

Report No.: ER/2015/40162 **Issue Date: Jun. 10, 2015**

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ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT

OF

PDA Phone Product Name:

Sony **Brand Name:**

PM-0872-BV Type No.:

N/A **Model Difference:**

PY7-PM0872 FCC ID:

ER/2015/40162 **Report No.:**

Jun. 10, 2015 **Issue Date:**

FCC Rule Part: §15.407

Sony Mobile Communications AB Prepared for:

Nya Vattentornet 22188 Lund/Sweden

SGS Taiwan Ltd. Prepared by:

Electronics & Communication Laboratory

No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan

24803





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VERIFICATION OF COMPLIANCE

Applicant: Sony Mobile Communications AB

Nya Vattentornet 22188 Lund/Sweden

Product Name: PDA Phone

Brand Name: Sony

PM-0872-BV Type No.:

Model Difference: N/A

FCC ID: PY7-PM0872

File Number: ER/2015/40162

Date of test: Apr. 22, 2015 ~ Jun. 10, 2015

Date of EUT Received: Apr. 22, 2015

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Marcus Tseng	Date:	Jun. 10, 2015
	Marcus Tseng / Engineer	_	
Prepared By:	Allen Isai	Date:	Jun. 10, 2015
Approved By:	Allen Tsai / Engineer Time Chang	Date:	Jun. 10, 2015
	Jim Chang / Asst. Manager		

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Revision History

Report Number	Revision	Description	Issue Date
ER/2015/40162	Rev.00	Initial creation of document	Jun. 10, 2015

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GENERAL INFORMATION

Product Description

General:

Product Name:	PDA Phone		
Brand Name:	Sony		
Type No.:	PM-0872-	BV	
Model Difference:	N/A		
Data Cable (USB):	Type No.:	: EC450, Supplier: K-one 1242-6715.3, Length: 100 cm	
Simple Hands-Free (SHF-White):	Model No. Type No.:	: MH410c, Supplier: Foster Electric AG-1100	
Car Charger:	Model No.	: AN400, Supplier: Salcomp CAA-0003013	
BT PHF:	Model No.: MW600, Supplier: BALDA Type No.: DDA-0002029.Bcoupling with Simple Hands Free (Model No.: MH755, Supplier: BALDA, Type No.: AG-0502)		
Product SW/HW version:	30.0.A.0.20 / A		
Radio SW/HW version:	30.0.A.0.20 / A		
Test SW Version:	WIFI Tool for MT6630		
RF power setting in TEST SW:	N/A		
	3.8Vdc		
D 6 1	Battery:	Model No.: AGPB016-A001, Supplier: Sony Type No.: N/A	
Power Supply:	Adapter:	 M odel No.: EP800, Supplier: Phihong Type No.: AC-0300-US Model No.: EP800, Supplier: Salcomp Type No.: AC-0030-US 	

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WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.)	Modulation Technology	
	5150~5250	4	12.92dBm		
1.1	5250~5350	4	12.99dBm	OFDM	
11a	5470~5725	11	12.99dBm	OFDM	
	5725-5850	5	12.98dBm		
	HT20 5150~5250	4	11.92dBm		
11n	HT20 5250~5350	4	11.97dBm	OEDM	
1111	HT20 5470~5725	11	11.95dBm	OFDM	
	HT20 5725-5850	5	11.98dBm		
	HT40 5150~5250	2	11.77dBm		
11	HT40 5250~5350	2	11.98dBm	- OFDM	
11n	HT40 5470~5725	5	11.89dBm		
	HT40 5725-5850	2	11.90dBm		
Antenna Designation			PIFA Antenna, 5GHz Gain: -6.18dBi (5150MHz-5250MHz) 5GHz Gain: -5.23dBi (5250MHz-5350MHz) 5GHz Gain: -4.84dBi (5470MHz-5725MHz) 5GHz Gain: -5.08dBi (5725MHz-5850MHz)		
Modulation type			64QAM, 16QAM, QPSK, BPSK for OFDM		
Transition Rate:			802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 65.0Mbps		

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1.2 Product Feature of Equipment Under Test

The equipment under Test (Hereafter Called: EUT) is PDA Phone supporting, GSM / WCDMA / LTE,

Wi-Fi 802 11abon Bluetooth with NFC features, and below is details of information

Product Feature				
Product Name:	PDA Phone			
Brand Name:	Sony			
Type No.:	PM-0872-BV			
Model Difference:	N/A			
FCC ID	PY7-PM0872			
GSM Operating Band(s)	GSM 850/900/1800/1900MHz			
GPRS / EGPRS Multi Slot Class	Class 12			
WCDMA Operating Band(s)	FDD Band II / IV / V			
WCDMA Rel. Version	Release 8			
LTE Operating Band(s)	FCC Band 2 / 4 / 5 / 7 / 12 / 13 / 17			
LTE Rel. Version	Release 9 / Category 4			
Wi-Fi Specification	802.11a/b/g/n			
Bluetooth Version	V4.0 dual mode + HS			
NFC Specification	NFC			

Note: The above EUT information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules v01

FCC KDB 662311 D01 Multiple Transmitter Output

ANSI C63.10:2009

Note:

- 1. All test items have been performed and record as per the above standards.
- 2. The composite system is compliance with FCC Subpart B is authorized under the certification procedure.
- The EUT was placed 1.5m height for frequency above 1GHz in accordance with AN-SI C63.10:2009.

Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan. (TAF code 0513)

FCC Registration Numbers are: 990257

Canada Registration Number: 4620A-5.

Special Accessories

There are no special accessories used while test was conducted.

Equipment Modifications

There was no modification incorporated into the EUT.

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2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

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

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plan. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plan. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m 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 and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

2.4 Measurement Results Explanation Example For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation example with cable loss 1.5 dB and 10 dB attenuator.

Offset = RF cable loss (dB)+ attenuation factor(dB) =1.5+10=11.5(dB)

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Configuration of Tested System

Fig. 2-1 Radiated Emission



Fig. 2-2 Conducted (Antenna Port) Configuration

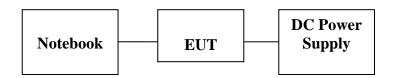


Fig. 2-3 AC Power Line Conducted Emission



Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	WIFI Tool for MT6630	N/A	N/A	N/A	N/A
2.	DC Power Supply	НР	E3640A	KR93300208	N/A	N/A
3.	Notebook	Lenovo	L420	LR-7HXZA	shielded	Un-shielded

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SUMMARY OF TEST RESULT

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	Compliant
\$15.403(i) \$15.407(e)	26 dB & 6dB Emission Bandwidth	Compliant
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.407(b)	Undesirable Radiated Emissions	Compliant
§15.407(c)	Transmission in case of Absence of Information	Compliant
§15.407(g)	Frequency Stability	Compliant
\$15.203 \$15.407(a)	Antenna Requirement	Compliant

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DESCRIPTION OF TEST MODES

4.1 Operated in U-NII Bands

Operated band in 5150 MHz ~5250 MHz:

4 channels are provided for 802.11a, 802.11n_HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n_HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

Operated band in 5250 MHz ~5350 MHz:

4 channels are provided for 802.11a, 802.11n_HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n_HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
54	5270 MHz	62	5310 MHz

Operated band in 5470 MHz ~5725 MHz:

11 channels are provided for 802.11a, 802.11n_HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

5 channels are provided for 802.11n_HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

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Operated band in 5725 MHz ~5850 MHz:

5 channels are provided for 802.11a, 802.11n_HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

2 channels are provided for 802.11n_HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755 MHz	159	5795 MHz

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4.2 The Worst Test Modes and Channel Details

- The EUT has been tested under operating condition. 1.
- 2. Test program used to control the EUT for staying in continuous transmitting mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.

RADIATED EMISSION TEST:

	RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	FREQUENCY BAND (MHz)		TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11a	5180~5240	36 to 48	44	OFDM	6	MAIN	
802.11a	5260~5320	52 to 64	60	OFDM	6	MAIN	
802.11a	5500~5700	100 to 140	116	OFDM	6	MAIN	
802.11a	5745~5825	149 to 165	157	OFDM	6	MAIN	
	RA	DIATED EM	ISSION TEST	(ABOVE 1 GHz)		
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11a	5190 5240	26 10 26 11 16	26 44 49	OFDM	6	MAIN	
802.11_HT20	5180~5240	36 to 48	36,44,48	OFDM	MCS0	MAIN	
802.11a_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	MAIN	
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN	
802.11n_HT20	3200~3320	32 10 04	32,00,04	OFDM	MCS0	MAIN	
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	MAIN	
802.11a	5500 5700	100 4 - 140	100 116 140	OFDM	6	MAIN	
802.11n_HT20	5500~5700	100 to 140	100,116,140	OFDM	MCS0	MAIN	
802.11n_HT40	5510~5670	102 to 134	102,110,134	OFDM	MCS0	MAIN	
802.11a	5745 5005	140 to 165	140 157 165	OFDM	6	MAIN	
802.11n_HT20	5745~5825	149 to 165	149,157,165	OFDM	MCS0	MAIN	
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0	MAIN	

Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/n WLAN Transmitter for channel Low, Mid and High, the worst case E1 position was reported.

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Note:

Type no, PM-0872-BV, and Type no PM-0873-BV share the equivalently identical enclosure, material of coating, I/O function, PCB board, display, and power source. In addition, PM-0872-BV, and Type no. PM-0873-BV implement the same Bluetooth/WLAN chipset/module with the same antenna that operates with the same transmitted power level. Hence, this given test report contains the identical test results that inherent from PM-0873-BV.

ANTENNA PORT CONDUCTED MEASUREMENT:

	MATERIAL ORI COMPOSIDE MEMBERENE.					
CONDUCTED TEST						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	MAIN
802.11n_HT20		30 10 40	30,44,46	OFDM	MCS0	MAIN
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	MAIN
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11n_HT20		32 10 04	32,00,04	OFDM	MCS0	MAIN
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	MAIN
802.11a	5500~5700	100 to 140	100,116,140	OFDM	6	MAIN
802.11n_HT20	3300~3700	100 to 140	100,110,140	OFDM	MCS0	MAIN
802.11n_HT40	5510~5670	102 to 134	102,110,134	OFDM	MCS0	MAIN
802.11a	5715 5005	140 to 165	140 157 165	OFDM	6	MAIN
802.11n_HT20	5745~5825	149 to 165	149,157,165	OFDM	MCS0	MAIN
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0	MAIN

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MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	
AC Power Line Conducted Emission	+/- 2.586 dB	
26dB Emission Bandwidth	+/- 123.36 Hz	
The Maximum Output Power Measurement	+/- 0.96 dB	
Peak Power Spectral Density Measurement	+/- 1.67 dB	
Frequency Stability	+/- 123.36 Hz	
Temperature	+/- 0.65 °C	
Humidity	+/- 4.6 %	
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%	

Radiated Spurious Emission:

Measurement uncertainty	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
(Polarization : Vertical)	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB
(Polarization : Horizontal)	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

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

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6. CONDUCTED EMISSION TEST

6.1. Standard Applicable

Frequency range within 150 kHz to 30 MHz shall not exceed the Limit table as below.

1 8				
	Limits			
Frequency range	dB(uV)			
MHz	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		

Note

- 1. The lower limit shall apply at the transition frequencies
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

6.2. Measurement Equipment Used

Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
TYPE		NUMBER	NUMBER	CAL.		
EMI Test Receiver	R&S	ESCI7	100760	05/04/2015	05/03/2016	
LISN	SCHWARZ BECK	NSLK 8127	8127-649	05/15/2015	05/14/2016	
LISN	FCC	FCC-LISN-50/250-25 -2-01	04034	03/13/2015	03/12/2016	
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2014	11/25/2015	

6.3. EUT Setup

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2009.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The LISN was connected with 120Vac/60Hz power source.

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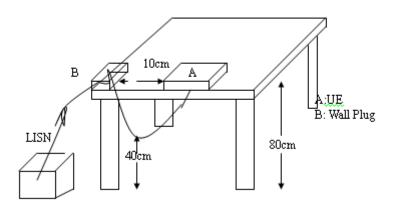
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6.4. Test SET-UP



6.5. Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plan.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all phases of power being supplied by given UE are completed.

6.6. Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that that closet to the limit

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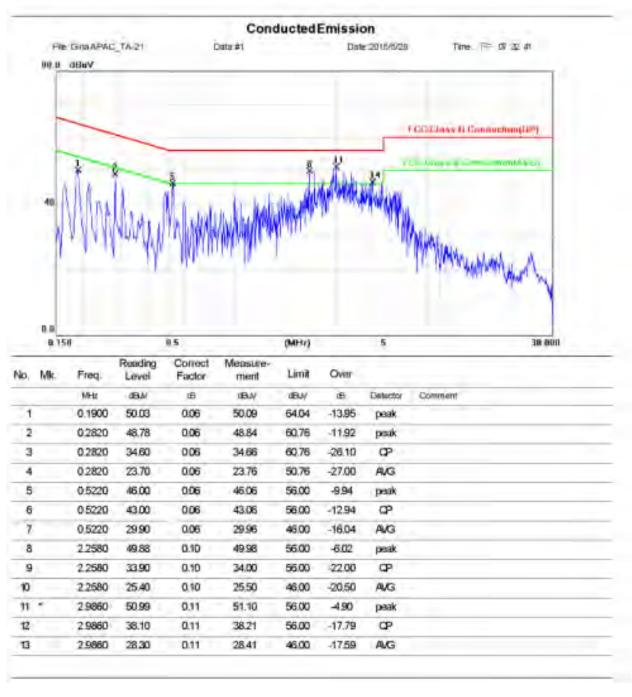


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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation mode			Test Date:	May 28, 2015
Temperature:	24	Humidity:	66 %	Test By:	Marcus
Model No.:	Adapter: EP800, Supplier: Phihong			Phase:	L1



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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dВ	dBuV	dBul/	ďΒ	Detector	Comment
14		4.4300	46.33	0.15	46.48	56.00	-9.52	peak	
15		4.4300	35.60	0.15	35.75	56.00	-20.25	œ	
16		4.4300	24.80	0.15	24.95	46.00	-21.05	AVG.	

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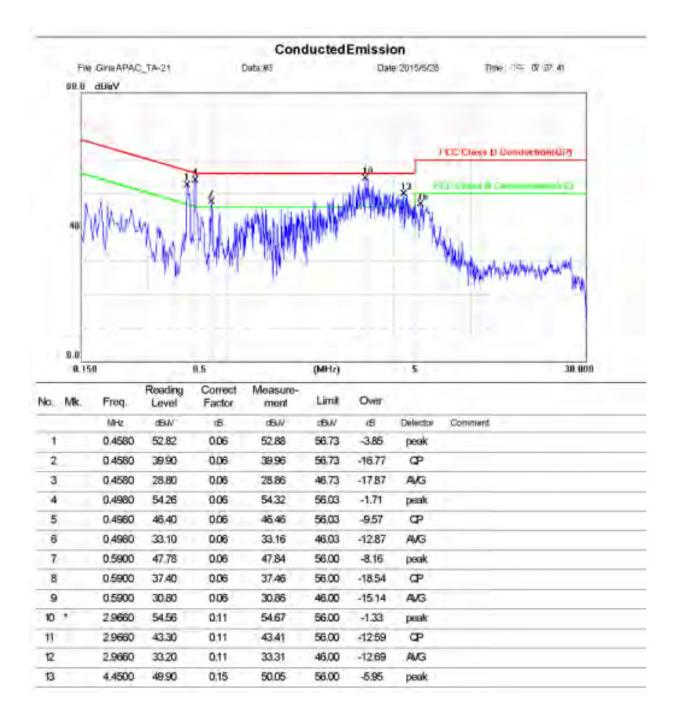
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Operation Mode:	Operation mode			Test Date:	May 28, 2015
Temperature:	24	Humidity:	66 %	Test By:	Marcus
Model No.:	Adapter: EP800, Supplier: Phihong			Phase:	N



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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBu//	dВ	dBuV	dBuV	dВ	Detector	Comment
14		4.4500	39.20	0.15	39.35	56.00	-16.65	æ	
15		4.4500	28.80	0.15	28.95	46.00	-17.05	AVG	
16		5.3300	46.99	0.16	47.15	60.00	-12.85	peak	
17		5.3300	35.20	0.16	35.36	60.00	-24.64	œ	
18		5.3300	24.60	0.16	24.76	50.00	-25.24	AAG	

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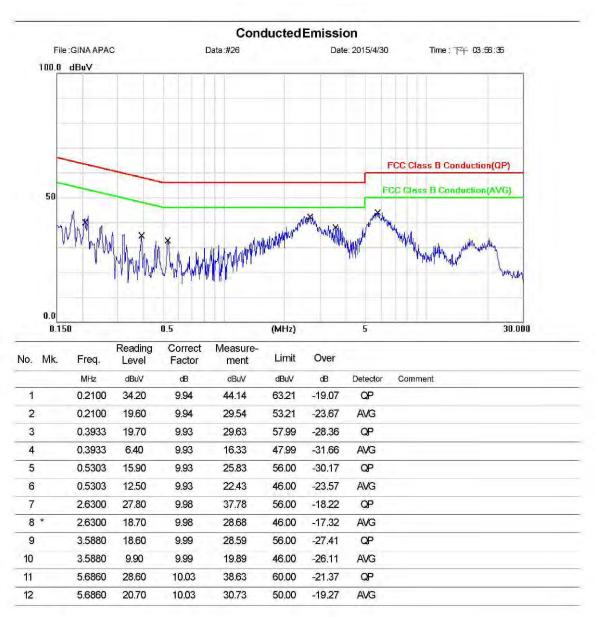
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Operation Mode:	Operation mode			Test Date:	Apr. 30, 2015
Temperature:	24	Humidity:	66 %	Test By:	Tin
Model No.:	Adapter: EP800, Supplier: Phihong			Phase:	L1



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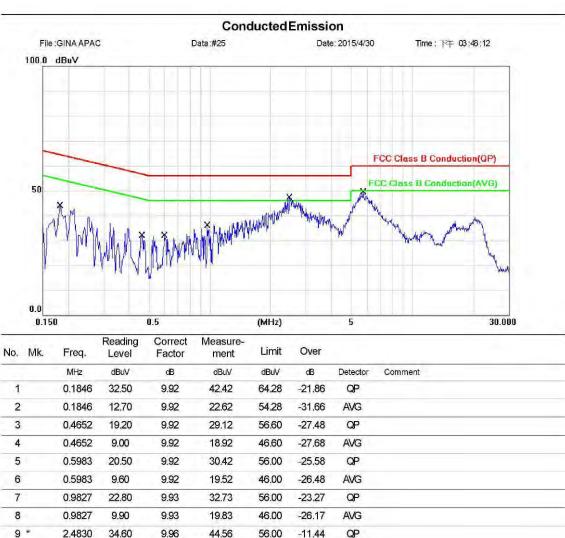
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Operation Mode:	Operation mode			Test Date:	Apr. 30, 2015
Temperature:	24	Humidity:	66 %	Test By:	Tin
Model No.:	Adapter: EP800, Supplier: Phihong			Phase:	N



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44.56

31.76

42.82

33.92

56.00

46.00

60.00

50.00

-11.44

-14.24

-17.18

-16.08

AVG

QP

AVG

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2.4830

2.4830

5.7180

5.7180

10

11

12

34.60

21.80

32.80

23.90

9.96

10.02

10.02



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DUTY CYCLE TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

Formula:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

- 1. Set span = Zero
- 2. RBW = 8MHz
- 3. VBW = 8MHz,
- 4. Detector = Peak

Duty Cycle:

	Duty Cycle	Duty Fator (dB)
802.11a	92.80%	0.32
802.11n_20	91.93%	0.37

Duty Cycle Factor: $10 * \log (1/0.9280) = 0.32$ Duty Cycle Factor: $10 * \log (1/0.9193) = 0.37$

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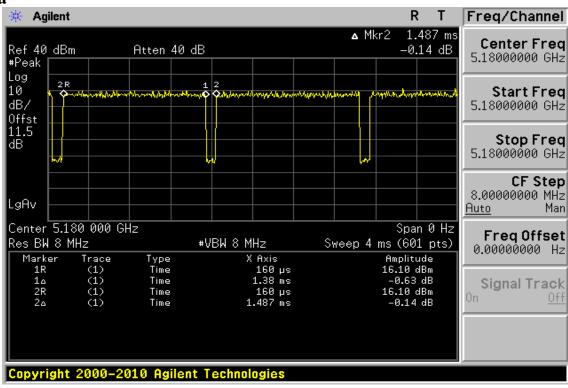
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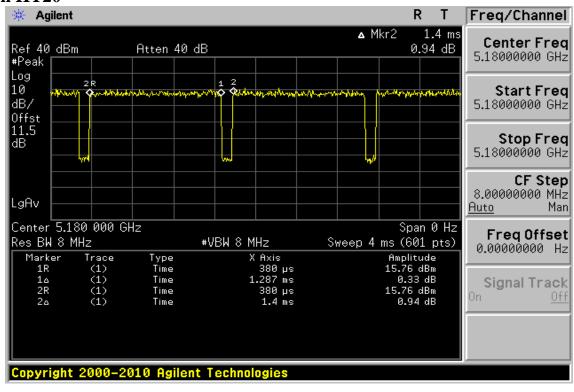
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DUTY CYCLE TEST SIGNAL Measurement Result 802.11a



802.11n HT20



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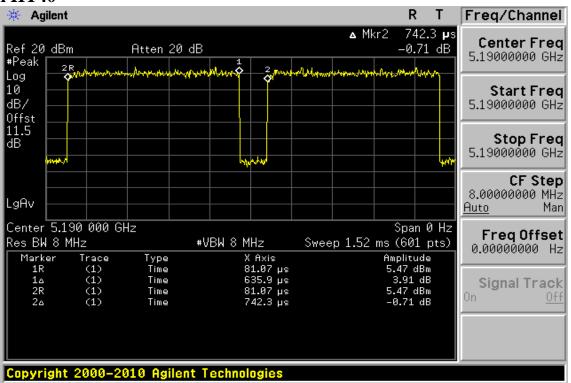
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802.11n HT40



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8. 26dB & 6dB EMISSION BANDWIDTH MEASUREMENT

8.1 Standard Applicable

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

8.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
 - a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
 - b. Mark the peak frequency and –26dB (upper and lower) frequency.
- 4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
- 5. Minimum Emission Bandwidth for the band 5.725-5.850GHz.
 - a. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=Peak, Sweep=auto
 - b. Mark the peak frequency and –6dB (upper and lower) frequency.
- 6. Repeat above procedures until all test default channel measured were complete.

8.3 Measurement Equipment Used

	Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2015	01/28/2016		
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2015	01/01/2016		
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016		
Splitter	Agilent	11636B	N/A	01/02/2015	01/01/2016		

8.4 Test Set-up



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Measurement Result

26dB Bandwidth

802.11a

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5180	19.653	12.93
5220	20.025	13.02
5240	19.422	12.88
5260	19.848	12.98
5300	19.561	12.91
5320	19.866	12.98
5500	19.546	12.91
5580	19.172	12.83
5700	19.862	12.98

802.11n_HT20

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5180	19.865	12.98
5220	19.729	12.95
5240	19.952	13.00
5260	19.877	12.98
5300	20.062	13.02
5320	20.020	13.01
5500	19.879	12.98
5580	19.807	12.97
5700	19.913	12.99

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802.11n _HT40

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5190	40.092	16.03
5230	40.192	16.04
5270	39.997	16.02
5310	40.120	16.03
5510	39.638	15.98
5550	39.501	15.97
5670	39.967	16.02

6dB Bandwidth (5725 MHz~ 5850 MHz)

802.11a

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5745	15.086	11.79
5785	14.117	11.50
5825	13.201	11.21

802.11n HT20

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5745	15.169	11.81
5785	12.558	10.99
5825	9.232	9.65

802.11n HT40

Frequency (MHz)	6dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5755	35.135	15.46
5795	35.070	15.45

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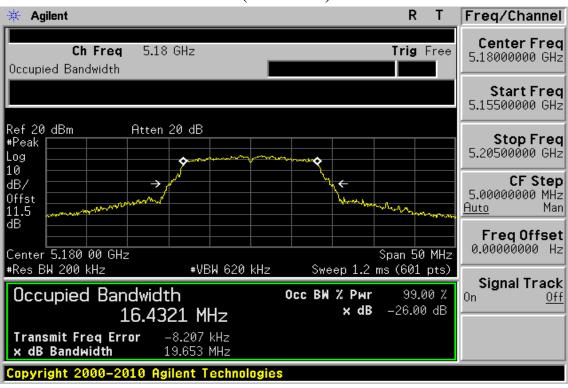
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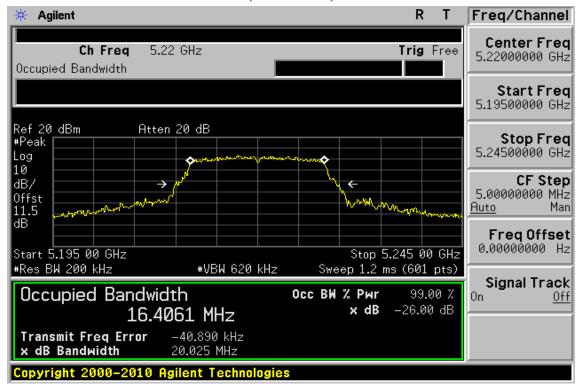
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802.11a, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180MHz)



26dB Band Width Test Data CH-Mid (5220MHz)



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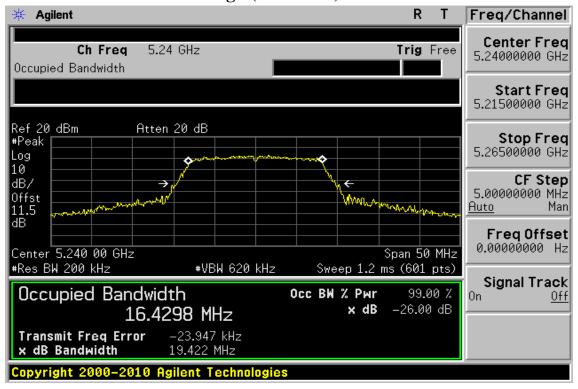
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26dB Band Width Test Data CH-High (5240MHz)



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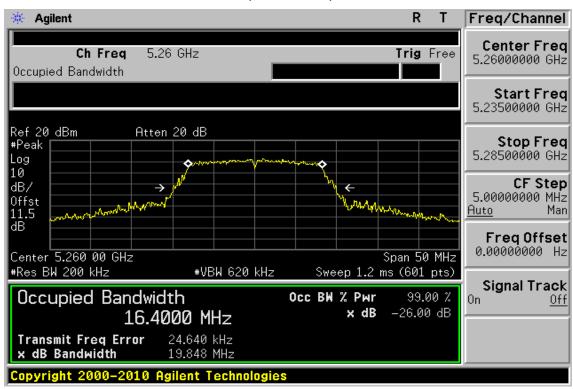
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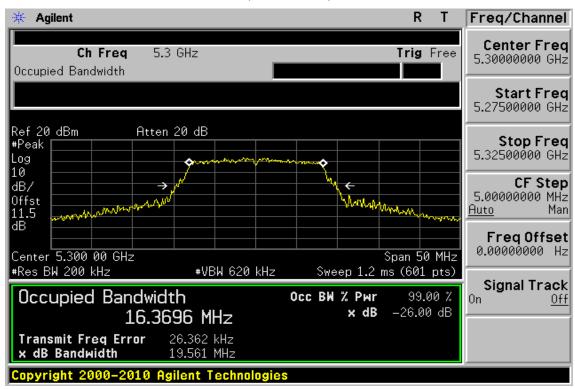
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802.11a, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260MHz)



26dB Band Width Test Data CH-Mid (5300MHz)



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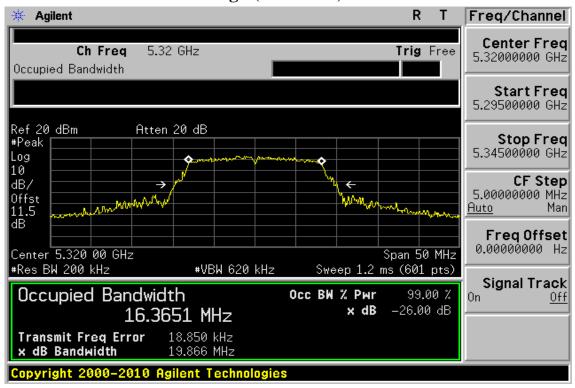
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26dB Band Width Test Data CH-High (5320MHz)



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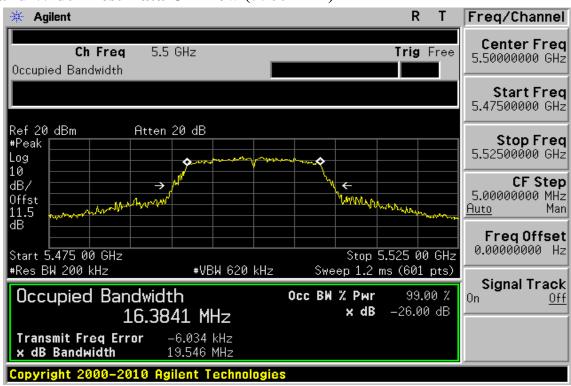
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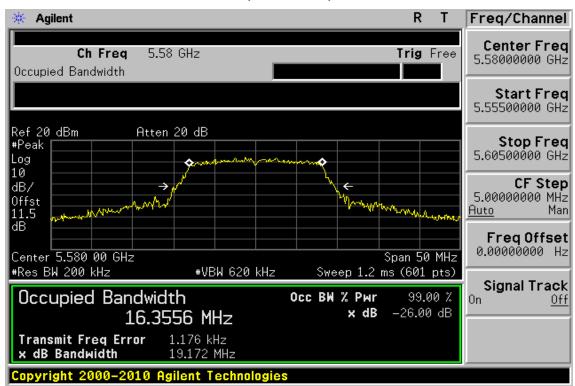
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802.11a, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500MHz)



26dB Band Width Test Data CH-Mid (5580MHz)



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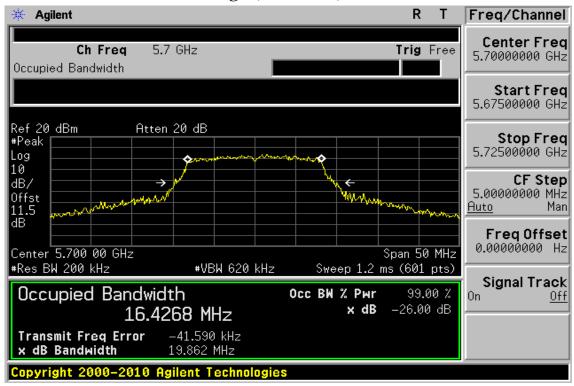
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26dB Band Width Test Data CH-High (5700MHz)



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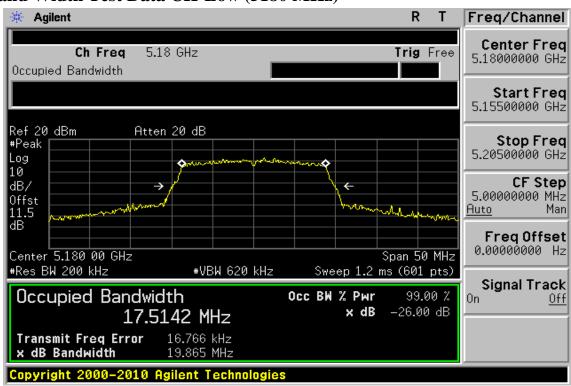
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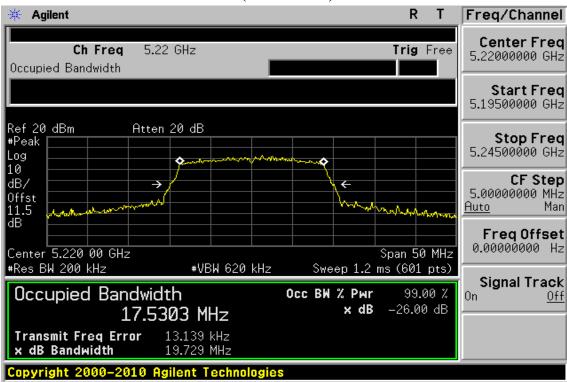
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802.11n HT20, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180 MHz)



26dB Band Width Test Data CH-Mid (5220 MHz)



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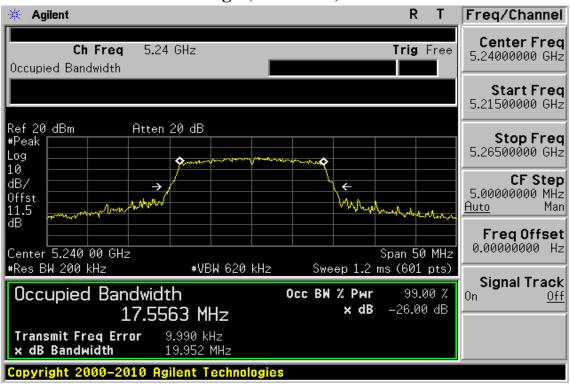
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26dB Band Width Test Data CH-High (5240 MHz)



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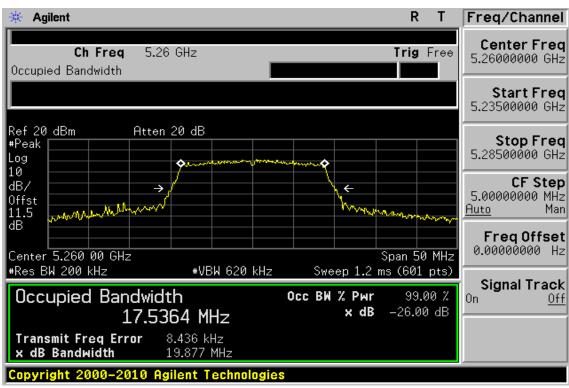
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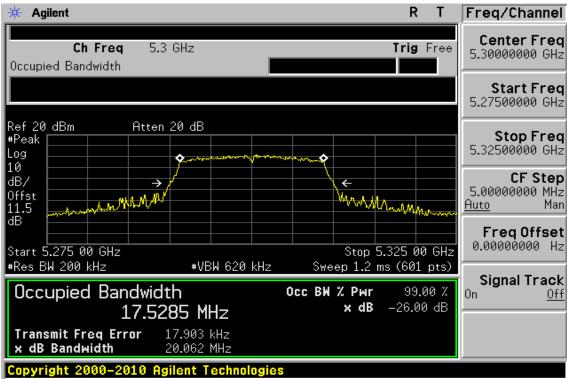
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802.11n HT20, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260 MHz)



26dB Band Width Test Data CH-Mid (5300 MHz)



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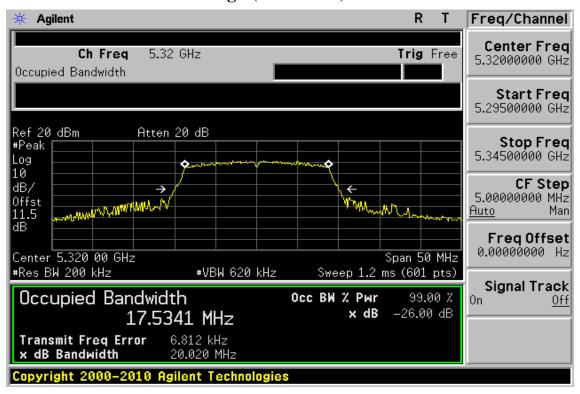
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26dB Band Width Test Data CH-High (5320 MHz)



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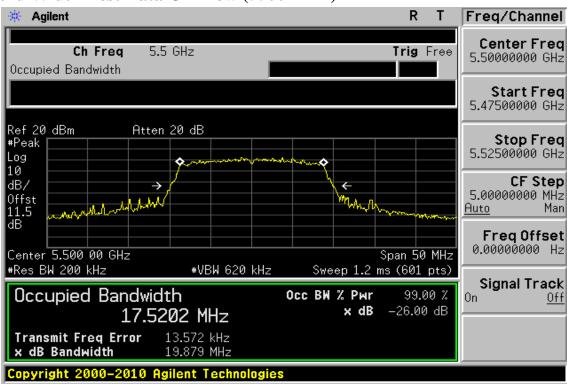
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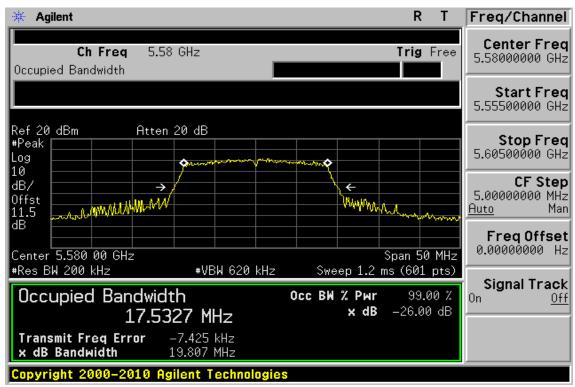
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802.11n HT20, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500 MHz)



26dB Band Width Test Data CH-Mid (5580 MHz)



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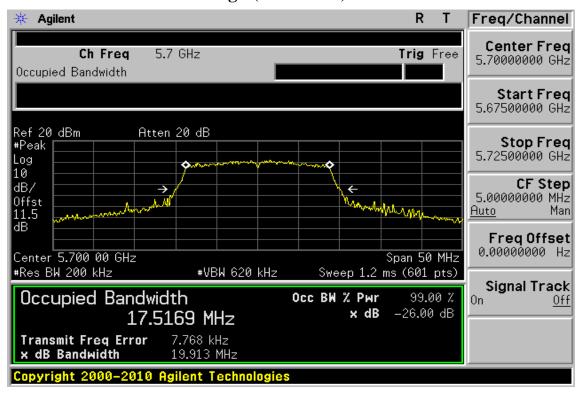
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26dB Band Width Test Data CH-High (5700 MHz)



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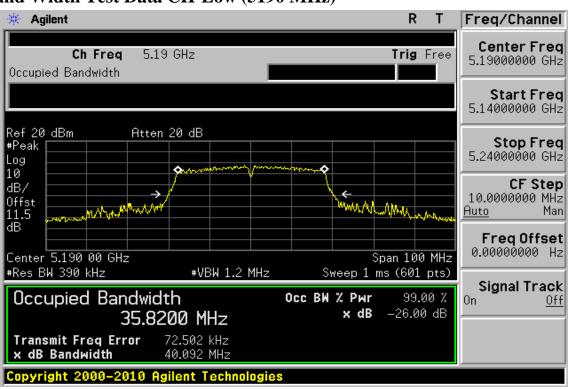
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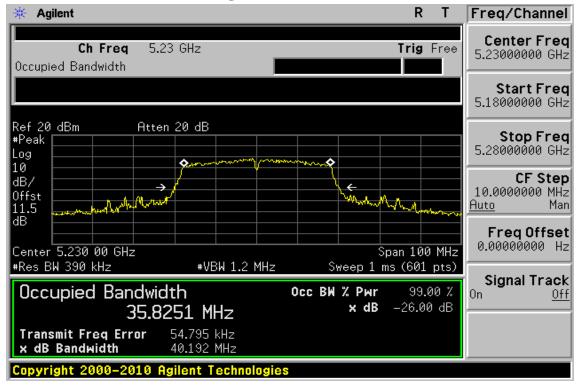
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802.11n HT40, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5190 MHz)



26dB Band Width Test Data CH-High (5230 MHz)



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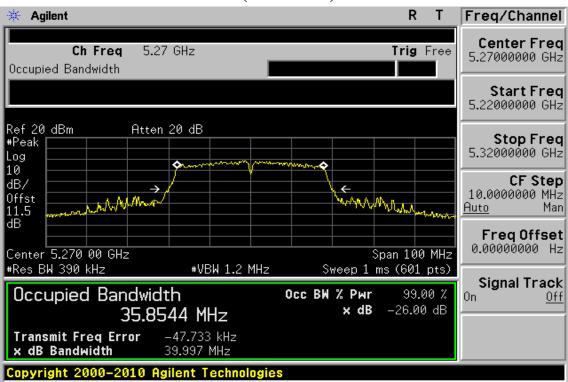
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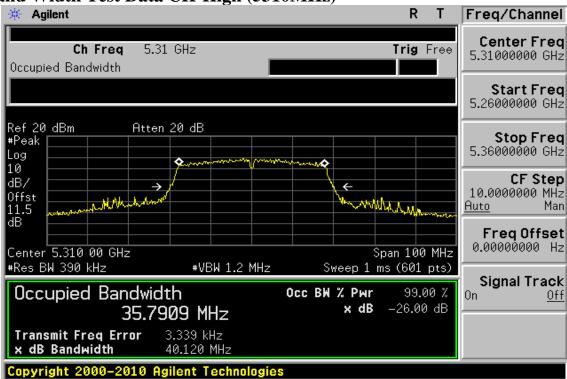
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802.11n HT40, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5270 MHz)



26dB Band Width Test Data CH-High (5310MHz)



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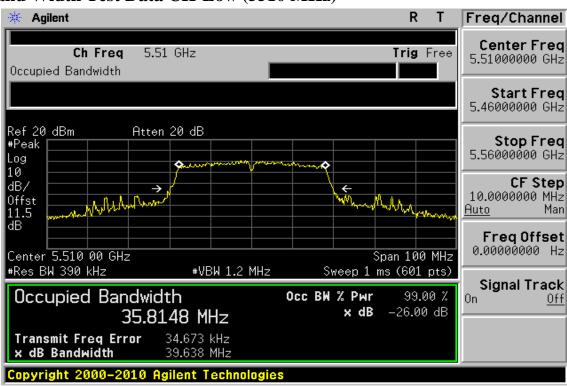
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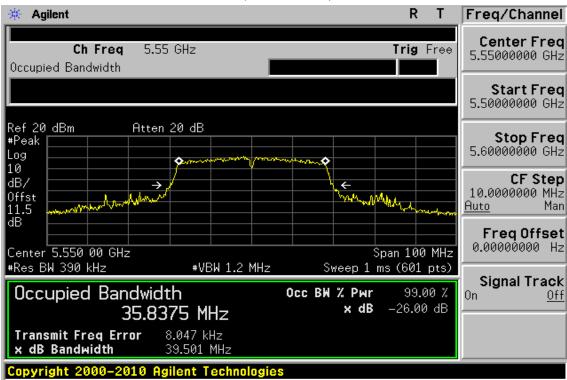
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802.11n HT40, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5510 MHz)



26dB Band Width Test Data CH-Mid (5550 MHz)



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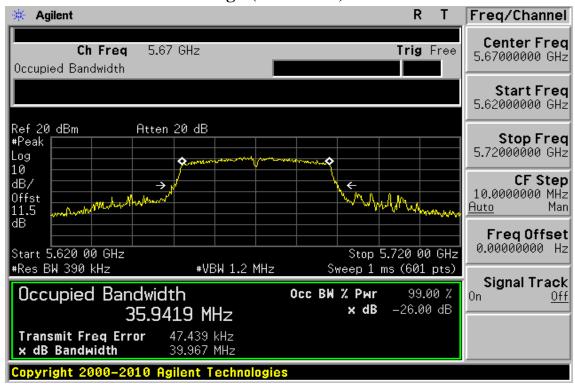
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26dB Band Width Test Data CH-High (5670 MHz)



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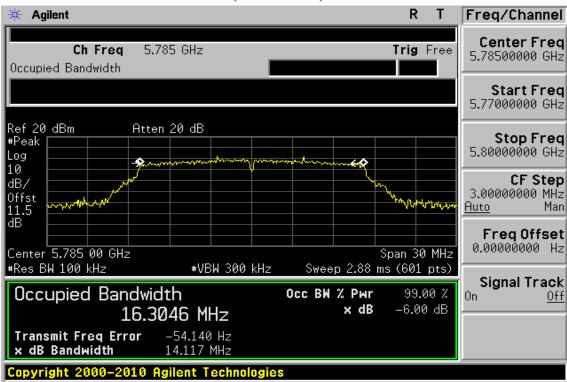
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802.11a, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



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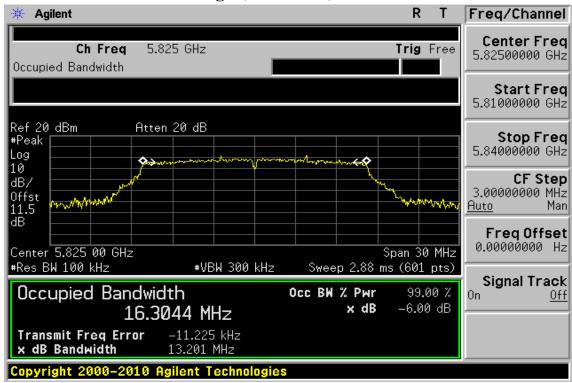
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6dB Band Width Test Data CH-High (5825 MHz)



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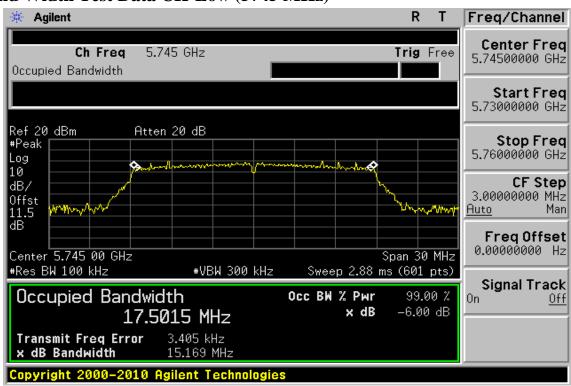
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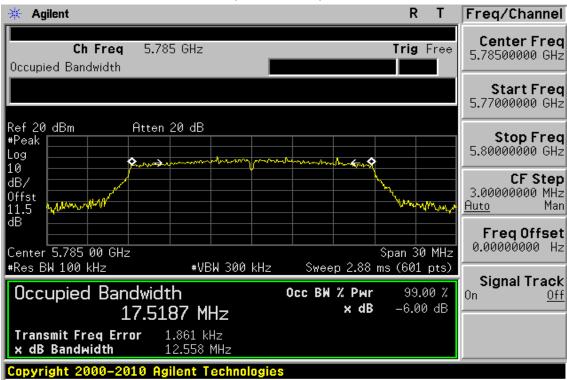
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802.11n HT20, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



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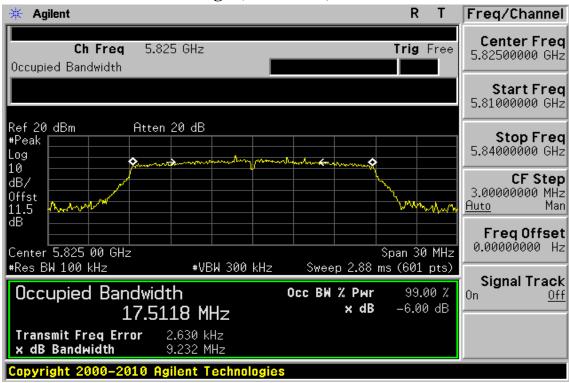
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6dB Band Width Test Data CH-High (5825 MHz)



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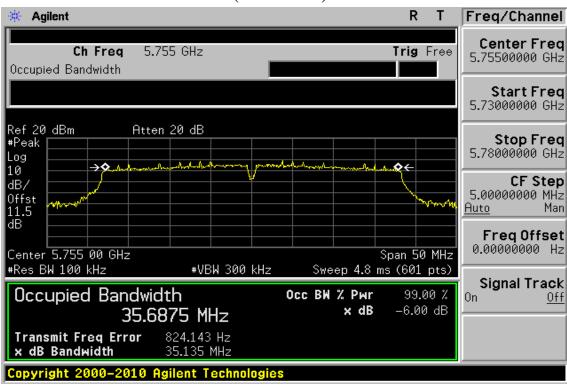
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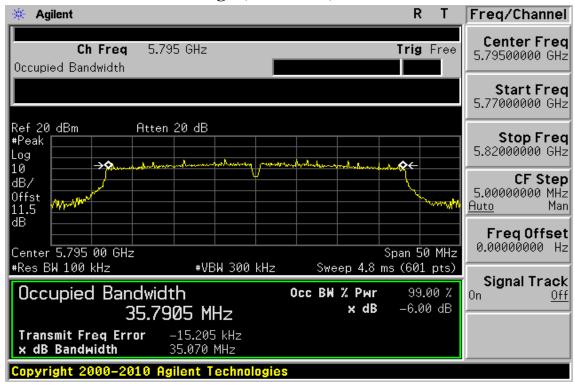
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802.11n HT40, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5755 MHz)



6dB Band Width Test Data CH-High (5795 MHz)



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9. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

9.1 Standard Applicable

OPERZTION Band	EUT CATEGORY		LIMIT
U-NII-1		Access Point (Mater device)	1 Watt(30dBm)
		Fixed point-to-point Acess Ponit	1 Watt(30dBm)
√		Mobile and portable clinet device	250mW(23.98dBm)
U-NII-2A	√		250mW(23.98dBm) or 11dBm+10 log B
U-NII-2C	√		250mW(23.98dBm) or 11dBm+10 log B
U-NII-3			1 Watt(30dBm)

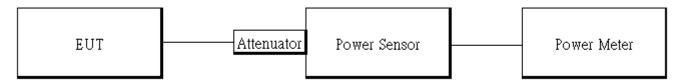
9.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
- 4. Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
- 5. Record the max. reading and add 10 log(1/duty cycle).
- 6. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

9.3 Measurement Equipment Used

Refer to section 8.3 for details.

9.4 Test Set-up



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9.5 Measurement Result

802.11a

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	12.86	19.320	23.98	PASS
44	5220	12.91	19.543	23.98	PASS
48	5240	12.92	19.588	23.98	PASS
52	5260	12.99	19.907	23.98 or 11+10log(B) =24.65	PASS
60	5300	12.99	19.907	23.98 or 11+10log(B) =24.65	PASS
64	5320	12.99	19.907	23.98 or 11+10log(B) =24.65	PASS
100	5500	12.97	19.815	23.98 or 11+10log(B) =24.65	PASS
116	5580	12.99	19.907	23.98 or 11+10log(B) =24.65	PASS
140	5700	12.88	19.409	23.98 or 11+10log(B) =24.65	PASS
149	5745	12.98	19.861	30	PASS
157	5785	12.88	19.409	30	PASS
165	5825	12.81	19.099	30	PASS

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802.11n HT20

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	11.92	15.560	23.98	PASS
44	5220	11.91	15.524	23.98	PASS
48	5240	11.71	14.825	23.98	PASS
52	5260	11.87	15.382	23.98 or 11+10log(B) =24.65	PASS
60	5300	11.97	15.740	23.98 or 11+10log(B) =24.65	PASS
64	5320	11.78	15.066	23.98 or 11+10log(B) =24.65	PASS
100	5500	11.68	14.723	23.98 or 11+10log(B) =24.65	PASS
116	5580	11.86	15.346	23.98 or 11+10log(B) =24.65	PASS
140	5700	11.95	15.668	23.98 or 11+10log(B) =24.65	PASS
149	5745	11.98	15.776	30	PASS
157	5785	11.70	14.791	30	PASS
165	5825	11.95	15.668	30	PASS

802.11n HT40

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	11.74	14.928	23.98	PASS
46	5230	11.77	15.031	23.98	PASS
54	5270	11.97	15.740	23.98	PASS
62	5310	11.98	15.776	23.98 or 11+10log(B) =24.65	PASS
102	5510	11.81	15.171	23.98 or 11+10log(B) =24.65	PASS
110	5550	11.89	15.453	23.98 or 11+10log(B) =24.65	PASS
134	5670	11.79	15.101	23.98 or 11+10log(B) =24.65	PASS
151	5755	11.90	15.488	30	PASS
159	5795	11.86	15.346	30	PASS

^{*} Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.

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10. PEAK POWER SPECTRAL DENSITY

10.1 Standard Applicable

OPERZTION Band	EUT CATEGORY		LIMIT
U-NII-1		Access Point (Mater device)	17dBm/ MHz
		Fixed point-to-point Acess Ponit	
		Mobile and portable clinet device	11dBm/ MHz
U-NII-2A	√		11dBm/ MHz
U-NII-2C	V		11dBm/ MHz
U-NII-3			30dBm/ 500kHz

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

10.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.

4. For U-NII1, U-NII-2A, U-NII-2C Band:

Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

For U-NII-3 Band:

Set RBW=500 kHz, VBW≥ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

- 5. User the cursor on spectrum to peak search the highest level of trace
- 6. Record the max. reading and add 10 log(1/duty cycle).
- 7. Repeat above procedures until all default test channel (low, middle, and high) was complete.

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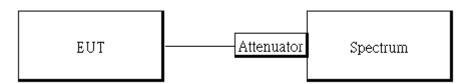
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10.3 Measurement Equipment Used

Conducted Emission Test Site						
EQUIPMENT	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.		
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2015	01/28/2016	
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2015	01/01/2016	
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016	

10.4 Test Set-up



10.5 Measurement Result

802.11a

Frequency	PPSD	Limit	Margin
(MHz)	(dBm)	(dBm)	(dB)
5180	-2.07	11.00	-13.07
5220	-2.19	11.00	-13.19
5240	-1.14	11.00	-12.14
5260	0.11	11.00	-10.89
5300	-2.48	11.00	-13.48
5320	-0.48	11.00	-11.48
5500	-2.04	11.00	-13.04
5580	-2.50	11.00	-13.50
5700	-1.04	11.00	-12.04
5745	7.22	30.00	-22.78
5785	7.21	30.00	-22.79
5825	6.85	30.00	-23.15

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802.11n HT20

Frequency	PPSD	Limit	Margin
(MHz)	(dBm)	(dBm)	(dB)
5180	-4.71	11.00	-15.71
5220	-3.17	11.00	-14.17
5240	-2.79	11.00	-13.79
5260	-4.57	11.00	-15.57
5300	-4.73	11.00	-15.73
5320	-3.90	11.00	-14.90
5500	-2.58	11.00	-13.58
5580	-3.07	11.00	-14.07
5700	-3.19	11.00	-14.19
5745	6.23	30.00	-23.77
5785	5.85	30.00	-24.15
5825	6.83	30.00	-23.17

802.11n HT40

Frequency	PPSD	Limit	Margin
(MHz)	(dBm)	(dBm)	(dB)
5190	-12.51	11.00	-23.51
5230	-12.52	11.00	-23.52
5270	-9.83	11.00	-20.83
5310	-8.00	11.00	-19.00
5510	-8.62	11.00	-19.62
5550	-8.77	11.00	-19.77
5670	-9.61	11.00	-20.61
5755	2.79	30.00	-27.21
5795	3.76	30.00	-26.24

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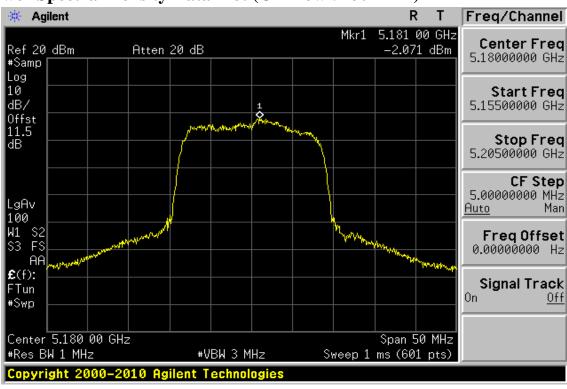
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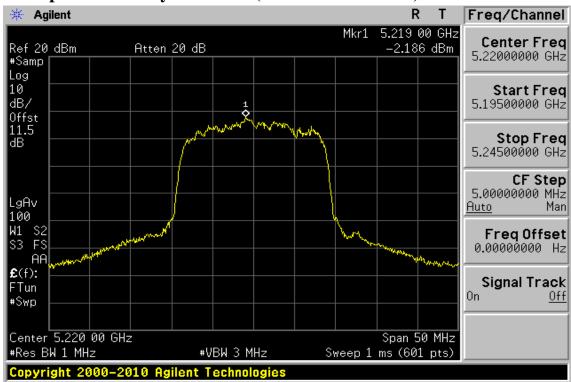
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802.11a, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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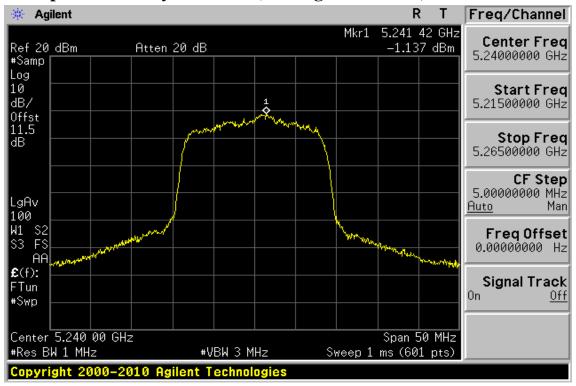
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Peak Power Spectral Density Data Plot (CH High 5240 MHz)



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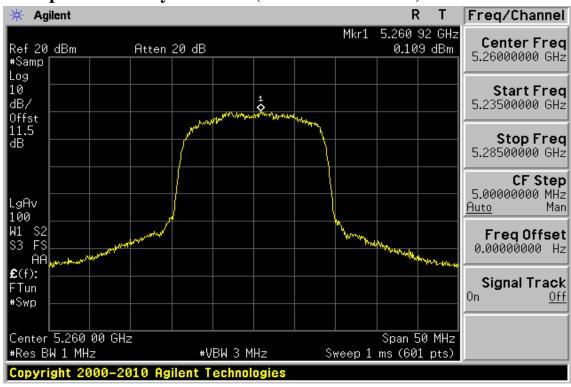


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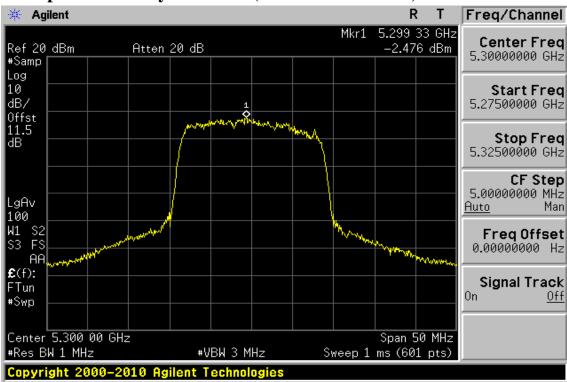
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802.11a, 5250~5350 MHz

Peak Power Spectral Density Data Plot (CH Low 5260 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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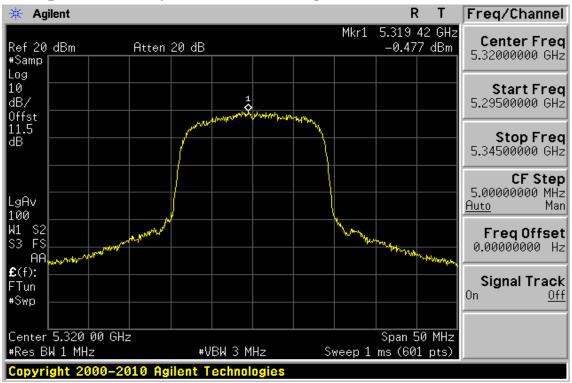
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Peak Power Spectral Density Data Plot (CH High 5320 MHz)



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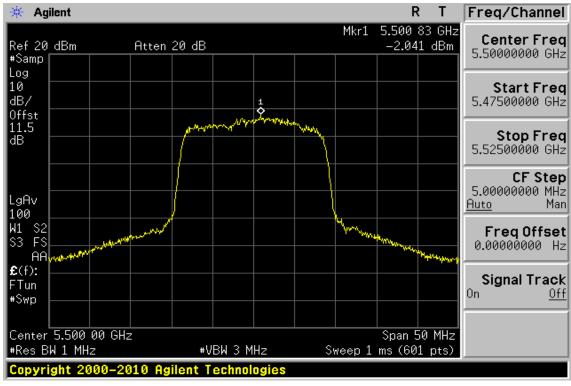


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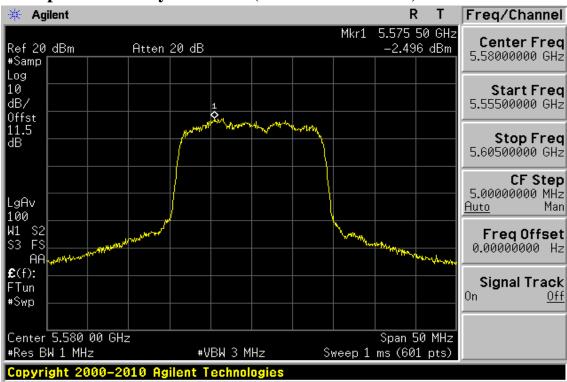
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802.11a, 5470~5725 MHz

Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5580 MHz)



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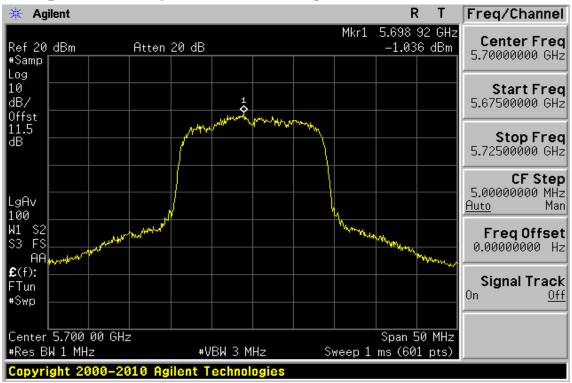
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Peak Power Spectral Density Data Plot (CH High 5700 MHz)



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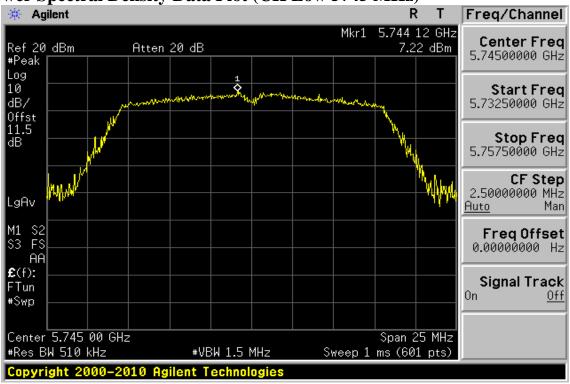


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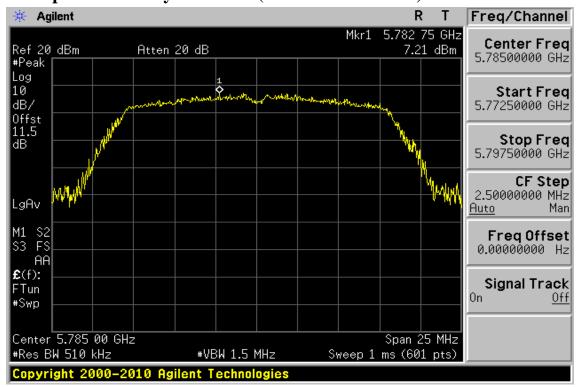
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802.11a, 5725~5850 MHz

Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



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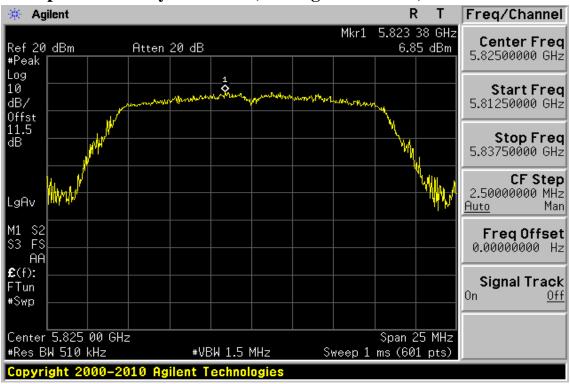
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Peak Power Spectral Density Data Plot (CH High 5825 MHz)



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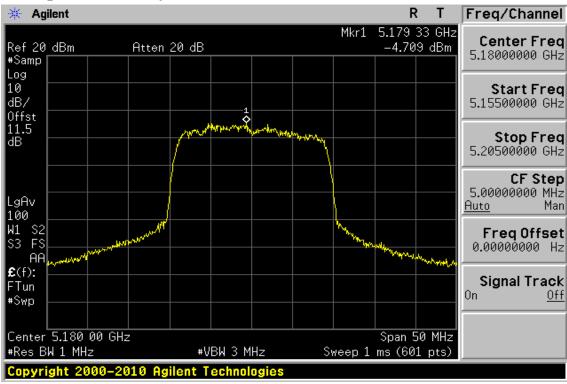


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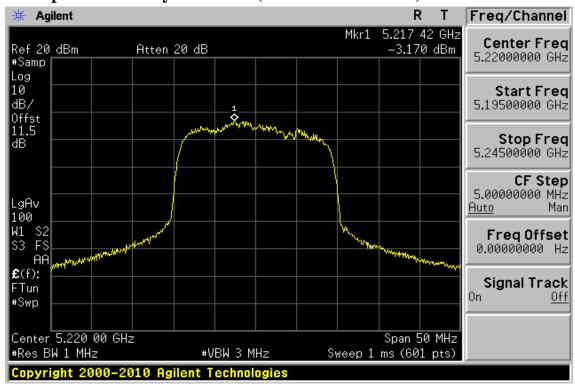
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802.11n HT20, 5150~5250 MHz

Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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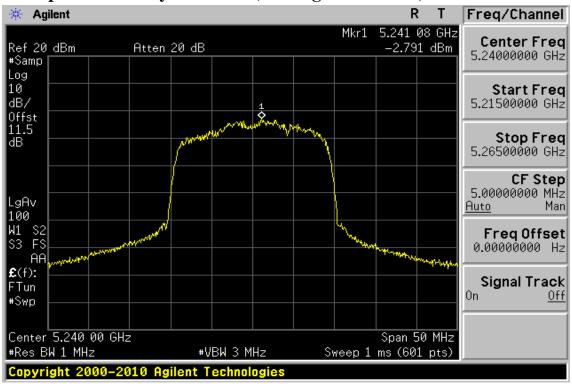
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Peak Power Spectral Density Data Plot (CH High 5240 MHz)



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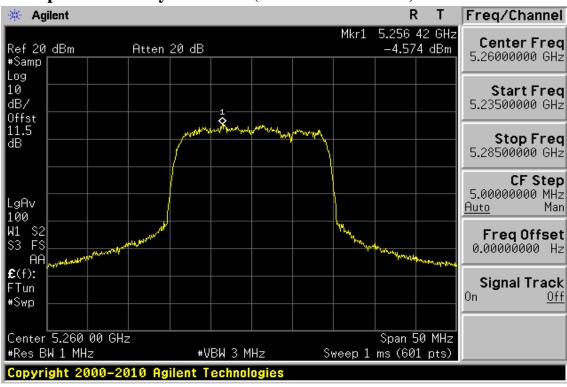


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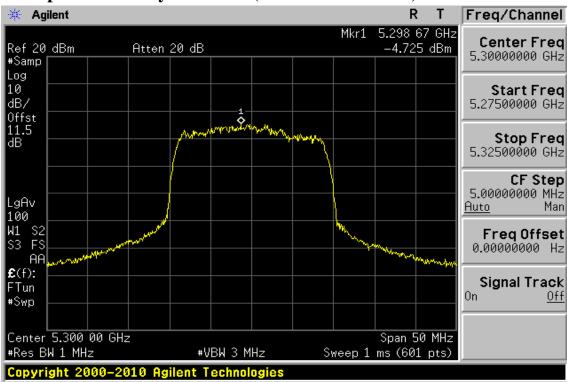
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802.11n HT20, 5250~5350 MHz

Peak Power Spectral Density Data Plot (CH Low 5260MHz)



Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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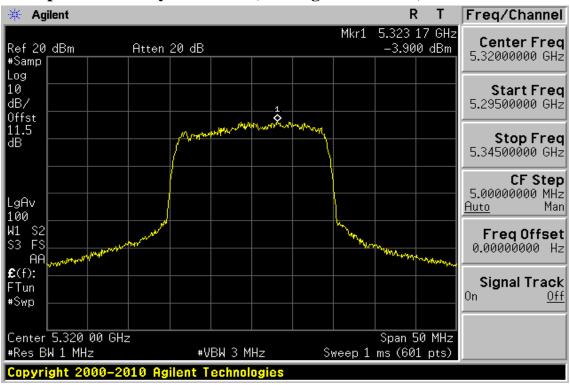
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Peak Power Spectral Density Data Plot (CH High 5320 MHz)



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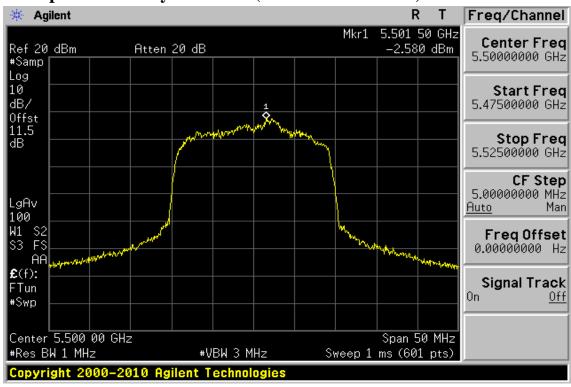


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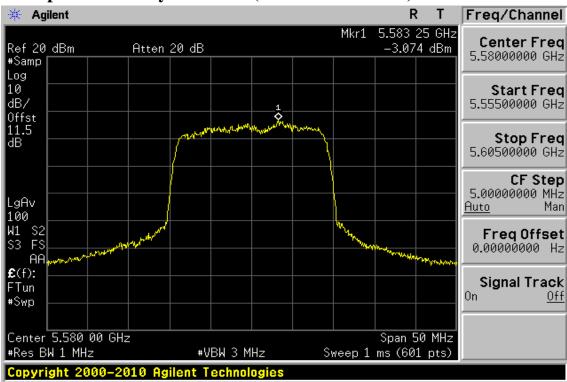
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802.11n HT20, 5470~5725 MHz

Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5580MHz)



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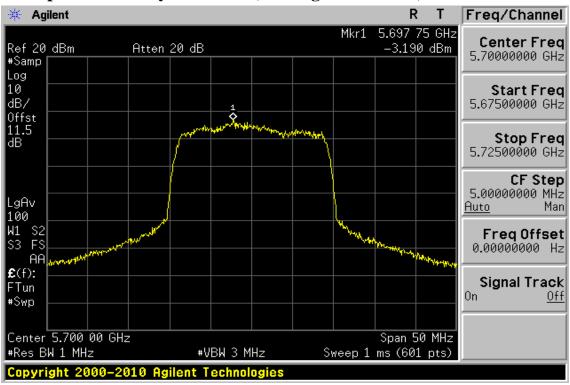
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Peak Power Spectral Density Data Plot (CH High 5700 MHz)



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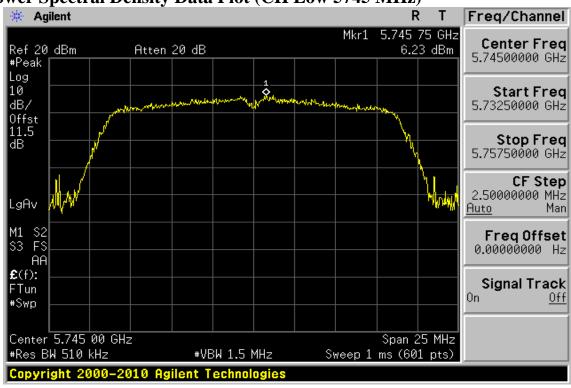


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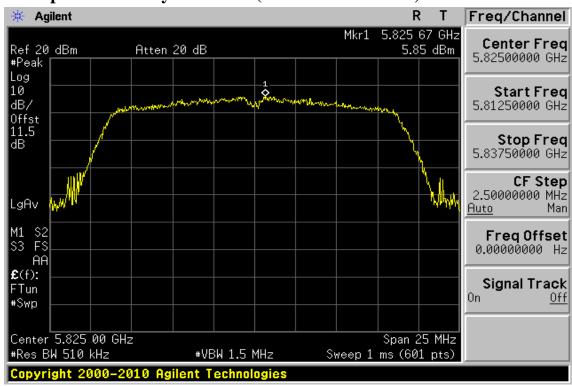
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802.11n HT20, 5725~5850 MHz

Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



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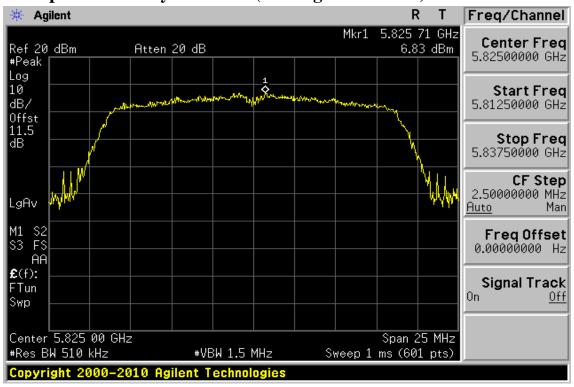
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Peak Power Spectral Density Data Plot (CH High 5825 MHz)



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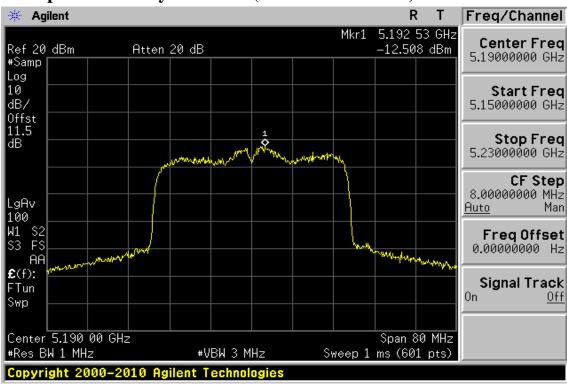


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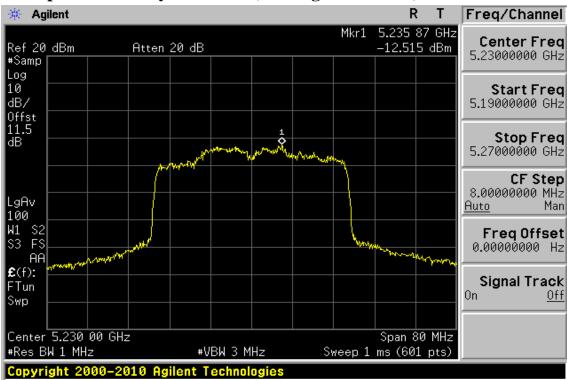
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802.11n HT40, 5150~5250 MHz

Peak Power Spectral Density Data Plot (CH Low 5190MHz)



Peak Power Spectral Density Data Plot (CH High 5230MHz)



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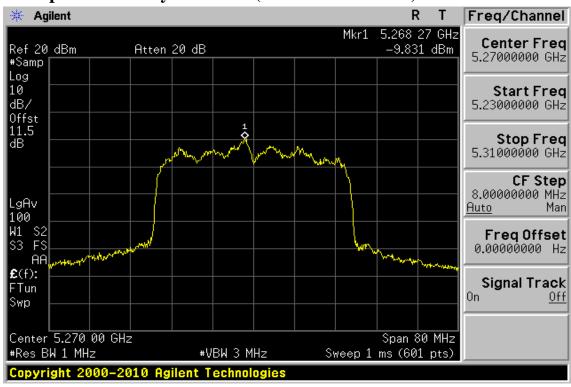


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802.11n HT40, 5250~5350 MHz

Peak Power Spectral Density Data Plot (CH Low 5270MHz)



Peak Power Spectral Density Data Plot (CH High 5310MHz)



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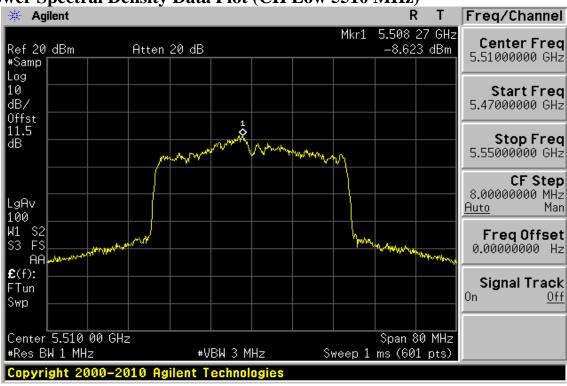


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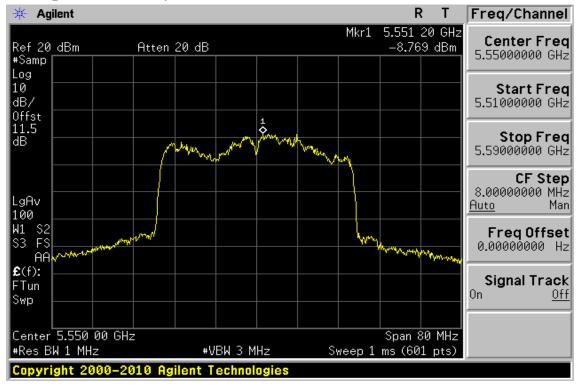
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802.11n HT40, 5470~5725 MHz

Peak Power Spectral Density Data Plot (CH Low 5510 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5550 MHz)



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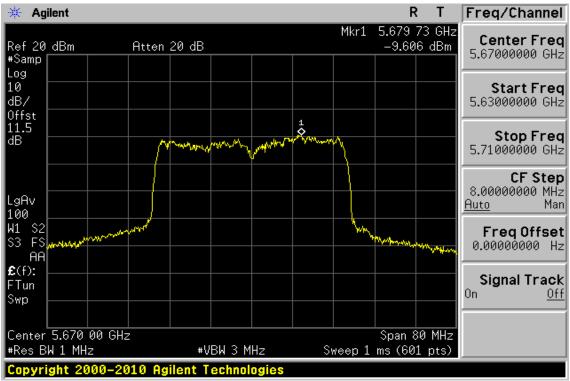
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Peak Power Spectral Density Data Plot (CH High 5670 MHz)



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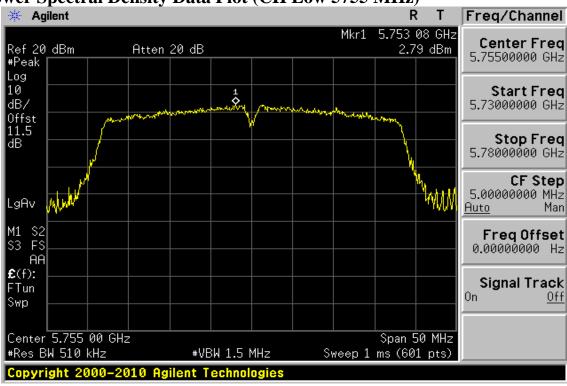


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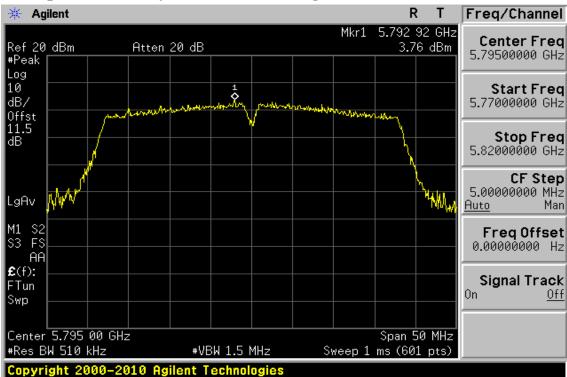
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802.11n HT40, 5725~5850 MHz

Peak Power Spectral Density Data Plot (CH Low 5755 MHz)



Peak Power Spectral Density Data Plot (CH High 5795 MHz)



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11. UNDESIRABLE RADIATED EMISSION MEASUREMENT1

11.1 Standard Applicable

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- 1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- 2. For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- 3. For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- 4. For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

APPLICABLE TO	LII	MIT			
FCC KDB 789033 D02 General UNII Test Procedures New Rules v01	FIELD STRENGTH AT 3m				
	PK: 74 (dBµV/m)	AV 54 (dBμV/m)			
APPLICABLE TO	EIRP LIMIT	FIELD STRENGTH AT 3m			
15.407(b)(1)					
15.407(b)(2)	PK: -27 (dBm/MHz)	PK: 68.3 (dBµV/m)			
15.407(b)(3)					
15.407(b)(4)	PK: -27 (dBm/MHz) PK: -17 (dBm/MHz)	PK: 68.3 (dBμV/m) PK: 78.2 (dBμV/m)			

EIRP = $((E*d)^2) / 30$, where E is the field in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

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Unwanted spurious emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
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

Note:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level $(dB\mu V/m) = 20 \log Emission level (dB\mu V/m)$

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Measurement Equipment Used

2 Weasurement Equ		066 Chamber			
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
EMI Test Receiver	R&S	ESCI7	100760	05/04/2015	05/03/2016
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2015	01/28/2016
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	12/22/2014	12/21/2015
Spectrum Analyzer	R&S	FSV-30	101398	10/07/2014	10/06/2015
Loop Antenna	ETS.LINDGREN	6502	00148045	07/03/2014	07/02/2015
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/23/2014	12/22/2015
Horn antenna	ETS.LINDGREN	3117	123995	05/05/2015	05/04/2016
Horn Antenna	Schwarzbeck	BBHA9170	184	12/25/2014	12/24/2015
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/02/2015	01/01/2016
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2015	01/01/2016
Pre-Amplifier	Agilent	8449B	3008A00578	01/02/2015	01/01/2016
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/02/2015	01/01/2016
5150-5350 Band Reject Filter	Micro-Tronics	BRM50703	1	01/02/2015	01/01/2016
5470-5725 Band Reject Filter	Micro-Tronics	BRM50704	1	01/02/2015	01/01/2016
5725-5875 Band Reject Filter	Micro-Tronics	BRM50705	1	01/02/2015	01/01/2016
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	01/02/2015	01/01/2016
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	01/02/2015	01/01/2016
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_Rx	9	01/02/2015	01/01/2016
3m Site NSA	SGS	966 chamber	N/A	07/15/2014	07/14/2015

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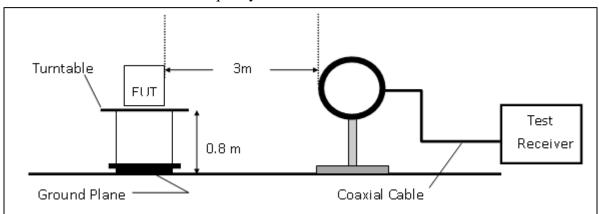
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Report No.: ER/2015/40162 **Issue Date: Jun. 10, 2015**

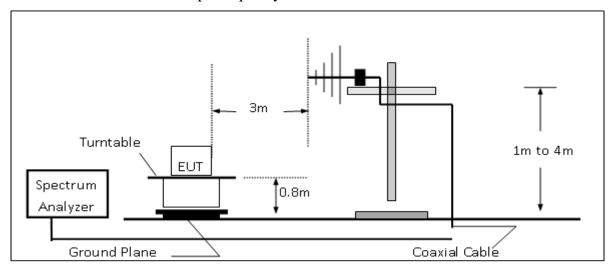
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Test SET-UP 11.3

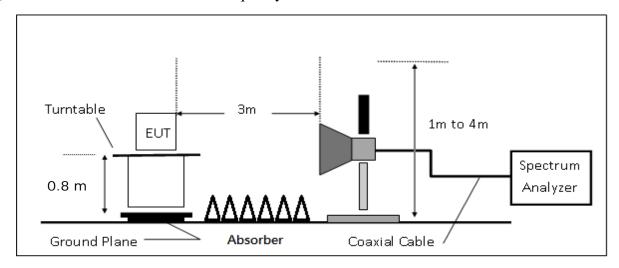
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



(C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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11.4 Measurement Procedure

- 1. The EUT was placed on a turn table which is 0.8m above ground plan.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.
- 3. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 0.8m for frequency> 1GHz above ground plan.
- 4. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 5. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 6. Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
- 7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
- 8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW $\ge 1/T$ (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- 9. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 10. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 11. Repeat above procedures until all frequency measured were complete.

11.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

W	here	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)				
		RA = Reading Amplitude	AG = Amplifier Gain				
		AF = Antenna Factor					

Actual $FS(dB\mu V/m) = SPA$. Reading level $(dB\mu V) + Factor(dB)$

 $Factor(dB) = Antenna \; Factor(dB\mu V/m) + Cable \; Loss(dB) - Pre_Amplifier \; Gain(dB)$

Note:

"F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

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11.6 Test Results of Radiated Spurious Emissions form 9 KHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

11.7 **Measurement Result**

Refer to attach tabular data sheets.

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Radiated Spurious Emission Measurement Result

Below 1GHz Worst-Case Data:

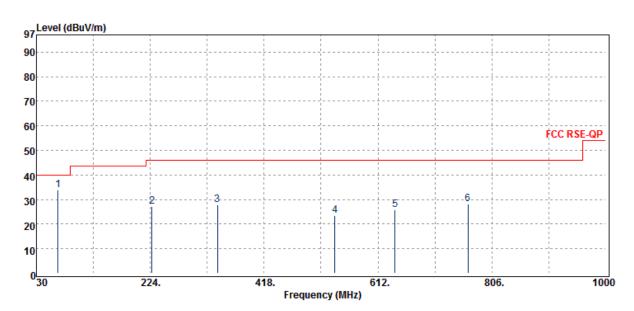
802.11a, 5150~5250 MHz

Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5220 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
66.86	S	Peak	45.09	-11.21	33.88	40.00	-6.12
226.91	S	Peak	38.39	-11.05	27.34	46.00	-18.66
338.46	S	Peak	35.43	-7.54	27.89	46.00	-18.11
538.28	S	Peak	27.39	-4.00	23.39	46.00	-22.61
641.10	S	Peak	27.58	-1.81	25.77	46.00	-20.23
765.26	S	Peak	27.08	1.11	28.19	46.00	-17.81

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

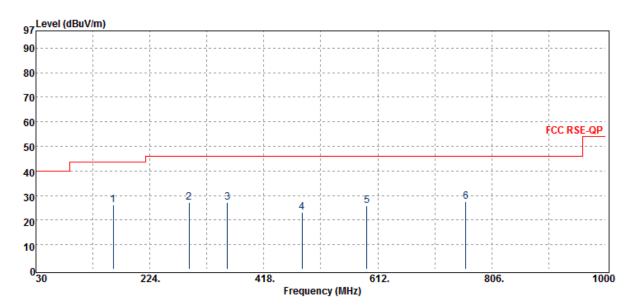
:802.11 a :5220 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
161.92	S	Peak	35.18	-8.85	26.33	43.50	-17.17
290.93	S	Peak	35.24	-8.18	27.06	46.00	-18.94
355.92	S	Peak	34.25	-7.08	27.17	46.00	-18.83
482.99	S	Peak	27.62	-4.46	23.16	46.00	-22.84
593.57	S	Peak	27.51	-1.59	25.92	46.00	-20.08
761.38	S	Peak	26.32	1.13	27.45	46.00	-18.55

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802.11a, 5250~5350 MHz

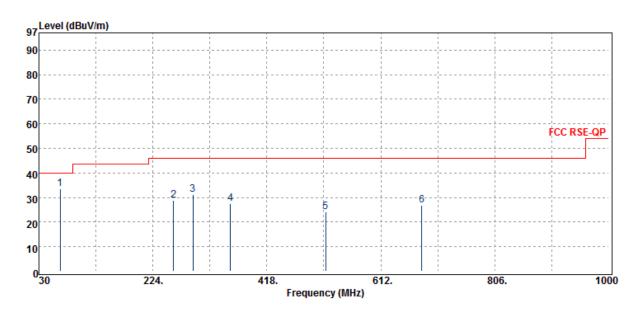
Operation Band Fundamental Frequency Operation Mode

EUT Pol.

:802.11 a :5300 MHz :TX MID :E1 Plan

Test Date Temp./Humi. :2015-05-26 :23 deg_C / 58 RH

Engineer :Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
65.89	S	Peak	44.62	-11.07	33.55	40.00	-6.45
258.92	S	Peak	38.47	-9.60	28.87	46.00	-17.13
291.90	S	Peak	39.42	-8.17	31.25	46.00	-14.75
355.92	S	Peak	34.52	-7.08	27.44	46.00	-18.56
517.91	S	Peak	28.66	-4.47	24.19	46.00	-21.81
681.84	S	Peak	27.81	-1.04	26.77	46.00	-19.23

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

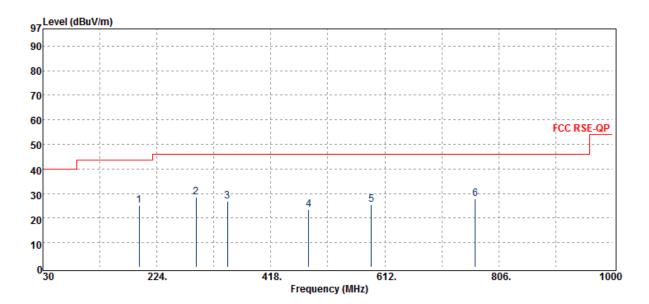
:802.11 a :5300 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

Measurement Antenna Pol.

:2015-05-26 :23 deg_C / 58 RH

:Curry :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
193.93	S	Peak	36.78	-11.69	25.09	43.50	-18.41
290.93	S	Peak	36.78	-8.18	28.60	46.00	-17.40
344.28	S	Peak	34.09	-7.35	26.74	46.00	-19.26
482.02	S	Peak	28.04	-4.51	23.53	46.00	-22.47
588.72	S	Peak	26.93	-1.55	25.38	46.00	-20.62
766.23	S	Peak	26.74	1.09	27.83	46.00	-18.17

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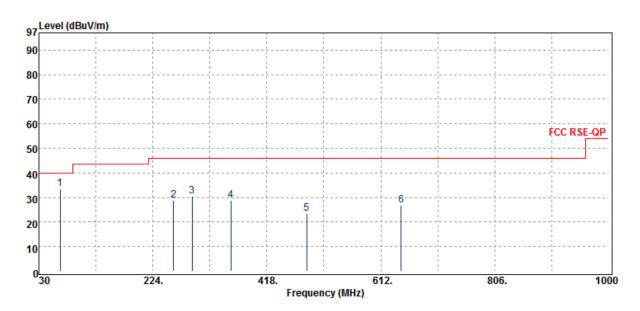
802.11a, 5470~5725 MHz

Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 a :5580 MHz :TX MID :E1 Plan

Test Date Temp./Humi. :2015-05-26 :23 deg_C / 58 RH

Engineer :Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
65.89	S	Peak	44.60	-11.07	33.53	40.00	-6.47
258.92	S	Peak	38.48	-9.60	28.88	46.00	-17.12
290.93	S	Peak	38.83	-8.18	30.65	46.00	-15.35
356.89	S	Peak	35.77	-7.07	28.70	46.00	-17.30
485.90	S	Peak	27.98	-4.37	23.61	46.00	-22.39
646.92	S	Peak	28.47	-1.49	26.98	46.00	-19.02

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

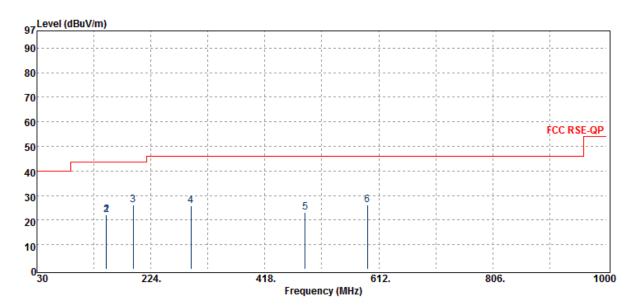
:802.11 a :5580 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
148.34	S	Peak	31.43	-9.43	22.00	43.50	-21.50
148.34	S	Peak	31.43	-9.43	22.00	43.50	-21.50
193.93	S	Peak	37.93	-11.69	26.24	43.50	-17.26
291.90	S	Peak	34.17	-8.17	26.00	46.00	-20.00
486.87	S	Peak	27.38	-4.35	23.03	46.00	-22.97
592.60	S	Peak	27.61	-1.55	26.06	46.00	-19.94

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802.11a, 5725~5850 MHz

Operation Band Fundamental Frequency Operation Mode

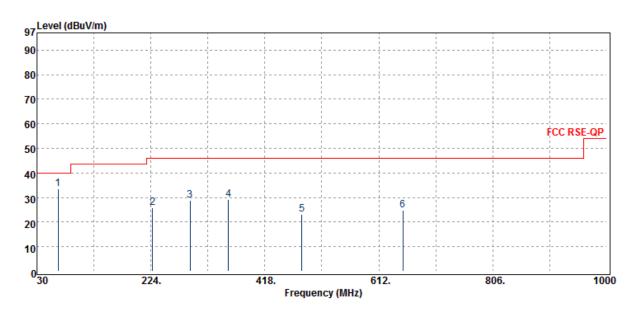
EUT Pol.

:802.11 a :5785 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
65.89	S	Peak	44.48	-11.07	33.41	40.00	-6.59	
226.91	S	Peak	36.85	-11.05	25.80	46.00	-20.20	
290.93	S	Peak	37.08	-8.18	28.90	46.00	-17.10	
355.92	S	Peak	36.25	-7.08	29.17	46.00	-16.83	
481.05	S	Peak	27.72	-4.55	23.17	46.00	-22.83	
652.74	S	Peak	26.24	-1.26	24.98	46.00	-21.02	

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Operation Band Fundamental Frequency Operation Mode

EUT Pol.

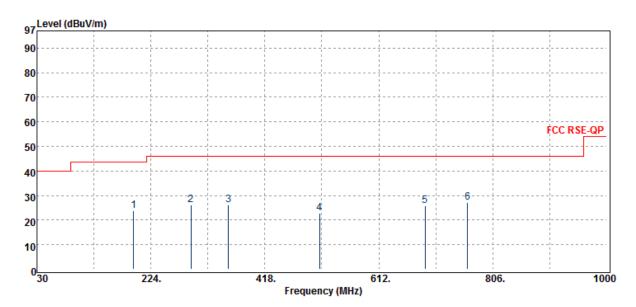
:802.11 a :5785 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
194.90	S	Peak	35.61	-11.71	23.90	43.50	-19.60
291.90	S	Peak	34.46	-8.17	26.29	46.00	-19.71
355.92	S	Peak	33.26	-7.08	26.18	46.00	-19.82
511.12	S	Peak	27.39	-4.50	22.89	46.00	-23.11
690.57	S	Peak	26.70	-0.83	25.87	46.00	-20.13
763.32	S	Peak	26.10	1.14	27.24	46.00	-18.76

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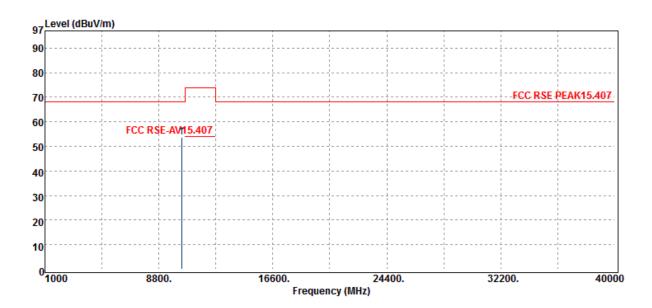
Above 1GHz Worst-Case Data:

802.11a, 5150~5250 MHz

Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5180 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
10360.00	Н	Peak	36.11	17.65	53.76	68.30	-14.54

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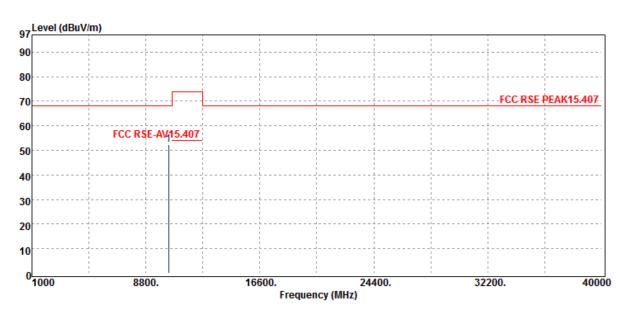
:2015-05-26

Operation Band :802.11 a Test Date

Fundamental Frequency Temp./Humi. :5180 MHz :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry

EUT Pol. :E1 Plan :HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
10360.00	Н	Peak	34.78	17.65	52.43	68.30	-15.87	

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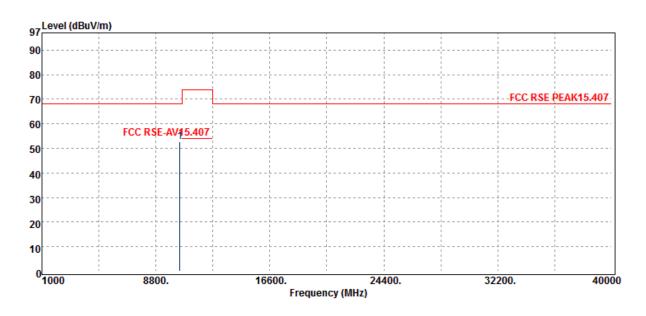
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Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency Temp./Humi. :5220 MHz :23 deg_C / 58 RH

Operation Mode :TX MID Engineer :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
10440.00	Н	Peak	34.22	18.47	52.69	68.30	-15.61

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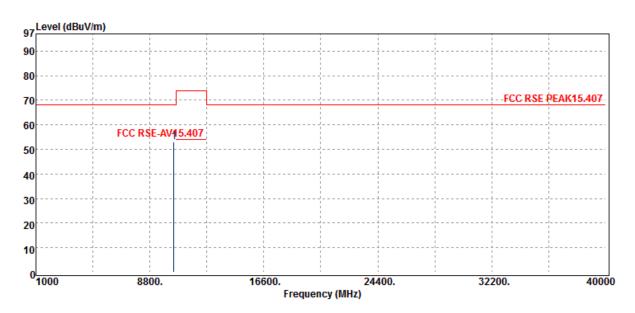
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Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency Temp./Humi. :5220 MHz :23 deg_C / 58 RH Operation Mode :TX MID Engineer :Curry

EUT Pol. :E1 Plan :HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
10440.00	Н	Peak	34.44	18.47	52.91	68.30	-15.39	

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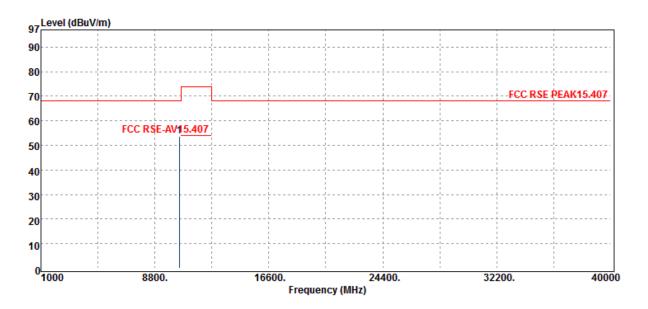
Operation Band Fundamental Frequency Operation Mode

EUT Pol.

:802.11 a :5240 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. :2015-05-26 :23 deg_C / 58 RH

Engineer :Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB	_
10480.00	Н	Peak	35.43	18.23	53.66	68.30	-14.64	

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Operation Band Fundamental Frequency

Operation Mode EUT Pol.

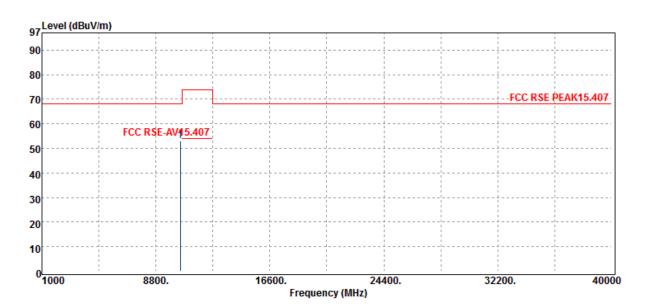
:802.11 a :5240 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi.

Measurement Antenna Pol.

:2015-05-26 :23 deg_C / 58 RH

Engineer :Curry :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
10480.00	Н	Peak	34.82	18.23	53.05	68.30	-15.25

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Band edge falling to restricted band

Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5180 MHz Temp./Humi. :23 deg_C / 58 RH Operation Mode Engineer

:Band Edge LOW :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	30.23	10.32	40.55	54.00	-13.45
5150.00	E	Peak	43.01	10.32	53.33	74.00	-20.67

Operation Band :802.11 a Test Date :2015-05-26 Fundamental Frequency :5180 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
5150.00	E	Average	32.07	10.32	42.39	54.00	-11.61
5150.00	E	Peak	44.78	10.32	55.10	74.00	-18.90

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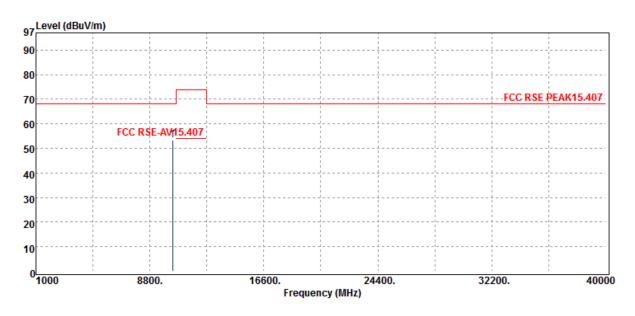
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz

Operation Band :802.11 n20M **Test Date** :2015-05-26 Fundamental Frequency :5180 MHz Temp./Humi. :23 deg_C / 58 RH

Engineer Operation Mode :TX LOW :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
10360.00	Н	Peak	35.78	17.65	53.43	68.30	-14.87	

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Operation Band Fundamental Frequency Operation Mode

EUT Pol.

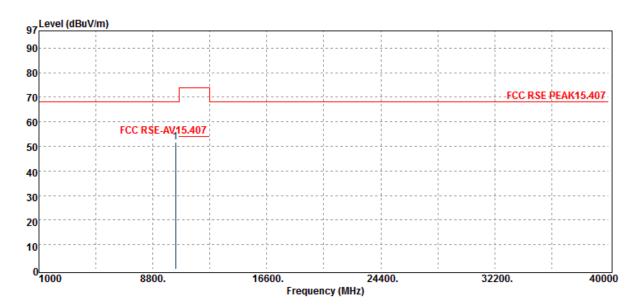
:802.11 n20M :5180 MHz :TX LOW :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	_
10360.00	Н	Peak	34.09	17.65	51.74	68.30	-16.56	

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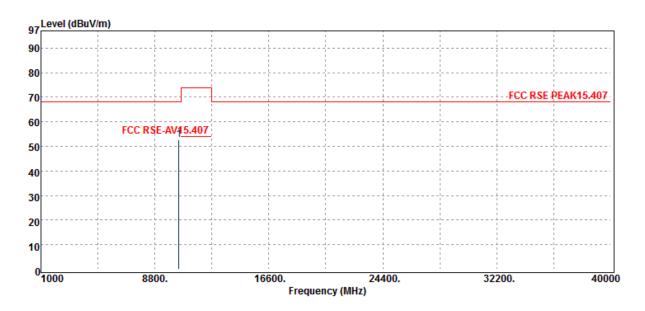
Operation Band Fundamental Frequency

Operation Mode EUT Pol.

:802.11 n20M :5220 MHz :TX MID :E1 Plan

Test Date Temp./Humi. :2015-05-26 :23 deg_C / 58 RH

Engineer :Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	_
10440.00	Н	Peak	34.36	18.47	52.83	68.30	-15.47	

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Operation Band Fundamental Frequency

Operation Mode EUT Pol.

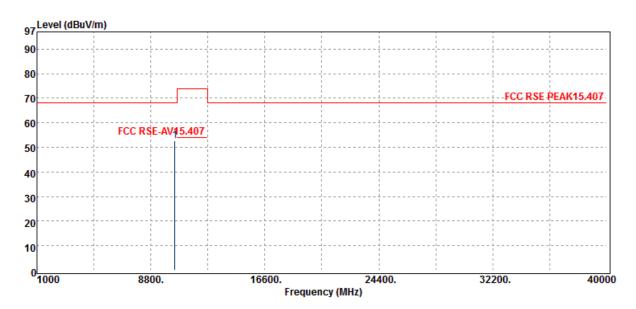
:802.11 n20M :5220 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
10440.00	Н	Peak	34.37	18.47	52.84	68.30	-15.46

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Operation Band Fundamental Frequency

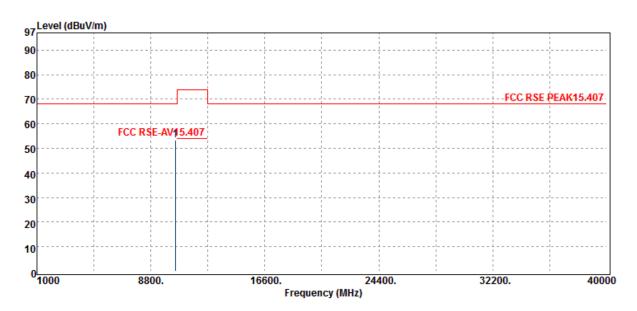
Operation Mode EUT Pol.

:802.11 n20M :5240 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
10480.00	Н	Peak	34.99	18.23	53.22	68.30	-15.08

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Operation Band Fundamental Frequency Operation Mode

EUT Pol.

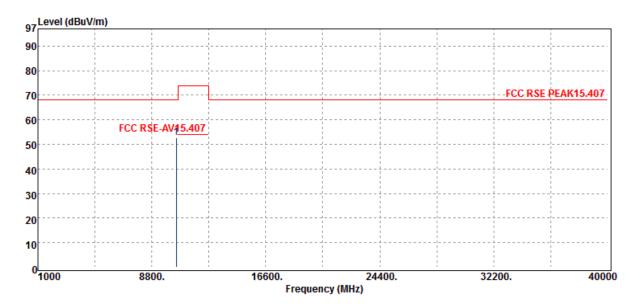
:802.11 n20M :5240 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
10480.00	Н	Peak	34.60	18.23	52.83	68.30	-15.47

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5150.00

FCC ID: PY7-PM0872

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74.00

-21.76

Band edge falling to restricted band

E

Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency :5180 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Spectrum Margin Freq. Note Detector Factor Actual Limit FS Reading Level @3m Mode PK/QP/AV dBμV dBµV/m dBµV/m MHz F/H/E/S dB dB 5150.00 29.32 39.64 -14.36 E Average 10.32 54.00

10.32

52.24

Operation Band :802.11 n20M Test Date :2015-05-26

41.92

Fundamental Frequency :5180 MHz Temp./Humi. :23 deg_C / 58 RH

:Band Edge LOW Operation Mode Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Actual $FS(dB\mu V/m) = SPA$. Reading level $(dB\mu V) + Factor(dB)$

Factor(dB) = Antenna Factor($dB\mu V/m$) + Cable Loss(dB) - Pre Amplifier Gain(dB)

"F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency. Note:

Peak

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	31.18	10.32	41.50	54.00	-12.50
5150.00	E	Peak	50.04	10.32	60.36	74.00	-13.64

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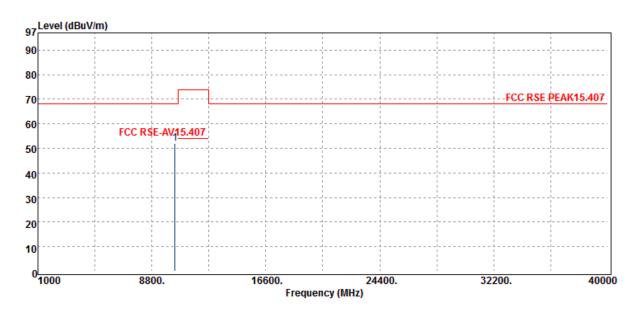
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz

Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5190 MHz Temp./Humi. :23 deg_C / 58 RH

Engineer Operation Mode :TX LOW :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
10380.00	Н	Peak	34.18	18.00	52.18	68.30	-16.12

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Operation Band Fundamental Frequency

Operation Mode EUT Pol.

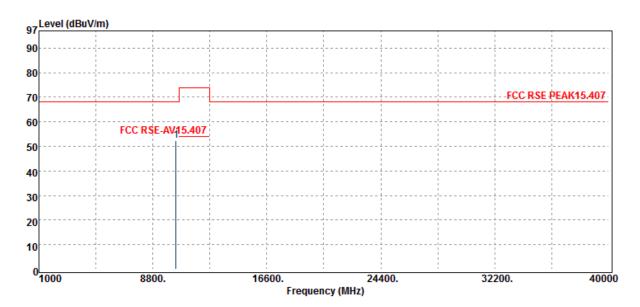
:802.11 n40M :5190 MHz :TX LOW :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	_
10380.00	Н	Peak	34.50	18.00	52.50	68.30	-15.80	

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Operation Band Fundamental Frequency Operation Mode

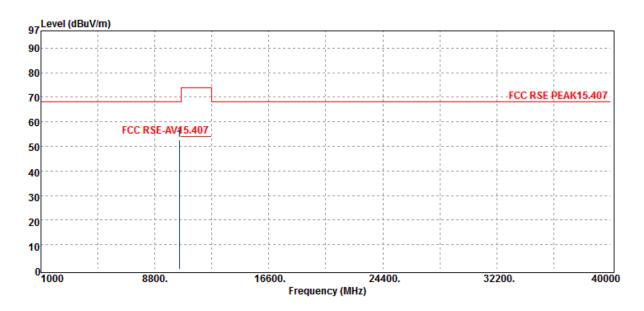
EUT Pol.

:802.11 n40M :5230 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
10460.00	Н	Peak	34.19	18.36	52.55	68.30	-15.75

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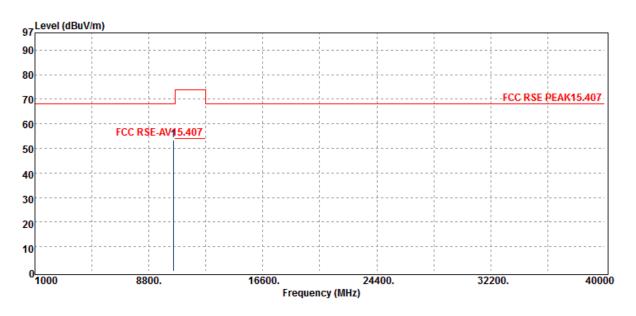
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Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency Temp./Humi. :5230 MHz :23 deg_C / 58 RH Operation Mode :TX HIGH Engineer :Curry

EUT Pol. :E1 Plan :HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
10460.00	Н	Peak	35.11	18.36	53.47	68.30	-14.83

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Band edge falling to restricted band

Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5190 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode Engineer :Band Edge LOW :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	29.79	10.32	40.11	54.00	-13.89
5150.00	E	Peak	49.54	10.32	59.86	74.00	-14.14

Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5190 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	30.72	10.32	41.04	54.00	-12.96
5150.00	E	Peak	44.54	10.32	54.86	74.00	-19.14

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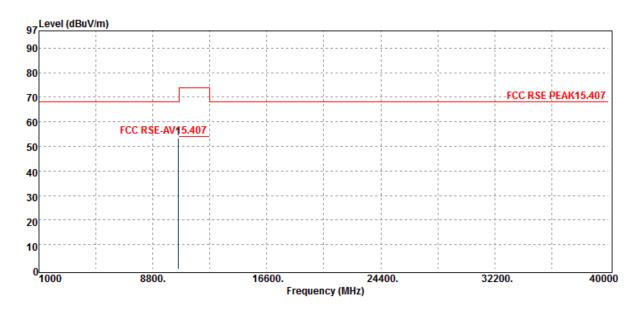
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Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz

Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5260 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB	
10520.00	Н	Peak	34.87	18.35	53.22	68.30	-15.08	

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:Curry

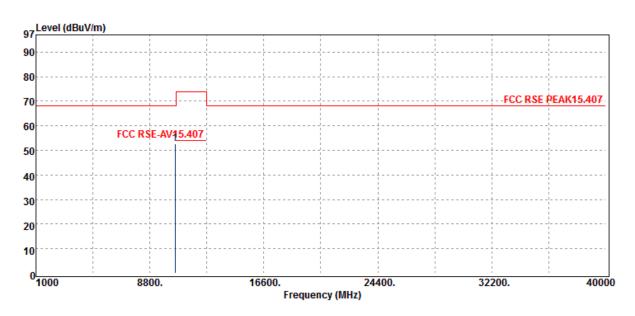
Operation Band :802.11 a Test Date :2015-05-26

:TX LOW

Fundamental Frequency Temp./Humi. :5260 MHz :23 deg_C / 58 RH Operation Mode

Engineer

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
10520.00	Н	Peak	34.24	18.35	52.59	68.30	-15.71

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Operation Band Fundamental Frequency Operation Mode

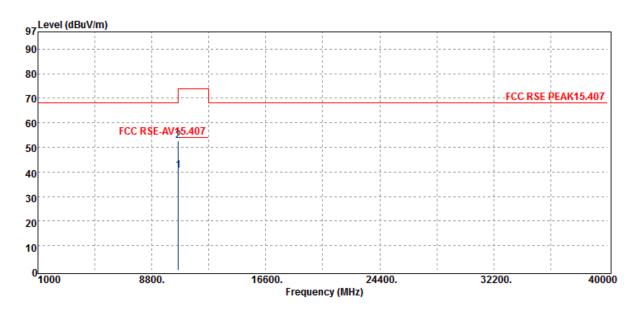
EUT Pol.

:802.11 a :5300 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
10600.00	Н	Average	21.80	18.69	40.49	54.00	-13.51
10600.00	Н	Peak	34.09	18.69	52.78	74.00	-21.22

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Operation Band Fundamental Frequency

Operation Mode EUT Pol.

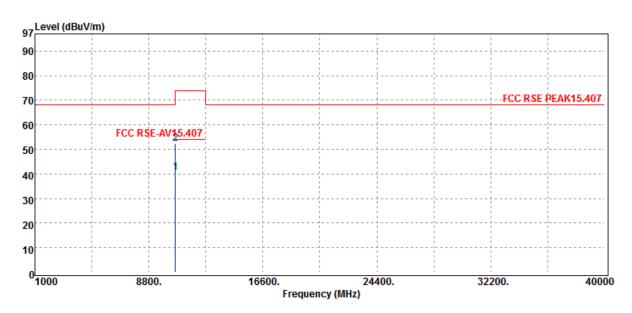
:802.11 a :5300 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
10600.00	Н	Average	21.82	18.69	40.51	54.00	-13.49	
10600.00	Н	Peak	33.62	18.69	52.31	74.00	-21.69	

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Operation Band Fundamental Frequency Operation Mode

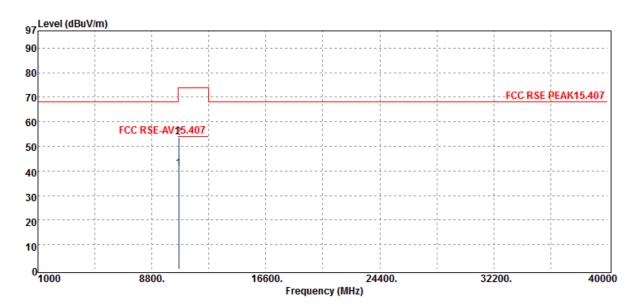
EUT Pol.

:802.11 a :5320 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
10640.00	Н	Average	21.89	19.02	40.91	54.00	-13.09	
10640.00	Н	Peak	34.80	19.02	53.82	74.00	-20.18	

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Operation Band Fundamental Frequency

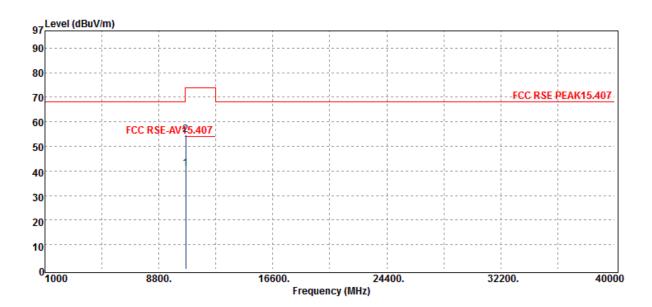
:802.11 a :5320 MHz Operation Mode :TX HIGH EUT Pol. :E1 Plan

Test Date Temp./Humi. Engineer

Measurement Antenna Pol.

:2015-05-26 :23 deg_C / 58 RH

:Curry :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
10640.00	Н	Average	22.00	19.02	41.02	54.00	-12.98
10640.00	Н	Peak	35.74	19.02	54.76	74.00	-19.24

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Band edge falling to restricted band

Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5320 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5350.00	E	Average	30.00	10.97	40.97	54.00	-13.03
5350.00	E	Peak	43.20	10.97	54.17	74.00	-19.83

Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5320 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	$dB\mu V/m$	dBμV/m	dB
5350.00	E	Average	30.16	10.97	41.13	54.00	-12.87
5350.00	E	Peak	43.41	10.97	54.38	74.00	-19.62

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Report No.: ER/2015/40162 **Issue Date: Jun. 10, 2015**

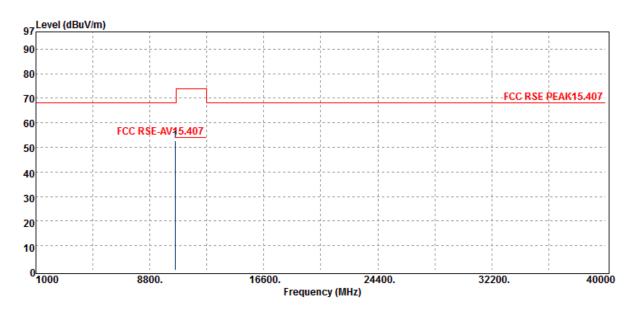
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz

Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency :5260 MHz Temp./Humi. :23 deg_C / 58 RH

Engineer Operation Mode :TX LOW :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
10520.00	Н	Peak	34.38	18.35	52.73	68.30	-15.57	

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Operation Band Fundamental Frequency

Operation Mode EUT Pol.

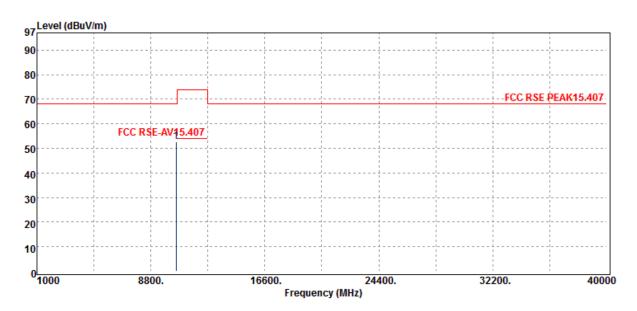
:802.11 n20M :5260 MHz :TX LOW :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
10520.00	Н	Peak	34.40	18.35	52.75	68.30	-15.55	

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Operation Band Fundamental Frequency Operation Mode

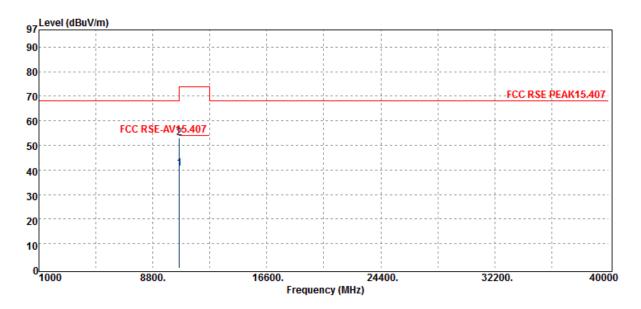
EUT Pol.

:802.11 n20M :5300 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
10600.00	Н	Average	21.88	18.69	40.57	54.00	-13.43	
10600.00	Н	Peak	34.36	18.69	53.05	74.00	-20.95	

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Operation Band Fundamental Frequency Operation Mode

EUT Pol.

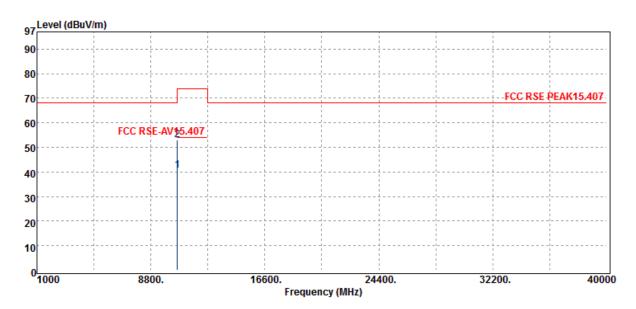
:802.11 n20M :5300 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
10600.00	Н	Average	21.82	18.69	40.51	54.00	-13.49	
10600.00	Н	Peak	34.50	18.69	53.19	74.00	-20.81	

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Operation Band Fundamental Frequency Operation Mode

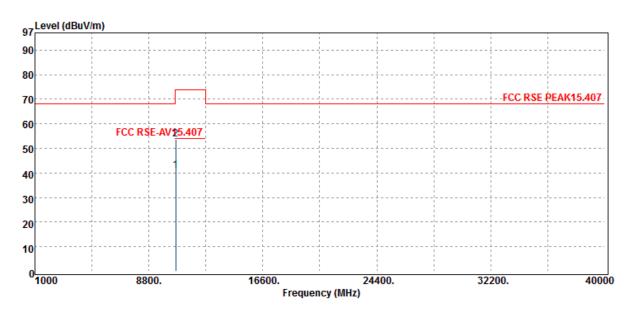
EUT Pol.

:802.11 n20M :5320 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{dB}\mu\mathrm{V}$	dB	dBμV/m	dBμV/m	dB
10640.00	Н	Average	21.88	19.02	40.90	54.00	-13.10
10640.00	Н	Peak	34.64	19.02	53.66	74.00	-20.34

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

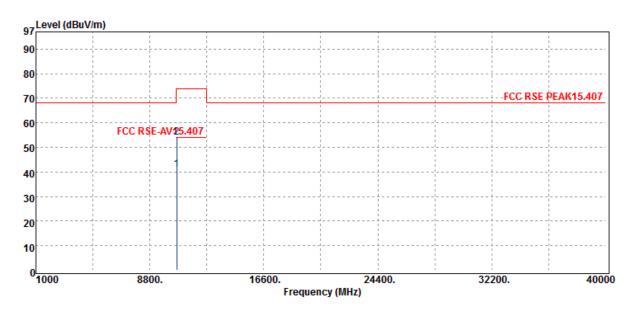
:802.11 n20M :5320 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
10640.00	Н	Average	21.96	19.02	40.98	54.00	-13.02	
10640.00	Н	Peak	34.92	19.02	53.94	74.00	-20.06	

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Band edge falling to restricted band

Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency :5320 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5350.00	E	Average	30.11	10.97	41.08	54.00	-12.92
5350.00	E	Peak	42.53	10.97	53.50	74.00	-20.50

Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency :5320 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
5350.00	E	Average	30.86	10.97	41.83	54.00	-12.17
5350.00	E	Peak	44.09	10.97	55.06	74.00	-18.94

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台灣檢驗科技股份有限公司

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f (886-2) 2298-0488



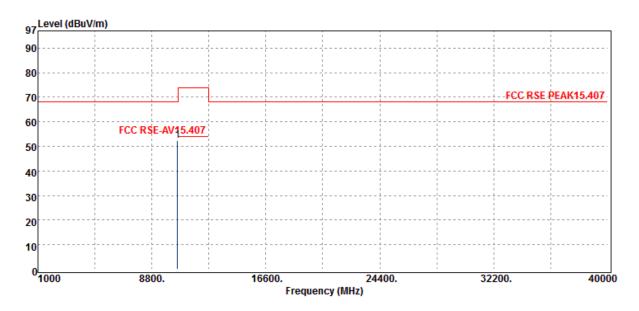
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5250~5350 MHz

Operation Band :802.11 n40M Test Date :2015-05-26 Fundamental Frequency :5270 MHz Temp./Humi. :23deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
10540.00	Н	Peak	33.98	18.45	52.43	68.30	-15.87	

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

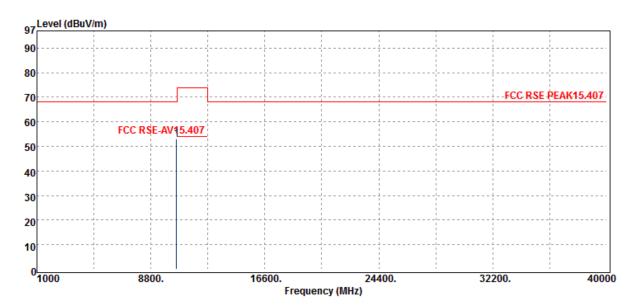
:802.11 n40M :5270 MHz :TX LOW :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
10540.00	Н	Peak	34.44	18.45	52.89	68.30	-15.41	

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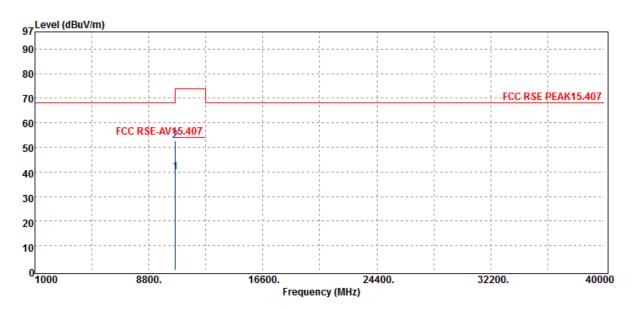
Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 n40M :5310 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
10620.00	Н	Average	21.09	18.86	39.95	54.00	-14.05	
10620.00	Н	Peak	33.95	18.86	52.81	74.00	-21.19	

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

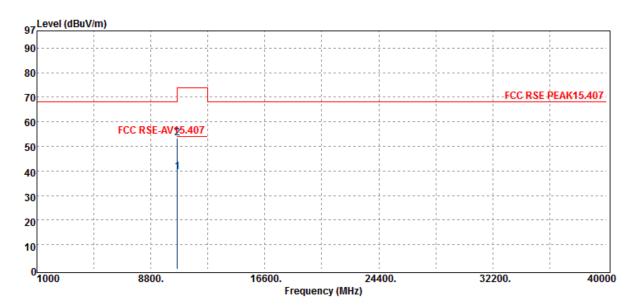
:802.11 n40M :5310 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
10620.00	Н	Average	20.65	18.86	39.51	54.00	-14.49	
10620.00	Н	Peak	34.50	18.86	53.36	74.00	-20.64	

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Band edge falling to restricted band

Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5310 MHz Temp./Humi. :23deg_C / 58 RH Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5350.00	E	Average	30.23	10.97	41.20	54.00	-12.80
5350.00	E	Peak	45.52	10.97	56.49	74.00	-17.51

Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5310 MHz Temp./Humi. :23deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
5350.00	E	Average	37.23	10.97	48.20	54.00	-5.80
5350.00	E	Peak	54.13	10.97	65.10	74.00	-8.90

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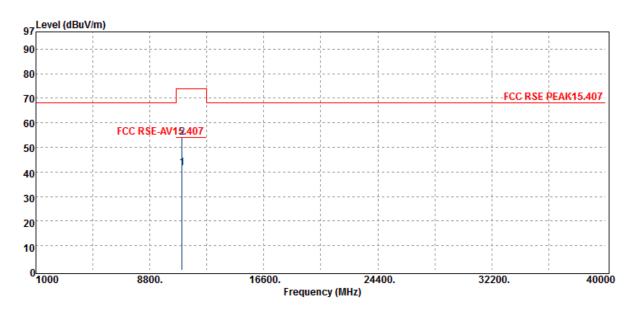
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Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

Operation Band :802.11 a Test Date :2015-05-26 Fundamental Frequency :5500 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry

:VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	$dB\mu V/m$	dB
11000.00	Н	Average	21.76	19.82	41.58	54.00	-12.42
11000.00	Н	Peak	34.18	19.82	54.00	74.00	-20.00

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Operation Band Fundamental Frequency Operation Mode

EUT Pol.

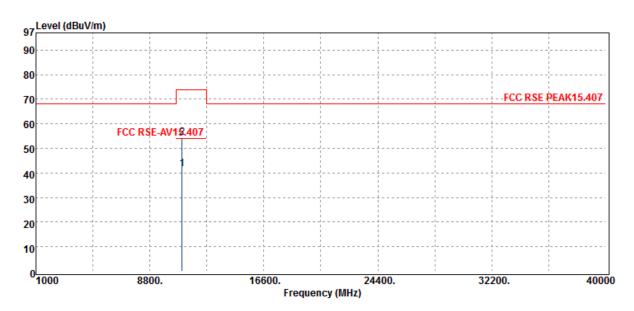
:802.11 a :5500 MHz :TX LOW :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
11000.00	Н	Average	21.75	19.82	41.57	54.00	-12.43	
11000.00	Н	Peak	34.50	19.82	54.32	74.00	-19.68	
		C						

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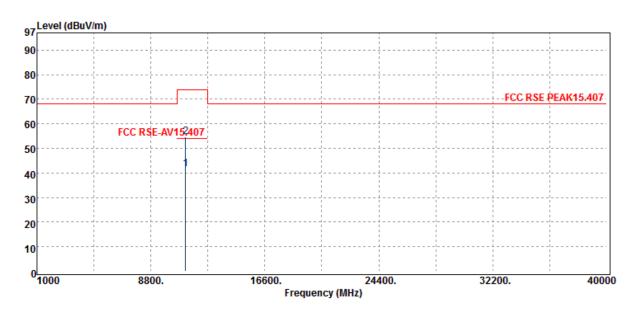
Operation Band Fundamental Frequency

Operation Mode EUT Pol.

:802.11 a :5580 MHz :TX MID :E1 Plan

Test Date Temp./Humi. :2015-05-26 :23 deg_C / 58 RH

Engineer :Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
11160.00	Н	Average	21.40	20.21	41.61	54.00	-12.39	
11160.00	Н	Peak	34.55	20.21	54.76	74.00	-19.24	

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Operation Band Fundamental Frequency

Operation Mode EUT Pol.

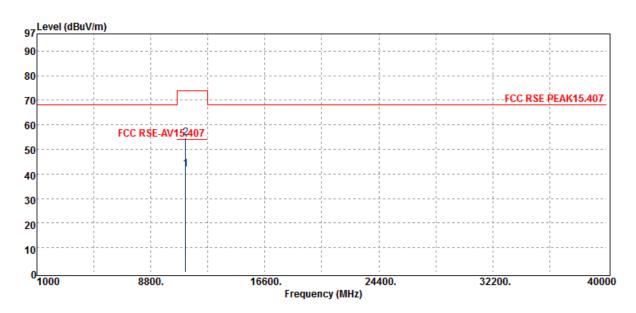
:802.11 a :5580 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



q.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
Iz F	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
0.00	Н	Average	21.78	20.21	41.99	54.00	-12.01
0.00	Н	Peak	34.46	20.21	54.67	74.00	-19.33
	q. Hz F 0.00 0.00	Hz F/H/E/S 0.00 H	Mode Hz F/H/E/S PK/QP/AV 0.00 H Average	Mode Reading Level Hz F/H/E/S PK/QP/AV dBμV 0.00 H Average 21.78	Mode Reading Level Hz F/H/E/S PK/QP/AV dBμV dB 0.00 H Average 21.78 20.21	Mode Reading Level FS Hz F/H/E/S PK/QP/AV dBμV dB dBμV/m 0.00 H Average 21.78 20.21 41.99	Mode Reading Level FS @3m Hz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m 0.00 H Average 21.78 20.21 41.99 54.00

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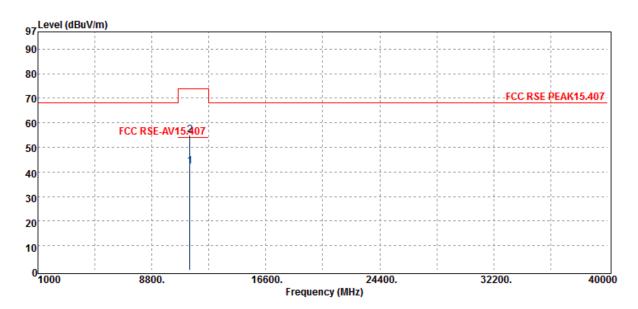
Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 a :5700 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
11400.00	Н	Average	21.59	20.65	42.24	54.00	-11.76
11400.00	Н	Peak	34.36	20.65	55.01	74.00	-18.99

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Operation Band Fundamental Frequency Operation Mode

EUT Pol.

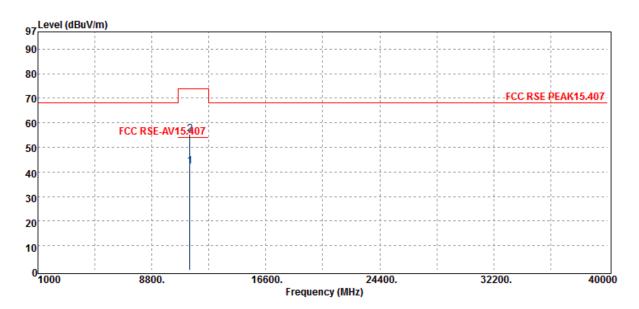
:802.11 a :5700 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
11400.00	Н	Average	21.67	20.65	42.32	54.00	-11.68	
11400.00	Н	Peak	34.67	20.65	55.32	74.00	-18.68	

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Band edge falling to restricted band

Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5500 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry

:VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.

Note	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
E	Average	29.92	10.89	40.81	54.00	-13.19
E	Peak	43.16	10.89	54.05	74.00	-19.95
E	Peak	43.38	10.91	54.29	68.30	-14.01
	F/H/E/S E E	Mode F/H/E/S PK/QP/AV E Average E Peak	Mode Reading Level F/H/E/S PK/QP/AV dBμV E Average 29.92 E Peak 43.16	Hode Reading Level F/H/E/S PK/QP/AV dBμV dB E Average 29.92 10.89 E Peak 43.16 10.89	Mode Reading Level FS F/H/E/S PK/QP/AV dBμV dB dBμV/m E Average 29.92 10.89 40.81 E Peak 43.16 10.89 54.05	Mode Reading Level FS @3m F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m E Average 29.92 10.89 40.81 54.00 E Peak 43.16 10.89 54.05 74.00

Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5500 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5460.00	E	Average	29.95	10.89	40.84	54.00	-13.16
5460.00	E	Peak	43.74	10.89	54.63	74.00	-19.37
5470.00	E	Peak	43.26	10.91	54.17	68.30	-14.13

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Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5700 MHz Temp./Humi. :23 deg C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Spectrum Note Factor Actual Limit Margin Freq. Detector FS Mode Reading Level @3m F/H/E/S PK/QP/AV $dB\mu V$ dΒ dBµV/m $dB\mu V/m$ dB MHz 5725.00 Е 44.19 11.04 55.23 68.30 -13.07 Peak

Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5700 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5725.00	E	Peak	43.97	11.04	55.01	68.30	-13.29

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Report No.: ER/2015/40162 **Issue Date: Jun. 10, 2015**

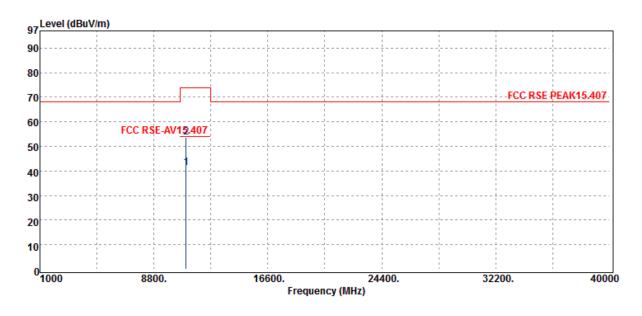
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz

Operation Band :802.11 n20M **Test Date** :2015-05-26

Fundamental Frequency :5500 MHz Temp./Humi. :23 deg_C / 58 RH Engineer Operation Mode :TX LOW :Curry

:VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
11000.00	Н	Average	21.51	19.82	41.33	54.00	-12.67
11000.00	Н	Peak	33.87	19.82	53.69	74.00	-20.31

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

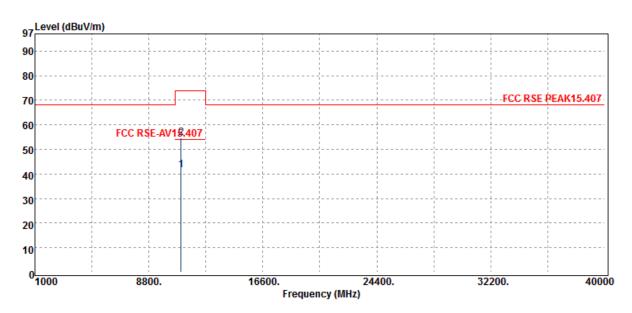
:802.11 n20M :5500 MHz :TX LOW :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
11000.00	Н	Average	21.71	19.82	41.53	54.00	-12.47	
11000.00	Н	Peak	34.76	19.82	54.58	74.00	-19.42	

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Operation Band Fundamental Frequency Operation Mode

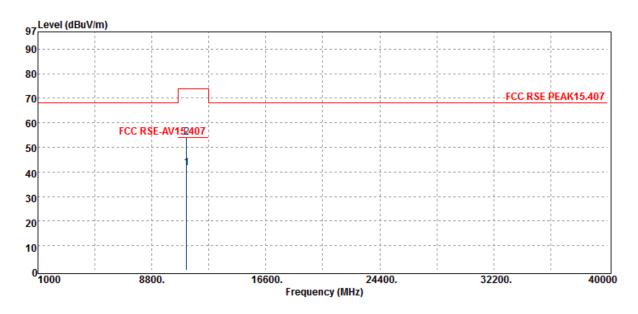
EUT Pol.

:802.11 n20M :5580 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} { m B} \mu { m V}$	dB	$dB\mu V/m$	dBμV/m	dB
11160.00	Н	Average	21.47	20.21	41.68	54.00	-12.32
11160.00	Н	Peak	33.79	20.21	54.00	74.00	-20.00

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Operation Band Fundamental Frequency

Operation Mode EUT Pol.

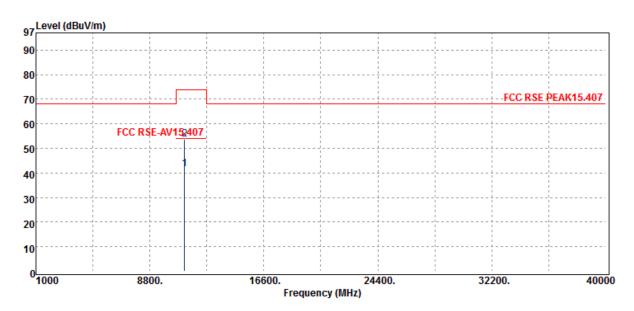
:802.11 n20M :5580 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
11160.00	Н	Average	21.49	20.21	41.70	54.00	-12.30	
11160.00	Н	Peak	33.57	20.21	53.78	74.00	-20.22	

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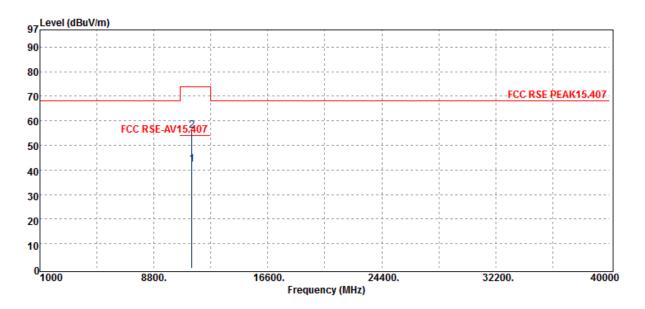
Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 n20M :5700 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
11400.00	Н	Average	21.62	20.65	42.27	54.00	-11.73	
11400.00	Н	Peak	35.35	20.65	56.00	74.00	-18.00	

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Operation Band Fundamental Frequency Operation Mode

EUT Pol.

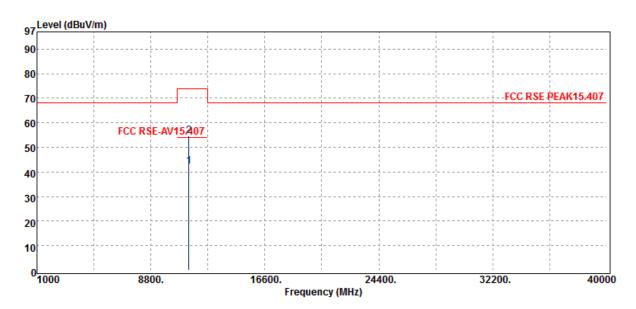
:802.11 n20M :5700 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
11400.00	Н	Average	21.79	20.65	42.44	54.00	-11.56	
11400.00	Н	Peak	33.95	20.65	54.60	74.00	-19.40	

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Band edge falling to restricted band

Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency :5500 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	29.95	10.89	40.84	54.00	-13.16
5460.00	E	Peak	42.76	10.89	53.65	74.00	-20.35
5470.00	E	Peak	42.81	10.91	53.72	68.30	-14.58

:2015-05-26 Operation Band :802.11 n20M Test Date

Fundamental Frequency :5500 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	31.12	10.89	42.01	54.00	-11.99
5460.00	E	Peak	43.13	10.89	54.02	74.00	-19.98
5470.00	E	Peak	44.19	10.91	55.10	68.30	-13.20

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Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency :5700 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d}\mathrm{B}\mu\mathrm{V}$	dB	dBμV/m	dBμV/m	dB
5725.00	Е	Peak	43.04	11.04	54.08	68.30	-14.22

Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency Temp./Humi. :5700 MHz :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5725.00	Е	Peak	43.89	11.04	54.93	68.30	-13.37

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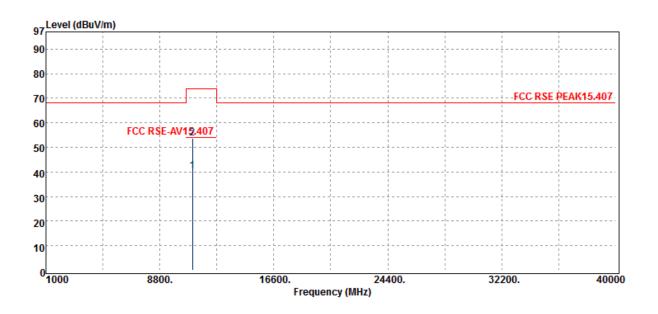


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Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz

Operation Band :802.11 n40M **Test Date** :2015-05-26 Fundamental Frequency :5510 MHz Temp./Humi. :23deg_C / 58 RH Operation Mode Engineer :TX LOW :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	$dB\mu V/m$	dBμV/m	dB	
11020.00	Н	Average	20.50	19.81	40.31	54.00	-13.69	
11020.00	Н	Peak	33.90	19.81	53.71	74.00	-20.29	

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

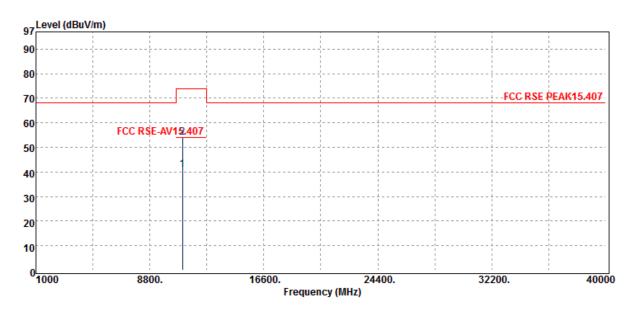
:802.11 n40M :5510 MHz :TX LOW :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



dB
-13.02
-20.01
•

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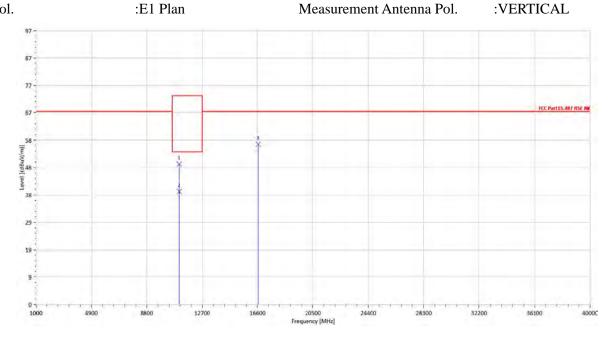
Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 n40M :5550 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23deg_C / 58 RH

:Curry :VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{dB}\mu\mathrm{V}$	dB	dBμV/m	dBμV/m	dB
11100.00	Н	Average	20.77	20.23	41.00	54.00	-13.00
11100.00	Н	Peak	34.64	20.23	54.87	74.00	-19.13

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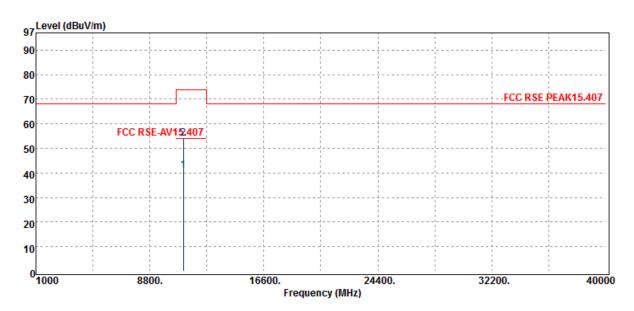
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Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 n40M :5550 MHz :TX MID :E1 Plan

Test Date :2015-05-26 Temp./Humi. :23deg_C / 58 RH Engineer :Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
11100.00	Н	Average	20.79	20.23	41.02	54.00	-12.98	
11100.00	Н	Peak	33.75	20.23	53.98	74.00	-20.02	

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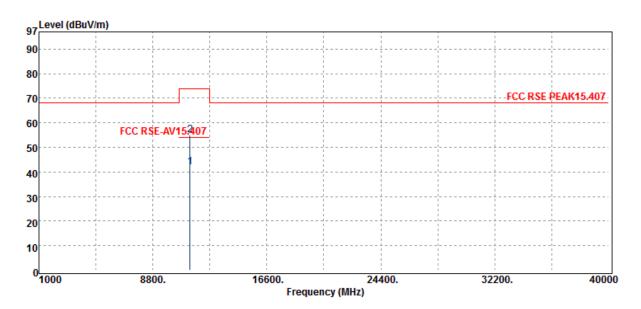
Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 n40M :5670 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
11340.00	Н	Average	21.23	20.64	41.87	54.00	-12.13	
11340.00	Н	Peak	34.51	20.64	55.15	74.00	-18.85	

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

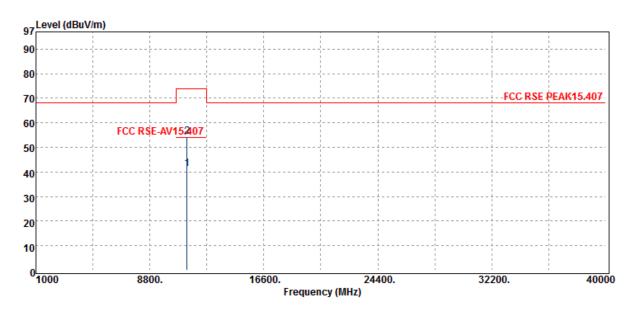
:802.11 n40M :5670 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
11340.00	Н	Average	20.77	20.64	41.41	54.00	-12.59	
11340.00	Н	Peak	33.76	20.64	54.40	74.00	-19.60	

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Band edge falling to restricted band

Operation Band :802.11 n40M Test Date :2015-05-26 Fundamental Frequency :5510 MHz Temp./Humi. :23deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	30.23	10.89	41.12	54.00	-12.88
5460.00	E	Peak	42.54	10.89	53.43	74.00	-20.57

Test Date Operation Band :802.11 n40M :2015-05-26 Fundamental Frequency :5510 MHz Temp./Humi. :23deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry

EUT Pol. :HORIZONTAL :E1 Plan Measurement Antenna Pol.

Actual $FS(dB\mu V/m) = SPA$. Reading level $(dB\mu V) + Factor(dB)$

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$

"F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency. Note:

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	30.10	10.89	40.99	54.00	-13.01
5460.00	E	Peak	42.30	10.89	53.19	74.00	-20.81

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Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5510 MHz Temp./Humi. :23deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5470.00	Е	Peak	46.63	10.91	57.54	68.30	-10.76

Operation Band :802.11 n40M Test Date :2015-05-26 Fundamental Frequency :5510 MHz Temp./Humi. :23deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry

EUT Pol. Measurement Antenna Pol. :HORIZONTAL :E1 Plan

Actual $FS(dB\mu V/m) = SPA$. Reading level $(dB\mu V) + Factor(dB)$

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$

"F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency. Note:

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5470.00	Е	Peak	45.92	10.91	56.83	68.30	-11.47

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Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5670 MHz Temp./Humi. :23deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBµV/m	dBμV/m	dB
5725.00	E	Peak	43.65	11.04	54.69	68.30	-13.61

Operation Band :802.11 n40M Test Date :2015-05-26 **Fundamental Frequency** Temp./Humi. :5670 MHz :23deg_C / 58 RH

:Curry Operation Mode :Band Edge HIGH Engineer

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5725.00	Е	Peak	43.48	11.04	54.52	68.30	-13.78

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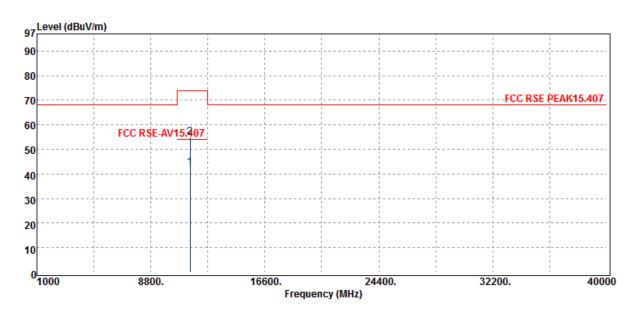
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Radiated Spurious Emission Measurement Result 802.11a, 5725~5850 MHz

Operation Band Test Date :802.11 a :2015-05-26

Fundamental Frequency :5745 MHz Temp./Humi. :23 deg_C / 58 RH Operation Mode :TX LOW

Engineer :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
			Mode	Reading Level		FS	@3m	
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
1	1490.00	Н	Average	21.88	20.81	42.69	54.00	-11.31
1	1490.00	Н	Peak	34.39	20.81	55.20	74.00	-18.80

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Operation Band Fundamental Frequency Operation Mode

EUT Pol.

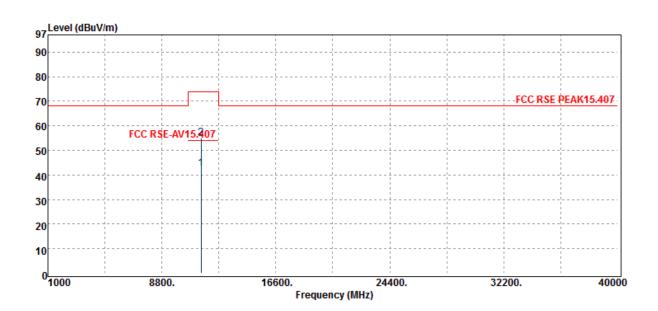
:802.11 a :5745 MHz :TX LOW :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
11490.00	Н	Average	21.78	20.81	42.59	54.00	-11.41	
11490.00	Н	Peak	34.38	20.81	55.19	74.00	-18.81	

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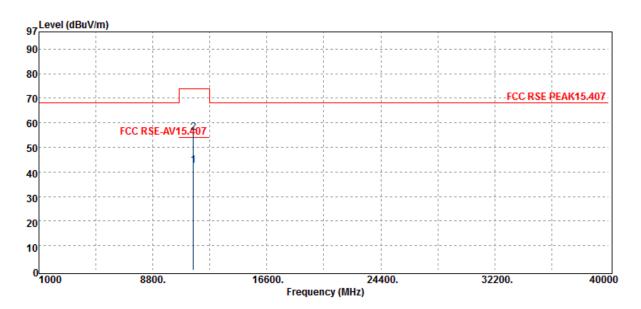
Operation Band Fundamental Frequency

Operation Mode EUT Pol.

:802.11 a :5785 MHz :TX MID :E1 Plan

Test Date Temp./Humi. :2015-05-26 :23 deg_C / 58 RH

Engineer :Curry :VERTICAL Measurement Antenna Pol.



ą. No	te Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Leve	el	FS	@3m		
z F/H/	E/S PK/QP/A	V dBµV	dB	dBμV/m	dBμV/m	dB	
0.00 H	I Average	21.59	21.16	42.75	54.00	-11.25	
0.00 H	I Peak	34.96	21.16	56.12	74.00	-17.88	
	iz F/H/ 0.00 H	Mode Iz F/H/E/S PK/QP/A 0.00 H Average	Mode Reading Lev Iz F/H/E/S PK/QP/AV dBμV 0.00 H Average 21.59	Mode Reading Level Iz F/H/E/S PK/QP/AV dBμV dB 0.00 H Average 21.59 21.16	Mode Reading Level FS Δz F/H/E/S PK/QP/AV dBμV dB dBμV/m 0.00 H Average 21.59 21.16 42.75	Mode Reading Level FS @3m Iz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m 0.00 H Average 21.59 21.16 42.75 54.00	Mode Reading Level FS @3m Iz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m dB 0.00 H Average 21.59 21.16 42.75 54.00 -11.25

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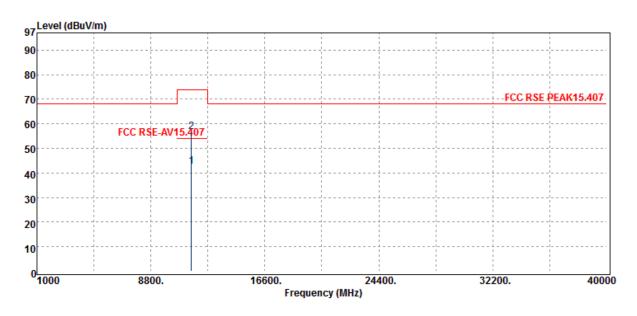
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Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency Temp./Humi. :5785 MHz :23 deg_C / 58 RH Operation Mode :TX MID Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL



Fr	eq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
			Mode	Reading Level		FS	@3m	
M	Hz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
1157	0.00	Н	Average	21.55	21.16	42.71	54.00	-11.29
1157	0.00	Н	Peak	35.43	21.16	56.59	74.00	-17.41

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Operation Band Fundamental Frequency

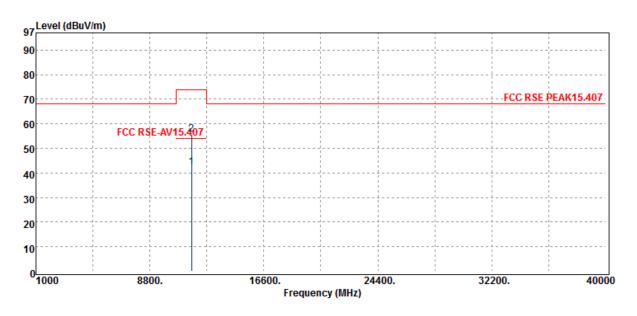
Operation Mode EUT Pol.

:802.11 a :5825 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	$dB\mu V/m$	dBμV/m	dB
11650.00	Н	Average	21.30	20.93	42.23	54.00	-11.77
11650.00	Н	Peak	34.71	20.93	55.64	74.00	-18.36

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Operation Band Fundamental Frequency Operation Mode

EUT Pol.

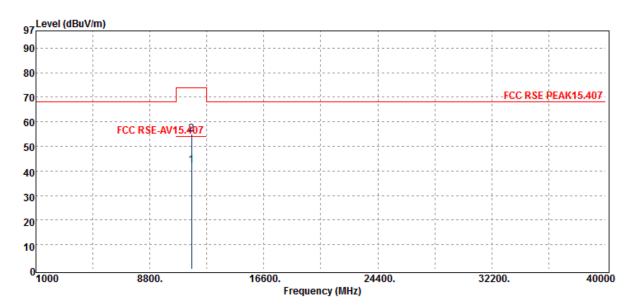
:802.11 a :5825 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



eq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
Hz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
50.00	Н	Average	21.39	20.93	42.32	54.00	-11.68
50.00	Н	Peak	34.13	20.93	55.06	74.00	-18.94
	1Hz 50.00 50.00	1Hz F/H/E/S 50.00 H	Mode Hz F/H/E/S PK/QP/AV 50.00 H Average	Mode Reading Level Hz F/H/E/S PK/QP/AV dBμV 50.00 H Average 21.39	Mode Reading Level Hz F/H/E/S PK/QP/AV dBμV dB 50.00 H Average 21.39 20.93	Mode Reading Level FS Hz F/H/E/S PK/QP/AV dBμV dB dBμV/m 50.00 H Average 21.39 20.93 42.32	Mode Reading Level FS @3m IHz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m 50.00 H Average 21.39 20.93 42.32 54.00

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Band edge falling to restricted band

Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5745 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Peak	44.31	11.04	55.35	78.20	-22.85

Operation Band Test Date :2015-05-26 :802.11 a

Fundamental Frequency Temp./Humi. :5745 MHz :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} \mathrm{B} \mu \mathrm{V}$	dB	dBμV/m	dBμV/m	dB
5725.00	Е	Peak	50.77	11.04	61.81	78.20	-16.39

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Operation Band :802.11 a Test Date :2015-05-26

Fundamental Frequency :5825 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	43.41	11.50	54.91	78.20	-23.29

Operation Band Test Date :2015-05-26 :802.11 a

Fundamental Frequency Temp./Humi. :5825 MHz :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	43.76	11.50	55.26	78.20	-22.94

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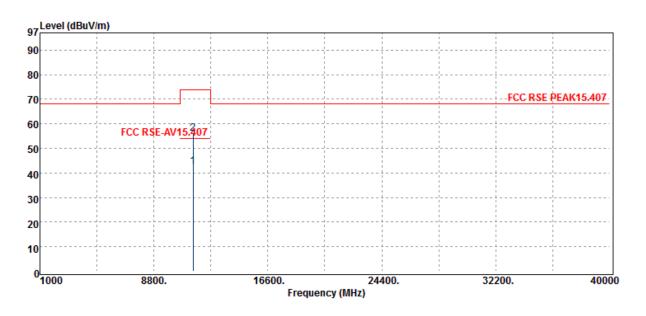
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5725~5850 MHz

Operation Band :802.11 n20M Test Date :2015-05-26 Fundamental Frequency :5745 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :TX LOW Engineer :Curry :VERTICAL EUT Pol. :E1 Plan Measurement Antenna Pol.



Fre	q.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
			Mode	Reading Level		FS	@3m	
MF	łz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11490	0.00	Н	Average	21.79	20.81	42.60	54.00	-11.40
11490	0.00	Н	Peak	35.27	20.81	56.08	74.00	-17.92

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

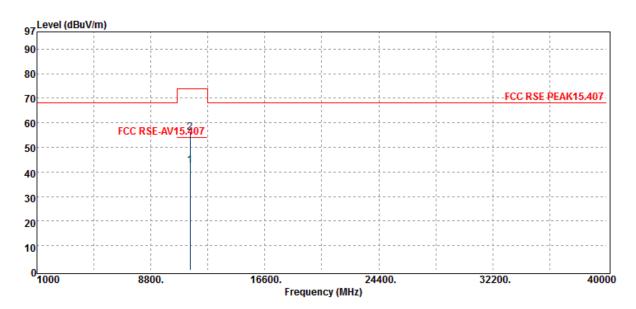
:802.11 n20M :5745 MHz :TX LOW :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

Measurement Antenna Pol. :HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
11490.00	Н	Average	21.78	20.81	42.59	54.00	-11.41	
11490.00	Н	Peak	35.16	20.81	55.97	74.00	-18.03	
	MHz 11490.00	MHz F/H/E/S 11490.00 H	Mode MHz F/H/E/S PK/QP/AV 11490.00 H Average	MHz F/H/E/S PK/QP/AV dBμV 11490.00 H Average 21.78	MHz F/H/E/S PK/QP/AV dBμV dB 11490.00 H Average 21.78 20.81	MHz Mode F/H/E/S Reading Level PK/QP/AV FS dBμV FS dBμV/m 11490.00 H Average 21.78 20.81 42.59	Mode MHz Reading Level PK/QP/AV FS @3m MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m 11490.00 H Average 21.78 20.81 42.59 54.00	Mode MHz Reading Level FS @ 3m MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m dB 11490.00 H Average 21.78 20.81 42.59 54.00 -11.41

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Operation Band Fundamental Frequency Operation Mode

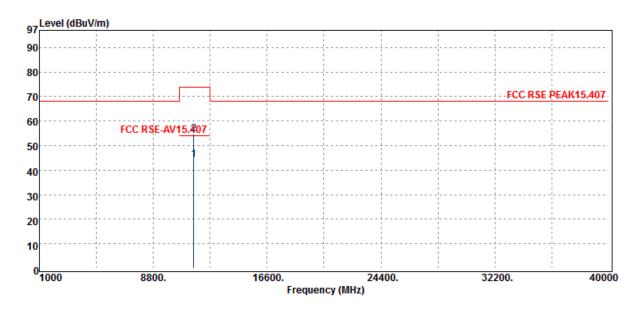
EUT Pol.

:802.11 n20M :5785 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



q.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
Z	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBµV/m	dB	
0.00	Н	Average	21.55	21.16	42.71	54.00	-11.29	
0.00	Н	Peak	35.13	21.16	56.29	74.00	-17.71	
1	q. Hz 0.00 0.00	Iz F/H/E/S 0.00 H	Mode Iz F/H/E/S PK/QP/AV 0.00 H Average	Mode Reading Level Iz F/H/E/S PK/QP/AV dBμV 0.00 H Average 21.55	Mode Reading Level Iz F/H/E/S PK/QP/AV dBμV dB 0.00 H Average 21.55 21.16	Mode Reading Level FS Az F/H/E/S PK/QP/AV $dB\mu V$ dB $dB\mu V/m$ 0.00 H Average 21.55 21.16 42.71	Mode Reading Level FS @3m Iz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m O.00 H Average 21.55 21.16 42.71 54.00	Mode Reading Level FS @3m Hz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m dB 0.00 H Average 21.55 21.16 42.71 54.00 -11.29

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Operation Band Fundamental Frequency

Operation Mode EUT Pol.

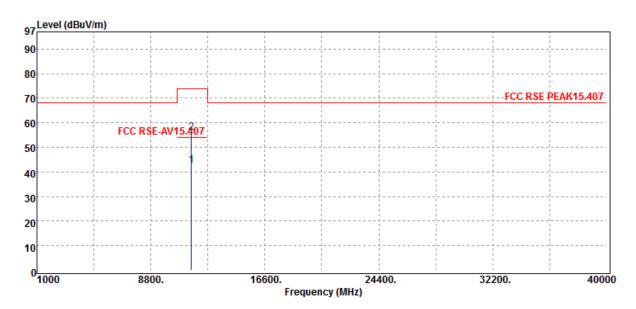
:802.11 n20M :5785 MHz :TX MID :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
1570.00	Н	Average	21.57	21.16	42.73	54.00	-11.27
1570.00	Н	Peak	34.80	21.16	55.96	74.00	-18.04
1	•	MHz F/H/E/S 1570.00 H	Mode MHz F/H/E/S PK/QP/AV 1570.00 H Average	Mode Reading Level MHz F/H/E/S PK/QP/AV dBμV 1570.00 H Average 21.57	Mode Reading Level MHz F/H/E/S PK/QP/AV dBμV dB 1570.00 H Average 21.57 21.16	Mode Reading Level FS MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m 1570.00 H Average 21.57 21.16 42.73	Mode Reading Level FS @3m MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m 1570.00 H Average 21.57 21.16 42.73 54.00

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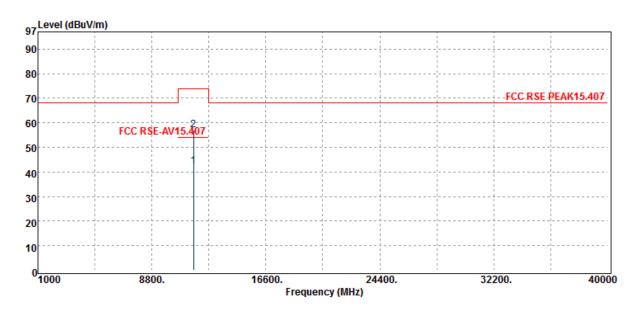
Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 n20M :5825 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
650.00	Н	Average	21.29	20.93	42.22	54.00	-11.78	
650.00	Н	Peak	36.22	20.93	57.15	74.00	-16.85	
	MHz 650.00	MHz F/H/E/S 650.00 H	Mode MHz F/H/E/S PK/QP/AV 650.00 H Average	Mode Reading Level MHz F/H/E/S PK/QP/AV dBμV 650.00 H Average 21.29	Mode Reading Level MHz F/H/E/S PK/QP/AV dBμV dB 650.00 H Average 21.29 20.93	Mode Reading Level FS MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m 650.00 H Average 21.29 20.93 42.22	Mode MHz Reading Level FS @3m MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m 650.00 H Average 21.29 20.93 42.22 54.00	Mode Reading Level FS @3m MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m dB 650.00 H Average 21.29 20.93 42.22 54.00 -11.78

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Operation Band Fundamental Frequency Operation Mode

EUT Pol.

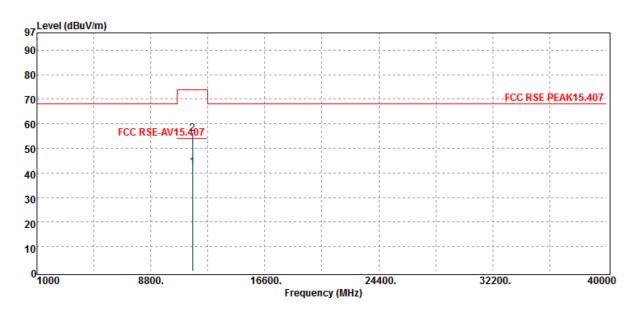
:802.11 n20M :5825 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23 deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
650.00	Н	Average	21.38	20.93	42.31	54.00	-11.69	
650.00	Н	Peak	35.27	20.93	56.20	74.00	-17.80	
	Freq. MHz 650.00 650.00	MHz F/H/E/S 650.00 H	Mode MHz F/H/E/S PK/QP/AV 650.00 H Average	Mode Reading Level MHz F/H/E/S PK/QP/AV dBμV 650.00 H Average 21.38	Mode Reading Level MHz F/H/E/S PK/QP/AV dBμV dB 650.00 H Average 21.38 20.93	Mode Reading Level FS MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m 650.00 H Average 21.38 20.93 42.31	Mode MHz Reading Level FS @3m MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m 650.00 H Average 21.38 20.93 42.31 54.00	Mode Reading Level FS @3m MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m dB 650.00 H Average 21.38 20.93 42.31 54.00 -11.69

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Band edge falling to restricted band

Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency :5745 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Note Spectrum Factor Actual Limit Margin Freq. Detector FS Mode Reading Level @3m dBμV dBµV/m dBµV/m MHz F/H/E/S PK/QP/AV dB dB E 43.58 78.20 5725.00 Peak 11.04 54.62 -23.58

Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency :5745 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge LOW Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{dB}\mu\mathrm{V}$	dB	dBμV/m	dBμV/m	dB
5725.00	Е	Peak	52.84	11.04	63.88	78.20	-14.32

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Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency :5825 MHz Temp./Humi. :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Note Detector Spectrum Factor Actual Limit Margin Freq. FS Mode Reading Level @3m dBμV dBµV/m dBµV/m MHz F/H/E/S PK/QP/AV dB dB E 43.75 11.50 55.25 78.20 -22.95 5850.00 Peak

Operation Band :802.11 n20M Test Date :2015-05-26

Fundamental Frequency Temp./Humi. :5825 MHz :23 deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5850.00	Е	Peak	44.49	11.50	55.99	78.20	-22.21

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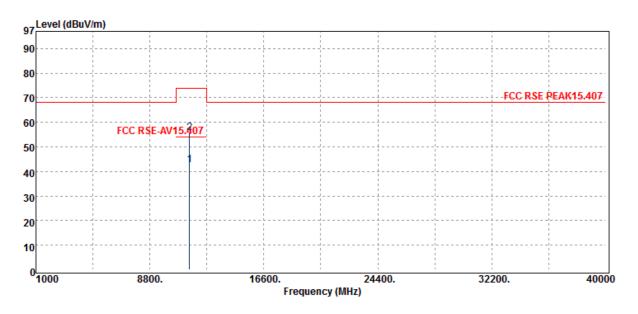
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5725~5850 MHz

Operation Band :802.11 n40M Test Date :2015-05-26 Fundamental Frequency :5755 MHz Temp./Humi. :23deg_C / 58 RH

Engineer Operation Mode :TX LOW :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
11510.00	Н	Average	21.47	21.03	42.50	54.00	-11.50
11510.00	Н	Peak	34.63	21.03	55.66	74.00	-18.34

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

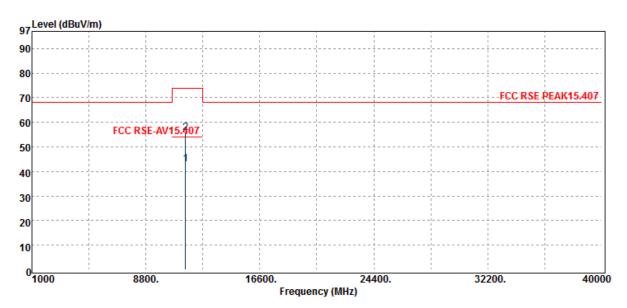
:802.11 n40M :5755 MHz :TX LOW :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBµV/m	dB	
11510.00	Н	Average	21.88	21.03	42.91	54.00	-11.09	
11510.00	Н	Peak	34.72	21.03	55.75	74.00	-18.25	
		C						

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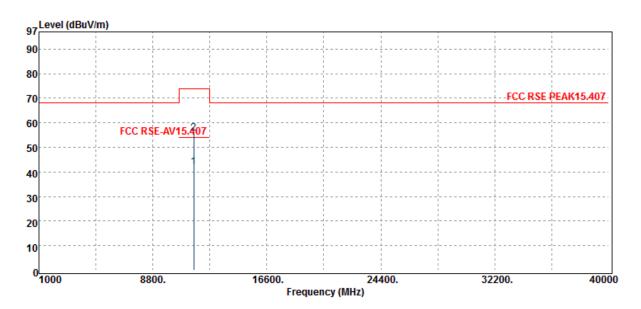
Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 n40M :5795 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23deg_C / 58 RH

:Curry :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
11590.00	Н	Average	20.92	21.11	42.03	54.00	-11.97	
11590.00	Н	Peak	34.58	21.11	55.69	74.00	-18.31	
	MHz 11590.00	MHz F/H/E/S 11590.00 H	Mode MHz F/H/E/S PK/QP/AV 11590.00 H Average	Mode Reading Level MHz F/H/E/S PK/QP/AV dBμV 11590.00 H Average 20.92	Mode Reading Level MHz F/H/E/S PK/QP/AV dBμV dB 11590.00 H Average 20.92 21.11	Mode Mode Meading Level FS dBμV MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m 11590.00 H Average 20.92 21.11 42.03	Mode MHz Reading Level FS @ 3m MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m 11590.00 H Average 20.92 21.11 42.03 54.00	Mode Mode Meading Level FS @3m MHz F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m dBμV/m dB 11590.00 H Average 20.92 21.11 42.03 54.00 -11.97

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Operation Band Fundamental Frequency Operation Mode EUT Pol.

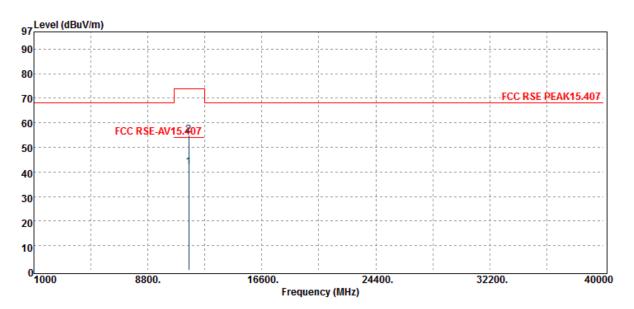
:802.11 n40M :5795 MHz :TX HIGH :E1 Plan

Test Date Temp./Humi. Engineer

:2015-05-26 :23deg_C / 58 RH

:Curry

:HORIZONTAL Measurement Antenna Pol.



	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
	MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
]	11590.00	Н	Average	20.96	21.11	42.07	54.00	-11.93	
1	11590.00	Н	Peak	33.88	21.11	54.99	74.00	-19.01	

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Band edge falling to restricted band

Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5755 MHz Temp./Humi. :23deg_C / 58 RH Operation Mode :Band Edge LOW Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{dB}\mu\mathrm{V}$	dB	dBμV/m	dBμV/m	dB
5725 00	E	Peak	48.24	11 04	59 28	78 20	-18 92

Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5755 MHz Temp./Humi. :23deg_C / 58 RH

:Curry Operation Mode :Band Edge LOW Engineer

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{dB}\mu\mathrm{V}$	dB	dBμV/m	dBμV/m	dB
5725.00	E	Peak	59.43	11.04	70.47	78.20	-7.73

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Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5795 MHz Temp./Humi. :23deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry EUT Pol. :E1 Plan Measurement Antenna Pol. :VERTICAL

Spectrum Actual Limit Margin Freq. Note Detector Factor FS Reading Level @3m Mode dBμV dBµV/m dBµV/m MHz F/H/E/S PK/QP/AV dB dB E 44.09 11.50 55.59 78.20 -22.61 5850.00 Peak

Operation Band :802.11 n40M Test Date :2015-05-26

Fundamental Frequency :5795 MHz Temp./Humi. :23deg_C / 58 RH

Operation Mode :Band Edge HIGH Engineer :Curry

EUT Pol. :E1 Plan Measurement Antenna Pol. :HORIZONTAL

-							
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	46.44	11.50	57.94	78.20	-20.26

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TRANSMISSION IN THE ABSENCE OF DATA

Standard Applicable 12.1

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

12.2 Result

No non-compliance noted:

Refer to the theory of operation.

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13. FREQUENCY STABILITY

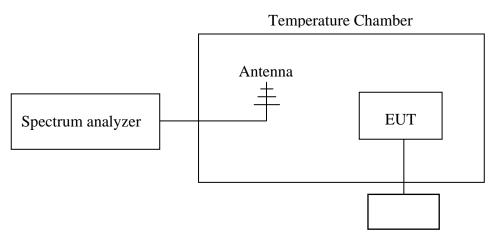
Standard Applicable

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

13.2 Measurement Procedure

- 1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
- 2. Set EUT as normal operation.
- 3. Turn the EUT on and couple its output to spectrum.
- 4. Turn the EUT off and set the chamber to the highest temperature specified.
- 5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
- 6. Repeat step with the temperature chamber set to the lowest temperature.

Test SET-UP 13.3



Variable AC Power Supply

Measurement Equipment Used 13.4

Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
TYPE	IVIFK	NUMBER	NUMBER	CAL.	CAL DUE.			
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2015	01/28/2016			
Temperature Chamber	TERCHY	MHG-120LF	911009	05/06/2015	05/05/2016			
AC Power Supply	APW-105N	887592	All Power	N/A	N/A			

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Measurement Result 13.5

Operation Mode	TX	Test Date	2015.5.19
Temperature	25	Test By	Cooper
Humidity	62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		36	5180.0000	5,179.999167	0.0008
		44	5220.0000	5,219.999250	0.0008
		48	5240.0000	5,239.999170	0.0008
		52	5260.0000	5,259.999100	0.0009
		60	5300.0000	5,299.999167	0.0008
25	3.8V	64	5320.0000	5,319.999117	0.0009
23	3.6 V	100	5500.0000	5,499.999200	8000.0
		116	5580.0000	5,579.999116	0.0009
		140	5700.0000	5,699.999067	0.0009
		149	5745.0000	5,744.998917	0.0011
		157	5785.0000	5,784.998934	0.0011
		165	5825.0000	5,824.998900	0.0011
		36	5180.0000	5,179.999137	0.0009
		44	5220.0000	5,219.999220	0.0008
		48	5240.0000	5,239.999140	0.0009
		52	5260.0000	5,259.999070	0.0009
		60	5300.0000	5,299.999137	0.0009
		64	5320.0000	5,319.999087	0.0009
-20	3.42V	100	5500.0000	5,499.999170	8000.0
		116	5580.0000	5,579.999086	0.0009
		140	5700.0000	5,699.999037	0.0010
		149	5745.0000	5,744.998887	0.0011
		157	5785.0000	5,784.998904	0.0011
		165	5825.0000	5,824.998870	0.0011

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		36	5180.0000	5,179.999147	0.0009
		44	5220.0000	5,219.999230	0.0008
		48	5240.0000	5,239.999150	0.0009
		52	5260.0000	5,259.999080	0.0009
		60	5300.0000	5,299.999147	0.0009
		64	5320.0000	5,319.999097	0.0009
-20	4.18V	100	5500.0000	5,499.999180	0.0008
		116	5580.0000	5,579.999096	0.0009
		140	5700.0000	5,699.999047	0.0010
		149	5745.0000	5,744.998897	0.0011
		157	5785.0000	5,784.998914	0.0011
		165	5825.0000	5,824.998880	0.0011
		36	5180.0000	5,179.999121	0.0009
		44	5220.0000	5,219.999204	0.0008
		48	5240.0000	5,239.999124	0.0009
		52	5260.0000	5,259.999054	0.0009
		60	5300.0000	5,299.999121	0.0009
60	2 4237	64	5320.0000	5,319.999071	0.0009
60	3.42V	100	5500.0000	5,499.999154	0.0008
		116	5580.0000	5,579.999070	0.0009
		140	5700.0000	5,699.999021	0.0010
		149	5745.0000	5,744.998871	0.0011
		157	5785.0000	5,784.998888	0.0011
		165	5825.0000	5,824.998854	0.0011
		36	5180.0000	5,179.999137	0.0009
		44	5220.0000	5,219.999220	0.0008
		48	5240.0000	5,239.999140	0.0009
		52	5260.0000	5,259.999070	0.0009
		60	5300.0000	5,299.999137	0.0009
60	4 1037	64	5320.0000	5,319.999087	0.0009
	4.18V	100	5500.0000	5,499.999170	0.0008
		116	5580.0000	5,579.999086	0.0009
		140	5700.0000	5,699.999037	0.0010
		149	5745.0000	5,744.998887	0.0011
		157	5785.0000	5,784.998904	0.0011
		165	5825.0000	5,824.998870	0.0011

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14. ANTENNA REQUIREMENT

Standard Applicable

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

According to §15.407, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connected Construction

An embedded-in antenna design is used.

The antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

The antenna gain is less than 6dBi. Therefore, it is not necessary to reduce maximum output power power limit.

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