CHAIN 2 OUTPUT POWER





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<u>BF</u>

CHAIN 0 OUTPUT POWER





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CHAIN 1 OUTPUT POWER





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CHAIN 2 OUTPUT POWER





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7.6.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

NBF

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total
		Power	Power	Power	Power
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5270	16.70	15.80	15.70	20.86
High	5310	14.50	13.25	13.00	18.41

ΒF

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total
		Power	Power	Power	Power
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5270	14.20	13.50	12.40	18.20
High	5310	14.50	13.25	13.00	18.41

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7.6.4. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25–5.35 GHz band, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 6.07 dBi, therefore the limit is 10.93 dBm.

The combination antenna gain is 10.24 dBi, therefore the limit is 6.76 dBm.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

Preliminary tests on individual chains, and on all chains with a combiner, were performed. The worst-case configuration was with a combiner, therefore final test were performed with all chains feeding a combiner.

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RESULTS

NBF

Channel	Frequency	Chain 0	Chain 1	Chain 2		Limit	Margin
		PPSD	PPSD	PPSD	Total		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5270	3.36	2.267	2.067	7.4	10.93	-3.56
High	5310	-0.338	-1.11	-0.963	4.0	10.93	-6.95

ΒF

Channel	Frequency	Chain 0	Chain 1	Chain 2		Limit	Margin
		PPSD	PPSD	PPSD	Total		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5270	2.259	1.728	1.309	6.6	6.76	-0.21
High	5310	-0.369	-0.952	-1.187	3.9	6.76	-2.81

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<u>NBF</u>

CHAIN 0 POWER SPECTRAL DENSITY





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CHAIN 1 POWER SPECTRAL DENSITY





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CHAIN 2 POWER SPECTRAL DENSITY





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<u>BF</u>

CHAIN 0 POWER SPECTRAL DENSITY





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CHAIN 1 POWER SPECTRAL DENSITY





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CHAIN 2 POWER SPECTRAL DENSITY





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7.6.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

The transmitter outputs are connected to the spectrum analyzer via a combiner.

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

CHAIN 0

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5270	9.21	13	-3.79
High	5310	10.40	13	-2.60

CHAIN 1

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5270	9.58	13	-3.42
High	5310	9.38	13	-3.62

CHAIN 2

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5270	9.00	13	-4.00
High	5310	8.91	13	-4.09

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PEAK EXCURSION





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PEAK EXCURSION





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PEAK EXCURSION





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7.6.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (3)

IC RSS-210 A9.3 (3)

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.25-5.35 GHz band shall not exceed an EIRP of -27 dBm / MHz.

Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.

TEST PROCEDURE

Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to EIRP limit, adjusted for the maximum antenna gain.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

Preliminary tests on individual chains, and on all chains with a combiner, were performed. The worst-case configuration was with a combiner, therefore final test were performed with all chains feeding a combiner.

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LOW CHANNEL SPURIOUS EMISSIONS





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HIGH CHANNEL SPURIOUS EMISSIONS





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7.7. 5.6GHz BAND CHANNEL TESTS FOR 802.11a MODE

7.7.1. 26 dB and 99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

TEST PROCEDURE

The transmitter outputs are connected to the spectrum analyzer via a combiner. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

CHAIN 0

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5500	20.776	16.5275
Middle	5600	20.574	16.4881
High	5700	20.15	16.5373

CHAIN 1

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5500	19.899	16.461
Middle	5600	20.388	16.4517
High	5700	20.402	16.4802

CHAIN 2

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5500	20.966	16.4756
Middle	5600	20.225	16.5161
High	5700	19.259	16.574

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26 dB and 99% BANDWIDTH





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BANDWIDTH HIGH CH	Sweep
Ch Freq 5.7 GHz Trig Free Occupied Bandwidth	Sweep Time 20.00 ms <u>Auto Man</u>
Ref 20 dBm Atten 20 dB	Sweep Single Cont
#Samp Log 10 dB/	Norm <u>Accy</u>
Offst 18.9 dB	
Center 5.700 00 GHz Span 50 MHz #Res BW 180 kHz #VBW 510 kHz Sweep 20 ms (601 pts)	Gale Setup
Occupied Bandwidth Occ BW % Pwr 99.00 % 16.5373 MHz x dB -26.00 dB	601
Transmit Freq Error -122.042 kHz x dB Bandwidth 20.150 MHz*	
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26 dB and 99% BANDWIDTH



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* Agilent 09:08:54 Nov 19, 2010			RT	Sw	әер
Ch Freq 5.6 GHz Occupied Bandwidth			Trig Free	Swe <u>Auto</u>	ep Time 20.00 ms <u>Ma</u>
				<u>Single</u>	Sweep <u>Cont</u>
Ref 20 dBm Atten 20 dB #Samp Log 10				Auto Norm	Sweep Time <u>Accy</u>
dB/ Offst 18.9 dB				On	Gate <u>Of</u>
Center 5.600 00 GHz #Res BW 180 kHz #V	/BW 510 kHz	Sweep 20 r	Span 50 MHz ns (601 pts)	Gate	Setup
Occupied Bandwidth 16.4517 N	₀₀ ∕IHz	c BW % Pwr x dB	99.00 % -26.00 dB		Points 601
Transmit Freq Error -17.134 x dB Bandwidth 20.388	kHz MHz*				



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26 dB and 99% BANDWIDTH





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BANDWIDTH HIGH CH	System
Ch Freq 5.7 GHz Trig Free Occupied Bandwidth	Show Errors 🔸
	Power On/ Preset
Ref 20 dBm Atten 20 dB #Samp Log	Time/Date ▸
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Alignments •
dB Center 5.700 00 GHz Span 50 MHz	Config I/O 🔸
#Res BW 180 kHz #VBW 510 kHz Sweep 20 ms (601 pts)	Reference 🔸
16.5740 MHz × dB -26.00 dB	
Transmit Freq Error -44.721 kHz x dB Bandwidth 19.259 MHz*	More 1 of 3
Copyright 2000-2010 Agilent Technologies	

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7.7.2. OUTPUT POWER

<u>LIMITS</u>

FCC §15.407 (a) (1) IC RSS-210 A9.2 (1)

Antenna gain of Chain 1 = antenna gain of Chain 2.

Antenna Gain	Antenna Gain	Antenna Gain	Effective Legacy
(Chain 0)	(Chain 1)	(Chain 2)	Gain
(dBi)	(dBi)	(dBi)	(dBi)
4.02	4.78	4.51	9.22

For the 5.47-5.725 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The combination antenna gain is 9.22 dBi.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

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RESULTS

Limit

Channel	Frequency	Fixed	В	11 + 10 Log B	Effective	Limit
		Limit		Limit	Ant. Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5500	23.98	20.776	24.18	9.22	20.76
Mid	5600	23.98	20.574	24.13	9.22	20.76
High	5700	23.98	20.15	24.04	9.22	20.76

Individual Chain Results

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total	Limit	Margin
		Power	Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	13.63	13.22	13.66	18.28	20.76	-2.48
Mid	5600	13.57	13.00	13.02	17.98	20.76	-2.78
High	5700	13.36	13.07	12.84	17.87	20.76	-2.89

TPC Results

TPC Dolta Bower		Chain 0	Chain 1	Chain 2			
TFC Della	FOWEI	3.55	3.46	5.22			
Worst-case	e TPC Power	Chain 0	Chain 1	Chain 2	Total Power	Ant Gain	EIRP
Low	5500	10.08	9.76	8.44	14.25	9.22	23.47
TPC Limit (dBm)						24	
Margin (dB)					-0.53		

CHAIN 0 OUTPUT POWER





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CHAIN 1 OUTPUT POWER



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CHAIN 2 OUTPUT POWER





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OUTPUT POWER WITH TPC (WORST CASE)





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7.7.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 18.9 was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total
		Power	Power	Power	Power
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5500	13.45	13.20	13.50	18.16
Middle	5600	13.50	13.00	13.00	17.94
High	5700	13.25	13.05	12.75	17.79

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7.7.4. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

Antenna Gain	Antenna Gain	Antenna Gain	Effective Legacy
(Chain 0)	(Chain 1)	(Chain 2)	Gain
(dBi)	(dBi)	(dBi)	(dBi)
4.02	4.78	4.51	9.22

For the 5.47-5.725 GHz band, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The combined antenna gain is 9.22 dBi, therefore the limit is 7.78 dBm.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

<u>RESULTS</u>

Channel	Frequency	Chain 0	Chain 1	Chain 2		Limit	Margin
		PPSD	PPSD	PPSD	Total		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	3.104	2.231	2.736	7.5	7.78	-0.30
Middle	5600	3.126	2.165	2.399	7.4	7.78	-0.43
High	5700	2.661	2.401	2.344	7.2	7.78	-0.54

CHAIN 0 POWER SPECTRAL DENSITY





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CHAIN 1 POWER SPECTRAL DENSITY



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CHAIN 2 POWER SPECTRAL DENSITY





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PSD HIGH CH, CH	HAIN 2 1, 2010	R T	Peak Search
Ch Freq 5. Channel Power	7 GHz	Trig Fre	e Next Peak
		Mkr1 5.695 432 5 GHz	Next Pk Right
Ref 30 dBm Atter #Samp Log	1 30 dB	2.344 dBm	Next Pk Left
dB/ Offst 18.9			Min Search
dB DI 7.8 dBm			Pk-Pk Search
#PAvg 100 W1 S2			Mkr©CF
Center 5.700 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 31.5 MH Sweep 20 ms (601 pts)	Iz More 1 of 2
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7.7.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

The transmitter outputs are connected to the spectrum analyzer via a combiner.

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

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RESULTS

CHAIN 0

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5500	9.54	13	-3.46
Middle	5600	9.36	13	-3.64
High	5700	8.83	13	-4.17

CHAIN 1

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5500	8.74	13	-4.26
Middle	5600	8.74	13	-4.26
High	5700	8.70	13	-4.30

CHAIN 2

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5500	8.61	13	-4.39
Middle	5600	9.41	13	-3.59
High	5700	10.84	13	-2.16

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CHAIN 0

PEAK EXCURSION





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CHAIN 1

PEAK EXCURSION



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CHAIN 2

PEAK EXCURSION





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PEAK EXCURSION	HIGH CH		5 Ŧ	
Agilent 09:39:14 Nov 19, 2	U1U		<u> </u>	BVV/Avg
Ch Freq 5.7 G Channel Power	GHz	Т	rig Free	Res BW 1.0 MHz Auto <u>Man</u>
		ΔM	1kr1 O Hz	Video BV 3.0 MHz Auto <u>Man</u>
Ref 30 dBm Atten 3	0 dB		10.84 dB	VBW/RBV
#Peak Log		1		1.00000 <u>Auto Man</u>
dB/	and the second s			Average 100
18.9 dB			A STORY AND THE AREA AND A STORY	On <u>Off</u> Avg/VBW Type
www.anglanganage			Mar What	Pwr (RMS) ► Auto <u>Man</u>
#PAvg				
V1 V2				
Center 5.700 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span Sweep 20 ms (31.5 MHz 601 pts)	106 Auto Man
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7.7.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (1)

IC RSS-210 A9.3 (1)

For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm / MHz.

TEST PROCEDURE

Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to EIRP limit, adjusted for the maximum antenna gain.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

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SPURIOUS EMISSIONS WITH COMBINER





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7.8. 5.6 GHz BAND CHANNEL TESTS FOR 802.11HT20 MODE

7.8.1. 99% & 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth measurement function is utilized.

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RESULTS

CHAIN 0

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5500	21.578	17.6769
Middle	5600	21.606	17.7103
High	5700	21.219	17.7922

CHAIN 1

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5500	21.571	17.7243
Middle	5600	21.749	17.6576
High	5700	21.057	17.6888

CHAIN 2

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5500	20.122	17.6935
Middle	5600	20.382	17.6906
High	5700	20.402	17.6869

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CHAIN 0

26 dB and 99% BANDWIDTH





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BANDWIDTH HIGH CH Agilent 09:32:34 Nov 6, 2010 R T	Sweep
Ch Freq 5.7 GHz Trig Free Occupied Bandwidth	Sweep Time 20.00 ms <u>Auto Man</u>
Ref 20 dBm Atten 20 dB	Sweep Single Cont
#Samp Log 10	Norm <u>Accy</u>
Diffst 18.9 dB	Gate On <u>Off</u>
Center 5.700 00 GHz Span 50 MHz #Res BW 200 kHz #VBW 560 kHz Sweep 20 ms (601 pts)	Gate Setup •
Occupied Bandwidth Occ BW % Pwr 99.00 % 17.7922 MHz × dB -26.00 dB	601
Transmit Freq Error -90.092 kHz x dB Bandwidth 21.219 MHz* Copyright 2000-2010 Agilent Technologies	

CHAIN 1

26 dB and 99% BANDWIDTH



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🔆 Agilent 19:43:54 Nov 11	, 2010		RL	Freq/Channel
Ch Freq 5. Occupied Bandwidth	6 GHz		Trig Free	5.60000000 GHz
				Start Freq 5.57500000 GHz
Ref 20 dBm Atter #Samp Log	1 20 dB			Stop Freq 5.62500000 GHz
dB/ offst 18.9 dB				CF Step 5.0000000 MHz <u>Auto Ma</u>
Center 5.600 00 GHz #Res BW 200 kHz	#VBW 560 kHz	Sweep 20 I	Span 50 MHz ns (601 pts)	Freq Offset 0.00000000 Hz
Occupied Bandw 17.6	idth 576 MHz	Occ BW % Pwr x dB	99.00 % -26.00 dB	Signal Track On <u>Of</u>
Transmit Freq Error x dB Bandwidth	-73.823 kHz 21.749 MHz*			



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CHAIN 2

26 dB and 99% BANDWIDTH





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BANDWIDTH HIGH CH ※ Agilent 19:44:46 Nov 11, 2010 R T	Freq/Channel
Ch Freq 5.7 GHz Trig Fre Occupied Bandwidth	e Center Freq 5.7000000 GHz
	Start Freq 5.67500000 GHz
Ref 20 dBm Atten 20 dB #Samp	Stop Freq 5.72500000 GHz
dB/ Offst 18.9	CF Step 5.00000000 MHz <u>Auto Man</u>
db db db db db db dc dc <thdc< th=""> dc dc dc<!--</th--><th>Freq Offset 0.00000000 Hz</th></thdc<>	Freq Offset 0.00000000 Hz
Occupied Bandwidth Occ BW % Pwr 99.00 % 17.6869 MHz × dB -26.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error -44.901 kHz x dB Bandwidth 20.402 MHz*	
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7.8.2. OUTPUT POWER

<u>LIMITS</u>

FCC §15.407 (a) (2) IC RSS-210 A9.2 (2)

For the 5.47-5.725 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is less than 6 dBi, and the combination antenna gain is 9.22 dBi.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

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RESULTS

Non Beam-Forming

Limit

Channel	Frequency	Fixed	В	11 + 10 Log B	Antenna	Limit
		Limit		Limit	Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5500	24	21.578	24.34	4.88	24.00
Mid	5600	24	21.606	24.35	4.88	24.00
High	5700	24	21.219	24.27	4.88	24.00

Individual Chain Results

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total	Limit	Margin
		Power	Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	15.12	14.95	14.13	19.53	24.00	-4.47
Mid	5600	16.37	15.32	15.42	20.50	24.00	-3.50
High	5700	12.72	12.62	12.33	17.33	24.00	-6.67

TPC Results

TPC Dolta Power		Chain 0	Chain 1	Chain 2			
	rowei	0.33	1.36	0.37			
Worst-case	e TPC Power	Chain 0	Chain 1	Chain 2	Total Power	Ant Gain	EIRP
Mid	5600	14.79	13.59	13.76	18.85	4.88	23.73
TPC Limit (dBm)						24	
Margin (dB)						-0.27	

Beam-Forming

Limit

Channel	Frequency	Fixed	В	11 + 10 Log B	Antenna	Limit
		Limit		Limit	Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5500	24	21.578	24.34	9.22	20.78
Mid	5600	24	21.606	24.35	9.22	20.78
High	5700	24	21.219	24.27	9.22	20.78

Individual Chain Results

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total	Limit	Margin
		Power	Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	14.53	14.48	12.91	18.81	20.78	-1.97
Mid	5600	14.77	13.56	14.13	18.95	20.78	-1.83
High	5700	12.72	12.62	12.33	17.33	20.78	-3.45

TPC Results

TPC Dolta Power		Chain 0	Chain 1	Chain 2			
TPC Della	Fower	4.80	4.82	3.84			
Worst-case	e TPC Power	Chain 0	Chain 1	Chain 2	Total Power	Ant Gain	EIRP
Mid	5600	9.73	9.66	9.07	14.27	9.22	23.49
TPC Limit (dBm)						24	
Margin (dB)						-0.51	

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CHAIN 0 OUTPUT POWER





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CHAIN 1 OUTPUT POWER



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CHAIN 2 OUTPUT POWER





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CHAIN 0 OUTPUT POWER





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CHAIN 2 OUTPUT POWER





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OUTPUT POWER WITH TPC AT NON-BEAM FORMING (WORST CASE)





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OUTPUT POWER WITH TPC AT BEAM FORMING (WORST CASE)





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7.8.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 18.9 dB was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Non Beam-Forming

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total
		Power	Power	Power	Power
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5500	15.10	14.90	14.00	19.46
Middle	5600	16.25	15.20	15.40	20.41
High	5700	12.70	12.50	12.20	17.24

Beam-Forming

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total
		Power	Power	Power	Power
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5500	14.40	14.45	12.85	18.73
Middle	5600	14.70	13.50	14.05	18.88
High	5700	12.70	12.60	12.30	17.31

7.8.4. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.47-5.725 GHz band, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is less than 6 dBi, therefore the limit is 11 dBm.

The combination antenna gain is 9.22 dBi, therefore the limit is 7.78 dBm.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

Preliminary tests on individual chains, and on all chains with a combiner, were performed. The worst-case configuration was with a combiner, therefore final test were performed with all chains feeding a combiner.

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RESULTS

Non Beam-Forming

Channel	Frequency	Chain 0	Chain 1	Chain 2		Limit	Margin
		PPSD	PPSD	PPSD	Total		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	3.758	3.142	2.035	7.8	11.00	-3.19
Middle	5600	5.165	3.688	4.409	9.2	11.00	-1.77
High	5700	2.697	2.449	1.696	7.1	11.00	-3.93

Beam-Forming

Channel	Frequency	Chain 0	Chain 1	Chain 2		Limit	Margin
		PPSD	PPSD	PPSD	Total		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	3.414	2.811	1.8	7.5	7.78	-0.28
Middle	5600	3.555	1.778	2.748	7.5	7.78	-0.25
High	5700	2.697	2.449	1.696	7.1	7.78	-0.71

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<u>NBF</u>

CHAIN 0 POWER SPECTRAL DENSITY





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CHAIN 1 POWER SPECTRAL DENSITY



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CHAIN 2 POWER SPECTRAL DENSITY





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PSD HIGH CH, C	HAIN 2 3, 2010	R T	Peak Search	
Ch Freq Channel Power	5.7 GHz	Trig Free	Next Peak	
		Mkr1 5.694 280 GHz	Next Pk Right	
Ref 30 dBm Att #Samp Log	en 30 dB	1.696 dBm	Next Pk Left	
dB/ Offst 18.9			Min Search	
dB DI 7.8			Pk-Pk Search	
#PAvg 100 W1 S2			Mkr © CF	
Center 5.700 000 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 33 MHz Sweep 20 ms (601 pts)	More 1 of 2	
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CHAIN 0 POWER SPECTRAL DENSITY





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CHAIN 1 POWER SPECTRAL DENSITY



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CHAIN 2 POWER SPECTRAL DENSITY





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PSD HIGH CH, CH	IAIN 2 2010	R	T Peak Search
Ch Freq 5.7 Channel Power	GHz	Trig F	Free Next Peak
		Mkr1 5.694 280 G	Next Pk Right
Ref 30 dBm Atten #Samp Log	30 dB	1.696 dE	Bm Next Pk Left
dB/ Offst 18.9			Min Search
dB DI 7.8 dBm		White was	Pk-Pk Search
#PAvg 100 W1 S2			Mkr © CF
Center 5.700 000 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 33 I Sweep 20 ms (601 pt	More MHz 1 of 2
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7.8.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

The transmitter outputs are connected to the spectrum analyzer via a combiner.

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

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RESULTS

CHAIN 0

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5500	9.27	13	-3.73
Middle	5600	8.85	13	-4.15
High	5700	9.87	13	-3.13

CHAIN 1

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5500	9.66	13	-3.34
Middle	5600	9.75	13	-3.25
High	5700	9.53	13	-3.47

CHAIN 2

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5500	9.28	13	-3.72
Middle	5600	8.82	13	-4.18
High	5700	8.74	13	-4.26

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CHAIN 0

PEAK EXCURSION





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CHAIN 1

PEAK EXCURSION



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CHAIN 2

PEAK EXCURSION





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7.8.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (3)

IC RSS-210 A9.3 (3)

For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm / MHz.

TEST PROCEDURE

Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to EIRP limit, adjusted for the maximum antenna gain.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

Preliminary tests on individual chains, and on all chains with a combiner, were performed. The worst-case configuration was with a combiner, therefore final test were performed with all chains feeding a combiner.

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LOW CHANNEL SPURIOUS EMISSIONS





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MID CHANNEL SPURIOUS EMISSIONS





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HIGH CHANNEL SPURIOUS EMISSIONS





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7.9. 5.6 GHz BAND CHANNEL TESTS FOR 802.11HT40 MODE

7.9.1. 99% & 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth measurement function is utilized.

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RESULTS

CHAIN 0

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5510	41.371	36.3528
Middle	5590	41.208	36.3445
High	5670	40.509	36.3413

CHAIN 1

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5510	41.955	36.2148
Middle	5590	40.668	36.1549
High	5670	41.858	36.3841

CHAIN 2

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5510	40.407	36.3979
Middle	5590	40.606	36.524
High	5670	39.872	36.2204

CHAIN 0

26 dB and 99% BANDWIDTH





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BANDWIDTH HIGH CH	Sweep
Ch Freq 5.67 GHz Trig Free Occupied Bandwidth	Sweep Time 20.00 ms <u>Auto Man</u>
	Sweep <u>Single Cont</u>
Ref 20 dBm Atten 20 dB #Samp Log 10 dB/	Auto Sweep Time Norm <u>Accy</u> Gate
Offst 18.9 dB Center 5.670 00 GHz Span 100 MH	Gate Setup
#Res BW 510 kHz #VBW 1.5 MHz Sweep 20 ms (601 pts)	Points
Occupied Bandwidth Occ BW % Pwr 99.00 % 36.3413 MHz × dB -26.00 dB	601
Transmit Freq Error -129.736 kHz x dB Bandwidth 40.509 MHz*	
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CHAIN 1

26 dB and 99% BANDWIDTH



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And WID I H MID CH & Agilent 19:48:04 Nov 11, 2010 R T		Sweep			
Ch Freq 5.59 GHz Occupied Bandwidth			Trig Free	Swe <u>Auto</u>	ep Time 20.00 ms <u>Ma</u>
				<u>Single</u>	Sweep <u>Con</u>
Ref 20 dBm Atten 20 dB #Samp Log 10	etennika verteketen akur			Auto Norm	Sweep Tim <u>Acc</u>
dB/ Offst 18.9 4				On	Gate <u>Of</u>
Center 5.590 00 GHz #Res BW 510 kHz #VI	BW 1.5 MHz	Sweep 20 n	pan 100 MHz 1s (601 pts)	Gate	e Setup
Occupied Bandwidth 36.1549 M	Occ IHz	BW % Pwr x dB	99.00 % -26.00 dB		Points 601
Transmit Freq Error 67.142 k x dB Bandwidth 40.668 N	Hz 1Hz*				



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CHAIN 2

26 dB and 99% BANDWIDTH





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BANDWIDTH HIGH CH	Sweep
Ch Freq 5.67 GHz Trig Free Occupied Bandwidth	Sweep Time 20.00 ms <u>Auto Man</u>
	Sweep <u>Single Cont</u>
Ref 20 dBm Atten 20 dB #Samp Log 10 dB/ Offst	Auto Sweep Time <u>Norm Accy</u> Gate Dn <u>Off</u>
dB gamma ga	Gate Setup •
Occupied Bandwidth Occ BW % Pwr 99.00 % 36.2204 MHz × dB -26.00 dB	Points 601
Transmit Freq Error 36.801 kHz x dB Bandwidth 39.872 MHz*	

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7.9.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2) IC RSS-210 A9.2 (2)

For the 5.47-5.725 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is less than 6 dBi, and the combination antenna gain is 9.22 dBi.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

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RESULTS

NBF

Limit

Channel	Frequency	Fixed	В	11 + 10 Log B	Antenna	Limit
		Limit		Limit	Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5510	23.98	41.371	27.17	4.88	23.98
Mid	5590	23.98	41.208	27.15	4.88	23.98
High	5670	23.98	40.509	27.08	4.88	23.98

Individual Chain Results

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total	Limit	Margin
		Power	Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	12.31	12.18	11.16	16.68	23.98	-7.30
Mid	5590	16.42	15.49	15.50	20.60	23.98	-3.38
High	5670	16.23	15.78	15.76	20.70	23.98	-3.28

TPC Results

TPC Delta Power		Chain 0	Chain 1	Chain 2			
		-2.10	-1.59	-2.31			
		Chain 0	Chain 1	Chain 2	Total Power	Ant Gain	EIRP
Worst-cas	e TPC Power						
High	5670	14.41	13.77	13.47	18.67	4.88	23.55
	TPC Limit (dBm)						
Margin (dB)				-0.45			

<u>BF</u>

Limit

Channel	Frequency	Fixed	В	11 + 10 Log B	Antenna	Limit
		Limit		Limit	Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5510	23.98	41.371	27.17	9.22	20.76
Mid	5590	23.98	41.208	27.15	9.22	20.76
High	5670	23.98	40.509	27.08	9.22	20.76

Individual Chain Results

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total	Limit	Margin
		Power	Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	12.31	12.18	11.16	16.68	20.76	-4.08
Mid	5590	16.42	15.49	15.50	20.60	20.76	-0.16
High	5670	16.23	15.78	15.76	20.70	20.76	-0.06

TPC Results

TPC Delta Power		Chain 0	Chain 1	Chain 2			
		2.16	2.16	2.36			
		Chain 0	Chain 1	Chain 2	Total Power	Ant Gain	EIRP
Worst-case	e TPC Power						
High	5670	10.15	10.02	8.80	14.47	9.22	23.69
TPC Limit (dBm)						24	
					Margin (dB)	-0.31	

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CHAIN 0 OUTPUT POWER





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CHAIN 1 OUTPUT POWER



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CHAIN 2 OUTPUT POWER





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OUTPUT POWER * Agilent 12:48:38 Nov 6,	HIGH CH, CH	AIN 2 R T	Svstem				
Ch Freq 5.6	7 GHz	Trig Free	Show Errors				
			Power On/ Preset				
Ref 30 dBm Atten #Samp Log	30 dB		Time/Date ►				
10 dB/ Offst 18.9			Alignments •				
dB		Span 63 MHz	Config I/O 🔸				
#Res BW 1 MHz Channel Power	#VBW 3 MHz	Sweep 20 ms (601 pts) Power Spectral Density	Reference •				
15.76 dBm / 42.	More 1 of 3						
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CHAIN 0 OUTPUT POWER





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CHAIN 1 OUTPUT POWER



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CHAIN 2 OUTPUT POWER





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OUTPUT POWER Agilent 12:48:38 Nov 6,	HIGH CH, CH	AIN 2 R T	System			
Ch Freq 5.6	7 GHz	Trig Free	Show Errors			
			Power On/ Preset			
Ref 30 dBm Atten #Samp Log	30 dB		Time/Date ▸			
dB/ Offst 18.9		Manager and State and Stat	Alignments •			
dB		Span 63 MHz	Config I/O ▸			
#Res BW 1 MHz Channel Power	#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts) Channel Power Power Spectral Density					
15.76 dBm / 42.	More 1 of 3					
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OUTPUT POWER WITH TPC AT NON-BEAM FORMING (WORST CASE)





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OUTPUT POWER WITH TPC AT BEAM FORMING (WORST CASE)





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7.9.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 18.9 dB was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Non Beam-Forming

Channel	Frequency	Chain 0	Chain 1 Chain 2		Total
		Power	Power	Power	Power
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5510	12.25	12.10	11.05	16.60
Middle	5590	15.45	15.40	15.40	20.19
High	5670	16.20	15.70	15.70	20.64

Beam-Forming

Channel	Frequency	Chain 0	Chain 1	Chain 2	Total
		Power	Power	Power	Power
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5510	12.25	12.10	11.05	16.60
Middle	5590	15.45	15.40	15.40	20.19
High	5670	16.20	15.70	15.70	20.64

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7.9.4. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.47-5.725 GHz band, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is less than 6 dBi, therefore the limit is 11 dBm.

The combination antenna gain is 9.22 dBi, therefore the limit is 7.78 dBm.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

Preliminary tests on individual chains, and on all chains with a combiner, were performed. The worst-case configuration was with a combiner, therefore final test were performed with all chains feeding a combiner.

Channel	Frequency	Chain 0	Chain 1	Chain 2		Limit	Margin
		PPSD	PPSD	PPSD	Total		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	-2.081	-2.676	-3.182	2.1	11.00	-8.85
Middle	5590	3.469	2.908	1.958	7.6	11.00	-3.41
High	5670	3.098	1.718	1.841	7.0	11.00	-3.96

<u>RESULTS</u> Non Beam-Forming

<u>Beam-Forming</u>

Channel	Frequency	Chain 0	Chain 1	Chain 2		Limit	Margin
		PPSD	PPSD	PPSD	Total		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	-2.081	-2.676	-3.182	2.1	7.78	-5.63
Middle	5590	3.469	2.908	1.958	7.6	7.78	-0.19
High	5670	3.098	1.718	1.841	7.0	7.78	-0.74

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CHAIN 0 POWER SPECTRAL DENSITY





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CHAIN 1 POWER SPECTRAL DENSITY



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CHAIN 2 POWER SPECTRAL DENSITY





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PSD HIGH CH, CH	HAIN 2 2010	R T	Peak Search
Ch Freq 5.8 Channel Power	i7 GHz	Trig Free	Next Peak
		Mkr1 5.654 145 GHz	Next Pk Right
Ref 30 dBm Atter #Samp Log	1 30 dB	1.841 dBm	Next Pk Left
dB/ Offst 18.9	the second s		Min Search
dB Dl 11.0		And	Pk-Pk Search
#PAvg 100 W1 S2			Mkr © CF
Center 5.670 000 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 63 MHz Sweep 20 ms (601 pts)	More 1 of 2
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CHAIN 0 POWER SPECTRAL DENSITY





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CHAIN 1 POWER SPECTRAL DENSITY



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CHAIN 2 POWER SPECTRAL DENSITY





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PSD HIGH CH, CH	HAIN 2 2010	RT	Peak Search
Ch Freq 5.8 Channel Power	7 GHz	Trig Free	Next Peak
		Mkr1 5.654 145 GHz	Next Pk Right
Ref 30 dBm Atter #Samp Log 10	1 30 dB	1.841 dBm	Next Pk Left
dB/ Offst 18.9			Min Search
dB DI 11.0 dBm		Marine marine	Pk-Pk Search
#PAvg 100 W1 S2			Mkr © CF
Center 5.670 000 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 63 MHz Sweep 20 ms (601 pts)	More 1 of 2
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7.9.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

The transmitter outputs are connected to the spectrum analyzer via a combiner.

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

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RESULTS

CHAIN 0

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5510	8.31	13	-4.69
Middle	5590	9.26	13	-3.74
High	5670	9.02	13	-3.98

CHAIN 1

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5510	9.85	13	-3.15
Middle	5590	8.97	13	-4.03
High	5670	7.76	13	-5.24

CHAIN 2

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5510	9.91	13	-3.09
Middle	5590	10.64	13	-2.36
High	5670	9.72	13	-3.28

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CHAIN 0

PEAK EXCURSION





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CHAIN 1

PEAK EXCURSION



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🎋 Agilent 19:32:19 Nov 11, 2	010		RT	B	W/Avg
Ch Freq 5.59 (Channel Power	GHz		Trig Free	Auto	Res B\ 1.0 MHz <u>Ma</u>
		١٨	Mkr1 O Hz	Auto	Video BV 3.0 MHz <u>Ma</u>
Ref 30 dBm Atten 3 #Peak			8.97 dB	<u>Auto</u>	VBW/RB 1.00000 <u>Ma</u>
IB/ Dffst 18.9		in in the second	0144	On	Average 100 <u>Of</u>
IB			and the second second	Avg/V Auto	/BW Type Pwr (RMS) <u>Ma</u>
¢PAvg					
/1 V2		Sp	an 63 MHz		Span/RBV 108
≮Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms	(601 pts)	<u>Auto</u>	Ma



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CHAIN 2

PEAK EXCURSION





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PEAK EXCURSION		RT	BW//Ava
Ch Freq 5.67	GHz	Trig Free	Res BV 1.0 MHz Auto <u>Mar</u>
D=(20.4D=	0.4D	Δ Mkr1 0 Hz	Video BV 3.0 MHz Auto <u>Mar</u>
#Peak Atten 3 10		9.72 dB	- VBW/RBV 1.00000 <u>Auto Mar</u>
dB/ Offst 18.9 dB		energe Renny V	- Average - 100 On <u>Off</u>
www.comedia.com		Mar	Avg/VBVVType Pwr (RMS) Auto <u>Mar</u>
#PAvg			_
Center 5.670 000 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 63 MH: Sweep 20 ms (601 pts)	J Span/RBW r 106 <u>Auto Mar</u>

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7.9.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (3)

IC RSS-210 A9.3 (3)

For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm / MHz.

TEST PROCEDURE

Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to EIRP limit, adjusted for the maximum antenna gain.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

Preliminary tests on individual chains, and on all chains with a combiner, were performed. The worst-case configuration was with a combiner, therefore final test were performed with all chains feeding a combiner.

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LOW CHANNEL SPURIOUS EMISSIONS





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MID CHANNEL SPURIOUS EMISSIONS





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HIGH CHANNEL SPURIOUS EMISSIONS





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8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

<u>LIMITS</u>

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each appplicable band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. 802.11a MODE IN THE LOWER 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





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Test Engr: Chin Pang Date: 10/28/10 Project #: 10013467 Company: Atheros Test Target: FCC 15.407 Mode Oper: TX, 5.2 GHz Band, Legacy f Measurement Frequency Amp Preamp Gain Average Field Strength Limit Dist Distance to Antenna D Corr Distance Correct to 3 meters Peak Field Strength Limit Read Analyzer Reading Average Field Strength @ 3 m Margin vs. Average Limit Margin vs. Average Limit CL Cable Loss HPF High Pass Filter Doin Det Peak Notes f Dist Read AF CL Amp D Corr Fitm Corr. 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15.720 3.0 23.3 38.4 11.4 -32.3 0.0 0.0 40.8 54.0 -13.2 H A 15.720 3.0 36.3 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P 15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V P 15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15720 30 233 384 114 323 00 00 408 540 132 H	3.0 23.3 38.4 11.4 -32.3 0.0 0.0 40.8 54.0 -13.2 H A	5.720 3.0 23.3 38.4 11.4 -32.3 0.0 0.0 40.8 54.0 -13.2 H A 5.720 3.0 36.3 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P 5.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P 5.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15.720 3.0 23.3 38.4 11.4 -32.3 0.0 0.0 40.8 54.0 -13.2 H A 15.720 3.0 36.3 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P 15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15.720 3.0 23.3 38.4 11.4 -32.3 0.0 0.0 40.8 54.0 -13.2 H A 15.720 3.0 36.3 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P 15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V P 15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15.720	3.0	36.1	38.4	11.4	-32.3	0.0	0.0	53.6	74.0	-20.4	н	Р		
15.720 3.0 36.3 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P 15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	INTER : OF : INT : INT : 'JED : OF : OF : "OF : "OF : "INT : "IN		5.720 3.0 36.3 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P 5.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15.720 3.0 36.3 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P 15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15.720 3.0 36.3 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P 15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15.720	3.0	23.3	38.4	11.4	-32.3	0.0	0.0	40.8	54.0	-13.2	H	A		
15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15.720 3.0 36.3 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P	3.0 36.3 38.4 11.4 -32.3 0.0 0.0 53.9 74.0 -20.1 V P	5.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	15.720	3.0	36.3	38.4	11.4	-32.3	0.0	0.0	53.9	74.0	-20.1	V	P		
	15.720 3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	3.0 23.4 38.4 11.4 -32.3 0.0 0.0 40.9 54.0 -13.1 V A	· · · · · · · · · · · · · · · · · · ·				3.0	23.4	38.4	11.4	-32.3	0.0	0.0	40.9	54.0	-13.1	V	A		
						15.720					Ì		Ì							
	Rev. 4.1.2.7	2.7	ev. 4.1.2.7	Rev. 4.1.2.7		15.720 Rev. 4.1.2	2.7			<u> </u>			<u>. </u>	•			i	: :		

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8.2.2. 802.11n HT20 MODE IN 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





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ligh Fre	quency]	Measuren	nent										
Complia	nce Cer	tification	Service	s, Frez	mont 5n	n Chamb	er						
Test Engr Date:		Chin Pa 10/28/10	ng										
Project #		10U1346	57										
Company	y:	Atheros											
Test Targ	et:	FCC 15.4	407										
Mode Op	er:	TX, 5.3G	Hz Ban	d, HT2	:0 Mode	ł							
	f	Measuren	nent Fred	mency	Amp	Preamp (Gain			A verage	Field Strem	z th Limit	
	- Dist	Distance	to Anter	ina.	D Corr	Distance	Correc	et to 3 me	ters	Peak Fie	ld Strength	Limit	
	Read	Analyzer	Reading		Avg	Average	Field S	trength @	(3 m	Margin v	s. Average	Limit	
	AF	Antenna	Factor		Peak	Calculate	d Peak	Field Stre	ength	Margin v	s. Peak Lir	nit	
	CL	Cable Los	35		HPF	High Pas:	s Filter	ſ		-			
f	Dist	Read	AF	CL	Атр	D Corr	Fltr	Согт.	Limit	Margin	Ant. Pol.	Det.	Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
Low Ch,	5180MH	(z		Ţ				T		Ţ			
15.540	3.0	35.8	38.9	11.3	-32.3	0.0	0.0	53.7	74.0	-20.3	Н	P	
15.540	3.0	23.1	38.9	11.3	-32.3	0.0	0.0	41.0	54.0	-13.0	H	<u>A</u>	
15.540	3.0	35.9	38.9	11.3	-32.3	0.0	0.0	53.8	74.0	-20.2	<u>V</u>	P	
15.540	3.0	23.1	38.9	11.3	-32.3	0.0	0.0	41.0	54.0	-13.0	V	A	
Mid Ch,	5200MH	ž								·			
15.600	3.0	36.3	38.6	11.4	-32.3	0.0	0.0	54.0	74.0	-20.0	V	P	
15.600	3.0	23.4	38.6	11.4	-32.3	0.0	0.0	41.1	54.0	-12.9	V	A	
15.600	3.0	36.4	38.6	11.4	-32.3	0.0	0.0	54.1	74.0	-19.9	H	P	
15.600	3.0	23.4	38.6	11.4	-32.3	0.0	0.0	41.1	54.0	-12.9	H	A	
High ('h	5240M	H-											
15,720	3.0	35.3	38.4	11.4	-32.3	0.0	0.0	52.9	74.0	-21.1	н	Р	
15.720	3.0	23.4	38.4	11.4	-32.3	0.0	0.0	40.9	54.0	-13.1	H	À	
	3.0	35.6	38.4	11.4	-32.3	0.0	0.0	53.2	74.0	-20.8	v	P	
15,720	3.0	23.4	38.4	11.4	-32.3	0.0	0.0	41.0	54.0	-13.0	V	Ā	
15.720 15.720	•						÷			· • · · · · · · · · · · · · • · · · •		·····	
15.720 15.720													

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8.2.3. 802.11n HT40 MODE IN 5.2 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





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T+ E		(1)- D-											
lest Eng	r:	Uhin Pa 10/20/10	ng										
Date:		10/29/10	-										
Ртојест # С	F:	1001340	14										
Compan T T	y:	Atheros	407										
iest iarș Mada Os	zet:	TV 5 2C	407 H- B	а 111 7/									
mode Of	per:	1A, 7.2G	IIX Dan	u, 1114	ю								
	f	Measuren	nent Fred	mency	Amp	Preamp (Gain			Average	Field Stren	eth Limit	
	Dist	Distance	to Anter	una -	D Corr	Distance	Correc	t to 3 me	ters	Peak Fie	ld Strength	Limit	
	Read	Analyzer	Reading		Avg	Average	Field S [.]	trength @	3 m	Margin v	s. Average	Limit	
	AF	Antenna	Factor		Peak	Calculate	d Peak	Field Stre	ngth	Margin v	s. Peak Lii	nit	
	CL	Cable Los	55		HPF	High Pas	s Filter	:					
f	Dist	Read	AF	CL	Атр	D Corr	Fltr	Согт.	Limit	Margin	Ant. Pol.	Det.	Notes
~~~	1.2.2												
GHz	(m)	dBuV	dB/m	∣dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
GHz Low Ch,	(m) 5190MH	dBuV Iz	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
GHz Low Ch, 15.570	(m) 5190MH 3.0	dBuV [z 35.1	dB/m 38.8	<u>ав</u> 11.4	dB -32.3	dB 0.0	dB 0.7	dBuV/m 53.7	<u>dBuV/m</u> 74.0	dB -20.3	V/H H	P/A/QP P	
GHz Low Ch, 15.570 15.570	(m) 5190MH 3.0 3.0	dBuV z 35.1 23.4	dB/m 38.8 38.8	dB 11.4 11.4	dB -32.3 -32.3	dB 0.0 0.0	dB 0.7 0.7	dBuV/m 53.7 42.0	dBuV/m 74.0 54.0	dB -20.3 -12.0	V/H H H	P/A/QP P A	
GHz Low Ch, 15.570 15.570 15.570	(m) 5190MH 3.0 3.0 3.0	dBuV [z 23.4 36.7	dB/m 38.8 38.8 38.8	dB 11.4 11.4 11.4	dB -32.3 -32.3 -32.3	dB 0.0 0.0 0.0	dB 0.7 0.7 0.7	dBuV/m 53.7 42.0 55.3	dBuV/m 74.0 54.0 74.0	dB -20.3 -12.0 -18.7	V/H H H V	P/A/QP P A P P P	
GHz Low Ch, 15.570 15.570 15.570 15.570	(m) 5190MH 3.0 3.0 3.0 3.0 3.0	dBuV z 35.1 23.4 36.7 25.1	dB/m 38.8 38.8 38.8 38.8 38.8	dB 11.4 11.4 11.4 11.4	dB -32.3 -32.3 -32.3 -32.3	dB 0.0 0.0 0.0 0.0	dB 0.7 0.7 0.7 0.7	dBuV/m 53.7 42.0 55.3 43.8	dBuV/m 74.0 54.0 74.0 54.0	dB -20.3 -12.0 -18.7 -10.2	V/H H H V V	P/A/QP P A P A A A A	
GHz Low Ch, 15.570 15.570 15.570 15.570 High Ch	(m) 5190ME 3.0 3.0 3.0 3.0 5230M	dBuV 35.1 23.4 36.7 25.1	dB/m 38.8 38.8 38.8 38.8 38.8	dB 11.4 11.4 11.4 11.4	dB -32.3 -32.3 -32.3 -32.3	dB 0.0 0.0 0.0 0.0	dB 0.7 0.7 0.7 0.7	dBuV/m 53.7 42.0 55.3 43.8	dBuV/m 74.0 54.0 74.0 54.0	dB -20.3 -12.0 -18.7 -10.2	V/H H V V V	P/A/QP P A A A	
GHz Low Ch, 15.570 15.570 15.570 15.570 High Ch 15.690	(m) 5190MH 3.0 3.0 3.0 3.0 5230MI 3.0	dBuV z 35.1 23.4 36.7 25.1 Hz 36.1	dB/m 38.8 38.8 38.8 38.8 38.8 38.5	dB 11.4 11.4 11.4 11.4 11.4	dB -32.3 -32.3 -32.3 -32.3 -32.3	dB 0.0 0.0 0.0 0.0 0.0	dB 0.7 0.7 0.7 0.7 0.7	dBuV/m 53.7 42.0 55.3 43.8 54.5	<u>dBuV/m</u> 74.0 54.0 74.0 54.0 74.0	dB -20.3 -12.0 -18.7 -10.2 -19.5	V/H H V V V	P/A/QP  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  P	
GHz Low Ch, 15.570 15.570 15.570 15.570 High Ch 15.690 15.690	(m) 5190MH 3.0 3.0 3.0 3.0 5230MI 3.0 3.0 3.0	dBuV z 35.1 23.4 36.7 25.1 Hz 36.1 24.0	dB/m 38.8 38.8 38.8 38.8 38.8 38.5 38.5	dB 11.4 11.4 11.4 11.4 11.4 11.4	dB -32.3 -32.3 -32.3 -32.3 -32.3 -32.3 -32.3	dB 0.0 0.0 0.0 0.0 0.0 0.0	dB 0.7 0.7 0.7 0.7 0.7 0.7	dBuV/m 53.7 42.0 55.3 43.8 54.5 42.4	dBuV/m 74.0 54.0 74.0 54.0 74.0 54.0	dB -20.3 -12.0 -18.7 -10.2 -19.5 -11.6	V/H H V V V V	P/A/QP  P A A A P A A P A A A A A A A A A A	
GHz Low Ch, 15.570 15.570 15.570 15.570 High Ch 15.690 15.690 15.690	(m) 5190MH 3.0 3.0 3.0 3.0 5230MI 3.0 3.0 3.0 3.0 3.0	dBuV z 35.1 23.4 36.7 25.1 Hz 36.1 24.0 35.5	dB/m 38.8 38.8 38.8 38.8 38.8 38.5 38.5 38.5	dB 11.4 11.4 11.4 11.4 11.4 11.4 11.4	dB -32.3 -32.3 -32.3 -32.3 -32.3 -32.3 -32.3 -32.3	dB 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	dB 0.7 0.7 0.7 0.7 0.7 0.7 0.7	dBuV/m 53.7 42.0 55.3 43.8 54.5 42.4 53.9	dBuV/m 74.0 54.0 74.0 54.0 74.0 54.0 74.0	dB -20.3 -12.0 -18.7 -10.2 -19.5 -11.6 -20.1	V/H H V V V V H	P/A/QP  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A  P  A	
GHz Low Ch, 15.570 15.570 15.570 15.570 15.570 High Ch 15.690 15.690 15.690 15.690	(m) 5190ME 3.0 3.0 3.0 3.0 5230M 3.0 3.0 3.0 3.0 3.0 3.0 3.0	dBuV z 35.1 23.4 36.7 25.1 Hz 36.1 24.0 35.5 23.4	dB/m 38.8 38.8 38.8 38.8 38.8 38.5 38.5 38.5	dB 11.4 11.4 11.4 11.4 11.4 11.4 11.4 11.	dB -32.3 -32.3 -32.3 -32.3 -32.3 -32.3 -32.3 -32.3 -32.3	dB           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0	dB 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	dBuV/m 53.7 42.0 55.3 43.8 54.5 42.4 53.9 41.8	dBuV/m 74.0 54.0 74.0 54.0 74.0 54.0 74.0 54.0	dB -20.3 -12.0 -18.7 -10.2 -19.5 -11.6 -20.1 -12.2	V/H H V V V V H H	P/A/QP  P A A A A A A A A A A A A A A A A A	

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## 8.2.4. 802.11a MODE IN 5.3 GHz BAND

### RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





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#### **RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**





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fest Eng Date:		Chin Pa 10/28/10	ng										
Project #	:	10U1346	7										
Compan	y:	Atheros											
Test Targ	;et:	FCC 15.	407										
Mode Op	er:	TX, 5.3G	Hz Ban	d, Leg	acy								
	f	Measuren	nent Freq	piency	Amp	Preamp (	Gain			Average	Field Stren;	gth Limit	
	Dist	Distance	to Anter	ma	D Corr	Distance	Correc	t to 3 me	eters	Peak Fie	ld Strength	Limit	
	Read	Analyzer	Reading		Avg	Average	Field St	trength @	)3 m	Margin	rs. Average	Limit	
	AF	Antenna	Factor		Peak	Calculate	d Peak	Field Stre	ength	Margin v	rs. Peak Lir	nit	
	CL	Cable Los	55		HPF	High Pas	s Filter						
f	Dist	Read	AF	CL	Amp	D Corr	Fltr	Согт.	Limit	Margin	Ant. Pol.	Det.	Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
Low Ch,	5260MH	Lz				ļ							
15.780	3.0	35.9	38.2	11.5	-32.2	0.0	0.7	54.1	74.0	-19.9	H	P	
15.780	3.0	23.2	38.2	11.5	-32.2	0.0	0.7	41.4	54.0	-12.6	H	A	
15./8U 15.700	3.0	38.2	38.2	11.5	-32.2	0.0	0.7	50.4	/4.0	-17.0	V V	P	
17./00	J.U		J0.4	11.7	-J4.4	0.0	<b>U.</b> 7		24NU	-7.0	•••••	<b>A</b>	
Mid Ch.	5300MH					•				÷			
10.600	3.0	39.3	37.5	9.0	-34.3	0.0	0.0	51.5	74.0	-22.5	H	P	
10.600	3.0	26.8	37.5	9.0	-34.3	0.0	0.0	39.1	54.0	-15.0	H	A	
15.900	3.0	34.9	37.9	11.5	-32.2	0.0	0.0	52.1	74.0	-21.9	H	P	
15.900	3.0	22.6	37.9	11.5	-32.2	0.0	0.0	39.8	54.0	-14.2	H	A	
10.600	3.0	41.6	37.5	9.0	-34.3	0.0	0.0	53.9	74.0	-20.1	V	P	
10.600	3.0	28.4	37.5	9.0	-34.3	0.0	0.0	40.7	54.0	-13.3	<u>V</u>	<u>A</u>	
15.900	3.0	35.7	37.9	11.5	-32.2	0.0	0.0	52.9	74.0	-21.1	V T	<b>P</b>	
15.900	3.0	22.0	37.9	11.5	-32.2	0.0	U.U	39.8	54.0	-14.2	V.	A	
High Ch	5320M	.i. H7											
10.640	3.0	42.2	37.6	9.1	-34.2	0.0	0.0	54.6	74.0	-19.4	v	P	
10.640	3.0	30.0	37.6	9.1	-34.2	0.0	0.0	42.3	54.0	-11.7	v	Ā	
15.960	3.0	34.9	37.7	11.5	-32.2	0.0	0.0	52.0	74.0	-22.0	V	P	
15.960	3.0	22.6	37.7	11.5	-32.2	0.0	0.0	39.7	54.0	-14.3	V	A	
10.640	3.0	39.8	37.6	9.1	-34.2	0.0	0.0	52.1	74.0	-21.9	H	P	
10.640	3.0	26.8	37.6	9.1	-34.2	0.0	0.0	39.2	54.0	-14.8	H	A	
15.960	3.0	35.3	37.7	11.5	-32.2	0.0	0.0	52.3	74.0	-21.7	H	P	
15.960	3.0	22.6	37.7	11.5	-32.2	U.U	U.U	39.7	54.0	-14.3	H	A	
		+											,
Dog d 14	; 7 7		:			1		:	:	1			
Kev. 4.1.	<u>.</u> ,					a							

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## 8.2.5. 802.11n HT20 MODE IN 5.3GHz BAND

### **RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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## **RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**





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fligh Freq Compliar	luency ice Cer	Measurer tification	nent Service	s, Fre	mont 51	n Chamb	er						
Test Engr		Chin Pa	ng										
Date:		10/29/10	2										
Project #:		10U1346	7										
Company		Atheros											
Test Targe	et:	FCC 15.	407										
Mode Ope	èr:	TX, 5.3G	Hz Ban	d, HT	20 Mode	!							
	f	Measurer	nent Freq	piency	Amp	Preamp (	Gain			Average	Field Stren	gth Limit	
	Dist	Distance	to Anter	ma	D Corr	Distance	Corre	ct to 3 me	eters	Peak Fie	eld Strength	Limit	
	Read	Analyzer	Reading		Avg	Average	Field S	trength @	)3 m	Margin	vs. Average	Limit	
	AF	Antenna	Factor		Peak	Calculate	d Peal	c Field Str	ength	Margin	vs. Peak Lii	nit	
	CL	Cable Lo:	55		HPF	High Pas	s Filte:	r					
f	Dist	Read dBV	AF JB/m	CL	Amp	D Corr	Fltr	Corr.	Limit BuV/m	Margin JB	Ant. Pol.	Det. D/A/OB	Notes
	: (m) 'acauru		aD/m	ab		<u>an</u>	<u>an</u>	douv/n	Edbuv/m	<u>an</u>	V/H	PIAJQP	
LOW CR, 2 15 790	3.0	257	39.7	115	39.9	0.0	07	53.0	74.0	-20.1	v	ъ	
15.780	3.0	23.3	38.2	11.5	-32.2	0.0	0.7	41.5	54.0	-12.5	v	Å	
15.780	3.0	35.9	38.2	11.5	-32.2	0.0	0.7	54.1	74.0	-19.9	H	P	
15.780	3.0	23.1	38.2	11.5	-32.2	0.0	0.7	41.3	54.0	-12.7	H	Ā	
		Ĵ			1	ļ				<u> </u>	<u></u>		
Mid Ch, 5	300MH	z		Į	ļ	ļ				Į			
10.600	3.0	40.4	37.5	9.0	-34.3	0.0	0.8	53.4	74.0	-20.6	H	Р	
10.600	3.0	26.8	37.5	9.0	-34.3	0.0	0.8	39.9	54.0	-14.1	H	A	
15.900	3.0	34.7	37.9	11.5	-32.2	0.0	0.7	52.6	74.0	-21.4	H	P	
15.900 10.400	3.0	23.0	37.9	11.5	-32.2	0.0	0.7	40.9	54.0	-13.1	H	A	
10.000 10.600	3.0	39.0 76 T	37.5	9.0	-34.3	0.0	0.8	24.7	/4.U 5/10	-21.3	V V	Р 4	
15.000	3.0	34.9	37.0	115	-39.9	0.0	0.0	57.8	74.0	-14.3	v	D D	
15.900	3.0	23.1	37.9	11.5	-32.2	0.0	0.7	41.0	54.0	-13.0	v	Å	
					1						<u>.</u>		
High Ch,	5320M	Hz									••••••••••••••••••••••••••••••••••••••		
10.640	3.0	39.9	37.6	9.1	-34.2	0.0	0.8	53.1	74.0	-20.9	V	P	
10.640	3.0	26.8	37.6	9.1	-34.2	0.0	0.8	39.9	54.0	-14.1	, V	A	
15.960	3.0	35.9	37.7	11.5	-32.2	0.0	0.7	53.7	74.0	-20.3	V	Р	
15.960	3.0	22.6	37.7	11.5	-32.2	0.0	0.7	40.4	54.0	-13.6	<u>v</u>	A	
10.640	3.0	38.9	37.6	9.1	-34.2	0.0	0.8	52.1	74.0	-21.9	H	P	
10.640	3.0	26.1	37.6	9.1	-34.2	0.0	0.8	39.2	54.0	-14.8	H	A	
15.960	3.0	35.0	37.7	11.5	-32.2	0.0	0.7	52.8	74.0	-21.2	H	Р ,	
	: 3.0	22.1	; 31.1	11.5	-32.2	į <b>U.U</b>	U./	: 40.5	54.0	: -13.5	; <b>n</b>	A	

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## 8.2.6. 802.11n HT40 MODE IN 5.3GHz BAND

#### **RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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### **RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**





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Complian	ice Cer	tification	Service	s, Fre	mont 51	n Chamb	er						
Iest Engr Date: Project #: Company Iest Targ Mode On	: : et:	Chin Pa 10/29/10 10U1346 Atheros FCC 15. TX 53C	ng 7 407 Hz Ban	а нт	10 Mode								
· <b>,</b>	f	Measurer	nent Fred	nency	Amp	Preamp (	Gain			Average	Field Stren;	gth Limit	
	Dist	Distance	to Anter	ina	D Corr	Distance	Correc	et to 3 me	ters	Peak Fie	ld Strength	Limit	
	Read ∧ ≂	Analyzer	Reading		Avg	Average :	Field S	trength @	)3m	Margin v	rs. Average	Limit	
	CL CL	Antenna Cable Lo:	Factor 55		Peak HPF	Calculate High Pas	d Peak s Filte:	r Field Stri r	ength	Margin v	rs. Peak Lu	nut	
f	Dist	Read	AF	CL	Amp	D Corr	Fltr	Corr.	Limit	Margin	Ant. Pol.	Det	Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
Low Ch, s	5270MH	[z											
15.810	3.0	35.4	38.2	11.5	-32.2	0.0	0.7	53.5	74.0	- <b>20.5</b>	H	P	
15.810	3.0	23.3	38.2	11.5	-32.2	0.0	0.7	41.4	54.0	-12.6	H	A	
15.810	3.0	36.7	38.2	11.5	-32.2	0.0	0.7	54.8	74.0	-19.2	V	P	
15.810	3.0	24.5	38.2	11.5	-32.2	0.0	0.7	42.6	54.0	-11.4	V	A	
Hizh Ch.	5310M	l Hz			•								
10.620	3.0	40.5	37.5	9.1	-34.3	0.0	0.8	53.6	74.0	-20.4	V	Р	
10.620	3.0	25.1	37.5	9.1	-34.3	0.0	0.8	38.2	54.0	-15.8	V	A	
15.930	3.0	34.7	37.8	11.5	-32.2	0.0	0.7	52.6	74.0	-21.4	V	P	
15.930	3.0	22.8	37.8	11.5	-32.2	0.0	0.7	40.7	54.0	-13.3	V	A	
10.620	3.0	37.5	37.5	9.1	-34.3	0.0	0.8	50.6	74.0	- <b>23.4</b>	H	Р	
10.620	3.0	25.2	37.5	9.1	-34.3	0.0	0.8	38.3	54.0	-15.7	H	A	
15.930	3.0	34.7	37.8	11.5	-32.2	0.0	0.7	52.6	74.0	-21.5	H	P	
15.930	3.0	22.8	37.8	11.5	-32.2	0.0	0.7	40.7	54.0	-13.3	H	A	
Rev. 4.1.2	.7 .7				!			: 		I		1	

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## 8.2.7. 802.11a MODE IN 5.6 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**





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### **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**





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### AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



### AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)



COMPLIANCE CERTIFICATION SERVICES (UL CCS)FORM NO: CCSUP4701C47173 BENICIA STREET, FREMONT, CA 94538, USATEL: (510) 771-1000FAX: (510) 661-0888This report shall not be reproduced except in full, without the written approval of UL CCS.

fest Engr Date: Project # Company fest Targ Mode Op	r: : y: :et: er:	Chin Pa 10/29/10 10U1346 Atheros FCC 15. TX, 5.6G	ng 7 407 Hz Ban	d, Leg	acy Moo	le							
	f Dist Read AF CL	Measurer Distance Analyzer Antenna Cable Lo:	nent Freq to Anter Reading Factor 55	pency ma	Amp D Corr Avg Peak HPF	Preamp ( Distance Average : Calculate High Pas:	Gain Correc Field Si d Peak s Filter	t to 3 me trength @ Field Str	ters ! 3 m ength	Average Peak Fie Margin v Margin v	Field Streng ld Strength 5. Average 5. Peak Lir	gth Limit Limit Limit nit	
f	Dist	Read	AF	CL	Amp	D Corr	Fltr	Corr.	Limit	Margin	Ant. Pol.	Det.	Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/n	dBuV/m	dB	V/H	P/A/QP	
Low Ch,	5500MH	2					<u> </u>			10.0			
	3.0	46.5	37.7	9.2	-33.8	U.O	0.7	60.4	74.0	-13.6	V	P	
1.000	3.0	33.2	37.7	9.2	-33.8	0.0	0.7	47.1	54.0	-6.9	V	A	
1.000	3.0	41.5	37.7	9.2	-55.8	0.0	0.7	55.4 41.7	/4.0	-18.0	H U	P	
.1.000	J.U	£/.8	31.1	7.2	-33.8	U.U	0.7	41./	74.U	-12.3	<b>r1</b>	A	
Mid Cb	5600MH	i 7				•				•			
11.200	3.0	46.1	37.9	9.3	-33.5	0.0	0.7	60.5	74.0	-13.5	v	P	
1.200	3.0	33.1	37.9	9.3	-33.5	0.0	0.7	47.5	54.0	-6.5	v	Ā	
1.200	3.0	41.8	37.9	9.3	-33.5	0.0	0.7	56.3	74.0	-17.7	H	 P	
11.200	3.0	29.9	37.9	9.3	-33.5	0.0	0.7	44.3	54.0	-9.7	H	A	
											_		
High Ch	, 5700MD	Iz								[			
11.400	3.0	48.2	38.0	9.4	-33.2	0.0	0.7	63.1	74.0	-10.9	H	P	
1.400	3.0	34.8	38.0	9.4	-33.2	0.0	0.7	49.8	54.0	-4.2	H	A	
1.400	3.0	48.4	38.0	9.4	-33.2	0.0	0.7	63.4	74.0	-10.6	V	Р	
11.400	3.0	33.8	38.0	9.4	-33.2	0.0	0.7	48.8	54.0	-5.2	V	A	
		ļ				ļ				ļ			
Rev. 4.1.2 Note: No	2.7 other e	missions	were de	tected	above 1	the system	m nois	e floor.					

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## 8.2.8. 802.11n HT20 MODE 5.6 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**





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## **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**





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#### AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



#### AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)



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COMPLIANCE CERTIFICATION SERVICES (UL CCS)FORM NO: CCSUP4701C47173 BENICIA STREET, FREMONT, CA 94538, USATEL: (510) 771-1000FAX: (510) 661-0888This report shall not be reproduced except in full, without the written approval of UL CCS.

Project #:       10013467         Company:       atheros         Iest Target:       FCC 15.407         Mode Oper:       TX, 5.6 GHz Band, HT20 Mode         f       Measurement Frequency Amp       Preamp Gain       Average Field Strength Limit         Dist       Distance to Antenna       D Corr       Distance Correct to 3 meters       Peak Field Strength Limit         Read       Antenna Factor       Peak       Calculated Peak Field Strength @ 3 m       Margin vs. Average Einit         CL       Cable Loss       HPF       High Pass Filter       Margin vs. Average Limit       Det.       Notes         GHz       (m)       dBuV       dB       dB       dB       dB       dB       Vit       P/A/QP         L0000       3.0       39.0       37.7       9.2       -33.8       0.0       0.7       53.0       74.0       -21.0       V       P         11.000       3.0       25.5       37.7       9.2       -33.8       0.0       0.7       53.0       74.0       -21.0       V       P         11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       53.1       74.0       -21.6       V       P <t< th=""><th>Project #:       10013467         Company:       atheros         Test Target:       FCC 15.407         Mode Oper:       TX, 5.6GHz Band, HT20 Mode         f       Measurement Frequency Amp       Preamp Gain       Average Field Strength Limit         Dist       Distance to Antenna       D Corr       Distance Correct to 3 meters       Peak Field Strength Limit         Read       Analyzer Reading       Average Field Strength (@ 3 m)       Margin vs. Average Limit       Average Limit         AF       Antenna Factor       Peak       Calculated Peak Field Strength       Margin vs. Average Limit         CL       Cable Loss       HPF       High Pass Filter       Margin vs. Peak Limit         f       Dist       Read       AF       CL       Amp       D Corr       Fitz       Corr.       Limit       Margin vs. Peak Limit         cHz       (m)       dBuV       dB       dB       D       O or       Fitz       Corr.       Limit       Margin Ant. Pol.       Det.       Notes         l1000       3.0       39.0       37.7       9.2       -33.8       0.0       0.7       53.0       74.0       -21.0       V       P         l10000       3.0       26.5       37.7</th><th>Test Engr Date:</th><th></th><th>Chin Pa 10/29/10</th><th>ng</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	Project #:       10013467         Company:       atheros         Test Target:       FCC 15.407         Mode Oper:       TX, 5.6GHz Band, HT20 Mode         f       Measurement Frequency Amp       Preamp Gain       Average Field Strength Limit         Dist       Distance to Antenna       D Corr       Distance Correct to 3 meters       Peak Field Strength Limit         Read       Analyzer Reading       Average Field Strength (@ 3 m)       Margin vs. Average Limit       Average Limit         AF       Antenna Factor       Peak       Calculated Peak Field Strength       Margin vs. Average Limit         CL       Cable Loss       HPF       High Pass Filter       Margin vs. Peak Limit         f       Dist       Read       AF       CL       Amp       D Corr       Fitz       Corr.       Limit       Margin vs. Peak Limit         cHz       (m)       dBuV       dB       dB       D       O or       Fitz       Corr.       Limit       Margin Ant. Pol.       Det.       Notes         l1000       3.0       39.0       37.7       9.2       -33.8       0.0       0.7       53.0       74.0       -21.0       V       P         l10000       3.0       26.5       37.7	Test Engr Date:		Chin Pa 10/29/10	ng										
Company:         atheros           Fest Target:         FCC 15.407           Wode Oper:         TX, 5.6 GHz Band, HT20 Mode           f         Measurement Frequency Amp Dist         Preamp Gain         Average Field Strength Limit           Read         Analyzer Reading         Avg Avg         Avgrage Field Strength (@ 3 m)         Margin vs. Average Limit           AF         Antenna Factor         Peak         Calculated Peak Field Strength         Margin vs. Peak Limit           f         Dist         Read         AF         CL         Amp         D Corr         Filt         Corr.         Limit         Margin vs. Average Limit           AF         Antenna Factor         Peak         Galculated Peak Field Strength         Margin vs. Peak Limit         Peak           f         Dist         Read         AF         CL         Amp         D Corr         Filtr         Corr.         Limit         Margin vs. Peak Limit           cLuo         Able Loss         HPF         High Pas Filter         Margin vs.         Peak         Notes           f         Obs         AF         CL         Amp         D Corr         Filt         Margin vs.         Peak         Notes           f         Obs         AB         B <th>Company: anderos Fast Target: FC 15.407 Mode Oper: TX, 5.6 GHz Band, HT20 Mode f Measurement Frequency Amp Preamp Gain Average Field Strength Limit Dist Distance to Antenna D Corr Distance Correct to 3 meters Peak Field Strength Limit Read Analyzer Reading Avg Average Field Strength @ 3 m Margin vs. Average Limit A Antenna Factor Peak Calculated Peak Field Strength Margin vs. Average Limit CL Cable Loss HPF High Pass Filter f (m) dBuV dB/m dB dB dB dB dB dB dB UV/m dBuV/m dB V/H P/A/QP Low Ch, 5500MHz J J J J J J J J J J J J J J J J J J J</th> <th>Project # C</th> <th>:</th> <th>1001346</th> <th></th>	Company: anderos Fast Target: FC 15.407 Mode Oper: TX, 5.6 GHz Band, HT20 Mode f Measurement Frequency Amp Preamp Gain Average Field Strength Limit Dist Distance to Antenna D Corr Distance Correct to 3 meters Peak Field Strength Limit Read Analyzer Reading Avg Average Field Strength @ 3 m Margin vs. Average Limit A Antenna Factor Peak Calculated Peak Field Strength Margin vs. Average Limit CL Cable Loss HPF High Pass Filter f (m) dBuV dB/m dB dB dB dB dB dB dB UV/m dBuV/m dB V/H P/A/QP Low Ch, 5500MHz J J J J J J J J J J J J J J J J J J J	Project # C	:	1001346											
Key Ling         TCC 12-NN           Wode Oper:         TX, 5.6 CHz Band, HT20 Mode           f         Measurement Frequency Amp Dist         Preamp Gain         Average Field Strength Limit           Read         Analyzer Reading         Average Field Strength (@ 3 m)         Margin vs. Average Limit           AF         Antenna Factor         Peak         Calculated Peak Field Strength (@ 3 m)         Margin vs. Average Limit           CL         Cable Loss         HPF         High Pass Filter         Corr.         Limit         Margin vs. Peak Limit           f         Dist         Read         AF         CL         Amp         D Corr         Filt         Corr.         Limit         Margin vs. Peak Limit           f         Dist         Read         AF         CL         Amp         D Corr         Filt         Corr.         Limit         Margin vs. Peak Limit           f         Obst         Read         AF         CL         Amp         D Corr         Filt         Corr.         Limit         Margin vs. Peak Limit           f         Uso         Ba         D         O         Filt         Corr.         Limit         Margin vs. Peak Limit           line00         3.0         39.0         37.7	Mode Oper:         TX, 5.6 CHz Band, HT20 Mode           f         Measurement Frequency Amp Dist         Preamp Gain         Average Field Strength Limit           Read         Analyzer Reading         Avg         Average Field Strength @ 3 m         Margin vs. Average Limit           AF         Antenna Factor         Peak         Calculated Peak Field Strength @ 3 m         Margin vs. Average Limit           CL         Cable Loss         HPF         High Pass Filter         Corr.         Limit         Margin vs. Peak Limit           f         Dist         Read         AF         CL         Amp         D Corr         Filt         Corr.         Limit         Margin vs. Peak Limit           f         Dist         Read         AF         CL         Amp         D Corr         Filt         Corr.         Limit         Margin Ant PoL         Det         Notes           f         Dist         Read         AF         CL         Amp         D Corr         Filt         Corr.         Limit         Margin Ant PoL         Det         Notes           f         Dist         Read         AF         CL         Amp         D Corr         State         Corr.         Limit         Margin V/m         Margin V/m           lo	Company Fact Tang	r: at:	atheros FCC 15.	407										
f       Measurement Frequency Amp Dist       Preamp Gain Distance Correct to 3 meters Read Analyzer Reading AF       Average Field Strength Limit AF       Average Limit AF       Average Limit AF       Average Limit AF       Average Limit AF       Margin vs. Average Limit CL       Calculated Peak Field Strength Calculated Peak Field Strength Margin vs. Peak Limit       Det. P/A/QP       Notes         f       Dist       Read AB       AF       CL       Amp D       D Corr Peak       Filt       Corr. BB       Limit       Margin vs. Average Limit       Notes         f       Dist       Read AB       AF       CL       Amp D       D Corr       Filt       Corr. BB       Limit       Margin vs. Peak Limit       Notes         f       Dist       Read AB       AF       CL       Amp D       D Corr       Filt       Corr. BB       Limit       Margin vs. Peak Limit       Notes         f       Dist       Read AB       AF       CL       Amp D       D Corr       Filt       Corr. BB       Limit       Margin vs. Peak Limit       Notes         f       Distance Correct to 3       Read       AF       CL       Amp D       D Corr       Filt       Aura       Pal       Notes         ll.000       3.0       39.0       37.7       9.2       -33	f       Measurement Frequency Amp Dist       Preamp Gain Distance Correct to 3 meters Read       Average Field Strength Limit Average Field Strength @ 3 m Areman Factor CL       Average Field Strength @ 3 m Calculated Peak Field Strength       Margin vs. Average Limit Margin vs. Peak Limit         f       Dist AF       Antenna Factor (n)       Peak BB/m       D Corr BB       Fitr BB       Corr.       Limit Margin vs. Peak Limit       Margin vs. Peak Limit         f       Dist CHz       Read (n)       AF       CL       Amp BB/m       D Corr       Fitr BB       Corr.       Limit Margin vs. Peak Limit         f       Dist CHz       Read (n)       AF       CL       Amp BB/m       D Corr       Fitr BB       Corr.       Limit Margin vs. Peak Limit         f       Dist CHz       Read (n)       AF       CL       Amp BB       D Corr       Fitr Corr.       Limit Margin vs. Peak Limit         l.000       3.0       39.0       37.7       9.2       -33.8       0.0       0.7       53.0       74.0       -21.0       V       P         l1.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       59.2       74.0       -14.6       V       A         l1.000       3.0       31.3       37.9       9.3	Mode On	el; et:	TX. 5.6G	Hz Ban	а. нт:	20 Mode								
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	f       Measurement Frequency       Amp       Preamp Gain       Average Field Strength Limit         Dist       Distance to Antenna       D Corr       Distance Correct to 3 meters       Peak Field Strength Limit         Read       Analyzez Reading       Avg       Average Field Strength @ 3 m.       Margin vs. Average Limit         AF       Antenna Factor       Peak       Calculated Peak Field Strength       Margin vs. Peak Limit         CL       Cable Loss       HPF       High Pass Filter       Notes       P/A/QP         International Strength       MB       dB       dB       dB       BBUV/m       Margin vs. Peak Limit         Margin vs.       Peak       Aint Pol       Det.       Notes         GHz       (n)       dBuV       dB       dB       dB       B       Distance       P         11000       3.0       25.5       37.7       9.2       -33.8       0.0       0.7       53.0       74.0       -21.0       V       P         11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       53.1       74.0       -21.0       V       P         11.000       3.0       26.3       37.7       9.2       -33.8					-,									
f       Measurement Prequency Amp       Preamp Gan       Average Field Strength Limit         Distance to Antenna       D Corr       Distance Correct to 3 meters       Peak Field Strength Limit         Read       Analyzer Reading       Average Field Strength @ 3 m       Margin vs. Average Limit         AF       Antenna Factor       Peak       Calculated Peak Field Strength       Margin vs. Average Limit         ft       Dist       Read       AF       CL       Calculated Peak       Filt       Corr.       Limit       Margin vs. Average Limit         dt       Dist       Read       AF       CL       Ame       D Corr       Fitr       Corr.       Limit       Margin vs. Average Limit         ft       Dist       Read       AF       CL       Amp       D Corr       Fitr       Corr.       Limit       Margin vs. Average Limit         ft       Dist       Read       AF       CL       Amp       D Corr       Fitr       Corr.       Limit       Margin vs. Average Limit         ft       MBuV       dB       dB       dB       dB       dB       dB       Dest       P/A/QP         cow       Ch       Side       O       O       Side       O       O       O     <	f       Measurement Frequency Amp       Preamp Gan       Average Field Strength Limit         Dist Distance to Antenna       D Corr       Distance Correct to 3 meters       Peak Field Strength Limit         Read       Analyzer Reading       Avg       Average Field Strength (2) 3 m       Margin vs. Average Limit         AF       Antenna Factor       Peak       Calculated Peak Field Strength       Margin vs. Peak Limit         f       Dist       Read       AF       CL       Amp       D Corr       Fitr       Corr       Limit       Margin vs. Peak Limit         f       Dist       Read       AF       CL       Amp       D Corr       Fitr       Corr       Limit       Margin vs. Peak Limit         f       Dist       Read       AF       CL       Amp       D Corr       Fitr       Corr       Limit       Margin vs. Peak Limit         l1000       3.0       39.0       37.7       9.2       -33.8       0.0       0.7       74.0       -21.0       V       P         l1.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       53.1       74.0       -20.9       H       P         l1.000       3.0       26.3       37.7       <							-	<b>_</b> .				-		
Dist         Distance to Antenna         D Corr         Distance to 3 meters         Peak         Peak average Field Strength @ 3 m         Margin vs. Average Limit           AF         Antenna Factor         Peak         Calculated Peak Field Strength         Margin vs. Average Limit           CL         Cabe Loss         HPF         High Pass Filter         Margin vs. Peak Limit           f         Dist         Read         AF         CL         Amp         D Corr         Fltr         Corr.         Limit         Margin vs. Average Limit           f         Dist         Read         AF         CL         Amp         D Corr         Fltr         Corr.         Limit         Margin vs. Peak Limit           l.000         3.0         39.0         37.7         9.2         -33.8         0.0         0.7         53.0         74.0         -21.0         V         P           l1.000         3.0         25.5         37.7         9.2         -33.8         0.0         0.7         53.1         74.0         -21.0         V         P           l1.000         3.0         25.5         37.7         9.2         -33.8         0.0         0.7         53.1         74.0         -20.9         H         P	Dist         Distance to Antenna         D Corr         Distance to 3 meters         Peak         Peak Analyzer Reading         Avg         Average Field Strength (@ 3 m)         Margin vs. Average Limit           AF         Antenna Factor         Peak         Calculated Peak Field Strength (@ 3 m)         Margin vs. Average Limit           CL         Cable Loss         HPF         High Pass Filter         Margin vs. Peak Limit         Det.         Notes           f         Dist         Read         AF         CL         Amp         D Corr         Fitr         Corr.         Limit         Margin vs. Peak Limit           f         Dist         Read         AF         CL         Amp         D Corr         Fitr         Corr.         Limit         Margin vs. Peak Limit           f         Dist         Read         AF         CL         Amp         D Corr         Fitr         Corr.         Limit         Margin vs. Peak Limit           f         Dist         Read         AF         CL         Amp         D Corr         Fitr         Corr         Limit         Margin vs. Peak Limit           f         Margin vs. Peak         Dist         MB         dB         D         Ontes           f         Margin vs.         <		f'	Measuren	nent Freq	piency	Amp	Preamp (	jam 7			Average	Field Stren;	gth Limit	
Kead         Anizyzer Keading CL         Avg Antenna Factor         Avg Peak         Calculated Peak Field Strength (6 3 m Calculated Peak Field Strength         Margin vs. Peak Limit           f         Dist CHz         Read         AF         CL         Amp dB uV         D Corr dB         Filt         Corr. dB         Limit         Margin vs. Peak Limit           f         Dist CHz         Read         AF         CL         Amp dB         D Corr         Filt         Corr. dB         Limit         Margin vs. Peak Limit           f         Dist CHz         Read         AF         CL         Amp dB         D Corr         Filt         Corr. dB         Limit         Margin vs. Peak Limit           linoto         3.0         39.0         37.7         9.2         -33.8         0.0         0.7         53.0         74.0         -21.0         V         P           linoto         3.0         39.1         37.7         9.2         -33.8         0.0         0.7         53.1         74.0         -20.9         H         P           linoto         3.0         26.3         37.7         9.2         -33.8         0.0         0.7         59.2         74.0         -14.8         H         P           lil	Read         Analyzer reading AF         Average Tield Strength (g 3 m Calculated Peak Field Strength         Margin vs. Average Limit           AF         Antenna Factor CL         Peak BB/w         Calculated Peak Field Strength         Margin vs. Peak Limit           f         Dist CHz         Read         AF         CL         Amp dB         D Corr dB         High Pass Filter         Margin vs. Peak Limit           f         Dist CHz         Read         AF         CL         Amp dB         D Corr dB         High Pass Filter           f         Dist CHz         Read         AF         CL         Amp dB         D Corr dB         High Pass Filter           f         Dist CHz         Read         AF         CL         Amp dB         D Corr         Fitz         Corr.         Limit Margin vs. Average Limit           lino00         3.0         39.0         37.7         9.2         -33.8         0.0         0.7         53.0         74.0         -21.0         V         P           lino00         3.0         26.3         37.7         9.2         -33.8         0.0         0.7         53.1         74.0         -14.6         V         A           lino00         3.0         26.3         37.7         9.2		Dist	Distance	to Anter	ma	D Corr	Distance	Correc	tto3me	ters	Peak Fie	ld Strength	Linut	
AF       Afterna Factor       Peak       Calculated Peak Field Strength       Margin Margin VS. Feak Linut         CL       Cable Loss       HPF       High Pass Filter         f       Dist       Read       AF       CL       Amp       D Corr       Fitz       Corr.       Limit       Margin Ant Pol       Det       Notes         GHz       (m)       dBuV       dB       dB       dB       dB       dB       dB       dB       dB       dB       Margin Ant Pol       Det       Notes         Low Ch, 5500MHz       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	Ar         Antenna Partor         Feak         Calculated Feak Field Strength         Margin VS. Feak Linut           CL         Cable Loss         HPF         High Pass Filter           f         Dist (m)         Read BBuV         AF         CL         Anne BB         D Corr BB         Filt         Corr. BB         Limit BB UV/m         Margin VS. Feak Limit BB         Notes           f         Dist (m)         Read BBUV         AF         CL         Anne BB         D Corr BB         Filt         Corr. BB         Limit BB         Margin VS. Feak Limit BB         Notes           line         BB         dB         dB         dB         D Corr. BB         Filt         Corr. Corr. BB         Limit BB         Margin VS. Feak Limit BB         Notes           line         D         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O		read AF	Analyzer	Reading Frates		Avg	Average.	ר הבות ג ייים ג	Fight (C	() m 	Margin V	75. Average Dl. I	Linut	
f         Dist         Read (m)         AF         CL         Amp dB         D Corr dB         Fltr dB         Corr. dB         Limit dB         Margin dB         Ant. Pol. V/H         Det. P/A/QP         Notes           Low Ch, 5500MHz	f         Dist         Read         AF         CL         Amp         D Corr         Fltr         Corr.         Limit         Margin         Ant. Pol         Det         Notes           GHz         (m)         dBuV         dB/m         dB         V/H         P/A/QP           Low Ch, 5500MHz         11.000         3.0         39.0         37.7         9.2         -33.8         0.0         0.7         53.0         74.0         -21.0         V         P           11.000         3.0         25.5         37.7         9.2         -33.8         0.0         0.7         53.1         74.0         -20.9         H         P           11.000         3.0         26.3         37.7         9.2         -33.8         0.0         0.7         40.2         54.0         -13.8         H         A           11.000         3.0         44.7         37.9         9.3         -33.5         0.0         0.7         59.2         74.0         -14.8         H         P           11.200         3.0         48.1         37.9         9.3 <td></td> <td>CI</td> <td>Cable Los</td> <td>ractor</td> <td></td> <td>Feak HDF</td> <td>High Dae</td> <td>a Feak • Filtor</td> <td>, rield Str</td> <td>ength</td> <td>Wargin \</td> <td>75. Feak LD</td> <td>tut</td> <td></td>		CI	Cable Los	ractor		Feak HDF	High Dae	a Feak • Filtor	, rield Str	ength	Wargin \	75. Feak LD	tut	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	f         Dist         Read         AF         CL         Amp         D Corr         Fltr         Corr.         Limit         Margin         Ant. Pol.         Det.         Notes           GHz         (m)         dBuV         dB/m         dB         dB         dB         dB         dB         dBuV/m         dB         V/H         P/A/QP           Low Ch, 5500MHz		01	Cable Lo.	,,,			menta	л <u>ш</u> ет						
GHz         (m)         dBuV         dB         dB         dB         dB         dB         dB         dB         dB         dB         dV/m         dB         V/H         P/A/QP           Low Ch, 5500MHz         3.0         39.0         37.7         9.2         -33.8         0.0         0.7         53.0         74.0         -21.0         V         P           11.000         3.0         25.5         37.7         9.2         -33.8         0.0         0.7         39.4         54.0         -14.6         V         A           11.000         3.0         39.1         37.7         9.2         -33.8         0.0         0.7         53.1         74.0         -20.9         H         P           11.000         3.0         26.3         37.7         9.2         -33.8         0.0         0.7         54.0         -13.8         H         A           11.000         3.0         44.7         37.9         9.3         -33.5         0.0         0.7         59.2         74.0         -14.8         H         P           11.200         3.0         44.7         37.9         9.3         -33.5         0.0         0.7         62.5	GHz         (m)         dBuV         dB/m         dB         dB         dB         dB         dB         dB         dB         dB/dV/m         dB         V/H         P/A/QP           Low Ch, 5500MHz         30         39.0         37.7         9.2         -33.8         0.0         0.7         53.0         74.0         -21.0         V         P           11.000         3.0         25.5         37.7         9.2         -33.8         0.0         0.7         53.0         74.0         -21.0         V         P           11.000         3.0         25.5         37.7         9.2         -33.8         0.0         0.7         53.1         74.0         -20.9         H         P           11.000         3.0         26.3         37.7         9.2         -33.8         0.0         0.7         40.2         54.0         -13.8         H         A           11.000         3.0         26.3         37.7         9.2         -33.8         0.0         0.7         59.2         74.0         -14.8         H         P           11.200         3.0         44.7         37.9         9.3         -33.5         0.0         0.7         62.5	f	Dist	Read	AF	CL	Атр	D Corr	Fltr	Corr.	Limit	Margin	Ant. Pol.	Det.	Notes
Low Cr, 5500 MHz       39.0       37.7       9.2       -33.8       0.0       0.7       53.0       74.0       -21.0       V       P         11.000       3.0       25.5       37.7       9.2       -33.8       0.0       0.7       53.0       74.0       -21.0       V       P         11.000       3.0       25.5       37.7       9.2       -33.8       0.0       0.7       53.1       74.0       -21.0       V       P         11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       53.1       74.0       -20.9       H       P         11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       40.2       54.0       -13.8       H       A         11.000       3.0       26.3       37.7       9.2       -33.5       0.0       0.7       59.2       74.0       -14.8       H       P         11.200       3.0       44.7       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       48.1       37.9       9.3       -33.5	Low Ch, 5500 HTz         Image: constraint of the state of the s	GHz	<u>i</u> (m)	dBuV	dB/m	dB	dB	dB	<u>dB</u>	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
Intervent       53.0       53.0       53.0       53.0       53.0       53.0       53.0       53.0       53.0       53.0       54.0       74.0       74.0       74.6       V       A         11.000       3.0       25.5       37.7       9.2       -33.8       0.0       0.7       39.4       54.0       -14.6       V       A         11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       59.1       74.0       -20.9       H       P         11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       40.2       54.0       -13.8       H       A         11.000       3.0       26.3       37.7       9.2       -33.5       0.0       0.7       59.2       74.0       -14.8       H       P         11.200       3.0       44.7       37.9       9.3       -33.5       0.0       0.7       45.7       54.0       -8.3       H       A         11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200 <t< td=""><td>11.000       3.0       25.5       37.7       9.2       -33.8       0.0       0.7       39.4       54.0       -14.6       V       A         11.000       3.0       25.5       37.7       9.2       -33.8       0.0       0.7       39.1       74.0       -20.9       H       P         11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       53.1       74.0       -20.9       H       P         11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       40.2       54.0       -13.8       H       A         Mid Ch, 5600MHz      </td><td>Low Ch, : 11 000</td><td>3.0</td><td>2 30 N</td><td>377</td><td>07</td><td>-33.8</td><td>0.0</td><td>07</td><td>53.0</td><td>740</td><td>-21.0</td><td>v</td><td>р</td><td></td></t<>	11.000       3.0       25.5       37.7       9.2       -33.8       0.0       0.7       39.4       54.0       -14.6       V       A         11.000       3.0       25.5       37.7       9.2       -33.8       0.0       0.7       39.1       74.0       -20.9       H       P         11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       53.1       74.0       -20.9       H       P         11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       40.2       54.0       -13.8       H       A         Mid Ch, 5600MHz	Low Ch, : 11 000	3.0	2 30 N	377	07	-33.8	0.0	07	53.0	740	-21.0	v	р	
11.000       3.0       39.1       37.7       9.2       -33.8       0.0       0.7       53.1       74.0       -10.0       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1 <th1< th="">       1       <th1< th=""></th1<></th1<>	11.000         3.0         39.1         37.7         9.2         -33.8         0.0         0.7         53.1         74.0         -20.9         H         P           11.000         3.0         26.3         37.7         9.2         -33.8         0.0         0.7         53.1         74.0         -20.9         H         P           11.000         3.0         26.3         37.7         9.2         -33.8         0.0         0.7         40.2         54.0         -13.8         H         A           Mid Ch, 5600MHz	11.000	3.0	25.5	37.7	9.2	-33.8	0.0	0.7	39.4	54.0	-14.6	v	Ā	
11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       40.2       54.0       -13.8       H       A         Mid Ch, 5600MHz	11.000       3.0       26.3       37.7       9.2       -33.8       0.0       0.7       40.2       54.0       -13.8       H       A         Mid Ch, 5600MHz		3.0	39.1	37.7	9.2	-33.8	0.0	0.7	53.1	74.0	-20.9	Ĥ	P	
Mid Ch, $5600$ MH $_{Z}$ v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v       v <td>Mid Ch, 5600MHz       No.       No.</td> <td>11.000</td> <td>3.0</td> <td>26.3</td> <td>37.7</td> <td>9.2</td> <td>-33.8</td> <td>0.0</td> <td>0.7</td> <td>40.2</td> <td>54.0</td> <td>-13.8</td> <td>H</td> <td>A</td> <td></td>	Mid Ch, 5600MHz       No.	11.000	3.0	26.3	37.7	9.2	-33.8	0.0	0.7	40.2	54.0	-13.8	H	A	
Mid Ch, 5600MHz       Image: second se	Mid Ch, 5600MHz       Image: second sec		l												
11.200       3.0       44.7       37.9       9.3       -33.5       0.0       0.7       59.2       74.0       -14.8       H       P         11.200       3.0       31.3       37.9       9.3       -33.5       0.0       0.7       59.2       74.0       -14.8       H       P         11.200       3.0       31.3       37.9       9.3       -33.5       0.0       0.7       45.7       54.0       -8.3       H       A         11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       42.0       54.0       -12.0       V       A         High Ch, 5700MHz       -       -       -       -         11.400       3.0       46.1       38.0       9.4       -33.2       0.0       0.7       64.5       74.0       -9.5	11.200       3.0       44.7       37.9       9.3       -33.5       0.0       0.7       59.2       74.0       -14.8       H       P         11.200       3.0       31.3       37.9       9.3       -33.5       0.0       0.7       59.2       74.0       -14.8       H       P         11.200       3.0       31.3       37.9       9.3       -33.5       0.0       0.7       45.7       54.0       -8.3       H       A         11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       27.6       37.9       9.3       -33.2       0.0       0.7       42.0       54.0       -12.0       V       A         High Ch, 5700MHz       -       -       -       -         11.400       3.0       46.1       38.0       9.4       -33.2       0.0       0.7       64.5       74.0       -9.5	Mid Ch, s	5600MH	ž											
11.200       3.0       31.3       37.9       9.3       -33.5       0.0       0.7       45.7       54.0       -8.3       H       A         11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       27.6       37.9       9.3       -33.5       0.0       0.7       42.0       54.0       -12.0       V       A         High Ch, 5700MHz         High Ch, 5700MHz         11.400       3.0       46.1       38.0       9.4       -33.2       0.0       0.7       61.1       74.0       -13.0       V       P         11.400       3.0       38.0       9.4       -33.2       0.0       0.7       64.5       74.0       -6.0       V       A         11.400       3.0       34.6       38.0       9.4       -33.2       0.0       0.7       64.5       74.0       -9.5       H       P         1	11.200       3.0       31.3       37.9       9.3       -33.5       0.0       0.7       45.7       54.0       -8.3       H       A         11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       27.6       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       27.6       37.9       9.3       -33.2       0.0       0.7       42.0       54.0       -12.0       V       A         High Ch, 5700MHz	11.200	3.0	44.7	37.9	9.3	-33.5	0.0	0.7	59.2	74.0	-14.8	H	P	
11.200       3.0       48.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       30       27.6       37.9       9.3       -33.5       0.0       0.7       42.0       54.0       -12.0       V       A         High Ch, 5700MHz         11.400       3.0       46.1       38.0       9.4       -33.2       0.0       0.7       61.1       74.0       -13.0       V       P         11.400       3.0       38.0       9.4       -33.2       0.0       0.7       61.1       74.0       -13.0       V       P         11.400       3.0       38.0       9.4       -33.2       0.0       0.7       64.5       74.0       -9.5       H       P         11.400       3.0       34.6       38.0       9.4       -33.2       0.0       0.7       64.5       74.0       -9.5       H       P         11.400       3.0       34.6       38.0       9.4       -33.2       0.0       0.7       49.6       54.0       -4.4       H       A	11.200       3.0       46.1       37.9       9.3       -33.5       0.0       0.7       62.5       74.0       -11.5       V       P         11.200       3.0       27.6       37.9       9.3       -33.5       0.0       0.7       42.0       54.0       -12.0       V       A         High Ch, 5700MHz	11.200	3.0	31.3	37.9	9.3	-33.5	0.0	0.7	45.7	54.0	-8.3	H	<u>A</u>	
High Ch, 5700MHz       3.0       46.1       38.0       9.4       -33.2       0.0       0.7       42.0       94.0       -12.0       V       A         High Ch, 5700MHz	High Ch, 5700MHz       -3.3       0.0       0.7       42.0       94.0       -12.0       V       A         High Ch, 5700MHz	11.200	3.0	48.1	37.9	9.3	-33.5	0.0	0.7	02.5	74.U 54.0	-11.5	V V	P	
High Ch, 5700 Hz     Image: Second seco	High Ch, 5700MHz     Image: Chi state of the	11.200	3.0	U	J	7.3	-33.2	0.0	<b>U.</b> (	46.0	24NU	-12.0	· · ·	<b>A</b>	
11.400         3.0         46.1         38.0         9.4         -33.2         0.0         0.7         61.1         74.0         -13.0         V         P           11.400         3.0         33.0         38.0         9.4         -33.2         0.0         0.7         61.1         74.0         -13.0         V         P           11.400         3.0         33.0         38.0         9.4         -33.2         0.0         0.7         48.0         54.0         -6.0         V         A           11.400         3.0         49.5         38.0         9.4         -33.2         0.0         0.7         64.5         74.0         -9.5         H         P           11.400         3.0         34.6         38.0         9.4         -33.2         0.0         0.7         49.6         54.0         -4.4         H         A	11.400       3.0       46.1       38.0       9.4       -33.2       0.0       0.7       61.1       74.0       -13.0       V       P         11.400       3.0       33.0       38.0       9.4       -33.2       0.0       0.7       61.1       74.0       -13.0       V       P         11.400       3.0       33.0       38.0       9.4       -33.2       0.0       0.7       48.0       54.0       -6.0       V       A         11.400       3.0       49.5       38.0       9.4       -33.2       0.0       0.7       64.5       74.0       -9.5       H       P         11.400       3.0       34.6       38.0       9.4       -33.2       0.0       0.7       49.6       54.0       -4.4       H       A	High Ch.	5700M	Hz	<u></u>					•	•				
11.400         3.0         33.0         38.0         9.4         -33.2         0.0         0.7         48.0         54.0         -6.0         V         A           11.400         3.0         49.5         38.0         9.4         -33.2         0.0         0.7         64.5         74.0         -9.5         H         P           11.400         3.0         34.6         38.0         9.4         -33.2         0.0         0.7         64.5         74.0         -9.5         H         P           11.400         3.0         34.6         38.0         9.4         -33.2         0.0         0.7         49.6         54.0         -4.4         H         A	11.400       3.0       33.0       38.0       9.4       -33.2       0.0       0.7       48.0       54.0       -6.0       V       A         11.400       3.0       49.5       38.0       9.4       -33.2       0.0       0.7       64.5       74.0       -9.5       H       P         11.400       3.0       34.6       38.0       9.4       -33.2       0.0       0.7       64.5       74.0       -9.5       H       P         11.400       3.0       34.6       38.0       9.4       -33.2       0.0       0.7       49.6       54.0       -4.4       H       A	11.400	3.0	46.1	38.0	9.4	-33.2	0.0	0.7	61.1	74.0	-13.0	v	Р	
11.400         3.0         49.5         38.0         9.4         -33.2         0.0         0.7         64.5         74.0         -9.5         H         P           11.400         3.0         34.6         38.0         9.4         -33.2         0.0         0.7         49.6         54.0         -4.4         H         A	11.400       3.0       49.5       38.0       9.4       -33.2       0.0       0.7       64.5       74.0       -9.5       H       P         11.400       3.0       34.6       38.0       9.4       -33.2       0.0       0.7       49.6       54.0       -4.4       H       A	11.400	3.0	33.0	38.0	9.4	-33.2	0.0	0.7	48.0	54.0	- <b>6.0</b>	V	A	
11.400 3.0 34.6 38.0 9.4 -33.2 0.0 0.7 49.6 54.0 -4.4 H A		11.400	3.0	49.5	38.0	9.4	-33.2	0.0	0.7	64.5	74.0	-9.5	H	Р	
		11.400	3.0	34.6	38.0	9.4	-33.2	0.0	0.7	49.6	54.0	-4.4	H	A	
					ļ										

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## 8.2.9. 802.11n HT40 MODE 5.6 GHz BAND

### **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**





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### **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**





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### AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)



### AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



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Test Eng Date: Project # Compan; Test Targ Mode Op	r: : y: :et: er:	Chin Pa 10/29/10 10U1346 Atheros FCC 15. TX, 5.6 G	ng 7 407 Hz Ban	d, HT	40								
	f Dist Read AF CL	Measurer Distance Analyzer Antenna Cable Lo:	nent Fred to Anter Reading Factor	piency ina	Amp D Corr Avg Peak HPF	Preamp ( Distance Average Calculate High Pas	Gain Correc Field S d Peak s Filter	rt to 3 me trength @ : Field Stro r	ters ! 3 m ength	Average Peak Fie Margin v Margin v	Field Stren ld Strength rs. Average rs. Peak Lir	gth Limit Limit Limit nit	
f	Dist	Read	AF	CL	Amp	D Corr	Fltr	Corr.	Limit	Margin	Ant. Pol.	Det	Notes
GHz Low Ch	<u>; (m)</u> 5510ME	<u>i dBuV</u> [~	dB/m	<u> </u>	<u>dB</u>	<u>qr</u>	<u>an</u>	dBuV/m	dBuV/m	<u>dB</u>	V/H	PIA/QP	
11.020	3.0	36.9	37.7	9.2	-33.7	0.0	0.7	50.9	74.0	-23.1	н	Р	
11.020	3.0	24.0	37.7	9.2	-33.7	0.0	0.7	37.9	54.0	-16.1	H	Ā	
11.020	3.0	43.7	37.7	9.2	-33.7	0.0	0.7	57.7	74.0	-16.3	V	P	
11.020	3.0	27.6	37.7	9.2	-33.7	0.0	0.7	41.6	54.0	-12.4	V	A	
міа съ	5590MH												
11.180	3.0	42.7	37.8	9.3	-33.5	0.0	0.7	57.0	74.0	-17.0	v	Р	
11.180	3.0	27.8	37.8	9.3	-33.5	0.0	0.7	42.2	54.0	-11.8	v	Ā	
11.180	3.0	40.9	37.8	9.3	-33.5	0.0	0.7	55.2	74.0	-18.8	H	P	
11.180	3.0	23.8	37.8	9.3	-33.5	0.0	0.7	38.2	54.0	-15.8	H	A	
High ('h	5670M	<u> </u> H <del>_</del>											
11.340	3.0	37.4	38.0	9.4	-33.3	0.0	0.7	52.1	74.0	-21.9	н	Р	
11.340	3.0	25.5	38.0	9.4	-33.3	0.0	0.7	40.2	54.0	-13.8	H	Ā	
11.340	3.0	46.9	38.0	9.4	-33.3	0.0	0.7	61.7	74.0	-12.3	V	Р	
11.340	3.0	29.9	38.0	9.4	-33.3	0.0	0.7	44.7	54.0	<b>-9.3</b>	v	A	
Rev. 4.1.2 Note: No	2.7 other e	missions	were de	tected	l above 1	the system	m noi:	se floor.					

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# 8.3. RECEIVER ABOVE 1 GHz

## 8.3.1. FOR 20 MHz BANDWIDTH

	High	Frequency	y Measurem	nent											
Compli	ance Ce	ertification	Services, Fr	emont	5m Ch	amber									
Compa	ny:		Atheros												
roject	#:		10U13467												
Date:			11/18/2010												
est Er	igineer:		Chin Pang												
Vode:			RX mode, 20M	/HzBW	րտի										
est Ec	nipmen	<u>it:</u>													
н	lorn 1-	18GHz	Pre-a	mplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	Но	orn > 18G	Hz		Limit
T59;	S/N: 324	5 @3m	- T145 A	Agilent	008A0	056 🖵				-				-	FCC 15.209
Hi Fre	quency Ca	bles					_								
3'	cable 2	22807700	12' c	able 2	28076	000	20' ca	ble 22	807500		HPF	Re	ject Filte	r <u>Peak</u> RBV	<u>Measurements</u> V=VBW=1MHz
3' c	able 22	807700	<b>▼</b> 12' ca	able 228	07600	•	20' cab	le 2280	7500			•		Average     RBW=1	ge Measurements MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg.	AF	$\mathbf{CL}$	Amp	D Сон	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
.193	3.0	53.9	39.8	24.6	2.6	-36.0	0.0	0.0	45.1	31.0	74	54	-28.9	-23.0	н
.130	3.0	53.8	35.4	27.8	3.6	-35.3	0.0	0.0	49.9	31.5	74	54	- <b>24.1</b>	-22.5	H
983	3.0	42.5	28.3	32.9	5.9	-34.9	0.0	0.0	46.4	32.2	74	54	-27.6	-21.8	H
193	3.0	54.8	40.7	24.6	2.6	-36.U	0.0	0.0	46.0	31.9	74	54	-28.0	-22.1	v
.983	3.0	43.0	28.5	32.9	59	-34.9	0.0 0.0	0.0	46.9	32.4	74	54	-27.1	-21.6	v
ev. 07.2	2.09			<u> </u>			<u> </u>		1	[]				1	
						4	T.	a :				A T.			<b>T</b> = 1
	I Diet	Distance to	ent Frequenc	у		Amp D.Com	Freamp Distance	Jain Corro	at to 3 mot			AVg Lim Dir Lim	Average I	rieid Strength A Strength T i	i Limit wit
	Read	Analyzer R	eading			Avo	Average	Field S	Strength @	3m		Avg Mar	Margin vo	Average Ti	mit
	AF	Antenna F	actor			⊷vg Peak	Calculate	d Peal	k Field Stre	noth		Pk Mar	Margin vo	: Peak Limit	1110
														0.44 224116	

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## 8.3.2. FOR 40 MHz BANDWIDTH

Complia	High ince Ce	Frequency rtification S	Measurem ervices, Fr	ent emont :	5m Ch	amber									
Test En Compar Project Date: Configu Mode: Test Eq	gineer: y: #: ration: uipmen	0 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Chin Pang Atheros 0U13467 1/12/2010 2UT with Ant 2X mode, 40Iv	enna / La IHz BW	ptop										
н	Horn 1-18GHz         Pre-amplifer 1-26GHz         Pre-amplifer 26-40 GHz         Horn > 18 GHz         Limit														
T59; 9	T59; S/N: 3245 @3m - T145 Agilent 3008A0056 - FCC 15.209 -														
3' c	Hi Frequency Cables 3' cable 22807700 3' cable 22807700 • 12' cable 22807600 • •			00	20' cable 22807500 20' cable 22807500				HPF Reject Filt			Peak Measurements RBW=VBW=1MHz           Average Measurements RBW=1MHz; VBW=10Hz			
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak dBuV/m	Avg dBuV/m	Pk Lim	Avg Lim	Pk Mar	Avg Mar JP	Notes
1.297 2.127 4.995 1.193 2.127 4.995	(III) 3.0 3.0 3.0 3.0 3.0 3.0	52.0 56.0 45.0 54.5 55.0 43.7	35.7 37.0 30.0 36.0 36.5 28.6	25.0 27.8 32.9 24.6 27.8 32.9	2.7 3.6 5.9 2.6 3.6 5.9	-35.9 -35.3 -34.9 -36.0 -35.3 -34.9	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0	438 52.1 49.0 45.7 51.1 47.7	27.5 33.1 34.0 27.2 32.6 32.6	74 74 74 74 74 74 74 74	54 54 54 54 54 54 54 54	-30.2 -21.9 -25.0 -28.3 -22.9 -26.3	-26.5 -20.9 -20.0 -26.8 -21.4 -21.4	((/H) H H V V V V V
Rev. 07.22 Note: No	Rev. 07.22.09 Note: No other emissions were detected above the system noise floor. f Measurement Frequency Amp Preamp Gain Avg Lim Average Field Strength Limit Dist Distance to Antenna D Corr Distance Correct to 3 meters Pk Lim Peak Field Strength Limit Read Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit														
	Dist Read AF CL	Distance to . Analyzer Re Antenna Fac Cable Loss	Antenna ading :tor			D Corr Avg Peak HPF	Distance ( Average F Calculated High Pass	Correc Field St Peak Filter	t to 3 meter trength @ 3 Field Stren	s m gth		Pk Lim Avg Mar Pk Mar	Peak Field Margin vs Margin vs	l Strength L . Average L . Peak Limit	imit imit t

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# 8.4. WORST-CASE BELOW 1 GHz

#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

Test Engr: Date: Project #: Company Test Targe Mode Ope	: .t: . <b>r</b> :	Chin Par 10/30/10 10U13467 Atheros FCC 15.2 TX ( Wor	ng 7 :09 st Case),	5GH	2 Band								
	f Dist Read AF CL	Measurem Distance t Analyzer I Antenna F Cable Loss	ent Frequ o Antenn Reading Factor	ency a	Amp D Corr Filter Corr. Limit	Preamp ( Distance Filter Ins Calculate Field Stre	Gain Correct ert Loss d Field S ngth Lii	to 3 meters trength mit		Margin	Margin vs.	Limit	
f	Dist	Read	AF	CL	Amp	D Corr	Pad	Согт.	Limit	Margin	Ant. Pol.	Det.	Notes
MHz	(m)	dBuV	dB/m	dB	dB_	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
/ert													
41.52	3.0	46.4	13.2	0.6	29.6	0.0	0.0	30.4	40.0	- <b>9.6</b>	V	Р	
33.042	3.0	53.2	7.6	0.8	29.6	0.0	0.0	32.0	40.0	- <b>8.0</b>	V	Р	
142.085	3.0	43.6	13.1	1.1	29.4	0.0	0.0	28.4	43.5	-15.1	V	Р	
151.325	3.0	42.0	12.4	1.1	29.3	0.0	0.0	26.1	43.5	-17.4	V	Р	
36.013	3.0	39.3	13.9	1.7	29.0	0.0	0.0	25.9	46.0	-20.1	V	Р	
432.017	3.0	39.9	15.6	2.0	29.4	0.0	0.0	28.0	46.0	-18.0	V	Р	
124.804	3.0	46.7	13.8	1.0	29.4	0.0	0.0	32.2	43.5	-11.3	H	P	
	3.0	51.4	12.3	1.1	29.3	0.0	0.0	35.5	43.5	-8.0	H	P	
151.685	3.0	46.0	9.9	1.2	29.2	0.0	0.0	27.9	43.5	-15.6	H	P	
151.685		47.8	11.4	1.2	29.0	0.0	0.0	31.4	43.5	-12.1	H	P	
151.685 173.886 192.007	3.0	30.5		: L./.	29.0	0.0	0.0	20.2	46.0	-19.8	н	P	
151.685 173.886 192.007 136.013	3.0 3.0	39.5	13.9		20 7	0.0	0.0	240	46.0			<b>n</b> :	
151.685 173.886 192.007 136.013 528.021	3.0 3.0 3.0	39.5 35.1	13.9	2.2	29.7	0.0	0.0	24.8	46.0	-21.2	H	Р	

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# 9. AC POWER LINE CONDUCTED EMISSIONS

## LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)			
	Quasi-peak	Average		
0.15-0.5	66 to 56 "	56 to 46 *		
0.5-5	56	46		
5-30	60	50		

* Decreases with the logarithm of the frequency.

## TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

**RESULTS** 

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#### **<u>6 WORST EMISSIONS</u>**

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.19	53.29		38.11	0.00	63.91	53.91	-10.62	-15.80	L1
0.65	39.25		31.75	0.00	56.00	46.00	-16.75	-14.25	L1
2.19	36.09		33.44	0.00	56.00	46.00	-19.91	-12.56	L1
0.19	53.27		35.97	0.00	63.91	53.91	-10.64	-17.94	L2
0.52	40.65		31.70	0.00	56.00	46.00	-15.35	-14.30	L2
2.19	33.50		28.88	0.00	56.00	46.00	-22.50	-17.12	L2
6 Worst I	Data								

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#### LINE 1 RESULTS



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#### LINE 2 RESULTS



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# **10. DYNAMIC FREQUENCY SELECTION**

# 10.1. OVERVIEW

## 10.1.1. LIMITS

## INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 7 A9.4 (b) (ii) Channel Availability Check Time: ...

Additional requirements for the band 5600-5650 MHz: Until further notice, devices subject to this Section shall not be capable of transmitting in the band 5600-5650 MHz, so that Environment Canada weather radars operating in this band are protected.

RSS-210 Issue 7 A9.4 (b) (iv) **Channel closing time:** the maximum channel closing time is 260 ms.

## FCC

§15.407 (h) and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

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## Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode					
	Master	Client (without radar detection)	Client (with radar detection)			
Non-Occupancy Period	Yes	Not required	Yes			
DFS Detection Threshold	Yes	Not required	Yes			
Channel Availability Check Time	Yes	Not required	Not required			
Uniform Spreading	Yes	Not required	Not required			

## Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode					
	Master	Client	Client			
		(without DFS)	(with DFS)			
DFS Detection Threshold	Yes	Not required	Yes			
Channel Closing Transmission Time	Yes	Yes	Yes			
Channel Move Time	Yes	Yes	Yes			

# Table 3: Interference Threshold values, Master or Client incorporating In-ServiceMonitoring

Maximum Transmit Power	Value						
	(see note)						
≥ 200 milliwatt	-64 dBm						
< 200 milliwatt	-62 dBm						
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna							
Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude							
of the test transmission waveforms to account for variations in measurement equipment. This							
will ensure that the test signal is at or above the detection thres	hold level to trigger a DFS						
response.							

## Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds +
	approx. 60 milliseconds
	over remaining 10 second
	period

The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

For the Short pulse radar Test Signals this instant is the end of the Burst.

For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated.

For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

## Table 5 – Short Pulse Radar Test Waveforms

Radar	Pulse Width	PRI	Pulses	Minimum	Minimum					
Туре	(Microseconds)	(Microseconds)		Percentage of	Trials					
				Successful						
				Detection						
1	1	1428	18	60%	30					
2	1-5	150-230	23-29	60%	30					
3	6-10	200-500	16-18	60%	30					
4	11-20	200-500	12-16	60%	30					
Aggregate (F	Aggregate (Radar Types 1-4) 80% 120									

Table 6 – Long Pulse Radar Test Signal

	ig i uise i		orginar				
Radar	Bursts	Pulses	Pulse	Chirp	PRI	Minimum	Minimum
Waveform		per	Width	Width	(µsec)	Percentage	Trials
		Burst	(µsec)	(MHz)		of Successful	
						Detection	
5	8-20	1-3	50-100	5-20	1000-	80%	30
					2000		

## Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform	Pulse Width (µsec)	PRI (µsec)	Burst Length (ms)	Pulses per Hop	Hopping Rate (kHz)	Minimum Percentage of Successful Detection	Minimum Trials
						Detection	
6	1	333	300	9	.333	70%	30

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## 10.1.2. TEST AND MEASUREMENT SYSTEM

## RADIATED METHOD SYSTEM BLOCK DIAGRAM



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## SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at runtime.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from  $F_L$  to  $F_H$  for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

## SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

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## ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

#### TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST									
Description	Manufacturer	Model	Asset Number	Cal Due					
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00996	10/29/11					
Vector signal generator, 20GHz	Agilent / HP	E8267C	C01066	02/12/12					

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## 10.1.3. SETUP OF EUT

## RADIATED METHOD EUT TEST SETUP



#### SUPPORT EQUIPMENT

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

PERIPHERAL SUPPORT EQUIPMENT LIST							
Description	Manufacturer	Model	Serial Number	FCC ID			
Wireless Access Point	Cisco	AIR-AP1252AG-A-K9	FTX120690N2	LDK102061			
AC Adapter (AP)	Delta Electronics	EADP-45BB B	DTH112490BD	DoC			
Notebook PC (Host)	Dell	PP18L	10657517255	DoC			
AC Adapter (Host PC)	Dell	LA65SN0-00	CN-ODF263-71615- 6AU-1019	DoC			
Notebook PC (Client)	Lenovo	Type 0769-AUU	L3-BA660 08/01	DoC			
AC Adapter (Client PC)	Lenovo	92P1156	11S92P1156Z1ZDX N99HDS5	DoC			

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## 10.1.4. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 28.7 dBm EIRP in the 5250-5350 MHz band and 29.9 dBm EIRP in the 5470-5725 MHz band.

The highest gain antenna assembly utilized with the EUT has an array gain of 10.24 dBi in the 5250-5350 MHz band and 9.22 dBi in the 5470-5725 MHz band. The lowest gain antenna assembly utilized with the EUT has an array gain of 10.17 dBi in the 5250-5350 MHz band and 9.11 dBi in the 5470-5725 MHz band.

Three non-identical antennas are utilized to meet the diversity and MIMO operational requirements.

The EUT uses three transmitter/receiver chains each connected to an antenna to perform radiated tests.

WLAN traffic is generated by streaming the video file TestFile.mp2 "6 ½ Magic Hours" from the Master to the Slave in full motion video mode using the media player with the V2.61 Codec package.

TPC is required since the maximum EIRP is greater than 500 mW (27 dBm).

The EUT utilizes the 802.11a/n architecture. Two nominal channel bandwidths are implemented: 20 MHz and 40 MHz.

The software installed in the access point is revision 9.2.0.118.

## MANUFACTURER'S STATEMENT REGARDING UNIFORM CHANNEL SPREADING

Not Applicable for Slave Devices.

## OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS

The Master Device is a Cisco Access Point, FCC ID: LDK102061. The minimum antenna gain for the Master Device is 3.5 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is -64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides margin to the limit.

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# 10.2. RESULTS FOR 20 MHz BANDWIDTH

## 10.2.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

## 10.2.2. RADAR WAVEFORM AND TRAFFIC

## RADAR WAVEFORM



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#### TRAFFIC



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## 10.2.3. OVERLAPPING CHANNEL TESTS

## RESULTS

These tests are not applicable.

## 10.2.4. MOVE AND CLOSING TIME

## REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

```
Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)
```

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

## **RESULTS**

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	0.000	10

Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	0.0	60
IC	0.0	260

#### **MOVE TIME**



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#### **CHANNEL CLOSING TIME**



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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the FCC aggregate monitoring period.



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No transmissions are observed during the IC aggregate monitoring period.



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## 10.3. RESULTS FOR 40 MHz BANDWIDTH

## 10.3.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5510 MHz.

## 10.3.2. RADAR WAVEFORM AND TRAFFIC

## RADAR WAVEFORM



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## TRAFFIC



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## 10.3.3. OVERLAPPING CHANNEL TESTS

## RESULTS

These tests are not applicable.

## 10.3.4. MOVE AND CLOSING TIME

## **REPORTING NOTES**

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

```
Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)
```

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

## **RESULTS**

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	0.000	10

Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	0.0	60
IC	0.0	260

#### **MOVE TIME**



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## **CHANNEL CLOSING TIME**



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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the FCC aggregate monitoring period.



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No transmissions are observed during the IC aggregate monitoring period.



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## 10.3.5. NON-OCCUPANCY PERIOD

## **RESULTS**

No EUT transmissions were observed on the test channel during the 30-minute observation time.

Agilent 09:27:	17 Dec 15, 2010	RT	Freq/Channe
-30 dBm	Atten 10 dB	Δ Mkr1 1.8 ks -23.49 dB	Center Fre
an			
t			Start Free 5.51000000 GH
•			Stop Fre
0			
n 🗰			3.00000000 MH <u>Auto</u>
S2 FS			Freq Offse 0.00000000 H
n			Signal Trac
E E 40 000 /			
ter 5.510 000 ( BW 3 MHz	onz VRW 3 MHz	Sween 2 ks (8001 nts)	

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#### 11. MAXIMUM PERMISSIBLE EXPOSURE

## FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
(A) Lin	nits for Occupational	I/Controlled Exposu	res	
0.3–3.0 3.0–30 30–300 300–1500 1500–100,000	614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 8
(B) Limits	for General Populati	ion/Uncontrolled Exp	posure	
0.3–1.34	614 824 <i>1</i> f	1.63 2.19/f	*(100) *(180/f ² )	30 30

#### TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

#### TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)-Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
30–300 300–1500	27.5	0.073	0.2 f/1500	30 30
1500–100,000			1.0	

f = frequency in MHz

* = Plane-wave equivalent power density NOTE 1 To TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occu-tions where a transient through a location where occu-

pational/controlled limits apply provided he or she is made aware of the potential for exposure. NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be ex-posed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

## IC RULES

IC Safety Code 6, Section 2.2.1 (a) A person other than an RF and microwave exposed worker shall not be exposed to electromagnetic radiation in a frequency band listed in Column 1 of Table 5, if the field strength exceeds the value given in Column 2 or 3 of Table 5, when averaged spatially and over time, or if the power density exceeds the value given in Column 4 of Table 5, when averaged spatially and over time.

## Table 5

Exposure Limits for Persons Not Classed As RF and Microwave Ex-
posed Workers (Including the General Public)

1 Frequency (MHz)	2 Electric Field Strength; rms (V/m)	3 Magnetic Field Strength; rms (A/m)	4 Power Density (W/m ² )	5 Averaging Time (min)
0.003–1	280	2.19		6
1–10	280/f	2.19/ <i>f</i>		6
10–30	28	2.19/ <i>f</i>		6
30–300	28	0.073	2*	6
300–1 500	1.585 <i>f</i> ^{0.5}	0.0042f ^{0.5}	f/150	6
1 500–15 000	61.4	0.163	10	6
15 000-150 000	61.4	0.163	10	616 000 /f ^{1.2}
150 000-300 000	0.158f ^{0.5}	4.21 x 10 ⁻⁴ f ^{0.5}	6.67 x 10 ⁻⁵ f	616 000 /f ^{1.2}

* Power density limit is applicable at frequencies greater than 100 MHz.

Notes: 1. Frequency, f, is in MHz.

- 2. A power density of 10 W/m² is equivalent to  $1 \text{ mW/cm}^2$ .
- A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

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## EQUATIONS

Power density is given by:

S = EIRP / (4 * Pi * D^2)

where

S = Power density in W/m² EIRP = Equivalent Isotropic Radiated Power in W D = Separation distance in m

Power density in units of W/m² is converted to units of mWc/m² by dividing by 10.

Distance is given by:

D = SQRT (EIRP / (4 * Pi * S))

where

D = Separation distance in m EIRP = Equivalent Isotropic Radiated Power in W S = Power density in W/m²

In the table(s) below, Power and Gain are entered in units of dBm and dBi respectively and conversions to linear forms are used for the calculations.

## <u>LIMITS</u>

From FCC 1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm² From IC Safety Code 6, Section 2.2 Table 5 Column 4, S = 10 W/m²

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## **RESULTS**

(MPE distance equals 20 cm)

Band	Separation	Output	Antenna	IC Power	FCC Power
	Distance	Power	Gain	Density	Density
	(m)	(dBm)	(dBi)	(W/m^2)	(mW/cm^2)
5.2 GHz	0.20	16.86	5.97	0.38	0.038
5.2 GHz	0.20	12.40	10.28	0.37	0.037
5.3 GHz	0.20	21.47	6.07	1.13	0.113
5.3 GHz	0.20	18.52	10.24	1.50	0.150
5.6 GHz	0.20	20.71	4.88	0.72	0.072
5.6 GHz	0.20	20.70	9.22	1.95	0.195

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