

CERTIFICATION TEST REPORT

Report Number.: 11785223-E5V3

- Applicant : SONY MOBILE COMMUNICATIONS INC. 4-12-3 HIGASHI-SHINAGAWA, SHINAGAWA-KU TOKYO, 140-0002, JAPAN
 - FCC ID : PY7-65365K
- **EUT Description :** GSM/WCDMA/LTE PHONE with BT, DTS/UNII a/b/g/n/ac, GPS & NFC
- Test Standard(s) : FCC 47 CFR PART 15 SUBPART E (EXCEPT DFS)

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Revision History

Rev.	lssue Date	Revisions	Revised By
V1	07/14/17	Initial Issue	D. Coronia
V2	07/31/17	Updated Section 2, 7, 8, 10.5.3, 10.11.1, 11.0 & Table of contents numbering	D. Coronia
V3	08/02/17	Updated RBE label (remove the word "Restricted" and "Authorized") & Updated Section 5.6 (SISO & MIMO statement)	D. Coronia

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SONY MOBILE COMMUNICATIONS INC. 4-12-3 HIGASHI-SHINAGAWA, SHINAGAWA-KU TOKYO, 140-0002, JAPAN
EUT DESCRIPTION:	GSM/WCDMA/LTE PHONE with BT, DTS/UNII a/b/g/n/ac, GPS & NFC
SERIAL NUMBER:	BH9000BU82 & BH9000AA82 (CONDUCTED) BH9000SE81 & BH9000L281 (RADIATED)
DATE TESTED:	JUNE 6 – JULY14 , 2017

APPLICABLE STANDARDS			
STANDARD	TEST RESULTS		
CFR 47 Part 15 Subpart E	Pass		

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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2. TEST METHODOLOGY

FCC: The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 14-30, FCC KDB 662911 D01 v02r01, FCC KDB 789033 D02 v01r04, FCC KDB 644545 D03 v01, ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street		
Chamber A(IC: 2324B-1)	Chamber D(IC: 22541-1)		
Chamber B(IC: 2324B-2)	Chamber E(IC: 22541-2)		
Chamber C(IC: 2324B-3)	Chamber F(IC: 22541-3)		
	Chamber G(IC: 22541-4)		
	Chamber H(IC: 22541-5)		

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

Chambers A through C are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under Industry Canada company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

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4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB - 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS & NFC.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5.2GHz Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
F180 F240	802.11a CDD 2TX	15.53	35.73
5180 - 5240	802.11n HT20 CDD 2TX	15.67	36.90
5190 - 5230	802.11n HT40 CDD 2TX	15.26	33.57
5210	802.11a c VHT80 CDD 2TX	15.44	34.99

5.3GHz Band

Frequency Range	Mode	Output Power	Output Power
(MHz)		(dBm)	(mW)
E260 E220	802.11a CDD 2TX	15.35	34.28
5200 - 5520	802.11n HT20 CDD 2TX	15.59	36.22
5270 - 5310	802.11n HT40 CDD 2TX	15.17	32.89
5290	802.11ac VHT80 CDD 2TX	15.57	36.06

5.6GHz Band

Frequency Range	Mode	Output Power	Output Power
(MHz)		(dBm)	(mW)
5500 - 5700	802.11a CDD 2TX	15.54	35.81
5503 - 5700	802.11n HT20 CDD 2TX	15.37	34.43
5510 - 5670	802.11n HT40 CDD 2TX	15.45	35.08
5530-5610	802.11ac VHT80 CDD 2TX	15.34	34.20

5.8GHz Band

Frequency Range	Mode	Output Power	Output Power
(MHz)		(dBm)	(mW)
5745 - 5825	802.11a CDD 2TX	15.15	32.73
5745 - 5825	802.11n HT20 CDD 2TX	15.26	33.57
5755 - 5795	802.11n HT40 CDD 2TX	15.15	32.73
5775	802.11ac VHT80 CDD 2TX	14.81	30.27

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two integrated antennas, with the following maximum gains:

	Peak Antenna Gain (dBi)		
Frequency (GHz)	Main (Chain 0)	Sub (Chain 1)	
5180-5320	-4.4	-6.7	
5500-5700	-3.1	-8.4	
5725-5850	-3.5	-8.4	

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was SONY, s_atp_1_00139_B_10_5. The test utility software used during testing was Tera Term Ver 4.79.

5.5. LIST OF TEST REDUCTION AND MODES

Antenna port & Radiated Testing				
Mode	Covered by			
802.11a Legacy	802.11a 2TX CDD			
802 11HT20 2TX	802.11n HT20 2TX CDD			
802.111120.21%	802.11n HT20 2TX CDD			
	802.11n HT20 2TX CDD			
802.1180 01120 21X	802.11n HT20 2TX CDD			
902 11n HT40 2TV	802.11n HT40 2TX CDD			
802.11111140.217	802.11n HT40 2TX CDD			
	802.11n HT40 2TX CDD			
802.1100 VH140 21X	802.11n HT40 2TX CDD			
	802.11ac VHT80 2TX CDD			
502.11aC V11160 21A	802.11ac VHT80 2TX CDD			

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5.6. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz and power line conducted emissions were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X (Flatbed), Y (Landscape), Z (Portrait), it was determined that Z (Portrait) was worst-case orientations. Therefore, all final radiated testing was performed with the EUT in Z (Portrait) orientation.

Worst-case data rates as provided by the client were:

802.11a mode: 6 Mbps 802.11n HT20 mode: 13 Mbps (MCS8) 802.11n HT40 mode: 27 Mbps (MCS8) 802.11ac VHT80 mode: 58.5 Mbps (MCS0)

802.11ac VHT20 and VHT40 mode are different from 802.11nHT20 and HT40 only in control messages and have the same power settings.

Both SISO and MIMO have the same power and have been investigated and the worst case was in MIMO mode which was set for final test.

For simultaneous transmission: SISO 2.4GHz Chain 0 and 5GHz Chain 1 was checked and no noticeable new emission was found.

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5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List						
Description Manufacturer Model Serial Number FCC ID						
Laptop	Lenovo	20B7S0A200	PC015REW	NA		
AC Adapter	SONY	1300-7137.1	4016W40310044	NA		
Headphones	SONY	N/A	N/A	N/A		

I/O CABLES (CONDUCTED TEST)

	I/O Cable List							
Cable	Port	# of identical	Connector	Cable Type	Cable	Remarks		
No		ports	Туре		Length (m)			
1	Antenna	1	RF	Shielded	0.2	To spectrum Analyzer		
2	USB	1	USB	Shielded	1	N/A		
3	DC	1	DC	Shielded	0.3	N/A		

I/O CABLES (RADIATED AND CONDUCTED EMISSIONS)

	I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks	
1	USB	1	USB	Shielded	3	N/A	
2	Audio	1	3.5mm	Shielded	1	N/A	

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CONDCUTED TEST SETUP DIAGRAM



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TEST SETUP

RADIATED AND AC LINE CONDUCTED EMISSIONS SETUP DIAGRAM



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6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST							
Description	Manufacturer	Model	Asset	Cal Due			
Antenna, Broadband Hybrid, 30MHz to 2000MHz w/4dB Pad	Sunol Sciences Corp.	JB3	T477	06/22/2018			
Antenna, Active Loop 9kHz-30MHz	ETS-Lindgren	6502	T1683	02/17/2018			
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T345	03/07/2018			
Antenna, Horn 18-26.5GHz	ARA	MWH-1826/B	T449	05/26/2018			
Antenna, Horn 26.5 - 40GHz	ARA	MWH-1826/B	T446	05/26/2018			
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1264	07/08/2018			
Power Sensor, P – series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T413	06/20/2018			
Amplifier, 1-26.5GHz	Agilent (Keysight) Technologies	8449B	T404	07/05/2018			
Amplifier, 10kHz-1GHz	Agilent (Keysight) Technologies	8447D	T15	08/26/2017			
RF Amplifier	MITEQ	AFS42-00101800-25- S-42	T493	02/15/2018			
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Agilent (Keysight) Technologies	E4440A	T199	07/22/2017			
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T907	01/23/2018			
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Agilent (Keysight) Technologies	E9030A	T905	01/11/2018			
LISN	FISCHER	FCC-LISN-50/250- 25-2-01	T1310	01/17/2018			

Test Software List						
Description Manufacturer Model Version						
Radiated Software	UL	UL EMC	Ver 9.5, Apr 26, 2016			
Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015			
Antenna Port Software	UL	UL RF	Ver 5.1.1, July 15, 2016			

The following test and measurement equipment was utilized for the tests documented in this report:

NOTE: *testing is completed before equipment calibration expiration date.

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 789033 D02 v01r04, Section B.

6 dB Emission BW: KDB 789033 D02 v01r04, Section C.2.

26 dB Emission BW: KDB 789033 D02 v01r04, Section C.2.1.

<u>99% Occupied BW</u>: KDB 789033 D02 v01r04, Section D.

Conducted Output Power: KDB 789033 D02 v01r04, Section E.3.b (Method PM-G) and KDB 662911 D01 v02r01.

Power Spectral Density: KDB 789033 D02 v01r04, Section F and KDB 662911 D01 v02r01.

Unwanted emissions in restricted bands: KDB 789033 D02 v01r04, Sections G.3, G.4, G.5, and G.6, and KDB 662911 D01 v02r01.

<u>Unwanted emissions in non-restricted bands</u>: KDB 789033 D02 v01r04, Sections G.3, G.4, and G.5, and KDB 662911 D01 v02r01.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

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8. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
§15.407 (a)	Occupied Band width (26dB)	N/A		Pass
§15.407	6dB Band width (5.8Ghz)	>500KHz		Pass
§15.407 (a)(1)	TX Cond. Power5.15-5.25 GHz	<24dBm (FCC)		Pass
§15.407 (a)(2)	TX Cond. Power 5.25-5.35 & 5.47- 5.725 GHz	<24dBm		Pass
§15.407 (a)(3)	TX Cond. Power 5.725-5.850 GHz	<30dBm	Conducted	Pass
§15.407 (a)(1)	PSD (5.15-5.25 GHz)	<11dBm/MHz (FCC)		Pass
§15.407 (a)(2)	PSD (5.3,5.5GHz)	<11dBm/MHz		Pass
§15.407 (a)(3)	PSD (5.8GHz)	<30dBm per 500kHz		Pass
§15.207 (a) §15.407(b) (6)	AC Power Line conducted emissions	Section 10		Pass
§15.407 (b) & 15.209	Radiated Spurious Emission	<54dBuV/m	Radiated	Pass

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9. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

9.1. ON TIME AND DUTY CYCLE

<u>LIMITS</u>

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

RESULTS

Mode	ON Time	Period	Duty Cycle	Duty	Duty Cycle	1/T
	В		x	Cycle	Correction Factor	Minimum VBW
	(msec)	(msec)	(linear)	(%)	(dB)	(kHz)
802.11a	2.030	2.140	0.949	94.9%	0.23	0.493
802.11n HT20	2.510	2.620	0.958	95.8%	0.19	0.398
802.11n HT40	1.226	1.327	0.924	92.4%	0.34	0.816
802.11ac VHT80	0.592	0.689	0.858	85.8%	0.66	1.691

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DUTY CYCLE PLOTS





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🔆 Agilent 17	03:58 Jun 27, 20	017	L	Measure
Pv6.9(06151 Ref 30 dBm ⊧Peak ┌───	7),39317 ST, Con #Atten 40	ducted B dB	▲ Mkr3 1.327 ms -32.974 dB	Meas Off
og Ø B/		annan da mana tan an a	nistanani panatisita ani	Channel Power
0.8 B			u	Occupied Bk
PAvg				ACF
Center 5.190 Ces BW 8 MHz Marker Tr	000 GHz ace Type	#VBW 50 MHz Swe X Axis	Span 0 Hz ep 5.067 ms (1001 pts) Amplitude	Multi Carrier Power
1R (1Δ (3R (3Δ (1) Time 1) Time 1) Time 1) Time 1) Time	1.262 ms 1.226 ms 1.262 ms 1.327 ms	7.68 dBm 6.94 dB 7.68 dBm -32.97 dB	Power Stat CCDF
				More 1 of 2



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10. ANTENNA PORT TEST RESULTS

10.1. 11a 2TX CDD MIMO MODE IN THE 5.2GHz BAND

10.1.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	23.80	22.30
Mid	5200	24.55	22.25
High	5240	26.05	22.05

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10.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	16.004	16.318
Mid	5200	15.909	16.517
High	5240	16.292	16.400

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Ch Freq 5.18 GHz Trig Free Occupied Bandwidth Averages: 20 APv6.9(061517),39317 ST, Conducted B	Meas Off Channel Power
APv6.9(061517),39317 ST, Conducted B	Channel Power
Ker 20 dbm #Htten 30 db #Samp	Occupied BW
10 dB/ → max +	ACF
dB Center 5.180 00 GHz Span 40 MHz	Multi Carrier Power
#Res BW 330 kHz #VBW 1 MHz Sweep 1.132 ms (1000 pts) Occupied Bandwidth Осс ВИ % Риг 99.00 % 16 00 42 мц – × dB – 26.00 dB	Power Stat CCDF
Interview Inter	More 1 of 2



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	Measure
Ch Freq 5.2 GHz Trig Free	Meas Off
APv6 9(061517) 39317 ST. Conducted B	Channel Power
Ref 20 dBm #Atten 30 dB #Samp	Occupied BW
10 dB/ Offst 10.8 matulation for the state of the state	ACP
dB	Multi Carrier Power
•кез би 350 кнг// •кг//	Power Stat CCDF
Transmit Freq Error 22.973 kHz x dB Bandwidth 20.328 MHz*	More 1 of 2



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Chain 0 OBW , CH HIGH	L	Measure
Ch Freq 5.24 GHz Trig	g Free	Meas Off
APv6 9(061517) 39317 ST. Conducted B		Channel Power
Ref 20 dBm #Atten 30 dB #Samp		Occupied BW
10 dB/ 0ffst 10.8 minimum		ACP
dB	40 MHz	Multi Carrier Power
•кез Би 330 кнг •VBW 1 MHZ Sweep 1.132 ms (100) Occupied Bandwidth 0cc BW % Pwr 9 16 2919 MHz × dB -26.	9.00 % 9.00 % 00 dB	Power Stat CCDF
Transmit Freq Error -47.959 kHz × dB Bandwidth 20.180 MHz*		More 1 of 2
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10.1.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

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Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5150-5250 MHz

Chain 0	Chain 1	Uncorrelated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-5.40

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5150-5250 MHz

Chain 0	Chain 1	Correlated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-2.46

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FCC ID: PY7-65365K

RESULTS

ID: 39317 Date: 06/26/17

Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional	Directional
		26 dB	99% Gain		Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5180	22.30	16.0040	-5.40	-2.46
Mid	5200	22.25	15.9090	-5.40	-2.46
High	5240	22.05	16.2920	-5.40	-2.46

Limits

Channel	Frequency	FCC	IC	Max	Power	FCC	IC	PPSD
		Power	EIRP	IC	Limit	PPSD	eirp	Limit
		Limit	Limit	Power		Limit	PSD	
							Limit	
	(MHz)	(dBm)						
Low	5180	24.00	22.04	27.44	24.00	11.00	10.00	11.00
Mid	5200	24.00	22.02	27.42	24.00	11.00	10.00	11.00
High	5240	24.00	22.12	27.52	24.00	11.00	10.00	11.00

Duty Cycle CF (dB)

Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5180	13.68	10.94	15.53	24.00	-8.47
Mid	5200	13.33	10.95	15.31	24.00	-8.69
High	5240	13.66	10.82	15.48	24.00	-8.52

0.23

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5180	1.894	-0.264	4.19	11.00	-6.81
Mid	5200	2.031	-0.279	4.27	11.00	-6.73
High	5240	2.006	-0.239	4.27	11.00	-6.73

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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10.2. 11n HT20 2TX CDD MIMO MODE IN THE 5.2GHz BAND

10.2.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	24.35	22.60
Mid	5200	35.30	23.50
High	5240	24.55	23.30

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10.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	17.831	17.581
Mid	5200	17.788	17.745
High	5240	17.751	17.464

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Chain 0 OBW , CH MID	I	Mooguro
Agient 10:15:56 Jun 27, 2017	L	measure
Ch Freq 5.2 GHz Occupied Bandwidth Averages: 20	Trig Free	Meas Off
QPu6.9/061517) 39317 ST. Conducted R		Channel Power
Ref 20 dBm +Atten 30 dB *Samp		Occupied BW
10 dB/ 0ffst 10.8		ACP
dB Center 5.200 00 GHz	Span 40 MHz	Multi Carrier Power
#Res BW 360 kHz #VBW 1.1 MHz Sweep 1.066 Occupied Bandwidth ٥cc BW % Pm 17 7879 MHz × d	ms (1000 pts) r 99.00 % B -26.00 dB	Power Stat CCDF
Transmit Freq Error -16.830 kHz x dB Bandwidth 21.750 MHz*		More 1 of 2
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Ch Freq 5.24 GHz Trig Ch Freq 5.24 GHz Trig Occupied Bandwidth Averages: 20 Image: 20 APv6.9(061517),39317 ST, Conducted B Ref 20 dBm *Atten 30 dB *Samp Image: 20 Image: 20 10 Image: 20 Image: 20	Meas Off
APv6.9(061517),39317 ST, Conducted B Ref 20 dBm #Atten 30 dB #Samp Log	
Ref 20 dBm #Atten 30 dB #Samp Log 10 , the second	Channel Power
	Occupied BW
dB/	ACP
dB	Multi Carrier Power
Image: Second knz #VDM 1.1 MH2 Sweep 1.006 ms (1000 pts) Occupied Bandwidth Occ BM % Pwr 99.00 % 17 75/09 MHz × dB -26.00 dB	Power Stat CCDF
Transmit Freq Error -21.540 kHz x dB Bandwidth 20.949 MHz*	More 1 of 2



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10.2.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

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Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5150-5250 MHz

Chain 0	Chain 1	Uncorrelated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-5.40

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5150-5250 MHz

Chain 0	Chain 1	Correlated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-2.46

RESULTS

ID: 39317 Date: 06/26/17

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Channel	Frequency	Min Min		Directional	Directional		
		26 dB	99%	Gain	Gain		
		BW	BW	for Power	for PPSD		
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)		
Low	5180	22.60	17.5810	-5.40	-2.46		
Mid	5200	23.50	17.7450	-5.40	-2.46		
High	5240	23.30	17.4640	-5.40	-2.46		

Bandwidth and Antenna Gain

Limits

Channel	Frequency	FCC Power Limit	IC EIRP Limit	Max IC Power	Power Limit	FCC PPSD Limit	IC eirp PSD	PPSD Limit
							Limit	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5180	24.00	22.45	27.85	24.00	11.00	10.00	11.00
Mid	5200	24.00	22.49	27.89	24.00	11.00	10.00	11.00
High	5240	24.00	22.42	27.82	24.00	11.00	10.00	11.00

Duty Cycle CF (dB) 0.19 Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5180	13.51	11.61	15.67	24.00	-8.33
Mid	5200	13.42	11.05	15.41	24.00	-8.59
High	5240	13.37	11.33	15.48	24.00	-8.52

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5180	1.720	-0.347	4.01	11.00	-6.99
Mid	5200	1.870	-0.177	4.17	11.00	-6.83
High	5240	1.721	-0.588	3.92	11.00	-7.08

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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10.3. 11n HT40 2TX CDD MIMO MODE IN THE 5.2GHz BAND

10.3.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5190	43.4	42.7
High	5230	43.1	52.4

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10.3.2. 99% BANDWIDTH

DATE: AUGUST 02, 2017

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5190	35.315	36.076
High	5230	36.462	35.875

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10.3.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5150-5250 MHz

Chain 0	Chain 1	Uncorrelated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-5.40

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5150-5250 MHz

Chain 0	Chain 1	Correlated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-2.46

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RESULTS

ID: 39317	Date:	06/26/17
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Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional	Directional
		26 dB	99%	Gain	Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5190	42.70	35.315	-5.40	-2.46
				= 10	0.40

Limits

Channel	Frequency	FCC	IC	Max	Power	FCC	IC	PPSD
		Power	EIRP	IC	Limit	PPSD	eirp	Limit
		Limit	Limit	Power		Limit	PSD	
							Limit	
	(MHz)	(dBm)						
Low	5190	24.00	23.00	28.40	24.00	11.00	10.00	11.00
High	5230	24.00	23.00	28.40	24.00	11.00	10.00	11.00

Duty Cycle CF (dB) 0.34

Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
	· ·	N ² 7	N ² 7	()	N ² /	1 - 1 - 1
Low	5190	13.12	10.97	15.19	24.00	-8.81

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5190	-1.132	-3.322	1.26	11.00	-9.74
High	5230	-1.258	-3.325	1.18	11.00	-9.82

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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10.4. 11ac HT80 2TX CDD MIMO MODE IN THE 5.2GHz BAND

10.4.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Mid	5210	121.4	95.6

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10.4.2. 99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5210	73 317	72 613

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Chain 0 OBW , CH	MID			Moosuro
Agient 10.50.16 Juli 27	, 2017		L	measure
Ch Freq 5.21 Occupied Bandwidth	GHz	Averages: 20	Trig Free	Meas Off
000 0/001E17) 20217 01	Conducted D			Channel Power
HPV6.3(061517),33317 31,	Londucted D			
#Samp Htten	30 dB			Occupied BW
10				
dB/ Offst 10.8				АСР
dB AB				
				Multi Carrier Power
Lenter 5.210 00 GHz		0 1 000	Span 160 MHz	
#Res BW 1.5 MHZ	#VBM 5 MHZ	Sweep 1.066 (ns (1000 pts)	Power Stat
Occupied Bandwidt	h	Occ BW % Pwr	99.00 %	CCDF
73.31	66 MHz	X dB	–26.00 dB	
Transmit Freq Error 4	73.221 kHz 0.749 MHz*			More 1 of 2
Conuriabt 2000, 2011, 0a	ilont Tooknologi			



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10.4.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

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TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5150-5250 MHz

Chain 0	Chain 1	Uncorrelated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-5.40

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5150-5250 MHz

Chain 0	Chain 1	Correlated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-2.46

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RESULTS

ID:	39317	Date:	06/26/17
	00017	Dute.	00/20/17

Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional	Directional
		26 dB	99%	Gain	Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5210	95.60	72.613	-5.40	-2.46

Limits

Channel	Frequency	FCC	IC	Max	Power	FCC	IC	PPSD
		Power	EIRP	IC	Limit	PPSD	eirp	Limit
		Limit	Limit	Power		Limit	PSD	
							Limit	
	(MHz)	(dBm)						
Low	5210	24.00	23.00	28.40	24.00	11.00	10.00	11.00

Duty Cycle CF (dB) 0.66 Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5210	13.48	11.05	15.44	24.00	-8.56

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5210	-4.698	-7.004	-2.03	11.00	-13.03

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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10.5. 11a 2TX CDD MIMO MODE IN THE 5.3GHz BAND

10.5.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

		26 dB BW	26 dB BW
Channel	Frequency	Chain 0 (MHz)	Chain 1 (MHz)
Low	5260	23.70	25.95
Mid	5300	23.55	25.60
High	5320	26.85	23.95

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10.5.2. 99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	16.286	16.221
Mid	5300	16.434	16.411
High	5320	16.440	16.134

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Chain 0 OBW, CH LOW	Masaura
# Aglient 10:39:35 Jun 27, 2017	measure
Ch Freq 5.26 GHz Trig Free Occupied Bandwidth Averages: 20	Meas Off
006 0/061E17\ 20217 ST. Canduated P.	Channel Power
Hrvo.3(001517),33517 51, Cunducted B Ref 20 dBm #Atten 30 dB #Samp	Occupied BW
Log 10 dB/ 0ffst 10.8 10.8 10.8 10.8 10.8 10.8 10.8 10.4 10.	ACP
dB Center 5.260 00 GHz Span 40 MHz	Multi Carrier Power
#Res BW 330 kHz #VBW 1 MHz Sweep 1.132 ms (1000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 16 2062 MUL x dB -26.00 dB	Power Stat CCDF
LO.2003 I'IFIZ II W Constant Transmit Freq Error -141.654 kHz x dB Bandwidth 19.997 MHz*	More 1 of 2
Copyright 2000–2011 Agilent Technologies	



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Chain 0 OBW , CH MID			Moosuro
Agilent 10.47.04 Juli 27, 2017		,	measure
Ch Freq 5.3 GHz Occupied Bandwidth	Averages: 20	Trig Free	Meas Off
00.00 0/001E17\ 20217_CT_Conduc	Lood P		Channel Power
Ref 20 dBm #Atten 30 dB #Samp			Occupied BW
10 dB/ 0ffst 10.8			ACP
dB		Span 40 MHz	Multi Carrier Power
Cccupied Bandwidth	витина эмеер 1.132 ms Осс ВМ % Риг Чатина Кав	99.00 % -26.00 dB	Power Stat CCDF
Transmit Freq Error -65.519 × dB Bandwidth 20.258	∙ - ⊨kHz MHz≭		More 1 of 2
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Chain 0 OBW , CH HIGH * Agilent 10:51:33 Jun 27, 2017	ł	L	Measure
Ch Freq 5.32 GHz Occupied Bandwidth	Averages: 20	Trig Free	Meas Off
APv6 9(061517) 39317 ST. Conduct	ed B		Channel Power
Ref 20 dBm #Atten 30 dB #Samp Log			Occupied BW
10 dB/ 0ffst 10.8 10.8	I I I I I I I I I I I I I I I I I I I		ACP
dB Center 5.320 00 GHz		Span 40 MHz	Multi Carrier Power
*Res BW 330 kHz +VE Occupied Bandwidth 1c 4200 ML	W 1 MHz Sweep 1.132 n Occ BW % Pwr	ns (1000 pts) 99.00 % –26.00 dB	Power Stat CCDF
10.4390 M Transmit Freq Error 36.986 k x dB Bandwidth 20.089 M	Hz Hz*		More 1 of 2
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10.5.3. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5250-5350 MHz

Chain 0	Chain 1	Uncorrelated Chain		
Antenna	Antenna	Directional		
Gain	Gain	Gain		
(dBi)	(dBi)	(dBi)		
-4.40	-6.70	-5.40		

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5250-5230 MHz

Chain 0	Chain 1	Correlated Chains	
Antenna	Antenna	Directional	
Gain	Gain	Gain	
(dBi)	(dBi)	(dBi)	
-4.40	-6.70	-2.46	

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RESULTS

ID: 39317 Date: 00/20/17	ID:	39317	Date:	06/26/17
--	-----	-------	-------	----------

Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional	Directional
		26 dB	99%	Gain	Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5260	23.70	16.221	-5.40	-2.46
Mid	5300	23.55	16.411	-5.40	-2.46
High	5320	23.95	16.134	-5.40	-2.46

Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5260	24.00	23.10	29.10	23.10	11.00	11.00	11.00
Mid	5300	24.00	23.15	29.15	23.15	11.00	11.00	11.00
High	5320	24.00	23.08	29.08	23.08	11.00	11.00	11.00

 Duty Cycle CF (dB)
 0.23
 Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	13.32	10.84	15.26	24.00	-8.74
Mid	5300	13.48	10.80	15.35	24.00	-8.65
High	5320	13.44	10.64	15.27	24.00	-8.73

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	2.132	0.047	4.45	11.00	-6.55
Mid	5300	2.003	-0.152	4.30	11.00	-6.70
High	5320	1.840	-0.313	4.14	11.00	-6.86

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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10.6. 11n HT20 2TX CDD MIMO MODE IN THE 5.3GHz BAND

10.6.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	24.30	23.10
Mid	5300	32.35	22.90
High	5320	34.60	23.20

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10.6.2. 99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	17.657	17.303
Mid	5300	17.462	17.341
High	5320	17.529	17.025

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Chain 0 OBW , CH LOW	
🔆 Agilent 11:02:48 Jun 27, 2017 L	Measure
Ch Freq 5.26 GHz Trig Free Occupied Bandwidth Averages: 20	Meas Off
APv6.9(061517).39317 ST. Conducted B	Channel Power
Ref 20 dBm #Atten 30 dB #Samp	Occupied BW
10 dB/ Offst 10.8 LALMMUNTUU	ACP
dB Center 5.260 00 GHz Span 40 MHz	Multi Carrier Power
*Kes BW 360 kHz *VBW 1.1 MHz Sweep 1.066 ms (1000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 17 6574 MHz × dB -26.00 dB	Power Stat CCDF
Transmit Freq Error 62.996 kHz x dB Bandwidth 21.826 MHz*	More 1 of 2
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Chain 0 OBW , CH MID	Macaura
🔆 Agiient 11:09:29 Jun 27, 2017	L measure
Ch Freq 5.3 GHz Occupied Bandwidth Averages: 2	Trig Free Meas Off
APu6 9(061517) 39317 ST Conducted B	Channel Power
Ref 20 dBm #Atten 30 dB #Samp Log	Occupied BW
10 dB/ Offst 10.8	ACP
dB	Span 40 MHz Power
*Res BW 360 kHz +VBW 1.1 MHz Sweep 1. Occupied Bandwidth Occ BW Z 17.4618 MHz	066 ms (1000 pts) Power Stat Pwr 99.00 % x dB -26.00 dB
Transmit Freq Error 142.672 kHz x dB Bandwidth 21.665 MHz*	More 1 of 2
Copyright 2000–2011 Agilent Technologies	



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Chain 0 OBW, CH HIGH	1	Moosuro
Agient 11.15.57 Jun 27, 2017	L	measure
Ch Freq 5.32 GHz Occupied Bandwidth Avera	Trig Free ages: 20	Meas Off
DPu6 9(861517) 39317 ST. Conducted R		Channel Power
Ref 20 dBm #Atten 30 dB #Samp		Occupied BW
10 dB/ 0ffst 10.8		ACP
dB	Span 40 MHz	Multi Carrier Power
KHZ #VEW 1.1 MHZ Sw Occupied Bandwidth 0cm 17 5290 MH-	c BW % Pwr 99.00 % x dB -26.00 dB	Power Stat CCDF
Transmit Freq Error 98.374 kHz x dB Bandwidth 21.498 MHz*		More 1 of 2
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10.6.3. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

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DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5250-5350 MHz

Chain 0	Chain 1	Uncorrelated Chains	
Antenna	Antenna	Directional	
Gain	Gain	Gain	
(dBi)	(dBi)	(dBi)	
-4.40	-6.70	-5.40	

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5250-5230 MHz

Chain 0	Chain 1	Correlated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-2.46

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RESULTS

Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional	Directional
		26 dB	99%	Gain	Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5260	23.10	17.303	-5.40	-2.46
Mid	5300	22.90	17.341	-5.40	-2.46
High	5320	23.20	17.025	-5.40	-2.46

0.19

Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5260	24.00	23.38	29.38	23.38	11.00	11.00	11.00
Mid	5300	24.00	23.39	29.39	23.39	11.00	11.00	11.00
High	5320	24.00	23.31	29.31	23.31	11.00	11.00	11.00

Duty Cycle CF (dB)

Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	13.44	11.51	15.59	24.00	-8.41
Mid	5300	13.27	10.81	15.22	24.00	-8.78
High	5320	13.45	11.15	15.46	24.00	-8.54

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	1.962	0.252	4.39	11.00	-6.61
Mid	5300	1.818	0.000	4.20	11.00	-6.80
High	5320	2.074	-0.160	4.30	11.00	-6.70

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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10.7. 11n HT40 2TX CDD MIMO MODE IN THE 5.3GHz BAND

10.7.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5270	43.2	56.4
High	5310	48.9	43.1

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Chain 0 26dB , C	CH HIGH un 27, 2017	L	Measure
APv6.9(061517),39317 Ref 20 dBm #At #Peak	ST, Conducted B ten 30 dB	▲ Mkr1 48.9 MHz 1.977 dB	Meas Off
Log 10 dB/			Channel Power
dB	1,8		Occupied BW
-18.9 dBm #PAvg		Marting and a strategy and a strategy and a	ACP
M1 S2 S3 FS AA			Multi Carrier Power
£(f): FTun Swp			Power Stat CCDF
Center 5.310 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 100 MHz #Sweep 100 ms (1001 pts)	More 1 of 2
Copyright 2000-2011	Agilent Technologies		



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10.7.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5270	36.045	36.237
High	5310	36.427	35.018

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10.7.3. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5250-5350 MHz

Chain 0	Chain 1	Uncorrelated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-5.40

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5250-5230 MHz

Chain 0	Chain 1	Correlated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-2.46

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RESULTS

Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional	Directional
		26 dB	99%	Gain	Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5270	43.20	36.045	-5.40	-2.46
High	5310	43.10	35.018	-5.40	-2.46

Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5270	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5310	24.00	24.00	30.00	24.00	11.00	11.00	11.00

	Duty Cycle CF (dB)	0.34	Included in Calculations of Corr'd PPS
--	--------------------	------	--

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5270	13.00	10.95	15.11	24.00	-8.89
Hiah	5310	13 17	10.83	15 17	24 00	-8.83

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5270	-1.223	-3.358	1.19	11.00	-9.81

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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10.8. 11ac HT80 2TX CDD MIMO MODE IN THE 5.3GHz BAND

10.8.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

		26 dB BW	26 dB BW
Channel	Frequency	Chain 0	Chain 1
		(MHz)	(MHz)
Mid	5290	86.0	99.0

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10.8.2. 99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
		(

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Chain 0 OBW, CH MID	Moosuro
Kynen (11.23.3) (001/27,2017	neasure
Ch Freq 5.29 GHz Trig Free	Meas Off
Occupied Bandwidth Averages: 20	
	Channel Power
APv6.9(061517),39317 ST, Conducted B	
Ref 20 dBm #Atten 30 dB #Samp	Occupied BM
10 ////////////////////////////////////	
	ACP
	Multi Carrier Power
Lenter 5.290/00/GHz Span 160/MHz #Res RW 1.5 MHz #VRW 5/MHz Sween 1/066/ms (1000/n+s)	
	Power Stat
Uccupied Bandwidth Occ BW 7. Pwr 99.00 7	CCDF
	Mana
Transmit Freq Error -658.579 kHz x dB Bandwidth 79.076 MHz*	1 of 2
Copyright 2000–2011 Agilent Technologies	<u></u>



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10.8.3. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5250-5350 MHz

Chain 0	Chain 1	Uncorrelated Chains		
Antenna	Antenna	Directional		
Gain	Gain	Gain		
(dBi)	(dBi)	(dBi)		
-4.40	-6.70	-5.40		

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5250-5230 MHz

Chain 0	Chain 1	Correlated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-4.40	-6.70	-2.46

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RESULTS

Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional	Directional
		26 dB	99%	Gain	Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5290	86.00	72.367	-5.40	-2.46

Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5290	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB) 0.66 Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5290	13.57	11.25	15.57	24.00	-8.43

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5290	-4.094	-6.376	-1.42	11.00	-12.42

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.





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10.9. 11a 2TX CDD MIMO MODE IN THE 5.6GHz BAND

10.9.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

		26 dB BW	26 dB BW
Channel	Frequency	Chain 0	Chain 1
		(MHz)	(MHz)
Low	5500	24.00	22.45
Mid	5580	23.60	22.35
Mid (FCC)	5640	23.55	22.75
High	5700	23.55	22.50
144	5720	23.70	21.90

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10.9.2. 99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	16.419	16.123
Mid	5580	16.453	16.272
Mid (FCC)	5640	16.561	16.392
High	5700	16.402	16.308
144	5720	16.161	16.374

DATE: AUGUST 02, 2017

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Chain 0 OBW, CH LOW	Maagura
* Agient 11:34:52 Jun 27, 2017	measure
Ch Freq 5.5 GHz Trig Free Occupied Bandwidth Averages: 20	Meas Off
	Channel Power
Ref 20 dBm #Atten 30 dB #Samp	Occupied BW
10 dB/ offst 10.8 dB/ 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	ACP
dB Center 5.500 00 GHz Span 40 MHz	Multi Carrier Power
#Res BW 330 kHz #VBW 1 MHz Sweep 1.132 ms (1000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 16,4102 MUL x dB -26.00 dB	Power Stat CCDF
IO.4133 I'III2 IIII2 IIII2 IIII2 Transmit Freq Error -62.744 kHz -62.744 kHz -62.744 kHz x dB Bandwidth 20.200 MHz*	More 1 of 2
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Chain 0 OBW, CH MID	I	Moosuro
Aginant 11.53.00 Juli 27, 2017		rieasure
Ch Freq 5.58 GHz Tr	ig Free	Meas Off
Hverages, 20		Channel Power
APv6.9(061517),39317 ST, Conducted B		
Ref 20 dBm #Atten 30 dB #Samp		Occupied BW
dB/ → → W → → → → → → → → → → → → → → → →		ACP
	40 MU-	Multi Carrier Power
#Res BW 330 kHz	140 mm2)00 pts)	
Occupied Bandwidth Occ BW % Pwr	99.00 %	Power Stat CCDF
16.4526 MHz × dB -2	6.00 dB	
Transmit Freq Error -29.225 kHz x dB Bandwidth 19.918 MHz*		More 1 of 2
Copyright 2000–2011 Agilent Technologies		



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Chain 0 OBW , CH MID	(FCC)		ВТ	Freq/Channel
Ch Freq 5.64 GHz		20	Trig Free	Center Freq 5.6400000 GHz
Occupied Bandwidth	ļ	verages: 20		Start Freq 5.61500000 GHz
Ref 20 dBm Atten 20 dB #Samp				Stop Freq 5.66500000 GHz
10 dB/ → 4 Offst 10.8 dB/ dB/ dB/ dB/ dB/ dB/ dB/ dB/ dB/ dB/				CF Step 5.0000000 MHz <u>Auto Ma</u> i
dB	8W 1 MHz	Swoon 1.4 m	Span 50 MHz	Freq Olfset 0.00000000 Hz
Occupied Bandwidth 16.5605 M	Hz	Occ BW % Pwr x dB	99.00 % -26.00 dB	Signal Track ^{On <u>C</u>if}
Transmit Freq Error -36.337 k x dB Bandwidth 20.093 M	Hz Hz*			
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	I	Moosuro
Aglient 11:42:31 Jun 27, 2017		measure
Ch Freq 5.7 GHz Occupied Bandwidth Averages: 20	Trig Free	Meas Off
00.06.0/061517) 20217 ST. Conducted P		Channel Power
Ref 20 dBm #Atten 30 dB #Samp		Occupied BW
10 dB/ Offst 10.8 www.waterington		ACP
Center 5.700 00 GHz	Span 40 MHz	Multi Carrier Power
Occupied Bandwidth Occ BW % Pwr 16.4015 MHz × dB	99.00 % -26.00 dB	Power Stat CCDF
Transmit Freq Error 69.969 kHz x dB Bandwidth 20.537 MHz*		More 1 of 2
Copyright 2000–2011 Agilent Technologies		



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Chain 0 OBW , CH 144	Mar and a state
Agilent 11:07:36 Jul 10, 2017	measure
Ch Freq 5.72 GHz Trig Free Occupied Bandwidth Averages: 20	Meas Off
	Channel Power
nrvo.3(001117),33317 , Daf 20 dPm = #Otton 20 dP	
	Occupied BW
dB/ →	ACF
	Multi Carrie
Center 5.720 00 GHz Span 40 MHz	Power
#Res BW 330 kHz #VBW 1 MHz Sweep 1.132 ms (1000 pts)	
Occupied Bandwidth Occ BW % Pwr 99.00 %	Power Sta CCDF
16.1609 MHz × dB -26.00 dB	
Transmit Freq Error 99.790 kHz × dB Bandwidth 19.910 MHz*	More 1 of 2
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10.9.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5470-5725 MHz

Chain 0	Chain 1	Uncorrelated Chains		
Antenna	Antenna	Directional		
Gain	Gain	Gain		
(dBi)	(dBi)	(dBi)		
-3.10	-8.40	-4.99		

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5470-5725 MHz

Chain 0	Chain 1	Correlated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-3.10	-8.40	-2.34

RESULTS

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Bandwidth and Antenna Gain

Channel	Frequency	Min	Min Directional		Directional
		26 dB	99%	Gain	Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5500	22.45	16.123	-4.99	-2.34
Mid	5580	22.35	16.272	-4.99	-2.34
Mid (FCC)	5640	22.75	16.392	-4.99	-2.34
High	5700	22.50	16.308	-4.99	-2.34
144	5720	21.90	16.161	-4.99	-2.34

Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5500	24.00	23.07	29.07	23.07	11.00	11.00	11.00
Mid	5580	24.00	23.11	29.11	23.11	11.00	11.00	11.00
Mid (FCC)	5640	24.00	23.15	29.15	23.15	11.00	11.00	11.00
High	5700	24.00	23.12	29.12	23.12	11.00	11.00	11.00
144	5720	24.00	23.08	29.08	23.08	11.00	11.00	11.00

Duty Cycle CF (dB) 0.23

Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	13.65	11.01	15.54	24.00	-8.46
Mid	5580	13.36	10.82	15.28	24.00	-8.72
Mid (FCC)	5640	12.84	11.05	15.05	24.00	-8.95
High	5700	13.21	10.82	15.19	24.00	-8.81
144	5720	13.04	10.78	15.07	24.00	-8.93

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	1.932	-0.225	4.23	11.00	-6.77
Mid	5580	1.587	-0.033	4.09	11.00	-6.91
Mid (FCC)	5640	2.082	-0.556	4.20	11.00	-6.80
High	5700	1.476	-0.438	3.86	11.00	-7.14
144	5720	0.926	-1.472	3.13	11.00	-7.87

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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10.10. 11n HT20 2TX CDD MIMO MODE IN THE 5.6GHz BAND

10.10.1.26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

		26 dB BW	26 dB BW
Channel	Frequency	Chain 0	Chain 1
		(MHz)	(MHz)
Low	5500	24.40	23.10
Mid	5580	25.00	22.95
Mid (FCC)	5640	25.40	24.00
High	5700	24.75	22.80
144	5720	24.70	23.05

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10.10.2.99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	17.776	17.606
Mid	5580	17.746	17.657
Mid (FCC)	5640	17.516	17.517
High	5700	17.520	17.655
144	5720	17.633	17.624

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CH (CH) CH)	LOW 7, 2017		L	Measure
Ch Freq 5.5 Occupied Bandwidth	GHz	Averages: 20	Trig Free	Meas Off
	C durand D			Channel Power
1776.9(061517),39317 51, lef 20 dBm #Atten Samp .09	Conducted B 30 dB			Occupied Bk
.0 JB/ Dffst 0.8	<u>1 milit i i i i i i i i i i i i i i i i i i</u>			ACI
B		2	Span 40 MHz	Multi Carrie Powe
Occupied Bandwid 1777	*VBW 1.1 MHz th 57 MH ₇	Occ BW % Pwr	ns (1000 pts) · 99.00 % · -26.00 dB	Power Sta CCDI
Transmit Freq Error x dB Bandwidth	-5.726 kHz 21.434 MHz*			More 1 of 1



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Chain 0 OBW, CH MID	Macaura
* Agiient 11:57:14 Jun 27, 2017	Measure
Ch Freq 5.58 GHz Trig Free Occupied Bandwidth Averages: 20	Meas Off
	Channel Power
Ref 20 dBm #Atten 30 dB #Samp Log Augustalitysethem duty (tau) nutrenetto	Occupied BW
10 dB/ Offst 10.8 Luch Llow matrix	ACP
dB	Multi Carrier Power
#Res BW 360 kHz #VBW 1.1 MHz Sweep 1.066 ms (1000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 177/EQ MU- × dB -26.00 dB	Power Stat CCDF
Transmit Freq Error -8.501 kHz x dB Bandwidth 21.248 MHz*	More 1 of 2
Copyright 2000–2011 Agilent Technologies	



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Chain 0 OBW , CH MID (F	CC)	RТ	Freq/Channel
Ch Freq 5.64 GHz	Averages: 20	Trig Free	Center Freq 5.64000000 GHz
AFv6.9(061517),39317 .	Averages: 20		Start Freq 5.61500000 GHz
Ref 20 dBm Atten 20 dB #Samp Log	uduuti ad hidilaanafaada Auroo		Stop Freq 5.66500000 GHz
10 dB/ Offst 10.8 − 10 − 10 − 10 − 10 − 10 − 10 − 10 − 10		Mentodistatera, tau	CF Step 5.0000000 MHz <u>Auto Mar</u>
dB		Span 50 MHz	Freq Offset 0.00000000 Hz
Occupied Bandwidth 17.5161 MH	Occ BW % Pwr Z x dB	99.00 % -26.00 dB	Signal Track ^{On <u>C</u>:f}
Transmit Freq Error 107.948 kHz x dB Bandwidth 21.260 MHz	*		
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Chain 0 OBW, CH HIGH	1	Moosuro
		rieasule
Ch Freq 5.7 GHz Trig	Free	Meas Off
Uccupied Bandwidth Hverages: 20	┛╢	
		Channel Power
APv6.9(061517),39317 ST, Conducted B		
Ref 20/dBm #Htten 30/dB #Samp		Occupied BH
Offst		ACP
	thut the	
		Multi Carrier
Center 5.700 00 GHz Span 40	MHz	Power
#Res BW 360 kHz	pts)	Power Stat
Occupied Bandwidth Occ BW % Pwr 99.0	00%	CCDF
17.5195 MHz × dB -26.00) dB	
Transmit Freg Error -118.206 kHz		More
x dB Bandwidth 21.346 MHz*		1 of 2
Copyright 2000–2011 Agilent Technologies		



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Chain 0 OBW , CH 144	
* Agilent 11:19:49 Jul 10, 2017	measure
Ch Freq 5.72 GHz Trig Free Occupied Bandwidth Averages: 20	Meas Off
	Channel Power
Ref 20 dBm #Atten 30 dB #Samp	Occupied BW
dB/ dB/ offst 10.8 10.8 10.8 10.8 10.8 10.8 10.8 10.8 10.8 10.8 10.8 10.8 10.8 10.8 10.8 10.4	ACP
Center 5.720 00 GHz Span 40 MHz #B2a PH 26 MHz Support 1 066 mg (1000 mg)	Multi Carrier Power
Image: Width Occupied Bandwidth Occ BW % Pwr 99.00 % 17.6325 MHz × dB -26.00 dB	Power Stat CCDF
Transmit Freq Error45.968 kHzx dB Bandwidth21.010 MHz*	More 1 of 2
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10.10.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5470-5725 MHz

Chain 0	Chain 1	Uncorrelated Chains		
Antenna	Antenna	Directional		
Gain	Gain	Gain		
(dBi)	(dBi)	(dBi)		
-3.10	-8.40	-4.99		

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5470-5725 MHz

Chain 0	Chain 1	Correlated Chains	
Antenna	Antenna	Directional	
Gain	Gain	Gain	
(dBi)	(dBi)	(dBi)	
-3.10	-8.40	-2.34	

RESULTS

ID:	39317	Date:	06/26/17
-----	-------	-------	----------

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Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional	Directional
		26 dB	99% Gain		Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5500	23.10	17.606	-4.99	-2.34
Mid	5580	22.95	17.657	-4.99	-2.34
Mid (FCC)	5640	24.00	17.516	-4.99	-2.34
High	5700	22.80	17.520	-4.99	-2.34
144	5720	23.05	17.624	-4.99	-2.34

Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5500	24.00	23.46	29.46	23.46	11.00	11.00	11.00
Mid	5580	24.00	23.47	29.47	23.47	11.00	11.00	11.00
Mid (FCC)	5640	24.00	23.43	29.43	23.43	11.00	11.00	11.00
High	5700	24.00	23.44	29.44	23.44	11.00	11.00	11.00
144	5720	24.00	23.46	29.46	23.46	11.00	11.00	11.00

Duty Cycle CF (dB) 0.20 Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	13.51	10.79	15.37	24.00	-8.63
Mid	5580	13.34	10.87	15.29	24.00	-8.71
Mid (FCC)	5640	13.41	10.87	15.33	24.00	-8.67
High	5700	13.12	10.95	15.18	24.00	-8.82
144	5720	12.93	11.33	15.21	24.00	-8.79

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	1.585	0.047	4.09	11.00	-6.91
Mid	5580	1.322	-0.203	3.84	11.00	-7.16
Mid (FCC)	5640	1.474	-0.740	3.72	11.00	-7.28
High	5700	1.599	-0.728	3.80	11.00	-7.20
144	5720	0.989	-1.472	3.14	11.00	-7.86

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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10.11. 11n HT40 2TX CDD MIMO MODE IN THE 5.6GHz BAND

10.11.1.26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

		26 dB BW	26 dB BW
Channel	Frequency	Chain 0	Chain 1
		(MHz)	(MHz)
Low	5510	43.20	43.30
Mid	5550	43.30	43.10
Mid (FCC)	5630	43.20	41.60
High	5670	43.10	42.60
142	5710	43.80	42.90

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10.11.2.99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5510	36.120	36.094
Mid	5550	35.824	36.043
Mid (FCC)	5630	36.105	35.255
High	5670	36.270	36.028
142	5710	35.713	35.187

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Ch Freq 5.51 GHz Trig Fro Occupied Bandwidth Averages: 20 APv6.9(061517),39317 ST, Conducted B Ref 20 dBm #Atten 30 dB *Samp	ee Meas Off
APv6.9(061517),39317 ST, Conducted B Ref 20 dBm #Atten 30 dB #Samp	Channel Power
Ref 20 dBm #Atten 30 dB #Samp	
	Occupied Bl
10 dB/ 0ffst 10.8 μμμαματική τη τητητήτητη τητήτητη και τη τητήτητη τη	ACI
dB	Hz Multi Carrie Powe
Occupied Bandwidth Occupie	Power Sta Z B
Transmit Freq Error 180.507 kHz × dB Bandwidth 39.475 MHz*	More 1 of 3



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Chain 0 OBW , CH	MID (FCC)		RТ	Freq/Channel
Ch Freq 5.63 Occupied Bandwidth	GHz	Averages: 20	Trig Free	Center Freq 5.6300000 GHz
AFv6.9(061517),39317 ,				Start Freq 5.5900000 GHz
Ref 20 dBm Atten 2 #Samp Log	0 dB			Stop Freq 5.6700000 GHz
10 dB/ Offst 10.8				CF Step 8.0000000 MHz <u>Auto Mar</u>
dB			Span 80 MHz	Freq Offset 0.00000000 Hz
Occupied Bandwid 36.10	Ith 46 MHz	Occ BW % Pwr x dB	99.00 % -26.00 dB	Signal Track ^{On <u>C</u>:f}
Transmit Freq Error - x dB Bandwidth 3	31.532 kHz 9.412 MHz*			
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10.11.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5470-5725 MHz

Chain 0	Chain 1	Uncorrelated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-3.10	-8.40	-4.99

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5470-5725 MHz

Chain 0	Chain 1	Correlated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-3.10	-8.40	-2.34

RESULTS

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Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional	Directional
		26 dB	99%	Gain	Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5510	43.20	36.094	-4.99	-2.34
Mid	5550	43.10	35.824	-4.99	-2.34
Mid (FCC)	5630	41.60	35.255	-4.99	-2.34
High	5670	42.60	36.028	-4.99	-2.34
142	5710	42.90	35.187	-4.99	-2.34

Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5510	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid	5550	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid (FCC)	5630	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5670	24.00	24.00	30.00	24.00	11.00	11.00	11.00
142	5710	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB) 0.34 Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	13.37	10.81	15.29	24.00	-8.71
Mid	5550	13.49	11.05	15.45	24.00	-8.55
Mid (FCC)	5630	13.21	10.71	15.15	24.00	-8.85
High	5670	13.34	11.05	15.35	24.00	-8.65
142	5710	12.92	10.75	14.98	24.00	-9.02

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	-1.485	-3.316	1.05	11.00	-9.95
Mid	5550	-1.089	-3.395	1.26	11.00	-9.74
Mid (FCC)	5630	-1.587	-3.465	0.93	11.00	-10.07
High	5670	-1.544	-3.336	1.00	11.00	-10.00
142	5710	-1.953	-4.119	0.45	11.00	-10.55

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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L	RF 5	50 Ω AC	SENSE:INT	ALIGNAUTO	10:46:19 AM Jul 14, 2017	-
enter F	req 5.710	DOOOOOO GHz PNO: Fast IFGain:Low	Trig: Free Run #Atten: 20 dB	#Avg Type: RMS Avg Hold: 100/100	TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N N	Frequency
) dB/div	Ref Offse Ref 10.0	t 10.84 dB 00 dBm		Mkr	2 5.713 20 GHz -1.953 dBm	Auto Tu
			∆ 1	2	-	Contor En
0.0	\square					5.710000000 G
0.0	and the second s					Start Fr
0.0						5.685000000 G
0.0						
0.0						Stop Fr
0.0						3.73500000 3
tart 5.6 Res BW	8500 GHz / 1.0 MHz	#VE	W 3.0 MHz*	Sweep 1	Stop 5.73500 GHz .000 ms (1001 pts)	CF Ste 5.000000 M
R MODE 1	TRC SCL	×	Y FL	INCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> M
1 N 2 N 3	f f	5.706 55 GHz 5.713 20 GHz	-2.590 dBm Ban -1.953 dBm	d Power 36.90 MHz	12.045 dB	Freq Offs
5						0
b						
7						
7 8 9						



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10.12. 11ac HT80 2TX CDD MIMO MODE IN THE 5.6GHz BAND

10.12.1.26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5530	86.2	85.4
Mid	5610	86.8	88.0
138	5690	86.8	85.4

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Chain 0 26dB , CH	LOW , 2017		L Measure
APv6.9(061517),39317 ST, (Ref 20 dBm #Atten : #Peak	Conducted B 30 dB	▲ Mkr1 86 -0.0	57 dB Meas Off
Log 10 dB/ 0ffst	paraser and the second		Channel Power
10.8 dB DI			Occupied BW
HPAvg		"Heldy in the second second	ACP
M1 S2 S3 FS AA			Multi Carrier Power
£ (f): FTun Swp			Power Stat CCDF
Center 5.530 0 GHz #Res BW 1.8 MHz	+VBW 5 MHz		00 MHz More 1 pts)
Copyright 2000-2011 Agi	lent Technologies		



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Chain 0 26dB Agilent 14:06:27	, CH MID Jun 27, 2017	,				L	Measure
֏Ρν6.9(061517),393 Ref 20 dBm ≢Peak	17 ST, Conduc #Atten 30 dB	ted B		▲ Mł	(r1 86 0.8	.8 MHz 86 dB	Meas Off
.og L0 dB/		****	*****				Channel Power
0.8 IB	1 R			1			Occupied BW
-17.5 dBm #PAvg	And and a second se			white the	the House	****	ACP
11 S2 3 FS AA							Multi Carrier Power
t(f): Tun Wp							Power Stat CCDF
enter 5.610 0 GHz Res BW 1.8 MHz	+\	 /BW 5 MHz	z #Sweep	S 100 m	pan 20 s (1001	0 MHz . pts)	More 1 of 2
pyright 2000-2	011 Agilent 1	echnolog	jies				



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10.12.2.99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5530	75.495	76.043
Mid	5610	75.559	73.750
138	5690	75.228	71.732





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Ch Freq 5.61 GHz Trig Occupied Bandwidth Averages: 20 APv6.9(061517),39317 ST, Conducted B Ref 20 dBm #Atten 30 dB	Meas Off Channel Power
APv6.9(061517),39317 ST, Conducted B Ref 20 dBm #Atten 30 dB	Channel Power
Ref 20 dBm #Atten 30 dB	
	Occupied BW
10 dB/ Offst 10.8 dAte min min and a state of the st	ACF
dB Center 5.610 00 GHz Span 160 MHz	Multi Carrier Power
#Kes BW 1.5 MHz #VBW 5 MHz Sweep 1.066 ms (1000 pts) Occupied Bandwidth Осс ВМ % Рыг 99.00 % 75 5588 MHz × dB -26.00 dB	Power Stat CCDF
Transmit Freq Error -183,613 kHz x dB Bandwidth 79.793 MHz*	More 1 of 2



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Chain 0 OBW , CH 138	L	Measure
Ch Freq 5.69 GHz	Trig Free Averages' 20	Meas Off
APv6.9(061517).39317 .		Channel Power
Ref 20 dBm #Atten 30 dB #Samp	horen Mital weist eti yözetzetik≪	Occupied BW
10 dB/ 0ffst 10.8		ACF
dB	Span 160 MHz	Multi Carrier Power
Cccupied Bandwidth 75.2280 MHz	HZ Sweep 1.000 ms (1000 pts) Occ BW % Pwr 99.00 % × dB -26.00 dB	Power Stat CCDF
Transmit Freq Error -410.707 kHz x dB Bandwidth 80.154 MHz*		More 1 of 2
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10.12.3. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5470-5725 MHz

Chain 0	Chain 1	Uncorrelated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-3.10	-8.40	-4.99

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5470-5725 MHz

Chain 0	Chain 1	Correlated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-3.10	-8.40	-2.34

RESULTS

ID: 39317 Date: 06/26/17

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Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional	Directional
		26 dB	99%	Gain	Gain
		BW	BW	for Power	for PPSD
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5530	85.40	75.495	-4.99	-2.34
Mid	5610	86.80	73.750	-4.99	-2.34
138	5690	85.40	71.732	-4.99	-2.34

Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5530	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid	5610	24.00	24.00	30.00	24.00	11.00	11.00	11.00
138	5690	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB) 0.66

Included in Calculations of Corr'd PPSD

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5530	13.31	11.07	15.34	24.00	-8.66
Mid	5610	13.21	11.09	15.29	24.00	-8.71
138	5690	12.94	11.08	15.12	24.00	-8.88

PPSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PPSD	PPSD
		Meas	Meas	Corr'd	Limit	Margin
		PPSD	PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5530	-4.731	-5.944	-1.62	11.00	-12.62
Mid	5610	-5.053	-6.842	-2.19	11.00	-13.19
138	5690	-5.430	-7.827	-2.79	11.00	-13.79

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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L	RF 50 \$	2 AC	SENSE:INT	ALIGNAUTO	10:42:49 AM Jul 14, 2017	Frequency
enter F	req 5.6900	00000 GHz PNO: Fast ↔ IFGain:Low	Trig: Free Run #Atten: 20 dB	#Avg Type: RMS Avg Hold: 100/100	TYPE A WWWWW DET A NNNN	Trequency
0 dB/div	Ref Offset 10 Ref 10.00	0.84 dB dBm		M	(r2 5.682 2 GHz -5.430 dBm	Auto Tui
og 1.00			▲ ² ∧1			Center Er
10.0						5.690000000 GI
0.0						Start Er
i0.0	-				and the second s	5.640000000 G
0.0						Oton En
0.0						5.740000000 Gi
tart 5.6 Res BW	4000 GHz / 1.0 MHz	#VB1	V 3.0 MHz*	Sweep 1	Stop 5.74000 GHz .000 ms (1001 pts)	CF Sto 10.000000 M
KR MODE T	TRC SCL	X	Y Bo	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> M
2 N 3 4 5	f	5.682 2 GHz	-5.430 dBm	10 POWer 76.40 MHZ	11.620 08	Freq Offs 0
6 7 8 9						
0						



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10.13. 11a 2TX CDD MIMO MODE IN THE 5.8GHz BAND

10.13.1.6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel Frequency		6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5745	16.45	16.40	0.5
Mid	5785	16.55	16.50	0.5
High	5825	16.40	16.45	0.5

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10.13.2.99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	
Low	5745	16.074	16.325	
Mid	5785	16.511	16.242	
High	5825	16.561	16.509	

Chain 0 OBW , CH LOW		Maggura
🔆 Agienτ 14:00:00 Jun 27, 2017		reasure
Ch Freq 5.745 GHz Occupied Bandwidth	Trig Free Averages: 20	Meas Off
00.0 0/001E17) 20217 ST. Conducted P.		Channel Power
Hrv0.3(001317),33317 31, Cunducted B Ref 20 dBm #Atten 30 dB #Samp		Occupied BW
10 dB/ Offst 10.8 dB/ 10.8 10.		ACP
dB	Span 40 MHz	Multi Carrier Power
*Res BW 330 kHz *VBW 1 M Occupied Bandwidth 16 0739 MHz	Hz Sweep 1.132 ms (1000 pts) Occ BW % Pwr 99.00 % × dB -26.00 dB	Power Stat CCDF
Transmit Freq Error 182.175 kHz x dB Bandwidth 20.003 MHz*		More 1 of 2
Copyright 2000-2011 Agilent Technol	ogies	-



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Chain 0 OBW , CH MID	Measure
Ch Freq 5.785 GHz Trig Free Occupied Bandwidth Averages: 20	Meas Off
APv6.9(061517),39317 ST, Conducted B	Channel Power
Ref 20 dBm #Atten 30 dB #Samp	Occupied BW
dB/ Offst 10.8	ACP
dB mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm	Multi Carrier Power
Occupied Bandwidth Occ BW % Pwr 99.00 % 16.5112 MHz × dB -26.00 dB	Power Stat CCDF
Transmit Freq Error -34.427 kHz x dB Bandwidth 20.103 MHz*	More 1 of 2



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10.13.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (3)

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

For power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

5725-5850 MHz

Chain 0	Chain 1	Uncorrelated Chains
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
-3.50	-8.40	-5.29

For PSD the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

5725-5850 MHz

Chain 0	Chain 1	Correlated Chains	
Antenna	Antenna	Directional	
Gain	Gain	Gain	
(dBi)	(dBi)	(dBi)	
-3.50	-8.40	-2.60	

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RESULTS

Antenna Gain and Limit

Channel	Frequency	Directional	Directional	Directional Power	
		Gain	Gain	Limit	Limit
		for Power	for PSD		
	(MHz)	(dBi)	(dBi)	(dBm)	(dBm)
Low	5745	-5.29	-2.60	30.00	30.00
Mid	5785	-5.29	-2.60	30.00	30.00
High	5825	-5.29	-2.60	30.00	30.00

Duty Cycle CF (dB) 0.23	Included in Calculations of Corr'd PSD
-------------------------	--

Output Power Results

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5745	12.80	10.83	14.94	30.00	-15.06
Mid	5785	12.85	11.28	15.15	30.00	-14.85
High	5825	12.57	11.11	14.91	30.00	-15.09

PSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5745	-0.050	-2.914	1.99	30.00	-28.01
Mid	5785	-0.475	-3.398	1.55	30.00	-28.45
High	5825	-0.071	-3.145	1.90	30.00	-28.10

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.





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10.14. 11n HT20 2TX CDD MIMO MODE IN THE 5.8GHz BAND

10.14.1.6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5745	17.65	17.65	0.5
Mid	5785	17.75	17.65	0.5
High	5825	17.65	17.65	0.5

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10.14.2.99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5745	17.555	17.583
Mid	5785	17.531	17.531
High	5825	17.786	17.103

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Ch Freq 5.745 GHz Trig Free Occupied Bandwidth Averages: 20 APv6.9(061517),39317 ST, Conducted B Ref 20 dBm #Atten 30 dB	Meas Off Channel Power
APv6.9(061517),39317 ST, Conducted B Ref 20 dBm #Atten 30 dB	Channel Power
Ref 20 dBm #Atten 30 dB	
Log	Occupied BW
10 dB/ → 11 → 11 → 11 → 11 → 11 → 11 → 11 →	ACF
dB Center 5.745 00 GHz Span 40 MHz	Multi Carrier Power
#Kes BM 360 KHz #VBW 1.1 MHz Sweep 1.066 ms (1000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 17 EEE2 MU- X dB -26.00 dB	Power Stat CCDF
Transmit Freq Error -133.057 kHz x dB Bandwidth 21.231 MHz*	More 1 of 2



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