HCT CO.,LTD.

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 **FAX: +82-31-645-6401**

FCC / IC UNII REPORT

Certification

Applicant Name:
I&C Technology Co.,Ltd.

Address:
(Sampyeong-dong , I&C Building), 24, Pangyo-ro255beon-gil,Bundang-gu Seongnam-si, South Korea

Date of Issue:
August 08, 2018
Test Site/Location:
HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majang-myeo,Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
Report No.: HCT-RF-1808-FC007
IC Registration Number: 5944A-6

FCC ID:	**2ADXS-WFM60-SFP2501**
IC:	**12641A-WFM6SFP2501**
APPLICANT:	**I&C Technology Co.,Ltd.**

Model:	WFM60-SFP2501
EUT Type:	Dual Module
Modulation type	OFDM
FCC Classification:	Unlicensed National Information Infrastructure(UNII)
FCC Rule Part(s):	Part 15.407
IC Rule Part(s):	RSS-247 Issue 2 (February 2017), RSS-Gen Issue 5(April 2018)

Band	Mode	Frequency Range (MHz)	Power (dBm)	Power (W)
UNII1	802.11a	5180 – 5240	14.81	0.03025
	802.11n_HT20		14.74	0.02976
UNII2A	802.11a	5260 – 5320	14.83	0.03039
	802.11n_HT20		14.83	0.03043
UNII2C	802.11a	5500 – 5700	13.86	0.02430
	802.11n_HT20		13.98	0.02502
UNII3	802.11a	5745 – 5825	14.26	0.02665
	802.11n_HT20		13.78	0.02389

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from thisequipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC / IC Rules under normal use and maintenance.

Report prepared by : Jeong Ho Kim
Engineer of Telecommunication testing center

Approved by : Jong Seok Lee
Manager of Telecommunication testing center

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1808-FC007	August 08, 2018	- First Approval Report

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1. GENERAL INFORMATION

Applicant:	I&C Technology Co.,Ltd.
Address:	(Sampyeong-dong , I&C Building), 24, Pangyo-ro255beon-gil,Bundang-gu Seongnam-si, South Korea
FCC ID:	2ADXS-WFM60-SFP2501
IC:	12641A-WFM6SFP2501
EUT Type:	Dual Module
Model:	WFM60-SFP2501
Date(s) of Tests:	July 03, 2018 ~ August 01, 2018
Place of Tests:	HCT Co., Ltd. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

2. EUT DESCRIPTION

Model	WFM60-SFP2501	
EUT Type	Dual Module	
Power Supply	3.30 V	
Frequency Range	TX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1) / 5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5700 MHz (UNII 2C) / 5745 MHz - 5825 MHz (UNII 3)
	RX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1) / 5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5700 MHz (UNII 2C) / 5745 MHz - 5825 MHz (UNII 3)
	For IC	5470-5600 MHz and 5650-5700 MHz [This restriction (5600-5650 MHz) is for the protection of Environment Canada's weather radars operating in this band.]
Modulation Type	OFDM(802.11a, 802.11n)	
Antenna Specification	Antenna type: WIFI Dual band PCB Antenna Peak Gain : 2.90 dBi (UNII 1) / 3.50 dBi(UNII 2A) / 3.34 dBi(UNII 2C) / 3.01 dBi(UNII 3)	

3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated December 14, 2017 entitled “Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E” and ANSI C63.10(Version : 2013) ‘the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices’ were used in the measurement.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E / RSS-Gen issue 5, RSS-247 issue 2.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 8 of ANSI C63.10. (Version: 2013)

Conducted Antenna Terminal

See Section from 8.1 to 8.4.(KDB 789033 D02 v02r01)

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.
Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).
For ISED, test facility was accepted dated October 19, 2015(Registration Number: 5944A-6)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203, §15.407

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

* The antennas of this E.U.T are permanently attached.
* The E.U.T Complies with the requirement of §15.203, §15.407 / RSS-Gen

7. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.71

8. SUMMARY OF TEST RESULTS

8.1 FCC Part

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26dB Bandwidth	§15.407 (for Power Measurement)	N/A	CONDUCTED	PASS
6 dB Bandwidth	§15.407(e)	>500 kHz (5725-5850 MHz)		PASS
Maximum Conducted Output Power	§15.407(a)	< 250 mW (5150-5250 MHz) < 250 mW or 11+10 log log $_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 log log $_{10}$ (BW) dBm (5470-5725 MHz) <1 W (5725-5850 MHz)		PASS
Peak Power Spectral Density	§15.407(a)	<11 dBm/ MHz (5150-5250 MHz) <11 dBm/ MHz (5250-5350 MHz) <11 dBm/ MHz (5470-5725 MHz) <30 dBm/500 kHz(5725-5850 MHz)		PASS
Frequency Stability	§15.407(g)	N/A		PASS
AC Conducted Emissions 150 kHz-30 MHz	15.207	<FCC 15.207 limits		PASS
Undesirable Emissions	§15.407(b)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 9.8.1 (UNII 3)	RADIATED	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(5), (6)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS

8.2 IC Part

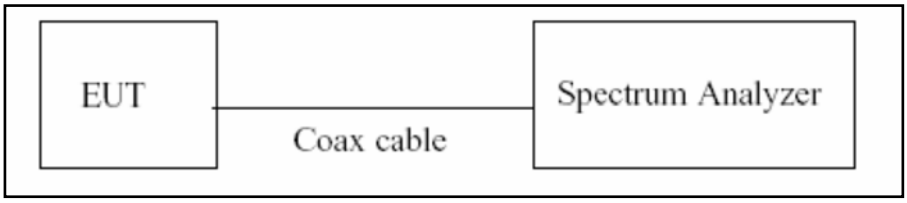
Test Description	IC Part Section(s)	Test Limit	Test Condition	Test Result
99% Bandwidth	RSS-GEN, 6.7	N/A	CONDUCTED	PASS
6 dB Bandwidth	RSS-247, 6.2.4.1	> 500 kHz (5725~5850 MHz)		PASS
Maximum Conducted Output Power,	RSS-247, 6.2	< 250 mW or 11+10 log $_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 log $_{10}$ (BW) dBm (5470-5600, 5650-5725 MHz) Whichever power is less		PASS
	RSS-247, 6.2.4 1	<1 W (5725-5850 MHz)		
Maximum e.i.r.p	RSS-247, 6.2	< 200 mW or 10+10 log $_{10}$ (BW) dBm (5150-5250 MHz) < 1 W or 17+10 log $_{10}$ (BW) dBm (5250-5350 MHz) < 1 W or 17+10 log $_{10}$ (BW) dBm (5470-5725 MHz) Whichever power is less		PASS
Power Spectral Density	RSS-247 6.2	<10 dBm/ MHz(e.i.r.p.) (5150-5250 MHz) <11 dBm/MHz(Conducted) (5250-5350 MHz, 5470-5600 MHz, 5650-5725 MHz)		PASS
	RSS-247, 6.2.4 1	<30 dBm/500 kHz(Conducted) (5725-5850 MHz)		
Frequency Stability	RSS-GEN 8.11	should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation.		PASS
AC Conducted Emissions 150 kHz-30 MHz	RSS-GEN, 8.8	RSS-GEN section 8.8 table 4		PASS
Undesirable Emissions	RSS-247, 6.2.1 2	26 dBc at 5250~5350 MHz (5150~5350 MHz)		PASS
	RSS-247, 6.2	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)	RADIATED	PASS
	RSS-247, 6.2.4 2	cf. Section 9.8.1 (UNII 3)		
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	RSS-Gen, 8.9 RSS-Gen, 8.10	RSS-Gen section 8.9 table 5, 6 section 8.10 table 7		PASS
Receiver Spurious Emissions	RSS-GEN, 5 RSS-GEN, 7.3	RSS-GEN section 7.3 table 3		PASS

9. TEST RESULT

9.1 DUTY CYCLE

The zero-span mode on a spectrum analyzer or EMI receiver ,if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ EBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/*T*, where *T* is defined in section B)1)a), and the number of sweep points across duration *T* exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if *T* ≤ 16.7 microseconds.)

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We tested according to the zero-span measurement method, (B.2 in KDB 789033 D02 v02r01)
The largest availble value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if T ≤ 6.25 microseconds. (50/6.25 = 8)
The zero-span method was used becaure all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/*T*.

1. RBW = 8 MHz (the largest availble value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10*log(1/Duty Cycle)

▣ **Duty Cycle Factor**

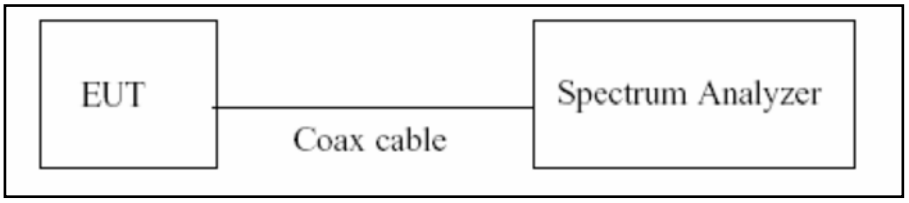
Mode	Data Rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11a	6	5.366	5.436	0.98703642	0.057
	9	3.584	3.654	0.98071534	0.085
	12	2.690	2.761	0.97431310	0.113
	18	1.799	1.870	0.96181818	0.169
	24	1.357	1.428	0.95000000	0.223
	36	0.912	0.981	0.92932797	0.318
	48	0.688	0.757	0.90846598	0.417
	54	0.615	0.686	0.89752022	0.470
Mode	**MCS INDEX**	T_{on} (ms)	T_{total} (ms)	**Duty Cycle**	**Duty Cycle Factor (dB)**
802.11n_HT20	0	3.865	3.939	0.98119573	0.082
	1	1.952	2.023	0.96467826	0.156
	2	1.314	1.386	0.94805195	0.232
	3	0.996	1.064	0.93609023	0.287
	4	0.676	0.746	0.90616622	0.428
	5	0.516	0.585	0.88154948	0.548
	6	0.464	0.533	0.87040397	0.603
	7	0.420	0.489	0.85877804	0.661

9.2 EMISSION BANDWIDTH AND MINIMUM EMISSION BANDWIDTH MEASUREMENT

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033 D02 v02r01, at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

The 26 dB bandwidth is used to determine the conducted power limits.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE (26dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.
The Spectrum Analyzer is set to(C.1 in KDB 789033 D02 v02r01)

1. RBW = approximately 1 % of the emission bandwidth
2. VBW > RBW
3. Detector = Peak
4. Trace mode = max hold
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

Note : We tested 26 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 26 dB.

1. In order to simplify the report, attached plots were only the most wide channel.
2. DFS test channels should be defined. So, We performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.

▣ TEST PROCEDURE (for the band 5.725-5.85 GHz, 6 dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to(C.2 in KDB 789033 D02 v02r01)

1. RBW = 100 kHz
2. VBW ≥ 3*RBW
3. Detector = Peak
4. Trace mode = max hold
5. Allow the trace to stabilize
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points(upper and lower frequencies) that are attenuated by 6 dB relative to the maximum lever measured in the fundamental emission.

Note : We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

▣ TEST RESULTS _802.11a

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	22.48	N/A	Pass
5200	40	21.84	N/A	Pass
5240	48	21.08	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	22.00	N/A	Pass
5300	60	21.96	N/A	Pass
5320	64	21.92	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	21.36	N/A	Pass
5580	116	22.11	N/A	Pass
5700	140	21.84	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	26.21	N/A	Pass
5785	157	27.87	N/A	Pass
5825	165	23.20	N/A	Pass

▣ TEST Plot _802.11a

802.11a UNII 1 BAND 26dB Bandwidth (CH 36)	802.11a UNII 2A BAND 26dB Bandwidth (CH 52)
	
802.11a UNII 2C BAND 26dB Bandwidth (CH 116)	**802.11a UNII 3 BAND 26dB Bandwidth (CH 157)**
	

Note : In order to simplify the report, attached plots were only the most wide channel.

▣ TEST RESULTS_802.11n_HT20

Conducted 26 dB Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	22.45	N/A	Pass
5200	40	21.64	N/A	Pass
5240	48	21.74	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	21.46	N/A	Pass
5300	60	21.95	N/A	Pass
5320	64	21.63	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	21.87	N/A	Pass
5580	116	21.43	N/A	Pass
5700	140	21.83	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	22.65	N/A	Pass
5785	157	27.04	N/A	Pass
5825	165	22.48	N/A	Pass

▣ TEST Plot _802.11n_HT20

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 36)	802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 60)
	
802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 100)	**802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 157)**
	

Note : In order to simplify the report, attached plots were only the most wide channel.

Conducted 6 dB Bandwidth

▣ TEST RESULTS _802.11a/n_HT20

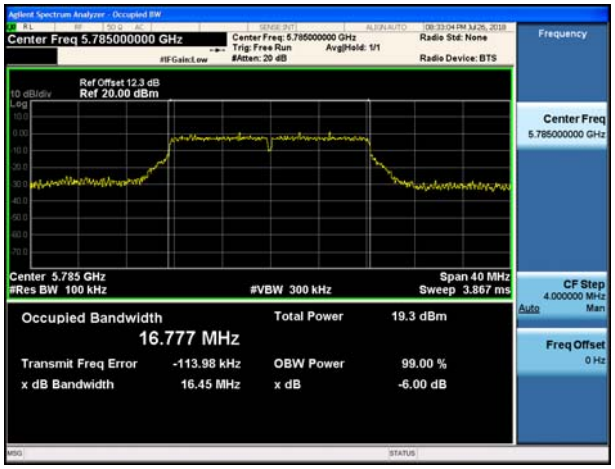
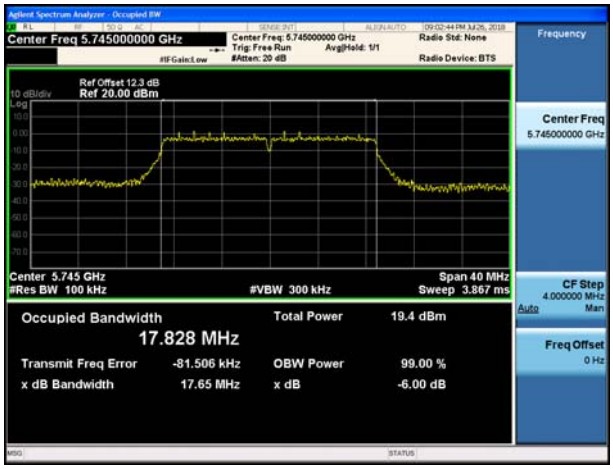
Conducted 6 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.46	0.5	Pass
5785	157	16.45	0.5	Pass
5825	165	16.50	0.5	Pass

Conducted 6 dB Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.65	0.5	Pass
5785	157	17.71	0.5	Pass
5825	165	17.67	0.5	Pass

▣ TEST PlotS for 802.11a/n_HT20

802.11a UNII 3 BAND 6dB Bandwidth (CH.157)	802.11n_HT20 UNII 3 BAND 6dB Bandwidth(CH.149)
	

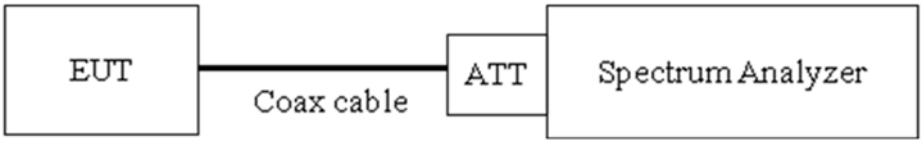
Note : In order to simplify the report, attached plots were only the most narrow channel.

9.3 99% BANDWIDTH MEASUREMENT

None; for IC reporting purposes only

The 99 % bandwidth is used to determine the conducted power limits(for IC).

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dBbandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RBW = 1% ~ 5% of the occupied bandwidth
VBW ≥ 3 x RBW
Detector = Peak
Trace mode = max hold
Sweep = auto couple
Allow the trace to stabilize

▣ TEST RESULTS _802.11a

99% Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5180	36	17.468
5200	40	17.425
5240	48	17.519

99% Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5260	52	17.598
5300	60	17.488
5320	64	17.434

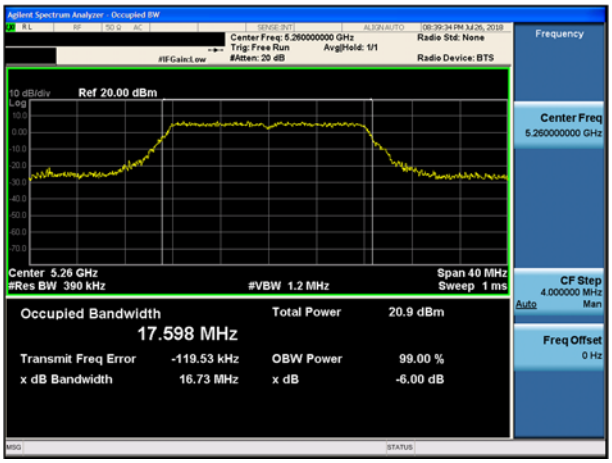
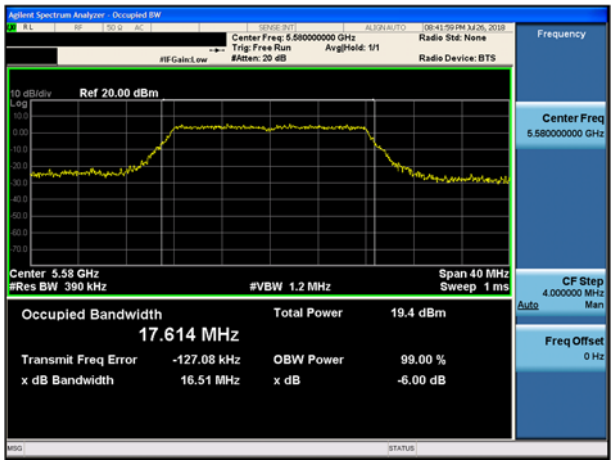
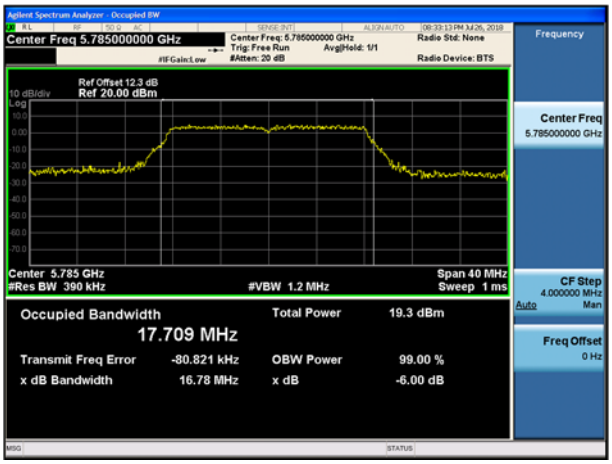
99% Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5500	100	17.557
5580	116	17.614
5700	140	17.427

99% Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.673
5785	157	17.709
5825	165	17.616

▣ TEST Plot _802.11a

802.11a UNII 1 BAND 99% Bandwidth (CH 48)	802.11a UNII 2A BAND 99% Bandwidth (CH 52)
	
802.11a UNII 2C BAND 99% Bandwidth (CH 116)	**802.11a UNII 3 BAND 99% Bandwidth (CH 157)**
	

Note : In order to simplify the report, attached plots were only the most wide channel.

▣ TEST RESULTS _802.11n_HT20

99% Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5180	36	18.385
5200	40	18.358
5240	48	18.356

99% Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5260	52	18.371
5300	60	18.357
5320	64	18.350

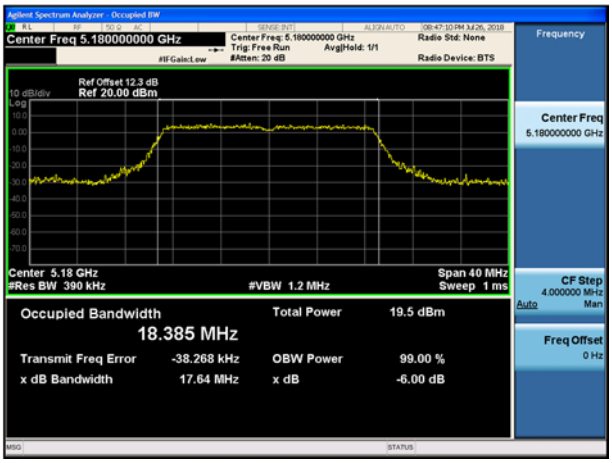
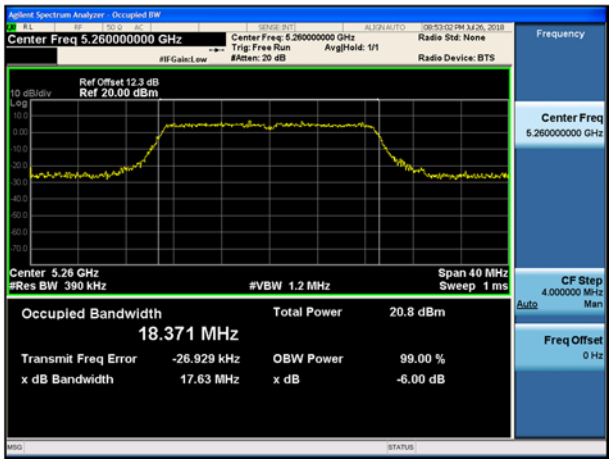
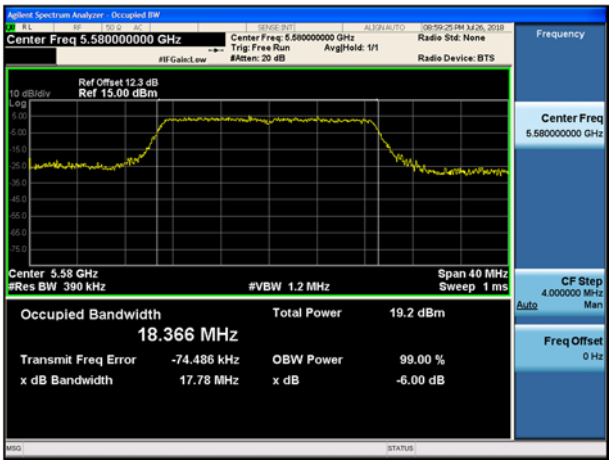
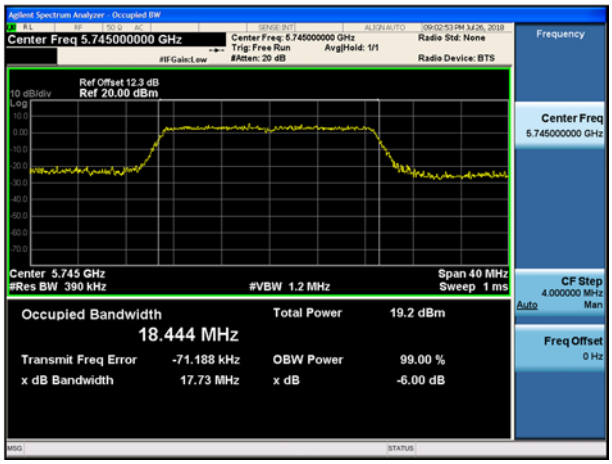
99% Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5500	100	18.350
5580	116	18.366
5700	140	18.311

99% Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	18.444
5785	157	18.423
5825	165	18.392

▣ TEST Plot _802.11n_HT20

802.11n_HT20 UNII 1 BAND 99% Bandwidth(CH 36)	802.11n_HT20 UNII 2A BAND 99% Bandwidth(CH 52)
	
802.11n_HT20 UNII 2C BAND 99% Bandwidth(CH 116)	**802.11n_HT20 UNII 3 BAND 99% Bandwidth(CH 149)**
	

Note : In order to simplify the report, attached plots were only the most wide channel.

9.4 OUTPUT POWER MEASUREMENT

A transmitter antenna terminal of EUT is connected to the input of a Power meter or Spectrum Analyzer .Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

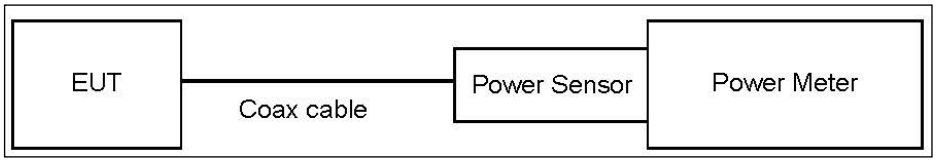
▣ FCC LIMIT

Band	Mode	Limit (dBm)
UNII 1	802.11a,n	23.98
UNII 2A	802.11a,n	23.98
UNII 2C	802.11a,n	23.98
UNII 3	802.11a,n	30.00

▣ IC LIMIT

Band	Mode	Limit (dBm)
UNII 1	802.11a,n	23.01 (e.i.r.p)
UNII 2A	802.11a,n	23.98
UNII 2C	802.11a,n	23.98
UNII 3	802.11a,n	30.00

▣ TEST CONFIGURATION(20 MHz BW)



▣ TEST PROCEDURE(20 MHz BW)

▪ Average Power (Procedure E.3.a in KDB 789033 D02 v02r01).

1. Measure the duty cycle.
2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3. Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Note :

Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1, 2A, 2C, 3	11.2

(Actual value of loss for the attenuator and cable combination)

802.11a (UNII 1)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11a Mode: 5180~5240)

802.11a Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	FCC Limit (dBm)	*IC Limit (dBm)
Frequency [MHz]	Channel No.						
5180	36	6	14.47	0.06	14.53	23.98	20.11
		9	14.06	0.08	14.14	23.98	20.11
		12	14.20	0.11	14.31	23.98	20.11
		18	14.05	0.17	14.22	23.98	20.11
		24	13.95	0.22	14.17	23.98	20.11
		36	13.50	0.32	13.82	23.98	20.11
		48	12.95	0.42	13.37	23.98	20.11
		54	12.30	0.47	12.77	23.98	20.11
5200	40	6	14.45	0.06	14.51	23.98	20.11
		9	14.20	0.08	14.28	23.98	20.11
		12	14.42	0.11	14.53	23.98	20.11
		18	14.33	0.17	14.50	23.98	20.11
		24	14.26	0.22	14.48	23.98	20.11
		36	13.70	0.32	14.02	23.98	20.11
		48	13.19	0.42	13.61	23.98	20.11
		54	12.61	0.47	13.08	23.98	20.11
5240	48	6	14.75	0.06	14.81	23.98	20.11
		9	14.52	0.08	14.60	23.98	20.11
		12	14.56	0.11	14.67	23.98	20.11
		18	14.51	0.17	14.68	23.98	20.11
		24	14.50	0.22	14.72	23.98	20.11
		36	13.92	0.32	14.24	23.98	20.11
		48	13.45	0.42	13.87	23.98	20.11
		54	12.95	0.47	13.42	23.98	20.11

[NOTE]

*** IC Limit = The maximum e.i.r.p. shall not exceed 200 mW (UNII1)**

= 23.01 dBm – 2.90 dBi (Highest Antenna Peak Gain)

= 20.11 dBm

802.11a (UNII 2A)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11a Mode: 5260~5320)

802.11a Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6	14.77	0.06	14.83	23.98
		9	14.45	0.08	14.53	23.98
		12	14.56	0.11	14.67	23.98
		18	14.45	0.17	14.62	23.98
		24	14.35	0.22	14.57	23.98
		36	14.00	0.32	14.32	23.98
		48	13.53	0.42	13.95	23.98
		54	12.88	0.47	13.35	23.98
5300	60	6	14.00	0.06	14.06	23.98
		9	13.70	0.08	13.78	23.98
		12	13.82	0.11	13.93	23.98
		18	13.80	0.17	13.97	23.98
		24	13.74	0.22	13.96	23.98
		36	13.25	0.32	13.57	23.98
		48	12.73	0.42	13.15	23.98
		54	12.13	0.47	12.60	23.98
5320	64	6	13.01	0.06	13.07	23.98
		9	12.70	0.08	12.78	23.98
		12	12.80	0.11	12.91	23.98
		18	12.75	0.17	12.92	23.98
		24	12.70	0.22	12.92	23.98
		36	12.09	0.32	12.41	23.98
		48	11.70	0.42	12.12	23.98
		54	11.15	0.47	11.62	23.98

802.11a (UNII 2C)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11a Mode: 5500~5700)

802.11a Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6	13.44	0.06	13.50	23.98
		9	13.30	0.08	13.38	23.98
		12	13.38	0.11	13.49	23.98
		18	12.90	0.17	13.07	23.98
		24	12.85	0.22	13.07	23.98
		36	12.43	0.32	12.75	23.98
		48	11.95	0.42	12.37	23.98
		54	11.63	0.47	12.10	23.98
5580	116	6	13.80	0.06	13.86	23.98
		9	13.60	0.08	13.68	23.98
		12	13.74	0.11	13.85	23.98
		18	13.67	0.17	13.84	23.98
		24	13.60	0.22	13.82	23.98
		36	13.10	0.32	13.42	23.98
		48	12.60	0.42	13.02	23.98
		54	11.97	0.47	12.44	23.98
5700	140	6	11.20	0.06	11.26	23.98
		9	11.25	0.08	11.33	23.98
		12	11.35	0.11	11.46	23.98
		18	11.30	0.17	11.47	23.98
		24	11.23	0.22	11.45	23.98
		36	11.88	0.32	12.20	23.98
		48	11.90	0.42	12.32	23.98
		54	11.78	0.47	12.25	23.98

802.11a (UNII 3)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11a Mode: 5745~5825)

802.11a Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5745	149	6	14.20	0.06	14.26	30
		9	14.07	0.08	14.15	30
		12	14.07	0.11	14.18	30
		18	13.90	0.17	14.07	30
		24	13.80	0.22	14.02	30
		36	13.25	0.32	13.57	30
		48	12.75	0.42	13.17	30
		54	12.05	0.47	12.52	30
5785	157	6	13.90	0.06	13.96	30
		9	13.64	0.08	13.72	30
		12	13.74	0.11	13.85	30
		18	13.55	0.17	13.72	30
		24	13.41	0.22	13.63	30
		36	12.84	0.32	13.16	30
		48	12.34	0.42	12.76	30
		54	11.70	0.47	12.17	30
5825	165	6	13.60	0.06	13.66	30
		9	13.22	0.08	13.30	30
		12	13.26	0.11	13.37	30
		18	13.37	0.17	13.54	30
		24	13.34	0.22	13.56	30
		36	12.85	0.32	13.17	30
		48	12.45	0.42	12.87	30
		54	11.80	0.47	12.27	30

802.11n_HT20 (UNII 1)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT20 Mode: 5180~5240)

802.11n_HT20 Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	FCC Limit (dBm)	*IC Limit (dBm)
Frequency [MHz]	Channel No.						
5180	36	0	13.67	0.08	13.75	23.98	20.11
		1	13.51	0.16	13.67	23.98	20.11
		2	13.39	0.23	13.62	23.98	20.11
		3	13.32	0.29	13.61	23.98	20.11
		4	12.93	0.43	13.36	23.98	20.11
		5	12.35	0.55	12.90	23.98	20.11
		6	11.45	0.60	12.05	23.98	20.11
		7	10.14	0.66	10.80	23.98	20.11
5200	40	0	14.12	0.08	14.20	23.98	20.11
		1	14.03	0.16	14.19	23.98	20.11
		2	13.94	0.23	14.17	23.98	20.11
		3	13.78	0.29	14.07	23.98	20.11
		4	13.44	0.43	13.87	23.98	20.11
		5	12.78	0.55	13.33	23.98	20.11
		6	12.07	0.60	12.67	23.98	20.11
		7	10.65	0.66	11.31	23.98	20.11
5240	48	0	14.65	0.08	14.73	23.98	20.11
		1	14.58	0.16	14.74	23.98	20.11
		2	14.48	0.23	14.71	23.98	20.11
		3	14.31	0.29	14.60	23.98	20.11
		4	14.01	0.43	14.44	23.98	20.11
		5	13.33	0.55	13.88	23.98	20.11
		6	12.60	0.60	13.20	23.98	20.11
		7	11.23	0.66	11.89	23.98	20.11

[NOTE]

*** IC Limit = The maximum e.i.r.p. shall not exceed 200 mW (UNII1)**

= 23.01 dBm – 2.90 dBi (Highest Antenna Peak Gain)

= 20.11 dBm

802.11n_HT20 (UNII 2A)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT20 Mode: 5260~5320)

802.11n_HT20 Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	0	14.75	0.08	14.83	23.98
		1	14.65	0.16	14.81	23.98
		2	14.60	0.23	14.83	23.98
		3	14.41	0.29	14.70	23.98
		4	14.08	0.43	14.51	23.98
		5	13.45	0.55	14.00	23.98
		6	12.70	0.60	13.30	23.98
		7	11.31	0.66	11.97	23.98
5300	60	0	14.11	0.08	14.19	23.98
		1	14.01	0.16	14.17	23.98
		2	13.90	0.23	14.13	23.98
		3	13.75	0.29	14.04	23.98
		4	13.35	0.43	13.78	23.98
		5	12.70	0.55	13.25	23.98
		6	11.85	0.60	12.45	23.98
		7	10.56	0.66	11.22	23.98
5320	64	0	12.90	0.08	12.98	23.98
		1	12.85	0.16	13.01	23.98
		2	12.80	0.23	13.03	23.98
		3	12.70	0.29	12.99	23.98
		4	12.25	0.43	12.68	23.98
		5	11.60	0.55	12.15	23.98
		6	10.95	0.60	11.55	23.98
		7	9.65	0.66	10.31	23.98

802.11n_HT20 (UNII 2C)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT20 Mode: 5500~5700)

802.11n_HT20 Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	0	13.72	0.08	13.80	23.98
		1	13.70	0.16	13.86	23.98
		2	13.58	0.23	13.81	23.98
		3	13.37	0.29	13.66	23.98
		4	12.95	0.43	13.38	23.98
		5	12.37	0.55	12.92	23.98
		6	11.55	0.60	12.15	23.98
		7	10.31	0.66	10.97	23.98
5580	116	0	13.90	0.08	13.98	23.98
		1	13.78	0.16	13.94	23.98
		2	13.69	0.23	13.92	23.98
		3	13.50	0.29	13.79	23.98
		4	13.11	0.43	13.54	23.98
		5	12.55	0.55	13.10	23.98
		6	11.61	0.60	12.21	23.98
		7	10.35	0.66	11.01	23.98
5700	140	0	11.28	0.08	11.36	23.98
		1	11.20	0.16	11.36	23.98
		2	11.12	0.23	11.35	23.98
		3	11.11	0.29	11.40	23.98
		4	11.15	0.43	11.58	23.98
		5	11.05	0.55	11.60	23.98
		6	11.35	0.60	11.95	23.98
		7	10.15	0.66	10.81	23.98

802.11n_HT20 (UNII 3)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT20 Mode: 5745~5825)

802.11n_HT20 Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5745	149	0	13.70	0.08	13.78	30
		1	13.56	0.16	13.72	30
		2	13.47	0.23	13.70	30
		3	13.28	0.29	13.57	30
		4	12.93	0.43	13.36	30
		5	12.31	0.55	12.86	30
		6	11.38	0.60	11.98	30
		7	10.13	0.66	10.79	30
5785	157	0	13.66	0.08	13.74	30
		1	13.58	0.16	13.74	30
		2	13.44	0.23	13.67	30
		3	13.25	0.29	13.54	30
		4	12.85	0.43	13.28	30
		5	12.22	0.55	12.77	30
		6	11.43	0.60	12.03	30
		7	10.15	0.66	10.81	30
5825	165	0	13.54	0.08	13.62	30
		1	13.49	0.16	13.65	30
		2	13.35	0.23	13.58	30
		3	13.28	0.29	13.57	30
		4	12.87	0.43	13.30	30
		5	12.27	0.55	12.82	30
		6	11.35	0.60	11.95	30
		7	10.05	0.66	10.71	30

9.6 POWER SPECTRAL DENSITY

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

▣ FCC Limit

Power Spectral Density

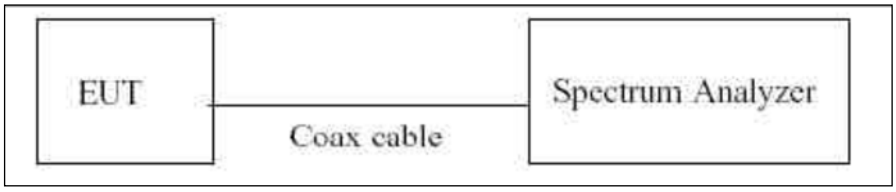
Band	Mode	Limit
UNII 1	802.11a,n	11 dBm/MHz
UNII 2A	802.11a,n	11 dBm/MHz
UNII 2C	802.11a,n	11 dBm/MHz
UNII 3	802.11a,n	30 dBm/500 kHz

▣ IC Limit

Power Spectral Density

Band	Mode	Limit
UNII 1	802.11a,n	10 dBm/MHz (e.i.r.p)
UNII 2A	802.11a,n	11 dBm/MHz
UNII 2C	802.11a,n	11 dBm/MHz
UNII 3	802.11a,n	30 dBm/500 kHz

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

We tested according to Method in KDB 789033 D02 v02r01.

The spectrum analyzer is set to :

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz(510 kHz for UNII 3)
3. VBW ≥ 3 MHz
4. Number of points in sweep ≥ 2*span/RBW.
5. Sweep time = auto.
6. Detector = RMS(i.e., power averaging), if available. Otherwise, use sample detector mode.
7. Do not use sweep triggering. Allow the sweep to “free run”.
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.

▣ SAMPLE CALCULATION

PSD = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor

Ex) PSD = -3 dBm + 10 dB + 0.8 dB + 0.2 dB = 8.0 dBm

Note :

1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1,2A, 2C, 3	12.3

(Actual value of loss for the attenuator and cable combination)

▣ 802.11a

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5180	36	802.11a	1.927	0.057	1.984	FCC: 11 * IC: 7.1	Pass
5200	40		2.494	0.113	2.607		Pass
5240	48		3.044	0.057	3.101		Pass
5260	52		2.982	0.057	3.039	11	Pass
5300	60		2.298	0.057	2.355		Pass
5320	64		1.292	0.057	1.349		Pass
5500	100		1.516	0.057	1.573	11	Pass
5580	116		1.469	0.057	1.526		Pass
5700	140		-0.239	0.417	0.178		Pass
5745	149		-1.515	0.057	-1.458	30	Pass
5785	157		-1.507	0.057	-1.450		Pass
5825	165		-1.351	0.057	-1.294		Pass

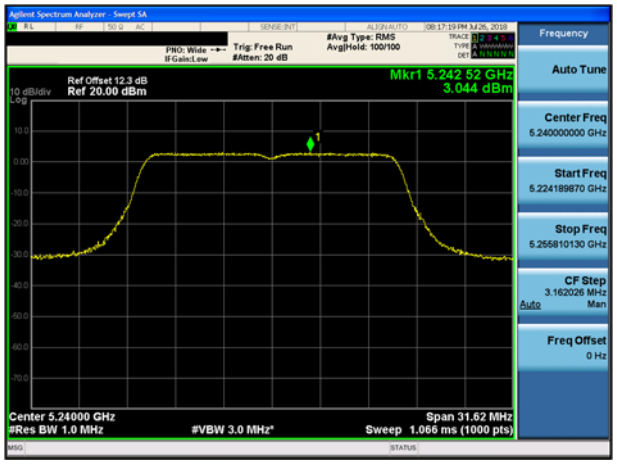
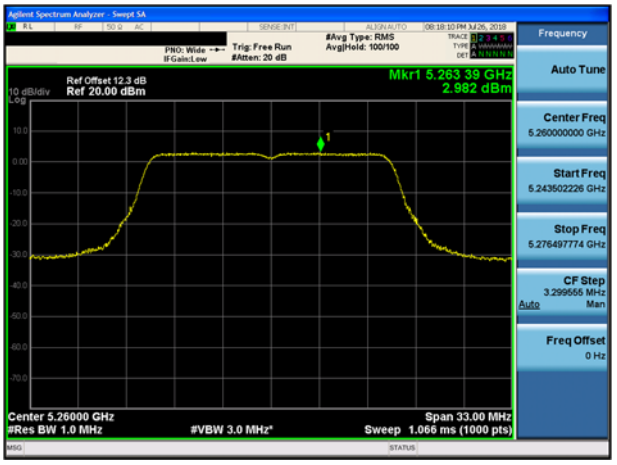
[NOTE]

*** IC Limit = 10dBm/MHz (e.i.r.p) _UNII1**

= 10 dBm – 2.90 dBi (Highest Antenna Peak Gain)

= 7.1 dBm

▣ TEST Plot for 802.11a

802.11a UNII 1 BAND PSD CH 48	802.11a UNII 2A BAND PSD CH 52
	
802.11a UNII 2C BAND PSD CH 100	**802.11a UNII 3 BAND PSD CH 165**
	

▣802.11n_HT20

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5180	36	802.11n _HT20	1.216	0.082	1.298	FCC: 11 *IC: 7.1	Pass
5200	40		1.802	0.082	1.884		Pass
5240	48		2.430	0.156	2.586		Pass
5260	52		2.697	0.082	2.779	11	Pass
5300	60		1.804	0.082	1.886		Pass
5320	64		0.746	0.232	0.978		Pass
5500	100		1.078	0.156	1.234	11	Pass
5580	116		1.172	0.082	1.254		Pass
5700	140		-1.041	0.603	-0.438		Pass
5745	149		-1.813	0.082	-1.731	30	Pass
5785	157		-1.873	0.082	-1.791		Pass
5825	165		-1.444	0.156	-1.288		Pass

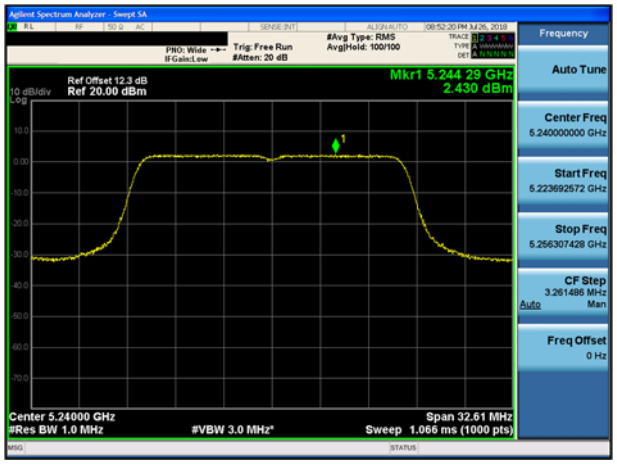
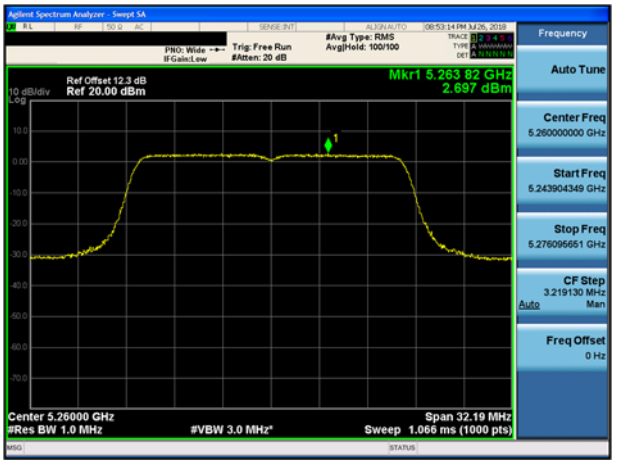
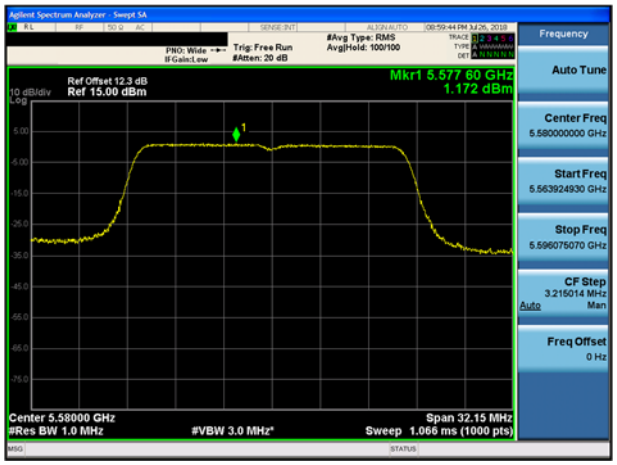
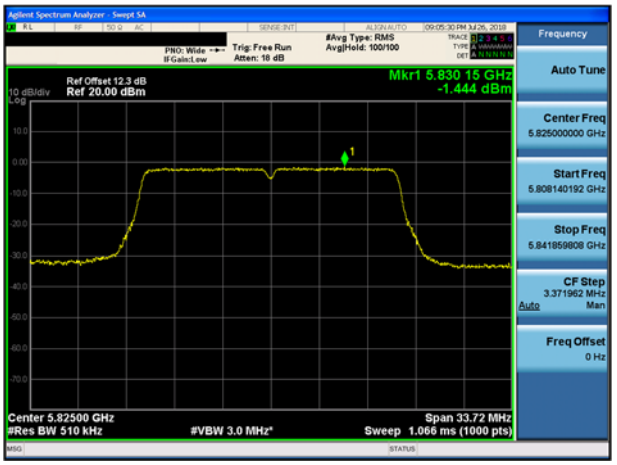
[NOTE]

*** IC Limit = 10dBm/MHz (e.i.r.p) _UNII1**

= 10 dBm – 2.90 dBi (Highest Antenna Peak Gain)

= 7.1 dBm

▣ TEST Plot for 802.11n_HT20

802.11n_HT20 UNII 1 BAND PSD CH 48	802.11n_HT20 UNII 2A BAND PSD CH 52
	
802.11n_HT20 UNII 2C BAND PSD CH 116	**802.11n_HT20 UNII 3 BAND PSD CH 165**
	

9.8 FREQUENCY STABILITY

The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 ℃ and 50 ℃. The temperature was incremented by 10 ℃ intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

§2.1055 Measurements required: Frequency stability.

The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battety operating end point which shall be specified by the manufacturer.

20 MHz BW_ Startup

OPERATING BAND: UNII Band 1
OPERATING FREQUENCY: 5,180,000,000 Hz
CHANNEL: 36
REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5180032.50	32.50
100%		-30	5180028.56	28.56
100%		-20	5180031.56	31.56
100%		-10	5180038.26	38.26
100%		0	5180042.51	42.51
100%		+10	5180045.62	45.62
100%		+30	5180058.62	58.62
100%		+40	5180055.16	55.16
100%		+50	5180041.39	41.39
High	3.60	+20	5180044.31	44.31
Low	3.00	+20	5180034.82	34.82

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5260036.81	36.81
100%		-30	5260029.81	29.81
100%		-20	5260027.53	27.53
100%		-10	5260033.68	33.68
100%		0	5260038.25	38.25
100%		+10	5260040.92	40.92
100%		+30	5260049.86	49.86
100%		+40	5260052.62	52.62
100%		+50	5260054.20	54.20
High	3.60	+20	5260041.57	41.57
Low	3.00	+20	5260040.58	40.58

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5500030.96	30.96
100%		-30	5500024.81	24.81
100%		-20	5500028.33	28.33
100%		-10	5500032.58	32.58
100%		0	5500050.62	50.62
100%		+10	5500035.92	35.92
100%		+30	5500028.96	28.96
100%		+40	5500036.81	36.81
100%		+50	5500025.44	25.44
High	3.60	+20	5500034.56	34.56
Low	3.00	+20	5500027.84	27.84

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,745,000,000 Hz

CHANNEL: 149

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5745039.87	39.87
100%		-30	5745033.56	33.56
100%		-20	5745027.18	27.18
100%		-10	5745035.12	35.12
100%		0	5745037.08	37.08
100%		+10	5745040.62	40.62
100%		+30	5745048.92	48.92
100%		+40	5745055.12	55.12
100%		+50	5745057.46	57.46
High	3.60	+20	5745028.64	28.64
Low	3.00	+20	5745036.31	36.31

2 minutes

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5180040.82	40.82
100%		-30	5180025.63	25.63
100%		-20	5180028.82	28.82
100%		-10	5180031.95	31.95
100%		0	5180036.64	36.64
100%		+10	5180040.85	40.85
100%		+30	5180049.92	49.92
100%		+40	5180055.63	55.63
100%		+50	5180028.46	28.46
High	3.60	+20	5180034.12	34.12
Low	3.00	+20	5180022.36	22.36

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5260033.69	33.69
100%		-30	5260035.84	35.84
100%		-20	5260040.81	40.81
100%		-10	5260068.21	68.21
100%		0	5260054.12	54.12
100%		+10	5260042.66	42.66
100%		+30	5260025.31	25.31
100%		+40	5260019.84	19.84
100%		+50	5260021.75	21.75
High	3.60	+20	5260041.56	41.56
Low	3.00	+20	5260033.45	33.45

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5500027.88	27.88
100%		-30	5500024.16	24.16
100%		-20	5500035.99	35.99
100%		-10	5500063.51	63.51
100%		0	5500050.41	50.41
100%		+10	5500031.85	31.85
100%		+30	5500057.48	57.48
100%		+40	5500040.28	40.28
100%		+50	5500036.79	36.79
High	3.60	+20	5500028.52	28.52
Low	3.00	+20	5500021.84	21.84

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,745,000,000 Hz

CHANNEL: 149

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5745041.40	41.40
100%		-30	5745026.08	26.08
100%		-20	5745029.74	29.74
100%		-10	5745033.84	33.84
100%		0	5745041.02	41.02
100%		+10	5745057.46	57.46
100%		+30	5745032.69	32.69
100%		+40	5745041.58	41.58
100%		+50	5745037.25	37.25
High	3.60	+20	5745028.97	28.97
Low	3.00	+20	5745025.44	25.44

5 minutes

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5180029.57	29.57
100%		-30	5180022.45	22.45
100%		-20	5180028.55	28.55
100%		-10	5180036.98	36.98
100%		0	5180048.67	48.67
100%		+10	5180053.27	53.27
100%		+30	5180028.44	28.44
100%		+40	5180040.25	40.25
100%		+50	5180035.37	35.37
High	3.60	+20	5180028.51	28.51
Low	3.00	+20	5180025.03	25.03

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5260042.06	42.06
100%		-30	5260044.87	44.87
100%		-20	5260033.51	33.51
100%		-10	5260045.68	45.68
100%		0	5260038.41	38.41
100%		+10	5260022.98	22.98
100%		+30	5260027.55	27.55
100%		+40	5260024.81	24.81
100%		+50	5260041.57	41.57
High	3.60	+20	5260042.93	42.93
Low	3.00	+20	5260056.05	56.05

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5500026.81	26.81
100%		-30	5500024.55	24.55
100%		-20	5500028.41	28.41
100%		-10	5500023.28	23.28
100%		0	5500048.26	48.26
100%		+10	5500035.91	35.91
100%		+30	5500044.13	44.13
100%		+40	5500045.81	45.81
100%		+50	5500027.33	27.33
High	3.60	+20	5500034.85	34.85
Low	3.00	+20	5500027.94	27.94

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,745,000,000 Hz

CHANNEL: 149

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5745042.85	42.85
100%		-30	5745029.81	29.81
100%		-20	5745033.71	33.71
100%		-10	5745037.26	37.26
100%		0	5745041.07	41.07
100%		+10	5745048.12	48.12
100%		+30	5745051.81	51.81
100%		+40	5745055.41	55.41
100%		+50	5745054.10	54.10
High	3.60	+20	5745027.84	27.84
Low	3.00	+20	5745042.85	42.85

10 minutes

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5180023.76	23.76
100%		-30	5180024.59	24.59
100%		-20	5180038.05	38.05
100%		-10	5180026.80	26.80
100%		0	5180034.91	34.91
100%		+10	5180029.09	29.09
100%		+30	5180027.80	27.80
100%		+40	5180039.94	39.94
100%		+50	5180054.81	54.81
High	3.60	+20	5180032.96	32.96
Low	3.00	+20	5180041.97	41.97

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5260027.81	27.81
100%		-30	5260026.90	26.90
100%		-20	5260050.73	50.73
100%		-10	5260034.58	34.58
100%		0	5260045.96	45.96
100%		+10	5260050.07	50.07
100%		+30	5260027.03	27.03
100%		+40	5260041.44	41.44
100%		+50	5260046.85	46.85
High	3.60	+20	5260033.86	33.86
Low	3.00	+20	5260039.85	39.85

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5500024.36	24.36
100%		-30	5500033.81	33.81
100%		-20	5500042.68	42.68
100%		-10	5500035.26	35.26
100%		0	5500042.79	42.79
100%		+10	5500036.88	36.88
100%		+30	5500034.51	34.51
100%		+40	5500036.24	36.24
100%		+50	5500024.75	24.75
High	3.60	+20	5500042.61	42.61
Low	3.00	+20	5500033.68	33.68

OPERATING BAND: UNII Band 3
OPERATING FREQUENCY: 5,745,000,000 Hz
CHANNEL: 149
REFERENCE VOLTAGE: 3.30 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.30	+20(Ref)	5745037.81	37.81
100%		-30	5745034.56	34.56
100%		-20	5745045.98	45.98
100%		-10	5745041.67	41.67
100%		0	5745036.98	36.98
100%		+10	5745040.72	40.72
100%		+30	5745027.88	27.88
100%		+40	5745022.11	22.11
100%		+50	5745037.16	37.16
High	3.60	+20	5745021.03	21.03
Low	3.00	+20	5745052.16	52.16

Note 1.

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Note 2.

Voltage variations were tested in low and high conditions declared by the manufacturer.

9.8 RADIATED MEASUREMENT

9.8.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209, §15.407

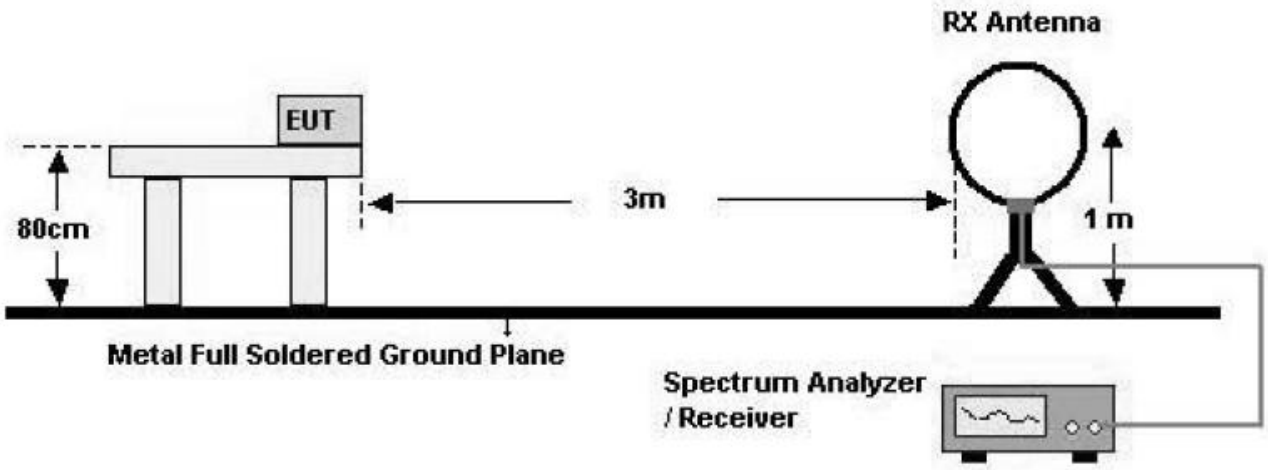
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

▣ §15.407,RSS-247, KDB 789033 D02v02r01

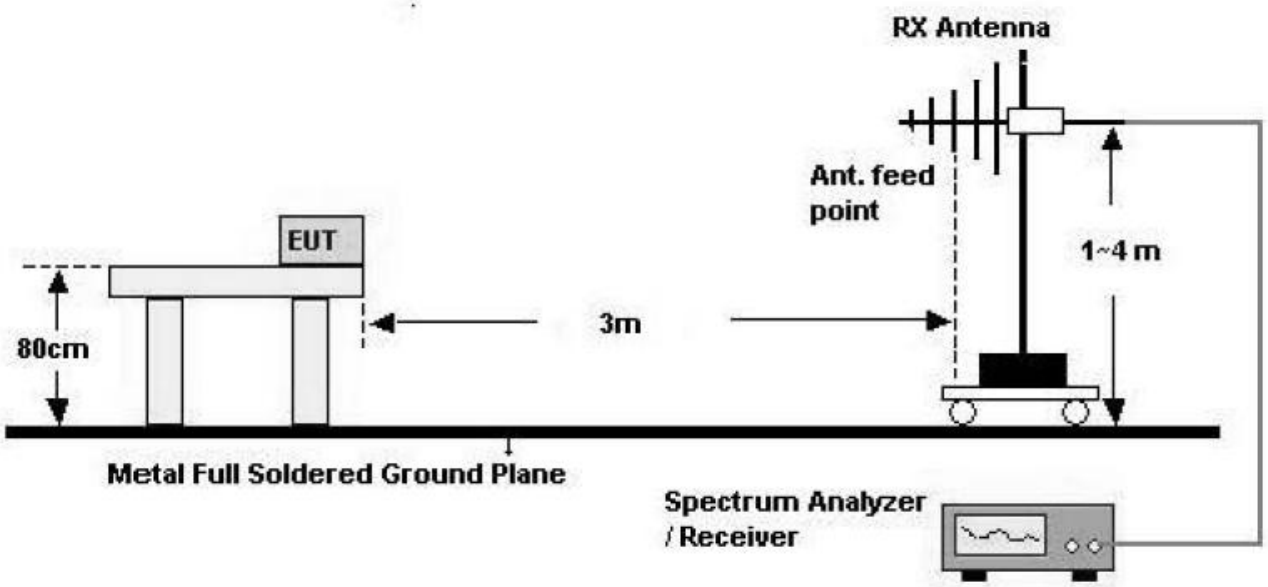
All harmonics that do not lie in a restricted band are subject to a peak limit of -27 dBm/MHz. At a distance of 3 meters the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2 dB to the EIRP limit of -27 dBm/MHz to obtain the limit for out of band spurious emissions of 68.2 dBμV/m. Espectally, for transmitter operating in the 5725 Mhz – 5850 MHz : All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Test Configuration

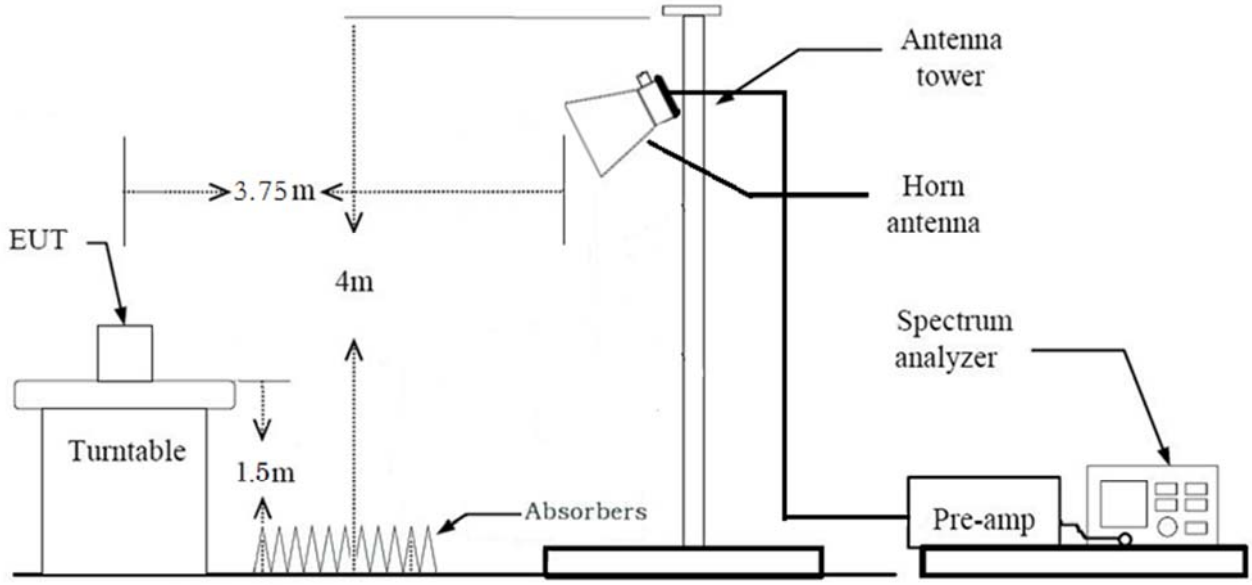
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE USED

ANSI C63.10:2013

Method G)5) in KDB 789033 D02 v02r01 (Peak)

Method G)6)d) in KDB 789033 D02 v02r01 (Average)

. Spectrum setting:

- Peak.

1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = Peak
4. Sweep Time = auto
5. Trace mode = max hold
6. Allow sweeps to continue until the trace stabilizes.
7. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

- Average (Method VB :Averaging using reduced video bandwidth)

1. RBW = 1 MHz
2. VBW
   2.1. If the EUT is configured to transmit with duty cycle ≥ 98 percent, set VBW ≤ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
   2.2. If the EUT duty cycle is < 98 percent, set VBW ≥ 1/T, where T is the minimum transmission duration.
3. The analyzer is set to linear detector mode.
4. Detector = Peak.
5. Sweep time = auto.
6. Trace mode = max hold.
7. Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimym number of traces by a factor of 1/x, where x is the duty cycle.

Note :

1. We used the Method VB for 802.11a/n_HT20 mode to perform the average filed strength measurements.
2. The actual setting value of VBW for 802.11a/n_HT20.
3. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
4. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Mode	Worst Data rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle (%)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
a	**6**	**5.366**	**5.436**	**0.98703642**	**186**	**1000**
n_HT20	**MCS 0**	**3.865**	**3.939**	**0.98119573**	**259**	**1000**

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
6. The test results for below 30 MHz is correlated to an open site.
   The result on OATS is about 2 dB higher than semi-anechoic chamber (10 m chamber)

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Above 1 GHz

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10360	64.11	-1.02	V	63.09	68.20	5.11	PK
15540	55.29	-1.27	V	54.02	73.98	19.96	PK
15540	41.85	-1.27	V	40.58	53.98	13.40	AV
10360	65.13	-1.02	H	64.11	68.20	4.09	PK
15540	56.50	-1.27	H	55.23	73.98	18.75	PK
15540	42.72	-1.27	H	41.45	53.98	12.53	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5200 MHz
Channel No.	40 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10400	64.61	-0.29	V	64.32	68.20	3.88	PK
15600	56.78	-3.24	V	53.54	73.98	20.44	PK
15600	41.79	-3.24	V	38.55	53.98	15.43	AV
10400	65.11	-0.29	H	64.82	68.20	3.38	PK
15600	57.62	-3.24	H	54.38	73.98	19.60	PK
15600	42.50	-3.24	H	39.26	53.98	14.72	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5240 MHz
Channel No.	48 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10480	67.32	-3.09	V	64.23	68.20	3.97	PK
15720	54.88	-3.17	V	51.71	73.98	22.27	PK
15720	40.79	-3.17	V	37.62	53.98	16.36	AV
10480	67.81	-3.09	H	64.72	68.20	3.48	PK
15720	55.73	-3.17	H	52.56	73.98	21.42	PK
15720	41.85	-3.17	H	38.68	53.98	15.30	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 1
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10360	64.81	-1.02	V	63.79	68.20	4.41	PK
15540	55.11	-1.27	V	53.84	73.98	20.14	PK
15540	41.92	-1.27	V	40.65	53.98	13.33	AV
10360	65.23	-1.02	H	64.21	68.20	3.99	PK
15540	56.64	-1.27	H	55.37	73.98	18.61	PK
15540	42.19	-1.27	H	40.92	53.98	13.06	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 1
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5200 MHz
Channel No.	40 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10400	64.16	-0.29	V	63.87	68.20	4.33	PK
15600	56.36	-3.24	V	53.12	73.98	20.86	PK
15600	40.99	-3.24	V	37.75	53.98	16.23	AV
10400	64.72	-0.29	H	64.43	68.20	3.77	PK
15600	57.29	-3.24	H	54.05	73.98	19.93	PK
15600	41.98	-3.24	H	38.74	53.98	15.24	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 1
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5240 MHz
Channel No.	48 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10480	66.24	-3.09	V	63.15	68.20	5.05	PK
15720	53.92	-3.17	V	50.75	73.98	23.23	PK
15720	40.61	-3.17	V	37.44	53.98	16.54	AV
10480	66.86	-3.09	H	63.77	68.20	4.43	PK
15720	54.74	-3.17	H	51.57	73.98	22.41	PK
15720	41.59	-3.17	H	38.42	53.98	15.56	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2A
Operation Mode:	802.11 a
Transfer MCS Index:	6 Mbps
Operating Frequency	5260 MHz
Channel No.	52 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10520	66.15	-1.52	V	64.63	68.20	3.57	PK
15780	56.88	-2.64	V	54.24	73.98	19.74	PK
15780	44.12	-2.64	V	41.48	53.98	12.50	AV
10520	66.71	-1.52	H	65.19	68.20	3.01	PK
15780	59.99	-2.64	H	57.35	73.98	16.63	PK
15780	45.50	-2.64	H	42.86	53.98	11.12	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2A
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5300 MHz
Channel No.	60 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10600	67.09	-1.32	V	65.77	73.98	8.21	PK
10600	53.89	-1.32	V	52.57	53.98	1.41	AV
15900	52.43	-1.51	V	50.92	73.98	23.06	PK
15900	38.11	-1.51	V	36.60	53.98	17.38	AV
10600	67.77	-1.32	H	66.45	73.98	7.53	PK
10600	54.10	-1.32	H	52.78	53.98	1.20	AV
15900	53.04	-1.51	H	51.53	73.98	22.45	PK
15900	38.42	-1.51	H	36.91	53.98	17.07	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2A
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10640	67.75	-1.01	V	66.74	73.98	7.24	PK
10640	52.88	-1.01	V	51.87	53.98	2.11	AV
15960	52.30	-2.17	V	50.13	73.98	23.85	PK
15960	40.11	-2.17	V	37.94	53.98	16.04	AV
10640	67.86	-1.01	H	66.85	73.98	7.13	PK
10640	53.07	-1.01	H	52.06	53.98	1.92	AV
15960	53.57	-2.17	H	51.40	73.98	22.58	PK
15960	40.14	-2.17	H	37.97	53.98	16.01	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2A
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5260 MHz
Channel No.	52 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10520	66.62	-1.52	V	65.10	68.20	3.10	PK
15780	58.94	-2.64	V	56.30	73.98	17.68	PK
15780	44.60	-2.64	V	41.96	53.98	12.02	AV
10520	66.93	-1.52	H	65.41	68.20	2.79	PK
15780	59.84	-2.64	H	57.20	73.98	16.78	PK
15780	45.18	-2.64	H	42.54	53.98	11.44	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2A
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5300 MHz
Channel No.	60 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10600	67.53	-1.32	V	66.21	73.98	7.77	PK
10600	53.58	-1.32	V	52.26	53.98	1.72	AV
15900	51.30	-1.51	V	49.79	73.98	24.19	PK
15900	38.07	-1.51	V	36.56	53.98	17.42	AV
10600	68.09	-1.32	H	66.77	73.98	7.21	PK
10600	53.72	-1.32	H	52.40	53.98	1.58	AV
15900	53.22	-1.51	H	51.71	73.98	22.27	PK
15900	39.30	-1.51	H	37.79	53.98	16.19	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2A
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10640	66.91	-1.01	V	65.90	73.98	8.08	PK
10640	52.98	-1.01	V	51.97	53.98	2.01	AV
10640	67.24	-1.01	H	66.23	73.98	7.75	PK
10640	53.04	-1.01	H	52.03	53.98	1.95	AV
15960	53.25	-2.17	H	51.08	73.98	22.90	PK
15960	39.85	-2.17	H	37.68	53.98	16.30	AV

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11000	63.11	0.37	V	63.48	73.98	10.50	PK
11000	49.05	0.37	V	49.42	53.98	4.56	AV
16500	51.89	0.03	V	51.92	68.20	16.28	PK
11000	63.85	0.37	H	64.22	73.98	9.76	PK
11000	51.42	0.37	H	51.79	53.98	2.19	AV
16500	52.16	0.03	H	52.19	68.20	16.01	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5580 MHz
Channel No.	116 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11160	63.18	-1.15	V	62.03	73.98	11.95	PK
11160	49.57	-1.15	V	48.42	53.98	5.56	AV
16740	52.16	0.18	V	52.34	68.20	15.86	PK
11160	63.82	-1.15	H	62.67	73.98	11.31	PK
11160	49.60	-1.15	H	48.45	53.98	5.53	AV
16740	52.65	0.18	H	52.83	68.20	15.37	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading [dBuV]	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11400	57.12	0.22	V	57.34	73.98	16.64	PK
11400	44.39	0.22	V	44.61	53.98	9.37	AV
17100	50.45	1.94	V	52.39	68.20	15.81	PK
11400	58.54	0.22	H	58.76	73.98	15.22	PK
11400	44.57	0.22	H	44.79	53.98	9.19	AV
17100	50.77	1.94	H	52.71	68.20	15.49	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2C
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11000	64.12	0.37	V	64.49	73.98	9.49	PK
11000	49.07	0.37	V	49.44	53.98	4.54	AV
16500	52.41	0.03	V	52.44	68.20	15.76	PK
11000	64.33	0.37	H	64.70	73.98	9.28	PK
11000	49.10	0.37	H	49.47	53.98	4.51	AV
16500	53.74	0.03	H	53.77	68.20	14.43	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2C
Operation Mode:	802.11 n_HT20
Transfer Rate:	0
Operating Frequency	5580 MHz
Channel No.	116 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11160	63.30	-1.15	V	62.15	73.98	11.83	PK
11160	48.75	-1.15	V	47.60	53.98	6.38	AV
16740	51.97	0.18	V	52.15	68.20	16.05	PK
11160	63.71	-1.15	H	62.56	73.98	11.42	PK
11160	48.93	-1.15	H	47.78	53.98	6.20	AV
16740	52.15	0.18	H	52.33	68.20	15.87	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 2C
Operation Mode:	802.11 n_ HT20
Transfer Rate:	0
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading [dBuV]	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11400	56.78	0.22	V	57.00	73.98	16.98	PK
11400	43.86	0.22	V	44.08	53.98	9.90	AV
17100	51.02	1.94	V	52.96	68.20	15.24	PK
11400	58.67	0.22	H	58.89	73.98	15.09	PK
11400	44.48	0.22	H	44.70	53.98	9.28	AV
17100	51.09	1.94	H	53.03	68.20	15.17	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 3
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5745MHz
Channel No.	149 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11490	59.18	-0.59	V	58.59	73.98	15.39	PK
11490	45.19	-0.59	V	44.60	53.98	9.38	AV
17235	51.23	3.63	V	54.86	68.20	13.34	PK
11490	58.01	-0.59	H	57.42	73.98	16.56	PK
11490	45.00	-0.59	H	44.41	53.98	9.57	AV
17235	50.46	3.63	H	54.09	68.20	14.11	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 3
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5785 MHz
Channel No.	157 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11570	59.71	-0.97	V	58.74	73.98	15.24	PK
11570	44.90	-0.97	V	43.93	53.98	10.05	AV
17355	49.42	5.02	V	54.44	68.20	13.76	PK
11570	58.42	-0.97	H	57.45	73.98	16.53	PK
11570	44.15	-0.97	H	43.18	53.98	10.80	AV
17355	50.65	5.02	H	55.67	68.20	12.53	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 3
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11650	58.61	-1.70	V	56.91	73.98	17.07	PK
11650	44.62	-1.70	V	42.92	53.98	11.06	AV
17475	50.95	5.75	V	56.70	68.20	11.50	PK
11650	57.09	-1.70	H	55.39	73.98	18.59	PK
11650	44.32	-1.70	H	42.62	53.98	11.36	AV
17475	51.12	5.75	H	56.87	68.20	11.33	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 3
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5745 MHz
Channel No.	149 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11490	59.25	-0.59	V	58.66	73.98	15.32	PK
11490	44.07	-0.59	V	43.48	53.98	10.50	AV
17235	50.89	3.63	V	54.52	68.20	13.68	PK
11490	57.15	-0.59	H	56.56	73.98	17.42	PK
11490	44.04	-0.59	H	43.45	53.98	10.53	AV
17235	50.28	3.63	H	53.91	68.20	14.29	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 3
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5785 MHz
Channel No.	157 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11570	58.79	-0.97	V	57.82	73.98	16.16	PK
11570	44.58	-0.97	V	43.61	53.98	10.37	AV
17355	50.41	5.02	V	55.43	68.20	12.77	PK
11570	58.71	-0.97	H	57.74	73.98	16.24	PK
11570	44.46	-0.97	H	43.49	53.98	10.49	AV
17355	49.83	5.02	H	54.85	68.20	13.35	PK

*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Band :	UNII 3
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11650	57.92	-1.70	V	56.22	73.98	17.76	PK
11650	44.26	-1.70	V	42.56	53.98	11.42	AV
17475	51.14	5.75	V	56.89	68.20	11.31	PK
11650	57.84	-1.70	H	56.14	73.98	17.84	PK
11650	44.01	-1.70	H	42.31	53.98	11.67	AV
17475	50.96	5.75	H	56.71	68.20	11.49	PK

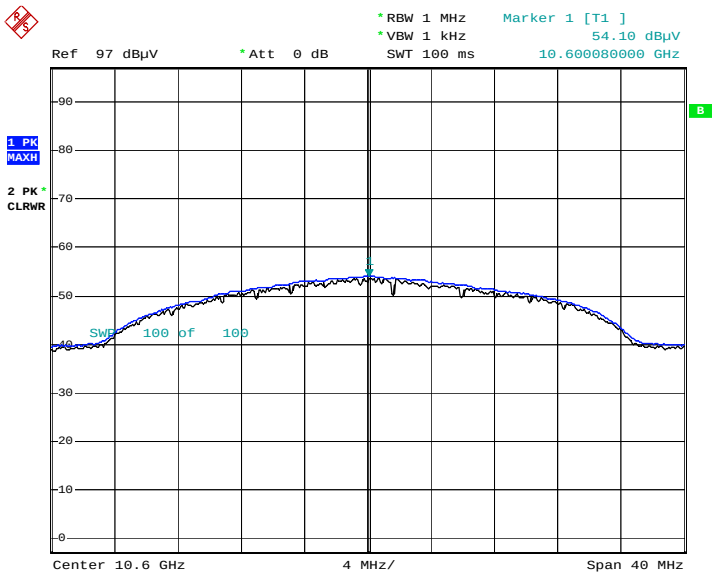
*AN. : Antenna Factor / CL : Cable Loss / Amp.G. : Amplifier Gain / D.F. : Distance Factor

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
5. We have done all data rate in 802.11n_HT20. Worst case is MCS0 in 802.11n_HT20.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

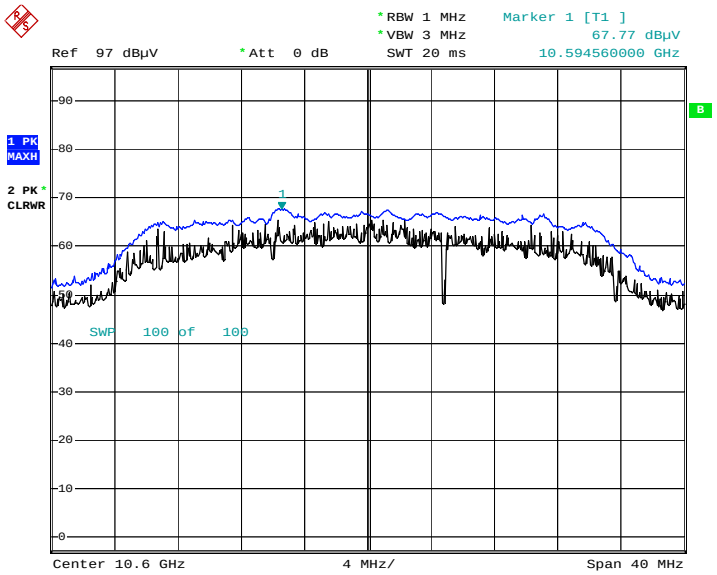
▣ RESULT PLOTS (Worst Case: Y-H)

Radiated Spurious Emissions plot –Average Reading (802.11a, Ch.60 2nd Harmonic)



Date: 23.JUL.2018 15:07:36

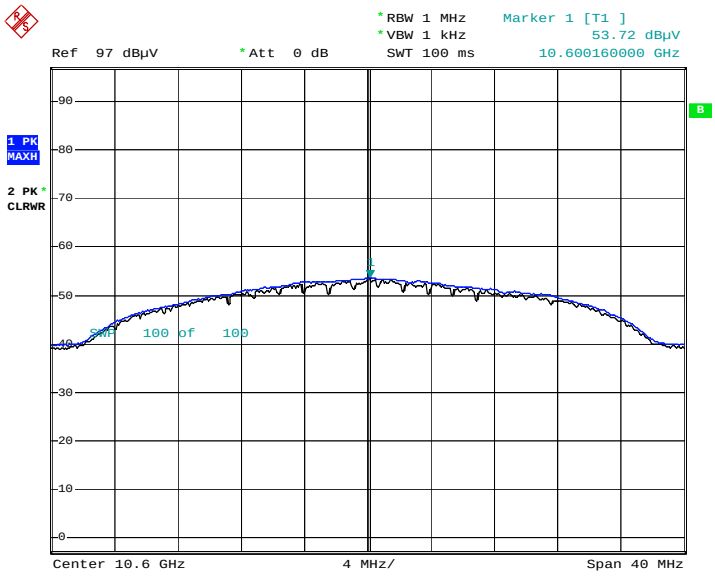
Radiated Spurious Emissions plot –Peak Reading (802.11a, Ch.60 2nd Harmonic)



Date: 23.JUL.2018 15:06:29

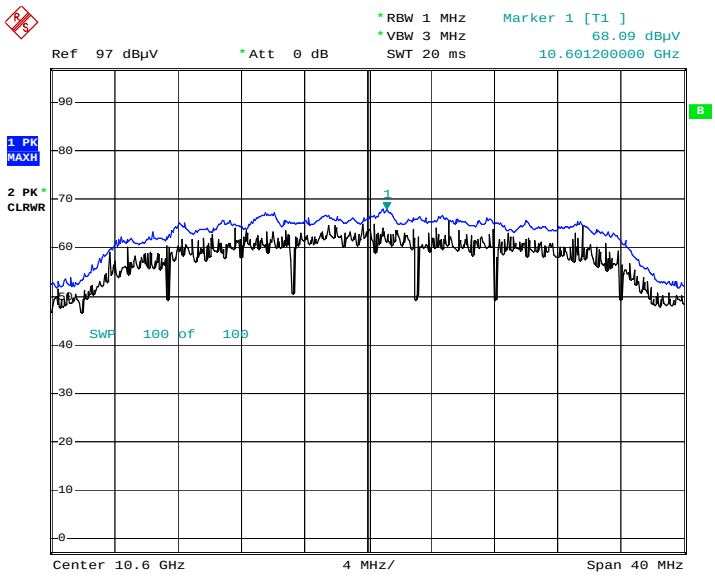
Radiated Spurious Emissions plot

(Worst Case: Y-H) – Average Reading (802.11n_HT20, Ch.60 2nd Harmonic)



Date: 23.JUL.2018 15:10:00

(Worst Case: Y-H) – Peak Reading (802.11n_HT20, Ch.60 2nd Harmonic)



Date: 23.JUL.2018 15:09:08

Note : Only the worst case plots for Radiated Spurious Emissions.

9.9.2 RADIATED RESTRICTED BAND EDGE MEASUREMENTS

Test Requirements and limit, §15.247(d) §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP+ATT. +D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	60.07	5.07	H	65.14	73.98	8.84	PK
5150	44.37	5.07	H	49.44	53.98	4.54	AV
5150	59.08	5.07	V	64.15	73.98	9.83	PK
5150	42.97	5.07	V	48.04	53.98	5.94	AV

Band :	UNII 1
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP+ATT. +D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	62.36	5.07	H	67.43	73.98	6.55	PK
5150	46.11	5.07	H	51.18	53.98	2.80	AV
5150	61.85	5.07	V	66.92	73.98	7.06	PK
5150	45.87	5.07	V	50.94	53.98	3.04	AV

Band :	UNII 2A
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP+ATT. +D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	60.59	4.42	H	65.01	73.98	8.97	PK
5350	44.67	4.42	H	49.09	53.98	4.89	AV
5350	59.97	4.42	V	64.39	73.98	9.59	PK
5350	44.51	4.42	V	48.93	53.98	5.05	AV

Band :	UNII 2A
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP+ATT. +D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	61.70	4.42	H	66.12	73.98	7.86	PK
5350	45.57	4.42	H	49.99	53.98	3.99	AV
5350	61.31	4.42	V	65.73	73.98	8.25	PK
5350	45.34	4.42	V	49.76	53.98	4.22	AV

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading DBuV	AN.+CL-AMP+ATT. +D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	51.03	5.72	H	56.75	73.98	17.23	PK
5460	37.64	5.72	H	43.36	53.98	10.62	AV
5470	59.03	5.26	H	64.29	68.20	3.91	PK
5460	50.83	5.72	V	56.55	73.98	17.43	PK
5460	37.61	5.72	V	43.33	53.98	10.65	AV
5470	57.39	5.26	V	62.65	68.20	5.55	PK

Band :	UNII 2C
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading DBuV	AN.+CL-AMP+ATT. +D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	50.83	5.72	H	56.55	73.98	17.43	PK
5460	37.89	5.72	H	43.61	53.98	10.37	AV
5470	59.55	5.26	H	64.81	68.20	3.39	PK
5460	50.54	5.72	V	56.26	73.98	17.72	PK
5460	37.75	5.72	V	43.47	53.98	10.51	AV
5470	58.67	5.26	V	63.93	68.20	4.27	PK

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading DBuV	AN.+CL-AMP+ATT. +D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5725	59.92	7.43	H	67.35	73.98	6.63	PK
5725	41.64	7.43	H	49.07	53.98	4.91	AV
5725	59.45	7.43	V	66.88	73.98	7.10	PK
5725	41.38	7.43	V	48.81	53.98	5.17	AV

Band :	UNII 2C
Operation Mode:	802.11 n_HT20
Transfer Rate:	0
Operating Frequency	5700 MHz
Channel No.	140 Ch

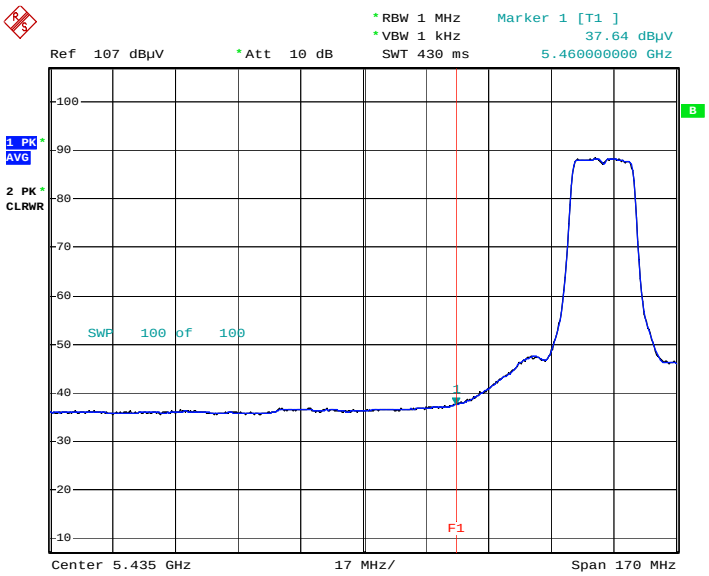
Frequency [MHz]	Reading DBuV	AN.+CL-AMP+ATT. +D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5725	57.63	7.43	H	65.06	73.98	8.92	PK
5725	42.22	7.43	H	49.65	53.98	4.33	AV
5725	56.89	7.43	V	64.32	73.98	9.66	PK
5725	41.92	7.43	V	49.35	53.98	4.63	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT + Distance Factor
2. We have done all data rate in 802.11a/n mode test. . Worst case of EUT is lowest data rate in 802.11a/n.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

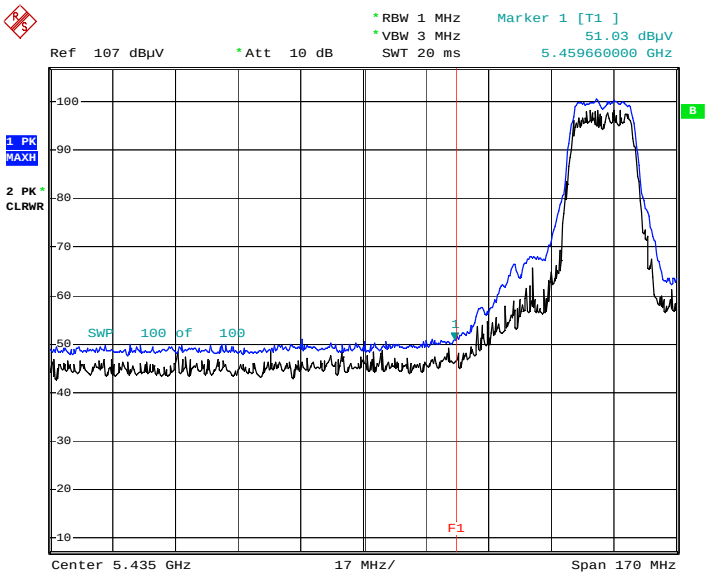
▣ RESULT PLOTS (Worst Case: Z-H)

Radiated Restricted Band Edges plot – Average Reading (802.11a, Ch.100)



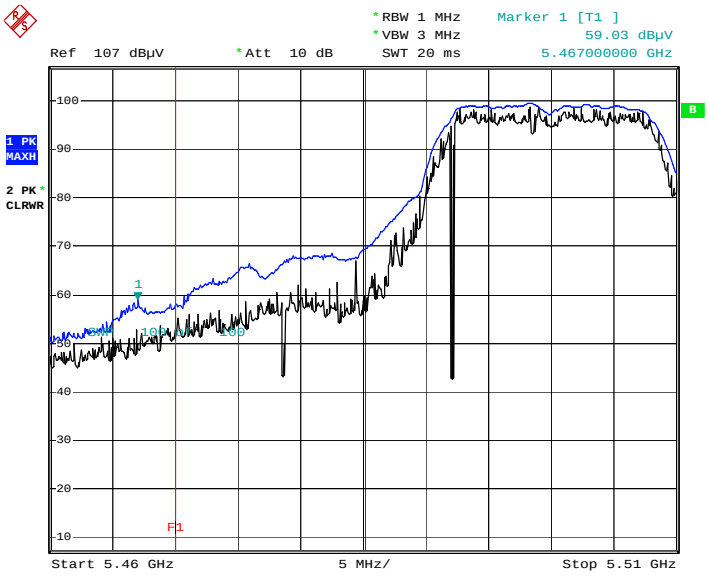
Date: 12.JUL.2018 15:48:47

Radiated Restricted Band Edges plot – Peak Reading (802.11a, Ch.100)



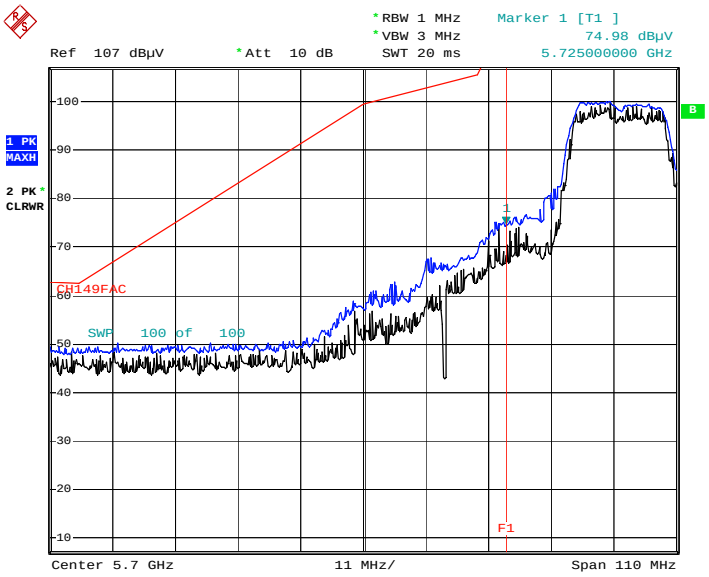
Date: 12.JUL.2018 15:47:22

Radiated Restricted Band Edges plot – Peak Reading (802.11a, Ch.100)



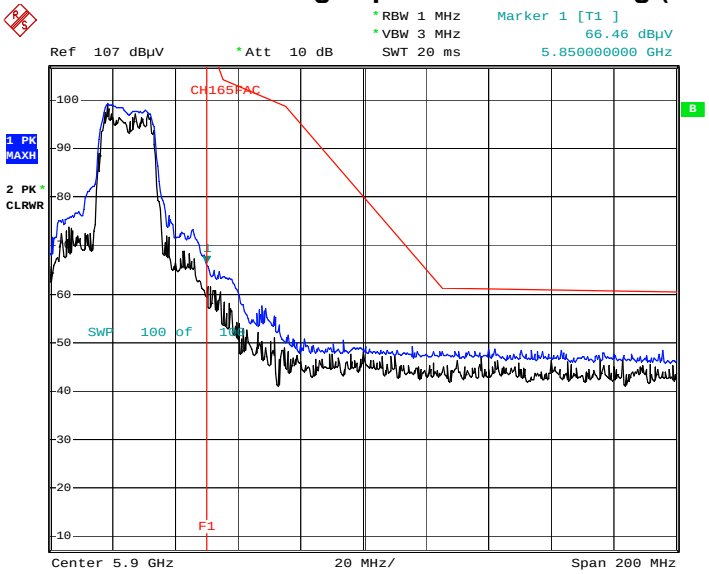
Date: 12.JUL.2018 15:50:02

Radiated Restricted Band Edges plot – Peak Reading (802.11a, Ch.149)



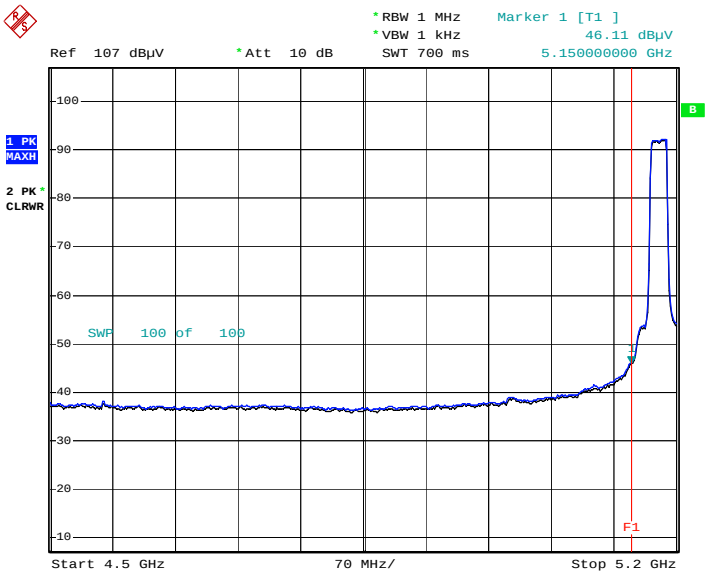
Date: 12.JUL.2018 15:44:46

Radiated Restricted Band Edges plot – Peak Reading (802.11a, Ch.165)



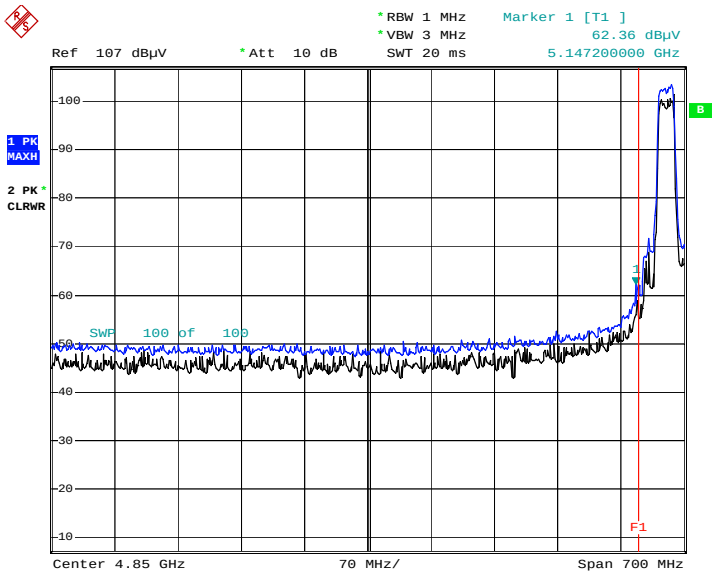
Date: 12.JUL.2018 15:30:13

Radiated Restricted Band Edges plot – Average Reading (802.11n_HT20, Ch.36)



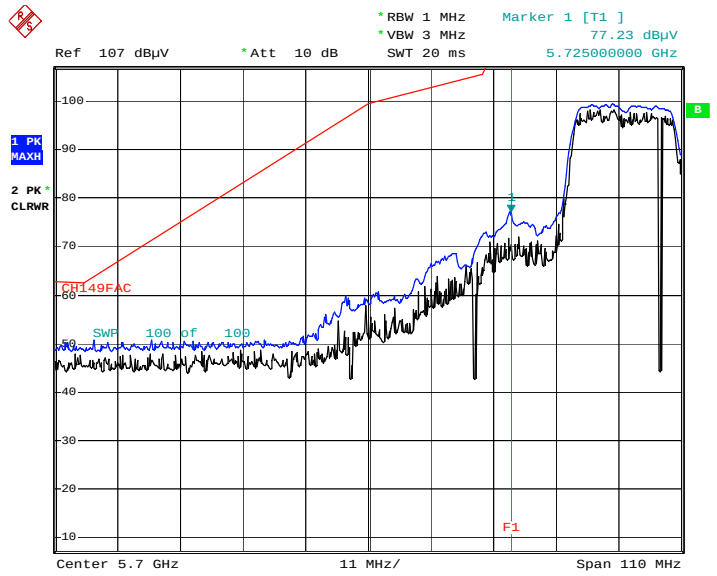
Date: 12.JUL.2018 15:52:21

Radiated Restricted Band Edges plot – Peak Reading (802.11n_HT20, Ch. Ch.36)



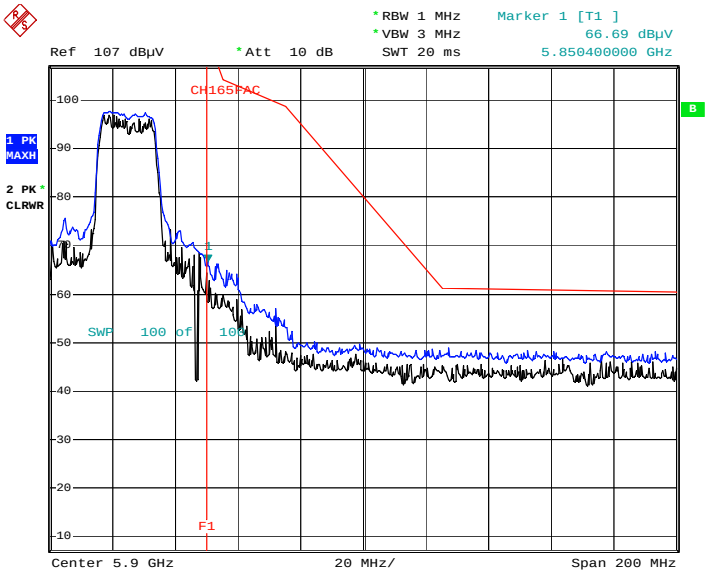
Date: 12.JUL.2018 15:52:53

Radiated Restricted Band Edges plot – Peak Reading (802.11n_HT20, Ch.149)



Date: 12.JUL.2018 15:43:53

Radiated Restricted Band Edges plot – Peak Reading (802.11n_HT20, Ch.165)



Date: 12.JUL.2018 15:39:20

9.9.3 RECEIVER SPURIOUS EMISSIONS

IC Rule(s)	**RSS-Gen**
Test Requirements:	**Blow the table**
Operating conditions:	**Under normal test conditions**
Method of testing:	**Radiated**
S/A. Settings:	**F < 1 GHz: RBW: 120 kHz, VBW: 300 kHz (Quasi Peak)** **F > 1 GHz: RBW: 1 MHz, VBW: 1 MHz (Peak)**
Mode of operation:	**Receive**

Frequency (MHz)	Field Strength (microvolts/m at 3 meters)
30 – 88	100
88 - 216	150
216 – 960	200
Above 960	500

Operation Mode: Receive:

30 MHz ~ 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/m	dB
No Critical peaks found							

Above 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/m	dB
No Critical peaks found							

9.10 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference groundplane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

▣ RESULT PLOTS

Conducted Emissions (Line 1)

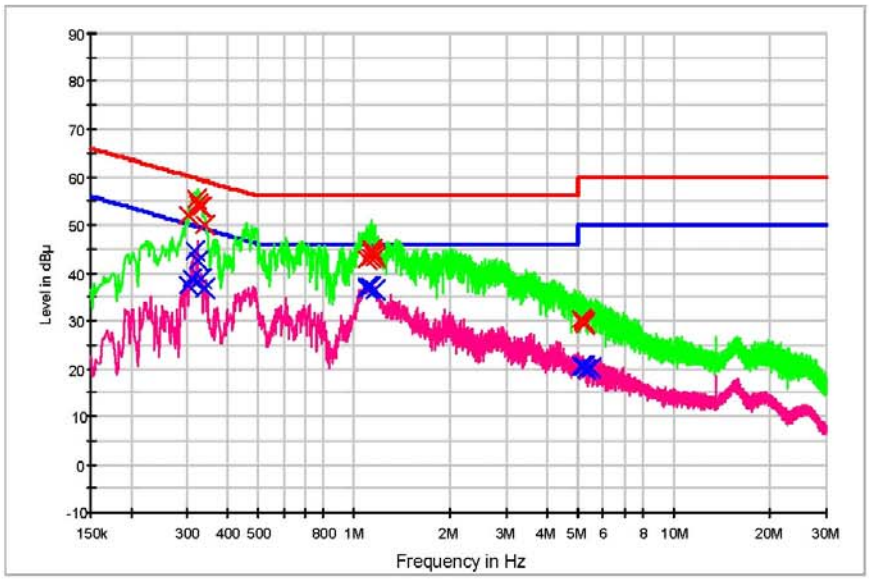
5G N 1 / 2

HCT TEST Report

Common Information

EUT:	WFM-SFP2501
Manufacturer:	I&C
Test Site:	SHIELD ROOM
Operating Conditions:	5G_WLAN_N

FCC CLASS B_Exten Cable



FCC CLASS B_QP
Preview Result 2-AVG
FCC CLASS B_AV
Final Result 1-QPK
Preview Result 1-PK+
Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.304000	51.9	9.000	Off	N	9.7	8.3	60.1
0.320000	55.5	9.000	Off	N	9.7	4.2	59.7
0.324000	54.4	9.000	Off	N	9.7	5.2	59.6
0.328000	53.9	9.000	Off	N	9.7	5.6	59.5
0.332000	53.8	9.000	Off	N	9.7	5.6	59.4
0.340000	50.1	9.000	Off	N	9.7	9.1	59.2
1.090000	42.9	9.000	Off	N	9.8	13.1	56.0
1.118000	43.3	9.000	Off	N	9.8	12.7	56.0
1.130000	44.1	9.000	Off	N	9.8	11.9	56.0
1.140000	44.9	9.000	Off	N	9.8	11.1	56.0
1.148000	44.0	9.000	Off	N	9.8	12.0	56.0
1.156000	43.4	9.000	Off	N	9.8	12.6	56.0
5.160000	30.2	9.000	Off	N	10.0	29.8	60.0
5.168000	29.9	9.000	Off	N	10.0	30.1	60.0
5.200000	29.6	9.000	Off	N	10.0	30.4	60.0
5.218000	29.6	9.000	Off	N	10.0	30.4	60.0
5.226000	29.6	9.000	Off	N	10.0	30.4	60.0
5.262000	29.4	9.000	Off	N	10.0	30.6	60.0

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5G N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.304000	37.3	9.000	Off	N	9.7	12.8	50.1
0.308000	38.7	9.000	Off	N	9.7	11.3	50.0
0.318000	44.6	9.000	Off	N	9.7	5.2	49.8
0.324000	42.6	9.000	Off	N	9.7	7.0	49.6
0.332000	38.8	9.000	Off	N	9.7	10.6	49.4
0.340000	36.8	9.000	Off	N	9.7	12.4	49.2
1.090000	36.9	9.000	Off	N	9.8	9.1	46.0
1.100000	37.0	9.000	Off	N	9.8	9.0	46.0
1.106000	36.7	9.000	Off	N	9.8	9.3	46.0
1.118000	37.2	9.000	Off	N	9.8	8.8	46.0
1.124000	37.1	9.000	Off	N	9.8	8.9	46.0
1.156000	36.3	9.000	Off	N	9.8	9.7	46.0
5.150000	20.5	9.000	Off	N	10.0	29.5	50.0
5.168000	20.5	9.000	Off	N	10.0	29.5	50.0
5.226000	20.5	9.000	Off	N	10.0	29.5	50.0
5.262000	20.5	9.000	Off	N	10.0	29.5	50.0
5.310000	19.9	9.000	Off	N	10.0	30.1	50.0
5.506000	20.1	9.000	Off	N	10.0	29.9	50.0

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Conducted Emissions (Line 2)

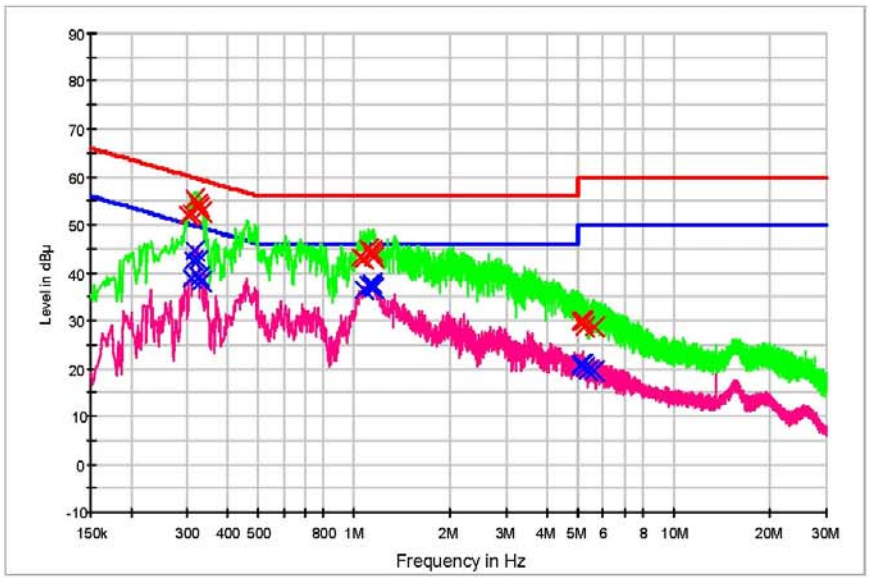
5G L1 1 / 2

HCT TEST Report

Common Information

EUT:	WFM-SFP2501
Manufacturer:	I&C
Test Site:	SHIELD ROOM
Operating Conditions:	5G_WLAN_L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.304000	52.1	9.000	Off	L1	9.7	8.0	60.1
0.308000	52.4	9.000	Off	L1	9.7	7.6	60.0
0.318000	55.4	9.000	Off	L1	9.7	4.4	59.8
0.324000	54.5	9.000	Off	L1	9.7	5.1	59.6
0.330000	53.8	9.000	Off	L1	9.7	5.7	59.5
0.334000	52.8	9.000	Off	L1	9.7	6.5	59.4
1.050000	43.1	9.000	Off	L1	9.8	12.9	56.0
1.070000	43.0	9.000	Off	L1	9.8	13.0	56.0
1.114000	44.8	9.000	Off	L1	9.8	11.2	56.0
1.130000	43.9	9.000	Off	L1	9.8	12.1	56.0
1.138000	44.6	9.000	Off	L1	9.8	11.4	56.0
1.154000	43.2	9.000	Off	L1	9.8	12.8	56.0
5.140000	29.7	9.000	Off	L1	10.0	30.3	60.0
5.158000	30.0	9.000	Off	L1	10.0	30.0	60.0
5.168000	30.0	9.000	Off	L1	10.0	30.0	60.0
5.176000	29.7	9.000	Off	L1	10.0	30.3	60.0
5.282000	28.5	9.000	Off	L1	10.0	31.5	60.0
5.658000	28.7	9.000	Off	L1	10.0	31.3	60.0

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5G L1 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.308000	38.9	9.000	Off	L1	9.7	11.1	50.0
0.314000	42.6	9.000	Off	L1	9.7	7.2	49.9
0.318000	44.7	9.000	Off	L1	9.7	5.1	49.8
0.324000	42.4	9.000	Off	L1	9.7	7.2	49.6
0.330000	39.2	9.000	Off	L1	9.7	10.2	49.5
0.334000	38.1	9.000	Off	L1	9.7	11.3	49.4
1.070000	36.6	9.000	Off	L1	9.8	9.4	46.0
1.114000	37.4	9.000	Off	L1	9.8	8.6	46.0
1.122000	37.2	9.000	Off	L1	9.8	8.8	46.0
1.132000	37.2	9.000	Off	L1	9.8	8.8	46.0
1.138000	37.7	9.000	Off	L1	9.8	8.3	46.0
1.150000	36.9	9.000	Off	L1	9.8	9.1	46.0
5.140000	20.5	9.000	Off	L1	10.0	29.5	50.0
5.158000	20.8	9.000	Off	L1	10.0	29.2	50.0
5.168000	20.7	9.000	Off	L1	10.0	29.3	50.0
5.282000	20.3	9.000	Off	L1	10.0	29.7	50.0
5.394000	19.4	9.000	Off	L1	10.0	30.6	50.0
5.658000	19.4	9.000	Off	L1	10.0	30.6	50.0

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10. LIST OF TEST EQUIPMENT

10.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	12/20/2017	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/27/2018	Annual	100033
ESPAC	SU-642 /Temperature Chamber	03/30/2018	Annual	0093008124
Agilent	N9020A / Signal Analyzer	06/08/2018	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	11/22/2017	Annual	MY49431210
Agilent	N1911A / Power Meter	04/16/2018	Annual	MY45100523
Agilent	N1921A / Power Sensor	04/16/2018	Annual	MY52260025
Agilent	87300B / Directional Coupler	11/20/2017	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	06/07/2018	Annual	05001
Hewlett Packard	E3632A / DC Power Supply	06/26/2018	Annual	KR75303960
Agilent	8493C / Attenuator(10 dB)	07/10/2018	Annual	07560
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A
HCT CO., LTD.	FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	N/A	N/A

10.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Audix	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	04/19/2017	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	05/02/2017	Biennial	9120D-937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	12/04/2017	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	09/06/2017	Annual	100688
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/27/2017	Annual	101068-SZ
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	06/07/2018	Annual	8
Wainwright Instruments	WHFX7.0/18G-8SS / High Pass Filter	05/09/2018	Annual	29
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/29/2018	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/03/2018	Annual	2
Api tech.	18B-03 / Attenuator (3 dB)	06/07/2018	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	07/17/2018	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	07/10/2018	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	07/10/2018	Annual	22965
CERNEX	CBL18265035 / Power Amplifier	01/10/2018	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/29/2018	Annual	25956

11. ANNEX A_EUT AND TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-1808-FC007-P