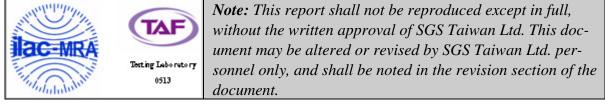


ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT

OF

Product Name:	Vehicle Mount Computer		
Brand Name:	Honeywell		
Marketing Name:	Thor VM3		
Model No.:	VM3WLAN		
Model Difference:	N/A		
FCC ID:	HD5-VM3WLANA		
Report No.:	ER/2015/20010		
Issue Date:	Mar. 10, 2015		
FCC Rule Part:	§15.407		
Prepared for:	Honeywell International Inc.,		
	Honeywell Scanning and Mobility		
	9680 Old Bailes Road, Fort Mill, SC 29707,		
	USA		
Prepared by:	SGS Taiwan Ltd.		
	Electronics & Communication Laboratory		
	No.134, Wu Kung Road, New Taipei Industrial		
	Park, Wuku District, New Taipei City, Taiwan 24803		
	2400		
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FCC ID: HD5-VM3WLANA

Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 2 of 289

VERIFICATION OF COMPLIANCE

Applicant:	Honeywell International Inc.,			
	Honeywell Scanning and Mobility			
	9680 Old Bailes Road, Fort Mill, SC 29707, USA			
Product Name:	Vehicle Mount Computer			
Brand Name:	Honeywell			
Marketing Name:	Thor VM3			
Model No.:	VM3WLAN			
Model Difference:	N/A			
FCC ID:	HD5-VM3WLANA			
File Number:	ER/2015/20010			
Date of test:	Feb. 03, 2014 ~ Mar. 06, 2014			
Date of EUT Received:	Feb. 03, 2014			

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: 2013 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:	Mar. 10, 2015	
	Marcus Tseng / Engineer			-
Prepared By:	Tiffany Kao	Date:	Mar. 10, 2015	
	Tiffany Kao / Clerk			-
Approved By:	Sim Chang	Date:	Mar. 10, 2015	

Jim Chang / Asst. Manager

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Revision History

Report Number	Revision	Description	Issue Date	
ER/2015/20010 Rev.00		Initial creation of document	Mar. 10, 2015	



FCC ID: HD5-VM3WLANA

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GENERAL INFORMATION 1.

1.1 **Product Description**

General:

Product Name:	Vehicle Mount Computer				
Brand Name:	Honeywel	Honeywell			
Marketing Name:	Thor VM3	3			
Mpdel No.:	VM3WLA	AN			
Model Difference:	N/A				
Product SW/HW version:	(a)Win7: 99.01.00.0002 (b)Win8: 99.01.00.0004 / ALXH48				
Radio SW/HW version:	10.0.27450 / V.1				
Test SW Version:	10.0.0 27450				
	7.3Vdc fr Adapter	om Rechargeable Li-ion Battery or 15V from AC/DC			
Power Supply:	Battery:	Model No.: L3-52301624-R / OVT270L1R00 / 50121692-001, Supplier: TOTEX			
	Adapter : Model No.: GT-81081-6015-T3, Supplier: GlobTel Inc.				



WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.)	Modulation Technology	
	5150~5250	4	15.14dBm		
11.	5250~5350	4	14.60dBm	OEDM	
11a	5470~5725	8	15.32Bm	OFDM	
	5725-5850	5	14.04dBm		
	HT20 5150~5250	4	(MIMO Chain 0): 10.57dBm (MIMO Chain 1): 10.44dBm (MIMO Chain 0+1): 13.52dBm		
11	HT20 5250~5350	4	(MIMO Chain 0): 13.57dBm (MIMO Chain 1): 13.54dBm (MIMO Chain 0+1): 16.57dBm	OEDM	
11n	HT20 5470~5725	11	(MIMO Chain 0): 15.15dBm (MIMO Chain 1): 16.07dBm (MIMO Chain 0+1): 18.64dBm	OFDM	
	HT20 5725-5850	5	(MIMO Chain 0): 14.27dBm (MIMO Chain 1): 13.74dBm (MIMO Chain 0+1): 17.02dBm		



Wi-Fi	Frequency Range	Channels	Rated Power (Avg.)	Modulation Technology	
	HT40 5150-5250	2	(MIMO Chain 0): 11.03dBm (MIMO Chain 1): 11.30dBm (MIMO Chain 0+1): 14.17dBm		
11n	HT40 5250-5350	2	(MIMO Chain 0): 11.17dBm (MIMO Chain 1): 11.48dBm (MIMO Chain 0+1): 14.34dBm	OEDM	
111	HT40 5470-5725	5	(MIMO Chain 0):15.24dBm (MIMO Chain 1): 14.41dBm (MIMO Chain 0+1): 17.86dBm	OFDM	
	HT40 5725-5850	2	(MIMO Chain 0): 14.27dBm (MIMO Chain 1): 13.15dBm (MIMO Chain 0+1): 16.76dBm		
Antenna Designation			Internal, PIFA Antenna: Part No.: FIT-VM3-ANT-21Y, FIT-VM 5GHz Gain: 5.5dBi External, Dipole Antenna: 1. Model No.: WTS 2450 5GHz Gain: 2.6dBi 2. Model No.: R380500314 5GHz Gain: 5.0dBi	ИЗ-АМТ-028	
Modulation	n 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 – 144Mbps 802.11 n_40MHz: 13.5 – 300Mbps		

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1.2 **Product Feature of Equipment Under Test**

The equipment under Test (Hereafter Called: EUT) is Vehicle Mount Computer supporting, Wi-Fi 802.11abgn and Bluetooth features, and below is details of information.

	Product Feature				
Product Name:	Vehicle Mount Computer				
Brand Name:	Honeywell				
Model No.:	VM3WLAN				
Model Difference:	N/A				
FCC ID	HD5-VM3WLANA				
Wi-Fi Specification	802.11a/b/g/n				
Bluetooth Version	V4.0 dual mode				

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



1.3 **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 C63.10:2013

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-3. SI C63.10:2013.

Test Facility 1.4

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-4.

Special Accessories 1.5

There are no special accessories used while test was conducted.

Equipment Modifications 1.6

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 plane. 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 plane. 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.

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Measurement Results Explanation Example 2.4 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 1.9 dB and 10 dB attenuator.

Single mode offset = RF cable loss (dB)+ attenuation factor(dB)=11.9(dB)

N20 MIMO mode offset

= RF cable loss (dB)+ attenuation factor(dB)+ $10 \log(NANT) dB$ +duty facty=14.9(dB)

N40 MIMO mode offset

= RF cable loss (dB)+ attenuation factor(dB)+ $10 \log(\text{NANT}) dB$ +duty facty=15.1(dB)

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2.5 **Configuration of Tested System**

Fig. 2-1 Radiated Emission



Fig. 2-2 Conducted (Antenna Port) Configuration



Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	Qualcomm Atheros	10.0.0 27450	N/A	N/A	N/A
2.	DC Power Supply	HP	E3640A	MY40005907	Shield	Un-shield



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Fig. 2-3 AC Power Line Conducted Emission



Table 2-2 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	Qualcomm Atheros	10.0.0 27450	N/A	N/A	N/A

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SUMMARY OF TEST RESULT 3.

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 Infor- mation	Compliant
§15.407(g)	Frequency Stability	Compliant
\$15.203 \$15.407(a)	Antenna Requirement	Compliant



DESCRIPTION OF TEST MODES 4.

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
	52	52 5260 MHz	52 5260 MHz 60

2 channels are provided for 802.11n_HT40

CHANNEL	CHANNEL FREQUENCY		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	5590 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

, <u> </u>							
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

- 1. The EUT has been tested under operating condition.
- 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 (Internal Antenna and External Antenna):

	RA	DIATED EM	ISSION TEST	(BELOW 1 GHz)	
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	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	5180~5240	36 to 48	36,44,48	OFDM	6	MAIN
802.11_HT20	5160~5240	50 10 48	50,44,40	OFDM	MCS8	MIMO
802.11a_HT40	5190~5230	38 to 46	38,46	OFDM	MCS8	MIMO
802.11a	5260~5320	52 to 64	52 60 64	OFDM	6	MAIN
802.11n_HT20	3200~3320	52 to 64	52,60,64	OFDM	MCS8	MIMO
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS8	MIMO
802.11a	5500 5700	100 + 140	100 116 140	OFDM	6	MAIN
802.11n_HT20	5500~5700	100 to 140	100,116,140	OFDM	MCS8	MIMO
802.11n_HT40	5510~5670	102 to 134	102,110,134	OFDM	MCS8	MIMO
802.11a	5745 5925	140 += 165	140 157 165	OFDM	6	MAIN
802.11n_HT20	5745~5825	149 to 165	149,157,165	OFDM	MCS8	MIMO
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS8	MIMO

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 H position was reported.

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ANTENNA PORT CONDUCTED MEASUREMENT:

	CONDUCTED TEST						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11a	5190 5240	36 to 48	36,44,48	OFDM	6	MAIN	
802.11n_HT20	5180~5240	50 10 48	30,44,40	OFDM	MCS8	MIMO	
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS8	MIMO	
802.11a	5260~5320	52 to 64	52 60 64	OFDM	6	MAIN	
802.11n_HT20		52 to 64	52,60,64	OFDM	MCS8	MIMO	
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS8	MIMO	
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	MCS8	MIMO	
802.11n_HT40	5510~5670	102 to 134	102,110,134	OFDM	MCS8	MIMO	
802.11a	5745 5905	140 / 165	140 157 165	OFDM	6	MAIN	
802.11n_HT20	2.11n_HT20 5745~5825	149 to 165	149,157,165	OFDM	MCS8	MIMO	
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS8	MIMO	



MEASUREMENT UNCERTAINTY 5.

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:

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

Measurement uncertainty (Polarization : Horizontal)	30MHz - 167MHz: +/- 4.22dB	
	167MHz -500MHz: +/- 3.44dB	
	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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CONDUCTED EMISSION TEST 6.

6.1. Standard Applicable

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

	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	he logarithm of the frequency in the r	ange 0.15 MHz to 0.50 MHz.				

6.2. Measurement Equipment Used

Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
ТҮРЕ		NUMBER	NUMBER	CAL.				
EMI Test Receiver	R&S	ESCI7	100760	05/26/2014	05/25/2015			
LISN	Rolf-Heine	NNB-2/16Z	99012	03/26/2014	03/25/2015			
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/19/2014	03/18/2015			
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2014	11/25/2015			

6.3. EUT Setup

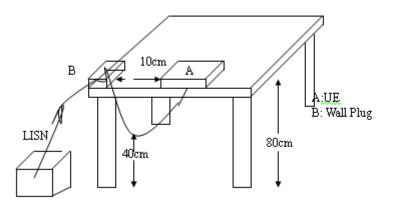
- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The LISN was connected with 120Vac/60Hz power source.

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6.4. Test SET-UP



6.5. Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 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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AC POWER LINE CONDUCTED EMISSION TEST DATA

eration N		-	on mode		1:4	()	07	Test Date:	Mar. 02, 201
nperatur	e:	26 °C		Humic	lity:	60)%	Test By:	Marcus
Site Cor	nductionRo	om			Phase		L1	Temp	erature: 24 °C
Limit: FC	CC Class E	Conductio	on(QP)		Power	AC1	20V/60Hz	Humi	dity: 66%
Mode: C	peration								
Note: A	dapter:GT	-81081-601	15-T3						
				Conc	luctedE	missi	on		
File	e :20008		C	Data :#2	aotou		e: 2015/3/2	Time : 下午	09:43:51
	dBu∀								
		Í	111						
-	-							mana mana m	
							F	CC Class B Condu	ction(QP)
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		Reading	Correct	Measure-					
No. Mk.	Freq.	Level	Factor	ment	Limit	Over			
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1	0.1580	46.36	0.05	46.41	65.57	-19.16	peak		
2	0.1820	43.57	0.06	43.63	64.39	-20.76	peak		
3	0.1940	42.95	0.06	43.01	63.86	-20.85	peak		
4	0.2060	40.83	0.06	40.89	63.37	-22.48	peak		
5	1.9100	22.87	0.12	22.99	56.00	-33.01	peak		
•									

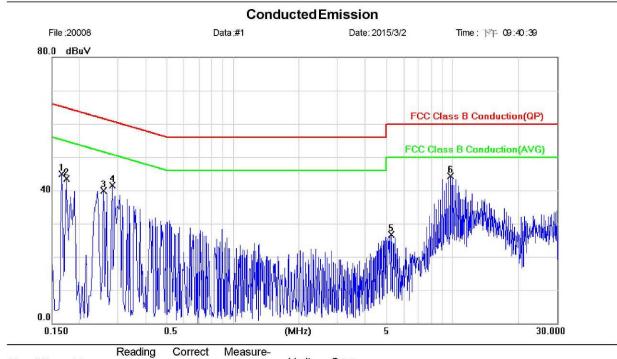


FCC ID: HD5-VM3WLANA

Site ConductionRoom Limit: FCC Class B Conduction(QP) Mode: Operation Note: Adapter:GT-81081-6015-T3

Phase: N Power: AC 120V/60Hz

24 °C Temperature: Humidity: 66%



No. M	lk.	Freq.	Level	Factor	ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1660	44.90	0.05	44.95	65.16	-20.21	peak	
2		0.1740	43.49	0.05	43.54	64.77	-21.23	peak	
3		0.2580	39.87	0.06	39.93	61.50	-21.57	peak	
4		0.2820	41.47	0.06	41.53	60.76	-19.23	peak	
5		5.2500	26.57	0.20	26.77	60.00	-33.23	peak	
6 *		9.7740	44.06	0.34	44.40	60.00	-15.60	peak	



7. 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:

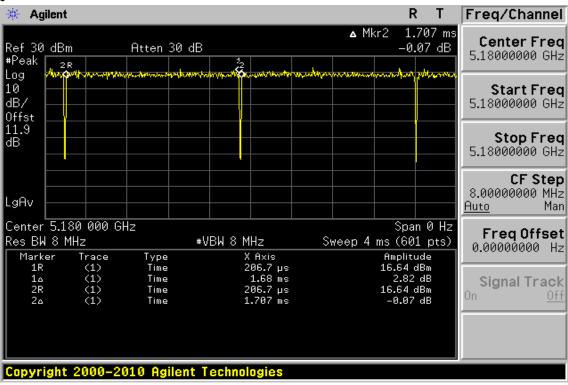
	Duty Cycle	Duty Fator (dB)
802.11a	98.42%	0.07
802.11n_20	96.81%	0.14
802.11n_40	93.33%	0.30

Duty Cycle Factor: $10 * \log (1/0.9842) = 0.07$ Duty Cycle Factor: $10 * \log (1/0.9681) = 0.14$ Duty Cycle Factor: $10 * \log (1/0.9333) = 0.30$

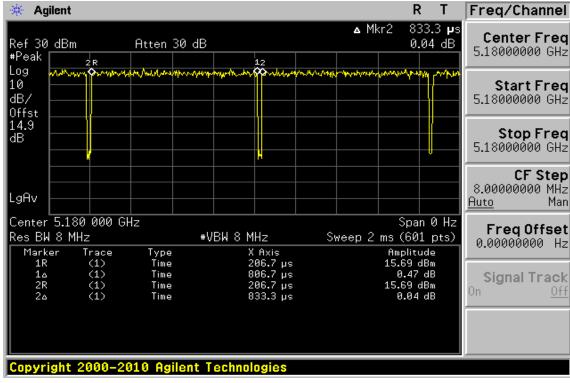
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DUTY CYCLE TEST SIGNAL Measurement Result 802.11a



802.11n HT20

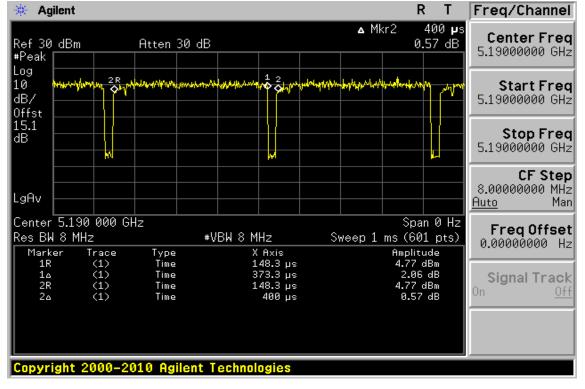


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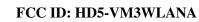
802.11n HT40



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26dB & 6dB EMISSION BANDWIDTH MEASUREMENT 8.

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.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

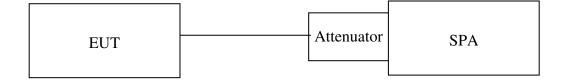
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8.3 Measurement Equipment Used

Conducted Emission Test Site									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
ТҮРЕ		NUMBER	NUMBER	CAL.					
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/19/2014	05/18/2015				
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				

Test Set-up 8.4



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Measurement Result 8.5

26dB Bandwidth

802.11a

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5180	23.556	13.72
5220	23.563	13.72
5240	22.818	13.58
5260	23.151	13.65
5300	23.763	13.76
5320	22.860	13.59
5500	22.532	13.53
5580	22.527	13.53
5700	22.866	13.59

802.11n_HT20 (Main)

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5180	22.871	13.59
5220	22.146	13.45
5240	21.617	13.35
5260	22.450	13.51
5300	22.155	13.45
5320	23.403	13.69
5500	22.769	13.57
5580	22.901	13.60
5700	23.431	13.70



802.11n_HT20 (Aux)

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5180	22.324	13.49
5220	22.866	13.59
5240	21.884	13.40
5260	22.286	13.48
5300	22.145	13.45
5320	21.994	13.42
5500	23.096	13.64
5580	22.867	13.59
5700	22.782	13.58

802.11n _HT40 (Main)

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5190	48.107	16.82
5230	48.087	16.82
5270	47.583	16.77
5310	48.050	16.82
5510	47.648	16.78
5550	47.251	16.74
5670	47.736	16.79

802.11n _HT40 (Aux)

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5190	47.892	16.80
5230	47.421	16.76
5270	47.130	16.73
5310	48.076	16.82
5510	47.440	16.76
5550	47.493	16.77
5670	47.094	16.73



6dB Bandwidth (5725 MHz~ 5850 MHz)

802.11a

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5745	16.437	12.16
5785	16.464	12.17
5825	16.391	12.15

802.11n_HT20 (Main)

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5745	17.698	12.48
5785	17.690	12.48
5825	17.692	12.48

802.11n_HT20 (Aux)

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5745	17.698	12.48
5785	17.779	12.50
5825	17.655	12.47

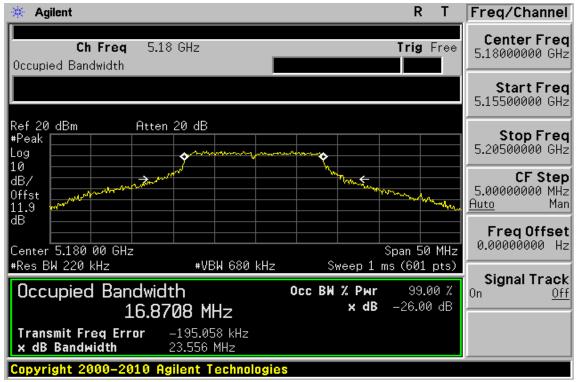
802.11n_HT40 (Main)

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5755	36.398	15.61
5795	35.792	15.54

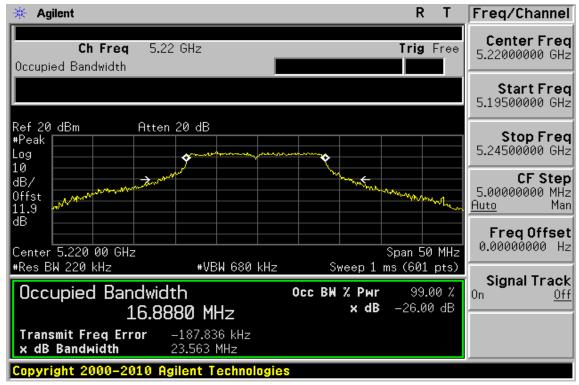
802.11n_HT40 (Aux)

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5755	36.327	15.60
5795	36.074	15.57

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



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



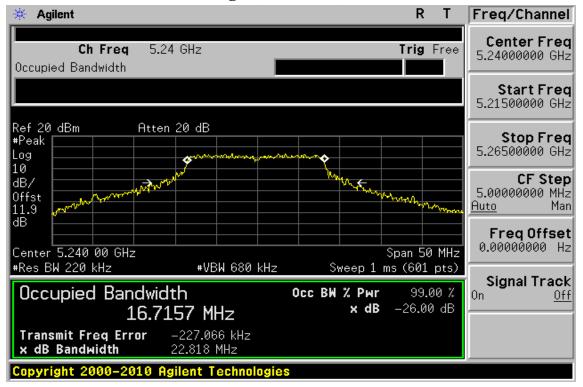
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26dB Band Width Test Data CH-High (5240MHz)



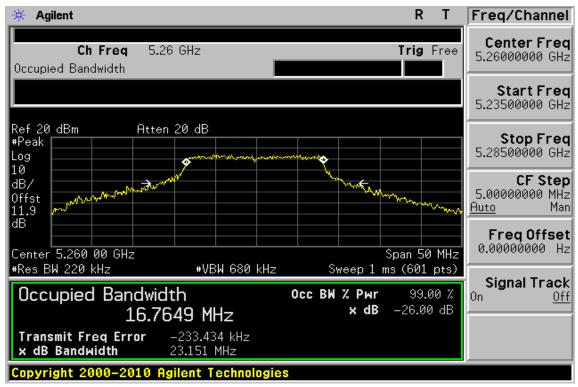
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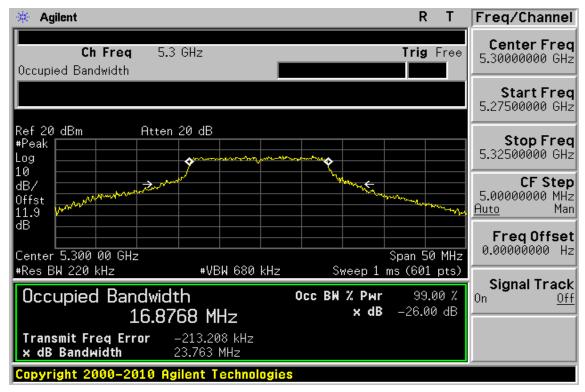
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802.11a, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260MHz)



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

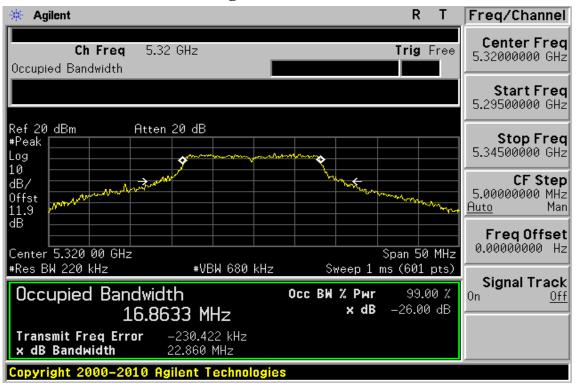


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26dB Band Width Test Data CH-High (5320MHz)



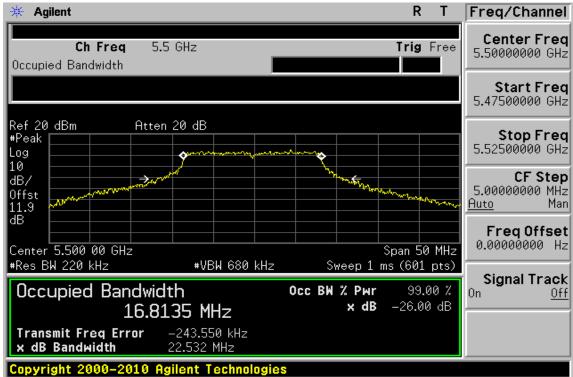
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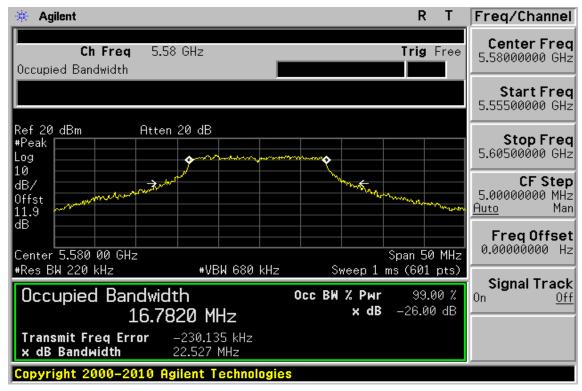
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802.11a, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500MHz)



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



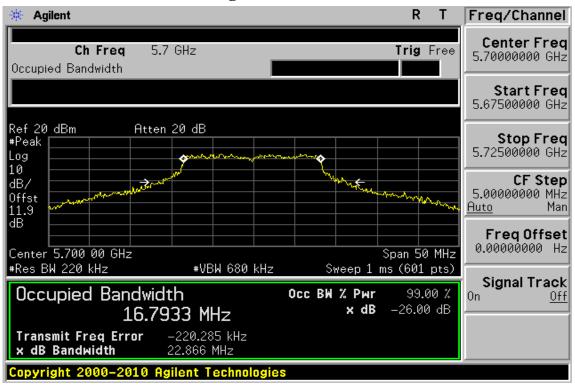
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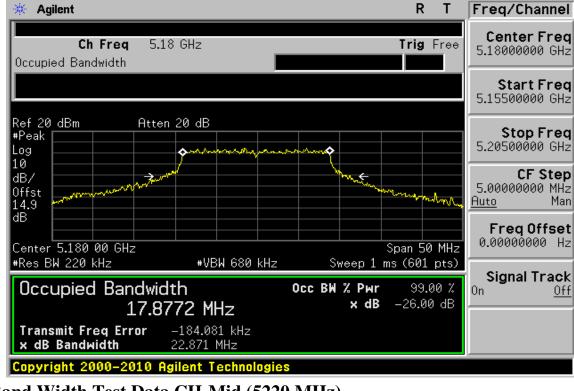
26dB Band Width Test Data CH-High (5700MHz)



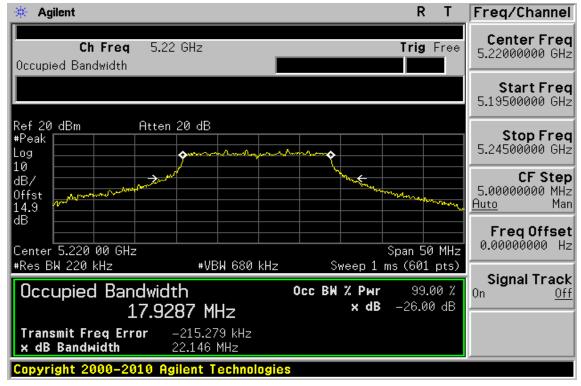
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802.11n HT20, 5150~5250 MHz (Main) 26dB Band Width Test Data CH-Low (5180 MHz)



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



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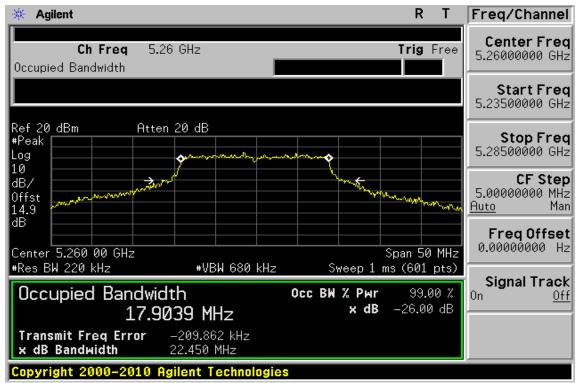
26dB Band Width Test Data CH-High (5240 MHz)



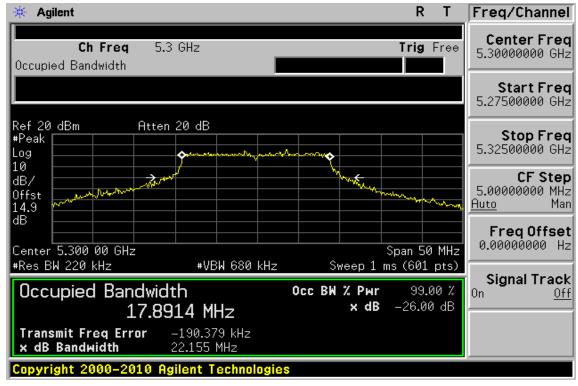
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802.11n HT20, 5250~5350 MHz (Main) 26dB Band Width Test Data CH-Low (5260 MHz)



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

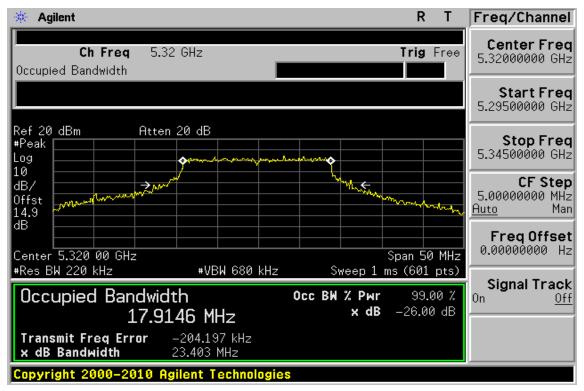


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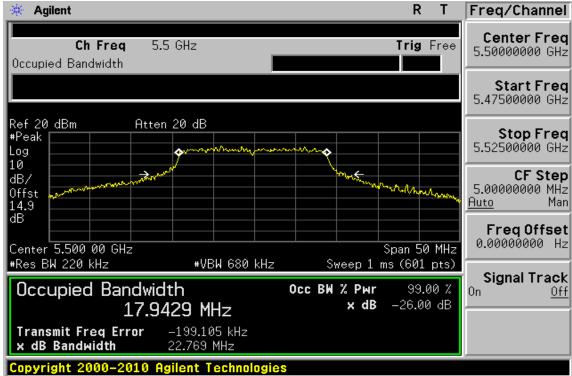
26dB Band Width Test Data CH-High (5320 MHz)



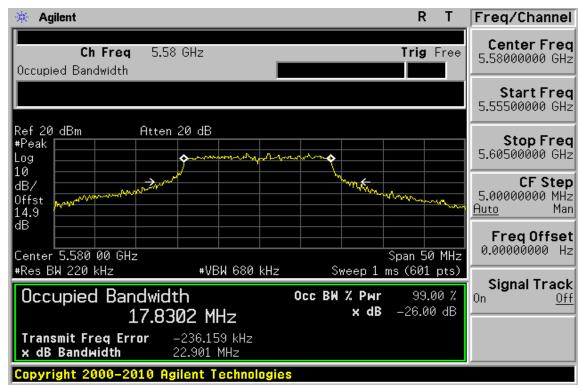
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802.11n HT20, 5470~5725 MHz (Main) 26dB Band Width Test Data CH-Low (5500 MHz)



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



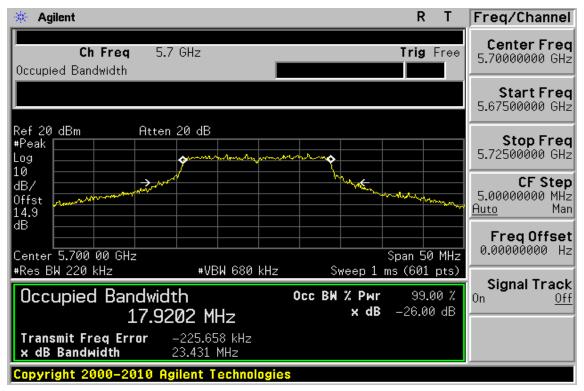
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26dB Band Width Test Data CH-High (5700 MHz)

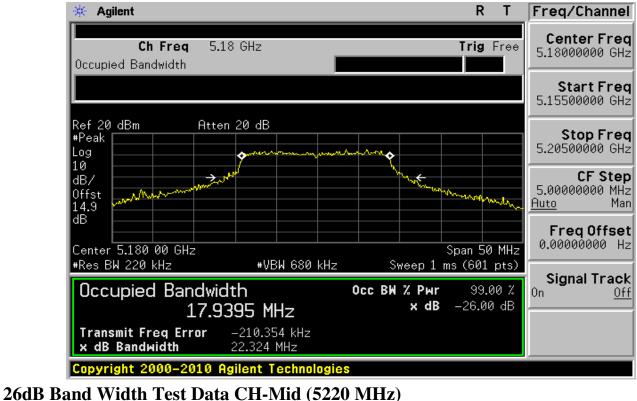


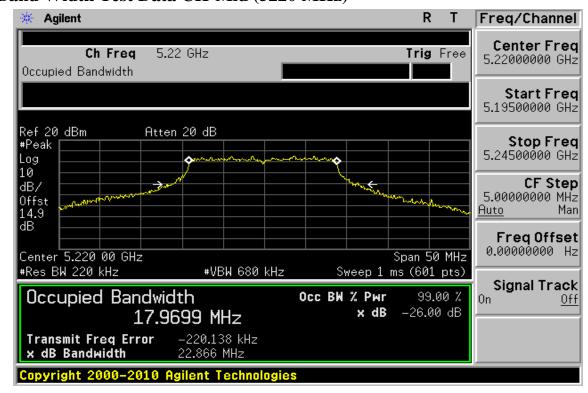
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802.11n HT20, 5150~5250 MHz (Aux) 26dB Band Width Test Data CH-Low (5180 MHz)





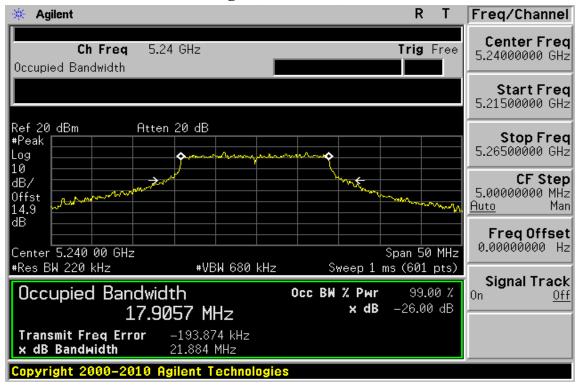
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26dB Band Width Test Data CH-High (5240 MHz)

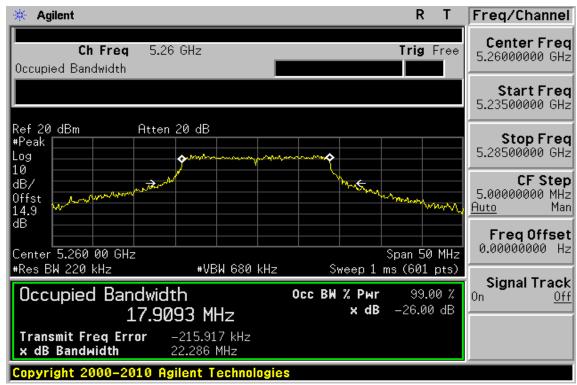


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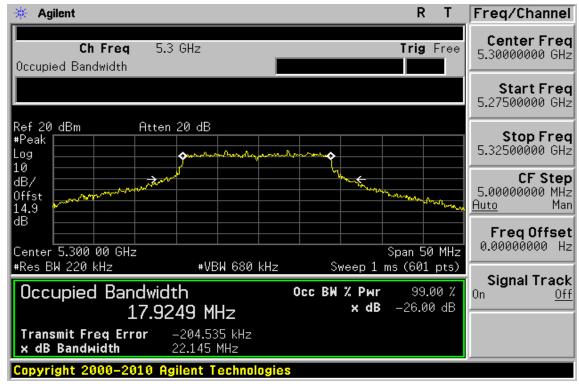
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802.11n HT20, 5250~5350 MHz (Aux) 26dB Band Width Test Data CH-Low (5260 MHz)



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



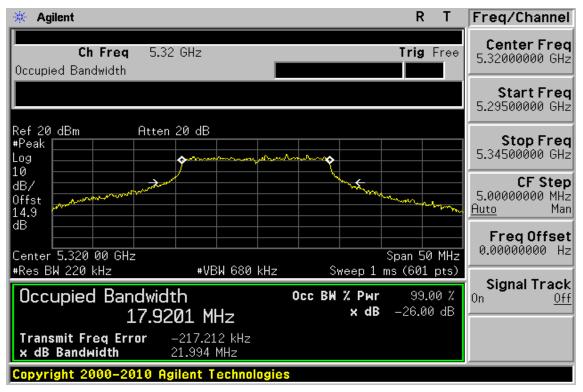
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26dB Band Width Test Data CH-High (5320 MHz)

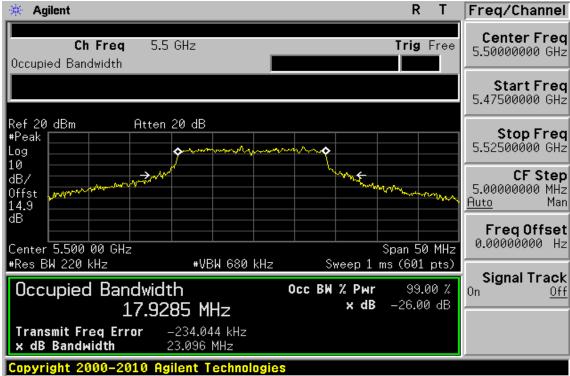


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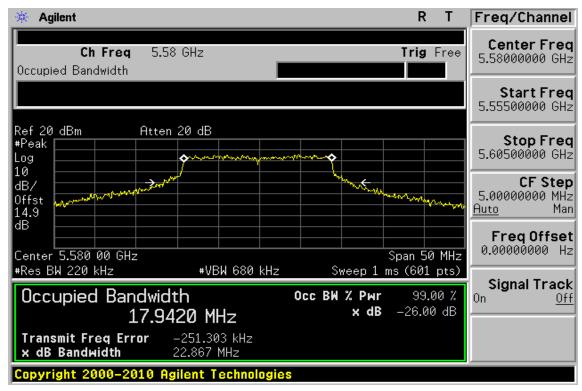
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802.11n HT20, 5470~5725 MHz (Aux) 26dB Band Width Test Data CH-Low (5500 MHz)



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

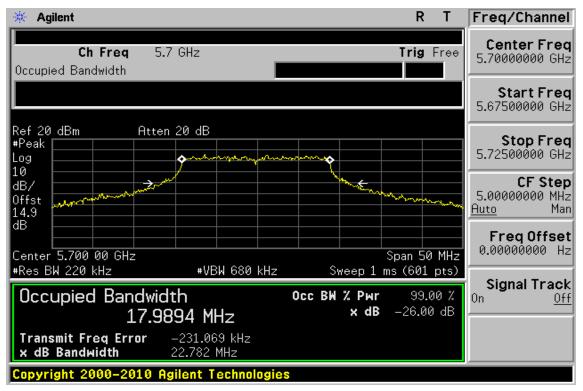


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26dB Band Width Test Data CH-High (5700 MHz)

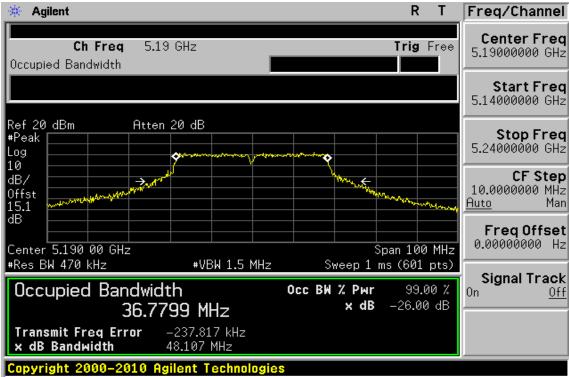


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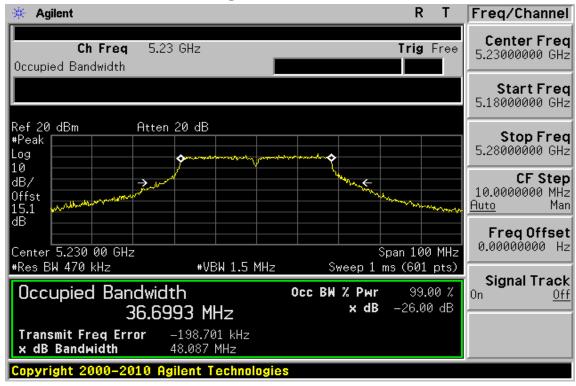
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802.11n HT40, 5150~5250 MHz (Main) 26dB Band Width Test Data CH-Low (5190 MHz)



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

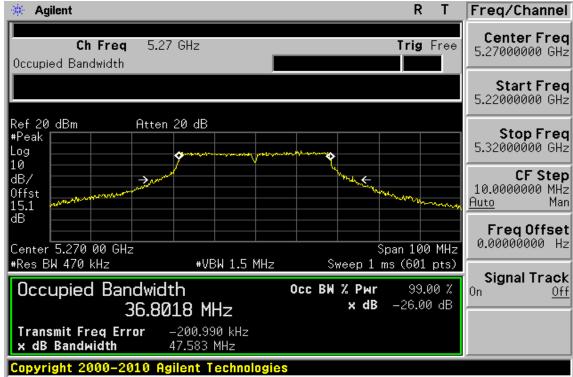


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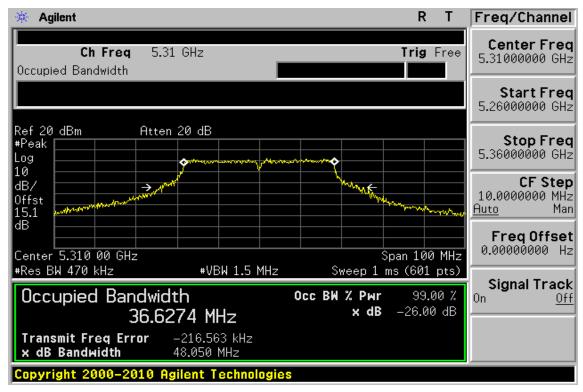
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802.11n HT40, 5250~5350 MHz (Main) 26dB Band Width Test Data CH-Low (5270 MHz)



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

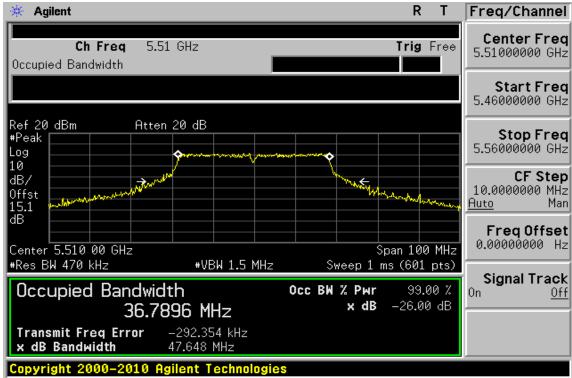


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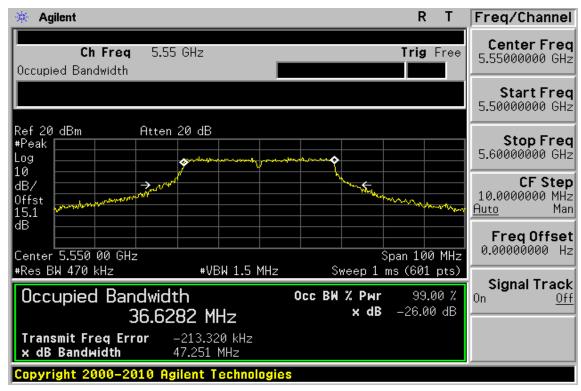
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802.11n HT40, 5470~5725 MHz (Main) 26dB Band Width Test Data CH-Low (5510 MHz)



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

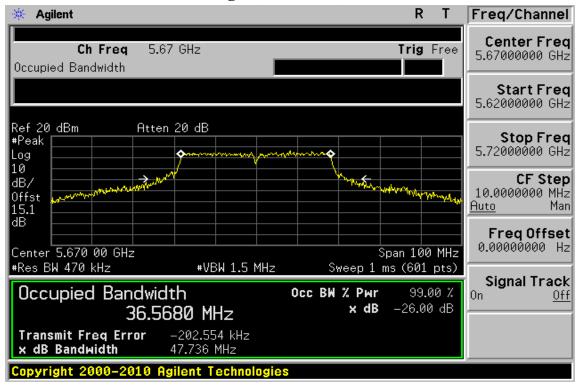


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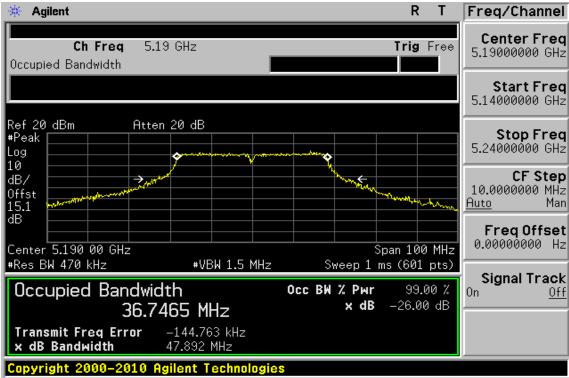
26dB Band Width Test Data CH-High (5670 MHz)



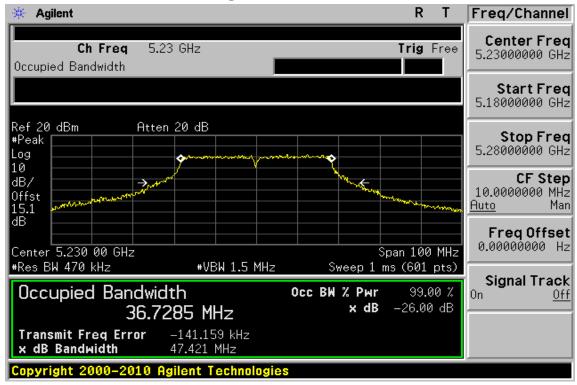
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802.11n HT40, 5150~5250 MHz (Aux) 26dB Band Width Test Data CH-Low (5190 MHz)



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



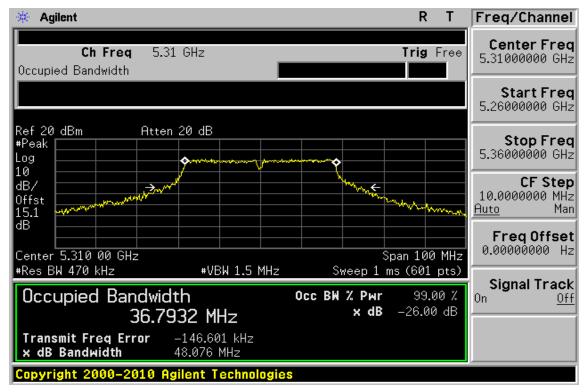
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802.11n HT40, 5250~5350 MHz (Aux) 26dB Band Width Test Data CH-Low (5270 MHz)



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



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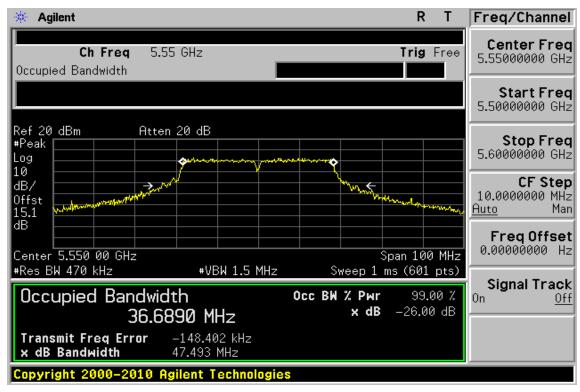
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802.11n HT40, 5470~5725 MHz (Aux) 26dB Band Width Test Data CH-Low (5510 MHz)



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

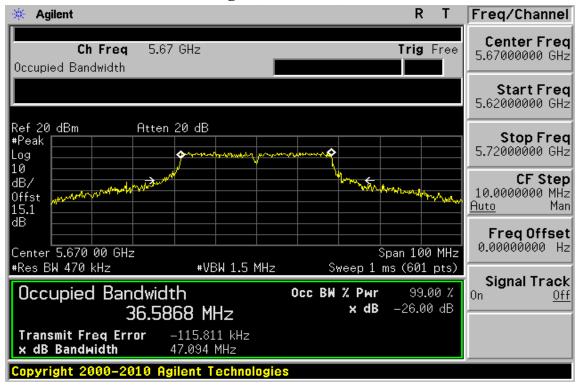


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26dB Band Width Test Data CH-High (5670 MHz)



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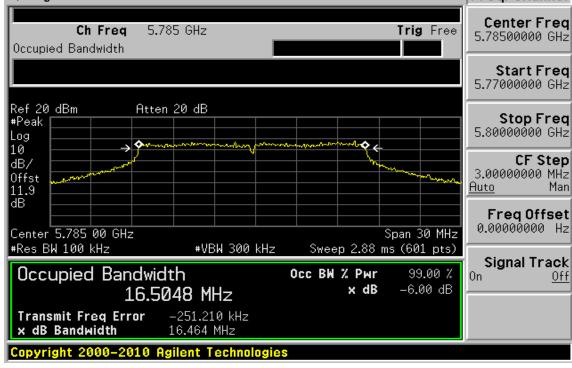
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802.11a, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5745 MHz)



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

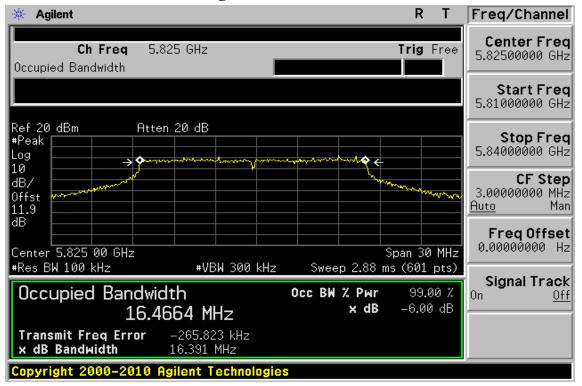


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6dB Band Width Test Data CH-High (5825 MHz)

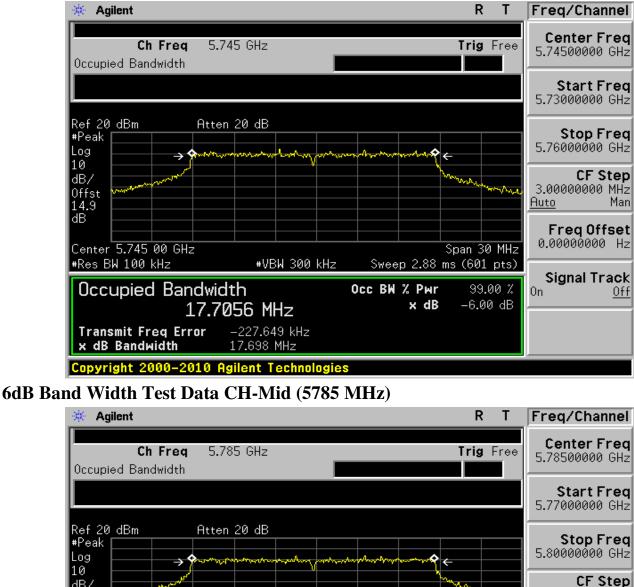


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802.11n HT20, 5725~5850 MHz (Main) 6dB Band Width Test Data CH-Low (5745 MHz)



dB/ 3.00000000 MHz Offst 14.9 Auto dB Freq Offset 0.00000000 Hz Center 5.785 00 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.88 ms (601 pts) Signal Track Occupied Bandwidth Occ BW % Pwr 99.00 % 0n -6.00 dB x dB 17.7045 MHz Transmit Freg Error -231.319 kHz x dB Bandwidth 17.690 MHz Copyright 2000–2010 Agilent Technologies

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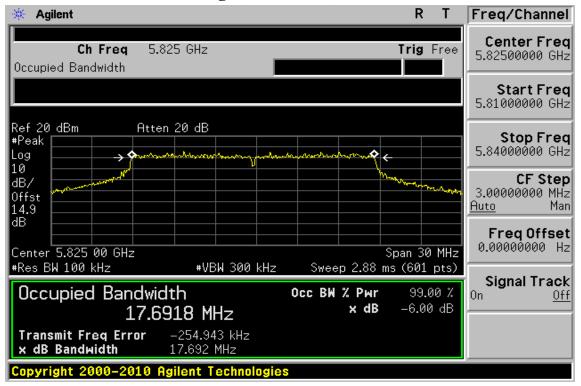
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6dB Band Width Test Data CH-High (5825 MHz)

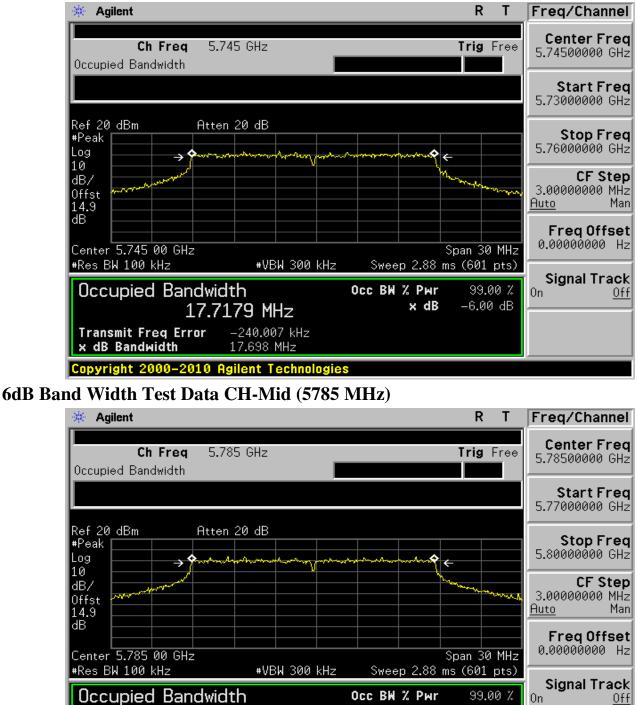


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802.11n HT20, 5725~5850 MHz (Aux) 6dB Band Width Test Data CH-Low (5745 MHz)



x dB 17.7225 MHz Transmit Freg Error -242.910 kHz x dB Bandwidth 17.779 MHz Copyright 2000–2010 Agilent Technologies

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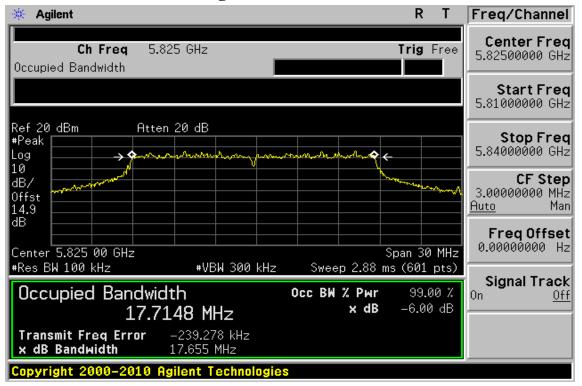
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-6.00 dB



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

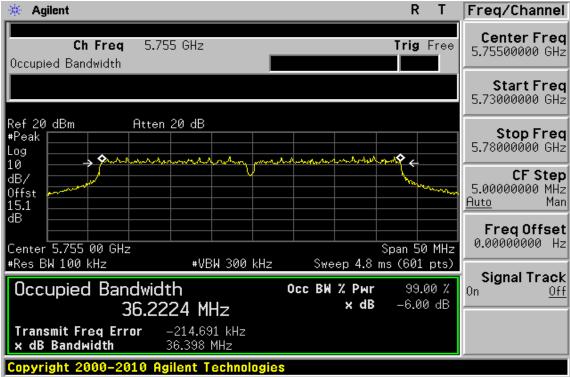


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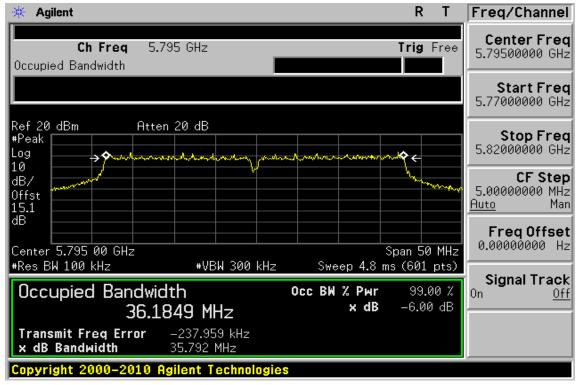
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802.11n HT40, 5725~5850 MHz (Main) 6dB Band Width Test Data CH-Low (5755 MHz)



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

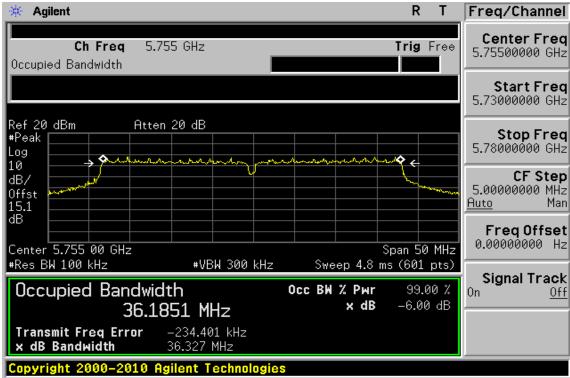


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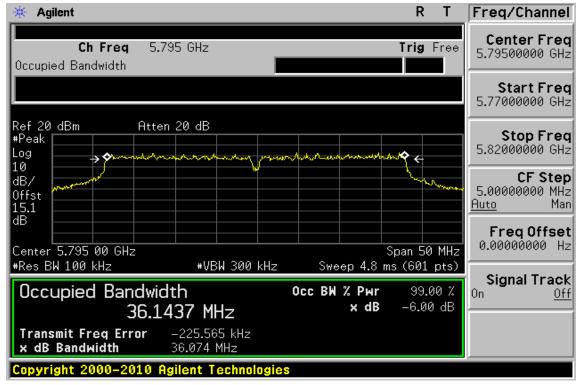
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802.11n HT40, 5725~5850 MHz (Aux) 6dB Band Width Test Data CH-Low (5755 MHz)



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



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MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT 9.

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)
	\checkmark	Mobile and portable clinet device	250mW(23.98dBm)
U-NII-2A			250mW(23.98dBm) or 11dBm+10 log B
U-NII-2C	\checkmark		250mW(23.98dBm) or 11dBm+10 log B
U-NII-3			1 Watt(30dBm)

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 direction-al gain of the antenna exceeds 6 dBi.

The antenna gain is granter than 6 dBi in MIMO mode the limit reduce as below:

Directional gain = gain of antenna element + $10 \log (\# \text{ of TX antenna elements})$

Effective Legacy Gain (dBi) = 5.5+3.01=8.51dBi

Limit: 23.98dBm – (8.51 - 6 dBi) = 21.47dBm

Therefore the limit needs to reduce for the U-NII-1, U-NII-2A and U-NII-2C band.

Effective Legacy Gain (dBi) = 5.5+3.01=8.51dBi

Limit: 30dBm - (8.51 - 6 dBi) = 27.49dBm

Therefore the limit needs to reduce for the U-NII-3 Band.

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FCC ID: HD5-VM3WLANA

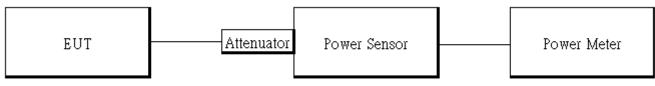
9.2 Measurement Procedure

- 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	15.14	32.659	23.98	PASS
44	5220	14.61	28.907	23.98	PASS
48	5240	14.57	28.642	23.98	PASS
52	5260	14.60	28.840	23.98 or 11+10log(B) =24.65	PASS
60	5300	14.27	26.730	23.98 or 11+10log(B) =24.65	PASS
64	5320	14.26	26.669	23.98 or 11+10log(B) =24.65	PASS
100	5500	15.32	34.041	23.98 or 11+10log(B) =24.65	PASS
116	5580	14.90	30.903	23.98 or 11+10log(B) =24.65	PASS
140	5700	13.13	20.559	23.98 or 11+10log(B) =24.65	PASS
149	5745	11.75	14.962	30	PASS
157	5785	12.10	16.218	30	PASS
165	5825	14.04	25.351	30	PASS

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802.11n HT20 MIMO

	Ene en en en	AVERAGE I	POWER (dBm)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	
СН	Frequency (MHz)	CHAIN 0	CHAIN 1				RESULT
36	5180	10.57	10.44	13.52	22.469	21.47	PASS
44	5220	10.32	10.59	13.47	22.220	21.47	PASS
48	5240	10.22	10.51	13.38	21.766	21.47	PASS
52	5260	13.57	13.54	16.57	45.345	21.47 or 11+10log(B) =24.51	PASS
60	5300	13.39	13.51	16.46	44.266	21.47 or 11+10log(B) =24.45	PASS
64	5320	12.95	13.35	16.16	41.351	21.47 or 11+10log(B) =24.69	PASS
100	5500	15.15	16.07	18.64	73.192	21.47 or 11+10log(B) =24.57	PASS
116	5580	14.99	15.55	18.29	67.442	21.47or 11+10log(B) =24.60	PASS
140	5700	14.27	13.10	16.73	47.147	21.47 or 11+10log(B) =24.70	PASS
149	5745	12.82	11.41	15.18	32.978	27.49	PASS
157	5785	13.11	11.65	15.45	35.086	27.49	PASS
165	5825	14.27	13.74	17.02	50.389	27.49	PASS

802.11n_HT40 MIMO

Frequency		AVERAGE P	OWER (dBm)	TOTAL	TOTAL	REQUIRED	
СН	CH Frequency (MHz)	CHAIN 0	CHAIN 1	POWER (dBm)	POWER (mW)	LIMIT (dBm)	RESULT
38	5190	11.03	11.28	14.17	26.104	21.47	PASS
46	5230	10.81	11.30	14.07	25.540	21.47	PASS
54	5270	10.94	11.13	14.05	25.388	21.47 or 11+10log(B) =27.77	PASS
62	5310	11.17	11.48	14.34	27.152	21.47 or 11+10log(B) =27.82	PASS
102	5510	11.26	12.12	14.72	29.659	21.47 or 11+10log(B) =27.78	PASS
110	5550	11.80	12.53	15.19	33.042	21.47 or 11+10log(B) =27.74	PASS
134	5670	15.24	14.41	17.86	61.025	21.47 or 11+10log(B) =27.79	PASS
151	5745	9.33	7.55	11.54	14.259	27.49	PASS

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10. PEAK POWER SPECTRAL DENSITY10.1 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	\checkmark		11dBm/ MHz
U-NII-2C	\checkmark		11dBm/ MHz
U-NII-3	\checkmark		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.

Note: The antenna gain is granter than 6 dBi in MIMO mode the limit reduce as below: Directional gain = gain of antenna element + $10 \log (\# \text{ of TX antenna elements})$

Effective Legacy Gain (dBi) = 5.5+3.01=8.51dBi

Limit: 11 dBm - (8.51 - 6 dBi) = 8.49 dBm

Therefore the limit needs to reduce for the U-NII-1, U-NII-2A and U-NII-2C band.

Effective Legacy Gain (dBi) = 5.5+3.01=8.51dBiLimit: 30dBm - (8.51-6 dBi) = 27.49dBm

Therefore the limit needs to reduce for the U-NII-3 band.

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10.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01. 2.
- 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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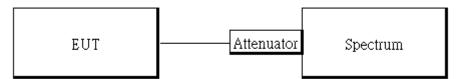
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10.3 Measurement Equipment Used

Conducted Emission Test Site							
EQUIPMENT	EQUIPMENT MFR MODEL SERIAL						
ТҮРЕ		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/19/2014	05/18/2015		
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	1.87	11.00	-9.14
5220	1.43	11.00	-9.57
5240	1.78	11.00	-9.22
5260	1.64	11.00	-9.36
5300	0.73	11.00	-10.27
5320	1.50	11.00	-9.50
5500	1.44	11.00	-9.56
5580	1.30	11.00	-9.70
5700	2.03	11.00	-8.97
5745	4.74	30.00	-25.26
5785	4.97	30.00	-25.03
5825	8.32	30.00	-21.68

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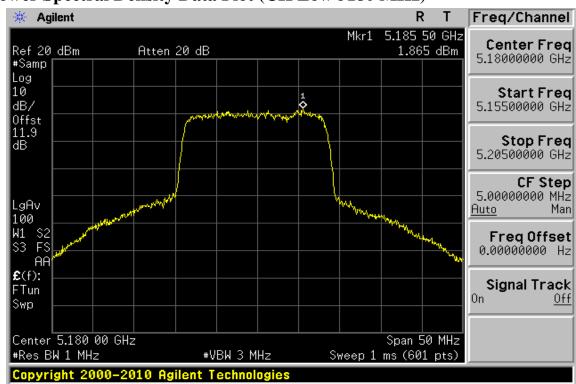
802.11n HT20

Frequency	PPSD	Limit	Margin
(MHz)	(dBm)	(dBm)	(dB)
5180	-0.93	8.49	-9.42
5220	-0.54	8.49	-9.03
5240	-0.74	8.49	-9.23
5260	-0.25	8.49	-8.74
5300	-1.02	8.49	-9.51
5320	0.14	8.49	-8.35
5500	1.45	8.49	-7.04
5580	1.32	8.49	-7.17
5700	0.34	8.49	-8.15
5745	6.87	27.49	-20.62
5785	6.84	27.49	-20.65
5825	9.59	27.49	-17.90

802.11n HT40

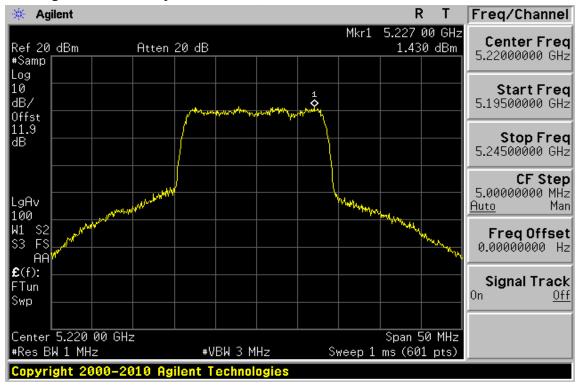
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5190	-6.18	8.49	-14.67
5230	-6.47	8.49	-14.96
5270	-7.24	8.49	-15.73
5310	-4.94	8.49	-13.43
5510	-5.95	8.49	-14.44
5550	-5.80	8.49	-14.29
5670	-2.45	8.49	-10.94
5755	-0.47	27.49	-27.96
5795	5.99	27.49	-21.50





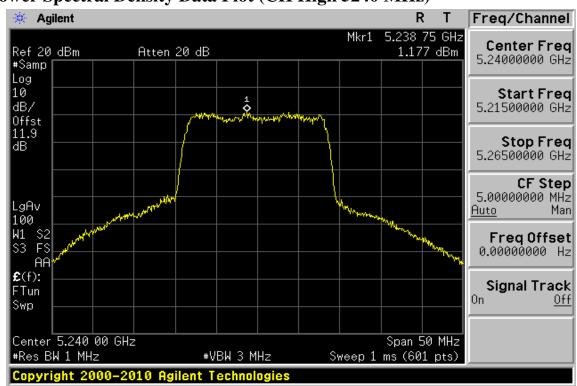
802.11a, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5180 MHz)

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



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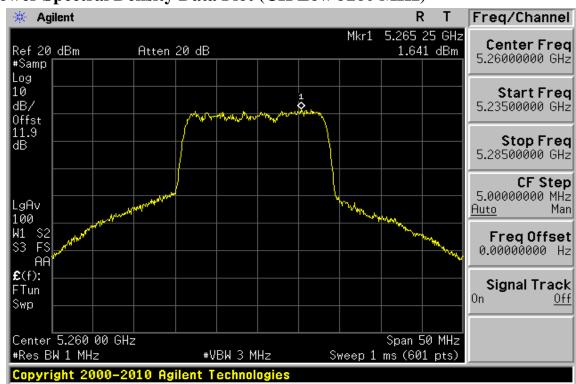
Peak Power Spectral Density Data Plot (CH High 5240 MHz)

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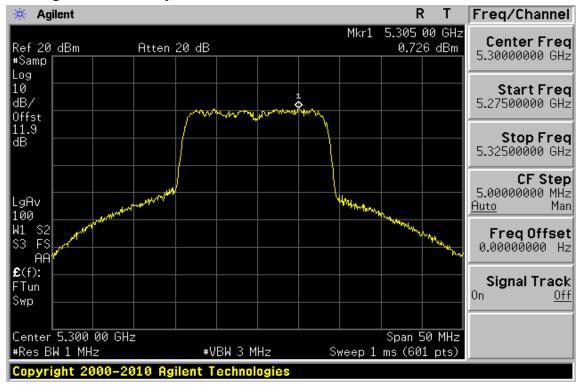
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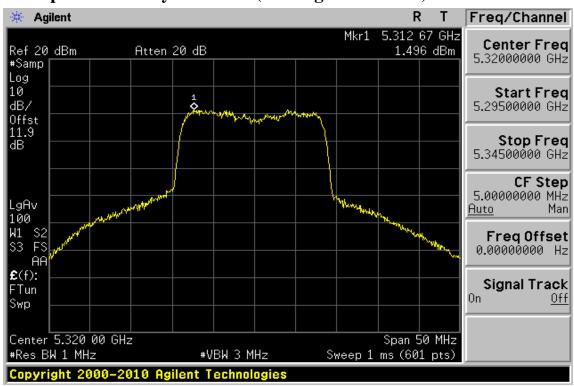
802.11a, 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5260 MHz)

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



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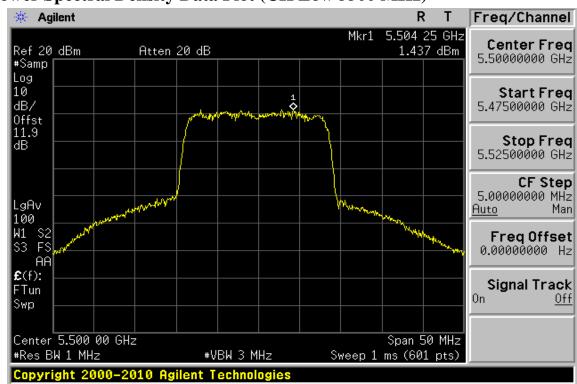
Peak Power Spectral Density Data Plot (CH High 5320 MHz)

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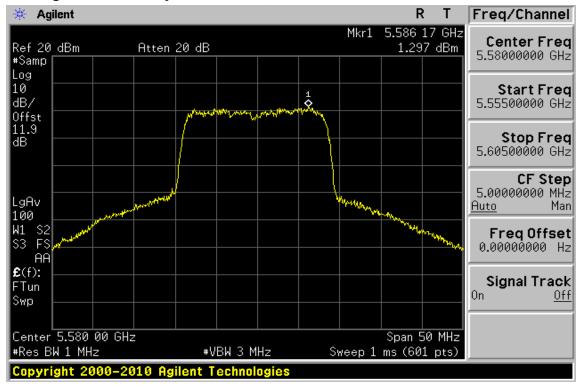
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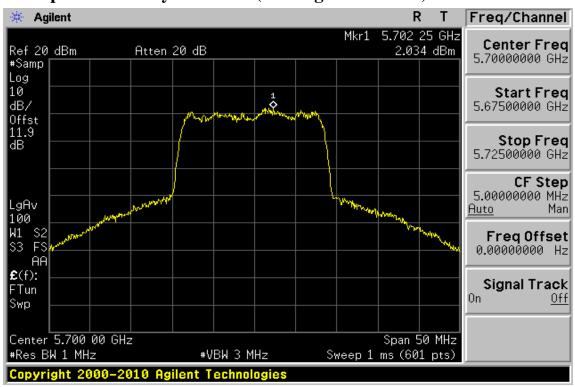
802.11a, 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5500 MHz)

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



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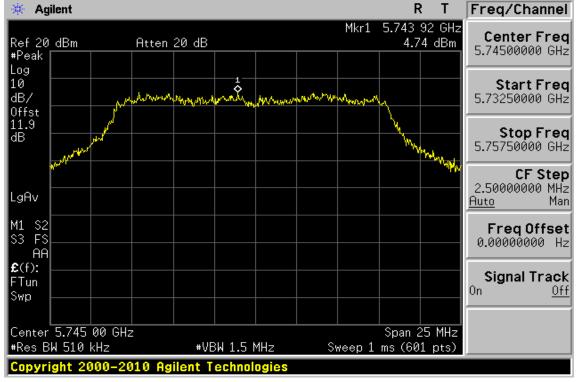




Peak Power Spectral Density Data Plot (CH High 5700 MHz)

802.11a, 5725~5850 MHz

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

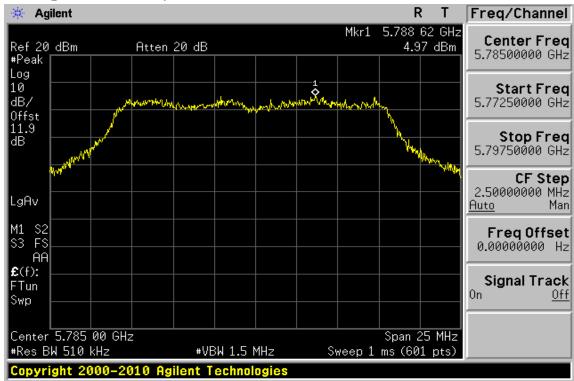


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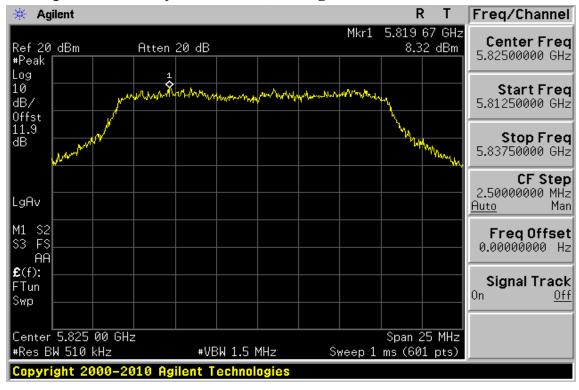
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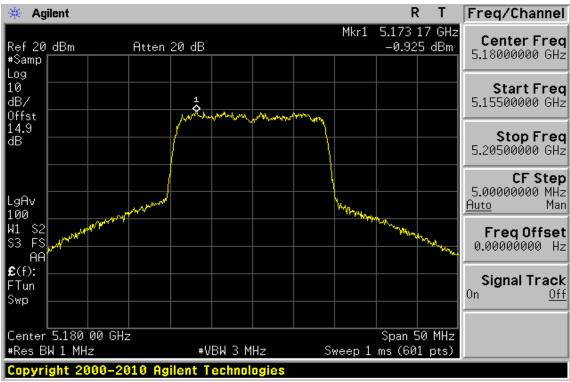
Peak Power Spectral Density Data Plot (CH High 5825 MHz)



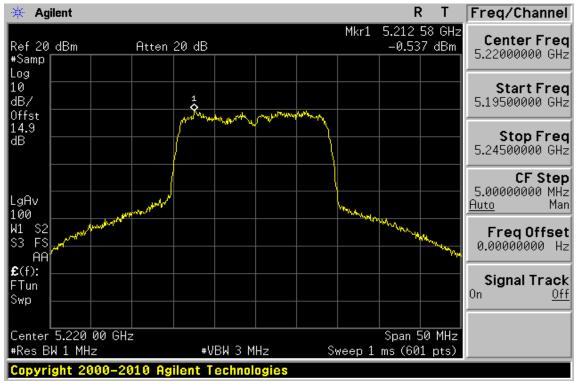
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802.11n HT20, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5180 MHz)

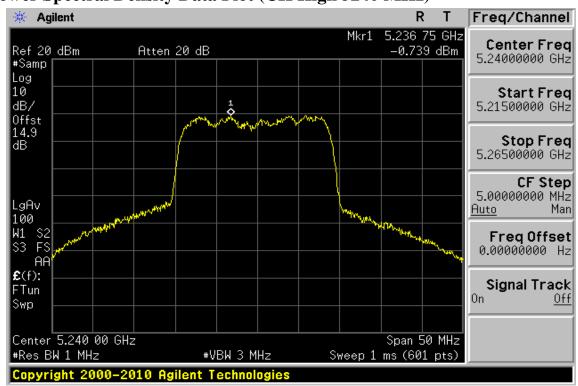


Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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

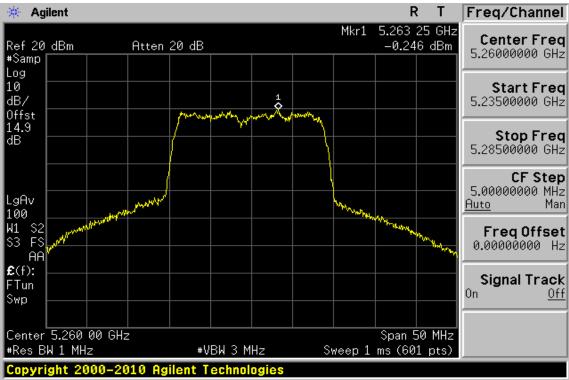
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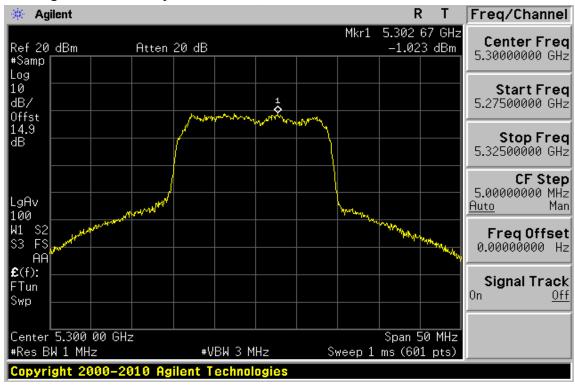
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802.11n HT20, 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5260MHz)

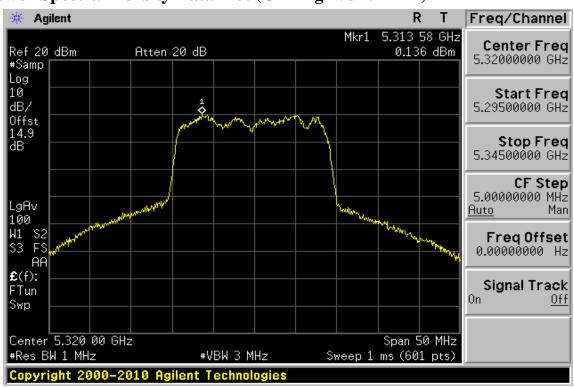


Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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

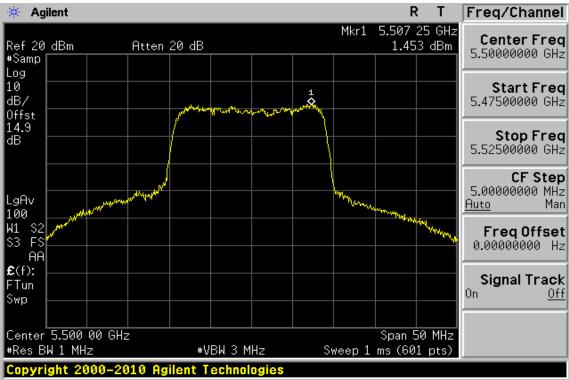
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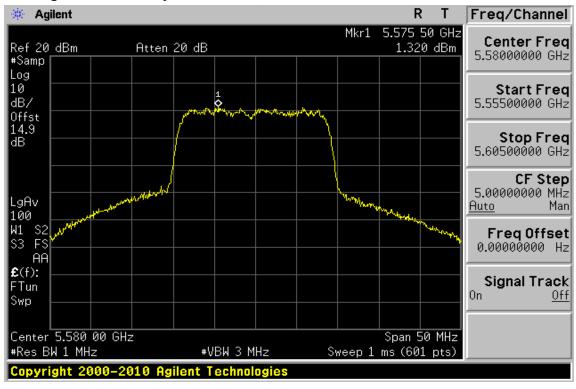
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802.11n HT20, 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5500 MHz)

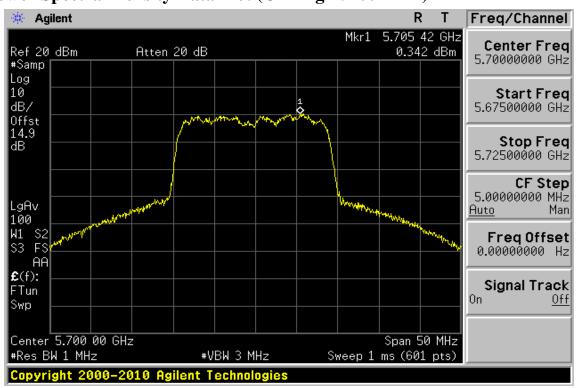


Peak Power Spectral Density Data Plot (CH Mid 5580MHz)



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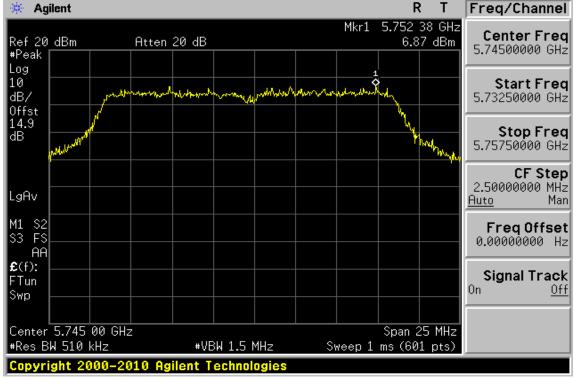




Peak Power Spectral Density Data Plot (CH High 5700 MHz)

802.11n HT20, 5725~5850 MHz

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

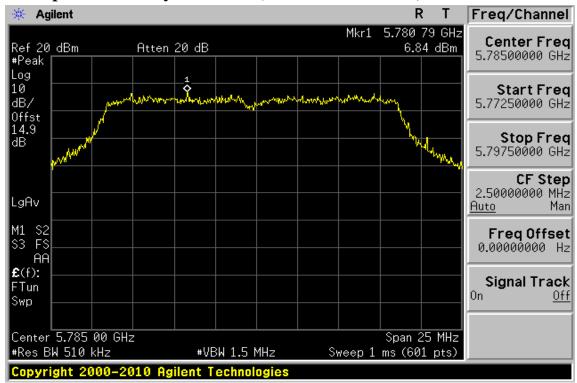


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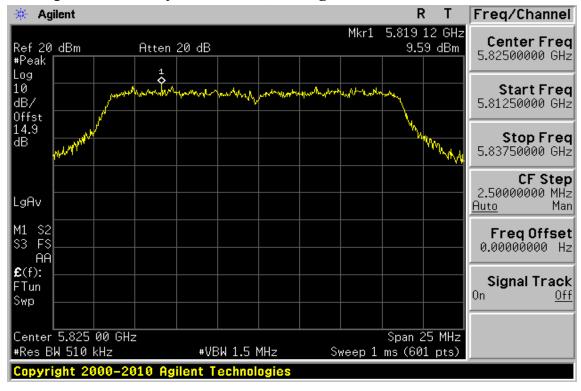
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Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



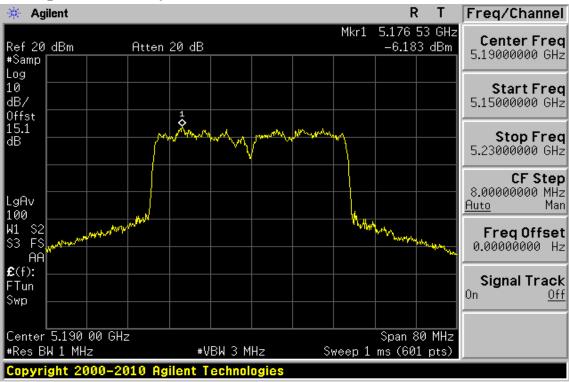
Peak Power Spectral Density Data Plot (CH High 5825 MHz)



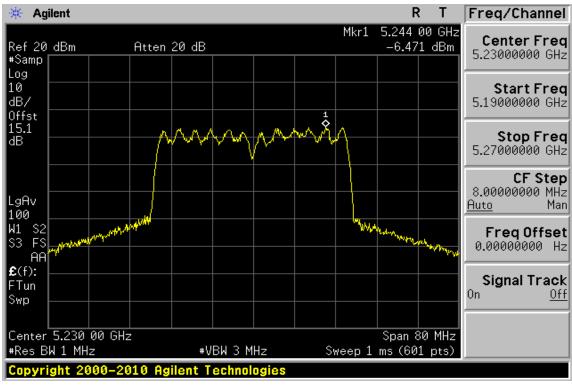
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802.11n HT40, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5190 MHz)



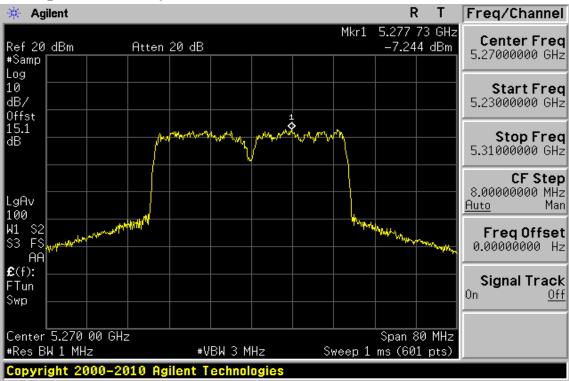
Peak Power Spectral Density Data Plot (CH High 5230 MHz)



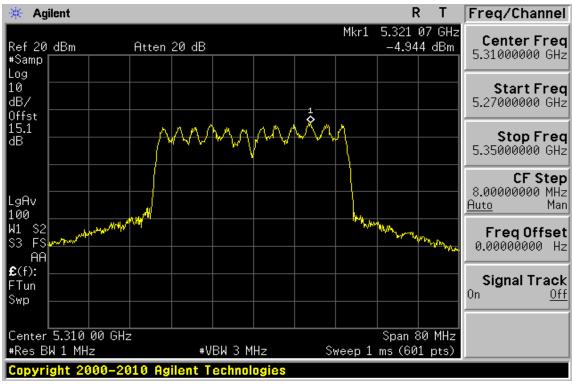
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802.11n HT40, 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5270 MHz)



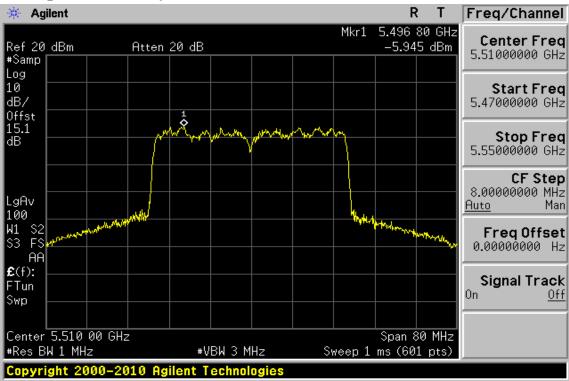
Peak Power Spectral Density Data Plot (CH High 5310 MHz)



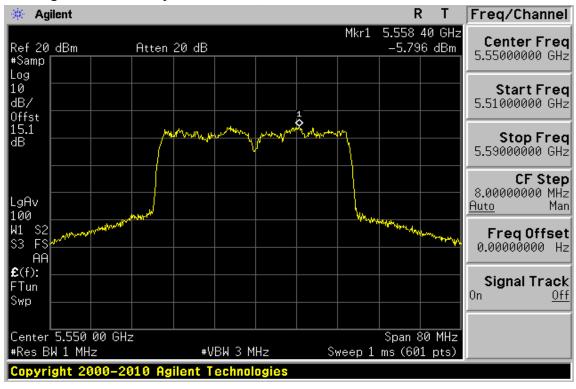
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802.11n HT40, 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5510 MHz)

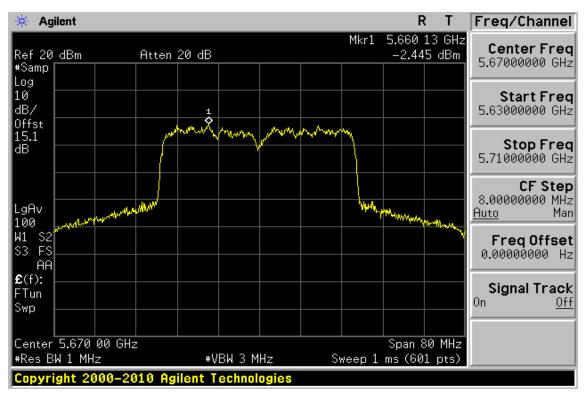


Peak Power Spectral Density Data Plot (CH Mid 5550 MHz)



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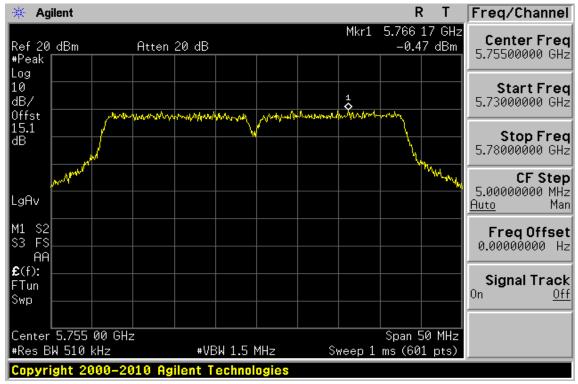




Peak Power Spectral Density Data Plot (CH High 5670 MHz)

802.11n HT40, 5725~5850 MHz

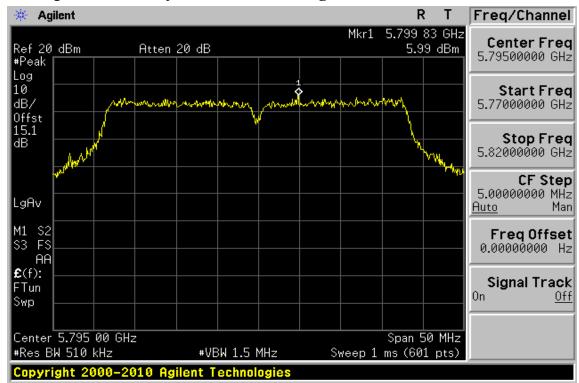
Peak Power Spectral Density Data Plot (CH Low 5755 MHz)



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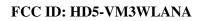


Peak Power Spectral Density Data Plot (CH High 5795 MHz)

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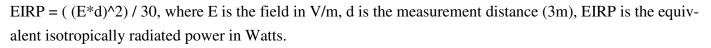


11. UNDESIRABLE RADIATED EMISSION MEASUREMENT111.1 Standard Applicable

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	LIMIT		
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)	



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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 11.2

966 Chamber								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
ТҮРЕ		NUMBER	NUMBER	CAL.				
EMI Test Receiver	R&S	ESCI7	100760	05/26/2014	05/25/2015			
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/19/2014	05/18/2015			
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	05/19/2014	05/18/2015			
Horn antenna	ETS.LINDGREN	3117	123995	05/19/2014	05/18/2015			
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	01/24/2014	01/23/2015			
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			

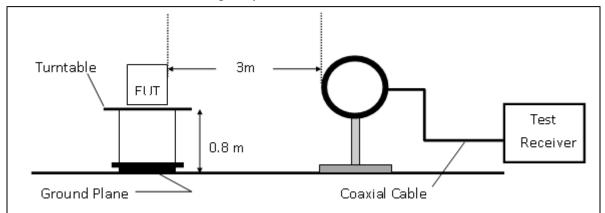
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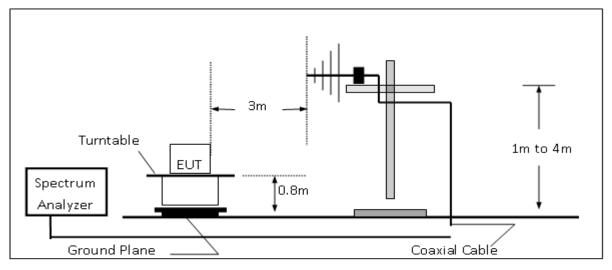


Test SET-UP 11.3

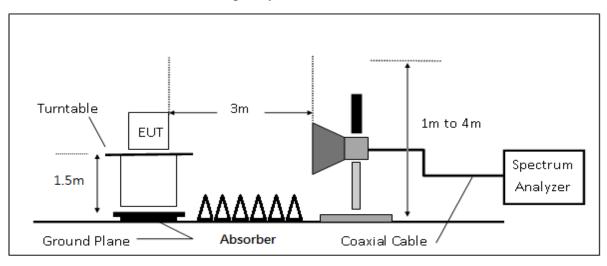
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(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

- The EUT was placed on a turn table which is 0.8m above ground plane. 1.
- 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 1.5m for frequency> 1GHz above ground plane.
- 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.
- Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and 6. 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.
- Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW $\geq 1/T$ 8. (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	
Where	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

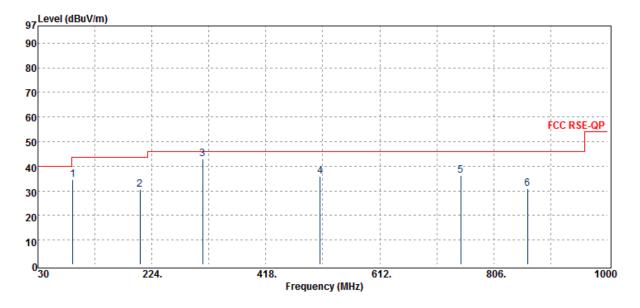
Below 1GHz Worst-Case Data (Internal Antenna):

802.11a, 5150~5250 MHz

Operation Band	:802.1
Fundamental Frequency	:5220
Operation Mode	:TX M
EUT Pol.	:H Pla

1 a MHz ЛD ine

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL



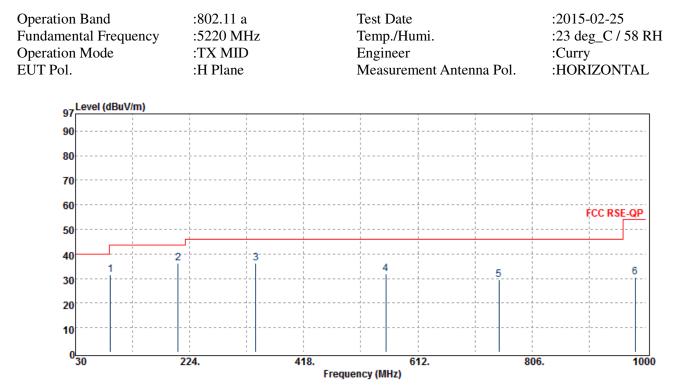
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	49.75	-15.33	34.42	43.50	-9.08
203.63	S	Peak	42.04	-11.57	30.47	43.50	-13.03
310.33	S	Peak	50.60	-7.64	42.96	46.00	-3.04
510.15	S	Peak	40.52	-4.49	36.03	46.00	-9.97
749.74	S	Peak	36.00	0.27	36.27	46.00	-9.73
863.23	S	Peak	28.52	2.30	30.82	46.00	-15.18

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms_and_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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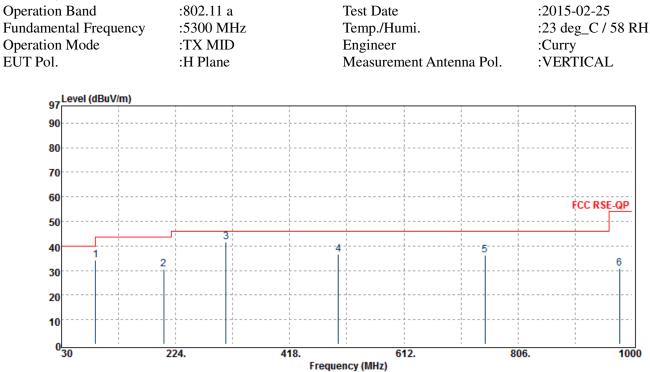
Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 101 of 289



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	46.88	-15.33	31.55	43.50	-11.95
204.60	S	Peak	47.83	-11.51	36.32	43.50	-7.18
336.52	S	Peak	43.91	-7.59	36.32	46.00	-9.68
557.68	S	Peak	35.63	-3.89	31.74	46.00	-14.26
749.74	S	Peak	29.38	0.27	29.65	46.00	-16.35
981.57	S	Peak	27.21	3.38	30.59	54.00	-23.41



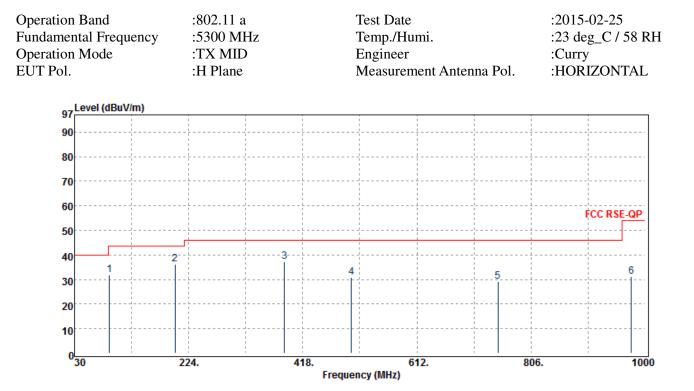
802.11a, 5250~5350 MHz



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
88.20	S	Peak	49.31	-15.13	34.18	43.50	-9.32
203.63	S	Peak	41.98	-11.57	30.41	43.50	-13.09
309.36	S	Peak	49.37	-7.67	41.70	46.00	-4.30
500.45	S	Peak	40.78	-4.34	36.44	46.00	-9.56
749.74	S	Peak	35.91	0.27	36.18	46.00	-9.82
978.66	S	Peak	27.43	3.43	30.86	54.00	-23.14



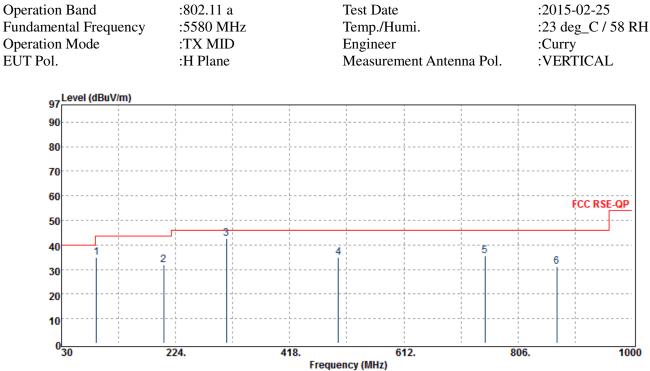
Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 103 of 289



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	47.14	-15.33	31.81	43.50	-11.69
200.72	S	Peak	47.89	-11.77	36.12	43.50	-7.38
386.96	S	Peak	43.51	-6.20	37.31	46.00	-8.69
500.45	S	Peak	35.17	-4.34	30.83	46.00	-15.17
749.74	S	Peak	28.90	0.27	29.17	46.00	-16.83
976.72	S	Peak	27.60	3.47	31.07	54.00	-22.93

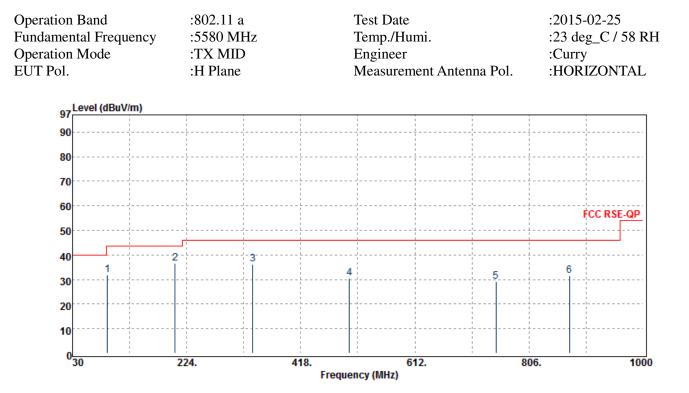


802.11a, 5470~5725 MHz



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	50.18	-15.33	34.85	43.50	-8.65
203.63	S	Peak	43.35	-11.57	31.78	43.50	-11.72
310.33	S	Peak	50.40	-7.64	42.76	46.00	-3.24
500.45	S	Peak	39.15	-4.34	34.81	46.00	-11.19
749.74	S	Peak	35.30	0.27	35.57	46.00	-10.43
871.96	S	Peak	28.79	2.51	31.30	46.00	-14.70

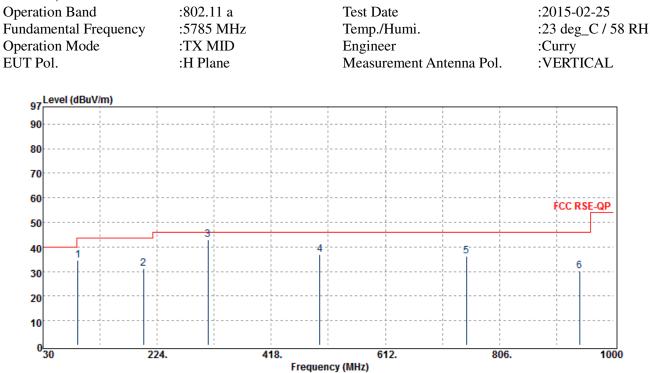




Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	47.37	-15.33	32.04	43.50	-11.46
204.60	S	Peak	47.99	-11.51	36.48	43.50	-7.02
336.52	S	Peak	43.83	-7.59	36.24	46.00	-9.76
500.45	S	Peak	34.86	-4.34	30.52	46.00	-15.48
749.74	S	Peak	28.97	0.27	29.24	46.00	-16.76
874.87	S	Peak	29.08	2.44	31.52	46.00	-14.48



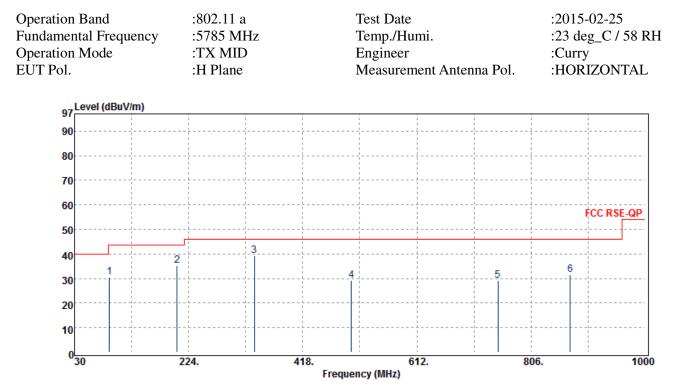
802.11a, 5725~5850 MHz



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	49.91	-15.33	34.58	43.50	-8.92
200.72	S	Peak	43.10	-11.77	31.33	43.50	-12.17
310.33	S	Peak	50.45	-7.64	42.81	46.00	-3.19
500.45	S	Peak	41.15	-4.34	36.81	46.00	-9.19
749.74	S	Peak	35.86	0.27	36.13	46.00	-9.87
941.80	S	Peak	27.24	2.97	30.21	46.00	-15.79



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Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	45.99	-15.33	30.66	43.50	-12.84
204.60	S	Peak	46.70	-11.51	35.19	43.50	-8.31
335.55	S	Peak	46.95	-7.61	39.34	46.00	-6.66
500.45	S	Peak	33.51	-4.34	29.17	46.00	-16.83
749.74	S	Peak	28.88	0.27	29.15	46.00	-16.85
872.93	S	Peak	28.89	2.50	31.39	46.00	-14.61



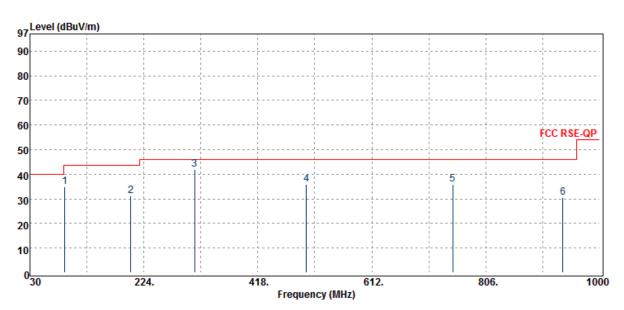
Below 1GHz Worst-Case Data (External Antenna):

802.11a, 5150~5250 MHz

Operation Band Fundamental Frequency Operation Mode EUT Pol.

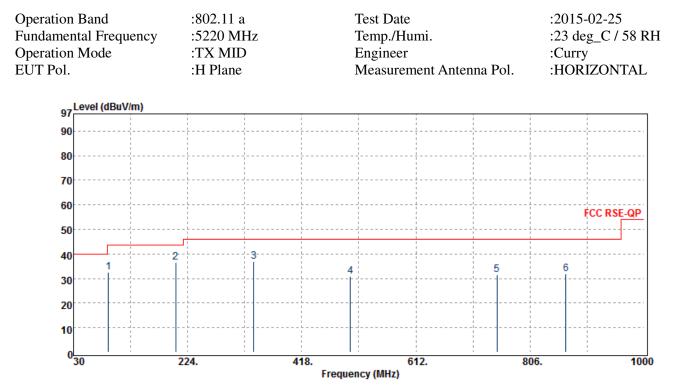
:802.11 a :5220 MHz :TX MID :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL



Note	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
S	Peak	50.07	-15.33	34.74	43.50	-8.76
S	Peak	42.77	-11.69	31.08	43.50	-12.42
S	Peak	49.75	-7.64	42.11	46.00	-3.89
S	Peak	40.16	-4.34	35.82	46.00	-10.18
S	Peak	35.78	0.27	36.05	46.00	-9.95
S	Peak	27.70	2.87	30.57	46.00	-15.43
	F/H/E/S S S S S S S	ModeF/H/E/SModeSPeakSPeakSPeakSPeakSPeakSPeakSPeak	F/H/E/SModeReading LevelF/H/E/SPK/QP/AVdBμVSPeak50.07SPeak42.77SPeak49.75SPeak40.16SPeak35.78	King Mode Reading Level F/H/E/S PK/QP/AV dBµV dB S Peak 50.07 -15.33 S Peak 42.77 -11.69 S Peak 49.75 -7.64 S Peak 40.16 -4.34 S Peak 35.78 0.27	F/H/E/SModeReading LevelFSF/H/E/SPK/QP/AVdBμVdBdBμV/mSPeak50.07-15.3334.74SPeak42.77-11.6931.08SPeak49.75-7.6442.11SPeak40.16-4.3435.82SPeak35.780.2736.05	F/H/E/SModeReading LevelFS@ 3mF/H/E/SPK/QP/AVdBμVdBdBμV/mdBμV/mSPeak50.07-15.3334.7443.50SPeak42.77-11.6931.0843.50SPeak49.75-7.6442.1146.00SPeak40.16-4.3435.8246.00SPeak35.780.2736.0546.00

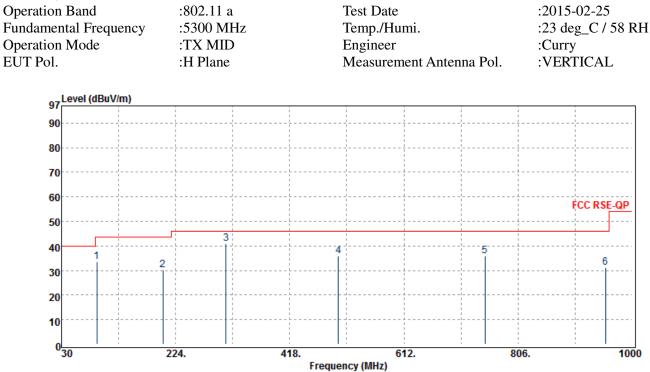




Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	47.74	-15.33	32.41	43.50	-11.09
203.63	S	Peak	48.14	-11.57	36.57	43.50	-6.93
336.52	S	Peak	44.39	-7.59	36.80	46.00	-9.20
500.45	S	Peak	35.35	-4.34	31.01	46.00	-14.99
749.74	S	Peak	31.27	0.27	31.54	46.00	-14.46
867.11	S	Peak	29.23	2.49	31.72	46.00	-14.28



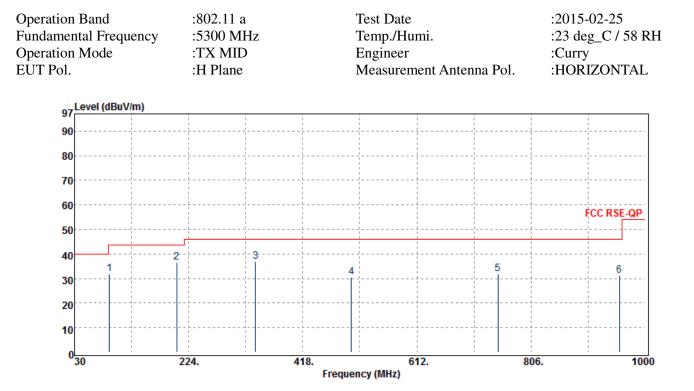
802.11a, 5250~5350 MHz



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
90.14	S	Peak	49.10	-15.48	33.62	43.50	-9.88
202.66	S	Peak	42.00	-11.63	30.37	43.50	-13.13
309.36	S	Peak	48.78	-7.67	41.11	46.00	-4.89
500.45	S	Peak	40.21	-4.34	35.87	46.00	-10.13
749.74	S	Peak	35.52	0.27	35.79	46.00	-10.21
954.41	S	Peak	27.64	3.49	31.13	46.00	-14.87



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Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	47.19	-15.33	31.86	43.50	-11.64
203.63	S	Peak	48.04	-11.57	36.47	43.50	-7.03
337.49	S	Peak	44.60	-7.56	37.04	46.00	-8.96
500.45	S	Peak	34.83	-4.34	30.49	46.00	-15.51
749.74	S	Peak	31.69	0.27	31.96	46.00	-14.04
956.35	S	Peak	27.69	3.56	31.25	46.00	-14.75



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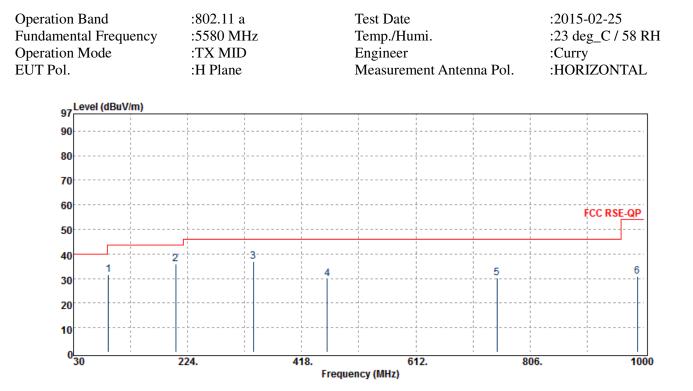
802.11a, 5470~5725 MHz

eration Band ndamental Frequency eration Mode	:802.11 a :5580 MHz :TX MID	Temp	Test Date Temp./Humi. Engineer			
T Pol.	:H Plane	Meas	:VERTICAL			
97 Level (dBuV/m)						
90						
80						
70						
60				FCC RSE-QP		
50						
40 1 2		4	5			
30				6		
20						
10						
0 <mark></mark> 30	224.	418. Frequency (MI	612.	806. 1 000		

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	50.01	-15.33	34.68	43.50	-8.82
202.66	S	Peak	42.34	-11.63	30.71	43.50	-12.79
311.30	S	Peak	50.08	-7.61	42.47	46.00	-3.53
500.45	S	Peak	40.47	-4.34	36.13	46.00	-9.87
749.74	S	Peak	37.03	0.27	37.30	46.00	-8.70
972.84	S	Peak	27.29	3.56	30.85	54.00	-23.15



Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 113 of 289



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	46.85	-15.33	31.52	43.50	-11.98
203.63	S	Peak	47.60	-11.57	36.03	43.50	-7.47
335.55	S	Peak	44.55	-7.61	36.94	46.00	-9.06
461.65	S	Peak	35.44	-5.44	30.00	46.00	-16.00
749.74	S	Peak	29.99	0.27	30.26	46.00	-15.74
988.36	S	Peak	27.45	3.40	30.85	54.00	-23.15



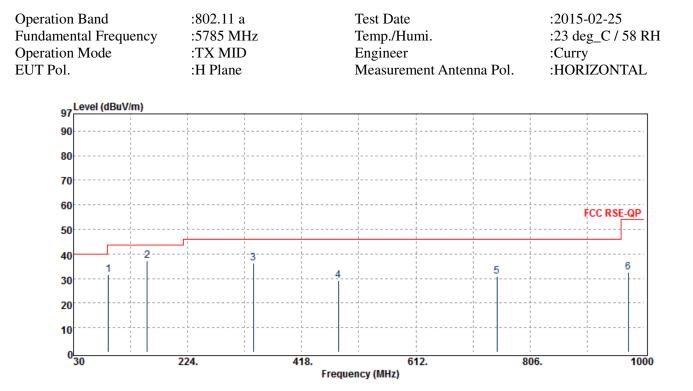
802.11a, 5725~5850 MHz

Operation Band :802.11 a Test Date :2015-02-25 **Fundamental Frequency** :5785 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 60 FCC RSE-QP 50 40 5 2 6 30 20 10 0<mark>_____</mark>30 224. 806. 1000 418. 612. Frequency (MHz)

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
88.20	S	Peak	49.13	-15.13	34.00	43.50	-9.50
204.60	S	Peak	42.43	-11.51	30.92	43.50	-12.58
310.33	S	Peak	49.53	-7.64	41.89	46.00	-4.11
500.45	S	Peak	39.61	-4.34	35.27	46.00	-10.73
749.74	S	Peak	33.70	0.27	33.97	46.00	-12.03
958.29	S	Peak	27.24	3.62	30.86	46.00	-15.14



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Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
89.17	S	Peak	46.86	-15.33	31.53	43.50	-11.97
155.13	S	Peak	46.43	-9.03	37.40	43.50	-6.10
335.55	S	Peak	43.95	-7.61	36.34	46.00	-9.66
480.08	S	Peak	33.94	-4.59	29.35	46.00	-16.65
749.74	S	Peak	30.51	0.27	30.78	46.00	-15.22
972.84	S	Peak	28.83	3.56	32.39	54.00	-21.61



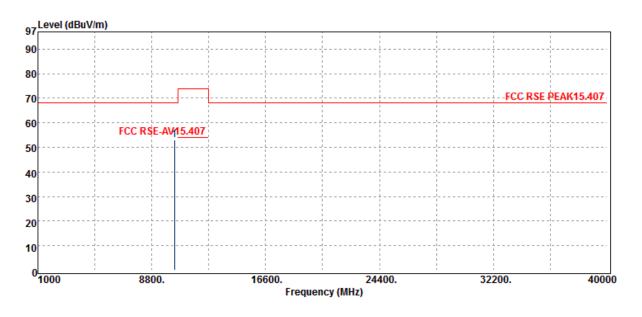
Above 1GHz Worst-Case Data (Internal Antenna):

802.11a, 5150~5250 MHz

Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 a :5180 MHz :TX LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-02-25 :23 deg_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	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Н	Peak	35.23	17.65	52.88	68.30	-15.42



Η

Peak

FCC ID: HD5-VM3WLANA

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Operation Band Fundamental Fr Operation Mode EUT Pol.	equency	:802.11 a :5180 MHz :TX LOW :H Plane		Test Date Temp./Humi. Engineer Measurement 4	Antenna Pol.	:2015-02-25 :23 deg_C / . :Curry :HORIZON	
97 Level (d	lBuV/m)						
90							
80							
70				· · · · · · · · · · · · · · · · · · ·		FCC RSE PEAK15.	407
60							
	FCC F	SE-AV1 <u>5.407</u>					
50							
40							
30				J I_			
20							·
10	 		 				
0 1000	8	800.	16600. Freque	24400. ncy (MHz)	322	200.	40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

34.36

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有说明,此報告结果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or ap-pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134, WuKungRoad, NewTaipeiIndustrialPark, WukuDistrict, NewTaipeiCity, Taiwan24803/新北市五股區新北產業園區五工路 134 號

17.65

52.01

68.30

-16.29



000 11

FCC ID: HD5-VM3WLANA

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Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 118 of 289

2015 02 25

Operation Band Fundamental Frequency Operation Mode EUT Pol.	:802.11 a :5220 MHz :TX MID :H Plane	Te Er	est Date emp./Humi. ngineer easurement An	:2015-02-25 :23 deg_C / 5 :Curry :VERTICAL	8 RH	
97 Level (dBuV/m)					1	
90			·			
80						
70					- FCC RSE PEAK15.4	07
60 FCC R	SE-AV15.407					
50						
40						
30						·
20						
10						·
0 <mark></mark> 8	800.	16600. Frequency	24400. / (MHz)	322	200. 4	0000
Freq. Note	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
10440.00 H	Peak	35.52	18.47	53.99	68.30	-14.31



FCC ID: HD5-VM3WLANA

Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 119 of 289

Operation Band Fundamental Fr Operation Mode EUT Pol.	requency	:802.11 a :5220 MHz :TX MID :H Plane		Test Date Temp./Humi. Engineer Measurement Ar	ntenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT	
97	dBuV/m)						
90							·
80							
70				, , , , , , , , , , , , , , , , , , ,		FCC RSE PEAK15.4	07.
60							
50	FUCH	SE-AV1 <u>5.407</u>		 			
40			L	1 I 1 I 1 J 1 J 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I			
30				1 I 1 I 1 J 1 J 1 J 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I 1 I			·
20							
10					· · · · · · · · · · · · · · · · · · ·		
0 <mark></mark> 1000	8	800.	16600. Freque	24400. ncy (MHz)	3220	0. 4	0000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Н	Peak	35.51	18.47	53.98	68.30	-14.32



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FCC ID: HD5-VM3WLANA

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2015 02 25

Operation Band Fundamental Frequency Operation Mode EUT Pol.	:802.11 a :5240 MHz :TX HIGH :H Plane	Te Er	Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-02-25 :23 deg_C / 5 :Curry :VERTICAL	8 RH
97 Level (dBuV/m)						
90			 			
80						
70					FCC RSE PEAK15.4	<u>07 -</u>
60	CC RSE-AV15.407					
50						
40						
30						
20			· · · · · · · · · · · · · · · · · · ·			
10						
0 1000	8800.	16600. Frequency	24400. / (MHz)	322	200. 4	0000
Freq. Note	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz F/H/E/	S PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00 H	Peak	34.68	18.23	52.91	68.30	-15.39



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Fundan	on Band nental Frequend on Mode ol.	:802.1 cy :5240 :TX H :H Pla	MHz IGH	Test Date Temp./Humi. Engineer Measurement A	Antenna Pol.	:2015-02-25 :23 deg_C / 58 :Curry :HORIZONTA	
97	evel (dBuV/m)			· · · ·			
<mark>90</mark> -							
80		·		· · · · · · · · · · · · · · · · · · ·			
70				· · · · · · · · · · · · · · · · · · ·	FC	C RSE PEAK15.407	
60		C RSE-AV15.407			· · · · · · · · · · · · · · · · · · ·		
50		C NGL-AV 13.407					
40							
30							
20							
10							
0			10000				
1	1000	8800.	16600. Freque	24400. ncy (MHz)	32200.	40000	
Fre	eq. No	te Dete	ector Spectr	um Factor	Actual	Limit	Margin
		Mo	de Reading	Level	FS	@3m	
Mł	Hz F/H/	E/S PK/Q	P/AV dBµV	V dB	dBµV/m	dBµV/m	dB
1048	0.00 ^Ц	[Da	ak 25.0	7 18.22	53 25	68 30	15.05
1048	0.00 H	I Pe	ak 35.02	2 18.23	53.25	68.30	-15.05



Band edge falling to restricted band

Operation Ban Fundamental I Operation Mod EUT Pol.	Frequency	:802.11 a :5180 MHz :Band Edge I :H Plane	LOW	Test Date Temp./Humi. OW Engineer Measurement Antenna Pol.			8 RH
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
5149.24	S	Average	35.24	10.32	45.56	54.00	-8.44
5149.24	S	Peak	58.01	10.32	68.33	74.00	-5.67
5150.00	E	Average	35.31	10.32	45.63	54.00	-8.37
5150.00	E	Peak	56.89	10.32	67.21	74.00	-6.79
Operation Band:802.11 aFundamental Frequency:5180 MHzOperation Mode:Band Edge LOWEUT Pol.:H Plane		LOW	Test Date Temp./Humi. DW Engineer Measurement Antenna Pol.		:2015-02-25 :23 deg_C / 58 RH :Curry :HORIZONTAL		
Freq.	Note	Detector Mode	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	35.78	10.32	46.10	54.00	-7.90
5150.00	E	Peak	57.66	10.32	67.98	74.00	-6.02



Radiated Spu	irious Emis	sion Measur	ement Result	802.11n HT20), 5150~5250	MHz (MIMC))
Operation Band		:802.11 n20N					
Fundamental F		:5180 MHz		Temp./Humi.		:23 deg_C / 5	8 RH
Operation Mod	le	:TX LOW		Engineer		:Curry	
EUT Pol.		:H Plane		Measurement An	ntenna Pol.	:VERTICAL	
97	dBuV/m)						
90							
80							
70				· · · · · · · · · · · · · · · · · · ·		FCC RSE PEAK15.4	07
60	FCC F	RSE-AV(15.407					·
50				, , , , , , , , , , , , , , , , , , ,			
40							
30							·
20							
10							
0 <mark></mark>	: 8	3800.	16600. Froque	24400. ncy (MHz)	322	00 . 4	10000
			Treque				
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Н	Peak	34.77	17.65	52.42	68.30	-15.88



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Fundamental Fr Operation Mode EUT Pol.	equency	:802.11 n20M :5180 MHz :TX LOW :H Plane		Test Date Temp./Hum Engineer Measureme		na Pol.	:Curry	g_C / 58 F	
97 Level (d	BuV/m)								
90									
80		-							
70					·		FCC RSE F	EAK15.407	
60	FCCB	SE-AV15.407							
50									
40									
30									
20			·				 		
10	·						 		
0 <mark></mark> 1000	8	800.	16600. Freque	2440 ency (MHz)	00.	3220	00.	4000	0
Freq.	Note	Detector	Spectrum	Fact	or	Actual	Lin	nit	Margin
		Mode	Reading Lev	/el		FS	@3		
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	3 C	lBµV/m	dBµ∖	//m	dB

34.98

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17.65

52.63

68.30



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Fundamental Fre Operation Mode EUT Pol.		:802.11 n20N :5220 MHz :TX MID :H Plane		Test Date Temp./Humi. Engineer Measurement Antenna Pol.		na Pol.	:2015-02-25 :23 deg_C / 58 R :Curry :VERTICAL		RН
97 Level (d	BuV/m)								1
90									
80							 		
70			·	· · · · · · · · · · · · · · · · · · ·			FCC RSE F	EAK15.407	
60	FCC F	SE-AV45.407				 	 		
50							 		
40			 				 		
30									
20									
10									
0 <mark></mark> 1000	: 8	800.	16600. Freque	244 ncy (MHz)	00.	322	00.	4000	0
Freq.	Note	Detector	Spectrum	Fac	tor	Actual	Lin		Margin
		Mode	Reading Lev			FS	@3		
MHz	F/H/E/S	PK/QP/AV	dBµV	dI	3	dBµV/m	dBµ∖	//m	dB

34.29

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18.47

52.76

68.30



Η

Peak

10440.00

FCC ID: HD5-VM3WLANA

Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5220 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV dBµV/m PK/QP/AV dBµV/m MHz F/H/E/S dB dB

34.60

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18.47

53.07

68.30



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5240 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV/m PK/QP/AV dBµV dBµV/m MHz F/H/E/S dB dB

35.19

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18.23

53.42

68.30

-14.88



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5240 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV/m PK/QP/AV dBµV dBµV/m MHz F/H/E/S dB dB

34.59

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18.23

52.82

68.30



Band edge falling to restricted band

Operation Ban Fundamental F Operation Mod EUT Pol.	adamental Frequency :5180 MHz Temp eration Mode :Band Edge LOW Engir		Test Date Temp./Humi. Engineer Measurement Ant	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL		
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Leve	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	35.73	10.32	46.05	54.00	-7.95
5150.00	E	Peak	55.93	10.32	66.25	74.00	-7.75

Operation Band	:802.11 n20M	Test Date	:2015-02-25
Fundamental Frequency	:5180 MHz	Temp./Humi.	:23 deg_C / 58 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plane	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 :

"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	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	38.58	10.32	48.90	54.00	-5.10
5150.00	E	Peak	60.77	10.32	71.09	74.00	-2.91



Operation Band	undamental Frequency:5190 MHzoperation Mode:TX LOW			,)) 8 RH
						:VERTICAL	
97	dBuV/m)						
90							
80							
70				i J	· · · · · · · · · · · · · · · · · · ·	FCC RSE PEAK15.4	07
60	FCCI	RSE-AV15.407					·
50		кас-Ам <u>ір.407</u>			·		
40							
30							
20			1				
10							·
0 <mark></mark>	; {	3800 .	16600. Eroquo	24400. ncy (MHz)	322	200. 4	10000
			rieque	псу (мпz)			
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Leve	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10380.00	Н	Peak	35.03	18.00	53.03	68.30	-15.27



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5190 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV dBµV/m PK/QP/AV dBµV/m MHz F/H/E/S dB dB

34.22

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52.22

18.00

68.30

-16.08



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5230 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry :VERTICAL EUT Pol. :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV dBµV/m PK/QP/AV dBµV/m MHz F/H/E/S dB dB

33.61

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18.36

51.97

68.30

-16.33



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5230 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV dBµV/m PK/QP/AV dBµV/m MHz F/H/E/S dB dB

35.51

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18.36

53.87

68.30

-14.43



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Band edge falling to restricted band

Operation Ban	ıd	:802.11 n40N	:802.11 n40M Test Date		:2015-02-25		
Fundamental I	Frequency	:5190 MHz		Temp./Humi.		:23 deg_C / 58 RH	
Operation Mo	de	:Band Edge I	LOW	Engineer		:Curry	
EUT Pol.		:H Plane		Measurement An	tenna Pol.	:VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Leve	Factor	Actual FS	Limit @3m	Margin
			e				
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	37.28	10.32	47.60	54.00	-6.40
5150.00	E	Peak	53.93	10.32	64.25	74.00	-9.75

Operation Bar Fundamental I Operation Mo EUT Pol.	Frequency	:802.11 n40N :5190 MHz :Band Edge I :H Plane	LOW	Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-02-25 :23 deg_C / 58 RH :Curry enna Pol. :HORIZONTAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
5150.00	Е	Average	40.62	10.32	50.94	54.00	-3.06
5150.00	Е	Peak	62.29	10.32	72.61	74.00	-1.39



Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz **Operation Band** :802.11 a Test Date :2015-02-25 **Fundamental Frequency** :5260 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000

16600.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	Н	Peak	34.42	18.35	52.77	68.30	-15.53

Frequency (MHz)

24400.

32200.

40000

8800.



Η

Peak

FCC ID: HD5-VM3WLANA

Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 136 of 289

Operation Band Fundamental Fr Operation Mode EUT Pol.	equency	:802.11 a :5260 MHz :TX LOW :H Plane		Test Date Temp./Humi. Engineer Measurement A	Antenna Pol.	:2015-02-25 :23 deg_C / : :Curry :HORIZONT	
97 Level (d	BuV/m)						
90							
80							
70						FCC RSE PEAK15.	407
60							
	FCC F	SE-AV15.407					
50							
40							
30							
20							
10				i i 			
0 <mark></mark>	8	800.	16600. Freque	24400. ncy (MHz)	322	200.	40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

34.34

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18.35

52.69

68.30



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5300 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Factor Margin Detector Spectrum Actual Limit . ~

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
10600.00	Н	Average	22.48	18.69	41.17	54.00	-12.83
10600.00	Н	Peak	34.16	18.69	52.85	74.00	-21.15



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5300 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq Note Detector Spectrum Factor Actual I imit Margin

ricq.	Note	Dettettor	Spectrum	Tactor	Actual	Lillit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
10600.00	Н	Average	22.49	18.69	41.18	54.00	-12.82	
10600.00	Н	Peak	34.30	18.69	52.99	74.00	-21.01	



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5320 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV 25.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Reading Level FS Mode @3m

			widde	Reading Level		15	eom		
_	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
-									_
	10640.00	Н	Average	22.51	19.02	41.53	54.00	-12.47	
	10640.00	Н	Peak	34.84	19.02	53.86	74.00	-20.14	



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5320 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :HORIZONTAL 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Н	Average	22.40	19.02	41.42	54.00	-12.58
10640.00	Н	Peak	33.54	19.02	52.56	74.00	-21.44



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Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5320 MHz :Band Edge HIGH :H Plane		Test Date Temp./Humi. Engineer Measurement Ant	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL		
Freq.	Note	Detector Mode	Spectrum Reading Leve	Factor	Actual FS	Limit @3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
5350.00	E	Average	37.13	10.97	48.10	54.00	-5.90	
5350.00	E	Peak	54.82	10.97	65.79	74.00	-8.21	

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5320 MHz :Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement Ant	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :HORIZONTAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	37.02	10.97	47.99	54.00	-6.01
5350.00	E	Peak	55.82	10.97	66.79	74.00	-7.21



Radiated Spu	urious Emis	ssion Measur	ement Result	802.11n HT2	0, 5250~5350	MHz (MIMC))
Operation Band Fundamental Frequency Operation Mode		:802.11 n201		Test Date		:2015-02-25	
		:5260 MHz		Temp./Humi.		:23 deg_C / 5	8 RH
		:TX LOW		Engineer		:Curry	
EUT Pol.		:H Plane		Measurement A	Intenna Pol.	:VERTICAL	
97	(dBuV/m)						
90							
80							
70						FCC RSE PEAK15.4	107
60	FCC I	RSE-AV1 <u>5.407</u>					
50							·
40							·
30	 						
20							
10							
0	5	3800.	16600.	24400.	322	00 4	10000
1000				ncy (MHz)	JLL		
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
10520.00	Н	Peak	34.08	18.35	52.43	68.30	-15.87



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5260 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV dBµV/m PK/QP/AV dBµV/m MHz F/H/E/S dB dB

34.66

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18.35

53.01

68.30



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5300 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** Engineer :TX MID :Curry EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV 25.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
									-
	10600.00	Н	Average	22.56	18.69	41.25	54.00	-12.75	
	10600.00	Н	Peak	34.90	18.69	53.59	74.00	-20.41	



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5300 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :H Plane :HORIZONTAL Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
	10600.00	Н	Average	22.49	18.69	41.18	54.00	-12.82	
	10600.00	Н	Peak	33.61	18.69	52.30	74.00	-21.70	



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5320 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry :VERTICAL EUT Pol. :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV 25.407 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Н	Average	22.58	19.02	41.60	54.00	-12.40
10640.00	Н	Peak	34.66	19.02	53.68	74.00	-20.32



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5320 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** Engineer :TX HIGH :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
_									_
	10640.00	Н	Average	22.42	19.02	41.44	54.00	-12.56	
	10640.00	Н	Peak	33.79	19.02	52.81	74.00	-21.19	



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Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5310 MHz :Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Leve	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	37.95	10.97	48.92	54.00	-5.08
5350.00	E	Peak	53.92	10.97	64.89	74.00	-9.11

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5310 MHz :Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :HORIZONTAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Leve	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Е	Average	39.05	10.97	50.02	54.00	-3.98
5350.00	Е	Peak	58.13	10.97	69.10	74.00	-4.90



Radiated Spurious Em Operation Band Fundamental Frequency Operation Mode EUT Pol.		mission Measurement Resu :802.11 n40M :5270 MHz :TX LOW :H Plane		802.11n HT4 Test Date Temp./Humi. Engineer Measurement A		0 MHz (MIMO) :2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL		
97 Level ((dBuV/m)							
90								
80								
						FCC RSE PEAK15.4	07	
70						FUU KSE PEANIDA	<u></u>	
60	FCC I	RSE-AV15.407						
50							·	
40								
30				· · · · · · · · · · · · · · · · · · ·				
20								
10				1 1 1 1 1 1 1 1				
0 <mark>1000</mark>	8	3800.	16600. Freques	24400. ncy (MHz)	322	00. 4	10000	
			rieque					
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Leve	el	FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
		~	· ·			· *		
10540.00	Н	Peak	34.37	18.45	52.82	68.30	-15.48	



Η

Peak

FCC ID: HD5-VM3WLANA

-15.72

Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5270 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV dBµV/m PK/QP/AV dBµV/m MHz F/H/E/S dB dB

34.13

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52.58

18.45

68.30



Operation Band :802.11 n40M Test Date :2015-02-25 **Fundamental Frequency** :5310 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz)

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
10620.00	Н	Average	22.33	18.86	41.19	54.00	-12.81
10620.00	Н	Peak	34.24	18.86	53.10	74.00	-20.90



Operation Band :802.11 n40M Test Date :2015-02-25 **Fundamental Frequency** :5310 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz) Frea Note Detector Spectrum Factor Actual I imit Margin

rieq.	Note	Delector	Spectrum	Factor	Actual	LIIIIIt	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
10620.00	Н	Average	22.25	18.86	41.11	54.00	-12.89	
10620.00	Н	Peak	33.95	18.86	52.81	74.00	-21.19	



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Band edge falling to restricted band

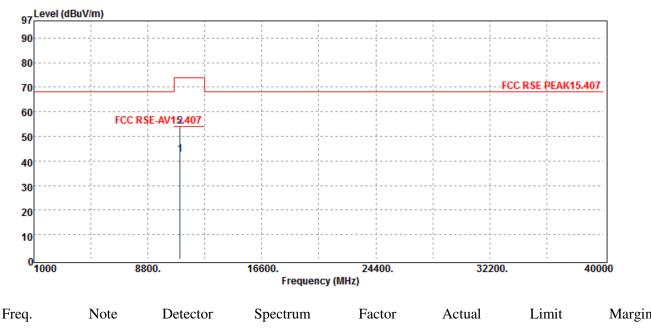
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5310 MHz :Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Leve	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Е	Average	39.42	10.97	50.39	54.00	-3.61
5350.00	Е	Peak	56.18	10.97	67.15	74.00	-6.85

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5310 MHz :Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement Ant	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :HORIZONTAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	42.51	10.97	53.48	54.00	-0.52
5350.00	E	Peak	62.20	10.97	73.17	74.00	-0.83



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

Operation Band	:802.11 a	Test Date	:2015-02-25
Fundamental Frequency	:5500 MHz	Temp./Humi.	:23 deg_C / 58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



1.1	cy.	Note	Dettettor	Spectrum	racion	Actual	Lillit	Margin	
			Mode	Reading Level		FS	@3m		
М	Hz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
1100	00.00	Н	Average	22.97	19.82	42.79	54.00	-11.21	
1100	00.00	Н	Peak	34.08	19.82	53.90	74.00	-20.10	



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5500 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :HORIZONTAL 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV12.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
11000.00	Н	Average	22.34	19.82	42.16	54.00	-11.84
11000.00	Н	Peak	34.06	19.82	53.88	74.00	-20.12



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5580 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15/407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Spectrum Margin Detector Factor Actual Limit . . . -~ ~

			Mode	Reading Level		FS	@3m		
	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
-									
	11160.00	Н	Average	23.27	20.21	43.48	54.00	-10.52	
	11160.00	Н	Peak	33.50	20.21	53.71	74.00	-20.29	



11160.00

Η

Η

Average

Peak

FCC ID: HD5-VM3WLANA

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Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5580 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV152407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV/m PK/QP/AV dBµV dBµV/m MHz F/H/E/S dB dB

22.53

34.40

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20.21

20.21

42.74

54.61

54.00

74.00

-11.26

-19.39



Operation Band :802.11 a Test Date :2015-02-25 **Fundamental Frequency** :5700 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15A07 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Note

	Freq.		Detector	Spectrum	Factor	Actual	Limit	Margin
			Mode	Reading Level		FS	@3m	
_	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
	11400.00	Н	Average	23.11	20.65	43.76	54.00	-10.24
	11400.00	Н	Peak	34.00	20.65	54.65	74.00	-19.35



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5700 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :HORIZONTAL 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11400.00	Н	Average	22.94	20.65	43.59	54.00	-10.41
11400.00	Н	Peak	35.04	20.65	55.69	74.00	-18.31



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Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5500 MHz :Band Edge LOW :H Plane		Test Date Temp./Humi. Engineer Measurement Ar	ntenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :VERTICAL	8 RH
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	rel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	E	Average	34.15	10.89	45.04	54.00	-8.96
5460.00	E	Peak	51.10	10.89	61.99	74.00	-12.01
5470.00	E	Average	37.16	10.91	48.07	54.00	-5.93
5470.00	E	Peak	58.51	10.91	69.42	74.00	-4.58
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5500 MHz :Band Edge I :H Plane	LOW	Test Date Temp./Humi. Engineer Measurement Ar	ntenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONTA	
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	E	Average	33.43	10.89	44.32	54.00	-9.68
5460.00	E	Peak	50.62	10.89	61.51	74.00	-12.49
5470.00	E	Average	37.96	10.91	48.87	54.00	-5.13
5470.00	E	Peak	59.35	10.91	70.26	74.00	-3.74



5725.00

E

E

Average

Peak

39.21

57.06

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Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5700 MHz :Band Edge I :H Plane	HIGH	Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :VERTICAL	8 RH
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Average	42.41	11.04	53.45	54.00	-0.55
5725.00	Е	Peak	59.71	11.04	70.75	74.00	-3.25
5727.08	S	Average	40.70	11.05	51.75	54.00	-2.25
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5700 MHz :Band Edge I :H Plane	HIGH	Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONTA	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

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11.04

11.04

50.25

68.10

54.00

74.00

-3.75

-5.90



Η

Peak

Radiated Spurious Em Operation Band Fundamental Frequency Operation Mode	l	ssion Measur :802.11 n201 :5500 MHz	M 7	802.11n HT20 Test Date Temp./Humi.), 5470~5725	MHz (MIMC :2015-02-25 :23 deg_C / 5	
Operation Mode		:TX LOW		Engineer		:Curry	0101
EUT Pol.	-	:H Plane		Aeasurement Ar	ntenna Pol.	:VERTICAL	
a-Level (dBuV/m)						
97							
80			· · · · · · · · · · · · · · · · · · ·				
70			· · · · · · · · · · · · · · · · · · ·	 		FCC RSE PEAK15.4	07
60	FCCI	RSE-AV12.407					
50	FUU	KSE-AV1 <u>2.407</u>					
40							
30							
20							
10			·				
0		B800.	16600.	24400.	3220	0. 4	10000
				cy (MHz)			
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Leve	1	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Н	Average	22.70	19.82	42.52	54.00	-11.48

34.17

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19.82

53.99

74.00

-20.01



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5500 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV18.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
11000.00	Н	Average	22.39	19.82	42.21	54.00	-11.79
11000.00	Н	Peak	35.05	19.82	54.87	74.00	-19.13



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5580 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV152407 50 40 30 20 10 0^L 1000 8800. 40000 16600. 24400. 32200. Frequency (MHz) Frea Note Detector Spectrum Factor Actual Limit Margin

rieq.	1,010	Detector	Speedum	1 detoi	rietuur	Linit	margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
11160.00	Н	Average	23.21	20.21	43.42	54.00	-10.58	
11160.00	Н	Peak	33.58	20.21	53.79	74.00	-20.21	



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Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5580 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV152407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m

MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	-
11160.00	Н	Average	22.53	20.21	42.74	54.00	-11.26	
11160.00	Н	Peak	33.82	20.21	54.03	74.00	-19.97	



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5700 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz) Frea Note Detector Spectrum Factor Actual Limit Margin

	rieq.	1000	Dettettor	Speedulli	1 actor	netuai	Linnt	Widigin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
	11400.00	Н	Average	23.12	20.65	43.77	54.00	-10.23	
	11400.00	Н	Peak	34.25	20.65	54.90	74.00	-19.10	



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5700 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** Engineer :TX HIGH :Curry EUT Pol. :H Plane :HORIZONTAL Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15/407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
	11400.00	Н	Average	22.85	20.65	43.50	54.00	-10.50	
	11400.00	Н	Peak	33.65	20.65	54.30	74.00	-19.70	



5460.00

5470.00

5470.00

E

E

E

E

FCC ID: HD5-VM3WLANA

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-8.18

-10.52

-8.19

-3.33

Band edge falling to restricted band

Operation Ban Fundamental I Operation Mo EUT Pol.	Frequency	:802.11 n20N :5500 MHz :Band Edge I :H Plane	O MHzTemp./Humi.d Edge LOWEngineer		:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL		
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
5460.00	E	Average	34.36	10.89	45.25	54.00	-8.75
5460.00	Е	Peak	51.49	10.89	62.38	74.00	-11.62
5470.00	Е	Average	38.25	10.91	49.16	54.00	-4.84
5470.00	E	Peak	61.67	10.91	72.58	74.00	-1.42
Operation Band:802.11 n20MFundamental Frequency:5500 MHzOperation Mode:Band Edge LOWEUT Pol.:H Plane			Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT.		
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

34.93

52.59

34.90

59.76

Average

Peak

Average

Peak

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10.89

10.89

10.91

10.91

45.82

63.48

45.81

70.67

54.00

74.00

54.00

74.00



E

Peak

FCC ID: HD5-VM3WLANA

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Operation Bar Fundamental 1 Operation Mo EUT Pol.	idamental Frequency:5700 MHzTemp./Humi.eration Mode:Band Edge HIGHEngineer		:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL				
Freq.	Note	Detector Mode	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Average	42.34	11.04	53.38	54.00	-0.62
5725.00	Е	Peak	61.55	11.04	72.59	74.00	-1.41
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n20M :5700 MHz :Band Edge F :H Plane		Test Date Temp./Humi. Engineer Measurement Ar	ntenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT.	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	/el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Average	38.66	11.04	49.70	54.00	-4.30

57.90

11.04

68.94

74.00

-5.06



11020.00

Η

Η

Average

Peak

Radiated Spu Operation Band Fundamental F Operation Mod EUT Pol.	l requency	ssion Measure :802.11 n40N :5510 MHz :TX LOW :H Plane	1	t Result 802.11n HT40, 5470~572. Test Date Temp./Humi. Engineer Measurement Antenna Pol.		MHz (MIM) :2015-02-25 :23 deg_C / :Curry :VERTICAL	58 RH
97Level (dBuV/m)						
90							
80		· · · · · · · · · · · · · · · · · · ·		i 			
70						FCC RSE PEAK15	.407
60				· · · · · · · · · · · · · · · · · · ·			
50	FCC	RSE-AV1 <u>2.407</u>		 			
		1					
40	J					· · · · · · · · · · · · · · · · · · ·	
30	·					· · · · · · · · · · · · · · · · · · ·	
20							
10			 				
0		8800.	16600.	24400.	3220	0	40000
1000		8800.		24400. ncy (MHz)	3220	υ.	40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

22.36

33.98

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19.81

19.81

42.17

53.79

54.00

74.00

-11.83

-20.21



Operation Band :802.11 n40M Test Date :2015-02-25 **Fundamental Frequency** :5510 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

etector Spectrum	Factor	Actual	Limit	Margin
Node Reading Level		FS	@3m	
QP/AV dBµV	dB	dBµV/m	dBµV/m	dB
verage 22.27	19.81	42.08	54.00	-11.92
Peak 33.75	19.81	53.56	74.00	-20.44
	AodeReading LevelQP/AVdBμVverage22.27	Aode Reading Level QP/AV dBμV dB verage 22.27 19.81	AodeReading LevelFS QP/AV $dB\mu V$ dB $dB\mu V/m$ verage22.2719.8142.08	AodeReading LevelFS $@3m$ QP/AV $dB\mu V$ dB $dB\mu V/m$ $dB\mu V/m$ verage22.2719.8142.0854.00



Operation Band :802.11 n40M Test Date :2015-02-25 **Fundamental Frequency** :5550 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

Note	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
Н	Average	22.87	20.23	43.10	54.00	-10.90
Н	Peak	34.06	20.23	54.29	74.00	-19.71
	F/H/E/S H	ModeF/H/E/SPK/QP/AVHAverage	ModeReading LevelF/H/E/SPK/QP/AVdBμVHAverage22.87	ModeReading LevelF/H/E/SPK/QP/AVdBμVdBHAverage22.8720.23	ModeReading LevelFSF/H/E/SPK/QP/AVdBμVdBdBμV/mHAverage22.8720.2343.10	ModeReading LevelFS@3mF/H/E/SPK/QP/AV $dB\mu V$ dB $dB\mu V/m$ $dB\mu V/m$ HAverage22.8720.2343.1054.00



Operation Band :802.11 n40M Test Date :2015-02-25 **Fundamental Frequency** :5550 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz)

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
11100.00	Н	Average	22.15	20.23	42.38	54.00	-11.62
11100.00	Н	Peak	33.27	20.23	53.50	74.00	-20.50



Operation Band :802.11 n40M Test Date :2015-02-25 **Fundamental Frequency** :5670 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV152407 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz) Freq Note Detector Spectrum Factor Actual Limit Margin

ricq.	Note	Dettettoi	Spectrum	ractor	Actual	Lillin	Wiaigin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
11340.00	Н	Average	22.78	20.64	43.42	54.00	-10.58	
11340.00	Н	Peak	33.76	20.64	54.40	74.00	-19.60	



Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5670 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV152407 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11340.00	Н	Average	22.31	20.64	42.95	54.00	-11.05
11340.00	Н	Peak	33.00	20.64	53.64	74.00	-20.36



Band edge falling to restricted band

Fundamental Frequency:551Operation Mode:Bar		:802.11 n40N :5510 MHz :Band Edge I :H Plane	LOW	Test Date Temp./Humi. Engineer Measurement Ant	enna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Е	Average	36.34	10.89	47.23	54.00	-6.77
5460.00	Е	Peak	54.26	10.89	65.15	74.00	-8.85
5470.00	Е	Average	42.42	10.91	53.33	54.00	-0.67
5470.00	Е	Peak	61.33	10.91	72.24	74.00	-1.76

Operation Band	:802.11 n40M	Test Date	:2015-02-25
Fundamental Frequency	:5510 MHz	Temp./Humi.	:23 deg_C / 58 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plane	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 :

"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	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	E	Average	36.48	10.89	47.37	54.00	-6.63
5460.00	E	Peak	54.01	10.89	64.90	74.00	-9.10
5470.00	E	Average	42.27	10.91	53.18	54.00	-0.82
5470.00	E	Peak	61.29	10.91	72.20	74.00	-1.80

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E

Peak

56.21

11.04

67.25

74.00

-6.75

FCC ID: HD5-VM3WLANA

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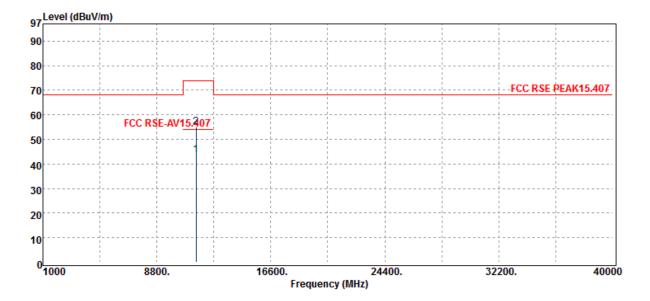
Operation Bar Fundamental I Operation Mo EUT Pol.	Frequency	:802.11 n40M :5670 MHz :Band Edge H :H Plane		Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Average	42.16	11.04	53.20	54.00	-0.80
5725.00	Е	Peak	58.32	11.04	69.36	74.00	-4.64
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n40M :5670 MHz :Band Edge F :H Plane		Test Date Temp./Humi. Engineer Measurement An	ntenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONTA	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	/el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Average	38.45	11.04	49.49	54.00	-4.51



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

Operation Band	:802.11 a
Fundamental Frequency	:5745 MHz
Operation Mode	:TX LOW
EUT Pol.	:H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-02-25 :23 deg_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	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00	Н	Average	22.81	20.81	43.62	54.00	-10.38
11490.00	Н	Peak	34.23	20.81	55.04	74.00	-18.96



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Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5745 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 Level (dBuV/m) 90 80 FCC RSE PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0<mark>1000</mark> 8800. 40000 16600. 24400. 32200. Frequency (MHz) Freq. Note Detector Spectrum Factor Actual Limit Margin FS Reading Level @3m Mode MHz F/H/E/S PK/QP/AV dBµV dB dBµV/m dBµV/m dB Average 11490.00 Η 22.77 20.81 43.58 54.00 -10.4211490.00 Η Peak 34.26 20.81 55.07 74.00 -18.93

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11570.00

Η

Η

Average

Peak

FCC ID: HD5-VM3WLANA

Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 180 of 289

Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5785 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15. 407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV/m dBµV/m PK/QP/AV dBµV MHz F/H/E/S dB dB

22.52

34.45

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21.16

21.16

43.68

55.61

54.00

74.00

-10.32

-18.39



11570.00

Η

Η

Average

Peak

FCC ID: HD5-VM3WLANA

Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 181 of 289

Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5785 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15. 207 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV/m dBµV/m PK/QP/AV dBµV MHz F/H/E/S dB dB

22.47

33.88

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21.16

21.16

43.63

55.04

54.00

74.00

-10.37

-18.96



11650.00

Η

Η

Average

Peak

FCC ID: HD5-VM3WLANA

Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 182 of 289

Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5825 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV/m dBµV/m PK/QP/AV dBµV MHz F/H/E/S dB dB

22.22

33.79

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20.93

20.93

43.15

54.72

54.00

74.00

-10.85

-19.28



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5825 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :HORIZONTAL 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Limit Margin Factor Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11650.00	Н	Average	22.09	20.93	43.02	54.00	-10.98
11650.00	Н	Peak	33.67	20.93	54.60	74.00	-19.40



Band edge falling to restricted band

Operation Band		:802.11 a		Test Date		:2015-02-25	
Fundamental Frequency		:5745 MHz		Temp./Humi.		:23 deg_C / 58 RH	
Operation Mode		:Band Edge LOW		Engineer		:Curry	
EUT Pol.		:H Plane M		Measurement Ant	Measurement Antenna Pol.		
Freq.	Note	Detector Mode	Spectrum Reading Leve			Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Peak	66.53	11.04	77.57	78.20	-0.63

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5745 MHz :Band Edge LOW		Test Date Temp./Humi. Engineer Measurement Ant	enna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :HORIZONTAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
5724.50	S	Peak	62.83	11.04	73.87	78.20	-4.33
5725.00	Е	Peak	61.47	11.04	72.51	78.20	-5.69



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Operation Bar Fundamental l Operation Mo EUT Pol.	damental Frequency:5825 MHzTemp./Heration Mode:Band Edge HIGHEngineer		Test Date Temp./Humi. Engineer Measurement An	emp./Humi. :23 deg_C / 58			
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	60.61	11.50	72.11	78.20	-6.09
5854.10	S	Peak	61.32	11.50	72.82	78.20	-5.38
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5825 MHz :Band Edge I :H Plane	HIGH	Test Date Temp./Humi. Engineer Measurement An	ttenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT.	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	60.81	11.50	72.31	78.20	-5.89



Η

Peak

FCC ID: HD5-VM3WLANA

Radiated Spe Operation Ban Fundamental F Operation Mod EUT Pol.	d Frequency	ssion Measur :802.11 n201 :5745 MHz :TX LOW :H Plane	М	802.11n HT2 Test Date Temp./Humi. Engineer Measurement A	20, 5725~585 0 Antenna Pol.	MHz (MIM :2015-02-25 :23 deg_C / :Curry :VERTICA	5 58 RH
97	(dBuV/m)						
90			 				
80			 				
70						FCC RSE PEAK1	5.407
60	FCC	RSE-AV1 <u>5.407</u>			· · · · · · · · · · · · · · · · · · ·		
50		NGL-AV 13.401			· · · · · · · · · · · · · · · · · · ·		
40							
30							
20							
10					i i i i i i i i i i i i i i i i i i i		
0 <mark></mark>		B800.	16600.	24400.	322	00	40000
1000				ncy (MHz)	522	.00.	40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00	Н	Average	22.77	20.81	43.58	54.00	-10.42

34.89

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20.81

55.70

74.00

-18.30



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5745 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :HORIZONTAL Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Spectrum Margin Detector Factor Actual Limit . . . -~ ~

		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
11490.00	Н	Average	22.71	20.81	43.52	54.00	-10.48	
11490.00	Н	Peak	34.25	20.81	55.06	74.00	-18.94	



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5785 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry :VERTICAL EUT Pol. :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15. **4**07 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz) Freq. Note Detector Spectrum Limit Margin Factor Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Н	Average	22.99	21.16	44.15	54.00	-9.85
11570.00	Н	Peak	33.63	21.16	54.79	74.00	-19.21



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5785 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 207 FCC RSE-AV15. 50 40 30 20 10 0^L 1000 8800. 40000 16600. 24400. 32200. Frequency (MHz) Freq. Note Detector Spectrum Limit Margin Factor Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Н	Average	22.47	21.16	43.63	54.00	-10.37
11570.00	Н	Peak	34.34	21.16	55.50	74.00	-18.50



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5825 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry :VERTICAL EUT Pol. :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 407 FCC RSE-AV15. 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz) Freq. Note Detector Spectrum Limit Margin Factor Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11650.00	Н	Average	22.25	20.93	43.18	54.00	-10.82
11650.00	Н	Peak	34.56	20.93	55.49	74.00	-18.51



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5825 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz) Freq Note Detector Spectrum Factor Actual I imit Margin

ricq.	Note	Dettettoi	Speenum	ractor	Actual	Lillin	wiaigin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
11650.00	Н	Average	22.04	20.93	42.97	54.00	-11.03	
11650.00	Н	Peak	33.93	20.93	54.86	74.00	-19.14	



Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5745 MHz :Band Edge LOW		Test Date Temp./Humi. Engineer Measurement Ar	ntenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Peak	66.57	11.04	77.61	78.20	-0.59
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n20N :5745 MHz :Band Edge I :H Plane		Test Date Temp./Humi. Engineer Measurement Ar	ntenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONTA	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	/el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Peak	62.39	11.04	73.43	78.20	-4.77



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Fundamental I	Operation Band:802.11 n20MFundamental Frequency:5825 MHzOperation Mode:Band Edge HIGHEUT Pol.:H Plane		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :VERTICAL	8 RH	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	66.34	11.50	77.84	78.20	-0.36
Operation Bar Fundamental I Operation Mo EUT Pol.	Frequency	:802.11 n20M :5825 MHz :Band Edge H :H Plane		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT.	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	64.26	11.50	75.76	78.20	-2.44



Radiated Spurious Emission Measurement Result (802.11n (5GHz)_40M) (MIMO)

Operation Band :802.11 n40M Test Date :2015-02-25 Fundamental Frequency :5755 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL evel (dBuV/m) 9 90 80 ECC RSE PEAK15 70 60 FCC RSE-AV15.407 50 40 30 20 10 ⁰1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Actual Limit Margin FS Reading Level @3m Mode

			Widde	Reading Level		15	esm		
	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
-									
	11510.00	Н	Average	22.89	21.03	43.92	54.00	-10.08	
	11510.00	Н	Peak	35.66	21.03	56.69	74.00	-17.31	

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11510.00

Η

Η

Average

Peak

FCC ID: HD5-VM3WLANA

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Operation Band Fundamental F Operation Mod EUT Pol.	requency	:802.11 n40N :5755 MHz :TX LOW :H Plane		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / :Curry :HORIZON	58 RH
97	dBuV/m)						
90							
80			 				
70			 			-FCC RSE PEAK15	407
60	FCC	R\$E-AV15.407	 				
50			 	· · · · · · · · · · · · · · · · · · ·			
40							
30							
20				 			
10				i i i i i i i i i i i i i i i i i i i			
0 <u></u> 1000		8800.	16600. Freque	24400. ncy (MHz)	322	00.	40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Leve	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

22.57

34.10

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21.03

21.03

43.60

55.13

54.00

74.00

-10.40

-18.87



Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5795 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 407 FCC RSE-AV15. 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Spectrum Margin Detector Factor Actual Limit Moda Dooding Loval EC @2....

			Mode	Reading Level		гэ	@ 5III		
	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
-									
	11590.00	Н	Average	22.57	21.11	43.68	54.00	-10.32	
	11590.00	Н	Peak	34.93	21.11	56.04	74.00	-17.96	



Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5795 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 407 FCC RSE-AV15. 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m

MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
11590.00	Н	Average	22.31	21.11	43.42	54.00	-10.58
11590.00	Н	Peak	34.17	21.11	55.28	74.00	-18.72



Band edge falling to restricted band

Operation Bar Fundamental I Operation Mo EUT Pol.	nd Frequency	:5755 MHz :Band Edge LOW		Test Date Temp./Humi. Engineer Measurement Ar	ntenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL		
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
5725.00	Ε	Peak	66.02	11.04	77.06	78.20	-1.14	
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n40N :5755 MHz :Band Edge I :H Plane		Test Date Temp./Humi. Engineer Measurement Ar	ntenna Pol.	:2015-02-25 :23 deg_C / 53 :Curry :HORIZONTA		
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
5725.00	E	Peak	62.54	11.04	73.58	78.20	-4.62	



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Operation Ban Fundamental I Operation Mo EUT Pol.	Frequency	:802.11 n40N :5795 MHz :Band Edge I :H Plane	HIGH	Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Leve	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	E	Peak	55.96	11.50	67.46	78.20	-10.74

Operation Band	:802.11 n40M	Test Date	:2015-02-25
Fundamental Frequency	:5795 MHz	Temp./Humi.	:23 deg_C / 58 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

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

Factor(dB) = Antenna Factor(dB μ 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.

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	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	57.94	11.50	69.44	78.20	-8.76



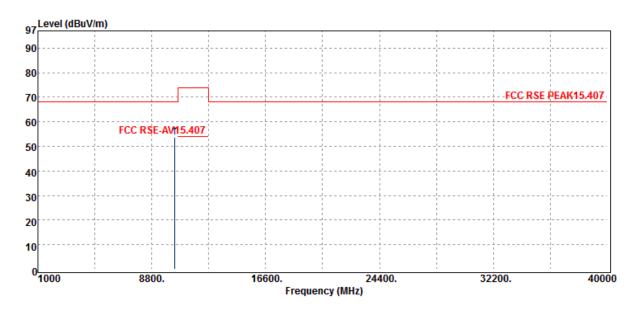
Above 1GHz Worst-Case Data (External Antenna):

802.11a, 5150~5250 MHz

Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11 a :5180 MHz :TX LOW :H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-02-25 :23 deg_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	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Н	Peak	35.98	17.65	53.63	68.30	-14.67



000 11

FCC ID: HD5-VM3WLANA

T D

Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 201 of 289

2015 02 25

Operation Banc Fundamental Fr Operation Mod EUT Pol.	requency	:802.11 a :5180 MHz :TX LOW :H Plane	ך ד	Test Date Temp./Humi. Engineer Measurement A	Antenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT	
97 Level (dBuV/m)	iii	; ;	i	i	i i	
90		I I I 					
80						· · · · · · · · · · · · · · · · · · ·	
70						FCC RSE PEAK15.4	107
60	FCC I	RSE-AV15.407					·
50							
40							·
30							·
20							
10					 		
0 <mark></mark> 1000	{	3800.	16600. Frequen	24400. cy (MHz)	32	200.	40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Leve	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	n dBµV/m	dB
10260.00			24.62	17.65	50.00	(0.20	16.02
10360.00	Н	Peak	34.63	17.65	52.28	68.30	-16.02



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Fundamental Free Operation Mode EUT Pol.		:802.11 a :5220 MHz :TX MID :H Plane		Test Date Temp./Humi. Engineer Measurement 4	Antenna Pol.	:2015-02-25 :23 deg_C / :Curry :VERTICAL	58 RH
97 Level (dl	BuV/m)						
90			·				
80							
70						FCC RSE PEAK15	.407
60	FCC R	SE-AV15.407					
50		13E-AV 15.401					
40							
30		- L	L				
20							
10							
0 <mark></mark>	0	800.	16600.	24400.	30	200.	40000
1000	0			ncy (MHz)	52.		40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
						<pre> • • •</pre>	

36.25

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18.47

54.72

68.30

-13.58



Η

Peak

000 11

FCC ID: HD5-VM3WLANA

T D

2015 02 25

eration Band ndamental Fr eration Mode JT Pol.	equency	:802.11 a :5220 MHz :TX MID :H Plane		Test Date Temp./Humi. Engineer Measurement A	Antenna Pol	:2015-02-25 :23 deg_C / . :Curry :HORIZON	
	Pu\//m)			ivicusurement i			
97 Level (d			1				
80		·					
70						FCC RSE PEAK15.	407
60							
50	FCC F	RSE-AV <u>15.407</u>					
40							
30							
20		·					
10							
0 <mark></mark>	8	800.	16600. Freque	24400. ency (MHz)	32	200.	40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Marg
_		Mode	Reading Lev	/el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

34.53

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18.47

53.00

68.30

-15.30



000 11

FCC ID: HD5-VM3WLANA

T D

Report No.: ER/2015/20010 Issue Date: Mar. 10, 2015 Page 204 of 289

2015 02 25

:802.11 a :5240 MHz :TX HIGH :H Plane	Te En	Test Date Temp./Humi. Engineer Measurement Antenna Pol.			8 RH
i i		1			
· · · · · · · · · · · · · · · · · · ·			 	FCC RSE PEAK15.4	<u>07.</u>
R\$E-AV45.407				 	·
					·
					·
8800.	16600. Frequency	24400. (MHz)	322	00. 4	0000
Detector	Spectrum	Factor	Actual	Limit	Margin
Mode	Reading Level		FS	@3m	
PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
Peak	34.66	18.23	52.89	68.30	-15.41
	:5240 MHz :TX HIGH :H Plane RSE-AV45.407 8800. Betector Mode PK/QP/AV	:5240 MHz Te :TX HIGH En :H Plane Ma R\$E-AV45.407 Image: Constraint of the second	:5240 MHz :TX HIGH :H Plane Measurement An RSE-AV15.407 8800. 16600. 24400. Frequency (MHz) Detector Spectrum Factor Mode Reading Level PK/QP/AV dBμV dB	 S240 MHz Temp./Humi. TX HIGH Engineer H Plane Measurement Antenna Pol. 	 S240 MHz Temp./Humi. :23 deg_C / 53 :TX HIGH Engineer :Curry :H Plane Measurement Antenna Pol. :VERTICAL FCC RSE PEAK15.44 FCC RSE PEAK15.44 RSE-AV45.407 6600. 24400. 32200. 44 Frequency (MHz) Detector Spectrum Factor Actual Limit Mode Reading Level FS @3m PK/QP/AV dBµV dB dBµV/m dBµV/m



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Bar		:802.11 a		Test Date		:2015-02-25	
Fundamental Operation Mc		:5240 MHz :TX HIGH		Temp./Humi. Engineer		:23 deg_C / 58 :Curry	5 KH
EUT Pol.	iuc -	:H Plane		Measurement A	ntenna Pol.	:HORIZONTA	AL.
			-				
97	uV/m)		- · · ·		• •		
90	·						
80							
70					FCC	RSE PEAK15.407	
60				 	 	 	
50	FCC RSE	-AV <u>15.407</u>		 			
40							
30							
20							
10							
0 ^L 1000	8800).	16600. Frequency (24400. MHz)	32200.	40000)
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Leve	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

34.91

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18.23

53.14

68.30

-15.16



Band edge falling to restricted band

Operation Band Fundamental F Operation Mod EUT Pol.	requency	:802.11 a :5180 MHz :Band Edge I :H Plane	1		tenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :VERTICAL	8 RH
Freq.	Note	Detector Mode	Spectrum Reading Leve	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Е	Average	36.01	10.32	46.33	54.00	-7.67
5150.00	Е	Peak	62.60	10.32	72.92	74.00	-1.08

Operation Bar Fundamental I Operation Mo EUT Pol.	Frequency	:802.11 a :5180 MHz :Band Edge I :H Plane	5180 MHz Temp./I Band Edge LOW Engined		o./Humi.		:2015-02-25 :23 deg_C / 58 RH :Curry :HORIZONTAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Lev	el	FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
5150.00	Е	Average	30.03	10.32	40.35	54.00	-13.65	
5150.00	E	Peak	51.04	10.32	61.36	74.00	-12.64	



Radiated Spu Operation Band Fundamental Fr Operation Mod EUT Pol.	l requency	ssion Measur :802.11 n20N :5180 MHz :TX LOW :H Plane	М	t Result 802.11n HT20, 5150~525 Test Date Temp./Humi. Engineer Measurement Antenna Pol.		MHz (MIMC) :2015-02-25 :23 deg_C / 5 :Curry :VERTICAL	
97	dBuV/m)						
90							
80						 	
70						FCC RSE PEAK15.4	107
60	FCC	RSE-AV15.407				 	
50			 			 	
40						 	
30			 			 	
20			 			 	
10			 		 	 	
0 <mark></mark>		3800.	16600. Freque	24400. ncy (MHz)	322	200.	40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	rel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Н	Peak	34.26	17.65	51.91	68.30	-16.39



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5180 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV dBµV/m PK/QP/AV dBµV/m MHz F/H/E/S dB dB

34.88

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17.65

52.53

68.30

-15.77



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Fundamental F Operation Mod EUT Pol.	requency	:802.11 n20N :5220 MHz :TX MID :H Plane	И	Test Date Temp./Humi. Engineer Measurement	Antenna Pol.	:2015-02-25 :23 deg_C / :Curry :VERTICAI	58 RH
97 Level (dBuV/m)						
90							
80							
70						FCC RSE PEAK15	.407
60	FCC I	RSE-AV1 <u>5.407</u>					
50				·			
40							
30							
20			I 				
10							
0 <mark></mark> 1000		8800.	16600. Freque	24400. ency (MHz)	322	200.	40000
Freq.	Note	Detector Mode	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	гз dBµV/m		dB
101112	1/11/1/3	INQUAV	αυμν	uD	αυμν/Π	αυμν/Π	uD

35.51

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18.47

53.98

68.30

-14.32



Η

Peak

10440.00

FCC ID: HD5-VM3WLANA

Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5220 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV dBµV/m PK/QP/AV dBµV/m MHz F/H/E/S dB dB

34.72

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53.19

18.47

68.30

-15.11



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Operation Band Fundamental F Operation Mod EUT Pol.	requency	:802.11 n20M :5240 MHz :TX HIGH :H Plane	,]	Test Date Temp./Humi. Engineer Measurement An	ntenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :VERTICAL	8 RH
97 Level (dBuV/m)						
90		· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·		
80							
70						FCC RSE PEAK15.4	07.
60	FOOT			, , , , , , , , , , , , , , , , , , ,			
50	FUCE	RSE-AV <u>15.407</u>		1 1 1 1 1 1 1 1			
40		· · · · · · · · · · · · · · · · · · ·		 			
30		· · · · · · · · · · · · · · · · · · ·		 			
20							
10							
0 ^L 1000	8	800.	16600. Frequei	24400. ncy (MHz)	3220	0. 4	0000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Leve	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
10480.00	Н	Peak	34.16	18.23	52.39	68.30	-15.91



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5240 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV/m PK/QP/AV dBµV dBµV/m MHz F/H/E/S dB dB

34.37

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18.23

52.60

68.30

-15.70



Band edge falling to restricted band

Operation Ban Fundamental I Operation Mod EUT Pol.	Frequency	:802.11 n20M :5180 MHz :Band Edge LOW :H Plane		Test Date Temp./Humi. Engineer Measurement Ant	enna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Е	Average	35.66	10.32	45.98	54.00	-8.02
5150.00	E	Peak	62.19	10.32	72.51	74.00	-1.49

Operation Band	:802.11 n20M	Test Date	:2015-02-25
Fundamental Frequency	:5180 MHz	Temp./Humi.	:23 deg_C / 58 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plane	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 :

"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	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Е	Average	30.16	10.32	40.48	54.00	-13.52
5150.00	E	Peak	50.33	10.32	60.65	74.00	-13.35

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Radiated Spu	urious Emis	sion Measur	ement Result	802.11n HT40), 5150~5250	MHz (MIMO)	
Operation Band		:802.11 n40N				:2015-02-25		
Fundamental F		:5190 MHz		Temp./Humi.		:23 deg_C / 58 RH		
	Operation Mode :TX LOW			Engineer				
EUT Pol.		:H Plane		Measurement An	ntenna Pol.	:VERTICAL		
97	(dBuV/m)							
90				· · · · · · · · · · · · · · · · · · ·				
80			1 1 1 1 1					
70						FCC RSE PEAK15.4	07.	
60			 			 		
50	FCCF	RSE-AV <u>15.407</u>			· · · · · · · · · · · · · · · · · · ·	 		
40			 			 		
30			 		· · · · · · · · · · · · · · · · · · ·	 		
20						1		
10								
0 <mark>1000</mark>	8	3800.	16600. Freque	24400. ncy (MHz)	3220	00. 4	0000	
			Toque					
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Lev	el	FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
10380.00	Н	Peak	34.64	18.00	52.64	68.30	-15.66	



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5190 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15 407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV/m PK/QP/AV dBµV dBµV/m MHz F/H/E/S dB dB

34.87

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18.00

52.87

68.30

-15.43



Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5230 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry :VERTICAL EUT Pol. :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15 407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV/m PK/QP/AV dBµV dBµV/m MHz F/H/E/S dB dB

34.98

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18.36

53.34

68.30

-14.96



10460.00

Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5230 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 ECC RSE PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV dBµV/m PK/QP/AV dBµV/m MHz F/H/E/S dB dB

34.33

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18.36

52.69

68.30

-15.61



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Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5190 MHz 7 :Band Edge LOW F		Test Date Temp./Humi. Engineer Measurement Ant	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL		
Freq.	Note	Detector Mode	Spectrum Reading Leve	Factor	Actual FS	Limit @3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
5150.00	Е	Average	41.09	10.32	51.41	54.00	-2.59	
5150.00	Е	Peak	61.86	10.32	72.18	74.00	-1.82	

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5190 MHz :Band Edge LOW		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :HORIZONTAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	31.12	10.32	41.44	54.00	-12.56
5150.00	Е	Peak	47.93	10.32	58.25	74.00	-15.75



Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz **Operation Band** :802.11 a Test Date :2015-02-25 **Fundamental Frequency** :5260 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz)

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	Н	Peak	35.71	18.35	54.06	68.30	-14.24



10520.00

Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Fundamental Fre Operation Mode EUT Pol.		:802.11 a :5260 MHz :TX LOW :H Plane		Test Date Temp./Humi. Engineer Measurement A	antenna Pol.	:2015-02-25 :23 deg_C / : :Curry :HORIZONT	
97 Level (dl	BuV/m)						
90							
80							
70						FCC RSE PEAK15.	407
							<u></u>
60	FCC R	SE-AV1 <u>5.407</u>					
50			·				
40				J	¹ ¹		
30							
20					 		
10							
0 <mark></mark> 1000	8	800.	16600. Freque	24400. ncy (MHz)	322	200.	40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

34.99

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18.35

53.34

68.30

-14.96



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5300 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		1				υ
	Mode	Reading Level		FS	@3m	
F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
Н	Average	22.08	18.69	40.77	54.00	-13.23
Н	Peak	34.24	18.69	52.93	74.00	-21.07
	Н	F/H/E/SPK/QP/AVHAverage	F/H/E/SPK/QP/AVdBμVHAverage22.08	F/H/E/SPK/QP/AVdBµVdBHAverage22.0818.69	F/H/E/S PK/QP/AV dBμV dB dBμV/m H Average 22.08 18.69 40.77	F/H/E/S PK/QP/AV dBμV dB dBμV/m dBμV/m H Average 22.08 18.69 40.77 54.00



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5300 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq Note Detector Spectrum Factor Actual I imit Margin

	rieq.	Note	Delector	Spectrum	racioi	Actual	LIIIIIt	wiargin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
	10600.00	Н	Average	22.12	18.69	40.81	54.00	-13.19	
	10600.00	Н	Peak	33.89	18.69	52.58	74.00	-21.42	



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5320 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV 25.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Н	Average	22.18	19.02	41.20	54.00	-12.80
10640.00	Н	Peak	34.68	19.02	53.70	74.00	-20.30



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5320 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :HORIZONTAL 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Н	Average	22.05	19.02	41.07	54.00	-12.93
10640.00	Н	Peak	33.86	19.02	52.88	74.00	-21.12



Band edge falling to restricted band

Operation Band		:802.11 a		Test Date		:2015-02-25	
Fundamental Frequency		:5320 MHz		Temp./Humi.		:23 deg_C / 58 RH	
Operation Mode		:Band Edge I	HIGH	Engineer		:Curry	
EUT Pol.		:H Plane N		Measurement Ant	tenna Pol.	:VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Leve	Factor	Actual FS	Limit Margin @3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	35.72	10.97	46.69	54.00	-7.31
5350.00	E	Peak	61.72	10.97	72.69	74.00	-1.31

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5320 MHz :Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement Ant	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :HORIZONTAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	30.47	10.97	41.44	54.00	-12.56
5350.00	E	Peak	43.60	10.97	54.57	74.00	-19.43



Radiated Spu Operation Band Fundamental F Operation Mod EUT Pol.	d requency	ssion Measur :802.11 n20N :5260 MHz :TX LOW :H Plane	М	802.11n HT2 Test Date Temp./Humi. Engineer Measurement A		MHz (MIMO) :2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL		
97 Level (dBuV/m)			, ,				
90				· · · · · · · · · · · · · · · · · · ·				
80				· · · · · · · · · · · · · · · · · · ·				
70						FCC RSE PE	AK15.407	
60	FCC	RSE-AV15.407						
50								
40								
30								
20								
10								
0	:	8800.	16600. Freque	24400. ncy (MHz)	322	200.	40000	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limi	t Margin	
		Mode	Reading Lev	el	FS	@3n	n	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV,	/m dB	
10520.00	Н	Peak	34.91	18.35	53.26	68.3	0 -15.04	



10520.00

Η

Peak

FCC ID: HD5-VM3WLANA

Fundamental Frequency :5260 Operation Mode :TX I		:802.11 n20M :5260 MHz :TX LOW :H Plane		Test Date Temp./Hun Engineer Measureme		na Pol.	:Curry)2-25 _C / 58 RH ZONTAL	[
97	BuV/m)								
90									
80									
70				J			FCC RSE PI	EAK15.407	
60	ECC D	SE-AV15.407							
50	FUC N	3E-AV1 <u>3.407</u>							
40									
30									
20									
10									
0 <mark></mark>	0	800.	16600.	244	00	322	00	40000	
1000	0	800.		ncy (MHz)	00.	322	00.	40000	
Freq.	Note	Detector	Spectrum	Fac	tor	Actual	Lim	it M	largin
•		Mode	Reading Lev	vel		FS	@31		C
MHz	F/H/E/S	PK/QP/AV	dBµV	dł	3	dBµV/m	dBµV	/m	dB

34.83

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18.35

53.18

68.30

-15.12



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5300 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** Engineer :TX MID :Curry EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
10600.00	Н	Average	22.48	18.69	41.17	54.00	-12.83	
10600.00	Н	Peak	34.13	18.69	52.82	74.00	-21.18	



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5300 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** Engineer :TX MID :Curry EUT Pol. :H Plane :HORIZONTAL Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
	10600.00	Н	Average	22.10	18.69	40.79	54.00	-13.21	
	10600.00	Н	Peak	34.53	18.69	53.22	74.00	-20.78	



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5320 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		•				e	
	Mode	Reading Level		FS	@3m		
F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
							-
Н	Average	22.08	19.02	41.10	54.00	-12.90	
Н	Peak	33.55	19.02	52.57	74.00	-21.43	
	Н	F/H/E/S PK/QP/AV	F/H/E/SPK/QP/AVdBµVHAverage22.08	F/H/E/SPK/QP/AVdBµVdBHAverage22.0819.02	F/H/E/SPK/QP/AV $dB\mu V$ dB $dB\mu V/m$ HAverage22.0819.0241.10	F/H/E/SPK/QP/AV $dB\mu V$ dB $dB\mu V/m$ $dB\mu V/m$ HAverage22.0819.0241.1054.00	ModeReading LevelFS $@3m$ F/H/E/SPK/QP/AV $dB\mu V$ dB $dB\mu V/m$ $dB\mu V/m$ $dB\mu V/m$ HAverage22.0819.0241.1054.00-12.90



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5320 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV 25.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Actual Limit Margin

rreq.	11010	Dettettor	Speedam	I detei	Tietuur	Linne	intan Sini	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
10640.00	Н	Average	22.47	19.02	41.49	54.00	-12.51	
10640.00	Н	Peak	34.92	19.02	53.94	74.00	-20.06	



Band edge falling to restricted band

Operation Band		:802.11 n20N	/1	Test Date		:2015-02-25	
Fundamental Frequency		:5310 MHz		Temp./Humi.		:23 deg_C / 5	8 RH
Operation Mode		:Band Edge I	HIGH	Engineer		:Curry	
EUT Pol.		:H Plane		Measurement Ant	tenna Pol.	:VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	37.40	10.97	48.37	54.00	-5.63
5350.00	E	Peak	62.14	10.97	73.11	74.00	-0.89

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n20M :5310 MHz :Band Edge HIGH :H Plane		Test Date Temp./Humi. Engineer Measurement Ant	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :HORIZONTAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	30.54	10.97	41.51	54.00	-12.49
5350.00	E	Peak	47.52	10.97	58.49	74.00	-15.51



Operation Band	d	:802.11 n40N	M ,	Test Date), 5250~535(MHz (MIMC) :2015-02-25	
Fundamental F		:5270 MHz		Temp./Humi.		:23 deg_C / 5	8 RH
Operation Mod	le	:TX LOW		Engineer	5.1	:Curry	
EUT Pol.		:H Plane	-	Measurement A	ntenna Pol.	:VERTICAL	
97 Level (dBuV/m)						
90							
80				; ; ;			
70				· · · · · · · · · · · · · · · · · · ·		FCC RSE PEAK15.4	<u>07</u> .
60					 		
50	FCC	RSE-AV1 <u>5.407</u>					
40				· · · · · · · · · · · · · · · · · · ·			
30							
20							
10							
0 ^L 1000	8	3800.	16600. Freque	24400. ncy (MHz)	322	00. 4	0000
			Trequer				
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Leve	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10540.00	Н	Peak	35.03	18.45	53.48	68.30	-14.82



10540.00

Η

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5270 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15 407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m dBµV dBµV/m PK/QP/AV dBµV/m MHz F/H/E/S dB dB

35.02

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18.45

53.47

68.30

-14.83



Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5310 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry :VERTICAL EUT Pol. :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15 407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
10620.00	Н	Average	22.27	18.86	41.13	54.00	-12.87
10620.00	Н	Peak	34.63	18.86	53.49	74.00	-20.51



Operation Band :802.11 n40M Test Date :2015-02-25 **Fundamental Frequency** :5310 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15 407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz) Fran Note ootrum Factor A atual Limit

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
10620.00	Н	Average	22.58	18.86	41.44	54.00	-12.56	
10620.00	Н	Peak	33.79	18.86	52.65	74.00	-21.35	



Band edge falling to restricted band

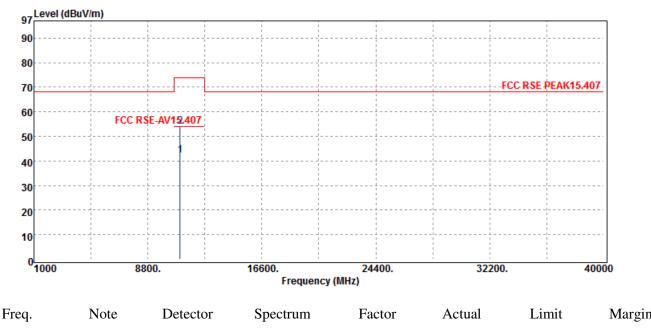
Operation Ban Fundamental I Operation Mod EUT Pol.	ld Frequency	:802.11 n40M :5310 MHz :Band Edge F :H Plane		Test Date Temp./Humi. Engineer Measurement An	ntenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :VERTICAL	8 RH
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Е	Average	39.56	10.97	50.53	54.00	-3.47
5350.00	E	Peak	58.17	10.97	69.14	74.00	-4.86
5352.08	S	Average	38.11	10.97	49.08	54.00	-4.92
5352.08	S	Peak	60.74	10.97	71.71	74.00	-2.29
Operation Ban Fundamental F Operation Mod EUT Pol.	Frequency	:802.11 n40M :5310 MHz :Band Edge H :H Plane		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT.	
Freq.	Note	Detector	Spectrum Reading Lev		Actual FS	Limit @3m	Margin

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	30.04	10.97	41.01	54.00	-12.99
5350.00	E	Peak	43.29	10.97	54.26	74.00	-19.74
5352.08	S	Average	29.75	10.97	40.72	54.00	-13.28
5352.08	S	Peak	45.93	10.97	56.90	74.00	-17.10



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

Operation Band	:802.11 a	Test Date	:2015-02-25
Fundamental Frequency	:5500 MHz	Temp./Humi.	:23 deg_C / 58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



rieq.	Note	Detector	Spectrum	Factor	Actual	LIIIII	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
11000.00	Н	Average	22.54	19.82	42.36	54.00	-11.64	
11000.00	Н	Peak	34.17	19.82	53.99	74.00	-20.01	



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5500 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
11000.00	Н	Average	22.31	19.82	42.13	54.00	-11.87
11000.00	Н	Peak	33.79	19.82	53.61	74.00	-20.39



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5580 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15/407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Spectrum Factor Margin Detector Actual Limit . . . -~ ~

		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	-
11160.00	Н	Average	22.37	20.21	42.58	54.00	-11.42	
11160.00	Н	Peak	34.22	20.21	54.43	74.00	-19.57	



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Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5580 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV152407 50 40 30 20 10 0 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Actual Limit Margin Mode Reading Level FS @3m **J**BuW dBuV/m $dB_{\rm H} W/m$ 110 1D

MHz	F/H/E/S	PK/QP/AV	αβμν	dB	abµv/m	abµv/m	dB	
11160.00	Н	Average	22.20	20.21	42.41	54.00	-11.59	
		U						
11160.00	Н	Peak	33.36	20.21	53.57	74.00	-20.43	



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Operation Band :802.11 a Test Date :2015-02-25 **Fundamental Frequency** :5700 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Note

	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
Н	Average	22.69	20.65	43.34	54.00	-10.66
Н	Peak	34.58	20.65	55.23	74.00	-18.77
		Mode <u>F/H/E/S PK/QP/AV</u> H Average	ModeReading LevelV/H/E/SPK/QP/AVdBμVHAverage22.69	ModeReading LevelVH/E/SPK/QP/AVdBµVHAverage22.6920.65	ModeReading LevelFS $V/H/E/S$ $PK/QP/AV$ $dB\mu V$ dB $dB\mu V/m$ HAverage22.6920.6543.34	ModeReading LevelFS@3m $V/H/E/S$ PK/QP/AVdB μ VdBdB μ V/mdB μ V/mHAverage22.6920.6543.3454.00



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5700 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

1		Mode	Panding Laval		FS	@3m	e
		Mode	Reading Level				
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11400.00	Н	Average	22.52	20.65	43.17	54.00	-10.83
11400.00	Н	Peak	35.13	20.65	55.78	74.00	-18.22



Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5500 MHz :Band Edge LOW :H Plane		Test Date Temp./Humi. Engineer Measurement Ant	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Leve	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	E	Average	30.54	10.89	41.43	54.00	-12.57
5460.00	E	Peak	45.35	10.89	56.24	74.00	-17.76
5468.12	S	Average	33.33	10.90	44.23	54.00	-9.77
5468.12	S	Peak	59.29	10.90	70.19	74.00	-3.81
5470.00	E	Average	31.68	10.91	42.59	54.00	-11.41
5470.00	Е	Peak	53.15	10.91	64.06	74.00	-9.94

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5500 MHz :Band Edge LOW		Test Date Temp./Humi. Engineer Measurement Ant	enna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :HORIZONTAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	E	Average	29.02	10.89	39.91	54.00	-14.09
5460.00	E	Peak	42.40	10.89	53.29	74.00	-20.71
5470.00	E	Average	29.94	10.91	40.85	54.00	-13.15
5470.00	E	Peak	50.04	10.91	60.95	74.00	-13.05



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Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5700 MHz :Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Average	37.52	11.04	48.56	54.00	-5.44
5725.00	E	Peak	60.74	11.04	71.78	74.00	-2.22
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5700 MHz :Band Edge I :H Plane		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONTA	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
_		Mode	Reading Lev	el	FS	@3m	-
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Average	31.60	11.04	42.64	54.00	-11.36
5725.00	Е	Peak		11.04	58.83	74.00	



11000.00

11000.00

Η

Η

Average

Peak

irious Emi	ssion Measur	ement Result 8()2.11n HT20), 5470~5725	MHz (MIM	0)
1	:802.11 n20N	Л Те	st Date		:2015-02-25	
requency	:5500 MHz	Te	mp./Humi.		:23 deg_C /	58 RH
e	:TX LOW	En	gineer		:Curry	
	:H Plane	Me	easurement Ar	ntenna Pol.	:VERTICAI	
dBuV/m)						
			· · · · · · · · · · · · · · · · · · ·			·
					FCC RSE PEAK15	.407
FCC	DE 11/12 407			·		
100	132-111					
J			·	· · · · · · · · · · · · · · · · ·	·	
· · · · · · · · · · · · · · · · · · ·					 	
			 		 	·
	8800.	16600. Frequency	24400. (MHz)	322	00.	40000
		Пециенсу	(11112)			
Note	Detector	Spectrum	Factor	Actual	Limit	Margir
	Mode	Reading Level		FS	@3m	
F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
	d requency le (dBuV/m) FCC	d :802.11 n20N requency :5500 MHz Ie :TX LOW :H Plane FCC RSE-AV12.407 FCC RSE-AV12.407 8800. 8800.	d :802.11 n20M Test requency :5500 MHz Test le :TX LOW En :H Plane Me dBuV/m) FCC RSE-AV12.407 FCC RSE-AV12.407 8800. 16600. Frequency Note Detector Spectrum Mode Reading Level	d :802.11 n20M Test Date requency :5500 MHz Temp./Humi. e :TX LOW Engineer :H Plane Measurement Ar (BUV/m) FCC RSE-AV15.407 FCC RSE-AV15.407 8800. 16600. 24400. Frequency (MHz) Note Detector Spectrum Factor Mode Reading Level	d :802.11 n20M Test Date requency :5500 MHz Temp./Humi. Engineer :H Plane Measurement Antenna Pol. dBuV/m) FCC RSE-AV15.407 FCC RSE-AV15.407 8800. 16600. 24400. 3220 Rote Detector Spectrum Factor Actual Mode Reading Level FS	requency :5500 MHz Temp./Humi. :23 deg_C / Engineer :Curry :H Plane Measurement Antenna Pol. :VERTICAI

22.67

35.48

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19.82

19.82

42.49

55.30

54.00

74.00

-11.51

-18.70



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5500 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
11000.00	Н	Average	22.28	19.82	42.10	54.00	-11.90
11000.00	Н	Peak	33.69	19.82	53.51	74.00	-20.49



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5580 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15_407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Frea Note Detector Spectrum Factor Actual I imit Margin

rieq.	Note	Detector	Spectrum	Factor	Actual	LIIIII	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
11160.00	Н	Average	22.40	20.21	42.61	54.00	-11.39	
11160.00	Н	Peak	33.12	20.21	53.33	74.00	-20.67	



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5580 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** Engineer :TX MID :Curry EUT Pol. :H Plane :HORIZONTAL Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV152407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

Note	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
Н	Average	22.29	20.21	42.50	54.00	-11.50
Н	Peak	33.29	20.21	53.50	74.00	-20.50
	F/H/E/S H	F/H/E/SPK/QP/AVHAverage	ModeReading LevelF/H/E/SPK/QP/AVdBμVHAverage22.29	ModeReading LevelF/H/E/SPK/QP/AVdBμVdBHAverage22.2920.21	ModeReading LevelFSF/H/E/SPK/QP/AVdBμVdBdBμV/mHAverage22.2920.2142.50	ModeReading LevelFS@3mF/H/E/SPK/QP/AV $dB\mu V$ dB $dB\mu V/m$ $dB\mu V/m$ HAverage22.2920.2142.5054.00



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5700 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Frea Note Detector Spectrum Factor Actual I imit Margin

	rieq.	Note	Detector	Spectrum	Factor	Actual	LIIIII	Margin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
	11400.00	Н	Average	22.68	20.65	43.33	54.00	-10.67	
	11400.00	Н	Peak	34.31	20.65	54.96	74.00	-19.04	



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5700 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
11400.00	Н	Average	22.41	20.65	43.06	54.00	-10.94
11400.00	Н	Peak	34.72	20.65	55.37	74.00	-18.63



Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n20M :5500 MHz :Band Edge LOW :H Plane		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	E	Average	31.07	10.89	41.96	54.00	-12.04
5460.00	Е	Peak	48.22	10.89	59.11	74.00	-14.89
5470.00	Е	Average	34.66	10.91	45.57	54.00	-8.43
5470.00	E	Peak	61.03	10.91	71.94	74.00	-2.06
Operation Ban Fundamental I Operation Mod EUT Pol.	Frequency	:802.11 n20M :5500 MHz :Band Edge L :H Plane		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONTA	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin

	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	_
	5460.00	E	Average	28.83	10.89	39.72	54.00	-14.28	
	5460.00	E	Peak	41.84	10.89	52.73	74.00	-21.27	
	5470.00	E	Average	29.56	10.91	40.47	54.00	-13.53	
	5470.00	E	Peak	48.89	10.91	59.80	74.00	-14.20	



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Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n20M :5700 MHz :Band Edge HIGH :H Plane		Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Average	40.42	11.04	51.46	54.00	-2.54
5725.00	Е	Peak	60.29	11.04	71.33	74.00	-2.67
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n20N :5700 MHz :Band Edge I :H Plane		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT.	
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Average	31.61	11.04	42.65	54.00	-11.35
5725.00	Е	Peak	51.16	11.04	62.20	74.00	-11.80



Η

11020.00

Peak

Radiated Spu	irious Emis	ssion Meas	urement Resul	t 802.11n HT	40, 5470~572	5 MHz (MIM	0)
Operation Band		:802.11 n4		Test Date		:2015-02-25	
Fundamental F		:5510 MH		Temp./Humi.		:23 deg_C /	58 RH
Operation Mod	le	:TX LOW		Engineer		:Curry	
EUT Pol.		:H Plane		Measurement	Antenna Pol.	:VERTICAI	_
97	dBuV/m)						
97			1				
80						<u>-</u>	
70						FCC RSE PEAK15	.407
60		RSE-AV12.407					
50	FLU	KSE-AV12.407	, , , , , , , , , , , , , , , , , , ,				
		1					
40							
30							
20						i + 1 1	
10						i i t t	
0 ^L 1000	8	3800.	16600.	24400.	32	200.	40000
			Frequ	ency (MHz)			
Freq.	Note	Detector	Spectrum	n Factor	Actual	Limit	Margin
		Mode	Reading Le	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/A	V dBµV	dB	dBµV/m	n dBµV/m	dB
11020.00	Н	Average	22.32	19.81	42.13	54.00	-11.87

34.30

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19.81

54.11

74.00

-19.89



Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5510 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15 407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Frea Note Detector Spectrum Factor Actual Limit Margin

	rieq.	1000	Detector	Speedum	1 detoi	rietuur	Linit	initian Sini	
			Mode	Reading Level		FS	@3m		
-	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
	11020.00	Н	Average	22.34	19.81	42.15	54.00	-11.85	
	11020.00	Н	Peak	34.40	19.81	54.21	74.00	-19.79	



Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5550 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Actual Limit Margin

rreq.	11010	Dettettor	Speedam	1 40001	Tietdai	Linne	inter Sin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
11100.00	Н	Average	22.28	20.23	42.51	54.00	-11.49	
11100.00	Н	Peak	34.08	20.23	54.31	74.00	-19.69	



Operation Band :802.11 n40M Test Date :2015-02-25 **Fundamental Frequency** :5550 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15 407 60 FCC RSE-AV1\$407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq Note Detector Spectrum Factor Actual I imit Margin

	rieq.	Note	Delector	Spectrum	Factor	Actual	Lillit	Margin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
	11100.00	Н	Average	21.96	20.23	42.19	54.00	-11.81	
	11100.00	Н	Peak	34.36	20.23	54.59	74.00	-19.41	



Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5670 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry :VERTICAL EUT Pol. :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15 407 60 FCC RSE-AV152407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Spectrum Margin Detector Factor Actual Limit Mode Dooding Loval FC @2....

		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
11340.00	Н	Average	22.27	20.64	42.91	54.00	-11.09	
11340.00	Н	Peak	33.56	20.64	54.20	74.00	-19.80	



Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5670 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15.407 60 FCC RSE-AV152407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Actual Limit Margin

	1104	11000	2000000	Speculati	1 40001	1100000		in an Bin	
			Mode	Reading Level		FS	@3m		
-	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
	11340.00	Н	Average	22.09	20.64	42.73	54.00	-11.27	
	11340.00	Н	Peak	33.69	20.64	54.33	74.00	-19.67	

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Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n40M :5510 MHz :Band Edge LOW :H Plane		Test Date Temp./Humi. Engineer Measurement Ant	enna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Е	Average	33.00	10.89	43.89	54.00	-10.11
5460.00	Е	Peak	50.59	10.89	61.48	74.00	-12.52
5470.00	Е	Average	39.92	10.91	50.83	54.00	-3.17
5470.00	Е	Peak	58.48	10.91	69.39	74.00	-4.61

Operation Band	:802.11 n40M	Test Date	:2015-02-25
Fundamental Frequency	:5510 MHz	Temp./Humi.	:23 deg_C / 58 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plane	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 :

"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	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Е	Average	28.04	10.89	38.93	54.00	-15.07
5460.00	E	Peak	41.00	10.89	51.89	74.00	-22.11
5470.00	E	Average	31.11	10.91	42.02	54.00	-11.98
5470.00	E	Peak	46.96	10.91	57.87	74.00	-16.13

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5725.88

5725.88

S

S

FCC ID: HD5-VM3WLANA

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Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n40M :5670 MHz :Band Edge HIGH :H Plane		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Average	38.23	11.04	49.27	54.00	-4.73
5725.00	Е	Peak	57.05	11.04	68.09	74.00	-5.91
5726.48	S	Average	38.45	11.04	49.49	54.00	-4.51
5726.48	S	Peak	59.00	11.04	70.04	74.00	-3.96

Operation Band Fundamental Frequency		:802.11 n40M :5670 MHz		Test Date Temp./Humi.		:2015-02-25 :23 deg_C / 58 RH	
Operation Mo	1 2	:Band Edge HIGH :H Plane		Engineer Measurement Antenna Pol.		:Curry	
EUT Pol.		:H Plane	N	Measurement An	tenna Pol.	:HORIZONT	AL
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level	1	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Average	30.86	11.04	41.90	54.00	-12.10
5725.00	Е	Peak	44.39	11.04	55.43	74.00	-18.57

30.55

46.65

Average

Peak

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11.04

11.04

41.59

57.69

54.00

74.00

-12.41

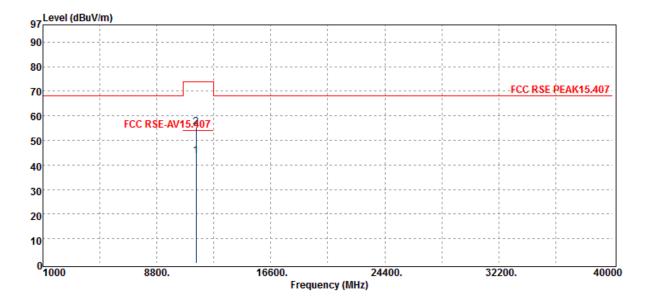
-16.31



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

Operation Band	:802.11 a
Fundamental Frequency	:5745 MHz
Operation Mode	:TX LOW
EUT Pol.	:H Plane

Test Date Temp./Humi. Engineer Measurement Antenna Pol. :2015-02-25 :23 deg_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	dBµV	dB	dBµV/m	dBµV/m	dB
11490.00	Н	Average	22.73	20.81	43.54	54.00	-10.46
11490.00	Н	Peak	34.44	20.81	55.25	74.00	-18.75

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Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5745 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 Level (dBuV/m) 90 80 FCC RSE PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0<mark>1000</mark> 8800. 40000 16600. 24400. 32200. Frequency (MHz) Freq. Note Detector Spectrum Factor Actual Limit Margin FS Reading Level @3m Mode MHz F/H/E/S PK/QP/AV dBµV dB dBµV/m dBµV/m dB 11490.00 Η 21.60 20.81 42.41 54.00 -11.59 Average 11490.00 Η Peak 34.96 20.81 55.77 74.00 -18.23

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Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5785 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry :VERTICAL EUT Pol. :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 407 FCC RSE-AV15. 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m

MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Н	Average	22.54	21.16	43.70	54.00	-10.30
11570.00	Н	Peak	34.95	21.16	56.11	74.00	-17.89



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5785 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX MID Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 407 FCC RSE-AV15. 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m

MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11570.00	Н	Average	22.44	21.16	43.60	54.00	-10.40
11570.00	Н	Peak	34.83	21.16	55.99	74.00	-18.01



11650.00

11650.00

Η

Η

Average

Peak

FCC ID: HD5-VM3WLANA

Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5825 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Actual Limit Margin FS Mode Reading Level @3m dBµV/m dBµV/m PK/QP/AV dBµV MHz F/H/E/S dB dB

22.16

34.31

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20.93

20.93

43.09

55.24

54.00

74.00

-10.91

-18.76



Operation Band Test Date :2015-02-25 :802.11 a **Fundamental Frequency** :5825 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. 97 90 80 FCC RSF PEAK15.407 70 60 207 FCC RSE-AV15. 50 40 30 20 10 0 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual FS Mode Reading Level @3m

			Wiede	Redding Level		15	eom		
_	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
									-
	11650.00	Н	Average	22.07	20.93	43.00	54.00	-11.00	
	11650.00	Н	Peak	34.20	20.93	55.13	74.00	-18.87	



Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5745 MHz :Band Edge LOW		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL		
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Lev	vel	FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
5713.10	S	Peak	53.40	11.00	64.40	68.30	-3.90	
5723.30	S	Peak	63.58	11.03	74.61	78.20	-3.59	
5725.00	E	Peak	63.32	11.04	74.36	78.20	-3.84	
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5745 MHz :Band Edge I :H Plane	LOW	Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / 55 :Curry :HORIZONT/		
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
5723.50	S	Peak	52.24	11.03	63.27	78.20	-14.93	
5725.00	Е	Peak	51.19	11.04	62.23	78.20	-15.97	



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Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5825 MHz :Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL		
Freq.	Note	Detector Mode	Spectrum Reading Lev	Factor	Actual FS	Limit @3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
5850.00	Е	Peak	63.67	11.50	75.17	78.20	-3.03	
5862.00	S	Peak	55.78	11.51	67.29	68.30	-1.01	
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 a :5825 MHz :Band Edge I :H Plane	HIGH	Test Date Temp./Humi. Engineer Measurement An	itenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT.		
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Lev	vel	FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
5850.00	Е	Peak	53.33	11.50	64.83	78.20	-13.37	



11490.00

Η

Peak

FCC ID: HD5-VM3WLANA

Radiated Spurious Emi Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5745 MHz :TX LOW		t 802.11n HT2 Test Date Temp./Humi. Engineer Measurement A) MHz (MIMO) :2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL		
97	(dBuV/m)							
90				· · · · · · · · · · · · · · · · · · ·			·	
80								
70						FCC RSE PEAK15.4	<u>07</u>	
60	TCC I	RSE-AV15.407		· · · · · · · · · · · · · · · · · · ·				
50	ruu	K3E-AV 13.407		· · · · · · · · · · · · · · · · · · ·				
40								
30				· · · · · · · · · · · · · · · · · · ·				
20						 		
10				· · · · · · · · · · · · · · · · · · ·		 		
0								
1000	1	3800.	16600. Freque	24400. ency (MHz)	322	00. 4	0000	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Lev	el	FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
11490.00	Н	Average	22.71	20.81	43.52	54.00	-10.48	

34.75

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20.81

55.56

74.00

-18.44



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5745 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 40000 24400. 32200. Frequency (MHz) Frea Note Detector Spectrum Factor Actual Limit Margin

ricq.	1000	Dettettor	Spectrum	1 actor	Tictual	Linnt	Wiaigin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
11490.00	Н	Average	22.56	20.81	43.37	54.00	-10.63	
11490.00	Н	Peak	34.71	20.81	55.52	74.00	-18.48	



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5785 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** Engineer :TX MID :Curry EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 407 FCC RSE-AV15. 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Marair Note ootrum Factor Actual I imit

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	_
11570.00	Н	Average	22.51	21.16	43.67	54.00	-10.33	
11570.00	Н	Peak	34.81	21.16	55.97	74.00	-18.03	



Operation Band :802.11 n20M Test Date :2015-02-25 **Fundamental Frequency** :5785 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** Engineer :TX MID :Curry EUT Pol. :H Plane :HORIZONTAL Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15. 407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz)

	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
	11570.00	Н	Average	22.86	21.16	44.02	54.00	-9.98	
	11570.00	Н	Peak	34.23	21.16	55.39	74.00	-18.61	



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5825 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :VERTICAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15. 407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual Mode Reading Level FS @3m

		1110 40	iteading Level		10	00111		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
								_
11650.00	Н	Average	22.16	20.93	43.09	54.00	-10.91	
11650.00	Н	Peak	34.48	20.93	55.41	74.00	-18.59	



Operation Band Test Date :2015-02-25 :802.11 n20M **Fundamental Frequency** :5825 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 FCC RSF PEAK15.407 70 60 FCC RSE-AV15. 407 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 40000 24400. Frequency (MHz) Freq. Note Detector Spectrum Limit Margin Factor Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
11650.00	Н	Average	22.18	20.93	43.11	54.00	-10.89
11650.00	Н	Peak	34.02	20.93	54.95	74.00	-19.05



Band edge falling to restricted band

Operation Bar Fundamental 1 Operation Mo EUT Pol.	nd Frequency	:802.11 n20M :5745 MHz :Band Edge LOW :H Plane		Test Date Temp./Humi. Engineer Measurement Ar	ntenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Peak	62.38	11.04	73.42	78.20	-4.78
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n20N :5745 MHz :Band Edge I :H Plane		Test Date Temp./Humi. Engineer Measurement Ar	ntenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONTA	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Peak	54.39	11.04	65.43	78.20	-12.77



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Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5825 MHz :Band Edge HIGH		Test Date Temp./Humi. Engineer Measurement An	ntenna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	65.03	11.50	76.53	78.20	-1.67
5860.50	S	Peak	56.34	11.51	67.85	68.30	-0.45
Operation Bar Fundamental I Operation Mo EUT Pol.	Frequency de	:802.11 n20M :5825 MHz :Band Edge H :H Plane	łIGH	Test Date Temp./Humi. Engineer Measurement An		:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT	AL
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	vel	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Е	Peak	54.82	11.50	66.32	78.20	-11.88



Radiated Spurious Emission Measurement Result (802.11n (5GHz)_40M) (MIMO)

Operation Band :802.11 n40M Test Date :2015-02-25 Fundamental Frequency :5755 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX LOW Engineer :Curry EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL evel (dBuV/m) 9 90 80 ECC RSE PEAK15 70 60 FCC RSE-AV15.407 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Actual Limit Margin FS Reading Level @3m Mode

		mode	Redding Devel		15	Com		
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB	
								_
11510.00	Н	Average	22.63	21.03	43.66	54.00	-10.34	
11510.00	Н	Peak	34.64	21.03	55.67	74.00	-18.33	

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Dperation Band Fundamental Freque Dperation Mode	uency	:802.11 n40N :5755 MHz :TX LOW	,	Test Date Temp./Humi. Engineer		:2015-02-25 :23 deg_C / :Curry	58 RH
EUT Pol.		:H Plane		Measurement A	ntenna Pol.	:HORIZON	IAL
97	V/m)						
90			 	 			
80			 				
70						FCC RSE PEAK15	.407
60	FCC	RSE-AV15.407					
50	FUU	KSE-AV1 <u>5.407</u>					
40				, , , , , , , , , , , , , , , , , , ,			
30			 				
20	 		 				
10			 				
0							
1000	1	8800.	16600. Frequei	24400. ncy (MHz)	322	200.	40000
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
1		Mode	Reading Leve		FS	@3m	6
MH ₂ F	/H/E/S	DK/OD/AV	dBuV	dB	dBuV/m		dB

MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
								_
11510.00	Н	Average	22.53	21.03	43.56	54.00	-10.44	
		U						
11510.00	Н	Peak	35.08	21.03	56.11	74.00	-17.89	



Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5795 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry :VERTICAL EUT Pol. :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 ECC RSE PEAK15.407 70 60 407 FCC RSE-AV15. 50 40 30 20 10 0^L 1000 8800. 16600. 32200. 24400. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Actual Limit Margin Mode Reading Level FS @3m -- /

MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB	
11590.00	Н	Average	22.46	21.11	43.57	54.00	-10.43	
11590.00	Н	Peak	34.45	21.11	55.56	74.00	-18.44	
11570.00	11	I Cak	54.45	21.11	55.50	74.00	-10.44	



Operation Band Test Date :2015-02-25 :802.11 n40M **Fundamental Frequency** :5795 MHz Temp./Humi. :23 deg_C / 58 RH **Operation Mode** :TX HIGH Engineer :Curry EUT Pol. :HORIZONTAL :H Plane Measurement Antenna Pol. Level (dBuV/m) 97 90 80 70 ECC RSE PEAK15 407 60 407 FCC RSE-AV15. 50 40 30 20 10 0^L 1000 8800. 16600. 24400. 32200. 40000 Frequency (MHz) Freq. Note Detector Spectrum Factor Limit Margin Actual

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11590.00	Н	Average	22.69	21.11	43.80	54.00	-10.20
11590.00	Н	Peak	35.24	21.11	56.35	74.00	-17.65



Band edge falling to restricted band

Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5755 MHz		Test Date Temp./Humi. Engineer Measurement Antenna Pol.		:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector Mode	Spectrum Reading Lev		Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Peak	61.83	11.04	72.87	78.20	-5.33
Operation Band Fundamental Frequency Operation Mode EUT Pol.		:802.11 n40M :5755 MHz :Band Edge L :H Plane		Test Date Temp./Humi. Engineer Measurement An	tenna Pol.	:2015-02-25 :23 deg_C / 5 :Curry :HORIZONT.	
Freq.	Note	Detector Mode	Spectrum Reading Lev		Actual FS	Limit @3m	Margin

		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Peak	50.49	11.04	61.53	78.20	-16.67



Operation Band Fundamental Frequency Operation Mode EUT Pol.		:5795 MHz T :Band Edge HIGH E		Test Date Temp./Humi. Engineer Measurement Ant	enna Pol.	:2015-02-25 :23 deg_C / 58 RH :Curry :VERTICAL	
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Lev	el	FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	E	Peak	54.84	11.50	66.34	78.20	-11.86
5853.80	S	Peak	58.14	11.50	69.64	78.20	-8.56
5860.90	S	Peak	56.20	11.51	67.71	68.30	-0.59

Operation Band	:802.11 n40M	Test Date	:2015-02-25
Fundamental Frequency	:5795 MHz	Temp./Humi.	:23 deg_C / 58 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL

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

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	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	E	Peak	47.01	11.50	58.51	78.20	-19.69
5852.20	S	Peak	48.55	11.50	60.05	78.20	-18.15



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12. TRANSMISSION IN THE ABSENCE OF DATA

12.1 Standard Applicable

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

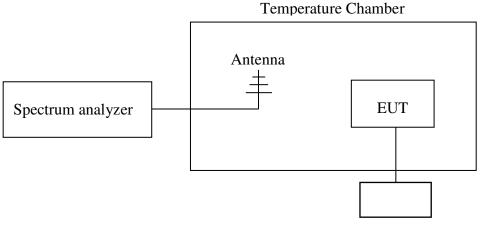
13.1 Standard Applicable

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.

13.3 Test SET-UP



Variable AC Power Supply

13.4 Measurement Equipment Used

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.	CITE D'C'L.		
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/19/2014	05/18/2015		
Temperature Chamber	TERCHY	MHG-120LF	911009	05/07/2014	05/06/2015		
AC Power Supply	APW-105N	887592	All Power	N/A	N/A		

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13.5 **Measurement Result**

Operation Mode	802.11 a	Test Date	2015.3.5
Temperature	:25 °C	Test By	Cooper
Humidity	:62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		36	5180.0000	5,180.012394	-0.0124
		44	5220.0000	5,220.012416	-0.0124
		48	5240.0000	5,240.012446	-0.0124
		52	5260.0000	5,260.012557	-0.0126
		60	5300.0000	5,300.012493	-0.0125
25 °C	15V	64	5320.0000	5,320.012316	-0.0123
25 (13 v	100	5500.0000	5,500.012539	-0.0125
		116	5580.0000	5,580.012493	-0.0125
		140	5700.0000	5,700.012486	-0.0125
		149	5745.0000	5,745.012396	-0.0124
		157	5785.0000	5,785.012413	-0.0124
		165	5825.0000	5,825.012230	-0.0122
		36	5180.0000	5,180.012413	-0.0124
		44	5220.0000	5,220.012431	-0.0124
		48	5240.0000	5,240.012457	-0.0125
		52	5260.0000	5,260.012544	-0.0125
		60	5300.0000	5,300.012518	-0.0125
		64	5320.0000	5,320.012397	-0.0124
-30 °C	15V	100	5500.0000	5,500.012522	-0.0125
		116	5580.0000	5,580.012503	-0.0125
		140	5700.0000	5,700.012534	-0.0125
		149	5745.0000	5,745.012433	-0.0124
		157	5785.0000	5,785.012457	-0.0125
		165	5825.0000	5,825.014690	-0.0147

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		36	5180.0000	5,180.012351	-0.0124
	44	5220.0000	5,220.012397	-0.0124	
		48	5240.0000	5,240.012411	-0.0124
		52	5260.0000	5,260.012471	-0.0125
		60	5300.0000	5,300.012433	-0.0124
60 ℃	15V	64	5320.0000	5,320.012297	-0.0123
00 C	15 V	100	5500.0000	5,500.012488	-0.0125
		116	5580.0000	5,580.012461	-0.0125
		140	5700.0000	5,700.012413	-0.0124
		149	5745.0000	5,745.012324	-0.0123
		157	5785.0000	5,785.012381	-0.0124
		165	5825.0000	5,825.012193	-0.0122



Operation Mode	802.11 n_HT40	Test Date	2015.3.5
Temperature	:25 °C	Test By	Cooper
Humidity	:62 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190.0000	5,190.012544	-0.0125
		46	5230.0000	5,230.012531	-0.0125
		54	5270.0000	5,270.012394	-0.0124
		62	5310.0000	5,310.012431	-0.0124
25 ℃	15V	102	5510.0000	5,510.012350	-0.0123
25 0	15 V	110	5550.0000	5,550.012422	-0.0124
		134	5670.0000	5,670.012513	-0.0125
		151	5755.0000	5,755.012390	-0.0124
		159	5795.0000	5,795.012438	-0.0124
		38	5190.0000	5,190.012583	-0.0126
		46	5230.0000	5,230.012574	-0.0126
		54	5270.0000	5,270.012436	-0.0124
		62	5310.0000	5,310.012473	-0.0125
		102	5510.0000	5,510.012416	-0.0124
-30 °C	15V	110	5550.0000	5,550.012475	-0.0125
		134	5670.0000	5,670.012539	-0.0125
		151	5755.0000	5,755.012441	-0.0124
		159	5795.0000	5,795.012469	-0.0125
		38	5190.0000	5,190.012510	-0.0125
		46	5230.0000	5,230.012483	-0.0125
		54	5270.0000	5,270.012344	-0.0123
		62	5310.0000	5,310.012391	-0.0124
		102	5510.0000	5,510.012311	-0.0123
60 °C	15V	110	5550.0000	5,550.012403	-0.0124
		134	5670.0000	5,670.012475	-0.0125
		151	5755.0000	5,755.012349	-0.0123
		159	5795.0000	5,795.012407	-0.0124
		38	5190.0000	5,190.012544	-0.0125



14. ANTENNA REQUIREMENT

Standard Applicable 14.1

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.

14.2 **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.

~ End of Report ~

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