

FCC CFR47 PART 15 SUBPART C INDUSTRY CANADA RSS-210 ISSUE 7 CERTIFICATION TEST REPORT

FOR 802.11n 2x2 PCIe MINICARD TRANSCEIVER MODEL NUMBER: AR5BXB92 FCC ID: PPD-AR5BXB92 IC: 4104A-AR5BXB92

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> > Prepared for

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Prepared by

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Page 2 of 255

TABLE OF CONTENTS

1.	ATT	ESTATION OF TEST RESULTS	. 6
2.	TES	T METHODOLOGY	.7
3.	FAC	ILITIES AND ACCREDITATION	.7
4.	CAL	IBRATION AND UNCERTAINTY	.7
2	4.1.	MEASURING INSTRUMENT CALIBRATION	. 7
4	4.2.	MEASUREMENT UNCERTAINTY	
5.	EQU	IPMENT UNDER TEST	. 8
Ę	5.1.	DESCRIPTION OF EUT	. 8
ł	5.2.	MAXIMUM OUTPUT POWER	. 8
Ę	5.3.	DESCRIPTION OF AVAILABLE ANTENNAS	. 8
ł	5.4.	SOFTWARE AND FIRMWARE	. 8
ł	5.5.	WORST-CASE CONFIGURATION AND MODE	. 9
ł	5.6.	DESCRIPTION OF TEST SETUP	10
6.	TES	TAND MEASUREMENT EQUIPMENT	12
7.	ANT	ENNA PORT TEST RESULTS	13
7	7.1.	802.11b DUAL CHAIN LEGACY MODE IN THE 2.4 GHz BAND	13
	7.1.1	. 6 dB BANDWIDTH	13
	7.1.2	. 99% BANDWIDTH	15
	7.1.3	. OUTPUT POWER	16
	7.1.4	. AVERAGE POWER	23
	7.1.5	. POWER SPECTRAL DENSITY	24
	7.1.6	. CONDUCTED SPURIOUS EMISSIONS	28
7	7.2.	802.11g DUAL CHAIN LEGACY MODE IN THE 2.4 GHz BAND	35
	7.2.1	. 6 dB BANDWIDTH	35
	7.2.2	. 99% BANDWIDTH	37
	7.2.3	OUTPUT POWER	38
	7.2.4	AVERAGE POWER	45
	7.2.5	. POWER SPECTRAL DENSITY	46
	7.2.6	. CONDUCTED SPURIOUS EMISSIONS	50
7	7.3.	802.11n HT20 MODE IN THE 2.4 GHz BAND	
	7.3.1		57
		Page 3 of 255	

		Page 4 of 255	
8.	RADIATE	ED TEST RESULTS	162
	7.7.6.	CONDUCTED SPURIOUS EMISSIONS	157
	7.7.5.	POWER SPECTRAL DENSITY	154
	7.7.4.	AVERAGE POWER	153
	7.7.3.	OUTPUT POWER	148
	7.7.2.	99% BANDWIDTH	147
	7.7.1.	6 dB BANDWIDTH	145
7.	.7. 802.	.11n HT40 MODE IN THE 5.8 GHz BAND	
	7.6.6.	CONDUCTED SPURIOUS EMISSIONS	-
	7.6.5.	POWER SPECTRAL DENSITY	
	7.6.4.	AVERAGE POWER	133
	7.6.3.	OUTPUT POWER	126
	7.6.2.	99% BANDWIDTH	
	7.6.1.	6 dB BANDWIDTH	_
7.		.11n HT20 MODE IN THE 5.8 GHz BAND	
	7.5.6.	CONDUCTED SPURIOUS EMISSIONS	
	7.5.5.	POWER SPECTRAL DENSITY	
	7.5.4.	AVERAGE POWER	-
	7.5.3.	OUTPUT POWER	
	7.5.2.	99% BANDWIDTH	
7.	.5. 002. 7.5.1.	6 dB BANDWIDTH	
7	-	.11a MODE IN THE 5.8 GHz BAND	
	7.4.5. 7.4.6.	CONDUCTED SPURIOUS EMISSIONS	
	7.4.4. 7.4.5.	POWER SPECTRAL DENSITY	
	7.4.3. 7.4.4.	AVERAGE POWER	
	7.4.2. 7.4.3.	99% BANDWIDTH	-
	7.4.1.	6 dB BANDWIDTH	
7.		.11n HT40 MODE IN THE 2.4 GHz BAND	-
7	7.3.6.	CONDUCTED SPURIOUS EMISSIONS	
	7.3.5.	POWER SPECTRAL DENSITY	
	7.3.4.		-
	7.3.3.	OUTPUT POWER	
	7.3.2.	99% BANDWIDTH	

8	.1. LI	MITS AND PROCEDURE
8	.2. TI	RANSMITTER ABOVE 1 GHz
	8.2.1.	TRANSMITTER ABOVE 1 GHz FOR 802.11b MODE IN THE 2.4 GHz BAND 164
	8.2.2.	TRANSMITTER ABOVE 1 GHz FOR 802.11g MODE IN THE 2.4 GHz BAND 182
	8.2.3. BAND	TRANSMITTER ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE 2.4 GHz 200
	8.2.4. BAND	TRANSMITTER ABOVE 1 GHz FOR 802.11n HT40 MODE IN THE 2.4 GHz 218
	8.2.5.	TRANSMITTER ABOVE 1 GHz FOR 802.11a MODE IN THE 5.8 GHz BAND 236
	8.2.6. BAND	TRANSMITTER ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE 5.8 GHz 237
	8.2.7. BAND	TRANSMITTER ABOVE 1 GHz FOR 802.11n HT40 MODE IN THE 5.8 GHz 238
8	.3. R	ECEIVER ABOVE 1 GHz239
	8.3.1.	RECEIVER ABOVE 1 GHz FOR 20 MHz BANDWIDTH IN THE 2.4 GHz BAND 239
	8.3.2.	RECEIVER ABOVE 1 GHz FOR 40 MHz BANDWIDTH IN THE 2.4 GHz BAND 240
	8.3.3.	RECEIVER ABOVE 1 GHz FOR 5.8 GHz BAND 241
8	.4. W	ORST-CASE BELOW 1 GHz242
9.	AC PO	WER LINE CONDUCTED EMISSIONS244
10.	МАХ	XIMUM PERMISSIBLE EXPOSURE
11.	SET	UP PHOTOS

Page 5 of 255

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	ATHEROS COMMUNICATION, INC
	5480 GREAT AMERICA PARKWAY
	SANTA CLARA, CA 95054 USA
EUT DESCRIPTION:	802.11n 2x2 PCIe Minicard transceiver
MODEL:	AR5BXB92
SERIAL NUMBER:	XB92-040-S0660 & XB92-040-S0579
DATE TESTED:	MARCH 03, 2008

APPLICABLE STANDARDS					
STANDARD	TEST RESULTS				
CFR 47 Part 15 Subpart C	No Non-Compliance Noted				
RSS-210 Issue 7 Annex 8 and RSS-GEN Issue 2	No Non-Compliance Noted				

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. 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 Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:

Down Charg

THU CHAN EMC SUPERVISOR COMPLIANCE CERTIFICATION SERVICES

DEVIN CHANG EMC ENGINEER COMPLIANCE CERTIFICATION SERVICES

Page 6 of 255

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 2, and RSS-210 Issue 7.

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11n 2x2 PCIe minicard transceiver, model AR5BXB92. Two front-end module parts were evaluated; vendors are SiGe (FEM1) and Hitachi (FEM2).

The radio module is manufactured by Atheros Communications, Inc.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range	Mode	Chain 0	Chain 1	Total	Total
		Power	Power	Power	Power
(MHz)		(dBm)	(dBm)	(dBm)	(mW)
2412 - 2462	802.11b	24.01	25.26	27.69	587.51
2412 - 2462	802.11g	24.13	25.12	27.66	583.91
2412 - 2462	802.11n HT20	24.71	25.22	27.98	628.46
2422 - 2452	802.11n HT40	22.40	22.71	25.57	360.42
5745 - 5825	802.11a	24.95	26.30	28.69	739.19
5745 - 5825	802.11n HT20	24.85	24.92	27.90	615.95
5755 - 5795	802.11n HT40	24.34	25.81	28.15	652.71

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The 2x2 configuration utilizes a set of PIFA antennas with maximum gain of 3.62 dBi from 2400 - 2483.5 MHz, 4.63 dBi from 5150 - 5350 MHz, 5.56 dBi from 5250 - 5350 MHz, 5.34 dBi from 5470 - 5725 MHz, and 4.76 dBi from 5725 - 5850 MHz.

5.4. SOFTWARE AND FIRMWARE

The test utility and driver software used during testing was Art ANWI 1.4 and Devlib Revision 0.6 Build #18 Art_11n.

Page 8 of 255

5.5. WORST-CASE CONFIGURATION AND MODE

The 2x2 configuration was used for all testing in this report.

Both FEM1 and FEM2 boards were evaluated on conducted and radiated emissions tests to find the worst case.

The worst-case data rates are determined to be as follows for each mode, based on the investigations by measuring the avarage power, peak power and PPSD across all the data rates, bandwidths, modulations and spatial stream modes.

Thus all emissions tests were made with following data rates:

- 802.11b mode, 20 MHz Channel Bandwidth, 1 Mb/s, CCK Modulation, Spatial Stream 1.
- 802.11g mode, 20 MHz Channel Bandwidth, 9 Mb/s, OFDM Modulation, Spatial Stream 1.
- 802.11a mode, 20 MHz Channel Bandwidth, 9 Mb/s, OFDM Modulation, Spatial Stream 1.
- 802.11n HT20 mode, 20 MHz Channel Bandwidth, MCS0, 6.5 Mb/s, OFDM Modulation, Spatial Stream 1.
- 802.11n HT40 mode, 40 MHz Channel Bandwidth, MCS0, 13.5 Mb/s, OFDM Modulation, Spatial Stream 1.

Baseline testing demonstrated that the Power Spectral Density as measured through a combiner with both chains operating simultaneously is worst case.

For RF conducted emissions, all tests were performed on FEM2 board excepted conducted spurious to use FEM1 board.

For RF radiated emissions, all tests were performed on FEM1 boards.

For radiated emissions bandedge, both FEM1 and FEM2 boards were performed at both vertical and horizontal polarizations.

For radiated emissions TX below 1 GHz, RX spurious, and AC line conduction were performed at FEM1 board.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST							
Description	Serial Number	FCC ID					
Laptop	IBM	ThinkPad T42	ZZ-27001	DoC			
AC Adapter	IBM	02K6749	11S02K6749Z122OM2436ST	DoC			

I/O CABLES

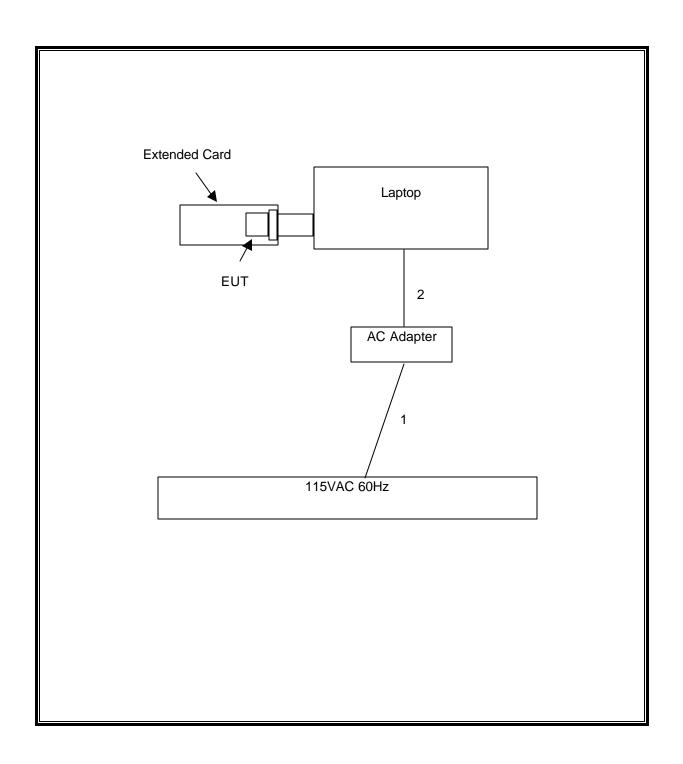
	I/O CABLE LIST						
Cable	Port	# of	Connector	Cable	Cable	Remarks	
No.		Identica	Туре	Type	Length		
		Ports					
1	AC	1	US 115V	Un-shielded	2m	One Ferrite at Laptop End	
2	DC	1	DC	Un-shielded	2m	N/A	

TEST SETUP

The EUT is connected to a laptop PC via a PCI extension card during the tests. Test software exercised the radio card.

Page 10 of 255

SETUP DIAGRAM FOR TESTS



Page 11 of 255

6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST						
Description	Manufacturer	Model	Asset	Cal Date	Cal Due	
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	12/3/2007	3/3/2009	
Peak Power Meter	Agilent/HP	E4416A	C00963	12/4/2007	12/4/2009	
Peak / Average Power Sensor	Agilent	E9327A	C00964	12/7/2007	12/7/2009	
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	9/28/2007	9/28/2008	
Antenna, Horn, 18 GHz	EMCO	3115	C00945	4/15/2007	4/15/2008	
Preamplifier, 26.5 GHz	Agilent/HP	8449B	C01063	9/27/2007	9/27/2008	
EMI Receiver, 2.9 GHz	Agilent/HP	8542E	C00957	2/6/2007	6/12/2008	
RF Filter Section, 2.9 GHz	Agilent/HP	85420E	C00958	2/6/2007	6/12/2008	
EMI Test Receiver, 30 MHz	R&S	ESHS 20	N02396	2/6/2008	8/6/2009	
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/25/2007	10/25/2008	
Preamplifier, 26.5 GHz	Agilent/HP	8449B	C00749	8/3/2007	9/27/2008	
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	9/29/2007	9/29/2008	
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	10/11/2007	10/11/2008	
2.4-2.5GHz Reject Filter	Micro Tronics	BRM50702	N02685	CNR	CNR	
Reject Filter, 5.15-5.35 GHz	Micro-Tronics	BRC13190	N02679	CNR	CNR	
Reject Filter, 5.47-5.725 GHz	Micro-Tronics	BRC13191	N02678	CNR	CNR	
Reject Filter, 5. 725-5. 85 GHz	Micro-Tronics	BRC13192	N02676	CNR	CNR	

Page 12 of 255

7. ANTENNA PORT TEST RESULTS

7.1. 802.11b DUAL CHAIN LEGACY MODE IN THE 2.4 GHz BAND

7.1.1.6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

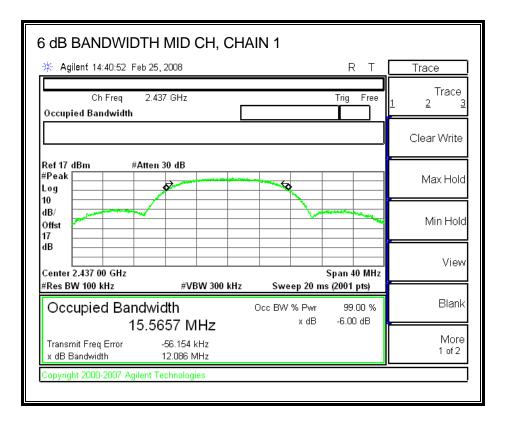
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

<u>RESULTS</u>

Channel	nnel Frequency Chain 1		Minimum Limit
	(MHz)	(MHz)	(MHz)
Middle	2437	12.086	0.5

Page 13 of 255



Page 14 of 255

7.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	Chain 1 (MHz)		
Middle	2437	17.47		

99% BANDWIDTH MID CH, CHAIN 1	
* Agilent 14:43:59 Feb 25, 2008 R T	Freq/Channel
Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Averages: 100	Center Freq 2.43700000 GHz
	Start Freq 2.41700000 GHz
Ref 17 dBm #Atten 30 dB #Samp	Stop Freq 2.45700000 GHz CF Step 25.0000000 MHz Auto Freq Offset 0.00000000 Hz
#Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (2001 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 17.4700 MHz x dB -6.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error -14.198 kHz x dB Bandwidth 13.624 MHz* Copyright 2000-2007 Agilent Technologies	

Page 15 of 255

7.1.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) IC RSS-210 A8.4

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain			
(dBi)			
6.33			

The maximum antenna gain is 6.33 dBi for P-To-M; therefore the limit is 29.67 dBm.

TEST PROCEDURE

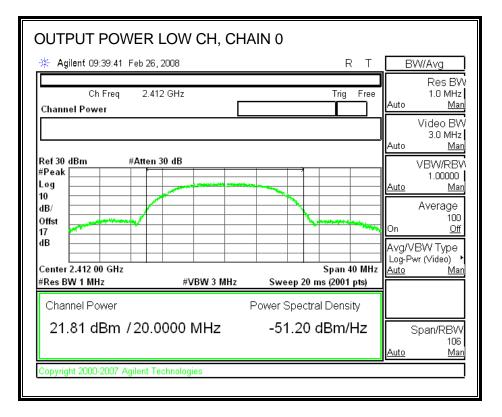
Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

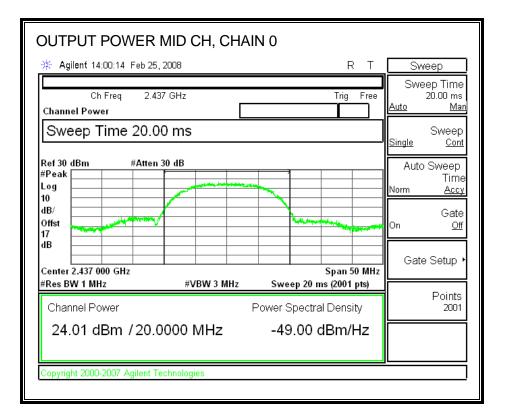
Channel	Frequency	Limit	Chain 0	Chain 1	Total	Margin
			Power	Power	Power	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	2412	29.67	21.81	21.72	24.78	-4.89
Mid	2437	29.67	24.01	25.26	27.69	-1.98
High	2462	29.67	23.32	23.89	26.62	-3.05

Page 16 of 255

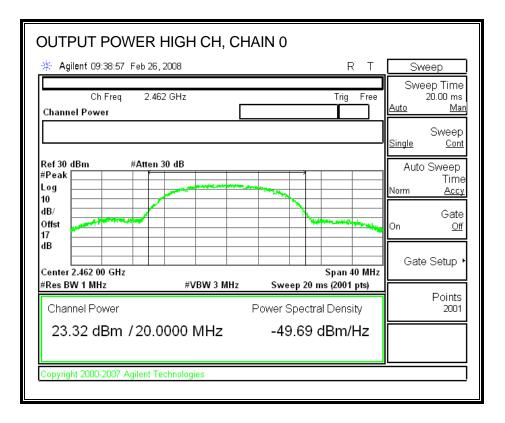
CHAIN 0 OUTPUT POWER



Page 17 of 255

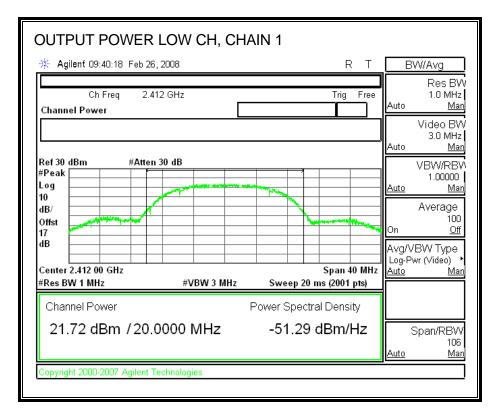


Page 18 of 255

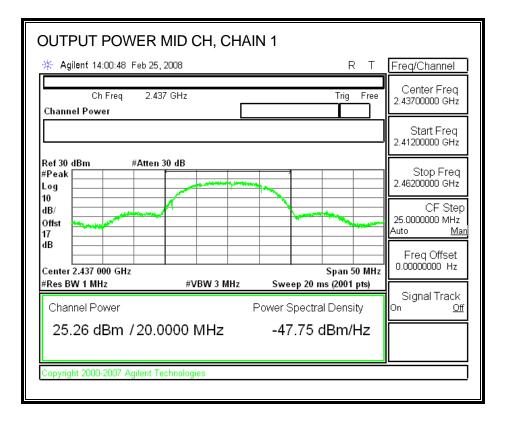


Page 19 of 255

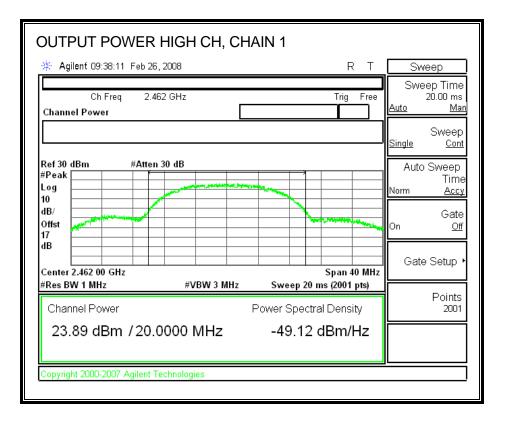
CHAIN 1 OUTPUT POWER



Page 20 of 255



Page 21 of 255



Page 22 of 255

7.1.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 17 dB (including 16 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Chain 0 Power	Chain 1 Power	Total Power
	(MHz)	(dBm)	(dBm)	(dBm)
Low	2412	16.81	16.84	19.84
Middle	2437	19.13	20.43	22.84
High	2462	18.67	19.08	21.89

Page 23 of 255

7.1.5. POWER SPECTRAL DENSITY

<u>LIMITS</u>

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

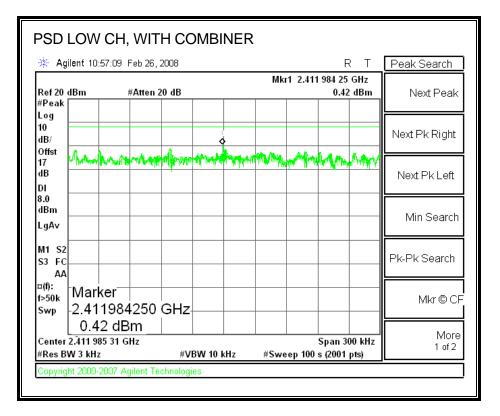
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

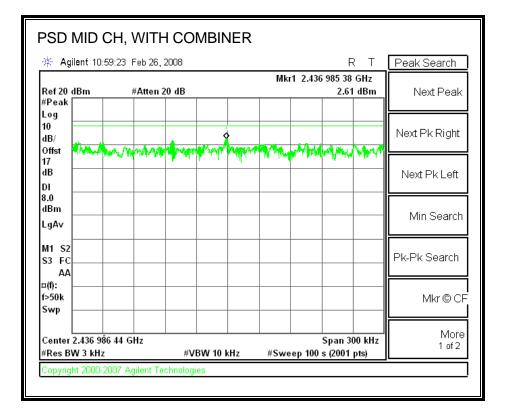
Channel	Frequency	PSD with Combiner	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	0.42	8	-7.58
Middle	2437	2.61	8	-5.39
High	2462	2.67	8	-5.33

Page 24 of 255

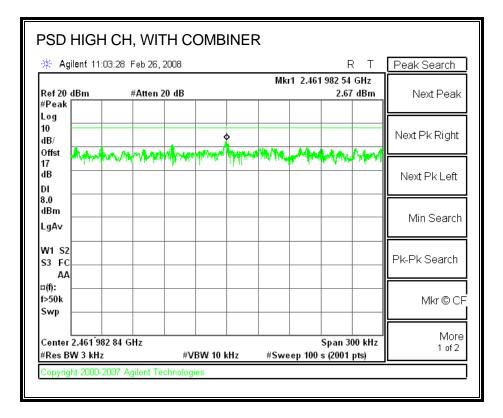
POWER SPECTRAL DENSITY, WITH COMBINER



Page 25 of 255



Page 26 of 255



Page 27 of 255

7.1.6. CONDUCTED SPURIOUS EMISSIONS

<u>LIMITS</u>

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

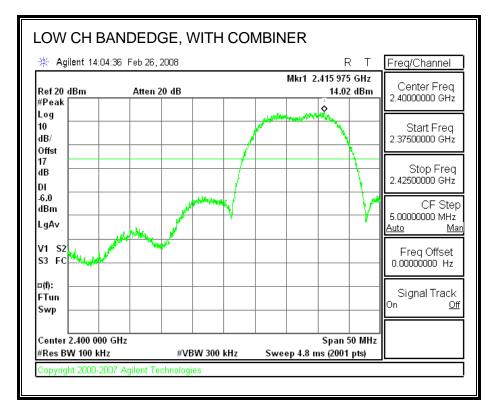
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

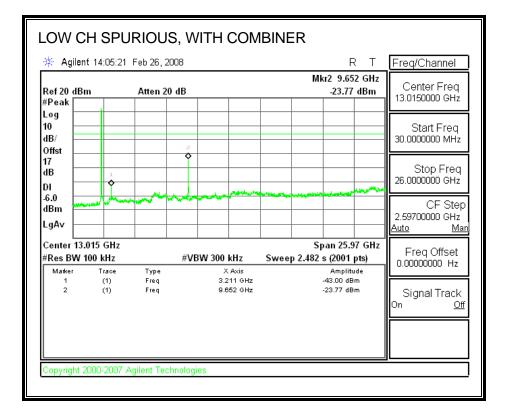
<u>RESULTS</u>

Page 28 of 255

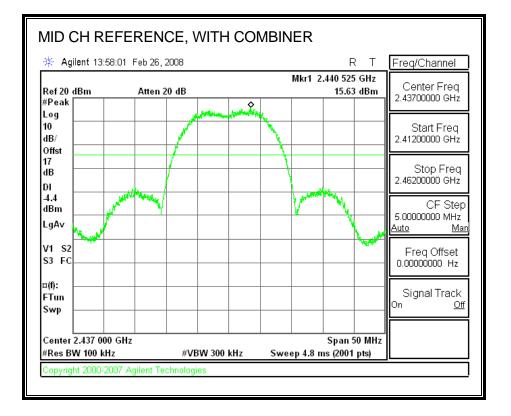
SPURIOUS EMISSIONS WITH COMBINER



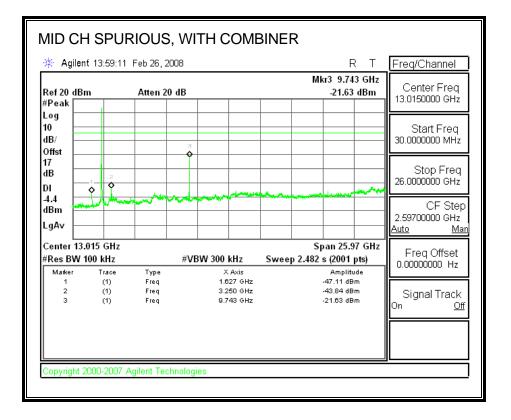
Page 29 of 255



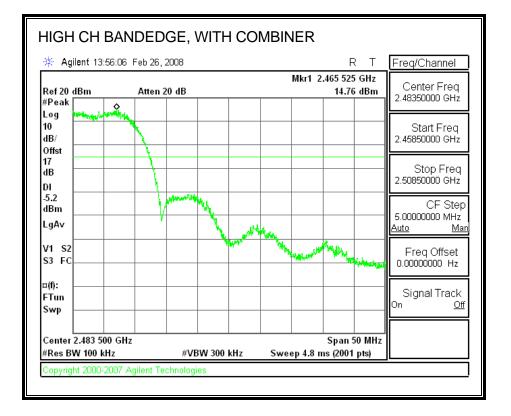
Page 30 of 255



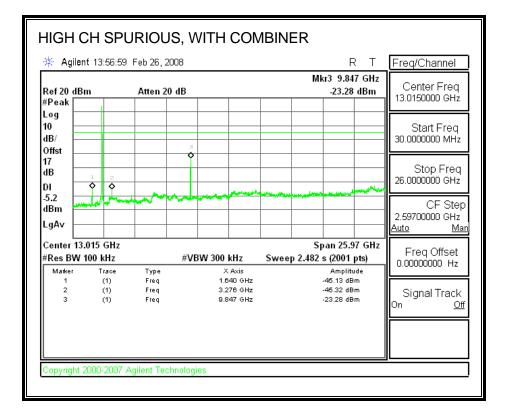
Page 31 of 255



Page 32 of 255



Page 33 of 255



Page 34 of 255

7.2. 802.11g DUAL CHAIN LEGACY MODE IN THE 2.4 GHz BAND

7.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency	Chain 1	Minimum Limit	
	(MHz)	(MHz)	(MHz)	
Middle	2437	16.361	0.5	

Page 35 of 255

6 dB BANDWIDT	H MID CH, C	HAIN 1			
🔆 Agilent 14:40:26 Feb 2	25, 2008		RΤ	Freq/Channel	
Ch Freq 2 Occupied Bandwidth	437 GHz		Trig Free	Center Freq 2.43700000 GHz	
				Start Freq 2.41700000 GHz	
#Peak	en 30 dB → polonsforsetantententententententententententententen	denter denteratural e e	MUNICUN LINEARIANAL	Stop Freq 2.45700000 GHz	
dB/ Offst				CF Step 25.000000 MHz Auto <u>Man</u>	
dB Center 2.437 00 GHz	#VBW 300 kt		Span 40 MHz	Freq Offset 0.00000000 Hz	
#Res BW 100 kHz Occupied Bandv 24.3	Signal Track On <u>Off</u>				
Transmit Freq Error x dB Bandwidth					
Copyright 2000-2007 Agilent	Technologies]	

Page 36 of 255

7.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	Chain 1 (MHz)
Middle	2437	18.4785

99% BANDWIDTH MID CH, CHAIN 1	
🔆 Agilent 14:44:59 Feb 25, 2008 🛛 🛛 R T	Freq/Channel
Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Averages: 100	Center Freq 2.43700000 GHz
	Start Freq 2.41700000 GHz
Ref 17 dBm #Atten 30 dB #Samp → </th <th>Stop Freq 2.45700000 GHz CF Step 25.0000000 MHz Auto <u>Man</u></th>	Stop Freq 2.45700000 GHz CF Step 25.0000000 MHz Auto <u>Man</u>
Center 2.437 00 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (2001 pts)	Freq Offset 0.00000000 Hz
Occupied Bandwidth Occ BW % Pwr 99.00 % 18.4785 MHz x dB -6.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error 134.818 kHz x dB Bandwidth 16.254 MHz* Copyright 2000-2007 Agilent Technologies	
Popjingin 2000 2001 Fighten Footmologioo	

Page 37 of 255

7.2.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) IC RSS-210 A8.4

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain	
(dBi)	
6.33	

The maximum antenna gain is 6.33 dBi for P-To-M; therefore the limit is 29.67 dBm.

TEST PROCEDURE

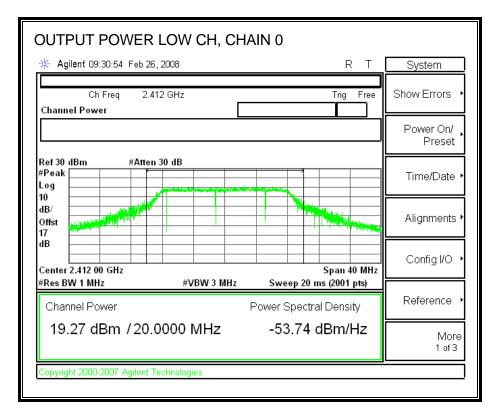
Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

Channel	Frequency	Limit	Chain 0	Chain 1	Total	Margin
			Power	Power	Power	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	2412	29.67	19.27	20.10	22.72	-6.95
Mid	2437	29.67	24.13	25.12	27.66	-2.01
High	2462	29.67	20.13	20.77	23.47	-6.20

Page 38 of 255

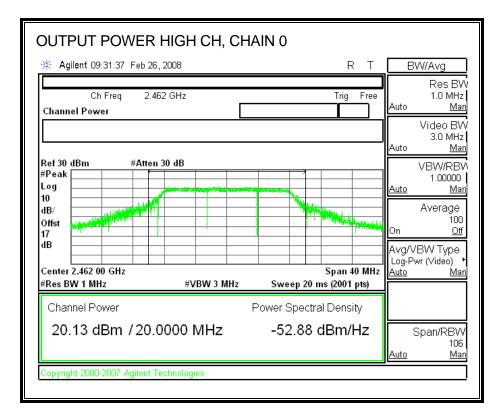
CHAIN 0 OUTPUT POWER



Page 39 of 255

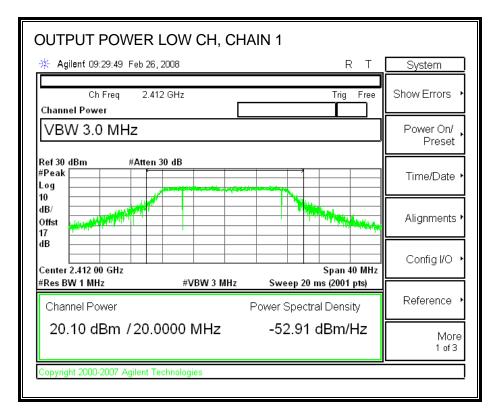
OUTPUT POWER MID CH, CHAIN 0	
✤ Agilent 14:13:05 Feb 25, 2008 R T	BW/Avg
Ch Freq 2.437 GHz Trig Free Channel Power	Res BW 1.0 MHz Auto <u>Man</u>
	Video BW 3.0 MHz Auto <u>Man</u>
	VBW/RBW 1.00000 Auto <u>Man</u>
dB/ Offst 17	Average 10 On <u>Off</u>
· · ·	Avg/VBW Type Log-Pwr (Video) ► <u>Auto Man</u>
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (2001 pts)	
Channel Power Power Spectral Density	
24.13 dBm / 20.0000 MHz -48.88 dBm/Hz	Span/RBW 106 Auto Man
Copyright 2000-2007 Agilent Technologies	Man

Page 40 of 255



Page 41 of 255

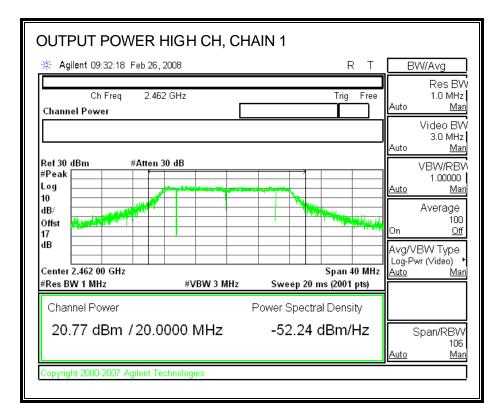
CHAIN 1 OUTPUT POWER



Page 42 of 255

OUTPUT POWER MID CH, CHAIN 1	
🔆 Agilent 14:12:43 Feb 25, 2008 🛛 🛛 🛛 R T	BW/Avg
Ch Freq 2.437 GHz Trig Free Channel Power	Res BVV 1.0 MHz Auto <u>Man</u>
VBW 3.0 MHz	Video BW 3.0 MHz Auto <u>Man</u>
Ref 30 dBm #Atten 30 dB #Peak	VBW/RBW 1.00000 Auto <u>Man</u>
dB/ Offst 17	Average 10 On <u>Off</u>
dB Center 2.437 000 GHz Span 50 MHz	Avg/VBW Type Log-Pwr (Video) ► <u>Auto Man</u>
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (2001 pts) Channel Power Power Spectral Density	
25.12 dBm / 20.0000 MHz -47.89 dBm/Hz	Span/RBW 106 Auto Man
Copyright 2000-2007 Agilent Technologies	

Page 43 of 255



Page 44 of 255

7.2.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 17 dB (including 16 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Chain 0 Power	Chain 1 Power	Total Power
	(MHz)	(dBm)	(dBm)	(dBm)
Low	2412	13.61	14.77	17.24
Middle	2437	18.67	19.55	22.14
High	2462	14.85	15.37	18.13

Page 45 of 255

7.2.5. POWER SPECTRAL DENSITY

<u>LIMITS</u>

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

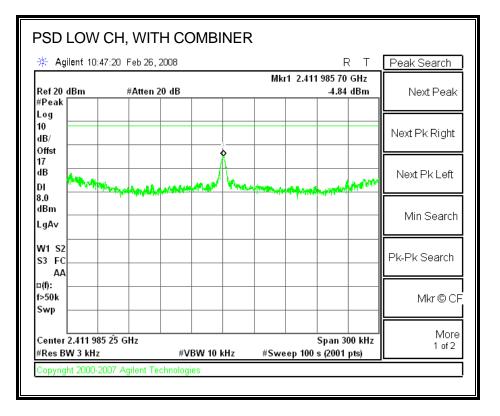
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

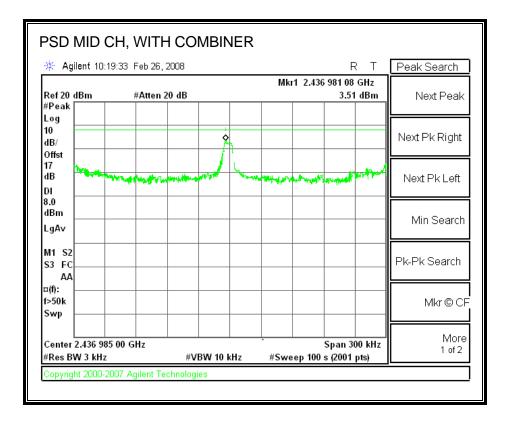
Channel	Frequency	PSD with Combiner	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	-4.84	8	-12.84
Middle	2437	3.51	8	-4.49
High	2462	-3.63	8	-11.63

Page 46 of 255

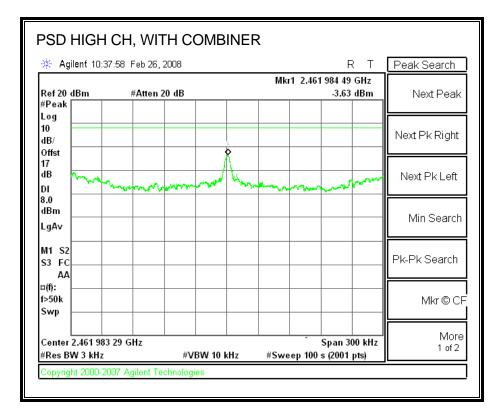
POWER SPECTRAL DENSITY, WITH COMBINER



Page 47 of 255



Page 48 of 255



Page 49 of 255

7.2.6. CONDUCTED SPURIOUS EMISSIONS

<u>LIMITS</u>

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

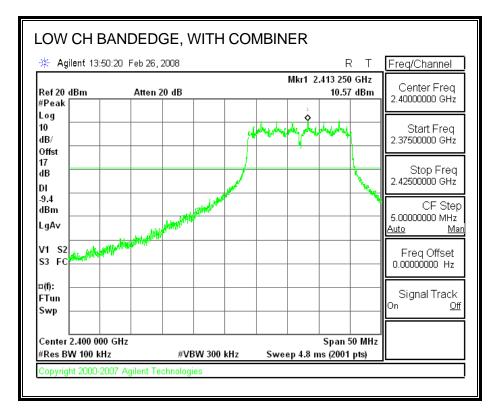
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

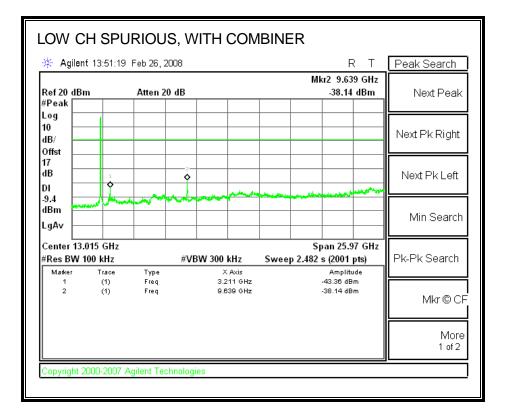
<u>RESULTS</u>

Page 50 of 255

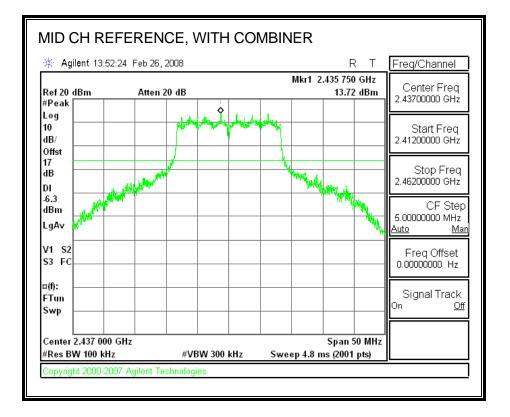
SPURIOUS EMISSIONS WITH COMBINER



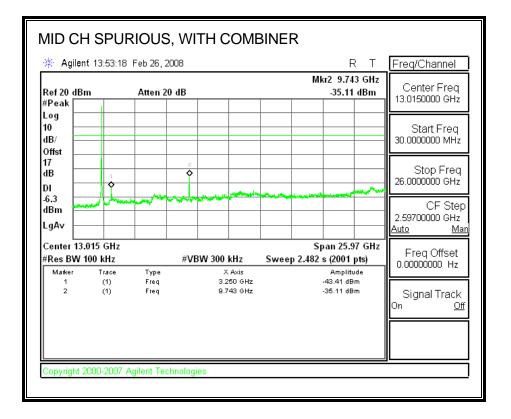
Page 51 of 255



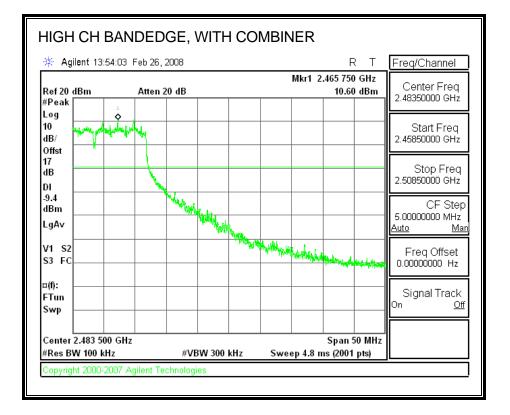
Page 52 of 255



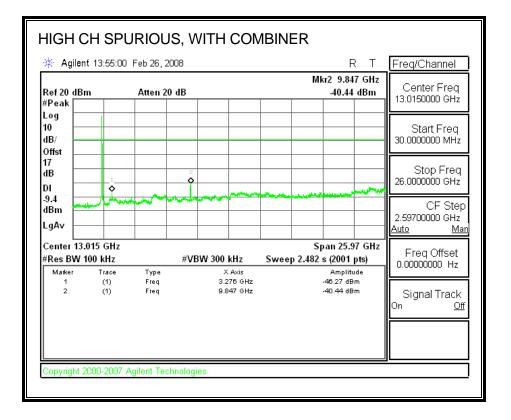
Page 53 of 255



Page 54 of 255



Page 55 of 255



Page 56 of 255

7.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

7.3.1.6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency	Chain 1	Minimum Limit
	(MHz)	(MHz)	(MHz)
Middle	2437	17.566	0.5

Page 57 of 255

6 dB BANDWIDTH	I MID CH, CH	IAIN 1		
🔆 Agilent 14:41:15 Feb 2	5, 2008		RΤ	Freq/Channel
Ch Freq 2.4 Occupied Bandwidth	137 GHz		Trig Free	Center Freq 2.43700000 GHz
				Start Freq 2.41700000 GHz
#Peak → Log	n 30 dB		Antonio (Martineoule	Stop Freq 2.45700000 GHz
10				CF Step 25.000000 MHz Auto <u>Man</u>
dB Center 2.437 00 GHz			Span 40 MHz	Freq Offset 0.00000000 Hz
#Res BW 100 kHz Occupied Bandw 24.6	#VBW 300 kHz idth 078 MHz	Sweep 20 ms Occ BW % Pwr x dB	; (2001 pts) 99.00 % -6.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error x dB Bandwidth	438.806 kHz 17.566 MHz			
Copyright 2000-2007 Agilent	Technologies			I

Page 58 of 255

7.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	Chain 1 (MHz)
Middle	2437	19.3262

99% BANDWIDTH MID CH, CHAIN 1	
ዡ Agilent 14:43:12 Feb 25, 2008	Freq/Channel
Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Averages: 100	Center Freq 2.43700000 GHz
	Start Freq 2.41700000 GHz
Ref 17 dBm #Atten 30 dB #Samp Log 10 10 10	Stop Freq 2.45700000 GHz
10 dB/ offst 17 dB 0ffst 17 dB 10 10 10 10 10 10 10 10 10 10	CF Step 25.0000000 MHz Auto <u>Man</u>
Center 2.437 00 GHz Span 40 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (2001 pts)	Freq Offset 0.00000000 Hz
Occupied Bandwidth Occ BW % Pwr 99.00 % 19.3262 MHz x dB -6.00 dB	Signal Track ^{On <u>Off</u>}
Transmit Freq Error 165.434 kHz x dB Bandwidth 17.527 MHz*	
Copyright 2000-2007 Agilent Technologies	

Page 59 of 255

7.3.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

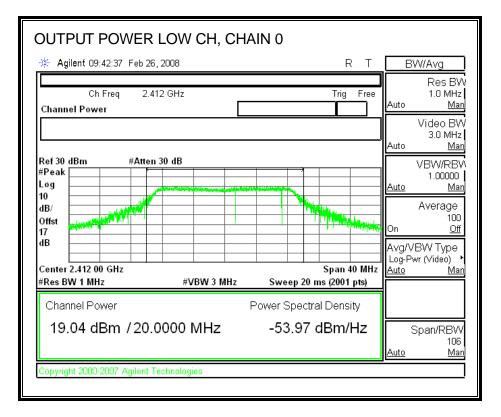
Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

Channel	Frequency	Limit	Chain 0	Chain 1	Total	Margin
			Power	Power	Power	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	2412	30.00	19.04	19.77	22.43	-7.57
Mid	2437	30.00	24.71	25.22	27.98	-2.02
High	2462	30.00	19.18	19.75	22.48	-7.52

Page 60 of 255

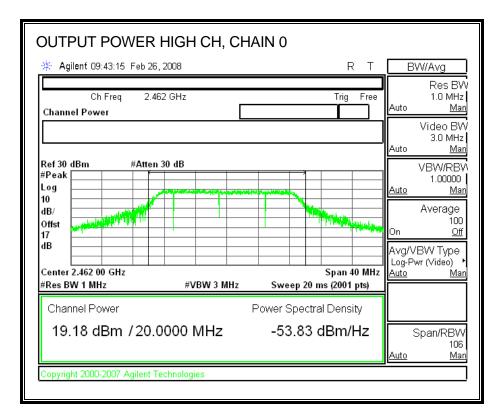
CHAIN 0 OUTPUT POWER



Page 61 of 255

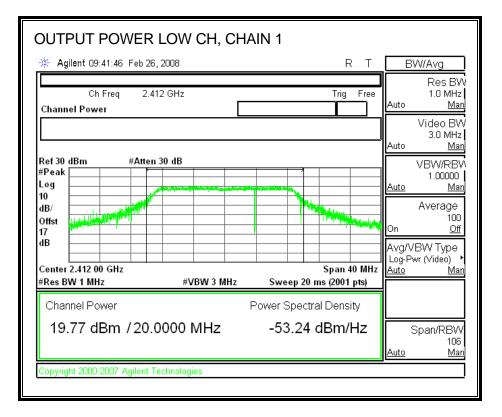
OUTPUT POWER MID CH, CHAIN 0	
₩ Agilent 14:18:12 Feb 25, 2008 R T	BW/Avg
Ch Freq 2.437 GHz Trig Free Channel Power	Res BVv 1.0 MHz Auto <u>Man</u>
VBW 3.0 MHz	Video BW 3.0 MHz Auto <u>Man</u>
Ref 30 dBm #Atten 30 dB #Peak	VBW/RBW 1.00000 Auto <u>Man</u>
dB/ Offst 17	Average 10 On <u>Off</u>
dB Center 2.437 000 GHz Span 50 MHz	Avg/VBW Type Log-Pwr (Video) ► <u>Auto Man</u>
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (2001 pts)	
Channel Power Power Spectral Density	
24.71 dBm / 20.0000 MHz -48.30 dBm/Hz	Span/RBW 106 Auto <u>Man</u>
Copyright 2000-2007 Agilent Technologies	

Page 62 of 255



Page 63 of 255

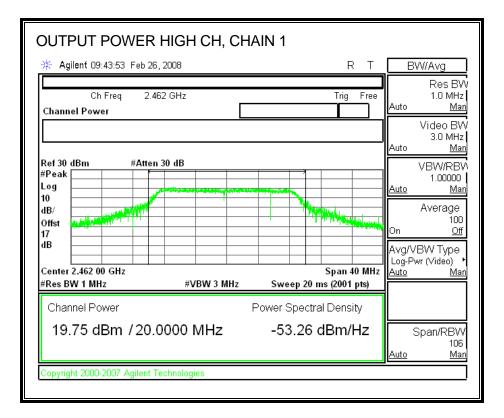
CHAIN 1 OUTPUT POWER



Page 64 of 255

OUTPUT POWER MID CH, CHAIN 1 * Agilent 14:18:53 Feb 25, 2008 R T	BW/Avg 1
Ch Freq 2.437 GHz Trig Free Channel Power	Res BW 1.0 MHz Auto <u>Man</u>
	Video BW 3.0 MHz Auto <u>Man</u>
Ref 30 dBm #Atten 30 dB #Peak Log 10 dB/	VBW/RBV 1.00000 Auto <u>Man</u> Average
Offst 17 dB	10 On <u>Off</u> Avg/VBW Type Log-Pwr (Video) Auto Man
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (2001 pts)	
Channel Power Power Spectral Density 25.22 dBm / 20.0000 MHz -47.79 dBm/Hz	Span/RBW 106 Auto <u>Man</u>
Copyright 2000-2007 Agilent Technologies	

Page 65 of 255



Page 66 of 255

7.3.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 17 dB (including 16 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Chain 0 Power	Chain 1 Power	Total Power	
	(MHz)	(dBm)	(dBm)	(dBm)	
Low	2412	13.28	14.11	16.73	
Middle	2437	19.26	20.04	22.68	
High	2462	13.56	14.46	17.04	

Page 67 of 255

7.3.5. POWER SPECTRAL DENSITY

<u>LIMITS</u>

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

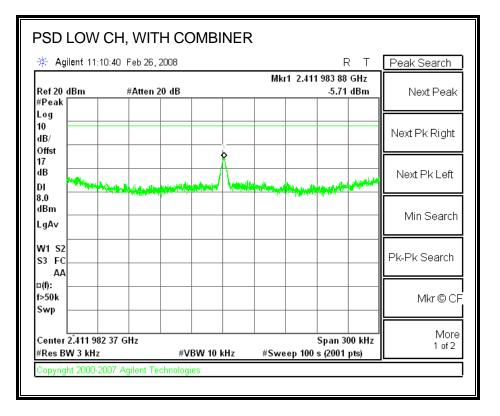
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

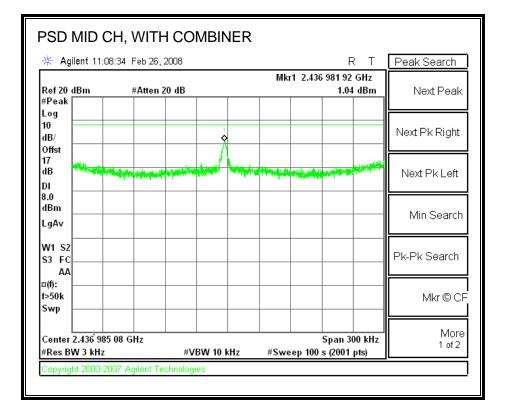
Channel	Frequency	PSD with Combiner	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	-5.71	8	-13.71
Middle	2437	1.04	8	-6.96
High	2462	-4.81	8	-12.81

Page 68 of 255

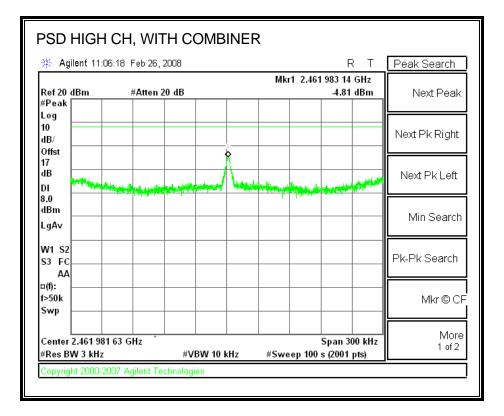
POWER SPECTRAL DENSITY, WITH COMBINER



Page 69 of 255



Page 70 of 255



Page 71 of 255

7.3.6. CONDUCTED SPURIOUS EMISSIONS

<u>LIMITS</u>

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

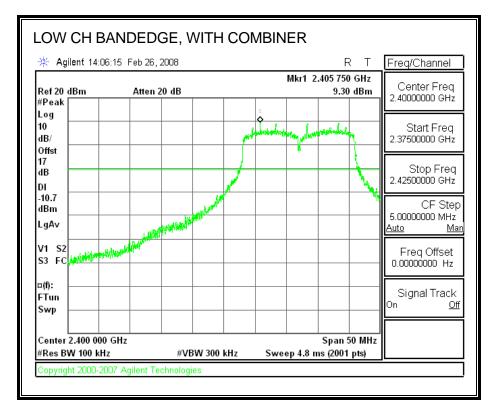
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

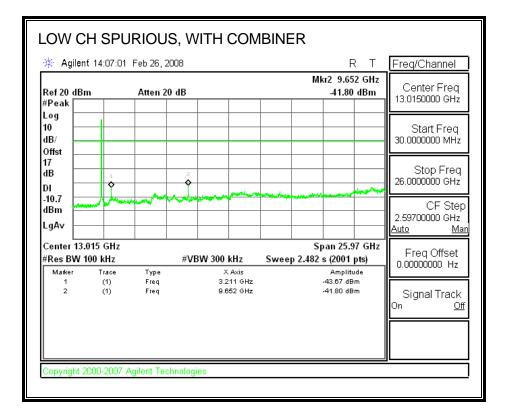
<u>RESULTS</u>

Page 72 of 255

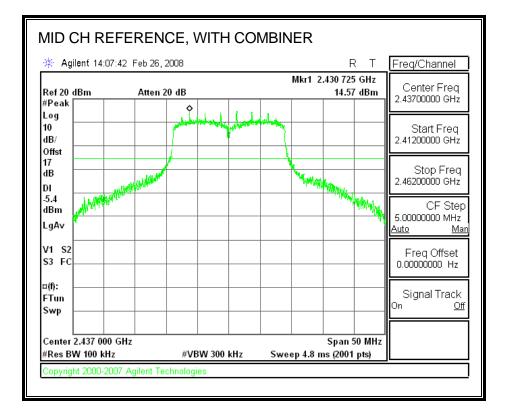
SPURIOUS EMISSIONS WITH COMBINER



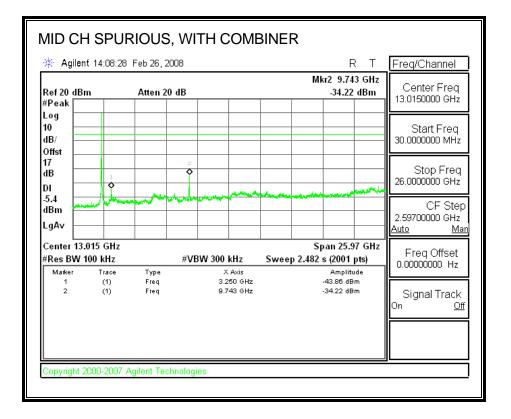
Page 73 of 255



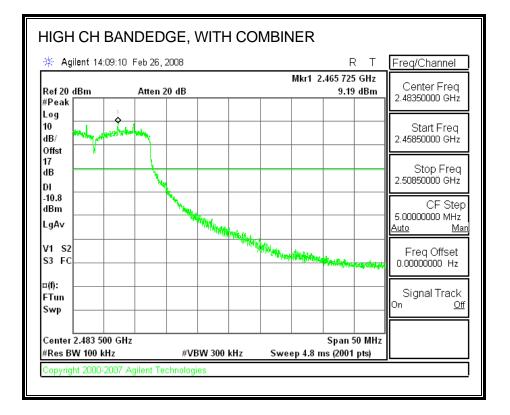
Page 74 of 255



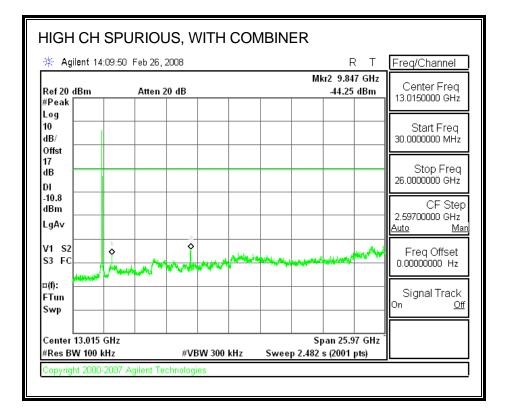
Page 75 of 255



Page 76 of 255



Page 77 of 255



Page 78 of 255

7.4. 802.11n HT40 MODE IN THE 2.4 GHz BAND

7.4.1.6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency	Chain 1	Minimum Limit
	(MHz)	(MHz)	(MHz)
Middle	2437	35.739	0.5

Page 79 of 255

6 dB BANDWIDTH MID CH, CHAIN 1				
₩ Agilent 14:38:54 Feb 25, 2008 R T	Freq/Channel			
Ch Freq 2.437 GHz Trig Free Occupied Bandwidth	Center Freq 2.43700000 GHz			
	Start Freq 2.39700000 GHz			
Ref 17 dBm #Atten 30 dB #Peak Log 10	Stop Freq 2.47700000 GHz			
10	CF Step 25.000000 MHz Auto <u>Man</u>			
dB Center 2.437 00 GHz Span 80 MHz	Freq Offset 0.00000000 Hz			
Res BW 100 kHz #VBW 300 kHz Sweep 27.07 ms (2001 pts) Signal Track Occupied Bandwidth Occ BW % Pwr 99.00 % On Off 49.6549 MHz x dB -6.00 dB On Off				
Transmit Freq Error 1.488 MHz x dB Bandwidth 35.739 MHz				
Copyright 2000-2007 Agilent Technologies				

Page 80 of 255

7.4.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	Chain 1 (MHz)
Middle	2437	39.5004

	,	CHAIN 1	<u>р</u> т	
🔆 Agilent 14:37:39 Fe	10 25, 2008		RT	Freq/Channel
Ch Freq Occupied Bandwidth	2.437 GHz	Averages: 100	Trig Free	Center Freq 2.43700000 GHz
·				Start Freq 2.39700000 GHz
	Atten 30 dB → contraction of the state of t			Stop Freq 2.47700000 GHz
dB/ Offst				CF Step 25.000000 MHz Auto <u>Man</u>
dB			Span 80 MHz	Freq Offset 0.00000000 Hz
#Res BW 510 kHz	#VBW 1 N	MHz Sweep 20 m	s (2001 pts)	
Occupied Ban 39	dwidth 9.5004 MHz	Occ BW % Pwr x dB	99.00 % -6.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error x dB Bandwidth	920.043 kHz 35.834 MHz*			
Copyright 2000-2007 Agil	ent Technologies			

Page 81 of 255

7.4.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

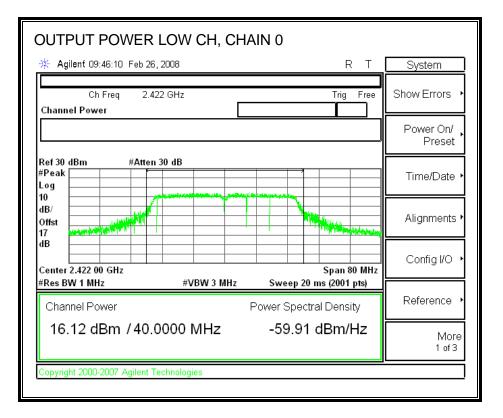
Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

Channel	Frequency	Limit	Chain 0	Chain 1	Total	Margin
			Power	Power	Power	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	2422	30.00	16.12	16.70	19.43	-10.57
Mid	2437	30.00	22.40	22.71	25.57	-4.43
High	2452	30.00	17.42	18.08	20.77	-9.23

Page 82 of 255

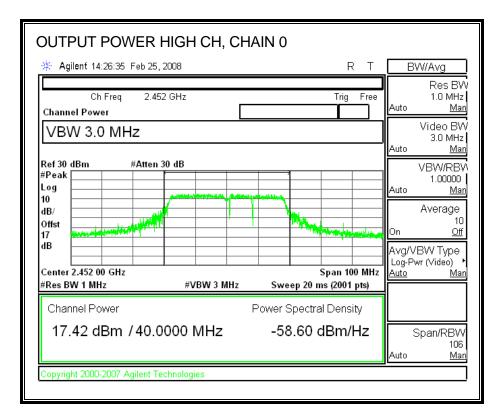
CHAIN 0 OUTPUT POWER



Page 83 of 255

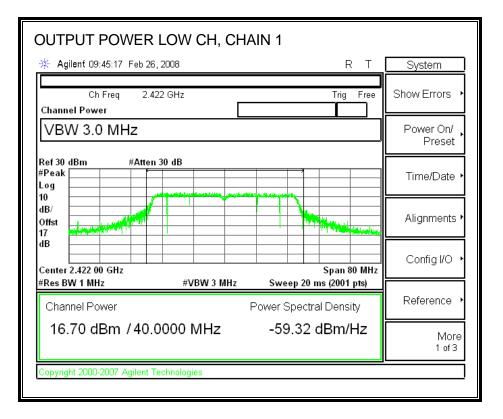
OUTPUT POWER MID CH, CHAIN 0	
🔆 Agilent 16:03:53 Dec 14, 2020 🛛 🛛 🛛 🔍 🛛 🖉	Freq/Channel
Ch Freq 2.437 GHz Trig Free Channel Power	Center Freq 2.43700000 GHz
	Start Freq 2.38700000 GHz
Ref 30 dBm #Atten 30 dB #Peak	Stop Freq 2.48700000 GHz
10 dB/ Offst 17 17	CF Step 100.000000 MHz Auto <u>Man</u>
dB	Freq Offset 0.00000000 Hz
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (2001 pts) Channel Power Power Spectral Density	Signal Track On <u>Off</u>
22.40 dBm / 40.0000 MHz -53.62 dBm/Hz	
Copyright 2000-2007 Agilent Technologies	

Page 84 of 255



Page 85 of 255

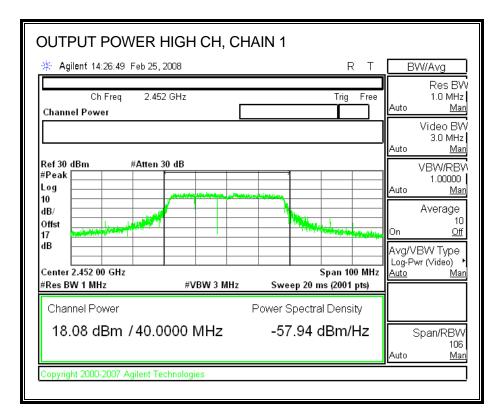
CHAIN 1 OUTPUT POWER



Page 86 of 255

OUTPUT POWER	,	N 1	
🔆 Agilent 16:04:33 Dec 14,	2020	RL	Freq/Channel
Ch Freq 2.43 Channel Power	7 GHz	Trig Free	Center Freq 2.43700000 GHz
		<u> </u>	Start Freq 2.38700000 GHz
Ref 30 dBm #Atten #Peak Log	30 dB		Stop Freq 2.48700000 GHz
10 dB/ Offst 17			CF Step 100.000000 MHz Auto <u>Man</u>
dB		Span 100 MHz	Freq Offset 0.00000000 Hz
#Res BW 1 MHz	#VBW 3 MHz	Sweep 20 ms (2001 pts)	
Channel Power	I	Power Spectral Density	Signal Track On <u>Off</u>
22.71 dBm /40.0	0000 MHz	-53.31 dBm/Hz	
Copyright 2000-2007 Agilent Te	chnologies		

Page 87 of 255



Page 88 of 255

7.4.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 17 dB (including 16 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Chain 0 Power	Chain 1 Power	Total Power
	(MHz)	(dBm)	(dBm)	(dBm)
Low	2422	10.50	11.00	13.77
Middle	2437	16.73	17.34	20.06
High	2452	11.84	12.64	15.27

Page 89 of 255

7.4.5. POWER SPECTRAL DENSITY

<u>LIMITS</u>

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

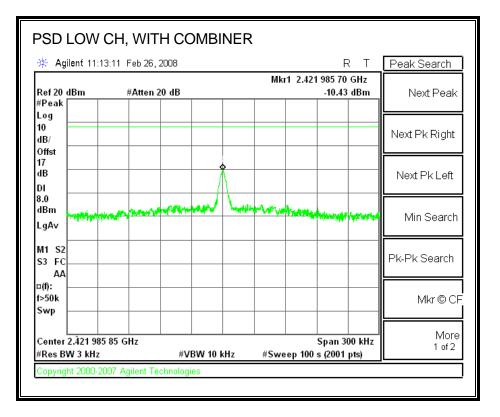
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

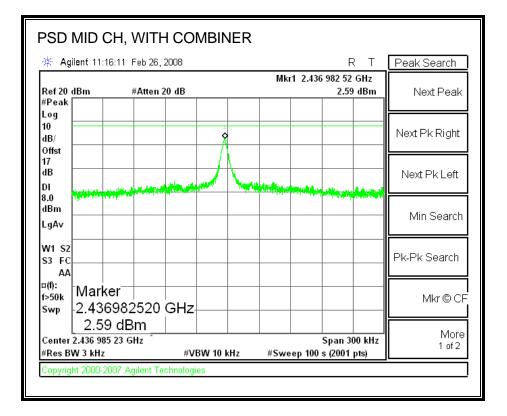
Channel	Frequency	PSD with Combiner	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2422	-10.43	8	-18.43
Middle	2437	2.59	8	-5.41
High	2452	-6.12	8	-14.12

Page 90 of 255

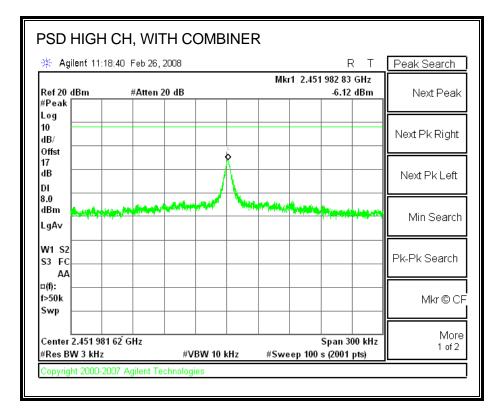
POWER SPECTRAL DENSITY, WITH COMBINER



Page 91 of 255



Page 92 of 255



Page 93 of 255

7.4.6. CONDUCTED SPURIOUS EMISSIONS

<u>LIMITS</u>

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

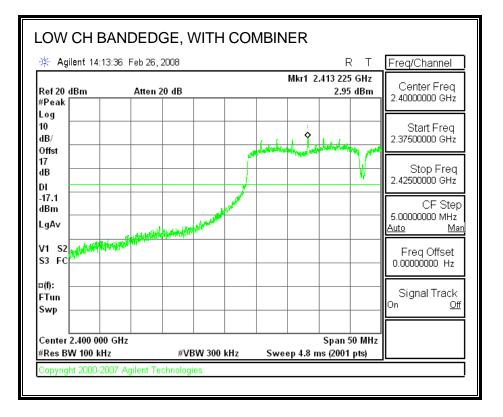
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

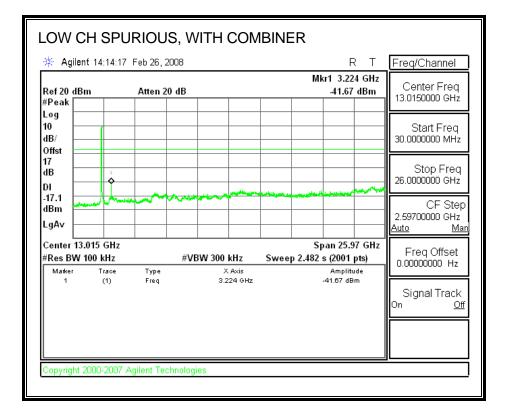
<u>RESULTS</u>

Page 94 of 255

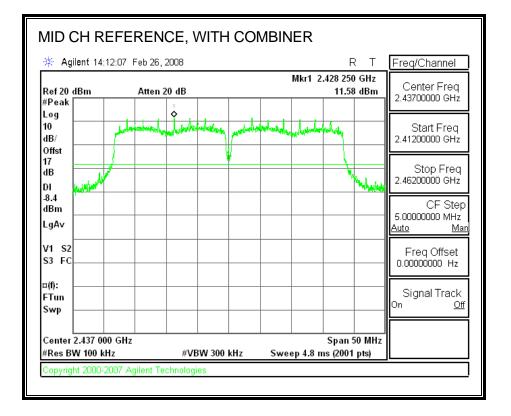
SPURIOUS EMISSIONS WITH COMBINER



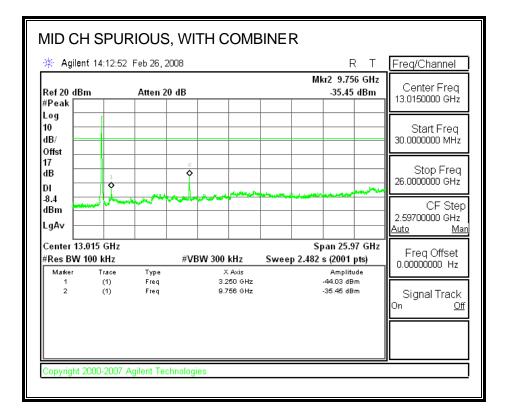
Page 95 of 255



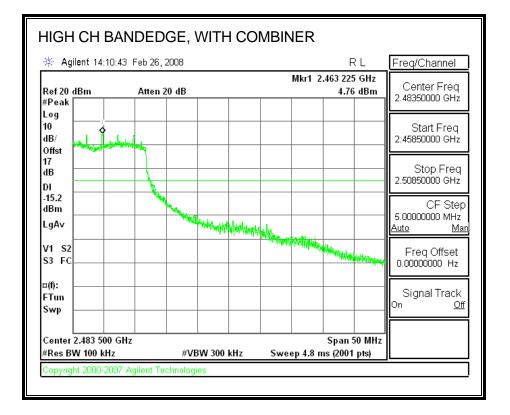
Page 96 of 255



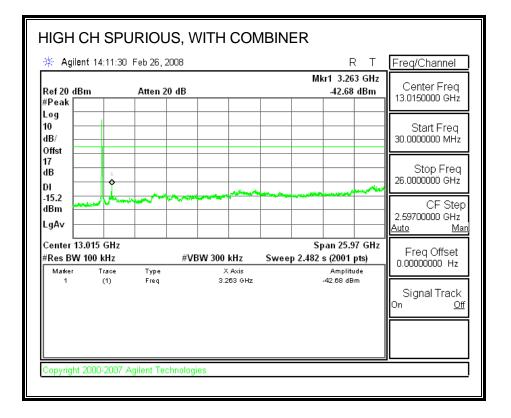
Page 97 of 255



Page 98 of 255



Page 99 of 255



Page 100 of 255

7.5. 802.11a MODE IN THE 5.8 GHz BAND

7.5.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency	Chain 1	Minimum Limit
	(MHz)	(MHz)	(MHz)
Middle	5785	16.47	0.5

Page 101 of 255

6 dB BANDWIDTH	I MID CH, CH	HAIN 1			
🔆 Agilent 11:40:56 Feb 2	7,2008		RΤ	Freq/Channel	
Ch Freq 5.7 Occupied Bandwidth	'95 GHz		Trig Free	Center Freq 5.79500000 GHz	
		<u> </u>		Start Freq 5.77000000 GHz	
#Peak	n 30 dB			Stop Freq 5.8200000 GHz	
10 dB/ Offst 17.5				CF Step 40.0000000 MHz Auto <u>Man</u>	
dB Center 5.795 000 GHz			Span 50 MHz	Freq Offset 0.00000000 Hz	
#Res BW 100 kHz	#VBW 300 kH:		/	Signal Track	
	Occupied Bandwidth Occ BW % Pwr 99.00 % 25.2302 MHz × dB -6.00 dB				
Transmit Freq Error x dB Bandwidth	-370.439 kHz 16.470 MHz				
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Page 102 of 255

7.5.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	Chain 1 (MHz)
Middle	5785	23.4542

99% BANDWIDTH MID C	CHAIN 1	R T Freq/Channel
Ch Freq 5.785 GHz Occupied Bandwidth	Averages: 10	Trig Free Center Freq 5.78500000 GHz
		Start Freq 5.76000000 GHz
Ref 20 dBm #Atten 30 dB #Samp Log 10 dB/ Offst 17.5 dB		Stop Freq 5.81000000 GHz 40.0000000 MHz Auto Man Freq Offset
Center 5.785 00 GHz #Res BW 300 kHz #VB	3W1MHz Swe	Span 50 MHz 0.00000000 Hz eep 20 ms (601 pts)
Occupied Bandwidth 23.4542 Mł	Occ BW %	Signal Track % Pwr 99.00 % x dB -6.00 dB
Transmit Freq Error -466.202 k x dB Bandwidth 16.132 MH	lz*	
Copyright 2000-2007 Agilent Technologie:	8	

Page 103 of 255

7.5.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) IC RSS-210 A8.4

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain	
(dBi)	
6.76	

The maximum antenna gain is 6.76 dBi for P-To-M; therefore the limit is 29.24 dBm.

TEST PROCEDURE

Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

Channel	Frequency	Limit	Chain 0	Chain 1	Total	Margin
			Power	Power	Power	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5745	29.24	24.95	26.30	28.69	-0.55
Mid	5785	29.24	24.07	25.36	27.77	-1.47
High	5825	29.24	23.26	24.51	26.94	-2.30

Page 104 of 255

CHAIN 0 OUTPUT POWER

OUTPUT POWER LOW CH, CHAIN 0	T Freq/Channel
Ch Freq 5.745 GHz Trig F Channel Power	Free Center Freq 5.74500000 GHz
	Start Freq 5.72625000 GHz
Ref 30 dBm #Atten 30 dB #Peak	Stop Freq 5.76375000 GHz
Offst	CF Step 40.0000000 MHz Auto <u>Man</u>
dB Center 5.745 000 0 GHz Span 37.5	
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pr Channel Power Power Spectral Density	Signal Track
24.95 dBm / 25.0000 MHz -49.03 dBm/H	z
Copyright 2000-2007 Agilent Technologies	

Page 105 of 255

OUTPUT POWER MID CH, CHAIN 0	
🔆 Agilent 10:44:04 Feb 27, 2008 R T	BW/Avg
Ch Freq 5.785 GHz Trig Free Channel Power	Res BW 1.0 MHz Auto <u>Man</u>
	Video BW 3.0 MHz Auto <u>Man</u>
	VBW/RBV 1.00000 Auto <u>Man</u>
dB/ where the second se	Average 10 On <u>Off</u>
	Avg/VBW Type Log-Pwr (Video) ^ <u>Auto Man</u>
Channel Power Power Spectral Density	
24.07 dBm / 25.0000 MHz -49.91 dBm/Hz	Span/RBW 106 Auto <u>Man</u>
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Page 106 of 255

OUTPUT POWER HIGH CH, CHAIN 0	
🔆 Agilent 10:46:20 Feb 27, 2008 R T	Freq/Channel
Ch Freq 5.825 GHz Trig Free Channel Power	Center Freq 5.82500000 GHz
	Start Freq 5.80625000 GHz
Ref 30 dBm #Atten 30 dB #Peak Log 10	Stop Freq 5.84375000 GHz
10 dB/ Offst 17.5	CF Step 40.0000000 MHz Auto <u>Man</u>
dB Center 5.825 000 0 GHz Span 37.5 MHz	Freq Offset 0.00000000 Hz
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts) Channel Power Power Spectral Density	Signal Track ^{On <u>Off</u>}
23.26 dBm / 25.0000 MHz -50.72 dBm/Hz	
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Page 107 of 255

CHAIN 1 OUTPUT POWER

OUTPUT POWER LOW CH, CHAIN 1	
🔆 Agilent 10:42:54 Feb 27, 2008 R T	Freq/Channel
Ch Freq 5.745 GHz Trig Free Channel Power	Center Freq 5.74500000 GHz
	Start Freq 5.72625000 GHz
Ref 30 dBm #Atten 30 dB #Peak Log	Stop Freq 5.76375000 GHz
0 B/ 0 ffst	CF Step 40.000000 MHz Auto <u>Man</u>
dB Center 5.745 000 0 GHz Span 37.5 MHz	Freq Offset 0.00000000 Hz
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts)	Signal Track
Channel Power Power Spectral Density	On <u>Off</u>
26.30 dBm / 25.0000 MHz -47.68 dBm/Hz	
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Page 108 of 255

OUTPUT POWER MID CH, CHAIN 1	
🔆 Agilent 10:44:46 Feb 27, 2008 R T	Freq/Channel
Ch Freq 5.785 GHz Trig Free Channel Power	Center Freq 5.78500000 GHz
	Start Freq 5.76625000 GHz
Ref 30 dBm #Atten 30 dB #Peak Log 10	Stop Freq 5.80375000 GHz
10 10 dB/ Offst 17.5	CF Step 40.000000 MHz Auto <u>Man</u>
dB Center 5.785 000 0 GHz Span 37.5 MHz	Freq Offset 0.00000000 Hz
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts) Channel Power Power Spectral Density	Signal Track ^{On <u>Off</u>}
25.36 dBm / 25.0000 MHz -48.62 dBm/Hz	
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Page 109 of 255

OUTPUT POWER HIGH CH, CHAIN 1	
🔆 Agilent 10:46:02 Feb 27, 2008 R T	Freq/Channel
Ch Freq 5.825 GHz Trig Free Channel Power	Center Freq 5.82500000 GHz
	Start Freq 5.80625000 GHz
Ref 30 dBm #Atten 30 dB #Peak	Stop Freq 5.84375000 GHz
10	CF Step 40.000000 MHz Auto <u>Man</u>
dB	Freq Offset 0.00000000 Hz
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts)	Signal Track
Channel Power Power Spectral Density	On <u>Off</u>
24.51 dBm / 25.0000 MHz -49.47 dBm/Hz	
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Page 110 of 255

7.5.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 17.5 dB (including 16 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Chain 0 Power	Chain 1 Power	Total Power
	(MHz)	(dBm)	(dBm)	(dBm)
Low	5745	18.15	19.51	21.89
Middle	5785	17.48	18.74	21.17
High	5825	16.41	17.79	20.16

Page 111 of 255

7.5.5. POWER SPECTRAL DENSITY

<u>LIMITS</u>

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

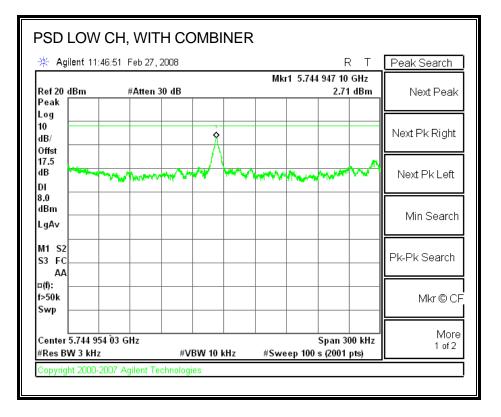
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS:

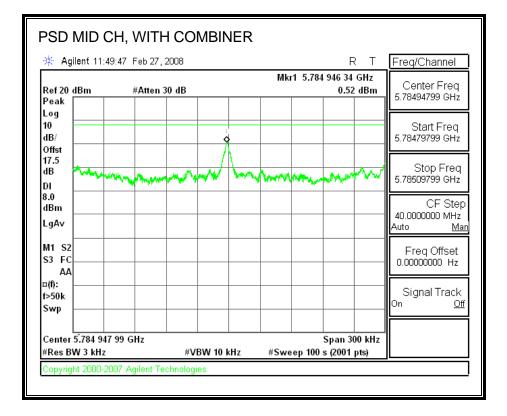
Channel	Frequency	PSD with Combiner	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5745	2.71	8	-5.29
Middle	5785	0.52	8	-7.48
High	5825	-1.90	8	-9.90

Page 112 of 255

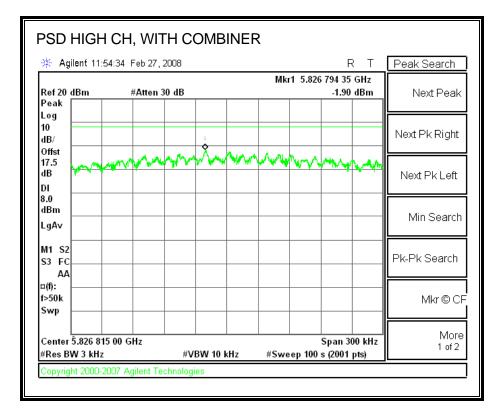
POWER SPECTRAL DENSITY, WITH COMBINER



Page 113 of 255



Page 114 of 255



Page 115 of 255

7.5.6. CONDUCTED SPURIOUS EMISSIONS

<u>LIMITS</u>

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

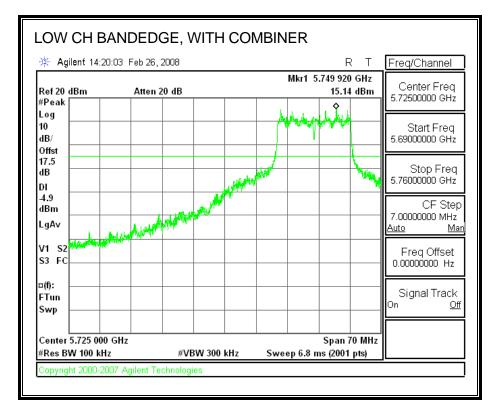
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

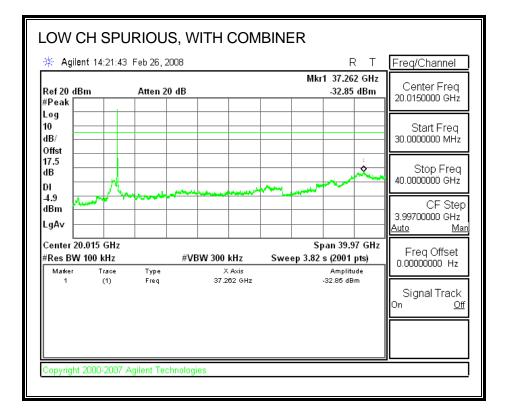
<u>RESULTS</u>

Page 116 of 255

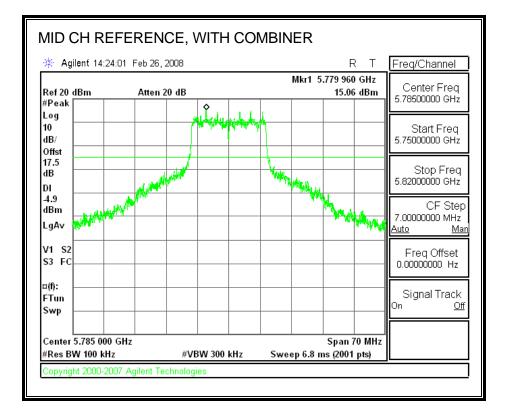
SPURIOUS EMISSIONS WITH COMBINER



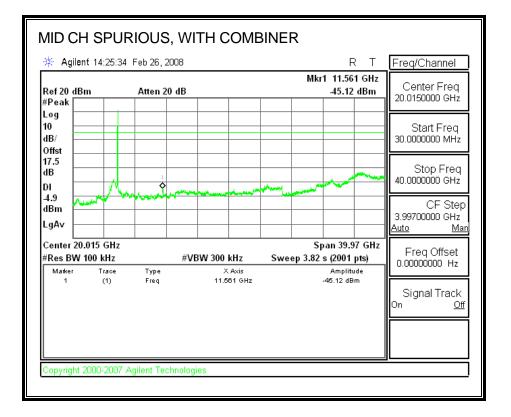
Page 117 of 255



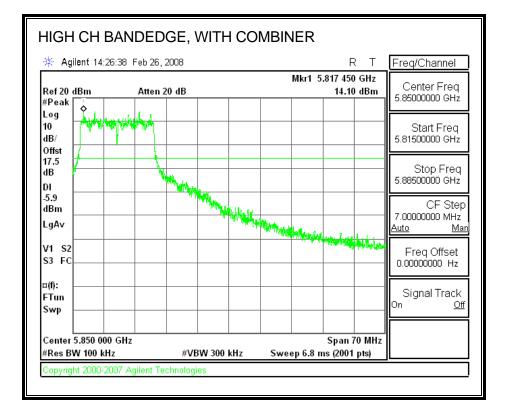
Page 118 of 255



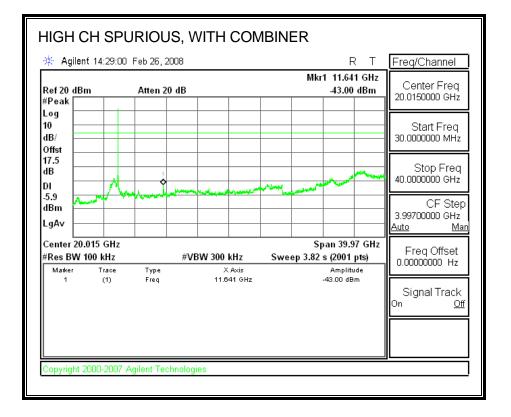
Page 119 of 255



Page 120 of 255



Page 121 of 255



Page 122 of 255

7.6. 802.11n HT20 MODE IN THE 5.8 GHz BAND

7.6.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency	Chain 1	Minimum Limit
	(MHz)	(MHz)	(MHz)
Middle	5785	17.59	0.5

Page 123 of 255

6 dB BANDWIDTH I	VID CH, CHA	AIN 1		
🔆 Agilent 11:41:24 Feb 27, 2	.008		RΤ	Freq/Channel
Ch Freq 5.795 Occupied Bandwidth	GHz		Trig Free	Center Freq 5.79500000 GHz
				Start Freq 5.77000000 GHz
Ref 20 dBm #Atten 3 #Peak Log	0 dB			Stop Freq 5.82000000 GHz
10 dB/ offst 17.5				CF Step 40.000000 MHz Auto <u>Man</u>
dB			Span 50 MHz	Freq Offset 0.00000000 Hz
#Res BW 100 kHz Occupied Bandwid 29.073	#VBW 300 kHz Ith 30 MHz	Sweep 20 ms Occ BW % Pwr x dB	· · /	Signal Track On <u>Off</u>
	504.511 kHz 7.590 MHz			
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Page 124 of 255

7.6.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	Chain 1 (MHz)
Middle	5785	21.2854

99% BANDWIDTH MID	CH, CHAIN 1	RТ	Freq/Channel
Ch Freq 5.785 GHz Occupied Bandwidth	Averages: 100	Trig Free	Center Freq 5.78500000 GHz
			Start Freq 5.76000000 GHz
Ref 20 dBm #Atten 30 dB #Samp Log 10			Stop Freq 5.81000000 GHz
dB/ offst 17.5			CF Step 40.000000 MHz Auto <u>Man</u>
dB	/DW 1 MHz Sween 20	Span 50 MHz	Freq Offset 0.00000000 Hz
#Res BW 300 kHz #VBW 1 MHz Sweep 20 ms (601 pts) Signal Track Occupied Bandwidth Occ BW % Pwr 99.00 % On Off 21.2854 MHz × dB -6.00 dB On Off			
Transmit Freq Error -459.394 x dB Bandwidth 17.399 N			
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Page 125 of 255

7.6.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

Channel	Frequency	Limit	Chain 0	Chain 1	Total	Margin
			Power	Power	Power	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5745	30.00	24.85	24.92	27.90	-2.10
Mid	5785	30.00	24.16	24.45	27.32	-2.68
High	5825	30.00	23.27	24.26	26.80	-3.20

Page 126 of 255

CHAIN 0 OUTPUT POWER

OUTPUT POWER LOW CH, CHAIN 0	
₩ Agilent 10:51:55 Feb 27, 2008 R T [BW/Avg
Ch Freq 5.745 GHz Trig Free Channel Power	Res BW 1.0 MHz Auto <u>Man</u>
	Video BVV 3.0 MHz Auto <u>Man</u>
10 dB/ Offst 17.5 dB	VBW/RBW 1.00000 Auto Man Average 10 On Off Avg/VBW Type Log-Pwr (Video) * Auto Man
Channel Power Power Spectral Density	
24.85 dBm / 25.0000 MHz -49.13 dBm/Hz	Span/RBW 106 Auto <u>Man</u>
Copyright 2000-2007 Agilent Technologies	

Page 127 of 255

OUTPUT POWER MID CH, CHAIN 0	
⅔ Agilent 10:49:37 Feb 27, 2008	BW/Avg
Ch Freq 5.785 GHz Trig Free Channel Power	Res BW 1.0 MHz Auto <u>Man</u>
	Video BW 3.0 MHz Auto <u>Man</u>
Ref 30 dBm #Atten 30 dB #Peak	VBW/RBW 1.00000 Auto <u>Man</u>
dB/ d/	Average 10 On <u>Off</u>
Center 5.785 000 0 GHz Span 37.5 MHz	Avg/VBW Type Log-Pwr (Video) ► <u>Auto Man</u>
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts)	
Channel Power Power Spectral Density	
24.16 dBm / 25.0000 MHz -49.82 dBm/Hz	Span/RBW 106 Auto Man
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Page 128 of 255

OUTPUT POWER HIGH CH, CHAIN 0			
⅔ Agilent 10:49:02 Feb 27, 2008 Ch Freq 5.825 GHz	R T Freq/Channel		
Channel Power	Start Freq 5.80525000 GHz		
Ref 30 dBm #Atten 30 dB #Peak	Stop Freq 5.84375000 GHz		
Log 10 dB/ wt/tw/fw/fw/fw/fw/fw/fw/fw/fw/fw/fw/fw/fw/fw	CF Step 40.0000000 MHz		
17.5 dB	Auto Man Freq Offset		
Center 5.825 000 0 GHz #Res BW 1 MHz #VBW 3 MHz Swee	span 37.5 MHz ep 20 ms (601 pts)		
Channel Power Power Spectral Density Signal Track 23.27 dBm / 25.0000 MHz -50.71 dBm/Hz Signal Track			
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Page 129 of 255

CHAIN 1 OUTPUT POWER

OUTPUT POWER LOW CH, CHAIN 1	
* Agilent 10:51:40 Feb 27, 2008 R T	BW/Avg
Ch Freq 5.745 GHz Trig Free Channel Power	Res BW 1.0 MHz Auto <u>Man</u>
VBW 3.0 MHz	Video BW 3.0 MHz Auto <u>Man</u>
Ref 30 dBm #Atten 30 dB #Peak Log 10	VBW/RBW 1.00000 Auto <u>Man</u>
Log	Average 10 On <u>Off</u>
dB Span 37.5 MHz Center 5.745 000 0 GHz Span 37.5 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts)	Avg/VBW Type Log-Pwr (Video) • <u>Auto Man</u>
Channel Power Power Spectral Density	
24.92 dBm / 25.0000 MHz -49.06 dBm/Hz	Span/RBW 106 Auto <u>Man</u>
Copyright 2000-2007 Agilent Technologies	

Page 130 of 255

OUTPUT POWER MID CH, * Agilent 10:49:54 Feb 27, 2008	, CHAIN 1	RT	BV	W/Avg
Ch Freq 5.785 GHz Channel Power		Trig Free	Auto	Res BW 1.0 MHz <u>Man</u>
			Auto	Video BW 3.0 MHz <u>Man</u>
Ref 30 dBm #Atten 30 dB #Peak Log 10 dB/	lana mila attanti	and the second s	Auto	VBW/RBV 1.00000 <u>Man</u> Average
Offst				10 <u>Off</u> BW Type /r (Video) ♪
Center 5.785 000 0 GHz #Res BW 1 MHz #VBW	3 MHz Sw	Span 37.5 MHz /eep 20 ms (601 pts)	Auto	Man
Channel Power	Power S	Spectral Density		
24.45 dBm / 25.0000 MH	lz -49	9.53 dBm/Hz	S Auto)pan/RBW 106 <u>Man</u>
Copyright 2000-2007 Agilent Technologies			-	

Page 131 of 255

OUTPUT POWER HIGH CH, CHAIN 1				
🔆 Agilent 10:48:48 Feb 27, 2008 R T	Freq/Channel			
Ch Freq 5.825 GHz Trig Free Channel Power	Center Freq 5.82500000 GHz			
	Start Freq 5.80625000 GHz			
Ref 30 dBm #Atten 30 dB #Peak	Stop Freq 5.84375000 GHz			
dB/	CF Step 40.0000000 MHz Auto <u>Man</u>			
dB Center 5.825 000 0 GHz Span 37.5 MHz	Freq Offset 0.00000000 Hz			
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts)				
Channel Power Power Spectral Density	Signal Track On <u>Off</u>			
24.26 dBm / 25.0000 MHz -49.72 dBm/Hz				
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Page 132 of 255

7.6.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 17.5 dB (including 16 dB pad and 1.5 dB cable) entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Chain 0 Power	Chain 1 Power	Total Power
	(MHz)	(dBm)	(dBm)	(dBm)
Low	5745	18.40	18.29	21.36
Middle	5785	17.82	17.85	20.85
High	5825	16.60	17.98	20.35

Page 133 of 255

7.6.5. POWER SPECTRAL DENSITY

<u>LIMITS</u>

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

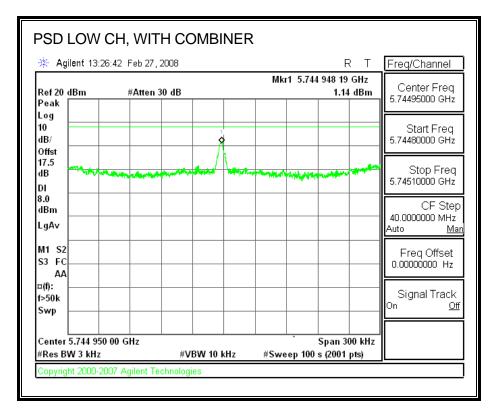
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS:

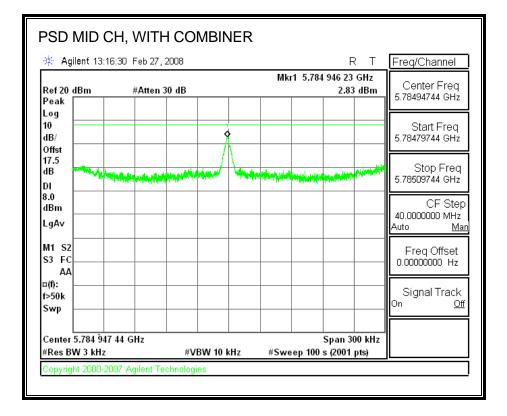
Channel	Frequency	PSD with Combiner	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5745	1.14	8	-6.86
Middle	5785	2.83	8	-5.17
High	5825	3.24	8	-4.76

Page 134 of 255

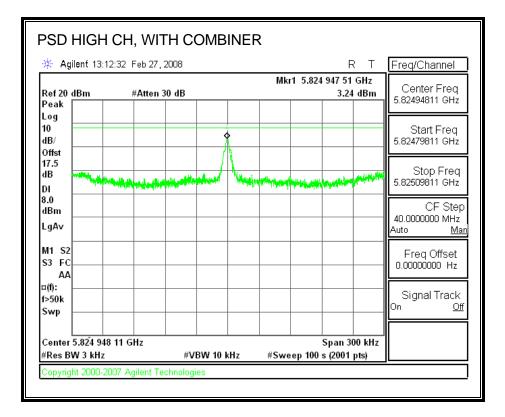
POWER SPECTRAL DENSITY, WITH COMBINER



Page 135 of 255



Page 136 of 255



Page 137 of 255

7.6.6. CONDUCTED SPURIOUS EMISSIONS

<u>LIMITS</u>

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

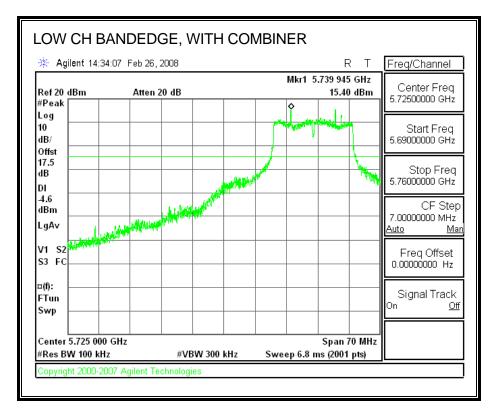
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

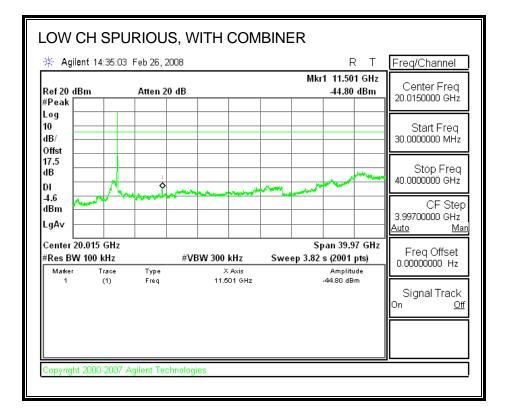
<u>RESULTS</u>

Page 138 of 255

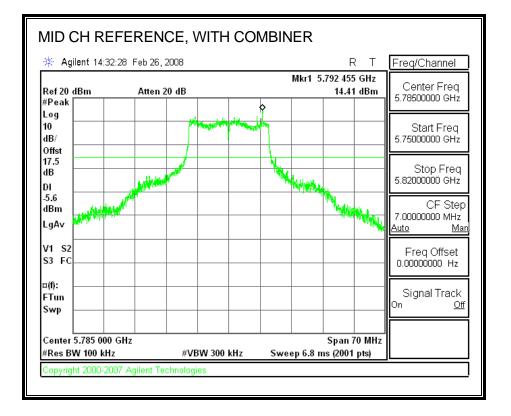
SPURIOUS EMISSIONS WITH COMBINER



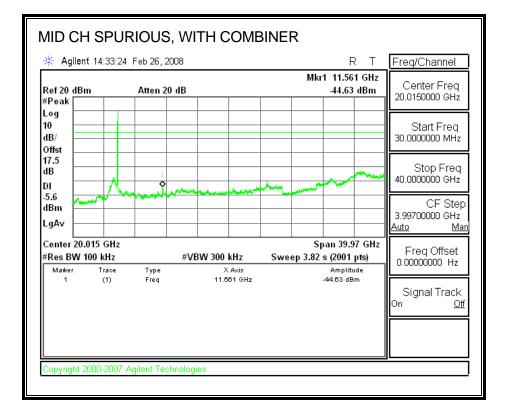
Page 139 of 255



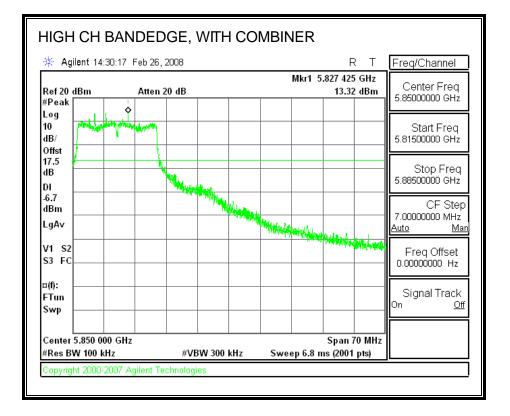
Page 140 of 255



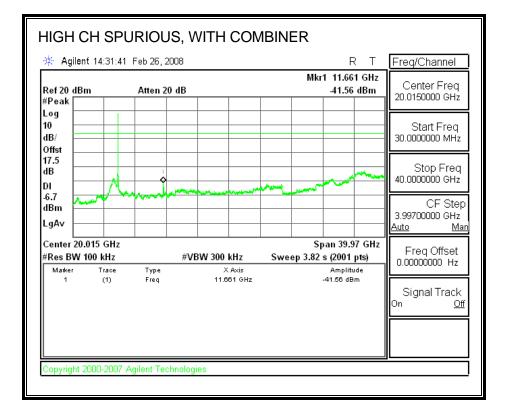
Page 141 of 255



Page 142 of 255



Page 143 of 255



Page 144 of 255

7.7. 802.11n HT40 MODE IN THE 5.8 GHz BAND

7.7.1.6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency	Chain 1	Minimum Limit
	(MHz)	(MHz)	(MHz)
Middle	5795	35.765	0.5

6 dB BANDWIDTH	MID CH, CH	AIN 1		
🔆 Agilent 11:40:10 Feb 27	, 2008		RΤ	Freq/Channel
Ch Freq 5.7 Occupied Bandwidth	95 GHz		Trig Free	Center Freq 5.79500000 GHz
	E			Start Freq 5.74500000 GHz
Ref 20 dBm #Atten #Peak Log 10				Stop Freq 5.84500000 GHz
dB/ Offst				CF Step 40.000000 MHz Auto <u>Man</u>
dB			pan 100 MHz	Freq Offset 0.00000000 Hz
#Res BW 100 kHz Occupied Bandwi 58 85	#VBW 300 kHz dth 584 MHz	Sweep 33.87 ms Occ BW % Pwr x dB	99.00 %	Signal Track ^{On <u>Off</u>}
	-1.623 MHz 35.765 MHz			
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Page 146 of 255

7.7.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency	Chain 1
		99% Bandwidth
	(MHz)	(MHz)
Middle	5795	48.6661

99% BANDWIDTH MID C	H, CHAIN 1	R T	Erog(Channel
Ch Freq 5.795 GHz		Trig Free	Freq/Channel Center Freq 5.79500000 GHz
Occupied Bandwidth	Averages: 100		Start Freq 5.74500000 GHz
dB/ offst 17.5 dB		WINTER INTERNET	Stop Freq 5.84500000 GHz CF Step 40.0000000 MHz Auto Man Freq Offset 0.0000000 Hz
Center 5.795 00 GHz #Res BW 1 MHz #VBV	W3MHz Swee	Span 100 MHz p 20 ms (601 pts)	
Occupied Bandwidth 48.6661 MH	Occ BW % F	Pwr 99.00 % (dB -6.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error-1.477 MHzx dB Bandwidth35.881 MHz	_		
Copyright 2000-2007 Agilent Technologies			

Page 147 of 255

7.7.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

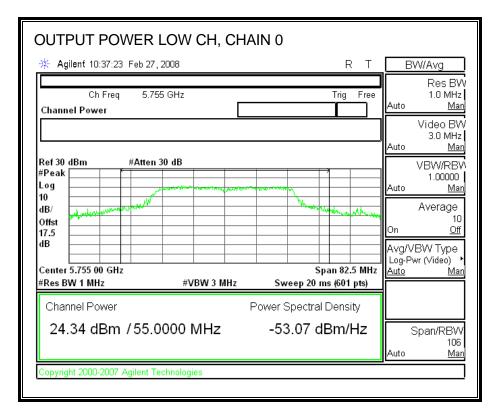
Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

Channel	Frequency	Limit	Chain 0	Chain 1	Total	Margin
			Power	Power	Power	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5755	30.00	24.34	25.81	28.15	-1.85
High	5795	30.00	23.16	24.82	27.08	-2.92

Page 148 of 255

CHAIN 0 OUTPUT POWER



Page 149 of 255

OUTPUT POWER HIGH CH, CHAIN 0	
🔆 Agilent 10:38:21 Feb 27, 2008 R T	Freq/Channel
Ch Freq 5.795 GHz Trig Free Channel Power	Center Freq 5.79500000 GHz
	Start Freq 5.75375000 GHz
Ref 30 dBm #Atten 30 dB #Peak	Stop Freq 5.83625000 GHz
dB/ Offst 17.5	CF Step 40.0000000 MHz Auto <u>Man</u>
dB Center 5.795 00 GHz Span 82.5 MHz	Freq Offset 0.00000000 Hz
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts) Channel Power Power Spectral Density	Signal Track ^{On <u>Off</u>}
23.16 dBm / 55.0000 MHz -54.25 dBm/Hz	
Copyright 2000-2007 Agilent Technologies	

Page 150 of 255

CHAIN 1 OUTPUT POWER

OUTPUT POWER LOW CH, CHAIN 1			
🔆 Agilent 10:36:46 Feb 27, 2008 R	Т	BV	V/Avg
Ch Freq 5.755 GHz Trig	Free	Auto	Res BW 1.0 MHz <u>Man</u>
VBW 3.0 MHz		Auto	Video BW 3.0 MHz <u>Man</u>
Ref 30 dBm #Atten 30 dB #Peak		Auto	VBW/RBV 1.00000 <u>Man</u>
10 dB/ Offst 17.5	A Aughry yk y	On	Average 10 <u>Off</u>
dB Center 5.755 00 GHz Span 82.			BW Type r (Video) ► <u>Man</u>
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 Channel Power Power Spectral Densi	. /		
25.81 dBm / 55.0000 MHz -51.60 dBm/l	Hz	S Auto	pan/RBW 106 <u>Man</u>
Copyright 2000-2007 Agilent Technologies			

Page 151 of 255

OUTPUT POWER HIGH CH, CHAIN 1	
🔆 Agilent 10:38:43 Feb 27, 2008 R T	Freq/Channel
Ch Freq 5.795 GHz Trig Free Channel Power	Center Freq 5.79500000 GHz
	Start Freq 5.75375000 GHz
Ref 30 dBm #Atten 30 dB #Peak	Stop Freq 5.83625000 GHz
dB/ ///////////////////////////////////	CF Step 40.0000000 MHz Auto <u>Man</u>
dB Center 5.795 00 GHz Span 82.5 MHz	Freq Offset 0.00000000 Hz
#Res BW 1 MHz #VBW 3 MHz Sweep 20 ms (601 pts) Channel Power Power Spectral Density	Signal Track ^{On <u>Off</u>}
24.82 dBm / 55.0000 MHz -52.58 dBm/Hz	
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Page 152 of 255

7.7.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 17.5 dB (including 16 dB pad and 1.5 dB cable) entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5755	17.80	19.34	21.65
High	5795	16.97	18.31	20.70

Page 153 of 255

7.7.5. POWER SPECTRAL DENSITY

<u>LIMITS</u>

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

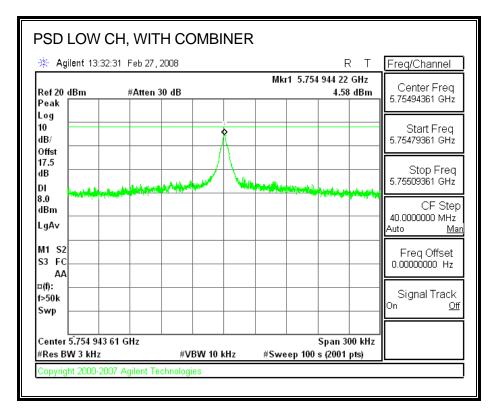
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS:

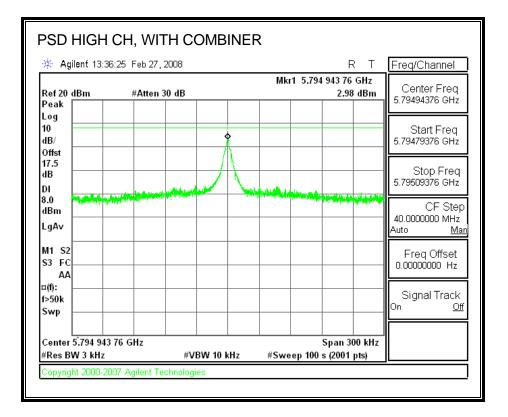
Channel	Frequency (MHz)	PSD with Combiner (dBm)	Limit (dBm)	Margin (dB)
Low	5755	4.58	8	-3.42
High	5795	2.98	8	-5.02

Page 154 of 255

POWER SPECTRAL DENSITY, WITH COMBINER



Page 155 of 255



Page 156 of 255

7.7.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

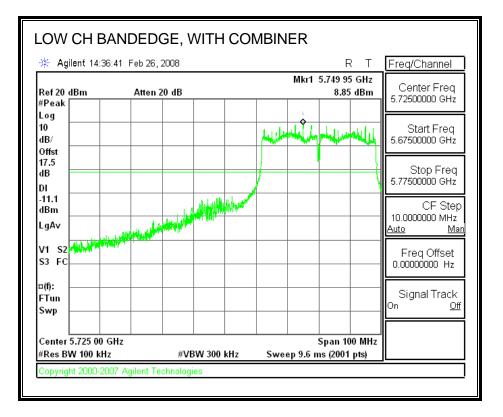
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest and highest channels.

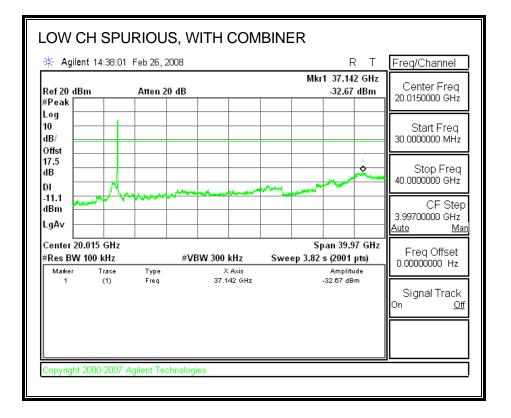
RESULTS

Page 157 of 255

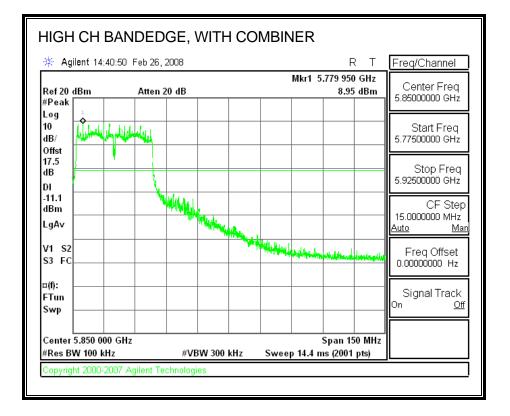
SPURIOUS EMISSIONS WITH COMBINER



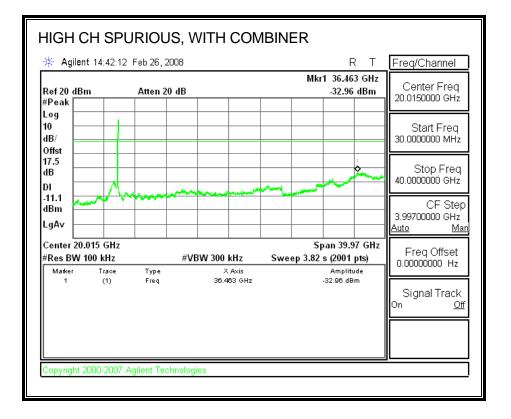
Page 158 of 255



Page 159 of 255



Page 160 of 255



Page 161 of 255

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

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

TEST PROCEDURE

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

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

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

Page 162 of 255

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz 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.

Page 163 of 255

8.2. TRANSMITTER ABOVE 1 GHz

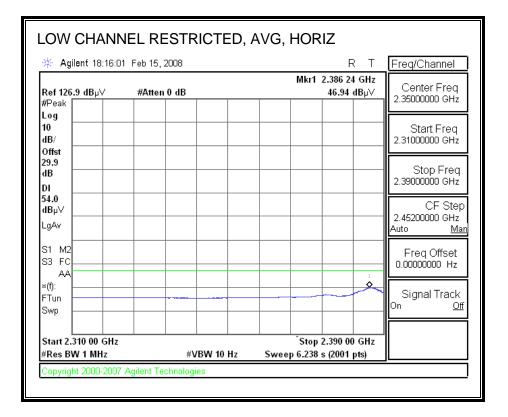
8.2.1. TRANSMITTER ABOVE 1 GHz FOR 802.11b MODE IN THE 2.4 GHz BAND

FEM #1

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

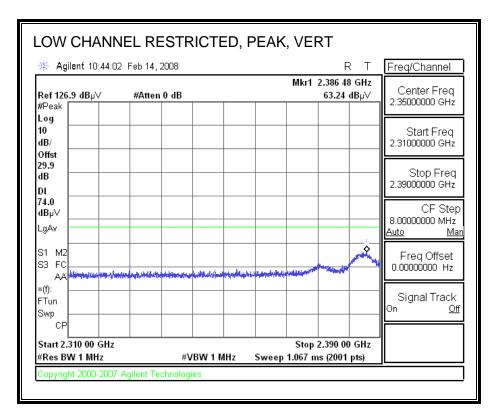
	Feb 15, 2008			RT	Freq/Channel
126.9 dBµ∨	#Atten 0 dB		Mkr1	2.388 84 GHz 58.43 dBµ∨	Center Fred
ak					2.03000000 011
					Start Fred 2.31000000 GH
					- Stop Fre 2.39000000 GH
/					CF Ste 2.45200000 GH
M2					Freq Offset
AA Waterhout Willifetersto					┣────
ı					Signal Trac
AA www.white	andal-dela-table scale maintable	nering termadika seri sering distance seri	and a state of the		Signal 1

Page 164 of 255

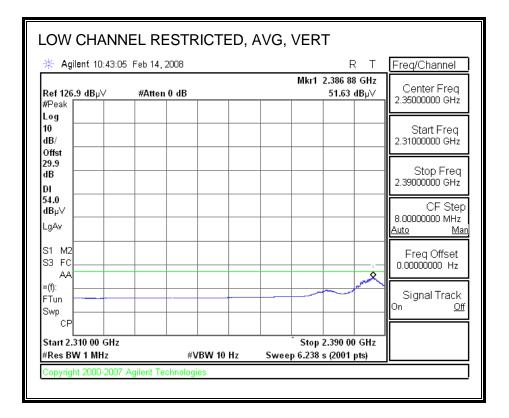


Page 165 of 255

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

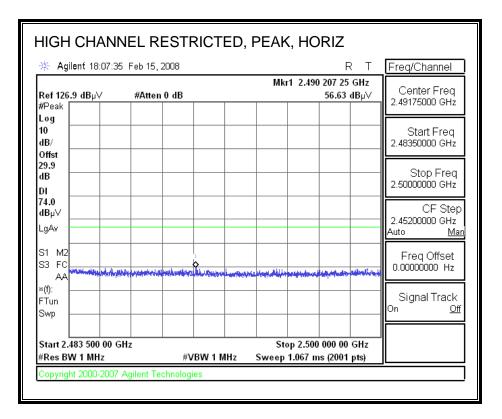


Page 166 of 255

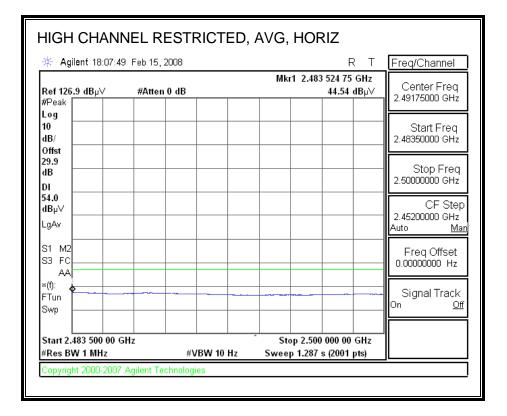


Page 167 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

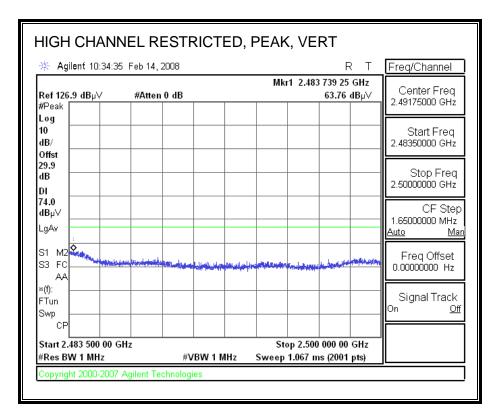


Page 168 of 255

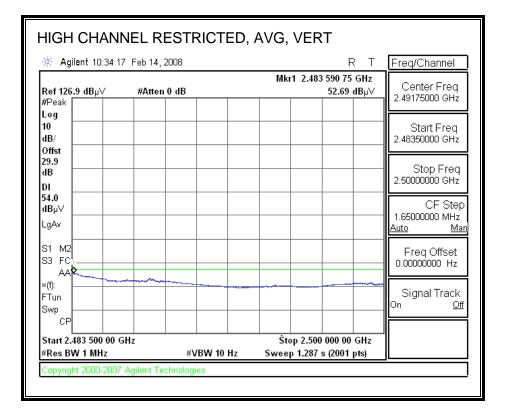


Page 169 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



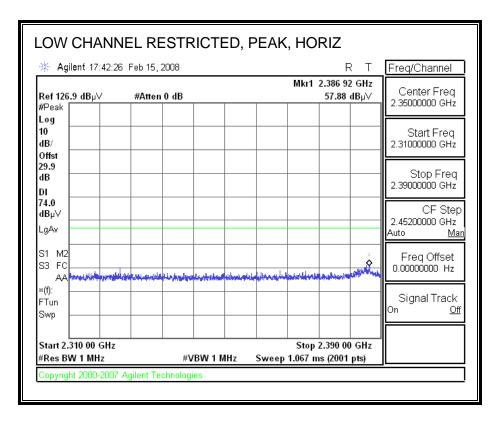
Page 170 of 255



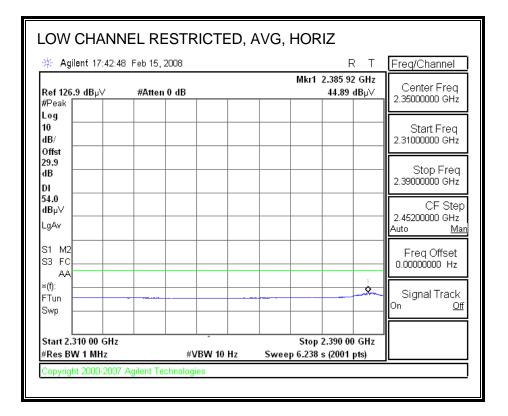
Page 171 of 255

FEM #2

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

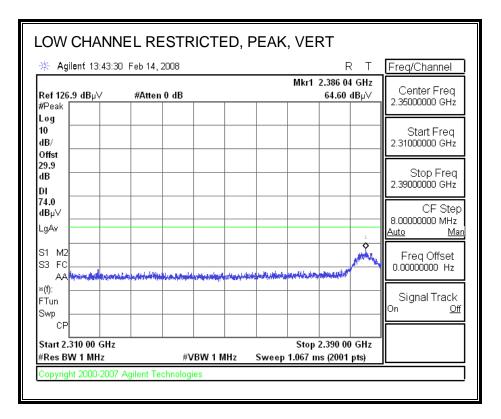


Page 172 of 255

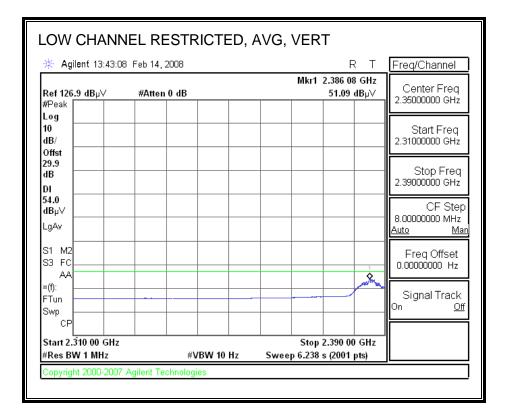


Page 173 of 255

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

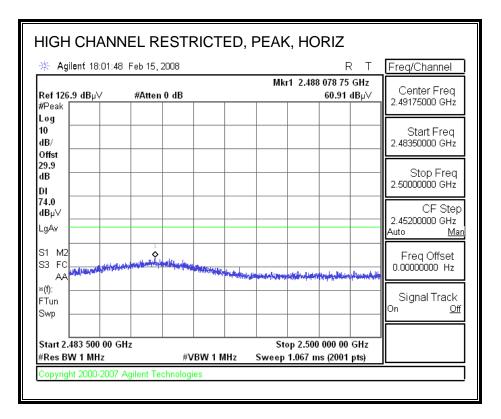


Page 174 of 255

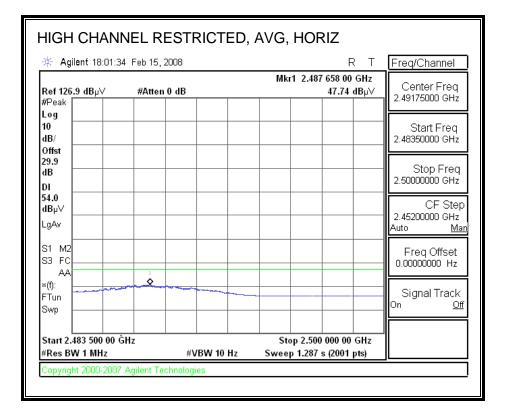


Page 175 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

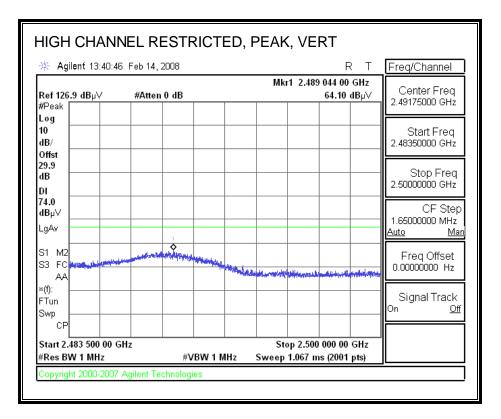


Page 176 of 255

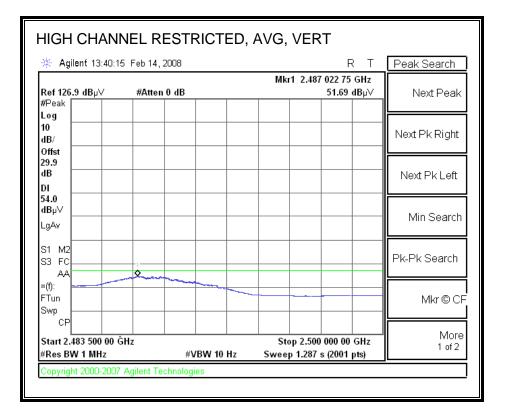


Page 177 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



Page 178 of 255



Page 179 of 255

HARMONICS AND SPURIOUS EMISSIONS

a	~		y Measurem		5 C1											
omplia	ance Ce	ertification	Services, Fr	emont	5m Ch	amber										
	ıy: Athe															
	#: 08U 22/200															
est En	gineer:	Devin Cha														
		B mode Tx 40-\$0660 (
			/													
'est Eq	uipmen	<u>.t:</u>														
н	orn 1-	18GHz	Pre-ar	Pre-amplifer 1-26GHz				Pre-amplifer 26-40GHz				Horn > 18GHz			Limit	
T73; S	S/N: 671	7 @3m	- T34 HF	T34 HP 8449B 🗸				-						-	FCC 15.205 🗸	
Hi Freq	quency Ca	bles														
	2 foot		3	3 foot cable				foot c	able		HPF Reject Filter				eak Measurements	
▼ v			-					A-5m Chamber							RBW=VBW=1MHz	
			•	•				A-5m Chamber				▼ R_001 ▼			Average Measurements RBW=1MHz ; VBW=10Hz	
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes	
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m		1	dBuV/m	dB	dB	(V/H)	
	nd (241				_			_								
824 326	3.0 3.0	48.9 43.0	34.1 31.2	33.3 35.0	6.9 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	54.2 52.3	39.5 40.5	74 74	54 54	-19.8 -21.7	-14.5 -13.5	v	
.824	3.0	45.9	32.0	33 <i>.</i> 3	6.9	-34.8	0.0	0.0	51.2	37.3	74	54	-22.8	-16.7	Н	
326	3.0	40.8	29.2	35.0	8.4	-34.1	0.0	0.0	50.2	38 <i>.</i> 5	74	54	-23.8	-15.5	Н	
Mid baı	nd (243	7MHz)														
874	3.0	50.0	35.8	33.4	6.9	-34.8	0.0	0.0	55.5	41.3	74	54	-18.5	-12.7	<u>v</u>	
311 874	3.0 3.0	44.4 46.6	33.0 32.8	35.0 33.4	8.4 6.9	-34.1 -34.8	0.0 0.0	0.0 0.0	53.7 52.1	42.3 38.3	74 74	54 54	-20.3 -21.9	-11.7 -15.7	 Н	
311	3.0	46.7	37.0	35.0	8.4	-34.1	0.0	0.0	56.D	46.3	74	54 54	-18.0	-7.7	H	
tigh ba	nd (246	2MHz)														
924	3.0	52.5	38.3	33.4	7.0	-34.8	0.0	0.0	58.1	43.9	74	54	-159	-10.1	v	
.386 .924	3.0 3.0	47.5 49.4	35.2 35.3	35.0 33.4	8.4 7.0	-34.1 -34.8	0.0 0.0	0.0 0.0	56.9 54.9	44.6 40.9	74 74	54 54	-17.1 -19.1	-9.4 -13.1	v	
924 386	3.0	49.4 45.8	35.3 34.8	33.4 35.0	7.0 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	54.9 55.2	40.9 44.1	74 74	54 54	-19.1 -18.8	-13.1 -9.9	v	
				L	L			L								
ev. 4.12.	7															
	f	Measurem	ent Frequency	9		Amp	Preamp (Gain				Avg Lim	Average F	ield Strengtl	h Limit	
	Dist	Distance to							ct to 3 mete					l Strength Li		
		Analyzer R				Avg	-		Strength @			-	-	Average Li		
	AF	Antenna F	actor			Peak	Calculate	d Peal	k Field Stre	noth		Pk Mar	Margin vs.	Peak Limit		

Page 180 of 255

HARMONICS AND SPURIOUS EMISSIONS

Compli	~	Frequency rtification (5m ('h	amher									
ompu	ance ce	runcation	Jerv.	ices, ri	emont .	Sin Ch	annoer									
-	ny: Athe															
	:#: 08U) /14/2008															
	0	Devin Cha	~													
		B mode Tx 40-80580 (1		do)												
moue.	AD92-0-	0-00-00 (1	, mo	ue)												
Fest E	quipmen	<u>t:</u>														
F	lorn 1-	18GHz		Pre-an	nplifer	1-260	GHZ	Pre-am	plifer	26-40GH	z	н	orn > 18(GHz		Limit
					9 8449B						-					FCC 15.205
173;	S/N: 6717	@3m	•	134 HP	° 8449D		•				-				•	FCC 13.203
Hi Fre	quency Cal	oles					1									
	2 foot	cable		3	foot c	able		12	footo	able		HPF	Re	ject Filte		k Measurements
			_				_	A-5m C	hamb	er				, 001	RB	W=VBW=1MHz ge Measurements
			•				•	Asing	.num/	• <u> </u>			<u> </u>	001		1MHz; VBW=10Hz
f	Dist	Read Pk	Res	ad Ava	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg I im	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV		BuV	dB/m	dB	dB	dB	dB		dBuV/m	1	· · ·	dB	dB	(V/H)
Low ba	nd (2412	2MHz)			<u> </u>											<u>````</u>
4.824	3.0	44.1		30.2	33.3	6.9	-34.8	0.0	0.0	49.4	35.5	74	54	-24.6	-18.5	<u>v</u>
7.326 4.824	3.0 3.0	41.6 42.9		28.8 28.6	35.0 33.3	8.4 6.9	-34.1 -34.8	0.0 0.0	0.0 0.0	50.9 48.2	38.1 33.9	74 74	54 54	-23.1 -25.8	-15.9 -20.1	 Н
326	3.0	38.9		26.0	35.0	8.4	-34.1	0.0	0.0	48.2	35.3	74	54	-25.8	-18.7	Н
Mid ba	nd (2431	7MHz)														
1.874	3.0	47.1		32.4	33.4	69	-34.8	0.0	0.0	52.6	37.9	74	54	-21.4	- 16.1	v
311	3.0	46.7		35.5	35.0	8.4	-34.1	0.0	0.0	56.0	44.8	74	54	-18.0	-9.2	V
4.874 7.311	3.0 3.0	43.7 44.5		29.9 33.5	33.4 35.0	6.9 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	49.2 53.8	35.3 42.8	74 74	54 54	-24.8 -20.2	-18.7 -11.2	H H
		•			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		- ***									**
	and (246	·														
924	3.0 3.0	45.4 46.1		31.4 36.1	33.4 35.0	7.0 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	50.9 55.5	36.9 45.4	74 74	54 54	-23.1 -18.5	-17.1 -8.6	v
386	3.0	42.1		27.1	33.4	7.0	-34.8	0.0	0.0	47.6	32.6	74	54	-26.4	-21.4	H
	3.0	44.1		33.1	35.0	8.4	-34.1	0.0	0.0	53.5	42.4	74	54	-20.5	- 11.6	H
7.386 4.924 7.386																
1.924			L												Å	
1924 7386																
1.924	1.7															
1924 7386	1.7															
1.924 7.386	f	Measureme			7		Amp	Preamp (-	-	Field Strengt	
924 386	f Dist	Distance to	Ante	enna	7		D Corr	Distance	Corre	ct to 3 mete			Pk Lim	Peak Field	d Strength L	imit
1.924 7.386	f Dist		Ante eadir	enna 1g	7		*	Distance Average	Corre Field :	ct to 3 mete Strength @ k Field Stre	3 m		Pk Lim Avg Mar	Peak Field Margin vs	-	imit imit

Page 181 of 255

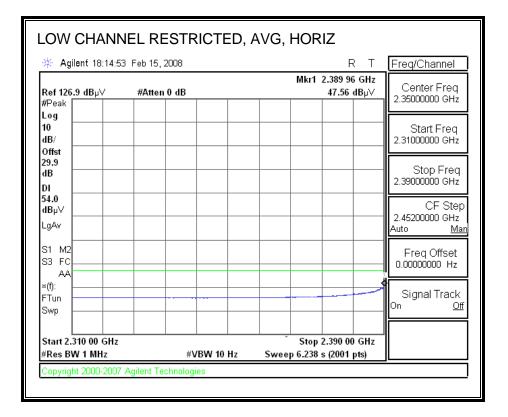
8.2.2. TRANSMITTER ABOVE 1 GHz FOR 802.11g MODE IN THE 2.4 GHz BAND

FEM #1

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

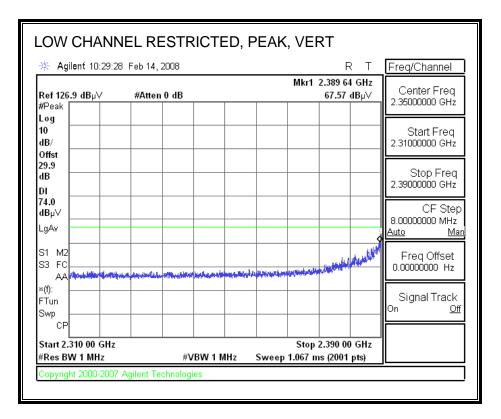
🌾 Agilent 18:14:2	8 Feb 15, 2008				RT	Freq/Channel
Ref 126.9 dBµ∨	#Atten 0 dB			0 GHz dBµ∨	Center Freq 2.3500000 GHz	
¥Peak _oq						2.0000000 0112
IO IB/						Start Freq 2.31000000 GHz
19.9 IB						Stop Freq 2.3900000 GHz
21						
lBµ∨						CF Step 2.4520000 GHz
_gAv					1	Auto <u>Ma</u>
S1 M2						Freq Offset 0.00000000 Hz
	e ^h an la Manala in 1970 and 1970 and 1	a plane with the	perturbations and bar.	da frank the local date	A Martine Contraction	
(f): Tun Swp						Signal Track On <u>Off</u>
5mb						L
Start 2.310 00 GHz		I I		Stop 2.390 0	0 GHz	
∉Res BW 1 MHz	#\	/BW 1 MHz	Sweep 1.0)67 ms (2001	lpts)	

Page 182 of 255

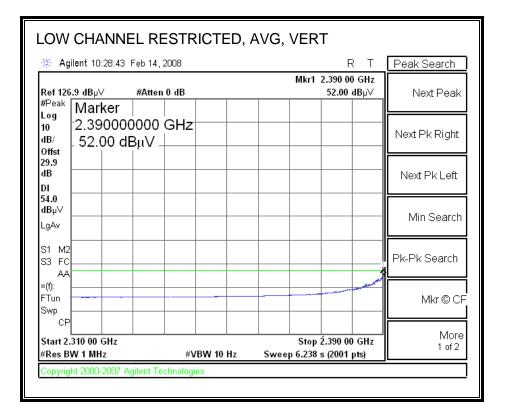


Page 183 of 255

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

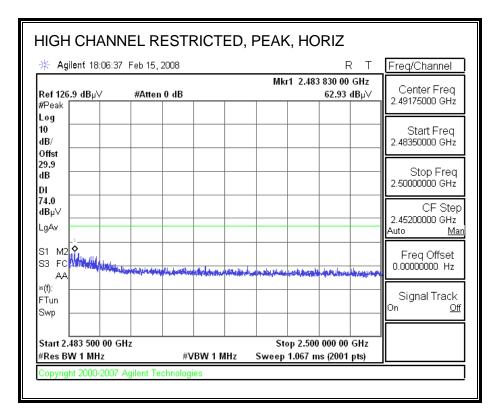


Page 184 of 255

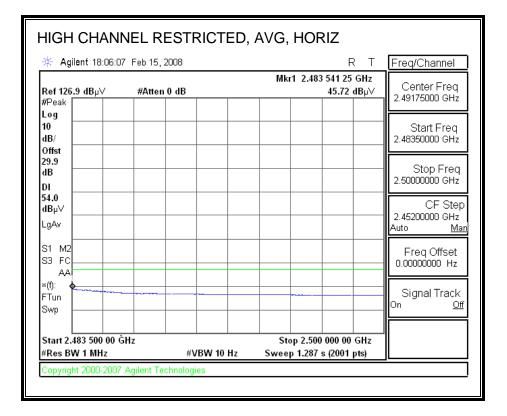


Page 185 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

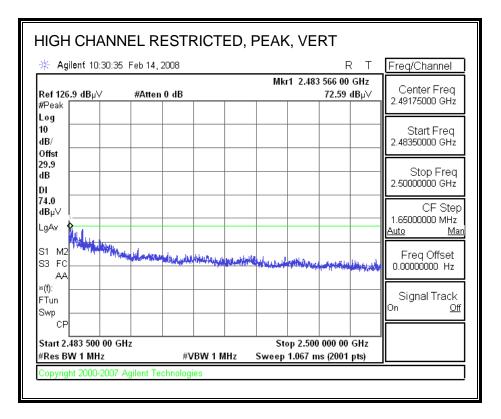


Page 186 of 255

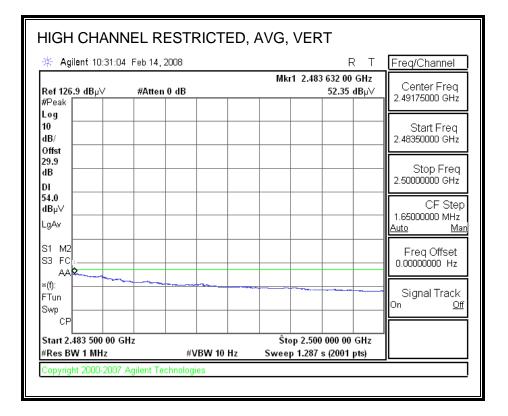


Page 187 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



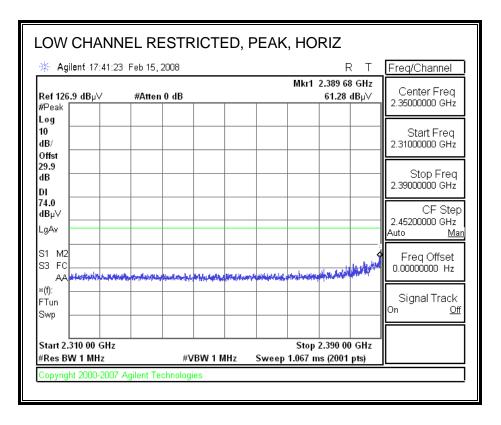
Page 188 of 255



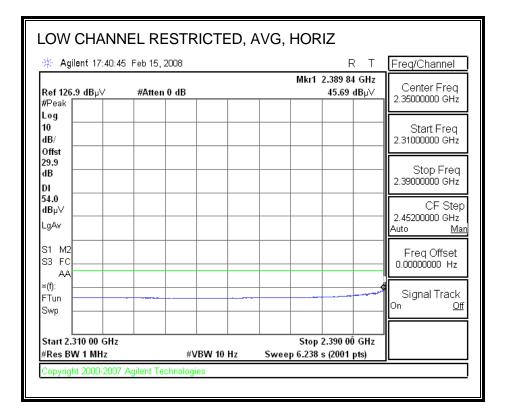
Page 189 of 255

FEM #2

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

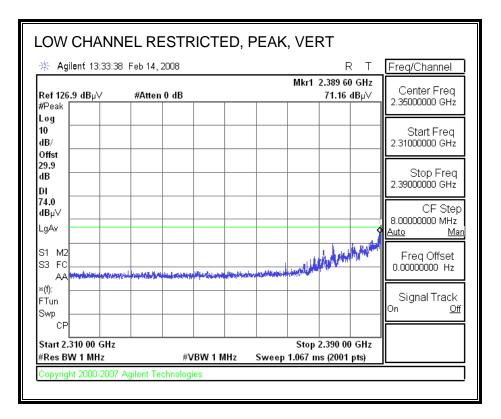


Page 190 of 255

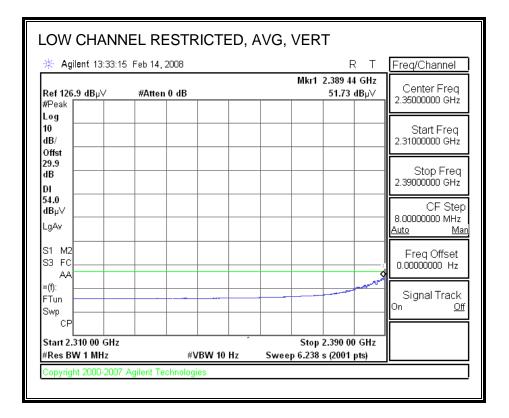


Page 191 of 255

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

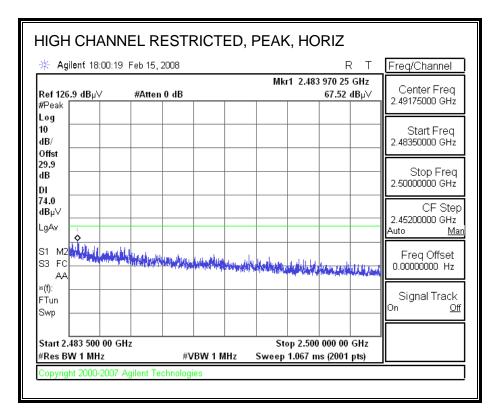


Page 192 of 255

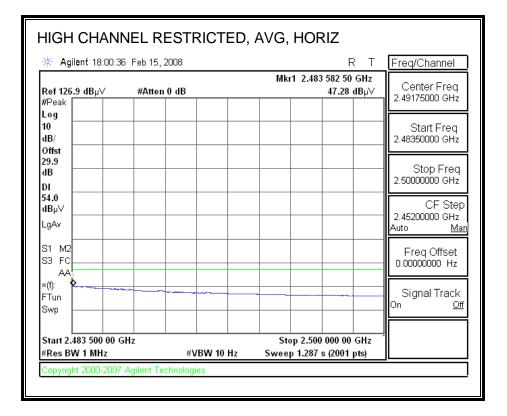


Page 193 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

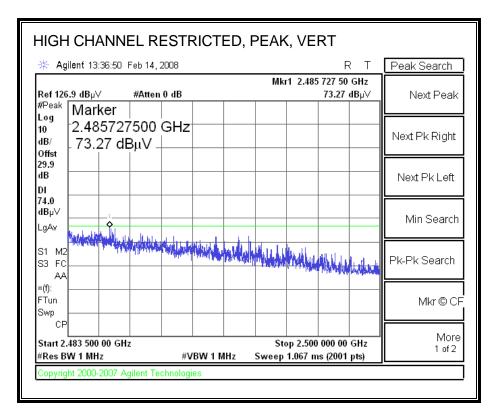


Page 194 of 255

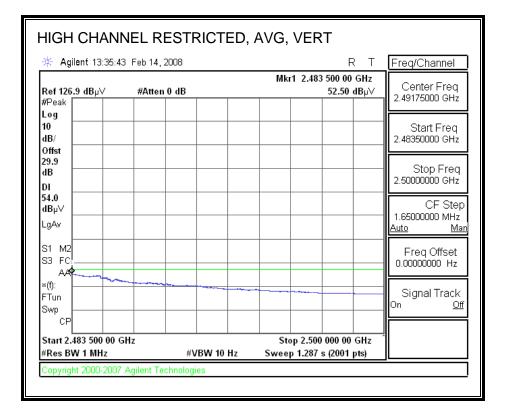


Page 195 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



Page 196 of 255



Page 197 of 255

HARMONICS AND SPURIOUS EMISSIONS

'əmnli:	~	n Frequency ertification \$			5m Ch	omher									
-			Services, r	remone .	om on	amper									
	ny: Athe #: 08U														
	/14/200														
		: Devin Cha													
		В mode Tx 140-\$0660 (g													
	quipmen		; hioue,												
н	lorn 1-	-18GHz	Pre-a	amplifer	: 1-26(GHz	Pre-am	plifer	26-40GH	Iz	Н	orn > 18	3GHz		Limit
T73; \$	S/N: 671	7 @3m	▼ T34 F	IP 8449B		-				-				-	FCC 15.209 🗸
- Hi Fred	quency Ca	ables													
		cable		3 foot c	able		12	foot c	able		HPF			Peal	k Measurements
	2 1001	capie		310000	able		12	10010	able		HPF	K	eject Filte		W=VBW=1MHz
		,	•			•	A-5m C	∶hamb€	er 🗸			F	R_001		ige <u>Measurements</u> =1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg	. AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lin	n Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m		dB	dB	dB	dBuV/m					dB	(V/H)
	nd (241			ļ				<u> </u>							
824 236	3.0	42.9	30.1 27.5	33.3	6.9	-34.8	0.0 0.0	0.0 0.0	48.2	35.4	74 74	54 54	-25.8 -22.9	-18.6	v v
236 824	3.0 3.0	41.9 40.6	27.5	34.9 33.3	8.4 6.9	-34.1 -34.8	0.0 0.0	0.0 0.0	51.1 45.9	36.7 32.5	74 74	54 54	-22.9 -28.1	-17.3 -21.5	V Н
236	3.0	37.4	23.7	34.9	8.4	-34.1	0.0	0.0	46.6	32.9	74	54	-27.4	-21.1	Noise
rid has	nd (243	73.(11-)													
110 0 AI 874	na (245 3.0	48.6	35.1	33.4	6.9	-34.8	0.0	0.0	54.0	40.5	74	54	-20.0	-13.5	v
311	3.0	44.4	29.5	35.0	8.4	-34.1	0.0	0.0	53.7	38.8	74	54	-20.3	-15.2	v
874 311	3.0 3.0	43.5 43.2	30.4 29.3	33.4 35.0	6.9 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	49.D 52.5	35.8 38.6	74 74	54 54	-25.0	-18.2 -15.4	H H
			ļ			ļ					ļ				
		52MHz)								40.0			10.5		
924 386	3.0 3.0	49.0 43.6	35.3 28.8	33.4 35.0	7.0 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	54.5 53.0	40.8 38.1	74 74	54 54	-19.5	-13.2 -15.9	V V
924	3.0	43.5	29.9	33.4	7.0	-34.8	0.0	0.0	49.0	35.5	74	54	-25.0	-18.5	Н
386	3.0	37.9	25.0	35.0	8.4	-34.1	0.0	0.0	47.2	34.3	74	54	-26.8	-19.7	Noise
									-						
			<u>i</u>			1						1			
ev. 4.12.	.7														
	f	Messurem	ent Frequenc			Amp	Preamp (Gain				Arra Tim	Average F	Sold Strengt	4. T innit
	Dist	Distance to	-	.у		-	-		ct to 3 mete	ers		Pk Lim		d Strength L	
						Avg			Strength @				Margin vs.	~	
	AF	Antenna Fa				Peak			k Field Stre				Margin vs.		
	CL	Cable Loss	,			H₽F	High Pas	s Filter	;						

Page 198 of 255

HARMONICS AND SPURIOUS EMISSIONS

	High	1 Frequency	y Meas	aurem	ent											
ompli		ertification				5m Ch	amber									
ompa	ny: Athe	eros														
roject	t#: 08U	11571														
	2/14/2008 ngineer:	8 : Devin Cha	on o													
onfigu	uration:	G mode Tx														
fode:	XB92-0	40-\$0580														
est E	quipmen	<u>ıt:</u>														
F	orn 1	-18GHz	Р	re-an	nplifer	1-260	GHz	Pre-am	oblifer	26-40GH	17	н	lorn > 18	GHz		Limit
	S/N: 671				P 8449B			T 14 4	Pinter	20 400.				0112		FCC 15.205
		-	<u> </u>	. J4 11	04455		•				-				•	
- Hi Fre	equency Ca							40							Bee	k Measurements
	2 foot	cable		3	foot c	able		121	foot c	able		HPF	R	eject Filte		BW=VBW=1MHz
			- T				•	A-5m C	:hamb+	er 🗸			• R	_001		age Measurements
															KBW=	=1MHz ; VBW=10Hz
f	Dist				AF	CL	Amp	D Corr		Peak	Avg	Pk Lim			Avg Mar	
GHz ow ha	(m) and (241)	dBuV 2MHz)	dBu	<u>1V</u>	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
.824	3.0	42.4	29.		33.3	69	-34.8	۵٥	0.0	47.8	34.8	74	54	-26.2	-19.2	v
.326 .824	3.0 3.0	39.1 44.1	26. 29.		35.0 33.3	8.4 6.9	-34.1 -34.8	0.0 0.0	0.0 0.0	48.4 49.4	35.7 35.1	74 74	54 54	-25.6 -24.6	-18.3 -18.9	V H
326	3.0	38.5	25.		35.0	8.4	-34.1	0.0	0.0	47.8	34.9	74	54	-26.2	-19.1	H
/Lid ba	ind (243	7MHz)														
.874 .311	3.0 3.0	46.9 50.2	34.) 35.		33.4 35.0	6.9 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	52.4 59.5	40.2 44.4	74 74	54 54	-21.6 -14.5	-13.8 -9.6	v v
.874	3.0	44.7	32.	5	33.4	6.9	-34.8	0.0	0.0	50.1	38.0	74	54	-23.9	-16.0	Н
311	3.0	43.9	29:	2	35.0	8.4	-34.1	0.0	0.0	53.1	38.5	74	54	-20.9	-15.5	Н
	and (246		ļ													
924 386	3.0 3.0	38.6 42.2	25. 28.		33.4 35.0	7.0 8.4	-34.8 -34.1	۵0 ۵0	0.0 0.0	44.1 51.6	31.0 38.1	74 74	54 54	-29.9 -22.4	-23.0 -15.9	v v
924	3.0	38.5	25.	2	33.4	7.0	-34.8	0.0	0.0	44.0	30.8	74	54	-30,0	-23.2	Н
.386	3.0	37.7	25.	2	35.0	8.4	-34.1	0.0	גס	47.1	34.6	74	54	-26.9	-19.4	H
		<u></u>	<u> </u>				<u> </u>									
.ev. 4.12	(7															
	f Dist	Measureme Distance to			·		Amp D.C.m	Preamp (ct to 3 mete			-	-	Field Strengt d Strength L	·
		Distance to Analyzer R					Avg			ct to 3 mete Strength @					d Strength L 3. Average L	
	AF	Antenna Fa	actor				Peak	Calculate	ed Peak	k Field Stre			-	-	s. Peak Limit	
	CL	Cable Loss	3				HPF	High Pas	s Filter	1						

Page 199 of 255

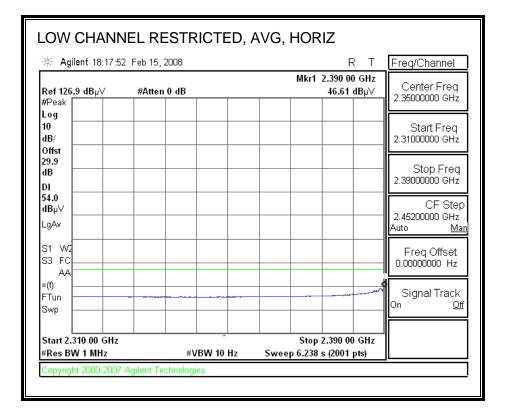
8.2.3. TRANSMITTER ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE 2.4 GHz BAND

FEM #1

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

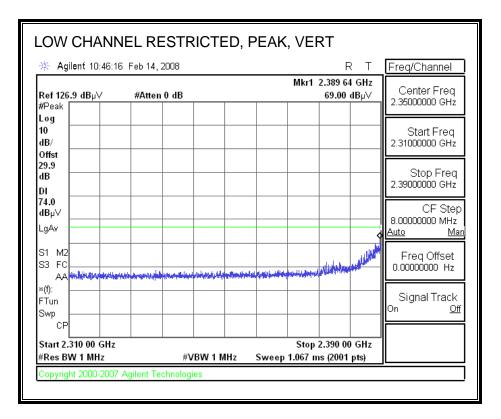
🔆 Agilent 18:17:38	3 Feb 15, 2008				RT	Freq/Channel
Ref 126.9 dBµ∀ #Peak □	#Atten 0 dB		I	Center Freq 2.3500000 GHz		
-og						
IO IB/						Start Freq 2.31000000 GHz
19.9 IB						Stop Freq 2.3900000 GHz
01 /4.0						
IBµ∀						CF Step 2.45200000 GHz
_gAv					1	Auto <u>Ma</u>
S1 M2					,	Freq Offset
33 FC	******		the promitive star	-	A A A A A A A A A A A A A A A A A A A	0.00000000 Hz
(f): Tun						Signal Track On Off
Swp						
Start 2.310 00 GHz				Stop 2.390 (0 GHz	
Res BW 1 MHz	#V	/BW 1 MHz		067 ms (200		

Page 200 of 255

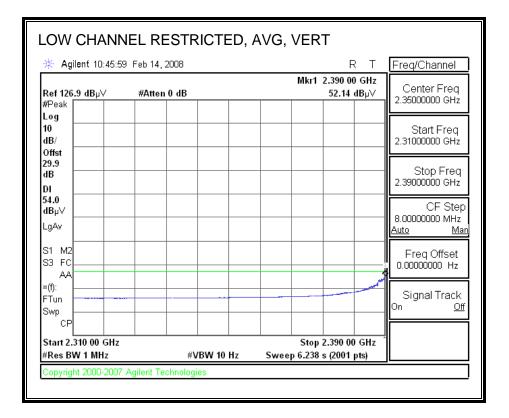


Page 201 of 255

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

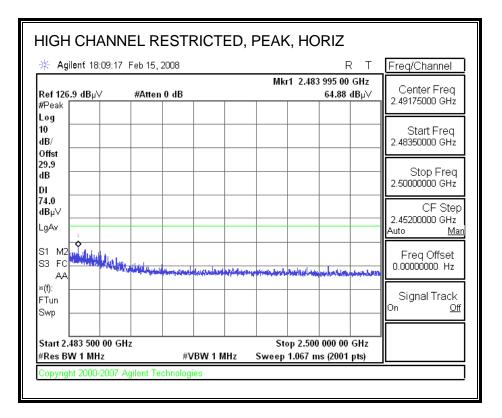


Page 202 of 255

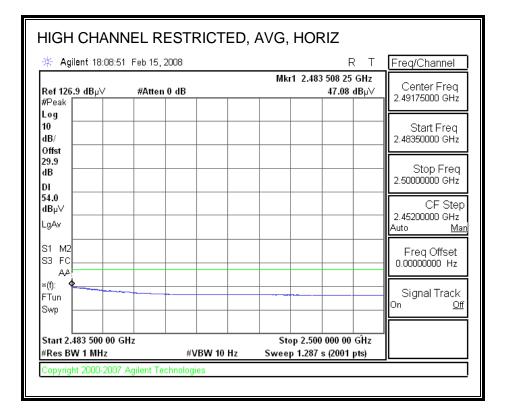


Page 203 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

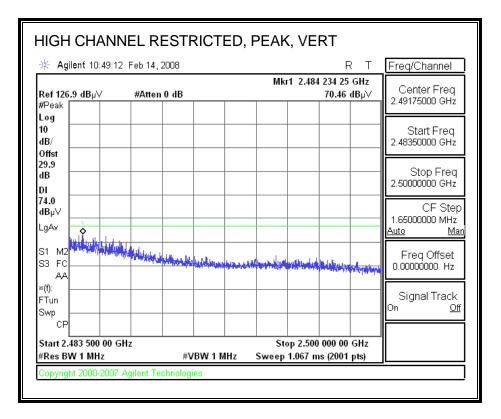


Page 204 of 255

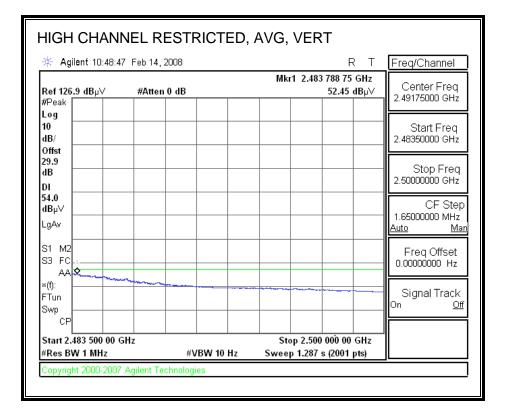


Page 205 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



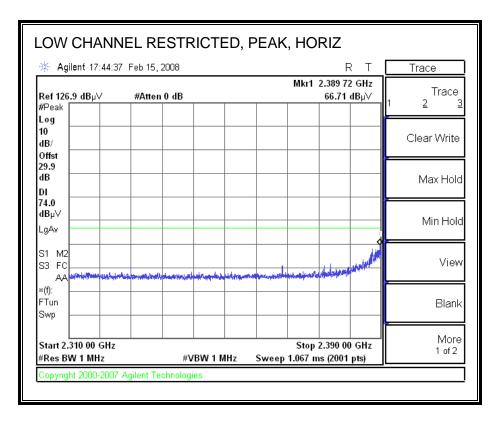
Page 206 of 255



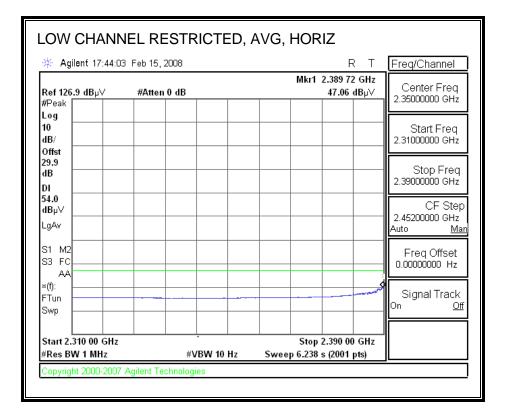
Page 207 of 255

FEM #2

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

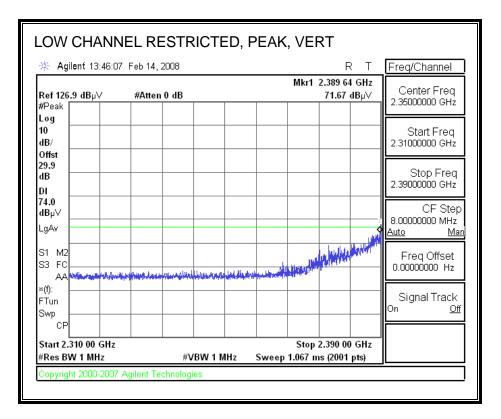


Page 208 of 255

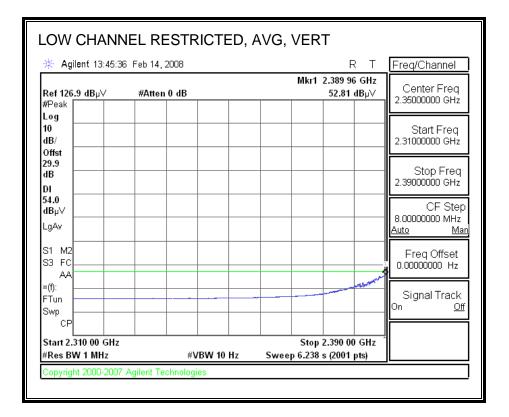


Page 209 of 255

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

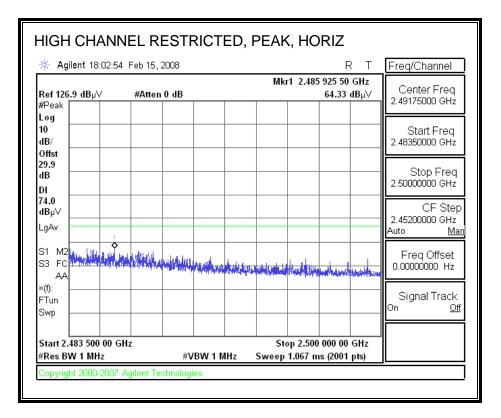


Page 210 of 255

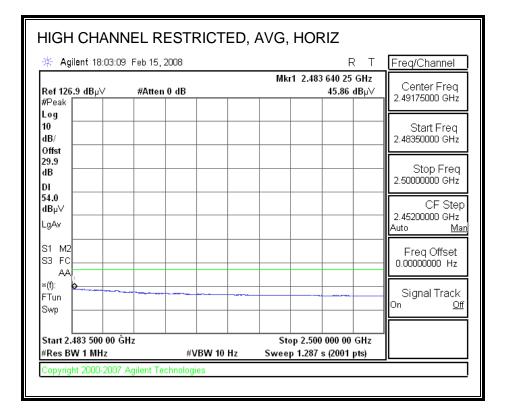


Page 211 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

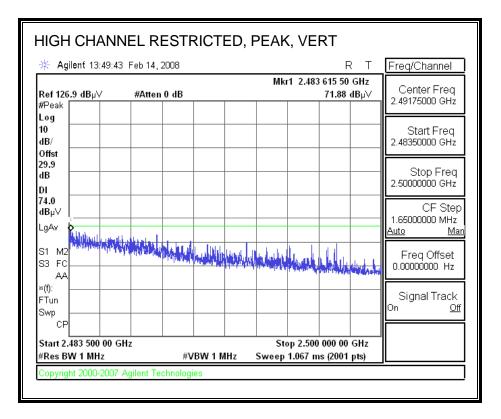


Page 212 of 255

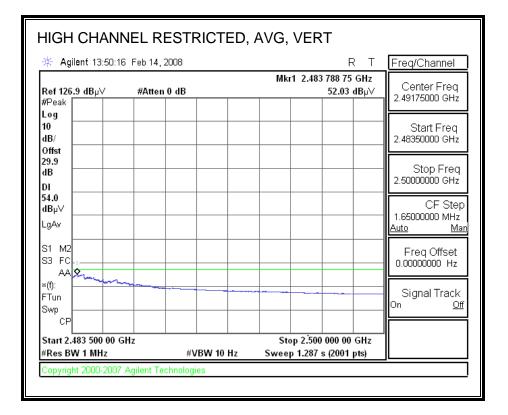


Page 213 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



Page 214 of 255



Page 215 of 255

HARMONICS AND SPURIOUS EMISSIONS

			Measurem		- a										
ompiia	ance Ce	runcation	Services, Fr	emont :	sm Ch	amber									
-	ny: Athe														
	#: 08U /25/2008														
		o Chin Pang													
onfigu	ration:	HT20 mod													
lode:]	XB92-0	40-80660													
est Eq	uipmen	ıt:													
		_													
н	orn 1-	18GHz	Pre-ar	mplifer	1-260	SHz	Pre-am	plifer	26-40GH	z	н	orn > 18	GHz		Limit
T73; S	S/N: 671	7 @3m		P 8449B		-				-				-	FCC 15.209
- Hi Fred	quency Ca	bles —								 					
	2 foot	cable		3 foot c	able		12	foot c	able		HPF	D	eject Filte		k Measurements
	21000	Capie		10000	apre								eject Fille	RB	W=VBW=1MHz
			-			•	A-5m C	hambe	эг 🗸			▼ R_	001		a <u>ge Measurements</u> =1MHz ; VBW=10Hz
J							I							KDW-	-IMINZ, VEW-IUNZ
f	Dist	1	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim		1	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
ow Ch 216	(2412N 3.0	VIHz) 46.5	39.8	30.5	5.5	-35.7	0.0	0.0	46.8	40.1	74	54	-27.2	-13.9	v
824	3.0	45.1	32.8	33.3	69	-34.8	0.0	0.0	50.5	38.2	74	54	-23.5	-15.8	V
326 216	3.0 3.0	44.6 46.7	31.0 41.4	35.0 30.5	8.4 5.5	-34.1 -35.7	0.0 0.0	0.0 0.0	53.9 47.0	40.3 41.7	74 74	54 54	-20.1 -27.0	-13.7 -12.3	V H
824	3.0	40.7	30.2	33.3	55 69	-35./	0.0	0.0	47.0	41./ 35.6	74	54 54	-27.0	-12.5	H
326	3.0	42.0	28.7	35.D	8.4	-34.1	Q.O	0.0	51.3	38.0	74	54	-22.7	-16.0	Н
fid Ch	(24371)	vIHz)													
249	3.0	38.2	35.4	30.6	55	-35.7	0.0	0.0	38.7	35.9	74	54	-35.3	-18.1	V
874 311	3.0 3.0	46.3 48.2	34.0 34.9	33.4 35.0	6.9 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	51.8 57.5	39.5 44.2	74 74	54 54	-22.2 -16.5	-14.5 -9.8	v
249	3.0	46.8	41.2	30.6	55	-35.7	0.0	QO	47.3	41.7	74	54	-26.7	-12.3	Н
874 311	3.0 3.0	45.5 44.9	33.3 32.2	33.4 35.0	6.9 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	51.0 54.2	38.8 41.4	74 74	54 54	-23.0 -19.8	-15.2 -12.6	H H
		445		35.0	0.4	-54.1	0.0	0.0					-193	-12.0	
	h (2462]														
283 924	3.0 3.0	47.8 50.2	43.8 37.0	30.7 33.4	5.6 7.0	35.6 34.8	0.0 0.0	0.0 0.0	48.4 55.8	44.4 42.6	74 74	54 54	-25.6 -18.2	-9.6 -11.4	v
386	3.0	49.2	33.9	35.0	8.4	-34.1	0.0	0.0	58.6	43.3	74	54	-15.4	-10.7	V
283 924	3.0 3.0	45.5 47.6	40.5 33.4	30.7 33.4	5.6 7.0	-35.6 -34.8	0.0 0.0	0.0 0.0	46.1 53.2	41.1 39.0	74 74	54 54	-27.9 -20.8	-12.9 -15.0	H H
386	3.0	47.0	35.0	35.0	8.4	-34.1	0.0	0.0 Q.0	57.8	44.4	74	54 54	-16.2	-15.0	Н
		1				1	1								
ev. 4.12.	.7														
ote: No	other emi	issions were	detected above 1	the syste	m noise	fleer.									
	f	Measurem	ent Frequency	u.		Amp	Preamp (Gain				Ava Tim	Average F	ield Strengt	th Timit
	Dist	Distance to		,					ct to 3 mete	ers		-	_	i Strength L	
	Read	Analyzer R				Avg			Strength @					. Average L	
	AF	Antenna Fa				Peak	Calculate	d Peak	c Field Stre	ngth		Pk Mar	Margin vs	Peak Limi	t
	CL	Cable Loss	3			HPF	High Pas	s Filter							

Page 216 of 255

HARMONICS AND SPURIOUS EMISSIONS

	High	Frequency	Measurem	ent											
ompli	ance Ce	rtification	Services, Fr	emont	5m Ch	amber									
ompai	ny: Athe	eros													
roject	#: 08U	11571													
	/14/2008 1 gineer:	3 Devin Cha	nσ												
onfigu	uation:	HT 20 Tx													
Iode:]	XB92-0	40-80580													
est Ec	quipmen	t:													
н	lorn 1-	18GHz	Pre-ar	nplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	н	orn > 18	GHz		Limit
T73: 1	S/N: 671	7 @3m	- T34 HI	P 8449B		_		-						-	FCC 15.205
			•			•				-					
HIFre	quency Ca						12	foot c	abla	1				Peal	<u>k Measurements</u>
	2 foot	cable	3	foot o	able		12	1001 0	able		HPF	R	eject Filte		W=VBW=1MHz
			•			•	A-5m C	hambe	er 🗸			• R.	_001		age Measurements =1MHz ; VBW=10Hz
										· ·					-10112, VB00-10112
f	Dist		Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak ID W	Avg	Pk Lim	· · ·	1	Avg Mar	Notes
GHz ow.ba	(m) nd (241)	dBuV 2MHz)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
824	3.0	43.5	29.8	33 <i>.</i> 3	69	-34.8	0.0	۵0	48.9	35.1	74	54	-25.1	-18.9	v
326 824	3.0 3.0	41.4 42.2	26.3 29.8	35.0 33.3	8.4 6.9	-34.1 -34.8	0.0 0.0	0.0 0.0	50.7 47.6	35.7 35.2	74 74	54 54	-23.3 -26.4	-18.3 -18.8	V H
326	3.0	38.4	25.5	35.0	8.4	-34.1	0.0	0.0	47.7	34.8	74	54	-26.3	-19.2	Н
lid ba	nd (243	7MHz)											•		
874	3.0	48.3	35.0	33.4	6.9	-34.8	0.0	0.0	53.8	40.5	74	54	-20.2	-13.5	V
311 874	3.0 3.0	47.0 44.8	31.4 31.6	35.0 33.4	8.4 6.9	-34.1 -34.8	0.0 0.0	0.0 0.0	56.3 50.3	40.7 37.0	74 74	54 54	-17.7 -23.7	-13.3 -17.0	V H
311	3.0	42.8	29.5	35.0	8.4	-34.1	0.0	0.0	52.1	38.8	74	54	-21.9	-15.2	Н
igh ba	and (246	2MHz)													
924 386	3.0	44.1	30.1	33.4	7.0	-34.8	0.0	0.0	49.7	35.7	74	54	-24.3	-18.3	v v
380 924	3.0 3.0	42.1 42.7	26.5 30.2	35.0 33.4	8.4 7.0	-34.1 -34.8	0.0 0.0	0.0 0.0	51.5 48.3	35.9 35.8	74 74	54 54	-22.5 -25.7	-18.1 -18.2	H H
386	3.0	38.8	26.0	35.0	8.4	-34.1	0.0	0.0	48.2	35.4	74	54	-25.8	-18.6	Н
v. 4.12	7														
	f	Measurem	ent Frequency	у		Amp	Preamp (Gain				Avg Lim	Average H	Field Strengt	h Limit
	Dist	Distance to				D Corr			ct to 3 mete			Pk Lim		d Strength L	
		Analyzer R	0			Avg	-		Strength @			-	-	. Average L	
	AF CL	Antenna F: Cable Los:				Peak HPF	Calculate High Pas		c Field Stre	ngth		Pk Mar	Margin vs	. Peak Limit	t
	CL.	Cable Los:	;			nrr	rugii r as	ѕ гщеі							

Page 217 of 255

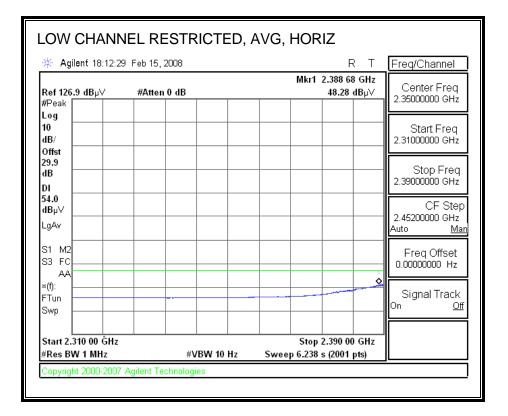
8.2.4. TRANSMITTER ABOVE 1 GHz FOR 802.11n HT40 MODE IN THE 2.4 GHz BAND

FEM #1

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

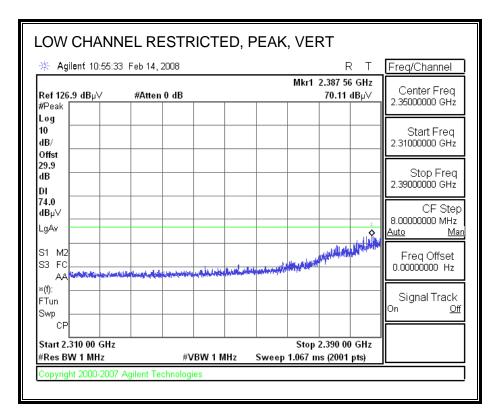
👫 Agilent 18:12	2:55 Feb 15, 2008				RT	Freq/Channel
tef 126.9 dBµ∨	#Atten 0 dB			Mkr1 2.386 4 65.75	48 GHz idBµ∨	Center Freq 2.3500000 GHz
Peak .oq						2.0000000 0112
0 IB/						Start Freq 2.31000000 GHz
)ffst 9.9 IB						Stop Freq 2.3900000 GHz
4.0						
 ΙΒμ∨						CF Step 2.45200000 GHz
.gAv					1	Auto <u>Ma</u>
31 M2 33 FC	an the name in some market					Freq Offset 0.00000000 Hz
AA handadahi	and the second second and a second	And the state of the state of the	nine interioristication and the state	April 1 and 1 a		
(f): Tun Swp						Signal Track ^{On <u>Off</u>}
						[
start 2.310 00 GF		BW 1 MHz	Sweep 1	Stop 2.390 (

Page 218 of 255

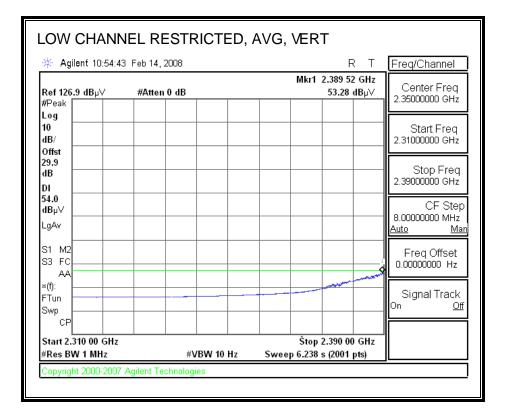


Page 219 of 255

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

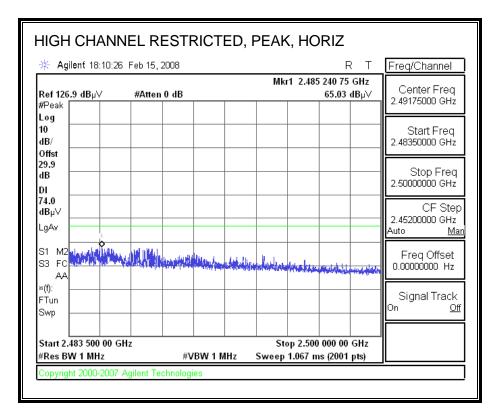


Page 220 of 255

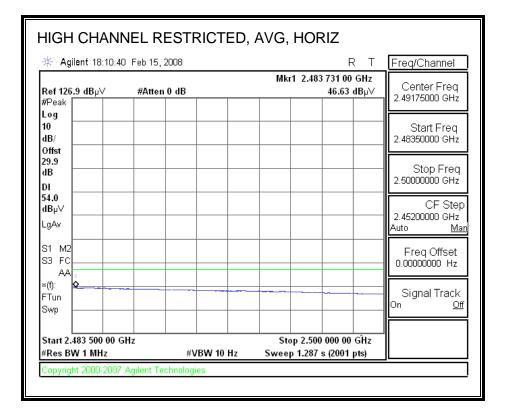


Page 221 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

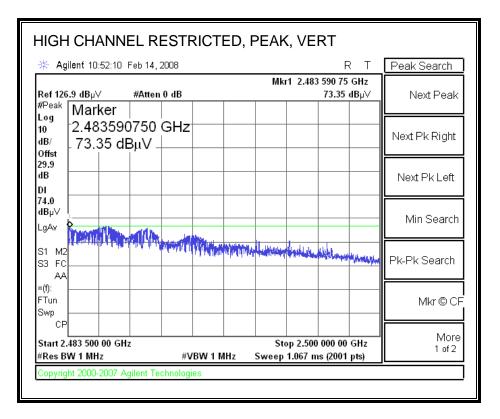


Page 222 of 255

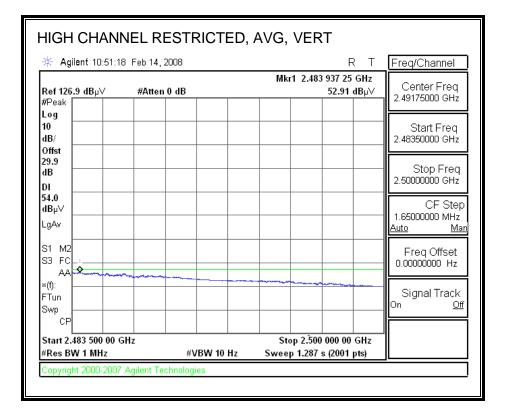


Page 223 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



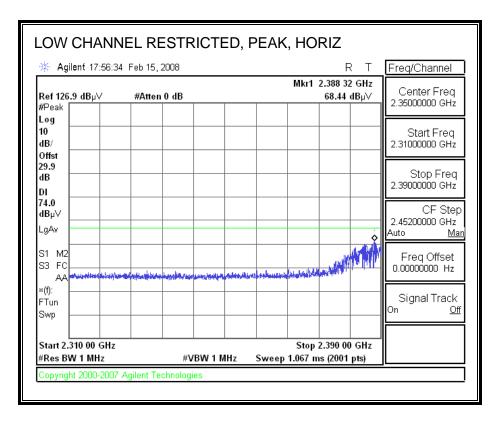
Page 224 of 255



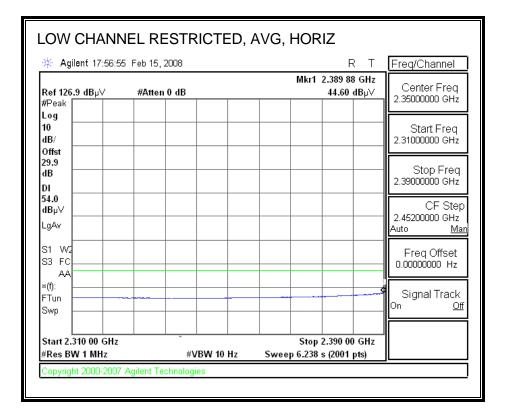
Page 225 of 255

FEM #2

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

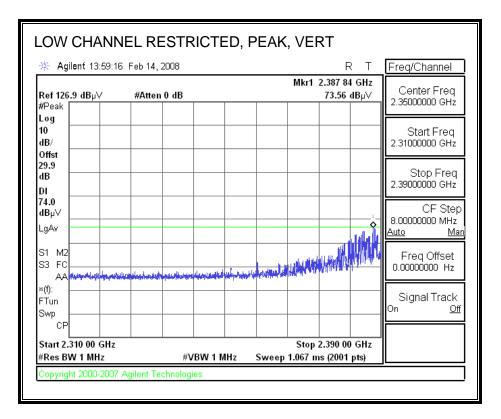


Page 226 of 255

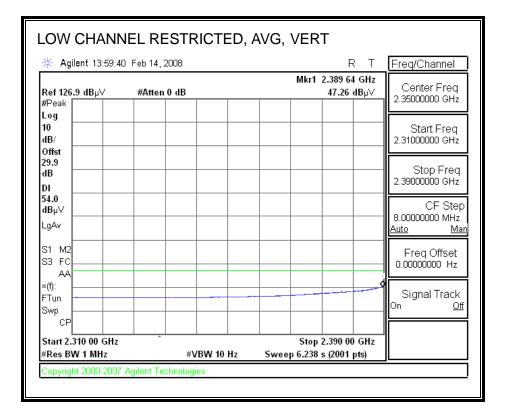


Page 227 of 255

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

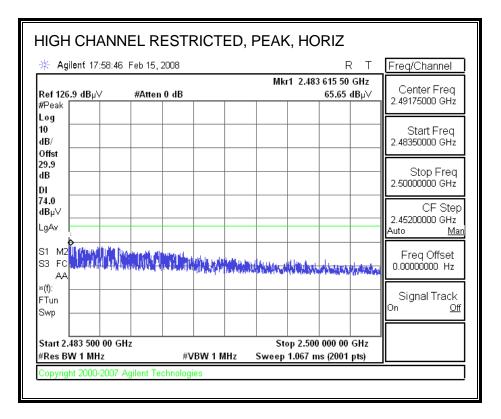


Page 228 of 255

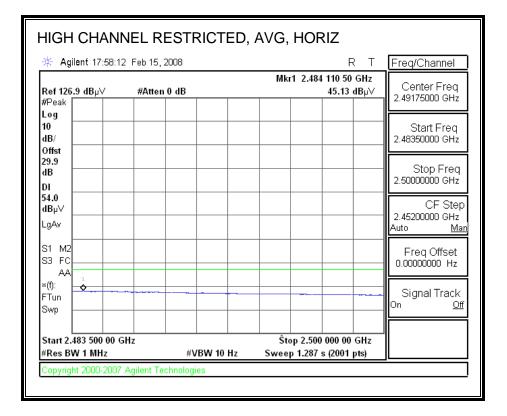


Page 229 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

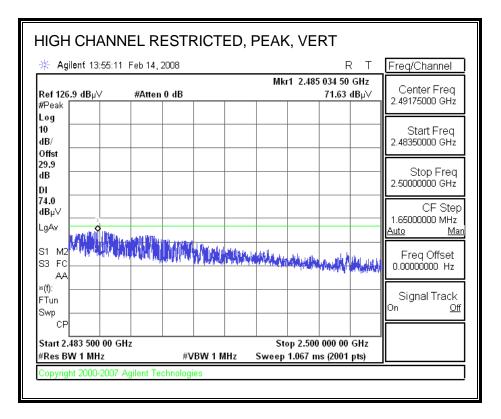


Page 230 of 255

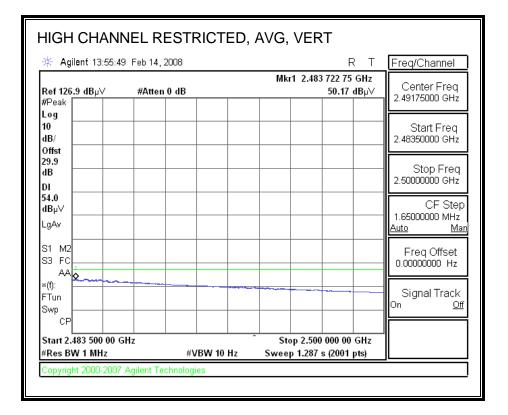


Page 231 of 255

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



Page 232 of 255



Page 233 of 255

HARMONICS AND SPURIOUS EMISSIONS

a .	-		Measurem			1									
ompli	iance Ce	ertification	Services, Fr	emont :	5m Ch	amber									
	ny: Athe														
	:#: 08U :/25/200														
		s Chin Pang													
Config	uration:	HT40 mod													
Mode:	XB92-0	40-\$0660													
Test E	quipmen	<u>it:</u>								_					
H	lorn 1-	18GHz	Pre-ar	nplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	H	orn > 1	8GHz		Limit
173;	S/N: 671	7 @3m	▼ T34 HF	9 8449B		•				•				-	FCC 15.209
Hi Fre	equency Ca	bles													
	2 foot	cable	3	foot c	able		12	foot c	able		HPF	F	Reject Filte		<u>k Measurements</u> W=VBW=1MHz
			-			-	A-5m C	hamb	er 🗸			-	R_001		n <mark>ge Measurements</mark> =1MHz ; VBW=10Hz
								-							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Liı dBuV/ı	n Pk Mar n dB	Avg Mar dB	Notes (V/H)
	h (24221		ubuv	ab/m	ш	w	w w		un an	abu v/m	an a	abu v/I		ш <u></u>	(11)
3.229	3.0	52.0	49.1	30.6	55	-35.7	Q.O	0.0	52.4	49.5	74	54	-21.6	-4.5	v
1.844	3.0	44.1	31.4	33 <i>.</i> 3	69	-34.8	0.0	0.0	49.5	36.8	74	54	-24.5	-17.2	v
7.266	3.0 3.0	43.5 49.8	30 <i>.5</i> 47.0	35.0 30.6	8.4 5.5	-34.1 -35.7	0.0 0.0	0.0 0.0	52.7 50.2	39.7 47.4	74 74	54 54	-21.3 -23.8	-14.3 -6.6	V н
3.229 1.844	3.0	49.8 44.0	47.U 30.6	30.6	5.5 6.9	-35.7 -34.8	U.U 0.0	0.0	50.2 49.4	47.4 36.0	74 74	54 54	-23.8	- 6.6 -18.0	H H
7.266	3.0	43.0	30.3	35.0	8.4	-34.1	0.0 QO	0.0 0.0	52.2	39 <i>.</i> 5	74	54 54	-21.8	-14.5	H
Mid Cl	h (24371	/IHz)							<u> </u>						
3.249	3.0	51.0	48.0	30.6	5.5	-35.7	0.0	0.0	51.5	48.5	74	54	-22.5	-55	v
4.874	3.0	44.1	33.0	33.4	6.9	-34.8	0.0	0.0	49.6	38 <i>.</i> 5	74	54	-24.4	-15.5	v
311	3.0	44.0	31.0	35.D	8.4	-34.1	0.0	0.0	53.3	40.3	74	54	-20.7	-13.7	<u>v</u>
3.249	3.0	50.1	47.6	30.6	55	-35.7	0.0	0.0	50.6 47.5	48.1	74	54 54	-23.4	-59	H
4.874 7.311	3.0 3.0	42.0 43.6	30.1 30.7	33.4 35.0	6.9 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	47.5 52.9	35.6 40.0	74 74	54 54	-26.5	-18.4 -14.0	H H
													- m A + A		
	h (2452)		45.4	20.7		AF F		0.0	70 /	48.2				60	
3.269 1.904	3.0 3.0	50.0 48.0	47.A 33.5	30.7 33.4	5.6 7.0	-35.6 -34.8	0.0 0.0	0.0 0.0	50.6 53.5	48.0 39.0	74 74	54 54	-23.4	-6.0 -15.0	v v
7.356	3.0	46.5	33.5	35.A 35.D	8.4	-34.8 -34.1	0.0	0.0	55.9	42.3	74 74	54	-20.5	-15.0	v V
3.269	3.0	40.2	47.0	30.7	5.6	-35.6	0.0	0.0	50.4	47.6	74	54 54	-23.6	-6.4	Н
4.904	3.0	46.8	33.0	33.4	7.0	-34.8	0.0	0.0	52 <i>3</i>	38.5	74	54	-21.7	-15.5	Н
7.356	3.0	46.2	32.0	35.0	8.4	-34.1	Q.O	0.0	55.Ó	41.4	74	54	-18.4	-12.6	H
								1							
					L		J	J	1		1	L			
Rev. 4.12	0														
	f	Measurem	ent Frequency	,		Amp	Preamp	Gain				Aug Tim	Average F	ield Strengt	h Timit
	Dist	Distance to		,		•	-		et to 3 mete	ers.		Pk Lim	-	l Strength L	
		Analyzer R				Avg			Strength @				r Margin vs.	-	
	AF	Antenna Fa	-			Avg Peak	-		c Field Stre			-	r Margin vs. Margin vs.	-	
	AF CL	Cable Loss				Peak HPF	High Pas			ngui		T IVIAL	TATAL BILL AS	I Car. LIIII	L .
	<u>ч</u> ь	JAUIE LOSS				TTE E	THRU L SS	sтurei							

Page 234 of 255

HARMONICS AND SPURIOUS EMISSIONS

Compli	-		- Measuren Services, Fi		5m Ch	amber									
-	ance ce ny: Athe		Services, FI	emont	on en	amoer									
roject	#: 08U	11571													
est Ei		Devin Cha	ng												
		HT 40 Tx 40-S0580													
est Ec	juipmen	t:													
		_	Dura		4.000	SU_	D		00.40.011			orn > 18	<u></u>		Limit
	IORN 1- S/N: 671	18GHz	_	m <mark>plifer</mark> P 8449B		_	Pre-am	piirer	26-40GH		H	orn > 18	GHZ		ECC 15 205
		-	• 134 H	P 0443D		•				-				•	FCC 15.205
HIFre	quency Ca 2 foot) foot o	able		12	foot c	able		HPF	D.	eject Filte	Pea	<u>k Measurements</u>
	21000	Cable	-				A-5m C				CIL F		·	RE	W=VBW=1MHz age Measurements
			•			•	A-SIL C	aambe	•			<u> </u>	_001		age Measurements =1MHz; VBW=10Hz
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m) nd (242)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
ow oa 844 266	3.0	41.2	30.2	33.3 35.0	6.9	-34.8	0.0	0.0 0.0	46.6	35.6	74	54	-27.4	-18.4	v
844	3.0 3.0	40.9 39.9	27.9 26.5	33.3	8.4 6.9	-34.1 -34.8	0.0 0.0	0.0	50.1 45.3	37.1 31.9	74 74	54 54	-23.9 -28.7	-16.9 -22.1	V H
266	3.0	40.2	26.7	35.0	8.4	-34.1	0.0	0.0	49.4	35.9	74	54	-24.6	- 18.1	H
fid ba 874	nd (243 3.0	7MHz) 43.4	31.4	33.4	6.9	-34.8	0.0	0.0	48.9	36.9	74	54	-25.1	-17.1	v
311 874	3.0 3.0	44.7 41.5	29.3 27.7	35.0 33.4	8.4 6.9	-34.1 -34.8	0.0 0.0	0.0 0.0	54.0 47.0	38.6 33.1	74 74	54 54	-20.0 -27.0	-15.4 -20.9	V H
311	3.0	42.0	27.8	35.0	8.4	-34.1	0.0	0.0	51.3	37.1	74	54	-22.7	- 16.9	Н
igh ba 904	and (245 3.0	2MHz) 41.6	30.8	33.4	7.0	-34.8	0.0	0.0	47.1	36.3	74	54	-26.9	-17.7	v
356	3.0	41.6	28.7	35.0	8.4	-34.1	0.0	0.0	51.0	38.1	74	54	-23.0	- 15 9	v
904 356	3.0 3.0	40.5 40.9	26.8 27.0	33.4 35.0	7.0 8.4	-34.8 -34.1	0.0 0.0	0.0 0.0	46.0 50.2	32.3 36.4	74 74	54 54	-28.0 -23.8	-21.7 -17.6	H H
ev. 4.12	.7														
	f Dist	Measurem Distance to	ent Frequenc	у		Amp D.Corr	Preamp Dictorce		ct to 3 mete	***		Avg Lim Pk Lim	-	ield Streng I Strength I	
	Read	Analyzer R	eading			Avg	Average	Field S	strength @	3 m		Avg Mar	Margin vs	. Average I	imit
	AF CL	Antenna Fa Cable Loss				Peak HPF	Calculate High Pas		t Field Stre	ngth		Pk Mar	Margin vs	. Peak Limi	t
	01	Ouble Los.	,			111.1	mentus	51 1001							

Page 235 of 255

8.2.5. TRANSMITTER ABOVE 1 GHz FOR 802.11a MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

omplia	_		Measurem Services, Fr		5m Ch	amber									
roject Date: 2/ Cest En Configu	ration:	11572 3 Thanh Ngu	ender card,	, Suppo	rt Lapt	ор									
est Eq	uipmen	<u>t:</u>													
H	orn 1-	18GHz	Pre-ar	mplifer	1-260	GHZ	Pre-am	plifer	26-40GH			orn > 180			Limit
T73; 5	5/N: 671	7 @3m	- T34 HI	P 8449B		-	T88 Mit	eq 26-4	40GHz	- T39	-T88 ARA 1	8-40GHz &	Mixer > 4	DGHz 🖵	FCC 15.205
	uency Cal 2 foot		3	3 foot o	able			foot c			HPF		ject Filte	RB	k Measurements W=VBW=1MHz
						•	A-5m C	hambe	er 🔹			- R_	001		age <u>Measurements</u> =1MHz ; VBW=10Hz
f	Dist	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dPnV/m	Avg dPnV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
CH-															
GHz 745MI	(m) Tz	авиу	ubuv	uD/m						иви у/ш	ubuv/m	идит/ш	uь	ub	(1/11)
GHz 745MI 1.490		ави v 48.1	32.6	37.5	11.6	-32.5	-9.5	0.0	55.1	39.6	74	UDU V/III 54	-18.9	-14.4	(V/H) V
745MI	Iz														
7 45MI 1.490 1.490	Hz 1.0 1.0	48.1	32.6	37.5	11.6	-32.5	-9.5	0.0	55.1	39.6	74	54	-18.9	-14.4	v
7 45MI 1.490	Hz 1.0 1.0	48.1	32.6	37.5	11.6	-32.5	-9.5	0.0	55.1	39.6	74	54	-18.9	-14.4	v
7 45MI 1.490 1.490 785 MI	Iz 1.0 1.0	48.1 45.7	32.6 32.1	37.5 37.5	11.6 11.6	-32.5 -32.5	-9.5 -9.5	0.0	55.1 52.7	39.6 39.1	74 74	54 54	-18.9 -21.3	-14.4 -14.9	V
745MI 1.490 1.490 785MI 1.570 1.570	Hz 1.0 1.0 Hz 1.0 1.0	48.1 45.7 44.0	32.6 32.1 31.2	37.5 37.5 37.5	11.6 11.6 11.7	-32.5 -32.5 -32.5	-9.5 -9.5 -9.5	0.0 0.0 0.0	55.1 52.7 51.2	39.6 39.1 38.3	74 74 74	54 54 54	-18.9 -21.3 -22.8	-14.4 -14.9 -15.7	V H V
745MI 1.490 1.490 785MI 1.570	Hz 1.0 1.0 Hz 1.0 1.0	48.1 45.7 44.0	32.6 32.1 31.2	37.5 37.5 37.5	11.6 11.6 11.7	-32.5 -32.5 -32.5	-9.5 -9.5 -9.5	0.0 0.0 0.0	55.1 52.7 51.2	39.6 39.1 38.3	74 74 74	54 54 54	-18.9 -21.3 -22.8	-14.4 -14.9 -15.7	V H V
745MI 1.490 1.490 785MI 1.570 1.570 825MI	Hz 1.0 1.0 Hz 1.0 1.0 Hz Hz	48.1 45.7 44.0 44.0	32.6 32.1 31.2 30.9	37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5	-9.5 -9.5 -9.5 -9.5	0.0 0.0 0.0 0.0	55.1 52.7 51.2 51.2	39.6 39.1 38.3 38.0	74 74 74 74 74	54 54 54 54 54	-18.9 -21.3 -22.8 -22.8	-14.4 -14.9 -15.7 -16.0	V H V H

Page 236 of 255

8.2.6. TRANSMITTER ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Compli	_		y Measurer Services, F		5m Ch	amber									
	ny: Athe														
	#: 08U /22/200														
		Devin Cha	ing												
			ender, Supp	ort Lapi	op.										
lode:	IX H12) mode(SiG	e FEM)												
est Ec	uipmen	<u>t:</u>													
					4 000		-					orn > 180			Limit
н	orn 1-	18GHz	Pre-a	mplifer	1-260	iHZ	Pre-am	pliter	26-40GH						
T73;	S/N: 671	7 @3m	- T34 H	IP 8449B		-	T88 Mite	eq 26-4	10GHz	- T39	-T88 ARA 1	8-40GHz &	Mixer > 40)GHz 🖵	FCC 15.209
' T Hi Fre	quency Ca	bles													
	2 foot			3 foot o	able		121	foot c	able		HPF	P	is at Filts	Peak	Measurements
	21000	cable		3 1001 0	able		12	0010	abic		HFF	Re	eject Filte		W=VBW=1MHz
			-			•	A-5m C	hambe	ər 🗸			- R_	001		ge Measurements
							I		_	I				RBW=	1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg	. AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV			100										
GHZ	(ш)	ubuv	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
57 45 M	Hz														
57 45M 11.490	Hz 1.0	49.5	33.4	37.5	11.6	-32.5	-9.5	0.0	56.5	40.4	74	54	-17.5	-13.6	v
57 45M 11.490	Hz														
5745M 1.490 1.490 5785M	Hz 1.0 1.0 Hz	49.5 48.3	33.4 32.7	37.5 37.5	11.6 11.6	-32.5 -32.5	-9.5 -9.5	0.0	56.5 55.3	40.4 39.7	74 74	54 54	-17.5 -18.7	-13.6 -14.3	V H
5745M 1.490 1.490 5785M 1.570	Hz 1.0 1.0 Hz 1.0	49.5 48.3 46.7	33.4 32.7 30.8	37.5 37.5 37.5	11.6 11.6 11.7	-32.5 -32.5 -32.5	-9.5 -9.5 -9.5	0.0 0.0 0.0	56.5 55.3 53.8	40.4 39.7 37.9	74 74 74	54 54 54	-17.5 -18.7 -20.2	-13.6 -14.3 -16.1	V H V
57 45 M	Hz 1.0 1.0 Hz	49.5 48.3	33.4 32.7	37.5 37.5	11.6 11.6	-32.5 -32.5	-9.5 -9.5	0.0	56.5 55.3	40.4 39.7	74 74	54 54	-17.5 -18.7	-13.6 -14.3	V H
5745M 11.490 11.490 5785M 11.570 11.570 5825M	Hz 1.0 1.0 Hz 1.0 Hz Hz	49.5 48.3 46.7 44.0	33.4 32.7 30.8 30.1	37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5	-9.5 -9.5 -9.5 -9.5	0.0 0.0 0.0 0.0	56.5 55.3 53.8 51.2	40.4 39.7 37.9 37.3	74 74 74 74 74	54 54 54 54 54	-17.5 -18.7 -20.2 -22.8	-13.6 -14.3 -16.1 -16.7	V H V H
5745M (1.490 (1.490 5785M (1.570 (1.570 (1.570 5825M (1.650	Hz 1.0 1.0 Hz 1.0 Hz Hz 1.0 1.0	49.5 48.3 46.7 44.0 48.4	33.4 32.7 30.8 30.1 33.8	37.5 37.5 37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5 -32.5	-9.5 -9.5 -9.5 -9.5 -9.5	0.0 0.0 0.0 0.0 0.0	56.5 55.3 53.8 51.2 55.7	40.4 39.7 37.9 37.3 41.1	74 74 74 74 74 74	54 54 54 54 54 54	-17.5 -18.7 -20.2 -22.8 -18.3	-13.6 -14.3 -16.1 -16.7 -12.9	V H V H
5745M (1.490 (1.490 5785M (1.570 (1.570 (1.570 5825M (1.650	Hz 1.0 1.0 Hz 1.0 Hz Hz	49.5 48.3 46.7 44.0	33.4 32.7 30.8 30.1	37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5	-9.5 -9.5 -9.5 -9.5	0.0 0.0 0.0 0.0	56.5 55.3 53.8 51.2	40.4 39.7 37.9 37.3	74 74 74 74 74	54 54 54 54 54	-17.5 -18.7 -20.2 -22.8	-13.6 -14.3 -16.1 -16.7	V H V H
5745M 11.490 11.490 5785M 11.570 11.570 5825M 11.650 11.650	Hz 1.0 1.0 Hz 1.0 1.0 Hz 1.0 1.0 1.0 1.0	49.5 48.3 46.7 44.0 48.4	33.4 32.7 30.8 30.1 33.8	37.5 37.5 37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5 -32.5	-9.5 -9.5 -9.5 -9.5 -9.5	0.0 0.0 0.0 0.0 0.0	56.5 55.3 53.8 51.2 55.7	40.4 39.7 37.9 37.3 41.1	74 74 74 74 74 74	54 54 54 54 54 54	-17.5 -18.7 -20.2 -22.8 -18.3	-13.6 -14.3 -16.1 -16.7 -12.9	V H V H
5745M 11.490 11.490 5785M 11.570 11.570 5825M 11.650 11.650	Hz 1.0 1.0 Hz 1.0 1.0 Hz 1.0 1.0 1.0 1.0	49.5 48.3 46.7 44.0 48.4	33.4 32.7 30.8 30.1 33.8	37.5 37.5 37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5 -32.5	-9.5 -9.5 -9.5 -9.5 -9.5	0.0 0.0 0.0 0.0 0.0	56.5 55.3 53.8 51.2 55.7	40.4 39.7 37.9 37.3 41.1	74 74 74 74 74 74	54 54 54 54 54 54	-17.5 -18.7 -20.2 -22.8 -18.3	-13.6 -14.3 -16.1 -16.7 -12.9	V H V H
5745M (1.490 (1.490 5785M (1.570 (1.570 (1.570 5825M (1.650	Hz 1.0 1.0 Hz 1.0 1.0 1.0 7	49.5 48.3 46.7 44.0 48.4 46.7	33.4 32.7 30.8 30.1 33.8 33.4	37.5 37.5 37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5	9.5 9.5 9.5 9.5 9.5	0.0 0.0 0.0 0.0 0.0	56.5 55.3 53.8 51.2 55.7	40.4 39.7 37.9 37.3 41.1	74 74 74 74 74 74	54 54 54 54 54 54 54	-17.5 -18.7 -20.2 -22.8 -18.3 -20.1	-13.6 -14.3 -16.1 -16.7 -12.9 -13.4	V H V H V H
5745M 11.490 11.490 5785M 11.570 11.570 5825M 11.650 11.650	Hz 1.0 1.0 Hz 1.0 1.0 1.0 1.0 1.0 7 f	49.5 48.3 46.7 44.0 48.4 46.7 Measurem	33.4 32.7 30.8 30.1 33.8 33.4 ent Frequen	37.5 37.5 37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5	-9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0	56.5 55.3 53.8 51.2 55.7 53.9	40.4 39.7 37.9 37.3 41.1 40.6	74 74 74 74 74 74	54 54 54 54 54 54 54 54	-17.5 -18.7 -20.2 -22.8 -18.3 -20.1 -48.3 -20.1	-13.6 -14.3 -16.1 -16.7 -12.9 -13.4 Field Strength	V H V H V H
5745M 11.490 11.490 5785M 11.570 11.570 5825M 11.650 11.650	Hz 1.0 1.0 Hz Hz 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	49.5 48.3 46.7 44.0 48.4 46.7 Measureme Distance to	33.4 32.7 30.8 30.1 33.8 33.4 ent Frequen o Antenna	37.5 37.5 37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5	-9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	56.5 55.3 53.8 51.2 55.7 53.9	40.4 39.7 37.9 37.3 41.1 40.6	74 74 74 74 74 74	54 54 54 54 54 54 54 54 54 54 54 54	-17.5 -18.7 -20.2 -22.8 -18.3 -20.1 Average F Peak Field	-13.6 -14.3 -16.1 -16.7 -12.9 -13.4 Field Strength	V H V H V H
5745M 11.490 11.490 5785M 11.570 11.570 5825M 11.650 11.650	Hz 1.0 1.0 Hz Hz 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	49.5 48.3 46.7 44.0 48.4 46.7 Measureme Distance to Analyzer R	33.4 32.7 30.8 30.1 33.8 33.4 ent Frequen o Antenna teading	37.5 37.5 37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5	-9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	56.5 55.3 53.8 51.2 55.7 53.9 ct to 3 mete Strength @	40.4 39.7 37.9 37.3 41.1 40.6	74 74 74 74 74 74	54 54 54 54 54 54 54 8 4 8 4 8 8 4 8 8 9 8 10 8 9 8 10 9 10 10 10 10 10 10 10 10 10 10 10 10 10	-17.5 -18.7 -20.2 -22.8 -18.3 -20.1 Average F Peak Field Margin vs	-13.6 -14.3 -16.1 -16.7 -12.9 -13.4 Field Strength Li Strength Li . Average Li	V H V H H
5745M 11.490 11.490 5785M 11.570 11.570 5825M 11.650 11.650	Hz 1.0 1.0 Hz Hz 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	49.5 48.3 46.7 44.0 48.4 46.7 Measureme Distance to	33.4 32.7 30.8 30.1 33.8 33.4 ent Frequen A Antenna Leading actor	37.5 37.5 37.5 37.5 37.5 37.5 37.5	11.6 11.6 11.7 11.7 11.7	-32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5 -32.5	-9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	56.5 55.3 53.8 51.2 55.7 53.9 ct to 3 mete Strength @ c Field Stre	40.4 39.7 37.9 37.3 41.1 40.6	74 74 74 74 74 74	54 54 54 54 54 54 54 8 4 8 4 8 8 4 8 8 9 8 10 8 9 8 10 9 10 10 10 10 10 10 10 10 10 10 10 10 10	-17.5 -18.7 -20.2 -22.8 -18.3 -20.1 Average F Peak Field Margin vs	-13.6 -14.3 -16.1 -16.7 -12.9 -13.4 Field Strength	V H V H H

Page 237 of 255

8.2.7. TRANSMITTER ABOVE 1 GHz FOR 802.11n HT40 MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

ompany: roject #: ate: 2/22 est Engi onfigura	ice Ce : Athe : 08U 2/2008 ineer: ntion:	11572	Services, ng nder, Sup	Fremont		amber									
est Equi	ipmen	<u>t:</u>													
Но	rn 1-	18GHz	Pre-	amplife	1-260	GHz	Pre-am	plifer	26-40GH	z	H	orn > 180	GHz		Limit
T73; S/I	N: 671	7 @3m	• T34	HP 8449E		-	T88 Mit	eq 26-	10GHz	- T:	39-T88 ARA 1	8-40GHz &	Mixer > 40	GHz 🖵	FCC 15.209 🗸
Hi Freque		cable		3 foot (able	•	12 A-5m C	foot c			HPF		ject Filte	RB Avera	<u>k Measurements</u> W=VBW=1MHz <u>ge Measurements</u> 1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Av	g. AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV 755MHz)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/r	n dBuV/m	dBuV/m	dB	dB	(V/H)
.510 .510	1.0 1.0	43.9 41.9	29.6 28.0	37.5 37.5	11.6 11.6	-32.5 -32.5	-9.5 -9.5	0.0 0.0	50.9 48.9	36.6 35.0	74 74	54 54	-23.1 -25.1	-17.4 -19.0	V H
		5795MHz)													
.590 .590	1.0 1.0	42.4 42.6	29.5 29.1	37.5 37.5	11.7 11.7	-32.5 -32.5	-9.5 -9.5	0.0 0.0	49.5 49.7	36.7 36.2	74 74	54 54	-24.5 -24.3	-17.3 -17.8	V H
I H A	f Dist Read AF CL	Measureme Distance to Analyzer Re Antenna Fa Cable Loss	Antenna eading .ctor	acy		Amp D Corr Avg Peak HPF	Average	Corre Field S ed Peal	ct to 3 meto Strength @ c Field Stre	3 m		Pk Lim Avg Mar	Peak Field Margin vs.	ield Strengt I Strength L Average L Peak Limit	imit imit

Page 238 of 255

8.3. RECEIVER ABOVE 1 GHz

8.3.1. RECEIVER ABOVE 1 GHz FOR 20 MHz BANDWIDTH IN THE 2.4 GHz BAND

String 2008 er: Devia Chang a: HT 20 TX 2040-50550 International String Stri	Compli		Frequency rtification S			5m Ch	amber									
er: Deria Chang m: HT 20 TX 2-040-50500 sent: 1-18GHz Pre-amplifer 1-26GHz Pre-amplifer 26-40GHz T34 HP 8449B T34 HP 844	roject		11572													
nent: 1.16GHz Pre-amplifer 1-26GHz Pre-amplifer 26-40GHz Horn > 18GHz Limit y.Guice 114 HP 8449B 1	est Er	ngineer:	Devin Cha	ng												
Pre-amplifer 1-26GHz Pre-amplifer 26-40GHz Horn > 18GHz Limit S717 @3m T34 HP 8449B Colspan="2">Colspan="2">Colspan="2">Colspan="2" Limit Colspan="2" Limit Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" <th< th=""><th></th><th>XB92-0 quipmen</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<>		XB92-0 quipmen														
Codes 3 foot cable 12 foot cable HPF Reject Filter Peak Measurements RBW=1MHz Average Measurements RBW=1MHz Peak Measurements RBW=1MHz Peak Measurements RBW=1MHz Peak Measurements RBW=1MHz ist Read Pk Read Avg. AF CL Amp D Corr Ftr Peak Avg Pk Lim Avg Lim Pk Mar Avg Mar Notes ist Read Pk Read Avg. AF CL Amp D Corr Ftr Peak Avg Pk Lim Avg Lim Pk Mar Avg Mar Notes 0 51.0 40.8 25.6 3.7 37.6 0.0 0.0 42.7 32.5 74 54 -31.3 21.5 V 0 60.7 44.4 26.0 3.8 37.4 0.0 0.0 43.3 32.5 74 54 -31.3 21.5 V 0 49.5 41.6 25.6 3.7 37.6 0.0 0.0 43.2 22.9 H 0 49.5 41.6 25.6 3.7 37.6 0.0 0.0			_	Pre-a	mplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	н	orn > 180	GHz		Limit
Joot cable J foot cable 12 foot cable HPF Reject Filter Peak Measurements RBW=1MHz x	T73;	S/N: 671	7 @3m	- T34 H	P 8449B		-				-				-	FCC 15.209 -
Neasurement Frequency Arg CL Amp D Corr Fltr Peak Avg Pk Lim Avg Lim Pk Mar Avg Mar Notes 0 dBuV dBuV dB Vm dBuV/m dBuV/m dB dB (VH) 0 51.0 40.8 25.6 3.7 37.6 0.0 0.0 42.7 32.5 74 54 31.3 21.5 V 0 60.7 44.4 26.0 3.8 37.4 0.0 0.0 39.5 31.1 74 54 31.0 -17.3 V 0 47.8 39.4 25.6 3.7 37.6 0.0 0.0 48.3 32.5 74 54 -25.7 -21.5 H 0 49.5 41.6 25.6 3.7 37.6 0.0 0.0 53.2 36.6 74 54 -32.8	- Hi Fre	quency Cal 2 foot		3	3 foot c	able		12 1	foot c	able		HPF	Re	eject Filte		
n) dBuV dB/m dB dB dB dB dBuV/m dBuV/m dBuV/m dB dB dB (V/H) 0 51.0 40.8 25.6 3.7 37.6 0.0 0.0 42.7 32.5 74 54 -31.3 -21.6 V 0 60.7 44.4 26.0 3.8 37.4 0.0 0.0 53.0 36.7 74 54 -31.3 -21.6 V V 0 0 47.8 39.4 25.6 3.7 -37.6 0.0 0.0 39.5 31.1 74 54 -34.5 -22.9 H 0 47.8 39.4 25.6 3.7 -37.6 0.0 0.0 48.3 32.5 74 54 -32.8 -20.7 V 0 49.5 41.6 25.6 3.7 37.6 0.0 0.0 41.2 33.3 74 54 -32.8 -20.7 V			•				•	A-5m C	hambe	er 🔺			-			
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0 60.9 44.3 26.0 3.8 -37.4 0.0 0.0 53.2 36.6 74 54 -20.8 -17.4 V 0 49.6 39.4 25.6 3.7 -37.6 0.0 0.0 41.3 31.1 74 54 -32.7 -22.9 H 0 55.9 40.5 26.0 3.8 -37.4 0.0 0.0 48.2 32.8 74 54 -32.7 -22.9 H 0 49.6 41.3 25.6 3.7 -37.6 0.0 0.0 48.2 32.8 74 54 -32.7 -21.0 V 0 49.6 41.3 26.0 3.8 -37.4 0.0 0.0 53.0 36.6 74 54 -32.7 -21.0 V 0.0 0.0 49.2 39.1 25.6 3.7 -37.6 0.0 0.0 40.9 30.8 74 54 -33.1 -23.2 H <t< td=""><td>fid ba</td><td>nd</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<>	fid ba	nd														
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Measurement Frequency Amp Preamp Gain Avg Lim Avg Lim Avg Lim Avgrage Field Strength Limit	.500 .596	3.0 3.0				÷		·								
0 60.7 44.3 26.0 3.8 -37.4 0.0 0.0 53.0 36.6 74 54 -21.0 -17.4 V 0 49.2 39.1 25.6 3.7 -37.6 0.0 0.0 40.9 30.8 74 54 -33.1 -23.2 H 0.0 55.7 40.2 26.0 3.8 -37.4 0.0 0.0 48.0 32.5 74 54 -33.1 -23.2 H 0 55.7 40.2 26.0 3.8 -37.4 0.0 0.0 48.0 32.5 74 54 -26.0 -21.5 H	.390	3.0	<i>د</i> .دو	40.5	20.0	3.0	-37.4	0.0	0.0	40.4	34.0	/4	- 24	-43.0	-21.2	<u>n</u>
0 60.7 44.3 26.0 3.8 -37.4 0.0 0.0 53.0 36.6 74 54 -21.0 -17.4 V 0 49.2 39.1 25.6 3.7 -37.6 0.0 0.0 40.9 30.8 74 54 -33.1 -23.2 H 0.0 55.7 40.2 26.0 3.8 -37.4 0.0 0.0 48.0 32.5 74 54 -33.1 -23.2 H 0 55.7 40.2 26.0 3.8 -37.4 0.0 0.0 48.0 32.5 74 54 -26.0 -21.5 H	High ba	and												1		
.0 49.2 39.1 25.6 3.7 -37.6 0.0 0.0 40.9 30.8 74 54 -33.1 -23.2 H .0 55.7 40.2 26.0 3.8 -37.4 0.0 0.0 48.0 32.5 74 54 -33.1 -23.2 H Measurement Frequency t Mmp Preamp Gain D Corr Amp Preamp Gain D Stance Correct to 3 meters Avg Lim Average Field Strength Limit	.500	3.0														
.0 55.7 40.2 26.0 3.8 -37.4 0.0 0.0 48.0 32.5 74 54 -26.0 -21.5 H Measurement Frequency t Distance to Antenna Amp Preamp Gain D Corr Amp Preamp Gain D Corr Avg Lim Peak Field Strength Limit																
t Distance to Antenna D Corr Distance Correct to 3 meters Pk Lim Peak Field Strength Limit		3.0	·			÷							÷	\$	······	
ad Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit	1.500 1.596 1.500 1.596 Rev. 4.12	3.0 3.0 3.0 7 f Dist	60.7 49.2 55.7 Measureme Distance to	44.3 39.1 40.2 nt Frequenc Antenna	26.0 25.6 26.0	3.8 3.7	-37.4 -37.6 -37.4 Amp D Corr	0.0 0.0 0.0 Preamp (Distance	0.0 0.0 0.0 Gain	53.0 40.9 48.0	36.6 30.8 32.5	74 74	54 54 54 Avg Lim Pk Lim	-21.0 -33.1 -26.0 Average F Peak Field	-17.4 -23.2 -21.5 Field Strengt 1 Strength L	V H H th Limit imit
Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit		AF	Antenna Fa	ctor			Peak	Calculate	d Pest	c Hield Stre	noth		Pk Mar	Margin ve	Peak Limit	•

Page 239 of 255

8.3.2. RECEIVER ABOVE 1 GHz FOR 40 MHz BANDWIDTH IN THE 2.4 GHz BAND

Company Project # Date: 2/1		rtification \$	Measure Services, F		5m Ch	amber									
Date: 2/1															
		Devin Cha													
		Rx 40MHz 40-80580	BW												
est Equ	iipmen	<u>t:</u>	1												
Ho	orn 1-	18GHz	Pre-a	mplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	н	orn > 180	GHz		Limit
T73; S	/N: 671	7 @3m	- T34 H	IP 8449B		-				-				-	FCC 15.109 🖵
i Hi Frequ	Jency Ca	oles													
	2 foot	cable		3 foot o	able		12	foot c	able		HPF	Re	eject Filte		<u> Measurements</u>
		_					A-5m C	hamt					,	RB	W=VBW=1MHz ge Measurements
		•				•	A-om C	nambe	er 💌			-			ge Measurements 1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg	. AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
.ow ban .500	d 3.0	50.3	41.4	25.6	3.7	-37.6	0.0	0.0	42.0	33.1	74	54	-32.0	-20.9	v
.596	3.0	60.9	44.6	26.0	3.8	-37.4	0.0	0.0	53.2	36.9	74	54	-20.8	-17.1	v
.500	3.0	48.4	39.3	25.6	3.7	-37.6	0.0	0.0	40.1	31.0	74	54	-33.9	- 23.0	H
.596	3.0	55.2	39.7	26.0	3.8	-37.4	0.0	0.0	47.5	32.0	74	54	-26.5	-22.0	Н
fid ban													• •		
.500	3.0	51.3	41.7	25.6	3.7	-37.6	0.0	0.0	43.0	33.4	74	54	-31.0	-20.6	<u>v</u>
	3.0	61.1 49.0	44.6 39.6	26.0 25.6	3.8 3.7	-37.4 -37.6	0.0	0.0 0.0	53.4 40.7	36.9 31.3	74 74	54 54	-20.6 -33.3	-17.1 -22.7	V H
.596	3.0		40.7	25.0	3.8	-37.0 -37.4	0.0	0.0	40.7	31.3	74 74	54 54	-33.3 -25.9	-22.7 -21.1	H
.596 .500 .596	3.0 3.0	55.8													
.596 .500 .596	3.0	55.8							1		1		1		
.596 .500 .596 Ligh bar	3.0	48.1	40.8	25.6	3.7	-37.6	0.0	0.0	39.8	32.5	74	54	-34.2	-21.5	v
.596 .500 .596 High ban .500 .596	3.0 nd 3.0 3.0	48.1 60.6	44.3	26.0	3.8	-37.4	0.0	0.0	52.9	36.6	74	54	- 21.1	-17.4	V
.596 .500 .596 High ban .500	3.0 1d 3.0	48.1													

Page 240 of 255

8.3.3. RECEIVER ABOVE 1 GHz FOR 5.8 GHz BAND

	uipmen orn 1-	<u>t:</u> 18GHz	Pre-a	mplifer	1-260	SHz	Pre-am	plifer	26-40GH	z	н	orn > 180	GHz		Limit
	S/N: 671			P 8449B		-				- -				-	RX RSS 210 _
	quency Ca														
	2 foot		;	3 foot c	able		12	foot c	able		HPF	Re	ject Filte		k Measurements
						-	A-5m C	hambe	er 🔽			• R_	001	• Aver	3W=VBW=1MHz age Measurement s =1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
Hz	(m)	dBuV	dBuV	dB/m	dB 3.1	dB	dB	dB		dBuV/m		dBuV/m	dB	dB	(V/H) V
53 31	1.0 1.0	58.5 59.0	32.1 42.8	24.0 25.0	3.1 3.4	-38.2 -37.8	-9.5 -9.5	0.0 0.0	37.9 40.1	11.5 23.9	74 74	54 54	-36.1 -33.9	-42.5 -30.1	v
96	1.0	64.5	52.6	26.0	3.8	-37.4	-9.5	0.0	47.2	35.3	74	54	-26.8	- 18.7	V
97 95	1.0 1.0	50.8 62.2	36.5 46.7	28.3 26.0	4.8 3.8	-36.3 -37.4	-9.5 -9.5	0.0 0.0	38.1 45.0	23.7 29.4	74 74	54 54	-35.9 -29.0	-30.3 -24.6	V H
v. 4.12.	7														
	f		ent Frequenc	y		Amp	Preamp (-	-	Field Streng	
	Dist	Distance to							ct to 3 mete					d Strength I	
		Analyzer R	-			Avg	-		Strength @			-	-	Average I	
	AF	Antenna Fa				Peak			c Field Stre	ngth		Pk Mar	Margin vs	. Peak Limi	t
	CL	Cable Loss				HPF	High Pas	s Filter							

Page 241 of 255

8.4. WORST-CASE BELOW 1 GHz

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

HORIZONTAL DATA

Test Proj Comp Conf Mode	ition: FCC Operator: ect # : any : ig : et :	Chin Pa 08U1157 Atheros EUT/lap 2.4GHz	ang 71 s ptop/ant Band, 2	enna	st Case)		
	Fred	Read		Level		Over Limit	Remark
	rieq	Dever	ractor	пелет	DINE	DIGIC	Renark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	258.920	54.67	-17.48	37.19	46.00	-8.81	Peak
2	365.620	52.50	-14.20	38.30	46.00	-7.70	Peak
3	450.010	49.17	-12.38	36.79	46.00	-9.21	Peak
2			10 44	33.56	46.00	-12.44	Peak
4	566.410	44.00	-10.44	22.20			
-	566.410 765.260						Peak

Page 242 of 255

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

VERTICAL DATA

Condition: FCC	CLASS-B VERTICAL
Test Operator:	Chin Pang
Project # :	08011571
Company :	Atheros
Config :	EUT/laptop/antenna
Mode :	2.4GHz Band, Tx (Worst Case)
Target :	FCC Class B

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHZ	dBuV	db	dBuV/m	dBuV/m	db	
1	88.200	59.83	-22.98	36.85	43.50	-6.65	Peak
2	129.910	53.33	-16.57	36.77	43.50	-6.73	Peak
3	388.900	51.00	-13.67	37.33	46.00	-8.67	Peak
4	532.460	43.00	-10.85	32.15	46.00	-13.85	Peak
5	797.270	40.50	-7.09	33.41	46.00	-12.59	Peak
6	899.120	41.58	-5.22	36.35	46.00	-9.65	Peak

Page 243 of 255

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

ANSI C63.4

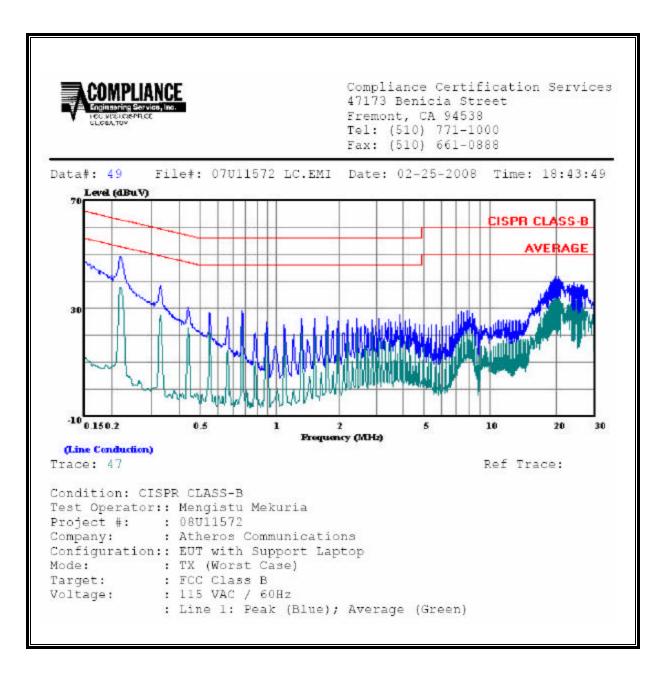
RESULTS

6 WORST EMISSIONS

	CONDUCTED EMISSIONS DATA (115VAC 60Hz)								
Freq.		Reading		Closs	Limit	EN_B	Marg	çin	Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1/L2
0.22	49.32		37.91	0.00	62.82	52.82	-13.50	-14.91	L1
0.33	38.54		27.55	0.00	59.45	49.45	-20.91	-21.90	L1
19.84	41.82		34.44	0.00	60.00	50.00	-18.18	-15.56	L1
0.22	51.44		40.65	0.00	62.82	52.82	-11.38	-12.17	L2
0.33	39.33		30.97	0.00	59.45	49.45	-20.12	-18.48	L2
23.02	37.51		29.63	0.00	60.00	50.00	-22.49	-20.37	L2
6 Worst Data									

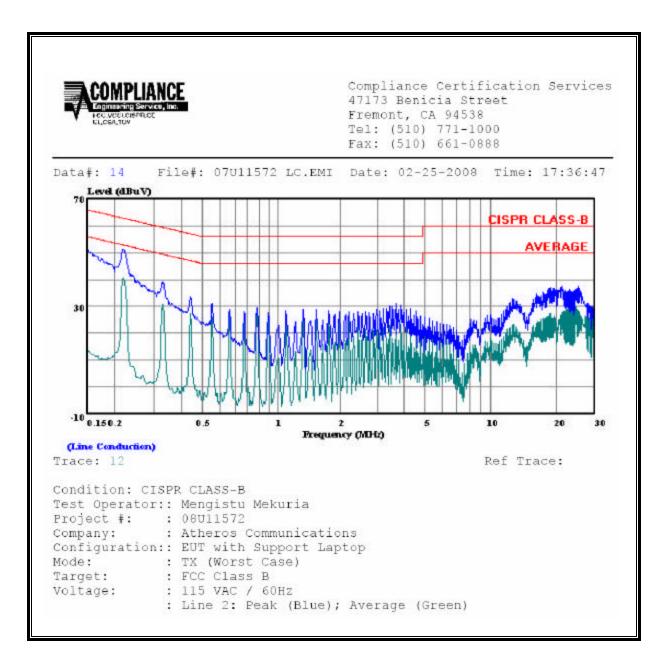
Page 244 of 255

LINE 1 RESULTS



Page 245 of 255

LINE 2 RESULTS



Page 246 of 255

MAXIMUM PERMISSIBLE EXPOSURE 10.

FCC RULES

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

TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)							
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)			
(A) Lim	its for Occupational	/Controlled Exposu	res				
0.3–3.0 3.0–30 30–300 300–1500 1500–100,000	614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 6			
(B) Limits for General Population/Uncontrolled Exposure							
0.3–1.34							

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

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

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

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

Page 247 of 255

IC RULES

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

Table 5

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

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

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

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

2. A power density of 10 W/m² is equivalent to 1 mW/cm².

 A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

Page 248 of 255

CALCULATIONS

Given

 $E = \sqrt{(30 * P * G)} / d$

and

S = E ^ 2 / 3770

where

E = Field Strength in Volts/meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts/square centimeter

Combining equations, rearranging the terms to express the distance as a function of the remaining variables, changing to units of Power to mW and Distance to cm, and substituting the logarithmic form of power and gain yields:

$$d = 0.282 * 10 \wedge ((P + G) / 20) / \sqrt{S}$$

where

d = MPE distance in cm P = Power in dBm

G = Antenna Gain in dBi

S = Power Density Limit in mW/cm^2

Rearranging terms to calculate the power density at a specific distance yields

 $S = 0.0795 * 10 ^ ((P + G) / 10) / (d^2)$

The power density in units of mW/cm^2 is converted to units of W/m^2 by multiplying by a factor of 10.

Page 249 of 255

LIMITS

From FCC §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm^2

From IC Safety Code 6, Section 2.2 Table 5 Column 4, S = 10 W/m^2

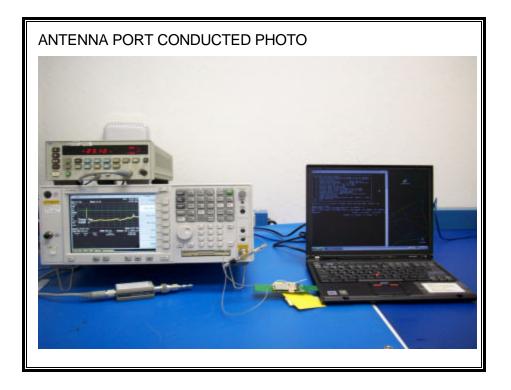
RESULTS

Mode	Band	MPE	Output	Antenna	FCC Power	IC Power
		Distance	Power	Gain	Density	Density
		(cm)	(dBm)	(dBi)	(mW/cm^2)	(W/m^2)
WLAN	2.4 GHz	20.0	27.98	6.33	0.54	5.36
WLAN	5 GHz	20.0	28.69	6.76	0.70	6.97

Page 250 of 255

11. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

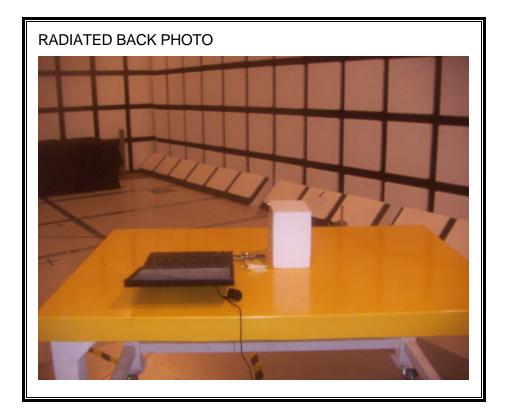


Page 251 of 255

RADIATED RF MEASUREMENT SETUP



Page 252 of 255

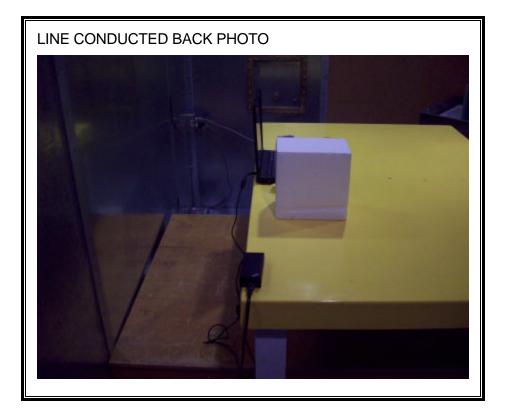


Page 253 of 255

POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



Page 254 of 255



END OF REPORT

Page 255 of 255