								alyzer - Swept SA	nt Spectrum Ana	Agilen
Marker	4 May 08, 2015	05:51:09 P TRAC	: Log-Pwr	Ava Tvp	INT REF			50 Q AC	RF	<mark>LXI</mark> Mar
Select Marker		TYF De	40/100	Avg Hold	e Run) dB	Trig: Fre Atten: 30	PNO: Fast IFGain:Low	.52070110000		Ivital
1	2 1 GHz 35 dBm	r1 2.232 -57.9	Mk					f 20.00 dBm	B/div Ref	10 dE
Normal										10.0
										0.00
Delta										-10.0
										-20.0
Fixed⊳										-30.0
Off										-40.0
			▲ 1 <i>]</i>		÷					-50.0
Properties►	hory All My delahory all	"A _{ver} allyhteteris	man all all all all all all all all all a	applessing and the second s		muniter	hand hadfan alaileh	www.www.www.	yywan manalala	-60.0
More										-70.0
1 of 2	000 GHz 1001 pts)	Stop 3 284 ms (Sweep			300 kHz	#VBW	kHz	t 30 MHz s BW 100 I	Star #Re



Date: 11.MAY.2015 10:35:17







(Plot 4.6.2 B2: Channel 6: 2437MHz @ 802.11g)

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Date: 11.MAY.2015 12:24:34



(Plot 4.6.2 B3: Channel 6: 2437MHz @ 802.11g)

(Plot 4.6.2 C1: Channel 11: 2462MHz @ 802.11g)







Date: 11.MAY.2015 10:37:39

4.6.3 802.11n HT20MHz Test Mode

A. Test Verdict

Channel	Frequency (MHz)	Frequency Range	Refer to Plot	Limit (dBc)	Verdict
		2.412 GHz	Plot 4.6.3 A1		PASS
1	2412	30MHz -3GHz	Plot 4.6.3 A2	-20	PASS
		3GHz-26.5 GHz	Plot 4.6.3 A3	-20	PASS
		2.412 GHz	Plot 4.6.3 A1		PASS
6	2437	30MHz -3GHz	Plot 4.6.3 A2	-20	PASS
		3GHz-26.5 GHz	Plot 4.6.3 A3	-20	PASS
		2.412 GHz	Plot 4.6.3 A1		PASS
11	2462	30MHz -3GHz	Plot 4.6.3 A2	-20	PASS
		3GHz-26.5 GHz	Plot 4.6.3 A3	-20	PASS

Note:

- 1. For 802.11n HT20MHz mode at finial test to get the worst-case emission at 6.5Mbps.
- 2. The test results including the cable lose.
- 3. For 9KHz -30MHz,Because there was only background, So We did not recorded data.
- B. Test Plots



(Plot 4.6.3 A1: Channel 1: 2412MHz @ 802.11n HT20)

Agilent Spectro	um Analyzer - Swept SA							
(X) Markor 1	RF 50 Ω AC		INT REF	Ava Type	· Log-Pwr	05:59:44 Pl TRAC	M May 08, 2015	Marker
Marker	1.715724750000	PNO: Fast C Trig: F	ree Run	Avg Hold:	24/100	TYP		
		IFGain:Low Atten:	: 30 dB			De		Select Marker
					MK	r1 1.71	57 GHz	1
10 dB/div	Ref 20.00 dBm					-00.0	ар арш	
10.0								Normal
0.00								
						ñ		Delta
-10.0								
- section								
-20.0							-21.98 dBm	
2010								Fixed
-30.0								
-40.0						[
40.0					ſ			Off
-50:0						1		
			¥1		J.			
-60.0	a dia adara di masi	- Instran ill a mar I shit but whether	And the forthe for the second	Putra and white	Wanshaper	Muhumhu	hydradyydrad	Properties▶
Manadia	alle and a state of a state of the state of	A settled of a later of a set						. repensee
-70.0								
								More
Start 30 M	IHz					Stop 3	.000 GHz	1 of 2
#Res BW	100 kHz	#VBW 300 ki	Hz		Sweep	284 ms (1001 pts)	





Date: 11.MAY.2015 10:38:17

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(Plot 4.6.3 B2: Channel 6: 2437MHz @ 802.11n HT20)

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Date: 11.MAY.2015 10:39:00



(Plot 4.6.3 B2: Channel 6: 2437MHz @ 802.11n HT20)

(Plot 4.6.3 C1: Channel 11: 2462MHz @ 802.11n HT20)

Agilen	t Spectru	ım Analyzer - S	Swept SA								
LXI		RF 50	Ω AC			INT REF	Aug Type	· Log-Pwr	06:03:42 P	M May 08, 2015	Marker
Mar	ker 1	Z.15/33.	5890000	PNO: Fast	Trig: Free	Run	Avg Hold:	23/100	TY		
				IFGain:Low	Atten: 30	dB			DI	TENNNNN	Select Marker
								Mk	r1 2.15	7 3 GHz	1
10 dE	3/div	Ref 20.00) dBm						-57.3	57 dBm	
LUG											
10.0											Normal
10.0											
0.00											
0.00									n		1
-10:0											Delta
-20.0										21.27 dBm	
											Fixed⊳
-30.0			- 0								
-40.0											
											Off
-50.0									<u> </u>		
								🔶 ' 🔥			
-60.0	a wat t		and Looke	الملاجع والمحال	MAN MARKA AN	W. Jackson Weards	and the star share	he have a start of the start of	"Villa of the	Reconsequences	Properties >
	ring details	rpulation	and the second second	e an dia anta rite (ade dan	ad a secollist a base						Toperaes
-70.0											
											More
Star	+ 20 M								Stop 3		1 of 2
#Res	s BW	100 kHz		#VBW	300 kHz			Sweep	284 ms (1001 pts)	1012
					S S S IVITE			Jinoop	Eo Fillo (ree pro,	



Date: 11.MAY.2015 10:39:29

4.6.4 802.11n HT40MHz Test Mode

A. Test Verdict

Channel	Frequency (MHz)	Frequency Range	Refer to Plot	Limit (dBc)	Verdict
		2.412 GHz	Plot 4.6.4 A1		PASS
3	2422	30MHz -3GHz	Plot 4.6.4 A2	-20	PASS
		3GHz-26.5 GHz	Plot 4.6.4 A3	-20	PASS
		2.412 GHz	Plot 4.6.4 B1		PASS
6	2437	30MHz -3GHz	Plot 4.6.4 B2	-20	PASS
		3GHz-26.5 GHz	Plot 4.6.4 B3	-20	PASS
		2.412 GHz	Plot 4.6.4 C1		PASS
9	2452	30MHz -3GHz	Plot 4.6.3 C2	-20	PASS
		3GHz-26.5 GHz	Plot 4.6.3 C3	-20	PASS

Note:

- 1. For 802.11n HT40MHz mode at finial test to get the worst-case emission at 13.5Mbps.
- 2. The test results including the cable lose.
- 3. For 9KHz -30MHz,Because there was only background, So We did not recorded data.



(Plot 4.6.4 A1: Channel 3: 2422MHz @ 802.11n HT40)

Agilent S	ipectrum Analyz	zer - Swept SA								
<mark>(X)</mark> Mark <i>e</i>	RF	50 Ω AC			INT REF	Ανα Τιτρε	- Log-Pwr	06:05:41 P	M May 08, 2015	Marker
IWAI KE		00177000	PNO: Fa IFGain:L	ow Trig	: Free Run en: 30 dB	Avg Hold:	34/100	TYI Di		Select Marker
10 dB/c	div Ref 2	0.00 dBm					Mk	r1 1.98 -58.8	8 8 GHz 82 dBm	1
10.0										Normal
0.00								<u></u>		Delta
-20.0 —									-26.97 dBm	Fixed⊳
-30.0										Off
-50.0						1	a second by	l l homester	should a head a	
-70.0	NULAN-HAINANA PARA	1/martines.	nhibrorithilionae	มามาราในที่ใจเรื่องไม	ipone.indi√i¤4%ip.ahy	nt				Properties►
Start : #Res I	30 MHz BW 100 kH	z	#	VBW 300	kHz		Sweep	Stop 3 284 ms (.000 GHz 1001 pts)	More 1 of 2





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(Plot 4.6.4 B2: Channel 6: 2437MHz @ 802.11n HT40)



Date: 11.MAY.2015 11:44:10



(Plot 4.6.4 B3: Channel 6: 2437MHz @ 802.11n HT40)

(Plot 4.6.4 C1: Channel 9 : 2452MHz @ 802.11n HT40)

								wept SA	m Analyzer - Sv	ent Spectru	Agile
Marker	M May 11, 2015	11:15:17 A TRAC	: Log-Pwr	Ava Tvp	INT REF		GH7	Ω ΑC	RF 50 1 8229/12	rker 1	ixi Ma
Select Marker		TYF De	52/100	AvgjHold	ee Run 30 dB	Trig: Fre #Atten: 3	PNO: Fast IFGain:Low	740000	1.022342		
1	2 9 GHz 60 dBm	r1 1.822 -58.4	Mk					dBm	Ref 20.00	dB/div	10 0
Normal											10.1
Delta		-								ö ———	0.0
		/ /									-10.0
Fixed⊳	-26.81 dBm									0	-30.0
Off		۶.									-40.0
Properties►	₩yyllinad _d eralprod	hangeliers	ant the second of	1 Muladythalormati	hlid the second	_ո րողությունը, թացի	ะ _{พร} ่ _{นเกม} ุณ _{สมมุ} ณสมุข	Hindermanna	physical and Alashing	0 	-60.0
More		Oton 2								×t 20 M	-co.
1012	1000 GH2 1001 pts)	284 ms (Sweep		z	300 kHz	#VBW		00 kHz	es BW	#Re





Date: 11.MAY.2015 11:45:06

4.7. 6dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=100 KHz and VBW=300KHz. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB. According to KDB558074 D01 V03 for one of the following procedures may be used to determine the modulated DTS device signal bandwidth.

1. Set RBW = 100 kHz.

2. Set the video bandwidth (VBW) \ge 3 RBW.

- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.

7. 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.

<u>LIMIT</u>

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST RESULTS

4.7.1 801.11b Test Mode

A. Test Verdict

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits (kHz)	Verdict
1	2412	10.03	Plot 4.7.1 A	≥500	PASS
6	2437	10.03	Plot 4.7.1 B	≥500	PASS
11	2462	10.03	Plot 4.7.1 C	≥500	PASS

Note:

1. For 802.11b mode at finial test to get the worst-case emission at 1Mbps.

2. The test results including the cable lose.

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(Plot 4.7.1 B: Channel 6: 2437MHz @ 802.11b)



(Plot 4.7.1 C: Channel 11: 2462MHz @ 802.11b)

4.7.2 801.11g Test Mode

A. Test Verdict

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits (kHz)	Verdict
1	2412	15.31	Plot 4.7.2 A	≥500	PASS
6	2437	15.45	Plot 4.7.2 B	≥500	PASS
11	2462	15.66	Plot 4.7.2 C	≥500	PASS

Note:

1. For 802.11g mode at finial test to get the worst-case emission at 6Mbps. 2.The test results including the cable lose.

Agilent Spe	ctrum Analyze	er - Occ	upied BW										
	RF	50 Ω		LI-7	Center F	INT REF	00000 GHz		05:02: Radio 9	00 PI Std:	M May 08, 2015 None	F	requency
Cerner	Fieq 2.4	+1200	#IF	Gain:Low	Trig: Fre #Atten: 3	e Run 0 dB	Avg Hold	>10/10	Radio [Dev	ice: BTS		
10 dB/div	Ref	20.00	dBm							_			
10.0													Center Fred
0.00												2.4	12000000 GHz
-10.0	0.40	Aur	America	mann	mondmy	pornte	mmmn	mhunn	mala				
- 10.0	d a					Ŵ				L			
20.0	Mar Mar									4	War		
40.0 Maple	w										Mr. ake		
-40.0													
-00.0													
-00.0													
-70.0													CF Step
Center	2.412 GH	z			-#\ <i>/</i>				S	pa	n 22 MHz	Auto	2.200000 MHz Man
#Res by		12			# 91	244 JUU			owee	P	2.7 33 1115		1
Occi	upied B	and	width			Total F	ower	14.9	9 dBm				Freq Offset
			16.3	86 M	Hz								0 Hz
Trans	smit Fred	q Erro	or	-24.085	kHz	OBW F	Power	99	9.00 %				
x dB	Bandwic	lth		15.31	ИНz	x dB		-6.	00 dB				





Agilent Spectrum Analyzer - Occupied BW	
INT REF 50 Ω AC INT REF 05:02:54 PM May 08, 2 Center Freq: 2.462000000 GHz Radio Std: None	Frequency
Trig: Free Run Avg Hold:>10/10	
#IFGain:Low #Atten: 50 4D Radio Device. D13	
10 dB/div Ref 20.00 dBm	
	Our transformer
	2 462000000 GHz
and and man how how how have been providently and and a section	2.402000000 0112
	nu h
	12
50.0	
-60.0	
-70.0	CF Step
Center 2.462 GHz Span 22 M	Hz 2.200000 MHz
#Res BW 100 kHz #VBW 300 kHz Sweep 2.733 i	ns Hato
Occupied Bandwidth Total Power 14.9 dBm	Freg Offset
16.370 MHz	0 Hz
Transmit Freq Error -23.763 kHz OBW Power 99.00 %	
x dB Bandwidth 15.66 MHz x dB -6.00 dB	



4.7.3 801.11n HT20 Test Mode

A. Test Verdict

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits (kHz)	Verdict
1	2412	15.70	Plot 4.7.3 A	≥500	PASS
6	2437	16.13	Plot 4.7.3 B	≥500	PASS
11	2462	16.26	Plot 4.7.3 C	≥500	PASS

Note:

1. For 802.11n HT20 mode at finial test to get the worst-case emission at 6.5Mbps. 2.The test results including the cable lose.

Agilent Sp	ectrum Analyzer - Oc	cupied BW								
Center	RF 50 S		Center	INT REF	0000 GHz		05:03:28 F Radio Std	M May 08, 2015	Frequency	
Conto		#IECoint	Trig: Fr #Atten:	ee Run 30 dB	Avg Hold	:>10/10	Radio Des	vice: BTS		
-		#IFGall.Lu	w written.	00 48			Than be	100.010		
10 dB/d	iv Ref 20.0	00 dBm								
Log									Contor E	rea
0.00									2.412000000	GHz
10.00		mmmmmm	mann	y manshing	Ann	manuel	A.			
-10.0	1			Y						
-20.0	, Mar							A.		
-30.0	W. M. W.									
-40.0										
-50.0										
-60.0										
-70.0					·				CFS	tep
Center	2.412 GHz		l				Spa	n 22 MHz	2.200000 M	MHz
#Res E	3W 100 kHz		#\	/BW 300 k	Hz		Sweep	2.733 ms		Viail
Occ	upied Band	dwidth		Total P	ower	14.8	3 dBm		Freg Off	set
	1. (9 1. (9. (9. <u>)</u> - <i>1. (1. (1. (1. (1. (1. (1. (1. (1. (1. (</i>	17.524	MHz						() Hz
Trar	nsmit Freq Er	ror -14.8	46 kHz	OBW P	ower	99	9.00 %			
x dE	8 Bandwidth	15.	70 MHz	x dB		-6.	00 dB			





(Plot 4.7.3 B: Channel 6: 2437MHz @ 802.11n HT20)

Agilent Spectrum Analyzer - Occupied BW					
RF 50 Ω AC	Center F	INT REF reg: 2.462000000 GHz	05:04:531 Radio Std	M May 08, 2015	Frequency
	Trig: Fre	e Run Avg Hold	>10/10 Radia Der	uico: BTS	
#IFG	ain:Low #Atten: 5	0 00	Radio De	nce. B15	
10 dB/div Ref 20.00 dBm					
Log					
10.0					Center Freq
Δ	mary how we have	manhana	MA. A A		2.462000000 GHZ
-10.0		w la	Proventing Departed Line of the	1	
-20.0				Mr.	
-30.0				M.M.L.	
-40.0					
-50.0					
-60.0					
-70.0					CF Sten
Center 2.462 GHz			Spa	n 22 MHz	2.200000 MHz
#Res BW 100 kHz	#VE	300 kHz	Sweep	2.733 ms	<u>Auto</u> Man
Occupied Bandwidth		Total Power	15.2 dBm		Fred Offset
17.5	25 MHz				0 Hz
11.0					
Transmit Freq Error -	22.475 kHz	OBW Power	99.00 %		
x dB Bandwidth	16.26 MHz	x dB	-6.00 dB		



4.7.4 801.11n HT40 Test Mode

A. Test Verdict

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits (kHz)	Verdict
3	2422	35.17	Plot 4.7.4 A	≥500	PASS
6	2437	35.44	Plot 4.7.4 B	≥500	PASS
9	2452	35.36	Plot 4.7.4 C	≥500	PASS

Note:

For 802.11n HT40 mode at finial test to get the worst-case emission at 13.5Mbps.
The test results including the cable lose.

Agilent Spe	ectrum Analyzer - Occupied	BW				
Span 4	44.000 MHz	Ce	INT REF nter Freq: 2.422000000 GHz	Radio Std	PM May 08, 2015 I: None	Span
		#IFGain:Low #At	g: Free Run Avg Holo ten: 30 dB	d:>10/10 Radio De [,]	vice: BTS	Span
						44.000 MHz
10 dB/div Log F	v Ref 20.00 dB	<u>n</u>				
10.0						
0.00						
-10.0	A. A. A. A. A.	news burlew protes aber	masses inverting the traction	allerand b A A A		
-20.0				and the stand of the state of t	1. 	Full Span
-30.0	_/					r un opan
-40.0	/				- Ver	
-50.0 📈					W. Wy	
-60.0						
-70.0						
Center	2.422 GHz			Spa	an 44 MHz	Last Span
#Res B	W 100 kHz		#VBW 300 kHz	Sweep	5.467 ms	
Occ	upied Bandwid	th	Total Power	12.1 dBm		
	3	5.786 MHz				
Tran	smit Freq Error	-50.539 kHz	OBW Power	99.00 %		
x dB	Bandwidth	35.17 MHz	x dB	-6.00 dB		





(Plot 4.7.3 B: Channel 6: 2437MHz @ 802.11n HT40

Agilent Spectrum Analyzer - Occupied BW	
Image: Conter Freq 2.452000000 GHz Image: Conter Freq D5:08:36 PM May 0 Center Freq 2.452000000 GHz Center Freq: 2.452000000 GHz Radio Std: None #IFGain:Low #IFGain:Low #Atten: 30 dB Radio Device: B'	8, 2015 Trace/Detector
10 dB/div Ref 20.00 dBm	
	Clear Write
-10.0 Analashadashadashadashadashadashadashadash	Average
-40.0	Max Hold
-70.0 Center 2.452 GHz Span 44 #Res BW 100 kHz #VBW 300 kHz Sweep 5.467	MHz 7 ms
Occupied Bandwidth Total Power 12.2 dBm 35.774 MHz	Detector Average ► <u>Auto</u> Man
Transmit Freq Error-57.612 kHzOBW Power99.00 %x dB Bandwidth35.36 MHzx dB-6.00 dB	

(Plot 4.7.4 C: Channel 9: 2452MHz @ 802.11n HT40)

4.8. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 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.

And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The maximum gain of WIFI antenna was -1.12dBi. it is a FPC ANT.



5. Test Setup Photos of the EUT



End of Report
