

# **TEST REPORT**

APPLICANT	: Hot Pepper, Inc.
PRODUCT NAME	: 4G Smart Phone
MODEL NAME	: H5
BRAND NAME	: Hot Pepper
FCC ID	: 2APD4-P26A
STANDARD(S)	: 47 CFR Part 15 Subpart E
TEST DATE	: 2018-04-12 to 2018-07-17
ISSUE DATE	: 2018-07-18

Tested by:

Yanan Tu

Approved by:

Tu Ya'nan (Test Engineer)

Andy Yeh $^{\vee}$ (Technical Director)

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Change History				
Issue Date Reason for change				
1.0	2018-07-17	First edition		



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## **1.** Technical Information

Note: Provide by applicant.

## 1.1. Applicant and Manufacturer Information

Applicant:         Hot Pepper, Inc.	
Applicant Address:5151 California Ave., Suite 100, Irvine 92617, USA	
Manufacturer:Hot Pepper, Inc.	
Manufacturer Address: 5151 California Ave., Suite 100, Irvine 92617, USA	

## **1.2. Equipment Under Test (EUT) Description**

Product Name:	4G Smart Phone		
Serial No:	(N/A, marked #1 by test site)		
Hardware Version:	T169-LK-V1.2		
Software Version:	HOTPEPPER_SW01_201803	20	
Modulation Type:	OFDM		
Modulation Mode:	802.11a, 802.11n(HT20), 802.	11n(HT40)	
Operating Frequency Pange	5.180 GHz- 5.240 GHz; 5.260 GHz -5.320 GHz ;		
Operating Frequency Range:	5.500 GHz -5.720 GHz ; 5.745GHz- 5.825GHz		
Channel Number:	Refer to 1.3		
Antenna Type:	PIFA Antenna		
Antenna Gain:	1.39 dBi		
	Normal(NV):	3.8V	
Operating voltage:	Lowest(LV):	3.5V	
	Highest(HV):	4.4V	

**Note 1:** The U-NII band is applicable to this report, another bands of operation (2.4GHz) is documented in a separate report.

Note 2: WIFI hotspot does not support U-NII band.

Note 3: During test, the duty cycle of the EUT was setting to 100%.

**Note 4:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



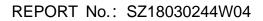


## 1.3. The channel number and frequency of EUT

Frequency Rang	ge: 5180-5240M	Hz		1
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	36	5180	40	5200
	44	5220	48	5240
40MHz	38	5190	46	5230
Frequency Rang	ge: 5260-5320M	Hz		
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
2014	52	5260	56	5280
20MHz	60	5300	64	5320
40MHz	54	5270	62	5310
Frequency Rang	ge: 5500-5720M	Hz		
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
	100	5500	105	5520
	108	5540	112	5560
20MHz	116	5580	120	5600
20101112	124	5620	128	5640
	132	5660	136	5680
	140	5700	144	5720
	102	5510	110	5550
40MHz	118	5590	126	5630
	134	5670	142	5710
Frequency Rang	ge: 5745-5805M	Hz		-
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
	149	5745	153	5765
20MHz	157	5785	161	5805
	165	5825		
40MHz	151	5775	159	5795

Note 1: The black bold channels were selected for test.







## 1.4. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart E (U-NII band) for the EUT FCC ID Certification:

No Identity		Document Title		
1	47 CFR Part 15 (5-1-14 Edition)	Radio Frequency Devices		

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	
1	15.203	Antenna Requirement	N/A	N/A	PASS	
2	15.407(a) (e)	Emission Bandwidth	Apr 12, 2018	Tu Ya'nan	PASS	
Ζ	15.407 (a) (e)		Jul 17, 2018	Tu fallali	FA33	
3	15.407(a)	Maximum conducted output Power	Apr 12, 2018	Tu Ya'nan	PASS	
			Apr 12, 2018	Tu Vo'non		
4 15.407(a)	15.407(a)	Peak Power spectral density	Jul 17, 2018	Tu Ya'nan	PASS	
5	15.407(b)	Restricted Frequency Bands	Apr 30, 2018	Wu Junke	PASS	
6	15.407(g)	Frequency Stability	Apr 12, 2018	Tu Ya'nan	PASS	
7	15.207	Conducted Emission	May 04, 2018	Wu Junke	PASS	
8	15.407(b)	Radiated Emission	Apr 07&21, 2018	Wu Junke	PASS	
9	15.407(c)	Automatically discontinue transmission requirement	N/A	N/A	PASS	
Note	Note1. The DES test report was documented in a separate report					

**Note1:** The DFS test report was documented in a separate report (Report No.: SZ18030244W05).

**Note2:** The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10 2013.

**Note3:** These RF tests were performed according to the method of measurements prescribed in KDB789033 D02 General UNII Test Procedures New Rules v01r03

## **1.5. Environmental Conditions**

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106





## **2.** 47 CFR Part 15C Requirements

### 2.1. Antenna requirement

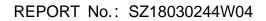
#### 2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

#### 2.1.2. 2.1.2 Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.







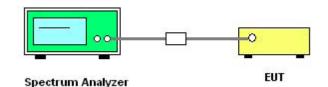
## 2.2. Emission Bandwidth

#### 2.2.1. Requirement

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement. Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

#### 2.2.2. Test Description

#### A. Test Set:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading.

#### B. Test Procedure

- 1. KDB 789033 Section C) 1) Emission Bandwidth was used in order to prove compliance
- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
- 2. KDB 789033 Section C) 2) minimum emission bandwidth for the band 5.725-5.85GHz was used in order to prove compliance.
- Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW)  $\geq$  3 × RBW.
- c) Detector = Peak.





- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### 2.2.3. Test Result

#### 802.11a Test mode

A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)		
36	5180	22.78		
44	5220	20.03		
48	5240	19.98 <sub>Note</sub>		
52	5260	19.60		
60	5300	19.33		
64	5320	20.51		
100	5500	28.22		
120	5600	27.58		
144	5720	20.36		
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		
144	5720	15.15		
149	5745	16.34		
157	5785	15.41		
165	5825	15.84		





#### **B. Test Plots**



(Channel 36, 5180MHz, 802.11a,)



(Channel 44, 5220 MHz, 802.11a,)







(Channel 48, 5240MHz, 802.11a,)



(Channel 48, 5240MHz, fh of -26dB, 802.11a,)







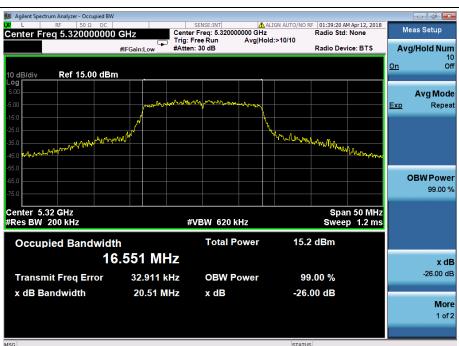
(Channel 52, 5260MHz, 802.11a,)



(Channel 60, 5300 MHz, 802.11a,)







#### (Channel 64, 5320MHz, 802.11a,)



(Channel 100, 5500MHz, 802.11a,)







(Channel 120, 5600 MHz, 802.11a,)



(Channel 144, 5720MHz, 802.11a,)





Agilent Spectrum Analyzer - Occupied B UM RF 50 Q AC Ref Value 20.00 dBm	Cen Trig	ter Freq: 5.720000000 GHz	ld:>10/10	01:39:26 P Radio Std: Radio Dev			leas Setup g/Hold Num
10 dB/div Ref 20.00 dBn	n					<u>On</u>	10 Off
	no lasalana malara	tron produced and and b	mhunhy			<u>Exp</u>	Avg Mode Repeat
-10.0 -20.0 -30.0				MANA MAN	www.wyrbow		
-40.0							OBW Power
-70.0							99.00 %
Center 5.72 GHz #Res BW 100 kHz		#VBW 300 kHz		Spai Sweep	n 30 MHz 2.933 ms		
Occupied Bandwidt		Total Power	19.0	dBm			
ר Transmit Freq Error x dB Bandwidth	5.493 MHz 13.772 kHz 15.15 MHz	OBW Power x dB		00 % 0 dB			<b>x dB</b> -6.00 dB
							More 1 of 2
MSG			STATUS				

(Channel 144, 5720MHz, 802.11a,)



(Channel 149, 5745MHz, 802.11a)







(Channel 157, 5785MHz, 802.11a)



(Channel 165, 5825MHz, 802.11a)





#### 802.11n (HT20) Test mode

#### A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)		
36	5180	20.42		
44	5220	22.69		
48	5240	21.68 <sub>Note</sub>		
52	5260	19.56		
60	5300	19.66		
64	5320	20.03		
100	5500	27.78		
120	5600	32.08		
144	5720	20.33		
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		
144	5720	15.16		
149	5745	13.15		
157	5785	16.86		
165	5825	16.48		
Note: The high	n frequency of the -26dB is	5249.98MHz which is out of the DFS frequency range		

so there is no DFS testing requirement.

#### **B. Test Plots**



(Channel 36, 5180MHz, 802.11 n (HT20))



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(Channel 44, 5220 MHz, 802.11 n (HT20))



(Channel 48, 5240MHz, 802.11 n (HT20))









(Channel 48, 5240MHz, fh of -26dB, 802.11 n (HT20))



(Channel 52, 5260MHz, 802.11 n (HT20))





Ju Agilent Spectrum Analyzer - Occup	ied BW				
L RF 50 Ω	DC	SENSE:INT		RF 01:50:07 AM Apr 12, 20	18
Center Freq 5.300000		Center Freq: 5.3000 Trig: Free Run	000000 GHz Avg Hold:>10/10	Radio Std: None	Meas Setup
	#IFGain:Low	#Atten: 30 dB	Avg Hold.>10/10	Radio Device: BTS	Avg/Hold Num
					10
10 dB/div Ref 20.00	dBm				<u>On</u> Off
Log					
10.0					Avg Mode
0.00	Annen	mound have metaligned			Exp Repeat
-10.0	min	Manh A.	Add a strategy and		
-20.0	/				
-30.0					
and Marine Ma	lower of the Arness		vr ng hang	An march phone in	
-50.0				a she per town	M.
					OBW Power
-60.0					99.00 %
-70.0					00.00 /0
Center 5.3 GHz				Span 50 MI	17
#Res BW 200 kHz		#VBW 620	kHz	Sweep 1.2 n	
Occupied Bandy	vidth	Total	Power 15	.3 dBm	
	17.608 M	IHz			x dB
					-26.00 dB
Transmit Freq Erro	or 11.536	kHz OBW I	Power 9	9.00 %	-20.00 dB
x dB Bandwidth	19.66	MHz xdB	-26	6.00 dB	
					More
					1 of 2
MSG			07.17	10	
MSG			STAT	US	

(Channel 60, 5300 MHz, 802.11 n (HT20))



(Channel 64, 5320MHz, 802.11 n (HT20))







(Channel 100, 5500MHz, 802.11 n (HT20))



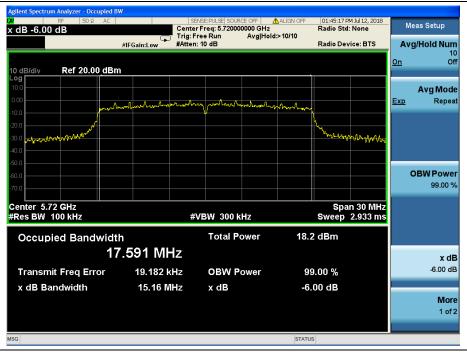
(Channel 120, 5600 MHz, 802.11 n (HT20))







(Channel 144, 5720MHz, 802.11 n (HT20))



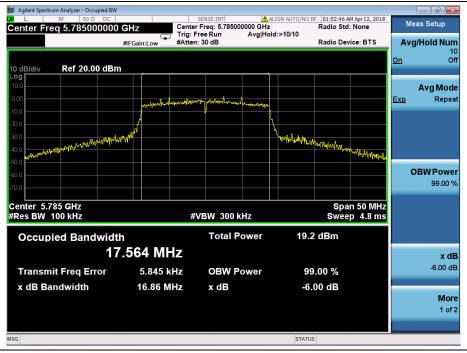
(Channel 144, 5720MHz, 802.11 n (HT20))





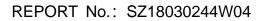
📕 Agilent Spectrum Analyzer - Occupied BV	1						
x dB -6.00 dB	Center	SENSE:INT A	ALIGN AUTO/NO R	F 01:52:25 Al Radio Std:		M	leas Setup
	Trig: F		ld:>10/10	Radio Dev	ice: BTS	Av	g/Hold Num
	#IFGain:Low #Atten	1. 50 dB		Radio Dev	ICE. DT3		10
10 dB/div Ref 20.00 dB	m					<u>On</u>	Of
Log							
10.0						_	AvgMode
0.00	montownown	ma monore management				Exp	Repea
-10.0			1				
	AN		And Inc.				
30.0 40.0 50.0	with the		1 www.allhayman	WWW HALLAND	like		
-50.0 WWW					all when the		
-60.0						1	<b>OBW</b> Powe
-70.0							99.00 %
Center 5.745 GHz #Res BW 100 kHz	#	VBW 300 kHz			n 50 MHz p 4.8 ms		
Occupied Bandwid	41a	Total Power	19.7	dBm			
			10.7	UBIII			
1	7.605 MHz						x dE
Transmit Freq Error	9.154 kHz	<b>OBW Power</b>	99	.00 %			-6.00 dE
x dB Bandwidth	13.15 MHz	x dB	-6.	00 dB			
							More
							1 of 2
ISG			STATUS	5			

(Channel 149, 5745MHz, 802.11 n (HT20))



(Channel 157, 5785MHz, 802.11 n (HT20))







Agilent Spectrum Analyzer - Occupied BW L RF 50 Ω DC Center Freq 5.825000000	GI12 Tains I	r Freq: 5.825000000 GHz	LIGN AUTO/NO RF 01: Rad d:>10/10	53:09 AM Apr 12, 2018 io Std: None	M	leas Setup
		n: 30 dB		io Device: BTS	Av	g/Hold Nun
0 dB/div Ref 20.00 dBn	n _				<u>On</u>	11 Of
.0g 10.0 .00	whereast	how provident and maintener			Exp	Avg Mod Repea
0.0 0 0 0 0 0 0 0 0 0 0 0 0	LAN W		h Mayson and Mulu	Vervatula .		
10.0				and and the former		OBWPowe
70.0						99.00 %
enter 5.825 GHz Res BW 100 kHz	#	VBW 300 kHz	Ę	Span 50 MHz Sweep 4.8 ms		
Occupied Bandwidt		Total Power	19.7 dB	m		
17	.583 MHz					x d
Transmit Freq Error	12.213 kHz	<b>OBW Power</b>	99.00	%		-6.00 d
x dB Bandwidth	16.48 MHz	x dB	-6.00 d	B		
						<b>Mo</b> 1 of
G			STATUS			

(Channel 165, 5825MHz, 802.11 n (HT20))

#### 802.11n (HT40) Test mode

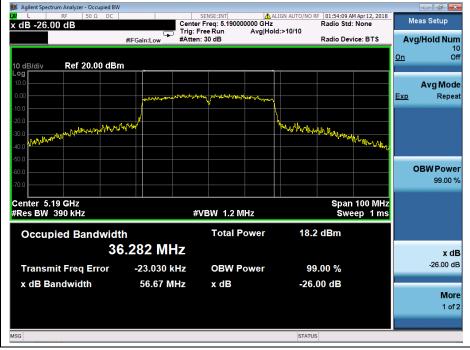
#### A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)			
38	5190	56.67			
46	5230	53.04 <sub>Note</sub>			
54	5270	54.83			
62	5310	50.3			
102	5510	64.54			
126	5630	62.27			
142	5710	58.11			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			
142	5710	35.24			
151	5755	35.46			
159	5795	35.17			
Note:The hig	Note: The high frequency of the -26dB is 5249.92MHz which is out of the DFS frequency				
range,so there	e is no DFS testing requirem	ent.			





#### B. Test Plots







(Channel 46, 5230 MHz, 802.11n (HT40))





Agilent Spectrum Analyzer - Swept SA	CENEROU	SE SOURCE OFF	10:21:59 AM Jul 17, 2018	
Marker 2 5.249920000000		Avg Type: Log-Pwr	TRACE 123456 TYPE MWAMAAAAA	Marker
	IFGain:Low Atten: 14 dB		DET P N N N N N	Select Marker
Ref Offset 11.5 dB 10 dB/div Ref 15.00 dBm		Mkr2	5.249 920 GHz -26.747 dBm	2
5.00		1 		Normal
-15.0			2	
-25.0			John March	Delta
-45.0				
-55.0				Fixed⊳
-75.0				Fixed
Center 5.23000 GHz #Res BW 390 kHz	#VBW 1.2 MHz	Sweep 1	Span 60.00 MHz .067 ms (4001 pts)	Off
MKR MODE TRC SCL X	310 GHz -0.128 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	
	920 GHz -26.747 dBm		3	Properties►
7				More
10 11				1 of 2
<			>	
MSG		STATU	3	

(Channel 46, 5230 MHz, fh of -26dB, 802.11n (HT40))



(Channel 54, 5270MHz, 802.11n (HT40))





M Agilent Spectrum Analyzer - Occupied BW M L RF 50 Ω DC Center Freq 5.310000000 C	Trig	nter Freq: 5.310000000 GHz	old:>10/10	5:32 AM Apr 12, 2018 o Std: None o Device: BTS	Meas Setup
10 dB/div Ref 20.00 dBm					10 <u>On</u> Off
Log 10.0	Mannan Master	the and prove to the the property to a second			Avg Mode Exp Repeat
-100 -200 -300 -400	4,4		Lusets boughting	<sup>NA</sup> ville Jack Market Court	
-50.0 -60.0 -70.0					<b>OBW Power</b> 99.00 %
Center 5.31 GHz #Res BW 390 kHz		#VBW 1.2 MHz	<u> </u>	pan 100 MHz Sweep 1 ms	
Occupied Bandwidth		Total Power	15.7 dBr	n	
36. Transmit Freq Error x dB Bandwidth	21.694 kHz 50.31 MHz	OBW Power x dB	99.00 ° -26.00 d		x dB -26.00 dB
			£0.00 u		More 1 of 2
MSG			STATUS		

(Channel 62, 5310 MHz, 802.11n (HT40))



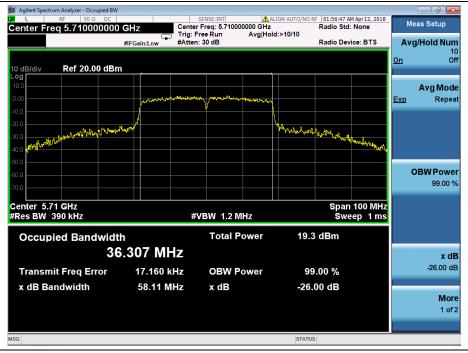
(Channel 102, 5510MHz, 802.11n (HT40))







(Channel 126, 5630 MHz, 802.11n (HT40))



(Channel 142, 5710MHz, 802.11n (HT40))





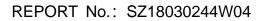
Agilent Spectrum Analyzer - Occ	cupied BW						
<b>LXI</b> RF 50 Ω		SENSE:PULSE SOUP			M Jul 12, 2018	M	eas Setup
Span 60.000 MHz		Center Freq: 5.71000 Trig: Free Run	10000 GHz Avg Hold:>10/10	Radio Std	: None	IVI	eas Setup
	#IFGain:Low	#Atten: 10 dB		Radio Dev	rice: BTS	Ave	g/Hold Num
						On	10 Off
10 dB/div Ref 20.0	0 dBm						UII
Log 10.0							
0.00						<b>-</b>	Avg Mode
-10.0	Inder have bort a formation have	Androhang purchalesh	- Andre Amon Andrew Have have a	u.		<u>Exp</u>	Repeat
-20.0		W					
the second se				Mr. A. C. Street			
-30.0 การพบไปหมดของไม่เกิดไม่					and see strated with a		
-50.0							
							DBWPower
-60.0							99.00 %
-70.0							00.00 /0
Center 5.71 GHz				Spa	n 60 MHz		
#Res BW 100 kHz		#VBW 300 H	Hz	Swee	p 5.8 ms		
Occupied Dand		Total P	ower 10	9.1 dBm			
Occupied Band				s.rubin			
	35.984 MH	1Z					x dB
Transmit Freq Err	or 24.482 k	Hz OBW P	ower	99.00 %			-6.00 dB
x dB Bandwidth	35.24 №			6.00 dB			
	35.24 W	пг хав		0.00 aB			More
							1 of 2
							1012
MSG			STA	TUS			

(Channel 142, 5710MHz, 802.11n (HT40))



(Channel 151, 5755 MHz, 802.11n (HT40))







📕 Agilent Spectrum Analyzer - Occupied BW						×
Center Freq 5.795000000		enter Freq: 5.795000000 GH:			Meas Setup	þ
		rig:FreeRun Avg He Atten:30 dB	old:>10/10 Radio De	vice: BTS	Avg/Hold N	
					On	10 Off
10 dB/div Ref 20.00 dBm	n					OII
Log 10.0					Avg M	odo
0.00						peat
-10.0	Inderson	whenty put and have been been a property of the second sec	1 <u>.</u>			pear
-20.0		U.				
-30.0	and the second second		Add to Add of the second			
-30.0	11-21		hand the stand of	Werter .		
-50.0				- water to and the		
-60.0					OBWPo	wer
-70.0					99.0	00 %
Center 5.795 GHz #Res BW 100 kHz		#VBW 300 kHz		n 100 MHz ep 9.6 ms		
#Res BW Too KH2		#VBVV JOOKHZ	Swe	ep a.o ma		
Occupied Bandwidt	h	Total Power	20.1 dBm			
35	5.967 MHz	,				dB
						0 dB
Transmit Freq Error	-2.731 kHz	Z OBW Power	99.00 %			Jub
x dB Bandwidth	35.17 MHz	x dB	-6.00 dB			
						lore
					1	of 2
MSG			STATUS			

(Channel 159, 5795MHz, 802.11n (HT40))



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## 2.3. Maximum conducted output power

#### 2.3.1. Requirement

(1) For 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.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands 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 megahertz.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(4) According to KDB662911D01Measure-and-sum technique, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in units that are directly proportional to power.

(5) According to KDB 662911 D01, the directional gain =  $G_{ANT}$  +10log( $N_{ANT}$ ) dBi, where  $G_{ANT}$  is the antenna gain in dBi,  $N_{ANT}$  is the number of outputs.

#### 2.3.2. Test Description

Section E) 3) of KDB 789033 defines a methodology using a USB Wideband Power Sensor.

#### A. Test Setup:



#### (Test Module)

The EUT (Equipment under the test) which is coupled to the USB Wideband Power Sensor; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading, all test result in USB Wideband Power Sensor.





#### 2.3.3. Test Result

#### 802.11a Test mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit (dBm)	Verdict
36	5180	18.44		
44	5220	18.49		
48	5240	18.69		
52	5260	18.56	24	PASS
60	5300	18.88		
64	5320	19.02		
100	5500	19.48		
120	5600	19.83		
144	5720	18.98		
149	5745	19.34		
157	5785	19.6	30	
165	5825	19.6		

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit 11 dBm + 10 log B (dBm)	Verdict
52	5260	18.56	23.92	
60	5300	18.88	23.86	
64	5320	19.02	24.12	PASS
100	5500	19.48	25.51	PASS
120	5600	19.83	25.41	
144	5720	18.98	24.09	





Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
36	5180	11.59		
44	5220	11.29		
48	5240	11.69		
52	5260	11.07	24	PASS
60	5300	11.68		
64	5320	11.45		
100	5500	12.09		
120	5600	13.00		
144	5720	11.59		
149	5745	11.82		
157	5785	11.6	30	
165	5825	11.94		

Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit 11 dBm + 10 log B (dBm)	Verdict
52	5260	11.07	23.92	
60	5300	11.68	23.86	
64	5320	11.45	24.12	PASS
100	5500	12.09	25.51	FA33
120	5600	13.00	25.41	
144	5720	11.59	24.09	





#### 802.11n (HT20) Test mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit (dBm)	Verdict
36	5180	18.07		
44	5220	17.77		
48	5240	17.79		
52	5260	17.83	24	
60	5300	17.81		
64	5320	18.00		PASS
100	5500	18.69		PASS
120	5600	18.81		
144	5720	18.99		
149	5745	19.08		
157	5785	19.41	30	
165	5825	19.66		

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit 11 dBm + 10 log B (dBm)	Verdict
52	5260	17.83	23.91	
60	5300	17.81	23.94	
64	5320	18.00	24.02	PASS
100	5500	18.69	25.44	PASS
120	5600	18.81	26.06	
144	5720	18.99	24.08	





Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
36	5180	10.73		
44	5220	10.61		
48	5240	10.71		
52	5260	10.96	24	
60	5300	10.41		PASS
64	5320	10.58		
100	5500	11.23		
120	5600	11.52		
144	5720	11.84		
149	5745	11.54	30	
157	5785	11.66		
165	5825	11.82		

	Frequency		Limit	Mandiat
Channel	(MHz)	Measured Average Power (dBm)	11 dBm + 10 log B	Verdict
	· · · ·		(dBm)	
52	5260	10.96	23.91	
60	5300	10.41	23.94	PASS
64	5320	10.58	24.02	
100	5500	11.23	25.44	FA33
120	5600	11.52	26.06	
144	5720	11.84	24.08	





#### 802.11n (HT40) Test mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit (dBm)	Verdict
38	5190	17.83	24	
46	5230	17.85		PASS
54	5270	17.81		
62	5310	18.00		
102	5510	18.74		
126	5630	19.03		
142	5710	19.15		
151	5755	19.33	- 30	
159	5795	19.53		

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit 11 dBm + 10 log B (dBm)	Verdict
54	5270	17.81	28.39	
62	5310	18.00	28.02	
102	5510	18.74	29.10	PASS
126	5630	19.03	28.94	
142	5710	19.15	28.64	



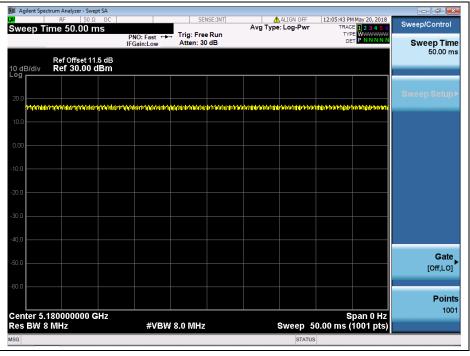


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Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
38	5190	10.78		
46	5230	10.88		
54	5270	10.74		PASS
62	5310	10.75	24	
102	5510	11.46	20	
126	5630	12.08		
142	5710	12.06		
151	5755	11.89		
159	5795	12.02	30	

Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit 11 dBm + 10 log B (dBm)	Verdict
54	5270	10.74	28.30	
62	5310	10.75	27.58	
102	5510	11.46	27.73	PASS
126	5630	12.08	27.23	
142	5710	12.06	27.68	

Plot for duty cycle



(Duty cycle for 802.11 a)

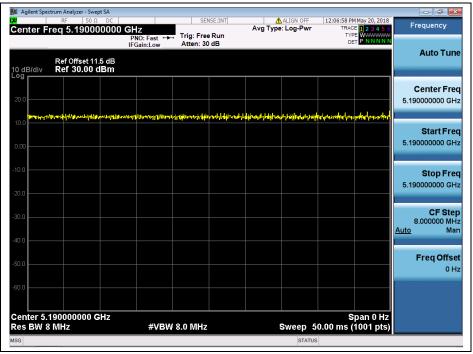


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we	ep Tim	e 50.00 i		PNO: Fast ↔ IFGain:Low				ALIGN OFF	TRAC	4 May 20, 2018 E 1 2 3 4 5 6 WWWWWWW T P N N N N N	Sweep/Control Sweep Tin
	Б	tef Offset 1		IPGalli.Low	,						50.00 r
0 dE	3/div	lef 30.00	dBm		1						
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	BW 8 M		SUS	#VBV	/ 8.0 MHz			Sween 5	0.00 ms (	pan 0 Hz 1001 pts)	

(Duty cycle for 802.11 n(HT20))



# (Duty cycle for 802.11 n(HT40))

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# 2.4. Peak Power spectral density

# 2.4.1. Requirement

(1) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

(3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500KHz band.

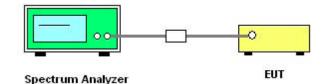
If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(4) According to KDB662911D01Measure-and-sum technique, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in units that are directly proportional to power.

(5) According to KDB 662911 D01, the directional gain =  $G_{ANT}$  +10log( $N_{ANT}$ ) dBi, where  $G_{ANT}$  is the antenna gain in dBi,  $N_{ANT}$  is the number of outputs.

# 2.4.2. Test Description

## A. Test Set:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading.

## B. Test Procedure

KDB 789033 Section F) Maximum Power Spectral Density (PSD) Method SA-1 was used in order to prove compliance

- 1) Set span to encompass the entire 26-dB emission bandwidth
- 2) Set RBW = 1 MHz. Set VBW  $\geq$  3 MHz.
- 3) Number of points in sweep  $\geq$  2 Span / RBW. Sweep time = auto.
- 4) Detector = RMS (i.e., power averaging)
- 5) Trace average at least 100 traces in power averaging (i.e., RMS) mode
- 6) Record the max value





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## 2.4.3. Test Result

# 802.11a Test mode

### A. Test Verdict:

Channal	Frequency	Measured PPSD	Limit	\ / a nali a t
Channel	(MHz)	(dBm/MHz)	(dBm/MHz)	Verdict
36	5180	9.60		
44	5220	8.69		
48	5240	8.65		
52	5260	8.32		
60	5300	8.27	11	PASS
64	5320	8.43		
100	5500	9.19		
120	5600	10.99		
144	5720	10.54		
Channel	Frequency	Measured PPSD	Limit	Vardiat
Channel	(MHz)	(dBm/500KHz)	(dBm/500KHz)	Verdict
144	5720	6.74		
149	5745	6.80	20	PASS
157	5785	7.11	30	PA00
165	5825	7.04		

#### B. Test Plots



(Channel 36, 5180MHz, 802.11a,)



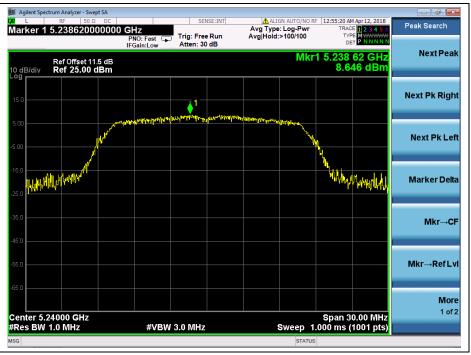
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(Channel 44, 5220 MHz, 802.11a,)



(Channel 48, 5240MHz, 802.11a,)









(Channel 52, 5260MHz, 802.11a,)



(Channel 60, 5300 MHz, 802.11a,)

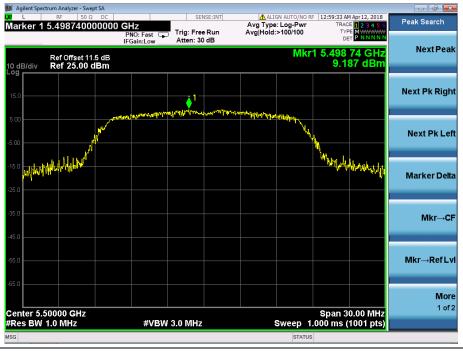








#### (Channel 64, 5320MHz, 802.11a,)



(Channel 100, 5500MHz, 802.11a,)

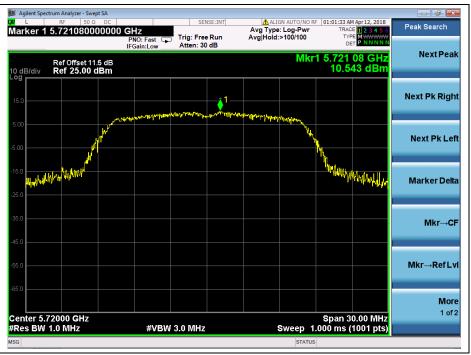








(Channel 120, 5600 MHz, 802.11a,)



(Channel 144, 5720MHz, 802.11a,)









(Channel 144, 5720MHz, 802.11a,)



(Channel 149, 5745MHz, 802.11a)









(Channel 157, 5785MHz, 802.11a)



(Channel 165, 5825MHz, 802.11a)

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### 802.11n (HT20) Test mode

#### A. Test Verdict:

Channel	Frequency	Measured PPSD	Limit	Vardiat
Channel	(MHz)	(dBm/MHz)	(dBm/MHz)	Verdict
36	5180	8.69		
44	5220	8.91		
48	5240	8.37		
52	5260	8.15		
60	5300	7.95	11	PASS
64	5320	8.02		
100	5500	9.02		
116	5600	10.00		
144	5720	10.43		
Channel	Frequency	Measured PPSD	Limit	Vardiat
Channel	(MHz)	(dBm/500KHz)	(dBm/500KHz)	Verdict
144	5720	5.71		
149	5745	7.29	20	DAGG
157	5785	6.46	30	PASS
165	5825	7.77		

### **B. Test Plots**



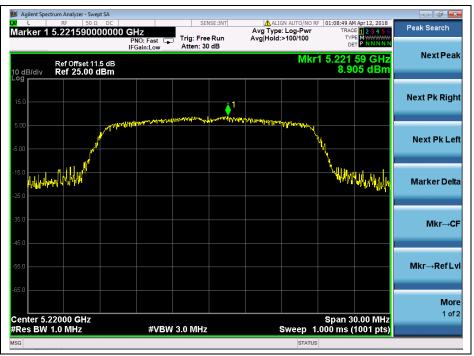
(Channel 36, 5180MHz, 802.11 n (HT20))



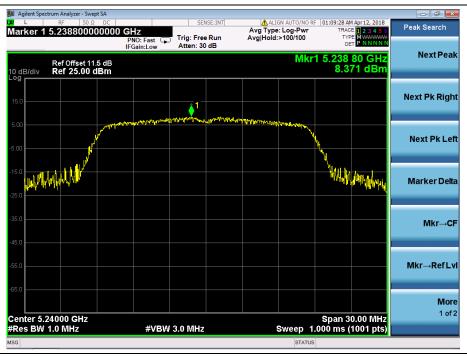
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(Channel 44, 5220 MHz, 802.11 n (HT20))



(Channel 48, 5240MHz, 802.11 n (HT20))

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(Channel 52, 5260MHz, 802.11 n (HT20))



(Channel 60, 5300 MHz, 802.11 n (HT20))









#### (Channel 64, 5320MHz, 802.11 n (HT20))



(Channel 100, 5500MHz, 802.11 n (HT20))

