



TEST REPORT

APPLICANT	 Shenzhen Chainway Information Technology Co.,Ltd.
PRODUCT NAME	: Mobile Data Terminal
MODEL NAME	: C6000
BRAND NAME	: CHAINWAY
FCC ID	: 2AC6AC6000
STANDARD(S)	: 47 CFR Part 15 Subpart E
TEST DATE	: 2017-12-29 to 2018-03-10
ISSUE DATE	: 2018-03-13

Tested by:

Approved by:

Tu Ya'nan

Tu Ya'nan (Test Engineer)

Andy Yeh (Technical Director)

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Change History			
Issue Date Reason for change			
1.0	2018-03-13	First edition	



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1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Shenzhen Chainway Information Technology Co.,Ltd.	
Applicant Address:	9/F, Building 2, Daqian Industrial Park, Longchang Rd., District	
	67, Bao'an, Shenzhen	
Manufacturer:	Shenzhen Chainway Information Technology Co.,Ltd.	
Manufacturer Address: 9/F, Building 2, Daqian Industrial Park, Longchang Rd., Distri		
	67, Bao'an, Shenzhen	

1.2. Equipment Under Test (EUT) Description

Product Name:	Mobile Data Terminal	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	C6000EA_MB_10	
Software Version:	C6000A_MT6735_V3_AM_GITe978618_20180315	
Modulation Type:	OFDM	
Modulation Mode:	802.11a, 802.11n(HT20), 802.11n(HT40)	
Operating Frequency Banger	5.150 GHz- 5.250 GHz; 5.250 GHz -5.350 GHz ;	
Operating Frequency Range:	5.470 GHz -5.725 GHz ; 5.725GHz- 5.850GHz	
Channel Number:	Refer to 1.3	
Antenna Type:	PIFA Antenna	
Antenna Gain:	0.58 dBi	

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 Range: 5150-5250MHz					
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
001411-	36	5180	40	5200	
20101112	44	5220	48	5240	
40MHz	38	5190	46	5230	
Frequency Rang	je: 5250-5350Ml	Ηz			
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
	52	5260	56	5280	
20101112	60	5300	64	5320	
40MHz	54	5270	62	5310	
Frequency Rang	je: 5470-5725Mł	Hz			
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
	100	5500	105	5520	
	108	5540	112	5560	
20141-7	116	5580	120	5600	
20101112	124	5620	128	5640	
	132	5660	136	5680	
	140	5700			
	102	5510	110	5550	
40MHz	118	5590	126	5630	
	134	5670	142	5710	
Frequency Range: 5725-5805MHz					
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	Dec 29, 2017	Tu Ya'nan	PASS
3	15.407(a)	Maximum conducted output Power	Dec 29, 2017	Tu Ya'nan	PASS
4	15.407(a)	Peak Power spectral density	Dec 29, 2017	Tu Ya'nan	PASS
5	15.407(b)	Restricted Frequency Bands	Jan 08, 2018& Mar 10, 2018	Wu Zhognwen	PASS
6	15.407(g)	Frequency Stability	Dec 29, 2017	Tu Ya'nan	PASS
7	15.207	Conducted Emission	Mar 08, 2018	Wu Zhognwen	PASS
8	15.407(b)	Radiated Emission	Jan 08, 2018& Mar 10, 2018	Wu Zhognwen	PASS
9	15.407(c)	Automatically discontinue transmission requirement	N/A	N/A	PASS

Note1: The DFS test report was documented in a separate report (Report No.: SZ17120080W05).

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	20.03
44	5220	20.35
48	5240	19.86
52	5260	20.39
60	5300	19.52
64	5320	20.10
100	5500	22.20
120	5600	20.32
140	5700	19.63
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
149	5745	16.35
157	5785	16.38
165	5825	16.36





B. Test Plots





(Channel 44, 5220 MHz, 802.11a,)

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Agilent Spectrum Analyzer - Occupied E	W			- 5 X
Center Freq 5.2400000	00 GHz Cen Tri #IFGain:Low #At	SENSE:INT Arg Ho ter Freq: 5.240000000 GHz g: Free Run Avg Ho ten: 20 dB	LIGN AUTO/NO RF 02:36:01 PM Dec 2 Radio Std: None Id:>10/10 Radio Device: B	9,2017 Trace/Detector
10 dB/div Ref 10.00 dE	ßm			
-10.0 -20.0	an a	MANY production and the	www.wy	Clear Write
-30.0				۹ Average
-50.0				Max Hold
-80.0 Center 5.24 GHz			Span 30	MHz
#Res BW 200 kHz Occupied Bandwid	ith	#VBW 620 kHz Total Power	Sweep 15.0 dBm	1 ms Min Hold
1	Detector Average ►			
Transmit Freq Error x dB Bandwidth	19.219 kHz 19.86 MHz	OBW Power x dB	99.00 % -26.00 dB	<u>Auto</u> Man
MSG			STATUS	

(Channel 48, 5240MHz, 802.11a,)



(Channel 52, 5260MHz, 802.11a,)







Agilent Spectrum Analyzer - Occupied BW	1			
04 RF 50Ω DC Center Freq 5.300000000) GHz Center #IFGain:Low #Atten:	ENSE:INT A Freq: 5.300000000 GHz ee Run Avg Hol 20 dB	LIGN AUTO/NO RF 02:37:09 PM D Radio Std: N d:>10/10 Radio Device	ec 29, 2017 one Trace/Detector
10 dB/div Ref 10.00 dBr	n			
-10.0	man hard hard and hard hard hard hard hard hard hard har	water of the second		Clear Write
-20.0 -30.0 -40.0			March	Average
-50.0				
-70.0				Max Hold
Center 5.3 GHz #Res BW 200 kHz	#V	'BW 620 kHz	Span Swee	30 MHz p 1 ms Min Hold
Occupied Bandwid	th S 494 MH7	Total Power	14.7 dBm	Detector
Transmit Freq Error	-1.274 kHz	OBW Power	99.00 %	Average► Auto Man
x dB Bandwidth	19.52 MHz	x dB	-26.00 dB	
MSG			STATUS	

(Channel 60, 5300 MHz, 802.11a,)



(Channel 64, 5320MHz, 802.11a,)









(Channel 100, 5500MHz, 802.11a,)



(Channel 120, 5600 MHz, 802.11a,)







(Channel 140, 5700MHz, 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 (MHz)	26 dB Bandwidth (MHz)
36	5180	19.87
44	5220	22.52
48	5240	20.89
52	5260	20.11
60	5300	19.85
64	5320	20.06
100	5500	20.33
120	5600	20.38
140	5700	21.82
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
149	5745	17.61
157	5785	17.63
165	5825	17.62

B. Test Plots



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







🎉 Agi	lent Spectrum Ana	alyzer - Occu	ipied BW									
Cent	rF ter Freq 5	50 Ω .22000	DC 00000 GH #IF	lz Gain:Low →	Center Fr Trig: Fre #Atten: 2	NSE:INT req: 5.22000 e Run 0 dB	AL 00000 GHz Avg Hold	IGN AUTO/NO I I:>10/10	RF 02:41:42 F Radio Std Radio Dev	MDec 29, 2017 : None rice: BTS	Trac	e/Detector
10 dE Log [3/div R	ef 10.0	0 dBm									
0.00 - -10.0 -			www	and the state of the	havenontown	mann	* Constantine	handwingen				Clear Write
-20.0 -30.0 -40.0	unorality	MWM HW AL							www.warha	᠕ᡟᠬᠯᢦᡊ᠕ᡃᡅᡗ		Average
-50.0 = -60.0 =											_	_
-70.0 - -80.0 -												Max Hold
Cent #Res	ter 5.22 GI s BW 200	Hz kHz			#VE	3W 6201	Hz		Spa Swe	n 30 MHz ep 1 ms		Min Hold
0	ccupied	Band	width			Total P	ower	14.:	3 dBm			
			17.6	43 MI	Ηz							Detector
т	ansmit Fi	req Err	or	27.487	Hz	OBW P	ower	99	9.00 %		<u>Auto</u>	Man
x	dB Bandv	vidth		22.52 N	Hz	x dB		-26	.00 dB			
MSG								STATU	s			

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



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







🗾 Agilent Spectrum Analyzer - Occu	upied BW								
Center Freq 5.26000	DC 00000 GHz #IEGai	Cent Trig:	SENSE:INT er Freq: 5.26000 Free Run en: 20 dB	AL 0000 GHz Avg Hold	IGN AUTO/NO F 1:>10/10	F 02:46:07 P Radio Std: Radio Dev	MDec 29, 2017 None	Trace	e/Detector
10 dB/div Ref 10.0	0 dBm	1							
-10.0	mm	······	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	han	h			c	lear Write
-20.0 -30.0						marga	MJAR		Average
-50.0									
-80.0									Max Hold
Center 5.26 GHz #Res BW 200 kHz			#VBW 620	Hz		Spa Swe	n 30 MHz ep 1 ms		Min Hold
Occupied Band	width 17.63	0 MHz	Total P	ower	15.2	dBm			Detector
Transmit Freq Err	or 2	8.377 kHz	OBW P	ower	99	.00 %		<u>Auto</u>	Man
x dB Bandwidth	2	20.11 MHz	x dB		-26.	00 dB			
мsg 🗼 Alignment Complete	ed				STATUS	6			

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



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







Agilent Spectrum Analyzer - Occupied E	3W				
Center Freq 5.32000000	0 GHz Center Trig: F	SENSE:INT AL Freq: 5.320000000 GHz ree Run Avg Hole	IGN AUTO/NO RF 02:46:56 P Radio Std d:>10/10	MDec 29, 2017 : None	Trace/Detector
	#IFGain:Low #Atten	20 08	Radio Dev	ice: BTS	
10 dB/div Ref 10.00 dE	3m				
0.00 ايمىر 0.01-	put he man who have have here here here here here here here he	www.www.	munhum		Clear Write
-20.0					
-30.0 unwiking the second			had whether	Virman WW	A
-40.0					Average
-60.0					
-70.0					Max Hold
-80.0					
Center 5.32 GHz #Res BW 200 kHz	#\	/BW 620 kHz	Spa Swe	n 30 MHz ep 1 ms	Min Hold
Occupied Bandwid	dth	Total Power	14.8 dBm		
1	7.601 MHz				Detector Average ►
Transmit Freq Error	28.388 kHz	OBW Power	99.00 %		<u>Auto</u> Man
x dB Bandwidth	20.06 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



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





Agilant Spectrum Analyzor Occupies	4 PW/				
Agreent Spectrum Analyzer - Occupier γ	00 GHz	SENSE:INT enter Freq: 5.600000000 (rig: Free Run Avg	ALIGN AUTO Hz Hold:>10/10	04:29:02 PM Jan 08, 2 Radio Std: None	Trace/Detector
	#IFGain:Low #	Atten: 10 dB		Radio Device: BTS	
10 dB/div Ref 15.00 dE	3m				
5.00 -5.00	monalyama	nerthyman	Muny		Clear Write
-15.0					
-25.0	p.s.m.M. ^{en}		400 Martin	Mannonman	Average
-45.0 Man 499 4				S. W.W.	
-55.0					
-75.0					Max Hold
Center 5.6 GHz		#\/ D \\/		Span 50 M	1Hz
#Res BW 200 KHZ		#VBW 620 KHZ		Sweep 1.2	ms Min Hold
Occupied Bandwid	ith	Total Power	19.	3 dBm	
1	17.666 MHz				Detector Peak
Transmit Freq Error	29.835 kHz	OBW Power	- 9	9.00 %	Auto <u>Man</u>
x dB Bandwidth	20.38 MHz	x dB	-26	.00 dB	
MSG			STATU	JS	

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



(Channel 140, 5700MHz, 802.11 n (HT20))







🎉 Agi	ilent Spectrum Analyzer - Oc	cupied BW									
Cen	RF 509 ter Freq 5.7450	DC 00000 G	Hz Gain:Low	SENSE Center Freq Trig: Free R #Atten: 20 d	:INT : 5.745000 !un B	AL 0000 GHz Avg Hold	IGN AUTO/NO F 1:>10/10	Radio Sto Radio De	M Dec 29, 2017 I: None vice: BTS	Trac	e/Detector
10 dE Log	B/div Ref 10.	00 _. dBm									
0.00 -10.0		A There Walnut	www.www.	and the second sec	han the second	ฟา/wewyshav	d. A. Myaki Marana				Clear Write
-20.0 -30.0 -40.0	wyweldy war why and	1						N. North	annortand		Average
-50.0 -60.0											J
-70.0 -80.0											Max Hold
Cen #Re:	ter 5.745 GHz s BW 100 kHz			#VBW	/ 300 k	Hz		Spa Sweep	in 30 MHz 3.733 ms		Min Hold
0	ccupied Ban	dwidth		т	otal Po	ower	18.4	4 dBm			
т	ransmit Freq Ei	17.5 rror	6.531 kH	Z z C	DBW Po	ower	99	9.00 %		<u>Auto</u>	Detector Average ► Man
x	dB Bandwidth		17.61 MH	z x	dB		-6.	00 dB			
MSG							STATU	s			

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



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





Agilent Spectrum Analyzer - Occupied BW	V cen		GN AUTO/NO RE 02:30:38 P	MDec 29, 2017	
Center Freq 5.82500000	0 GHz Center Fr	req: 5.825000000 GHz	Radio Std	: None	Trace/Detector
	#IFGain:Low #Atten: 2	0 dB	Radio Dev	rice: BTS	
to up the Dof 10.00 dB					
Log	m				
0.00	mannonananan	Manangalown	man way		Clear Write
-10.0					
-30.0			<u> </u>		
-40.0 WWW40.0			mark	WARAA MANA	Average
-50.0					
-60.0					
-70.0					Max Hold
-80.0					
Center 5.825 GHz	#\/=	NAC 300 KHZ	Spa Sween	n 30 MHz	
TOO KIIZ	<i></i>	500 KH2	эмеер	5.7 55 115	Min Hold
Occupied Bandwid	th	Total Power	17.7 dBm		
1	7.567 MHz				Detector
Transmit Freq Error	14.061 kHz	OBW Power	99.00 %		Auto Man
x dB Bandwidth	17.62 MHz	x dB	-6.00 dB		
MSG			STATUS		
			014100		

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





802.11n (HT40) Test mode

A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	48.50
46	5230	39.36
54	5270	39.41
62	5310	39.50
102	5510	60.11
126	5630	53.84
142	5710	53.63
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
151	5755	36.38
159	5795	36.41

B. Test Plots

M PF ISO 2 DC Image: Solution of the image: Solution of th	Mailent Spectrum Analyzer - Occupied BW					- • •
10 dB/div Ref 10.00 dBm 10 dB/div Ref 10.20 dBm	VBW 1.2000 MHz	S Center F Trig: Fro #IFGain:Low	ENSE:INT A Freq: 5.190000000 GHz ee Run Avg Ho 20 dB	ALIGN AUTO/NO RF 02:48:24 F Radio Std Id:>10/10 Radio Dev	MDec 29, 2017 : None /ice: BTS	Trace/Detector
Image: Comparison of the second se	10 dB/div Ref 10.00 dBn	۱				
300 300 4	-10.0	white many and a second	a reasonable and a second			Clear Write
400 4	-20.0 -30.0 -40.0 -50.0	,mar)		The source for the source of t	Warnwapteria	Average
Center 5.19 GHz #Res BW 390 kHz #VBW 1.2 MHz Speen 100 MHz Occupied Bandwidth Total Power 14.5 dBm 36.099 MHz Transmit Freq Error 87.685 kHz OBW Power 99.00 % x dB Bandwidth 48.50 MHz x dB -26.00 dB	-60.0 -70.0 -80.0					Max Hold
Occupied Bandwidth Total Power 14.5 dBm 36.099 MHz Transmit Freq Error 87.685 kHz OBW Power 99.00 % x dB Bandwidth 48.50 MHz x dB -26.00 dB	Center 5.19 GHz #Res BW 390 kHz	#V	BW 1.2 MHz	Spar Swi	100 MHz eep 1 ms	Min Hold
36.099 MHz Transmit Freq Error 87.685 kHz OBW Power 99.00 % x dB Bandwidth 48.50 MHz x dB -26.00 dB MSG STATUS	Occupied Bandwidt	h	Total Power	14.5 dBm		
Transmit Freq Error 87.685 kHz OBW Power 99.00 % x dB Bandwidth 48.50 MHz x dB -26.00 dB MSG STATUS	36	6.099 MHz				Detector
x dB Bandwidth 48.50 MHz x dB -26.00 dB	Transmit Freq Error	87.685 kHz	OBW Power	99.00 %		Average ► Auto Man
MSG STATUS	x dB Bandwidth	48.50 MHz	x dB	-26.00 dB		
	MSG			STATUS		

(Channel 38, 5190MHz, 802.11n (HT40))



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Agilent Spectrum Analyzer - Occupied BW				
RF 50 Ω DC Center Freq 5.230000000 C	GHz Center Trig: F #FGain:Low #Atten	SENSE:INT A Freq: 5.230000000 GHz free Run Avg Ho : 20 dB	ALIGN AUTO/NO RF 02:48:43 PM De Radio Std: No old:>10/10 Radio Device:	c 29,2017 me Trace/Detector BTS
10 dB/div Ref 10.00 dBm				
-10.0	ndistandistand stranger	w runnhannahar		Clear Write
-20.0 -30.0 -40.0 2000	p.n.1 ⁴		L	Average
-50.0				
-80.0				Max Hold
Center 5.23 GHz #Res BW 390 kHz	#	VBW 1.2 MHz	Span 10 Sweep	0 MHz 1 ms Min Hold
Occupied Bandwidth		Total Power	14.2 dBm	
36.	000 MHz			Detector Average►
Transmit Freq Error	74.574 kHz	OBW Power	99.00 %	<u>Auto</u> Man
x dB Bandwidth	39.36 MHz	x dB	-26.00 dB	
MSG			STATUS	

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



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







Jacobia Spectrum Analyzer - Occupied BW				
DX RF 50Ω DC Center Freq 5.310000000	GHz #IFGain:Low	SENSE:INT A Freq: 5.310000000 GHz ree Run Avg Ho : 20 dB	ALIGN AUTO/NO RF 02:49:21 PM De Radio Std: No Id:>10/10 Radio Device:	r 29,2017 ne Trace/Detector BTS
10 dB/div Ref 10.00 dBm				
-10.0	hhuldener warmenter	Vi potra della		Clear Write
-20.0			4 White all a month to all a long the start	Average
-50.0 -60.0				
-70.0				Max Hold
Center 5.31 GHz #Res BW 390 kHz	#1	VBW 1.2 MHz	Span 10 Sweep	0 MHz 1 ms Min Hold
Occupied Bandwidth	ı	Total Power	14.6 dBm	
36	.023 MHz			Detector Average►
Transmit Freq Error	81.368 kHz	OBW Power	99.00 %	<u>Auto</u> Man
x dB Bandwidth	39.50 MHz	x dB	-26.00 dB	
MSG			STATUS	

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



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





Agilent Spectrum Analyzer - Occupie	ed BW				
Center Freq 5.6300000	00 GHz Cente #IFGain:Low #Atten	SENSE:INT FFreq: 5.630000000 GHz ree Run Avg Ho : 10 dB	ALIGN AUTO 04:32:14 z Radio St old:>10/10 Radio De	PM Jan 08, 2018 d: None evice: BTS	Trace/Detector
10 dB/div Ref 15.00 d	Bm				
-5.00		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1		Clear Write
-15.0 -25.0 -35.0 -45.0	man man		how www.	"htmlthhurhhy	Average
-65.0 -65.0 -75.0					Max Hold
Center 5.63 GHz #Res BW 390 kHz	#	VBW 1.2 MHz	Spa Sv	n 100 MHz ⁄eep 1 ms	Min Hold
Occupied Bandwi	^{dth} 36.138 MHz	Total Power	19.2 dBm		Detector
Transmit Freq Error	61.326 kHz	OBW Power	99.00 %		Peak▶ Auto <u>Man</u>
x dB Bandwidth	53.84 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



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







Agilent Spectrum Analyzer - Occupied BW					-	
Center Freq 5.755000000 GI	Hz Center F Gain:Low #Atten: 2	ENSE:INT (1) Freq: 5.755000000 GHz Run Avg Hc 20 dB	ALIGN AUTO/NO RF 02:50:03 Radio Sto Id:>10/10 Radio De	PMDec 29, 2017 d: None vice: BTS	Trace/I	Detector
10 dB/div Ref 10.00 dBm						
-10.0	altrodestative (teastrology)	photosocher and a photosocher			CI	ear Write
-30.0 -40.0 -50.0			L Martinganderskrypplecheijheibreterste	Amalytonday		Average
-60.0 -70.0 -80.0						Max Hold
Center 5.755 GHz #Res BW 100 kHz	#VI	BW 300 kHz	Spai Sweej	n 100 MHz o 12.4 ms		Min Hold
Occupied Bandwidth		Total Power	18.1 dBm			
35.9	33 MHz					Detector
Transmit Freq Error	-47.541 kHz	OBW Power	99.00 %		<u>Auto</u>	Man
x dB Bandwidth	36.38 MHz	x dB	-6.00 dB			
MSG			STATUS			

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



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





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.

(3) 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.

(4) 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	16.61		
44	5220	16.96		
48	5240	17.38	24	
52	5260	17.50		PASS
60	5300	17.96		
64	5320	18.50		
100	5500	18.49		
116	5600	19.35		
140	5700	19.45		
149	5745	22.28		
157	5785	22.11	30	
165	5825	21.87		

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit 11 dBm + 10 log B (dBm)	Verdict
52	5260	17.50	24.00	
60	5300	17.96	23.90	
64	5320	18.50	24.00	DAGG
100	5500	18.49	24.00	FA33
116	5600	19.35	24.00	
140	5700	19.45	23.93	





Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
36	5180	8.24	24	
44	5220	8.86		
48	5240	9.80		
52	5260	9.54		PASS
60	5300	9.64		
64	5320	10.19		
100	5500	10.25		
116	5600	11.42		
140	5700	10.89		
149	5745	13.67	30	
157	5785	13.02		
165	5825	13.02		

Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit 11 dBm + 10 log B (dBm)	Verdict
52	5260	9.54	24.00	
60	5300	9.64	23.90	
64	5320	10.19	24.00	DASS
100	5500	10.25	24.00	FA33
116	5600	11.42	24.00]
140	5700	10.89	23.93	





802.11n (HT20) Test mode

Channel	Frequency	Measured Peak Power (dBm)	Measured Peak Power (dBm)	Verdict	
Channel	(MHz)	(MHz)	Measured Feak Fower (dbill)	(dBm)	veruici
36	5180	17.83			
44	5220	17.21			
48	5240	17.00			
52	5260	17.47	24	PASS	
60	5300	17.64			
64	5320	18.41			
100	5500	17.90			
116	5600	19.59			
140	5700	19.72			
149	5745	22.06	30		
157	5785	21.22			
165	5825	22.07			

	Frequency		Limit	
Channel	(MHz)	Measured Peak Power (dBm)	11 dBm + 10 log B	Verdict
	(101112)		(dBm)	
52	5260	17.47	24.00	
60	5300	17.64	23.98	
64	5320	18.41	24.00	DASS
100	5500	17.90	24.00	FA33
116	5600	19.59	24.00]
140	5700	19.72	24.00	





Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
36	5180	8.56		
44	5220	9.23		
48	5240	9.14	24	
52	5260	9.28		PASS
60	5300	9.79		
64	5320	10.19		
100	5500	9.91		
116	5600	10.97		
140	5700	11.10		
149	5745	13.69		
157	5785	13.01	30	
165	5825	13.04		

Channel	Frequency	Measured Average Power (dBm)	Limit	Verdict
Channer	(MHz)	Measured Average Fower (ubiii)	(dBm)	Veruici
52	5260	9.28	24.00	
60	5300	9.79	23.98	
64	5320	10.19	24.00	DASS
100	5500	9.91	24.00	PASS
116	5600	10.97	24.00	
140	5700	11.10	24.00	





802.11n (HT40) Test mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit (dBm)	Verdict
38	5190	15.87	24	
46	5230	16.56		
54	5270	17.21		PASS
62	5310	17.637		
102	5510	17.67		
126	5630	18.67		
142	5710	19.13		
151	5755	21.71	- 30	
159	5795	21.34		

Channel	Frequency (MHz)	Measured Peak Power (dBm)	Limit 11 dBm + 10 log B (dBm)	Verdict
54	5270	17.21	24.00	
62	5310	17.637	24.00	
102	5510	17.67	24.00	PASS
126	5630	18.67	24.00	
142	5710	19.13	24.00	





Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit (dBm)	Verdict
38	5190	8.27		
46	5230	9.34		
54	5270	9.59		
62	5310	10.07	24	
102	5510	9.87		PASS
126	5630	10.98		
142	5710	11.08		
151	5755	13.55	20	
159	5795	12.95	30	

Channel	Frequency (MHz)	Measured Average Power (dBm)	Limit 11 dBm + 10 log B (dBm)	Verdict
54	5270	9.59	24.00	
62	5310	10.07	24.00	
102	5510	9.87	24.00	PASS
126	5630	10.98	24.00	
142	5710	11.08	24.00	

Plot for duty cycle



(Duty cycle for 802.11 a)



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📕 Agilent Spectrum Analyzer - Swept SA 👘 👘 🕰											
x Swe	ep Tim	e 50.00 i	n de ms		SEN	ISE:INT		GN AUTO/NO RF : Log-Pwr	02:00:37 PI TRAC	MDec 29, 2017 E 1 2 3 4 5 6	Trace/Detector
				PNO: Fast ++-	Atten: 30	e Run I dB			DE		Select Trace
	F	Ref Offset 1	1.5 dB								1
10 dE Log	3/div	Ref 25.00	dBm								
											Clear Write
15.U	- hall the state of the state o	al-lupifalqiquistariy	nterinterine	sa ng kang kang kang kang kang kang kang	₩₩₩₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽	niuteren farte	i tradukterina fr	enkytherekytherentet.	dia dia kaominina dia kaomi I dia kaominina	andar da an	
5.00											
5.00											Trace Average
-5.00											
-15.0											
25.0											Max Hold
-25.0											
-35.0											Min Hold
-45.0											
-40.0											Mieur Diemir
-55.0											Trace On
-65.0											
											More
Cen	ter 5.18	0000000	GHz						s	pan 0 Hz	1 of 3
Res	BW 8 N	IHz		#VBW	8.0 MHz			Sweep 5	0.00 ms (1001 pts)	
MSG								STATUS			

(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. 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.

(2) 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.

(3) 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.

(4) 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





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 $VBW \ge 3$ 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





2.4.3. Test Result

802.11a Test mode

A. Test Verdict:

Channel	Frequency Measured PPSD		Limit	Verdict	
Channel	(MHz) (dBm/MHz)		(dBm/MHz)		
36	5180	6.22			
44	5220	6.44			
48	5240	6.27			
52	5260	6.42			
60	5300	7.47	11	PASS	
64	5320	7.06			
100	5500	9.11			
116	5600	9.72			
140	5700	9.72			
Channel	Frequency	Measured PPSD	Limit	Vardiat	
Channel	(MHz)	(dBm/500KHz)	(dBm/500KHz)	verdict	
149	5745	8.29			
157	5785	7.51	30	PASS	
165	5825	7.28			

B. Test Plots



(Channel 36, 5180MHz, 802.11a,)



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(Channel 44, 5220 MHz, 802.11a,)



(Channel 48, 5240MHz, 802.11a,)

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(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 140, 5700MHz, 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	Measured PPSD	Limit	\/a naliat
Channel	(MHz)	(dBm/MHz)	(dBm/MHz)	verdict
36	5180	5.39		
44	5220	6.25		
48	5240	6.19		
52	5260	6.43		PASS
60	5300	6.46	11	
64	5320	6.96		
100	5500	8.52		
116	5600	10.19		
140	5700	10.12		
Channel	Frequency	Measured PPSD	Limit	Vardiat
	(MHz)	(dBm/500KHz)	(dBm/500KHz)	verdici
149	5745	8.18		
157	5785	7.63	30	PASS
165	5825	7.06		

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 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))









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



(Channel 140, 5700MHz, 802.11 n (HT20))







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



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







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

