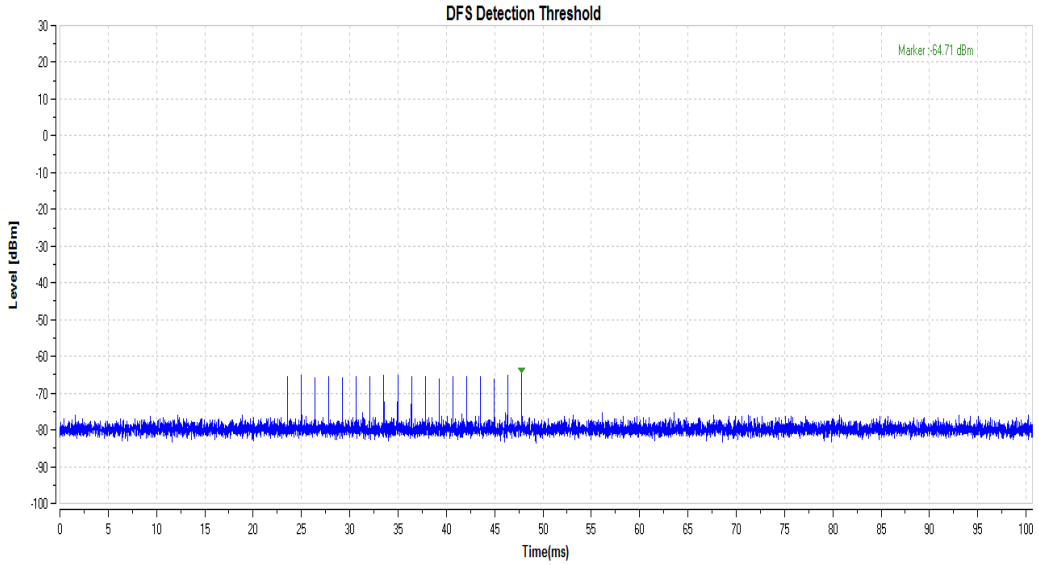
AppendixA:DFS Detection Thresholds

Test Result

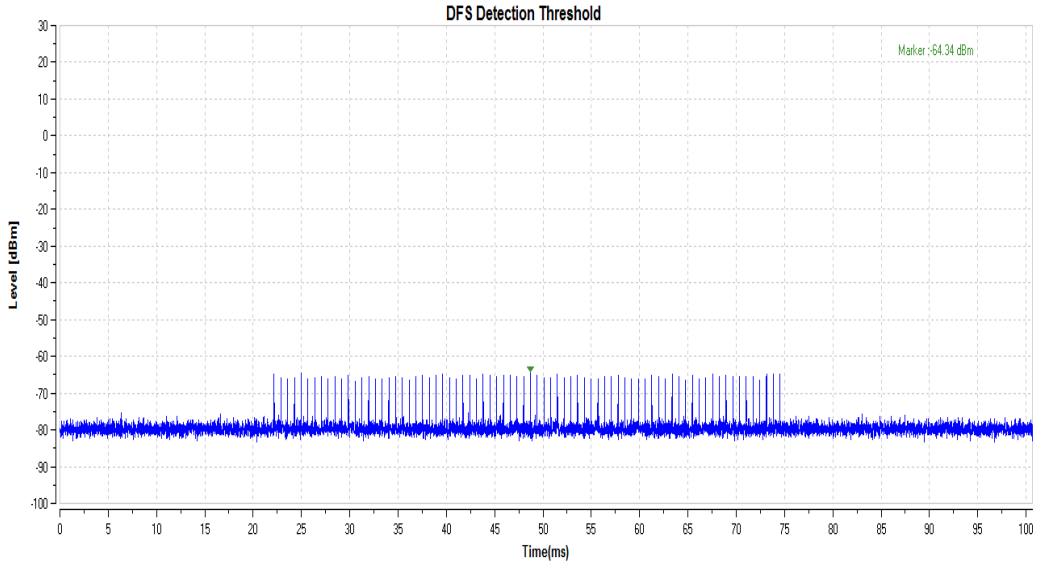
TestMode	Channel	Radar Type	Result	Limit[dbm]	Verdict
11N20SISO	5320	Type0	-64.71	-61.00	PASS
		Type1	-64.34	-61.00	PASS
		Type2	-64.26	-61.00	PASS
		Type3	-64.37	-61.00	PASS
		Type4	-64.21	-61.00	PASS
		Type5	-64.49	-61.00	PASS

Test Graphs

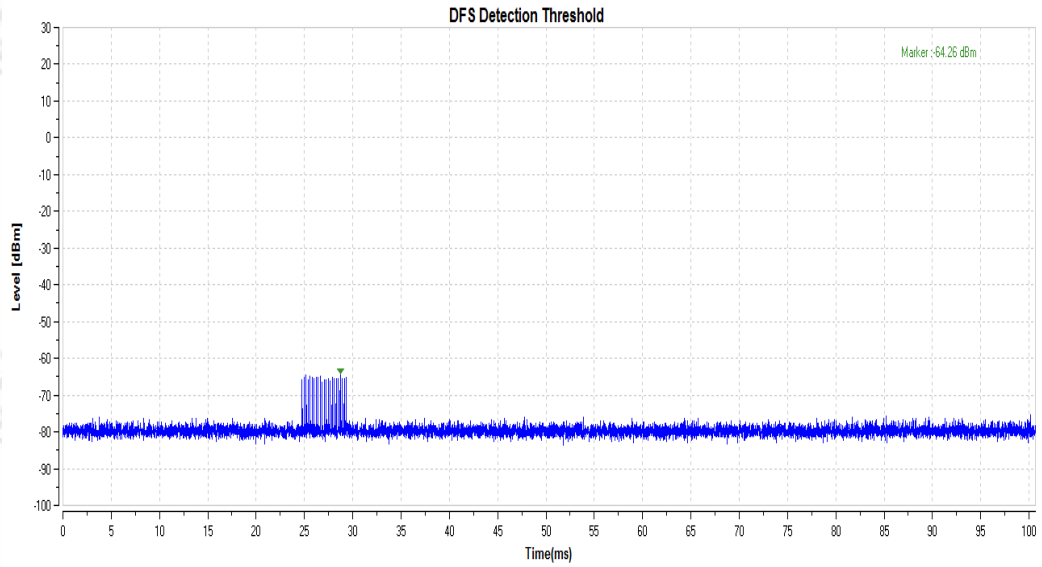
11N20SISO_5320_Type0



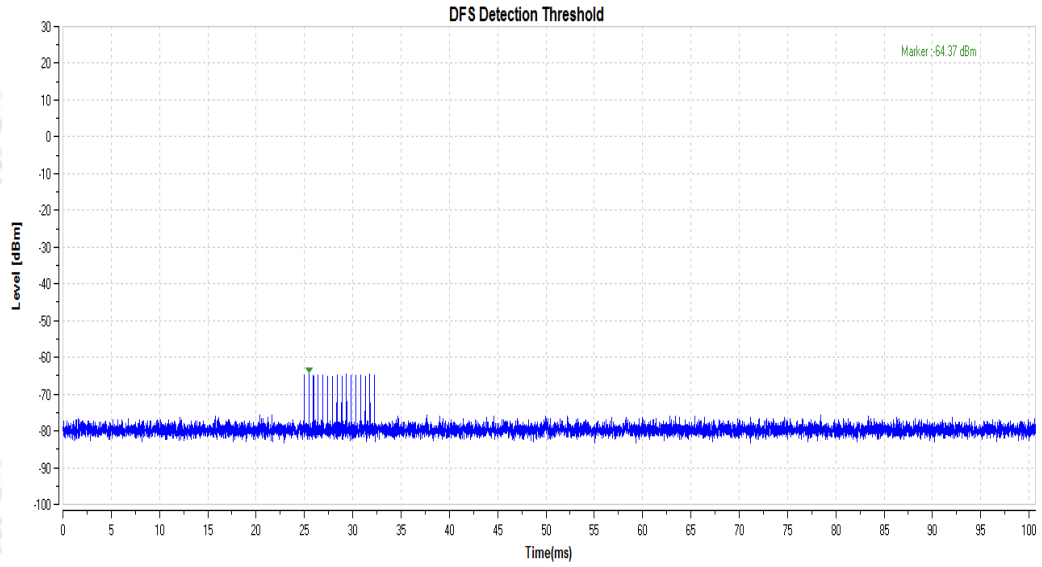
11N20SISO_5320_Type1



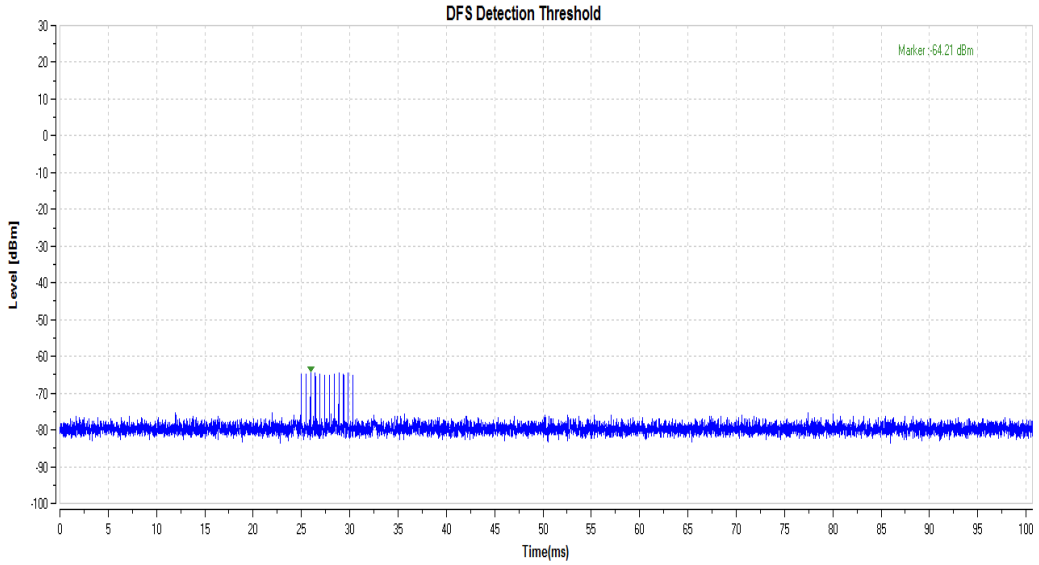
11N20SISO_5320_Type2



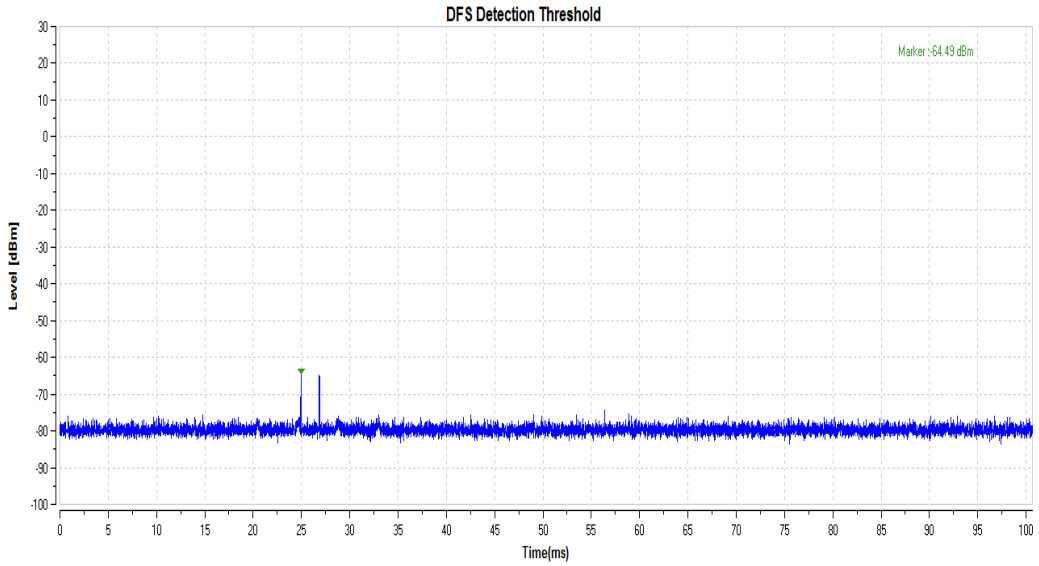
11N20SISO_5320_Type3



11N20SISO_5320_Type4



11N20SISO_5320_Type5



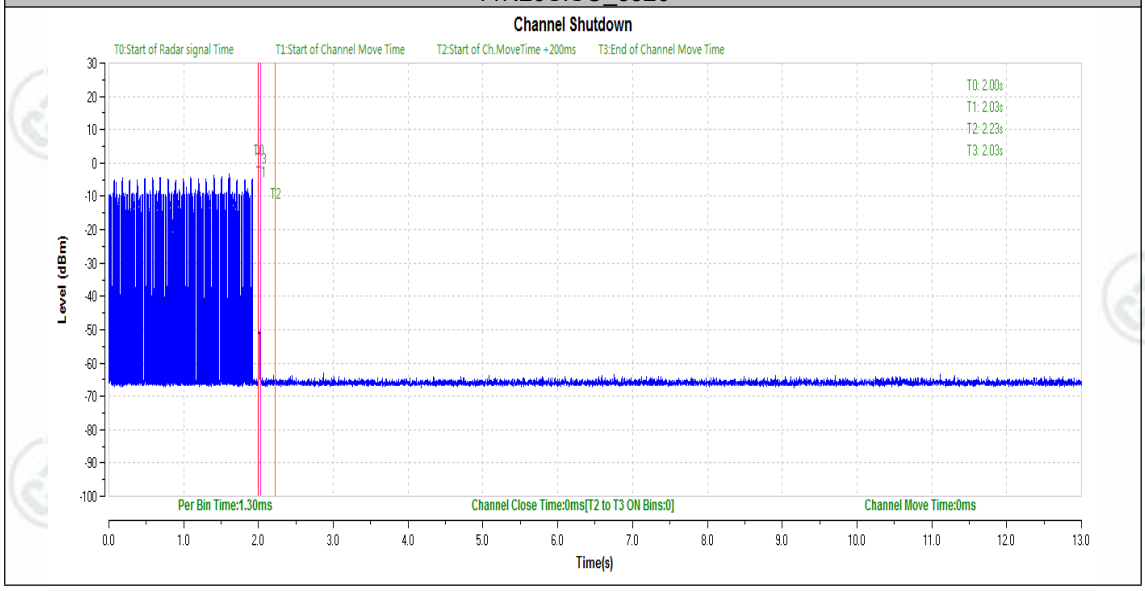
AppendixD:Channel Move Time and Channel Closing Transmission Time

Test Result

TestMode	Channel	CCT[ms]	Limit[ms]	CMT[ms]	Limit[ms]	Verdict
11N20SISO	5320	0	60	0	10000	PASS

Test Graphs

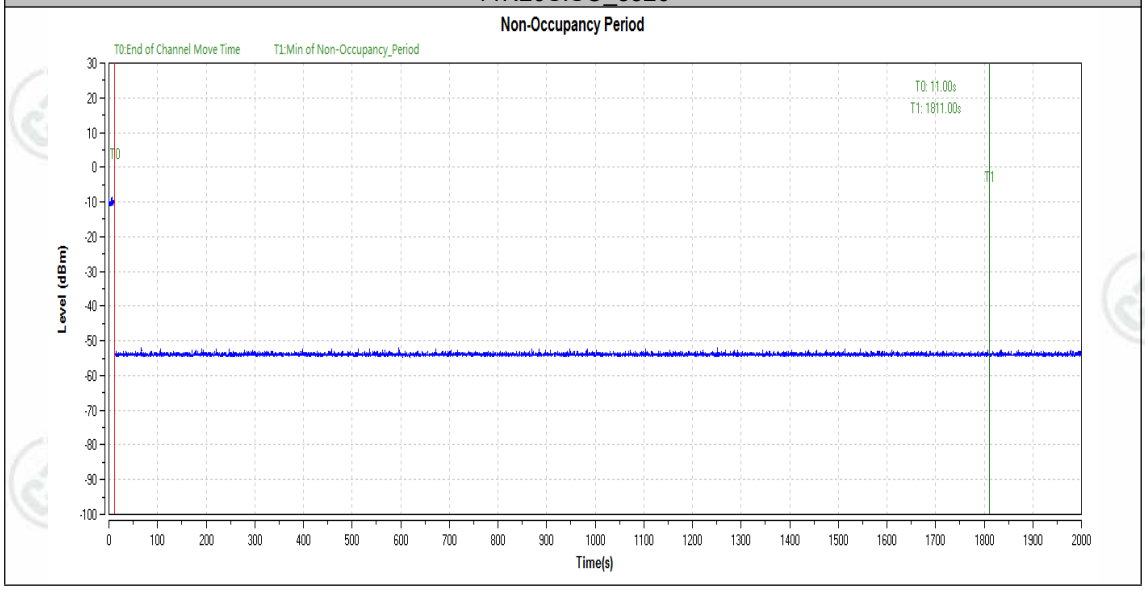
11N20SISO_5320



AppendixE:Non-Occupancy Period

Test Result

TestMode	Channel	Result	Limit[s]	Verdict
11N20SISO	5320	see test graph	>=1800	PASS

Test Graphs

11N20SISO_5320