

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

**CERTIFICATION TEST REPORT** 

FOR

## WIRELESS CONTROLLER

### **MODEL NUMBER: 1537**

FCC ID: C3K-1537 IC: 3048A-1537

### REPORT NUMBER: 13U14963, Revision A

**ISSUE DATE: 2013-07-10** 

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UL LLC

#### **Revision History**

Rev.	Issue Date	Revisions	Revised By
	7/10/13	Initial Issue	M. Antola
А	10/8/13	Added clarification to Radiated test section to address testing per 15.407	T. Lee

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# **1. ATTESTATION OF TEST RESULTS**

COMPANY NAME: MICROSOFT 1 MICROSOFT WAY REDMOND, WA, 98052, USA				
EUT DESCRIPTION: WIRELESS CONTROLLER				
<b>MODEL:</b> 1537				
SERIAL NUMBER: NON-SERIALIZED PRODUCTION UNITS				
DATE TESTED:	2013-04-08 to 2013-07-10			
	APPLICABLE STANDARDS			
ST	ANDARD	TEST RESULTS		
CFR 47 P	art 15 Subpart E	Pass		
INDUSTRY CANADA	RSS-210 Issue 8 Annex 9	Pass		
INDUSTRY CAN	ADA RSS-GEN Issue 3	Pass		

UL LLC 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 LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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:

Mirtal

Bob DeLisi WiSE Principal Engineer UL LLC Mike Antola WiSE Project Lead UL LLC

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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033, ANSI C63.4-2003, 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 1285 Walt Whitman Road, Melville, New York, USA.

UL LLC is accredited by NVLAP, Laboratory Code 100255-0. The full scope of accreditation can be viewed at <u>http://ts.nist.gov/standards/scopes/1002550.htm</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
Radiated Emissions, 1-26GHz (worst case, Ground Plane)	± 5.7dB

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

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# 5. EQUIPMENT UNDER TEST

# 5.1. DESCRIPTION OF EUT

The EUT is an 802.11a/n transceiver, Model: 1537.

# 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5260 - 5320	802.11a	7.86	6.11
5260 - 5320	802.11n HT20	7.9	6.17
5500 - 5700	802.11a	6.26	4.23
5500 - 5700	802.11n HT20	6.22	4.19

# 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral antenna, with a maximum gain of 1 dBi.

# 5.4. SOFTWARE AND FIRMWARE

The EUT uses network adapter Atheros AR6006 USB ART\_MDK.

The EUT driver software installed during testing was Atheros, ver. 1.0.1.1019.

The test utility software used during testing was Atheros Radio Test 2 (ART2-GUI), ver. 2.3.

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# 5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Based on the baseline scan, the worst-case data rates were:

802.11a mode: 6 Mbps 802.11n HT20mode: MCS0

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# 5.6. DESCRIPTION OF TEST SETUP

#### SUPPORT EQUIPMENT

Support Equipment List					
Description Manufacturer Model FCC ID					
Laptop	Dell	Latitude D830	DoC		

#### I/O CABLES

	I/O Cable List						
Cable	Cable Port # of identical Connector Cable Type Cable Remarks						
No		ports	Туре		Length (m)		
1	USB	1	USB	Shielded	<3M	None	
2	DC	1	Mains	Unshielded	<3M	None	
3	AC	1	Mains	Unshielded	<3M	None	

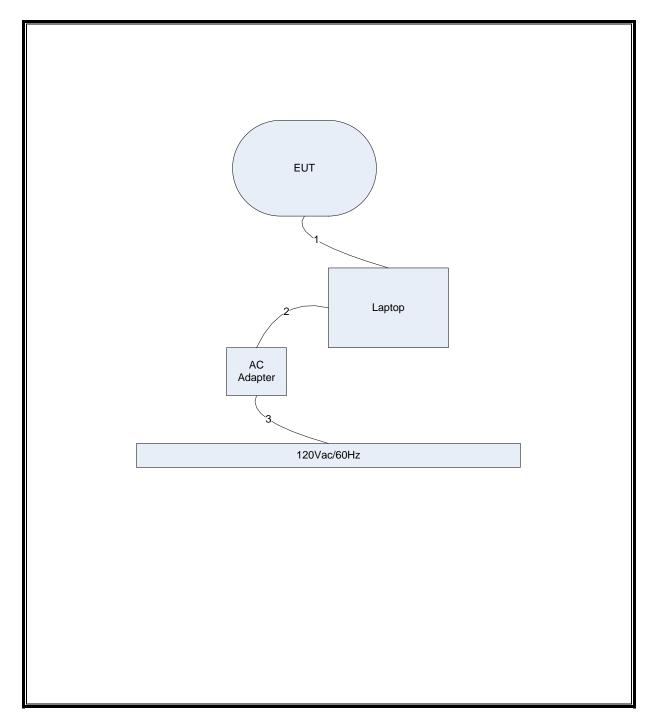
#### TEST SETUP

The EUT is a wireless controller used as a stand-alone device. Test software exercised the radio module.

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#### SETUP DIAGRAM FOR TESTS



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# 6. TEST AND MEASUREMENT EQUIPMENT

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

	Radiated Emissions						
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date		
30-1000MHz							
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2013-01-29	2014-01-31		
Log-P Antenna	Schaffner	UPA6109	44068	2013-04-03	2014-04-03		
Bicon Antenna	Schaffner	VBA6106A	54	2013-04-03	2014-04-03		
Switch Driver	HP	11713A	ME7A-627	N/A	N/A		
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A		
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A		
RF Switch Box	UL	1	44398	N/A	N/A		
Measurement Software	UL	Version 9.5	44740	N/A	N/A		
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268				
Multimeter	Fluke	83111	ME5B-305	2013-01-28	2014-01-31		
Above 1GHz (Band Optimized Sy		1	1				
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2013-01-30	2014-01-31		
Horn Antenna (1-2 GHz)	ETS	3161-01 (26°)**	51442	2008-03-28	See * below		
Horn Antenna (2-4 GHz)	ETS	3161-02 (22°)**	48107	2007-09-27	See * below		
Horn Antenna (4-8 GHz)	ETS	3161-03 (22°)**	48106	2007-09-27	See * below		
Horn Antenna (8-12 GHz)	ETS	3160-07 (26°)**	8933	2008-11-24	See * below		
Horn Antenna (12-18 GHz)	ETS	3160-08 (26°)**	8932	2007-09-27	See * below		
Horn Antenna (18-26.5 GHz)	ETS	3160-09 (27°)**	8947	2007-09-26	See * below		
Horn Antenna (26.5-40 GHz)	ETS	3160-10 (27°)**	73004	2007-09-26	See * below		
Signal Path Controller	HP	11713A	50250	N/A	N/A		
Gain Controller	HP	11713A	50251	N/A	N/A		
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A		
System Controller	UL	BOMS2	50252	N/A	N/A		
Measurement Software	UL	Version 9.5	44740	N/A	N/A		
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2012-12-22	2014-12-22		
Multimeter	Fluke	83111	ME5B-305	2013-01-28	2014-01-31		

Radiated Emissions						
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date	
<ul> <li>* - Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration. Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than 2D<sup>2</sup>/λ. Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.</li> <li>** - Number in parentheses denotes antenna beam width.</li> </ul>						

Conducted Emissions							
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date		
Conducted Emissions – GP 1			•				
	Rohde &						
EMI Receiver	Schwarz	ESCI 7	75141	2013-01-30	2014-01-31		
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2013-01-31	2014-01-31		
Switch Driver	HP	11713A	44397	N/A	N/A		
RF Switch Box	UL	4	44404	N/A	N/A		
Measurement Software	UL	Version 9.5	44736	N/A	N/A		
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2012-03-13	2014-03-13		
Multimeter	Fluke	87V	79648	2013-01-29	2014-01-31		

Bench Tests							
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date		
RF Room 2							
Spectrum Analyzer	Agilent	E4446A	72822	2013-01-29	2014-01-31		
Power Sensor	Rohde & Schwarz	NRP-Z81	75345	2013-01-30	2014-01-31		
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2012-12-22	2014-12-22		

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# 7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

#### <u>LIMITS</u>

None; for reporting purposes only.

#### PROCEDURE

KDB 789033 D01 V01r03 Zero-Span Spectrum Analyzer Method.

## 7.1.1. ON TIME AND DUTY CYCLE RESULTS

Mode	<b>ON</b> Time	Period	Duty Cycle	Duty	Duty Cycle	1/B
	В		х	Cycle	<b>Correction Factor</b>	Minimum VBW
	(msec)	(msec)	(linear)	(%)	(dB)	(kHz)
802.11a 20 MHz	2.03	2	0.953	95.3%	0.21	0.494
802.11n HT20	1.89	2	0.947	94.7%	0.23	0.529

## 7.1.2. MEASUREMENT METHOD FOR POWER AND PPSD

The Duty Cycle is less than 98% and consistent therefore KDB 789033 D01 V01r03 Method SA-2 is used.

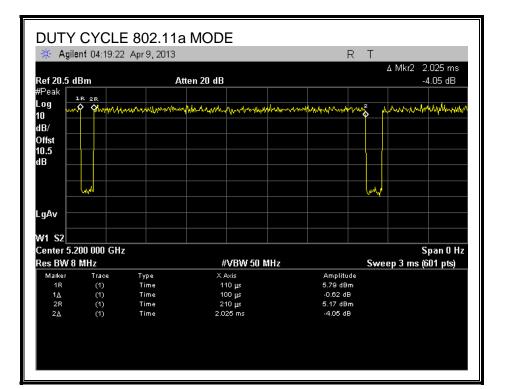
### 7.1.3. MEASUREMENT METHOD FOR AVG SPURIOUS EMISSIONS > 1 GHz

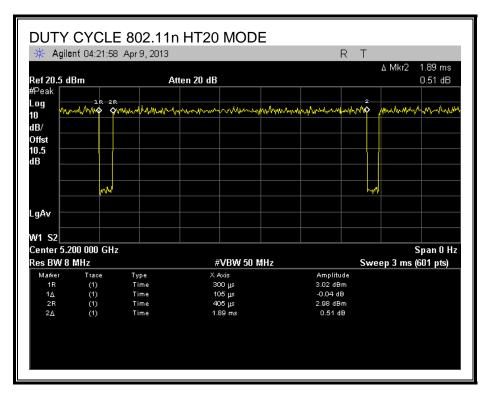
The Duty Cycle is less than 98% and consistent, KDB 789033 D01 V01r03 Method AD with Power RMS Averaging and VB with reduced video bandwidth Averaging and duty cycle correction is used.

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## 7.1.4. DUTY CYCLE PLOTS





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# 8. ANTENNA PORT TEST RESULTS

# 8.1. 802.11a MODE IN THE 5.3 GHz BAND

### 8.1.1. 26 dB BANDWIDTH

#### LIMITS

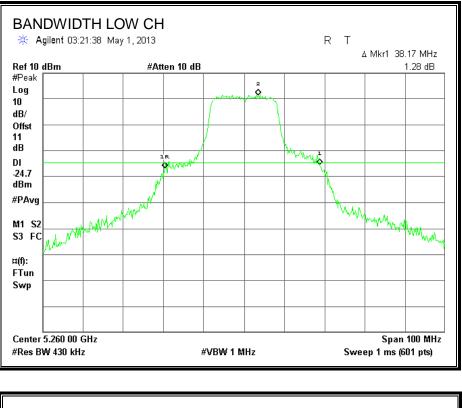
None; for reporting purposes only.

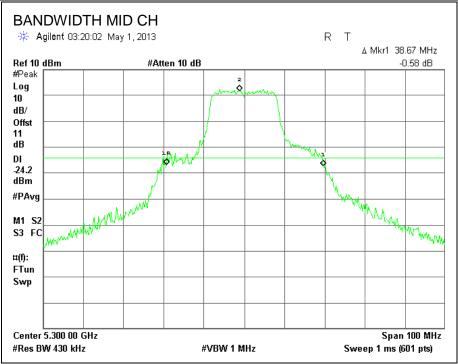
#### **RESULTS**

Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
Low	5260	38.2
Mid	5300	38.7
High	5320	38.3

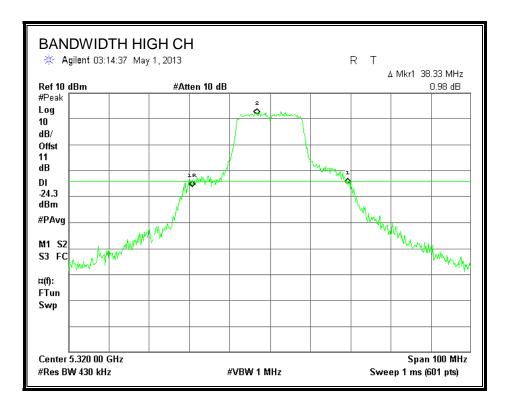
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#### 26 dB BANDWIDTH





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### 8.1.2. 99% BANDWIDTH

#### **LIMITS**

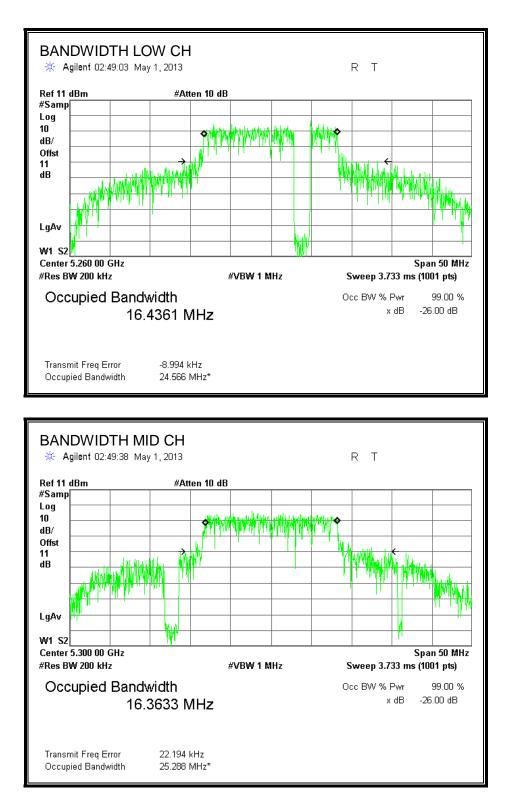
None; for reporting purposes only.

#### **RESULTS**

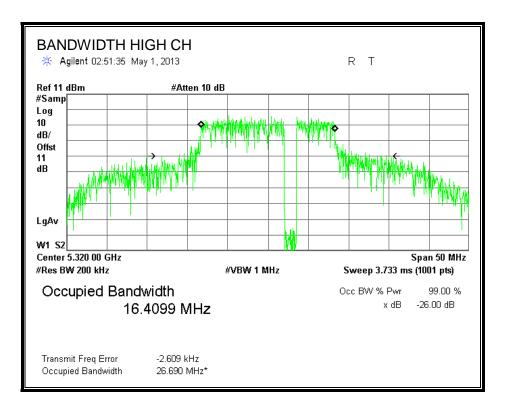
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5260	16.4
Mid	5300	16.4
High	5320	16.4

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#### 99% BANDWIDTH



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### 8.1.3. AVERAGE POWER

#### **LIMITS**

None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

#### **RESULTS**

Channel	Frequency	Power
	(MHz)	(dBm)
Low	5260	8.9
Mid	5300	8.9
High	5320	9.1

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## 8.1.4. OUTPUT POWER AND PPSD

#### <u>LIMITS</u>

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 251 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

#### DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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#### **RESULTS**

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	<b>99%</b>	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5260	38.2	16.4	1.00
Mid	5300	38.7	16.4	1.00
High	5320	38.3	16.4	1.00

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5260	24.00	23.15	29.15	23.15	11.00	11.00	11.00
Mid	5300	24.00	23.15	29.15	23.15	11.00	11.00	11.00
High	5320	24.00	23.15	29.15	23.15	11.00	11.00	11.00

Duty Cycle CF (dB) 0.20 Included in Calculations of Corr'd Power & PPSD

#### **Output Power Results**

Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	9.79	9.99	23.15	-13.16
Mid	5300	9.43	9.63	23.15	-13.52
High	5320	9.72	9.92	23.15	-13.23

#### **PPSD** Results

Channel	Frequency	Chain 0	Total	PPSD	PPSD
		Meas	Corr'd	Limit	Margin
		PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	-1.78	-1.58	11.00	-12.58
Mid	5300	-3.04	-2.84	11.00	-13.84
High	5320	-2.94	-2.74	11.00	-13.74

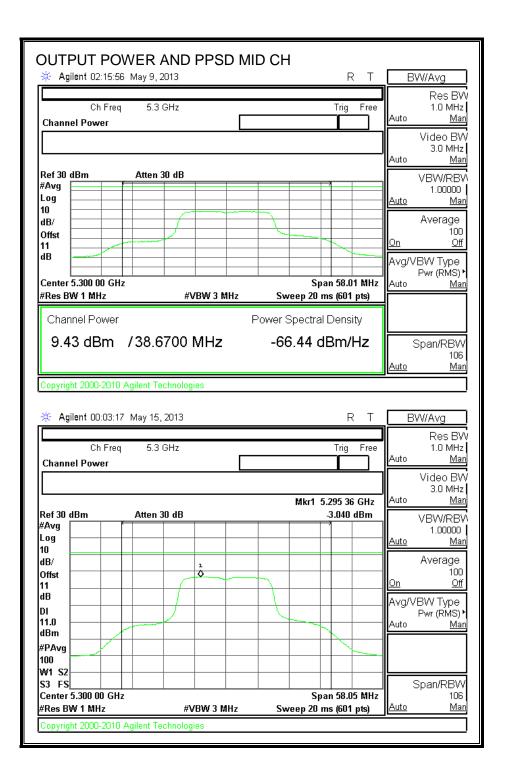
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#### OUTPUT POWER AND PPSD

		OW CH	
🄆 Agilent 02:08:49 May	9, 2013	RT	BW/Avg
			Res B\
	5.26 GHz	Trig Free	1.0 MHz
Channel Power			Auto <u>Ma</u>
			Video BV
			3.0 MHz Auto <u>Ma</u>
Ref 30 dBm Att	en 30 dB		VBW/RB
/Avg			1.00000
_og  0			<u>Auto Ma</u>
10 1B/		$\neg$	Average
Offst			100
			<u>On Of</u>
			Avg/VBW Type
Center 5.260 00 GHz		Span 57.26 MHz	Auto Pwr (RMS)
Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms (601 pts)	
Channel Dower		Dowor Sportrol Dopoity	
Channel Power		Power Spectral Density	
9.79 dBm / 38	8.1700 MHz	-66.02 dBm/Hz	Span/RBV
			10E
			<u>Auto Ma</u>
Copyright 2000-2010 Agilen	t Technologies		
🎋 Agilent 00:00:56 May	16.2013	R T	
	· - <b>,</b> · -		BW/Avg
			Res B\
I	5.26 GHz	Trig Free	Res BV
Ch Freq 5 Channel Power			Res B\ 1.0 MHz Auto <u>Ma</u>
•			Res B\ 1.0 MH; Auto <u>Ma</u> Video BV
•			Res B\ 1.0 MHz Auto <u>Ma</u>
Channel Power		Trig Free	Res BV 1.0 MHz Auto <u>Ma</u> Video BV 3.0 MHz
Channel Power	.26 GHz	Trig Free Mkr1 5.255 22 GHz	Res BV 1.0 MHz Auto <u>Ma</u> Video BV 3.0 MHz Auto <u>Ma</u> VBW/RB <sup>4</sup> 1.00000
Channel Power	.26 GHz	Trig Free Mkr1 5.255 22 GHz	Res BV 1.0 MH; Auto <u>Ma</u> Video BV 3.0 MH; Auto <u>Ma</u> VBW/RB 1.00000 <u>Auto Ma</u>
Channel Power	En 30 dB	Trig Free Mkr1 5.255 22 GHz	Res BV 1.0 MH; Auto <u>Ma</u> Video BV 3.0 MH; Auto <u>Ma</u> VBW/RB 1.00000 <u>Auto Ma</u> Average
Channel Power Channel Power Arte Arg O B/ D Fist Channel Power Channel P	i.26 GHz	Trig Free Mkr1 5.255 22 GHz	Res BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma VBW/RB' 1.00000 Auto Ma Average 100
Channel Power Channel Power Ref 30 dBm Attu Avg Attu Avg Attu B/	En 30 dB	Trig Free Mkr1 5.255 22 GHz	Res BV           1.0 MH;           Auto         Ma           Video BV           3.0 MH;           Auto         Ma           Video BV           3.0 MH;           Auto         Ma           VBW/RB           1.00000           Auto         Ma           Auto         Ma           Auto         Ma           1.00000         Auto           Auto         Ma           0n         Off
Channel Power  Ref 30 dBm Atto Avg Atto Og Bl Bl Dffst 1	En 30 dB	Trig Free Mkr1 5.255 22 GHz	Res BV 1.0 MH; Auto <u>Ma</u> Video BV 3.0 MH; Auto <u>Ma</u> VBW/RB 1.00000 <u>Auto Ma</u> Average 100 On <u>Of</u> Avg/VBW Type
Channel Power Ch	En 30 dB	Trig Free Mkr1 5.255 22 GHz	Res BV           1.0 MH;           Auto         Ma           Video BV           3.0 MH;           Auto         Ma           Video BV           3.0 MH;           Auto         Ma           VBW/RB           1.00000           Auto         Ma           Auto         Ma           Auto         Ma           1.00000         Auto           Auto         Ma           0n         Off
Channel Power Channel Power Ref 30 dBm Attu- Avg Attu- A	En 30 dB	Trig Free Mkr1 5.255 22 GHz	Res BV 1.0 MH; Auto <u>Ma</u> Video BV 3.0 MH; Auto <u>Ma</u> VBW/RB' 1.00000 <u>Auto Ma</u> Average 100 <u>On Of</u> Avg/VBW Type Pwr (RMS)
Channel Power  Ref 30 dBm Attu- Avg	En 30 dB	Trig Free Mkr1 5.255 22 GHz	Res BV 1.0 MH; Auto <u>Ma</u> Video BV 3.0 MH; Auto <u>Ma</u> VBW/RB' 1.00000 <u>Auto Ma</u> Average 100 <u>On Of</u> Avg/VBW Type Pwr (RMS)
Channel Power  Ref 30 dBm Attu- Avg Avg Attu- Avg	En 30 dB	Trig Free Mkr1 5.255 22 GHz	Res BV 1.0 MH; Auto <u>Ma</u> Video BV 3.0 MH; Auto <u>Ma</u> VBW/RB' 1.00000 <u>Auto Ma</u> Average 100 <u>On Of</u> Avg/VBW Type Pwr (RMS)
Channel Power Aef 30 dBm Attu Avg Attu Avg Attu Avg Attu Avg Attu Avg Attu Avg Attu	En 30 dB	Trig Free Mkr1 5.255 22 GHz -1.778 dBm	Res BV 1.0 MH; Auto <u>Ma</u> Video BV 3.0 MH; Auto <u>Ma</u> VBW/RB' 1.00000 <u>Auto Ma</u> Average 100 On <u>Of</u> Avg/VBW Type Pwr (RMS) Auto <u>Ma</u> Span/RBV
Channel Power Aef 30 dBm Attu Avg Attu Avg Attu Avg Attu Avg Attu Avg Attu Avg Attu	26 GHz	Trig Free Mkr1 5.255 22 GHz -1.778 dBm	Res BV 1.0 MH2 Auto Ma Video BV 3.0 MH2 Auto Ma VBW/RB' 1.00000 Auto Ma Average 100 On Of Avg/VBW Type Pwr (RMS) Auto Ma Span/RBV' 100
Channel Power  Ref 30 dBm Attu- Avg .og 0 1 B/ 0 HB/ 1 1 B 1 1 1 B 1 1 1 B 1 1 1 1 1 C 1 C C C C	26 GHz	Trig Free Mkr1 5.255 22 GHz -1.778 dBm	Res BV 1.0 MH; Auto <u>Ma</u> Video BV 3.0 MH; Auto <u>Ma</u> VBW/RB' 1.00000 <u>Auto Ma</u> Average 100 On <u>Of</u> Avg/VBW Type Pwr (RMS) Auto <u>Ma</u> Span/RBV

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Agilent 02:18:01 May	9, 2013	RT	BW/Avg
			Res B
Ch Freq 5	i.32 GHz	Trig Free	1.0 MH
hannel Power			Auto <u>Ma</u>
			Video B <sup>1</sup>
			3.0 MH Auto Ma
ef 30 dBm Att			
er 30 dBm Att Avg	en 30 dB		VBW/RB
og			1.00000 Auto <u>Ma</u>
		+	
3/			Average
ffst			On Of
3			Avg/VBW Type
			Pwr (RMS)
enter 5.320 00 GHz		Span 57.49 MHz	Auto <u>Ma</u>
Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms (601 pts)	╡
Channel Power	ļ	Power Spectral Density	
9.72 dBm /38	2200 MU-	-66.11 dBm/Hz	
9.72 UDIII 730	5.5500 IVITZ		Span/RBV
			100
			100 <u>Auto Ma</u>
pyright 2000-2010 Agilen	-	D T	<u>Auto Ma</u>
C Agilent 00:05:44 May	15, 2013	R T	
Agilent 00:05:44 May	-	R T Trig Free	<u>Auto Ma</u> BW/Avg Res B' 1.0 MH
Agilent 00:05:44 May	15, 2013		Auto Ma BW/Avg Res B' 1.0 MH Auto Ma
Agilent 00:05:44 May Ch Freq 5	15, 2013		Auto Ma BW/Avg BW/Avg Res B <sup>a</sup> 1.0 MH Auto Ma Video B <sup>a</sup>
Agilent 00:05:44 May Ch Freq 5	15, 2013	Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma
Ch Freq &	15, 2013		Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma Video B' 3.0 MH Auto Ma
Agilent 00:05:44 May Ch Freq 5 hannel Power	15, 2013 .32 GHz	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma Video B' 3.0 MH
Agilent 00:05:44 May Ch Freq 5 hannel Power	15, 2013 .32 GHz	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma VBW/RB
Agilent 00:05:44 May Ch Freq & hannel Power	15, 2013 .32 GHz	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma VBW/RB 1.00000
Agilent 00:05:44 May Ch Freq & hannel Power	15, 2013 .32 GHz	Trig Free Mkr1 5.315 60 GHz	Auto         Million           BW/Avg         BW/Avg           Res B' 1.0 MH         1.0 MH           Auto         Million           Video B' 3.0 MH         3.0 MH           Auto         Million           VBW/RB         1.00000           Auto         Million           Average         100
Agilent 00:05:44 May     Ch Freq 5 hannel Power      f 30 dBm Att     g     f 30 dBm Att     f 30 dBm Att Att Att Att Att Att Att Att Att At	15, 2013 5.32 GHz en 30 dB	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma
Agilent 00:05:44 May     Ch Freq 5 hannel Power  ef 30 dBm Att  g  fixt a	15, 2013 5.32 GHz en 30 dB	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma Average 100 On O
Agilent 00:05:44 May Ch Freq & hannel Power ef 30 dBm Att yg Att g Att fist Att fist Att g Att han	15, 2013 5.32 GHz en 30 dB	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma Average 100 On Or Pwr (RMS)
Ch Freq &	15, 2013 5.32 GHz en 30 dB	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma Average 100 On O
Agilent 00:05:44 May Ch Freq & hannel Power ef 30 dBm Att Vg Att g Att fst a .0 Bm Avg	15, 2013 5.32 GHz en 30 dB	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma Average 100 On Or Pwr (RMS)
Agilent 00:05:44 May Ch Freq 5 hannel Power af 30 dBm Att by Att ch Freq 5 hannel Power Att Att Att Att Att Att Att At	15, 2013 5.32 GHz en 30 dB	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma Average 100 On Or Pwr (RMS)
Agilent 00:05:44 May Ch Freq 5 hannel Power ef 30 dBm Att yg fist .0 3m PAvg 0 1 S2	15, 2013 5.32 GHz en 30 dB	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma Average 100 On O Pwr (RMS) Auto Ma
Agilent 00:05:44 May Ch Freq 5 hannel Power af 30 dBm Att by Att ch Freq 5 hannel Power Att Att Att Att Att Att Att At	15, 2013 5.32 GHz en 30 dB	Trig Free Mkr1 5.315 60 GHz	Auto Ma BW/Avg BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma 1.00000 Auto Ma Average 100 On Or Pwr (RMS) Auto Ma

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### 8.1.5. PEAK EXCURSION

#### LIMITS

FCC §15.407 (a) (6)

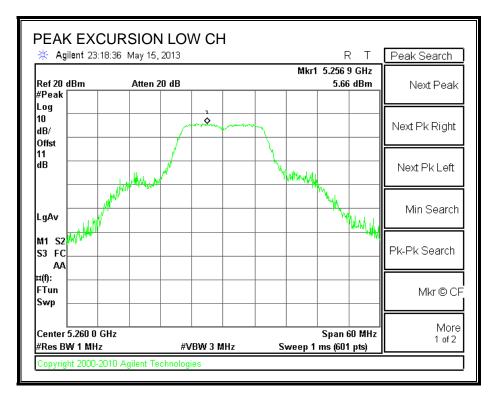
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

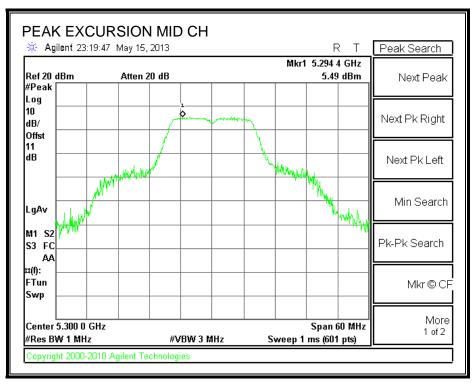
#### **RESULTS**

Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Low	5260	5.66	-1.78	0.20	7.24	13	-5.76
Mid	5300	5.49	-3.04	0.20	8.33	13	-4.67
High	5320	5.52	-2.94	0.20	8.26	13	-4.74

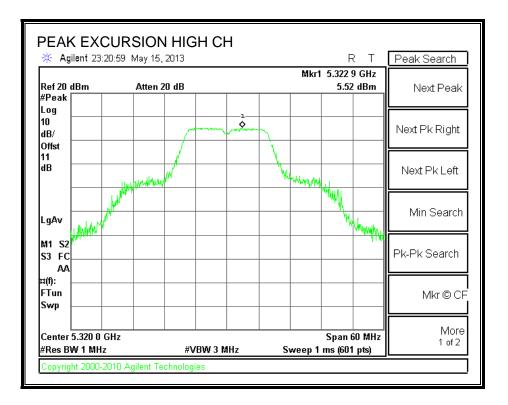
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#### PEAK EXCURSION





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## 8.2. 802.11n HT20 MODE IN THE 5.3 GHz BAND

### 8.2.1. 26 dB BANDWIDTH

#### LIMITS

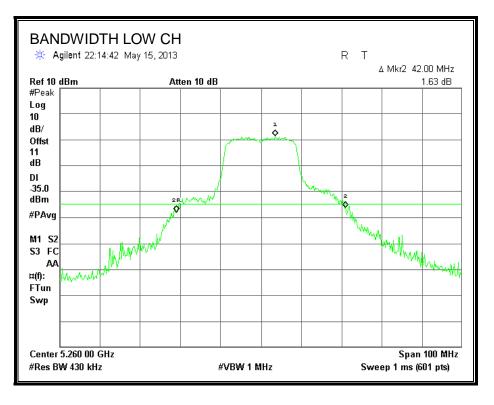
None; for reporting purposes only.

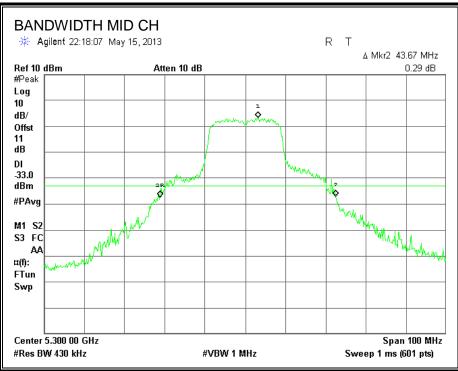
#### **RESULTS**

Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
Low	5260	42.0
Mid	5300	43.7
High	5320	39.7

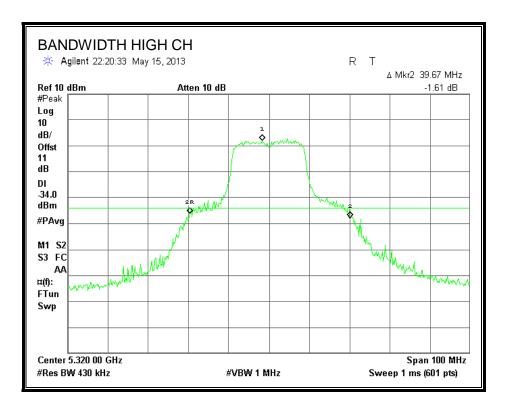
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#### 26 dB BANDWIDTH





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### 8.2.2. 99% BANDWIDTH

#### **LIMITS**

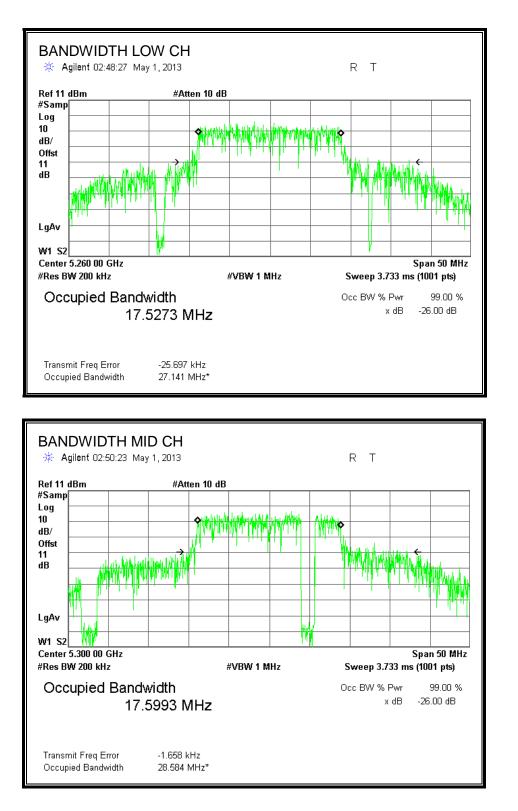
None; for reporting purposes only.

#### **RESULTS**

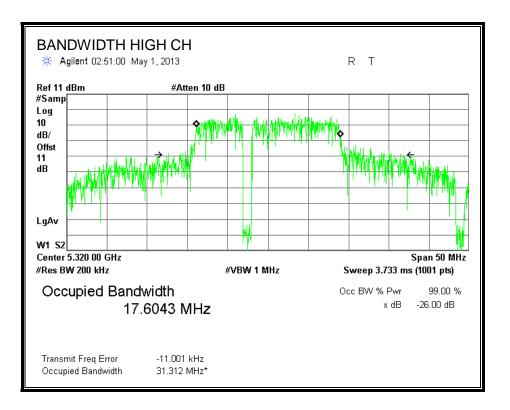
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5260	17.5
Mid	5300	17.6
High	5320	17.6

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#### 99% BANDWIDTH



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### 8.2.3. AVERAGE POWER

#### <u>LIMITS</u>

None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

#### **RESULTS**

Channel	Frequency	Power
	(MHz)	(dBm)
Low	5260	6.7
Mid	5300	7.0
High	5320	7.0

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# 8.2.4. OUTPUT POWER AND PPSD

## <u>LIMITS</u>

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 251 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

### DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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### **RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	<b>99%</b>	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5260	42.0	17.5	1.00
Mid	5300	43.7	17.6	1.00
High	5320	39.7	17.6	1.00

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5260	24.00	23.44	29.44	23.44	11.00	11.00	11.00
Mid	5300	24.00	23.46	29.46	23.46	11.00	11.00	11.00
High	5320	24.00	23.46	29.46	23.46	11.00	11.00	11.00

Duty Cycle CF (dB) 0.20 Included in Calculations of Corr'd Power & PPSD

### **Output Power Results**

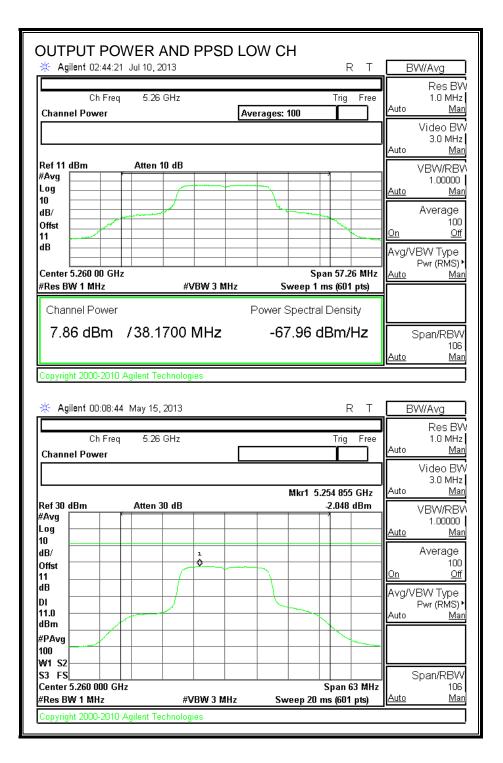
Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	7.86	8.06	23.44	-15.38
Mid	5300	7.79	7.99	23.46	-15.47
High	5320	7.76	7.96	23.46	-15.50

### **PPSD** Results

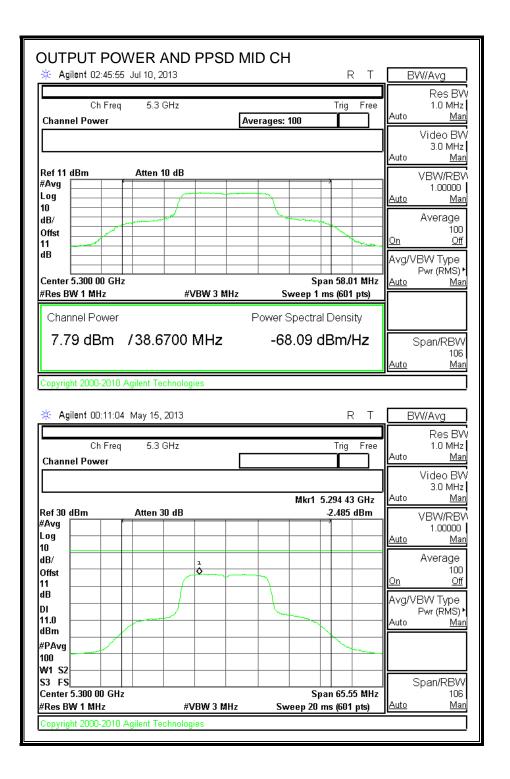
Channel	Frequency	Chain 0	Total	PPSD	PPSD
		Meas	Corr'd	Limit	Margin
		PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	-2.05	-1.85	11.00	-12.85
Mid	5300	-2.49	-2.29	11.00	-13.29
High	5320	-4.58	-4.38	11.00	-15.38

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### OUTPUT POWER AND PPSD



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UTPUT POW Agilent 02:47:17 J	ul 10, 2013		RT	BW/Avg
				Res B
Ch Freq	5.32 GHz		Trig Free	1.0 MH
hannel Power		Averages: 100		Auto <u>M</u>
				Video B
				Auto Mi
ef 11 dBm	Atten 10 dB			
Avg T			1	VBW/RE
og 📃 🗌				<u>Auto M</u>
				Average
3/ ffst				
			- mark	<u>On 0</u>
3				Avg/VBW Type
				Pwr (RMS)
enter 5.320 00 GHz Res BW 1 MHz	#VBW 3 MHz	•	an 57.49 MHz ns (601 pts)	<u>Auto M</u>
			na (oo i braj	1
Channel Power		Power Spectral	Density	
7 76 dBm /	38.3300 MHz	-68.07 d	Bm/Hz	Span/RB\
7.70 ubm 7	50.5500 Militz	-00.07 u		
opyright 2000-2010 Ag				Auto M
<ul> <li>Agilent 00:13:09 N</li> </ul>			R T	10
				10 Auto M BW/Avg Res B 1.0 MH
Agilent 00:13:09 M	v 1ay 15, 2013		RT	BW/Avg BW/Avg I Res B 1.0 MH Auto M
Agilent 00:13:09 M	v 1ay 15, 2013		RT	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B
Agilent 00:13:09 M	v 1ay 15, 2013		R T Trig Free	BW/Avg BW/Avg I Res B 1.0 MH Auto M
Agilent 00:13:09 N Ch Freq hannel Power	v 1ay 15, 2013	  	RT	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B 3.0 MH Auto M
Agilent 00:13:09 N Ch Freq hannel Power	flay 15, 2013 5.32 GHz	 Mkr1 5	R T Trig Free	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B 3.0 MH Auto M VBW/RE 1.00000
Agilent 00:13:09 N Ch Freq hannel Power	flay 15, 2013 5.32 GHz		R T Trig Free	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B 3.0 MH Auto M VBW/RE
Agilent 00:13:09 M Ch Freq hannel Power ef 30 dBm vg	Atten 30 dB		R T Trig Free	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B 3.0 MH Auto M VBW/RE 1.00000 Auto M
Agilent 00:13:09 N Ch Freq hannel Power	flay 15, 2013 5.32 GHz	Mkr1 5	R T Trig Free	BW/Avg           BW/Avg           Res B           1.0 MH           Auto           Wideo B           3.0 MH           Auto           Video B           3.0 MH           Auto           WBW/RE           1.00000           Auto           Average           10           Average           10
Agilent 00:13:09 N     Ch Freq hannel Power	Atten 30 dB	Mkr1 5	R T Trig Free	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B 3.0 MH Auto M VBW/RE 1.00000 Auto M Average 10 0n 0
Agilent 00:13:09 N     Ch Freq hannel Power  ef 30 dBm Nvg	Atten 30 dB	Mkr1 5	R T Trig Free	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B 3.0 MH Auto M VBW/RE 1.00000 Auto M Average 10 0n 0
Agilent 00:13:09 N     Ch Freq hannel Power  af 30 dBm yg fist fist .0	Atten 30 dB	Mkr1 5	R T Trig Free	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B 3.0 MH Auto M VBW/RE 1.00000 Auto M Average 10 0n 0
Agilent 00:13:09 N     Ch Freq hannel Power  af 30 dBm  yg  af 30 dBm  fst  a a a b b b b b b b b b b b b b b b b	Atten 30 dB	Mkr1 5	R T Trig Free	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B 3.0 MH Auto M VBW/RE 1.00000 Auto M Average 0n Q Avg/VBW Type Pwr (RMS
Agilent 00:13:09 N Ch Freq hannel Power	Atten 30 dB	Mkr1 5	R T Trig Free	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B 3.0 MH Auto M VBW/RE 1.00000 Auto M Average 0n Q Avg/VBW Type Pwr (RMS
Agilent 00:13:09 N Ch Freq hannel Power	Atten 30 dB	Mkr1 5	R T Trig Free	BW/Avg BW/Avg Res B 1.0 MH Auto M Video B 3.0 MH Auto M VBW/RE 1.00000 Auto M Average 0n Q Avg/VBW Type Pwr (RMS
Agilent 00:13:09 N Ch Freq hannel Power	Atten 30 dB		R T Trig Free .315 24 GHz .4.583 dBm	Auto     10       BW/Avg     Res B       Auto     M       Auto     M       Video B     3.0 MH       Auto     M       VBW/RE     1.00000       Auto     M       Auto     M       Auto     M       Auto     M       Average     10       On     O       Auto     M       Span/RBV
Agilent 00:13:09 N Ch Freq hannel Power	Atten 30 dB	Spa	R T Trig Free .315 24 GHz 4.583 dBm 1 1 1 1 1 1 1 1 1 1 1 1 1	Auto     10       BW/Avg     Res B       Auto     M       Auto     M       Video B     3.0 MH       Auto     M       VBW/RE     1.00000       Auto     M       Auto     M       Auto     M       Auto     M       Average     10       On     O       Auto     M       Span/RBV

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## 8.2.5. PEAK EXCURSION

#### LIMITS

FCC §15.407 (a) (6)

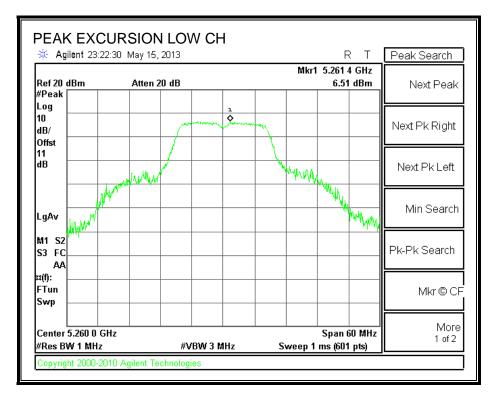
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

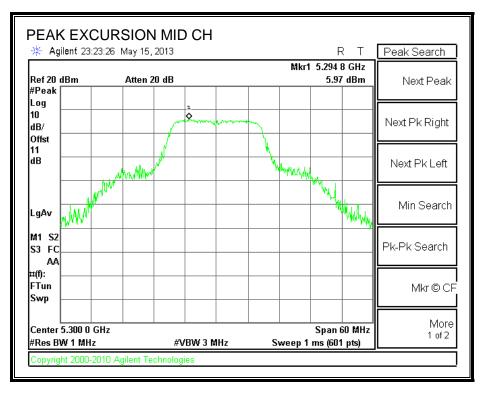
### **RESULTS**

Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Low	5260	6.51	-2.05	0.20	8.36	13	-4.64
Mid	5300	5.97	-2.49	0.20	8.26	13	-4.74
High	5320	3.84	-4.58	0.20	8.22	13	-4.78

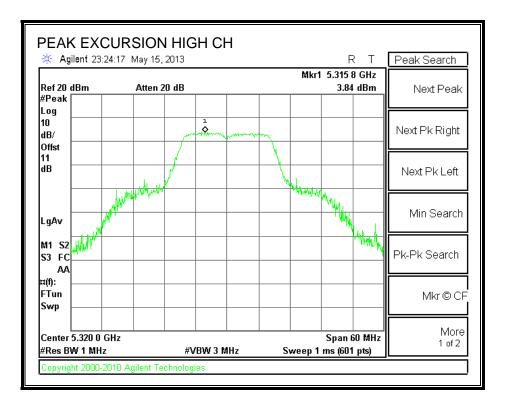
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## PEAK EXCURSION





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# 8.3. 802.11a MODE IN THE 5.6 GHz BAND

## 8.3.1. 26 dB BANDWIDTH

### **LIMITS**

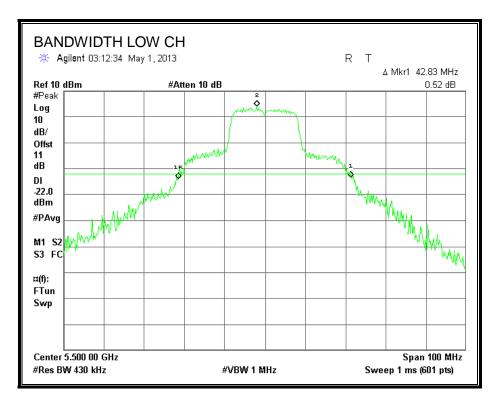
None; for reporting purposes only.

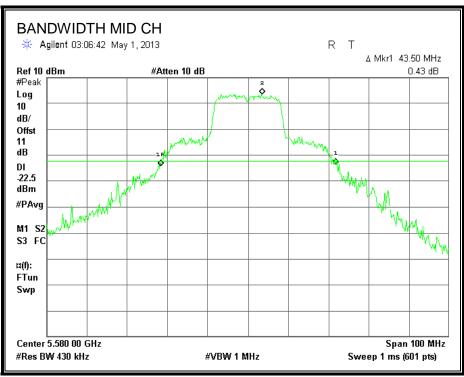
### **RESULTS**

Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
Low	5500	42.8
Mid	5580	43.5
High	5700	41.3

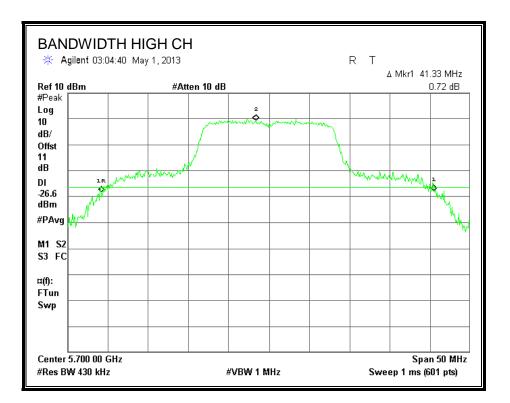
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### 26 dB BANDWIDTH





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## 8.3.2. 99% BANDWIDTH

### **LIMITS**

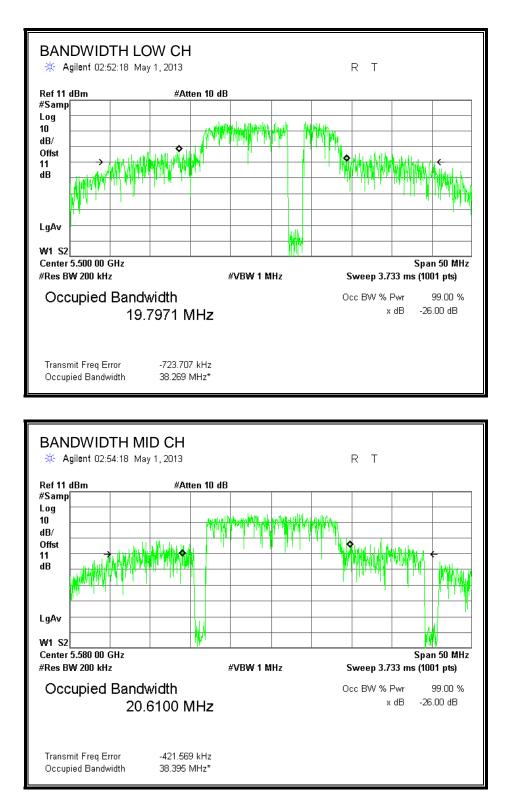
None; for reporting purposes only.

### **RESULTS**

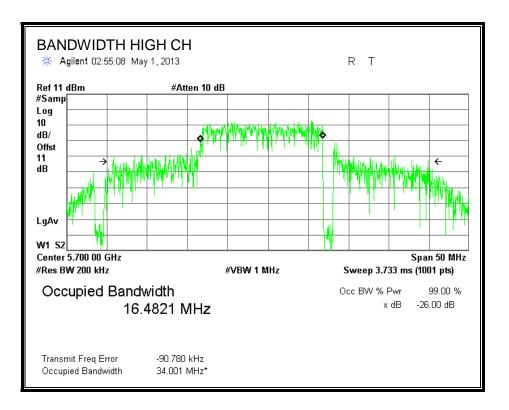
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5500	19.8
Mid	5580	20.6
High	5700	16.5

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### 99% BANDWIDTH



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# 8.3.3. AVERAGE POWER

#### <u>LIMITS</u>

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

#### **RESULTS**

Channel	Frequency	Power
	(MHz)	(dBm)
Low	5500	7.1
Mid	5580	7.3
High	5700	7.4

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# 8.3.4. OUTPUT POWER AND PPSD

## <u>LIMITS</u>

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 251 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

## IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

### DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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### **RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	<b>99%</b>	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5500	42.8	19.8	1.00
Mid	5580	43.5	20.6	1.00
High	5700	41.3	16.5	1.00

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5500	24.00	23.97	29.97	23.97	11.00	11.00	11.00
Mid	5580	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5700	24.00	23.17	29.17	23.17	11.00	11.00	11.00

Duty Cycle CF (dB) 0.20 Included in Calculations of Corr'd Power & PPSD

### **Output Power Results**

Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	7.82	8.02	23.97	-15.95
Mid	5580	7.84	8.04	24.00	-15.96
High	5700	7.90	8.10	23.17	-15.07

### **PPSD** Results

Channel	Frequency	Chain 0	Total	PPSD	PPSD
		Meas	Corr'd	Limit	Margin
		PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	-6.11	-5.91	11.00	-16.91
Mid	5580	-6.25	-6.05	11.00	-17.05
High	5700	-7.72	-7.52	11.00	-18.52

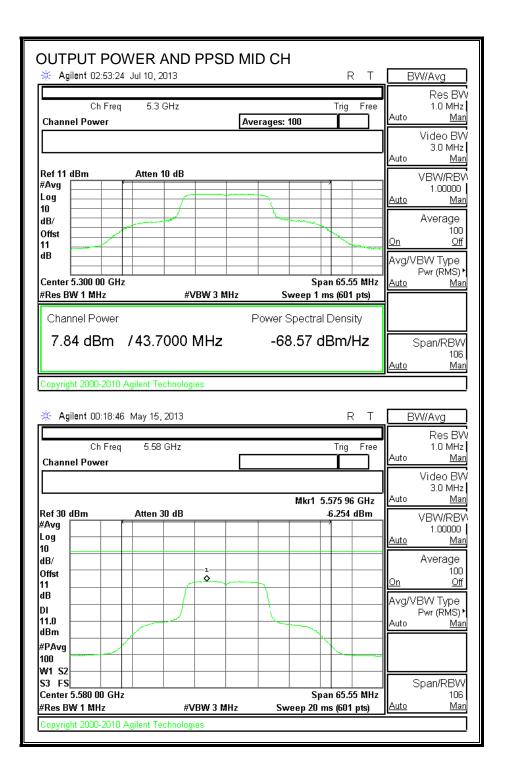
UL LLC FORM NO: CCSUP4701D 1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577 This report shall not be reproduced except in full, without the written approval of Underwriters Laboratories Inc.

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## OUTPUT POWER AND PPSD

	AND PPSD LO	OW CH	
Agilent 02:52:19 Jul 10,	, 2013	R	T BW/Avg
			Res B\
1	26 GHz	Trig	Free 1.0 MH:
Channel Power	A	verages: 100	Auto <u>Ma</u>
			Video BV
			3.0 MH; Auto <u>Ma</u>
Ref 11 dBm Atter	n 10 dB		
#Avg			1.00000
			<u> </u>
10 #B/			Average
Offst			100
11			On Of
dB			Avg/VBW Type
Center 5.260 000 GHz		Span 6	Pwr (RMS)
Res BW 1 MHz	#VBW 3 MHz	Sweep 1 ms (601	
Channel Power		Power Spectral Densi	ty
7.82 dBm /42.	0000 MHz	-68.42 dBm/l	Hz Span/RBV
7.02 dDin 742.		00.42 dbm/	106
			<u>Auto Ma</u>
Copyright 2000-2010 Agilent T	Technologies		
Agilent 00:16:25 May 1:	5, 2013	R	Res B\
Agilent 00:16:25 May 1: Ch Freq 5:		R Trig	
Agilent 00:16:25 May 1:	5, 2013		Res B\           Free         1.0 MH;           Auto         Ma
Agilent 00:16:25 May 1: Ch Freq 5:	5, 2013		Res B\ Free 1.0 MH;
Agilent 00:16:25 May 1: Ch Freq 5. Channel Power	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free Res BV Auto Ma Video BV 3.0 MH: GHz Auto Ma
Ch Freq 5. Ch Freq 5. Channel Power	5, 2013	Trig	Free         Res BV           Free         1.0 MH;           Auto         Ma           Video BV         3.0 MH;           GHz         Auto         Ma           dBm         VBW/RB
Ch Freq 5. Ch Freq 5. Channel Power	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free         Res BV           Free         1.0 MH;           Auto         Ma           Video BV         3.0 MH;           GHz         Auto         Ma           dBm         VBVV/RB         1.00000
Ch Freq 5. Ch Freq 5. Channel Power	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free         Res BV           Free         1.0 MH;           Auto         Ma           Video BV         3.0 MH;           GHz         Auto         Ma           dBm         VBW/RB         1.00000           Auto         Ma         1.00000
Agilent 00:16:25 May 1:     Ch Freq 5:     Channel Power  Ref 30 dBm Atter Avg Atter I 0 IB/	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free Auto Res BV Auto Ma Video BV 3.0 MH; Auto Ma dBm VBW/RB 1.00000 Auto Ma Average
Agilent 00:16:25 May 1:     Ch Freq 5:     Channel Power  Ref 30 dBm Atter Avg I I I I I I	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free Res BV Free 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma dBm VBW/RB 1.0000 Auto Ma Auto Ma
Agilent 00:16:25 May 1:     Ch Freq 5:     Channel Power  Ref 30 dBm Atter Avg Atter I 0 IB/	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free         Res BV           Auto         Main           Auto         Main           GHz         Auto           Auto         Main           GHz         Auto           Auto         Main           On         Off
Agilent 00:16:25 May 1:     Ch Freq 5:     Channel Power  Ref 30 dBm Atter Avg .og III	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free Res BV Free 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma dBm VBW/RB 1.0000 Auto Ma Auto Ma
Agilent 00:16:25 May 1:           Ch Freq         5.:           Channel Power         5.:           Channel Power         5.:           Ref 30 dBm         Atter           Agilent 00:16:25 May 1:         5.:           Channel Power         5.:           Channel Power         5.:           Ref 30 dBm         Atter           Agilent 1         5.:           JB/         5.:           JB         5.:           J1         5.:           J1         5.:           J1         5.:	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free         Res BV           Free         1.0 MH;           Auto         Ma           Video BV         3.0 MH;           GHz         Auto         Ma           dBm         VBW/RB         1.00000           Auto         Ma         1.00000           Average         1.00000         1.00000           Aveg/VBW Type         1.00000         1.00000
Agilent 00:16:25 May 1: Ch Freq 5: Channel Power Channel Power Avg agilton Atter Agilton Atter Agilton Atter Agilton Atter Atter Agilton Atter Agilton Atter Agilton Atter Atter Atter Atter Agilton Atter	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free         Res B\ 1.0 MHz           Auto         Mai           GHz         Auto         Mai           dBm         VBW/RB         1.00000           Auto         Mai         Average           100         On         Of           Avg/VBW Type         Pwr (RMS)         Pwr (RMS)
Agilent 00:16:25 May 1: Ch Freq 5: Channel Power Channel Power Avg agilton Atter Agilton Atter Agilton Atter Agilton Atter Agilton Atter Atter Agilton Atter Agilton Atter Atter Atter Atter Agilton Atter	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free         Res B\ 1.0 MHz           Auto         Mai           GHz         Auto         Mai           dBm         VBW/RB         1.00000           Auto         Mai         Average           100         On         Of           Avg/VBW Type         Pwr (RMS)         Pwr (RMS)
Agilent 00:16:25 May 1: Ch Freq 5: Channel Power Channel Power Avg agilton Atter Agilton Atter Agilton Atter Agilton Atter Atter Agilton Atter Agilton Atter Agilton Atter Atter Atter Atter Agilton Atter	5, 2013 5 GHz	Trig Mkr1 5.496 041	Free         Res B\ 1.0 MHz           Auto         Mai           GHz         Auto         Mai           dBm         VBW/RB         1.00000           Auto         Mai         Average           100         On         Of           Avg/VBW Type         Pwr (RMS)         Pwr (RMS)
Agilent 00:16:25 May 1: Ch Freq 5: Channel Power Channel Power	5, 2013 5 GHz	Trig	Free Auto Material Average 100 On Of Auto Material Average Pwr (RMS) Auto Material Auto Auto Material Auto Auto Auto Auto Auto Auto Auto Auto
Agilent 00:16:25 May 1:           Ch Freq         5:           Channel Power         5:	5, 2013	Trig Mkr1 5.496 041 -6.114	Free         Res B\ 1.0 MHz           Auto         Mai           GHz         Auto         Mai           dBm         Video B\ 3.0 MHz         3.0 MHz           dBm         VBW/RB         1.00000           Auto         Mai         100           On         Of         Of           Auto         Mai         Span/RBV           Span/RBV         100
Agilent 00:16:25 May 1: Ch Freq 5: Channel Power Channel Power	5, 2013 5 GHz	Trig	Free         Res B\ 1.0 MHz           Auto         Mai           GHz         Auto         Mai           dBm         Video B\ 3.0 MHz         3.0 MHz           dBm         VBW/RB         1.00000           Auto         Mai         100           On         Of         Of           Auto         Mai         Span/RBV           Span/RBV         100

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UTPUT POWE Agilent 02:54:17 Ju	I 10, 2013		RT	BW/Avg
•				Res B
Ch Freq	5.32 GHz		Trig Free	1.0 MH
hannel Power		Averages: 100		Auto <u>Ma</u>
			<u> </u>	Video B
				. 3.0 MH
				Auto <u>Ma</u>
	Atten 10 dB		- <b>)</b>	VBW/RB
Avg by				1.00000
)				<u>Auto Ma</u>
B/		- harring		Average
ffst				100 0n 01
3			- muse	
				Avg/VBW Type Pwr (RMS)
enter 5.320 00 GHz		Sp	an 59.55 MHz	Auto Ma
Res BW 1 MHz	#VBW 3 MHz		ns (601 pts)	
Channel Dawar		Douvor Or a sturi	Danaiti	1
Channel Power		Power Spectral	Density	
7.90 dBm /3	39.7000 MHz	-68.09 d	Bm/Hz	Span/RBV
				100
opyright 2000-2010 Agil			RT	Auto Ma BW/Avg
<ul> <li>Agilent 00:20:59 Ma</li> </ul>				<u>Auto Ma</u>
	ay 15, 2013			Auto Ma BW/Avg Res B'
Ch Freq	ay 15, 2013			Auto Ma BW/Avg Res B' 1.0 MH
Ch Freq	ay 15, 2013		Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma Video B' 3.0 MH
Agilent 00:20:59 Ma Ch Freq Channel Power	ay 15, 2013 5.7 GHz	 Mkr1 5	Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma Video B'
Agilent 00:20:59 Mi Ch Freq hannel Power	ay 15, 2013		Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma VBW/RB
Agilent 00:20:59 Ma Ch Freq hannel Power	ay 15, 2013 5.7 GHz		Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma VBW/RB 1.00000
Agilent 00:20:59 M: Ch Freq hannel Power	ay 15, 2013 5.7 GHz	Mkr1 5	Trig Free	Auto Ma BW/Avg BW/Avg 1.0 MH Auto Ma Video B <sup>1</sup> 3.0 MH Auto Ma Auto Ma 1.00000 Auto Ma
Agilent 00:20:59 M:     Ch Freq hannel Power  ef 30 dBm     A yg     J	ay 15, 2013 5.7 GHz .tten 30 dB	Mkr1 5	Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma VBW/RB 1.00000 Auto Ma Average
Agilent 00:20:59 Mi Ch Freq hannel Power	ay 15, 2013 5.7 GHz	Mkr1 5	Trig Free	Auto Ma BW/Avg BW/Avg 1.0 MH Auto Ma Video B <sup>1</sup> 3.0 MH Auto Ma Auto Ma 1.00000 Auto Ma
Agilent 00:20:59 Ma     Ch Freq hannel Power	xtten 30 dB	Mkr1 5	Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma Average 100 On O
Agilent 00:20:59 Ma     Ch Freq hannel Power  ef 30 dBm     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A	xtten 30 dB	Mkr1 5	Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma Video B' 3.0 MH Auto Ma Auto Ma 1.00000 Auto Ma Average 100 On Or Pwr (RMS)
Agilent 00:20:59 M:     Ch Freq hannel Power  ef 30 dBm     A yg     fist     fist     fist     control	xtten 30 dB	Mkr1 5	Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma Video B' 3.0 MH Auto Ma 1.00000 Auto Ma Average 100 On Or Avg/VBW Type
Agilent 00:20:59 Ma     Ch Freq hannel Power  ef 30 dBm     A     A     fist     A	xtten 30 dB	Mkr1 5	Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma Video B' 3.0 MH Auto Ma 1.00000 Auto Ma Average 100 On Or Pwr (RMS)
Agilent 00:20:59 M:     Ch Freq hannel Power  ef 30 dBm     A yg     fist     fist     fist     control	xtten 30 dB	Mkr1 5	Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma Video B' 3.0 MH Auto Ma 1.00000 Auto Ma Average 100 On Or Pwr (RMS)
Agilent 00:20:59 Ma Ch Freq hannel Power ef 30 dBm A wg fist a a b b b c c c c c c c c c c c c c	xtten 30 dB	Mkr1 5	Trig Free	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma Average 100 On O Pwr (RMS) Auto Ma
Agilent 00:20:59 Ma Ch Freq hannel Power ef 30 dBm / log / a/ fist / a .0 Bm / Avg / a .0 Bm / .0 .0 .0 .0 .0 .0 .0 .0 .0 .0	xtten 30 dB		Trig Free 5.696 28 GHz 7.722 dBm	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma Average 100 On O Pwr (RMS) Auto Ma Span/RBV
Agilent 00:20:59 Mi Ch Freq hannel Power	xtten 30 dB	Sp	Trig Free 	Auto Ma BW/Avg Res B' 1.0 MH Auto Ma 3.0 MH Auto Ma 1.00000 Auto Ma Average 100 On O Pwr (RMS) Auto Ma

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## 8.3.5. PEAK EXCURSION

#### LIMITS

FCC §15.407 (a) (6)

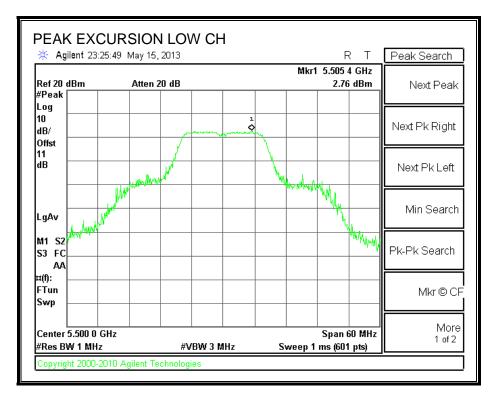
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

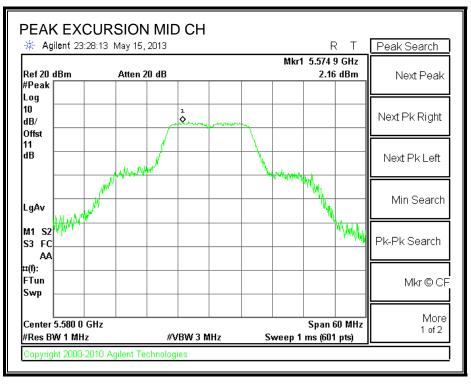
### **RESULTS**

Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Low	5500	2.76	-6.11	0.20	8.67	13	-4.33
Mid	5580	2.16	-6.25	0.20	8.21	13	-4.79
High	5700	0.91	-7.72	0.20	8.43	13	-4.57

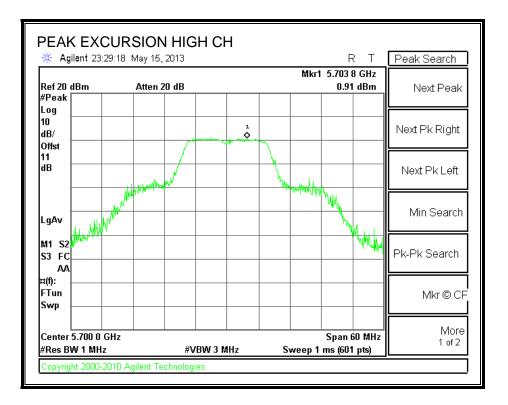
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## PEAK EXCURSION





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# 8.4. 802.11n HT20 MODE IN THE 5.6 GHz BAND

# 8.4.1. 26 dB BANDWIDTH

### LIMITS

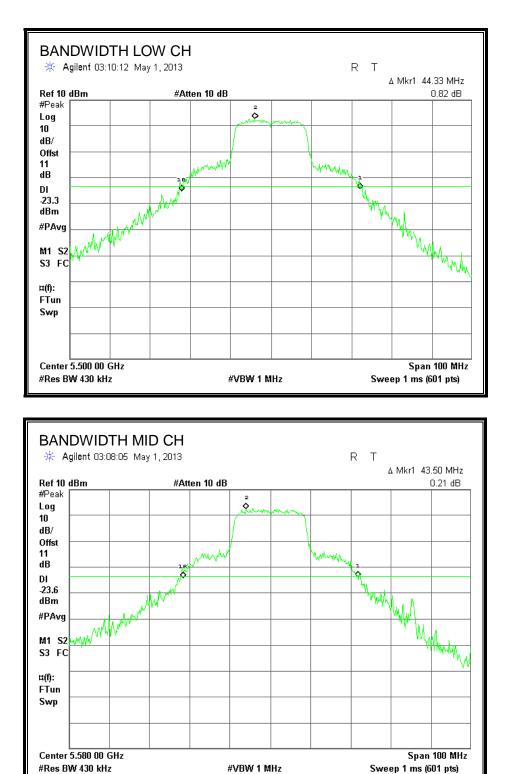
None; for reporting purposes only.

### **RESULTS**

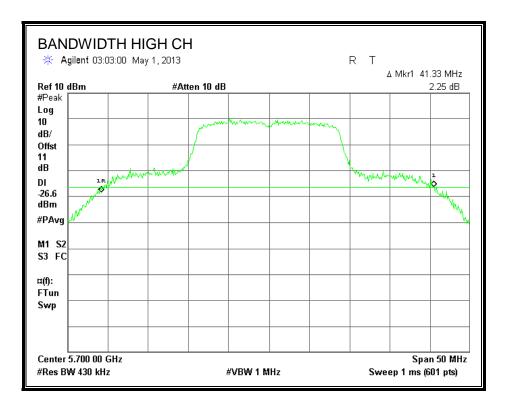
Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
Low	5500	44.3
Mid	5580	43.5
High	5700	41.3

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### 26 dB BANDWIDTH



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## 8.4.2. 99% BANDWIDTH

### **LIMITS**

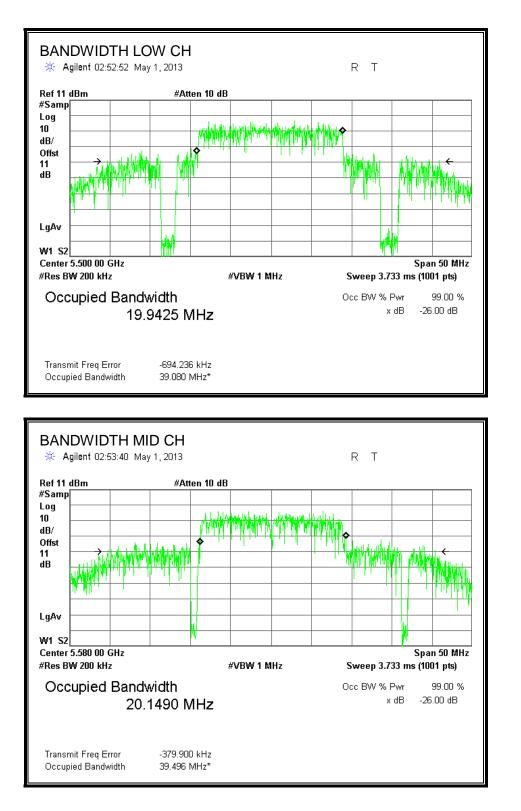
None; for reporting purposes only.

### **RESULTS**

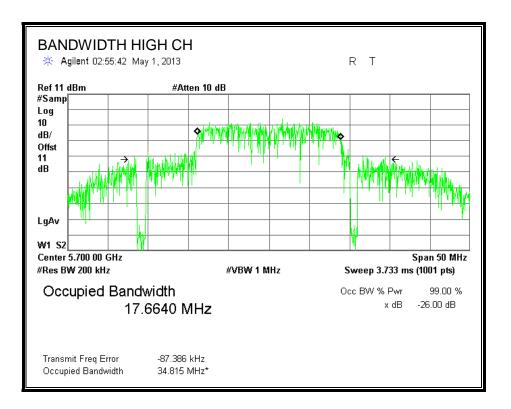
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5500	19.9
Mid	5580	20.1
High	5700	17.7

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### 99% BANDWIDTH



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# 8.4.3. AVERAGE POWER

### **LIMITS**

None; for reporting purposes only.

## TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

### <u>RESULTS</u>

Channel	Frequency	Power
	(MHz)	(dBm)
Low	5500	6.2
Mid	5580	6.2
High	5700	6.0

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# 8.4.4. OUTPUT POWER AND PPSD

## <u>LIMITS</u>

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 251 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, 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 maximum conducted output 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.

### IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

### DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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### **RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5500	44.3	19.9	1.00
Mid	5580	43.5	20.1	1.00
High	5700	41.3	17.7	1.00

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PPSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5500	24.00	23.99	29.99	23.99	11.00	11.00	11.00
Mid	5580	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5700	24.00	23.48	29.48	23.48	11.00	11.00	11.00

Duty Cycle CF (dB) 0.20 Included in Calculations of Corr'd Power & PPSD

### **Output Power Results**

Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	5.14	5.34	23.99	-18.65
Mid	5580	6.32	6.52	24.00	-17.48
High	5700	6.41	6.61	23.48	-16.87

### **PPSD** Results

Channel	Frequency	Chain 0	Total	PPSD	PPSD
		Meas	Corr'd	Limit	Margin
		PPSD	PPSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	-6.60	-6.40	11.00	-17.40
Mid	5580	-6.60	-6.40	11.00	-17.40
High	5700	-8.00	-7.80	11.00	-18.80

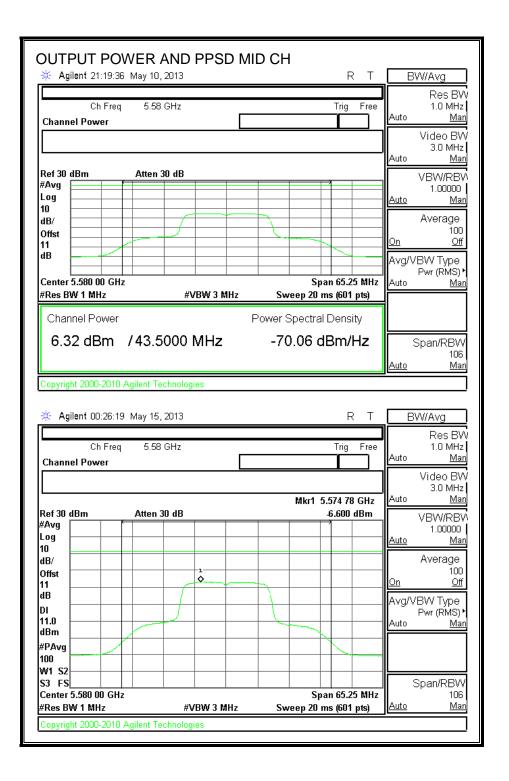
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## OUTPUT POWER AND PPSD

👫 Agilent 03:	:30:48 May 9,	2013		RT	BW/Avg
					Res B\
		GHz		Trig Free	1.0 MH:
Channel Powe	er	L			Auto <u>Ma</u>
					Video BV 3.0 MH;
					Auto <u>Ma</u>
Ref 30 dBm	Atten	30 dB			VBW/RB
Avg					1.00000
.og 0					<u>Auto Ma</u>
IB/					Average
)ffst					100 0n 0f
1   IB					
					Avg/VBW Type Pwr (RMS)
Center 5.500 O				Span 66.5 MHz	
Res BW 1 MH	Z	#VBW 3 MHz	Sweep 20	ms (601 pts)	_
Channel Po	wer		Power Spectra	al Density	
E 4 4 - 10	-	2200 1411-	·		<b></b>
5.14 aB	m /44.	3300 MHz	-71.33 (	dBm/Hz	Span/RBV
					100
					108 <u>Auto Ma</u>
	2010 Agilent T :23:53 May 15			RT	
🔆 Agilent 00:	:23:53 May 15			R T Trig Free	<u>Auto Ma</u>
🔆 Agilent 00:	:23:53 May 15	i, 2013			Auto Ma BW/Avg Res BV
Agilent OD: Ch	:23:53 May 15	i, 2013			Auto Ma BW/Avg Res BV 1.0 MH; Auto Ma Video BV
Agilent OD: Ch	:23:53 May 15	i, 2013	Mird	Trig Free	Auto Ma BW/Avg Res B\ 1.0 MH; Auto Ma Video B\ 3.0 MH;
Agilent OD: Ch	:23:53 May 15 Freq 5.5 <b>er</b>	i, 2013	Mkr1		Auto Ma BW/Avg Res BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma
Channel Powe	:23:53 May 15 Freq 5.5 <b>er</b>	;, 2013 ; GHz	Mkr1	Trig Free	Auto Ma BW/Avg Res B\ 1.0 MH; Auto Ma Video B\ 3.0 MH;
Channel Powe	:23:53 May 15 Freq 5.5 <b>er</b>	;, 2013 ; GHz		Trig Free	Auto Ma BW/Avg BW/Avg 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma VBW/RB
Channel Powe	:23:53 May 15 Freq 5.5 <b>er</b>	;, 2013 ; GHz	Mkr1	Trig Free	Auto Ma BW/Avg Res BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma VBVV/RB 1.00000
Channel Power Channel Power Ref 30 dBm Avg 0 B/	:23:53 May 15 Freq 5.5 <b>er</b>	30 dB	Mkr1	Trig Free	Auto         Ma           BW/Avg         Res B\           1.0 MH;         1.0 MH;           Auto         Ma           Video B\         3.0 MH;           Auto         Ma           Video B\         3.0 MH;           Auto         Ma           VBW/RB         1.00000           Auto         Ma           Auto         Ma           Auto         Ma           Auto         Ma           Average         100
Channel Power Channel Power Avg 0 B/ Dffst	:23:53 May 15 Freq 5.5 <b>er</b>	;, 2013 ; GHz	Mkr1	Trig Free	Auto Ma BW/Avg Res BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma 1.00000 Auto Ma Average 100 0n Of
Channel Power Channel Power Ref 30 dBm Avg 0 B/	:23:53 May 15 Freq 5.5 <b>er</b>	30 dB	Mkr1	Trig Free	Auto Ma BW/Avg Res BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma 1.00000 Auto Ma Average 100 On Of Avg/VBW Type
Channel Power Channel Power Ref 30 dBm Avg 0 B/ 0 IB/ 0 Iffst 1 1 1 1	:23:53 May 15 Freq 5.5 <b>er</b>	30 dB	Mkr1	Trig Free	Auto Ma BW/Avg Res BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma 1.00000 Auto Ma Average 100 0n Of
Channel Power Channel Power Avg 0 0 B/ Dffst BB 1 BB 10 BM	:23:53 May 15 Freq 5.5 <b>er</b>	30 dB	Mkr1	Trig Free	Auto Ma BW/Avg Res BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma 1.00000 Auto Ma Average 100 On Of Avg/VBW Type Pwr (RMS)
Channel Power Channel Power Avg 0 0 B/ Dffst 1 BB 1.0 Bm PAvg	:23:53 May 15 Freq 5.5 <b>er</b>	30 dB	Mkr1	Trig Free	Auto Ma BW/Avg Res BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma 1.00000 Auto Ma Average 100 On Of Avg/VBW Type Pwr (RMS)
Channel Power Channel Power Avg 0 0 B/ Dffst BB 1 BB 10 BM	:23:53 May 15 Freq 5.5 <b>er</b>	30 dB	Mkr1	Trig Free	Auto Ma BW/Avg Res BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma 1.00000 Auto Ma Average 100 On Of Avg/VBW Type Pwr (RMS)
Agilent 00: Channel Power Channel	:23:53 May 15  Freq 5.5 er  Atten	30 dB		Trig Free 5.494 91 GHz 6.599 dBm	Auto Ma BW/Avg BW/Avg BW/Avg CRes BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma VBVVRB 1.00000 Auto Ma Average 100 On Of Avg/VBW Type Pwr (RMS) Auto Ma Span/RBV
Agilent 00: Channel Power Channel Power Avg og O B/ Dffst B I Bm PAvg 00	:23:53 May 15 IFreq 5.5 er Atten	30 dB	SI	Trig Free	Auto Ma BW/Avg BW/Avg Res BV 1.0 MH; Auto Ma Video BV 3.0 MH; Auto Ma VBVV/RB 1.00000 Auto Ma Average 100 On Of Avg/VBW Type Pwr (RMS) Auto Ma

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	-		
🔆 Agilent 21:17:25 May 10	1, 2013	R	T BW/Avg
Ch Freq 5.7	′ GHz	Trig Fr	Res BV ee 1.0 MHz
Channel Power			Auto <u>Mar</u>
			Video BV
RBW 1.0 MHz	3.0 MHz		
	Auto <u>Mar</u>		
	30 dB		VBW/RB\
Avg statements and statem Extension and statements			1.00000
)			<u>Auto Mar</u>
B/			Average
ffst			100 0n 0ff
			Avg/VBW Type Pwr (RMS)
enter 5.700 00 GHz		Span 61.99 M	Hz Auto Mai
Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms (601 pts	
Channel Power		Power Spectral Density	
6.41 dBm /41.3	3300 MHz	-69.75 dBm/Hz	Span/RBW
		00.10 00110112	
			106
opyright 2000-2010 Agilent T	echnologies		
opyright 2000-2010 Agilent T & Agilent 00:28:51 May 16	echnologies	R	106 Auto Mar T BW/Avg Res BV ee 1.0 MHz
opyright 2000-2010 Agilent T & Agilent 00:28:51 May 15	iechnologies 5, 2013	R	T BW/Avg Res BV ee Auto Mar
opyright 2000-2010 Agilent T <b>Agilent</b> 00:28:51 May 15 Ch Freq 5.7	iechnologies 5, 2013	R	T BW/Avg T BW/Avg Res BV Auto Mar Video BV
opyright 2000-2010 Agilent T <b>Agilent</b> 00:28:51 May 15 Ch Freq 5.7	iechnologies 5, 2013	R	T BW/Avg T BW/Avg Res BV Auto Mar Video BV 3.0 MHz
opyright 2000-2010 Agilent T Agilent 00:28:51 May 15 Ch Freq 5.7 Channel Power	iechnologies 5, 2013	R Trig Fr	T BW/Avg T BW/Avg ee Auto Mai Video BV 3.0 MHz Auto Mai
opyright 2000-2010 Agilent T Agilent 00:28:51 May 15 Ch Freq 5.7 Channel Power ef 30 dBm Atten	iechnologies 5, 2013 7 GHz	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg Res BV Auto Mar Video BV 3.0 MHz Auto Mar
opyright 2000-2010 Agilent T Agilent 00:28:51 May 15 Ch Freq 5.7 Channel Power ef 30 dBm Atten Avg	iechnologies 5, 2013 7 GHz	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg Res BV Auto Mar Video BV 3.0 MHz Auto Mar Ja Auto Mar N VBW/RBV
opyright 2000-2010 Agilent T Agilent 00:28:51 May 15 Ch Freq 5.7 Channel Power ef 30 dBm Atten Avg	iechnologies 5, 2013 7 GHz	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg Res BV Auto Mar Video BV 3.0 MHz Auto Mar N VBW/RBV 1.00000
Ch Freq 5.7 Ch Freq 5.7 Ch Freq 5.7 Channel Power	iechnologies	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg T BW/Avg T BW/Avg Res BV 1.0 MHz Auto Mai Video BV 3.0 MHz Auto Mai N VBV/RBV 1.00000 Auto Mai Average 100
ch Freq 5.7 Ch Freq 5.7 Ch Freq 5.7 Ch Freq 5.7 Ch Agilent OD:28:51 May 16 Ch Freq 5.7 Ch Agilent OD:28:51 May 16 Ch Freq 5.7 Ch Freq 5.7 C	iechnologies 5, 2013 / GHz	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg Res BV 1.0 MHz Auto Mai Video BV 3.0 MHz Auto Mai VBW/RBV 1.00000 Auto Mai Average 100 On Off
ch Freq 5.7 Ch Freq 5.7 Ch Freq 5.7 Ch Freq 5.7 Channel Power channel Power	iechnologies	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg T BW/Avg BW/Avg BW/Avg C Res BV 1.0 MHz Auto Mai Video BV 3.0 MHz Auto Mai VBW/RBV 1.00000 Auto Mai Average 100 On Off Avg/VBW Type
ch Freq 5.7 Ch Freq 5.7 Ch Freq 5.7 Ch Freq 5.7 Channel Power ef 30 dBm Atten Avg Atten Atten Avg Atten Avg Atten Avg Atten Avg Atten Atten Avg Atten	iechnologies	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg Res BV 1.0 MHz Auto Mai Video BV 3.0 MHz Auto Mai VBW/RBV 1.00000 Auto Mai Average 100 On Off
opyright 2000-2010 Agilent T Ch Freq 5.7 Ch Freq 5.7 Channel Power ef 30 dBm Atten Avg Atten B/ I I I I I I I I I I I I I I I I I I I	iechnologies	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg T BW/Avg Bee Auto Mai Video BV 3.0 MHz Auto Mai Video BV 3.0 MHz Auto Mai VBW/RBV 1.00000 Auto Mai Average 100 On Off Avg/VBW Type Pwr (RMS) <sup>1</sup>
opyright 2000-2010 Agilent T Ch Stannel Power Ch Freq 5.7 Channel Power ef 30 dBm Atten Avg Atten B/ I I I I I I I I I I I I I I I I I I I	iechnologies	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg T BW/Avg Bee Auto Mai Video BV 3.0 MHz Auto Mai Video BV 3.0 MHz Auto Mai VBW/RBV 1.00000 Auto Mai Average 100 On Off Avg/VBW Type Pwr (RMS) <sup>1</sup>
opyright 2000-2010 Agilent T ← Agilent 00:28:51 May 16 Ch Freq 5.7 Channel Power ef 30 dBm Atten Avg Atten Avg Atten Avg Atten b B/ ffst Atten B Ch Freq 5.7 Channel Power Atten Avg Atten Avg Atten Avg Atten Avg Atten Atten Avg Atten Atten Avg Atten Atten Avg Atten	iechnologies	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg T BW/Avg Bee Auto Mai Video BV 3.0 MHz Auto Mai Video BV 3.0 MHz Auto Mai VBW/RBV 1.00000 Auto Mai Average 100 On Off Avg/VBW Type Pwr (RMS) <sup>1</sup>
opyright 2000-2010 Agilent T Agilent 00:28:51 May 15 Ch Freq 5.7 Ch Freq 5.7 Channel Power ef 30 dBm Atten Avg Atten Avg Atten B I.0 Bm Avg	iechnologies	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg T BW/Avg Pee Auto Mai Video BV Auto Mai Video BV 3.0 MHz Auto Mai VBW/RB\ 1.00000 Auto Mai Average 00 0n Off Avg/VBW Type Pwr (RMS)' Auto Mai
Ch Freq 5.7 Ch Freq 5.7 Ch Freq 5.7 Ch Freq 5.7 Channel Power Ch Freq 5.7 Ch Fre	iechnologies	R Trig Fr Mkr1 5.695 15 GF	T BW/Avg T BW/Avg T BW/Avg Pee Auto Mai Video BV Auto Mai Video BV 3.0 MHz Auto Mai VBW/RB\ 1.00000 Auto Mai Average 00 0n Off Avg/VBW Type Pwr (RMS)' Auto Mai Span/RBW

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## 8.4.5. PEAK EXCURSION

### **LIMITS**

FCC §15.407 (a) (6)

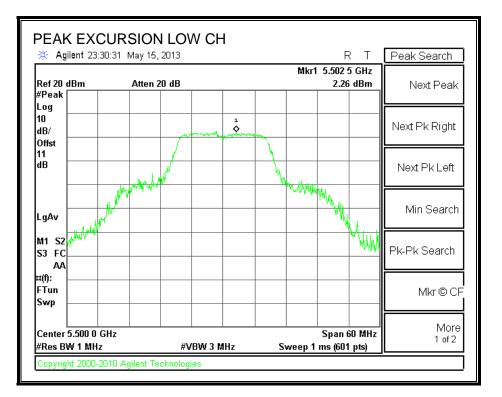
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

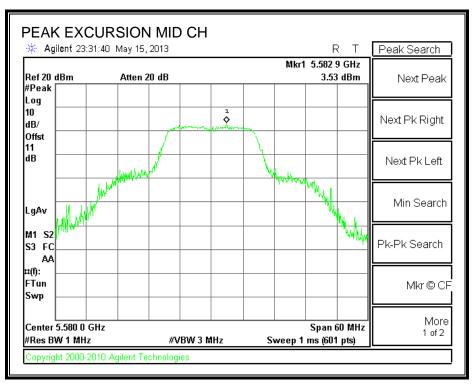
### **RESULTS**

Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Low	5500	2.26	-6.60	0.20	8.66	13	-4.34
Mid	5580	3.53	-6.60	0.20	9.93	13	-3.07
High	5700	0.27	-8.00	0.20	8.07	13	-4.93

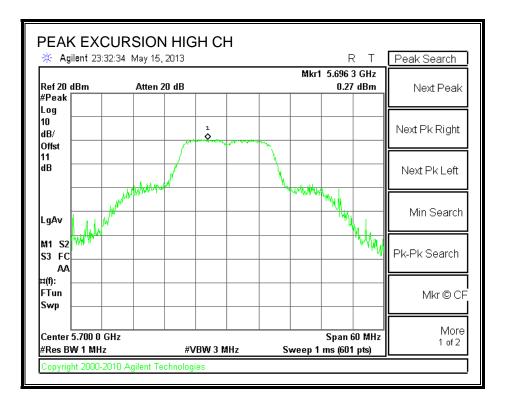
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## PEAK EXCURSION





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# 9. RADIATED TEST RESULTS

# 9.1. 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.

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; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements (see below).

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.

Based on the duty cycle of this EUT, the VBW used during all average measurements was 1kHz.

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The -27dBm EIRP limit per 15.407(b)(1) was converted to field strength based on the following formula, taken from AS/NZS 4268: 2003:

 $E_{lim} = 20*log_{10} [(\sqrt{30}P_{lim})/d] + 120$ 

Where

 $E_{lim}$  = Electric Field Strength Limit, in dBµV/m P<sub>lim</sub> = EIRP Limit, in Watts d = Measurement distance, in meters

#### **Sample Calculations**

 $E_{lim} = 20^{*}log_{10} [(\sqrt{30^{*}2.0E^{-}6})/3] + 120 = 68.2 dB\mu V/m$ 

Where  $P_{lim} = -27 dBm (2.0E-6 Watts)$ d = 3 meters

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# 9.2. TRANSMITTER ABOVE 1 GHz

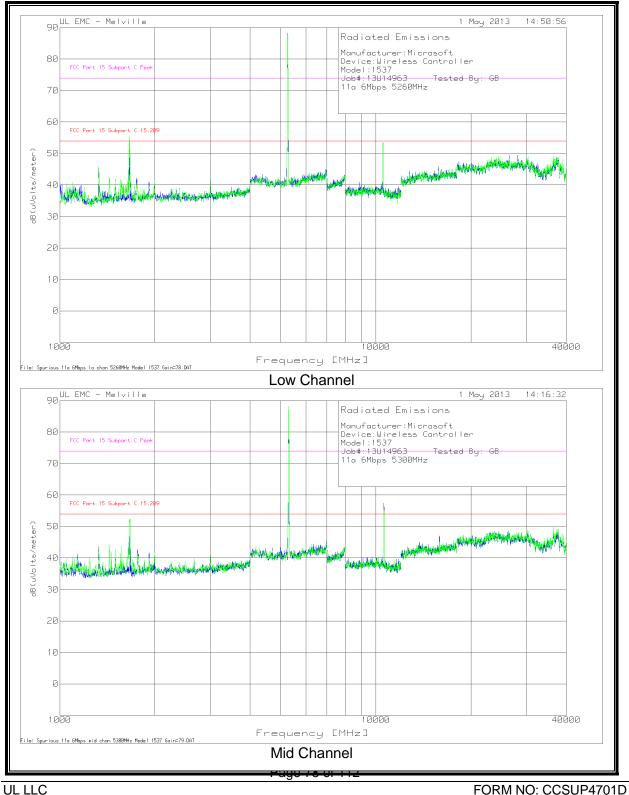
## 9.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

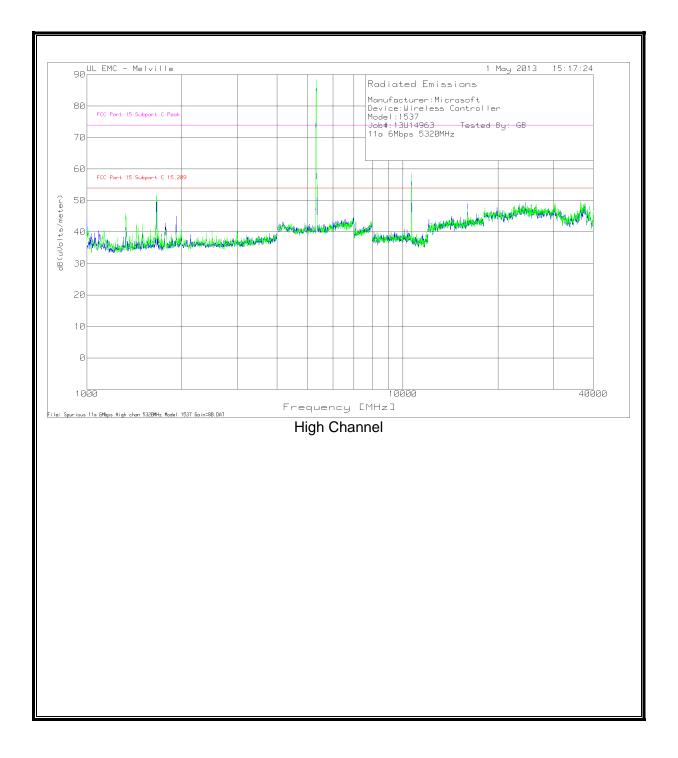
#### **RESTRICTED BANDEDGE (HIGH CHANNEL)**

10 UL EMC - Melville		29 Apr 2013 Restricted Bandedge Monufasture:Microsoft Device.Wireless Controller Hody:1537 Uob:131014963 Tested by: MA 802.11e 6Mbps 5320MHz	16:32:03
80 70 MW	Restricted Bond - Peak		
60	Restricted Bord - Avg	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
30			
20			5502
		ency [MHz]	
Range (1842) Det 1889 USA / Ang Tap 1:5388-5588 PEAK IN 18 / Lag-Fur (11da	Seeep Pis Boya/Sode Lubel ) Auto/Epice 588 Inf/960H Borizantal-Pk	Rever (1962) Det 1984 UBA / Ang Tya Seep. Pis KyayAbde Lakel 2:5389-5388 F534 H Ii / LayFer Uldaca AutorQuiad 598 En/1994 Herizontal-lex	

DL ENC - Merville	29 Apr 2013 16:27:5 Restricted Bandedge
	Monufocture:Microsoft Device:Wireless Controller Model:1537 Jubb:13U14963 Tested by: MA 802.11o 6Mpps 5320MHz
m	Restricted Bord - Peak
	-การเปลามีการการการไปการสำนัญการการการการการการการการการการการการการก
]	
]	
]	
380	5 Frequency [MHz]
Rouge CMt2         Del:         RSV         USI / Avg Tup         Sweep           1:5388-5588         FE6K         H         H / Lag-fur (Tideo)         Auto/Cj	Phi Hopp/Rode Label Prover (1961) Det 834 (961 / No 1ge Seeve Phi Hopp/Rode Label 2339/2008 F356 W 16 / Lighter Watcal Associated 2008 Exhibition Contractive Philippine (Watcal Associated Phi
6Mbps Low Channel 5328 Vertical Gain Set 89.0AT	

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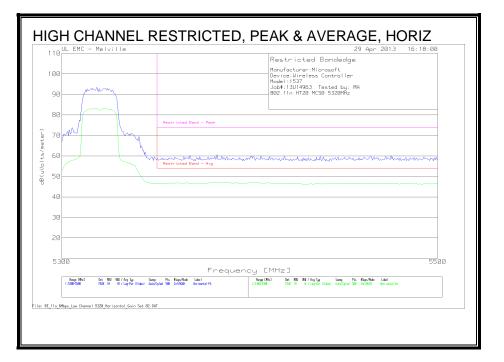
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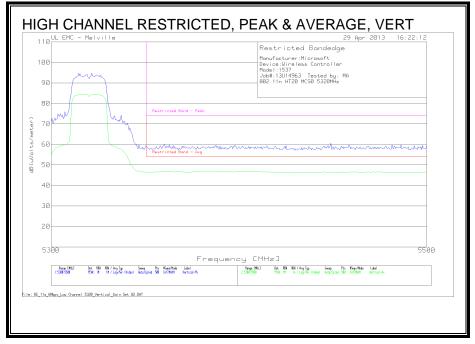
Manufacturer:N	licrosoft													
Device:Wireless	s Controll	er												
Model:1537														
Job#:13U14963	Tested	By: GB												
11a 6Mbps		-												
Low Channel - 52	260MHz													
	Meter		AF	BOMS		FCC Part 15 Subpart C	Margin	FCC Part 15 Subpart C	Margin		Margin	Azimuth	Height	
Test Frequency					dB(uVolts/meter)	15.209	(dB)	Peak	(dB)	EIRP Peak	(dB)	[Degs]	[cm]	Polarity
10525.05	67.67	PK	33.2	-47.67	53.2	-	-	-	-	68.2	-15	236	101	Horz
10517.034	67.89	PK	33.2	-47.46	53.63	-	-	-	-	68.2	-14.57	200	101	Vert
15774.289	63.7	PK	37.3	-48.02	52.98	-	-	74	-21.02	-	-	89	342	Vert
15774.289	64.02	PK	37.3	-48.02	53.3	-	-	74	-20.7	-	-	150	346	Horz
15774.289	48.74	LnAv	37.3	-48.02	38.02	54	-15.98	-	-	-	-	89	342	Vert
15774.289	48.52	LnAv	37.3	-48.02	37.8	54	-16.2	-	-	-	-	150	346	Horz
Mid Channel - 5	300MHz													
						FCC Part 15		FCC Part 15						
Test Frequency	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	Subpart C	Margin (dB)	Subpart C Peak	Margin (dB)	EIRP Peak	-	Azimuth [Degs]	-	Polarity
10600	_		33.2				,		-11.22		/	104		Vert
10600			33.2						-13.41		-			Horz
15900			37.3						-20.43		-			Vert
15900			37.3				-		-24.89		-			Horz
10600			33.2				-8.34		-21.05			104		Vert
10600			33.2							-		217		Horz
10800				-48.36			-14.41		-	-	-	356		Horz
15900			37.3				-15.37		-	-	-	250		Vert
High Channel - 5	32UIVIH2													
	Meter		AF	BOMS		FCC Part 15 Subpart C	-	FCC Part 15 Subpart C	-		-	Azimuth	-	
	_				dB(uVolts/meter)		(dB)	Peak	(dB)	EIRP Peak	(dB)	[Degs]		Polarity
10640			33.2				-		-10.12	-	-	175		Vert
10640			33.2				-	74	-7.25	-	-	164		Horz
15960			37.3				-	74		-	-	156		Horz
15960			37.3				-		-21.77	-	-	156		Vert
10640				-48.35			-8.06		-	-	-			Vert
10640			33.2				-3.81		-	-	-	164		Horz
15960			37.3						-	-	-			Horz
15960	49.11	LnAv	37.3	-48.05	38.36	54	-15.64	-	-	-	-	156	338	Vert
PK - Peak detect														
LnAv - Linear Ave	erage det	ector												
NOTE: No additio	onal emis	sions dete	cted abov	e the system	noise floor.									

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# 9.2.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND

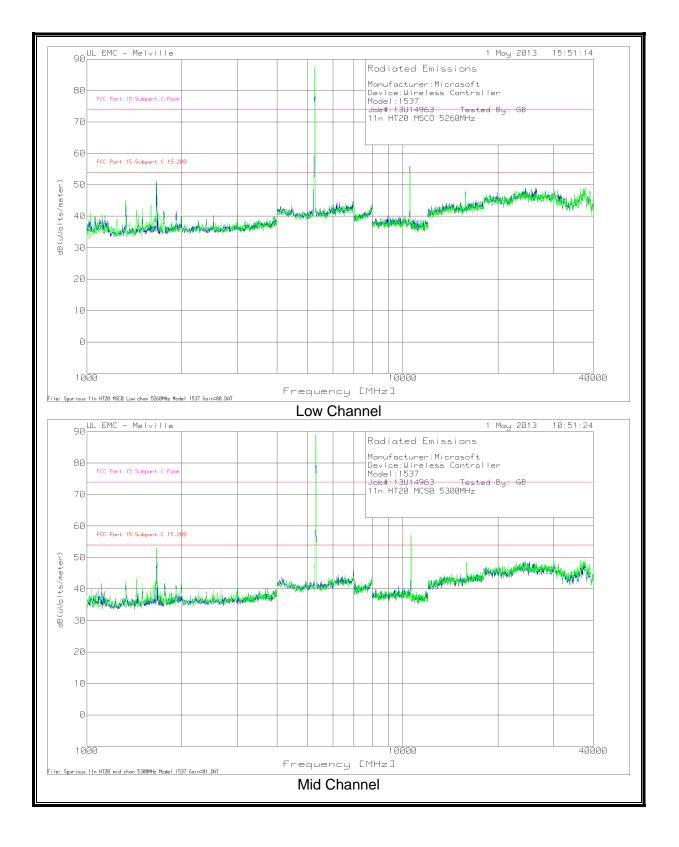
#### **RESTRICTED BANDEDGE (HIGH CHANNEL)**



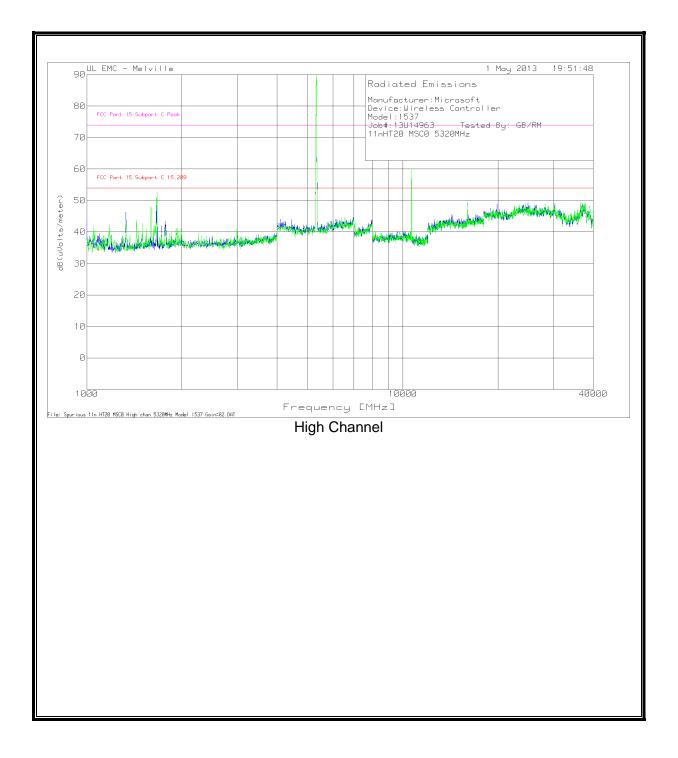


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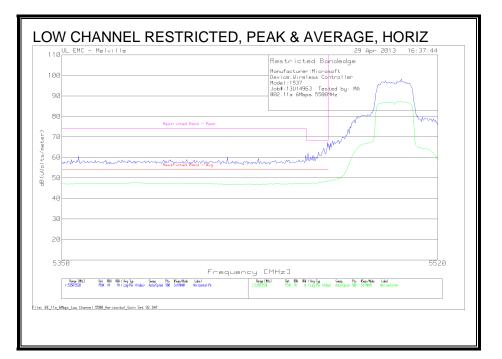
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Note:13014963         Tested By: GB         In         I													
In H720 MCS0         International state         Internat         Intern													
Meter         Meter         Control         BOMS         Subpart C         Margin (B)         Margin (B)         Margin (B)         Subpart C         Margin (B)         Marg													
In H720 MCS0         Mater         Mater         AF         BOMS         Mater         FCC Part 15         <													
Meter         AF         BOMS         FCC Part 15         Margin         FCC Part 15         Margin         Subpart C	-												
Meter         Meter         Results         Detector         Rdf         BOMS         Subpart C         Margin (B)         Subpart C         Margin (B)         Peak         (B)           ToS17.04         70.25         FK         33.2         47.46         56         -         -         -         66.2         66.2           TS770.98         65.09         FK         37.3         448.15         57.7         54         16.03         - <td></td>													
Meter         Meter         Control         BOMS         Subpart C         Margin (B)         Margin (B)         Margin (B)         Subpart C         Margin (B)         Marg													
10517.034       70.26       PK       33.2       447.46       56       -       -       -       68.2         10533.066       71.56       PK       33.2       449.08       55.68       -       -       74       -19.76         15779.098       60.03 PK       37.3       448.15       37.97       54       -16.03       -				dP(w)(alts (motor)	Subpart C		Subpart C	Margin	EIPP Pook	-	Azimuth [Degs]	Height [cm]	Polarity
10533.066       71.56       PK       33.2       449.08       55.68           74       -19.76          15779.098       60.35       PK       37.3       448.15       54.24         74       -24.5          15779.098       48.82       LnAv       37.3       448.15       37.97       54       -16.03						(00)	I CON	(00)			236		Horz
15779.098       65.09       PK       37.3       48.15       54.24       -       -       74       -19.76         15779.098       60.35       PK       37.3       48.15       37.9       -       -       74       -24.5       -         15779.098       49.41       LnAv       37.3       48.15       38.56       54       -15.44       -       -       -         Mid Channel - 5300Htz       -										-12.52	200		Vert
15779.098       60.35       PK       37.3       48.15       37.97       54       -16.03       -       -         15779.098       49.41       LnAv       37.3       48.15       38.56       54       -15.44       -       -         Mid Channel - 5300MHz       -						-	74	10.76	00.2	-12.52	332		Horz
15779.098       48.82       LnAv       37.3       48.15       37.97       54       -16.03           15779.098       49.41       LnAv       37.3       48.15       38.56       54       -15.44           Mid Channel - SJOMHz						-			-	-	227		Vert
15779.098       49.41       LnAv       37.3       48.15       38.56       54       -15.44           Mid Channel - S300MHz						46.03	/4	-24.5	-	-	227		Vert
Mid Channel - 5300MHz         AF         BOMS         FCC Part 15 Subpart C         Margin Ball         FCC Part 15 Subpart C         Margin Past         FCC Part 15 Subpart C <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td>-</td><td>-</td><td>-</td><td></td><td></td><td></td></th<>							-	-	-	-			
Meter         AF         BOMS         FCC Part 15 Subpart C         Margin Subpart C         FCC Part 15 Subpart C         Margin Subpart C         FCC Part 15 Subpart C         Margin Margin (d8)         ERP Peak           10600.351         79.73         PK         33.2         -48.34         64.59         -         74         -9.41         -           15897.244         54.7         PK         33.2         -48.34         61.28         -         74         -9.41         -           15897.244         54.7         PK         37.3         -48.19         59.11         -         -         74         -29.84         -           110600.351         60.07         LnAv         33.2         -48.34         44.16         -         -         74         -29.84         -           10600.351         60.07         LnAv         33.2         -48.34         44.03         54         -9.07         -         -         -           10600.351         61.15         LnAv         33.2         -48.34         44.03         54         -9.07         -         -         -           115891.383         43.02         LnAv         37.3         -48.19         40.82         54         -13.18	3	37.:	-48.15	38.56	54	-15.44	-	-	-	-	332	393	Horz
Meter         AF         BOMS         Subpart C         Margin (dB)         Subpart C         Margin (dB)         Subpart C         Margin (dB)         Subpart C         Margin (dB)	_												
10600.351       79.73       PK       33.2       -48.34       64.59       -       -       74       -9.41         10600.351       76.42       PK       33.2       -48.34       61.28       -       -74       -12.72       -         15897.244       54.7       PK       37.3       -48.19       43.89       -       -       74       -20.11         15903.858       70       PK       37.3       -48.19       95.11       -       -       74       -29.84         21125       56.8       PK       40.07       -53.34       44.16       -       -       74       -29.84         21176.202       60.88       PK       40.8       -53.38       44.33       -				dB(u)/olts/motor)	Subpart C		Subpart C	Margin	EIRP Port		Azimuth [Degs]	Height [cm]	Polarity
10600.351 76.42 PK 33.2 48.34 61.28 74 12.72 15897.244 54.7 PK 37.3 48.11 43.89 74 30.11 15903.858 70 PK 37.3 48.19 59.11 74 14.89 21126 56.8 PK 40.7 53.34 44.16 74 29.81 21176.202 60.88 PK 40.8 553.38 48.3 74 22.57 10600.351 60.07 LnAv 33.2 48.34 44.93 54 9.07 74 25.7 10600.351 61.15 LnAv 33.2 48.34 44.93 54 9.07 74 25.7 10600.351 61.15 LnAv 37.3 47.74 32.58 54 1593.858 51.71 LnAv 37.3 47.74 32.58 54 1593.858 51.71 LnAv 37.3 448.19 40.82 54 13.18 15903.858 51.71 LnAv 40.8 21177.501 48.57 LnAv 40.8 21177.501 48.57 LnAv 40.8 15903.858 51.71 LnAv 40.8 168/M 40.8 15903.858 51.71 LnAv 40.8 15903.858 51.71 LnAv 40.8 15903.858 51.71 LNAV 40.8 168/M 40.8 168/M 40.8 15903.858 51.71 LNAV 40.8 15903.858 51.71 LNAV 40.8 15904.050 48.23 LnAv 40.8 15907 15907 168/M 40.8 15909 15909 15901.053 15920 15921.053 65.4 11.83 15909 15920 15921.053 65.4 PK1 33.2 49.34 65.85 15.209 15921.053 65.6 PK1 37.3 48.99 53.94 15.209 15921.053 65.6 PK1 37.3 48.99 53.94 15921.053 65.6 PK1 37.3 49.90 54.51 10640.449 67.34 AD1 33.2 49.42 51.32 54 10640.449 67.34 AD1 33.2 15927.35 53.8 AD1 37.3 48.99 42.31 54 10640.449 67.34 AD1 33.2 15959.379 54.38 AD1 37.3 48.99 42.31 54 10640.449 67.34 AD1 33.2 10640.449 67.34 AD1 33.2 10640.449 67.34 AD1 33.2 1074 4 1074 10						(00)			EINF FEBK	[00]	[Degs] 16		Vert
15897.244       54.7       PK       37.3       -48.11       43.89        74       -30.11         15903.858       70       PK       37.3       -48.19       59.11        .74       -14.89         21222       56.8       PK       40.7       -53.34       44.16        .74       -29.84          21176.02       60.88       PK       40.8       -53.38       48.3						-			-	-	217		Horz
15903.858       70       PK       37.3       -48.19       59.11       -       -       74       -14.89       -         21225       56.8       PK       40.7       -53.34       44.16       -       -       74       -29.84       -         21176.022       60.88       PK       40.8       -53.38       48.3       -       74       -25.7       -         10600.351       61.15       LnAv       33.2       -48.34       44.93       54       -9.07       -	_					-			-	-			Horz
21225       56.8       PK       40.7       -53.34       44.16       -       -       774       -29.84         21176.202       60.88       PK       40.8       -53.38       48.3       -       -       774       -25.7         10600.351       60.07       LnAv       33.2       -48.34       44.93       564       -9.07       -       -       -         10600.351       61.15       LnAv       37.3       -48.34       46.01       54       -7.99       -       -       -         115903.858       51.71       LnAv       37.3       -48.19       40.82       54       -13.18       -       <						-					245		Vert
21176.202       60.88       PK       40.8       -53.38       48.3       -       -       774       -25.7         10600.351       60.07       LnAv       33.2       -48.34       44.93       54       -9.07       -       -       -         10600.351       61.15       LnAv       33.2       -48.34       46.01       54       -7.99       -						-			-	-	225		Vert
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						-			-	-	144		Horz
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						-	/4	-25.7	-	-			
15891.333       43.02       LnAv       37.3       -47.74       32.58       54       -21.42           15903.858       51.71       LnAv       37.3       -48.19       40.82       54       -13.18           21175.501       48.57       LnAv       40.8       -53.4       35.97       54       -18.03           21177.501       48.23       LnAv       40.8       -53.48       35.95       54       -18.03           21177.501       48.23       LnAv       40.8       -53.48       35.95       54       -18.05           High Channel - SZOMHz       InAv       40.8       FCC Part 15							-	-	-	-	217		Horz Vert
15903.858       51.71       LnAv       37.3       -48.19       40.82       54       -13.18           21175.501       48.57       LnAv       40.8       -53.48       35.97       54       -18.03           21177.806       48.23       LnAv       40.8       -53.48       35.55       54       -18.45            190       48.23       LnAv       40.8       -53.48       35.55       54       -18.45            High Channel - 520MHz									-	-			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	-						-	-	-	-	243		Horz
21177.806         48.23         LnAv         40.8         -53.48         35.55         54         -18.45             High Channel - 5320MHz							-	-	-	-	1		Vert Vert
High Channel - 5320MHz         AF         BOMS Factor [dB]         AF         BOMS BOMS         FCC Part 15 Subpart C         Margin Margin (dB)         FCC Part 15 Subpart C         Margin Margin (dB)         EIRP Peak           10638.396         81.99         PK1         33.2         -49.34         65.85         -         -         74         -8.15         -           10638.396         81.99         PK1         33.2         -49.34         65.85         -         -         74         -8.15         -           10639.798         82.15         PK1         33.2         -49.42         65.93         -         -         74         -8.07         -           15956.152         65.63         PK1         37.3         -48.99         53.94         -         -         74         -8.07         -           10641.051         67.65         AD1         33.2         -49.42         51.32         54         -2.68         -							-	-	-	-	225 144		
Image: Problem in the sector of the	8	40.8	-53.48	35.55	54	-18.45	-	-	-	-	144	368	Horz
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	_												
10638.396       81.99       PK1       33.2       -49.34       65.85       -       -       74       -8.15       -         10639.798       82.15       PK1       33.2       -49.42       65.93       -       -       74       -8.07       -         15956.152       65.63       PK1       37.3       -48.99       53.94       -       -       74       -20.06       -         15956.152       65.63       PK1       37.3       -49.99       54.51       -       -       74       -19.49         10641.051       67.65       AD1       33.2       -49.42       51.32       54       -2.68       -       -         10640.449       67.34       AD1       37.3       -48.99       42.31       54       -11.69       -       -         15957.936       53.8       AD1       37.3       -48.98       42.91       54       -11.09       -       -       -         15959.379       54.39       AD1       37.3       -48.98       42.91       54       -11.09       -       -       -         PK - Peak detector				dB(uVolts/meter)	Subpart C	-	Subpart C	Margin	EIRP Peak	-	Azimuth [Degs]	Height [cm]	Polarity
15956.152       65.63       PK1       37.3       -48.99       53.94       -       -       774       -20.06       -         15961.603       66.3       PK1       37.3       -49.09       54.51       -       -       774       -19.49       -         10641.051       67.65       AD1       33.2       -49.4       51.65       54       -2.35       -       -       -         10640.449       67.34       AD1       33.2       -49.42       51.32       54       -2.68       -       -       -         15957.936       53.8       AD1       37.3       -48.99       42.91       54       -11.69       -       -       -       -         15959.379       54.39       AD1       37.3       -48.98       42.91       54       -11.09       -						-	74	-8.15	-	-	177		Vert
15961.603       66.3       PK1       37.3       -49.09       54.51       -       -       774       -19.49         10641.051       67.65       AD1       33.2       -49.4       51.65       54       -2.35       -       -         10640.449       67.34       AD1       33.2       -49.42       51.32       54       -2.68       -       -         15957.936       53.8       AD1       37.3       -48.99       42.31       54       -11.69       -       -         15959.379       54.39       AD1       37.3       -48.98       42.91       54       -11.09       -       -         PK - Peak detector	2	33.2	-49.42	65.93	-	-	74	-8.07	-	-	174	327	Horz
10641.051       67.65       AD1       33.2       -49.4       51.65       54       -2.35       -       -       -         10640.449       67.34       AD1       33.2       -49.42       51.32       54       -2.68       -       -       -         15957.936       53.8       AD1       37.3       -48.99       42.31       54       -11.69       -       -       -         15959.379       54.39       AD1       37.3       -48.98       42.91       54       -11.09       -       -       -         PK - Peak detector             -       <	3	37.3	-48.99	53.94	-	-	74	-20.06	-	-	317	292	Horz
10640.449       67.34       AD1       33.2       -49.42       51.32       54       -2.68       -       -         15957.936       53.8       AD1       37.3       -48.99       42.31       54       -11.69       -       -         15959.379       54.39       AD1       37.3       -48.98       42.91       54       -11.09       -       -         PK - Peak detector	3	37.3	-49.09	54.51	-	-	74	-19.49	-	-	250	224	Vert
15957.936 53.8 AD1 37.3 -48.99 42.31 54 -11.69	2	33.2	-49.4	51.65	54	-2.35	-	-	-	-	177	290	Vert
15959.379 54.39 AD1 37.3 -48.98 42.91 54 -11.09	2	33.2	-49.42	51.32	54	-2.68	-	-	-	-	174	327	Horz
PK - Peak detector LnAv - Linear Average detector PK1 - KDB 789033 v01r02 G)5) Method: Peak	3	37.3	-48.99	42.31			-	-	-	-	317	292	Horz
LnAv - Linear Average detector PK1 - KDB 789033 v01r02 G)5) Method: Peak	3	37.3	-48.98	42.91	54	-11.09	-	-	-	-	250	224	Vert
PK1 - KDB 789033 v01r02 G)5) Method: Peak													
AD1 - KDB 789033 v01r02 G)6) Method: AD Primary Power Average			mary Power	Average									
NOTE: No additional emissions detected above the system noise floor.	ove	ected abo	e the system	noise fioor.									

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# 9.2.3. TX ABOVE 1 GHz 802.11a MODE IN THE 5.6 GHz BAND

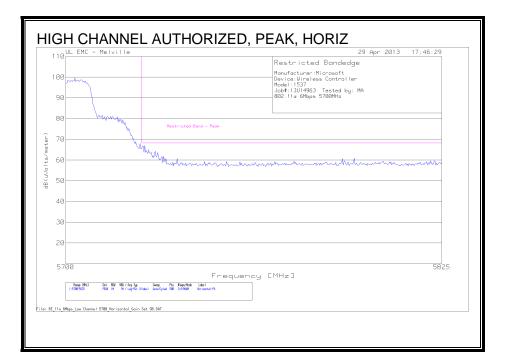
#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**

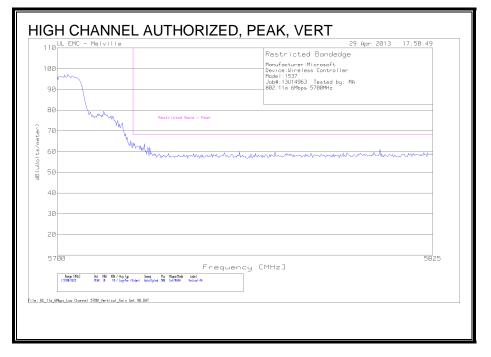


0 UL EMC - Melvil	le	29 Apr Restricted Bandedge	2013 16:42:58
10 10		Manufacture:Microboft Device:Wireless Controller Madel:1537 Job#:13U14963 Tested by: MA 802.110.6Mps 5580Mtz	
	Restricted Band - Peak		-
0			
0 tummutun	Restricted Band - Avg	www.www.www.www.	
i0			
0			
0			
0			
350	Fr	equency EMHz]	55
Ronge 19923 Det 1994 USA 1:5558-5528 PEak IN 1N	W/Avg3up Sweep Pts #Sweet/Node Label //Log-Ner(Video) Auto/Cpied 588 [nf/8001] Nertical-Pt:	Parge DNL2 Det 184 VBW / Ang Tap Sweep Pts Kings/Nute 2508-5503 PEdi 16 ik / Lagner Oldeal Accurginal 588 Entration	Label Verticol-Av
L			

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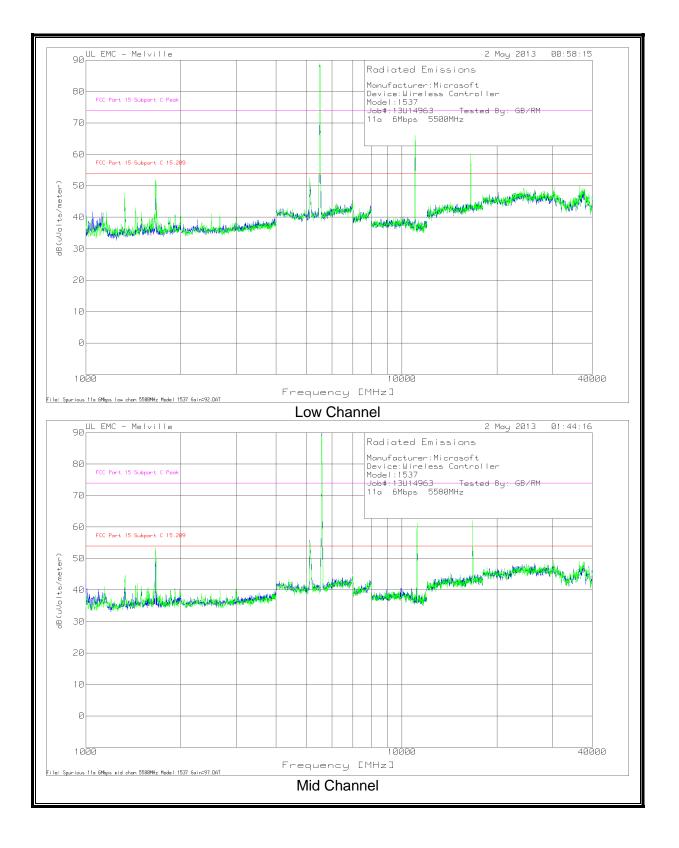
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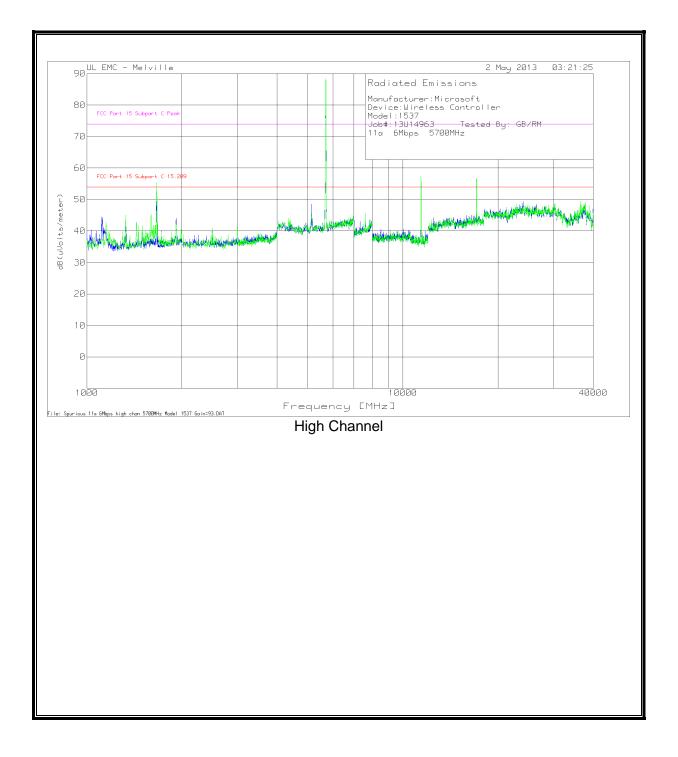


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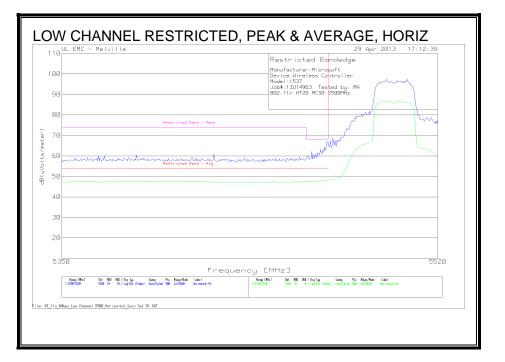
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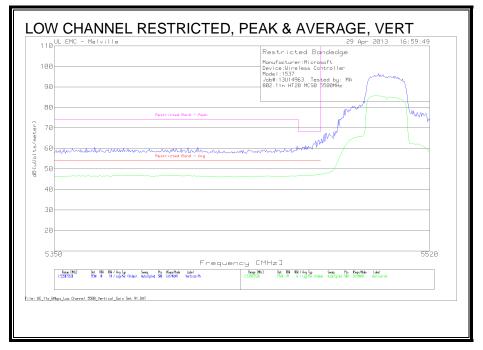
Device:Wireless														
	Controll	er												
Model:1537														
lob#:13U14963	Tested	By: GB												
11a 6Mbps		· · · ·												
Low Channel - 55	500MHz													
	Meter		AF	BOMS		FCC Part 15 Subpart C	Margin	FCC Part 15 Subpart C	Margin		Margin	Azimuth	Height	
fest Frequency	Reading	Detector	[dB/m]	Factor [dB]	dB(uVolts/meter)	15.209	(dB)	Peak	(dB)	EIRP Peak	(dB)	[Degs]	[cm]	Polarity
16509.018	69.04	PK	37.4	-48.4	58.04	-	-	-	-	68.2	-10.16	215	100	Horz
16496.994	71.23	РК	37.4	-48.36	60.27	-	-	-	-	68.2	-7.93	319	100	Vert
11001.724	83.23	PK1	33.4	-49.01	67.62	-	-	74	-6.38	-	_	321	173	Horz
11000.361	79.36	PK1	33.4	-49.07	63.69	-	-	74	-10.31	-	-	237	278	Vert
11001.704		AD1	33.4				-0.61		10.21			321		Horz
10997.194			33.4											Vert
10557.154	00.2	ADI	55.4	-45.10	52.44	54	-1.50	-	-	-	-	257	2/0	vert
Mid Channel - 55	580MHz													
	Meter		AF	BOMS		FCC Part 15 Subpart C	Margin	FCC Part 15 Subpart C	Margin		Margin	Azimuth	Height	
lest Frequency	Reading	Detector	[dB/m]	Factor [dB]	dB(uVolts/meter)	15.209	(dB)	Peak	(dB)	EIRP Peak	(dB)	[Degs]	[cm]	Polarity
16737.475	71.48	PK	37.4	-49.17	59.71	-	-	-	-	68.2	-8.49	212	100	Horz
16749.499	72.66	PK	37.4	-49.08	60.98	-	-	-	-	68.2	-7.22	36	100	Vert
11160.926	72.51	PK1	33.2	-49.26	56.45	-	-	74	-17.55	-	-	234	302	Horz
11164.533	81.09	PK1	33.2	-49.37	64.92	-	-	74	-9.08	-	-	234	302	Vert
22317.796	61.94	PK1	40.8	-53.73	49.01	-	-	74	-24.99	-	-	310	389	Vert
22304.489		PK1	40.8			-	-	74	-25.49	-	-	53	245	Horz
11159.561			33.2				-8.61	-	-	-	-			Horz
11160.412			33.2						-	-	-			Vert
22312.365			40.8				-12.28	-	-	-	-	310		Vert
22302.425			40.8				-12.88		-		-	53		Horz
High Channel - 57	700MHz													
	Meter Reading	Detector	AF [dB/m]	BOMS Factor [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	FCC Part 15 Subpart C Peak		EIRP Peak		Azimuth [Degs]		Polarity
17110.22	-		37.4				-	-			-15.38			Horz
17110.22		PK	37.5				-	-	-	68.2			100	Vert
11399.8			33.3				-	74	-11.06			6		Vert
11400.641			33.3				-		-14.43		-			Horz
11399.8			33.3				-7.28			-		6		Vert
11400.641			33.3						-	-	-	153		Horz
PK - Peak detect	or													
LnAv - Linear Ave	erage det	ector												
PK1 - KDB 78903	3 v01r02	G)5) Metho	od: Peak											
AD1 - KDB 78903	3 v01r02	G)6) Meth	od: AD Pri	mary Power	Average									
NOTE: No additio	onalemis	sions dete	cted abo	e the system	n noise floor									
	onarenna	sions dete		e the system	intoise noor									

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# 9.2.4. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.6 GHz BAND

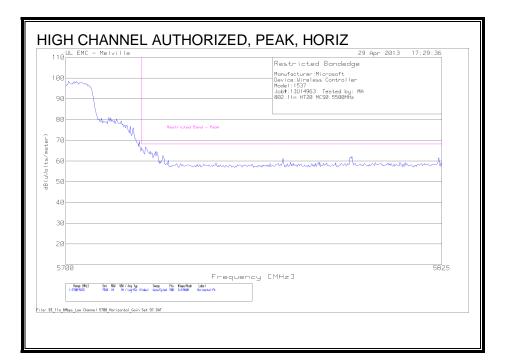
#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**

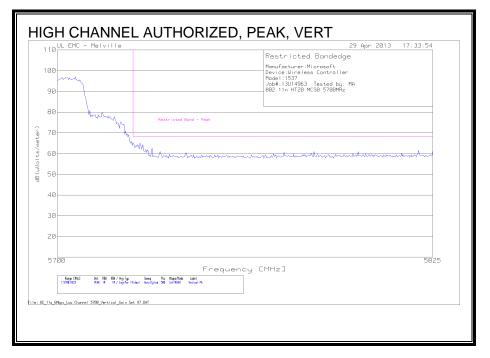




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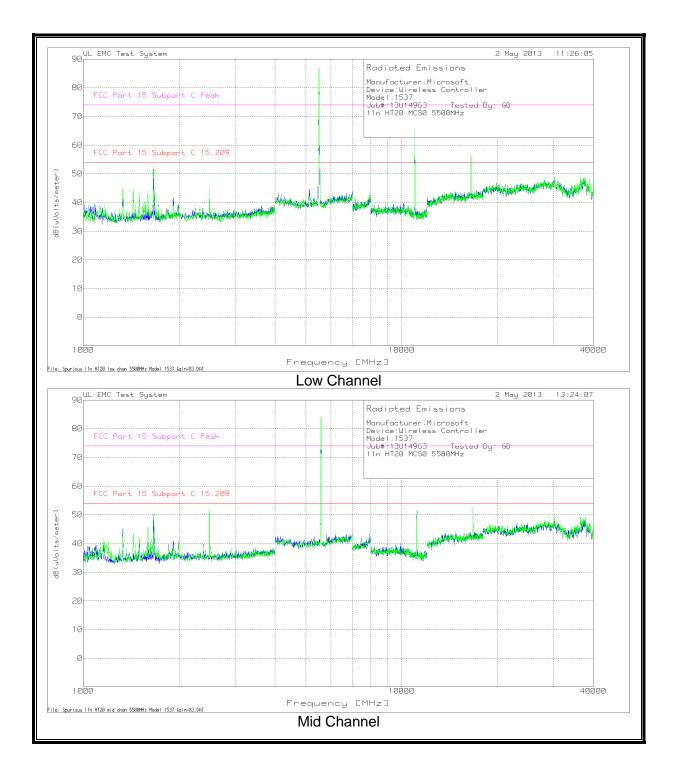
#### **AUTHORIZED BANDEDGE (HIGH CHANNEL)**



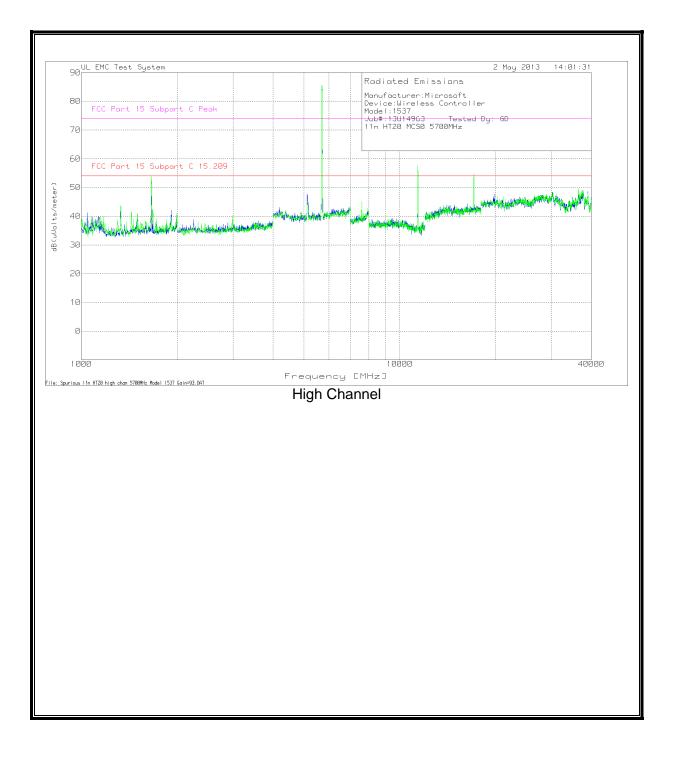


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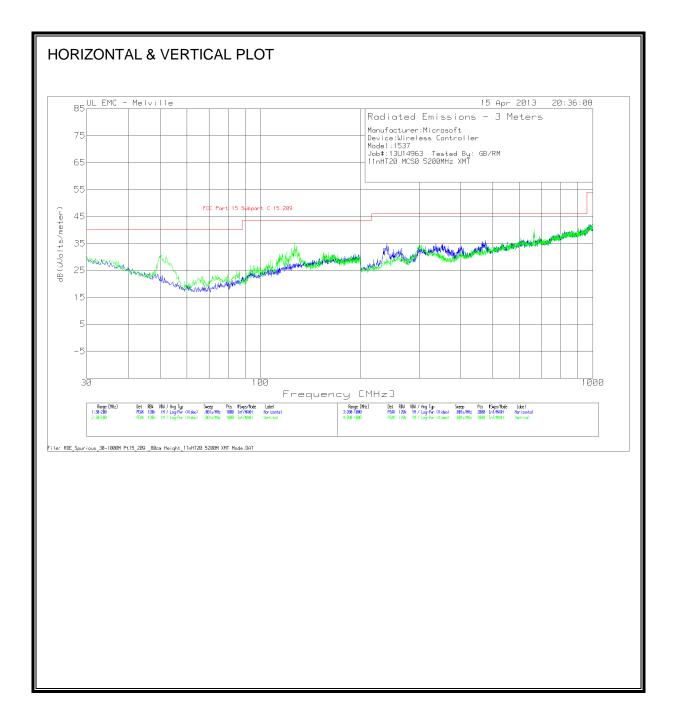
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Notes:         AF         BOM         PCC Part 15         Subpart C         Margin         Almuch         Almuch         Height           11 M MCS0 Model         Margin         Subpart C         Margin         Subpart C         Margin         Almuch         Height           16495 694         67.41         PK         BOM         Factor (BB)         de(lov/ets/mare)         BEP Pask         (68)         BEP Pask         (68)         BEP Pask         (68)         10.00         Factor (BD)         Point         10.00         Factor (BD)         Factor (BD)         68.2         11.01         2231         10.00         Vert           10995 465 694         67.41         PK         BOM         Factor (BD)         68.2         11.01         2231         100         Vert           10995 465 694         67.4         PL         33.4         49.22         55.15         5.4         -2.42         -         -         2.237         278         Vert           10995 465 694         67.4         PL         BA         BSD         Subpart C         Margin         Margin         Almuch         Hait         1.237         1293         Vert         1.237         1293         Vert         1.237         1293         1	Manufacturer:N	licrosoft													
Notes:         AF         BOM         PCC Part 15         Subpart C         Margin         Almuch         Almuch         Height           11 M MCS0 Model         Margin         Subpart C         Margin         Subpart C         Margin         Almuch         Height           16495 694         67.41         PK         BOM         Factor (BB)         de(lov/ets/mare)         BEP Pask         (68)         BEP Pask         (68)         BEP Pask         (68)         10.00         Factor (BD)         Point         10.00         Factor (BD)         Factor (BD)         68.2         11.01         2231         10.00         Vert           10995 465 694         67.41         PK         BOM         Factor (BD)         68.2         11.01         2231         100         Vert           10995 465 694         67.4         PL         33.4         49.22         55.15         5.4         -2.42         -         -         2.237         278         Vert           10995 465 694         67.4         PL         BA         BSD         Subpart C         Margin         Margin         Almuch         Hait         1.237         1293         Vert         1.237         1293         Vert         1.237         1293         1	Device:Wireles	s Controll	er												
Low Channel - S500MHz         Visite         Pactor         PCC Part 15 Subpart C (48)         Margin Subpart C (48)         PCC Part 15 Subpart C (48)         Margin Pactor [48]         Margin Subpart C (48)         Margin Pactor [48]	Model:1537														
Meter         AF         BOMS         FC Part 15         FC Part 15         FC Part 15         Subpart C         Margin	Job#:13U14963	Tested	By: GB												
Meter         AF         BOMS         FC Part 15         FC Part 15         FC Part 15         Subpart C         Margin	11n MCS0 Mode	2													
Meter         FF         DMS         Subpart C         Margin Subpart C															
Mater Tast Frequer (1640)Mater (1	Low Channel - 5	500MHz													
Mater         AF         SDMS         Subpart C         Margin Subpart C															
Text Frequency         Reading         Detector         (eld)         Factor (eld)         High/volts/metery         15.209         (eld)         Feath         (eld)         FEBP Pack         (fEP							FCC Part 15		FCC Part 15						
16496994       67.4       PK       37.4       .49.2       55.61       -       -       -       68.2       12.9       115       100 Horz         1699594       68.39       PK1       33.4       .49.1       66.654       -       74       -7.46       -       232       173       Horz         10995456       60.27       PK1       33.4       .49.1       66.654       -       74       -9.54       -       237       278       Vert         109957991       65.81       AD1       33.4       .49.1       S0.07       54       -3.93       -       -       -       237       278       Vert         Mid Channel-5580MHz       -       -       -       237       278       Vert       -       -       -       237       278       Vert         Mid Channel-5580MHz       -       -       -       -       -       -       -       -       237       278       Vert         16739 75       S0.15       FX       37.4       49.08       68.57       -       -       -       -       -       66.2       15.42       201       201       201       201       201       201       201 <td></td> <td>Meter</td> <td></td> <td>AF</td> <td>BOMS</td> <td></td> <td>Subpart C</td> <td>Margin</td> <td>Subpart C</td> <td>Margin</td> <td></td> <td>Margin</td> <td>Azimuth</td> <td>Height</td> <td></td>		Meter		AF	BOMS		Subpart C	Margin	Subpart C	Margin		Margin	Azimuth	Height	
16469.994       67.4       PK       37.4       49.2       55.61       -       -       -       66.2       12.59       215       100 Horz         10991.227       22.3 Pt1       33.4       49.21       66.46       -       -       74       9.56       -       2321       173       Horz         10995.496       80.27       Pt1       33.4       49.21       66.46       -       74       9.54       -       -       2321       173       Horz         10995.496       80.27       Pt1       33.4       49.21       51.55       54       2.42       -       -       -       2237       278       Vert         10997.991       65.81       AD1       33.4       49.12       50.07       54       3.93       -       -       -       2237       278       Vert         Mid Channel-SS00MHz       -       -       -       -       66.2       1.94.2       100       Horz         167397475       64.55       PK       37.4       49.0       65.27       -       -       -       -       66.2       1.94.2       100       Horz         11158.422       73.55       PK1       33.2	Test Frequency	Reading	Detector	[dB/m]	Factor [dB]	dB(uVolts/meter)	15.209	(dB)	Peak	(dB)	EIRP Peak	(dB)	[Degs]	[cm]	Polarity
10991227       82.22 Pk1       33.4       -49.18       66.54       -       74       -7.46       -       92.27       27.8       Vert         10994.66       80.27 Pk1       33.4       -49.21       64.46       -       74       -9.54       -       23.7       27.8       Vert         10995.991       65.81 AD1       33.4       -49.2       51.58       54       -2.42       -       -       -       23.7       27.8       Vert         Mid Channel - 5500MHz       -       -       2.37       27.8       Vert       -       -       2.37       27.8       Vert         Meter       AF       BOMS       50.07       54       3.93       -       -       -       2.37       27.8       Vert         1573 475       64.55       K       37.4       49.08       48.57       -       -       -       -       62.2       1.54.2       2.15.62       2.15.62       2.15.62       2.15.62       2.15.62       2.15.62       2.15.62       2.15.62       2.15.62       1.00       Nort					-49.2	55.61	-	-	-	-	68.2	-12.59	215	100	Horz
10999.496       60.2 PK1       33.4       49.21       66.46       -       -       74       9.54       -       237       278       Vert         10999.496       67.4       AD1       33.4       49.22       S1.58       54       2.42       -       -       237       278       Vert         Mid Channel - 5530MHz       33.4       49.14       S0.07       54       3.33       -       -       237       278       Vert         Mid Channel - 5530MHz       -       -       -       237       278       Vert         Test Frequency       Reading       Datector       [db///db///db///db///db///db///db///db	16496.994	68.99	PK	37.4	-49.2	57.19	-	-	-	-	68.2	-11.01	231	100	Vert
10994 884       67.4       AD1       33.4       49.22       51.58       54       2.42       -       -       321       173       Horz         10997.991       65.81       AD1       33.4       49.14       50.07       54       3.33       -       -       237       278       Vert         Mid Channel - 5580MHz       Image: Comparison of the comparison of t	10991.227	82.32	PK1	33.4	-49.18	66.54	-	-	74	-7.46	-	-	321	173	Horz
10997.991       65.81       AD1       33.4       -49.14       50.07       54       -3.93       -       -       237       278       Vert         Mid Channel - 5580MHz       AF       BOMS       Subpart C       Margin       Subpart C       Margin       Alimuth       Height       Polaritis         16749.499       60.25       PK       37.4       49.08       48.57       -       -       66.2       -16.62       214       100       Horz         1158.42       73.2       PK1       33.2       49.3       59.65       -       -       -       66.2       -15.42       305       100       Hort         11168.42       73.26       PK1       33.2       49.3       59.65       -       -       74       -16.43       -       74       -3.53       384       Vert         22288.837       60.8       AD1       33.2       49.31       -       74       -16.3       -       74       -3.53       384       Vert         222978.391       60.8       AD1       33.2       49.33       46.72       54       -7.28       -       -       -       74       355       384       Vert         222978.			PK1	33.4	-49.21	64.46	-	-	74		-	-	237	278	Vert
10997.991       65.81       AD1       33.4       -49.14       50.07       54       -3.93       -       -       237       278       Vert         Mid Channel - 5580MHz       Mater       AF       BOMS       Subpart C       Margin       Subpart C       Margin       Alimuth       Height       Polaritis         16749.499       0.25       PK       37.4       49.08       64.57       -       -       66.2       -16.52       214       100       Horz         11574.27       73.26       PK1       33.2       -49.3       59.65       -       -       -       66.2       -16.52       15.62       305       Horz       100       Horz       100       Horz       202       346       Vert       -       -       66.2       -16.52       -15.63       214       100       Horz       202       346       Vert       -       -       74       -16.3       -       -       74       -16.3       -       -       74       -3.53       384       Vert       -       -       74       -3.53       384       Vert       -       -       -       -       74       353       384       Vert       -       -       - </td <td>10994.684</td> <td>67.4</td> <td>AD1</td> <td>33.4</td> <td>-49.22</td> <td>51.58</td> <td>54</td> <td>-2.42</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>321</td> <td>173</td> <td>Horz</td>	10994.684	67.4	AD1	33.4	-49.22	51.58	54	-2.42	-	-	-	-	321	173	Horz
Mid Channel - 5580MHz         AF         BOMS         FCC Part 15 Subpart C         FCC Part 15 Subpart C         FCC Part 15 Subpart C         Margin (dB)         Margin Peak         Margin Peak <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td>-</td><td>-</td><td>-</td><td></td><td></td><td></td></t<>									-	-	-	-			
Meter         AF         BOMS         FCC Part 15         Subpart C         (d8)         FCC Part 15         Margin         Margin         Aimuth         Height           16749.499         60.25         PK         37.4         -49.08         48.57         -         -         -         66.2         15.20         100         Hor           16739.475         64.55         PK         37.4         -49.17         52.78         -         -         -         66.2         15.42         305         100         Vert           11158.602         75.75         PK1         33.2         -49.3         59.65         -         74         -14.35         -         -         -         202         346         Vert           222311.232         62.15         PK1         40.8         -53.61         48.23         -         -         74         -14.35         -         -         -         202         346         Vert           22289.13         51.62         AD1         33.2         -49.33         46.72         54         -7.28         -         -         -         53         384         Vert           22279.33         51.62         AD1         40.8						20.07	54	2.22							
Meter         AF         BOMS         FCC Part 15         Subpart C         (d8)         FCC Part 15         Margin         Margin         Aimuth         Height           16749.499         60.25         PK         37.4         -49.08         48.57         -         -         -         66.2         15.20         100         Hor           16739.475         64.55         PK         37.4         -49.17         52.78         -         -         -         66.2         15.42         305         100         Vert           11158.602         75.75         PK1         33.2         -49.3         59.65         -         74         -14.35         -         -         -         202         346         Vert           222311.232         62.15         PK1         40.8         -53.61         48.23         -         -         74         -14.35         -         -         -         202         346         Vert           22289.13         51.62         AD1         33.2         -49.33         46.72         54         -7.28         -         -         -         53         384         Vert           22279.33         51.62         AD1         40.8	Mid Channel - 5	580MHz													
Meter         AF         BOMS         Subpart (Id)         Margin (Id)         Subpart (Id)         Margin (Id) </td <td></td>															
Meter         AF         BOMS         Subpart (Id)         Margin (Id)         Subpart (Id)         Margin (Id) </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>FCC Part 15</td> <td></td> <td>FCC Part 15</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							FCC Part 15		FCC Part 15						
Test Frequency         Reading         Detector         [dB]m]         Pactor [dB]         dB(uVolts/meter)         15.209         (dB)         Peak         (dB)         EIRP Peak         (dB)         EIRP Peak         (dB)         [Deg]         [Cm]         Polarith           16737.479.499         60.25 PK         37.4         49.08         48.57         -         -         66.2         15.62         214         100         Vert           11158.422         73.26         FK         37.4         49.0         53.64         49.3         -         -         74         16.74         -         202         346         Vert           11168.605         75.75 PK1         33.2         49.3         59.65         -         -         74         -16.74         -         202         346         Vert           22228.837         61.04 PK1         40.8         -53.61         48.23         -         -         -         202         346         Vert           22291.33         51.62         AD1         40.8         -53.93         38.67         54.51         -         -         -         53         384         Vert           22297.8391         49.85         AD1         4		Meter		AF	BOMS			Margin		Margin		Margin	Azimuth	Heigh+	
16749.499       60.25       PK       37,4       49.08       48.57       -       -       68.2       -19.63       214       100       Horz         16737.475       64.55       PK       37,4       49.17       52.78       -       -       68.2       -15.42       305       100       Vert         11158.422       75.75       PK1       33.2       -49.3       59.65       -       74       -16.74       -14.35       -       74       385       Horz         22311.232       62.15       PK1       40.8       -53.64       49.31       -       -       74       -25.77       -       345       398       Horz         11168.207       62.85       AD1       33.2       -49.31       44.69       54       -9.31       -       -       -       74       385       Horz         2229.33       51.62       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       53       384       Vert         2229.33       51.62       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       53       384       Vert	Test Frequency		Detector			dP(u)(olts/motor)		-		-	EIPP Popk				Polarity
16737.475       64.55       PK       37.4       49.17       52.78       -       -       68.2       -15.42       305       100       Vert         11158.422       73.26       PK1       33.2       49.2       57.26       -       74       -16.74       -       -202       346       Vert         22311.232       62.15       PK1       40.8       -53.64       49.31       -       74       -24.69       -       53       384       Vert         22288.837       60.8       AD1       33.2       49.33       446.23       -       74       -24.69       -       202       346       Vert         11162.307       62.85       AD1       33.2       49.33       46.72       54       -7.28       -       -       -       74       385       Horz         22278.391       49.85       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       53       384       Vert         22278.391       Mater       AF       BOMS       Foct Part 15       Subpart C       Margin       Margin       Margin       Margin       Margin       Margin       Margin       Margin       M		_					13.205			(00)					
11158.422       73.26       PK1       33.2       49.2       57.26       -       74       -16.74       -       74       385       Horz         12311232       62.15       PK1       40.8       53.64       49.31       -       74       -24.69       -       53       384       Vert         22281.837       61.04       PK1       40.8       53.61       48.23       -       -       74       -24.69       -       53       384       Vert         11162.393       60.8       AD1       33.2       49.33       46.72       54       -7.28       -       -       74       248       Vert       385       Horz         2229.33       51.62       AD1       33.2       49.33       36.72       54       15.03       -       -       53       384       Vert         22278.391       49.85       AD1       40.8       53.93       36.72       54       17.28       -       -       -       53       384       Vert         1110.22       64.52       PK       37.4       48.86       53.06       -       -       -       68.2       15.14       252       100       Vert							-			-					
11168.605 75.75 PK1 33.2 49.3 59.65 - 74 -14.35 - 74 385 Horz 2231.232 62.15 PK1 40.8 -53.61 48.23 - 74 -24.69 - 53 384 Vert 22288.837 61.04 PK1 40.8 -53.61 48.23 - 74 -26.69 - 345 398 Horz 22299.133 51.62 AD1 33.2 49.33 446.72 54 -7.28 - 74 -25.77 - 74 385 Horz 22299.133 51.62 AD1 33.2 49.33 46.72 54 -7.28 - 7.28 - 74 385 Horz 22278.391 49.85 AD1 40.8 -53.45 38.97 54 15.03 - 7 - 75 3 384 Vert 11163.207 62.85 AD1 40.8 -53.45 38.97 54 15.03 - 7 - 75 3 384 Vert 22278.391 49.85 AD1 40.8 -53.93 36.72 54 17.28 - 7 - 75 3 384 Vert 11162 - 700MHz - 700MHz - 700 MHz - 75 3 384 Vert 11162 - 700 MHz							-	-		16.74	00.2	-15.42			
22311.232       62.15       PK1       40.8       -53.64       49.31       -       -       74       -24.69       -       53       384       Vert         22288.837       61.04       PK1       40.8       -53.61       48.23       -       -       74       -25.77       -       345       398       Horz         11163.207       62.85       AD1       33.2       -49.33       46.72       54       -7.28       -       -       -       53       384       Vert         22299.133       51.62       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       345       398       Horz         22278.391       49.85       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       345       398       Horz         High Channel - 5700MHz       AF       BOMS       Factor [dB]       dB[uVolts/meter]       15.20       IMargin       FCC Part 15       Margin       Margin       Azimuth       Height       Fol artin       168.2       -15.14       252       100       Horz         17110.22       66.19       PK       37.5							-	-			-	-			
22288.837       61.04       PK1       40.8       -53.61       48.23       -       -       74       -25.77       -       -       345       398       Horz         11162.393       60.8       AD1       33.2       49.33       446.69       54       9.31       -       -       -       202       345       Vert         11163.207       62.85       AD1       33.2       49.33       46.72       54       -7.28       -       -       -       53       384       Vert         222978.391       49.85       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       345       398       Horz         Test Frequency       AF       BOMS       -53.93       d8(u/olts/metrin)       FCC Part 15       Subpart C       Margin							-	-			-	-			
11162.393       60.8       AD1       33.2       49.31       44.69       54       -9.31       -       -       -       202       346       Vert         11163.207       62.85       AD1       33.2       49.33       46.72       54       -7.28       -       -       -       74       385       Horz         22279.133       149.85       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       53       384       Vert         22278.391       49.85       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       63       384       Vert         High Channel - 5       Margin       Margin       A							-	-			-	-			
11163.207       62.85       AD1       33.2       -49.33       46.72       54       -7.28       -       -       -       74       385       Horz         22299.133       51.62       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       53       384       Vert         22278.391       49.85       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       345       398       Horz         High Channel - 5700MHz       -       AF       BOMS       FCC Part 15       Subpart C       Margin       Margin       Margin       Margin       Margin       Margin       Af       Margin       C       -								-		-25.77	-	-			
22299.133       51.62       AD1       40.8       -53.45       38.97       54       -15.03       -       -       -       53       384       Vert         22278.391       49.85       AD1       40.8       -53.93       36.72       54       -17.28       -       -       -       345       398       Horz         High Channel - 5700MHz       Image: Colspan="4">Image: Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4"         Meter       AF       BOMS       FCC Part 15       Subpart Colspan="4"       Colspan="4">Colspan="4">Colspan="4"         Test Frequency       AF       BOMS       FCC Part 15       Subpart Colspan="4"       Margin       Azimuth       Height         17110.22       66.52       PK       37.4       48.86       53.05       -       -       66.2       -15.14       Colspan="4">Colspan="4"         17110.22       66.19									-	-	-	-			
22278.391       49.85       AD1       40.8       -53.93       36.72       54       -17.28          345       398       Horz         High Channel - 5700MHz									-	-	-	-			
High Channel - 5700MHz         AF         BOMS         FCC Part 1S         Subpart C         Margin         Margin         Agin         Azimuth         Height           Test Frequency         Reading         Detector         [dB/m]         Factor [dB]         dB(uVolts/meter)         15.209         (dB)         Margin									-	-	-	-			
Meter         AF         BOMS         FCC Part 15         Margin         FCC Part 15         Margin         LIRP Peak         Margin         Aimuth         Height         Polarity           17110.22         64.52         PK         37.4         448.86         53.06         -         -         68.2         15.14         252         100         Horz           17110.22         66.19         PK         37.4         448.86         53.06         -         -         68.2         15.14         252         100         Horz           1110.02         66.19         PK         37.5         48.86         59.87         -         -         74         -14.25         -         1337         340         100         Vert           11398.572         76.22         PK1         33.3         -49.55         59.87         -         -         74         -14.13         -         25         394         Horz           22746.012         60.9         PK1         40.7         -53.75         48.65         -         -         74         -25.35         -         -         53         370         Vert           11403.457         61.88         AD1         33.3         -	22278.391	49.85	AD1	40.8	-53.93	36.72	54	-17.28	-	-	-	-	345	398	Horz
Meter         AF         BOMS         FCC Part 15         Margin         FCC Part 15         Margin         LIRP Peak         Margin         Aimuth         Height         Polarity           17110.22         64.52         PK         37.4         448.86         53.06         -         -         68.2         15.14         252         100         Horz           17110.22         66.19         PK         37.4         448.86         53.06         -         -         68.2         15.14         252         100         Horz           1110.02         66.19         PK         37.5         48.86         59.87         -         -         74         -14.25         -         1337         340         100         Vert           11398.572         76.22         PK1         33.3         -49.55         59.87         -         -         74         -14.13         -         25         394         Horz           22746.012         60.9         PK1         40.7         -53.75         48.65         -         -         74         -25.35         -         -         53         370         Vert           11403.457         61.88         AD1         33.3         -															
Meter         AF         BOMS         Subpart C         Margin (dB)         Subpart C         Margin (dB)         Subpart C         Margin (dB)         Subpart C         Margin (dB)	High Channel - 5	700MHz													
Meter         AF         BOMS         Subpart C         Margin (dB)         Subpart C         Margin (dB)         Subpart C         Margin (dB)         Subpart C         Margin (dB)															
Test Frequency         Reading         Detector         [dB/m]         Factor [dB]         dB(uVolts/meter)         15.209         (dB)         Peak         (dB)         EIRP Peak         (dB)         [Degs]         [cm]         Polarity           17110.22         64.52         PK         37.4         48.86         53.06         -         -         -         68.2         -15.14         252         100         Horz           17110.22         66.19         PK         37.5         48.86         54.83         -         -         -         68.2         -13.37         340         100         Vert           11406.238         75.99         PK1         33.3         49.54         59.87         -         -         74         -14.25         -         1337         240         Vert           13139.572         76.22         PK1         33.3         49.55         59.87         -         -         74         -14.13         -         25         337         Horz           22698.637         61.7         PK1         40.7         -53.62         47.98         -         -         -         306         373         Horz           22698.637         61.7         PK1															
17110.22       64.52       PK       37.4       -48.86       53.06       -       -       -       68.2       -15.14       252       100       Horz         17110.22       66.19       PK       37.5       -48.86       54.83       -       -       68.2       -13.37       340       100       Vert         11406.238       75.99       PK1       33.3       -49.54       59.75       -       -       74       -14.25       -       137       240       Vert         11398.572       76.22       PK1       33.3       -49.65       59.87       -       -       74       -14.13       -       -       253       394       Horz         22746.012       60.9       PK1       40.7       -53.62       47.98       -       -       74       -26.02       -       306       373       Horz         22698.637       61.7       PK1       40.7       -53.75       48.65       -       -       4       -       137       240       Vert         11398.246       63.66       AD1       33.3       -49.53       45.65       54       -6.7       -       -       25       394       Horz <tr< td=""><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>-</td><td></td><td>-</td><td></td><td>-</td><td></td></tr<>			_					-		-		-		-	
17110.22       66.19       PK       37.5       -48.86       54.83       -       -       -       66.2       -13.37       340       100       Vert         11406.238       75.99       PK1       33.3       -49.54       59.75       -       -       74       -14.25       -       137       240       Vert         11398.572       76.22       PK1       33.3       -49.65       59.87       -       -       74       -14.13       -       -       225       394       Horz         22746.012       60.9       PK1       40.7       -53.62       47.98       -       -       74       -26.02       -       -       306       373       Horz         22698.637       61.7       PK1       40.7       -53.75       48.65       -       -       74       -25.35       -       53       370       Vert         11403.457       61.88       AD1       33.3       -49.65       47.3       54       -6.7       -       -       137       240       Vert         11398.246       63.66       AD1       33.3       -49.65       37.13       54       -6.7       -       -       -       53		_													
11406.238 75.99 PK1 33.3 -49.54 59.75								-	-	-					
11398.572       76.22       PK1       33.3       -49.65       59.87       -       -       74       -14.13       -       -       225       394       Horz         22746.012       60.9       PK1       40.7       -53.62       47.98       -       -       74       -26.02       -       -       306       373       Horz         22698.637       61.7       PK1       40.7       -53.75       48.65       -       -       74       -25.35       -       -       53       370       Vert         11403.457       61.88       AD1       33.3       -49.66       47.3       54       -6.7       -       -       -       25       394       Horz         12398.246       63.66       AD1       33.3       -49.66       47.3       54       -6.7       -       -       25       394       Horz         22682.224       49.95       AD1       40.7       -53.52       37.13       54       -16.78       -       -       -       53       370       Vert         PK-Peak detector       -       -       -       -       53       370       Vert       -       -       53       370							-	-	-	-	68.2	-13.37			
22746.012       60.9       PK1       40.7       -53.62       47.98       .       .       74       -26.02       .       .       306       373       Horz         22698.637       61.7       PK1       40.7       -53.75       48.65       .       .       74       -25.35       .       .       53       370       Vert         11403.457       61.88       AD1       33.3       -49.53       45.65       54       -8.35       .       .       .       137       240       Vert         11398.246       63.66       AD1       33.3       -49.66       47.3       54       -6.7       .       .       .       .       25       394       Horz         22722.024       49.95       AD1       40.7       -53.52       37.13       54       -16.87       .							-	-			-	-			
22698.637       61.7       PK1       40.7       -53.75       48.65       -       -       74       -25.35       -       53       370       Vert         11403.457       61.88       AD1       33.3       -49.53       45.65       54       -8.35       -       -       137       240       Vert         11398.246       63.66       AD1       33.3       -49.66       47.3       54       -6.7       -       -       25       394       Horz         22722.024       49.95       AD1       40.7       -53.52       37.13       54       -16.87       -       -       306       373       Horz         22682.224       49.71       AD1       40.7       -53.19       37.22       54       -16.78       -       -       -       53       370       Vert         PK - Peak detector          -       -       53       370       Vert         PK1 - KDB 789033 v01r02 G)5) Method: AD Primary Power Average							-	-			-	-			
11403.457       61.88       AD1       33.3       -49.53       45.65       54       -8.35       -       -       -       137       240       Vert         11398.246       63.66       AD1       33.3       -49.66       47.3       54       -6.7       -       -       25       394       Horz         22722.024       49.95       AD1       40.7       -53.52       37.13       54       -16.87       -       -       306       373       Horz         22682.224       49.71       AD1       40.7       -53.59       37.22       54       -16.78       -       -       53       370       Vert         PK - Peak detector         -       -       -       53       370       Vert         PK1 - KDB 78903 3 v01r02       G)S) Method: AD Primary Power Average							-				-	-			
11398.246       63.66       AD1       33.3       -49.66       47.3       54       -6.7       -       -       -       25       394       Horz         22722.024       49.95       AD1       40.7       -53.52       37.13       54       -16.87       -       -       306       373       Horz         22682.224       49.71       AD1       40.7       -53.19       37.22       54       -16.78       -       -       53       370       Vert         PK - Peak detector          -       -        53       370       Vert         PK - Peak detector               53       370       Vert         PK - Neak detector <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>74</td><td>-25.35</td><td>-</td><td>-</td><td></td><td></td><td></td></t<>							-		74	-25.35	-	-			
22722.024       49.95       AD1       40.7       -53.52       37.13       54       -16.87       -       -       -       306       373       Horz         22682.224       49.71       AD1       40.7       -53.19       37.22       54       -16.78       -       -       -       53       370       Vert         PK - Peak detector          -       -       53       370       Vert         PK1 - KD8 78903 - v01r02       G)5) Method: Peak									-	-	-	-			
22682.224       49.71       AD1       40.7       -53.19       37.22       54       -16.78       -       -       53       370       Vert         PK - Peak detector									-	-	-	-			
PK - Peak detector         PK - Peak detector         Image: Constraint of the second s									-	-	-	-			
PK1 - KDB 789033 v01r02 G)5) Method: Peak AD1 - KDB 789033 v01r02 G)6) Method: AD Primary Power Average	22682.224	49.71	AD1	40.7	-53.19	37.22	54	-16.78	-	-	-	-	53	370	Vert
PK1 - KDB 789033 v01r02 G)5) Method: Peak AD1 - KDB 789033 v01r02 G)6) Method: AD Primary Power Average															
AD1 - KDB 789033 v01r02 G)6) Method: AD Primary Power Average															
NOTE: No additional emissions detected above the system noise floor	AD1 - KDB 7890	33 v01r02	G)6) Metho	od: AD Pri	mary Power	Average									
NOTE: No additional emissions detected above the system noise floor															
	NOTE: No additi	ional emis	sions dete	cted abov	e the system	n noise floor									

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# 9.3. WORST-CASE BELOW 1 GHz

## SPURIOUS EMISSIONS 30 TO 1000 MHz (5.2GHZ BAND WORST-CASE CONFIGURATION)

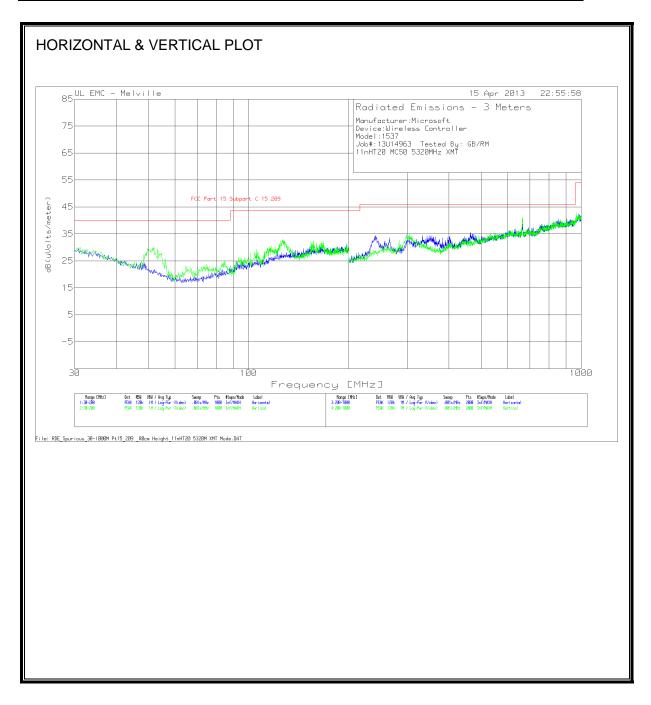


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Manufacturer:	Aicrosoft									
Device:Wireles	s Controller									
Model:1537										
Job#:13U14963	Tested By: GB/R	M								
11nHT20 MCS0	5200MHz XMT									
Vertical 30 - 20	OMHz									
Test Frequency	Meter Reading	Detector	AF-43441 [dB/m]	GL-3M [dB]	dB/uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
50.0249	-		10.2						• •	Vert
113.8404			12.5							Vert
126.5521	17	QP	13.7	0.5	31.2	43.5	-12.3	52	103	Vert
Horizontal 200	- 1000MHz									
Test Frequency	Meter Reading	Detector	AF-44067 [dB/m]	GL-3M [dB]	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
240.0015	-		11.2							Horz
665.0524	14.01	QP	20.1	1.9	36.01	46	-9.99	337	110	Horz
Vertical 200 - 1	DOOMHz									
				GL-3M		FCC Part 15		Azimuth	-	
	Meter Reading		[dB/m]	[dB]		Subpart C 15.209			[cm]	Polarity
665.0372	15.44	QP	20.1	1.9	37.44	46	-8.56	360	101	Vert
	detector									

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#### SPURIOUS EMISSIONS 30 TO 1000 MHz (5.3GHZ BAND WORST-CASE CONFIGURATION)

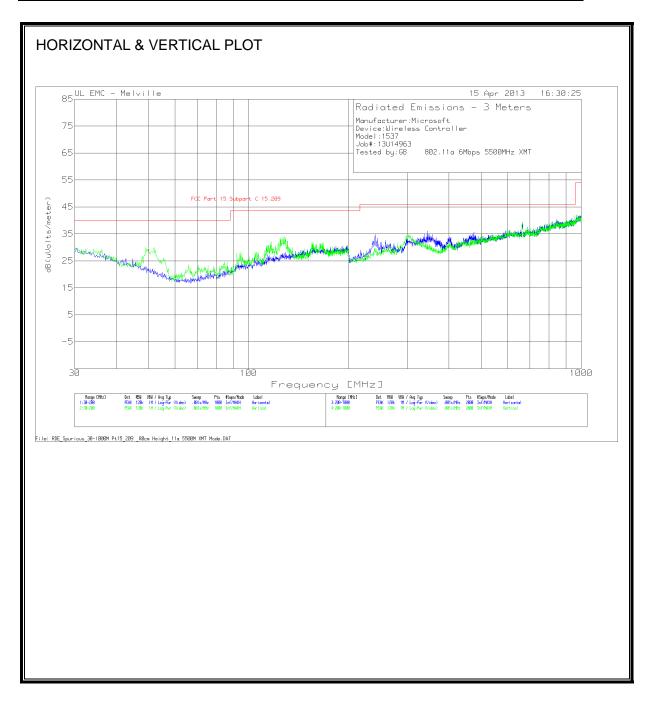


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Device:Wireles Model:1537										
Model:1E27	s Controller									
Wodel.1557										
Job#:13U14963	Tested By: GB/R	м								
11nHT20 MCS0	5320MHz XMT									
Vertical 30 - 20	00414-									
/ertical 50-20	UNITZ		AF-43441	GL 2M		FCC Part 15		Azimuth	Hoight	
Fost Frequency	Meter Reading	Detector		[dB]	dP(u)(olts/motor)	Subpart C 15.209	Margin (dB)		-	Polarity
50.0181	-		10.2	• •						Vert
52.0121			9.2							Vert
126.1774		-	13.7							Vert
120.1774	10.54	4	13.7	0.5	50.74		-12.70		102	vert
Horizontal 200	- 1000MHz									
	200000		AF-44067	GL-3M		FCC Part 15		Azimuth	Height	
est Frequency	Meter Reading	Detector	[dB/m]		dB(uVolts/meter)	Subpart C 15.209	Margin (dB)		-	Polarit
239.9992	-		11.2							Horz
665.1462			20.1							Horz
		-								
/ertical 200 - 1	000MHz									
			AF-44067	GL-3M		FCC Part 15		Azimuth	Height	
Fest Frequency	Meter Reading	Detector	[dB/m]	[dB]	dB(uVolts/meter)	Subpart C 15.209	Margin (dB)	[Degs]	[cm]	Polarity
302.2793	17.95	QP	13	1.1	32.05	46	-13.95	345	166	Vert
665.0356	14.23	QP	20.1	1.9	36.23	46	-9.77	314	173	Vert
0.0										
JP - Quasi-Pear	detector									
302.2793	17.95 14.23	QP	[dB/m] 13	[dB] 1.1	32.05	Subpart C 15.209 46	-13.95	[Degs] 345	[cm] 166	Ve

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#### SPURIOUS EMISSIONS 30 TO 1000 MHz (5.6GHZ BAND WORST-CASE CONFIGURATION)



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Manufacturer:N	licrosoft									
Device:Wireles										
Model:1537										
lob#:13U14963										
Tested by:GB 8	02.11a 6Mbps 5	500MHz XN	т							
Vertical 30 - 200	N. 41 I									
	Meter Reading	Detector	AF-43441 [dB/m]	GL-3M [dB]	dP(u)(olts/motos)	FCC Part 15 Subpart C 15.209	Margin (dP)	Azimuth		Polarity
51.952	-		9.2	• •						Vert
116.957			12.9							Vert
127.8478			13.8							Vert
Horizontal 200 -	1000MHz									
Fest Frequency	Meter Reading	Detector	AF-44067 [dB/m]		dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	Azimuth [Degs]	-	Polarit
344.8724	_			1.2						Horz
665.4327	17.5	PK	20.1	1.9	39.5	46	-6.5	4	100	Horz
/ertical 200 - 10	00MHz									
			AF-44067	GL-3M		FCC Part 15		Azimuth	Height	
Test Frequency	Meter Reading	Detector		[dB]	dB(uVolts/meter)	Subpart C 15.209	Margin (dB)		[cm]	Polarity
665.4327			20.1	1.9		46			100	Vert
PK - Peak detect	or									

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# **10. AC POWER LINE CONDUCTED EMISSIONS**

## LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

\* Decreases with the logarithm of the frequency.

## TEST PROCEDURE

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

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

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

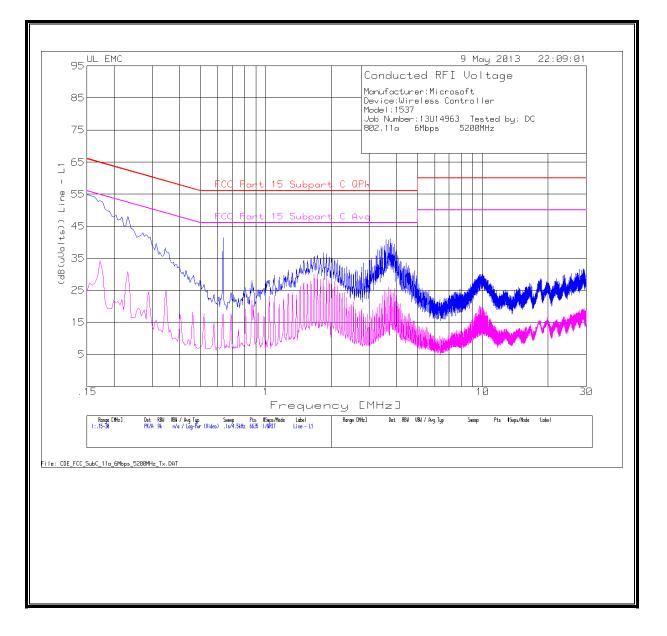
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#### **RESULTS**

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

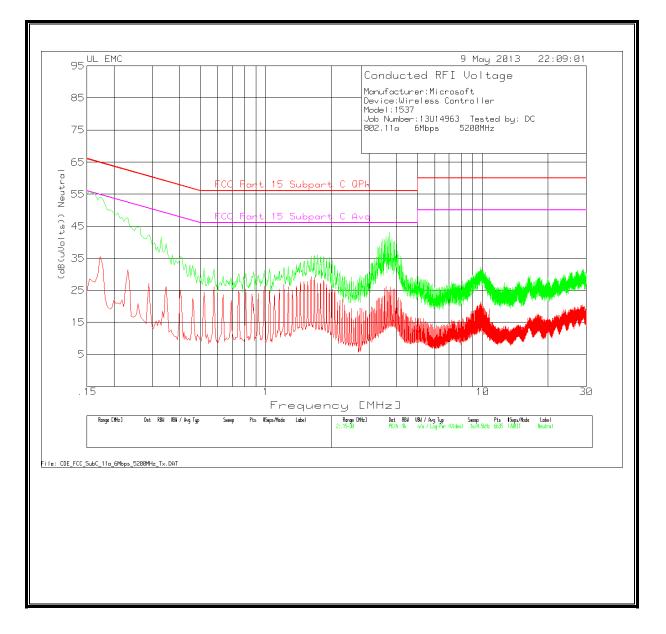
Manufacturer:N	Vicrosoft							
Device:Wireles	s Controller							
Model:1537								
Job Number:13	U14963 Tested I	by: DC						
802.11a 6Mbp	s 5200MHz	i i						
Line - L1 .15 - 30	OMHz							
			5A636 L1		FCC Part 15		FCC Part 15	
Test Frequency	Meter Reading	Detector	[dB]	(dB(uVolts))	Subpart C QPk	Margin (dB)	Subpart C Avg	Margin (dB)
0.15	44.92	PK	10	54.92	66	-11.08	56	-1.08
0.15	14.48	Av	10	24.48	66	-41.52	56	-31.52
0.1725	42.89	PK	10	52.89	64.84	-11.95	54.84	-1.95
0.1725	24.24	Av	10	34.24	64.84	-30.6	54.84	-20.6
0.231	38.05	PK	10	48.05	62.41	-14.36	52.41	-4.36
0.231	20.87	Av	10	30.87	62.41	-31.54	52.41	-21.54
0.636	31.33	PK	10	41.33	56	-14.67	46	-4.67
0.636	7.64	Av	10	17.64	56	-38.36	46	-28.36
1.8465	26.59	PK	10.1	36.69	56	-19.31	46	-9.31
1.8465	18.77	Av	10.1	28.87	56	-27.13	46	-17.13
3.75	30.93	PK	10.1	41.03	56	-14.97	46	-4.97
3.75	15.23	Av	10.1	25.33	56	-30.67	46	-20.67
Neutral .15 - 30	MH7							
1000101.25 50			5A636					
			L4Neut		FCC Part 15		FCC Part 15	
Test Frequency	Meter Reading	Detector		(dB(uVolts))	Subpart C QPk	Margin (dB)		Margin (dB)
0.1635	-		10	55.05	65.28	-10.23	55.28	
0.1635			10	27.57	65.28	-37.71	55.28	
0.2085			10	49.25	63.26	-14.01	53.26	
0.2085			10	21.01	63.26	-42.25	53.26	
0.33			10	41.67	59.45	-17.78	49.45	-7.78
0.33			10	14.01	59.45	-45.44	49.45	
0.5775			10.1	31.7	56	-24.3	46	-14.3
0.5775			10.1	26.09	56	-29.91	46	
1.734			10.1	36.16	56	-19.84	46	-9.84
1.734			10.1	27.13	56	-28.87	46	-18.87
			10.2	43.22	56	-12.78	46	
3.7005					56	-31.34	46	-21.34
3.7005 3.7005	14.46	Av	10.2	24.66	50	-51.54	40	
		Av	10.2	24.66	50	-51.54	40	-21.51

# LINE 1 RESULTS



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# LINE 2 RESULTS



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