

FCC CFR47 PART 15 SUBPART C INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

802.11 a/b/g/n + BT2.1

MODEL NUMBER: A1395

FCC ID: BCGA1395 IC: 579C-A1395

REPORT NUMBER: 10U13548-2, Revision A

ISSUE DATE: MARCH 1, 2011

Prepared for APPLE, INC. 1 INFINITE LOOP CUPERTINO, CA 95014, U.S.A.

Prepared by COMPLIANCE CERTIFICATION SERVICES (UL CCS) 47173 BENICIA STREET FREMONT, CA 94538, U.S.A. TEL: (510) 771-1000 FAX: (510) 661-0888

(R)

NVLAP LAB CODE 200065-0

Revision History

Rev.	lssue Date	Revisions	Revised By
	01/18/11	Initial Issue	F. Ibrahim
A	03/01/11	Revised description of EUT setup section, removed MPE section, removed AV power section, revised PK output power sections, and added co-location radiated data for 11a/5.3GHz band.	F. Ibrahim

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1. ATTESTATION OF TEST RESULTS

	APPLICABLE STANDARDS
DATE TESTED:	DECEMBER 15, 2010 – FEBRUARY 28, 2011
SERIAL NUMBER:	PT523312
MODEL:	A1395
EUT DESCRIPTION:	802.11a/b/g/n + BT 2.1
COMPANY NAME:	APPLE, INC. 1 INFINITE LOOP CUPERTINO, CA, 95014, U.S.A.

APPLICABLE STANDARDS					
STANDARD	TEST RESULTS				
CFR 47 Part 15 Subpart C	Pass				
INDUSTRY CANADA RSS-210 Issue 8	Pass				
INDUSTRY CANADA RSS-GEN Issue 3	Pass				

Compliance Certification Services (UL CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

Tested By:

FRANK IBRAHIM EMC SUPERVISOR UL CCS

TOM CHEN EMC ENGINEER UL CCS

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <u>http://www.ccsemc.com</u>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

802.11 a/b/g/n + BT2.1

The radio module is manufactured by Apple, Inc.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range	Mode	Output Power	Output Power
(MHz)		(dBm)	(mW)
5180 - 5240	802.11a	14.60	28.84
5180 - 5240	802.11n HT20	15.29	33.81
5260 - 5320	802.11a	15.52	35.65
5260 - 5320	802.11n HT20	15.13	32.58
5500 - 5700	802.11a	15.45	35.08
5500 - 5700	802.11n HT20	15.54	35.81

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes the following antenna:

Antenna Name	Description	Manufacturer	Cable Length
631-1482 WiFi / Bluetooth	PIFA	Amphenol / Tyco	81.6 mm

	631-1482 WiFi / Bluetooth
	Peak Gain (includes Cable)
Freq [GHz]	dBi
2.4-2.484	0,59
5,15 - 5,25	4.07
5.25 - 5.35	4.2
5.47-5.725	4.21
5.725-5.85	3,57

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5.4. SOFTWARE AND FIRMWARE

The firmware installed on the EUT was version 4.221.50.2 (BCM MFGTEST)

The EUT driver rev: 0x4dd3202

The test utility software: wl.exe version: 4.218 RC175.1

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case data rate for each mode is determined to be as follows, based on preliminary tests of the chipset utilized in this radio.

All final tests in the 802.11b mode were made at 1 Mb/s. All final tests in the 802.11g mode were made at 6 Mb/s. All final tests in the 802.11a mode were made at 6 Mb/s. All final tests in the 802.11n HT20 SISO mode were made at MCS0.

For radiated emissions below 1 GHz and Power Line Conducted Emissions, the worst-case configuration is determined to be the mode and channel with the highest output power

To determine the worst-position of highest emissions, the EUT's antenna was investigated for X, Y, Z positions, and the worst position was turned out to be a Y-position.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

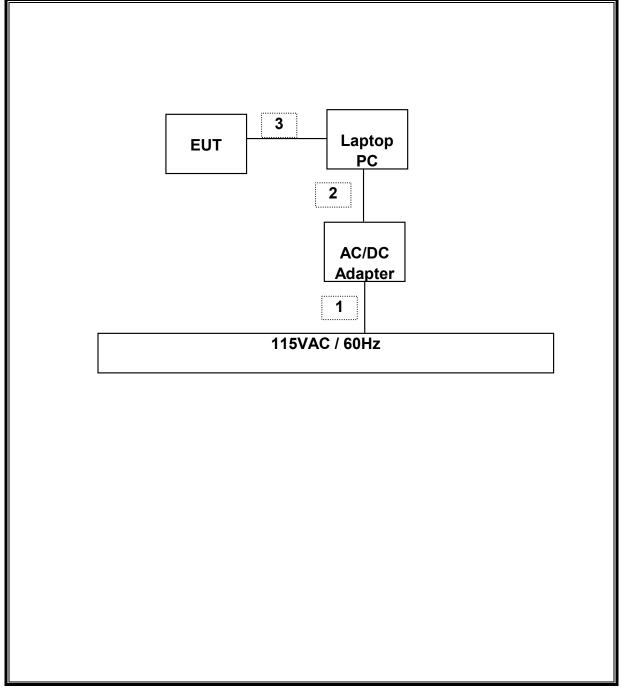
PERIPHERAL SUPPORT EQUIPMENT LIST								
Description Manufacturer Model Serial Number FCC ID								
Laptop	Apple	A1286	W8917005998	DoC				
Laptop AC Adapter	Laptop AC Adapter Apple A1290 N/A DoC							

I/O CABLES

	I/O CABLE LIST							
Cable No.	Port	# of Identica Ports	Connector Type	Cable Type	Cable Length	Remarks		
1	AC	1	US 115V	Un-shielded	2m	N/A		
2	DC	1	DC	Un-shielded	2m	N/A		
3	USB	1	USB	Un-shielded	1m	Connect to Laptop		

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SETUP DIAGRAM FOR TESTS



Note: Laptop PC was used to control the operation of the EUT.

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6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST							
Description Manufacturer Model Asset Cal Due							
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	07/14/11			
Antenna, Horn, 18 GHz	EMCO	3115	C00945	06/29/11			
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/06/11			
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07/12/11			
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/06/11			
EMI Test Receiver, 30 MHz	R&S	ESHS 20	N02396	05/06/11			
High Pass Filter, 7.6 GHz	Micro-Tronics	HPM13195	N02682	CNR			
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/30/11			
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01159	05/08/11			
Peak Power Meter	Boonton	4541	C01186	03/01/11			
Peak Power Sensor	Boonton	57318	C01202	02/23/11			

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7. ANTENNA PORT TEST RESULTS

7.1. 802.11a MODE IN THE 5.2 GHz BAND

7.1.1. 26 dB and 99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

TEST PROCEDURE

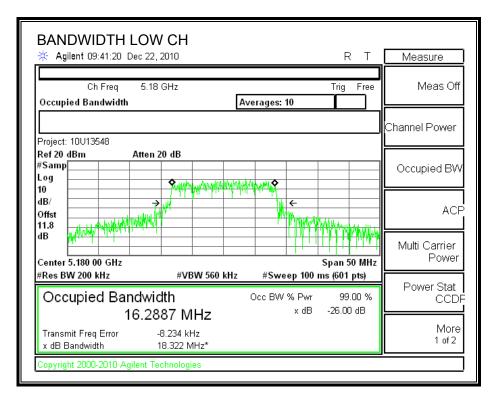
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5180	18.322	16.2887
Middle	5200	18.556	16.2743
High	5240	18.564	16.2618

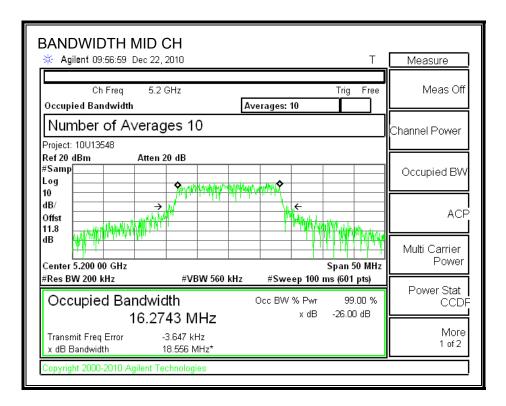
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26 dB and 99% BANDWIDTH



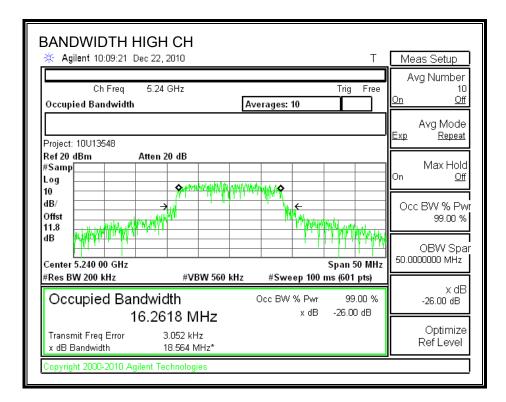
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7.1.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 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.

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.

RESULTS

Limit

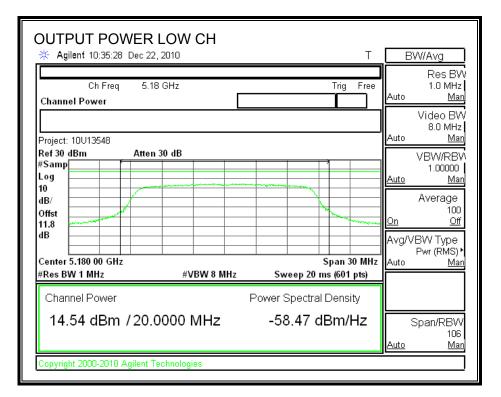
-						
Channel	Frequency	Fixed	В	4 + 10 Log B	Antenna	Limit
		Limit		Limit	Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5180	17	18.322	16.63	4.07	16.63
Mid	5200	17	18.556	16.68	4.07	16.68
High	5240	17	18.564	16.69	4.07	16.69

Results

Channel	Frequency	Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5180	14.54	16.63	-2.09
Mid	5200	14.57	16.68	-2.11
High	5240	14.60	16.69	-2.09

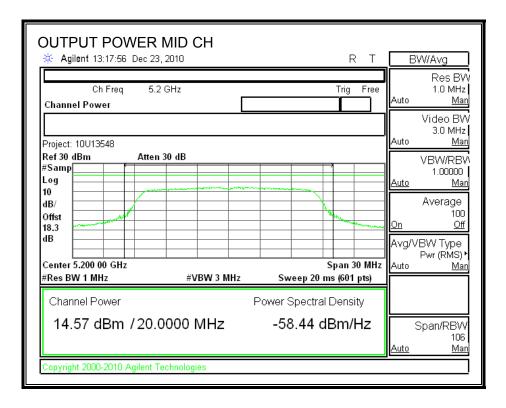
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OUTPUT POWER



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OUTPUT POWER		Т	Measure
Ch Freq 5.24 Channel Power	l GHz	Trig Free	Meas Off
RBW 1.0 MHz Project: 10U13548			Channel Power
Ref 30 dBm Atten #Samp Description Log	30 dB		Occupied BW
10 dB/ Offst 11.8			ACP
dB Center 5.240 00 GHz	#VBW 3 MHz	Span 30 MHz Sweep 20 ms (601 pts)	Multi Carrier Power
#Res BW 1 MHz Channel Power	Power Stat CCDF		
14.60 dBm / 20.0	More 1 of 2		
Copyright 2000-2010 Agilent T	echnologies		

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7.1.3. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the peak power spectral density shall not exceed 4 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 or equal to 6 dBi, therefore the limit is 4 dBm.

TEST PROCEDURE

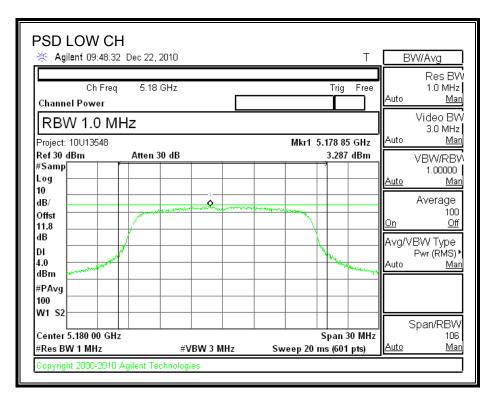
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5180	3.287	4	-0.713
Middle	5200	3.933	4	-0.067
High	5240	3.698	4	-0.302

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POWER SPECTRAL DENSITY



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🔆 Agilent 10:05:	01 Dec 22, 20	010					Т	B	W/Avg
Ch Fre Channel Power	q 5.2 G	Hz				Trig	Free	Auto	Res B\ 1.0 MHz <u>Ma</u>
RBW 1.0 N Project: 10U13548	/IHz			Mk	r1 5.2	201 75	i GHz	Auto	Video BV 3.0 MHz <u>Ma</u>
Ref 30 dBm #Samp Log 10	Atten 30	dB				3.933	dBm	<u>Auto</u>	VBW/RB 1.00000 <u>Ma</u>
dB/ Offst				199 ⁶ 10-1909 (1996)				<u>On</u>	Average 100 <u>Of</u>
dB DI 4.0					-	a start	With my the start of	Avg/V Auto	BW Type Pwr (RMS) <u>Ma</u>
dBm #PAvg 100									
W1 S2	Hz				s	pan 3	0 MHz		Span/RBV 108
#Res BW 1 MHz		#VBW 3	3 MHz	Sweep		•		<u>Auto</u>	Ma

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🔆 Agilent 10:28:14 Dec 2	2,2010	Т	BW/Avg
Ch Freq 5. Channel Power	241 GHz	Trig Free	Res B\ 1.0 MH; Auto <u>Ma</u>
RBW 1.0 MHz Project: 10U13548		Mkr1 5.240 95 GHz	Video BV 3.0 MHz Auto <u>Ma</u>
#Samp Log 10 dB/	n 30 dB	3.698 dBm	VBW/RB 1.00000 Auto <u>Ma</u> Average 100
Offst 11.8 dB DI 4.0			On Off Avg/VBW Type Pwr (RMS) Auto Ma
4Bm			
Center 5.241 00 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 30 MH: Sweep 1 ms (601 pts)	Span/RBV z 106 Auto <u>Ma</u>

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7.1.4. 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 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

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5180	9.08	13	-3.92
Middle	5200	9.12	13	-3.88
High	5240	12.10	13	-0.90

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PEAK EXCURSION

🔆 Agilent 09:51:	. LI DOO LLI	20100					т	B	W/Ava
Ch Fre Channel Power	eq 5.18					Trig	Free	Auto	Res BW 1.0 MHz <u>Man</u>
RBW 1.0 N Project: 10U13548						∆ Mkr1	0 Hz	Auto	Video BW 3.0 MHz <u>Man</u>
Ref 30 dBm #Peak Log 10	Atten 3	0 dB	1			9.1	08 dB	<u>Auto</u>	VBW/RBV 1.00000 <u>Man</u>
dB/ Offst 11.8		a galquind and	1R ••••••	*****		~		On	Average 100 <u>Off</u>
dB						A A A A A A A A A A A A A A A A A A A	volecarthurs/40	Avg/\ Auto	/BW Type Pwr (RMS)≛ <u>Man</u>
#PAvg									
V1 V2 Center 5.180 00 G #Res BW 1 MHz	iHz		N 3 MHz		/eep 20 r	•	30 MHz	: Auto	Span/RBW 106 Man

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🔆 Agilent 10:05:39 Dec 22,	1 MID CH 2010		Т	B	///Avg
Ch Freq 5.2 Channel Power	GHz		Trig Free	Auto	Res BV 1.0 MHz <u>Man</u>
RBW 1.0 MHz Project: 10U13548		۵	Mkr1 0 Hz	Auto	Video BW 3.0 MHz <u>Man</u>
Ref 30 dBm Atten #Peak Log 10	30 dB		9.12 dB	<u>Auto</u>	VBW/RBV 1.00000 <u>Man</u>
dB/ Offst 11.8	¢			On	Average 100 <u>Off</u>
dB			Martin Martin	Avg/V Auto	BW Type Pwr (RMS)≛ <u>Man</u>
#PAvg					
V1 V2		Sr.	an 30 MHz		Span/RBW 106
#Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms		<u>Auto</u>	<u>Man</u>

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🔆 Agilent 10:29:03 Dec 22	2, 2010	Т	BW/Avg
Ch Freq 5.2 Channel Power	141 GHz	Trig Free	Res BV 1.0 MHz Auto <u>Ma</u>
RBW 1.0 MHz Project: 10U13548		∆ Mkr1 0 Hz	Video BV 3.0 MHz Auto <u>Ma</u>
Ref 30 dBm Atter #Peak Log 10	1 30 dB	12.10 dB	VBW/RB 1.00000 Auto <u>Ma</u>
dB/ Offst 11.8			Average 100 On <u>Off</u>
dB		har	Avg/VBW Type Pwr (RMS) Auto <u>Ma</u>
#PAvg			-
V1 V2			Span/RBV
Center 5.241 00 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 30 MHz Sweep 20 ms (601 pts)	

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7.1.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (1)

IC RSS-210 A9.3 (1)

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 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.

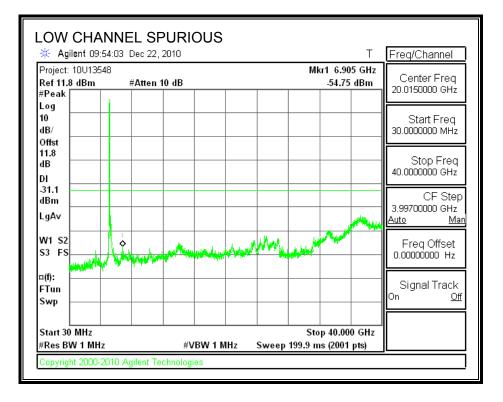
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

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FAX: (510) 661-0888

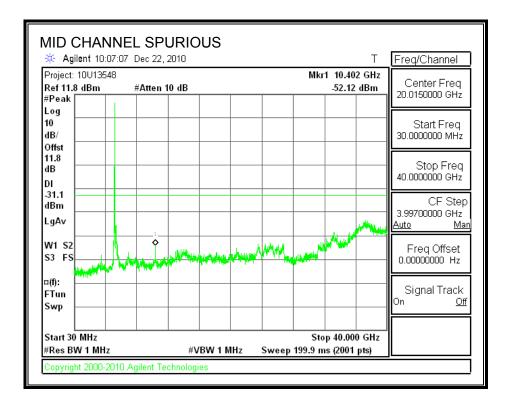
RESULTS

SPURIOUS EMISSIONS

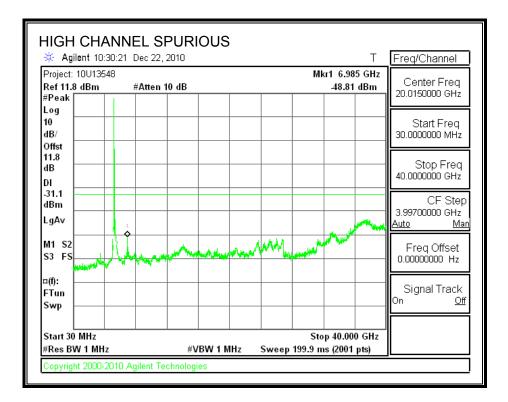


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7.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

7.2.1. 26 dB and 99% 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 measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

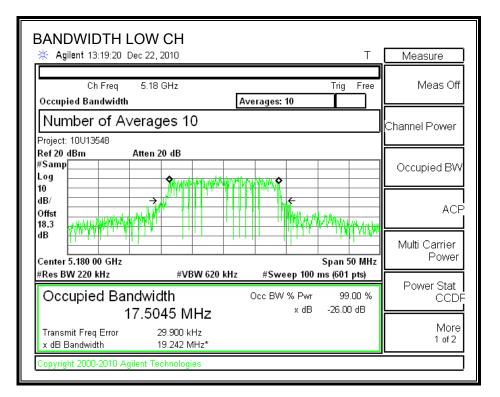
RESULTS

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5180	19.242	17.5045
Middle	5200	19.136	17.5046
High	5240	19.265	17.5307

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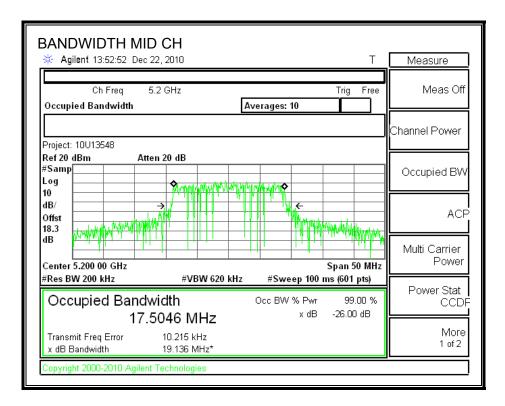
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26 dB and 99% BANDWIDTH



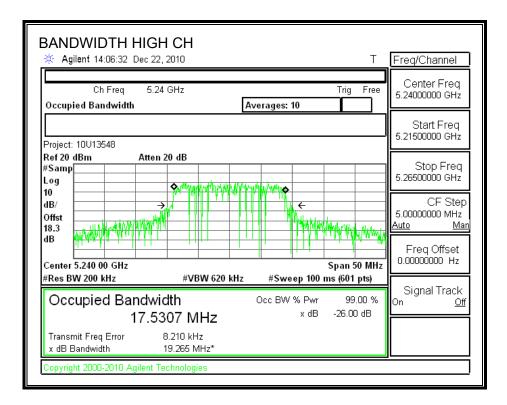
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7.2.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 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.

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.

RESULTS

Limit

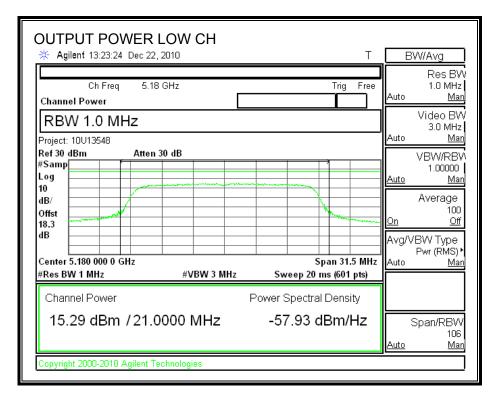
Channel	Frequency	Fixed	В	4 + 10 Log B	Antenna	Limit		
		Limit		Limit	Gain			
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)		
Low	5180	17	19.242	16.84	4.07	16.84		
Mid	5200	17	19.136	16.82	4.07	16.82		
High	5240	17	19.265	16.85	4.07	16.85		

Results

Channel	Frequency	Power Limit		Margin	
	(MHz)	(dBm)	(dBm)	(dB)	
Low	5180	15.29	16.84	-1.55	
Mid	5200	15.00	16.82	-1.82	
High	5240	14.71	16.85	-2.14	

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OUTPUT POWER



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🔆 Agilent 13:55:13 Dec 22,	2010		Τ [[3W/Avg
Ch Freq 5.2 Channel Power	GHz	Trig F	ree Auto	Res BV 1.0 MHz <u>Mar</u>
Project: 10U13548		•		Video BV 3.0 MHz <u>Mar</u>
Ref 30 dBm Atten #Samp Dog	30 dB		Auto	VBW/RBV 1.00000 <u>Mar</u>
dB/ Offst 18.3			<u>On</u>	Average 100 <u>Off</u>
dB		Span 31.5 M		VBW Type Pwr (RMS) <u>Mar</u>
#Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms (601 pts	»	
Channel Power	F	Power Spectral Density		
15.00 dBm /21.0	000 MHz	-58.22 dBm/Hz	Z Auto	Span/RBW 106 <u>Mar</u>

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OUTPUT POWER Agilent 14:08:06 Dec 22		Т	BW/Avg
Ch Freq 5.24 Channel Power	l GHz	Trig Free	Res BW 1.0 MHz Auto <u>Man</u>
RBW 1.0 MHz Project: 10U13548			Video BW 3.0 MHz Auto <u>Man</u>
Ref 30 dBm Atten #Samp Log	30 dB		VBW/RBW 1.00000 <u>Auto Man</u>
10 dB/ Offst 18.3			Average 100 <u>On Off</u>
dB Center 5.240 000 0 GHz		Span 31.5 MHz	Avg/VBW Type Pwr (RMS) • Auto <u>Man</u>
#Res BW 1 MHz Channel Power	#VBW 3 MHz	Sweep 20 ms (601 pts) Power Spectral Density	-
14.71 dBm /21.0			Span/RBW 106 <u>Auto Man</u>
Copyright 2000-2010 Agilent To	echnologies		

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7.2.3. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the peak power spectral density shall not exceed 4 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 or equal to 6 dBi, therefore the limit is 4 dBm.

TEST PROCEDURE

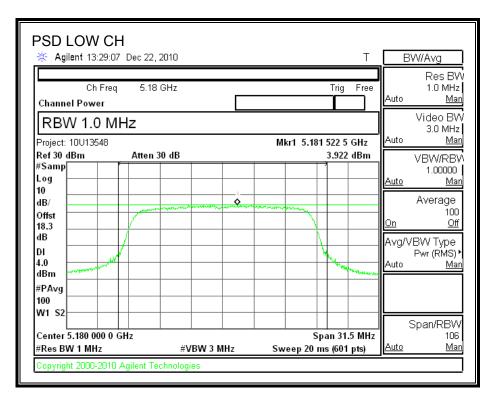
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5180	3.922	4	-0.078
Middle	5200	3.824	4	-0.176
High	5240	3.889	4	-0.111

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POWER SPECTRAL DENSITY



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🔆 Agilent 14:04:46 Dec 22,	2010		T BW/Avg
Ch Freq 5.2 Channel Power	GHz	Trig F	Free Res B\ 1.0 MH; Auto <u>Ma</u>
RBW 1.0 MHz Project: 10U13548		Mkr1 5.200 997 5 G	Video BV 3.0 MH: Hz Auto <u>Ma</u>
Ref 30 dBm Atten #Samp Log 10	30 dB	3.824 dl	Bm VBW/RB 1.00000 Auto Ma
0 dB/ 0 ffst 18.3	-1		Average 100 <u>On Of</u>
dB / / / / / / / / / / / / / / / / / / /			Avg/VBW Type Pwr (RMS) Auto <u>Ma</u>
#PAvg			
W1 S2 Center 5.200 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 31.5 Sweep 20 ms (601 pt	

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🔆 Agilent 14:15:40	Dec 22, 2010	Т	BW/Avg
Ch Freq Channel Power	5.24 GHz	Trig Free	Res B\ 1.0 MH: Auto <u>Ma</u>
RBW 1.0 MI Project: 10U13548	Ηz	Mkr1 5.242 310 0 GHz	Video B\ 3.0 MH: Auto <u>M</u> a
Ref 30 dBm #Samp f Log	Atten 30 dB	3.889 dBm	VBW/RB 1.00000 <u>Auto Ma</u>
10 dB/ Offst 18.3			Average 100 On Of
dB DI 4.0			Avg/VBW Type Pwr (RMS) Auto Ma
dBm			
W1 S2			Span/RBV
#Res BW 1 MHz	HZ #VBW 3 MH;	Span 31.5 MHz Sweep 20 ms (601 pts)	Auto Ma

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7.2.4. 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 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

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5180	9.802	13	-3.198
Middle	5200	8.880	13	-4.120
High	5240	9.690	13	-3.310

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PEAK EXCURSION

🔆 Agilent 13:32:31 Dec 22, 20			Т	B	W/Avg
Ch Freq 5.18 G Channel Power	Hz	Т	rig Free	Auto	Res BV 1.0 MHz <u>Mar</u>
VBW 3.0 MHz Project: 10U13548		ΔN	lkr1 0 Hz	Auto	Video BV 3.0 MHz <u>Mar</u>
Ref 30 dBm Atten 30 #Peak Log	dB		9.802 dB	<u>Auto</u>	VBW/RBV 1.00000 <u>Mar</u>
10 dB/ Offst 18.3		A for the second second		<u>On</u>	Average 100 <u>Off</u>
dB			Mary and	Avg/V Auto	BW Type Pwr (RMS) • <u>Mar</u>
#PAvg					
V1 V2 Center 5.180 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span Sweep 20 ms (31.5 MHz 601 pts)	< Auto	Span/RBVV 106 <u>Mar</u>

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🔆 Agilent 13:58:05 Dec 22	, 2010		Т	BV	WAvg
Ch Freq 5.2 Channel Power	2 GHz	Т	rig Free	Auto	Res BV 1.0 MHz <u>Mar</u>
Project: 10U13548		ΔM	kr1 0 Hz	Auto	Video BV 3.0 MHz <u>Mar</u>
Ref 30 dBm Atten #Peak	30 dB		8.88 dB	, <u>Auto</u>	VBW/RB\ 1.00000 <u>Mai</u>
dB/ Offst 18.3				On	Average 100 <u>Off</u>
dB			New Martines		3W Type ⁹ wr (RMS) ' <u>Ma</u> i
#PAvg					
V1 V2			_		pan/RBV\
Center 5.200 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span Sweep 20 ms (31.5 MHz 601 pts)	<u>Auto</u>	106 <u>Mar</u>

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🔆 Agilent 14:10:44 Dec 22	, 2010		Т	_ E	W/Avg
Ch Freq 5.24 Channel Power	1 GHz		Trig Free	Auto	Res BV 1.0 MHz <u>Ma</u> i
RBW 1.0 MHz Project: 10U13548	E		Δ Mkr1 O Hz	Auto	Video BV 3.0 MHz <u>Ma</u> r
Ref 30 dBm Atten #Peak Log 10	30 dB		9.69 dB	Auto	VBW/RB\ 1.00000 <u>Ma</u> i
dB/ Offst 18.3			<u> </u>	On	Average 100 <u>Off</u>
dB			A Color Contraction	Avg/\ Auto	/BW Type Pwr (RMS) <u>Ma</u> i
#PAvg					
V1 V2				⊫	Span/RBV
Center 5.240 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Sweep 20 r	pan 31.5 MHz ne /601 nte)	Auto	106 Mai

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7.2.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (1)

IC RSS-210 A9.3 (1)

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 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.

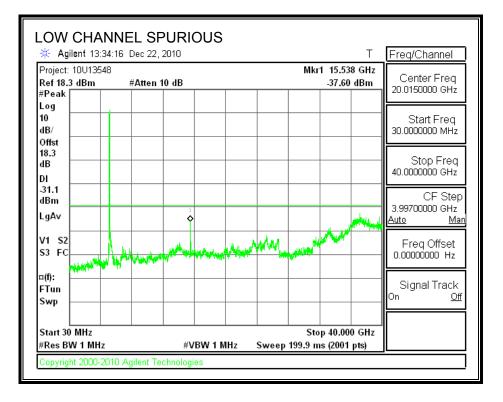
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to EIRP limit, adjusted for the maximum antenna gain.

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

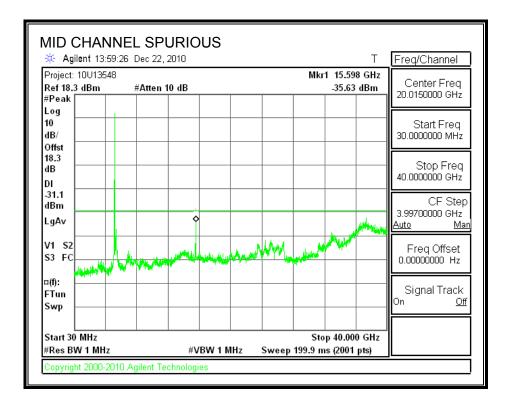
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RESULTS

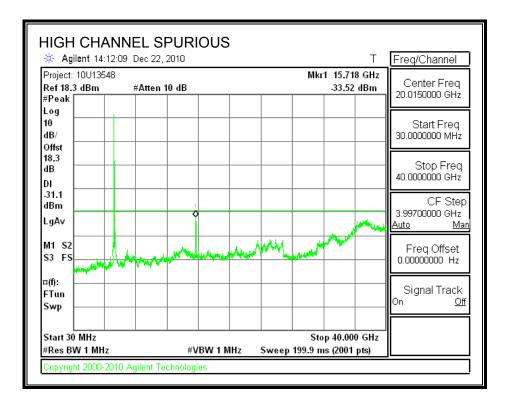
SPURIOUS EMISSIONS



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7.3. 802.11a MODE IN THE 5.3 GHz BAND

7.3.1. 26 dB and 99% 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 measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

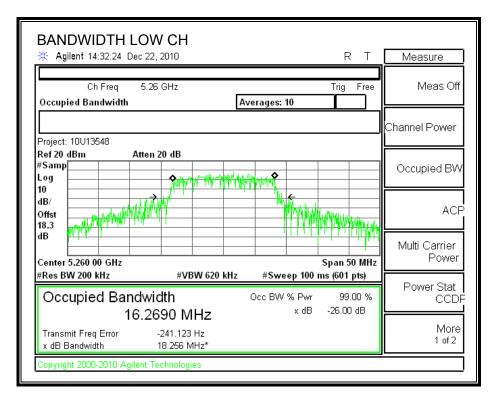
RESULTS

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5260	18.256	16.269
Middle	5300	18.988	16.3014
High	5320	18.505	16.2731

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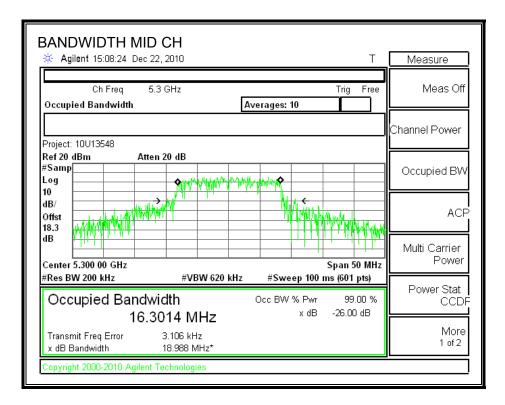
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26 dB and 99% BANDWIDTH

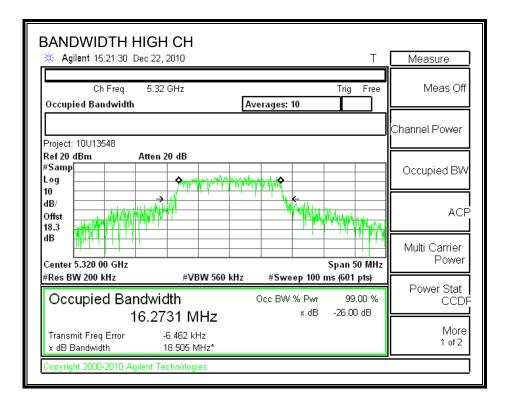


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7.3.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25-5.35 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.

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.

RESULTS

Limit

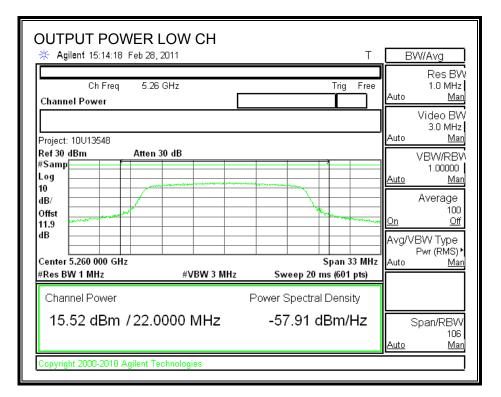
Frequency	Fixed	В	11 + 10 Log B	Antenna	Limit
	Limit		Limit	Gain	
(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
5260	24	18.256	23.61	4.20	23.61
5300	24	18.988	23.78	4.20	23.78
5320	24	18.505	23.67	4.20	23.67
	(MHz) 5260 5300	Limit (MHz) (dBm) 5260 24 5300 24	Limit Limit (MHz) (dBm) (MHz) 5260 24 18.256 5300 24 18.988	Limit Limit Limit (MHz) (dBm) (MHz) (dBm) 5260 24 18.256 23.61 5300 24 18.988 23.78	Limit Limit Gain (MHz) (dBm) (MHz) (dBm) (dBi) 5260 24 18.256 23.61 4.20 5300 24 18.988 23.78 4.20

Results

Channel	Frequency	Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5260	15.52	23.61	-8.09
Mid	5300	15.50	23.78	-8.28
High	5320	15.38	23.67	-8.29

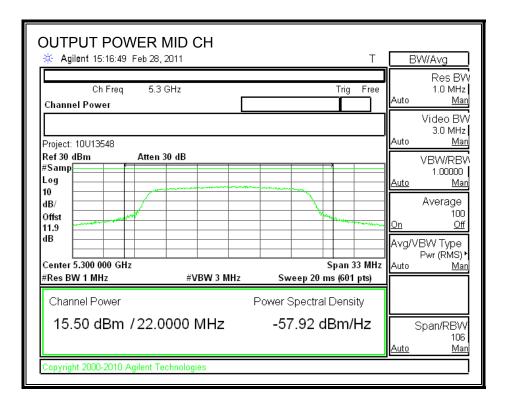
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OUTPUT POWER



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🔆 Agilent 15:21:14 Feb 28	, 2011	-		3W/Avg
Ch Freq 5.32 Channel Power	2 GHz	Trig Fr	ee Auto	Res BV 1.0 MHz <u>Mar</u>
Project: 10U13548			Auto	Video BW 3.0 MHz <u>Mar</u>
Ref 30 dBm Atten #Samp Dog	30 dB		Auto	VBW/RBV 1.00000 <u>Mar</u>
dB/ Offst 11.9			<u>On</u>	Average 100 <u>Off</u>
dB Center 5.320 000 GHz		Span 33 M	Hz Auto	/BW Type Pwr (RMS)∙ <u>Mar</u>
#Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms (601 pts)		
Channel Power	I	Power Spectral Density		
15.38 dBm /22.0	0000 MHz	-58.04 dBm/Hz	Auto	Span/RBW 106 Mar

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7.3.3. 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 less than or equal to 6 dBi, therefore the limit is 11 dBm.

TEST PROCEDURE

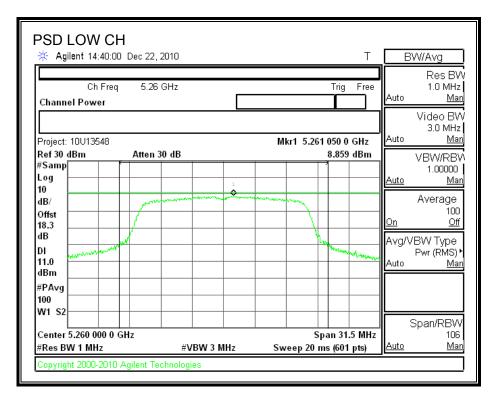
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5260	8.859	11	-2.141
Middle	5300	9.105	11	-1.895
High	5320	9.173	11	-1.827

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POWER SPECTRAL DENSITY



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🔆 Agilent 15:11:44 Dec	22, 2010				Т	B	/V/Avg
Ch Freq Channel Power	5.3 GHz			Trig	Free	Auto	Res B\ 1.0 MHz <u>Ma</u>
RBW 1.0 MHz Project: 10U13548			Mkr1 5.30'	1 995 0	GHz	Auto	Video BV 3.0 MHz <u>Ma</u>
#Samp Log	ten 30 dB	1		9.105	dBm	<u>Auto</u>	VBW/RB 1.00000 <u>Ma</u>
10 dB/ Offst 18.3						<u>On</u>	Average 100 <u>Of</u>
dB DI 11.0 dBm				An ever	manifel marine	Avg/V Auto	BW Type Pwr (RMS) <u>Ma</u>
#PAvg 100 W1 S2							
Center 5.300 000 0 GHz #Res BW 1 MHz	#VBW 3 N	IHz	Sweep 20 n	pan 31. ns (601		S <u>Auto</u>	Span/RBV 108 <u>Ma</u>

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🔆 Agilent 15:24	:45 Dec 22,1	2010					Т		W/Avg
Ch Fr Channel Power	eq 5.32	GHz				Trig	Free	Auto	Res B' 1.0 MH <u>Ma</u>
Project: 10U13548				Mkr1	5.321			Auto	Video B ^v 3.0 MH <u>M</u> a
Ref 30 dBm #Samp	Atten 3	0 dB				9.173 1	dBm		VBW/RE
Log 10			1					<u>Auto</u>	1.00000 <u>M</u> a
dB/		and a second second second	- and a second	an all the second	~				Average
Offst 18.3								<u>On</u>	10 <u>O</u>
dB	and the				1			Augo	/BW Type
DI wearing and 11.0						wayly by	ad an an she have no way as	Auto	Pwr (RMS)
#PAvg									
100									
W1 S2									Span/RBV
Center 5.320 000 #Res BW 1 MHz	0 GHz	#VBW	2 MU-	Swee	•		.5 MHz	Auto	10 10

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7.3.4. 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 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.

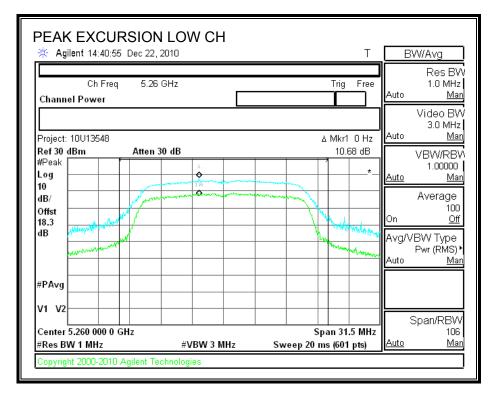
Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5260	10.680	13	-2.320
Middle	5300	10.380	13	-2.620
High	5320	10.190	13	-2.810

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PEAK EXCURSION



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🔆 Agilent 15:12:51 Dec 22,	2010		Т	В	W/Avg
Ch Freq 5.3 Channel Power	GHz		Trig Free	Auto	Res BV 1.0 MHz <u>Mar</u>
RBW 1.0 MHz Project: 10U13548		۵	Mkr1 0 Hz	Auto	Video BV 3.0 MHz <u>Mar</u>
Ref 30 dBm Atten 3 #Peak Log 10		ang utilities of present all galagements	10.38 dB	<u>Auto</u>	VBW/RBV 1.00000 <u>Mar</u>
dB/ Offst 18.3	en an	manument of the	humphonest with the state of th	On	Average 100 <u>Off</u>
dB			And washington	A∨g/\ Auto	/BW Type Pwr (RMS) • <u>Mar</u>
#PAvg					
V1 V2					Span/RBW
Center 5.300 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Spa Sweep 20 ms	n 31.5 MHz (601 pts)	<u>Auto</u>	106 <u>Mar</u>

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🔆 Agilent 15:25:26 Dec 22,	2010		Т	B	W/Avg
Ch Freq 5.32 Channel Power	GHz	T	rig Free	Auto	Res B\ 1.0 MH; <u>Ma</u>
Project: 10U13548		ΔM	kr1 0 Hz	Auto	Video B\ 3.0 MH; <u>Ma</u>
Ref 30 dBm Atten #Peak Log 10	30 dB		10.19 dB	<u>Auto</u>	VBW/RB 1.00000 <u>Ma</u>
dB/ Offst 18.3		V	allyland in	On	Average 100 <u>Of</u>
dB			White days they are a	Avg/V Auto	/BW Type Pwr (RMS) <u>Ma</u>
#PAvg					
V1 V2			_		Span/RBV
Center 5.320 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span Sweep 20 ms (31.5 MHz 601 pts)	Auto .	эран/ком 108 <u>Ма</u>

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7.3.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (2)

IC RSS-210 A9.3 (2)

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.

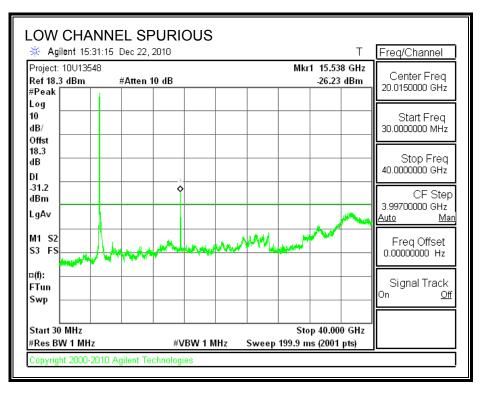
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

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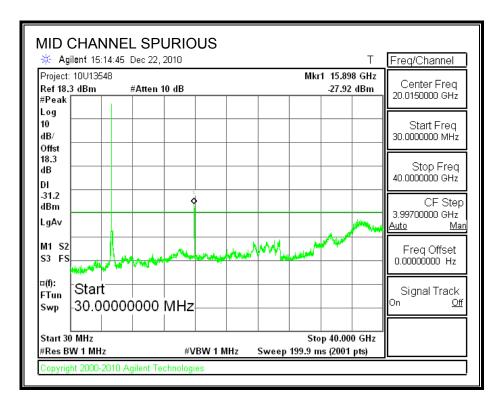
RESULTS

SPURIOUS EMISSIONS

See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



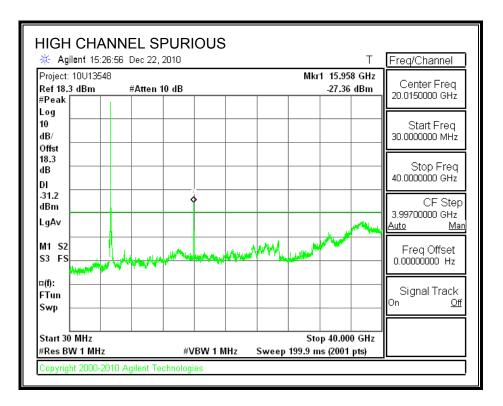
 COMPLIANCE CERTIFICATION SERVICES (UL CCS)
 FORM NO: CCSUP4701D

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See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



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RESULTS

SPURIOUS EMISSIONS

For the failing conducted spurious a radiated measurement was performed for EIRP and it passed as shown in the data below.

			uency Fundame e Certification Se					
	: 10U1354 12/23/10 ineer: Tom ch ation: EUT only TX mode, 11a) Ien Y						
f GHz	SA reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Ant. Pol. (H/∨)	Notes
15.54	-37.5	5.7	15.0	-28.2	-27.0	-1.2	Н	
	-38.7	5.7	15.0	-29.4	-27.0	-2.4	V	

		Compliance	e Certification Se	ervices Cl	namber E	3		
roject #:		-						
ate:	12/23/10							
•	neer: Tom ch							
onfigura lode:	tion: EUT only							
ode:	TX mode, 11a	1 5500 WITZ						
f	SA reading	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Ant. Pol.	Notes
GHz	(dBm)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	(H/∨)	
45.00	20.4	6.7	45.0		07.0			
15.90 15.90	-39.1 -40.3	5.7 5.7	<u> </u>	-29.8 -31.0	-27.0 -27.0	-2.8 -4.0	H V	
15.50	40.5		15.0	-51.0	-21.0	-1.0	•	
v. 1.24.7								

REPORT NO: 10U13548-2A FCC ID: BCGA1395

10U13548 12/23/10 Tom chen EUT only							
node, 11a 53	20MHz						
reading Ca dBm)	able Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Ant. Pol. (H/∨)	Notes
-38.5 -39.7	5.7 5.7	15.0 15.0	-29.2 -30.4	-27.0 -27.0	-2.2 -3.4	H V	
	reading Ca JBm) -38.5	1Bm) (dB) -38.5 5.7	reading Cable Loss Antenna Gain IBm) (dB) (dBi) 38.5 5.7 15.0	reading Cable Loss Antenna Gain EIRP IBm) (dB) (dBi) (dBm) 38.5 5.7 15.0 -29.2	reading Cable Loss Antenna Gain EIRP Limit IBm) (dB) (dBi) (dBm) (dBm) 38.5 5.7 15.0 -29.2 -27.0	reading Cable Loss Antenna Gain BIRP Limit Delta (dBm) (dB) (dBi) (dBm) (dBm) (dBm) 38.5 5.7 15.0 -29.2 -27.0 -2.2	reading Cable Loss Antenna Gain (dBn) (dBn) (dBm) (dBm) (dBm) (dBm) (dBm) (dBm) (dBm) (dBm) (dBm) (H/V) (H/V

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7.4. 802.11n HT20 MODE IN THE 5.3 GHz BAND

7.4.1. 26 dB and 99% 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 measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

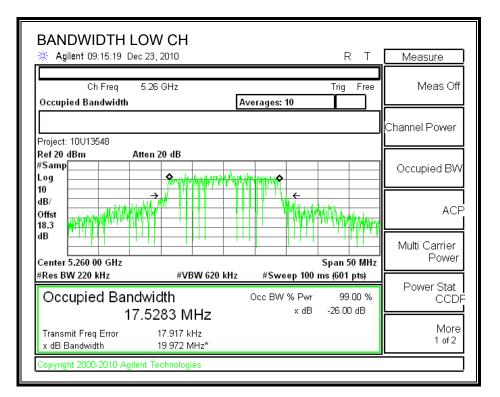
RESULTS

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5260	19.972	17.5283
Middle	5300	19.421	17.5064
High	5320	19.839	17.5242

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26 dB and 99% BANDWIDTH

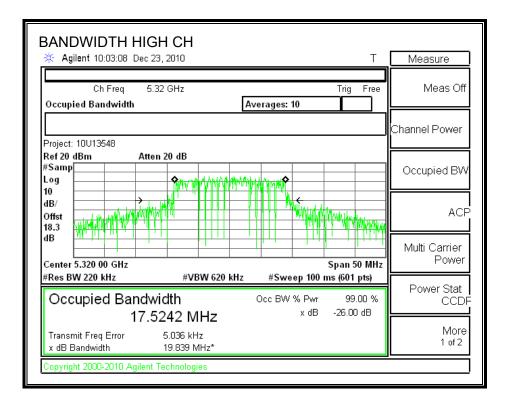


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BANDWIDTH MID CH	Т	Measure
Ch Freq 5.3 GHz Trig F Occupied Bandwidth Averages: 10	Free	Meas Off
Project: 10U13548		Channel Power
Ref 20 dBm Atten 20 dB #Samp Log		Occupied BW
10 dB/ Offst 18.3 dB	t t t t t t t t t t t t t t t t t t t	ACP
Center 5.300 00 GHz Span 50 #Res BW 220 kHz #VBW 620 kHz #Sweep 100 ms (601 pt		Multi Carrier Power
Occupied Bandwidth Occ BW % Pwr 99.00 17.5064 MHz x dB -26.00 d)%	Power Stat CCDF
Transmit Freq Error -1.053 kHz x dB Bandwidth 19.421 MHz*		More 1 of 2
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7.4.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25-5.35 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.

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.

RESULTS

Limit

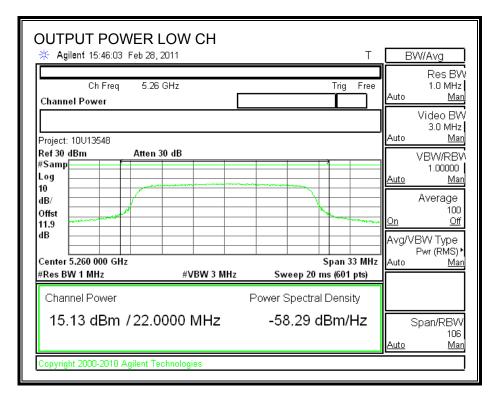
E 11111						
Channel	Frequency	Fixed	В	11 + 10 Log B	Antenna	Limit
		Limit		Limit	Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5260	24	19.972	24.00	4.20	24.00
Mid	5300	24	19.421	23.88	4.20	23.88
High	5320	24	19.839	23.98	4.20	23.98

Results

Channel	Frequency	Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5260	15.13	24.00	-8.87
Mid	5300	15.11	23.88	-8.77
High	5320	15.12	23.98	-8.86

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OUTPUT POWER



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OUTPUT POWER MID CH	BW/Avg
Ch Freq 5.3 GHz Trig Free Channel Power	Res BW 1.0 MHz Auto <u>Man</u>
Project: 10U13548 Ref 30 dBm Atten 30 dB	Video BW 3.0 MHz Auto <u>Man</u> VBW/RBW
#Samp Log 10 dB/	1.00000 <u>Auto Man</u> Average
	100 <u>On Off</u> Avg/VBW Type Pwr (RMS) ^
Center 5.300 000 GHz Span 33 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts)	
Channel Power Dever Spectral Density 15.11 dBm / 22.0000 MHz -58.31 dBm/Hz	Span/RBW 106 <u>Auto Man</u>
Copyright 2000-2010 Agilent Technologies	

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🔆 Agilent 15:42:51 Feb 28,	2011	Т	BV	W/Avg
Ch Freq 5.32 Channel Power	GHz	Trig Free	e Auto	Res BM 1.0 MHz <u>Man</u>
Project: 10U13548		•	Auto	Video BW 3.0 MHz <u>Man</u>
Ref 30 dBm Atten #Samp Log 10	30 dB		<u>Auto</u>	VBW/RBV 1.00000 <u>Mar</u>
dB/ Offst 11.9 dB			<u>On</u>	Average 100 <u>Off</u>
Center 5.320 000 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 33 MH Sweep 20 ms (601 pts)		BW Type Pwr (RMS)► <u>Man</u>
Channel Power	ŀ	Power Spectral Density		
15.12 dBm /22.0	000 MHz	-58.31 dBm/Hz	S <u>Auto</u>	pan/RBW 106 <u>Mar</u>

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7.4.3. 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 less than or equal to 6 dBi, therefore the limit is 11 dBm.

TEST PROCEDURE

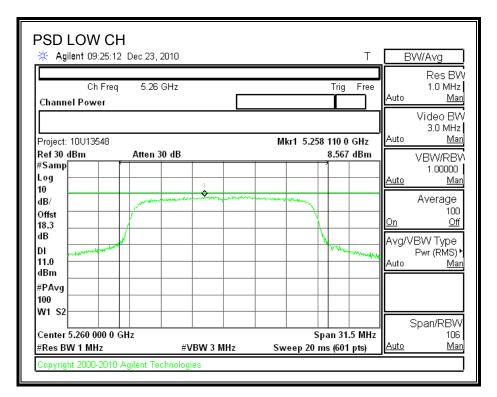
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5260	8.567	11	-2.433
Middle	5300	8.799	11	-2.201
High	5320	8.153	11	-2.847

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POWER SPECTRAL DENSITY



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🔆 Agilent 09:55:11	Dec 23, 2010				Т	В	W/Avg
Ch Freq Channel Power	5.3 GHz			Trij	g Free	Auto	Res B [*] 1.0 MH <u>M</u> a
Project: 10U13548			Mkr1 5.3			Auto	Video B\ 3.0 MH: <u>Ma</u>
Ref 30 dBm #Samp	Atten 30 dB			8.79	9 dBm		VBW/RB
Log		1				<u>Auto</u>	1.00000 <u>Ma</u>
dB/	James and a second	American and the second	and a second				Average
Offst 18.3	1					<u>On</u>	01
dB	/			N.		Ava/v	/BW Type
DI and the second second					human	Auto	Pwr (RMS)
dBm						Auto	<u>Ma</u>
#PAvg							
100 W1 S2							
VVI 52							Span/RBV
Center 5.300 000 0 G	Hz			•	1.5 MHz		. 100
#Res BW 1 MHz	#	VBW 3 MHz	Sweep 20	ms (6()1 pts)	<u>Auto</u>	<u>Ma</u>

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🔆 Agilent 10:08:0	11 Dec 23,	2010							T	В	W/Avg
Ch Free Channel Power	a 5.32	GHz						Trig	Free	Auto	Res B ¹ 1.0 MH <u>Ma</u>
Project: 10U13548					М	kr1 5.32				Auto	Video B ¹ 3.0 MH <u>Ma</u>
Ref 30 dBm #Samp	Atten	30 dB					8 च्य	3.153	dBm		VBW/RB
Log 10				1						<u>Auto</u>	1.00000 <u>Ma</u>
dB/	1 porter	man		an a	- and a start of the	have					Average
Offst 18.3	1/									On	10(Of
dB							N			AvaA	/BW Type
DI Marken Marken 11.0 dBm								and a start of	humana	Auto	Pwr (RMS)
#PAvg											
100											
W1 S2											Span/RBV
Center 5.320 000 0	GHz	<u> </u>				s	Spa	n 31	.5 MHz		Spanikov 10
#Res BW 1 MHz		#VE	3 W 3 M	IHz	Sw	eep 20	ms	(601	pts)	<u>Auto</u>	<u>Ma</u>

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7.4.4. EAK 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 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

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5260	9.80	13	-3.20
Middle	5300	8.89	13	-4.11
High	5320	9.16	13	-3.84

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PEAK EXCURSION

PEAK EXCURSION L			Т	BV	W/Avg
Ch Freq 5.26 GHz Channel Power			Trig Free	Auto	Res BV 1.0 MHz <u>Mar</u>
Project: 10U13548		۵۱	Mkr1 0 Hz	Auto	Video BW 3.0 MHz <u>Mar</u>
Ref 30 dBm Atten 30 d #Peak Log 10		energen 1	9.80 dB	Auto	VBW/RBV 1.00000 <u>Mar</u>
dB/ Offst 18.3	<u></u>	and the second s	Nhusally of the free of	On	Average 100 <u>Off</u>
dB			and the second second		BW Type Pwr (RMS) • <u>Mar</u>
#PAvg					
V1 V2		Spa	n 31.5 MHz	S	pan/RBW
#Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms		<u>Auto</u>	<u>Mar</u>

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🔆 Agilent 09:56:56 Dec 23,	, 2010		T BW/Avg
Ch Freq 5.3 Channel Power	GHz	Trig Fi	ree Res BV 1.0 MHz Auto <u>Ma</u>
Project: 10U13548		∆ Mkr1 0	
Ref 30 dBm Atten #Peak Log 10	30 dB	8.89 d	B VBW/RB\ _* <u>Auto Ma</u>
dB/ Offst 18.3		and the second sec	Average 100 On <u>Off</u>
dB			AVON/RW/TUDO
#PAvg			
V1 V2			Span/RBV
Center 5.300 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 31.5 M Sweep 20 ms (601 pts	1Hz 106

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🔆 Agilent 10:09:03 Dec 23	, 2010		Т	B	W/Avg
Ch Freq 5.3 Channel Power	2 GHz	Tri	g Free	Auto	Res B\ 1.0 MHz <u>Ma</u>
Project: 10U13548			r1 0 Hz	Auto	Video BV 3.0 MHz <u>Ma</u>
Ref 30 dBm Atten #Peak Log 10	30 dB		9.16 dB	<u>Auto</u>	VBW/RB ¹ 1.00000 <u>Ma</u>
dB/ Offst				On	Average 100 <u>Of</u>
dB			Marine Marine Marine	Avg/V Auto	BW Type Pwr (RMS) <u>Ma</u>
#PAvg					
V1 V2					Span/RBV
Center 5.320 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 3 Sweep 20 ms (60	1.5 MHz)1 pts)	<u>Auto</u>	108 <u>Ma</u>

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7.4.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (2)

IC RSS-210 A9.3 (2)

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.

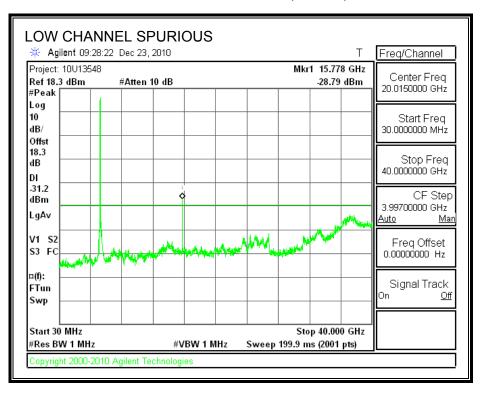
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

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RESULTS

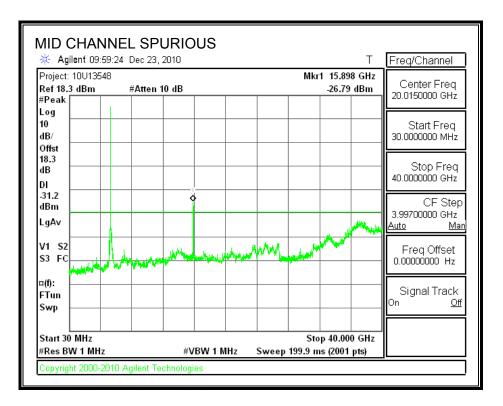
SPURIOUS EMISSIONS

See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



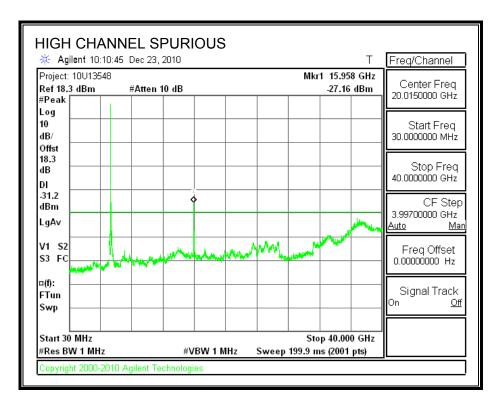
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See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



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See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



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RESULTS

SPURIOUS EMISSIONS

For the failing conducted spurious a radiated measurement was performed for EIRP and it passed as shown in the data below.

			US Jency Fundame Certification Se					
-	10U1354 12/23/10 neer: Tom ch tion: EUT only TX mode, HT	en V						
f GHz	SA reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Ant. Pol. (H/∨)	Notes
15.78 15.78	-39.5 -40.7	5.7 5.7	15.0 15.0	-30.2 -31.4	-27.0 -27.0	-3.2 -4.4	H V	

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			uency Fundame Certification Se					
-	10U1354 12/23/10 ineer: Tom ch ation: EUT only TX mode, HT	en /						
f GHz	SA reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Ant. Pol. (H/∨)	Notes
	-38.1	5.7	15.0	-28.8	-27.0	-1.8	Н	
15.90		5.7	15.0	-30.0	-27.0	-3.0	V	
15.90 15.90	-39.3	A						

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			uency Fundame Certification Se					
Project #:	10U1354	8						
Date:	12/23/10							
-	neer: Tom ch							
•	ation: EUT only	,						
lode:	TX mode, HT	20 5320MHz						
f	SA reading	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Ant. Pol.	Notes
GHz	(dBm)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	(H/∨)	
15.96 15.96	-38.3 -39.5	5.7 5.7	15.0 15.0	-29.0 -30.2	-27.0 -27.0	-2.0 -3.2	H V	
13.30	-33.3	5.1	13.0	-30.2	-21.0	-3.2	V	
ev. 1.24.7								
w. 1.24.7								

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7.5. 802.11a MODE IN THE 5.6 GHz BAND

7.5.1. 26 dB and 99% 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 measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

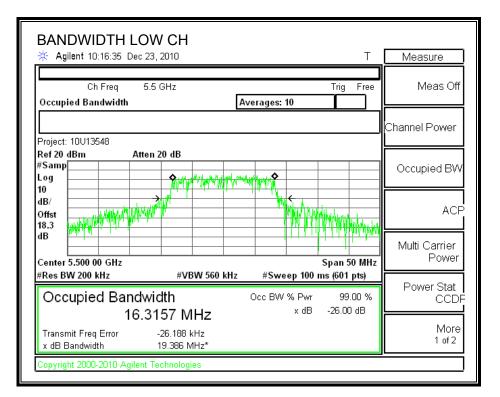
RESULTS

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5500	19.386	16.3157
Middle	5600	18.84	16.3312
High	5700	19.589	16.2553

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26 dB and 99% BANDWIDTH



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BANDWIDTH MID CH	T Measure
Ch Freq 5.6 GHz Occupied Bandwidth Averages:	Trig Free Meas Off
Project: 10U13548	Channel Power
Ref 20 dBm Atten 20 dB #Samp Log	Occupied BW
10 dB/ Offst 18.3	ACP
Center 5.600 00 GHz	Multi Carrier Span 50 MHz Power
	eep 100 ms (601 pts)
Occupied Bandwidth Occ BW 16.3312 MHz	/ % Pwr 99.00 % x dB -26.00 dB
Transmit Freq Error -9.132 kHz x dB Bandwidth 18.840 MHz*	More 1 of 2
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BANDWIDTH HIGH CH	Freq/Channel
Ch Freq 5.7 GHz Trig Free Occupied Bandwidth	Center Freq 5.7000000 GHz
Project: 10U13548	Start Freq 5.67500000 GHz
Ref 20 dBm Atten 20 dB #Samp Log	Stop Freq 5.7250000 GHz
10 dB/ Offst 18.3 dB	CF Step 5.0000000 MHz <u>Auto Man</u>
Center 5.700 00 GHz Span 50 MHz #Res BW 200 kHz #VBW 560 kHz #Sweep 100 ms (601 pts)	Freq Offset 0.00000000 Hz
Occupied Bandwidth Occ BW % Pwr 99.00 % 16.2553 MHz x dB -26.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error 72.442 kHz x dB Bandwidth 19.589 MHz*	
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7.5.2. 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.

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.

RESULTS

Limit

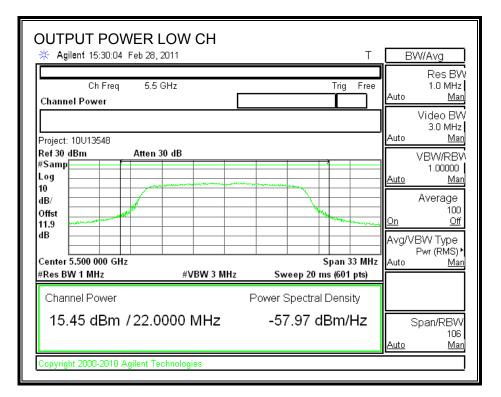
Channel	Frequency	Fixed	В	11 + 10 Log B	Antenna	Limit
		Limit		Limit	Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5500	24	19.386	23.87	4.21	23.87
Mid	5600	24	18.84	23.75	4.21	23.75
High	5700	24	19.589	23.92	4.21	23.92

Results

Channel	Frequency	Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5500	15.45	23.87	-8.42
Mid	5600	15.30	23.75	-8.45
High	5700	15.27	23.92	-8.65

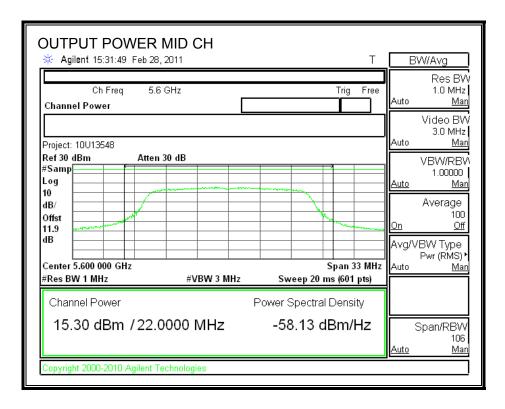
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OUTPUT POWER



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🔆 Agilent 15:33:12 Feb 28	, 2011	Т	· E	3W/Avg
Ch Freq 5.7 Channel Power	GHz	Trig Fre	e Auto	Res BV 1.0 MHz <u>Mar</u>
Project: 10U13548			Auto	Video BV 3.0 MHz <u>Mar</u>
Ref 30 dBm Atten #Samp Dog 10	30 dB		Auto	VBW/RBV 1.00000 <u>Mar</u>
dB/ Offst 11.9		Man and a second s	<u>On</u>	Average 100 <u>Off</u>
dB		Span 33 Mł		/BW Type Pwr (RMS)∙ <u>Mar</u>
#Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms (601 pts)		
Channel Power		Power Spectral Density		
15.27 dBm /22.0	0000 MHz	-58.15 dBm/Hz	Auto	Span/RBW 106 <u>Mar</u>

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7.5.3. 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 or equal to 6 dBi, therefore the limit is 11 dBm.

TEST PROCEDURE

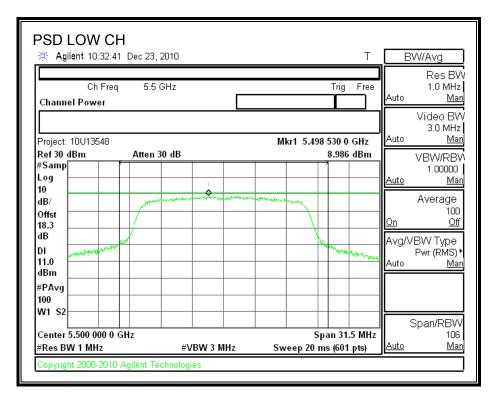
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5500	8.986	11	-2.014
Middle	5600	9.055	11	-1.945
High	5700	8.725	11	-2.275

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POWER SPECTRAL DENSITY



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PSD MID CH <u>*</u> Agilent 10:44:17 Dec 23	3, 2010		Т	BW/Avg
Ch Freq 5. Channel Power	6 GHz	Trig	Free Au	Res B ⁾ 1.0 MH: ito <u>Ma</u>
Project: 10U13548		Mkr1 5.598 162 5 G		Video B\ 3.0 MH to <u>Ma</u>
Ref 30 dBm Atter #Samp Log 10	1 30 dB	9.055 d		VBW/RB 1.00000 <u>ito Ma</u>
dB/ Offst 18.3		and a second sec		Average 100 1 01
dB DI Market Mar				/g/VBW Type Pwr (RMS) Ito Ma
dBm #PAvg 100				
W1 S2		Span 31.5	MHz	Span/RBV 100
#Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms (601 p	II.	<u>ito Ma</u>

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Agilent 10:59:53 Dec 23	, 2010	I	BW/Avg
Ch Freq 5.7 Channel Power	GHz	Trig Free	Res B 1.0 MH Auto <u>Ma</u>
Project: 10U13548		Mkr1 5.701 050 0 GHz	Video B ¹ 3.0 MH Auto <u>Ma</u>
#Samp	30 dB	8.725 dBm	VBW/RB
Log 10	1		Auto Ma
dB/ Offst 18.3			- Average - 100 <u>On O</u>
dB			Ava/VBW/Type
DI harryye Mult ^{ay} 11.0 dBm		and the second s	Auto <u>Ma</u>
#PAvg			_
W1 S2			
Center 5.700 000 0 GHz		Span 31.5 MHz	Span/RBV

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7.5.4. 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

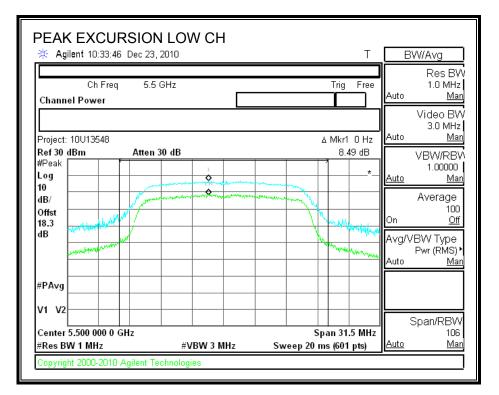
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

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

RESULTS

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5500	8.49	13	-4.51
Middle	5600	8.78	13	-4.22
High	5700	9.26	13	-3.74

PEAK EXCURSION



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🔆 Agilent 10:44:57 Dec 23	, 2010		Т	B۱	/V/Avg
Ch Freq 5.6 Channel Power	GHz	T	rig Free	Auto	Res BV 1.0 MHz <u>Ma</u>
Project: 10U13548		ΔM	lkr1 0 Hz	Auto	Video BV 3.0 MHz <u>Ma</u>
Ref 30 dBm Atten #Peak Log 10			8.78 dB	<u>Auto</u>	VBW/RB ⁾ 1.00000 <u>Ma</u>
dB/ Offst 18.3 dB		and the second s	sh.ut.	On	Average 100 <u>Off</u>
dB			Martin Martin	Avg/V Auto	BVV Type Pwr (RMS) <u>Ma</u>
#PAvg					
V1 V2					pan/RBV
Center 5.600 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span Sweep 20 ms (31.5 MHz 601 nte)	Auto	106 Ma

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🔆 Agilent 11:01:47 Dec 23	, 2010		Т	В	W/Avg
Ch Freq 5.7 Channel Power	' GHz	T	rig Free	Auto	Res B\ 1.0 MH: <u>Ma</u>
Project: 10U13548		ΔM	lkr1 0 Hz	Auto	Video BV 3.0 MHz <u>Ma</u>
Ref 30 dBm Atten #Peak Log 10	30 dB		9.26 dB	<u>Auto</u>	VBW/RB ¹ 1.00000 <u>Ma</u>
dB/ Offst	and the second sec		h.14	On	Average 100 <u>Of</u>
dB Manutanting and a			m marcher	Avg/\ Auto	/BW Type Pwr (RMS) <u>Ma</u>
#PAvg					
V1 V2					Span/RBV
Center 5.700 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Span Sweep 20 ms (31.5 MHz 601 nts)	<u>Auto</u>	108 Ma

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7.5.5. 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.

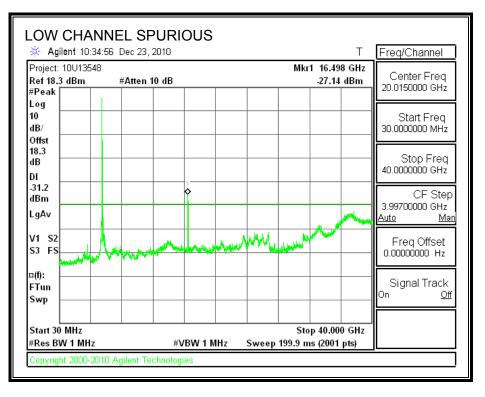
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

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RESULTS

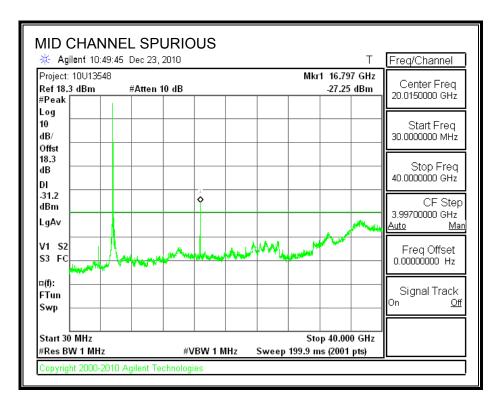
SPURIOUS EMISSIONS

See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



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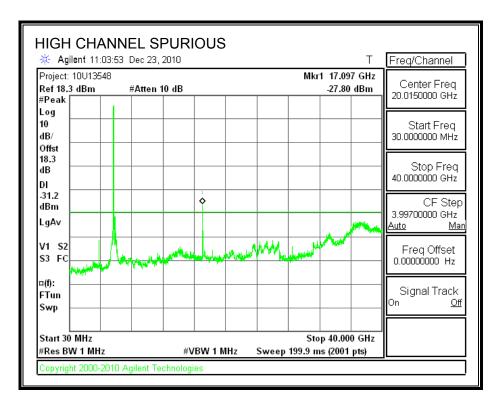
See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



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See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



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SPURIOUS EMISSIONS

For the failing conducted spurious a radiated measurement was performed for EIRP and it passed as shown in the data below.

			uency Fundamer Certification Se					
Configura	10U1354 12/23/10 neer: Tom ch tion: EUT only TX mode, 11a	en /						
f GHz	SA reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Ant. Pol. (H/V)	Notes
16.50 16.50	-38.5 -39.7	5.7 5.7	15.0 15.0	-29.2 -30.4	-27.0 -27.0	-2.2 -3.4	H	

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REPORT NO: 10U13548-2A FCC ID: BCGA1395

	10U13548 12/23/10										
Test Enginee.											
	Test Engineer: Tom chen										
Configuration											
Mode: TX	mode, 11a 5	5600MHz									
f SA	A reading C	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Ant. Pol.	Notes			
GHz	(dBm)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	(H/V)				
16.80 16.80	-38.1	5.7 5.7	15.0	-28.8 -30.0	-27.0	-1.8 -3.0	<u>н</u> V				
10.00	-39.3	3./	15.0	-30.0	-27.0	-3.0	V				

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			ency Fundame Certification Se					
-	10U1354 12/23/10 ineer: Tom ch ation: EUT only TX mode, 11a	en /						
f GHz	SA reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Ant. Pol. (H/∨)	Notes
17.10	-38.5	5.7	15.0	-29.2	-27.0	-2.2	Н	
17.10	-39.7	5.7	15.0	-30.4	-27.0	-3.4	V	
Rev. 1.24.7								

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7.6. 802.11n HT20 MODE IN THE 5.6 GHz BAND

7.6.1. 26 dB and 99% 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 measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

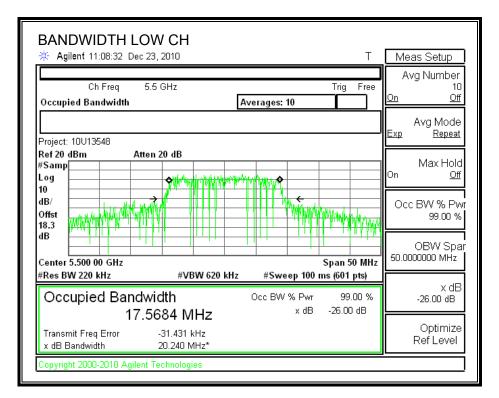
RESULTS

Channel	Frequency	26 dB Bandwidth	99% Bandwidth
	(MHz)	(MHz)	(MHz)
Low	5500	20.24	17.5684
Middle	5600	20.246	17.5237
High	5700	19.851	17.5158

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26 dB and 99% BANDWIDTH



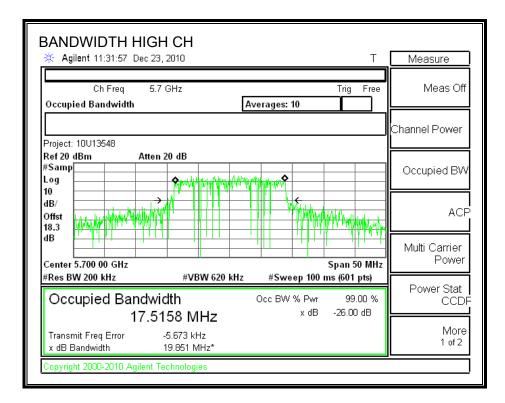
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BANDWIDTH MID CI			Т	Measure
Ch Freq 5.6 GH Occupied Bandwidth	_	verages: 10	Trig Free	Meas Off
Number of Average	s 10]	Channel Power
Ref 20 dBm Atten 20 #Samp Log C	dB			Occupied BW
10 dB/ Offst 18.3 dB		<u> </u>	AMAY ANA ANA ANA ANA ANA ANA ANA ANA ANA A	ACP
Center 5.600 00 GHz #Res BW 220 kHz	#VBW 620 kHz	#Sweep 100	Span 50 MHz	Multi Carrier Power
Occupied Bandwidtl 17.523	า	Occ BW % Pwr x dB	99.00 %	Power Stat CCDF
Transmit Freq Error -4.9	972 kHz 246 MHz*			More 1 of 2
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7.6.2. 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.

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.

RESULTS

Limit

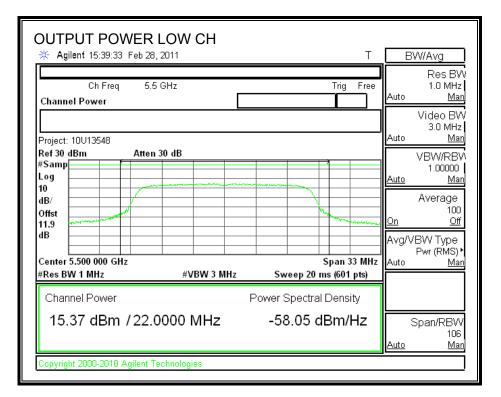
	_		_			
Channel	Frequency	Fixed	В	11 + 10 Log B	Antenna	Limit
		Limit		Limit	Gain	
	(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dBm)
Low	5500	24	20.24	24.06	4.21	24.00
Mid	5580	24	20.246	24.06	4.21	24.00
High	5700	24	19.851	23.98	4.21	23.98

Results

Channel	Frequency	Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5500	15.37	24.00	-8.63
Mid	5580	15.38	24.00	-8.62
High	5700	15.54	23.98	-8.44

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OUTPUT POWER



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OUTPUT POWER		Т	BW/Avg
Ch Freq 5.6 Channel Power	GHz	Trig Free	Res BW 1.0 MHz Auto <u>Man</u>
Project: 10U13548 Ref 30 dBm Atten	30 dB		Video BW 3.0 MHz Auto <u>Man</u> VBW/RBW
#Samp Log 10 dB/ Offst 11.9 dB			1.00000 <u>Auto Man</u> Average 100 <u>On Off</u>
Center 5.600 000 GHz #Res BW 1 MHz	#VBW 3 MHz	Span 33 MHz Sweep 20 ms (601 pts)	Avg/VBW Type Pwr (RMS) • Auto <u>Man</u>
Channel Power 15.38 dBm /22.0	0000 MHz	Power Spectral Density -58.04 dBm/Hz	Span/RBW 106 Auto Man
Copyright 2000-2010 Agilent Te	echnologies		

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🔆 Agilent 15:36:58 Feb 28,	2011	Т	B	W/Avg
Ch Freq 5.7 Channel Power	GHz	Trig Free	e Auto	Res BV 1.0 MHz <u>Mar</u>
Project: 10U13548			Auto	Video BV 3.0 MHz <u>Mar</u>
Ref 30 dBm Atten 3	30 dB		Auto	VBW/RBV 1.00000 <u>Mar</u>
dB/ Offst			<u>On</u>	Average 100 <u>Off</u>
dB		Span 33 MH		/BW Type Pwr (RMS)∙ <u>Mar</u>
#Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms (601 pts)		
Channel Power	I	Power Spectral Density		
15.54 dBm /22.0	000 MHz	-57.89 dBm/Hz	Auto	Span/RBW 106 <u>Mar</u>

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7.6.3. 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 or equal to 6 dBi, therefore the limit is 11 dBm.

TEST PROCEDURE

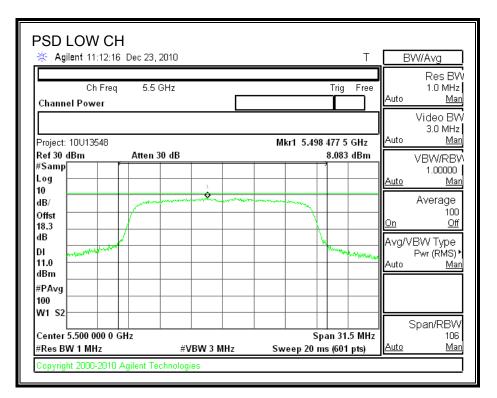
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5500	8.083	11	-2.917
Middle	5600	8.234	11	-2.766
High	5700	8.439	11	-2.561

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POWER SPECTRAL DENSITY



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🔆 Agilent 11:25:59 Dec 23,	2010		T	_ <u> </u>	W/Avg
Ch Freq 5.6 Channel Power	GHz		Trig Free	e Auto	Res B ¹ 1.0 MH <u>Ma</u>
Project: 10U13548		Mkr1 5.59	8 477 5 GHz	Auto	Video B\ 3.0 MH: <u>Ma</u>
Ref 30 dBm Atten 3 #Samp Log			8.234 dBm	Auto	VBW/RB 1.00000 Ma
10 dB/ Offst	1 m,	and the second s			Average
18.3 dB				<u>On</u> Avg/v	<u>Ot</u> /BW Type
DI			and and a second second	Auto	Pwr (RMS) <u>Ma</u>
#PAvg 100 W1 S2					
Center 5.600 000 0 GHz #Res BW 1 MHz		Sweep 20 r	pan 31.5 MH		Span/RBV 100 Ma

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🔆 Agilent 11:35:10 D	ec 23, 2010		Т	BW/Avg	ļ
Ch Freq Channel Power	5.7 GHz		Trig Free		s B\ MH; <u>M</u> a
RBW 1.0 MHz Project: 10U13548	2	Mkr1 5.701	1 312 5 GHz	Video 3.0 Auto	o B∖ MH: <u>Ma</u>
Ref 30 dBm #Samp Log 10	Atten 30 dB	1	8.439 dBm	VBW. 1.00 <u>Auto</u>	/RB 0000 <u>Ma</u>
10 dB/ Offst 18.3				Avera <u>On</u>	age 100 <u>Of</u>
dB DI 11.0 dBm			hanna alimenna	Avg/VBW T Pwr (R Auto	ype MS) <u>Ma</u>
#PAvg 100 W1 S2					
Center 5.700 000 0 GHz #Res BW 1 MHz	#VBW 3 MI	•	oan 31.5 MHz ns (601 pts)	Span/F	RBV 108 <u>M</u> a

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7.6.4. 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 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

Channel	Frequency	Peak Excursion	Limit	Margin
	(MHz)	(dB)	(dB)	(dB)
Low	5500	9.15	13	-3.85
Middle	5600	9.89	13	-3.11
High	5700	9.77	13	-3.23

PEAK EXCURSION

PEAK EXCURSION			т	BV	V/Ava
Ch Freq 5.5 (Channel Power		Trig	Free	Auto	Res BW 1.0 MHz <u>Man</u>
Project: 10U13548		م Mkr1 (Hz	Auto	Video BV 3.0 MHz <u>Man</u>
Ref 30 dBm Atten 3 #Peak Log 10		9.15	dB *	<u>Auto</u>	VBVV/RBV 1.00000 <u>Man</u>
dB/ Offst 18.3				On	Average 100 <u>Off</u>
dB manufacture			herrit a	Avg/VE Auto	BW Type Pwr (RMS)∙ <u>Mar</u>
#PAvg					
V1 V2		Span 31.5	MHz	S	ipan/RBW 106
# Res BW 1 MHz Copyright 2000-2010 Agilent Ter	#VBW 3 MHz chnologies	Sweep 20 ms (601 p		<u>Auto</u>	<u>Man</u>

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PEAK EXCURSION			Т	В	W/Avg
Ch Freq 5.6 Channel Power	GHz		Trig Free	Auto	Res BV 1.0 MHz <u>Ma</u>
Project: 10U13548		1	۸ Mkr1 O Hz	Auto	Video BV 3.0 MHz <u>Ma</u>
Ref 30 dBm Atten 3 #Peak Log 10			9.89 dB	Auto	VBW/RB\ 1.00000 <u>Mar</u>
dB/ Offst 18.3	al and the second s		Mary dury of the state	On	Average 100 <u>Off</u>
dB			harmon and a star	. A∨g/\ Auto	/BW Type Pwr (RMS) <u>Ma</u>
#PAvg					
V1 V2					
Center 5.600 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Sp Sweep 20 m	an 31.5 MHz is (601 pts)	<u>Auto</u>	Span/RBV 106 <u>Ma</u>

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🔆 Agilent 11:35:53 Dec 23,	2010		Т	В	W/Avg
Ch Freq 5.7 Channel Power	GHz		Trig Free	Auto	Res BV 1.0 MHz <u>Ma</u> i
RBW 1.0 MHz Project: 10U13548		۵	Mkr1 0 Hz	Auto	Video BV 3.0 MHz <u>Ma</u>
Ref 30 dBm Atten 3 #Peak Log 10	30 dB		9.77 dB	<u>Auto</u>	VBW/RB\ 1.00000 <u>Mar</u>
dB/ Offst 18.3			La hora matter de la la	On	Average 100 <u>Off</u>
dB (Martin Martin			and	A∨g/\ Auto	/BW Type Pwr (RMS) <u>Ma</u>
#PAvg					
V1 V2					Span/RBV
Center 5.700 000 0 GHz #Res BW 1 MHz	#VBW 3 MHz	Spa Sweep 20 ms	n 31.5 MHz (601 pts)	Auto	106 Mai

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7.6.5. 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.

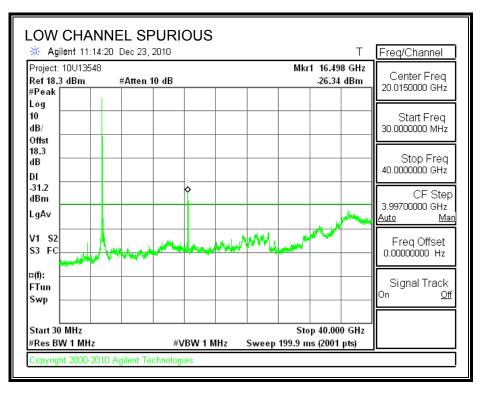
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

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RESULTS

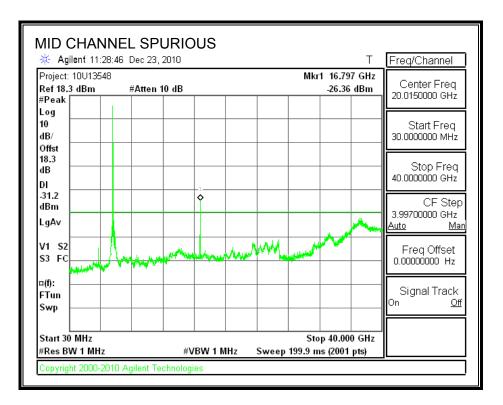
SPURIOUS EMISSIONS

See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



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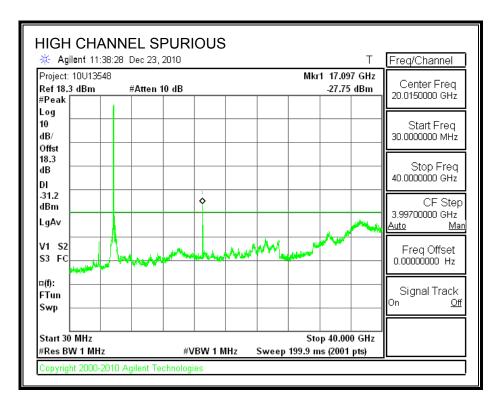
See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



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See radiated EIRP in this section for the conducted spurious point that exceeds the limit line.



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SPURIOUS EMISSIONS

For the failing conducted spurious a radiated measurement was performed for EIRP and it passed as shown in the data below.

			ency Fundame					
onfigurat	10U13544 12/23/10 neer: Tom cho tion: EUT only TX mode, HT2	en						
f GHz	SA reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Ant. Pol. (H/V)	Notes
16.50	-38.5	5.7	15.0	-29.2	-27.0	-2.2	H	
16.50	-39.7	5.7	15.0	-30.4	-27.0	-3.4	V	

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REPORT NO: 10U13548-2A FCC ID: BCGA1395

	10U1354	8						
roject#:)ate:	12/23/10							
Test Engineer: Tom chen								
Configuration: EUT only								
lode:	TX mode, HT	20 5600MHz						
f	SA reading	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Ant. Pol.	Notes
GHz	(dBm)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	(H/V)	
16.80	-38.1	5.7	15.0	-28.8	-27.0	-1.8	Н	
16.80	-39.3	5.7	15.0	-20.0	-27.0	3.0	v v	

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roject#:		-						
Date: Fact En di	12/23/10							
-	ineer: Tom ch ation: EUT only							
Mode:	TX mode, HT							
f	SA reading	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Ant. Pol.	Notes
f GHz	SA reading (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Ant. Pol. (H/V)	Notes
•	-					1		Notes

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.

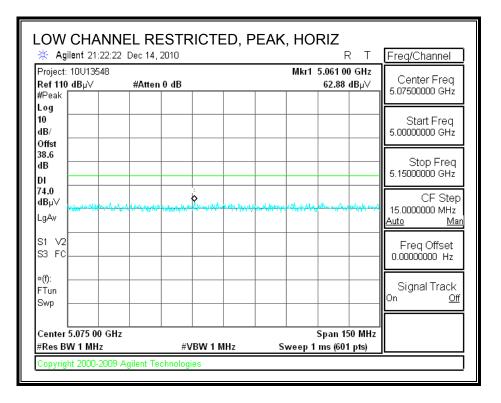
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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. TX ABOVE 1 GHz (802.11a MODE IN THE 5.2 GHz BAND)

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



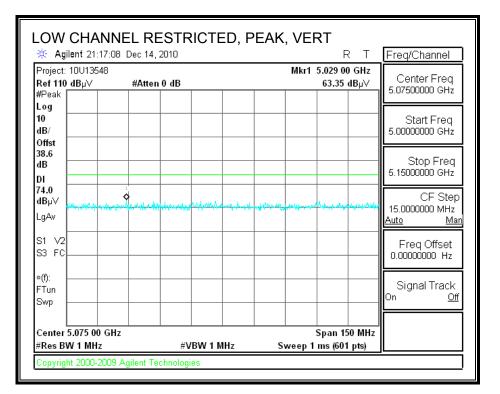
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🔆 Agilent 21:23:	19 Dec 14, 2010	RT	Freq/Channel
Project: 10U13548 Ref 110 dB µ∨ #Peak	#Atten 0 dB	Mkr1 5.147 25 GHz 50.76 dBµ∨	Center Freq 5.07500000 GHz
Log 10 dB/			Start Freq 5.0000000 GHz
Offst 38.6 dB DI			Stop Freq 5.1500000 GHz
54.0 dBµ∀ LqAv			CF Step 15.0000000 MHz
S1 V2 S3 FC			Auto Mar Freq Offset 0.00000000 Hz
»(f): FTun Swp			Signal Track On <u>Off</u>
Center 5.075 00 G #Res BW 1 MHz	Hz #VBW 10 H:	Span 150 MHz z Sweep 11.7 s (601 pts)	*

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



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🔆 Agilent 21:18	:03 Dec 14, 2010	R	T Freq/Channel
Project: 10U13548 Ref 110 dB µ∨ #Peak 	#Atten 0 dB	Mkr1 5.150 00 G 50.79 dB _F	Contor Frog
Log 10 dB/			Start Freq 5.00000000 GHz
Offst 38.6 dB			Stop Freq
DI 54.0 dBµ∨			CF Step 15.000000 MHz
LgAv			Auto Mar
S1 V2 S3 FC			Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track On <u>Off</u>
Omp			
Center 5.075 00 (#Res BW 1 MHz	GHz #VBW 10	Span 150 M Hz Sweep 11.7 s (601 pts)	

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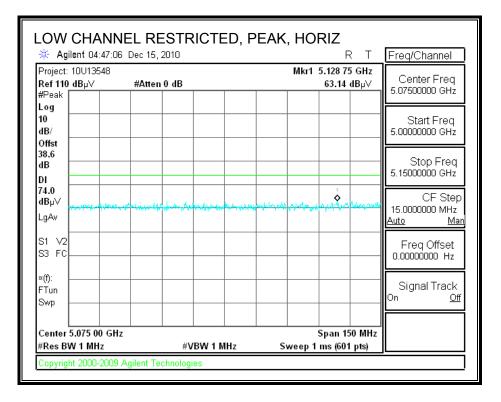
HARMONICS AND SPURIOUS EMISSIONS

High Free Compliar		Measurer tification		s, Fre	mont 51	n Chamb	er						
-													
Test Engr	:	Tom che											
Date:		12/16/10											
Project #:		10U1354											
Test Targ		FCC Cla											
Mode Op	er:	TX mode	, 802.11	a									
	f	Measurer	nent Fred	пенси	Amp	Preamp (Tain			A verage	Field Stren	eth Limit	
	Dist	Distance			-	Distance		ct to 3 me	ters	-	ld Strength	-	
	Read	Analyzer			Avg			trength @			rs. Average		
	AF	Antenna	-		Peak	-		r Field Stre		-	s. Average s. Peak Li		
	CL	Cable Lo:			HPF	High Pas			ing tit	wargin /	5. Fear LD		
f	Dist	Read	AF	CL	Атр	D Согг	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	
5180 MH			1					1				L	
10.360	3.0	36.7	37.4	8.9	-34.6	0.0	0.8	49.2	74.0	-24.8	H	Р	
10.360	3.0	24.5	37.4	8.9	-34.6	0.0	0.8	37.0	54.0	-17.0	H	Â	
15.540	3.0	35.0	38.9	11.3	-32.3	0.0	0.7	53.7	74.0	-20.3	H	P	
15.540	3.0	22.6	38.9	11.3	-32.3	0.0	0.7	41.2	54.0	-12.8	H	Ā	
5180 MH		· A											
10.360	3.0	35.8	37.4	8.9	-34.6	0.0	0.8	48.4	74.0	-25.6	v	Р	
10.360	3.0	23.7	37.4	8.9	-34.6	0.0	0.8	36.3	54.0	-17.7	V	Ā	
15.540	3.0	35.0	38.9	11.3	-32.3	0.0	0.7	53.7	74.0	-20.3	V	Р	
15.540	3.0	22.6	38.9	11.3	\$	0.0	0.7	41.3	54.0	-12.7	V	A	
5200 MH	r Mid C	H											
10.400	3.0	36.7	37.5	8.9	-34.6	0.0	0.8	49.3	74.0	-24.7	V	Р	
10.400	3.0	24.4	37.5	8.9	-34.6	0.0	0.8	37.0	54.0	-17.0	V	A	
15.600	3.0	34.9	38.7	11.4	-32.3	0.0	0.7	53.4	74.0	-20.6	V	Р	
15.600	3.0	22.3	38.7	11.4	-32.3	0.0	0.7	40.8	54.0	-13.2	V	A	
5200 MHL	z Mid C	H				ļ							
10.400	3.0	37.8	37.5	8.9	-34.6	0.0	0.8	50.4	74.0	- 23.6	H	Р	
10.400	3.0	25.6	37.5	8.9	-34.6	0.0	0.8	38.2	54.0	-15.8	H	A	
15.600	3.0	34.1	38.7	11.4	*····	0.0	0.7	52.7	74.0	-21.3	H	Р	
15.600	3.0	22.3	38.7	11.4	-32.3	0.0	0.7	40.8	54.0	-13.2	H	A	
5240 MHz	·······	· · · · · · · · · · · · · · · · · · ·		ļ									
15.720	3.0	34.3	38.4	11.4	¢	0.0	0.7	52.6	74.0	-21.4	H	Р	
15.720	3.0	22.3	38.4	11.4	*	0.0	0.7	40.6	54.0	-13.4	H	A	
15.720	3.0	34.4	38.4	11.4	*	0.0	0.7	52.7	74.0	-21.3	V	P	
15.720	3.0	22.3	38.4	11.4	-32.3	0.0	0.7	40.6	54.0	-13.4	V	A	
Rev. 4.1.2	.7												
		missions											

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8.2.2. TX ABOVE 1 GHz (802.11n HT20 MODE IN THE 5.2 GHz BAND)

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

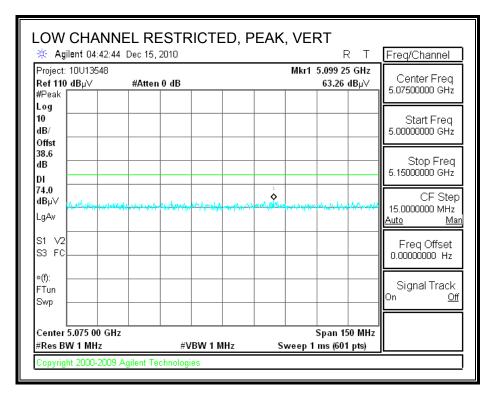


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🔆 Agilent 04:48:	08 Dec 15, 2010	R T	Freq/Channel
Project: 10U13548 Ref 110 dBµ∨	#Atten 0 dB	Mkr1 5.150 00 GHz 51.10 dBµ∀	Center Freq 5.07500000 GHz
#Peak Log			
10 dB/			Start Freq 5.0000000 GHz
Offst 38.6 dB			Stop Freq
DI			5.15000000 GHz
54.0 dBµ∨			CF Step 15.000000 MHz
LgAv			Auto Mai
S1 V2 S3 FC			Freq Offset 0.00000000 Hz
×(f):			
FTun Swp			Signal Track
Center 5.075 00 G #Res BW 1 MHz	Hz #VBW 10 H	Span 150 MHz z Sweep 11.7 s (601 pts)	

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



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🔆 Agilent 04:43:	42 Dec 15, 2010	RT	Freq/Channel
Project: 10U13548 Ref 110 dB µ∨ #Peak	#Atten 0 dB	Mkr1 5.146 00 GHz 50.81 dBµ∨	Center Freq 5.07500000 GHz
Log 10 dB/			Start Freq 5.00000000 GHz
Offst 38.6 dB DI			Stop Freq 5.15000000 GHz
54.0 dBµ∨ LαAv			CF Step 15.0000000 MHz <u>Auto Ma</u> i
S1 V2 S3 FC		◆	Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track On <u>Off</u>
Center 5.075 00 G #Res BW 1 MHz	Hz #VBW 10 Hz	Span 150 MHz 2 Sweep 11.7 s (601 pts)	

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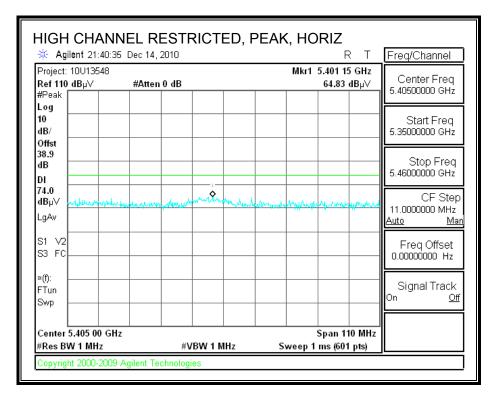
HARMONICS AND SPURIOUS EMISSIONS

Compliand	-	Measuren tification		s, Frei	nont 5n	n Chamb	er						
est Engr:		Tom che	n										
Date:		12/16/10											
Project #:		10U1354											
lest Targei		FCC Cla											
Iode Open	г:	TX mode	, 802.11	n HT2	0								
	f	Measuren		• •	Amp	Preamp Gain				Average	Field Stren	gth Limit	
	Dist	Distance [·]			D Corr	Distance Correct to 3 meters				Peak Fiel			
	Read	Analyzer	-		Avg	-		rength @		-	s. Average		
	AF	Antenna			Peak			Field Stre	ength	Margin v	s. Peak Lii	nit	
	CL	Cable Los	is		HPF	High Pas:	s Filter						
f CHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB		Corr. dBuV/m	Limit dBuV/m		Ant. Pol. V/H	Det. P/A/QP	Notes
180 MHz	<u> </u>	<u>.</u>	abait		<u> </u>	<u>w</u>			abuvilt		¥/11	TWAN I	
5.540	1.0W C	35.3	38.9	11.3	-32.3	0.0	0.7	54.0	74.0	- 20.0	н	Р	
5.540	3.0	22.3	¢	11.3	-32.3	0.0	0.7	41.0	54.0	-13.0	H	Å	
5.540	3.0	35.2	o	11.3	-32.3	0.0	0.7	53.8	74.0	-20.2	v	P	
5.540	3.0	22.4		11.3	-32.3	0.0	0.7	41.1	54.0	-12.9	v	A	
200 MHz	Mid C												
5.600	3.0	34.2	¢	11.4	-32.3	0.0	0.7	52.7	74.0	-21.3	V	Р	
5.600	3.0	22.3	38.7	11.4	-32.3	0.0	0.7	40.8	54.0	-13.2	<u>v</u>	A	
5.600 5.600	3.0	34.5	o	11.4	-32.3	0.0	0.7	53.0	74.0	-21.0	H	P	
5.600 240 MHz	3.0 High (22.4	38.7	11.4	-32.3	0.0	0.7	40.9	54.0	-13.1	H	A	
5.720	111gn (3.0	л 34.4	38.4	11.4	-32.3	0.0	0.7	52.7	74.0	- 21. 3	н	Р	
5.720	¢		¢			0.0							
5.720	3.0	34.7	38.4		-32.3	0.0	0.7	53.0	74.0	-21.0	v		
5.720	3.0	22.2			-32.3	0.0	0.7	40.5	54.0	-13.5	V	A	
5.720 5.720 ev. 4.1.2.7	<u>3.0</u> 7		38.4	11.4 11.4	-32.3	0.0 0.0	0.7	40.5				A P A	

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8.2.3. TX ABOVE 1 GHz (802.11a MODE IN THE 5.3 GHz BAND)

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



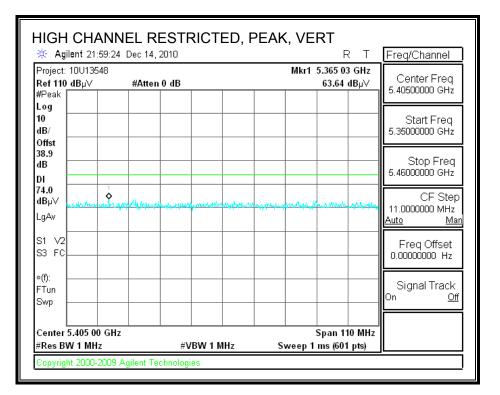
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🔆 Agilent 21:41	:22 Dec 14, 2010		, R	T Freq/Channel
Project: 10U13548 Ref 110 dB µ∨ #Peak	#Atten 0 dB		Mkr1 5.401 33 GH 53.91 dBµ	Contor Frod
Log 10 dB/				Start Freq 5.35000000 GHz
Offst 38.9 dB DI				
54.0 dBµ∨ LqAv				CF Step 11.0000000 MHz Auto Mai
S1 V2 S3 FC				Freq Offset 0.00000000 Hz
×(f): FTun Swp				Signal Track
Center 5.405 00 0 #Res BW 1 MHz		/BW 10 Hz	Span 110 M Sweep 8.577 s (601 pts)	

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RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



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🔆 Agilent 22:00		,	AVG, VERT	T Freq/Channel
Project: 10U13548 Ref 110 dB µ∀ #Peak	} #Atten 0 dE	3	Mkr1 5.398 58 G 51.41 dB	Contor From
Log 10 dB/				Start Freq 5.35000000 GHz
Offst 38.9 dB DI				
54.0 dBµ∀ LqAv		1		CF Step 11.0000000 MHz Auto Mar
S1 V2 S3 FC		♦		Freq Offset 0.00000000 Hz
×(f): FTun Swp				Signal Track
Center 5.405 00 (#Res BW 1 MHz	GHz	#VBW 10 Hz	Span 110 Sweep 8.577 s (601 pts	

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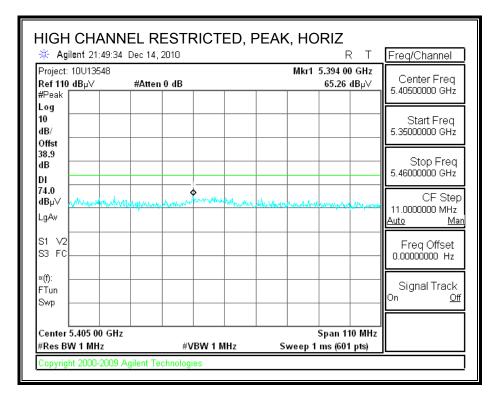
HARMONICS AND SPURIOUS EMISSIONS

Compliar		Measures tification		s, Fre	mont 51	n Chamb	er						
Test Engr		Tom Ch	en										
Date:	•	12/16/10											
Project #:		10U1354											
riojeci #: Test Targ		FCC Ch											
Mode Op		TX mode		_									
mode Op	21:	1x mode	, ov <u>2</u> .11	a									
	f	Measurer	nent Fred	piency	Amp	Preamp (Gain			Average	Field Stren	gth Limit	
	Dist	Distance			-	Distance	Corre	ct to 3 me	ters	-	ld Strength	-	
	Read	Analyzer	Reading		Avg	Average	Field S	trength @	3 m	Margin v	rs. Average	Limit	
	AF	Antenna	-		Peak	-				-	rs. Peak Lii		
AF Antenna Factor Peak Calculated Peak Field Strength Margin vs. Peak Limit CL Cable Loss HPF High Pass Filter													
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	
5260 MHz	t Low C	H											
15.780	3.0	34.0	38.2	11.5	-32.2	0.0	0.7	52.2	74.0	-21.8	V	P	
15.780	3.0	22.2	38.2	11.5	-32.2	0.0	0.7	40.4	54.0	-13.6	V	A	
15.780	3.0	35.2	38.2	11.5	-32.2	0.0	0.7	53.3	74.0	-20.7	H	P	
15.780	3.0	22.6	38.2	11.5	-32.2	0.0	0.7	40.8	54.0	-13.2	H	A	
5300 MHz	t Mid C	H		[1								
10.600	3.0	38.4	37.5	9.0	-34.3	0.0	0.8	51.4	74.0	-22.6	H	Р	
10.600	3.0	25.6	37.5	9.0	-34.3	0.0	0.8	38.7	54.0	-15.3	H	A	
15.900	3.0	34.9	37.9	11.5	-32.2	0.0	0.7	52.8	74.0	-21.2	H	Р	
15.900	3.0	22.2	37.9	11.5	-32.2	0.0	0.7	40.2	54.0	-13.8	H	A	
5300 MH	r Mid C			ļ	ļ	ļ				ļ			
10.600	3.0	36.0	37.5	9.0	-34.3	0.0	0.8	49.0	74.0	-25.0	V	Р	
10.600	3.0	23.9	37.5	9.0	-34.3	0.0	0.8	37.0	54.0	-17.0	V	A	
15.900	3.0	34.1	37.9	11.5	-32.2	0.0	0.7	52.0	74.0	-22.0	V	Р	
15.900	3.0	22.1	37.9	11.5	-32.2	0.0	0.7	40.0	54.0	-14.0	V	A	
5320 MH				ļ	ļ	ļ				ļ			
10.640	3.0	35.8	37.6	9.1	-34.2	0.0	0.8	48.9	74.0	-25.1	V	Р	
10.640	3.0	23.3	37.6	9.1	-34.2	0.0	0.8	36.4	54.0	-17.6	V	A	
15.960	3.0	34.1	37.7	11.5	-32.2	0.0	0.7	51.9	74.0	-22.1	V	P	
15.960	3.0	22.0	37.7	11.5	-32.2	0.0	0.7	39.8	54.0	-14.2	V	A	
5320 MH		-~				ļ				ļ			
15.960	3.0	34.3	37.7	11.5	-32.2	0.0	0.7	52.1	74.0	-21.9	H	P	
15.960	3.0	22.0	37.7	11.5	-32.2	0.0	0.7	39.8	54.0	-14.2	H	A	
10.640	3.0	35.2	37.6	9.1	-34.2	0.0	0.8	48.3	74.0	-25.7	H	P	
10.640	3.0	23.0	37.6	9.1	-34.2	0.0	0.8	36.1	54.0	-17.9	Н	A	
Rev. 4.1.2	.7												
Note: No	other e	missions	were de	tected	l above 1	the system	m noi	se floor.					

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8.2.4. TX ABOVE 1 GHz (802.11n HT20 MODE IN THE 5.3 GHz BAND)

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

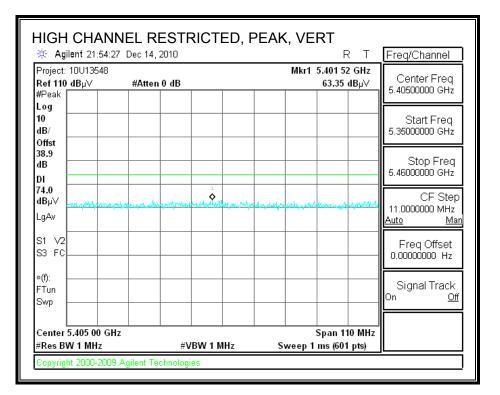


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🔆 Agilent 21:50	:29 Dec 14, 2010		R	T Freq/Channel
Project: 10U13548 Ref 110 dB µ∨ #Peak	#Atten 0 dB		Mkr1 5.401 15 53.66 d	Contor From
Log 10 dB/				Start Freq 5.35000000 GHz
Offst 38.9 dB				Stop Freq 5.4600000 GHz
DI		1		CF Step 11.0000000 MHz
LgAv S1 V2		*		Freq Offset
S3 FC				0.00000000 Hz
FTun Swp				Signal Track On <u>Off</u>
Center 5.405 00 0 #Res BW 1 MHz		W 10 Hz	Span 110 Sweep 8.577 s (601 p	

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RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



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Agilent 21:55			AVG, VERT	Freq/Channel
Project: 10U13548 Ref 110 dB µ∨ #Peak	#Atten 0 dB		Mkr1 5.402 43 GHz 51.41 dBµ∀	II Contor Eroa
Log 10 dB/				Start Freq 5.35000000 GHz
Offst 38.9 dB DI				- Stop Freq 5.46000000 GHz
54.0 dBµ∨ LgAv		1		CF Step 11.0000000 MHz Auto Mar
S1 V2 S3 FC				Freq Offset 0.00000000 Hz
×(f): FTun Swp				Signal Track On <u>Off</u>
Center 5.405 00 G #Res BW 1 MHz		VBW 10 Hz	Span 110 MH Sweep 8.577 s (601 pts)	z

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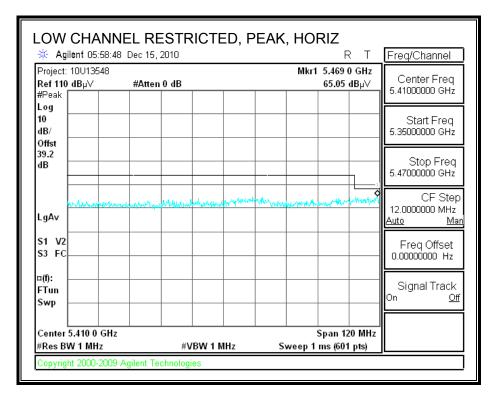
HARMONICS AND SPURIOUS EMISSIONS

Test Engr	•	Tom Che	en										
Date:	•	12/16/10											
Project #		10U1354											
Test Targ		FCC Cla											
Mode Op		TX mode		<u>ь нт</u>	0								
mode Op	c1.	IX mode	,		.0								
	f	Measuren	nent Fred	mencv	Amp	Preamp (Gain			Averaze	Field Stren	eth Limit	
	Dist	Distance			-	Distance		ct to 3 me	ters	-	ld Strength	-	
	Read	Analyzer			Avg			trength @			s. Average		
	AF	Antenna			Peak	-		: Field Str	*	-	s. Peak Li		
	CL	Cable Los			HPF	High Pas							
						-							
f	Dist		AF	CL	Amp	D Corr		Corr.	Limit	. – .	Ant. Pol.	Det	Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
5260 MH			ļ										
15.780	3.0	33.9	38.2	11.5	-32.2	0.0	0.7	52.1	74.0	-21.9	V	Р	
15.780	3.0	22.2	38.2	11.5	-32.2	0.0	0.7	40.3	54.0	-13.7	<u>v</u>	A	
15.780	3.0	35.0	38.2	11.5	-32.2	0.0	0.7	53.2	74.0	-20.8	H	P	
15.780	3.0	22.1	38.2	11.5	-32.2	0.0	0.7	40.3	54.0	-13.7	H	A	
5300 MH 10.600	z Miid C 3.0	н 38.8	37.5	9.0	-34.3	0.0	0.8	510	74.0		н	Р	
10.600	3.0	38.8 26.5	37.5	9.0	-34.3	0.0	0.8 0.8	51.8 39.5	74.0 54.0	-22.2 -14.5	<u>п</u> Н	P A	
15.900	3.0	34.9	37.9	9.0 11.5	-34.5	0.0	0.8 0.7	52.8	54.0 74.0	-14.5	H	P	
15.900	3.0	22.2	37.9	11.5		0.0	0.7	40.1	54.0	-13.9		A	
5300 MH					-04.4		•••			-1012			
10.600	3.0	35.6	37.5	9.0	-34.3	0.0	0.8	48.6	74.0	-25.4	v	Р	
10.600	3.0	23.5	37.5	9.0	-34.3	0.0	0.8	36.6	54.0	-17.4	v	Ā	
15.900	3.0	34.7	37.9	11.5	-32.2	0.0	0.7	52.6	74.0	-21.4	v	P	
15.900	3.0	22.0	37.9	11.5		0.0	0.7	40.0	54.0	-14.0	V	A	
5320 MH	z High (CH	1						••••••				
10.640	3.0	35.5	37.6	9.1	-34.2	0.0	0.8	48.6	74.0	-25.4	V	Р	
10.640	3.0	23.0	37.6	9.1	-34.2	0.0	0.8	36.2	54.0	- 17.8	V	A	
15.960	3.0	34.6	37.7	11.5	-32.2	0.0	0.7	52.4	74.0	-21.6	V	Р	
15.960	3.0	22.0	37.7	11.5	-32.2	0.0	0.7	39.8	54.0	-14.2	V	A	
5320 MH									.				
10.640	3.0	39.4	37.6	9.1	-34.2	0.0	0.8	52.5	74.0	-21.5	H	P	
	3.0	26.6	37.6	9.1	-34.2	0.0	0.8	39.8	54.0	-14.2	H	A	
10.640	3.0	34.8	37.7	11.5	-32.2	0.0 0.0	0.7 0.7	52.6 39.8	74.0 54.0	-21.5 -14.2	H H	P A	
10.640 10.640 15.960 15.960	3.0	22.0	37.7	11.5	-32.2								

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8.2.5. TX ABOVE 1 GHz (802.11a MODE IN THE 5.6 GHz BAND)

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

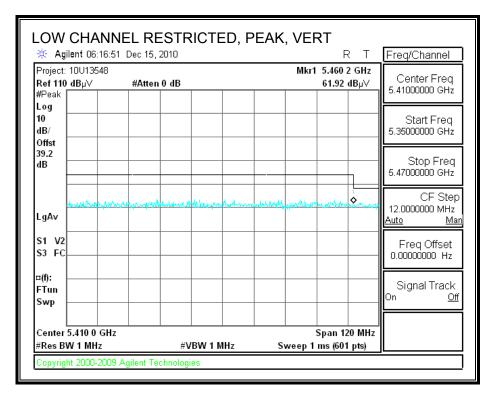


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🔆 Agilent 05:59	9:42 Dec 15, 2010			RT	Freq/Channel
Project: 10U13548 Ref 110 dB µ∨ #Peak	3 #Atten 0 dB		N	lkr1 5.418 20 GHz 53.44 dBµ∀	Center Freq 5.40500000 GHz
Log 10 dB/					Start Freq 5.3500000 GHz
Offst 39.2 dB					- Stop Freq 5.4600000 GHz
DI 54.0 dBµ∀			1		CF Step 11.000000 MHz
LgAv S1 V2 S3 FC			•		<u>Auto Mar</u> Freq Offset 0.00000000 Hz
×(f): FTun Swp					Signal Track
Center 5.405 00 #Res BW 1 MHz		/BW 10 Hz	Sween	Span 110 MH: 8.577 s (601 pts)	

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



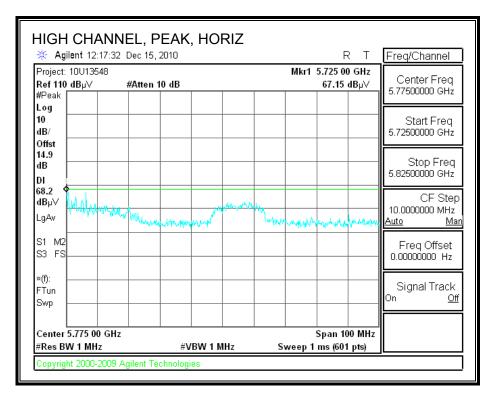
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🔆 Agilent 06:19:	:11 Dec 15, 2010	R T	Freq/Channel
Project: 10U13548 Ref 110 dB µ∨ #Peak □	#Atten 0 dB	Mkr1 5.353 85 GHz 51.46 dBµ∀	Center Freq 5.40500000 GHz
Log 10 dB/			Start Freq 5.3500000 GHz
Offst 39.2 dB			- Stop Freq 5.46000000 GHz
54.0 dBµ∨ LgAv ⊥			CF Step 11.0000000 MHz <u>Auto Mar</u>
S1 V2 S3 FC			Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track On <u>Off</u>
Center 5.405 00 G #Res BW 1 MHz	Hz #VBW 10 H	Span 110 MHz Iz Sweep 8.577 s (601 pts)	

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AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



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AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)

- 								F 700 00		Freq/Channel
Project: 10 Ref 110_dE		#Atten	0 dB				MKM	5.728 00 65.81		Center Freq 5.77500000 GHz
Peak .og										3.77300000 0112
0										Start Freq
IB/										5.72500000 GHz
)ffst										
9.4 IB										Stop Freq
										5.82500000 GHz
8.2	· · · · · · · · · · · · · · · · · · ·									
ІВµ∨ М	Manager Andrew	hyberners	man	MARAM	4 march markers	manner	minhaanin	-	molution	CF Step 10.0000000 MHz
.gAv										Auto Ma
31 V2 33 FC										Freq Offset
										0.00000000 Hz
(f): 📙										
Tun										Signal Track
Swp										
enter 5.7	75 00 GHz							Span 10	0 MHz	

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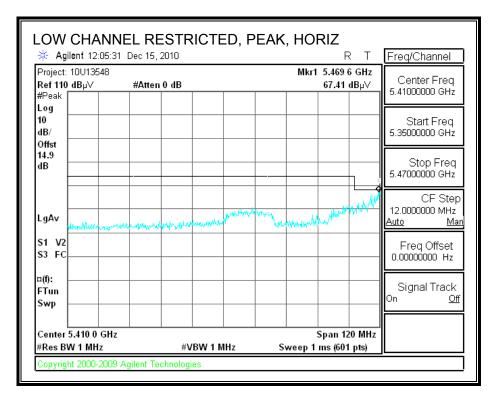
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HARMONICS AND SPURIOUS EMISSIONS

.11a	18 ass B			n						ea		., 11e		n Chamb							
.11a	18 ass B	48 lass B	•					n	L												
.11a	ass B	lass B		12/16/10 10U13548																	
.11a					-		-		-												
	, 802.11	le, 802.11																			
			, 802.11	802.11	02.11:	4.118	UZ.11	802.11	502.11	2.11	1a	a									
<i>r</i> requenc	nent Fre	ment Free	nent Freq	ent Freq	ıt Freg	Freq	ıt Freq	ent Fre	nt Freq	Freq	equ	puency	-	Preamp(Average	Field Stren	gth Limit	
ntenna	to Anter	e to Anter	to Anter	o Anter	Anten	nten	Anter	o Anter	Anter	nten	enr	ma	D Corr	Distance	Correc	ct to 3 me	ters	Peak Fiel	ld Strength	Limit	
× .	-	r Reading	~		~	~					÷.		Avg			trength @		Margin v	s. Average	Limit	
r	Factor	a Factor	Factor	actor	ctor	or	rtor	actor	actor	or			Peak	Calculate	d Peak	r Field Stre	ength	Margin v	s. Peak Lii	nit	
	55	DSS	is	;				;					HPF	High Pas	s Filter	r					
	AF											CL	Amp	D Corr		Согт.			Ant. Pol.	Det.	Notes
<u>m dB</u>	dB/m	dB/m	dB/m	dB/m	B/m	/m	B/m	dB/m	dB/m	5/m	Ļ	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
								~~ ~	~~ ~						~ -						
	37.7											9.2	-33.8	0.0	0.7	50.4	74.0	-23.6	H	P	
	37.7 37.7				••••••							9.2 9.2	-33.8	0.0 0.0	0.7 0.7	38.1 49.2	54.0 74.0	-15.9 -24.8	H V	A P	
	37.7				••••••	·····				••••••	···\$··	9.2 9.2	-33.8 -33.8	0.0	0.7	49.2 36.2	74.0 54.0	-24.0 -17.8	v	A P	
		91.1	J (1)		.	•/		91.1	J'n	· · ·			-33.0	0.0	•••		2760	-11.0	×		
9 9.3	37.9	37.9	37.9	37.9	37.9	.9	37.9	37.9	37.9	7.9		9.3	-33.5	0.0	0.7	49.3	74.0	-24.7	v	Р	
					••••••						···\$··	\$•••••		\$	þ			o		·····	
					*************							o		0.0	þ						
	37.9											9.3	-33.5	0.0	0.7	39.8	54.0	-14.2	н		
ĺ											l		ĺ								
.0 9.4	38.0	38.0	38.0	38.0	38.0	.0	38.0	38.0	38.0	3.0		9.4	-33.2	0.0	0.7	51.0	74.0	- 23.0	H	Р	
	38.0											9.4	-33.2	0.0	0.7	38.6	54.0	-15.4	H		
					••••••	·····			38.0	3.0		• O /	-33.2	0.0 0.0	þ	••••••••••••••••••••••••••••		o			
<u>.0 9.4</u>	38.0	38.0	38.0	38.0	20 A 3		38.0			••••••	···\$··	o					E40	-16.6	V	A	
.9 9.3 .9 9.3 .9 9.3 .0 9.4 .0 9.4 .0 9.4	38.0	37.9 37.9 37.9 38.0 38.0 38.0 38.0	37.9 37.9 37.9 38.0 38.0 38.0 38.0	37.9 37.9 37.9 38.0 38.0 38.0	37.9 37.9 37.9 38.0 38.0 38.0 38.0	.9 .9 .9 .0 .0	37.9 37.9 37.9 38.0 38.0 38.0 38.0	37.9 37.9 37.9 38.0 38.0 38.0 38.0	37.9 37.9 37.9 37.9 38.0 38.0	7.9 7.9 7.9 8.0 8.0		9.4 9.4	-33.2	0.0 0.0 0.0 0.0	0.7	51.0	74.0	- 23.0	Н	P A P A P A P A A	

8.2.6. TX ABOVE 1 GHz (802.11n HT20 MODE IN THE 5.6 GHz BAND)

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

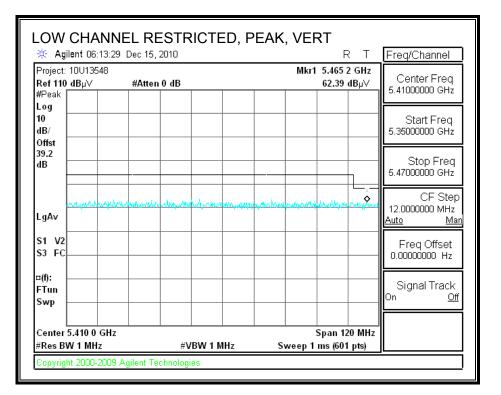


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🔆 Agilent 12:06	27 Dec 15, 2010			RT	Freq/Channel
Project: 10U13548 Ref 110 dB µ∨ #Peak	#Atten 0 dB		Mkr	I 5.418 57 GHz 49.43 dBµ∨	Center Freq 5.40500000 GHz
Log 10 dB/					Start Freq 5.3500000 GHz
Offst 14.9 dB					Stop Freq 5.4600000 GHz
DI 54.0 dBµ∀					CF Step 11.0000000 MHz
LgAv S1 V2 S3 FC			×		<u>Auto Mar</u> Freq Offset 0.0000000 Hz
×(f): FTun Swp					Signal Track
Center 5.405 00 0		VBW 10 Hz	Sweep 8 5	Span 110 MHz 77 s (601 pts)	

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

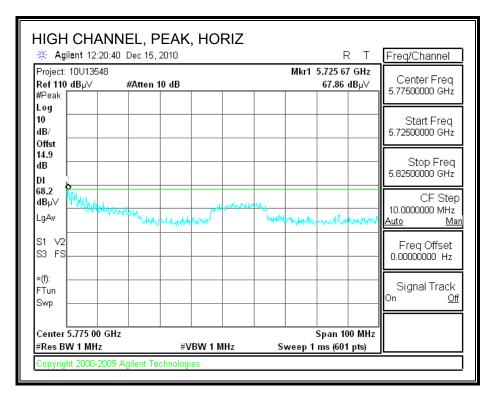


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🔆 Agilent 06:14:	46 Dec 15, 2010	RT	Freq/Channel
Project: 10U13548 Ref 110 dB µ∨ #Peak	#Atten 0 dB	Mkr1 5.352 02 GHz 51.44 dBμ∨	Center Freq 5.40500000 GHz
Log 10 dB/			Start Freq 5.35000000 GHz
Offst 39.2 dB			Stop Freq 5.4600000 GHz
DI 54.0 dBµ∨ LgAv □			CF Step 11.000000 MHz
S1 V2 S3 FC			Auto <u>Mar</u> Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track
Center 5.405 00 GI #Res BW 1 MHz	Hz #VBW 10 H	Span 110 MHz z Sweep 8.577 s (601 pts)	

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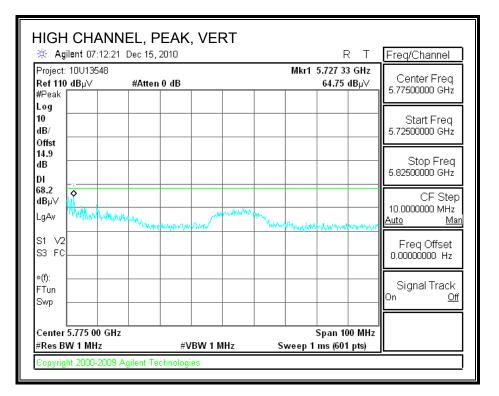
AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



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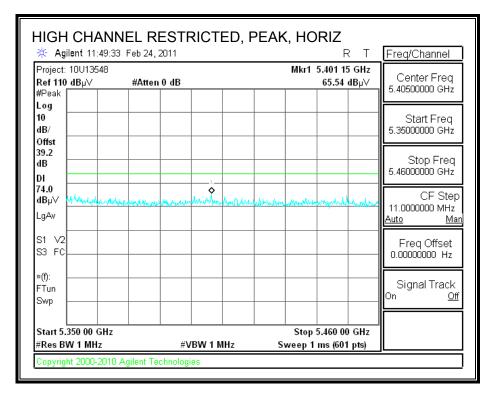
HARMONICS AND SPURIOUS EMISSIONS

est Engr	:	Tom Che											
late:		12/16/10 10U13548											
roject #:													
est Targe		FCC Cla		TTT									
ode Ope	er:	TX mode	, 802.11	n H12	U								
	f	Measuren	nent Freg	piency	Amp	Preamp (Gain			Average Field Strength Limit			
	Dist	Distance to Antenna D Corr			D Corr	Distance	Correc	t to 3 me	ters	Peak Fie	ld Strength	Limit	
	Read	Analyzer	Reading		Avg	Average 3	Field S	trength @	3 m	Margin v	rs. Average	Limit	
	AF	Antennal			Peak			Field Stre	ngth	Margin v	rs. Peak Lii	mit	
	CL	Cable Los	s		HPF	High Pas:	s Filter						
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 C												
.000	3.0	34.6	37.7	9.2	-33.8	0.0	0.7	48.5	74.0	-25.5	V	P	
000	3.0	22.3	37.7	9.2	-33.8	0.0	0.7	36.3	54.0	-17.7	V.	A	
000 000	3.0 3.0	35.4 23.0	37.7	9.2	-33.8	0.0 0.0	0.7 0.7	49.3	74.0	-24.7	H	P A	
	i Mid C		37.7	9.2	-33.8	U.U	U./	36.9	54.0	-17.1	H	A	
200	3.0	37.5	37.9	9.3	-33.5	0.0	0.7	51.9	74.0	-22.1	н	Р	
200	3.0	25.3	37.9	9.3	-33.5	0.0	0.7	39.7	54.0	-14.3	H	Å	
200	3.0	34.9	37.9	9.3	-33.5	0.0	0.7	49.3	74.0	-24.7	V	P	
200	3.0	22.7	37.9	9.3	-33.5	0.0	0.7	37.1	54.0	-16.9	V	A	
DO MIHz	t High 🤇	CH											
400	3.0	35.0	38.0	9.4	-33.2	0.0	0.7	50.0	74.0	-24.0	V	Р	
400	3.0	22.4	38.0	9.4	-33.2	0.0	0.7	37.3	54.0	-16.7	V	A	
	• • • • • • • • • • • • • • • • • • • •		¢					¢¢				o	
		23.0	38.0	9.4	-33.2	0.0	0.7	38.0	54.0	-10.0	н	A	
400 400 v. 4.1.2	3.0 3.0 .7	35.2 23.0 missions	38.0 38.0	9.4 9.4	-33.2 -33.2	0.0 0.0	0.7 0.7	50.1 38.0	74.0 54.0	-23.9 -16.0	H H	P A	

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CO-LOCATION WORST CASE TX ABOVE 1 GHz (802.11a/ 5.3 8.3. **GHz BAND**)

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

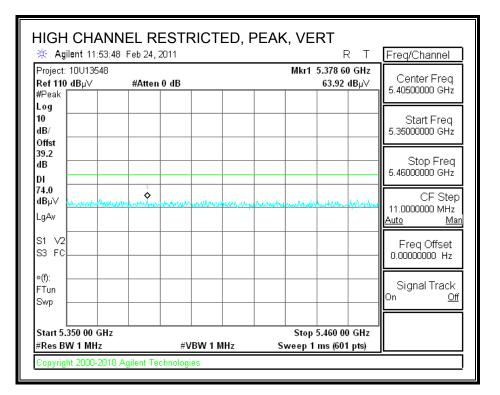


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🔆 Agilent 11:50	:45 Feb 24, 2011	-	R	T Freq/Channel
Project: 10∪13548 Ref 110 dB µ∨ #Peak 	#Atten 0 dB		Mkr1 5.350 00 GH 52.58 dΒμ'	E Contor Eroa
Log 10 dB/				Start Freq 5.35000000 GHz
Offst 39.2 dB DI				
54.0 dBµ∨ LgAv 1				CF Step 11.000000 MHz Auto Mar
S1 V2 S3 FC				Freq Offset 0.00000000 Hz
×(f): FTun Swp				Signal Track
Start 5.350 00 GH #Res BW 1 MHz	-	/ 10 Hz	Stop 5.460 00 GH Sweep 8.577 s (601 pts)	z

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RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



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🔆 Agilent 11:54	NEL RESTR :42 Feb 24, 2011	,	,	RТ	Freq/Channel
Project: 10∪13548 Ref 110 dB µ∨ #Peak	#Atten 0 dB			50 18 GHz 1.88 dBµ∨	Center Freq 5.40500000 GHz
Log 10 dB/ Offst					Start Freq 5.3500000 GHz
39.2 dB DI					Stop Freq 5.46000000 GHz
54.0 dBµ∨ LgAv					CF Step 11.0000000 MHz <u>Auto Man</u>
S1 V2 S3 FC					Freq Offset 0.00000000 Hz
»(f): FTun Swp					Signal Track On <u>Off</u>
Start 5.350 00 GH #Res BW 1 MHz	-	W 10 Hz	Stop 5.4 Sweep 8.577 s	60 00 GHz (601 pts)	

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HARMONICS AND SPURIOUS EMISSIONS

Test Engr: Date: Project #: Test Target: Mode Oper:		02/24/11 10U1354 FCC Cla	Tom Chen 02/24/11 10U13548 FCC Class B TX mode, 802.11a and BT CH78												
	f	Measurer			-	Preamp (-	Field Stren	-			
	Dist	Distance				Distance					ld Strength				
	Read	Analyzer	~		Avg	-		trength @		-	rs. Average				
	AF	Antenna			Peak			r Field Stre	ngth	Margin v	rs. Peak Lii	nut			
	CL	Cable Lo:	55		HPF	High Pas:	s Filter	r							
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuW/m	Limit dBuV/m		Ant. Pol. V/H	Det. P/A/QP	Notes		
5260 MH															
15.780	3.0	32.7	38.2	11.5	-32.2	0.0	0.7	50.9	74.0	-21.8	v	Р			
15.780	3.0	20.9	38.2	11.5	-32.2	0.0	0.7	39.1	54.0	-13.6	v	A			
15.780	3.0	33.9	38.2	11.5	-32.2	0.0	0.7	52.0	74.0	-20.7	H	Р			
15.780	3.0	21.3	38.2	11.5	-32.2	0.0	0.7	39.5	54.0	-13.2	H	A			
5300 MH	z Mid C	H													
10.600	3.0	37.1	37.5	9.0	-34.3	0.0	0.8	50.1	74.0	-22.6	H	P			
10.600	3.0	24.3	37.5	9.0	-34.3	0.0	0.8	37.4	54.0	-15.3	H	A			
15.900	3.0	33.6	37.9	11.5	-32.2	0.0	0.7	51.5	74.0	-21.2	H	Р			
15.900	3.0	20.9	37.9	11.5	-32.2	0.0	0.7	38.9	54.0	-13.8	H	A			
5300 MH			ļ												
10.600	3.0	34.7	37.5	9.0	-34.3	0.0	0.8	47.7	74.0	-25.0	v	P			
10.600	3.0	22.6	37.5	9.0	-34.3	0.0	0.8	35.7	54.0	-17.0	v	A			
15.900	3.0	32.8	37.9	11.5	-32.2	0.0	0.7	50.7	74.0	-22.0	V	Р			
15.900 5220 MH	3.0	20.8	37.9	11.5	-32.2	0.0	0.7	38.7	54.0	-14.0	v	A			
5320 MH 10.640	z High (3.0	34.5	37.6	9.1	-34.2	0.0	0.8	47.6	74.0	-25.1	v	Р			
10.640	3.0	34.5 22.0	37.6	9.1 9.1	-34.2	0.0	0.8 0.8	47.0	74.0 54.0	-25.1	v V	P A			
10.040	3.0	32.8	37.0	9.1 11.5	-34.2	0.0	0.8 0.7	35.1 50.6	54.0 74.0	-17.0	v	P			
15.960	3.0	20.7	37.7	11.5	-32.2	0.0	0.7	38.5	54.0	-14.2	v	A			
5320 MH		Å							6-11V		*				
15.960	3.0	33.0	37.7	11.5	-32.2	0.0	0.7	50.8	74.0	-21.9	н	Р			
15.960	3.0	20.7	37.7	11.5	-32.2	0.0	0.7	38.5	54.0	-14.2	H	Ā			
10.640	3.0	33.9	37.6	9.1	-34.2	0.0	0.8	47.0	74.0	-25.7	H	P			
10.640	3.0	21.7	37.6	9.1	-34.2	0.0	0.8	34.8	54.0	-17.9	H	Ā			
Rev. 4.1.2 Note: No		missions	were de	tected	above 1	the system	n noi:	se floor.							

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8.4. RECEIVER ABOVE 1 GHz

8.4.1. RX ABOVE 1 GHz FOR 20 MHz BANDWIDTH IN THE 5.3 GHz BAND

	uipmen	-					_								Limit
	orn 1. 5/N: 324	18GHz 5 @3m		nplifer			Pre-am	plifer	26-40GH	z	Ho	orn > 18G	HZ	_	RX RSS 210
	uency Cat			gnonto		ŭ.								•	
		22807700	12' c	able 22	28076	00	20' cal	ble 22	807500		HPF	Re	ject Filte		k Measurements
3' c	able 22	307700	12' ca	ble 2280	07600		20' cab	le 2280)7500 🖕			•		Avera	W=VBW=1MHz ge Measurements
														RBW=	1MHz ; VBW=10Hz
f Hz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
8	3.0	45.2	31.7	24.1	2.4	-36.1	300 0.0	0.0	35.7	22.1	74	54	-38.3	- <u>31.9</u>	v
2	3.0 3.0	47.8 44.6	31.1 29.9	25.2 30.4	2.8 4.5	-35.9 -35.1	0.0 0.0	0.0 0.0	39.9 44.4	23.1 29.6	74 74	54 54	-34.1 -29.6	-30.9 -24.4	v v
5 2	3.0	44.0 45.1	31.3	24.1	4.5 2.4	-35.1	0.0	0.0	44.A 35.5	29.6	74	54 54	-29.0 -38.5	-24.4 -32.3	H H
2 7	3.0 3.0	46.4 43.3	33.2 30.0	27.0 30.6	3.3 4.6	-35 <i>.</i> 5 -35.1	0.0 0.0	0.0 0.0	41.2 43.4	28.0 30.0	74 74	54 54	-32.8 -30.6	-26.0 -24.0	H H
	Read	Measuremen Distance to . Analyzer Re Antenna Fac Cable Loss	ading] [[D Corr Avg Peak	Average 3	Correc Field S d Peak	ct to 3 mete Strength @ c Field Stre	3 m		Pk Lim Avg Mar	Peak Fiel Margin vs	Field Strengt d Strength L :. Average L :. Peak Limit	imit imit

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8.4.2. RX ABOVE 1 GHz FOR 20 MHz BANDWIDTH IN THE 5.6 GHz BAND

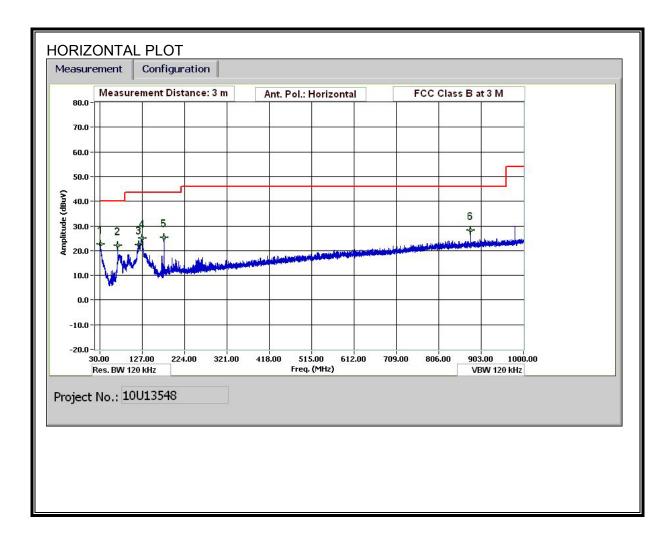
est Equipment: Horn 1-18GHz Pre-amplifer 1-26GHz Pre-amplifer 26-40GHz Horn > 18GHz Limit Tits 3008A0054 Pre-amplifer 26-40GHz Horn > 18GHz Limit Tits 3008A0054 O' cable 22807500 D' cable 22807500 Peak Measurements RBW=1MHz PEak Measurements RBW=1MHz VBW=1MHz 3' cable 22807700 12' cable 22807600 20' cable 22807500 Peak Measurements RBW=1MHz VBW=1MHz 3' cable 22807700 12' cable 22807600 20' cable 22807500 Peak Measurements RBW=1MHz VBW=1MHz 10' cable 22807600 20' cable 22807500 Peak Measurements RBW=1MHz VBW=1MHz 10' cable 22807600 20' cable 22807500 Peak Measurements RBW=1MHz VBW=1MHz 12' cable 22807600 20' cable 22807500 Peak Measurements RBW=1MHz VBW=1MHz 10' cable 22807500 Peak Measurements RBW=1MHz VBW=10Hz <	
Troumption Product Troumption Product <th< th=""></th<>	
How shifts is an algorithm of the second	
3' cable 22807700 12' cable 22807600 20' cable 22807500 3' cable 22807700 12' cable 22807600 20' cable 22807500 3' cable 22807700 12' cable 22807600 20' cable 22807500 3' cable 22807600 Peak Measurements RBW=UBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz 1 D Corr Fltr Peak Average Measurements RBW=1MHz ; VBW=10Hz 1 D Corr Fltr Peak Average Measurements RBW=1MHz ; VBW=10Hz 1 D Corr Fltr Peak Average Measurements RBW=1MHz ; VBW=10Hz 1 D Corr Fltr Peak Average Measurements RBW=1MHz ; VBW=10Hz 30 d66 303 At 66 30 At 66 30 At 66 30 0.0 0.0 0.0 0.0 0.0 316 32.6 <th co<="" td=""></th>	
3Hz (m) dBuV dBuV dB dB dB dB dB dB dB dV/m dBuV/m dBuV/m dB dB dB (V/H) 27 3.0 46.6 30.3 24.4 2.5 -36.1 0.0 0.0 37.4 21.2 74 54 -36.6 -32.8 V 93 3.0 46.0 29.7 25.0 2.7 -35.9 0.0 0.0 37.8 21.5 74 54 -36.6 -32.8 V 80 3.0 44.6 29.6 24.5 2.5 0.0 0.0 37.8 21.5 74 54 -36.6 -32.8 V V 0.5 3.0 43.4 28.5 29.1 41.1 -35.2 0.0 0.0 35.6 20.6 74 54 -38.4 -33.4 H 40 3.0 45.1 31.5 25.9 3.0 -35.7 0.0 0.0 38.3	
27 30 46.6 30.3 24.4 25 -36.1 0.0 0.0 37.4 21.2 74 54 -36.6 -32.8 V 93 30 46.0 29.7 250 2.7 359 0.0 0.0 37.8 21.5 74 54 -36.6 -32.8 V 93 30 46.0 29.7 250 2.7 -359 0.0 0.0 37.8 21.5 74 54 -36.6 -32.5 V 80 3.0 43.4 28.5 29.1 4.1 -35.2 0.0 0.0 31.4 26.5 74 54 -36.6 -32.6 -27.5 V 53 3.0 445.1 31.5 25.9 3.0 -35.7 0.0 0.0 38.3 24.7 74 54 -36.4 -33.4 H 40 3.0 43.3 28.3 29.3 4.1 -35.2 0.0 0.0 41.6 26.6 74 54 -32.4 -27.4 H 7.07 22.09 A<	
13 3.0 46.0 29.7 25.0 2.7 -35.9 0.0 0.0 37.8 21.5 74 54 -36.2 -32.5 V 10 3.0 43.4 28.5 29.1 4.1 -35.2 0.0 0.0 41.4 26.5 74 54 -32.6 -27.5 V 13 3.0 44.6 29.6 24.5 2.5 -36.0 0.0 0.0 35.6 20.6 74 54 -32.6 -27.5 V 10 3.0 45.1 31.5 25.9 3.0 -35.7 0.0 0.0 38.3 24.7 74 54 -35.7 -29.3 H 17 3.0 43.3 28.3 29.3 4.1 -35.2 0.0 0.0 41.6 26.6 74 54 -32.4 -27.4 H OT 22.09 f Measurement Frequency Amp Preamp Gain Avg Lim Average Field Strength Limit D Corr Distance to Antenna D Corr D Corr </td	
3 3.0 44.6 29.6 24.5 2.5 -36.0 0.0 0.0 35.6 20.6 74 54 -38.4 -33.4 H 0 3.0 45.1 31.5 25.9 3.0 -35.7 0.0 0.0 38.3 24.7 74 54 -38.4 -33.4 H 7 3.0 43.3 28.3 29.3 4.1 -35.2 0.0 0.0 41.6 26.6 74 54 -38.4 -33.4 H 07.22.09 M Arg Lim Average Field Strength Limit Measurement Frequency Amp Preamp Gain Avg Lim Average Field Strength Limit D Corr Distance Correct to 3 meters Pk Lim Peak Field Strength Limit May Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit Artenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit	
10 3.0 45.1 31.5 25.9 3.0 -35.7 0.0 0.0 38.3 24.7 74 54 -35.7 -29.3 H 17 3.0 43.3 28.3 29.3 4.1 -35.2 0.0 0.0 41.6 26.6 74 54 -35.7 -29.3 H 107 22.09 f Measurement Frequency Dist Distance to Antenna Read Analyzer Reading AF Amp Preamp Gain D Corr Avg Lim Average Field Strength Limit Pak Field Strength Limit Avg Mar Average Field Strength Limit AF Antenna Factor Peak Calculated Peak Field Strength Pix	
107 22.09 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	
CL Cable Loss HPF High Pass Filter	

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8.5. WORST-CASE BELOW 1 GHz

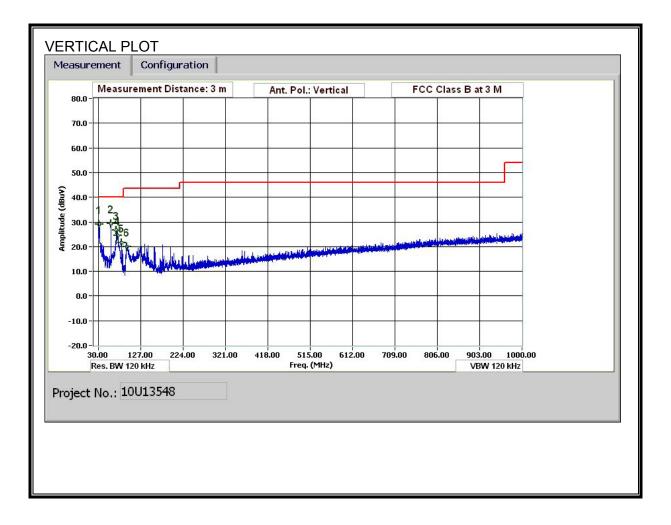
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)



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



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Test Engr: Date: Project #: Test Targe Mode Ope		Tom Che 12/17/10 10U13544 FCC Cla TX mode	} ss B	se									
	f Dist Read AF CL	Measurem Distance t Analyzer I Antenna F Cable Loss	o Antenn Reading Factor		Amp D Corr Filter Corr. Limit	Preamp G Distance (Filter Inse Calculated Field Stree	Correct ert Loss 1 Field S	trength		Margin	Margin vs.	Limit	
f	Dist	Read	AF	CL	Amp	D Corr	Pad	Corr.	Limit		Ant. Pol.	Det.	Notes
MHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
Horizonta													
32.04	3.0	32.3	19.4	0.5	29.7	0.0	0.0	22.5	40.0	-17.5	H	Р	
71.402	3.0	42.9	8.2	0.7	29.6	0.0	0.0	22.2	40.0	-17.8	H	P	
119.644	3.0	37.2	13.7	1.0	29.5	0.0	0.0	22.3	43.5	-21.2	H	P	
126.844	3.0	39.7	13.8	1.0	29.4	0.0	0.0	25.1	43.5	-18.4	H	P	
177.366	3.0	42.9	10.4	1.2	29.1	0.0	0.0	25.3	43.5	-18.2	H	P	
879.155	3.0	32.5	21.4	3.0	28.7	0.0	0.0	28.2	46.0	-17.8	H	P	
Vertical		20.0	10.4				~ ~ ~		40.0	110	TT		
32.04 59.041	3.0	38.8	19.4	0.5	29.7	0.0	0.0	29.0	40.0	-11.0 -10.5	v v	P	
59.041 70.802	3.0 3.0	50.5	7.9 8.2	0.7 0.7	29.6	0.0 0.0	0.0	29.5	40.0 40.0	• \$	v	P P	
74.162	3.0	47.3	••••••••••••••••••	·····	29.6		0.0	26.6		-13.4	v	P P	
74.102 83.642	3.0	45.3 42.7	8.0 7.6	0.8 0.8	29.6 29.6	0.0 0.0	0.0 0.0	24.4 21.5	40.0 40.0	-15.6 -18.5	v	P P	
03.042 94.923	3.0	39.7	8.8	0.9	29.5	0.0	0.0	19.8	43.5	-10.5	v	P	
Rev. 1.27.0 Note: No o		issions we	re detect	ed abo	ve the sy	rstem nois	se floor						

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9. AC POWER LINE CONDUCTED EMISSIONS

<u>LIMITS</u>

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted I	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

ANSI C63.4

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RESULTS

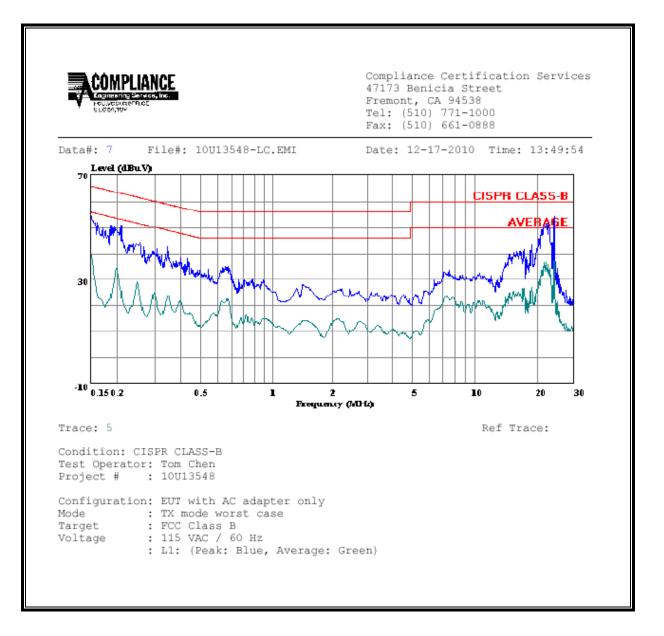
<u>6 WORST EMISSIONS</u>

	CONDUCTED EMISSIONS DATA (115VAC 60Hz)										
Freq.			Closs	Limit	EN_B	Margin		Remark			
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV(dB)	L1/L2		
0.15	52.60		34.66	0.00	65.84	55.84	-13.24	-21.18	L1		
0.21	51.08		25.61	0.00	63.28	53.28	-12.20	-27.67	L1		
24.01	54.58		45.07	0.00	60.00	50.00	-5.42	-4.93	L1		
0.15	53.47		33.40	0.00	65.84	55.84	-12.37	-22.44	L2		
0.20	51.52		31.87	0.00	63.82	53.82	-12.30	-21.95	L2		
22.90	50.47		32.17	0.00	60.00	50.00	-9.53	-17.83	L2		
6 Worst I	 Data 										

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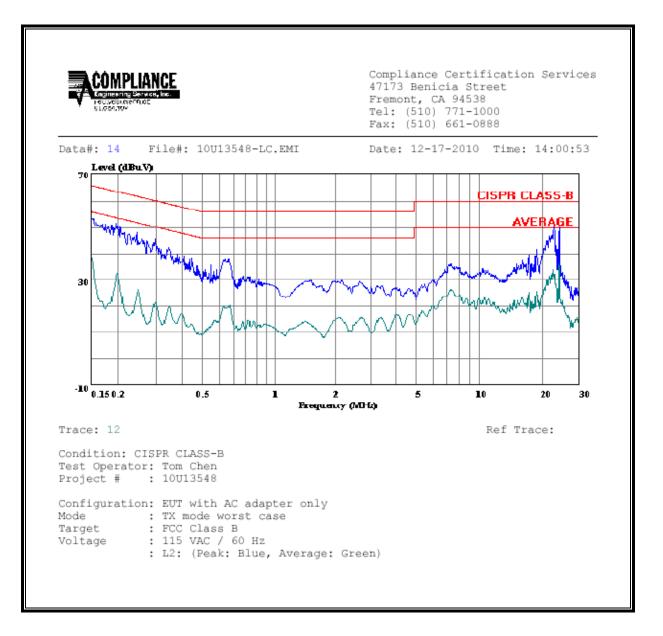
LINE 1 RESULTS



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LINE 2 RESULTS

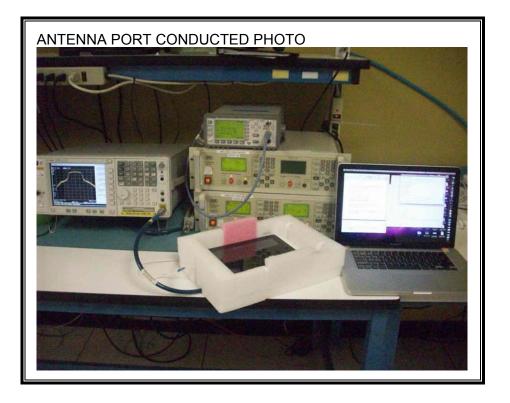


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10. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



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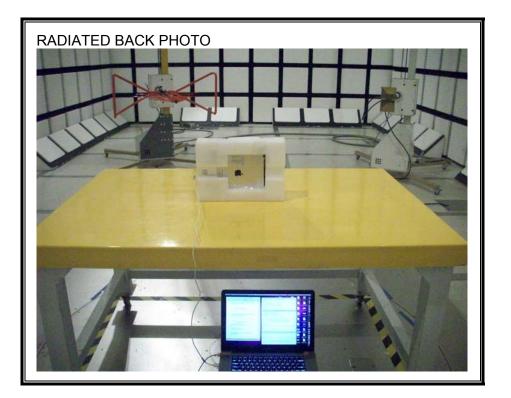
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RADIATED RF MEASUREMENT SETUP



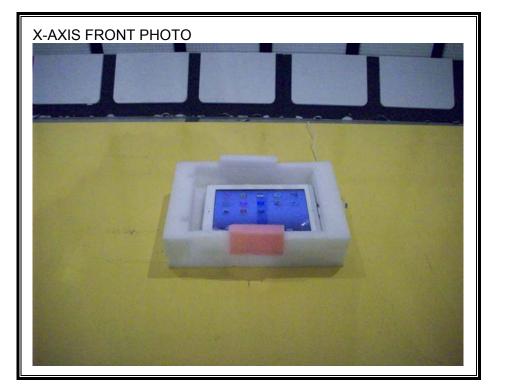
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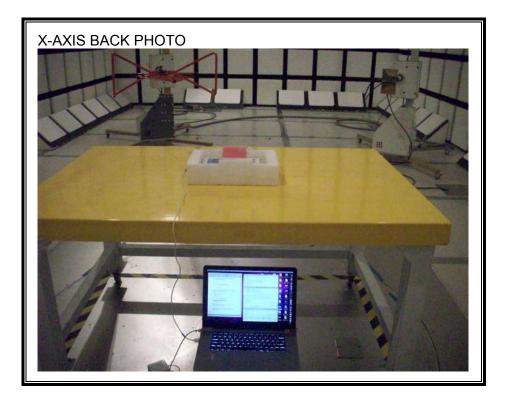
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RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION



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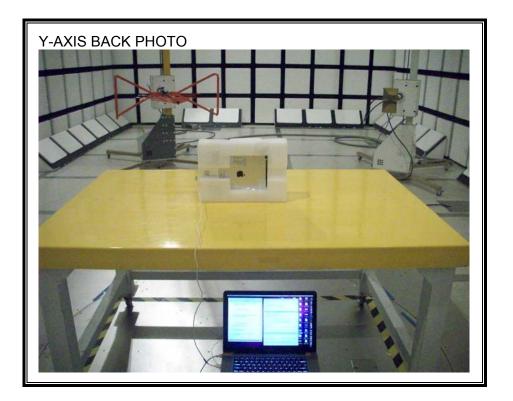


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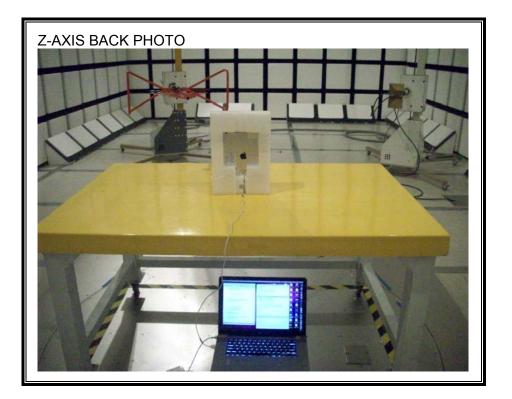


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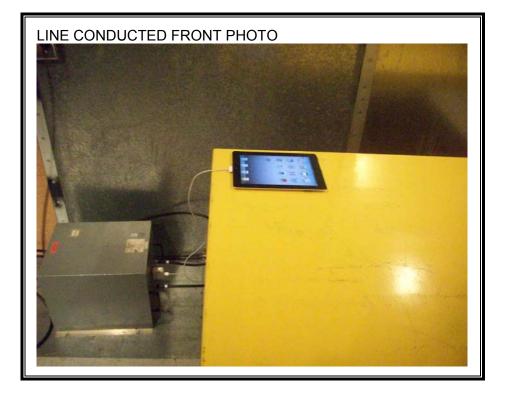
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POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



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DYNAMIC FREQUENCY SELECTION MEASUREMENT SETUP



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11. DYNAMIC FREQUENCY SELECTION

11.1. OVERVIEW

11.1.1. 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.

<u>FCC</u>

§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	Operationa	Operational Mode						
	Master	Client (without DFS)	Client (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-Service Monitoring

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 threshold level to trigger a DFS							
response.							

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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 $5 = 51$	IOIL PUISE Rauai	Table 5 - Short Pulse Radar Test Wavelornis										
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	Radar Types 1-4)			80%	120							

Table 5 – Short Pulse Radar Test Waveforms

Table 6 – Long Pulse Radar Test Signal

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

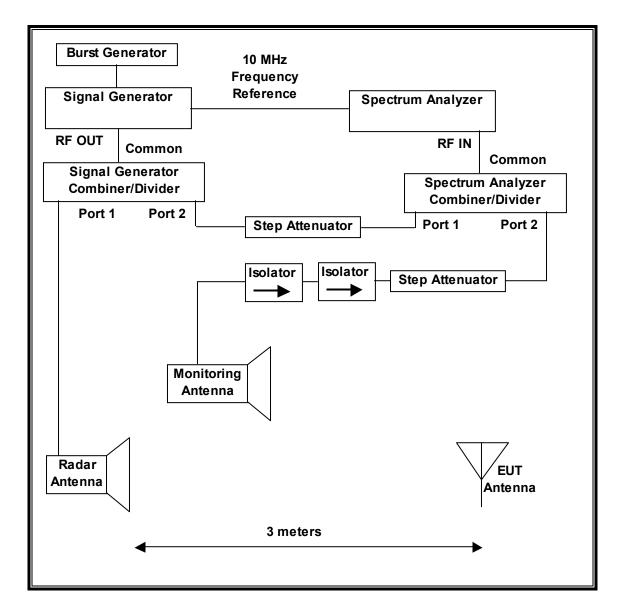
Table 7 – Frequency Hopping Radar Test Signal

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

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11.1.2. 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

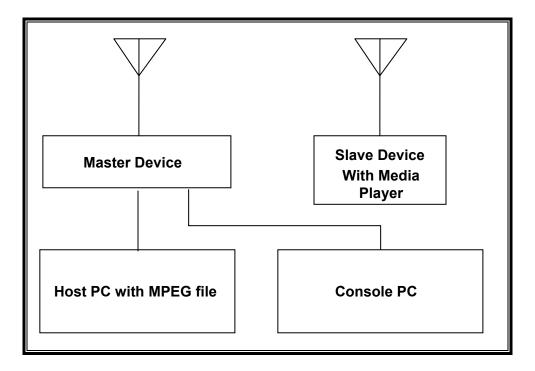
The following test and measurement equipment was utilized for the DFS tests documented in this report:

TEST EQUIPMENT LIST						
Description	Manufacturer	Model	Serial Number	Cal Due		
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00169	04/05/11		
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	02/12/12		

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11.1.3. 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		
N600 Wireless Dual Band Router	Netgear	WNDR3400	2BK311730FF6B	PY309300116		
AC Adapter (AP)	Netgear	FA-1201500SJA / FA-1201500SUA	4F105116T1020904 5B	DoC		
Notebook PC (Console)	HP	Pavilion zv6000	CND5290401	DoC		
AC Adapter (Console PC)	HP	PA-1121-12HD	58B240ALLRK0HU	DoC		
Notebook PC (Host)	Apple	Mac Book Pro 17"	SW8630002WHS	DoC		
AC Adapter (Host PC)	Apple	A1172	MV628LSGWDA	DoC		

11.1.4. DESCRIPTION OF EUT

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

The EUT is a Slave Device with without Radar Detection.

The highest power level within these bands is 20.81 dBm EIRP in the 5250-5350 MHz band and 20.21 dBm EIRP in the 5470-5725 MHz band.

The only antenna assembly utilized with the EUT has a gain of 4.2 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.

The EUT uses one transmitter/receiver chain 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 not required since the maximum EIRP is less than 500 mW (27 dBm), however TPC is implemented.

The EUT utilizes the 802.11a/n architecture. One nominal channel bandwidth, 20 MHz, is implemented.

MANUFACTURER'S STATEMENT REGARDING UNIFORM CHANNEL SPREADING

This is not applicable to slave devices.

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

The Master Device is a Netgear N600 Dual Band Router, FCC ID: PY309300116. The DFS software installed in the Master Device is Linux revision 5.22.84.0. The minimum antenna gain for the Master Device is 2.73 dBi.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm.

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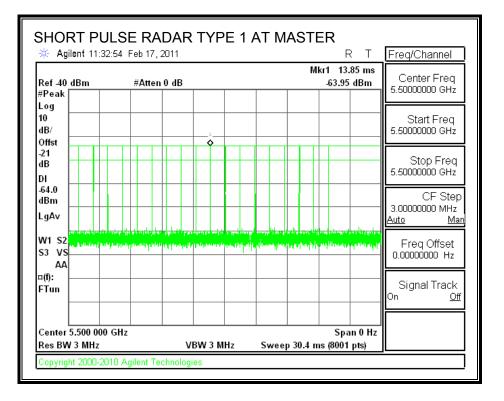
11.2. RESULTS FOR 20 MHz BANDWIDTH

11.2.1. TEST CHANNEL

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

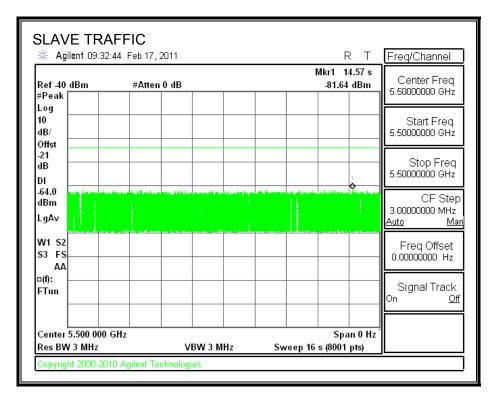
11.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



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TRAFFIC



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11.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.2.4. 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).

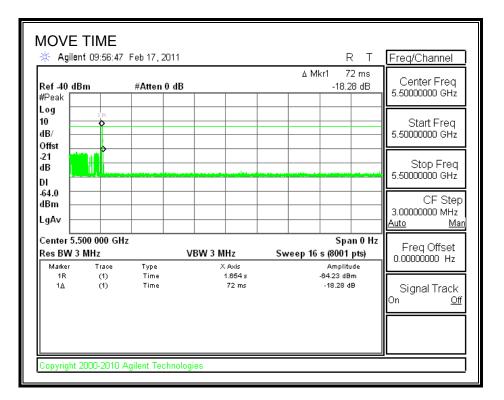
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	0.072	10

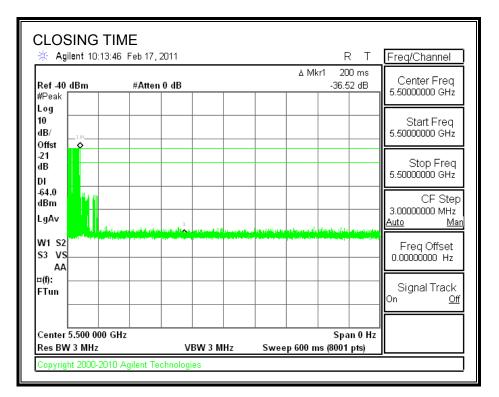
Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	0.0	60
IC	2.0	260

MOVE TIME



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CHANNEL CLOSING TIME

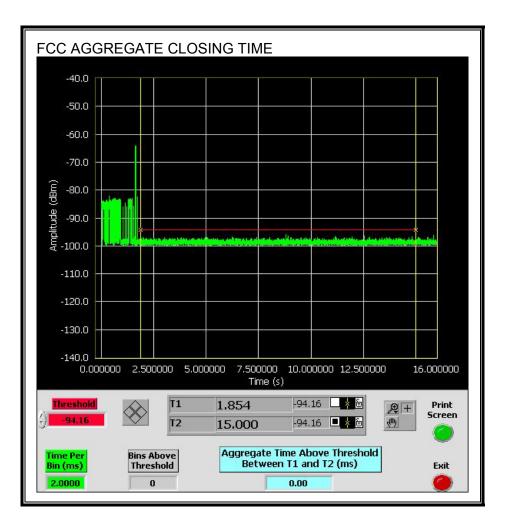


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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

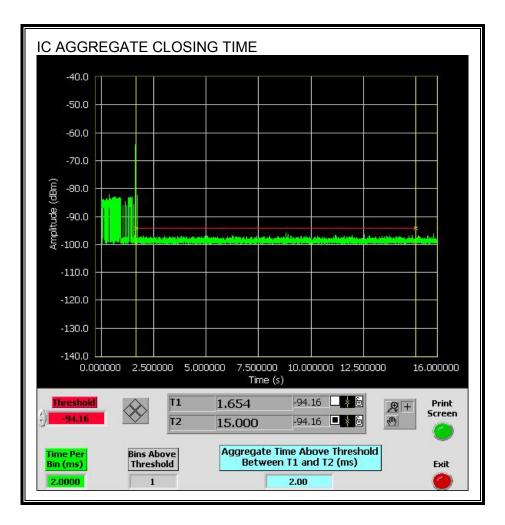
No transmissions are observed during the FCC aggregate monitoring period.



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Only intermittent transmissions are observed during the IC aggregate monitoring period.



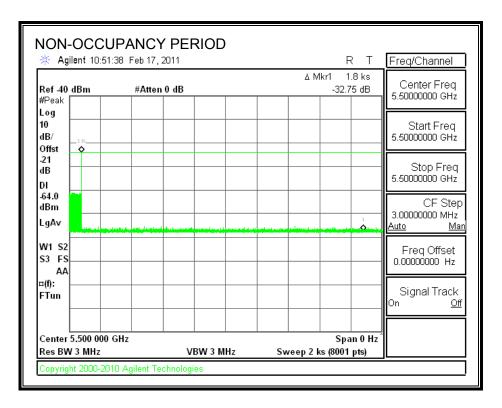
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11.2.5. NON-OCCUPANCY PERIOD

RESULTS

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



END OF REPORT

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