

<u>5670 MHz</u>





Date: 1.DEC.2014 18:59:57

Limit for Radiated

Frequency Band (MHz)	FCC Limit
5150 to 5250	Lesser of 200 mW or 10 dBm + 10 log B
5250 to 5350	Lesser of 1 W or 17 dBm + 10 log B
5470 to 5725	Lesser of 1 W or 17 dBm + 10 log B
5725 to 5825	Lesser of 4 W or 23 dBm + 10 log B

Note: "B" = 26 dB Bandwidth.

It is acceptable to have an antenna with up to 6 dBi gain, without reducing the conducted output power.



Conducted

Frequency Band 1

<u>5190 MHz</u>

EIRP (dBm)	EIRP (mW)
11.04	12.71

<u>5230 MHz</u>

EIRP (dBm)	EIRP (mW)
10.56	11.38

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Conducted

Frequency Band 2

<u>5270 MHz</u>

EIRP (dBm)	EIRP (mW)
11.29	13.46

<u>5310 MHz</u>

EIRP (dBm)	EIRP (mW)
10.85	12.16

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.



Conducted

Frequency Band 3

<u>5510 MHz</u>

EIRP (dBm)	EIRP (mW)
11.06	12.76

<u>5590 MHz</u>

EIRP (dBm)	EIRP (mW)
11.21	13.21

<u>5670 MHz</u>

EIRP (dBm)	EIRP (mW)
11.37	13.71

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

Limit for Conducted

Frequency Band (MHz)	FCC Limit
5150 to 5250	Lesser of 50 mW or 4 dBm + 10 log B
5250 to 5350	Lesser of 250 mW or 11 dBm + 10 log B
5470 to 5725	Lesser of 250 mW or 11 dBm + 10 log B
5725 to 5825	Lesser of 1 W or 17 dBm + 10 log B

Note: "B" = 26 dB Bandwidth.



2.4 PEAK POWER SPECTRAL DENSITY

2.4.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)(5)

2.4.2 Equipment Under Test and Modification State

S/N: IMEI 004401115303360 - Modification State 0

2.4.3 Date of Test

27 November 2014

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.407 (a) and KDB 789033 D02 v01 Method SA-1 Alternative.

The EUT was transmitted at maximum power for bottom, middle and top channels on the data rate pre-determined to give the highest level of average output power. The EUT was connected to the Spectrum Analyser via attenuators and cables. The analyser settings were configured with an RBW of 1 MHz and VBW of 3MHz. The trace was set to a 10 second sweep time using an RMS detector. The maximum value was recorded for Power Spectral Density.

2.4.6 Environmental Conditions

Ambient Temperature21.0°CRelative Humidity41.9%



2.4.7 Test Results

<u>802.11(a)</u>

Frequency Band 1

<u>5180 MHz</u>

Modulation: BPSK

Peak Power Spectral Density (dBm)

-0.74

📕 Keysight Spec	trum Analyzer - Swept SA					
Center Fr	eq 5.180000000		SENSE:EXT	ALIGN AUTO Avg Type: RMS	02:37:58 PM Nov 27, 2014 TRACE 1 2 3 4 5 6 TYPE W	Frequency
10 dB/div	Ref Offset 20.8 dB Ref 10.00 dBm	IFGain:Low	#Atten: 10 dB	Mkr	1 5.174 72 GHz -0.74 dBm	Auto Tune
0.00		↓ ¹				Center Freq 5.180000000 GHz
-10.0						Start Freq 5.160000000 GHz
-30.0					\	Stop Freq 5.200000000 GHz
-50.0						CF Step 4.000000 MHz Auto Man
-70.0						Freq Offset 0 Hz
-80.0 Center 5.1	8000 GHz				Span 40.00 MHz	
#Res BW	I.U WIHZ	#VBW	3.0 WIHZ*	#Sweep	10.00 s (1001 pts)	



<u>5200 MHz</u>

Modulation: BPSK

Peak Power Spectral Der	nsity (dBm)	-0.	80	
Keysight Spectrum Analyzer - Swept SA RF 50 Ω DC nter Freq 5-200000000 GH	SENSE:EXT	ALIGN AUTO	02:44:20 PM Nov 27, 2014 TRACE 1 2 3 4 5 0	Frequency
Ref Offset 20.8 dB B/div Ref 10.00 dBm	NO: Wide 🛶 Trig: Free Run Gain:Low #Atten: 10 dB	Mkr	1 5.195 12 GHz -0.80 dBm	Auto Tune
	↓ ¹			Center Freq 5.20000000 GHz
				Start Freq 5.180000000 GHz
				Stop Freq 5.220000000 GHz
				CF Step 4.000000 MHz <u>Auto</u> Man
0				Freq Offset 0 Hz
			Spap 40.00 MHz	
Res BW 1.0 MHz	#VBW 3.0 MHz*	#Sweep	10.00 s (1001 pts)	



<u>5240 MHz</u>

Modulation: BPSK

Peak Power Spectral I	Density (dBm)	-().81	
Keysight Spectrum Analyzer - Swept SA				- 0 -
enter Freq 5.240000000	GHz PNO: Wide → Trig: Free Run	ALIGN AUTO	02:42:30 PM Nov 27, 2014 TRACE 2 3 4 5 6 TYPE W	Frequency
Ref Offset 20.8 dB 0 dB/div Ref 10.00 dBm	IFGain:Low #Atten: 10 dB	M	(r1 5.234 88 GHz -0.81 dBm	Auto Tune
9	↓ 1			Center Freq
0.0				
20.0				5.220000000 GHz
30.0				Stop Freq 5.26000000 GHz
				CF Step
				4.000000 MHz Auto Man
0.0				Freq Offset 0 Hz
80.0				
enter 5.24000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz*	#Swee	Span 40.00 MHz p 10.00 s (1001 pts)	
ISG		STAT	us	

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.



<u>5260 MHz</u>

Modulation: BPSK

Keyright Spe	rtrum Analyzer - Swent SA							
enter Fr	RF 50 Ω DC req 5.260000000) GHz PNO: Wide ← IFGain:Low	SENSE:EX → Trig: Free Run #Atten: 10 dB	T Avg Ty	ALIGN AUTO pe: RMS	02:45:44 P TRAC TYI D	M Nov 27, 2014 DE 1 2 3 4 5 6 PE W M N N N N ET A N N N N N	Frequency
0 dB/div	Ref Offset 20.8 dB Ref 10.00 dBm				Mki	1 5.263 -0.	68 GHz 96 dBm	Auto Tune
				1				Center Freq 5.260000000 GHz
0.0								Start Freq 5.240000000 GHz
30.0						X		Stop Freq 5.28000000 GHz
50.0								CF Step 4.000000 MHz
0.0								Freq Offset
30.0								0 Hz
enter 5.2 Res BW	26000 GHz 1.0 MHz	#VB	W 3.0 MHz*		#Sweep	Span 4 10.00 s (0.00 MHz (1001 pts)	
SG					STATU	5		



5300 MHz

Modulation: BPSK

Peak Power Spectral Der				
Keysight Spectrum Analyzer - Swept SA RF 50 Ω DC	SENSE:EXT	ALIGN AUTO	02:49:37 PM Nov 27, 2014	Frequency
nter Freq 5.300000000 GH	VO: Wide Trig: Free Run Gain:Low #Atten: 10 dB	Avg Type: RMS	144CE 123456 TYPE WWWWW DET A NNNNN	Auto Tune
Ref Offset 20.8 dB dB/div Ref 10.00 dBm			-0.64 dBm	
				Center Freq 5.300000000 GHz
				Start Freq 5.280000000 GHz
			<u></u>	Stop Freq 5.32000000 GHz
0				CF Step 4.000000 MHz
.0				Freq Offset
				0 Hz
enter 5.30000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz*	#Sweep	Span 40.00 MHz 10.00 s (1001 pts)	
ŝG		STATU	S	



5320 MHz

Modulation: BPSK

Peak Power Spectral Dens	ity (dBm)	-0.03		
Keysight Spectrum Analyzer - Swept SA				- 6 -
enter Freq 5.320000000 GHz PN0:	SENSE:EXT Avg Wide +++ Trig: Free Run	ALIGN AUTO 02: Type: RMS	51:20 PM Nov 27, 2014 TRACE 1 2 3 4 5 0 TYPE	Frequency
Ref Offset 20.8 dB 0 dB/div Ref 10.00 dBm	n:Low #Atten: 10 dB	Mkr1 5.	315 72 GHz -0.03 dBm	Auto Tune
9	1		5	Center Freq
			5	Start Freq .300000000 GHz
			5	Stop Freq .34000000 GHz
			Aut	CF Step 4.000000 MHz to Man
0.0				Freq Offset 0 Hz
0.0				
enter 5.32000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz*	Sp #Sweep 10.0	oan 40.00 MHz 00 s (1001 pts)	
SG		STATUS		

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.



<u>5500 MHz</u>

Modulation: BPSK

Peak Power Spectral Density (dBm) -1.12 Keysight Spectrum Analyzer - Swept SA ALIGN AUTO 02:52:51 PM Nov 27, 2014 Avg Type: RMS TRACE 23 3 5 TYPE WHAT AND N N DET A NN N N Frequency Mkr1 5.495 28 GHz -1.12 dBm Auto Tune Ref Offset 20.8 dB Ref 10.00 dBm 0 dB/div Center Freq **▲**1 5.50000000 GHz Start Freq 5.48000000 GHz Stop Freq 5.520000000 GHz CF Step 4.000000 MHz Auto Man **Freq Offset** 0 Hz Center 5.50000 GHz #Res BW 1.0 MHz Span 40.00 MHz #Sweep 10.00 s (1001 pts) #VBW 3.0 MHz*



<u>5600 MHz</u>

Modulation: BPSK

Peak Power Spectral Density (
Keysight Spectrum Analyzer - Swept SA	SENSE:EXT	ALIGN AUTO	02:54:28 PM Nov 27, 2014	- 0
enter Freq 5.600000000 GHz PNO: Wide IFGain:Low	→ Trig: Free Run #Atten: 10 dB	pe: RMS	TRACE 2 3 4 5 0 TYPE WWWWWW DET A N N N N N	Frequency
Ref Offset 20.8 dB dB/div Ref 10.00 dBm		Mkr	1 5.595 48 GHz -0.51 dBm	Auto Tune
.00	▲1			Center Freq 5.60000000 GHz
0.0				Start Freq
20.0				5.58000000 GHz
40.0				Stop Freq 5.62000000 GHz
50.0				CF Step 4.000000 MHz
				<u>Auto</u> Man
0.0				Freq Offset 0 Hz
80.0				
enter 5.60000 GHz Res BW 1.0 MHz #V	BW 3.0 MHz*	#Sweep	Span 40.00 MHz 10.00 s (1001 pts)	
ISG		STATU	5	



<u>5700 MHz</u>

Modulation: BPSK

Keysight Spectrum Analyzer - Swept SA RF 50 Ω DC		SENSE:EXT	ALIGN	AUTO 02:55:42	PM Nov 27, 2014	Erequency
nter Freq 5.7000000	PNO: Wide ↔ IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Type: RM	S TRA T'	CE 1 2 3 4 5 6 PE WHAT A N N N N DET A N N N N N	Trequency
Ref Offset 20.8 dB				Mkr1 5.695 -1	36 GHz 70 dBm	Auto Tune
g		1				Center Freq
						5.700000000 GHz
5.0						Start Freq
0,0						5.58000000 GH2
1.0						Stop Freq 5.72000000 GHz
				~		CF Step 4.000000 MHz
0						<u>Mato</u> man
0						Freq Offset 0 Hz
0						
				Snan	10 00 MHz	
es BW 1.0 MHz	#VBW	3.0 MHz*	#Sv	veep 10.00 s	(1001 pts)	

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 9 Mbps.

<u>Limit</u>

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz



802.11(ac) - 5 GHz 20 MHz BW

Frequency Band 1

<u>5180 MHz</u>

Modulation: QPSK

Peak Power Spectral Density (dBm)

-0.62

🚺 Keysight S	pectrum Analyzer - Swept SA				
Center F	RF 50 Ω DC	GH7 SENSE:EXT	ALIGN AUTO Avg Type: RMS	03:13:42 PM Nov 27, 2014 TRACE 1 2 3 4 5 6	Frequency
	Ref Offset 20.8 dB	PNO: Wide →→ IFGain:Low #Atten: 10 dB	Mkr	1 5.173 84 GHz	Auto Tune
		↓ ¹			Center Freq 5.180000000 GHz
-10.0					Start Freq 5.160000000 GHz
-30.0					Stop Freq 5.20000000 GHz
-50.0					CF Step 4.000000 MHz <u>Auto</u> Man
-70.0					Freq Offset 0 Hz
Center 5 #Res BW	.18000 GHz ₩ 1.0 MHz	#VBW 3.0 MHz*	#Sweep	Span 40.00 MHz 10.00 s (1001 pts)	
MSG			STATU	5	



<u>5200 MHz</u>

Modulation: QPSK

Peak Power Spectral Density (dBm) -1.22					
Keysight Spectrum Analyzer - Swept SA		SENSE-EXT	ALIGN ALITO	03:17:39 PM Nov 27, 2014	- 6 - X
enter Freq 5.2000000	00 GHz PNO: Wide ↔ TI IFGain:Low #/	ig: Free Run Atten: 10 dB	Avg Type: RMS	TRACE 123450 TYPE W	Frequency
Ref Offset 20.8 dB 0 dB/div Ref 10.00 dBm			Mkr	1 5.195 08 GHz -1.22 dBm	Auto Tune
og 0.00	↓ 1				Center Freq 5.20000000 GHz
0.0					Start Freq
20,0					5.18000000 GHz
40.0					5.220000000 GHz
50.0					CF Step 4.000000 MHz <u>Auto</u> Man
70.0					Freq Offset
80.0					0 Hz
Center 5.20000 GHz	#VBM(3)) MHz*	#Sween	Span 40.00 MHz	
sg			STATUS	rono o (roor pro)	
			Tana and the second sec		

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<u>5240 MHz</u>

Modulation: QPSK

Keysight Spectrum Analyzer - Swept SA RF 50 Ω DC		SENSE:EXT	ALIGN AUTO	03:19:09 PM Nov 27, 2014	
nter Freq 5.24000000	O GHz PNO: Wide ↔ IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Type: RMS	TRACE 2 3 4 5 6 TYPE WWWWWW DET ANNNNN	Frequency
Ref Offset 20.8 dB dB/div Ref 10.00 dBm			Mk	r1 5.233 96 GHz -1.29 dBm	Auto Tune
	↓ ¹				Center Freq
0					5.24000000 GH2
0.0					Start Freq 5.22000000 GHz
					Stop Fred
0.0					5.260000000 GHz
					CF Step
9.0					Auto Man
3.0					Freq Offset
0.0					0.112
enter 5.24000 GHz				Span 40.00 MHz	
Res BW 1.0 MHz	#VBW	3.0 MHz*	#Sweep	10.00 s (1001 pts)	

The test was performed on the worst case data rate for 802.11(ac) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.



<u>5260 MHz</u>

Modulation: QPSK

Peak Power Spectral Density (dBm) -0.77 Keysight Spectrum Analyzer - Swept SA ALIGN AUTO 03:20:22 PM Nov 27, 2014 Avg Type: RMS TRACE 23 3 5 TYPE WHAT AND N N DET A NN N N Frequency Mkr1 5.254 36 GHz -0.77 dBm Auto Tune Ref Offset 20.8 dB Ref 10.00 dBm 0 dB/div Center Freq 01 5.26000000 GHz Start Freq 5.24000000 GHz Stop Freq 5.280000000 GHz CF Step 4.000000 MHz Auto Man **Freq Offset** 0 Hz Center 5.26000 GHz #Res BW 1.0 MHz Span 40.00 MHz #Sweep 10.00 s (1001 pts) #VBW 3.0 MHz*



5300 MHz

Modulation: QPSK

-0.72 Peak Power Spectral Density (dBm) Keysight Spectrum Analyzer - Swept SA ALIGN AUTO 03:23:06 PM Nov 27, 201 Avg Type: RMS TRACE 23 4 TYPE WWWWW DET A NINITN Frequency Mkr1 5.295 68 GHz -0.72 dBm Auto Tune Ref Offset 20.8 dB Ref 10.00 dBm 0 dB/div 1 Center Freq 5.30000000 GHz Start Freq 5.280000000 GHz Stop Freq 5.32000000 GHz CF Step 4.000000 MHz Man Auto Freq Offset 0 Hz Center 5.30000 GHz #Res BW 1.0 MHz Span 40.00 MHz #Sweep 10.00 s (1001 pts) #VBW 3.0 MHz*



5320 MHz

Modulation: QPSK

Peak Power Spectral Density (dBm)	-0.45	0.45		
Keysight Spectrum Analyzer - Swept SA	ALIGN ALITO 03-24-20 P	MNov 27 2014		
enter Freq 5.320000000 GHz PNO: Wide	Avg Type: RMS TRAC	E 123456 Frequency		
Ref Offset 20.8 dB 0 dB/div Ref 10.00 dBm	Mkr1 5.315 -0.	72 GHz Auto Tune 45 dBm		
		Center Freq 5.320000000 GHz		
		Start Freq 5.300000000 GHz		
		5.34000000 GHz		
		CF Step 4.000000 MHz		
00		Auto Man Freq Offset		
80.0		0 Hz		
enter 5.32000 GHz Res BW 1.0 MHz #VBW 3.0 MHz*	Span 4 #Sweep 10.00 s	0.00 MHz 1001 pts)		
ISG	STATUS			

The test was performed on the worst case data rate for 802.11(ac) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.



<u>5500 MHz</u>

Modulation: QPSK

Peak Power Spectral Density (dBm) -1.14 Keysight Spectrum Analyzer - Swept SA ALIGN AUTO 03:25:53 PM Nov 27, 2014 Avg Type: RMS TRACE 23 4 5 TYPE WHAT AND N N DET A NN N N Frequency Mkr1 5.494 20 GHz -1.14 dBm Auto Tune Ref Offset 20.8 dB Ref 10.00 dBm I0 dB/div Center Freq **0**1 5.50000000 GHz Start Freq 5.48000000 GHz Stop Freq 5.520000000 GHz CF Step 4.000000 MHz Auto Man **Freq Offset** 0 Hz Center 5.50000 GHz #Res BW 1.0 MHz Span 40.00 MHz #Sweep 10.00 s (1001 pts) #VBW 3.0 MHz*



<u>5600 MHz</u>

Modulation: QPSK

-0.70 Peak Power Spectral Density (dBm) Keysight Spectrum Analyzer - Swept SA 8 ALIGN AUTO 03:27:14 PM Nov 27, 2014
Avg Type: RMS TRACE 12:3:45
TYPE
DET A Center Freq 5.600000000 GHz Freq 5.600000000 GHz IFGain:Low IFGain:Low Frequency Mkr1 5.595 12 GHz -0.70 dBm Auto Tune Ref Offset 20.8 dB Ref 10.00 dBm 0 dB/div 1 Center Freq 5.60000000 GHz Start Freq 5.58000000 GHz Stop Freq 5.62000000 GHz CF Step 4.000000 MHz Man Auto Freq Offset 0 Hz Center 5.60000 GHz #Res BW 1.0 MHz Span 40.00 MHz #Sweep 10.00 s (1001 pts) #VBW 3.0 MHz*



<u>5700 MHz</u>

Modulation: QPSK

Peak Power Spectral	I Density (dBm)	-1.53	
Keysight Spectrum Analyzer - Swept SA	10 GHz PNO: Wide - Trig: Free Run	ALIGN AUTO 03:28:36 PM Nov 27, 20 Avg Type: RMS TRACE TYPE DET	D14 Frequency
Ref Offset 20.8 dB	I Gan. Low Mittain to GD	Mkr1 5.694 64 GF -1.53 dB	Hz Auto Tune m
00	↓ ¹		Center Freq 5.700000000 GHz
0.0			Start Freq 5.680000000 GHz
0.0			Stop Freq 5.720000000 GHz
			CF Step 4.000000 MHz <u>Auto</u> Man
0			Freq Offset
enter 5.70000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz*	Span 40.00 Ml #Sweep 10.00 <u>s (1001 p</u>	Hz ts)
ISG		STATUS	

The test was performed on the worst case data rate for 802.11(ac) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.

<u>Limit</u>

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz



802.11(ac) - 5 GHz 40 MHz BW

Frequency Band 1

<u>5190 MHz</u>

Modulation: QPSK

Peak Power Spectral Density (dBm)

-4.07

Keysight Spectrum Analyzer - Swept SA				
RF 50 Ω DC	SENSE:EXT	ALIGN AUTO	05:00:23 PM Nov 27, 2014	Frequency
	PNO: Fast PNO: Fast FGain:Low Trig: Free Run #Atten: 10 dB		TYPE WHATTANK DET A N N N N N	Auto Tupe
Ref Offset 20.8 dB 10 dB/div Ref 10.00 dBm		Mkr	1 5.178 96 GHz -4.07 dBm	Auto Tune
0.00	1			Center Freq 5.19000000 GHz
-10.0				Start Freq 5.150000000 GHz
-30.0				Stop Freq 5.230000000 GHz
-50.0				CF Step 8.000000 MHz <u>Auto</u> Man
-70.0				Freq Offset 0 Hz
-80.0				
Center 5.19000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz*	#Sweep	Span 80.00 MHz 10.00 s (1001 pts)	
MSG		STATU	5	



5230 MHz

Modulation: QPSK

Keysight Spectrum Analyzer - Sweept SA. enter Freq 5.230000000 GHz PRO: Fest PRO: Fest	Peak Power Spectral Dens	sity (dBm)	-4.	69	
nter Freq 5.230000000 GHz PHO: Fast PHO: Fast Trig: Free Run Arg Type: RMS Trig: Free Run Arg Type: Run Arg	Keysight Spectrum Analyzer - Swept SA	SENSE-EVT	ALIGN AUTO	05:01:42 PM Nov 27 2014	d- -
Ref Offset 20.8 dB GB(div Ref 10.00 dBm Center Freq 5.23000000 GHz Start Freq 5.27000000 GHz Center Step Start Freq 5.27000000 GHz Center Step Start Freq 5.27000000 GHz CF Step 8.00000 MHz Man Freq Offset 0 Hz Start Start Freq 5.27000000 GHz Start Freq 5.2700000 GHz Start Freq 5.27000000 GHz Start Freq 5.2700000 GHz Start Freq 5.27000000 GHz Start Freq 5.27000000 GHz Start Freq 5.2700000 GHz Start Freq 5.270000 GHz Start Freq 5.2700000 GHz Start Freq 5.2700	enter Freq 5.230000000 GHz PNO IFGai	: Fast +++ Trig: Free Run in:Low #Atten: 10 dB	Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE WWWWWWW DET A N N N N N	Frequency
Center Freq 5.23000000 GHz Start Freq 5.19000000 GHz Start Freq 5.27000000 GHz CF Step 8.00000 MHz Man Freq Offset 0 Hz WBW 3.0 MHz* #Sweep 10.00 s (1001 pts)	Ref Offset 20.8 dB		Mkr	1 5.218 88 GHz -4.69 dBm	Auto Tune
Start Freq 5.19000000 GHz Stop Freq 5.27000000 GHz CF Step 8.00000 MHz Man Freq Offset 0 Hz 0 Hz when 5.23000 GHz tes BW 1.0 MHz #VBW 3.0 MHz* #Sweep 10.00 s (1001 pts)	00	↓1			Center Freq 5.230000000 GHz
Stop Freq Stop Freq S.27000000 GHz CF Step 8.00000 MHz Auto Man Freq Offset 0 Hz s BW 1.0 MHz #VBW 3.0 MHz* #Sweep 10.00 s (1001 pts)	0	V			Start Freq 5.19000000 GHz
CF Step 8.00000 MHz Auto Man Freq Offset 0 Hz enter 5.23000 GHz Res BW 1.0 MHz #VBW 3.0 MHz* #VBW 3.0 MHz* #Sweep 10.00 s (1001 pts)					Stop Freq 5.270000000 GHz
Freq Offset 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz					CF Step 8.000000 MHz <u>Auto</u> Man
10 enter 5.23000 GHz tes BW 1.0 MHz #VBW 3.0 MHz* #Sweep 10.00 s (1001 pts) status	.0				Freq Offset 0 Hz
Bes BW 1.0 MHz #VBW 3.0 MHz* #Sweep 10.00 s (1001 pts) G starus				Spop 20.00 MHz	
s status	Res BW 1.0 MHz	#VBW 3.0 MHz*	#Sweep	10.00 s (1001 pts)	
	SG		STATUS	3	

The test was performed on the worst case data rate for 802.11(ac) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.



<u>5270 MHz</u>

Modulation: QPSK

Peak Power Spectral Density (dBm) -3.97 Keysight Spectrum Analyzer - Swept SA ALIGN AUTO 05:02:58 PM Nov 27, 2014 Avg Type: RMS TRACE 23 3 5 Type Det A NNNN N Frequency Mkr1 5.258 72 GHz -3.97 dBm Auto Tune Ref Offset 20.8 dB Ref 10.00 dBm 0 dB/div Center Freq **1** 5.270000000 GHz Start Freq 5.230000000 GHz Stop Freq 5.310000000 GHz CF Step 8.000000 MHz Auto Man **Freq Offset** 0 Hz Center 5.27000 GHz #Res BW 1.0 MHz Span 80.00 MHz #Sweep 10.00 s (1001 pts) #VBW 3.0 MHz*



<u>5310 MHz</u>

Modulation: QPSK

sight Spectrum Analyzer - Swept SA						
RF 50 Ω DC ter Freq 5.310000000	PNO: Fast	SENSE:EXT	ALIGN AUT Avg Type: RMS	0 05:04:08 TF	PM Nov 27, 2014 ACE 2 3 4 5 6 TYPE W	Frequency
Ref Offset 20.8 dB 8/div Ref 10.00 dBm	II Guineon		M	kr1 5.29	8 00 GHz 3.74 dBm	Auto Tune
	1					Center Freq 5.310000000 GHz
	\int	V				Start Freq 5.270000000 GHz
	/					Stop Freq 5.35000000 GHz
						CF Step 8.000000 MHz Auto Man
						Freq Offset
ter 5.31000 GHz BW 1.0 MHz	#VBW	3.0 MHz*	#Swe	Span 20.00 s	80.00 MHz (1001 pts)	
			ST	TUS		

The test was performed on the worst case data rate for 802.11(ac) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.



<u>5510 MHz</u>

Modulation: QPSK

Peak Power Spectral Density (dBm) -4.06 Keysight Spectrum Analyzer - Swept SA ALIGN AUTO 05:05:34 PM Nov 27, 2014 Avg Type: RMS TRACE 234 5 TYPE WHAT AND DET A NNNN N Frequency Mkr1 5.498 64 GHz -4.06 dBm Auto Tune Ref Offset 20.8 dB Ref 10.00 dBm 10 dB/div Center Freq • 5.510000000 GHz Start Freq 5.47000000 GHz Stop Freq 5.550000000 GHz CF Step 8.000000 MHz Auto Man **Freq Offset** 0 Hz Center 5.51000 GHz #Res BW 1.0 MHz Span 80.00 MHz #Sweep 10.00 s (1001 pts) #VBW 3.0 MHz*



<u>5590 MHz</u>

Modulation: QPSK

Peak Power Spectral D	Density (dBm)	-3.	66	
Keysight Spectrum Analyzer - Swept SA	CONCLEASE		05-07-02 PMNey 27, 2014	- 6 -
enter Freq 5.590000000 (GHZ PNO: Fast IFGain:Low #Atten: 10 dB	Avg Type: RMS	05:07:02 PM Nov 27, 2014 TRACE 2 3 4 5 6 TYPE WWWWWW DET A N N N N N	Frequency
Ref Offset 20.8 dB 0 dB/div Ref 10.00 dBm		Mkr	1 5.579 04 GHz -3.66 dBm	Auto Tune
1.00	↓ ¹			Center Freq 5.590000000 GHz
0.0				Start Freq 5.550000000 GHz
30.0				Stop Freq 5.630000000 GHz
50.0				CF Step 8.00000 MHz <u>Auto</u> Man
				Freq Offset 0 Hz
80.0				
#Res BW 1.0 MHz	#VBW 3.0 MHz*	#Sweep	Span 80.00 MHz 10.00 s (1001 pts)	
MSG		STATUS		
		Terror ea		

COMMERCIAL-IN-CONFIDENCE



<u>5670 MHz</u>

Modulation: QPSK



The test was performed on the worst case data rate for 802.11(ac) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.

<u>Limit</u>

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz



802.11(ac) - 5 GHz 80 MHz BW

Frequency Band 1

<u>5210 MHz</u>

Modulation: QPSK

 Peak Power Spectral Density (dBm)
 -7.36



The test was performed on the worst case data rate for 802.11(ac) - 80 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.



<u>5290 MHz</u>

Modulation: QPSK



The test was performed on the worst case data rate for 802.11(ac) - 80 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.



<u>5530 MHz</u>

Modulation: QPSK

Peak Power Spectral Density (dBm) -6.94 Keysight Spectrum Analyzer - Swept SA ALIGN AUTO 05:12:29 PM Nov 27, 2014 Avg Type: RMS TRACE 23 4 5 TYPE WHAT AND N N DET A NN N N Frequency Mkr1 5.541 36 GHz -6.94 dBm Auto Tune Ref Offset 20.8 dB Ref 10.00 dBm 10 dB/div Center Freq 5.530000000 GHz Start Freq 5.45000000 GHz Stop Freq 5.61000000 GHz CF Step 16.000000 MHz Auto Man **Freq Offset** 0 Hz Center 5.53000 GHz #Res BW 1.0 MHz Span 160.0 MHz #Sweep 10.00 s (1001 pts) #VBW 3.0 MHz*



<u>5610 MHz</u>

Modulation: QPSK



The test was performed on the worst case data rate for 802.11(ac) - 80 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS1.

<u>Limit</u>

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz



802.11(n) - 5 GHz 20 MHz BW

Frequency Band 1

<u>5180 MHz</u>

Modulation: BPSK

Peak Power Spectral Density (dBm)

-0.90

📕 Keysight Sp	bectrum Analyzer - Swept SA				
LXI	RF 50 Ω DC	SENSE:EXT	ALIGN AUTO	03:00:09 PM Nov 27, 2014	Fraguanau
Center F	req 5.180000000	GHz PNO: Wide ↔ IFGain:Low #Atten: 10 dB	Avg Type: RMS	TRACE 2 3 4 5 6 TYPE WWWWWWW DET A N N N N N	Frequency
10 dB/div	Ref Offset 20.8 dB Ref 10.00 dBm		Mkr	1 5.172 56 GHz -0.90 dBm	Auto Tune
0.00		↓ ¹			Center Freq 5.180000000 GHz
-10.0					Start Freq 5.16000000 GHz
-30,0					Stop Freq 5.20000000 GHz
-50.0					CF Step 4.000000 MHz <u>Auto</u> Man
-70.0					Freq Offset 0 Hz
-80.0 Center 5.	.18000 GHz			Span 40.00 MHz	
#Res BW	1.0 MHz	#VBW 3.0 MHz*	#Sweep	10.00 s (1001 pts)	
MSG			STATU	5	



<u>5200 MHz</u>

Modulation: BPSK

Peak Power Spectral Den	isity (dBm)	-1.	16		
Keysight Spectrum Analyzer - Swept SA RF 50 Ω DC Inter Freq 5.20000000 GH	Z SENSE:EXT	ALIGN AUTO Avg Type: RMS	03:02:23 PM Nov 27, 2014	Frequency	
Ref Offset 20.8 dB dB/div Ref 10.00 dBm	O: Wide Trig: Free Run ain:Low #Atten: 10 dB	Mkr	1 5.195 80 GHz -1.16 dBm	Auto Tune	
	1			Center Freq 5.20000000 GHz	
				Start Freq 5.180000000 GHz	
10				Stop Freq 5.220000000 GHz	
				CF Step 4.000000 MHz <u>Auto</u> Man	
0				Freq Offset 0 Hz	
0					
nter 5.20000 GHz es BW 1.0 MHz	#VBW 3.0 MHz*	#Sweep	Span 40.00 MHz 10.00 s (1001 pts)		
		STATUS	5		



<u>5240 MHz</u>

Modulation: BPSK

Peak Power Spectral Density	y (dBm)	-0.9	90	
É Keysight Spectrum Analyzer - Swept SA				- 6 💌
enter Freq 5.240000000 GHz PNO: W	ide →→ Trig: Free Run	ALIGN AUTO	03:03:48 PM Nov 27, 2014 TRACE 2 3 4 5 0 TYPE	Frequency
Ref Offset 20.8 dB	.ow #Atten: 10 dB	Mkr1	5.247 40 GHz	Auto Tune
		↓ 1		Center Freq
				5.240000000 GHz
0.0				Start Freq 5.220000000 GHz
				Stop Freq
0.0				5.26000000 GHz
0.0				CF Step 4.000000 MHz Auto Man
				Freg Offset
0.0				0 Hz
0.0				
enter 5.24000 GHz Res BW 1.0 MHz #	≠VBW 3.0 MHz*	#Sweep	Span 40.00 MHz 10.00 s (1001 pts)	
3G		STATUS		

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.


Frequency Band 2

<u>5260 MHz</u>

Modulation: BPSK

Peak F	eak Power Spectral Density (dBm)					-0.86			
Keysight Sp Center F	ectrum Analyzer - Swept SA RF 50 Ω DC req 5.26000000	0 GHz	SENSE:	EXT Avg Typ	ALIGN AUTO	03:05:16 P TRAC TYI	M Nov 27, 2014 CE 123450 PE W	Frequency	
0 dB/div	Ref Offset 20.8 dB Ref 10.00 dBm	IFGain:Low	#Atten: 10 dE	3	Mkr	¤ 1 5.255 -0.	88 GHz 86 dBm	Auto Tune	
0.00			1					Center Freq 5.260000000 GHz	
20.0								Start Freq 5.240000000 GHz	
30.0								Stop Freq 5.280000000 GHz	
-40.0								CF Step 4.000000 MHz	
60.0								Freq Offset	
80.0								0 Hz	
Center 5. #Res BW	26000 GHz 1.0 MHz	#VB	W 3.0 MHz*	I	#Sweep	Span 4 10.00 s	0.00 MHz (1001 pts)		
SG					STATUS	i			



5300 MHz

Modulation: BPSK

Peak Power Spectra	I Density (dBm)		-1.1	4	
Keysight Spectrum Analyzer - Swept SA					
enter Freq 5.30000000	O GHz PNO: Wide ↔ Trig: IEGain:Low #Atter	SENSE:EXT Avg Ty Free Run h: 10 dB	ALIGN AUTO pe: RMS	03:07:00 PM Nov 27, 2014 TRACE 2 3 4 5 6 TYPE WWWWWWW DET A N N N N N	Frequency
Ref Offset 20.8 dB 0 dB/div Ref 10.00 dBm	3		Mkr1	5.295 56 GHz -1.14 dBm	Auto Tune
.00	↓ 1		-		Center Freq 5.300000000 GHz
.0					Start Freq
0.0					Stop Freq
10.0					5.320000000 GHz
50.0					4.000000 MHz Auto Man
3.0					Freq Offset 0 Hz
80.0					
enter 5.30000 GHz Res BW 1.0 MHz	#VBW 3.0 M	Hz*	#Sweep	Span 40.00 MHz 10.00 s (1001 pts)	
SG			STATUS		



<u>5320 MHz</u>

Modulation: BPSK

Peak Power Spectral I	Density (dBr	-0.53				
Keysight Spectrum Analyzer - Swept SA	-					
nter Freq 5.32000000	GHz PNO: Wide ↔ IFGain:Low	Trig: Free Run #Atten: 10 dB	ALIGN AUT Avg Type: RMS	TRACE 2 3 4 5 6 TYPE DET A N N N N	Frequency	
Ref Offset 20.8 dB dB/div Ref 10.00 dBm			M	kr1 5.312 72 GHz -0.53 dBm	Auto Tune	
00	1				Center Freq 5.320000000 GHz	
o o					Start Freq 5.30000000 GHz	
					Stop Freq 5.34000000 GHz	
					CF Step 4.000000 MHz	
0					Freq Offset	
0						
nter 5.32000 GHz es BW 1.0 MHz	#VBW 3	3.0 MHz*	#Swe	Span 40.00 MHz ep 10.00 s (1001 pts)		
3G			ST	ATUS		

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.



Frequency Band 3

<u>5500 MHz</u>

Modulation: BPSK

Keysight Spe	ctrum Analyzer - Swent SA							
enter Fi	RF 50 Ω DC req 5.50000000	0 GHz PNO: Wide ← IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Ty	ALIGN AUTO	03:09:52 P TRAC TYI D	M Nov 27, 2014 CE 1 2 3 4 5 6 PE W	Frequency
0 dB/div	Ref Offset 20.8 dB Ref 10.00 dBm				Mki	1 5.504 -1.	76 GHz 10 dBm	Auto Tune
0.00				• ¹	-			Center Freq 5.50000000 GHz
20.0								Start Freq 5.48000000 GHz
30.0								Stop Freq 5.52000000 GHz
50.0								CF Step 4.000000 MHz
70.0								Freq Offset
80.0								0112
enter 5. Res BW	50000 GHz 1.0 MHz	#VB	W 3.0 MHz*		#Sweep	Span 4 10.00 s	10.00 MHz (1001 pts)	
SG					STATU	s		

-0.77



<u>5600 MHz</u>

Modulation: BPSK

Peak Power Spectral Density (dBm)

Keysight Sp	pectrum Analyzer - Swept SA							
Center F	RF 50Ω DC Freq 5.600000000 G	HZ PNO: Wide ↔ FGain:Low	SENSE:EXT	Avg Ty	ALIGN AUTO	03:11:03 PM TRACE TYPE DE	Nov 27, 2014	Frequency
0 dB/div	Ref Offset 20.8 dB Ref 10.00 dBm				Mkr	1 5.604 -0.7	88 GHz 77 dBm	Auto Tuno
0.00				↓ 1				Center Free 5.60000000 GH
10.0	/							
20.0								Start Fre 5.580000000 GH
30.0 40.0								Stop Fre 5.620000000 GH
0.0								CF Ste 4.000000 MH
50.0								Adto
70.0								Freq Offse 0 H
80.0								
Center 5.	.60000 GHz	#VBW 3	.0 MHz*		#Sweep	Span 40	0.00 MHz	
SG					STATUS			



<u>5700 MHz</u>

Modulation: BPSK

eysight Spectrum Analyzer - Swept SA RF 50 Ω DC	SENSE:EXT	ALIGN AUTO	03:12:11 PM Nov 27, 2014	
nter Freq 5.700000000 GHz PNO: IFGair	Wide +++ Trig: Free Run #Atten: 10 dB	Avg Type: RMS	TRACE 123450 TYPE WHITTOWN DET ANNNNN	Frequency
Ref Offset 20.8 dB B/div Ref 10.00 dBm		Mkr	1 5.694 72 GHz -1.51 dBm	Auto Tune
	↓ ¹			Center Freq
				5.70000000 GH2
				Start Freq 5.68000000 GHz
				Stop Freg
			\	5.720000000 GHz
				CF Step 4.000000 MHz
				<u>Auto</u> Man
				Freq Offset 0 Hz
nter 5.70000 GHz			Span 40.00 MHz	
S BW 1.0 MHZ	#VBW 3.0 WHZ*	#Sweep	10.00 s (1001 pts)	

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

<u>Limit</u>

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz



802.11(n) - 5 GHz 40 MHz BW

Frequency Band 1

<u>5190 MHz</u>

Modulation: BPSK

Peak Power Spectral Density (dBm)

-4.06

Keysight Sp	ectrum Analyzer - Swept SA					
Center F	RF 50 Ω DC	GHz	SENSE:EXT	ALIGN AUTO	04:50:09 PM Nov 27, 2014 TRACE 2 3 4 5 6	Frequency
Genterr	req 5.15000000	PNO: Fast	Trig: Free Run #Atten: 10 dB	•	TYPE WHAT WANTED	
10 dB/div	Ref Offset 20.8 dB Ref 10.00 dBm			Mkr	1 5.177 60 GHz -4.06 dBm	Auto Tune
0.00		11				Center Freq 5.19000000 GHz
-10.0			V			Start Freq 5.150000000 GHz
-30.0						Stop Freq 5.230000000 GHz
-50.0						CF Step 8.000000 MHz <u>Auto</u> Man
-70.0						Freq Offset 0 Hz
-80.0 Center 5.	19000 GHz	#\/B\A(3 0 MHz*	#Sween	Span 80.00 MHz	
MSG	1.0 10112	#VDVV	5.0 WH2	SWGCD	10.00 S (1001 pts)	



<u>5230 MHz</u>

Modulation: BPSK

Peak Power Spectral I	Density (dBm)	-4.3	-4.38			
Keysight Spectrum Analyzer - Swept SA				- 0 -		
RF 50 Ω DC nter Freq 5.230000000	GHz PNO: Fast ↔ Trig: Free Run	ALIGN AUTO Avg Type: RMS	04:52:05 PM Nov 27, 2014 TRACE 2 3 4 5 6 TYPE	Frequency		
Ref Offset 20.8 dB	IFGain:Low #Atten: 10 dB	Mkr	1 5.218 08 GHz -4.38 dBm	Auto Tune		
0	1			Center Freq 5.230000000 GHz		
0				Start Freq 5.19000000 GHz		
				Stop Freq 5.270000000 GHz		
				CF Step 8.000000 MHz <u>Auto</u> Man		
0				Freq Offset 0 Hz		
.0						
enter 5.23000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz*	#Sweep	Span 80.00 MHz 10.00 s (1001 pts)			
G		STATUS				

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.



Frequency Band 2

<u>5270 MHz</u>

Modulation: BPSK

Peak Power Spectral Density (dBm) -3.85 Keysight Spectrum Analyzer - Swept SA 04:53:23 PM Nov 27, 2014 TRACE 1 2 3 4 5 6 TYPE WHAT HANNIN DET A N N N N N ALIGN AUTO Avg Type: RMS Frequency Mkr1 5.257 60 GHz -3.85 dBm Auto Tune Ref Offset 20.8 dB Ref 10.00 dBm 0 dB/div Center Freq 1 5.270000000 GHz Start Freq 5.230000000 GHz Stop Freq 5.310000000 GHz CF Step 8.000000 MHz Auto Man **Freq Offset** 0 Hz Center 5.27000 GHz #Res BW 1.0 MHz Span 80.00 MHz #Sweep 10.00 s (1001 pts) #VBW 3.0 MHz*



<u>5310 MHz</u>

Modulation: BPSK

Peak Power Spectral	eak Power Spectral Density (dBm)				-3.74				
Keysight Spectrum Analyzer - Swept SA					- 6 -				
enter Freq 5.31000000	OGHZ PNO: Fast →→ Trig: Fr	ENSE:EXT Avg Type ree Run	ALIGN AUTO E: RMS	04:54:46 PM Nov 27, TRACE 2 3 TYPE W	Frequency				
Ref Offset 20.8 dB	IFGain:Low #Atten:	10 dB	Mkr1	5.298 80 G	Hz Auto Tune				
	1				Center Freq				
.0			5		5.31000000 GHz				
20.0					Start Freq 5.270000000 GHz				
30.0					Stop Freq				
0.0					5.35000000 GHz				
0.0					CF Step 8.000000 MHz Auto Man				
0.0					Eren Offset				
0.0					0 Hz				
enter 5.31000 GHz Res BW 1.0 MHz	#VBW 3.0 MH	Z*	#Sweep	Span 80.00 M 10.00 s (1001	MHz pts)				
SG			STATUS						

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.



Frequency Band 3

<u>5510 MHz</u>

Modulation: BPSK

Keysight Spectrum Analyzer - Swent SA				
RF 50 Ω DC Center Freq 5.51000000	DO GHZ PNO: Fast →→ IFGain:Low Trig: Free Run #Atten: 10 dB	ALIGN AUTO 0 Avg Type: RMS	4:56:00 PM Nov 27, 2014 TRACE 2 3 4 5 0 TYPE WWWWWW DET A N N N N N	Frequency
Ref Offset 20.8 dB 0 dB/div Ref 10.00 dBm	3	Mkr1 5	.497 28 GHz -3.88 dBm	Auto Tune
0.00	1			Center Freq 5.51000000 GHz
20.0				Start Freq 5.470000000 GHz
30.0				Stop Freq 5.55000000 GHz
50.0			A	CF Step 8.000000 MHz uto Man
70.0				Freq Offset 0 Hz
80.0				
enter 5.51000 GHz		S	pan 80.00 MHz	



<u>5590 MHz</u>

Modulation: BPSK

-3.91 Peak Power Spectral Density (dBm) Keysight Spectrum Analyzer - Swept SA 8 ALIGN AUTO 04:57:24 PM Nov 27, 201 Avg Type: RMS TRACE 24 4 TYPE WWWWW DET A NININ Frequency Mkr1 5.577 36 GHz -3.91 dBm Auto Tune Ref Offset 20.8 dB Ref 10.00 dBm 0 dB/div Center Freq 1 5.59000000 GHz Start Freq 5.550000000 GHz Stop Freq 5.63000000 GHz CF Step 8.000000 MHz Man Auto Freq Offset 0 Hz Center 5.59000 GHz #Res BW 1.0 MHz Span 80.00 MHz #Sweep 10.00 s (1001 pts) #VBW 3.0 MHz*



<u>5670 MHz</u>

Modulation: BPSK

eysight Spectrum Analyzer - Swept SA						
nter Freq 5.6700000	0 GHz PNO: Fast ↔ IFGain:Low	• Trig: Free Run #Atten: 10 dB	ALIGN AUT Avg Type: RMS	0 04:58:37 PM TRACI TYP DE	I Nov 27, 2014 E 1 2 3 4 5 6 E WHAT A N N N N N	Frequency
Ref Offset 20.8 dB B/div Ref 10.00 dBm			М	kr1 5.658 -4.2	80 GHz 28 dBm	Auto Tune
0	1-		+			Center Freq 5.670000000 GHz
		V				Start Freq 5.63000000 GHz
						Stop Freq 5.710000000 GHz
						CF Step 8.000000 MHz <u>Auto</u> Man
, 						Freq Offset 0 Hz
nter 5.67000 GHz es BW 1.0 MHz	#VBW	3.0 MHz*	#Swee	Span 80	0.00 MHz 1001 pts)	
			STA	TUS		

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was MCS0.

<u>Limit</u>

Frequency Band (MHz)	FCC Limit	IC Limit		
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz		
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz		
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz		
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz		



2.5 UNDESIRABLE EMISSION LIMITS

2.5.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (b)(1)(2)(3)(4)(6)(7)

2.5.2 Equipment Under Test and Modification State

S/N: IMEI 004401115303394 - Modification State 0 and 1

2.5.3 Date of Test

23 November 2014, 24 November 2014, 25 November 2014, 26 November 2014, 30 November 2014, 1 December 2014, 2 December 2014, 3 December 2014, 11 December 2014, 12 December 2014 & 13 December 2014

2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.407 (b) and FCC KDB 789033 D02 v01.

For conducted emissions, the EUT was set to operate at maximum power on the data rate predetermined to give the highest level of average output power. The analyser settings were configured with a peak detector and max hold trace; the measurement path loss in each relevant frequency band was measured and entered as a reference level offset. The test was performed on the bottom, middle and top channels of each sub-band. The. The test was performed over the frequency range 9 kHz to 40 GHz.

For radiated emissions, the test method described above was also used. However, the measurement was performed from 30 MHz to 40 GHz and the path loss is incorporated as a transducer factor and entered into the spectrum analyser. In each frequency span the level was maximised by rotating the EUT 360° and a height search of the measuring antenna.

Band edge measurements were performed in accordance with ANSI C63.10, Clause 6.9.3. The results were analysed to ensure compliance with restricted bands. The EUT was set to the lowest and highest operating frequencies.

2.5.6 Environmental Conditions

Ambient Temperature	19.1 - 22.2°C
Relative Humidity	32.0 - 44.0%



2.5.7 Test Results

<u>802.11(a)</u>

4.0 V DC Supply

Spurious Radiated Emissions

Frequency Band 1

<u>5180 MHz</u>



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
32.232	29.3	29.2	40.0	100	-10.7	-70.8	98	1.00	Vertical
57.066	19.8	9.8	40.0	100	-20.2	-90.2	258	1.00	Vertical
66.272	19.5	9.4	40.0	100	-20.5	-90.6	8	1.00	Vertical
75.433	21.5	11.9	40.0	100	-18.5	-88.1	186	1.25	Vertical
88.495	25.2	18.2	43.5	150	-18.3	-131.8	352	1.00	Vertical
847.565	33.0	44.7	46.0	200	-13.0	-155.3	159	4.00	Vertical



1 GHz to 7 GHz



Date: 23.NOV.2014 12:40:19

7 GHz to 8 GHz



Date: 26.NOV.2014 17:04:30



8 GHz to 18 GHz



Date: 2.DEC.2014 22:59:47

18 GHz to 40 GHz



Date: 25.NOV.2014 17:59:13



<u>5200 MHz</u>



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
33.149	29.1	28.5	40.0	100	-10.9	-71.5	203	1.00	Vertical
58.179	20.6	10.7	40.0	100	-19.4	-89.3	2	1.00	Vertical
71.470	21.3	11.6	40.0	100	-18.7	-88.4	143	1.00	Vertical
76.194	21.8	12.3	40.0	100	-18.2	-87.7	212	1.02	Vertical
88.494	26.8	21.9	43.5	150	-16.7	-128.1	48	1.02	Vertical
769.275	33.0	44.7	46.0	200	-13.0	-155.3	53	1.00	Vertical



1 GHz to 7 GHz



Date: 23.NOV.2014 13:07:44

7 GHz to 8 GHz



Date: 26.NOV.2014 17:08:24



8 GHz to 18 GHz



Date: 2.DEC.2014 23:10:42

18 GHz to 40 GHz



Date: 25.NOV.2014 18:36:55



<u>5240 MHz</u>



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
33.684	28.5	26.6	40.0	100	-11.5	-73.4	144	1.00	Vertical
57.645	19.5	9.4	40.0	100	-20.5	-90.6	103	1.00	Vertical
67.349	18.8	8.7	40.0	100	-21.2	-91.3	353	1.00	Vertical
76.465	22.6	13.5	40.0	100	-17.4	-86.5	187	1.00	Vertical
88.500	26.2	20.4	43.5	150	-17.3	-129.6	93	1.00	Vertical
805.116	32.9	44.2	46.0	200	-13.1	-155.8	148	1.00	Vertical



1 GHz to 7 GHz



Date: 23.NOV.2014 13:25:01

7 GHz to 8 GHz



Date: 26.NOV.2014 17:13:23



8 GHz to 18 GHz



Date: 2.DEC.2014 23:19:41





Date: 25.NOV.2014 19:01:36



Frequency Band 2

<u>5260 MHz</u>



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
33.392	29.5	29.9	40.0	100	-10.5	-70.1	349	1.00	Vertical
57.653	19.7	9.7	40.0	100	-20.3	-90.3	0	1.00	Vertical
76.507	22.0	12.6	40.0	100	-18.0	-87.4	195	1.00	Vertical
88.488	26.7	21.6	43.5	150	-16.8	-128.4	98	1.00	Vertical
111.157	22.7	13.6	43.5	150	-20.8	-136.4	49	1.00	Vertical
860.340	33.0	44.7	46.0	200	-13.0	-155.3	12	1.00	Horizontal



1 GHz to 7 GHz



Date: 23.NOV.2014 13:47:01

7 GHz to 8 GHz



Date: 26.NOV.2014 17:17:02



8 GHz to 18 GHz



Date: 2.DEC.2014 23:28:53

18 GHz to 40 GHz



Date: 25.NOV.2014 19:25:12



<u>5300 MHz</u>



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
33.005	28.7	27.2	40.0	100	-11.3	-72.8	251	1.00	Vertical
58.087	19.9	9.9	40.0	100	-20.1	-90.1	84	1.00	Vertical
76.359	22.3	13.0	40.0	100	-17.7	-87.0	173	1.00	Vertical
88.497	27.7	24.3	43.5	150	-15.8	-125.7	187	1.00	Vertical
104.785	21.3	11.6	43.5	150	-22.2	-138.4	0	1.00	Vertical
913.336	33.8	49.0	46.0	200	-12.2	-151.0	268	1.00	Horizontal



1 GHz to 7 GHz



Date: 23.NOV.2014 14:09:44

7 GHz to 8 GHz



Date: 26.NOV.2014 17:20:44



8 GHz to 18 GHz



Date: 2.DEC.2014 23:38:01

18 GHz to 40 GHz



Date: 25.NOV.2014 19:44:51



<u>5320 MHz</u>



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
31.068	29.7	30.5	40.0	100	-10.3	-69.5	170	1.00	Vertical
58.084	19.6	9.5	40.0	100	-20.4	-90.5	240	1.00	Vertical
77.311	20.2	10.2	40.0	100	-19.8	-89.8	154	1.00	Vertical
88.505	27.9	24.8	43.5	150	-15.6	-125.2	102	1.00	Vertical
104.784	21.6	12.0	43.5	150	-21.9	-138.0	360	1.00	Vertical
928.735	33.7	48.4	46.0	200	-12.3	-151.6	123	1.00	Vertical



1 GHz to 7 GHz



Date: 23.NOV.2014 14:30:35

7 GHz to 8 GHz



Date: 26.NOV.2014 17:24:38



8 GHz to 18 GHz



Date: 2.DEC.2014 23:49:46

18 GHz to 40 GHz



Date: 25.NOV.2014 19:57:39



Frequency Band 3

<u>5500 MHz</u>



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
31.699	29.5	29.9	40.0	100	-10.5	-70.1	178	1.00	Vertical
57.641	19.8	9.8	40.0	100	-20.2	-90.2	48	1.00	Vertical
67.193	21.4	11.7	40.0	100	-18.6	-88.3	195	1.00	Vertical
76.320	21.6	12.0	40.0	100	-18.4	-88.0	277	1.00	Vertical
108.873	22.3	13.0	43.5	150	-21.2	-137.0	0	1.00	Vertical
804.154	33.0	44.7	46.0	200	-13.0	-155.3	360	1.63	Vertical



1 GHz to 7 GHz



Date: 23.NOV.2014 14:53:08

7 GHz to 8 GHz



Date: 26.NOV.2014 17:28:17



8 GHz to 18 GHz



Date: 3.DEC.2014 00:00:58

18 GHz to 40 GHz



Date: 25.NOV.2014 20:13:24



<u>5600 MHz</u>



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
33.785	28.6	26.9	40.0	100	-11.4	-73.1	360	1.00	Vertical
57.651	19.4	9.3	40.0	100	-20.6	-90.7	59	1.00	Vertical
67.191	21.0	11.2	40.0	100	-19.0	-88.8	190	1.00	Vertical
76.319	22.6	13.5	40.0	100	-17.4	-86.5	181	1.02	Vertical
110.659	20.2	10.2	43.5	150	-23.3	-139.8	86	1.00	Vertical
865.128	33.6	47.9	46.0	200	-12.4	-152.1	174	1.00	Horizontal


1 GHz to 7 GHz



Date: 23.NOV.2014 15:10:28

7 GHz to 8 GHz



Date: 26.NOV.2014 17:31:34



8 GHz to 18 GHz



Date: 3.DEC.2014 17:09:59

18 GHz to 40 GHz



Date: 25.NOV.2014 20:24:17



<u>5700 MHz</u>

30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
33.781	28.8	27.5	40.0	100	-11.2	-72.5	360	1.00	Vertical
57.658	20.3	10.4	40.0	100	-19.7	-89.6	0	1.00	Vertical
67.299	21.9	12.4	40.0	100	-18.1	-87.6	225	1.00	Vertical
76.560	22.8	13.8	40.0	100	-17.2	-86.2	185	1.00	Vertical
110.465	22.4	13.2	43.5	150	-21.1	-136.8	32	1.00	Vertical
889.143	33.8	49.0	46.0	200	-12.2	-151.0	195	1.00	Horizontal



1 GHz to 7 GHz



Date: 23.NOV.2014 15:33:25

7 GHz to 8 GHz



Date: 26.NOV.2014 17:35:06



8 GHz to 18 GHz



Date: 3.DEC.2014 17:27:13





Date: 25.NOV.2014 20:38:22

<u>Limit</u>

Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0



Band Edge

Modulation/Data Rate: OFDM/9 Mbps

Restricted Bands of Operation						
Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)				
5150.00	59.09	47.69				
5350.00	60.51	48.52				
5460.00	59.87	48.47				

5150.00 MHz

Final Peak



Date: 30.NOV.2014 08:44:47



Final Average





5350.00 MHz

Final Peak



Date: 30.NOV.2014 09:26:26



Final Average





5460.00 MHz

Final Peak



Date: 30.NOV.2014 09:39:00



Final Average



Date: 30.NOV.2014 09:39:47



Band Edge				
Frequency (MHz)	Final Peak (dBm)			
5150.00	-36.22			
5350.00	-35.02			
5470.00	-35.02			
5725.00	-35.34			

5150.00 MHz

Final Peak



Date: 30.NOV.2014 08:47:19

COMMERCIAL-IN-CONFIDENCE



5350.00 MHz

Final Peak



Date: 30.NOV.2014 09:29:03

<u>5470.00 MHz</u>

Final Peak



Date: 30.NOV.2014 09:37:53

COMMERCIAL-IN-CONFIDENCE



5725.00 MHz

Final Peak



Date: 30.NOV.2014 10:15:33