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

CERTIFICATION TEST REPORT

FOR

WIRELESS NETWORK RADIO

MODEL NUMBER: 1525

FCC ID: C3K1525
IC: 3048A-1525

REPORT NUMBER: 13U14860-8

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Microsoft Corporation
One Microsoft Way
Redmond, WA 98052, U.S.A.

EUT DESCRIPTION: Wireless Network Radio

MODEL: 1525

SERIAL NUMBER: 0050432165B0 (antenna-port sample)
0050432165BA (radiated and line-conducted sample)
1C3E842233F0 (DFS)

DATE TESTED: March 26 to April 4, 2013 (RF) and May 14,2013 (DFS)

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 9	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

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

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

Approved & Released For
UL Verification Services Inc. By:

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WiSE PROGRAM MANAGER
UL CCS

Tested By:

TOM CHEN
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033, ANSI C63.10-2009, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11a/b/g/n radio.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5260 - 5320	802.11a	18.82	76.21
5260 - 5320	802.11n HT20	17.51	56.36
5270 - 5310	802.11n HT40	16.78	47.64
5500 - 5700	802.11a	17.83	60.67
5500 - 5700	802.11n HT20	17.21	52.60
5510 - 5670	802.11n HT40	16.14	41.11

List of test reduction and modes covering other modes:

5 GHz BAND

Frequency Range (MHz)	Tested Mode	Representive Mode
5260 - 5320	802.11a	N/A
5260 - 5320	802.11n HT20, CDD	802.11n HT20, STBC
5270 - 5310	802.11n HT40, CDD	802.11n HT40, STBC
5500 - 5700	802.11a	N/A
5500 - 5700	802.11n HT20, CDD	802.11n HT20, STBC
5510 - 5670	802.11n HT40, CDD	802.11n HT40, STBC

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an PCB antenna, with a maximum gain of 3.38 and 3.43 dBi for 5GHz band.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 14.2.201.17.

The EUT driver software installed during testing was 2.0.0.13.

The test utility software used during testing was DutApiMimoBtFmBridgeEth.exe.

5.5. WORST-CASE CONFIGURATION AND MODE

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

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

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

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0

Radiated emissions for EUT with antenna was performed and passed; therefore, antenna port spurious was not performed.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

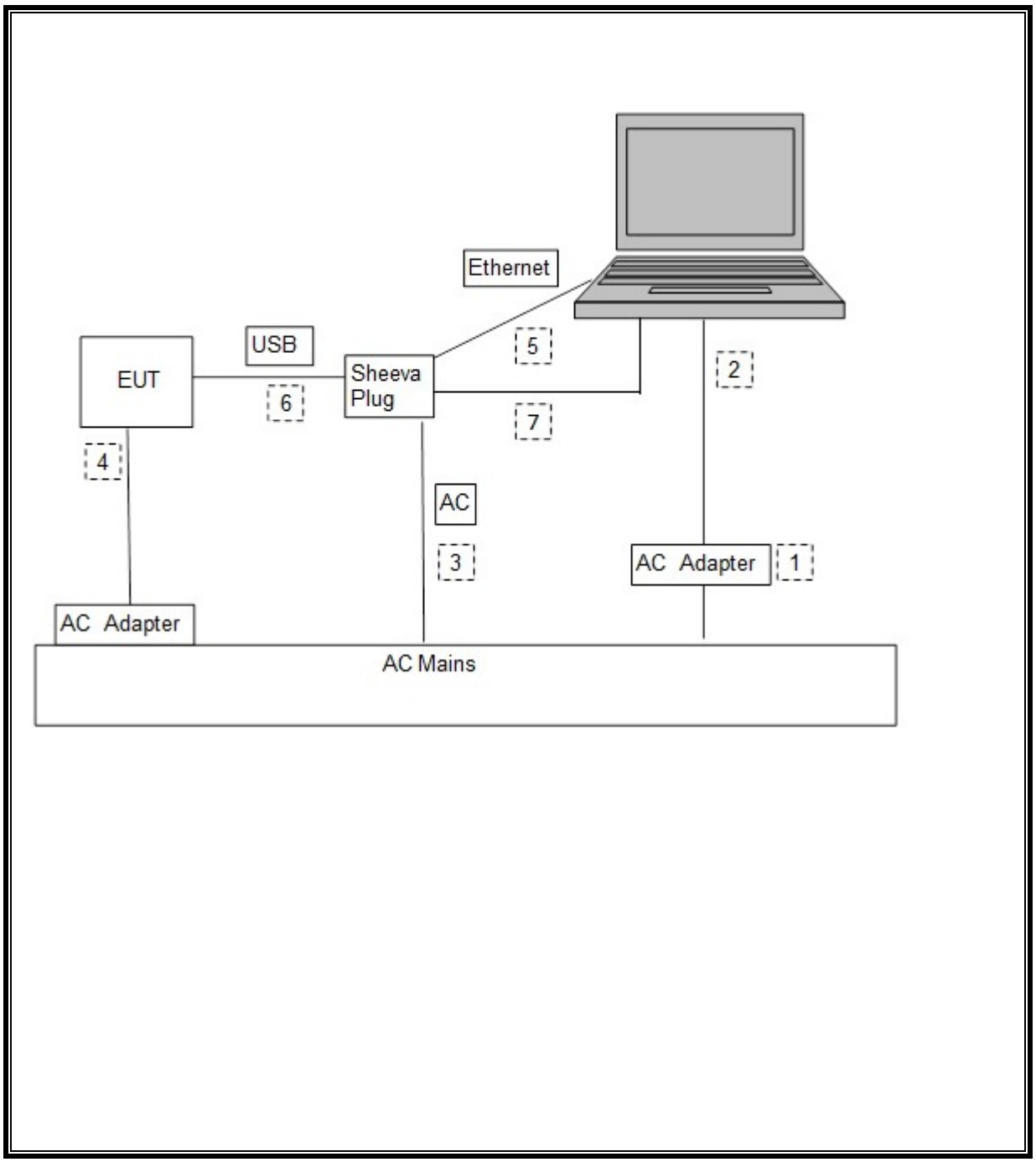
Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop PC	DELL	Vostro 1000	DVT	DoC
AC-DC Adapter	DELL	LA65NS0-00	CN-ODF263-71615-6C4	DoC
Sheeva Plug	Globalscale	003-SP1001	1043-002835	N/A

I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	USA 3P	Unshielded	1.8	None
2	DC	1	DC	Unshielded	1.8	None
3	AC	1	USA 2P	Unshielded	1.5	None
4	DC	1	DC	Unshielded	1.3	None
5	Ethernet	1	Ethernet	Unshielded	1	None
6	USB	1	USB	Unshielded	1.2	None
7	USB	1	USB	Unshielded	1.5	None

TEST SETUP

SETUP DIAGRAM FOR TESTS



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**
Antenna, Horn, 18 GHz	ETS	3117	C01022	02/21/13	02/21/14
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/13/13	02/13/14
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/12	11/14/13
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/14/11	06/14/13
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	02/16/12	02/26/14
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/12	10/21/13
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/02/11	08/02/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/12	10/22/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/16/13	01/16/14
Reject Filter, 5.725-5.825 GHz	Micro-Tronics	BRC13192	N02677		CNR
P-Series single channel Power Meter	Agilent / HP	N1911A	N/A	10/12/12	10/12/13
Peak / Average Power Sensor	Agilent / HP	E9323A	N/A	10/11/12	10/11/13
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/13	01/14/14
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/12	08/08/13
Reject Filter, 2.0-2.9 GHz	Micro-Tronics	BRM50702	N02684		CNR
Spectrum Analyzer	Agilent	N9030A	Pending	02/22/13	02/22/14
Peak and Average Power Sensor	Agilent	E9323A	N/A	04/03/13	04/03/14
Single Channel PK Power Meter	Agilent	N1911A	Pending	04/02/13	04/02/14

7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

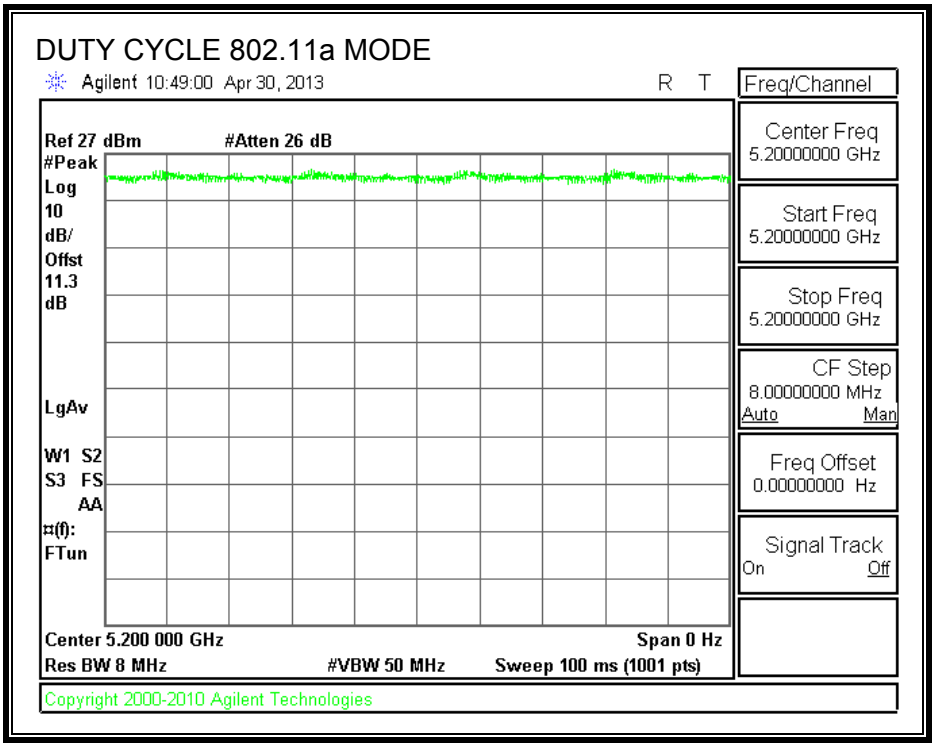
None; for reporting purposes only.

PROCEDURE

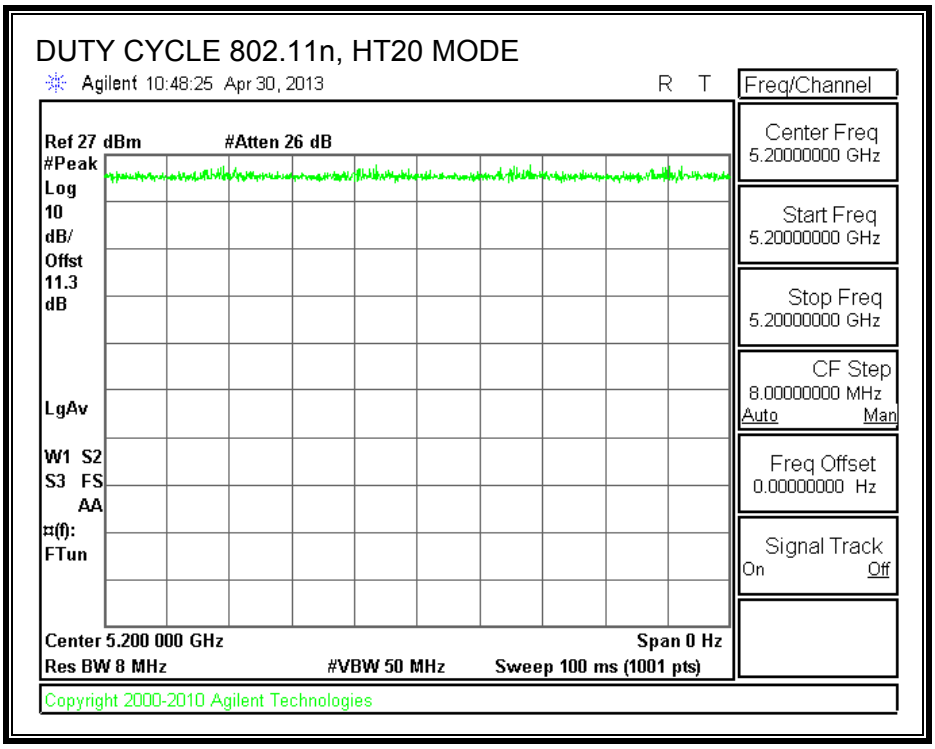
KDB 789033 Zero-Span Spectrum Analyzer Method.

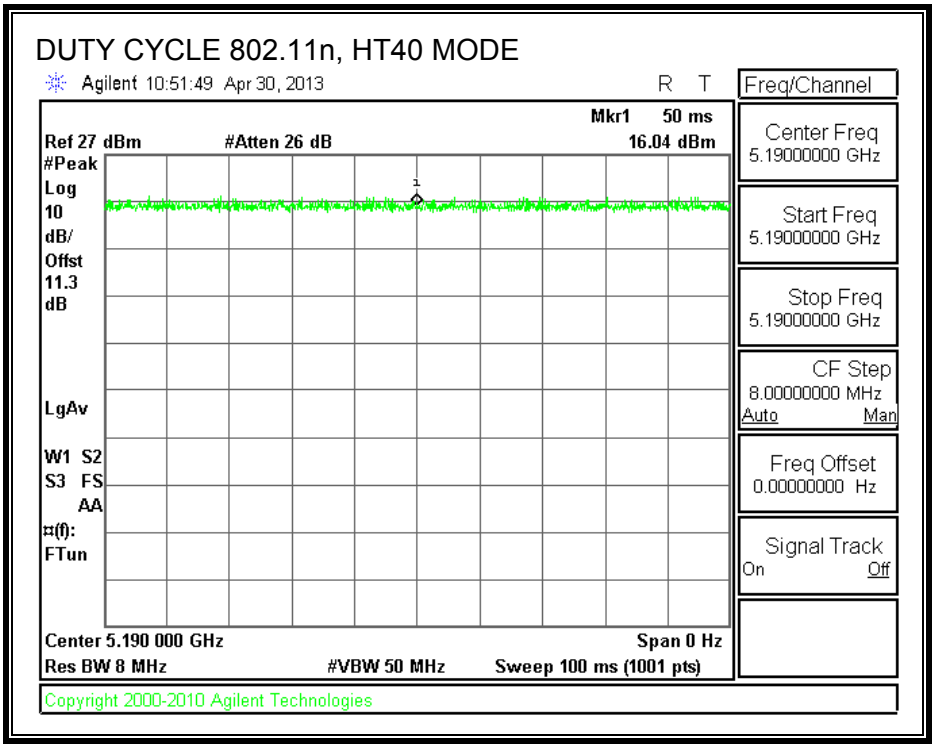
7.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
802.11a 20 MHz	100.00	100	1.000	100.0%	0.00	0.010
802.11n HT20	100.00	100	1.000	100.0%	0.00	0.010
802.11n HT40	100.00	100	1.000	100.0%	0.00	0.010



DUTY CYCLE 802.11n, HT20 MODE





7.2. MEASUREMENT METHOD FOR POWER AND PPSD

The Duty Cycle is greater than or equal to 98% therefore KDB 789033 Method SA-1 is used.

7.3. MEASUREMENT METHOD FOR AVERAGE SPURIOUS EMISSIONS ABOVE 1 GHz

The Duty Cycle is greater than or equal to 98%, KDB 789033 Method AD with Power RMS Averaging is used.

8. ANTENNA PORT TEST RESULTS

8.1. TRANSMITTER ABOVE 1 GHz

8.2. 802.11a MODE IN THE 5.3 GHz BAND

8.2.1. **26 dB BANDWIDTH**

LIMITS

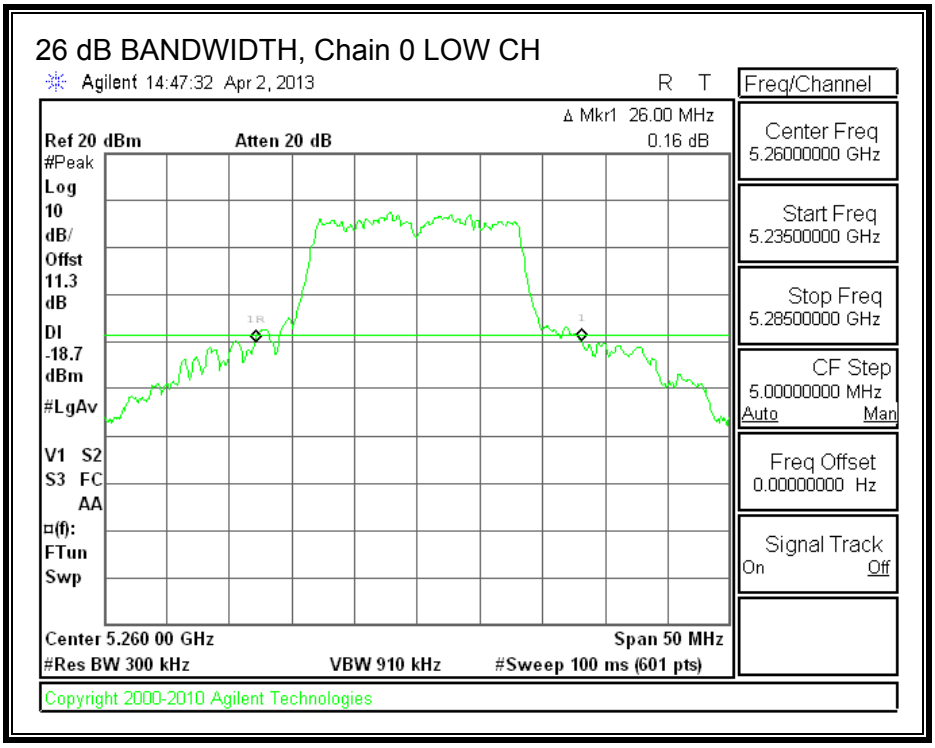
None; for reporting purposes only.

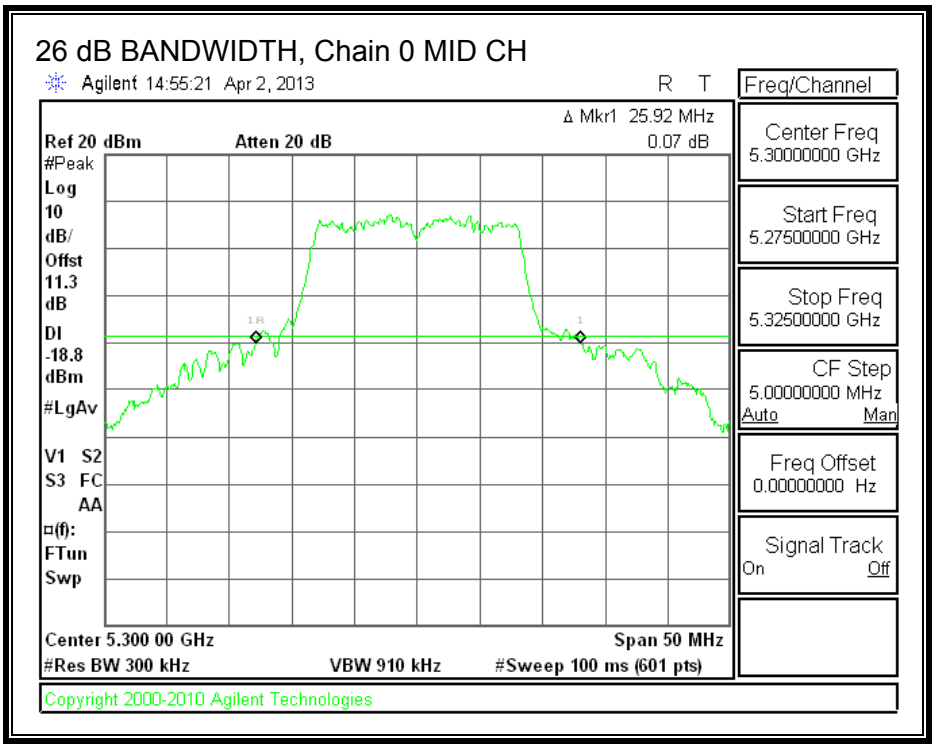
RESULTS

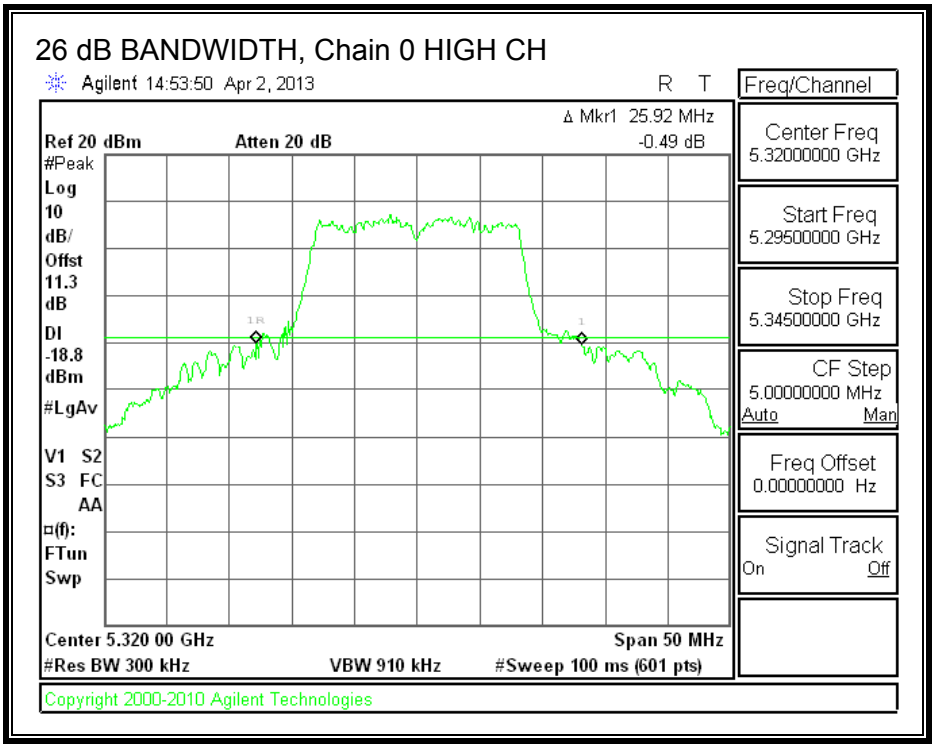
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	26.0	35.3
Mid	5300	25.9	35.4
High	5320	25.9	35.3

26 dB BANDWIDTH

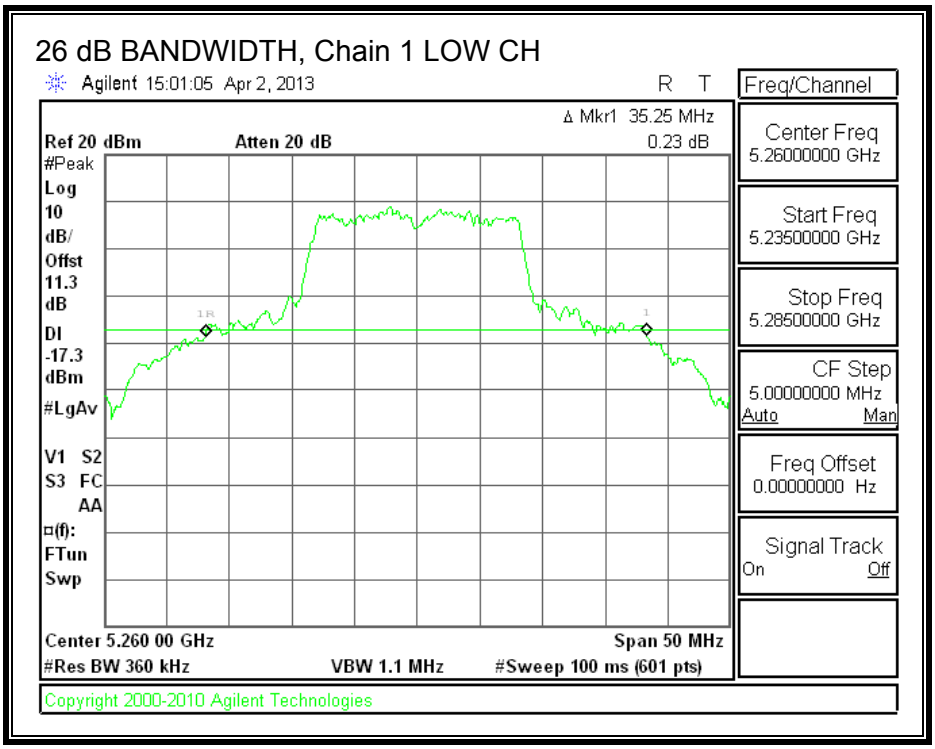
26 dB BANDWIDTH, Chain 0

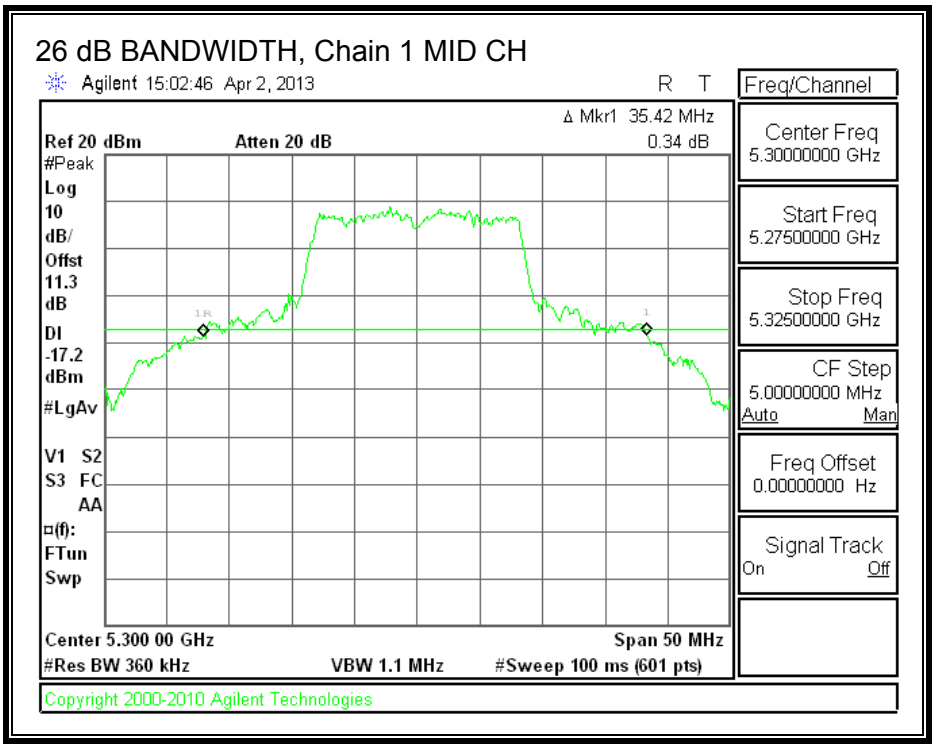


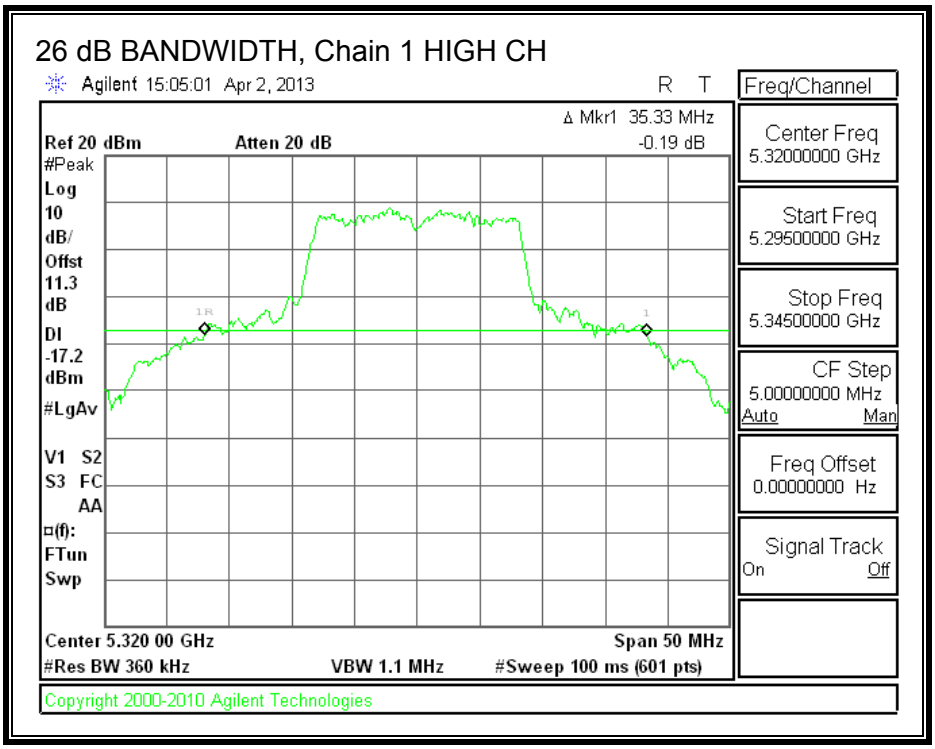




26 dB BANDWIDTH, Chain 1







8.2.2. **99% BANDWIDTH**

LIMITS

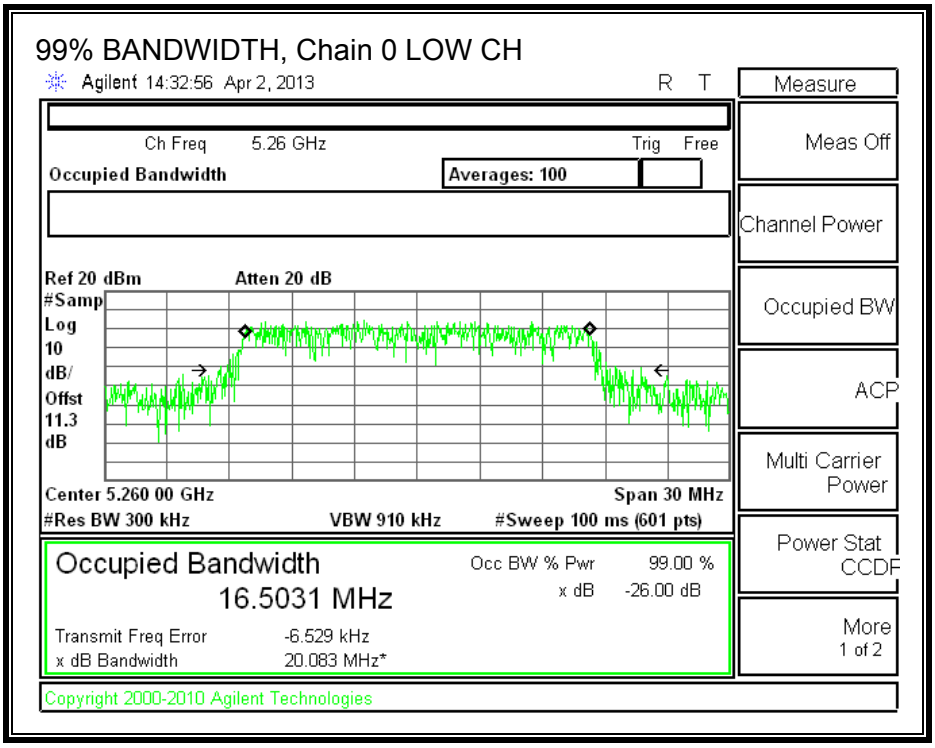
None; for reporting purposes only.

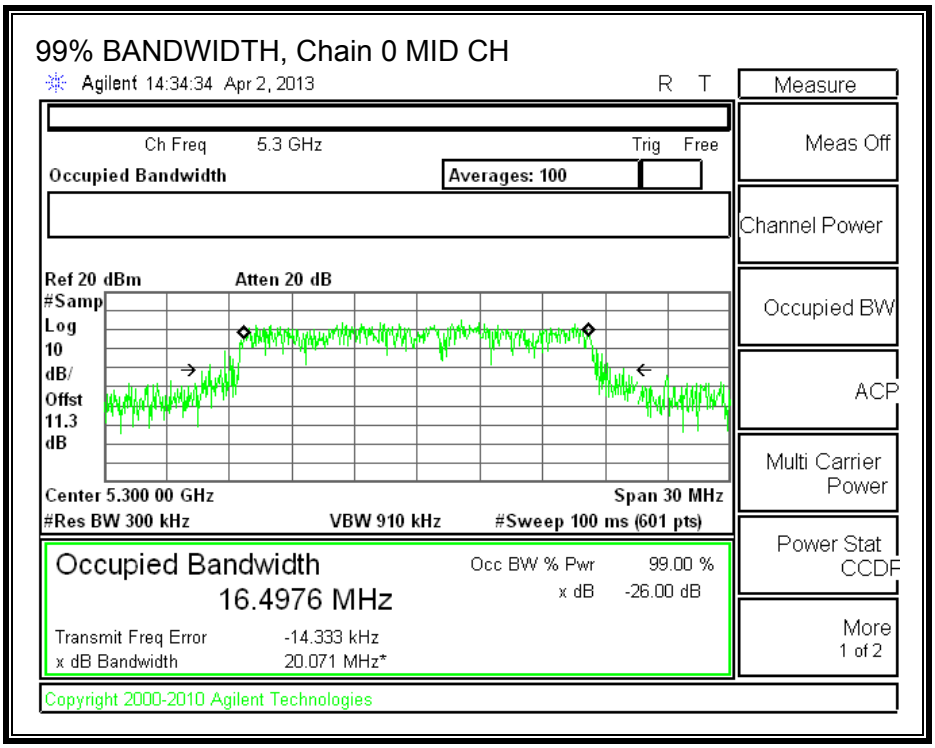
RESULTS

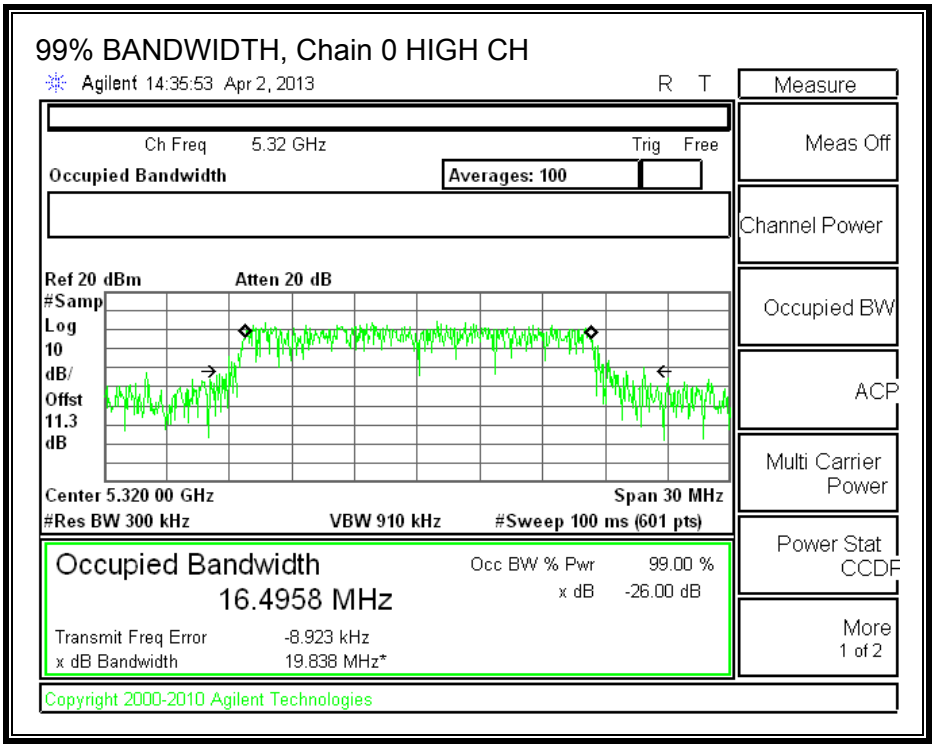
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	16.5	16.6
Mid	5300	16.5	16.6
High	5320	16.5	16.6

99% BANDWIDTH

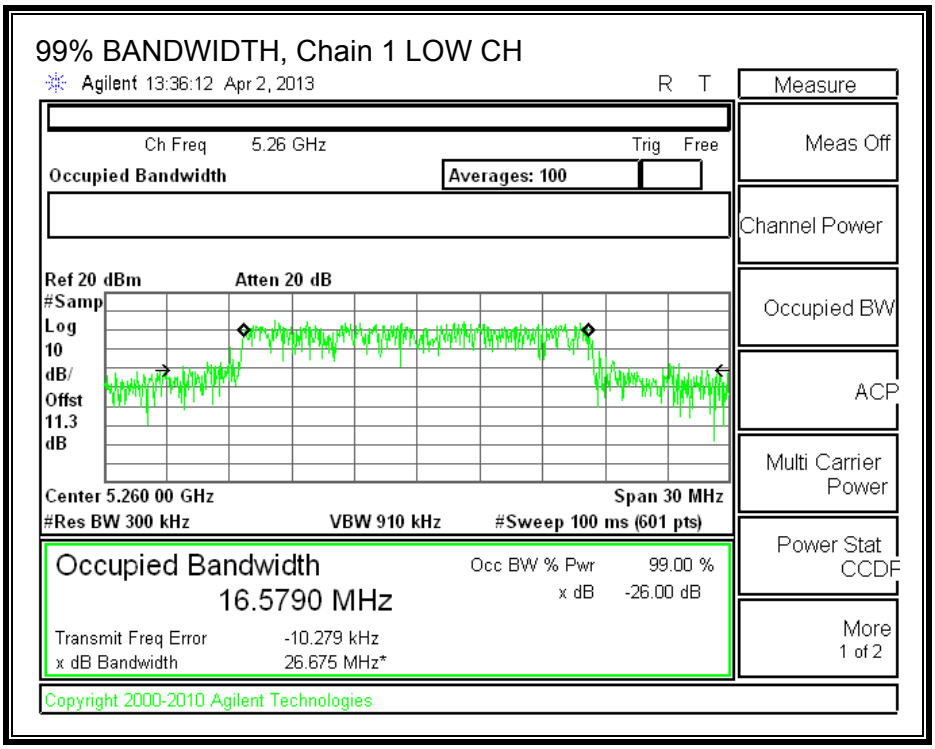
99% BANDWIDTH, Chain 0

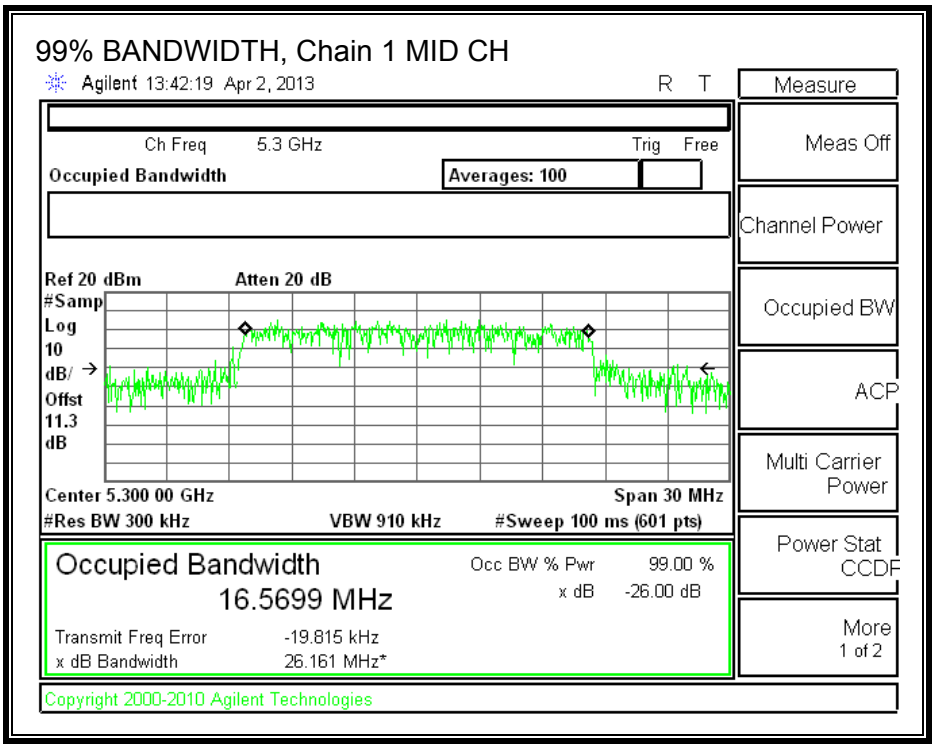


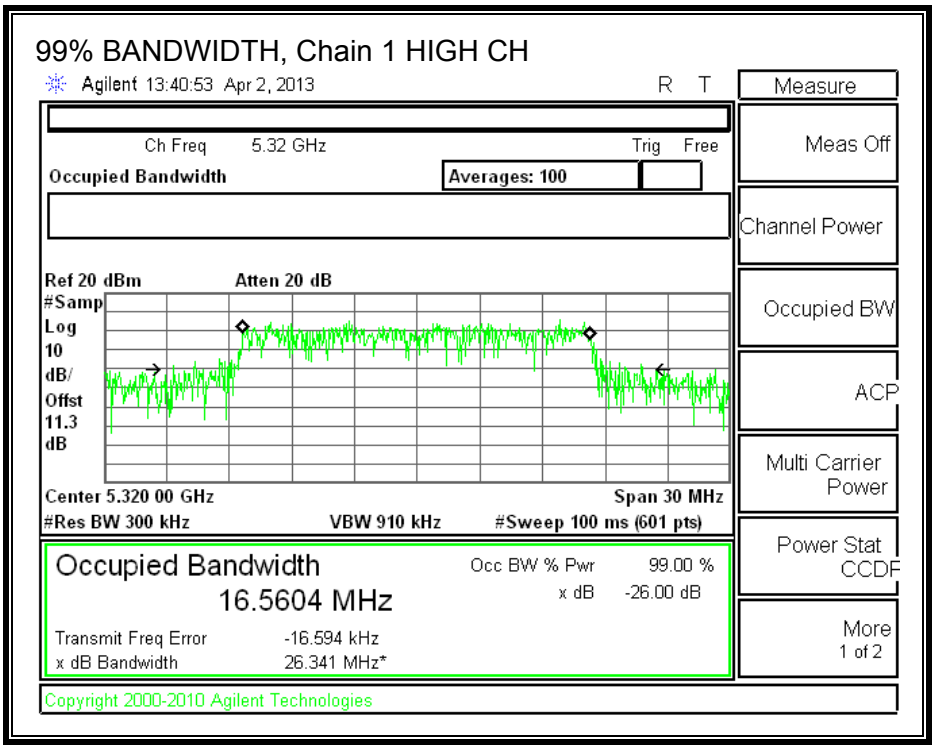




99% BANDWIDTH, Chain 1







8.2.3. **AVERAGE POWER**

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5260	16.10	16.00	19.06
Mid	5300	15.80	16.30	19.07
High	5320	15.60	16.30	18.97

8.2.4. **OUTPUT POWER AND PPSD**

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Un-Correlated Gain =10*LOG((10^(3.38/10)+10^(3.43/10))/2)

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.38	3.43	3.41

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Correlated Gain =10*LOG(((10^(3.38/20)+10^(3.43/20))^2)/2)

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.38	3.43	6.42

RESULTS

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	26.00	16.5000	3.41
Mid	5300	25.90	16.5000	3.41
High	5320	25.90	16.5000	3.41

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5260	24.00	23.17	29.17	23.17
Mid	5300	24.00	23.17	29.17	23.17
High	5320	24.00	23.17	29.17	23.17

Duty Cycle CF (dB)	0.00	

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	15.76	15.85	18.82	23.17	-4.36
Mid	5300	15.44	15.72	18.59	23.17	-4.58
High	5320	15.23	15.80	18.53	23.17	-4.64

PSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	26.00	16.5000	6.42
Mid	5300	25.90	16.5000	6.42
High	5320	25.90	16.5000	6.42

Limits

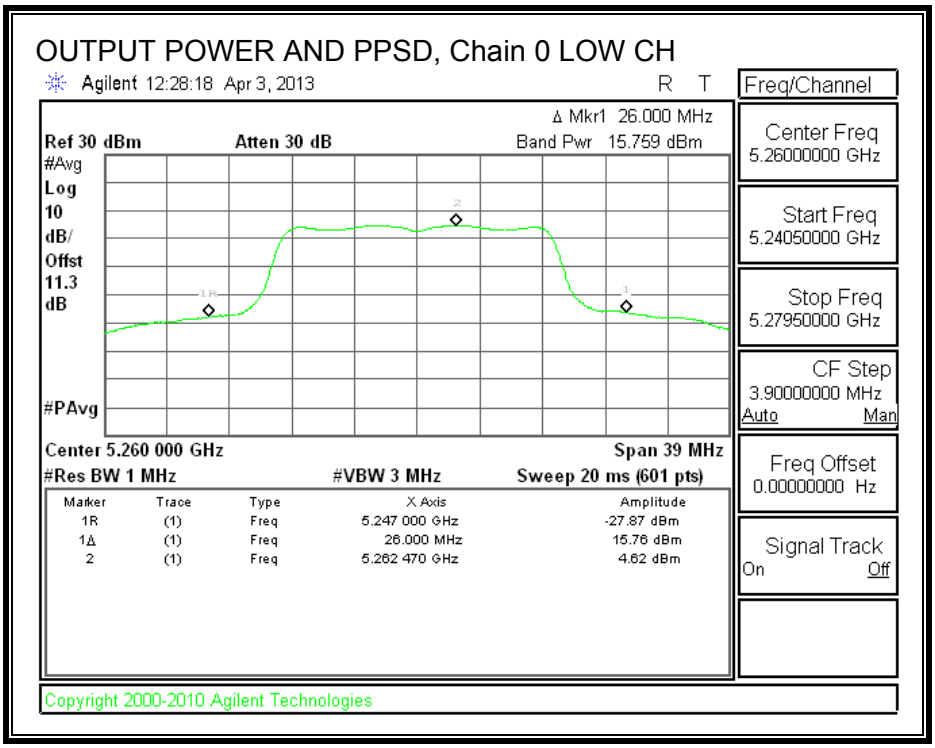
Channel	Frequency (MHz)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5260	10.58	11.00	10.58
Mid	5300	10.58	11.00	10.58
High	5320	10.58	11.00	10.58

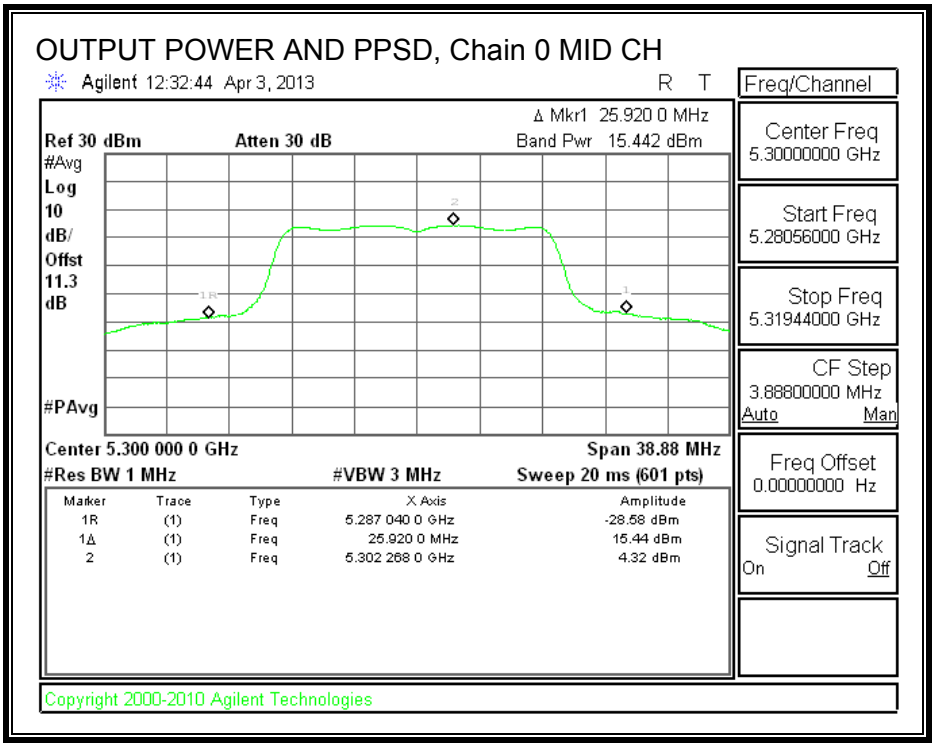
Duty Cycle CF (dB)	0.00	

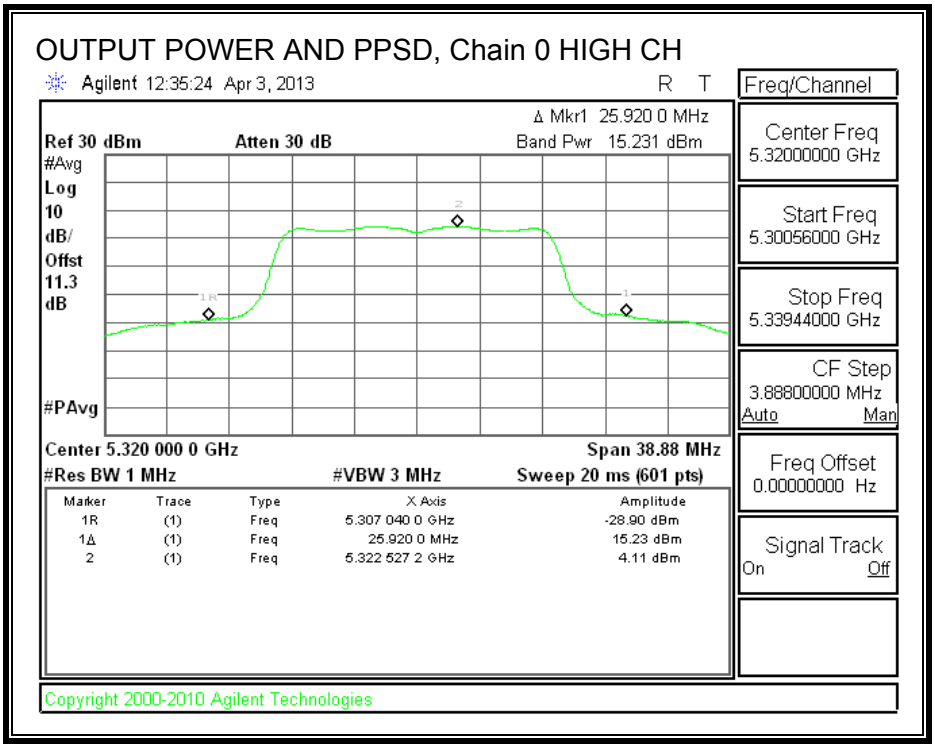
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	4.62	4.74	7.69	10.58	-2.89
Mid	5300	4.32	4.58	7.46	10.58	-3.12
High	5320	4.11	4.67	7.41	10.58	-3.17

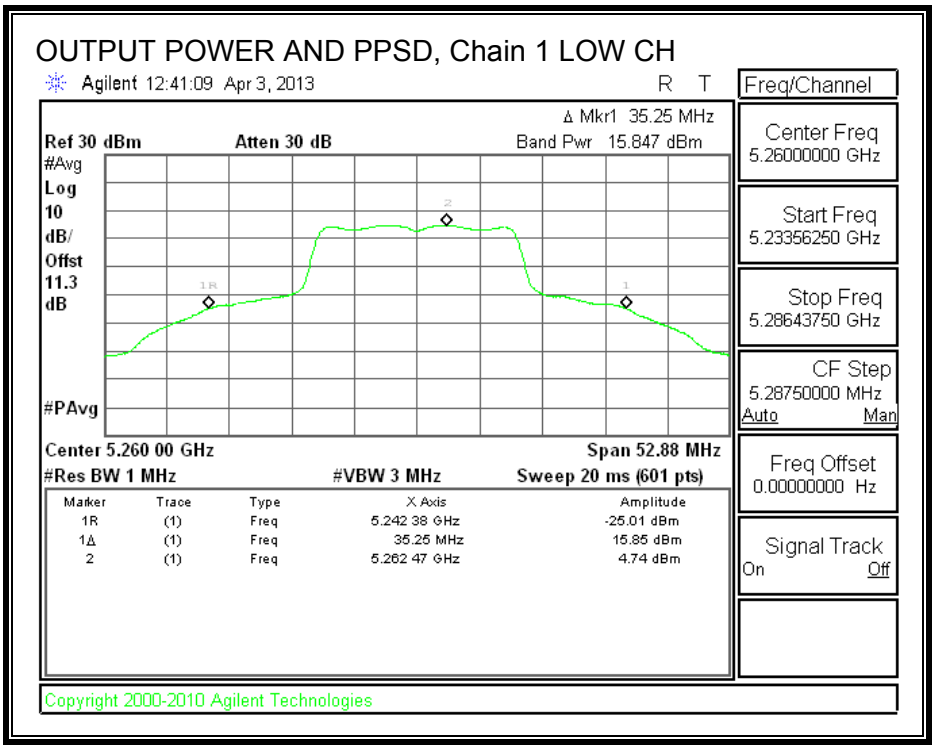
OUTPUT POWER AND PPSD, Chain 0

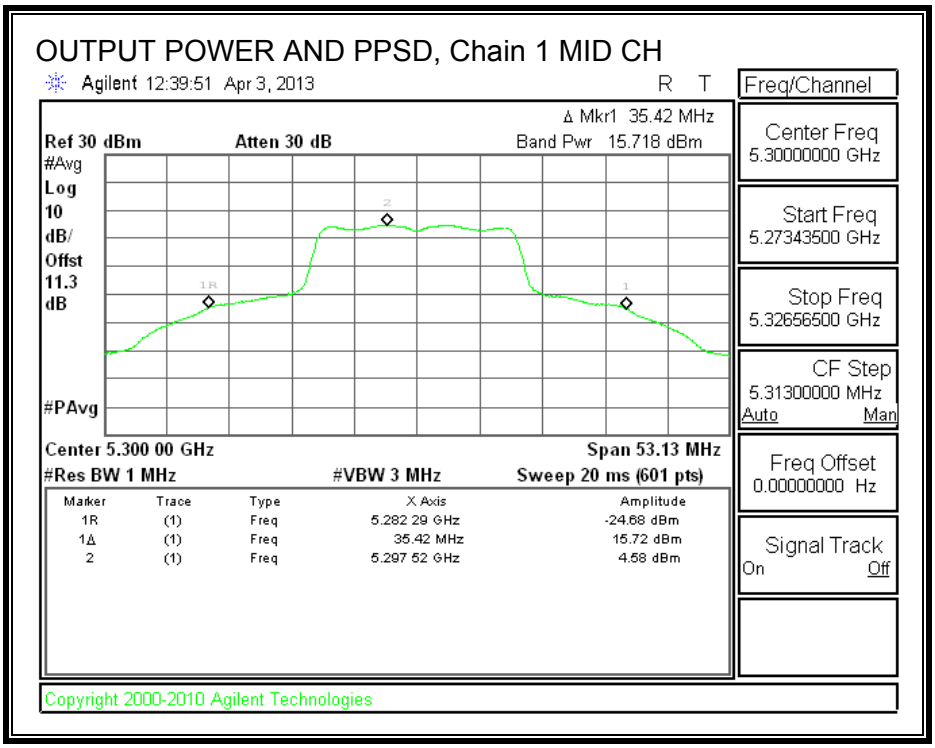


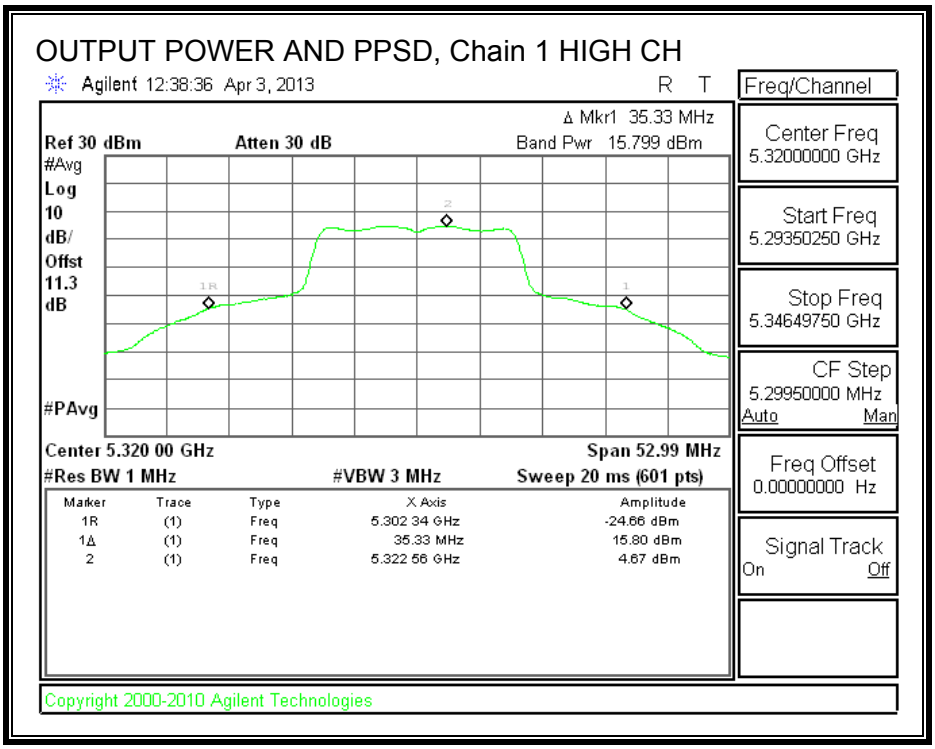




OUTPUT POWER AND PPSD, Chain 1







8.2.5. **PEAK EXCURSION**

LIMITS

FCC §15.407 (a) (6)

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

RESULTS

Refer to the results of 802.11n HT20 mode in the 5.2 GHz band.

8.2.6. **TPC POWER**

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (2)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

A TPC mechanism is not required since e.i.r.p. of less than 500 mW.

8.3. 802.11n HT20 MODE IN THE 5.3 GHz BAND

8.3.1. **26 dB BANDWIDTH**

LIMITS

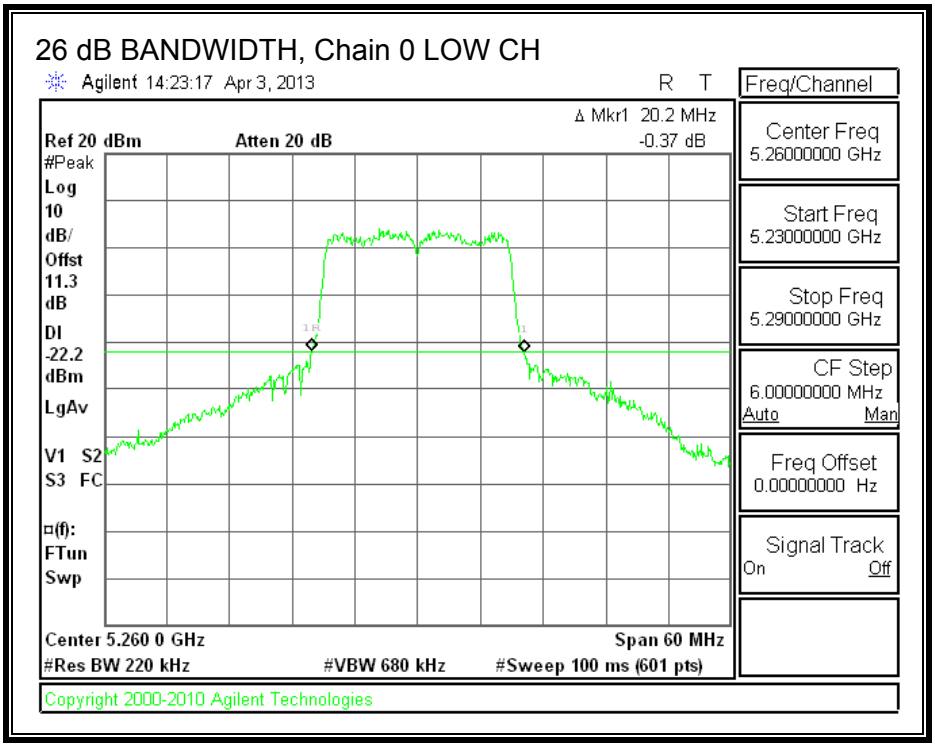
None; for reporting purposes only.

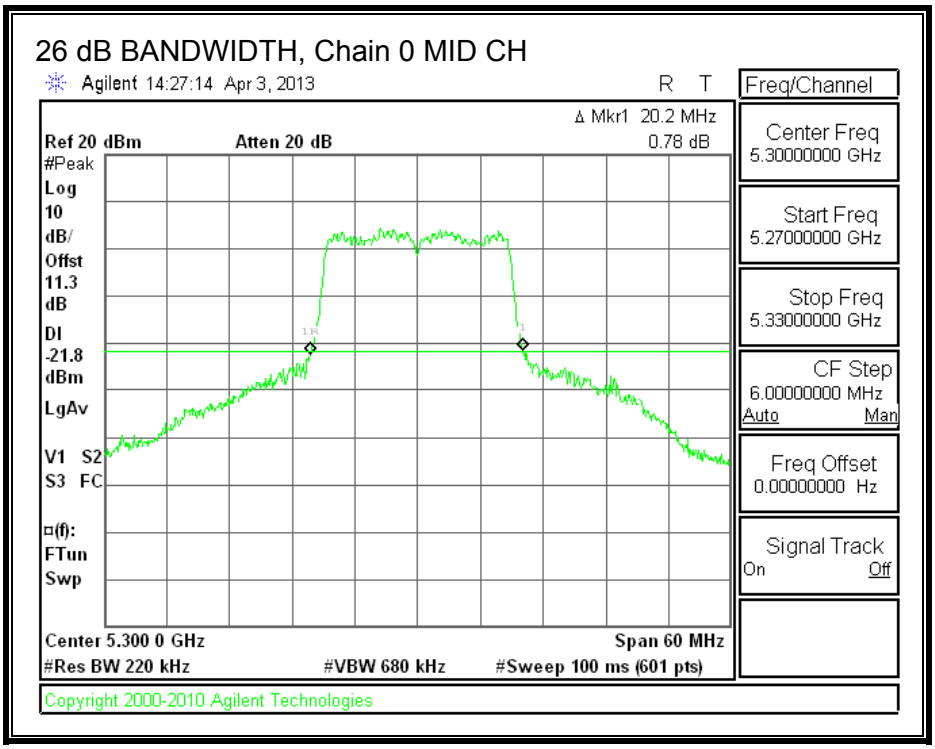
RESULTS

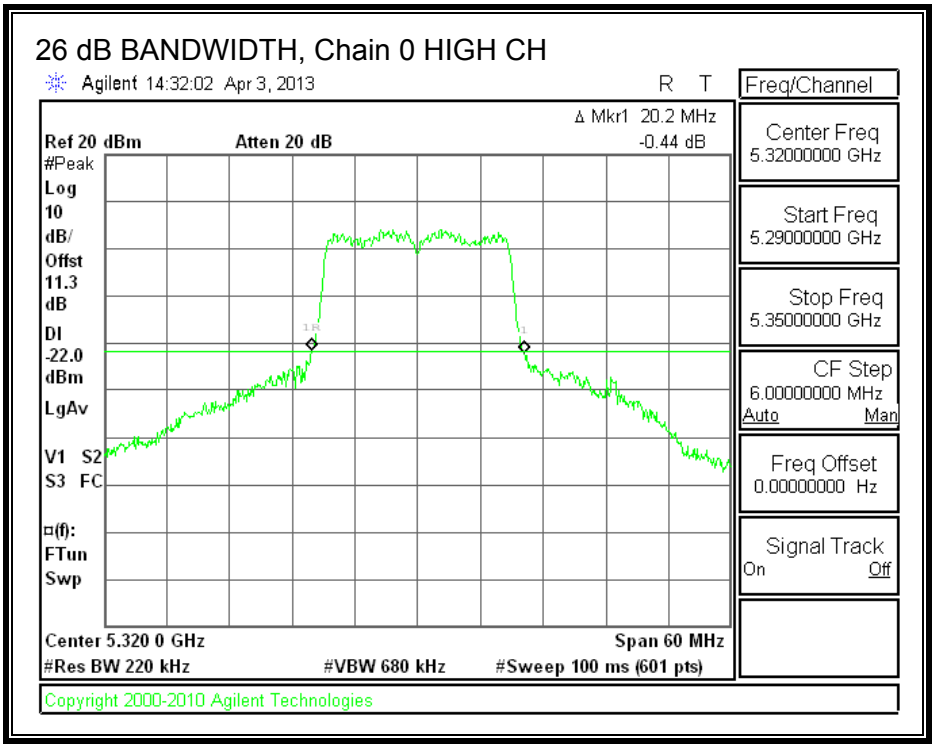
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	20.2	26.5
Mid	5300	20.2	21.0
High	5320	20.2	21.8

26 dB BANDWIDTH

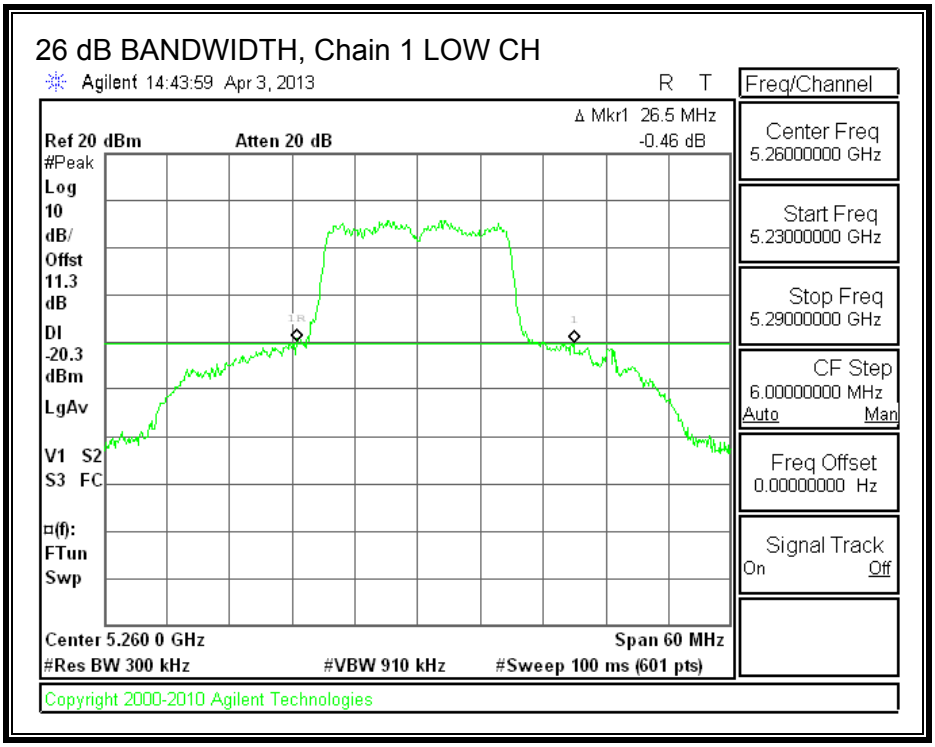
26 dB BANDWIDTH, Chain 0

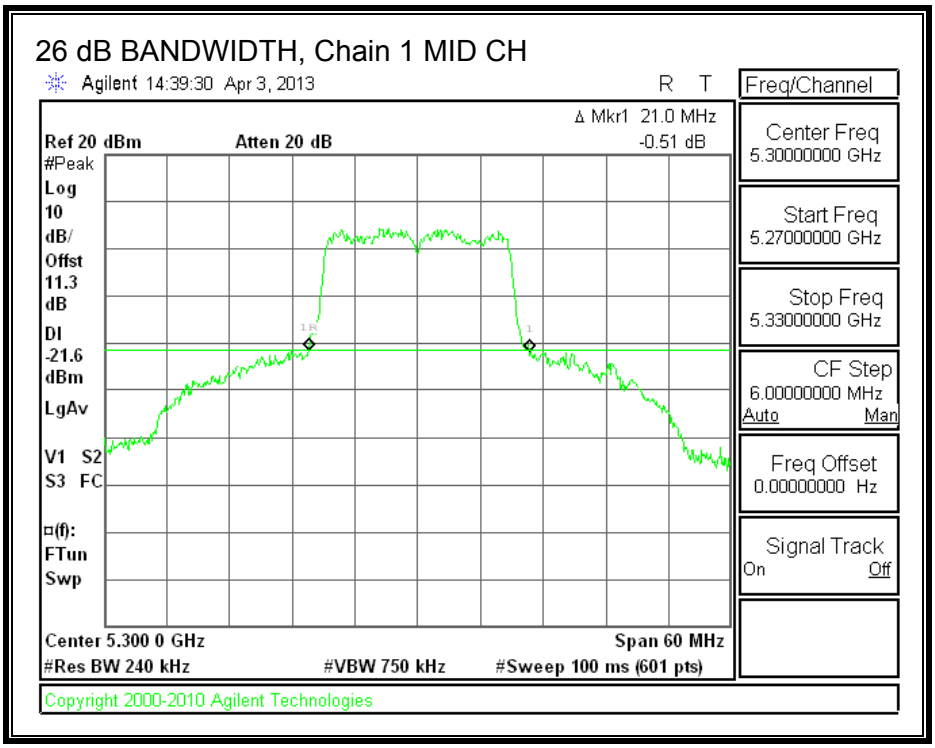


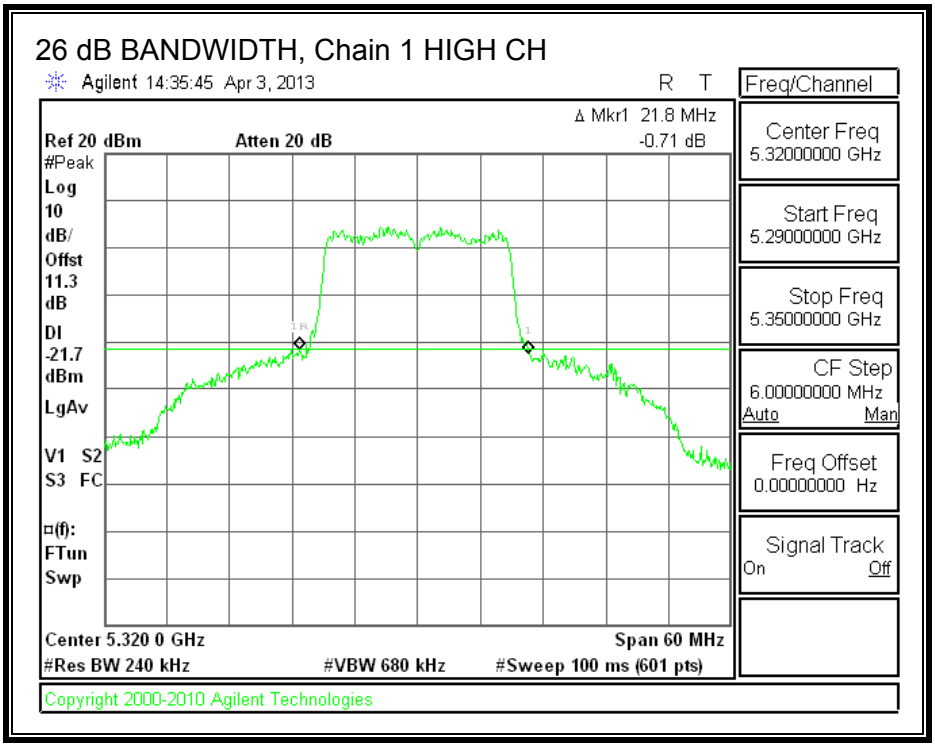




26 dB BANDWIDTH, Chain 1







8.3.2. **99% BANDWIDTH**

LIMITS

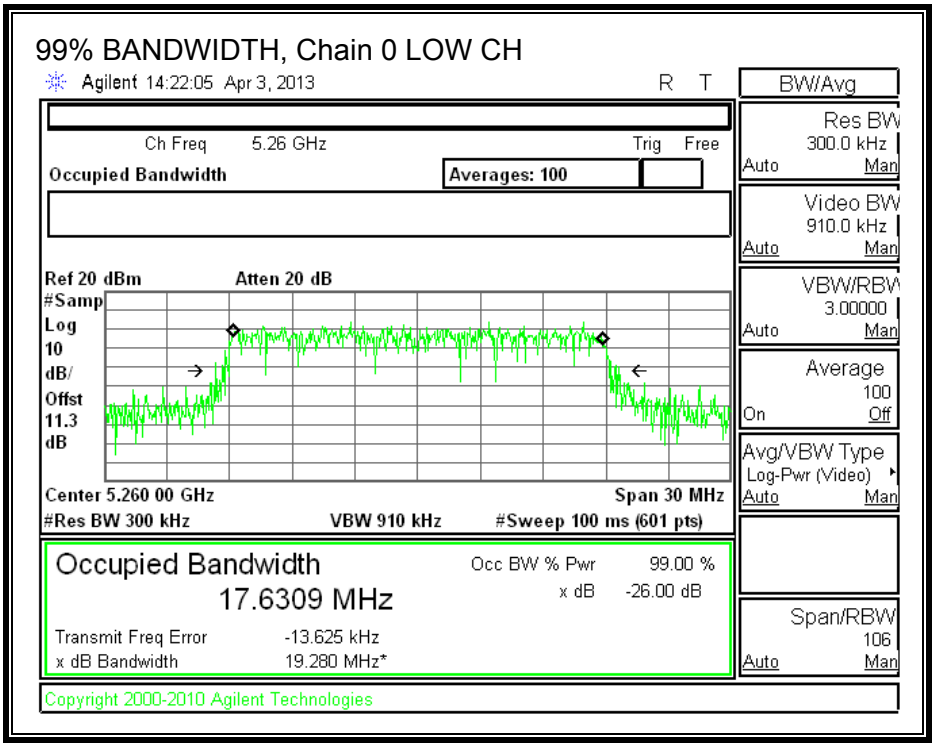
None; for reporting purposes only.

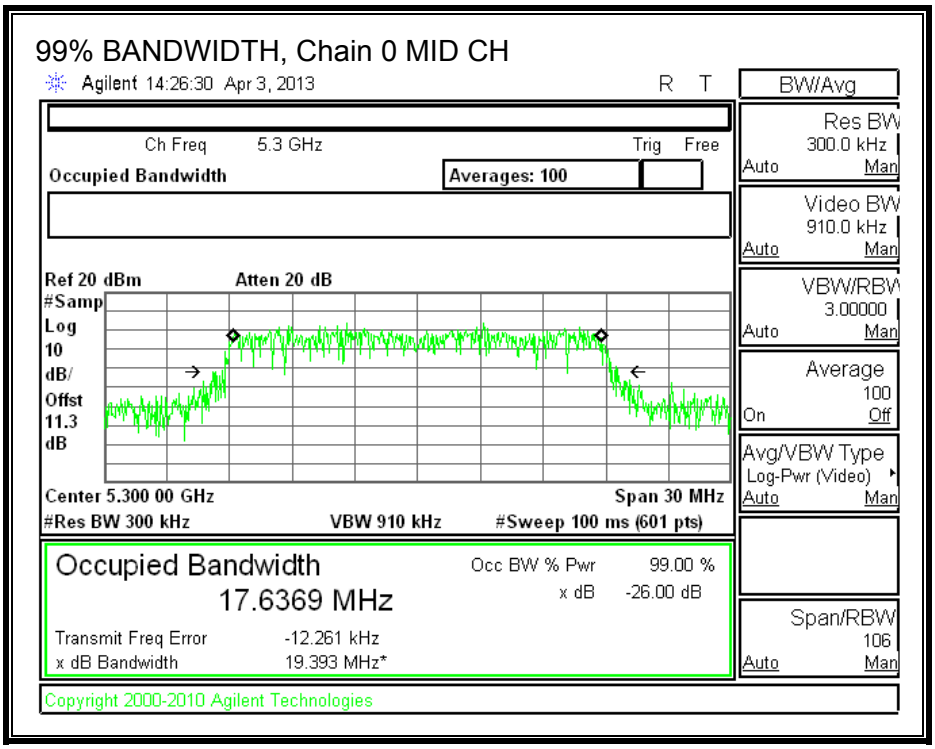
RESULTS

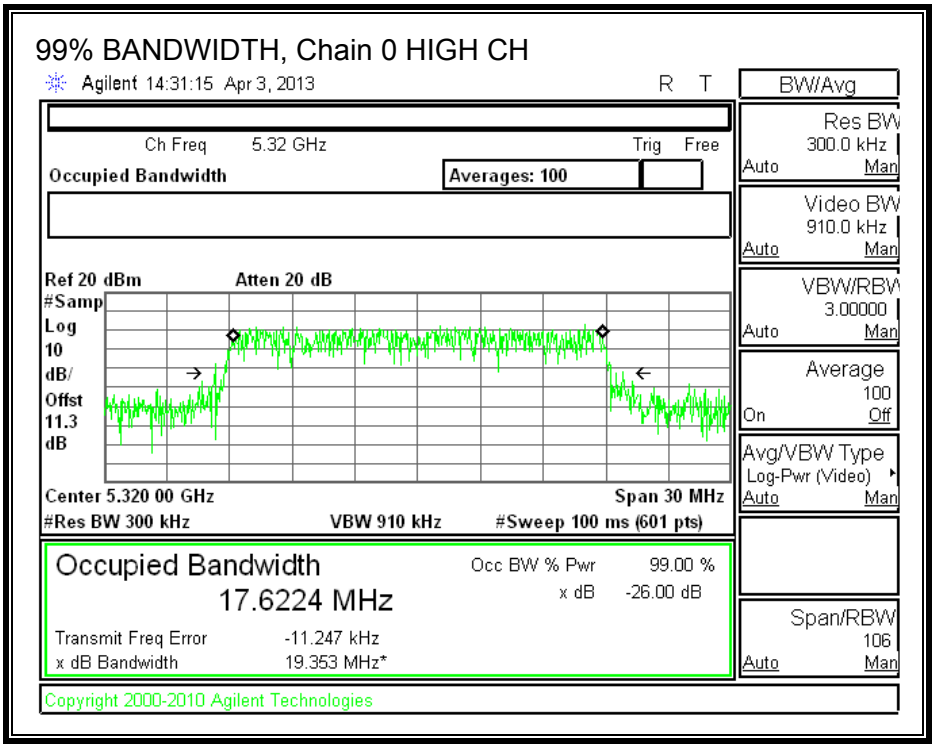
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	17.6	17.6
Mid	5300	17.6	17.6
High	5320	17.6	17.6

99% BANDWIDTH

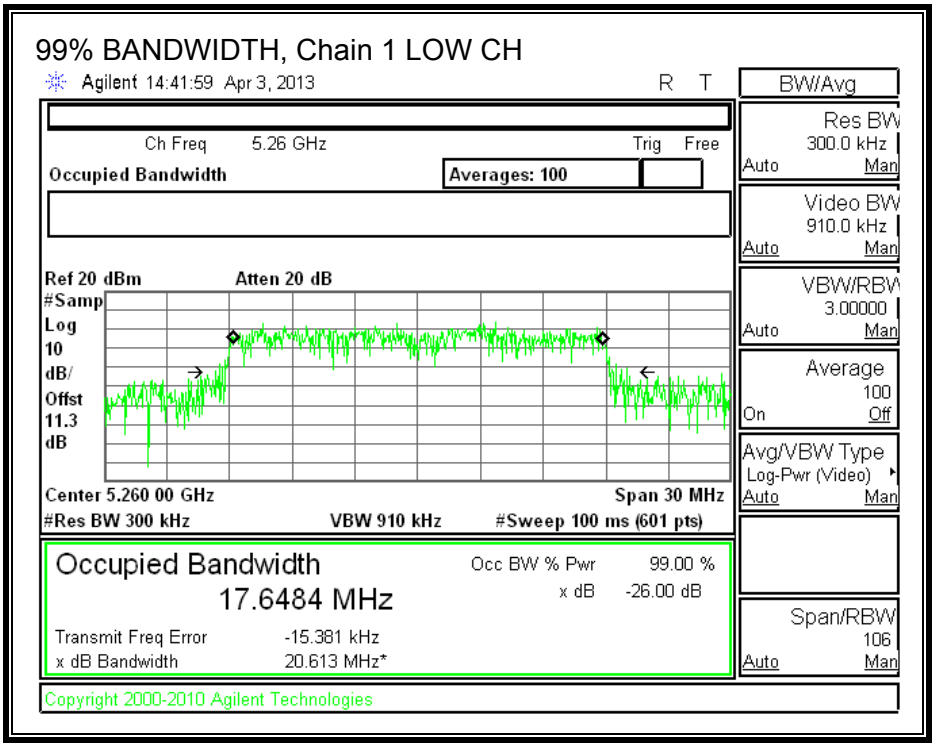
99% BANDWIDTH, Chain 0

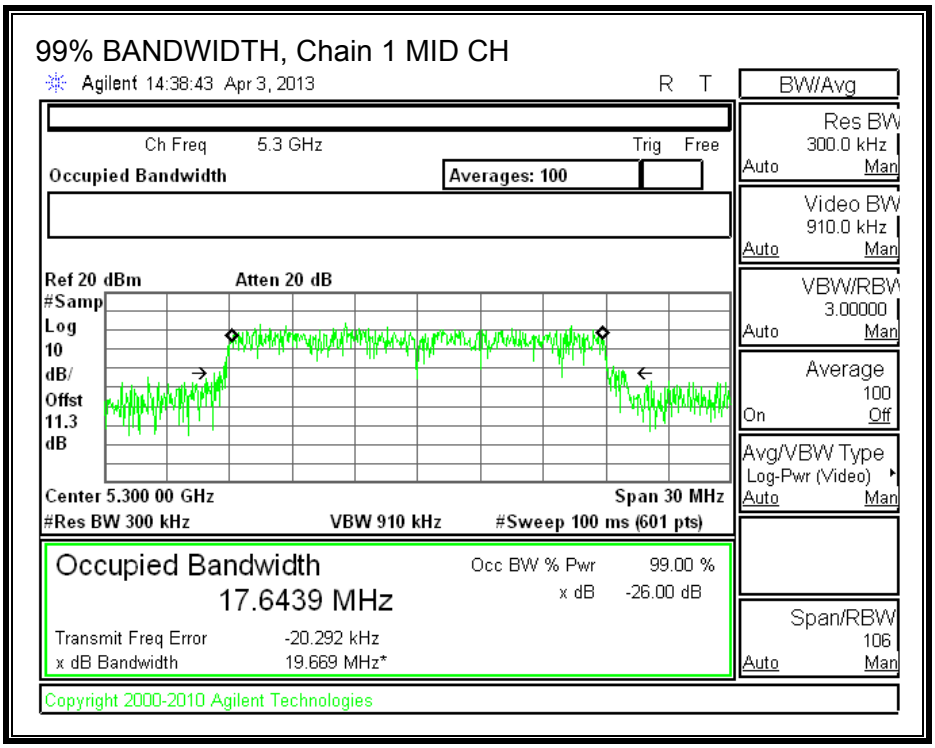


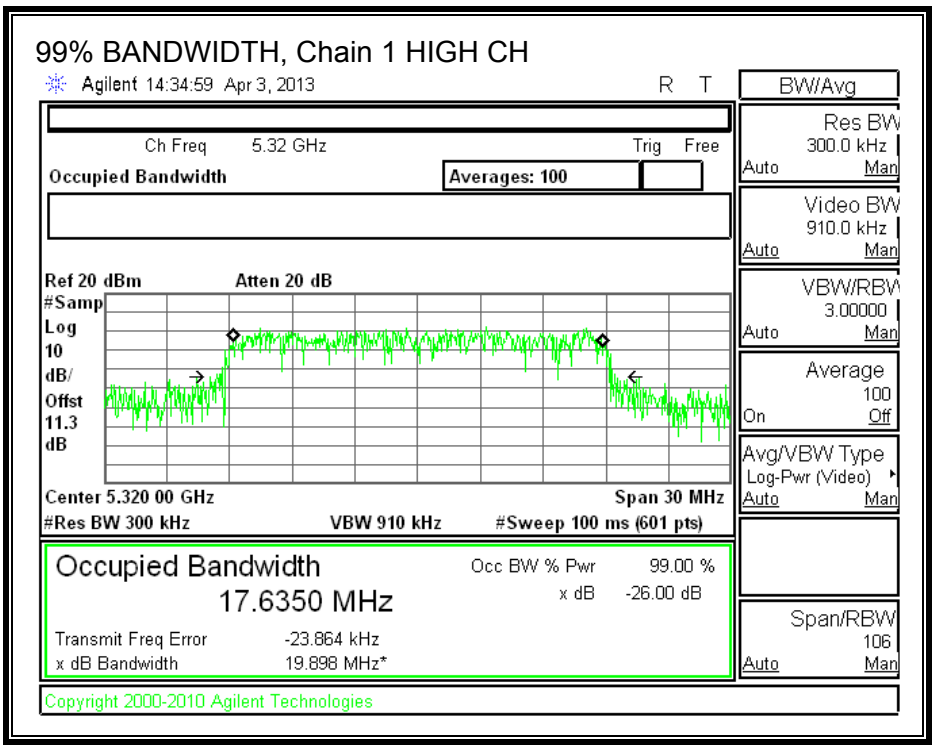




99% BANDWIDTH, Chain 1







8.3.3. **AVERAGE POWER**

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5260	13.75	13.79	16.78
Mid	5300	13.69	13.64	16.68
High	5320	12.45	12.53	15.50

8.3.4. **OUTPUT POWER AND PPSD**

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.38	3.43	3.41

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.38	3.43	6.42

RESULTS

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	20.20	17.6000	3.41
Mid	5300	20.20	17.6000	3.41
High	5320	20.20	17.6000	3.41

Limits

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

Duty Cycle CF (dB)	0.00	

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.18	14.79	17.51	23.46	-5.95
Mid	5300	13.88	14.10	17.00	23.46	-6.45
High	5320	13.91	13.65	16.79	23.46	-6.66

PSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	20.20	17.6000	6.42
Mid	5300	20.20	17.6000	6.42
High	5320	20.20	17.6000	6.42

Limits

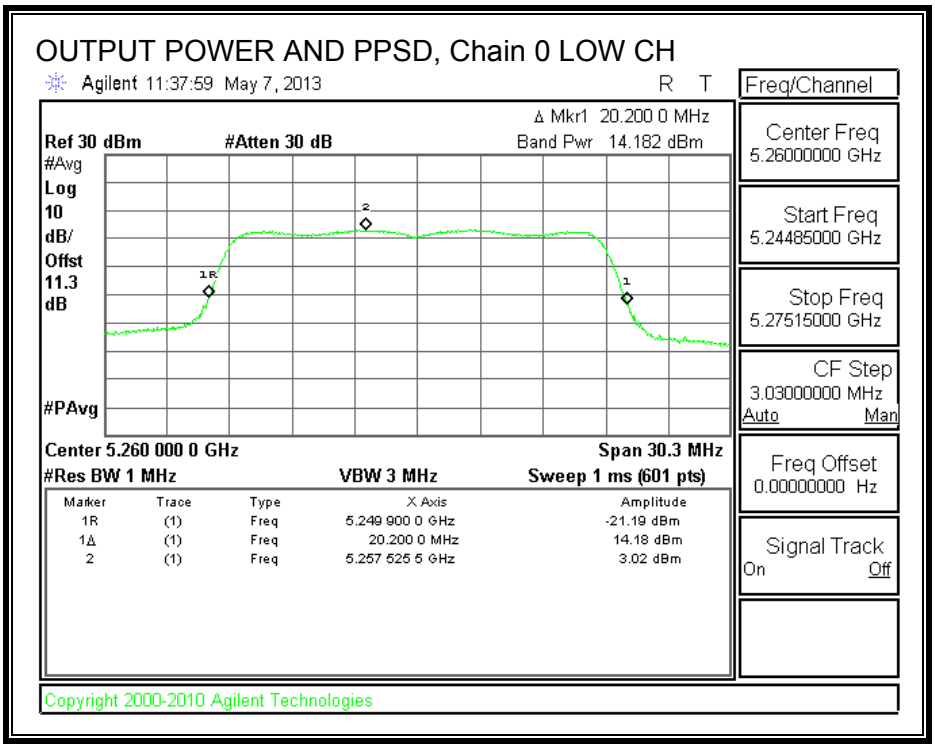
Channel	Frequency (MHz)	FCC PSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5260	10.58	11.00	10.58
Mid	5300	10.58	11.00	10.58
High	5320	10.58	11.00	10.58

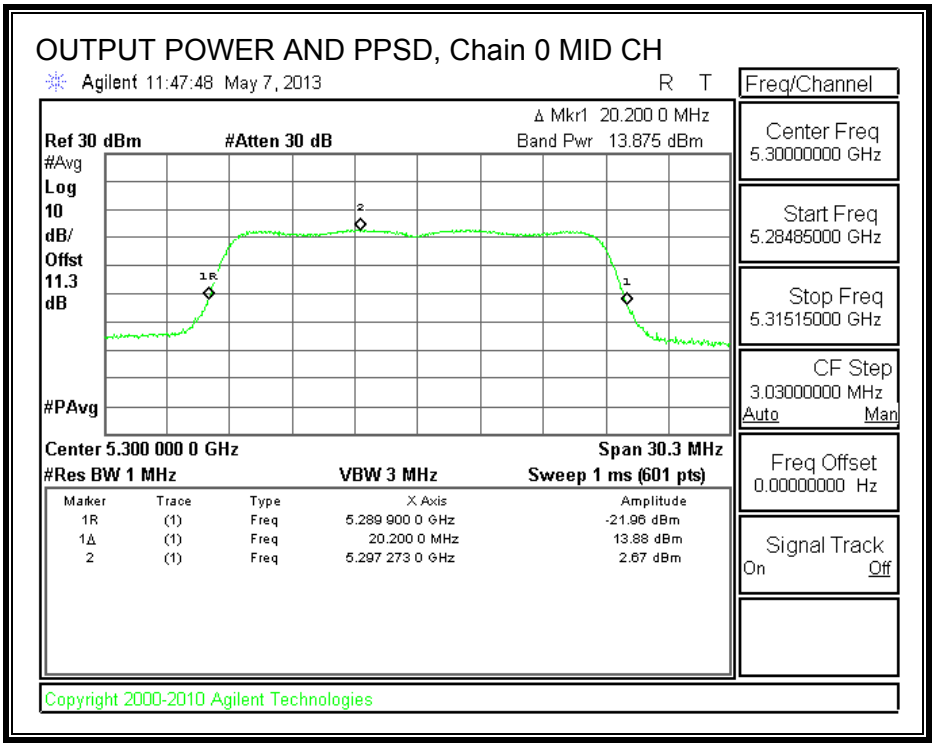
Duty Cycle CF (dB)	0.00	

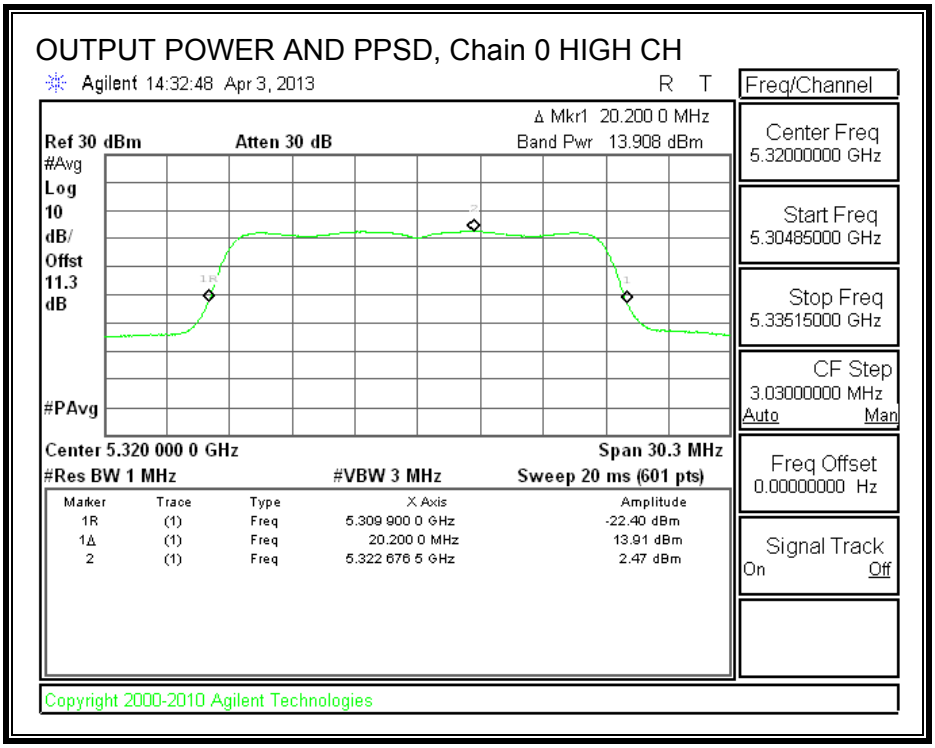
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	3.02	3.69	6.38	10.58	-4.20
Mid	5300	2.67	3.20	5.95	10.58	-4.63
High	5320	2.47	2.22	5.36	10.58	-5.22

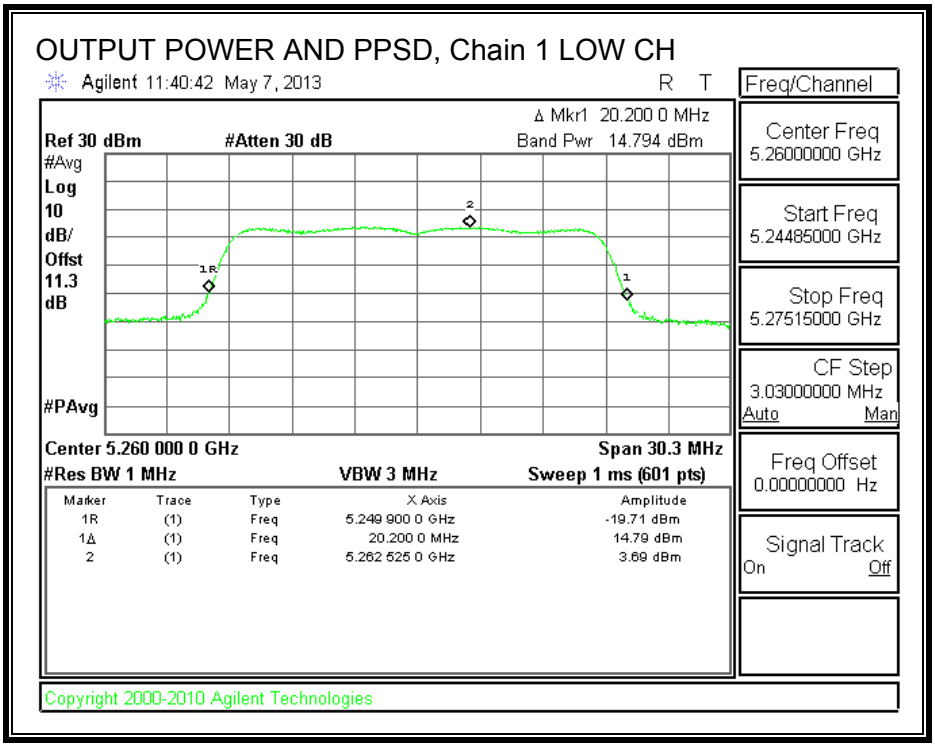
OUTPUT POWER AND PPSD, Chain 0

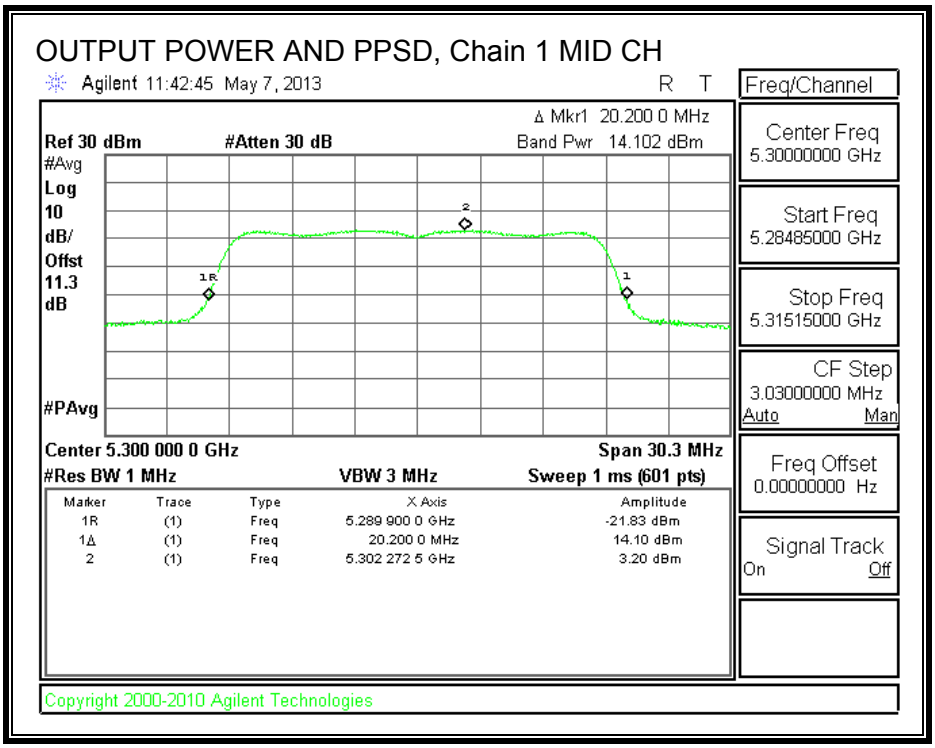


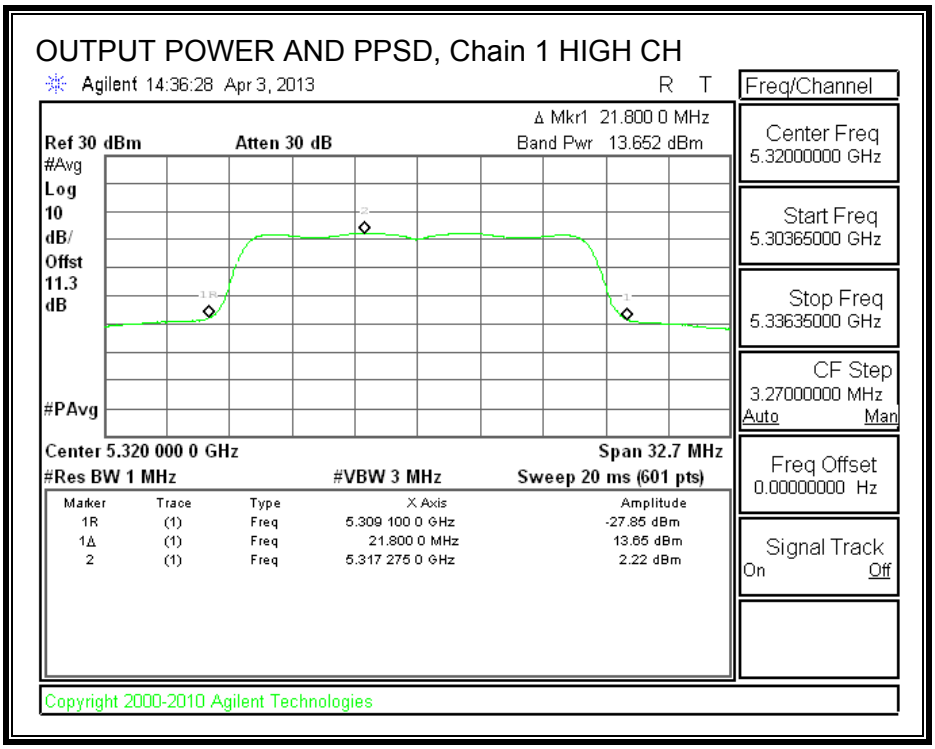




OUTPUT POWER AND PPSD, Chain 1







8.3.5. **PEAK EXCURSION**

LIMITS

FCC §15.407 (a) (6)

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

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5300	10.49	13.88	0.00	-3.39	13	-16.39

Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5300	11.85	14.10	0.00	-2.25	13	-15.25

8.3.6. **TPC POWER**

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (2)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

A TPC mechanism is not required since e.i.r.p. is less than 500 mW.

8.4. 802.11n HT40 MODE IN THE 5.3 GHz BAND

8.4.1. **26 dB BANDWIDTH**

LIMITS

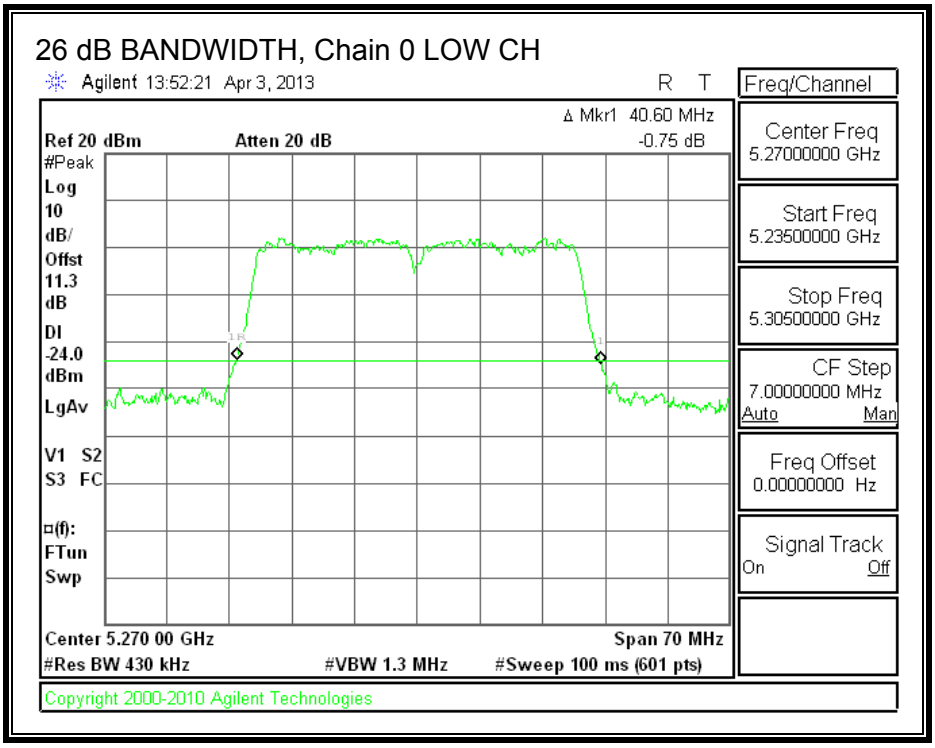
None; for reporting purposes only.

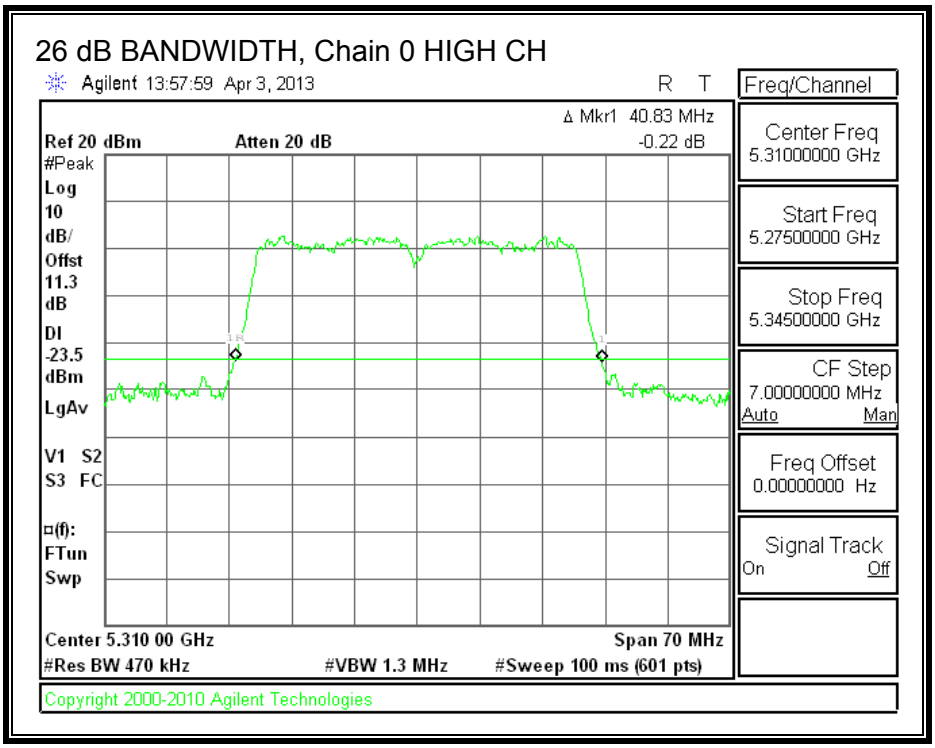
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5270	40.6	46.2
High	5310	40.8	40.8

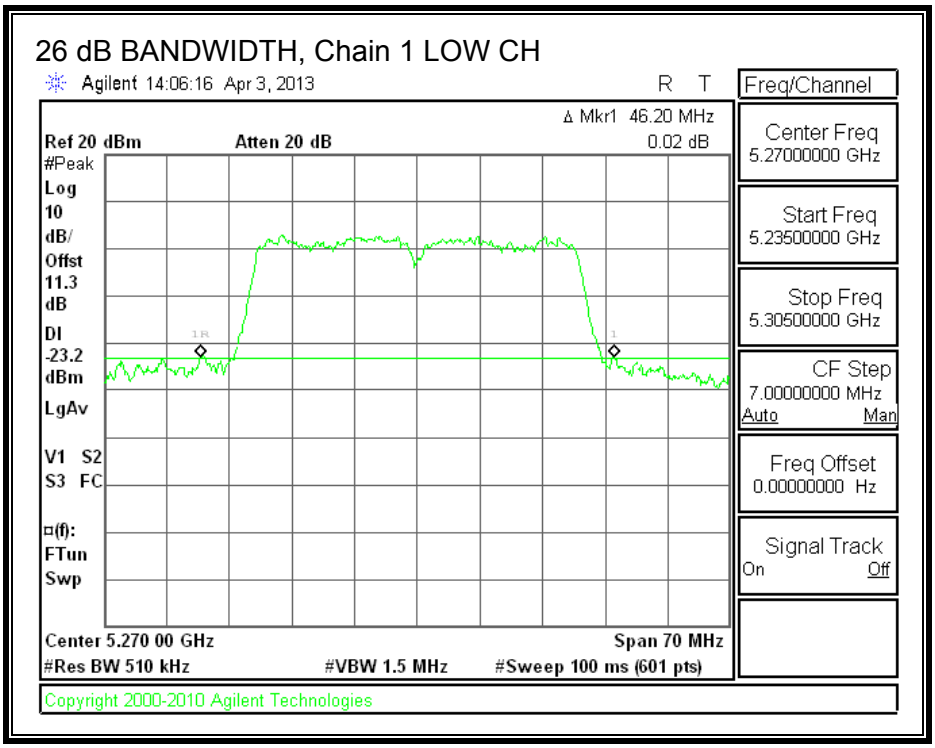
26 dB BANDWIDTH

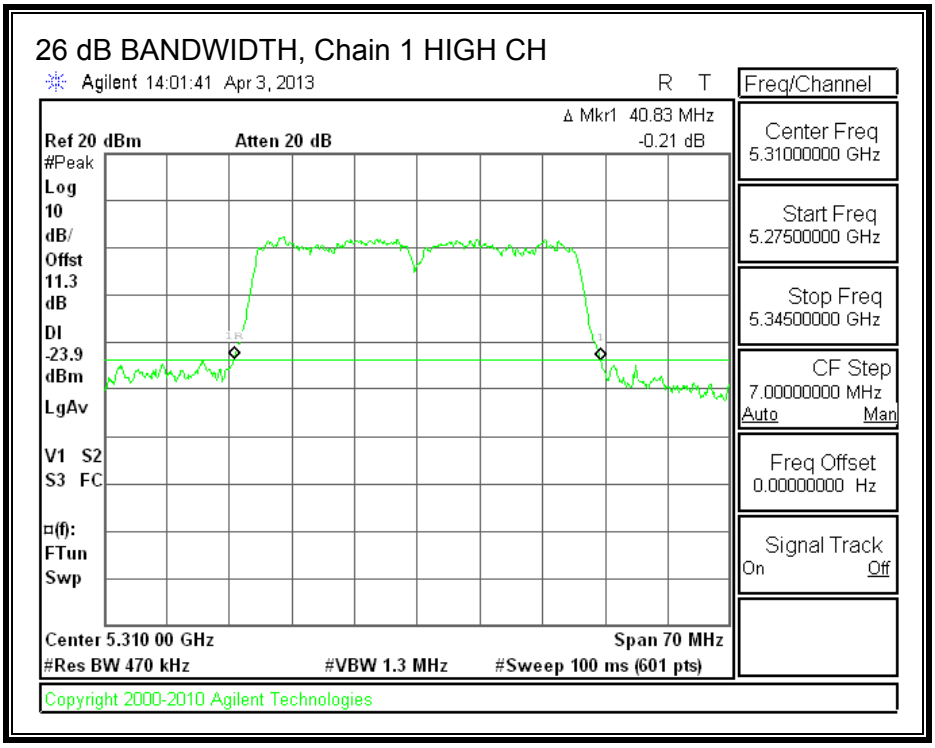
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.4.2. **99% BANDWIDTH**

LIMITS

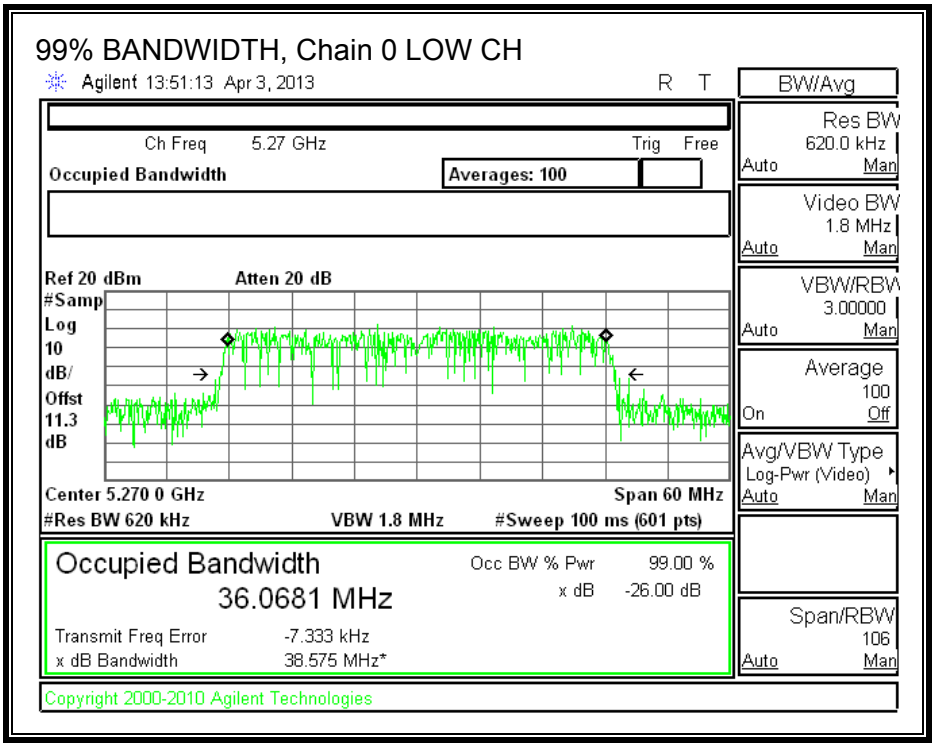
None; for reporting purposes only.

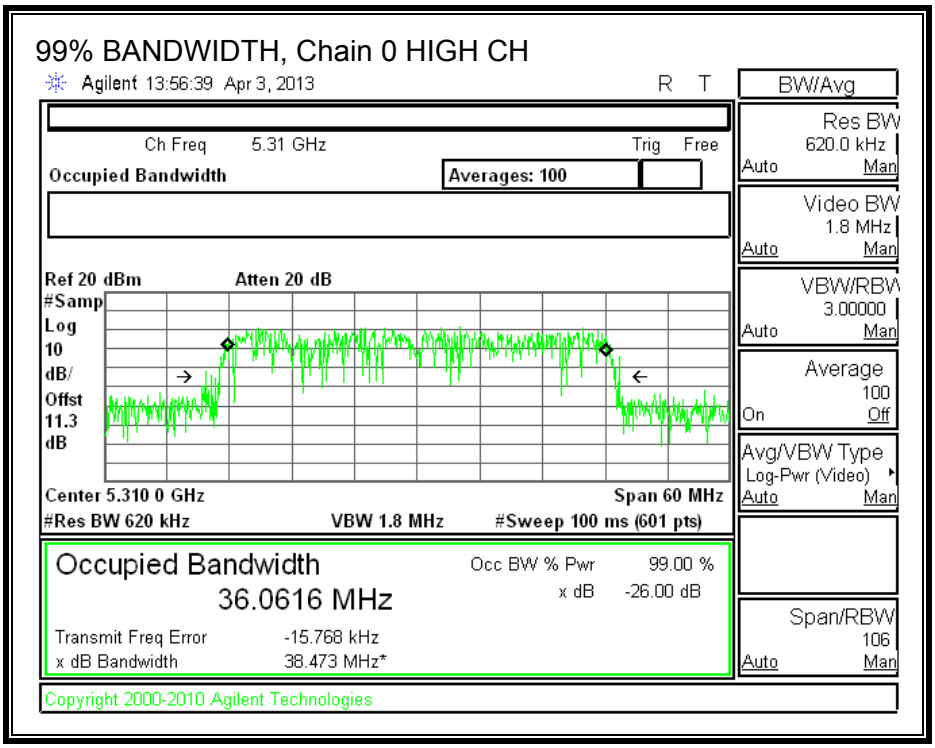
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5270	36.1	36.1
High	5310	36.1	36.1

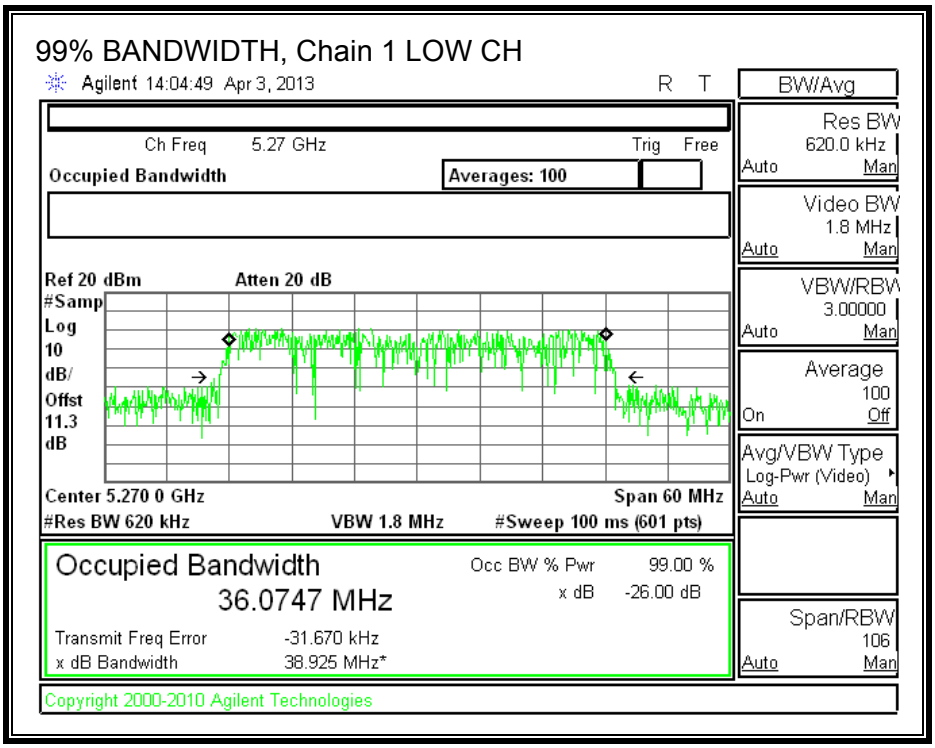
99% BANDWIDTH

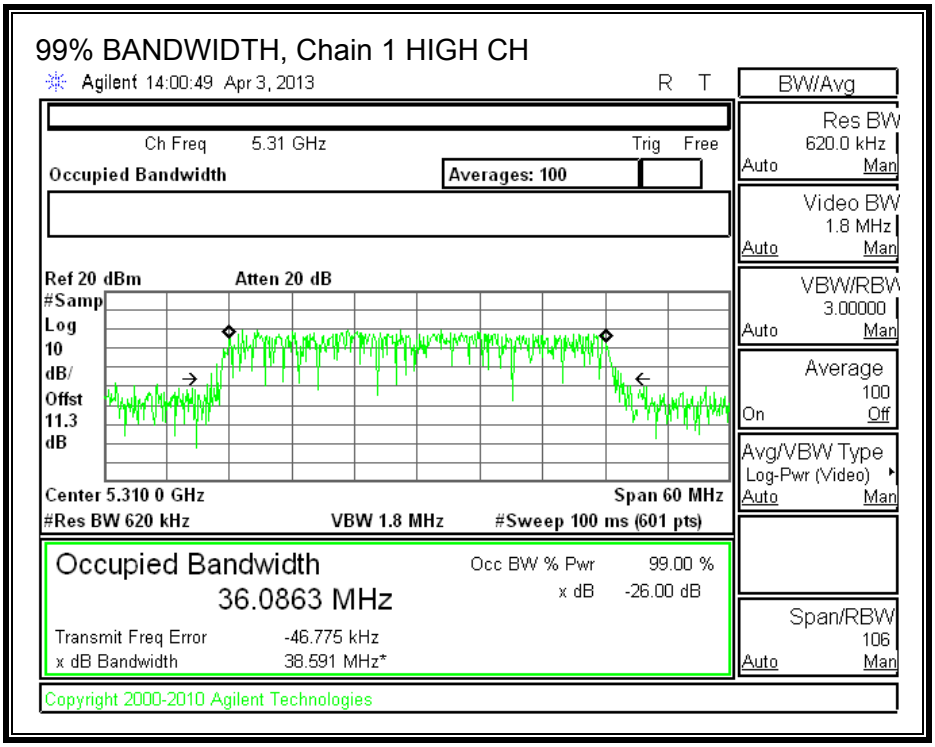
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.4.3. **AVERAGE POWER**

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5270	11.86	11.93	14.91
High	5310	10.96	10.81	13.90

8.4.4. **OUTPUT POWER AND PPSD**

LIMITS

FCC §15.407 (a) (1)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.38	3.43	3.41

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.38	3.43	6.42

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	40.6	36.1	6.42
High	5310	40.8	36.1	6.42

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5270	23.58	24.00	30.00	23.58	10.58	11.00	10.58
High	5310	23.58	24.00	30.00	23.58	10.58	11.00	10.58

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

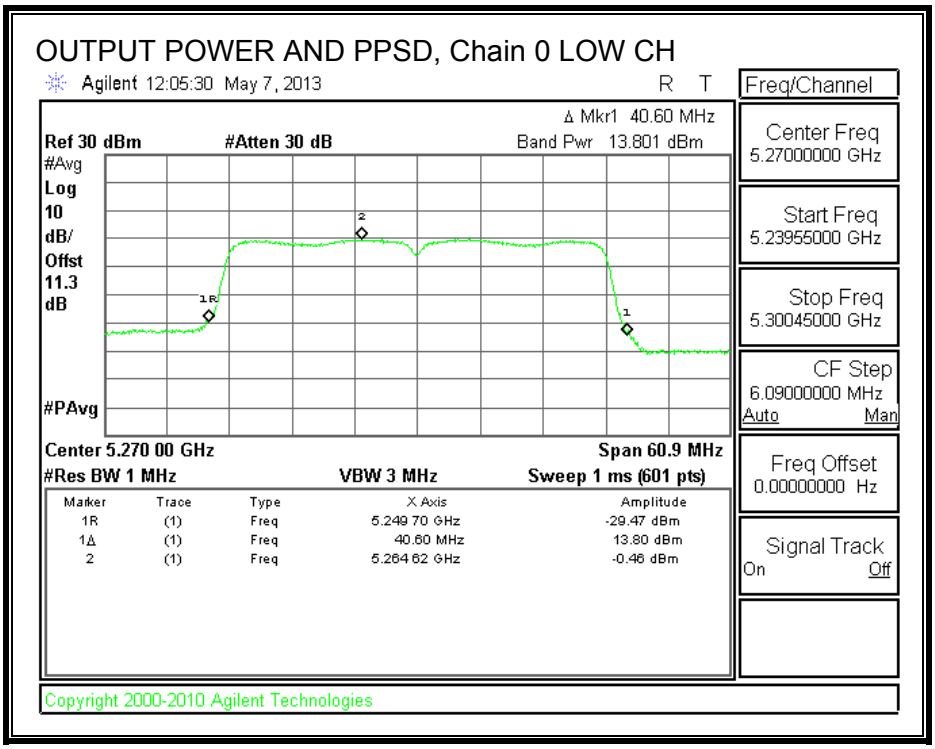
Output Power Results

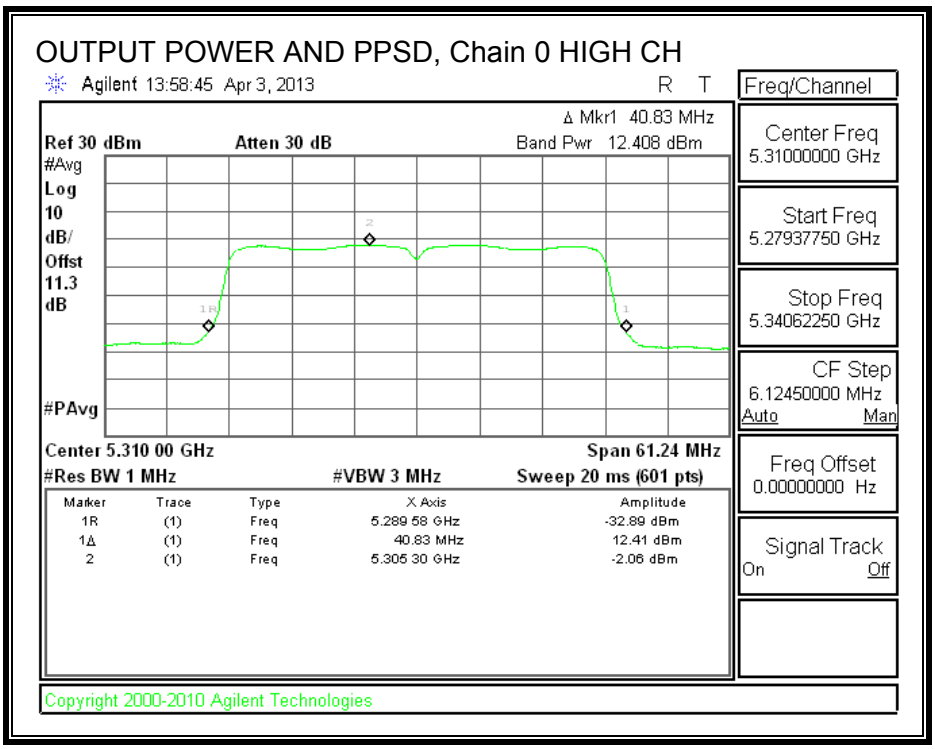
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	13.80	13.74	16.78	23.58	-6.80
High	5310	12.41	11.77	15.11	23.58	-8.47

PPSD Results

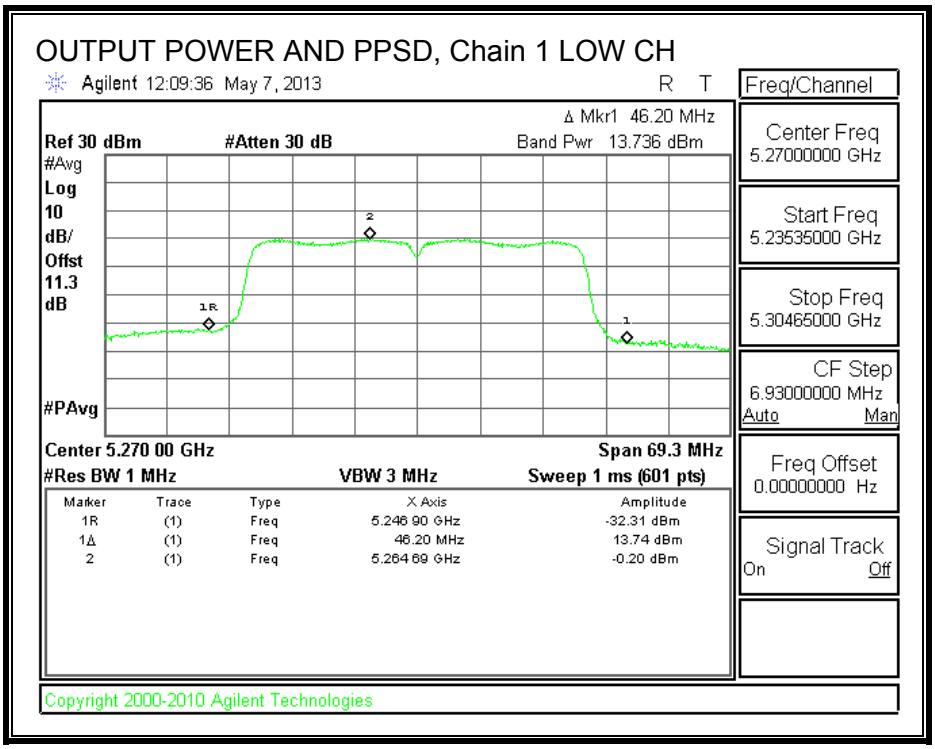
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	-0.46	-0.20	2.68	10.58	-7.90
High	5310	-2.06	-2.61	0.68	10.58	-9.90

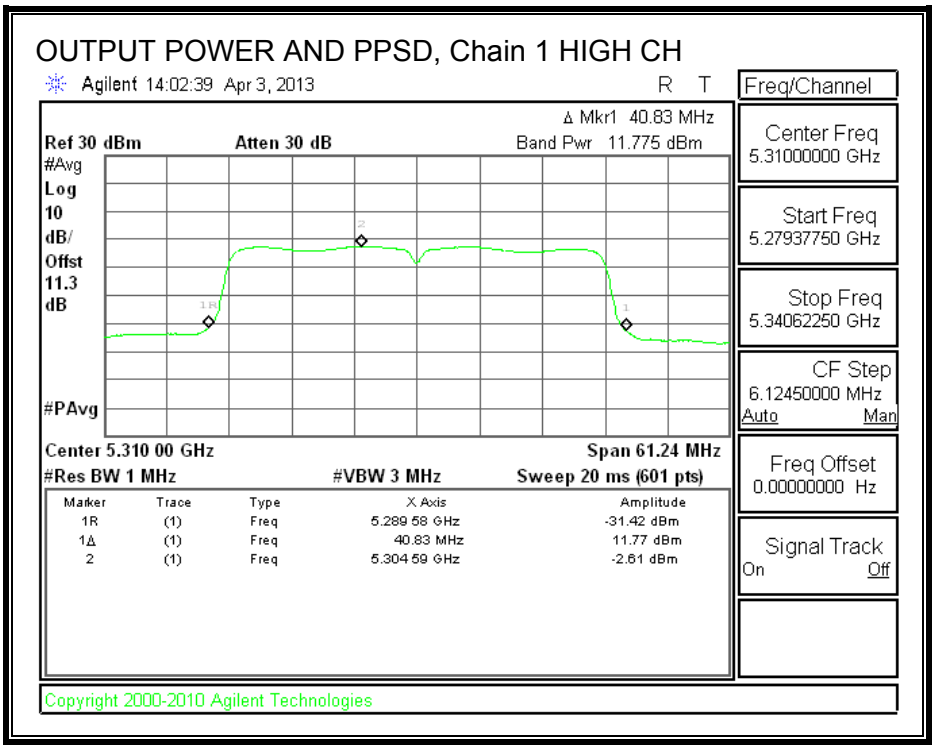
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





8.4.5. **PEAK EXCURSION**

LIMITS

FCC §15.407 (a) (6)

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

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5270	6.40	13.80	0.00	-7.40	13	-20.40

Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5270	6.76	13.74	0.00	-6.98	13	-19.98

8.4.6. **TPC POWER**

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (2)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

A TPC mechanism is not required since e.i.r.p. is less than 500 mW.

8.5. 802.11a MODE IN THE 5.6 GHz BAND

8.5.1. **26 dB BANDWIDTH**

LIMITS

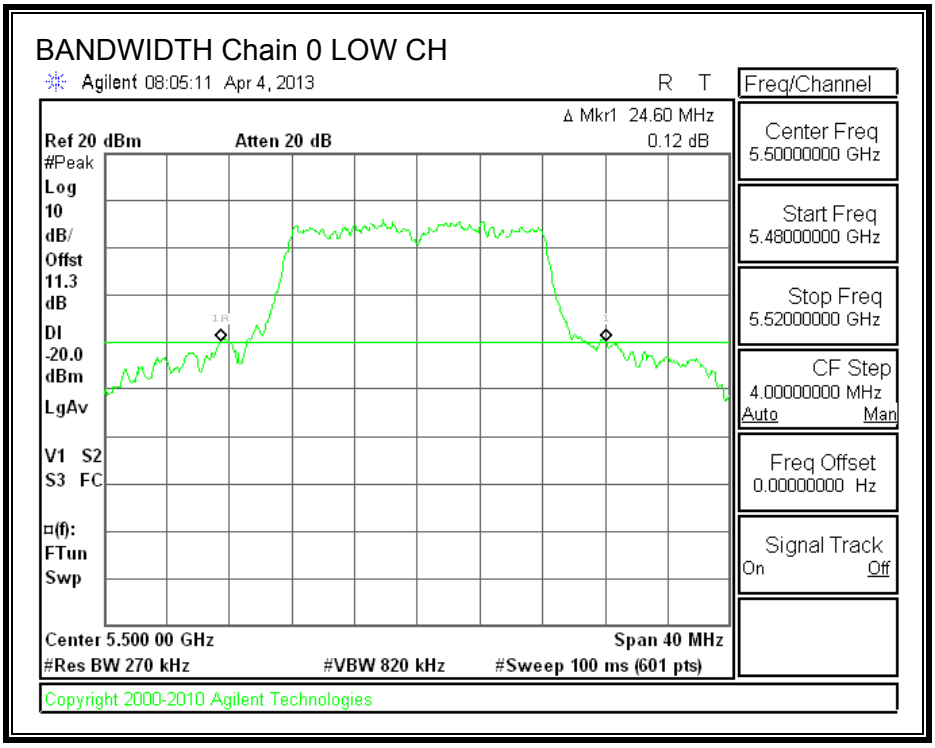
None; for reporting purposes only.

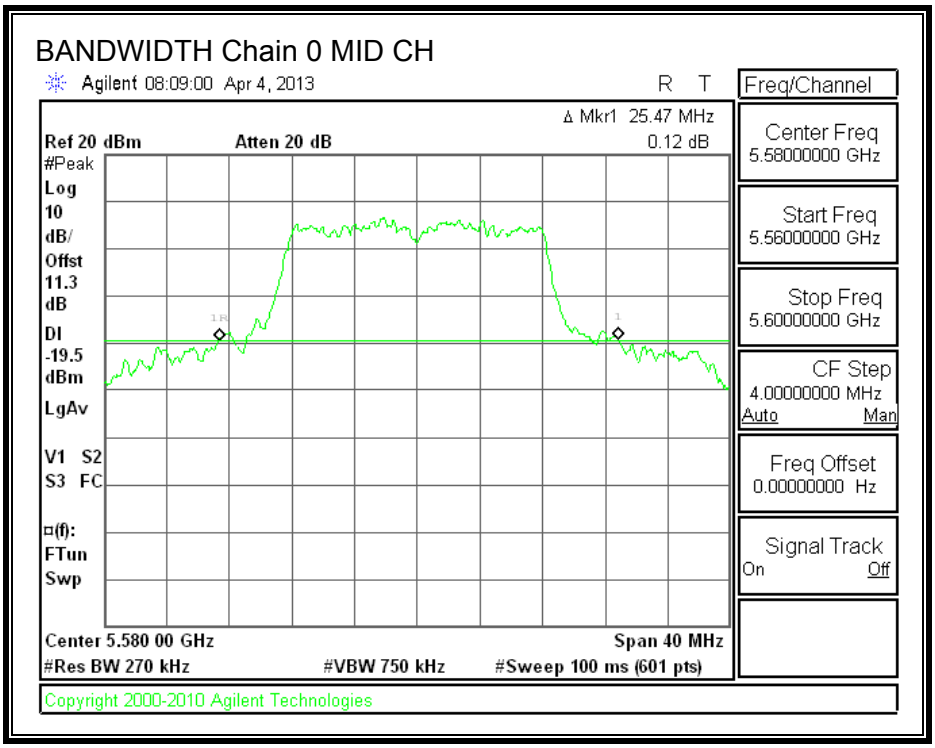
RESULTS

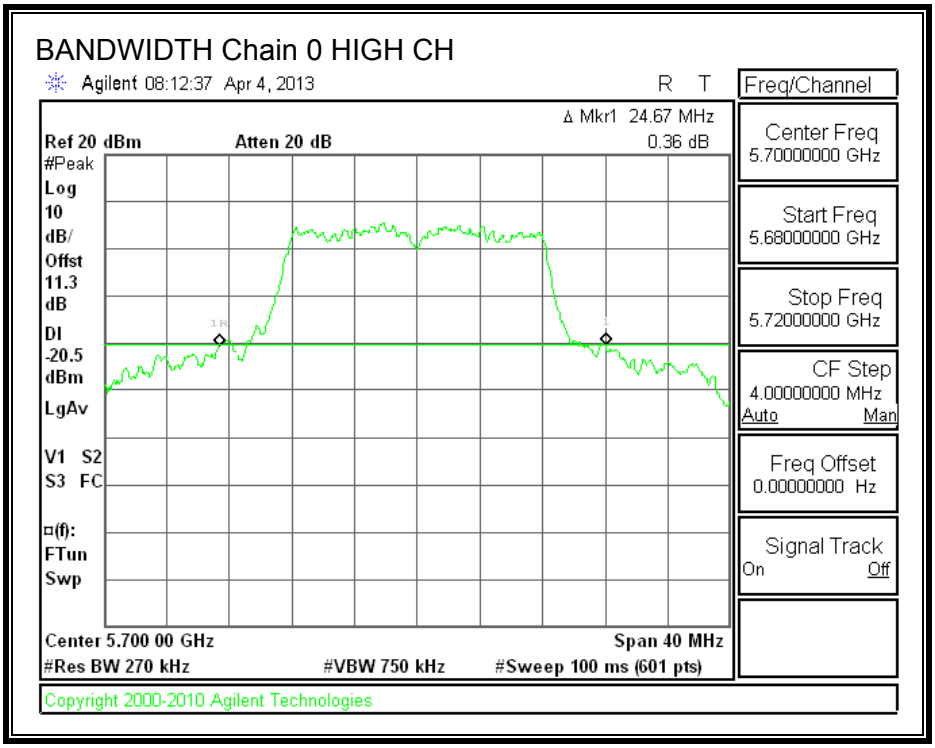
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5500	24.6	29.7
Mid	5580	25.5	34.7
High	5700	24.7	34.7

26 dB BANDWIDTH

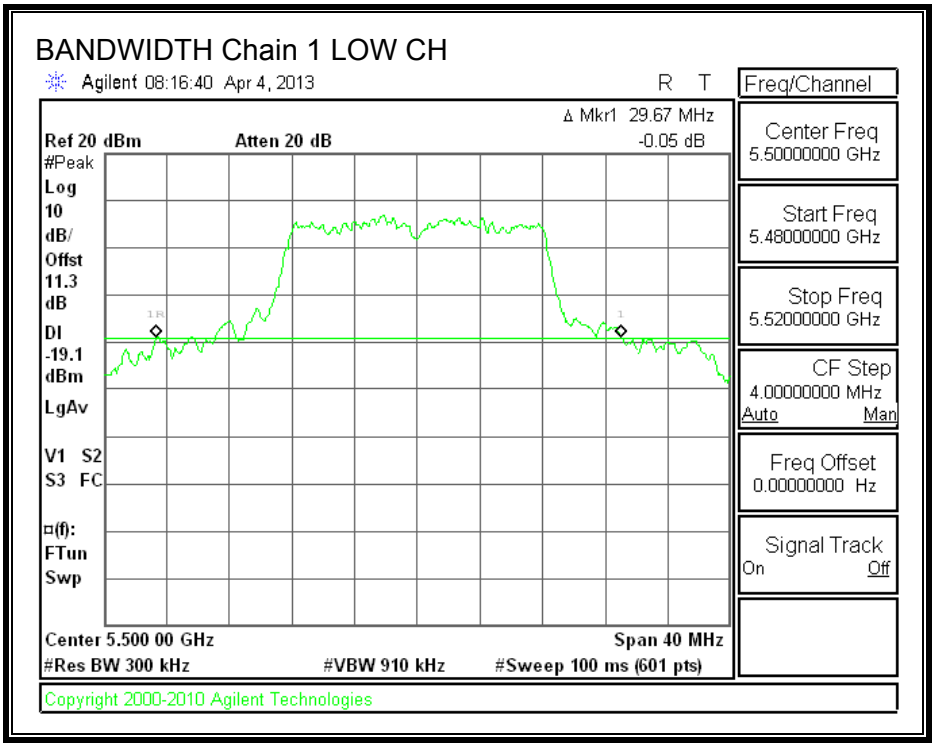
26 dB BANDWIDTH, Chain 0

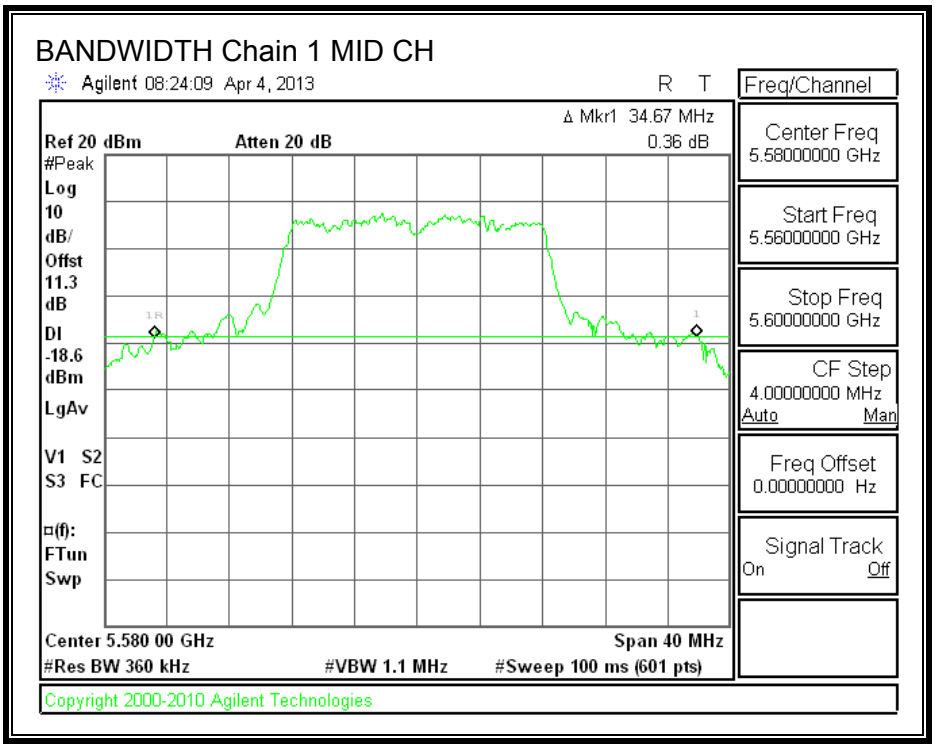


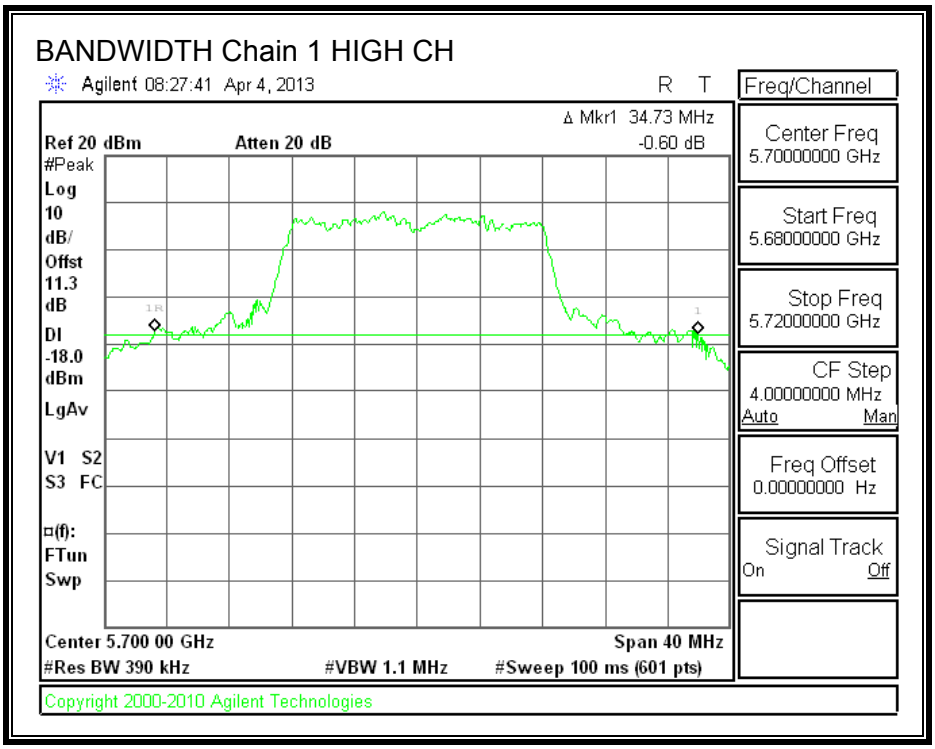




26 dB BANDWIDTH, Chain 1







8.5.2. **99% BANDWIDTH**

LIMITS

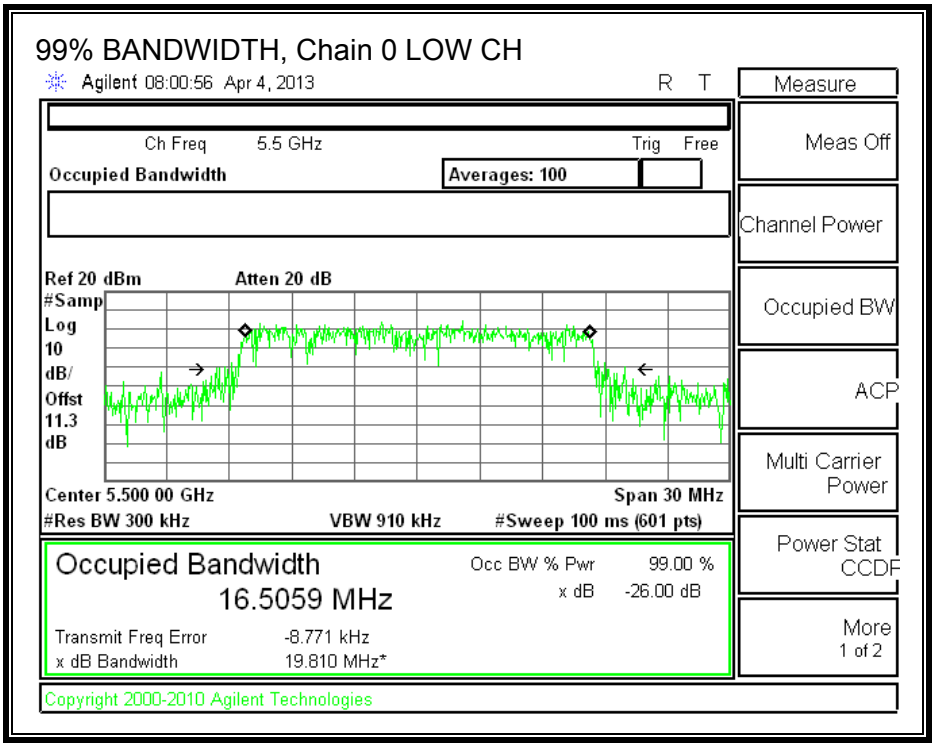
None; for reporting purposes only.

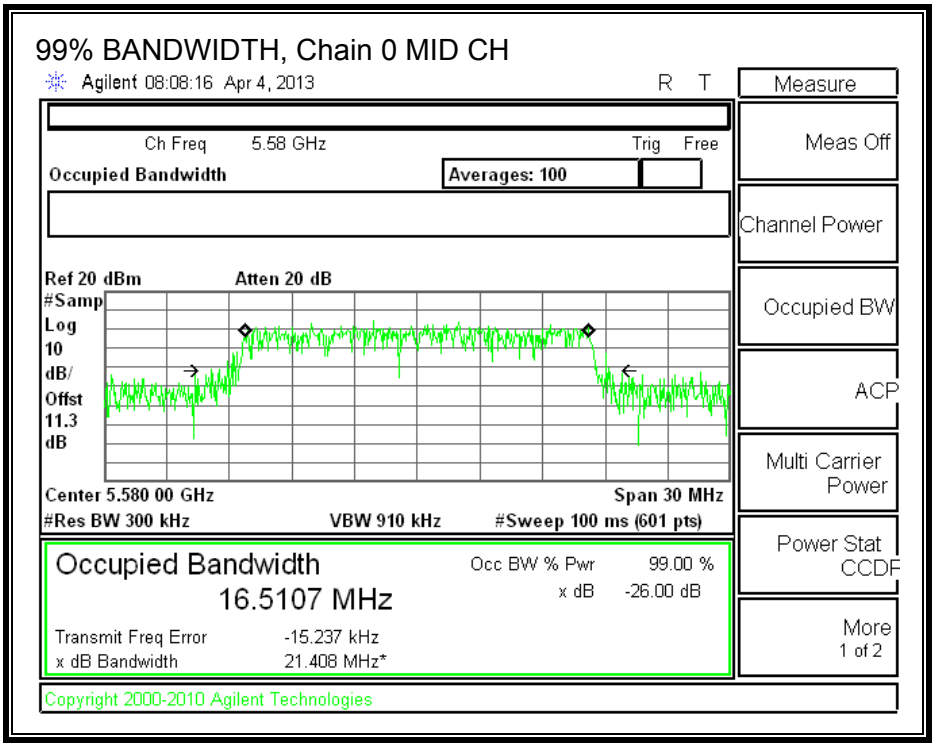
RESULTS

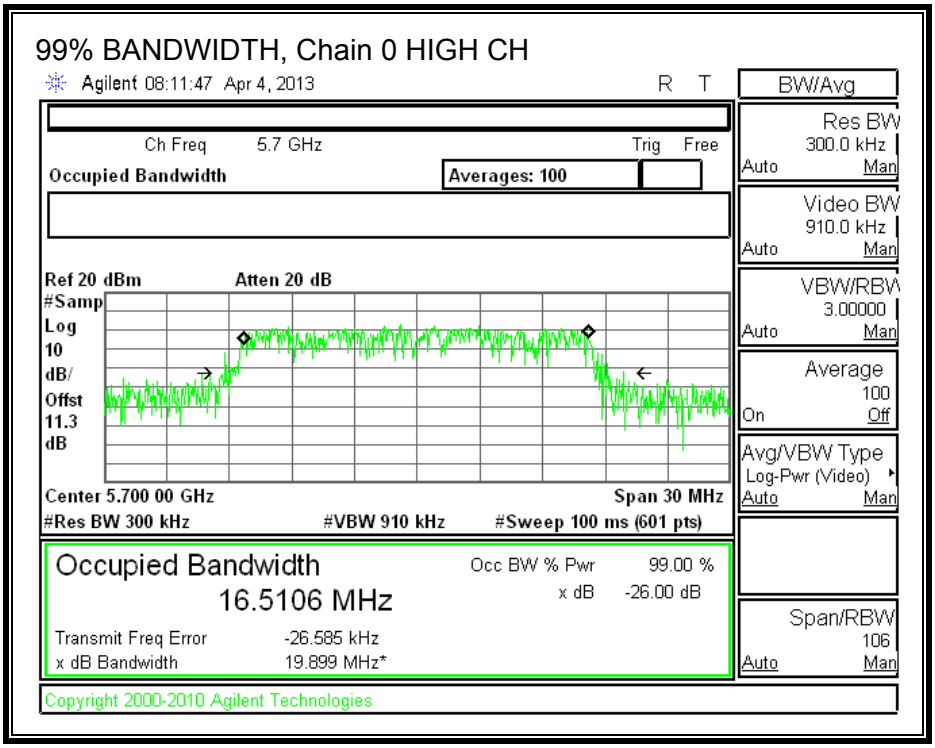
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	16.5	16.5
Mid	5580	16.5	16.5
High	5700	16.5	16.6

99% BANDWIDTH

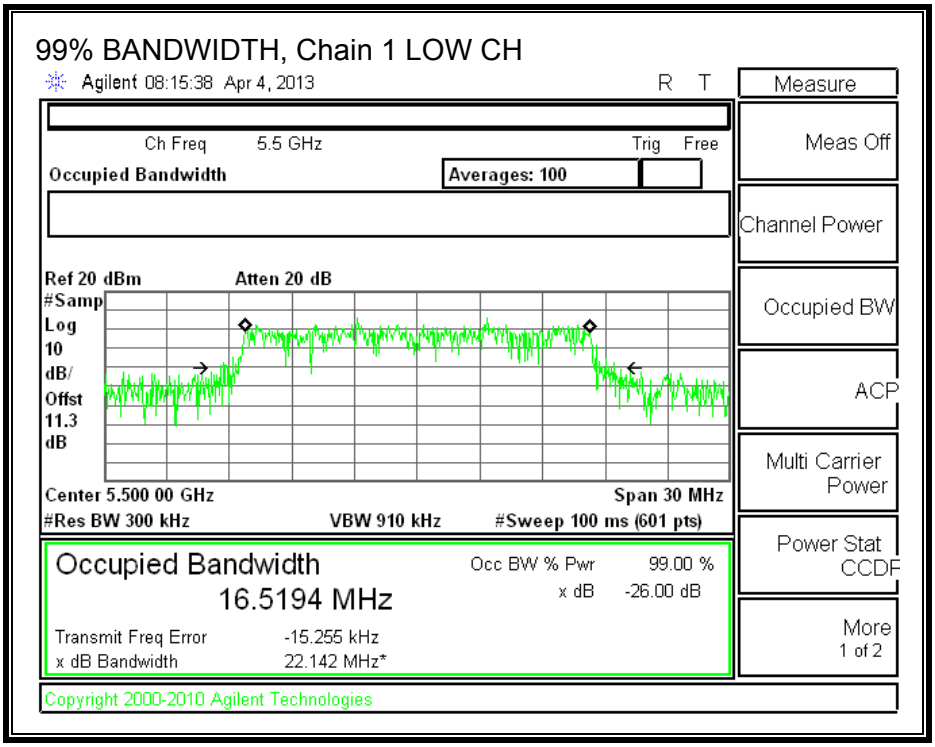
99% BANDWIDTH, Chain 0

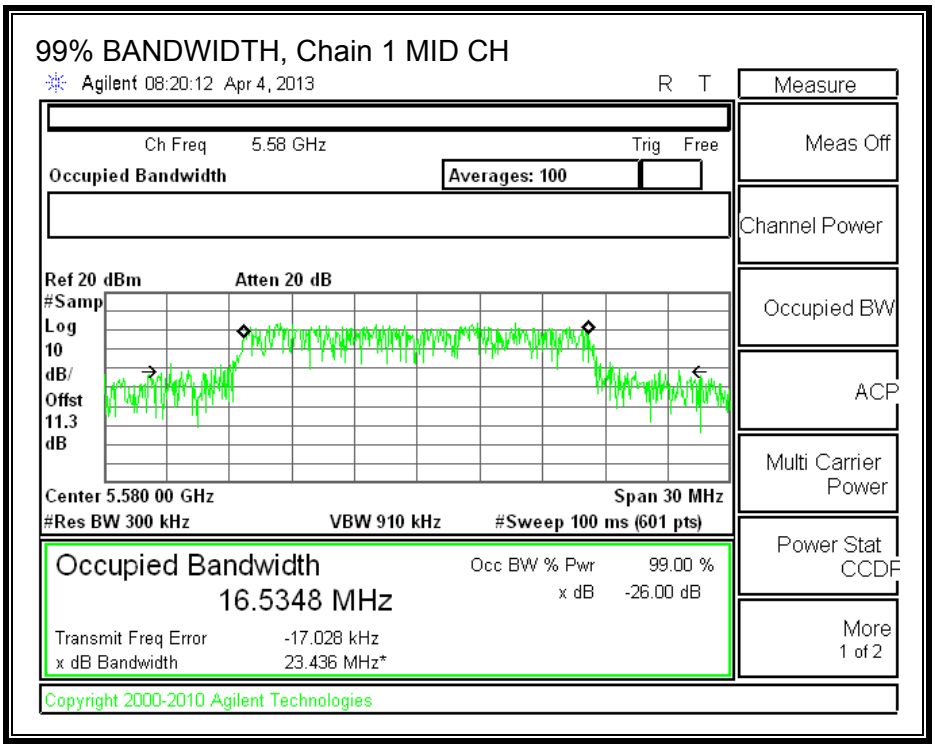


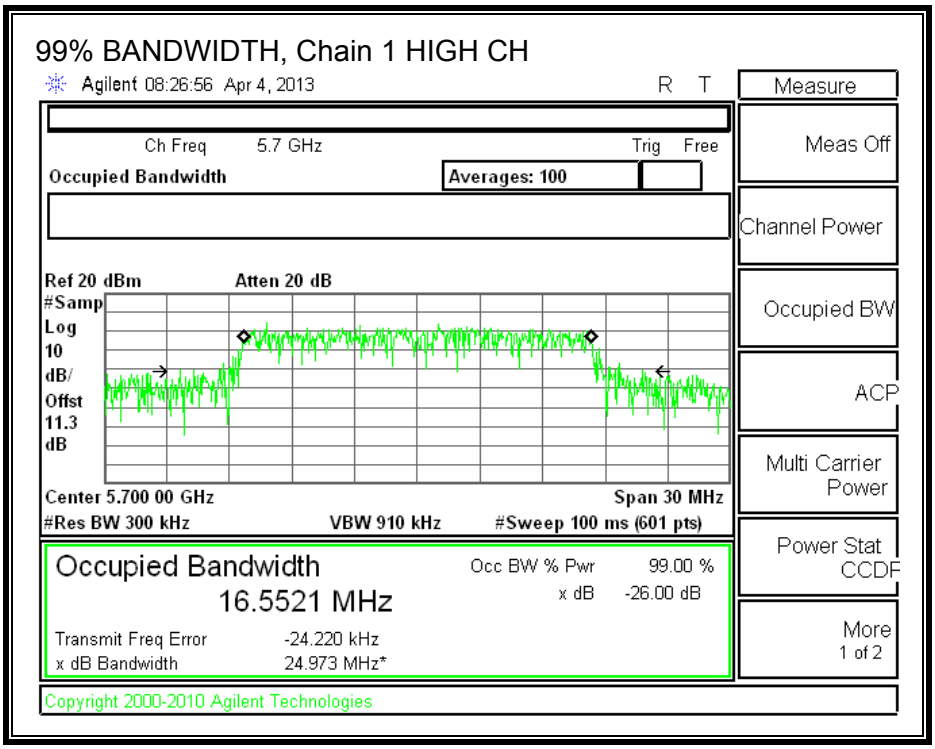




99% BANDWIDTH, Chain 1







8.5.3. **AVERAGE POWER**

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5500	12.88	13.44	16.18
Mid	5580	13.27	13.34	16.32
High	5700	12.08	12.96	15.55

8.5.4. **OUTPUT POWER AND PPSD**

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.38	3.43	3.41

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.38	3.43	6.42

RESULTS

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	24.60	16.5000	3.41
Mid	5580	25.50	16.5000	3.41
High	5700	24.70	16.5000	3.41

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5500	24.00	23.17	29.17	23.17
Mid	5580	24.00	23.17	29.17	23.17
High	5700	24.00	23.17	29.17	23.17

Duty Cycle CF (dB)	0.00	

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.52	14.75	17.65	23.17	-5.53
Mid	5580	14.80	14.83	17.83	23.17	-5.35
High	5700	3.99	14.48	14.85	23.17	-8.32

PSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	24.60	16.5000	6.42
Mid	5580	24.60	16.5000	6.42
High	5700	24.60	16.5000	6.42

Limits

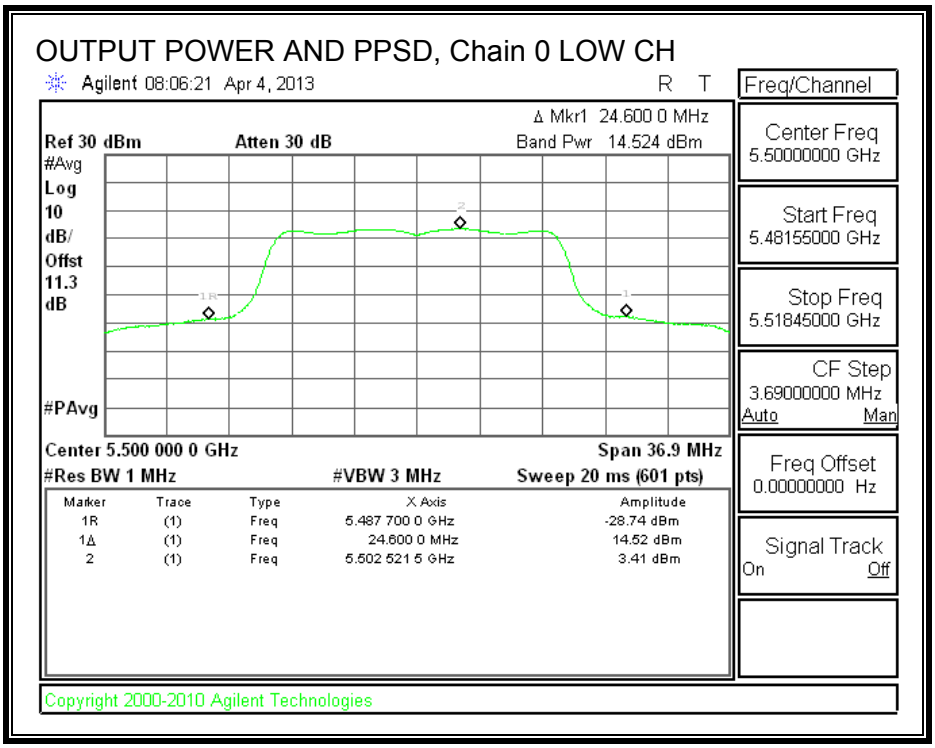
Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5500	10.58	11.00	10.58
Mid	5580	10.58	11.00	10.58
High	5700	10.58	11.00	10.58

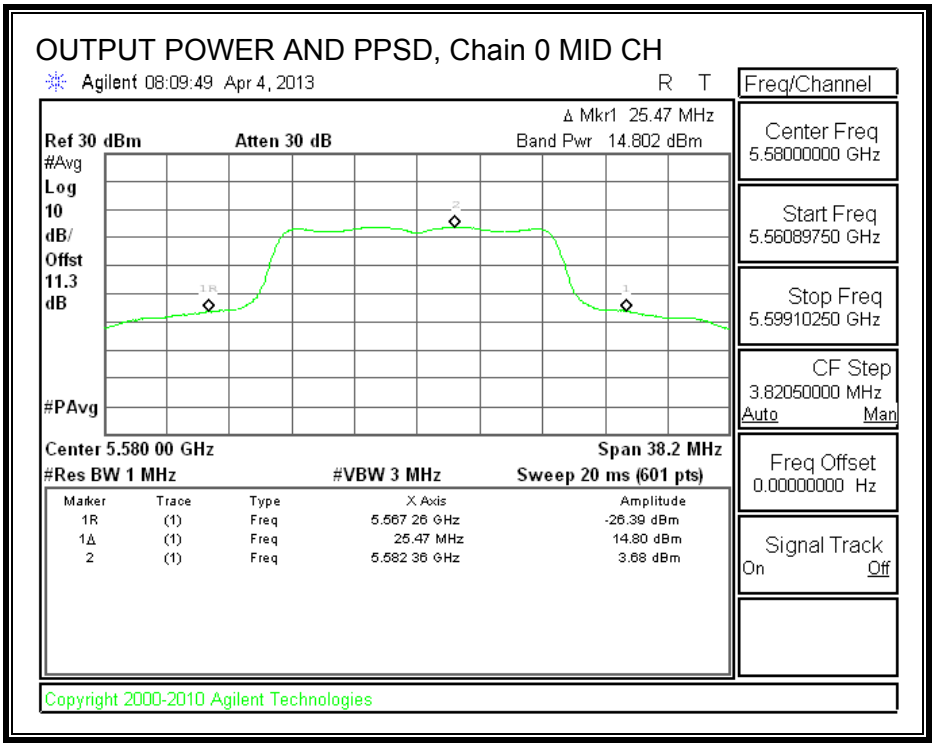
Duty Cycle CF (dB)	0.00	

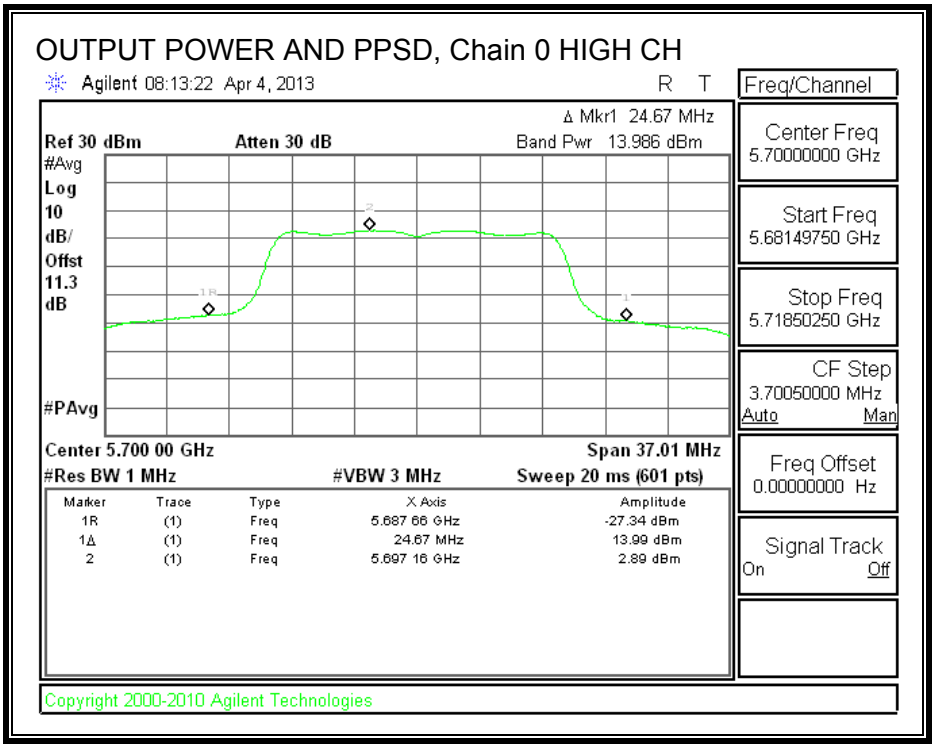
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	3.41	3.63	6.53	10.58	-4.05
Mid	5580	3.68	3.70	6.70	10.58	-3.88
High	5700	2.89	3.33	6.13	10.58	-4.45

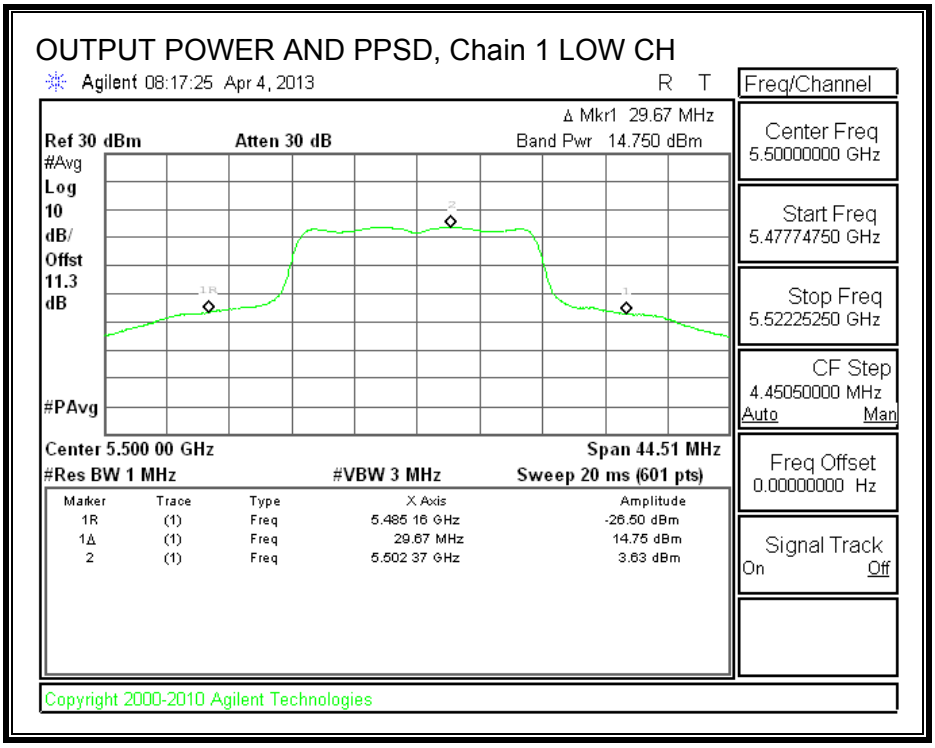
OUTPUT POWER AND PPSD, Chain 0

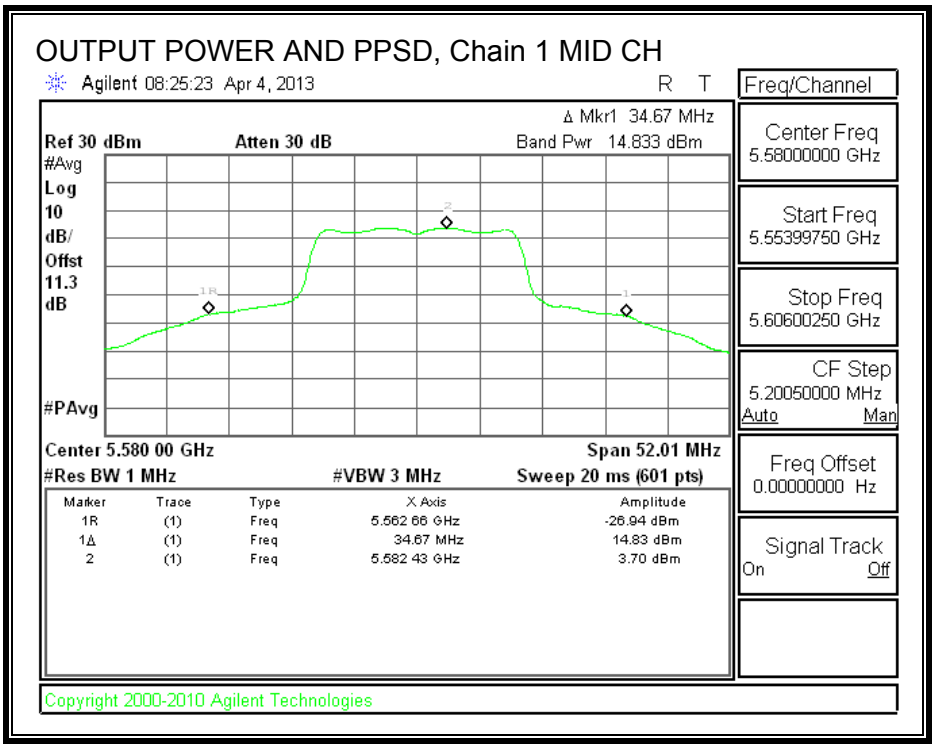


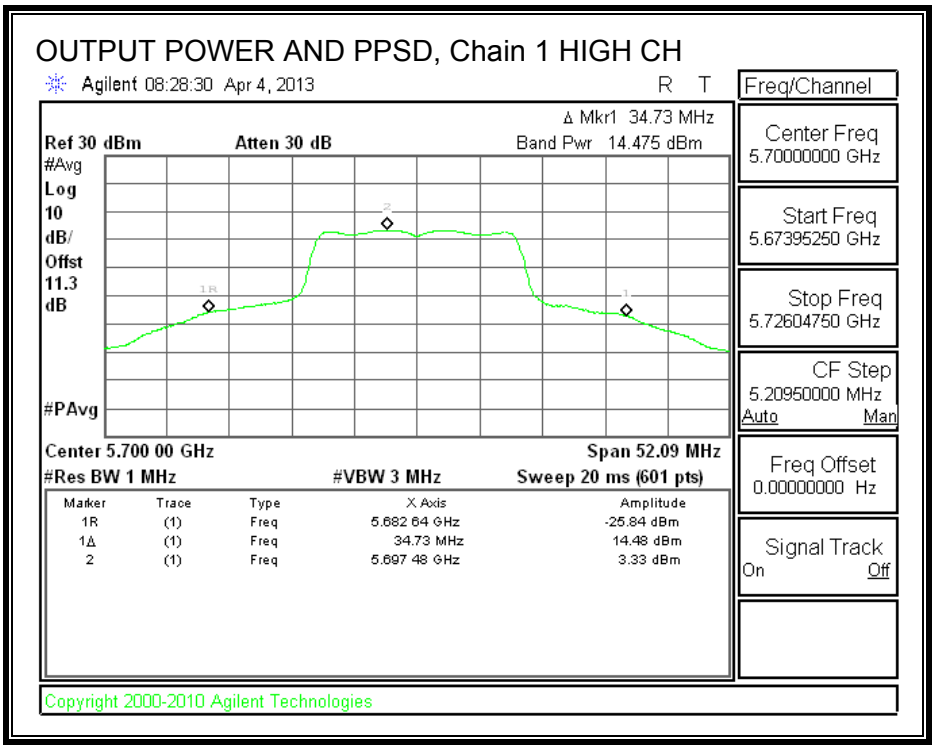




OUTPUT POWER AND PPSD, Chain 1







8.5.5. **PEAK EXCURSION**

LIMITS

FCC §15.407 (a) (6)

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

RESULTS

Refer to the results of 802.11n HT20 mode in the 5.2 GHz band.

8.5.6. **TPC POWER**

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (3)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

A TPC mechanism is not required since e.i.r.p. is less than 500 mW.

8.6. 802.11n HT20 MODE IN THE 5.6 GHz BAND

8.6.1. **26 dB BANDWIDTH**

LIMITS

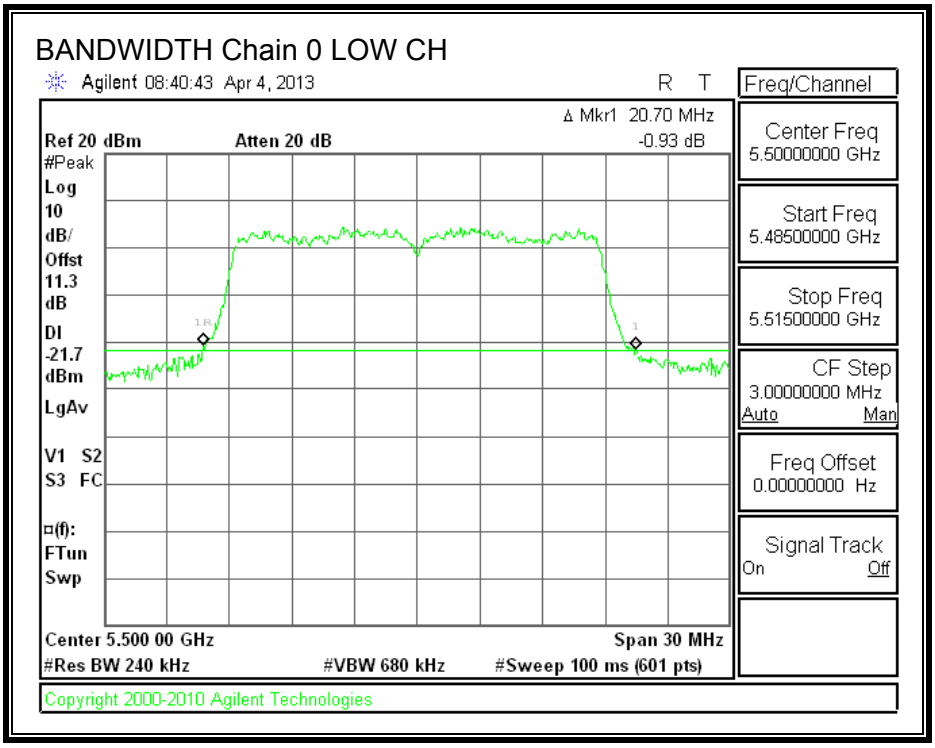
None; for reporting purposes only.

RESULTS

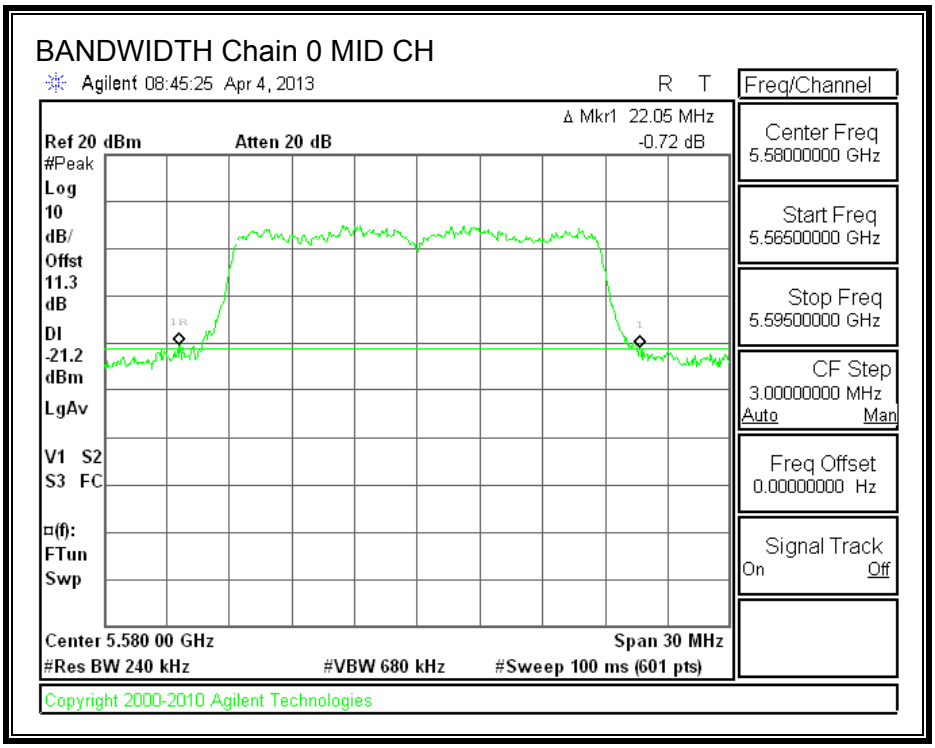
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5500	20.7	26.5
Mid	5580	22.1	29.1
High	5700	20.7	26.0

26 dB BANDWIDTH

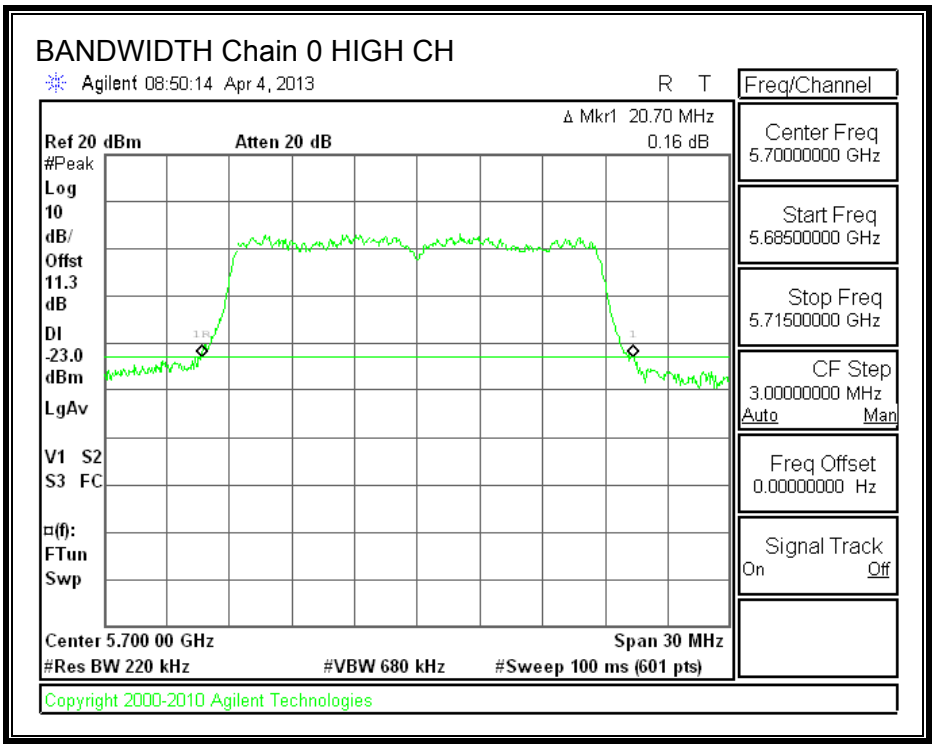
26 dB BANDWIDTH, Chain 0



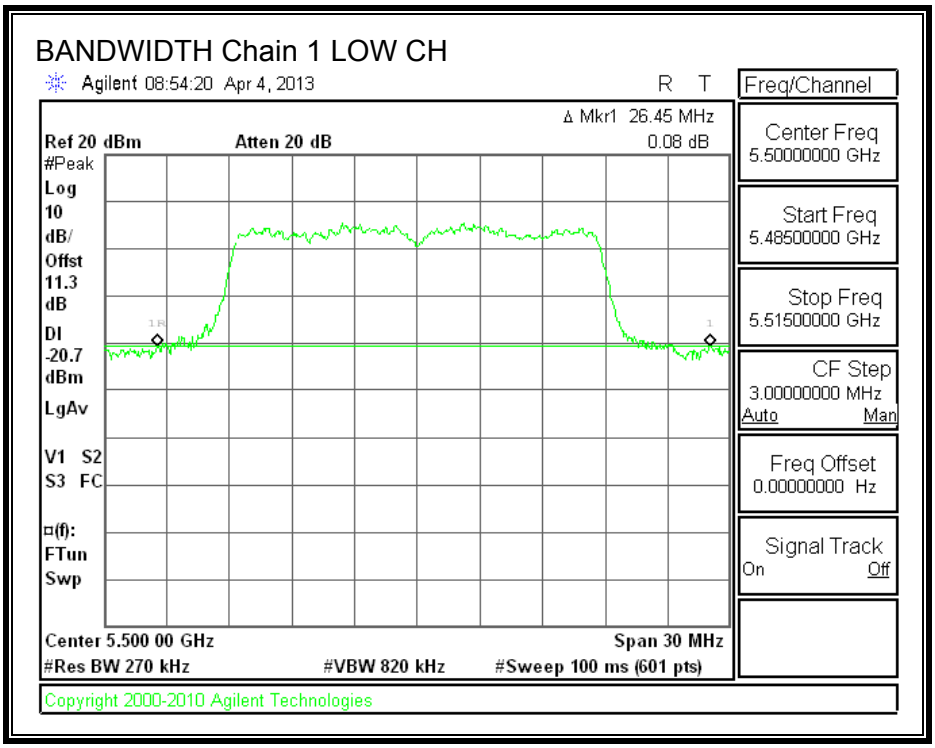
BANDWIDTH Chain 0 MID CH

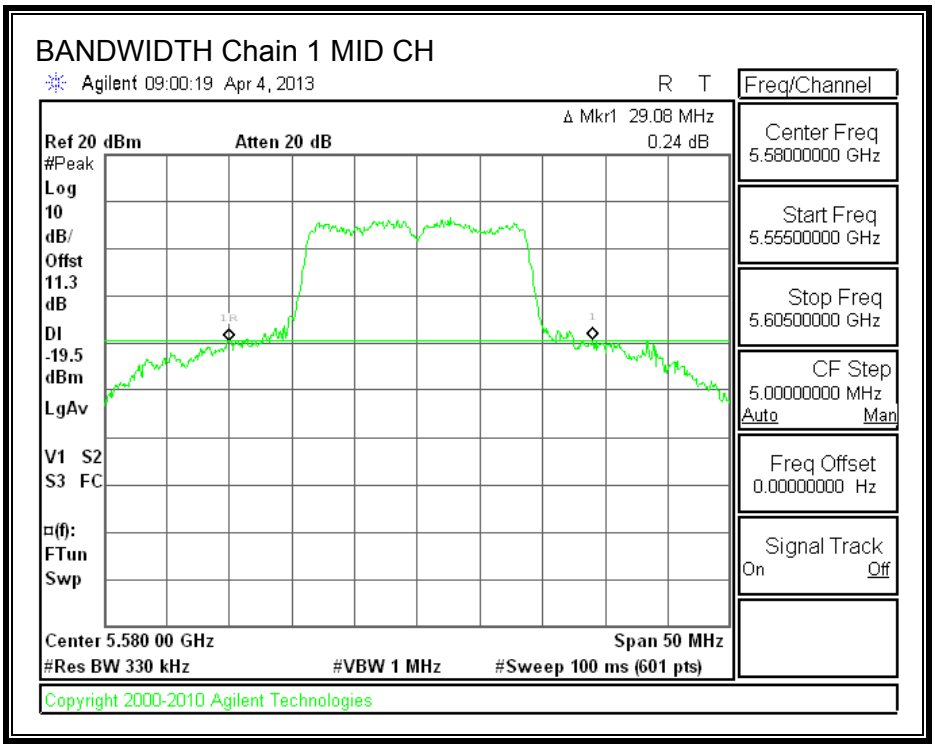


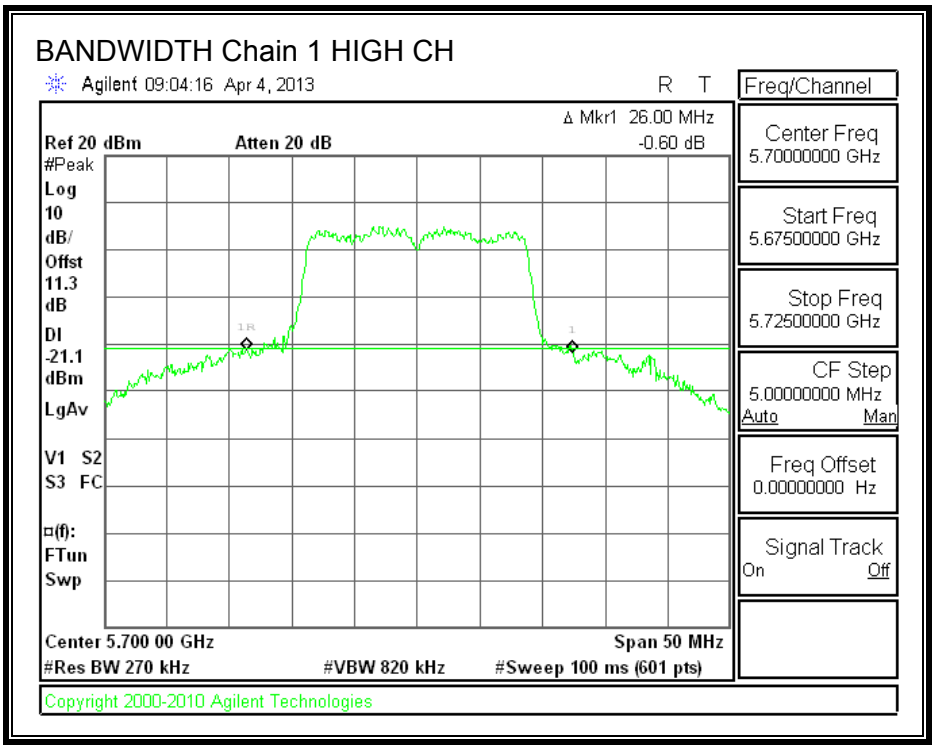
BANDWIDTH Chain 0 HIGH CH



26 dB BANDWIDTH, Chain 1







8.6.2. **99% BANDWIDTH**

LIMITS

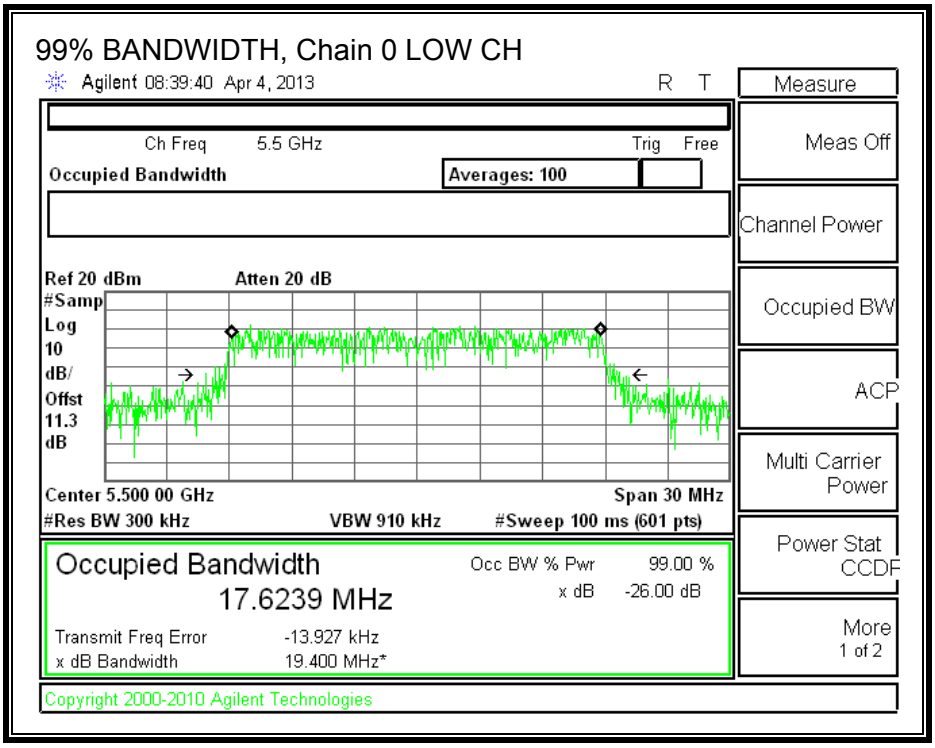
None; for reporting purposes only.

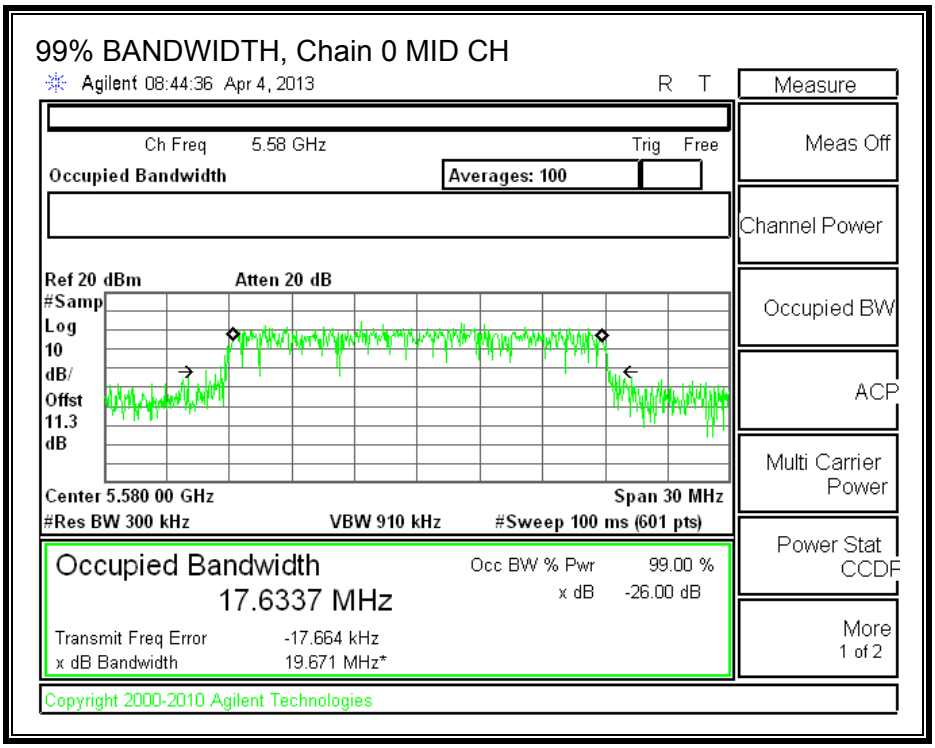
RESULTS

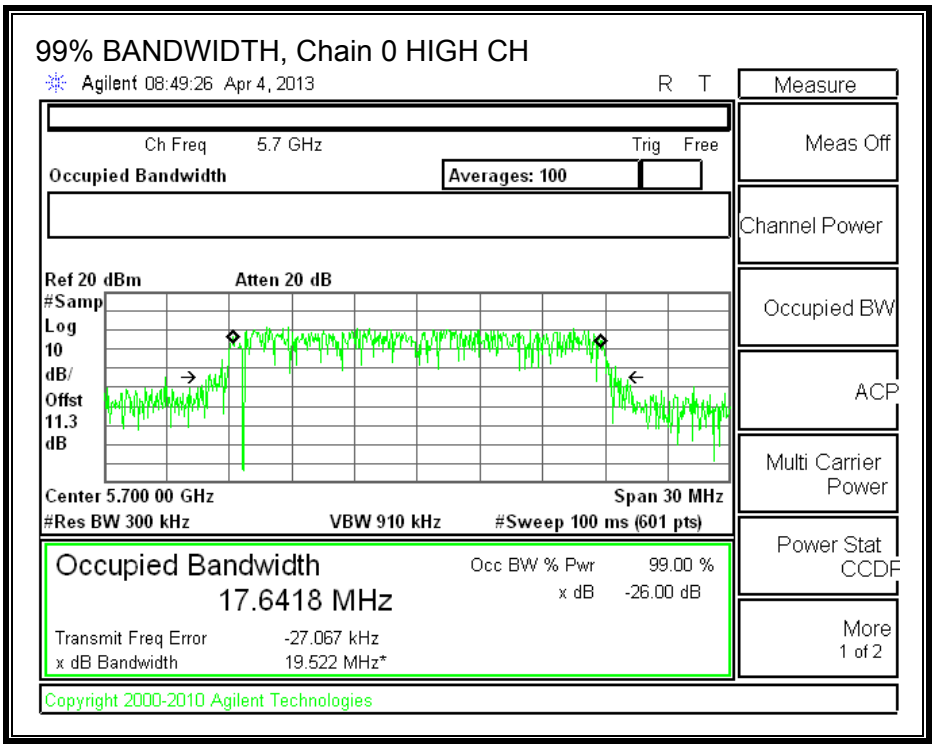
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	17.6	17.6
Mid	5580	17.6	17.7
High	5700	17.6	17.6

99% BANDWIDTH

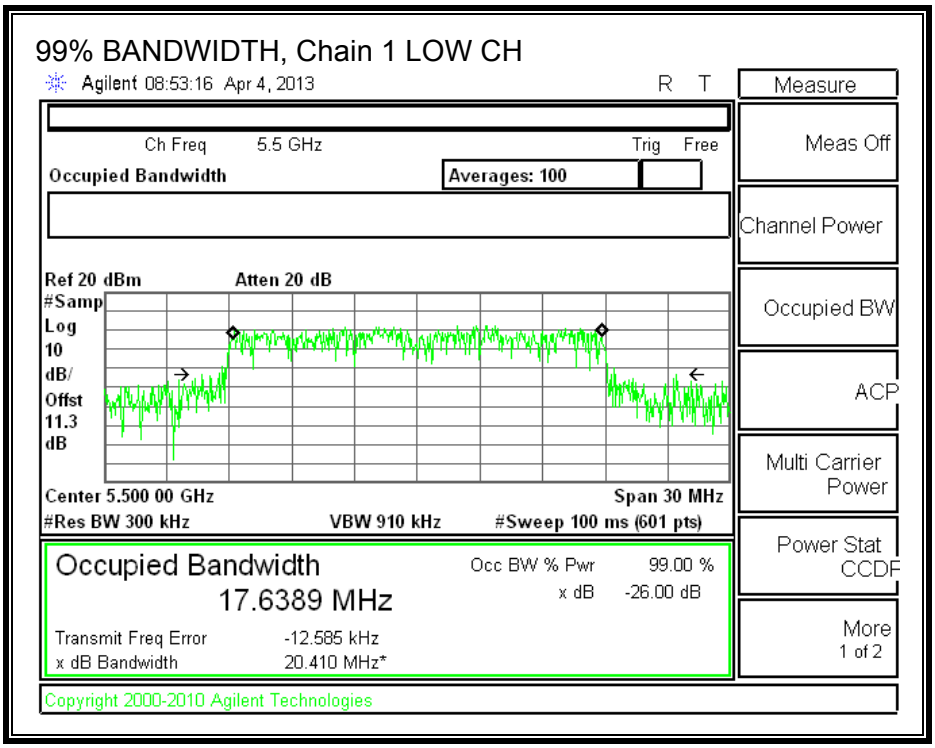
99% BANDWIDTH, Chain 0

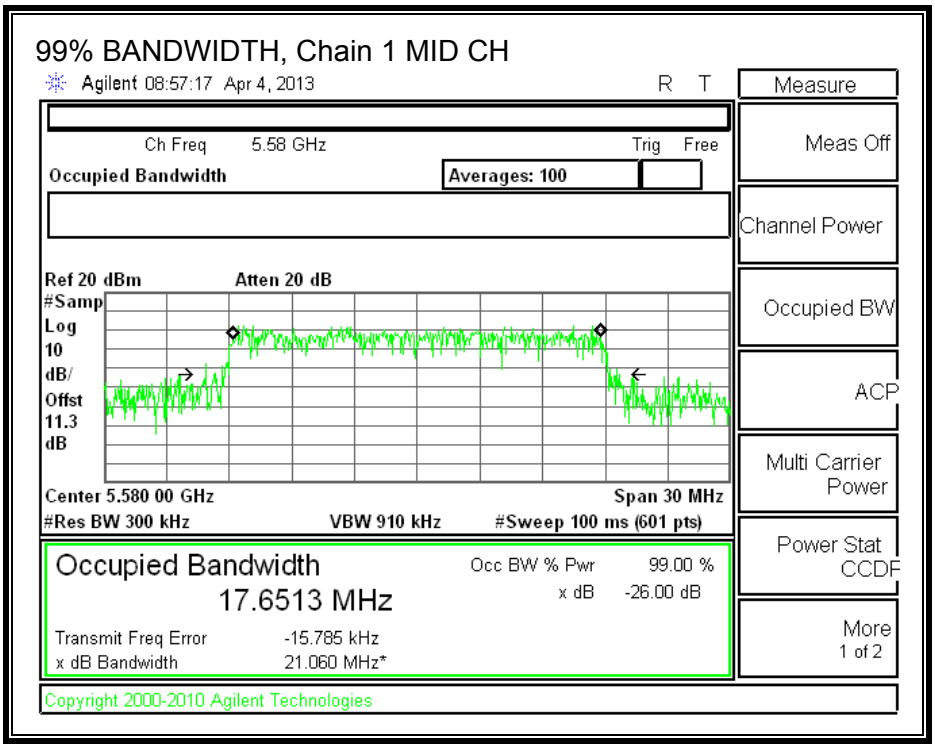


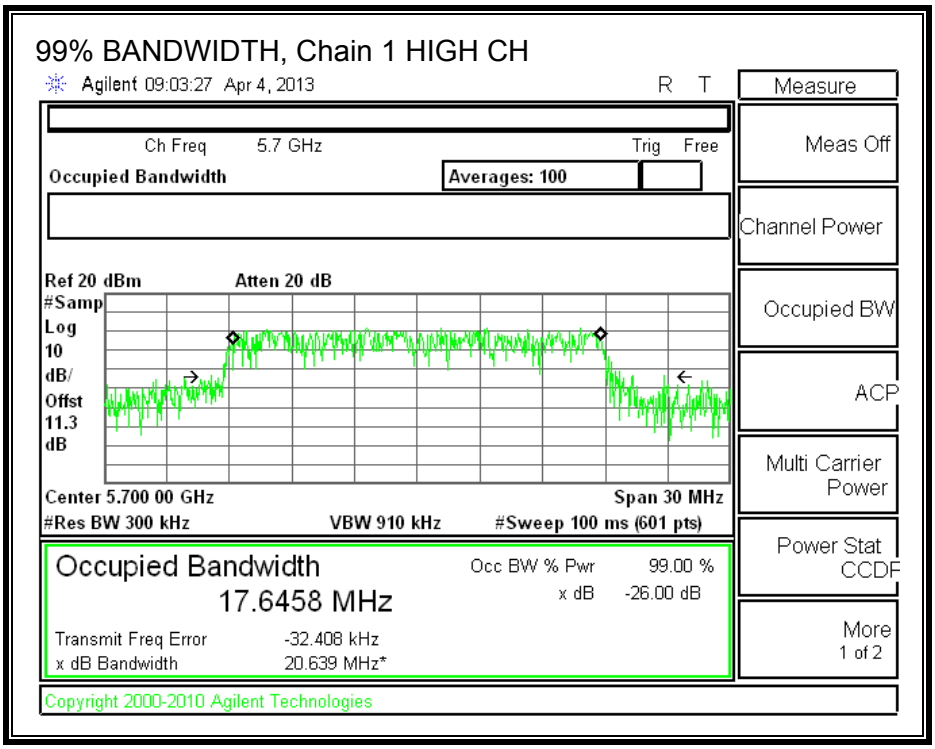




99% BANDWIDTH, Chain 1







8.6.3. **AVERAGE POWER**

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5500	12.45	13.19	15.85
Mid	5580	13.49	13.58	16.55
High	5700	11.60	12.27	14.96

8.6.4. **OUTPUT POWER AND PPSD**

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.38	3.43	3.41

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.38	3.43	6.42

RESULTS

OUTPUT POWER RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	20.70	17.60	3.41
Mid	5580	22.10	17.60	3.41
High	5700	20.70	17.60	3.41

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)
Low	5500	24.00	23.46	29.46	23.46
Mid	5580	24.00	23.46	29.46	23.46
High	5700	24.00	23.46	29.46	23.46

Duty Cycle CF (dB)	0.00	

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.76	14.03	16.91	23.46	-6.55
Mid	5580	14.18	14.22	17.21	23.46	-6.24
High	5700	12.98	13.03	16.02	23.46	-7.44

PSD RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	20.70	17.60	6.42
Mid	5580	22.10	17.60	6.42
High	5700	20.70	17.60	6.42

Limits

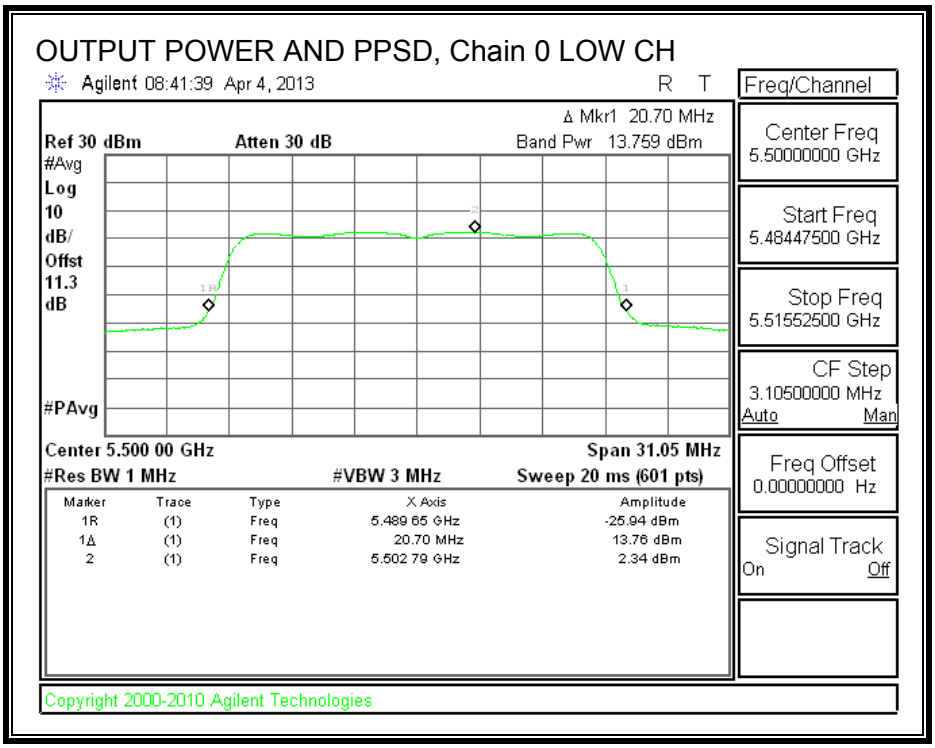
Channel	Frequency (MHz)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PSD Limit (dBm)
Low	5500	10.58	11.00	10.58
Mid	5580	10.58	11.00	10.58
High	5700	10.58	11.00	10.58

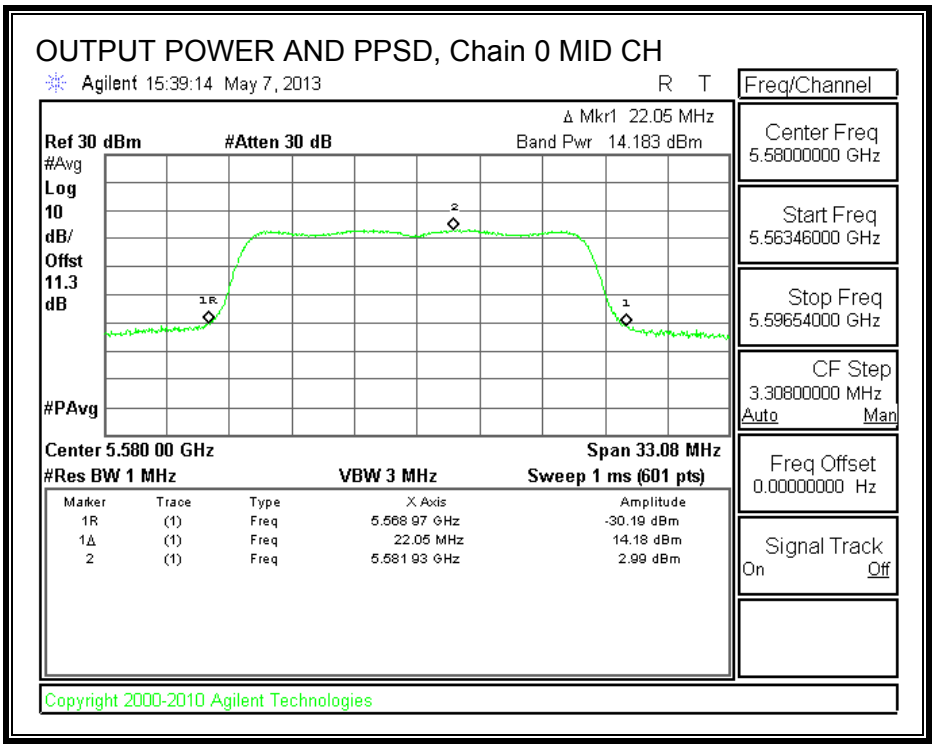
Duty Cycle CF (dB)	0.00	

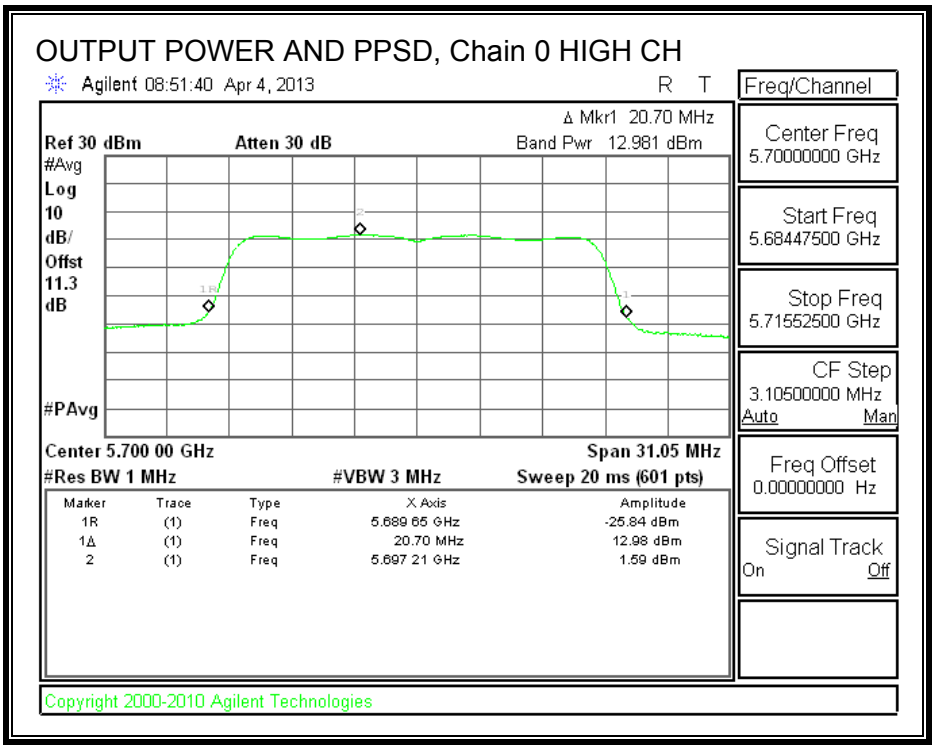
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	2.34	2.63	5.50	10.58	-5.08
Mid	5580	2.99	3.23	6.12	10.58	-4.46
High	5700	1.59	1.62	4.62	10.58	-5.96

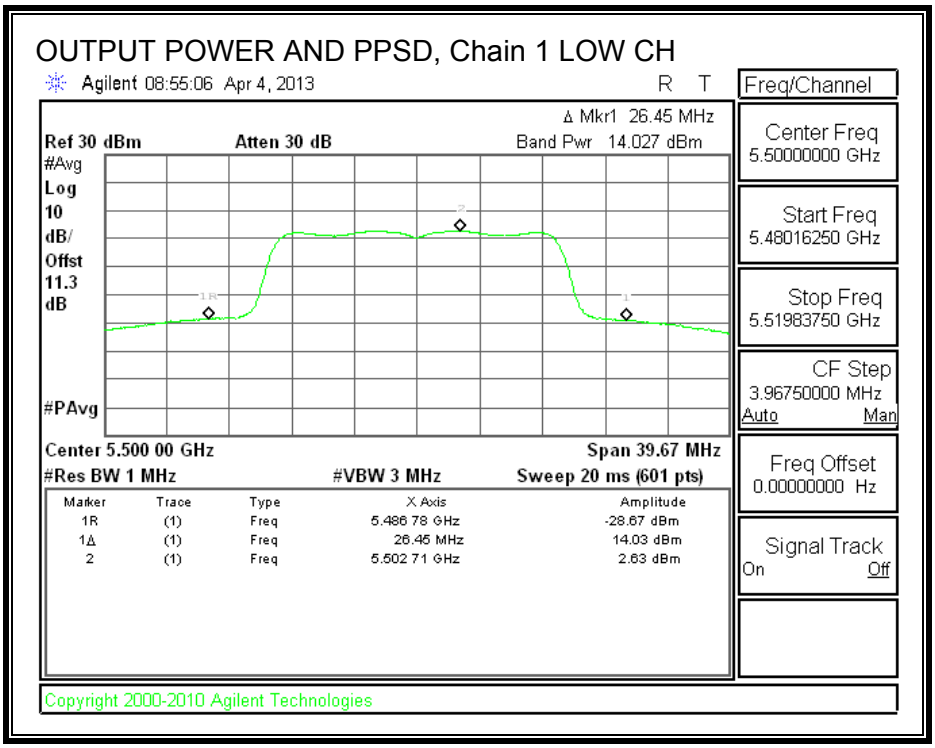
OUTPUT POWER AND PPSD, Chain 0

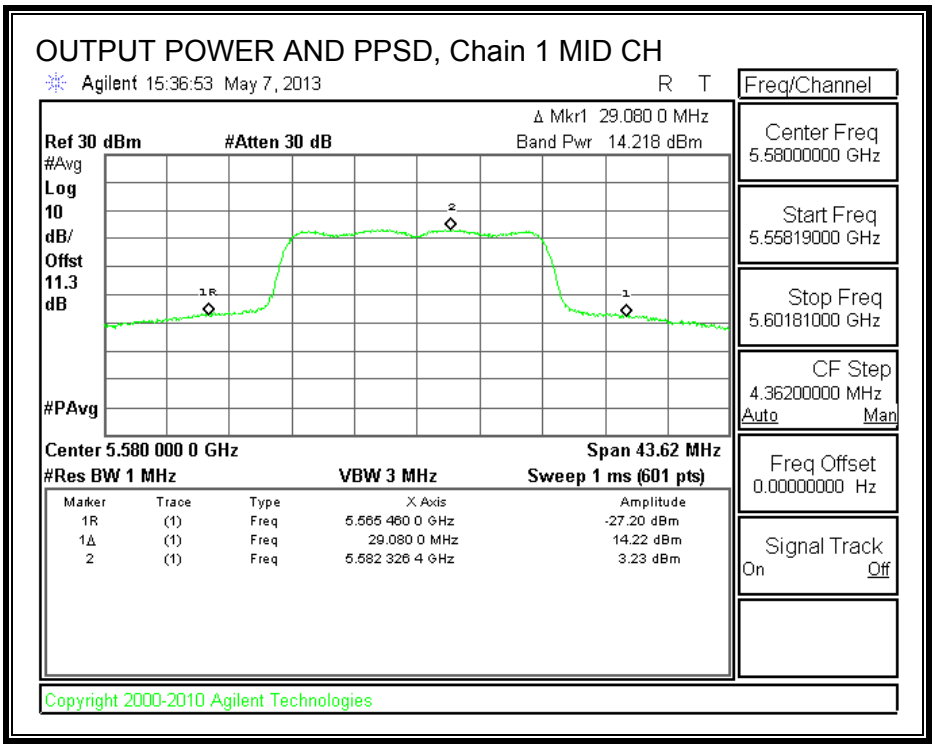


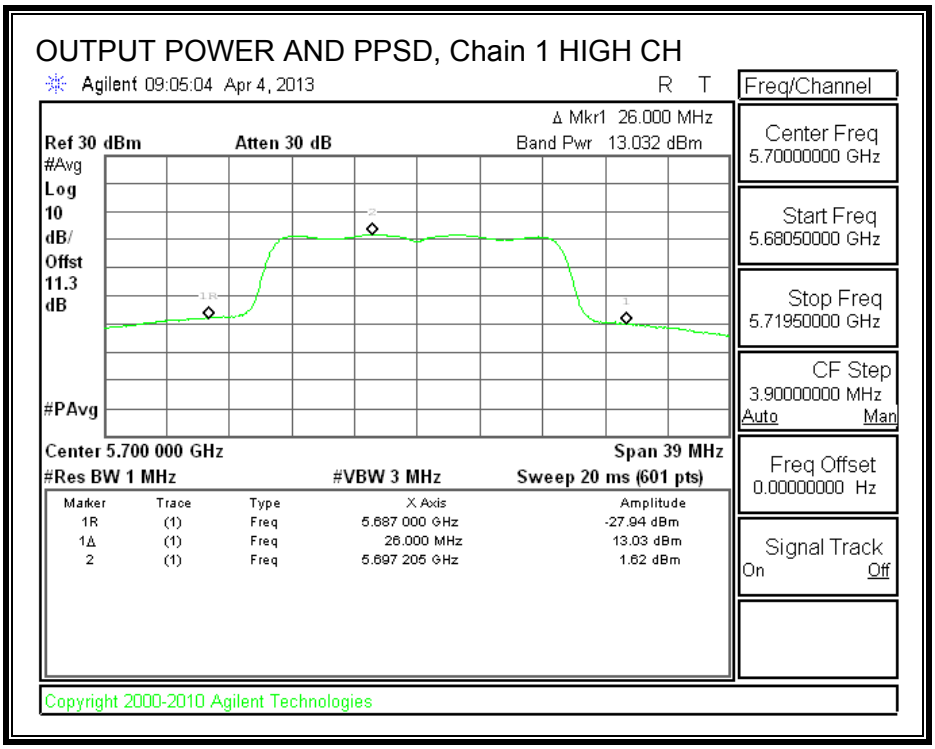




OUTPUT POWER AND PPSD, Chain 1







8.6.5. **PEAK EXCURSION**

LIMITS

FCC §15.407 (a) (6)

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

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5580	10.95	14.18	0.00	-3.23	13	-16.23

Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5580	11.79	14.22	0.00	-2.43	13	-15.43

8.6.6. **TPC POWER**

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (3)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

A TPC mechanism is not required since e.i.r.p. is less than 500 mW.

8.7. 802.11n HT40 MODE IN THE 5.6 GHz BAND

8.7.1. **26 dB BANDWIDTH**

LIMITS

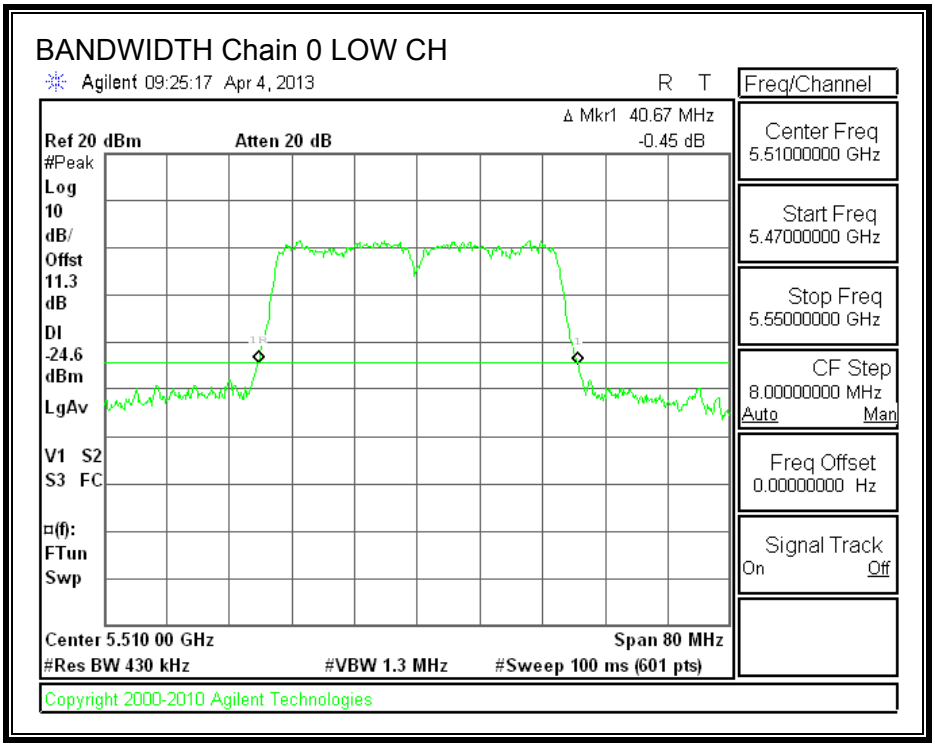
None; for reporting purposes only.

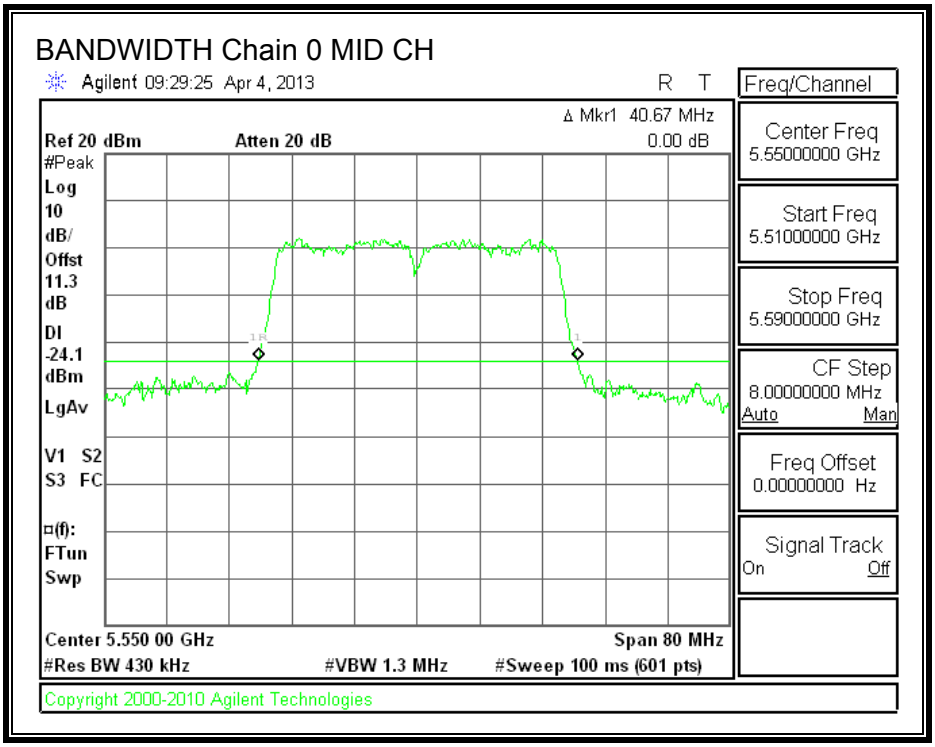
RESULTS

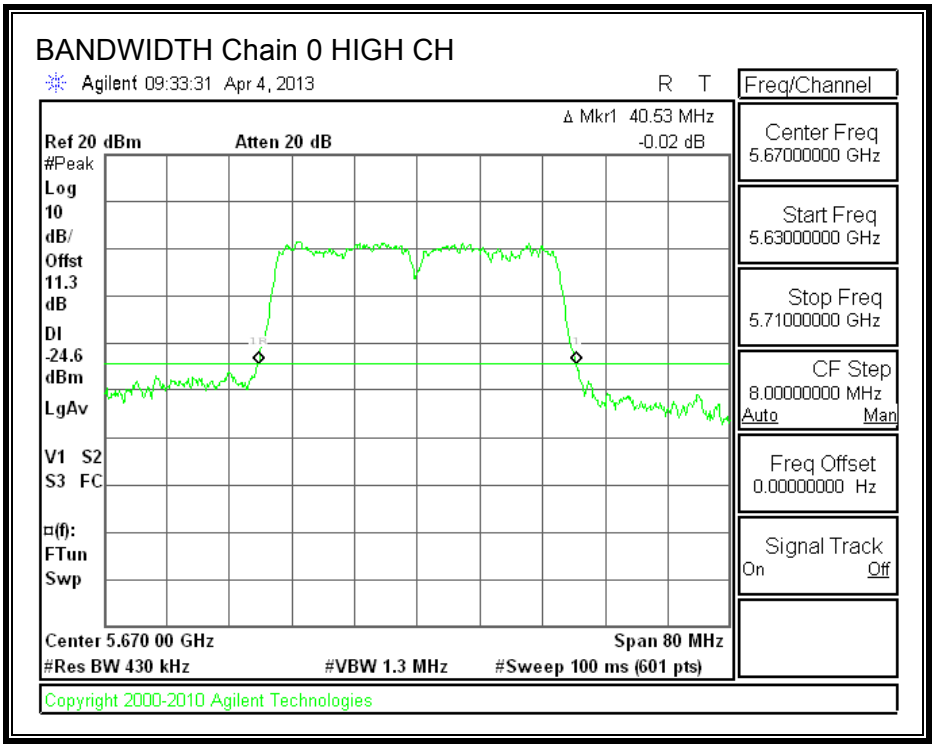
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5510	40.7	40.9
Mid	5550	40.7	50.9
High	5670	40.5	51.7

26 dB BANDWIDTH

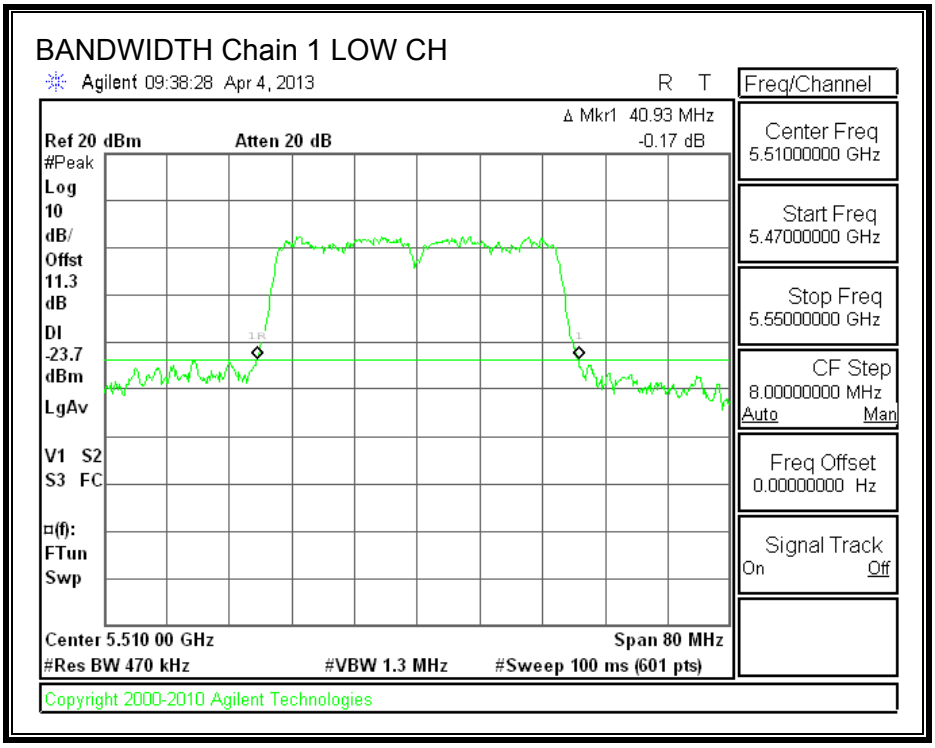
26 dB BANDWIDTH, Chain 0

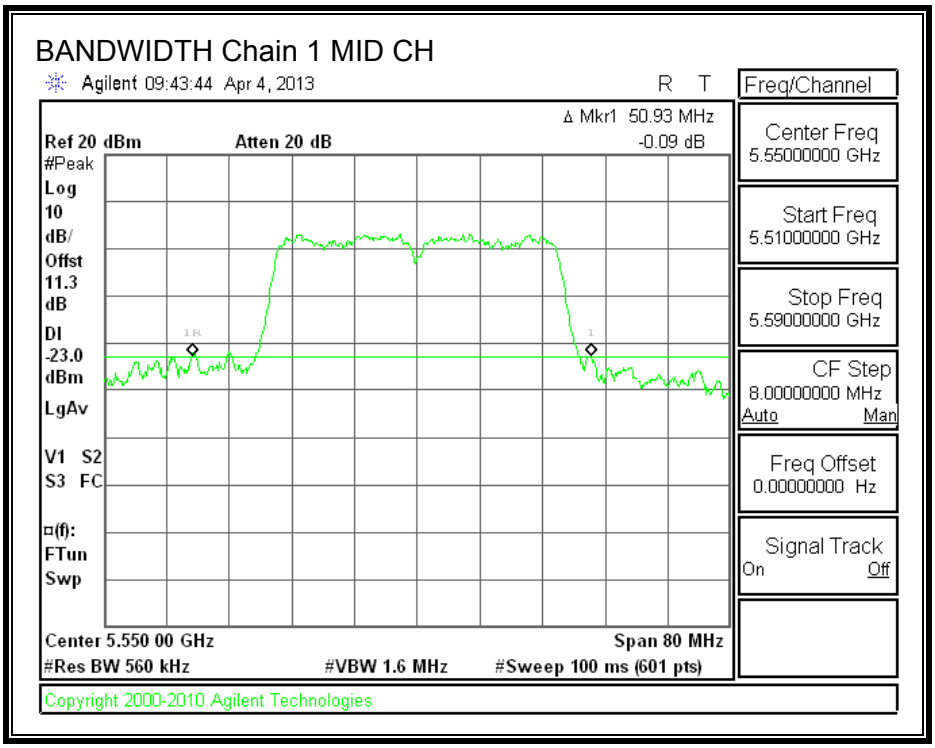


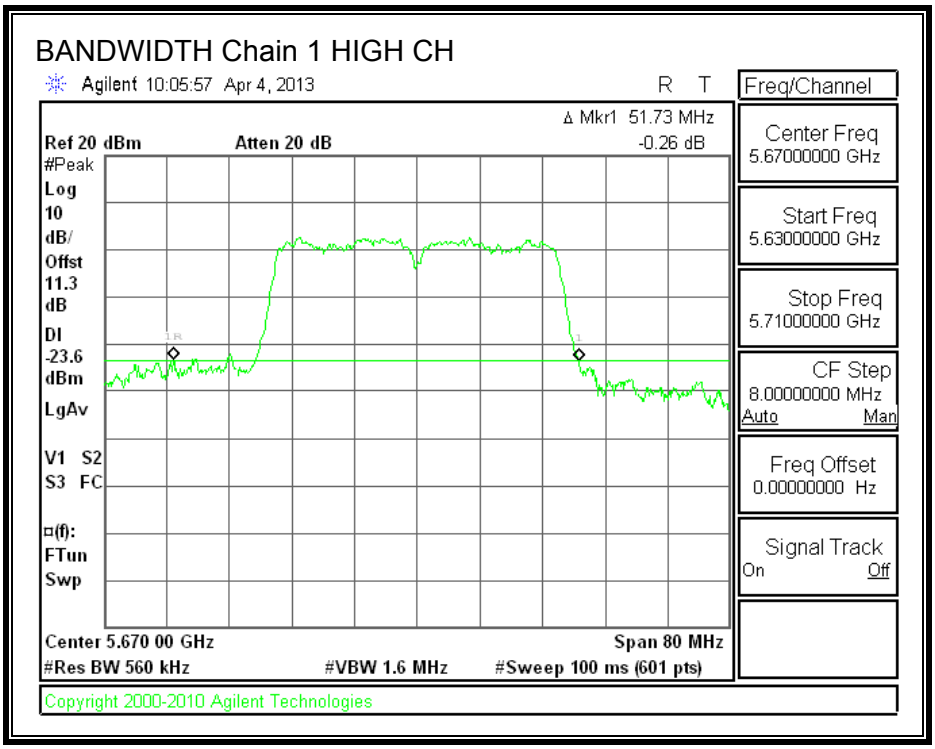




26 dB BANDWIDTH, Chain 1







8.7.2. **99% BANDWIDTH**

LIMITS

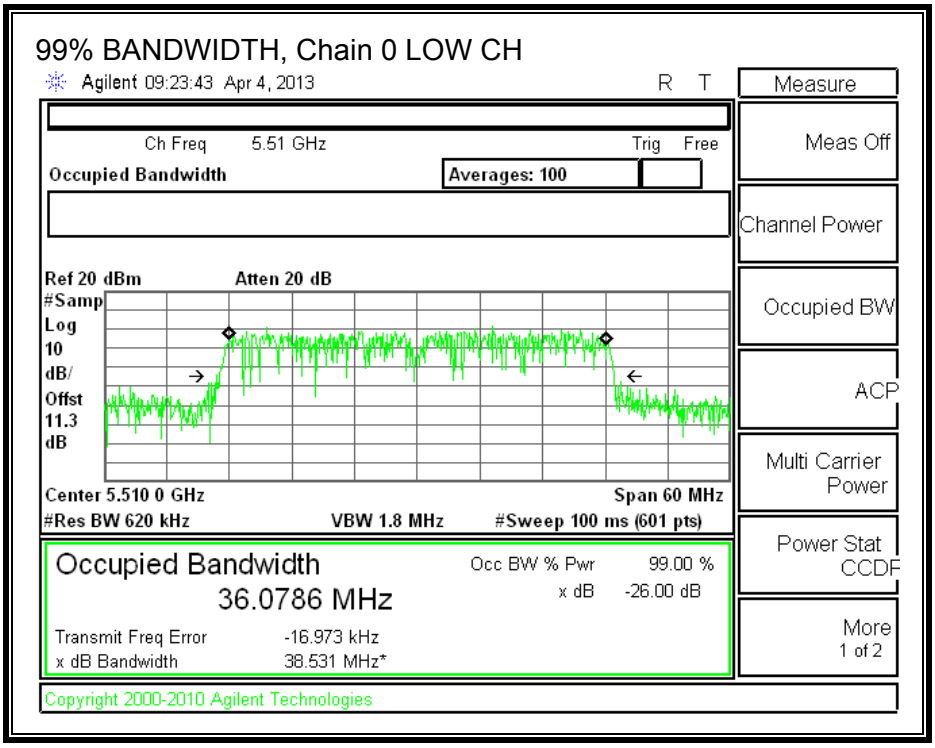
None; for reporting purposes only.

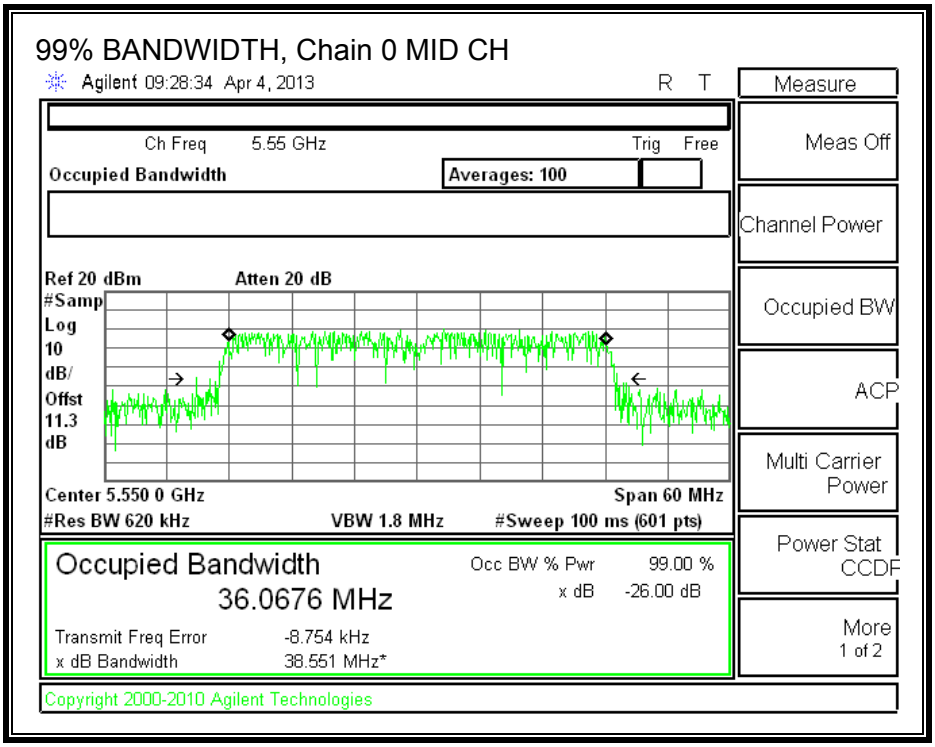
RESULTS

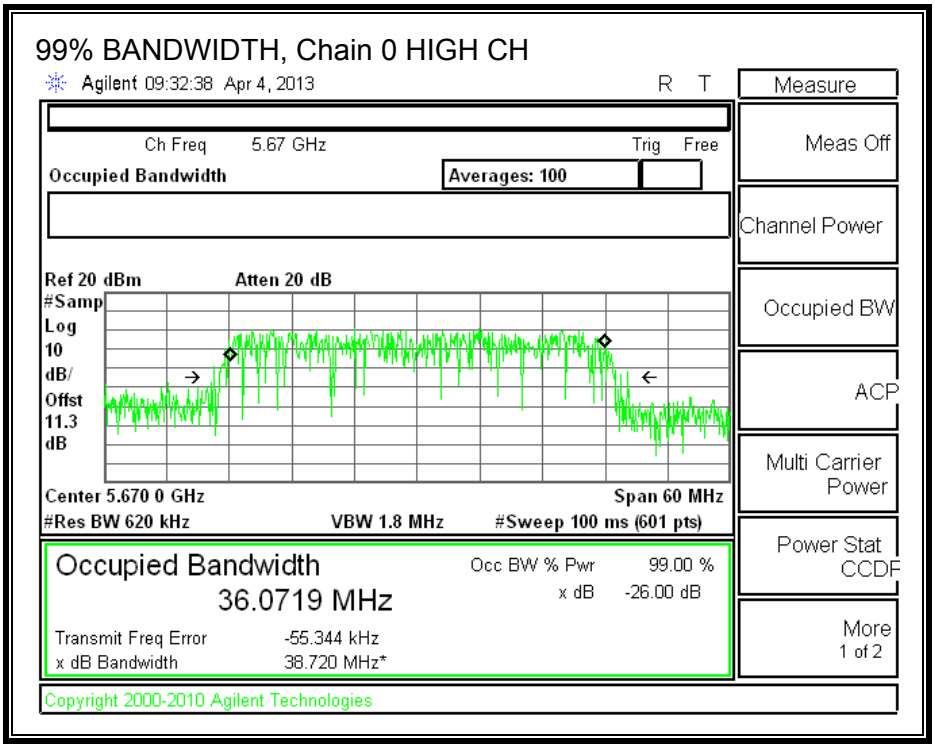
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5510	36.1	36.1
Mid	5550	36.1	36.1
High	5670	36.1	36.1

99% BANDWIDTH

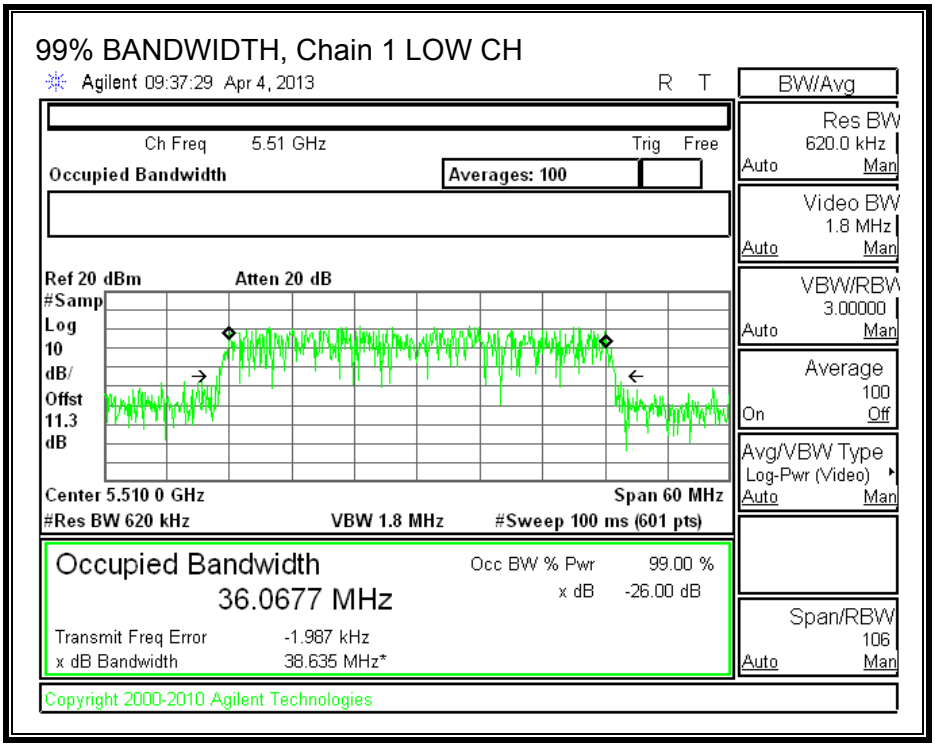
99% BANDWIDTH, Chain 0

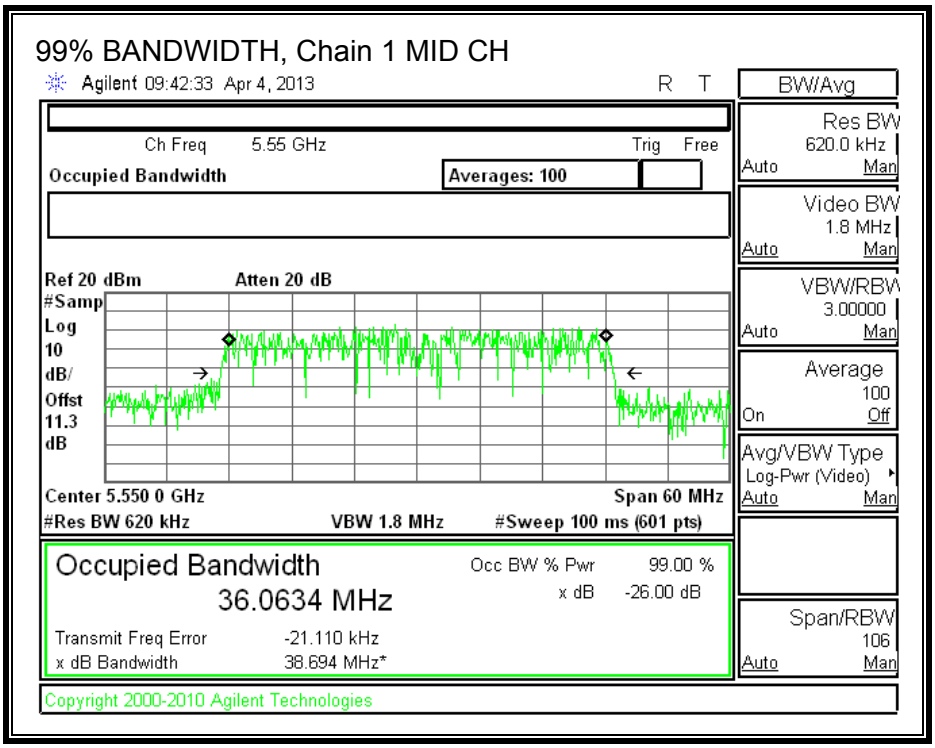


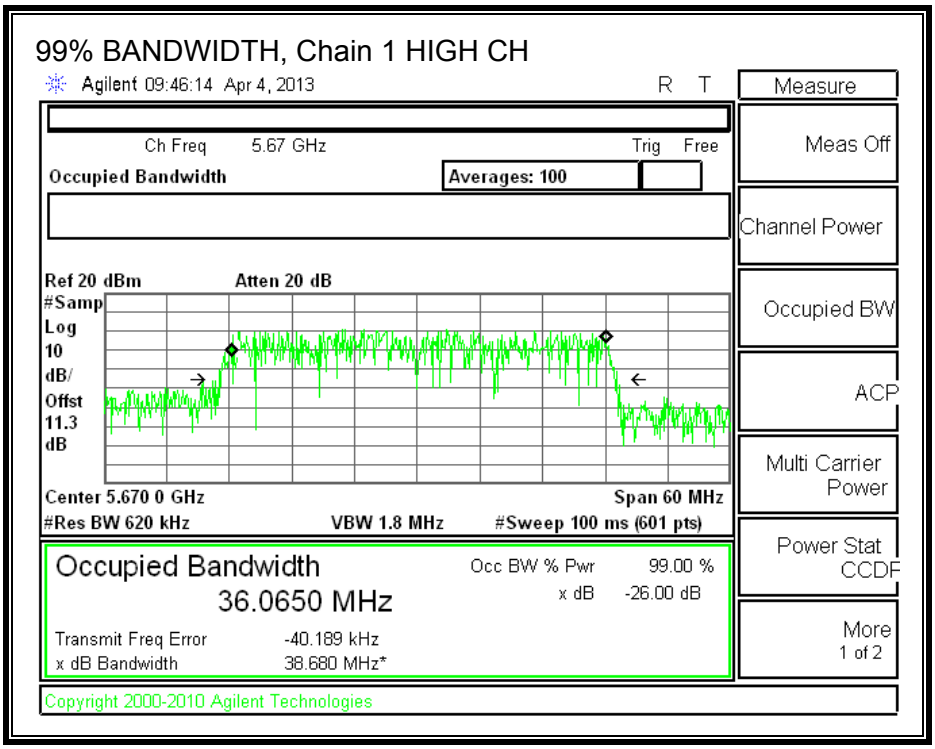




99% BANDWIDTH, Chain 1







8.7.3. **AVERAGE POWER**

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5510	10.51	11.04	13.79
Mid	5550	12.13	12.53	15.34
High	5670	10.78	10.93	13.87

8.7.4. **OUTPUT POWER AND PPSD**

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
3.38	3.43	3.41

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
3.38	3.43	6.42

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	40.7	36.1	6.42
Mid	5550	40.7	36.1	6.42
High	5670	40.5	36.1	6.42

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5510	23.58	24.00	30.00	23.58	10.58	11.00	10.58
Mid	5550	23.58	24.00	30.00	23.58	10.58	11.00	10.58
High	5670	23.58	24.00	30.00	23.58	10.58	11.00	10.58

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

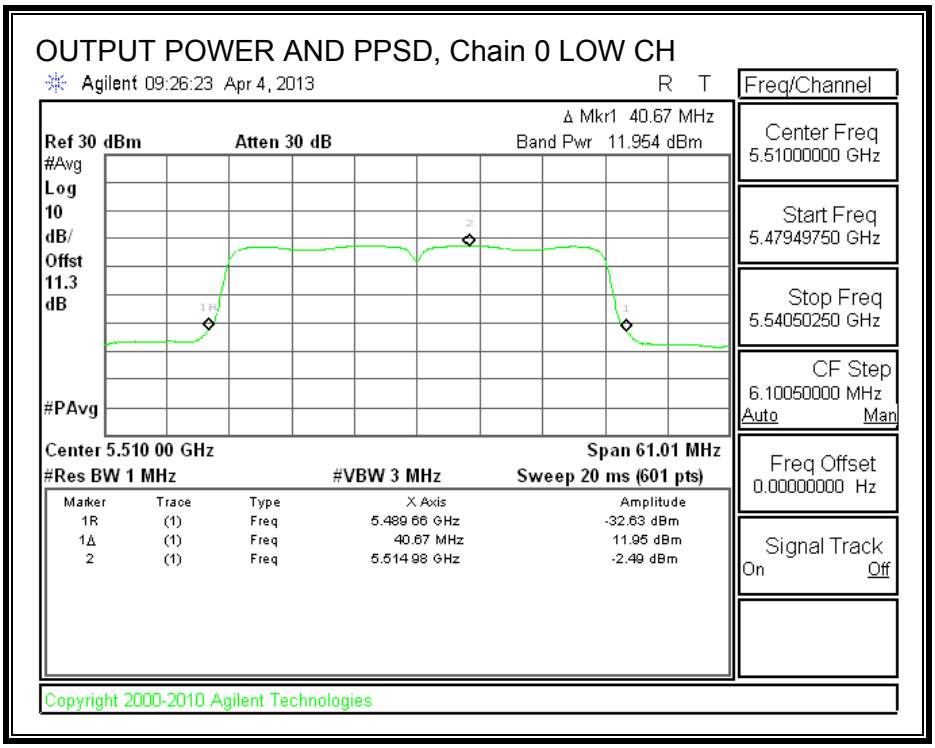
Output Power Results

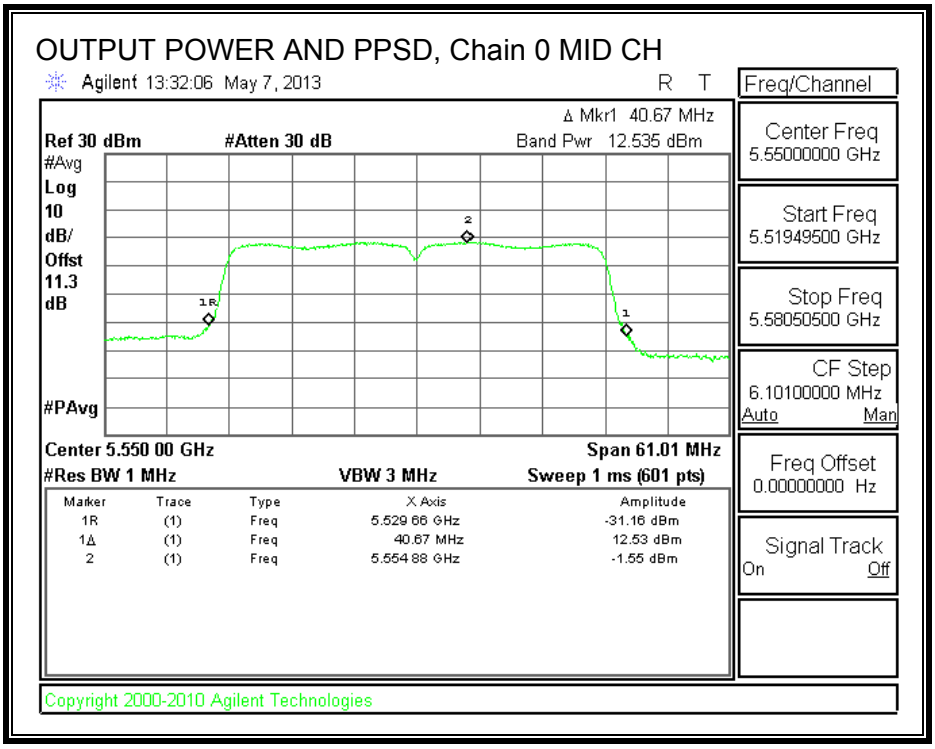
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	11.95	12.18	15.08	23.58	-8.50
Mid	5550	12.54	12.88	15.72	23.58	-7.86
High	5670	13.05	13.21	16.14	23.58	-7.44

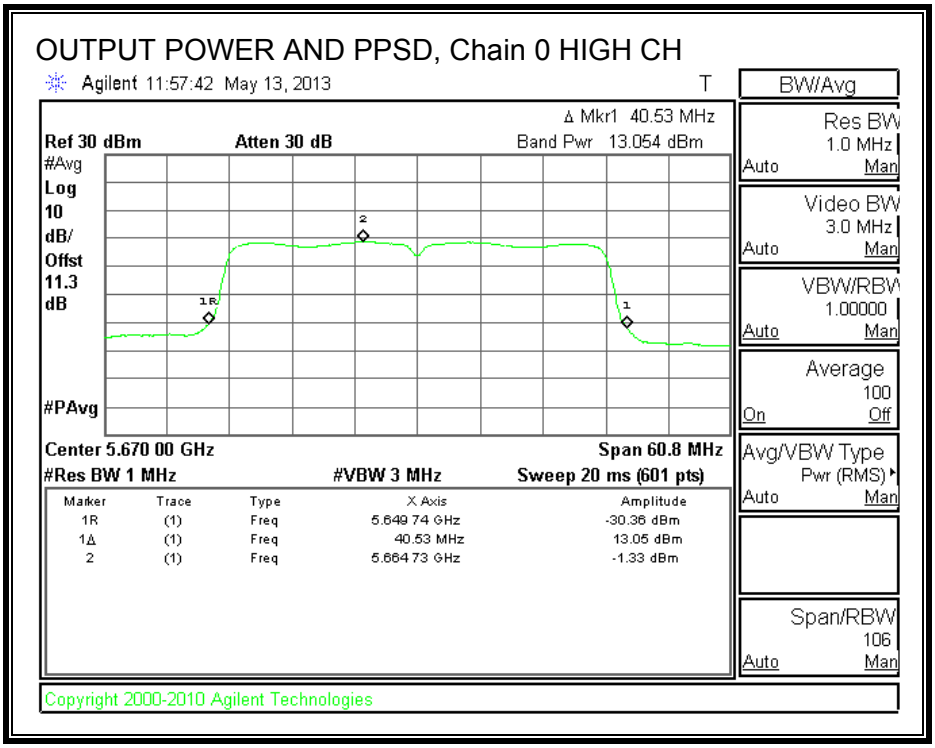
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-2.49	-2.27	0.63	10.58	-9.95
Mid	5550	-1.55	-1.31	1.58	10.58	-9.00
High	5670	-1.33	-1.22	1.74	10.58	-8.84

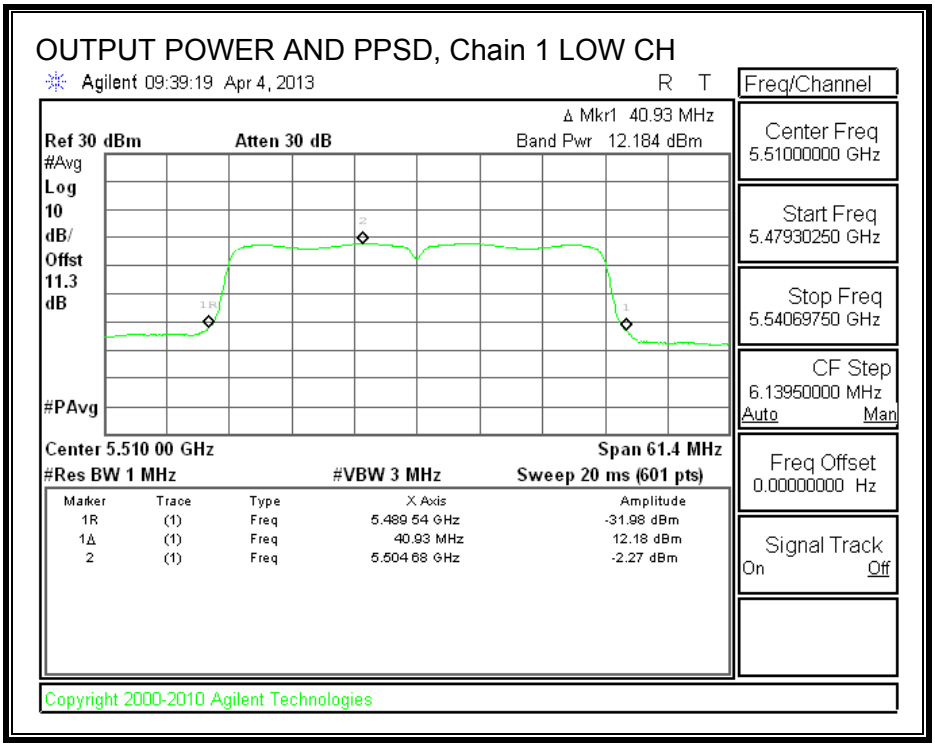
OUTPUT POWER AND PPSD, Chain 0

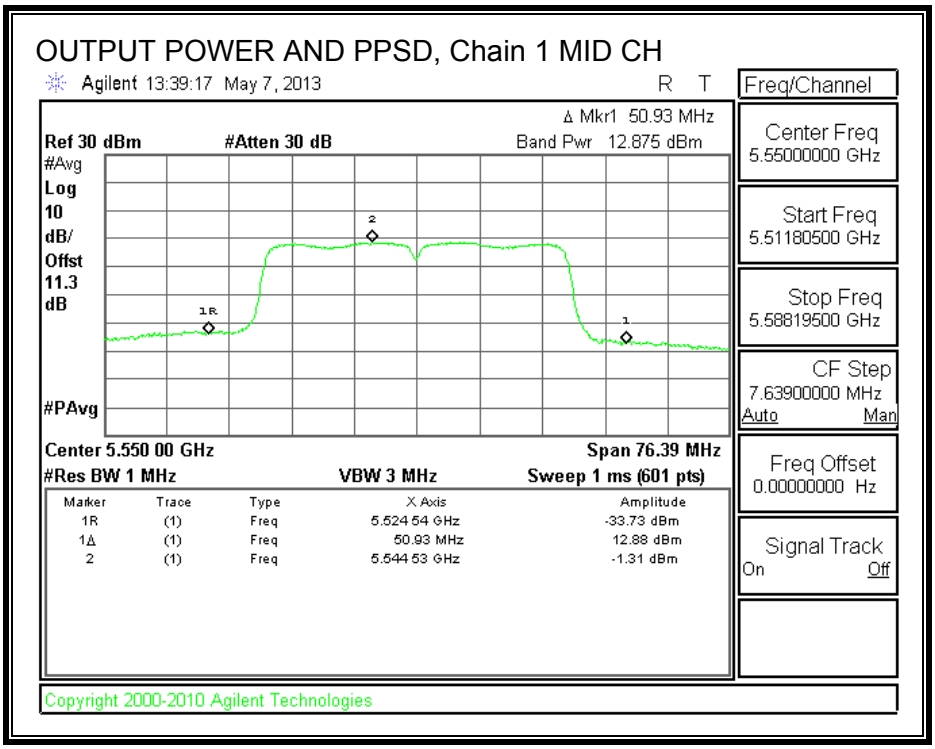


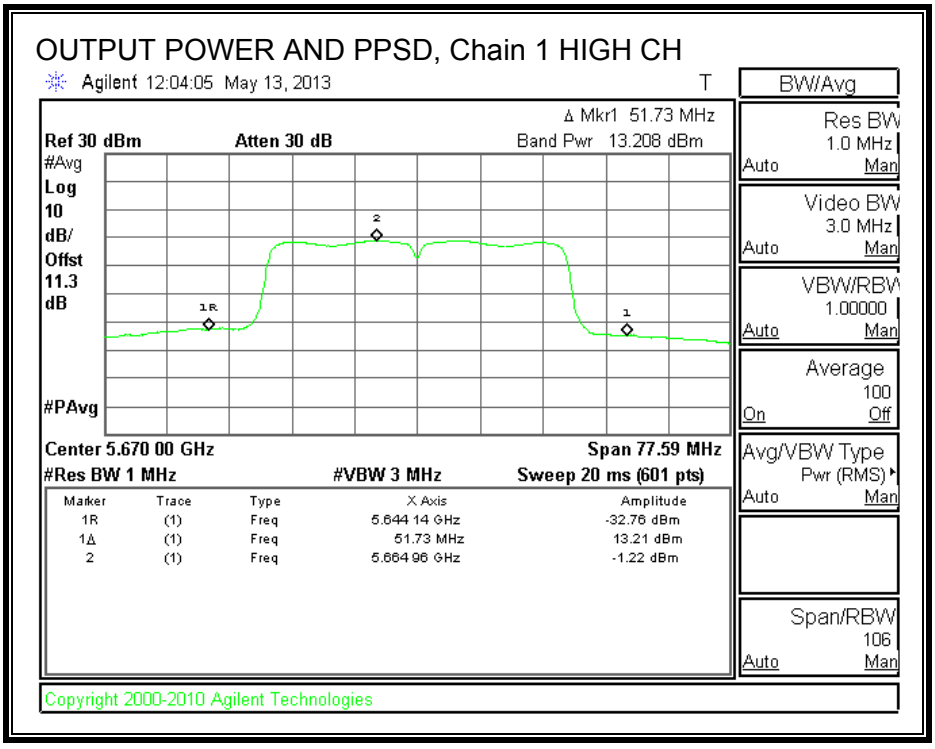




OUTPUT POWER AND PPSD, Chain 1







8.7.5. **PEAK EXCURSION**

LIMITS

FCC §15.407 (a) (6)

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

RESULTS

Chain 0

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5550	6.52	12.54	0.00	-6.02	13	-19.02

Chain 1

Channel	Frequency (MHz)	PK Level (dBm)	PSD (dBm)	DCCF (dB)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Mid	5550	7.36	12.88	0.00	-5.52	13	-18.52

8.7.6. **TPC POWER**

LIMITS

FCC §15.407 (h) (1)

IC RSS-210 A9.2 (3)

Transmit power control (TPC). U-NII devices operating in the 5.25–5.35 GHz band and the 5.47–5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

RESULTS

A TPC mechanism is not required since e.i.r.p. is less than 500 mW.

9. RADIATED TEST RESULTS

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters.

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

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements.

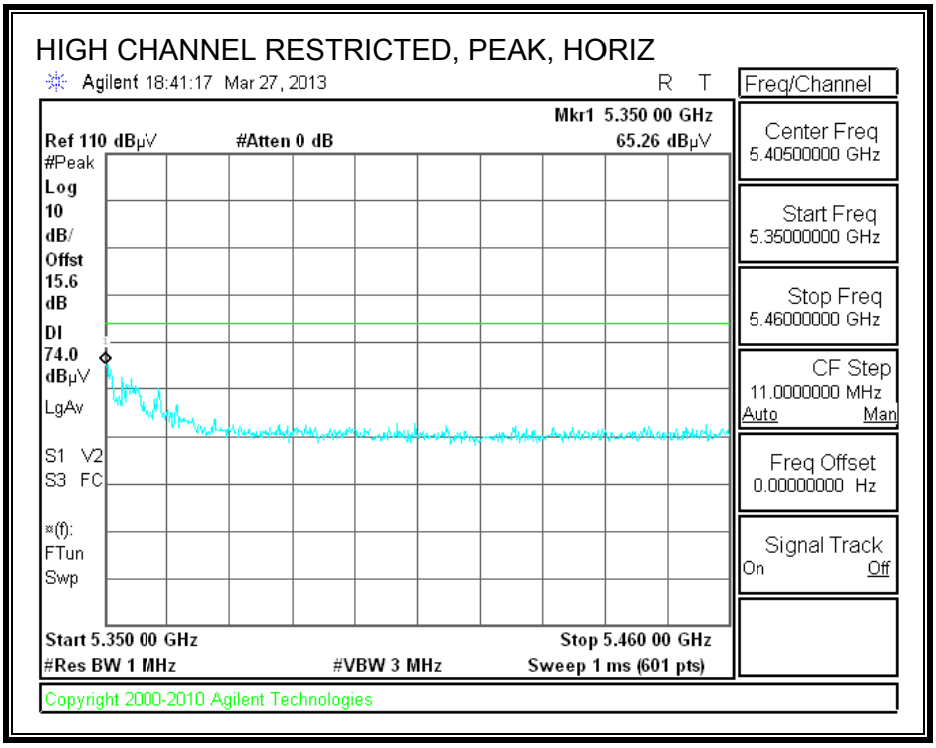
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

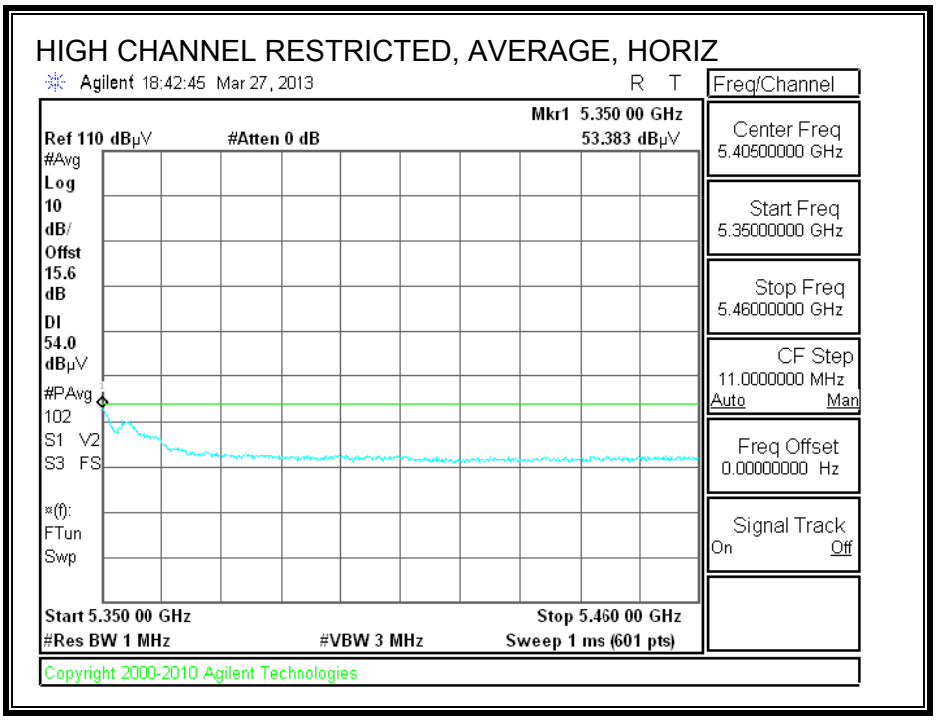
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

9.2. TRANSMITTER ABOVE 1 GHz

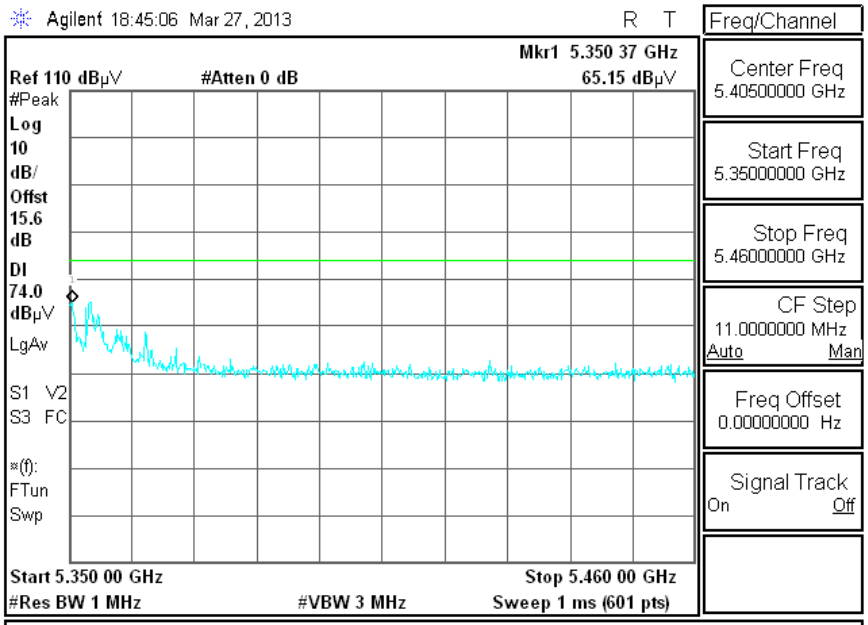
9.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)

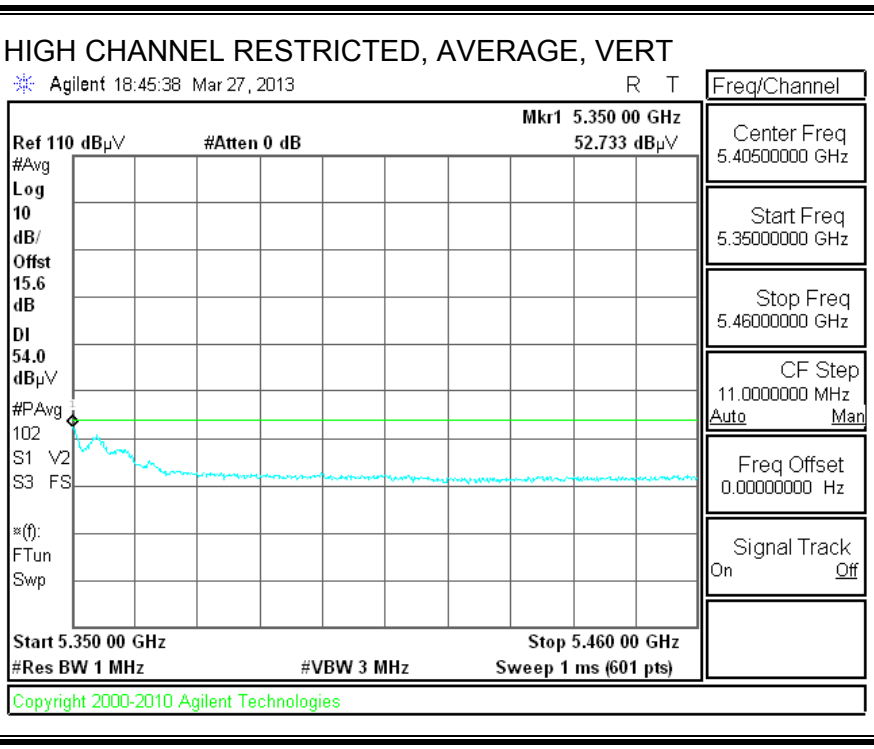




HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CH

Project :13U14860

Model / Config:1525

Mode:Tx 5.3GHz 11a low ch

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?	
1	1197.901	49.20	PK	28.30	-35.70	3.40	0.00	45.20	54.0	-8.8	74.0	-28.8	100	Horz	Y	
2	1995.240	51.93	PK1	31.80	-35.00	4.20	0.00	52.93	-	-	74.0	-21.1	147	Horz	N	
	1996.110	40.13	AD1	31.80	-35.00	4.20	0.00	41.13	54.0	-12.8	-	-	147	Horz	N	
3	2781.330	44.67	PK1	32.80	-35.10	5.00	0.00	47.37	-	-	74.0	-26.6	262	Horz	Y	
	2779.740	33.29	AD1	32.80	-35.10	5.00	0.00	35.99	54.0	-18.0	-	-	262	Horz	Y	
4	4967.916	39.86	PK	34.60	-34.90	7.20	0.40	47.16	54.0	-6.8	74.0	-26.8	100	Horz	Y	
10	5258.171	48.86	PK	34.90	-34.90	7.40	0.90	57.16	-	-	-	-	200	Horz	N	(Fundamental)
5	1193.870	55.42	PK1	28.30	-35.70	3.40	0.00	51.42	-	-	74.0	-22.6	135	Vert	Y	
	1195.220	41.22	AD1	28.30	-35.70	3.40	0.00	37.22	54.0	-16.8	-	-	135	Vert	Y	
8	1593.703	47.84	PK	28.90	-35.20	3.80	0.00	45.34	54.0	-8.6	74.0	-28.7	100	Vert	Y	
6	1994.260	54.70	PK1	31.80	-35.00	4.20	0.00	55.70	-	-	74.0	-20.1	157	Vert	N	
	1995.790	39.44	AD1	31.80	-35.00	4.20	0.00	40.44	54.0	-13.5	-	-	157	Vert	N	
7	2797.260	48.51	PK1	32.90	-35.10	5.00	0.10	51.41	-	-	74.0	-22.6	142	Vert	Y	
	2796.430	37.23	AD1	32.90	-35.10	5.00	0.10	40.13	54.0	-13.8	-	-	142	Vert	Y	
11	5258.171	52.49	PK	34.90	-34.90	7.40	0.90	60.79	-	-	-	-	200	Vert	N	(Fundamental)
9	6181.709	37.44	PK	36.00	-34.90	8.10	0.10	46.74	54.0	-7.2	74.0	-27.3	200	Vert	N	

PK - Peak detector

PK1 - KDB 789033 v01r02 G)5) Method: Peak

AD1 - KDB 789033 v01r02 G)6) Method: AD Primary Power Average

VB1 - KDB 789033 v01r02 G)6) Method: VB Alternative Reduced Video

PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak

MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

MAv2 - KDB558074 v02 10.2.3.3/8.2.2 Option 2 Slow Sweep RMS Average

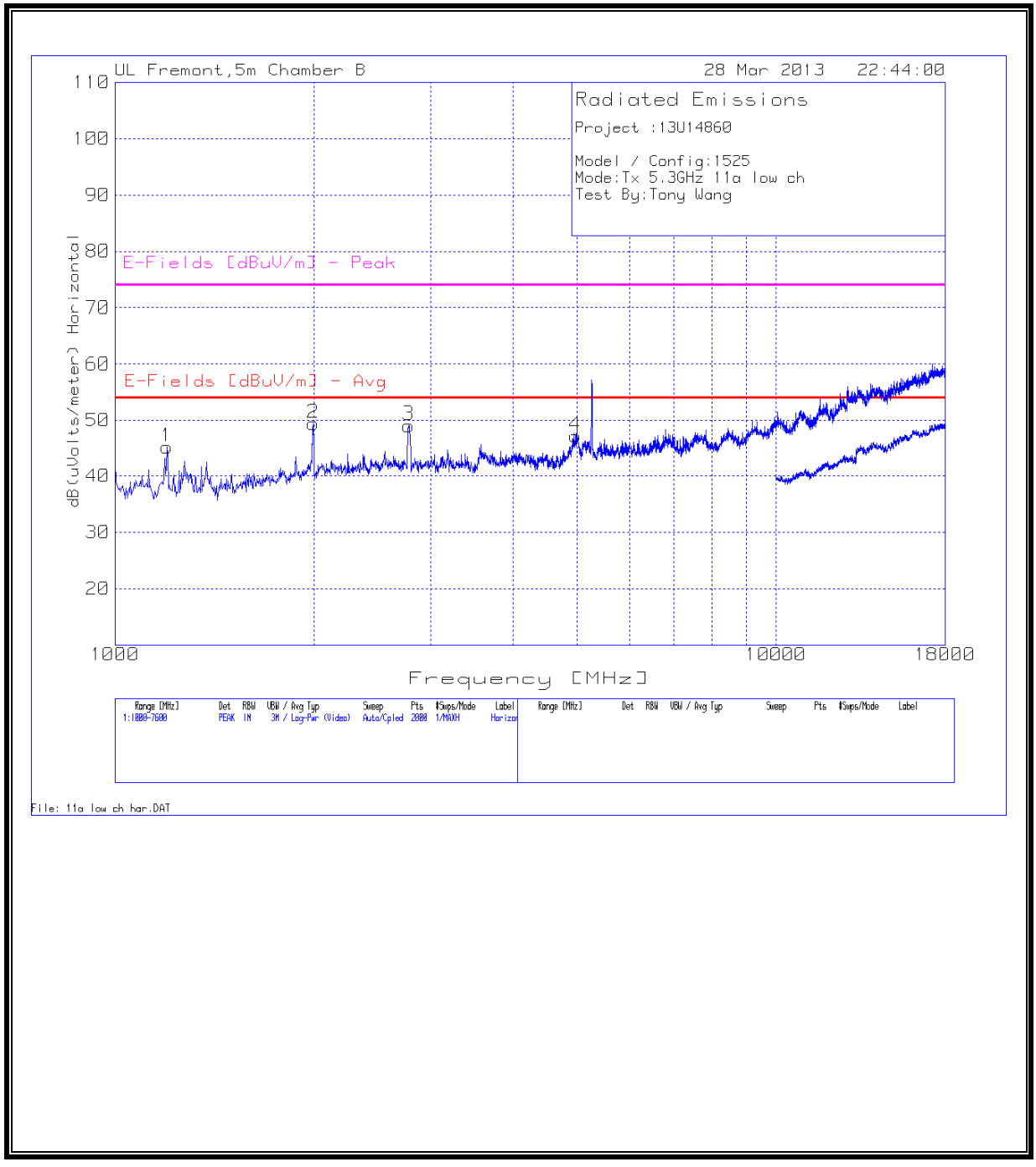
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

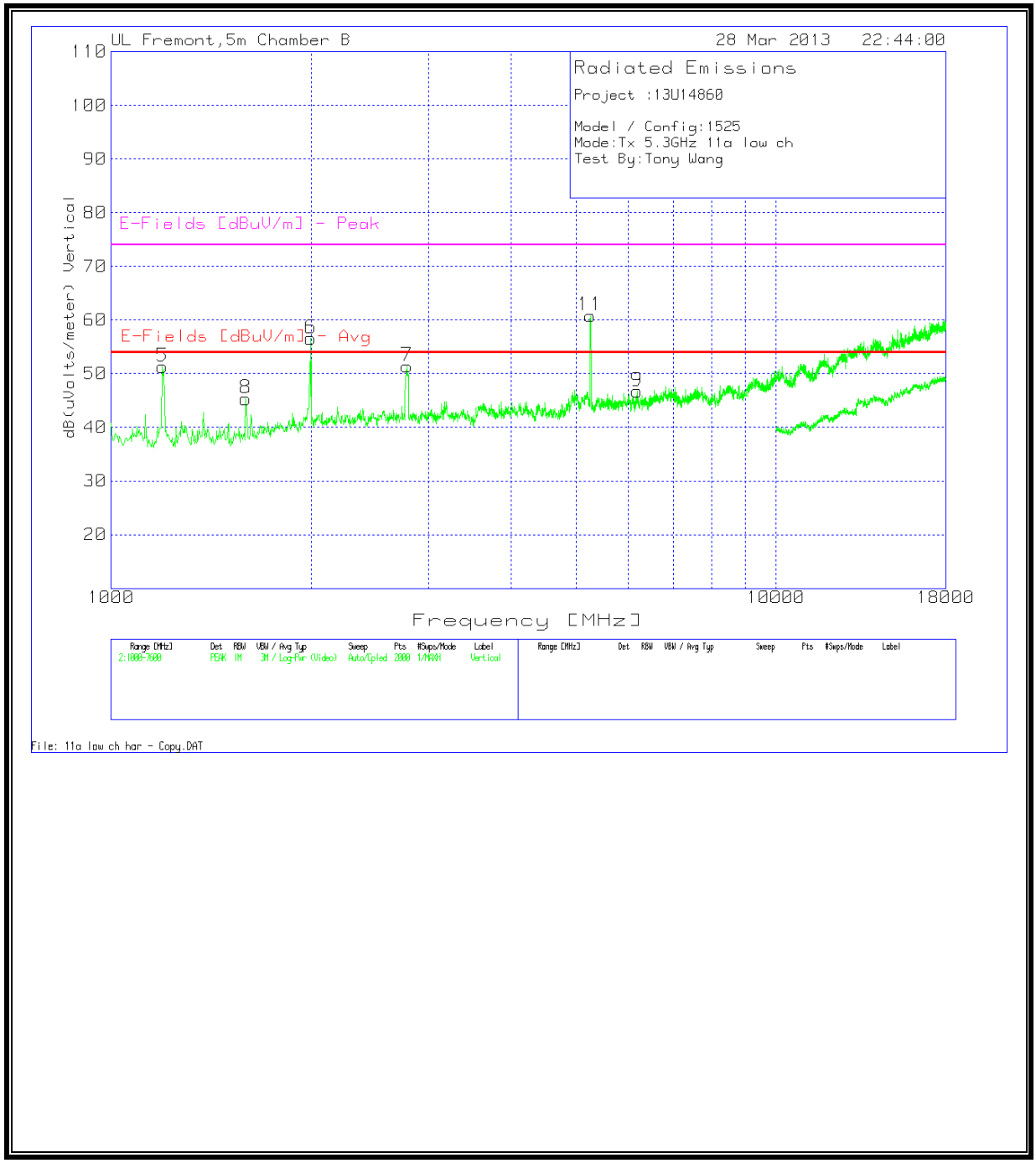
HARMONICS AND SPURIOUS EMISSIONS

LOW CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

LOW CH Vertical



HARMONICS AND SPURIOUS EMISSIONS

MID CH

Project :13U14860

Model / Config:1525

Mode:Tx 5.3GHz 11a Mid ch

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?	
1	1197.901	48.72	PK	28.30	-35.70	3.40	0.00	44.72	54.0	-9.3	74.0	-29.3	200	Horz	Y	
2	1995.810	48.27	PK1	31.80	-35.00	4.20	0.00	49.27	-	-	74.0	-24.7	144	Horz	N	
	1996.490	37.54	AD1	31.80	-35.00	4.20	0.00	38.54	54.0	-15.4	-	-	144	Horz	N	
3	2777.630	46.69	PK1	32.80	-35.10	5.00	0.00	49.39	-	-	74.0	-24.7	259	Horz	Y	
	2778.130	35.09	AD1	32.80	-35.10	5.00	0.00	37.79	54.0	-16.2	-	-	259	Horz	Y	
9	5301.049	50.00	PK	34.90	-34.90	7.40	0.90	58.30	-	-	-	-	200	Horz	N	(Fundamental)
4	5716.642	38.30	PK	35.20	-34.90	7.70	0.10	46.40	54.0	-7.6	74.0	-27.6	100	Horz	N	
5	1125.337	47.48	PK	28.00	-35.80	3.30	0.00	42.98	54.0	-11.0	74.0	-31.0	200	Vert	Y	
6	1993.870	51.70	PK1	31.80	-35.00	4.20	0.00	52.70	-	-	74.0	-23.1	162	Vert	N	
	1994.480	40.38	AD1	31.80	-35.00	4.20	0.00	41.38	54.0	-12.6	-	-	162	Vert	N	
7	2790.750	47.32	PK1	32.90	-35.10	5.00	0.10	50.22	-	-	74.0	-23.8	137	Vert	Y	
	2789.120	35.45	AD1	32.90	-35.10	5.00	0.10	38.35	54.0	-15.6	-	-	137	Vert	Y	
10	5301.049	49.95	PK	34.90	-34.90	7.40	0.90	58.25	-	-	-	-	200	Vert	N	(Fundamental)
8	6458.771	36.01	PK	35.90	-35.00	8.30	0.00	45.21	54.0	-8.8	74.0	-28.8	100	Vert	N	

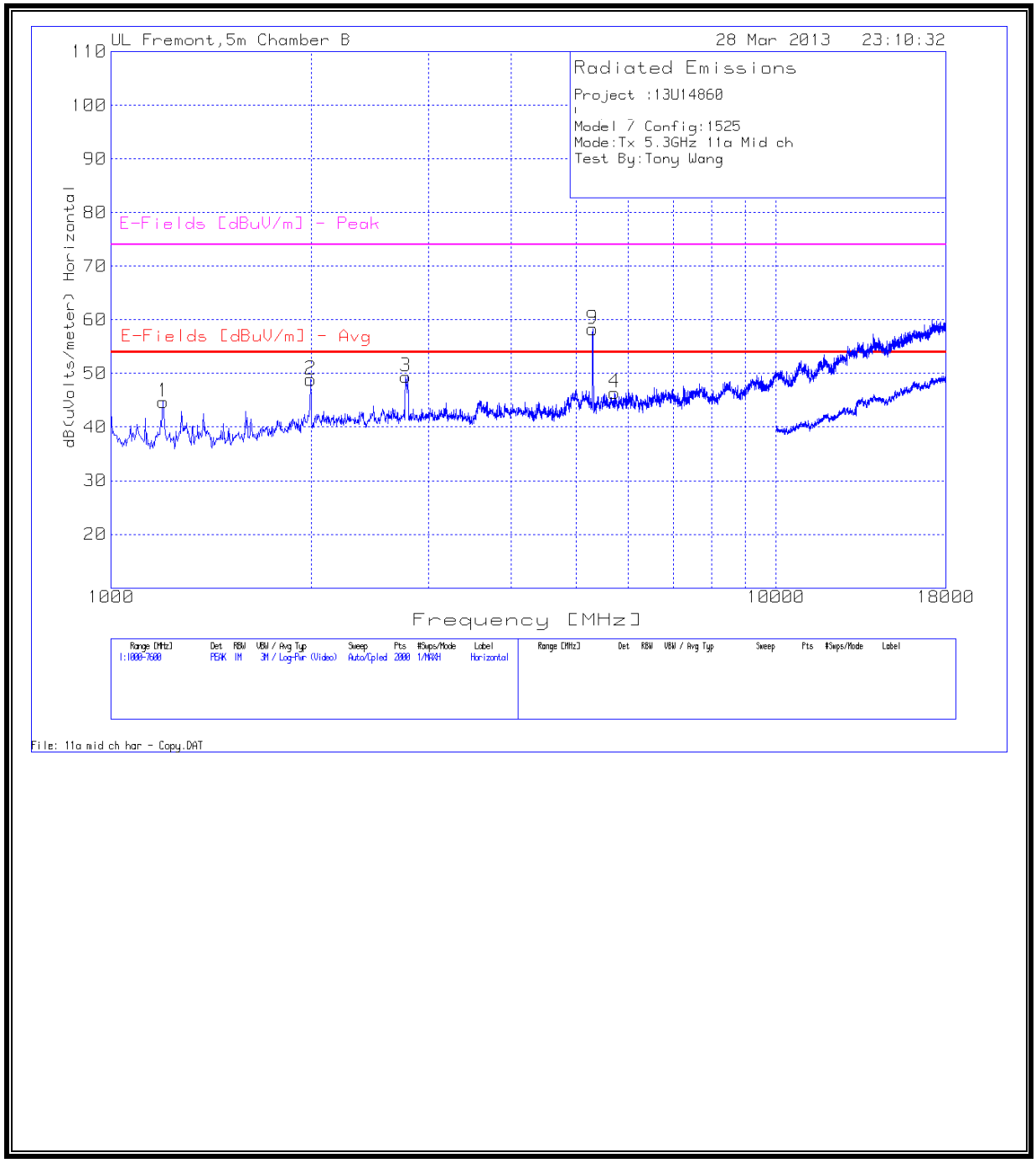
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

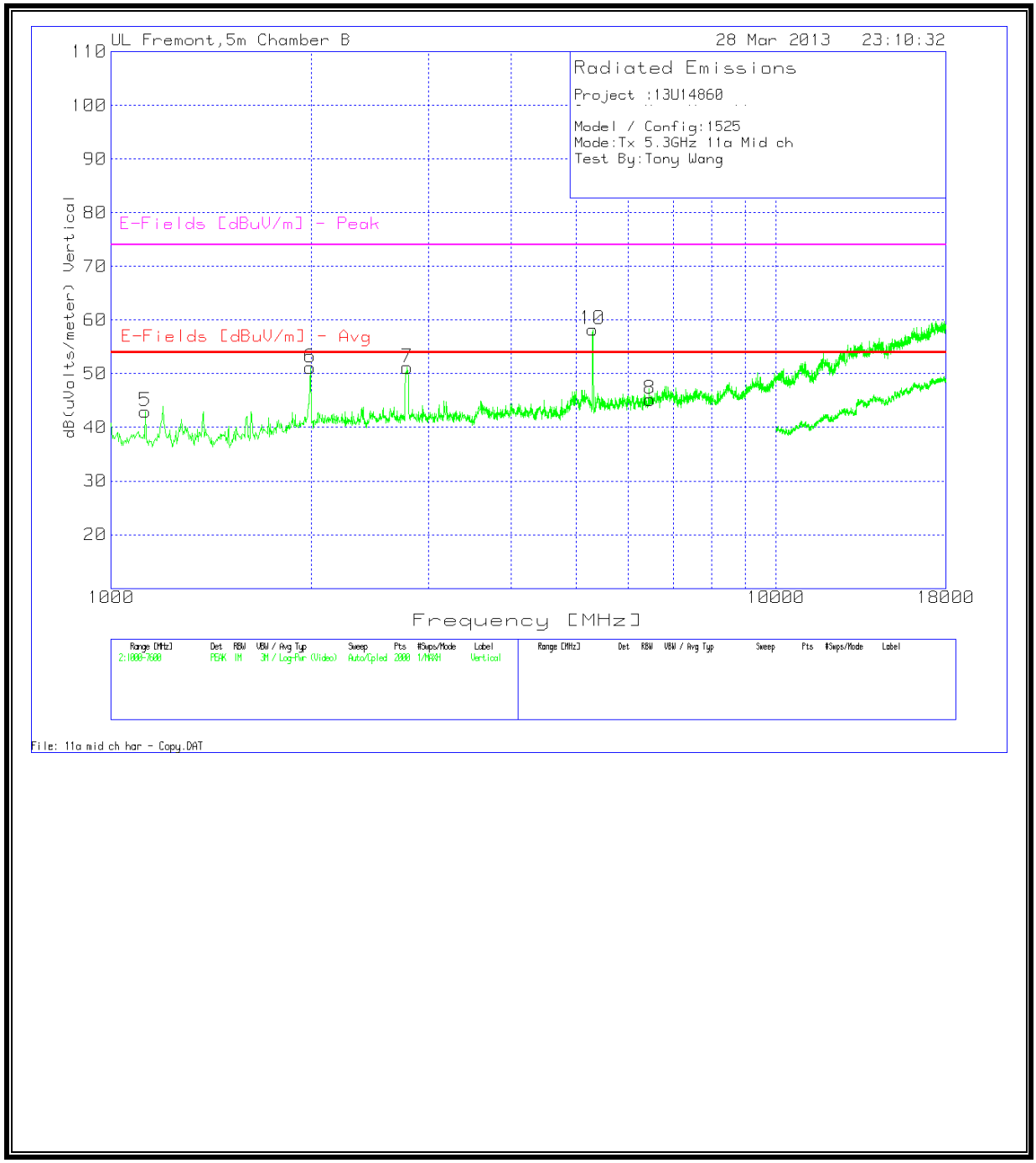
HARMONICS AND SPURIOUS EMISSIONS

MID CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

MID CH Vertical



HARMONICS AND SPURIOUS EMISSIONS

HIGH CH

Project :13U14860

Model / Config:1525

Mode:Tx 5.3GHz 11a High ch

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?	
1	1273.763	45.94	PK	28.60	-35.60	3.40	0.00	42.34	54.0	-11.6	74.0	-31.7	200	Horz	N	
2	1996.102	44.29	PK	31.80	-35.00	4.20	0.00	45.29	54.0	-8.7	74.0	-28.7	100	Horz	N	
3	2784.410	46.81	PK1	32.80	-35.10	5.00	0.00	49.51	-	-	74.0	-24.5	247	Horz	Y	
	2779.560	35.47	AD1	32.80	-35.10	5.00	0.00	38.17	54.0	-15.8	-	-	247	Horz	Y	
4	4107.046	40.29	PK	34.00	-34.80	6.30	0.10	45.89	54.0	-8.1	74.0	-28.1	200	Horz	Y	
10	5317.541	47.48	PK	34.90	-34.90	7.40	0.90	55.78	-	-	-	-	200	Horz	N	(Fundamental)
5	1195.170	54.22	PK1	28.30	-35.70	3.40	0.00	50.22	-	-	74.0	-23.8	134	Vert	Y	
	1196.260	40.93	AD1	28.30	-35.70	3.40	0.00	36.93	54.0	-17.0	-	-	134	Vert	Y	
6	1995.380	50.19	PK1	31.80	-35.00	4.20	0.00	51.19	-	-	74.0	-22.8	152	Vert	N	
	1996.470	36.56	AD1	31.80	-35.00	4.20	0.00	37.56	54.0	-16.4	-	-	152	Vert	N	
7	2780.220	48.71	PK1	32.80	-35.10	5.00	0.00	51.41	-	-	74.0	-22.6	143	Vert	Y	
	2779.030	35.84	AD1	32.80	-35.10	5.00	0.00	38.54	54.0	-15.4	-	-	143	Vert	Y	
8	4394.003	37.83	PK	34.30	-34.90	6.60	0.10	43.93	54.0	-10.0	74.0	-30.1	100	Vert	Y	
11	5317.541	50.23	PK	34.90	-34.90	7.40	0.90	58.53	-	-	-	-	200	Vert	N	(Fundamental)
9	5485.757	38.31	PK	34.90	-34.90	7.60	0.90	46.81	54.0	-7.2	74.0	-27.2	200	Vert	N	

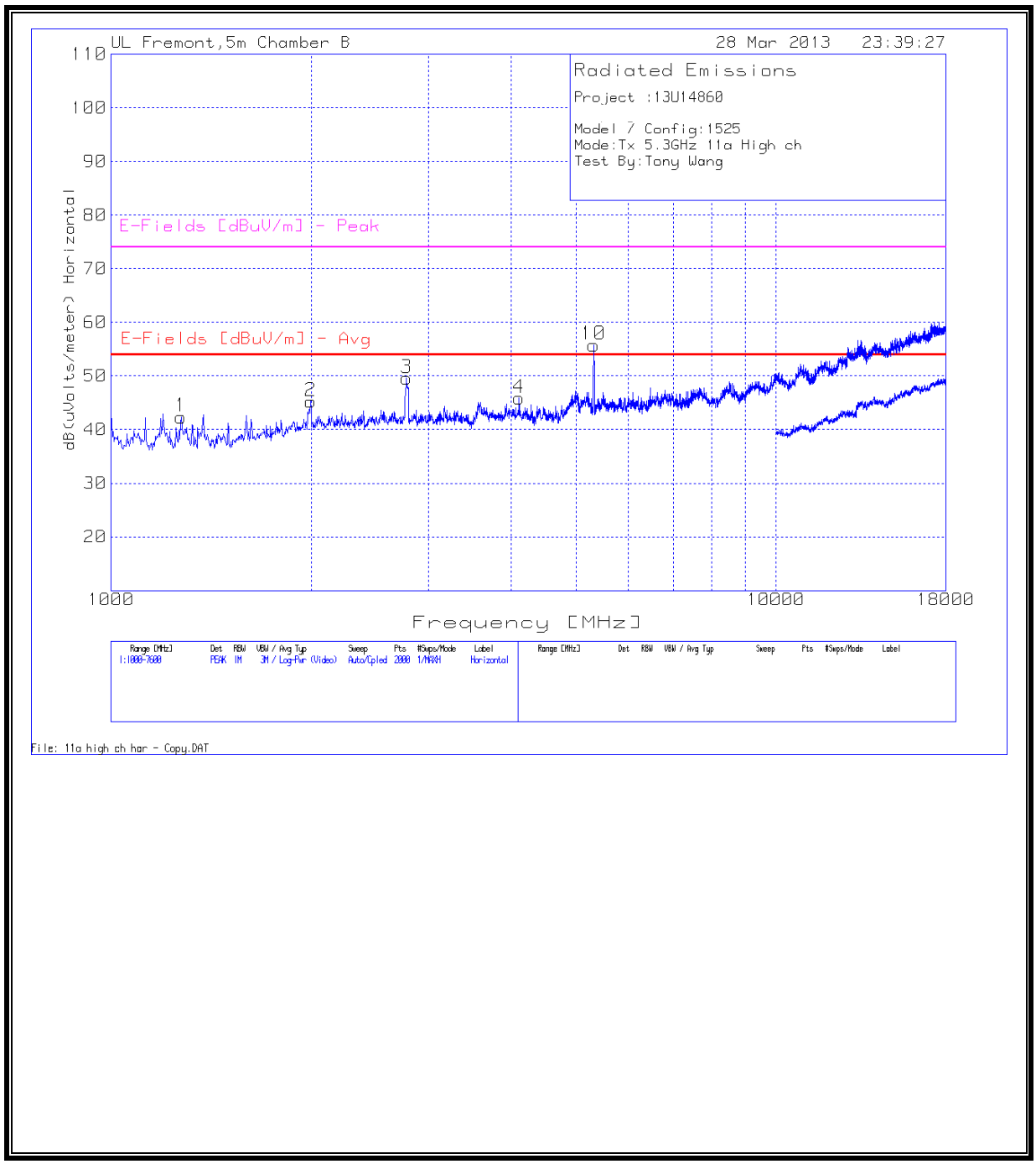
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

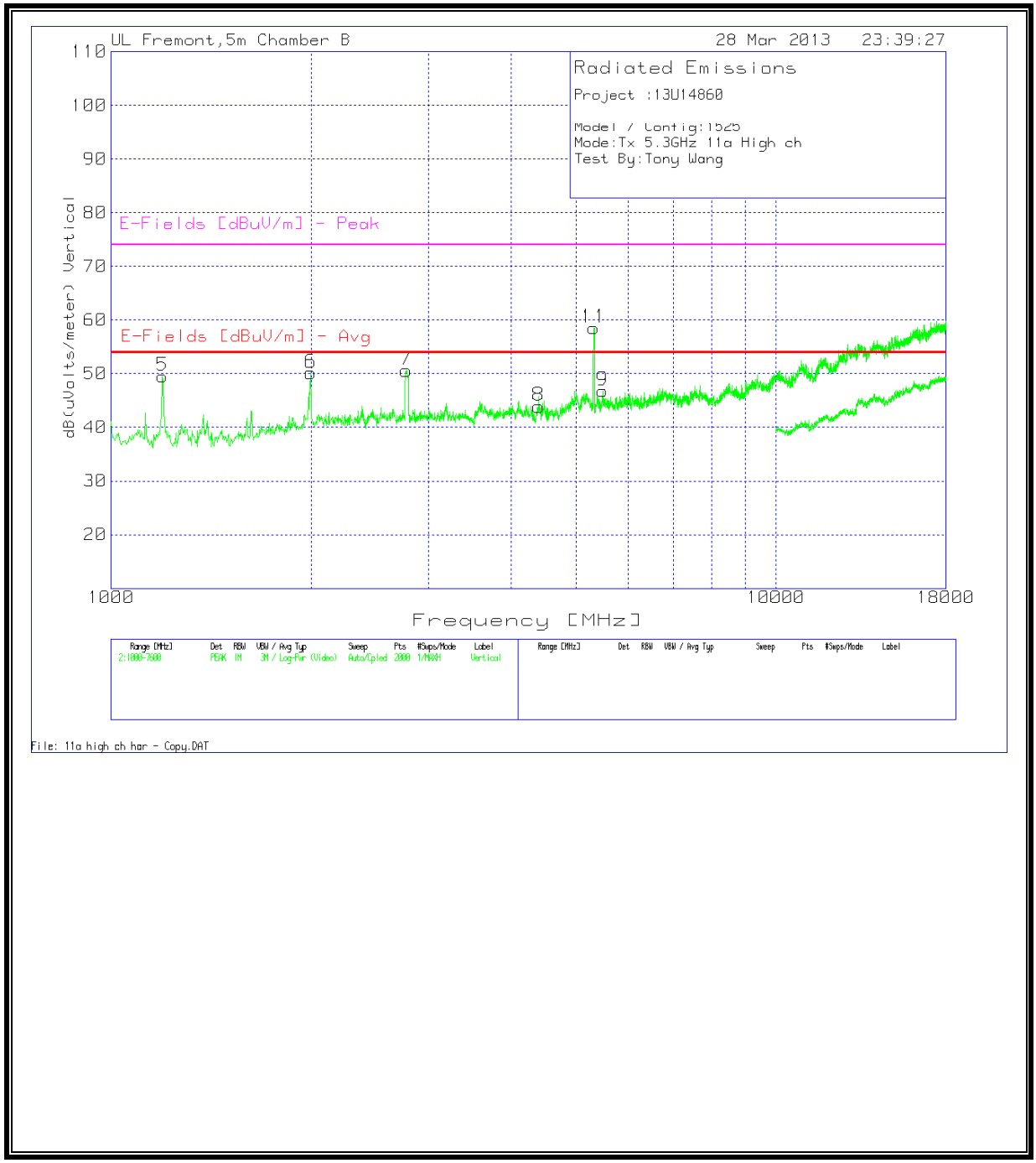
HARMONICS AND SPURIOUS EMISSIONS

HIGH CH Horizontal



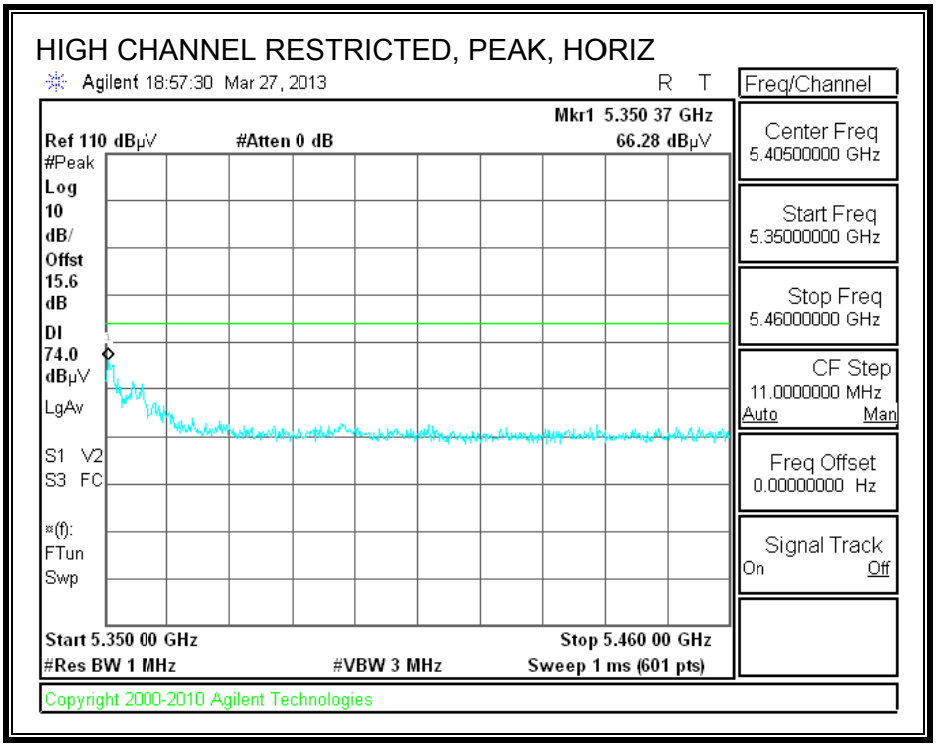
HARMONICS AND SPURIOUS EMISSIONS

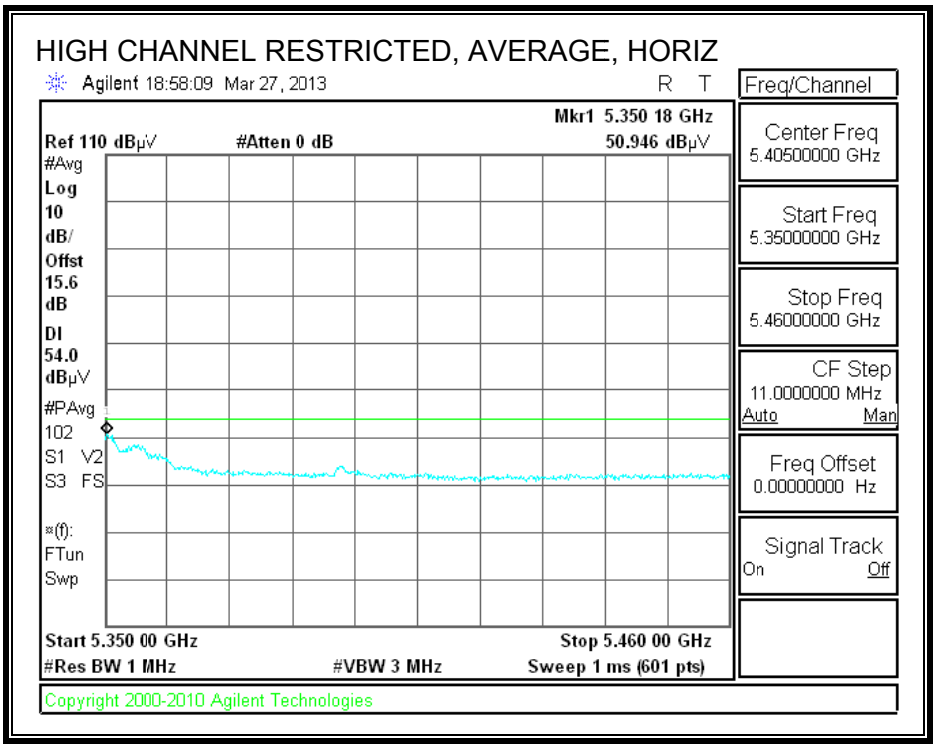
HIGH CH Vertical



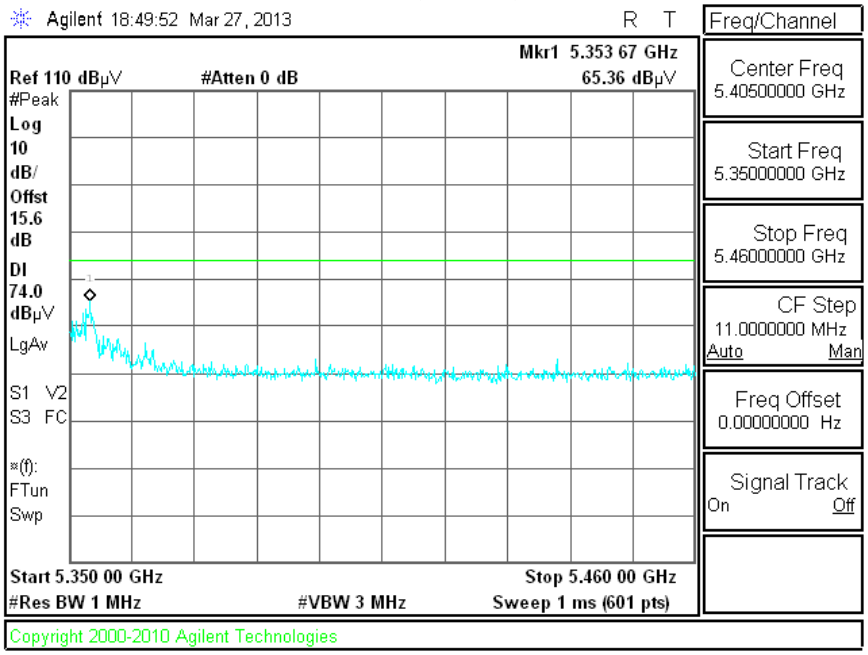
9.2.2. **TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND**

RESTRICTED BANDEDGE (HIGH CHANNEL)

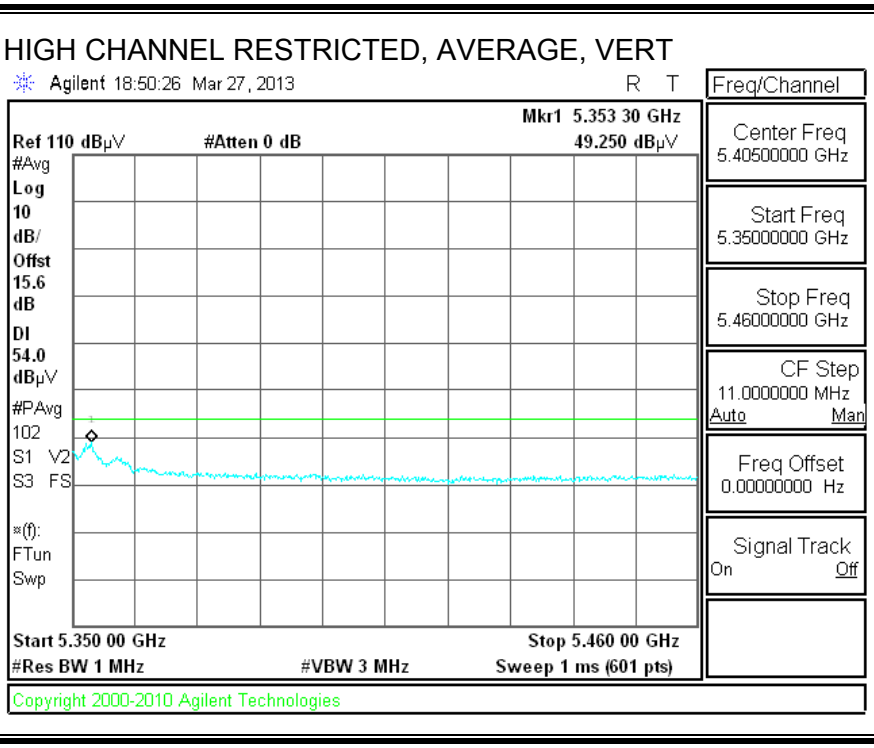




HIGH CHANNEL RESTRICTED, PEAK, VERT

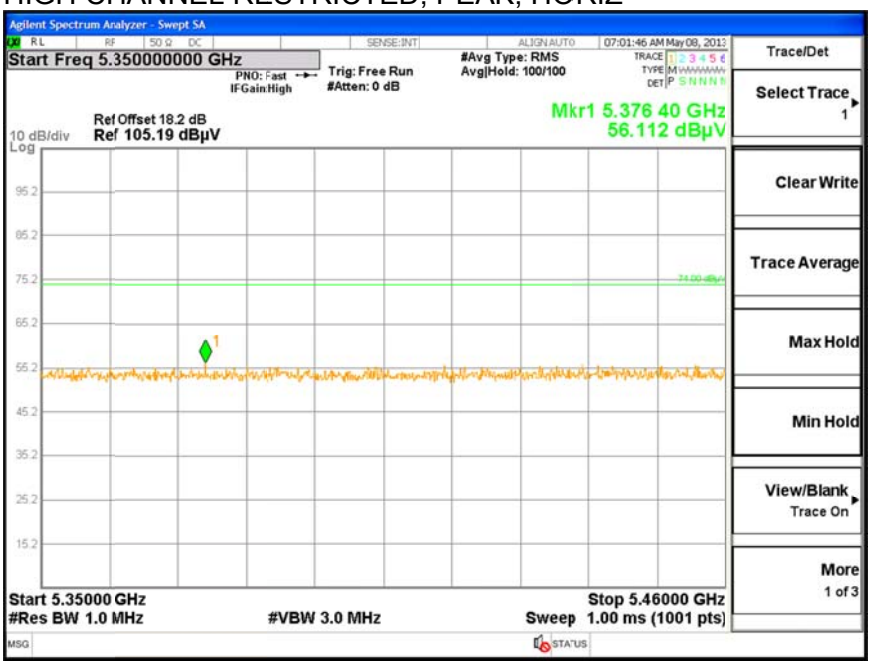


HIGH CHANNEL RESTRICTED, AVERAGE, VERT

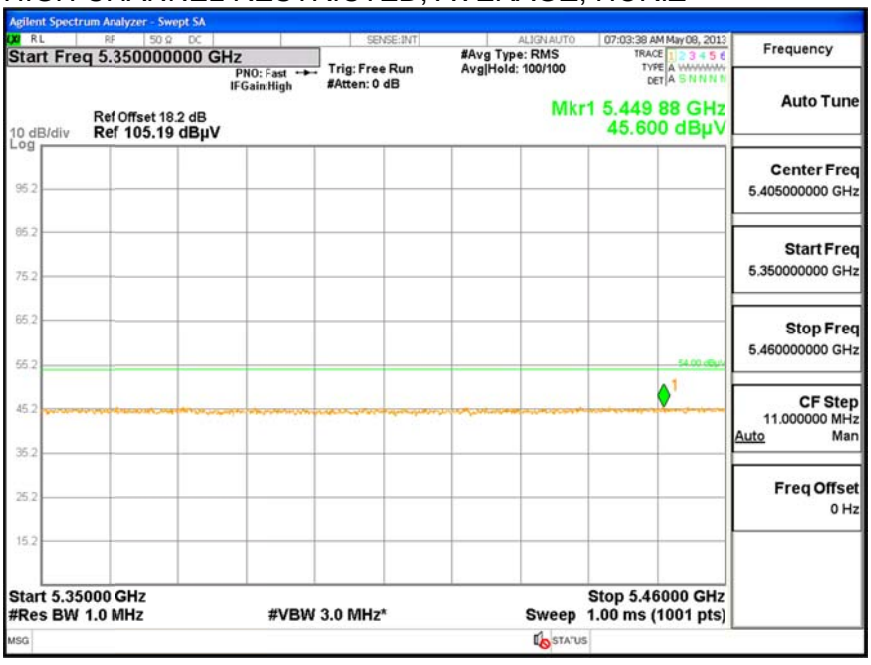


RESTRICTED BANDEDGE (HIGH CHANNEL 5300MHz)

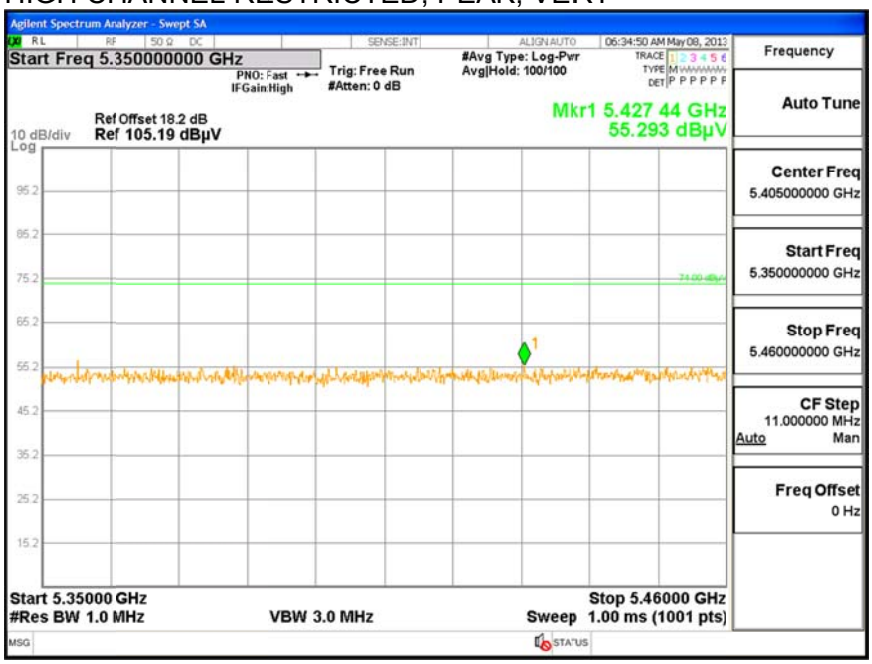
HIGH CHANNEL RESTRICTED, PEAK, HORIZ



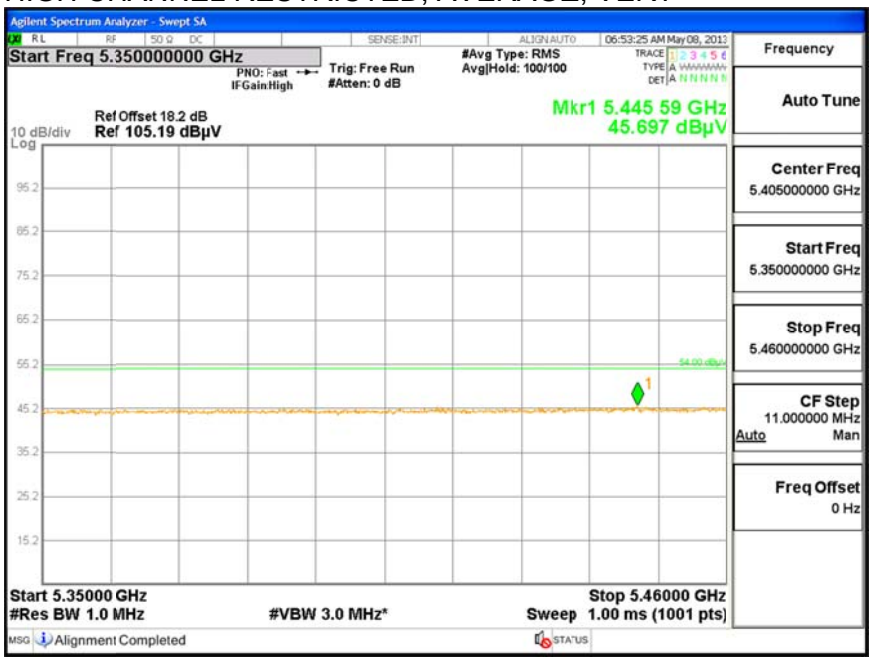
HIGH CHANNEL RESTRICTED, AVERAGE, HORIZ



HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CH

Project :13U14860
Model / Config:1525
Mode:Tx 5.3GHz 11n20 low ch
Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?	
1	1197.901	47.29	PK	28.30	-35.70	3.40	0.00	43.29	54.0	-10.7	74.0	-30.7	200	Horz	Y	
2	1993.180	54.21	PK1	31.80	-35.00	4.20	0.00	55.21	-	-	74.0	-18.8	133	Horz	N	
	1994.480	35.43	AD1	31.80	-35.00	4.20	0.00	36.43	54.0	-17.5	-	-	133	Horz	N	
3	2790.340	47.07	PK1	32.80	-35.10	5.00	0.10	49.87	-	-	74.0	-24.1	142	Horz	Y	
	2791.110	33.69	AD1	32.80	-35.10	5.00	0.10	36.49	54.0	-17.5	-	-	142	Horz	Y	
11	5264.768	48.04	PK	34.90	-34.90	7.40	0.90	56.34	54.0	2.4	74.0	-17.7	200	Horz	N	(Fundamental)
4	5815.592	37.81	PK	35.40	-34.90	7.80	0.10	46.21	-	-	-	-	100	Horz	N	
5	1194.603	51.75	PK	28.30	-35.70	3.40	0.00	47.75	54.0	-6.2	74.0	-26.3	100	Vert	Y	
6	1597.001	49.85	PK	28.90	-35.20	3.80	0.00	47.35	54.0	-6.6	74.0	-26.7	100	Vert	Y	
7	1623.388	46.94	PK	29.10	-35.20	3.80	0.00	44.64	54.0	-9.3	74.0	-29.4	100	Vert	Y	
8	1993.490	55.69	PK1	31.80	-35.00	4.20	0.00	56.69	-	-	74.0	-17.3	127	Vert	N	
	1995.300	38.33	AD1	31.80	-35.00	4.20	0.00	39.33	54.0	-14.6	-	-	127	Vert	N	
9	2787.900	51.11	PK1	32.80	-35.10	5.00	0.10	53.91	-	-	74.0	-20.1	120	Vert	Y	
	2789.860	37.98	AD1	32.80	-35.10	5.00	0.10	40.78	54.0	-13.2	-	-	120	Vert	Y	
12	5264.768	49.29	PK	34.90	-34.90	7.40	0.90	57.59	-	-	-	-	200	Vert	N	(Fundamental)
10	5917.841	37.19	PK	35.70	-34.90	7.90	0.10	45.99	54.0	-8.0	74.0	-28.0	100	Vert	N	

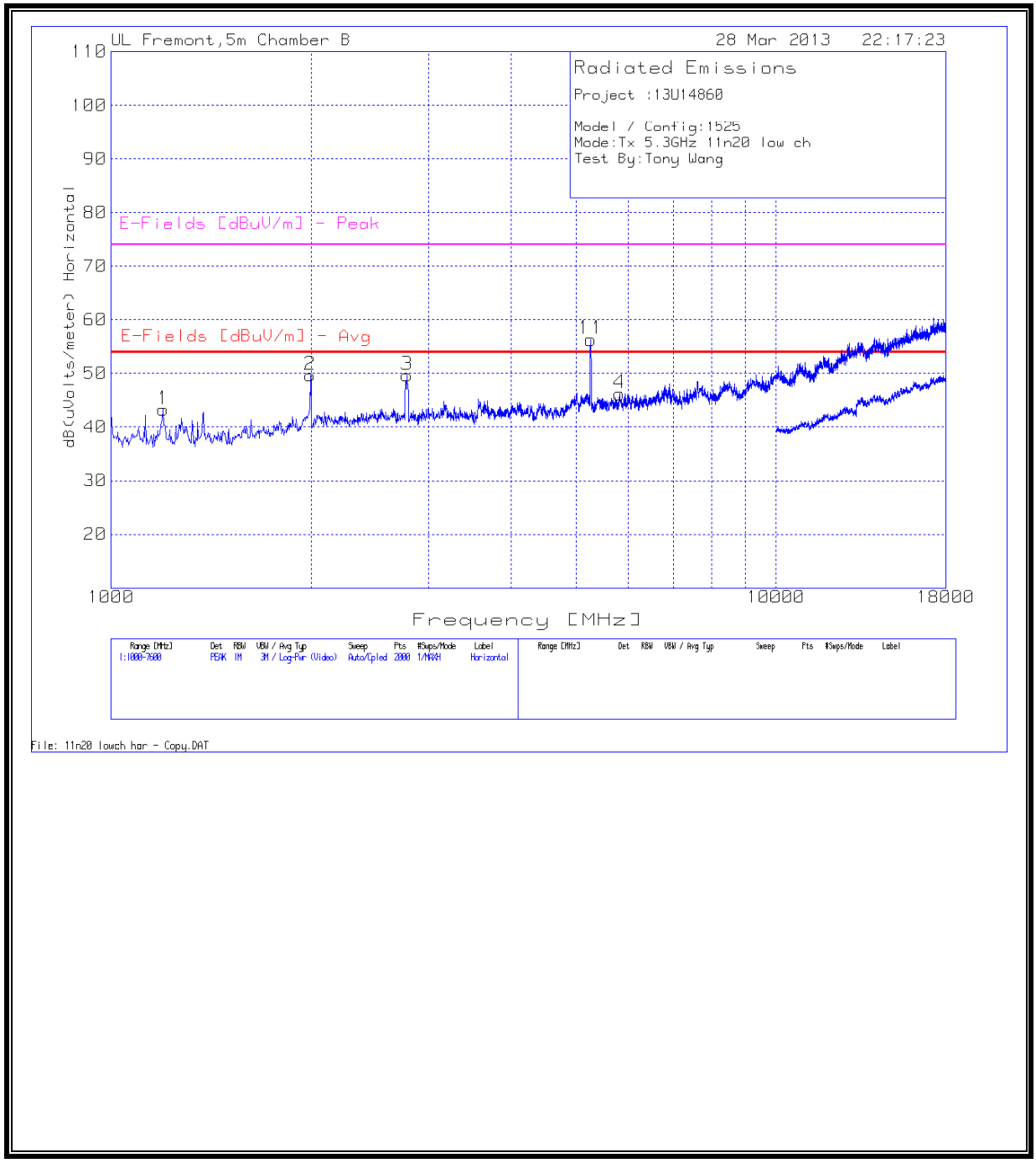
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

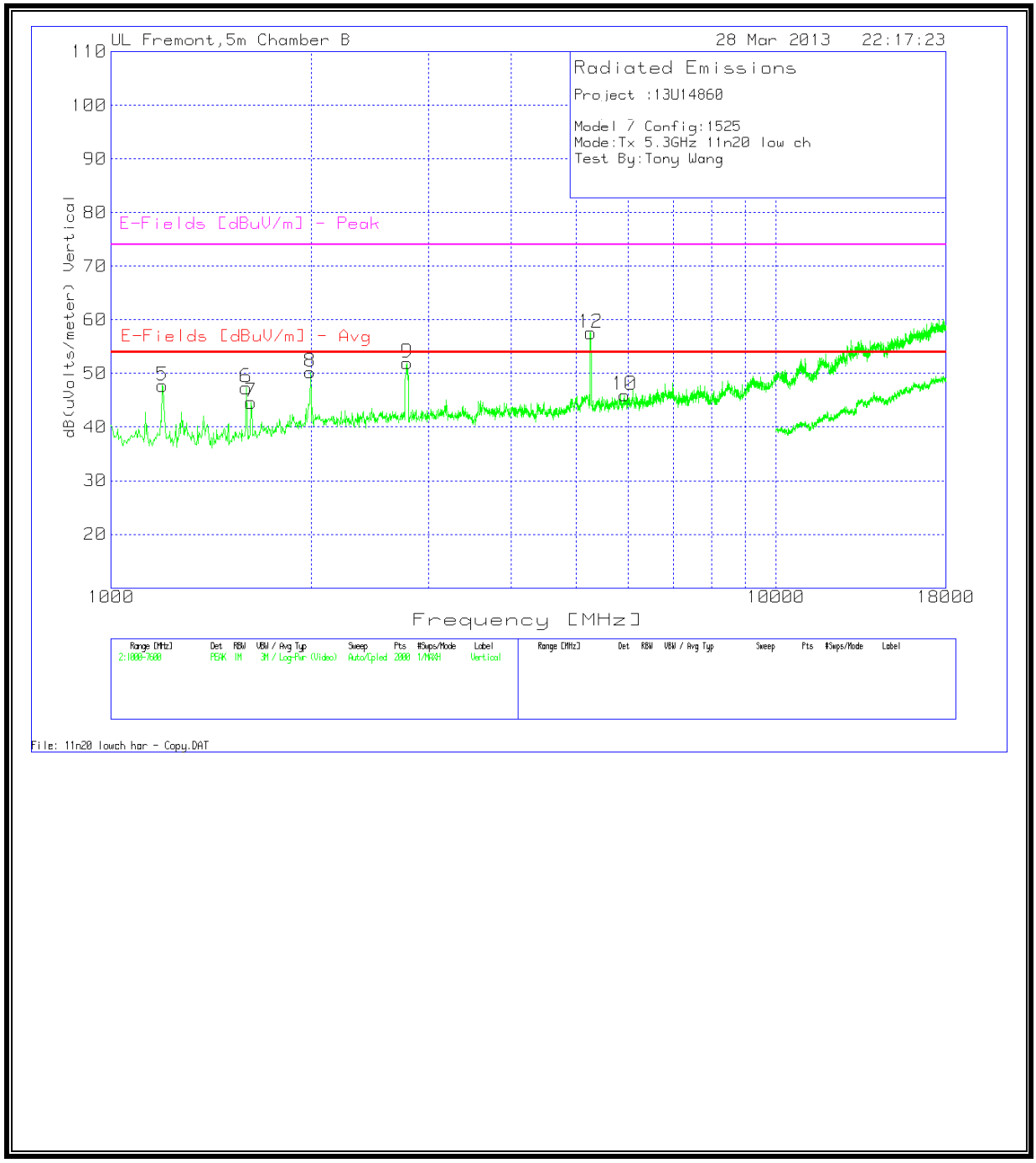
HARMONICS AND SPURIOUS EMISSIONS

LOW CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

LOW CH Vertical



HARMONICS AND SPURIOUS EMISSIONS

MID CH

Project :13U14860

Model / Config:1525

Mode:Tx 5.3Ghz 11n20 mid ch

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?
1	1197.901	51.12	PK	28.30	-35.70	3.40	0.00	47.12	54.0	-6.9	74.0	-26.9	200	Horz	Y
2	1376.012	48.19	PK	28.40	-35.40	3.60	0.00	44.79	54.0	-9.2	74.0	-29.2	200	Horz	Y
3	1993.350	53.41	PK1	31.80	-35.00	4.20	0.00	54.41	-	-	74.0	-19.6	164	Horz	N
	1996.910	35.12	AD1	31.80	-35.00	4.20	0.00	36.12	54.0	-17.9	-	-	164	Horz	N
4	2777.811	45.22	PK	32.80	-35.10	5.00	0.00	47.92	54.0	-6.1	74.0	-26.1	100	Horz	Y
5	3585.907	40.20	PK	33.40	-35.00	5.80	0.00	44.40	54.0	-9.6	74.0	-29.6	200	Horz	N
6	1197.901	50.35	PK	28.30	-35.70	3.40	0.00	46.35	54.0	-7.6	74.0	-27.7	100	Vert	Y
7	1995.140	53.06	PK1	31.80	-35.00	4.20	0.00	54.06	-	-	74.0	-19.9	205	Vert	N
	1996.590	35.02	AD1	31.80	-35.00	4.20	0.00	36.02	54.0	-18.0	-	-	205	Vert	N
8	2781.380	48.51	PK1	32.80	-35.10	5.00	0.00	51.21	-	-	74.0	-22.8	173	Vert	Y
	2777.750	35.74	AD1	32.80	-35.10	5.00	0.00	38.44	54.0	-15.5	-	-	173	Vert	Y
9	3724.438	40.45	PK	33.70	-34.90	6.00	0.00	45.25	54.0	-8.7	74.0	-28.8	200	Vert	Y
10	6191.604	36.15	PK	36.00	-34.90	8.10	0.10	45.45	54.0	-8.5	74.0	-28.6	100	Vert	N

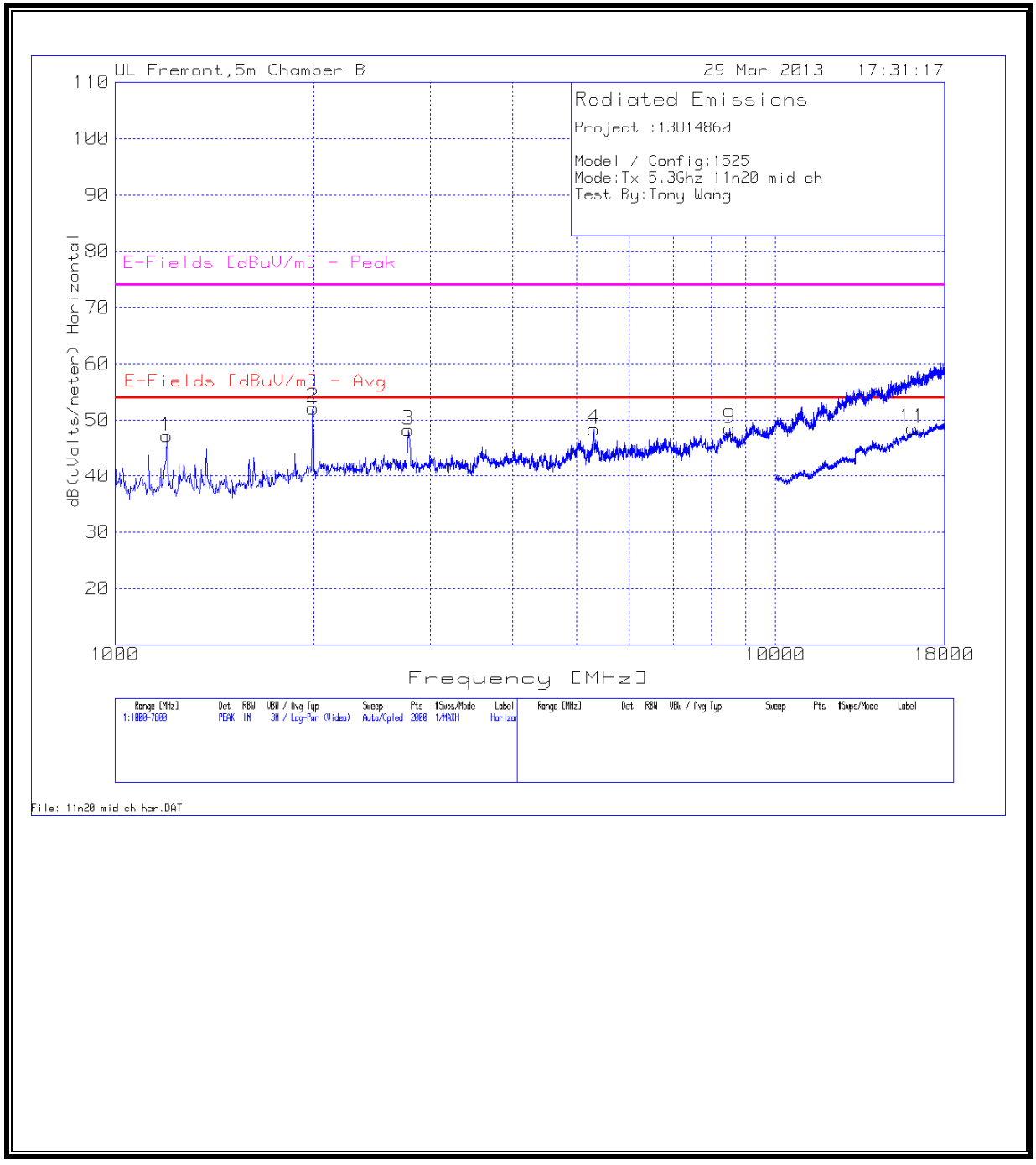
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

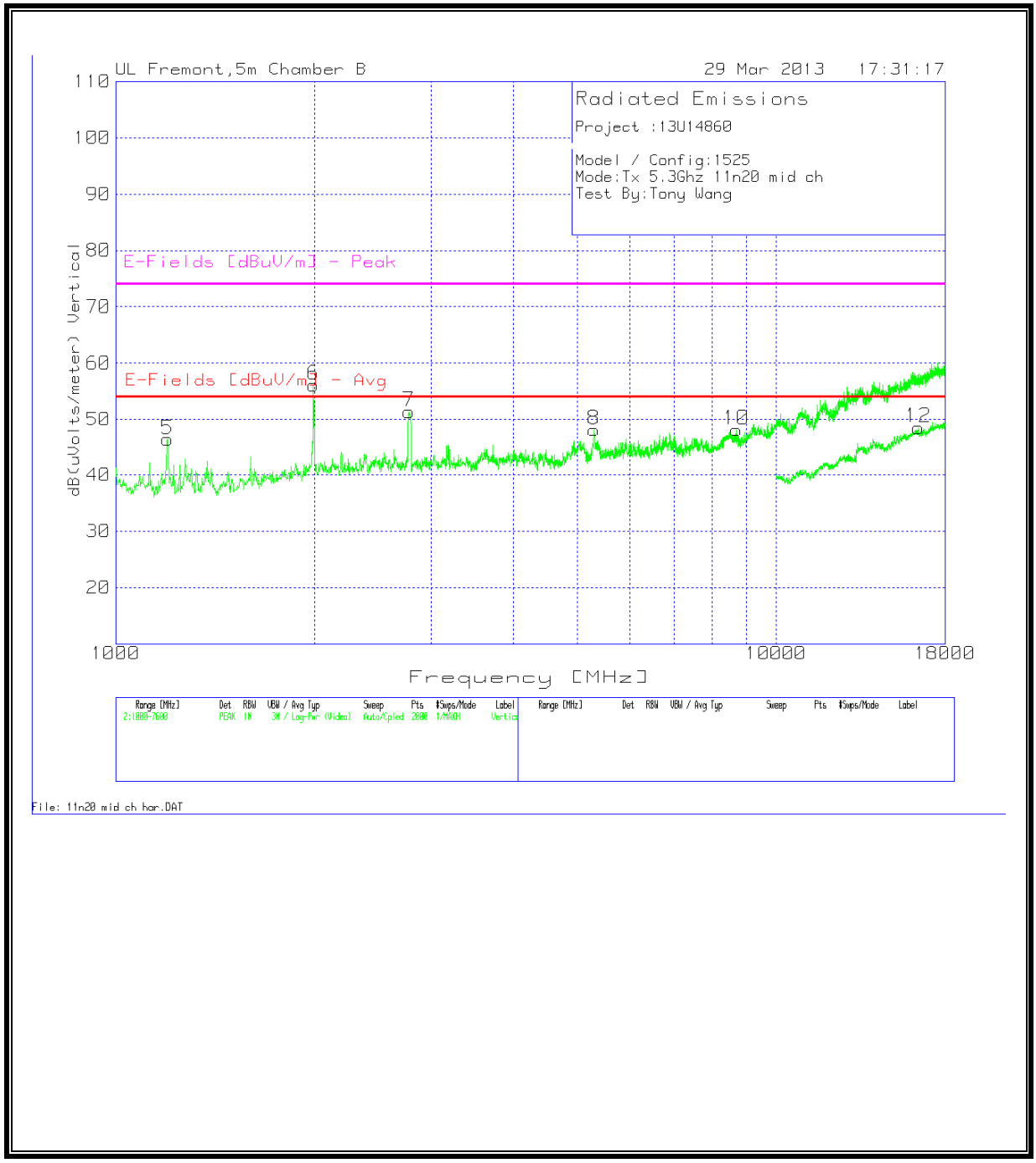
HARMONICS AND SPURIOUS EMISSIONS

MID CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

MID CH Vertical



HARMONICS AND SPURIOUS EMISSIONS

HIGH CH

Project :13U14860

Model / Config:1525

Mode:Tx 5.3Ghz 11n20 High ch

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?
1	1197.901	50.96	PK	28.30	-35.70	3.40	0.00	46.96	54.0	-7.0	74.0	-27.04	124	Horz	Y
2	1600.300	46.19	PK	29.00	-35.20	3.80	0.00	43.79	54.0	-10.2	74.0	-30.21	200	Horz	Y
3	1999.970	52.12	PK1	31.80	-35.00	4.20	0.00	53.12	-	-	74.0	-20.88	149	Horz	N
	1996.870	36.28	AD1	31.80	-35.00	4.20	0.00	37.28	54.0	-16.7	-	-	149	Horz	N
4	2777.811	45.12	PK	32.80	-35.10	5.00	0.00	47.82	54.0	-6.2	74.0	-26.18	124	Horz	Y
5	4097.151	39.94	PK	34.00	-34.80	6.30	0.10	45.54	54.0	-8.4	74.0	-28.46	124	Horz	Y
6	5591.304	35.73	PK	35.00	-34.90	7.60	0.20	43.63	54.0	-10.3	74.0	-30.37	200	Horz	N
7	1194.603	50.70	PK	28.30	-35.70	3.40	0.00	46.70	54.0	-7.3	74.0	-27.3	100	Vert	Y
8	1376.012	46.89	PK	28.40	-35.40	3.60	0.00	43.49	54.0	-10.5	74.0	-30.51	100	Vert	Y
9	1989.820	44.52	PK1	31.70	-35.00	4.20	0.00	45.42	-	-	74.0	-28.58	116	Vert	N
	1994.370	31.15	AD1	31.80	-35.00	4.20	0.00	32.15	54.0	-21.8	-	-	116	Vert	N
10	2197.301	40.99	PK	32.00	-35.00	4.40	0.10	42.49	54.0	-11.5	74.0	-31.51	100	Vert	N
11	2799.460	46.10	PK1	32.90	-35.10	5.00	0.10	49.00	-	-	74.0	-25	208	Vert	Y
	2797.690	31.77	AD1	32.90	-35.10	5.00	0.10	34.67	54.0	-19.3	-	-	208	Vert	Y
12	5828.786	37.37	PK	35.40	-34.90	7.80	0.10	45.77	54.0	-8.2	74.0	-28.23	100	Vert	N

PK - Peak detector
PK1 - KDB 789033 v01r02 G)5) Method: Peak
AD1 - KDB 789033 v01r02 G)6) Method: AD Primary Power Average
VB1 - KDB 789033 v01r02 G)6) Method: VB Alternative Reduced Video
PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak
MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average
MAv2 - KDB558074 v02 10.2.3.3/8.2.2 Option 2 Slow Sweep RMS Average

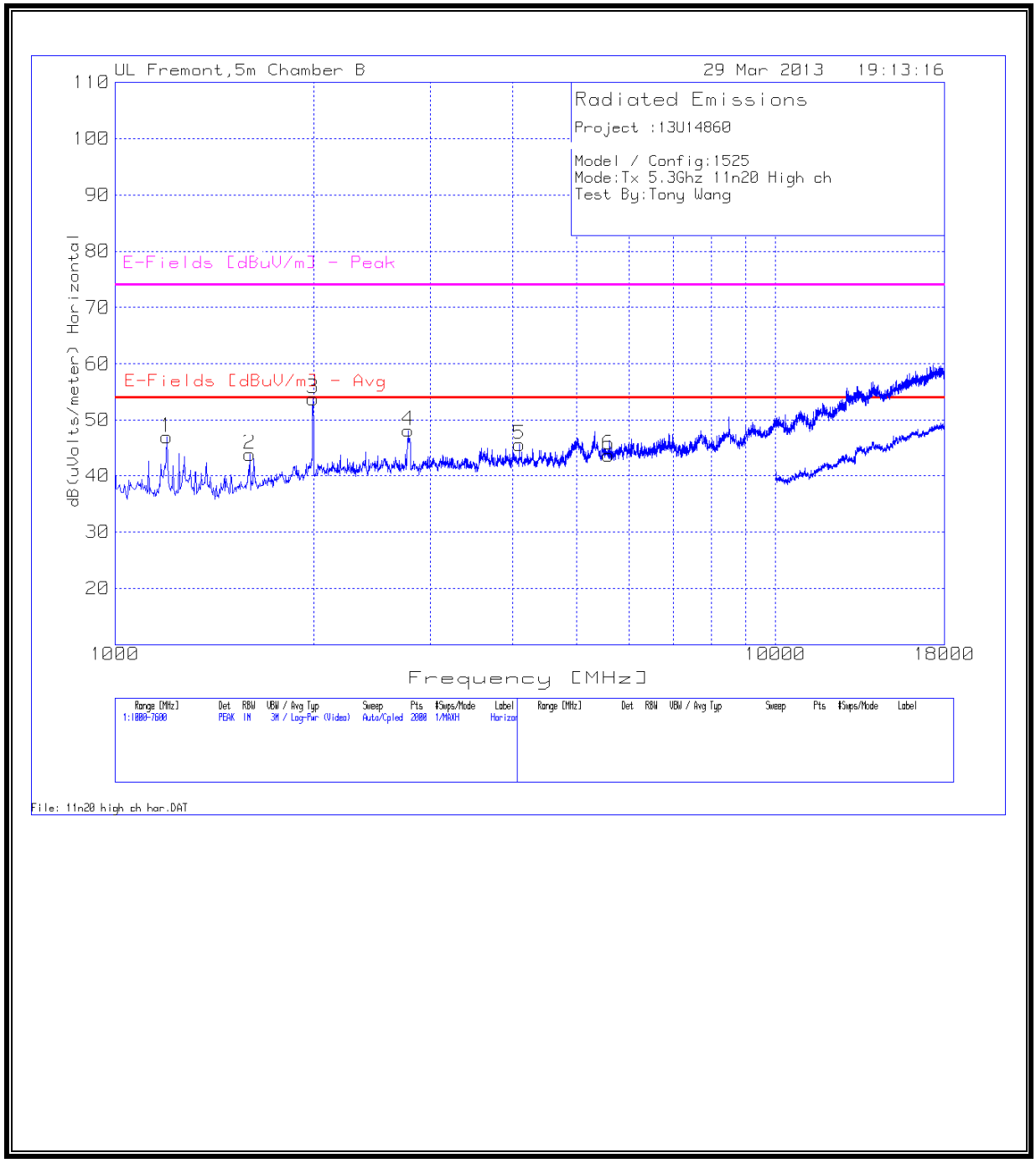
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

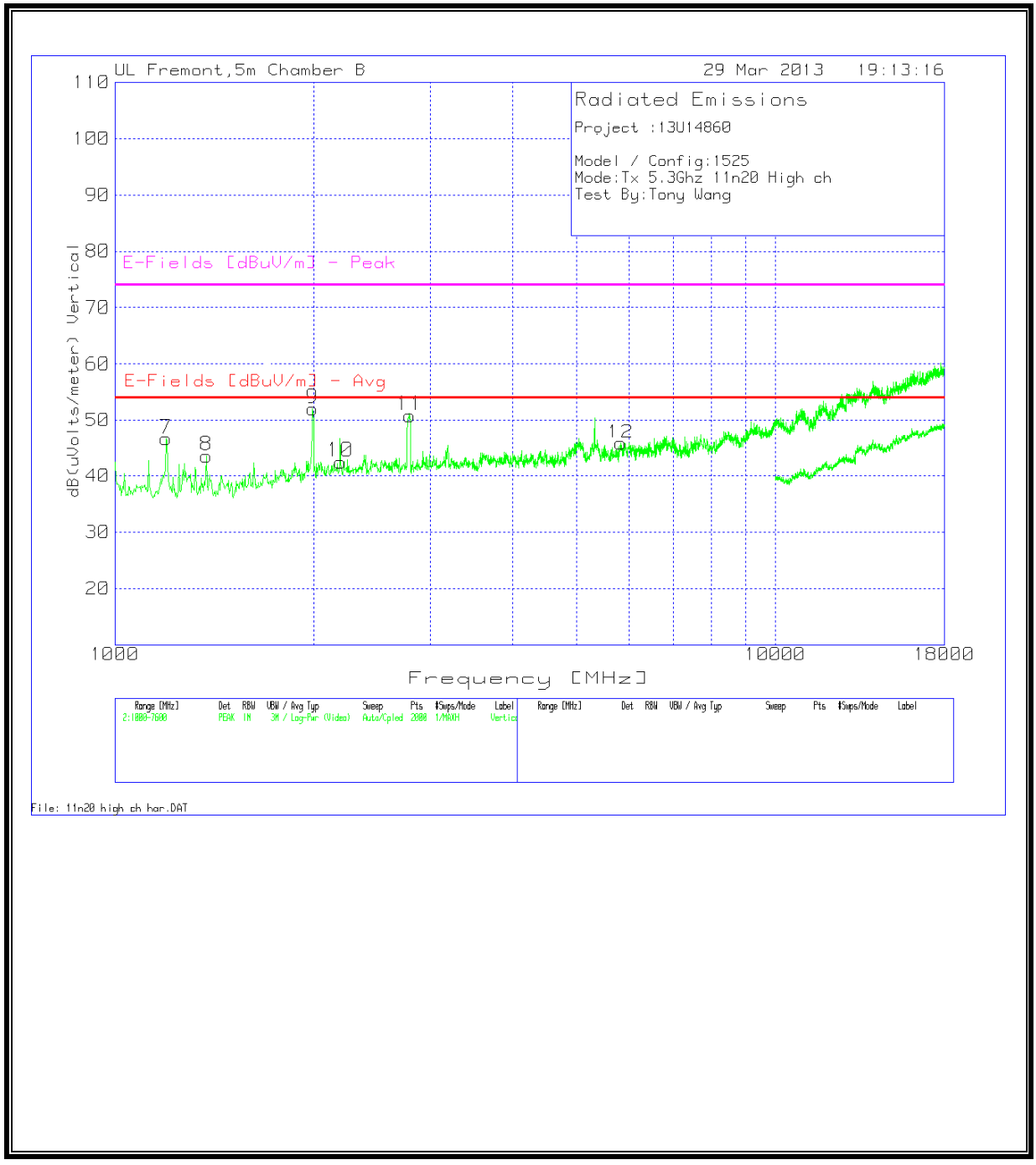
HARMONICS AND SPURIOUS EMISSIONS

HIGH CH Horizontal



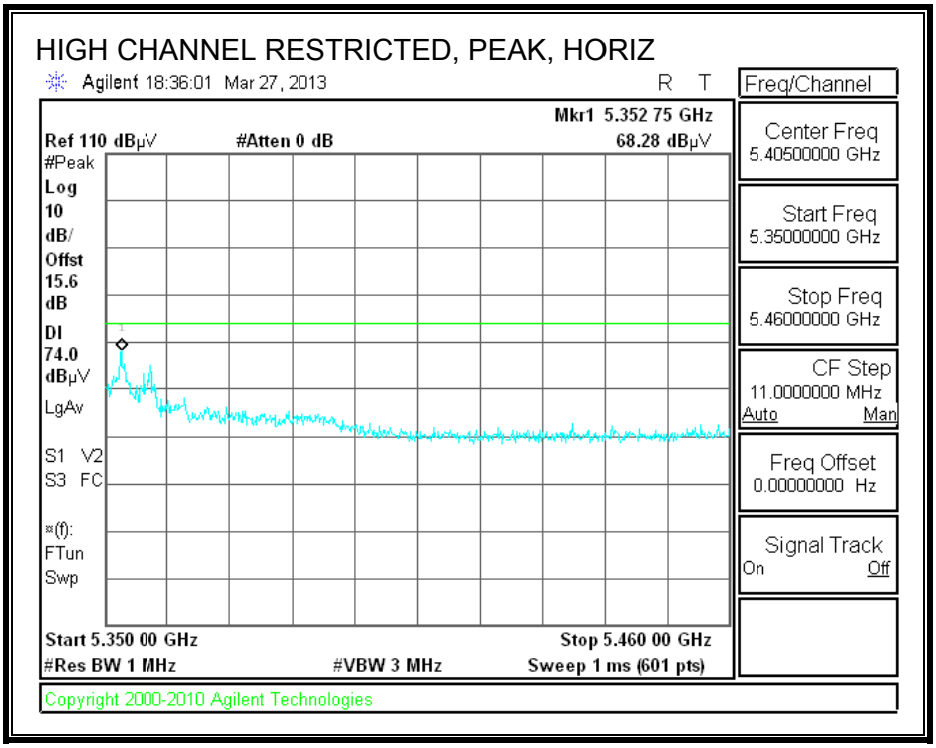
HARMONICS AND SPURIOUS EMISSIONS

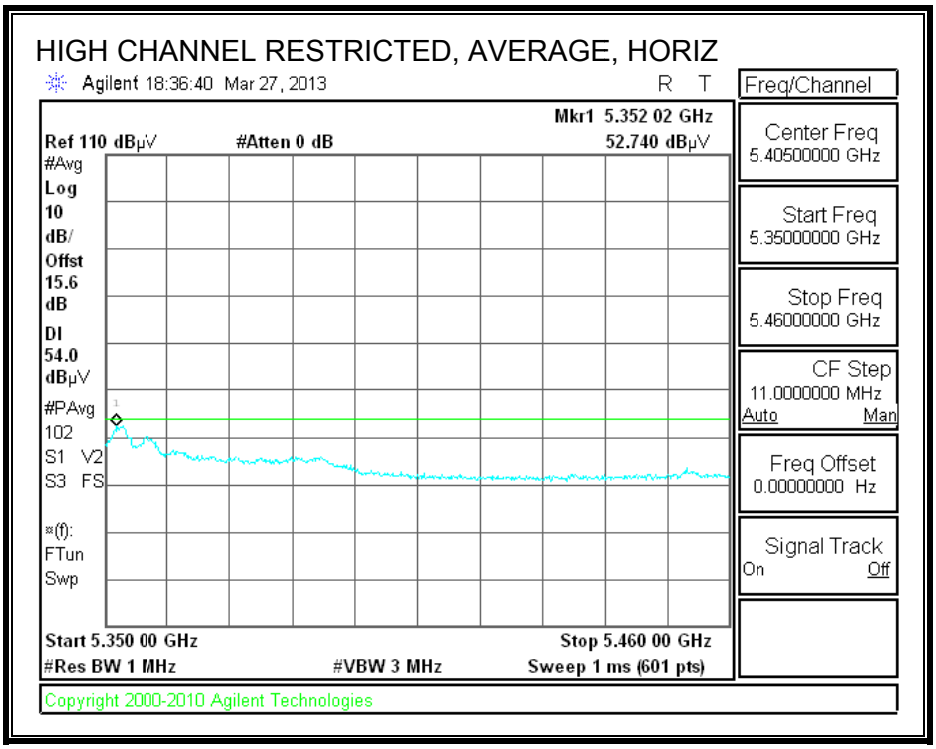
HIGH CH Vertical



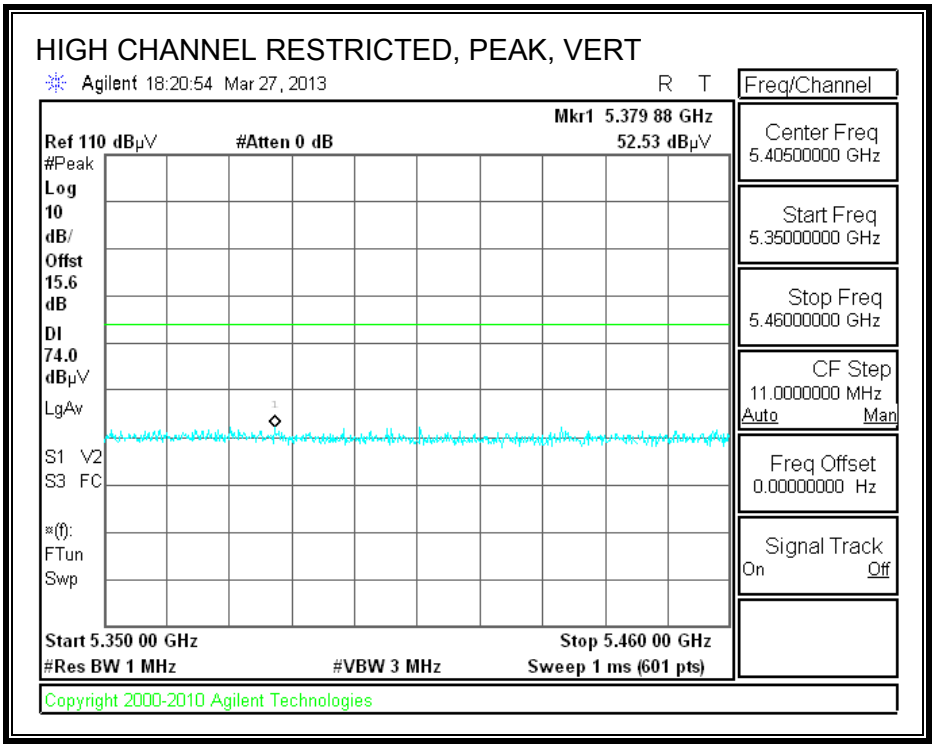
9.2.3. **TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND**

RESTRICTED BANDEDGE (HIGH CHANNEL)

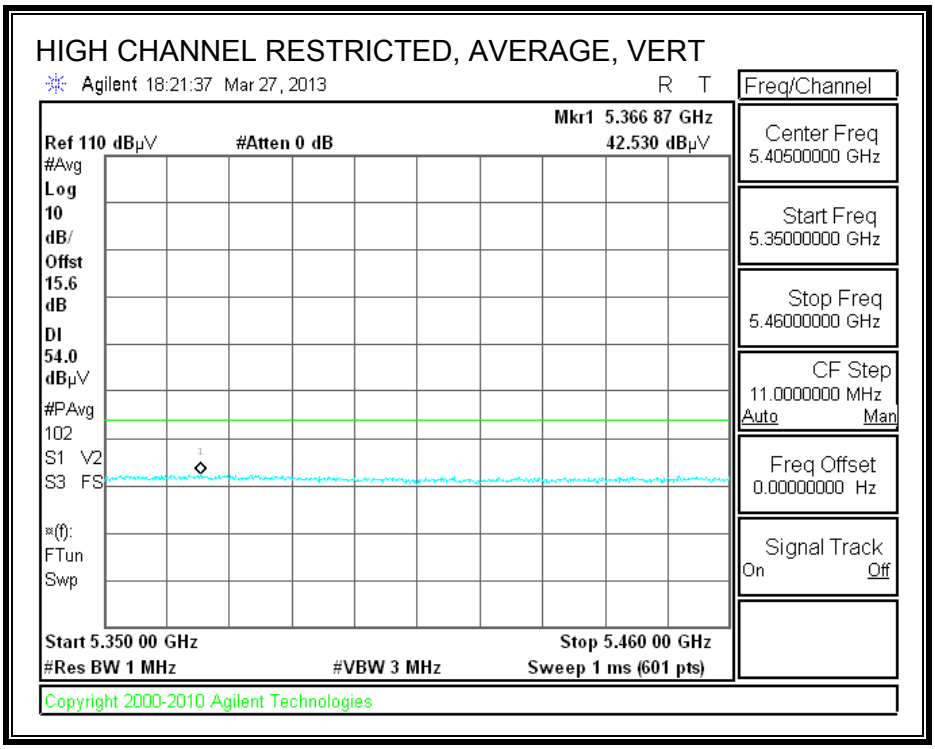




HIGH CHANNEL RESTRICTED, PEAK, VERT

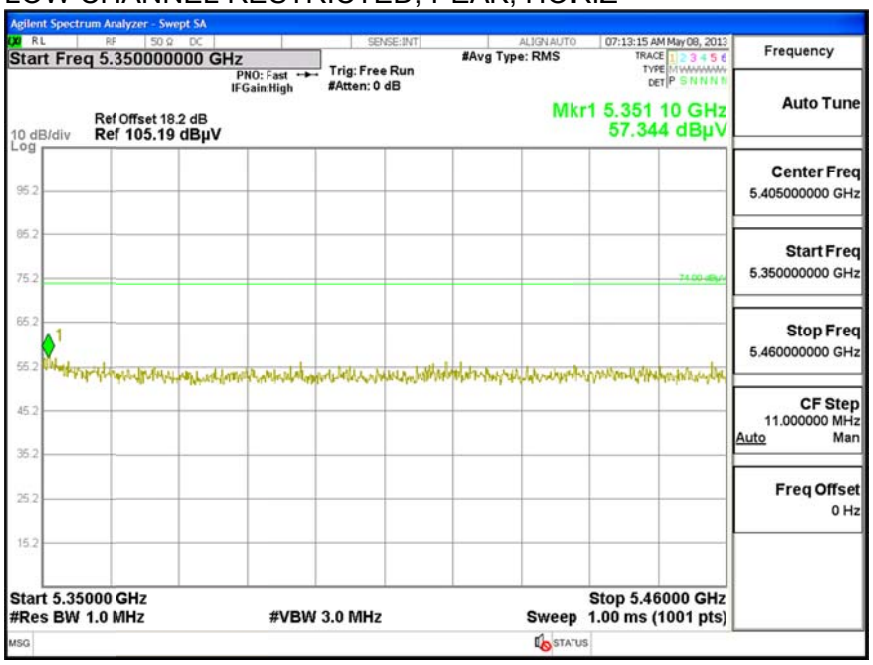


HIGH CHANNEL RESTRICTED, AVERAGE, VERT

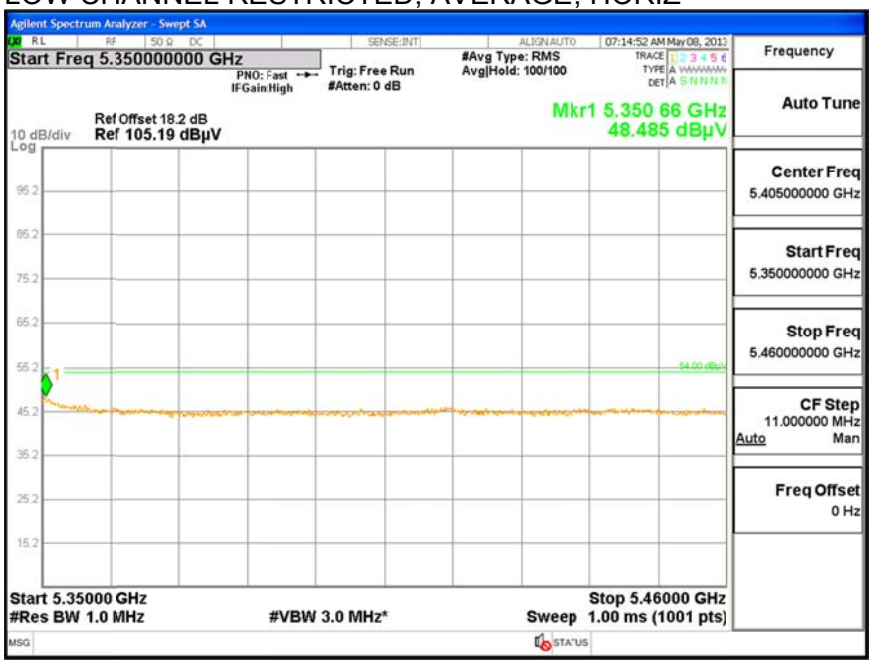


RESTRICTED BANDEDGE (LOW CHANNEL)

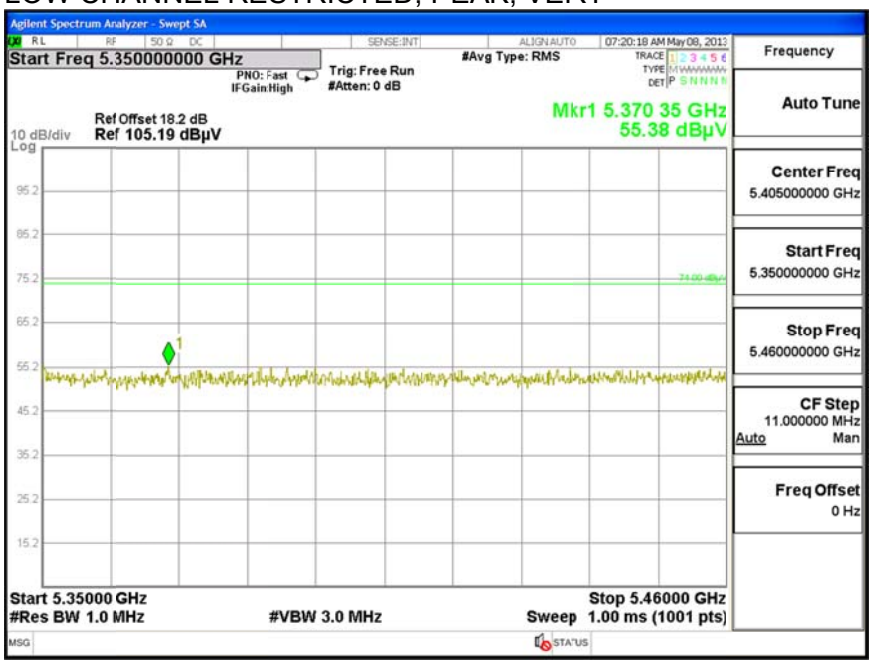
LOW CHANNEL RESTRICTED, PEAK, HORIZ



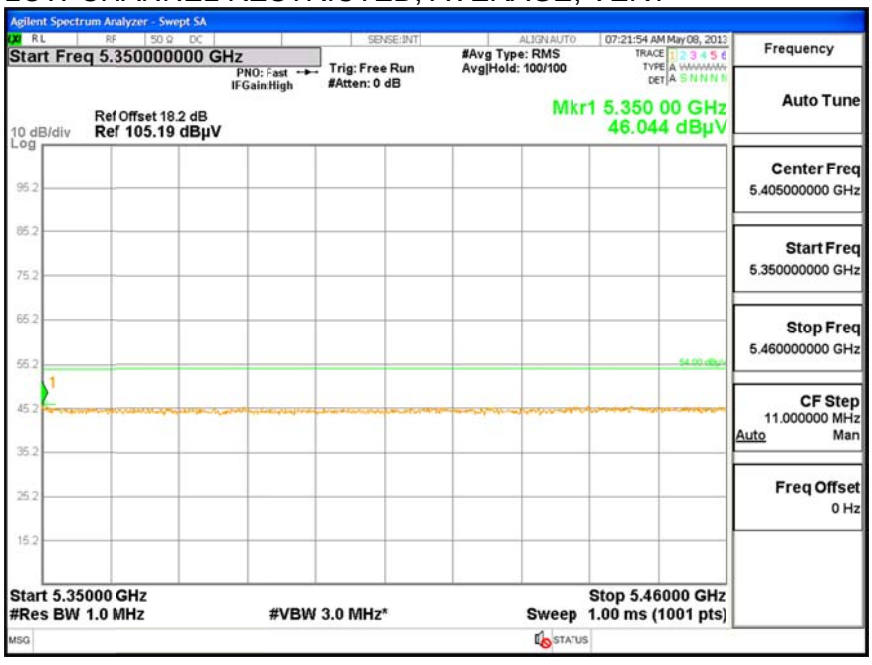
LOW CHANNEL RESTRICTED, AVERAGE, HORIZ



LOW CHANNEL RESTRICTED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CH

Project :13U14860

Model / Config:1525
Mode:Tx 5.3Ghz 11n40 low ch set13
Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?
1	1197.901	49.64	PK	28.30	-35.70	3.40	0.00	45.64	54.0	-8.3	74.0	-28.4	200	Horz	Y
2	1995.470	52.14	PK1	31.80	-35.00	4.20	0.00	53.14	-	-	74.0	-20.9	163	Horz	N
	1995.570	35.40	AD1	31.80	-35.00	4.20	0.00	36.40	54.0	-17.6	-	-	163	Horz	N
3	2774.513	45.11	PK	32.80	-35.10	5.00	0.00	47.81	54.0	-6.2	74.0	-26.2	100	Horz	Y
4	4578.711	38.30	PK	34.60	-34.90	6.80	0.10	44.90	54.0	-9.1	74.0	-29.1	200	Horz	Y
5	6155.322	37.16	PK	36.00	-34.90	8.10	0.10	46.46	54.0	-7.5	74.0	-27.5	100	Horz	N
6	1201.199	50.58	PK	28.40	-35.70	3.40	0.00	46.68	54.0	-7.3	74.0	-27.3	100	Vert	Y
7	1395.802	42.94	PK	28.40	-35.40	3.60	0.00	39.54	54.0	-14.4	74.0	-34.5	100	Vert	Y
8	1995.380	52.26	PK1	31.70	-35.00	4.20	0.00	53.16	-	-	74.0	-20.8	216	Vert	N
	1996.100	35.22	AD1	31.80	-35.00	4.20	0.00	36.22	54.0	-17.8	-	-	216	Vert	N
9	2799.960	42.29	PK1	32.90	-35.10	5.00	0.10	45.19	-	-	74.0	-28.8	240	Vert	Y
	2797.180	30.19	AD1	32.90	-35.10	5.00	0.10	33.09	54.0	-20.9	-	-	240	Vert	Y
10	3196.702	40.56	PK	33.30	-35.10	5.40	0.00	44.16	54.0	-9.8	74.0	-29.8	100	Vert	N
11	4413.793	37.75	PK	34.40	-34.90	6.60	0.10	43.95	54.0	-10.0	74.0	-30.1	100	Vert	N

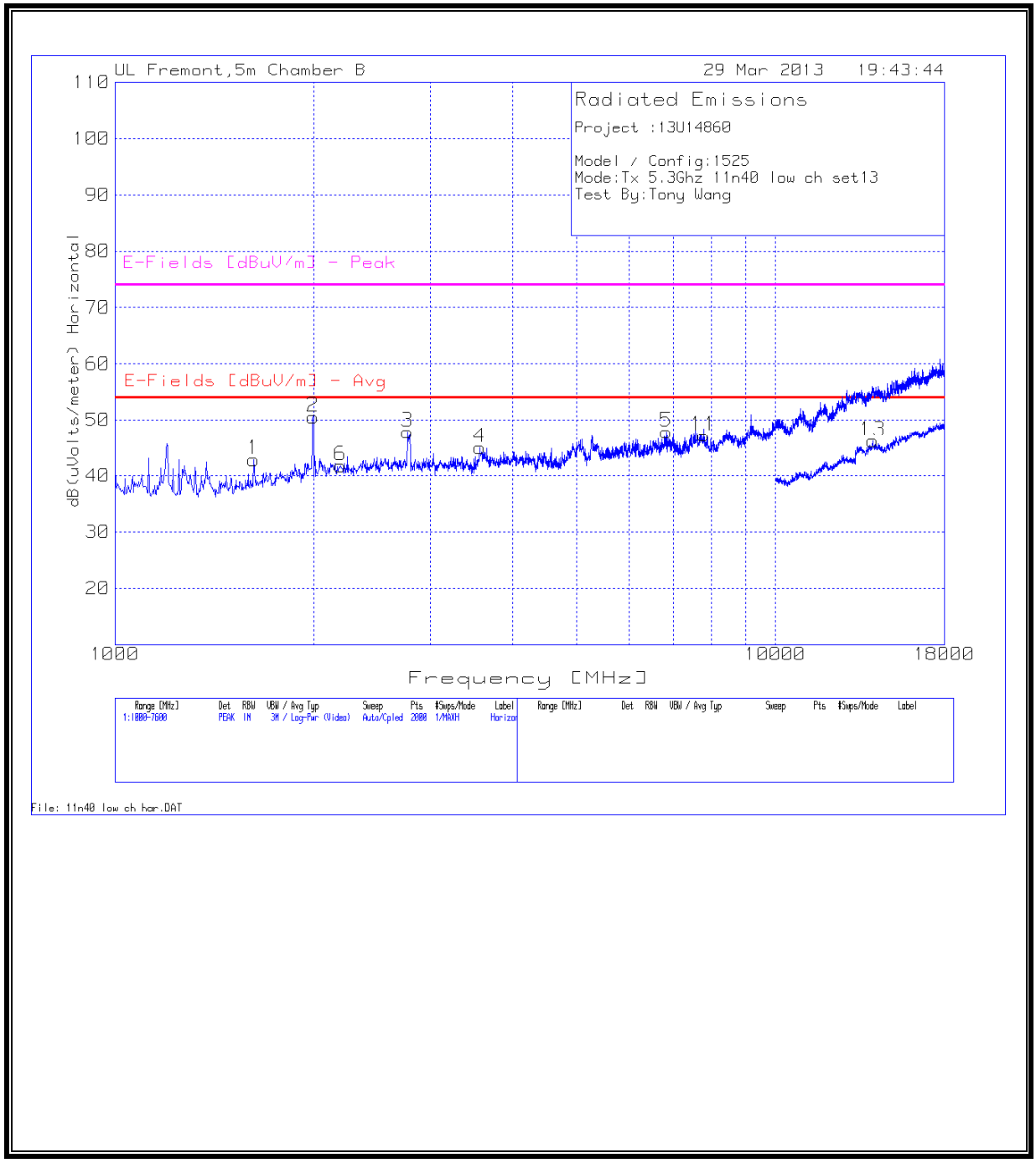
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

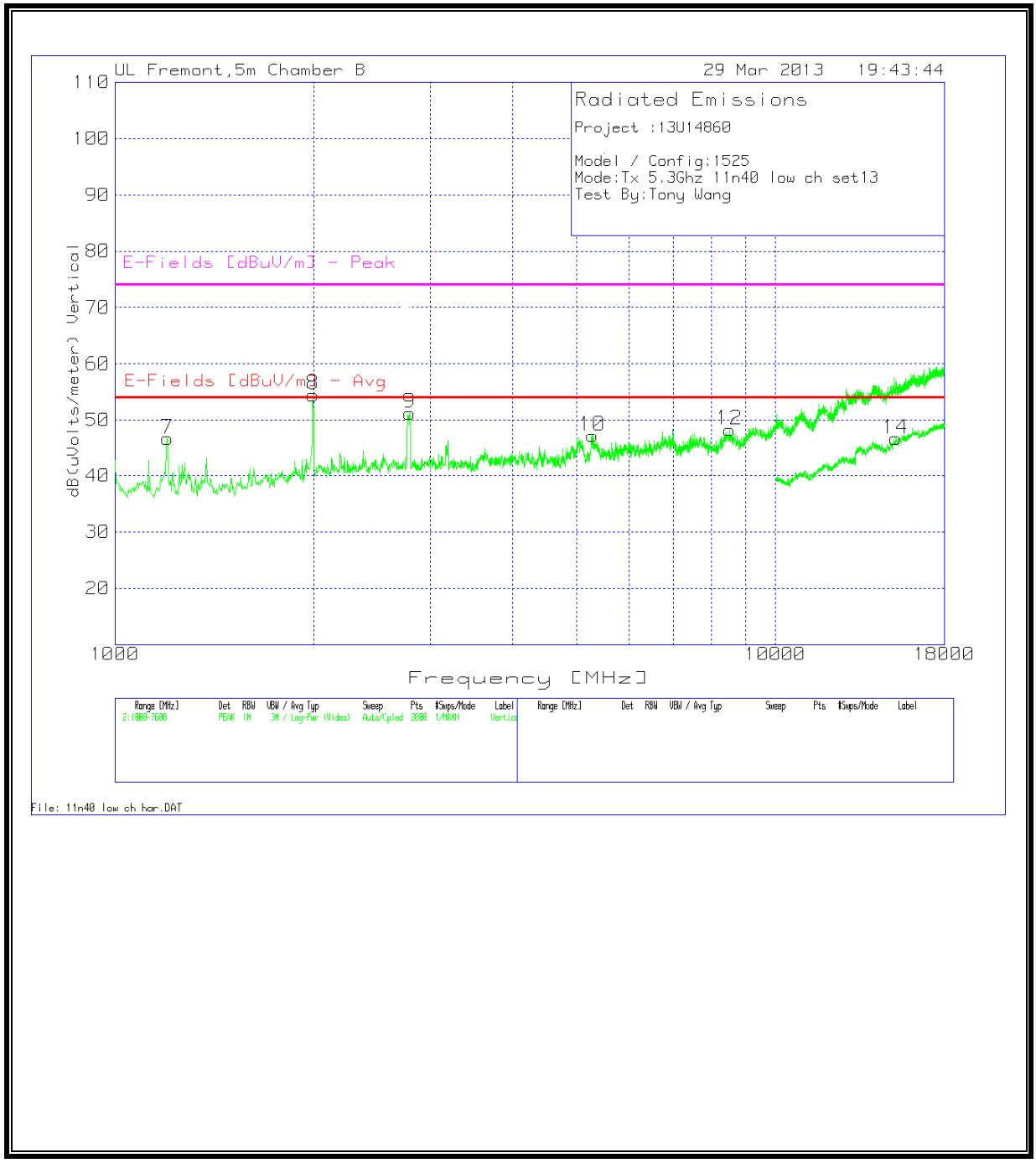
HARMONICS AND SPURIOUS EMISSIONS

LOW CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

LOW CH Vertical



HARMONICS AND SPURIOUS EMISSIONS

HIGH CH

Project :13U14860

Model / Config:1525
Mode:Tx 5.3Ghz 11n40 High ch set13
Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?
1	1197.901	51.60	PK	28.30	-35.70	3.40	0.00	47.60	54.0	-6.4	74.0	-26.4	200	Horz	Y
2	1994.360	52.27	PK1	31.80	-35.00	4.20	0.00	53.27	54.0	-0.7	74.0	-20.7	141	Horz	N
	1995.030	34.83	AD1	31.80	-35.00	4.20	0.00	35.83	54.0	-18.1	74.0	-38.2	141	Horz	N
3	2787.706	45.07	PK	32.80	-35.10	5.00	0.10	47.87	54.0	-6.1	74.0	-26.1	200	Horz	Y
4	3592.504	42.06	PK	33.40	-35.00	5.80	0.00	46.26	54.0	-7.7	74.0	-27.7	200	Horz	N
5	6471.964	36.81	PK	35.90	-35.00	8.30	0.00	46.01	54.0	-8.0	74.0	-28.0	200	Horz	N
6	1194.603	51.39	PK	28.30	-35.70	3.40	0.00	47.39	54.0	-6.6	74.0	-26.6	200	Vert	Y
7	1593.703	45.57	PK	28.90	-35.20	3.80	0.00	43.07	54.0	-10.9	74.0	-30.9	100	Vert	Y
8	1994.770	53.19	PK1	31.80	-35.00	4.20	0.00	54.19	54.0	0.2	74.0	-19.8	133	Vert	N
	1996.130	36.07	AD1	31.80	-35.00	4.20	0.00	37.07	54.0	-16.9	74.0	-36.9	133	Vert	N
9	2780.380	47.62	PK1	32.80	-35.10	5.00	0.00	50.32	54.0	-3.7	74.0	-23.7	106	Vert	Y
	2779.660	34.43	AD1	32.80	-35.10	5.00	0.00	37.13	54.0	-16.8	74.0	-36.9	106	Vert	Y
10	4113.643	39.83	PK	34.00	-34.80	6.30	0.10	45.43	54.0	-8.5	74.0	-28.6	100	Vert	Y
11	5917.841	38.12	PK	35.70	-34.90	7.90	0.10	46.92	54.0	-7.1	74.0	-27.1	100	Vert	N

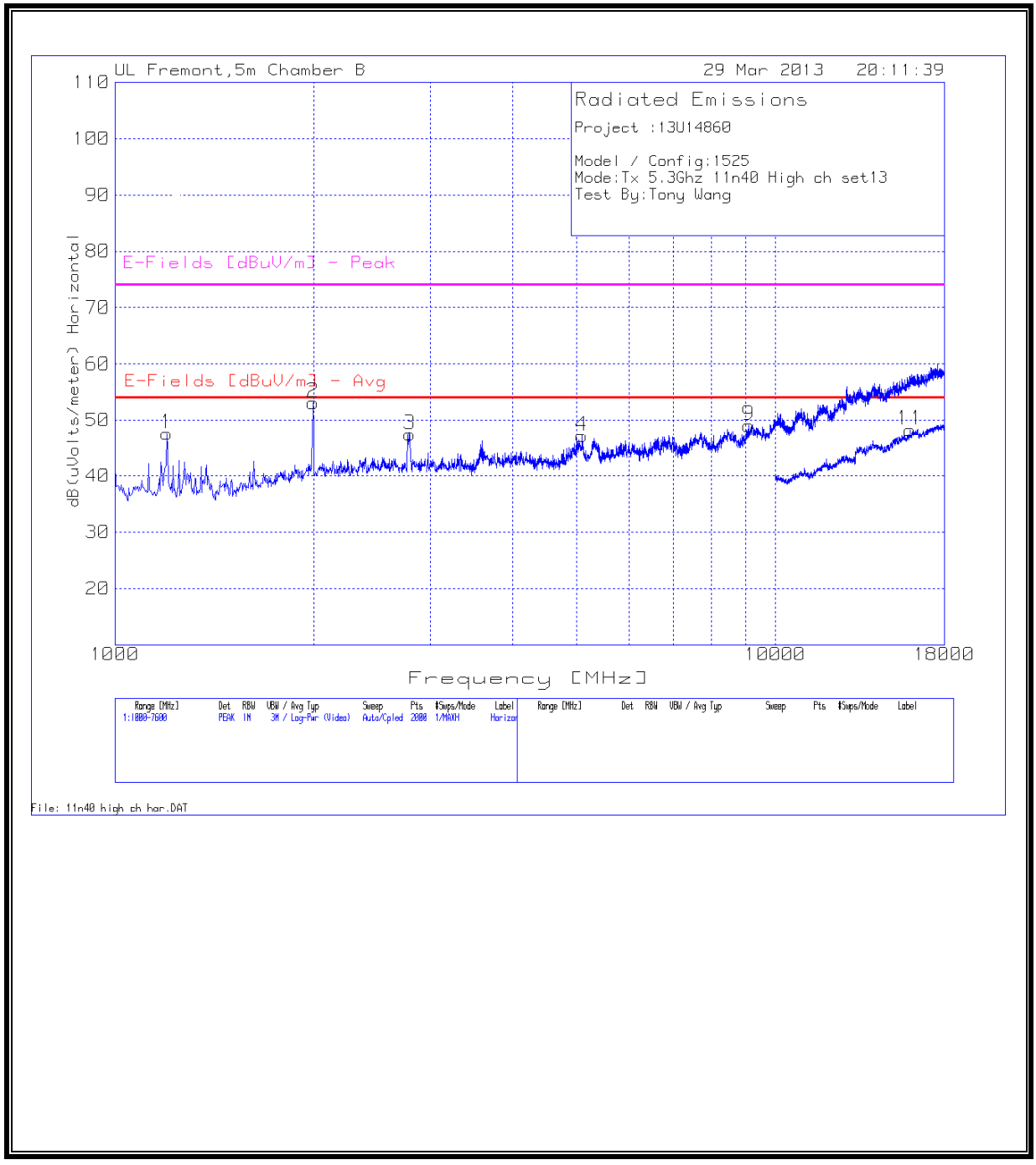
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

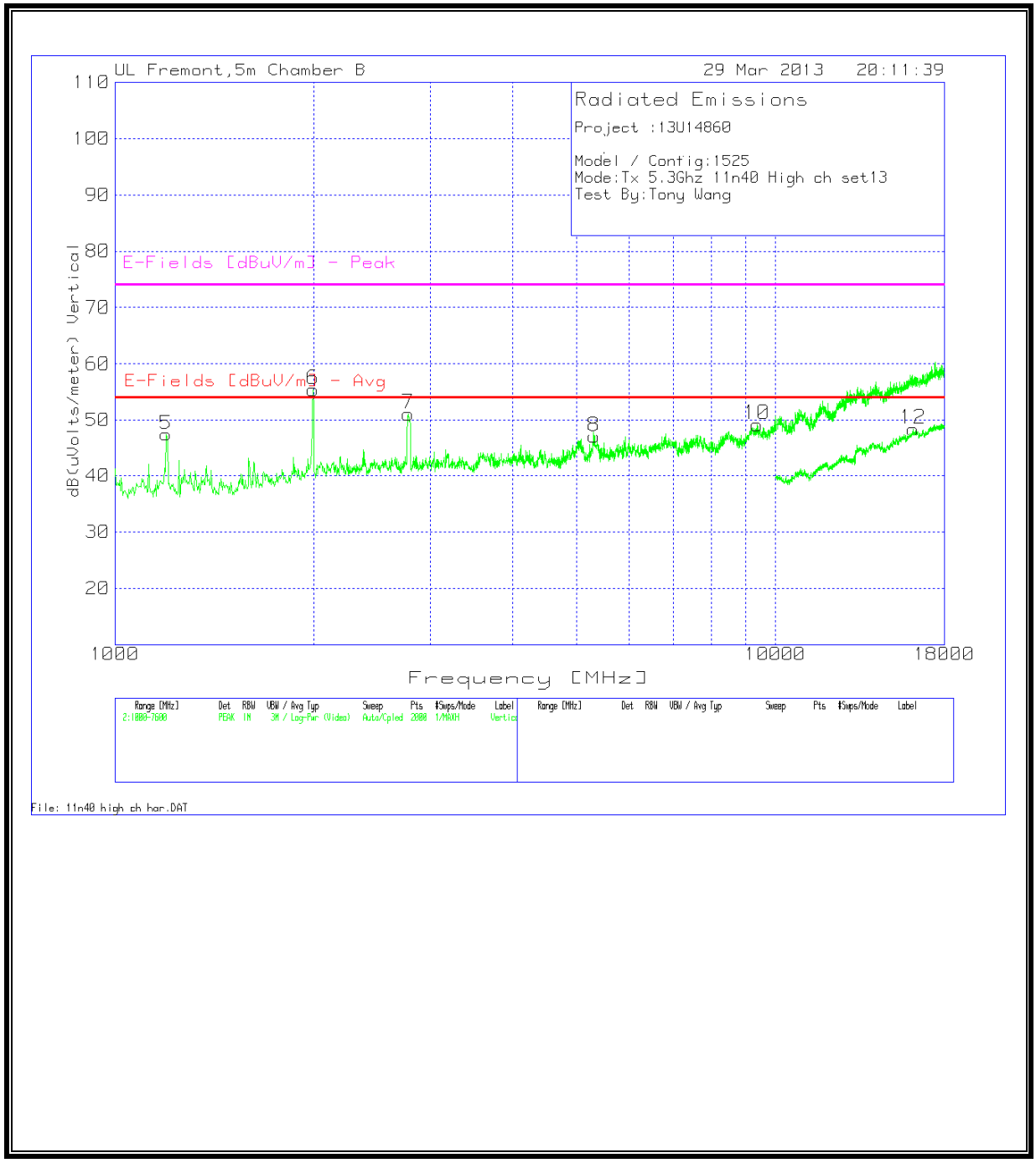
HARMONICS AND SPURIOUS EMISSIONS

HIGH CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

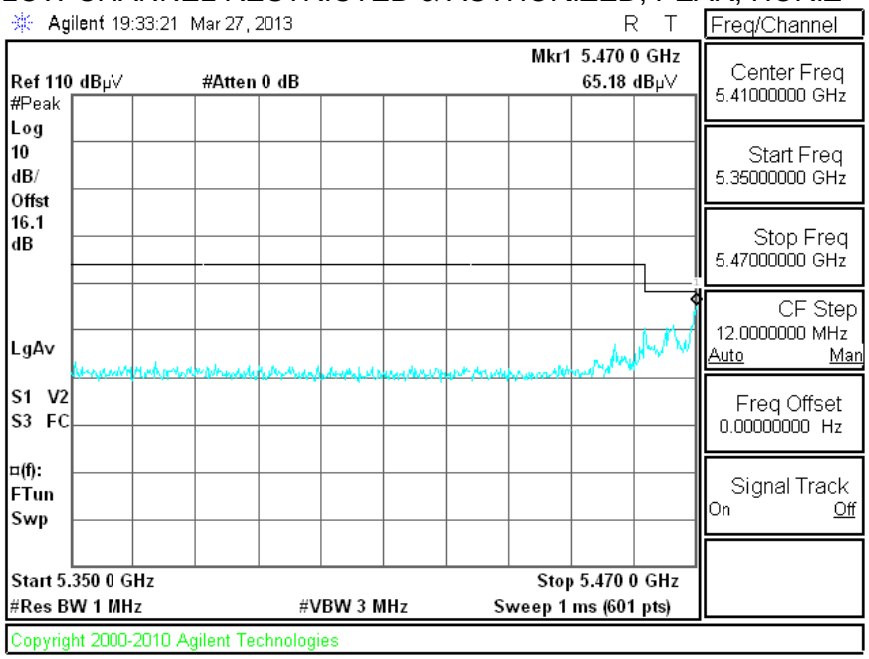
HIGH CH Vertical



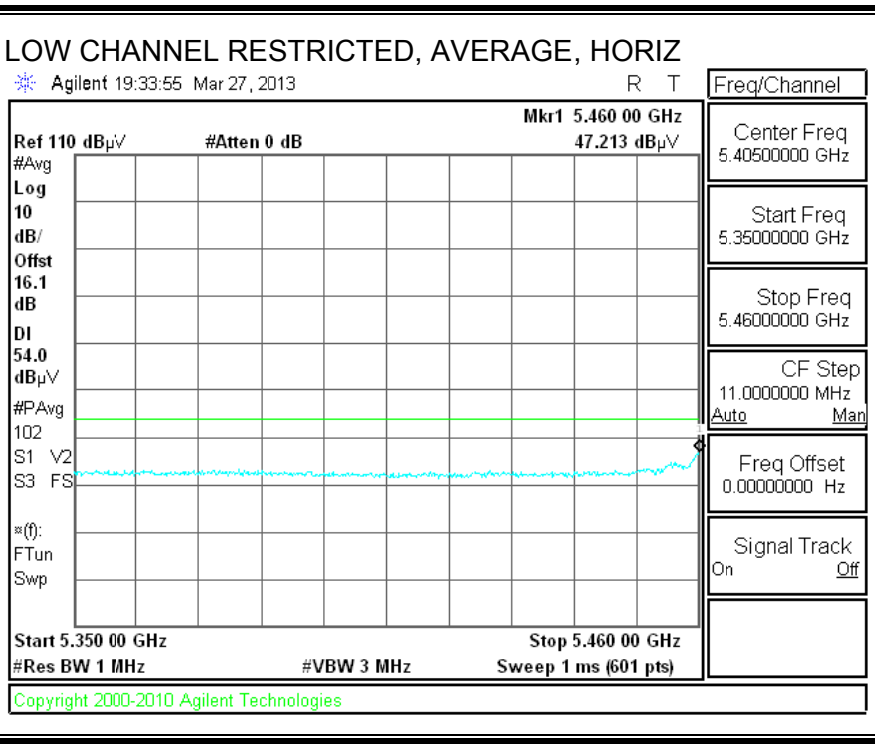
9.2.4. **TX ABOVE 1 GHz 802.11a MODE IN THE 5.6 GHz BAND**

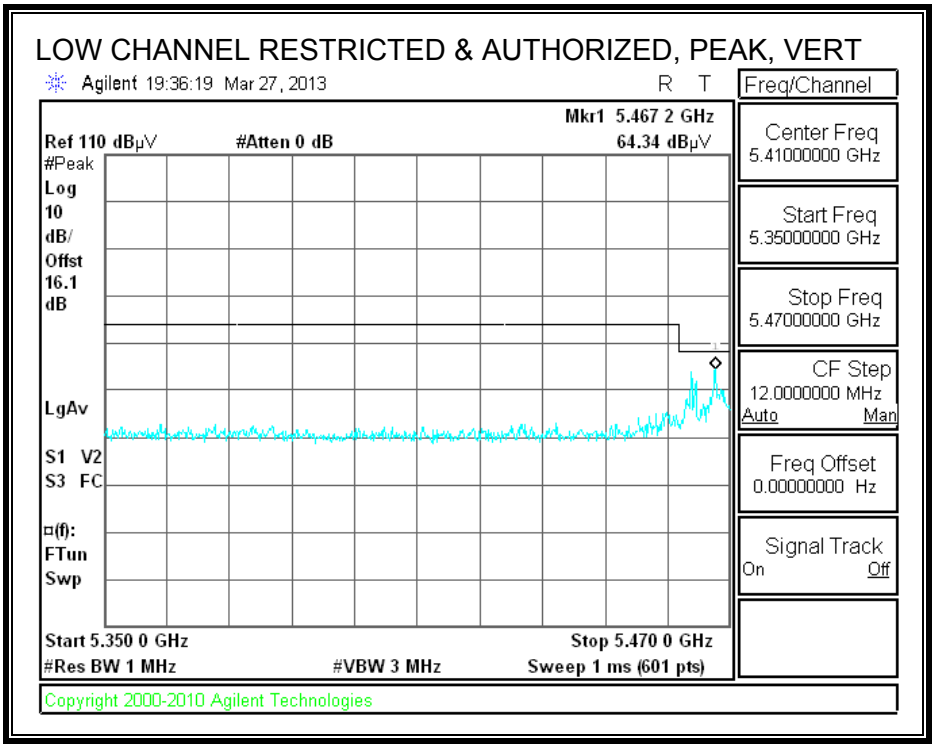
RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

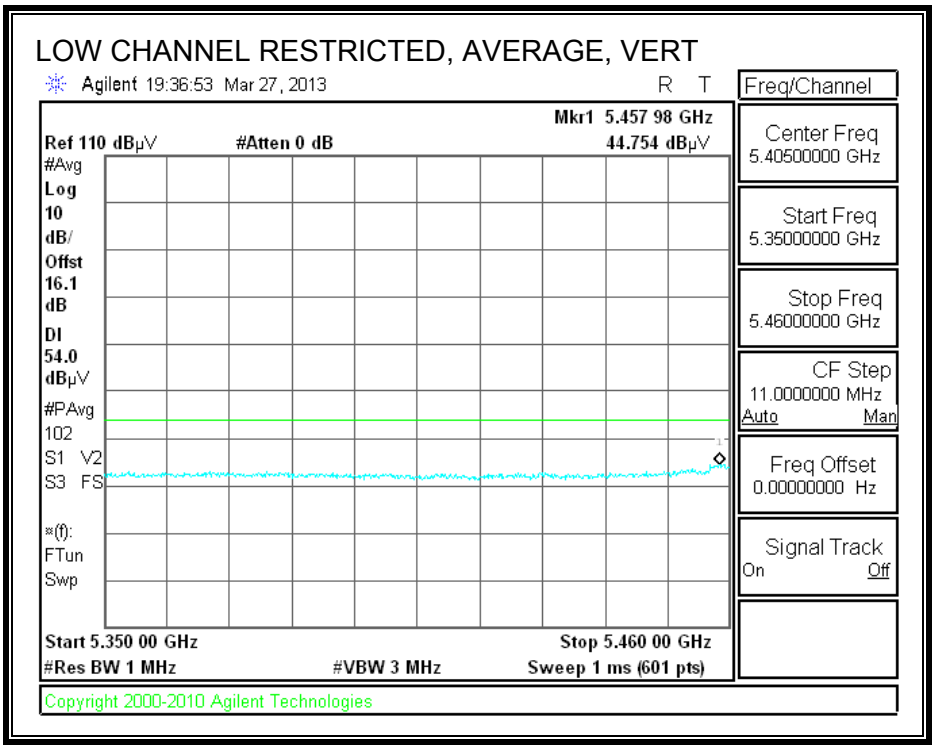
LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, HORIZ



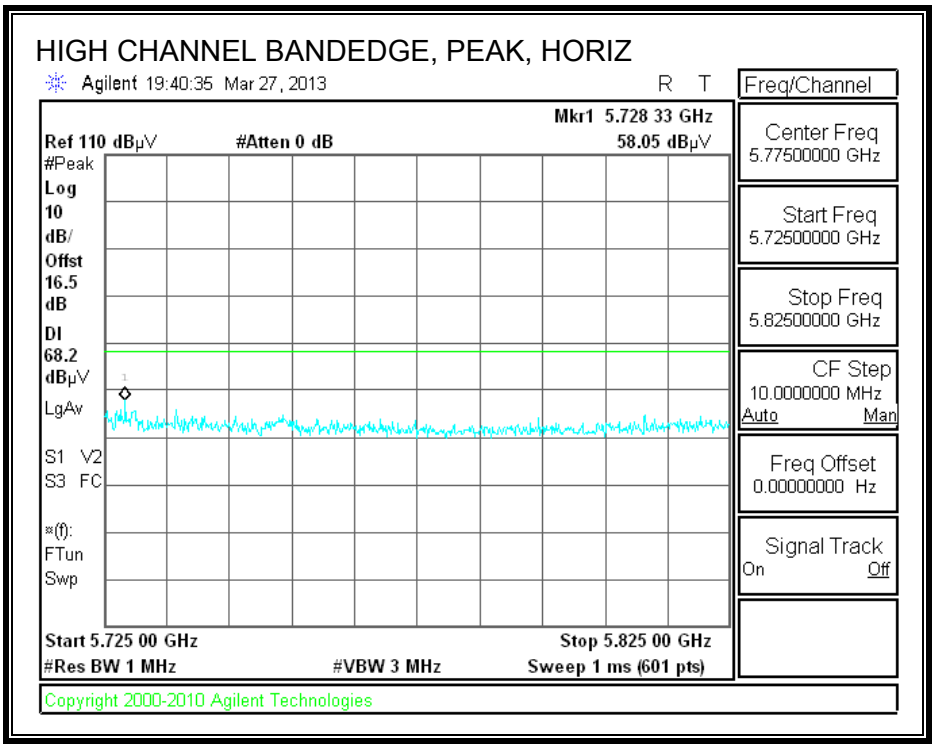
LOW CHANNEL RESTRICTED, AVERAGE, HORIZ

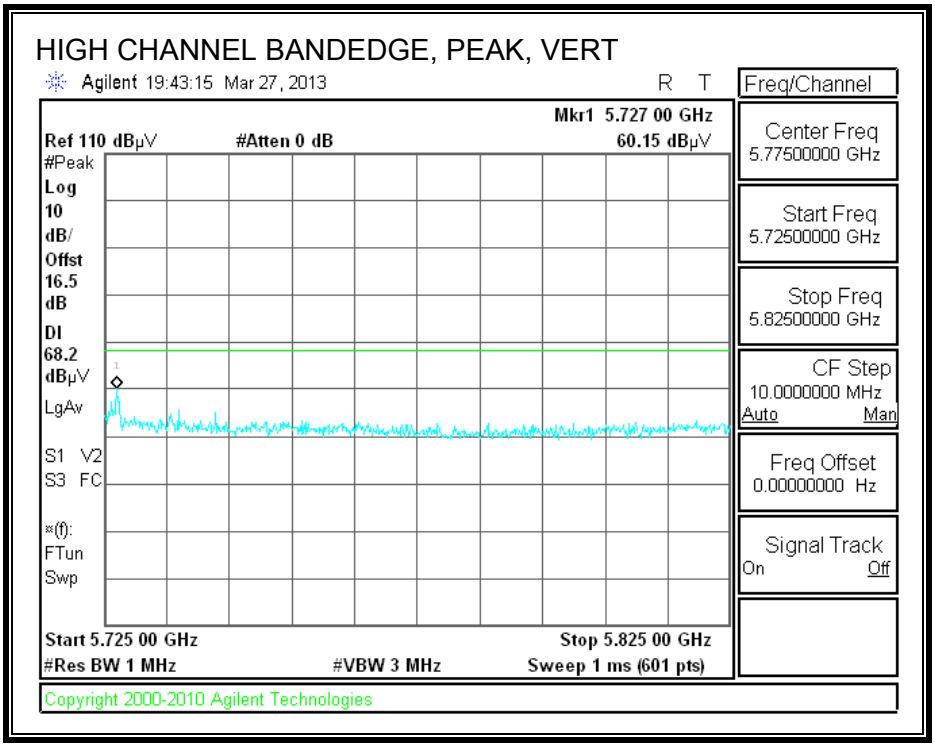






AUTHORIZED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

LOW CH

Project :13U14860

Model / Config:1525
Mode:11a 5.5ghz low ch set15
Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?	
1	1877.361	44.88	PK	31.00	-35.00	4.10	0.10	45.08	54.0	-8.9	74.0	-28.9	200	Horz	N	
2	2520.540	41.94	PK	32.50	-35.00	4.80	0.20	44.44	54.0	-9.5	74.0	-29.6	200	Horz	N	
3	3641.979	40.47	PK	33.50	-35.00	5.90	0.20	45.07	54.0	-8.9	74.0	-28.9	100	Horz	Y	
4	4931.634	38.84	PK	34.60	-34.90	7.20	0.30	46.04	54.0	-7.9	74.0	-28.0	100	Horz	Y	
11	5498.951	40.49	PK	34.90	-34.90	7.60	0.70	48.79	-	-	-	-	200	Horz	N	(Fundamental)
9	7828.686	36.87	PK	36.20	-35.10	9.20	0.30	47.47	54.0	-6.5	74.0	-26.5	100	Horz	N	
5	1900.450	43.10	PK	31.10	-35.00	4.10	0.10	43.40	54.0	-10.6	74.0	-30.6	100	Vert	N	
6	2622.789	41.93	PK	32.60	-35.10	4.90	0.20	44.53	54.0	-9.4	74.0	-29.5	200	Vert	N	
7	4400.600	39.48	PK	34.30	-34.90	6.60	0.20	45.68	54.0	-8.3	74.0	-28.3	100	Vert	N	
12	5498.951	46.03	PK	34.90	-34.90	7.60	0.70	54.33	-	-	-	-	-	Vert	N	(Fundamental)
8	5607.796	37.85	PK	35.00	-34.90	7.70	0.90	46.55	54.0	-7.4	74.0	-27.5	100	Vert	N	
10	8176.912	36.24	PK	36.10	-35.20	9.40	0.40	46.94	54.0	-7.0	74.0	-27.1	200	Vert	Y	

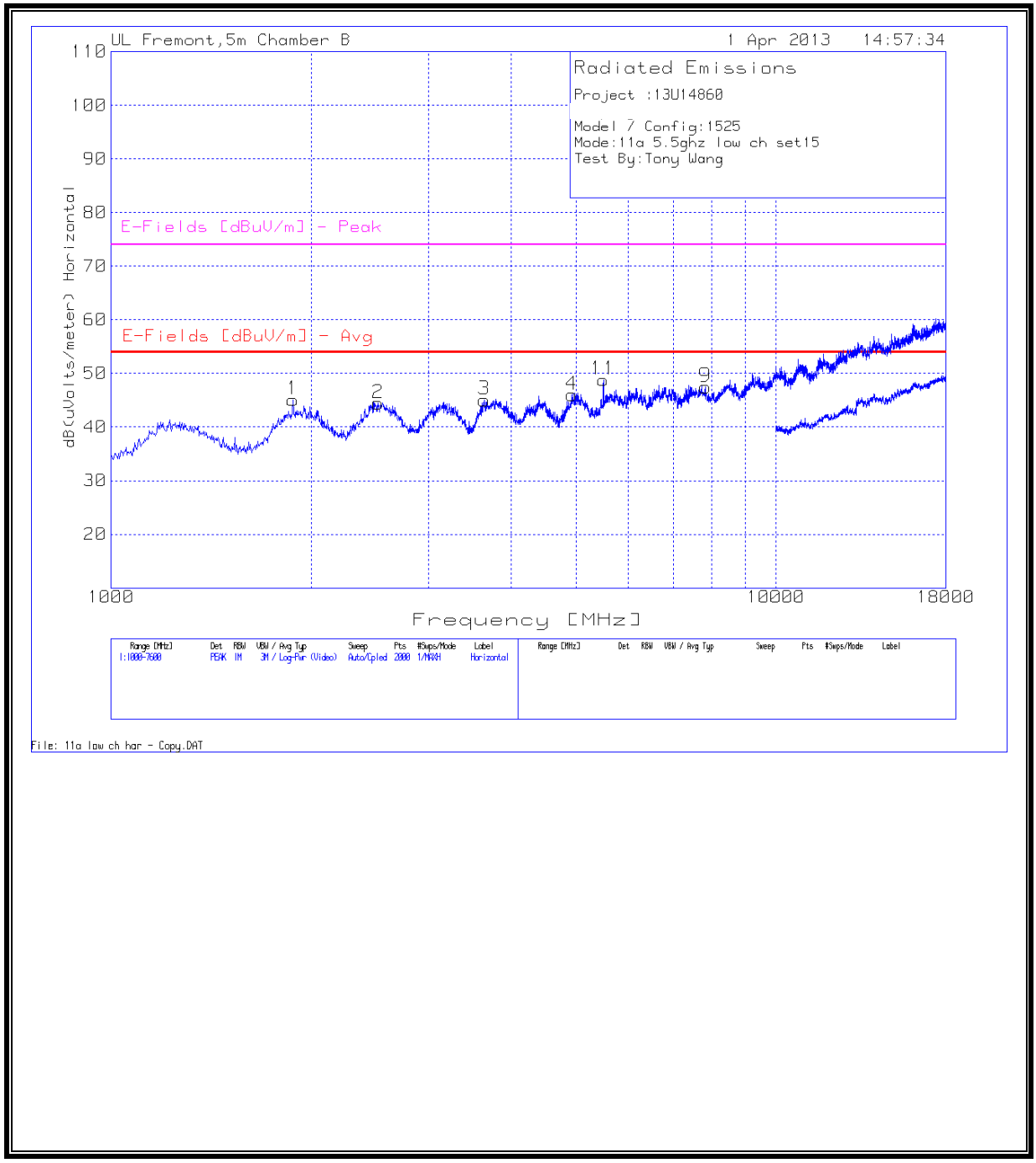
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

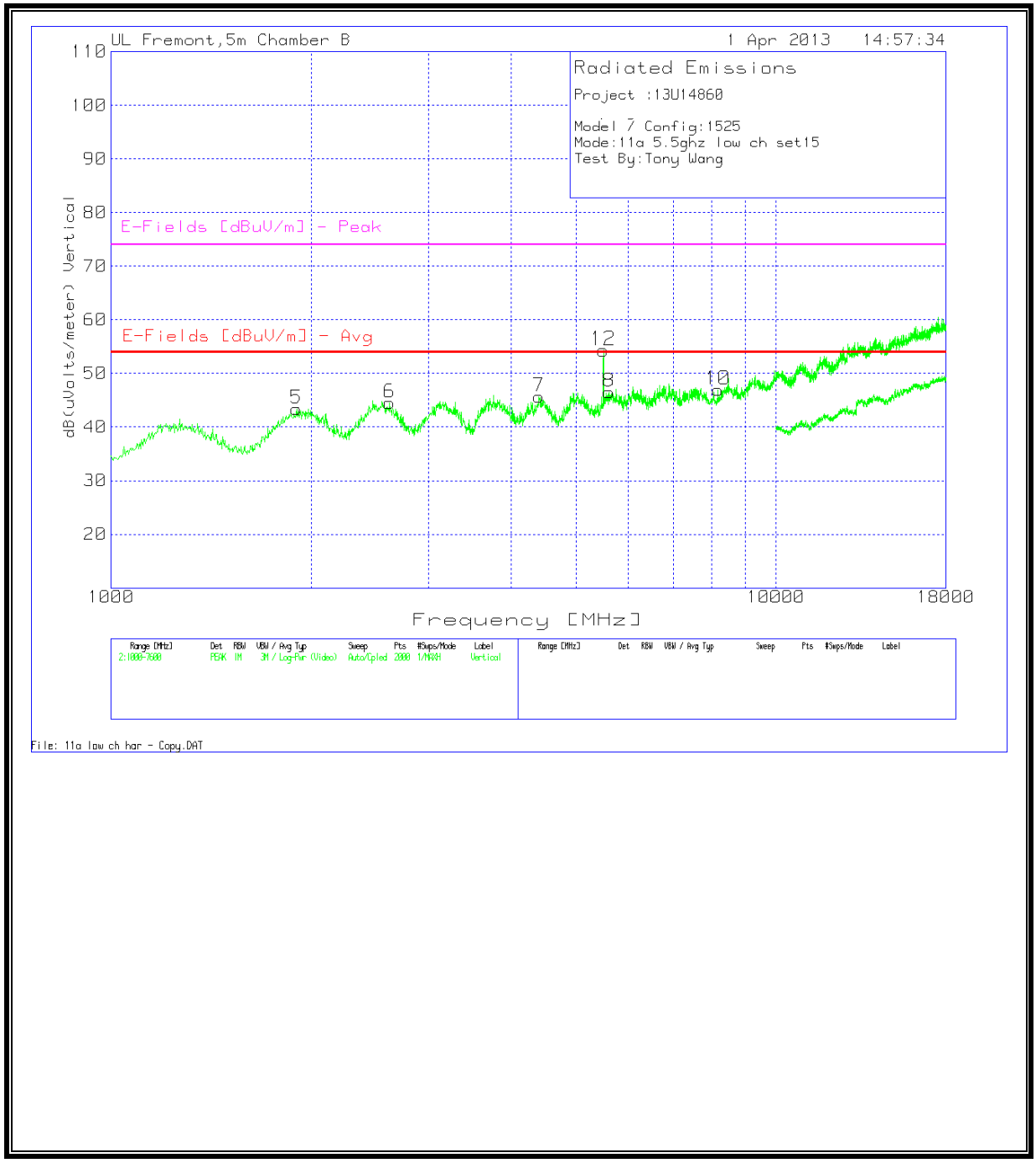
HARMONICS AND SPURIOUS EMISSIONS

LOW CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

LOW CH Vertical



HARMONICS AND SPURIOUS EMISSIONS

MID CH

Project :13U14860

Model / Config:1525

Mode:11a 5.5ghz Mid ch set15

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?	
1	1900.450	43.38	PK	31.10	-35.00	4.10	0.10	43.68	54.0	-10.3	74.0	-30.3	200	Horz	N	
2	2540.330	43.01	PK	32.50	-35.00	4.80	0.20	45.51	54.0	-8.5	74.0	-28.5	200	Horz	N	
3	3724.438	40.21	PK	33.70	-34.90	6.00	0.10	45.11	54.0	-8.9	74.0	-28.9	100	Horz	Y	
11	5588.006	42.65	PK	35.00	-34.90	7.60	0.90	51.25	-	-	-	-	200	Horz	N	(Fundamental)
4	6254.273	37.49	PK	36.00	-35.00	8.10	0.40	46.99	54.0	-7.0	74.0	-27.0	100	Horz	N	
9	8098.951	36.30	PK	36.10	-35.20	9.40	0.10	46.70	54.0	-7.3	74.0	-27.3	200	Horz	Y	
5	1963.118	43.81	PK	31.50	-35.00	4.20	0.10	44.61	54.0	-9.4	74.0	-29.4	100	Vert	N	
6	2434.783	42.41	PK	32.40	-35.00	4.70	0.20	44.71	54.0	-9.3	74.0	-29.3	200	Vert	N	
7	4938.231	38.87	PK	34.60	-34.90	7.20	0.20	45.97	54.0	-8.0	74.0	-28.0	200	Vert	Y	
12	5584.708	46.34	PK	35.00	-34.90	7.60	0.90	54.94	-	-	-	-	200	Vert	N	(Fundamental)
8	6099.250	37.48	PK	35.90	-34.90	8.00	0.70	47.18	54.0	-6.8	74.0	-26.8	200	Vert	N	
10	8202.899	35.72	PK	36.10	-35.20	9.40	0.50	46.52	54.0	-7.5	74.0	-27.5	100	Vert	Y	

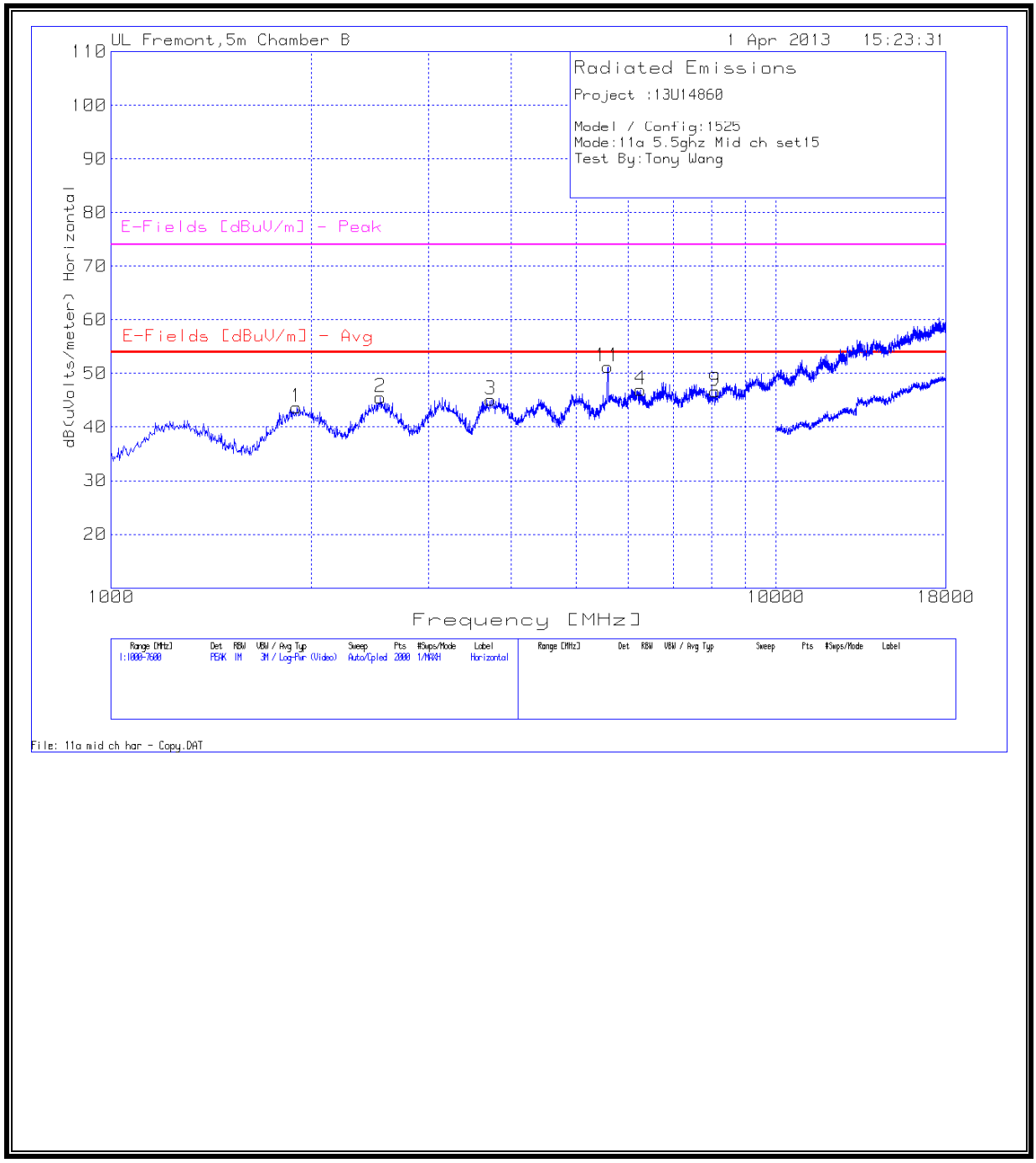
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

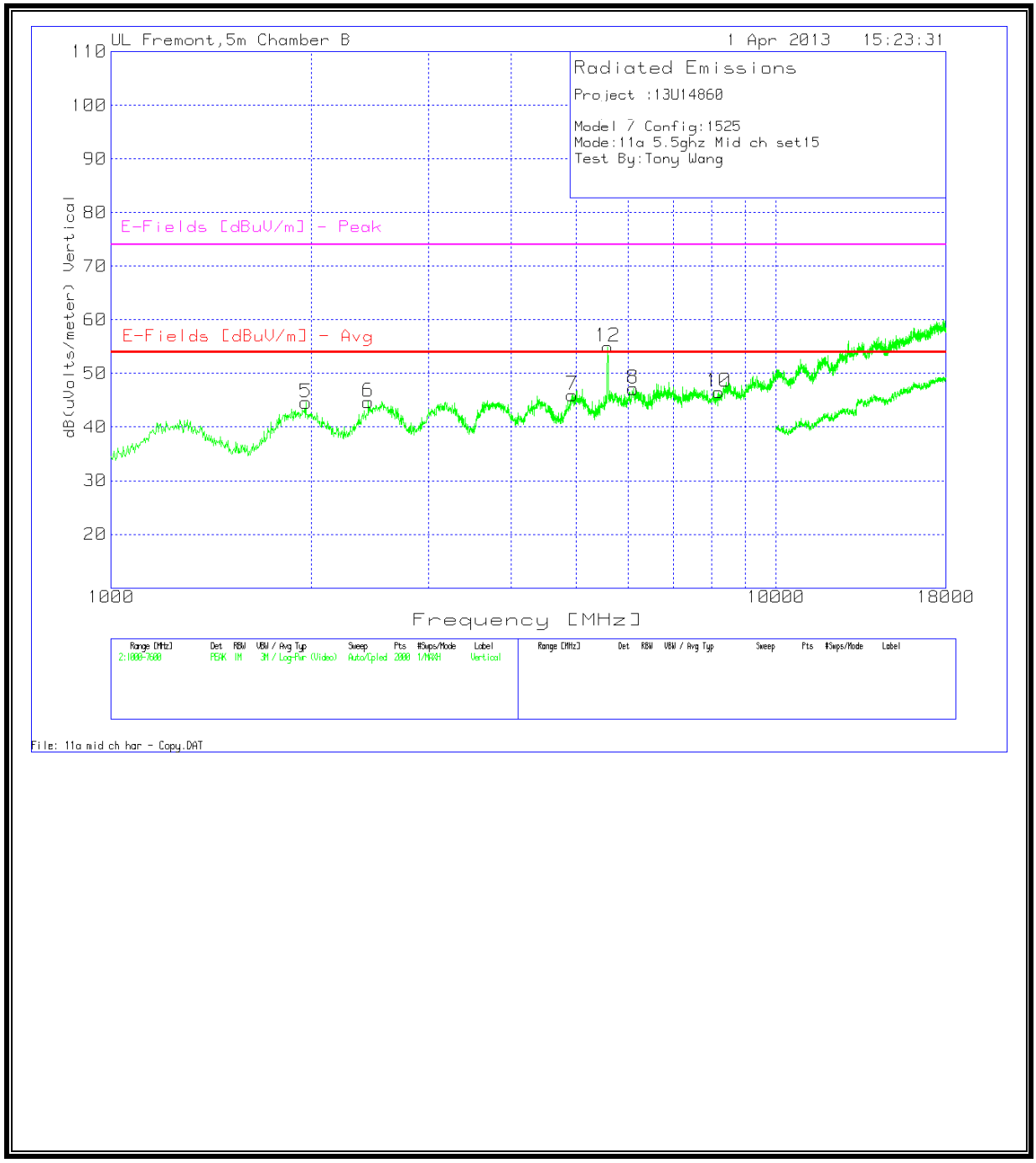
HARMONICS AND SPURIOUS EMISSIONS

MID CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

MID CH Vertical



HARMONICS AND SPURIOUS EMISSIONS

HIGH CH

Project :13U14860

Model / Config:1525

Mode:11a 5.5ghz High ch set15

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?	
1	1893.853	43.54	PK	31.10	-35.00	4.10	0.10	43.84	54.0	-10.1	74.0	-30.2	200	Horz	N	
2	2629.385	42.37	PK	32.70	-35.10	4.90	0.20	45.07	54.0	-8.9	74.0	-28.9	100	Horz	N	
3	3810.195	40.37	PK	33.80	-34.90	6.10	0.30	45.67	54.0	-8.3	74.0	-28.3	200	Horz	Y	
4	5568.216	38.25	PK	35.00	-34.90	7.60	0.90	46.85	54.0	-7.1	74.0	-27.2	200	Horz	N	
10	5683.658	40.62	PK	35.10	-34.90	7.70	0.90	49.42	-	-	-	-	100	Horz	N	(Fundamental)
8	7849.475	36.45	PK	36.20	-35.10	9.20	0.30	47.05	54.0	-6.9	74.0	-27.0	100	Horz	N	
5	1992.804	42.60	PK	31.80	-35.00	4.20	0.10	43.70	54.0	-10.3	74.0	-30.3	100	Vert	N	
6	3124.138	42.10	PK	33.20	-35.20	5.40	0.20	45.70	54.0	-8.3	74.0	-28.3	100	Vert	N	
7	4459.970	37.77	PK	34.40	-34.90	6.70	0.30	44.27	54.0	-9.7	74.0	-29.7	100	Vert	N	
11	5673.763	44.19	PK	35.10	-34.90	7.70	0.90	52.99	-	-	-	-	200	Vert	N	(Fundamental)
9	7677.961	36.80	PK	36.10	-35.10	9.10	0.60	47.50	54.0	-6.5	74.0	-26.5	200	Vert	Y	

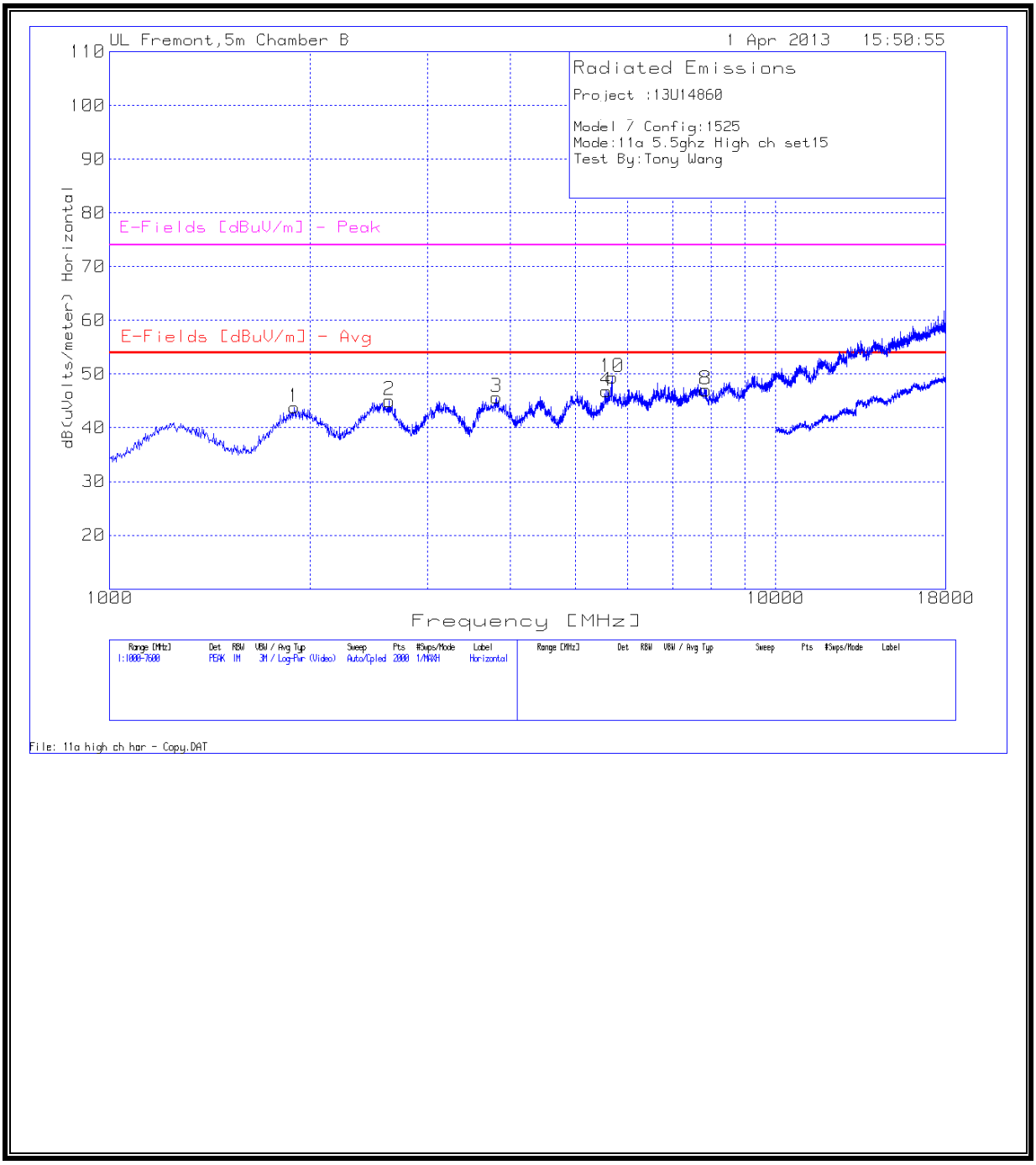
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

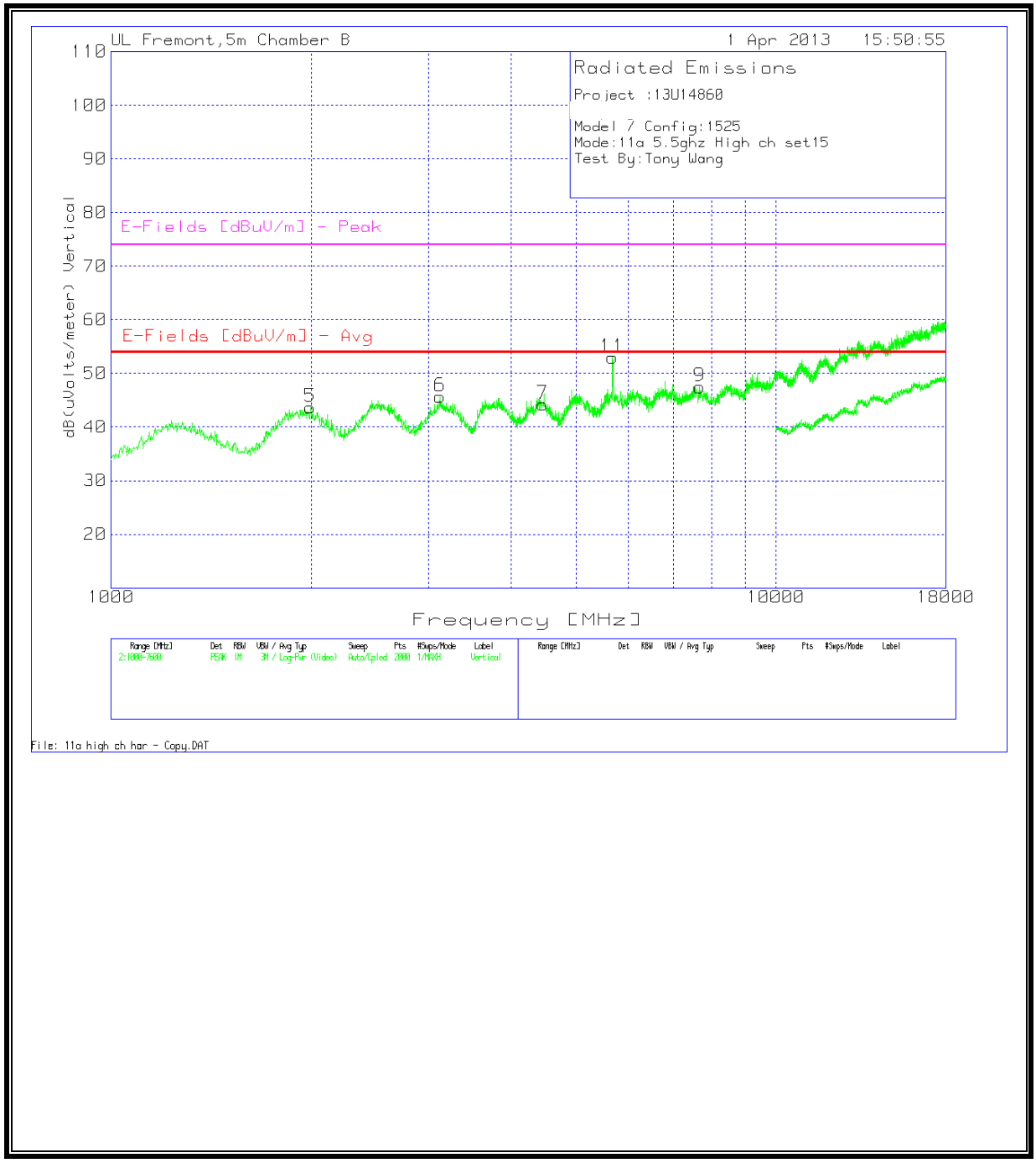
HARMONICS AND SPURIOUS EMISSIONS

HIGH CH Horizontal



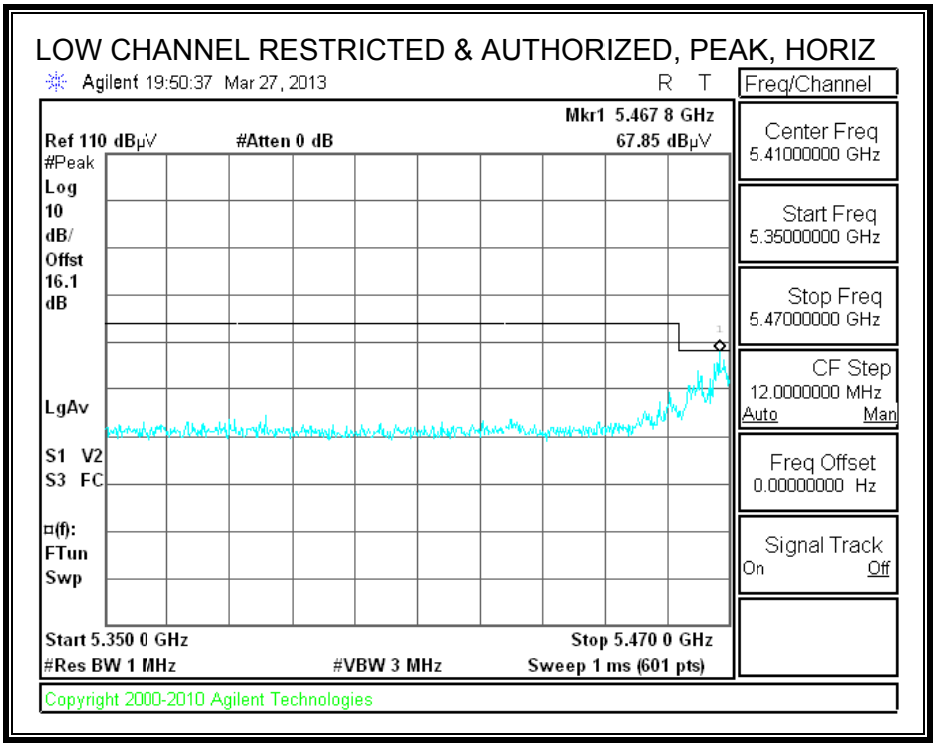
HARMONICS AND SPURIOUS EMISSIONS

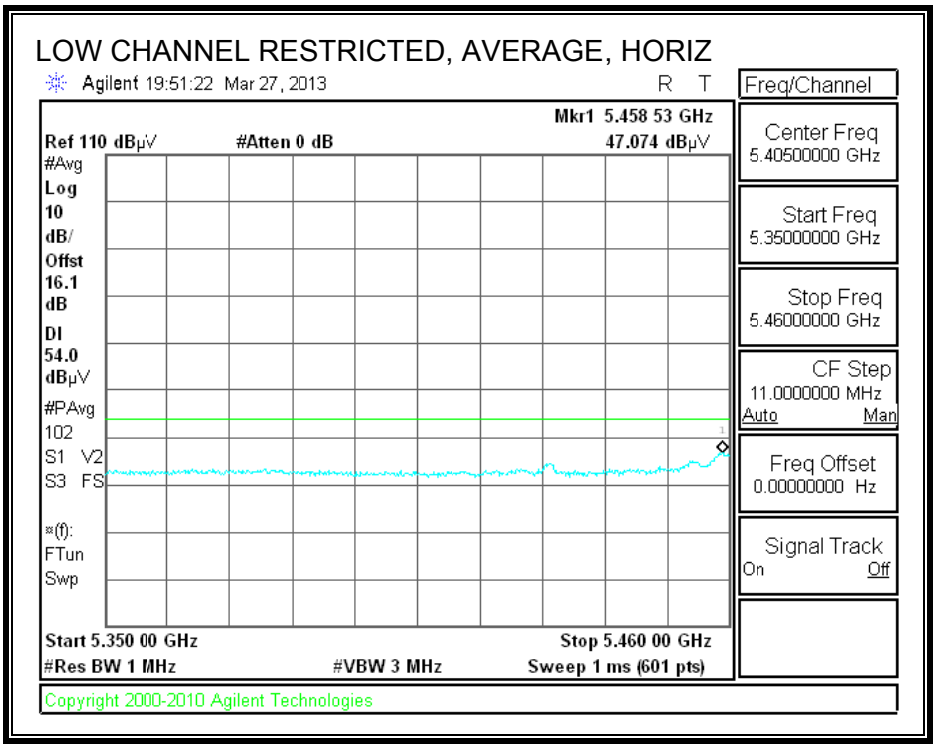
HIGH CH Vertical

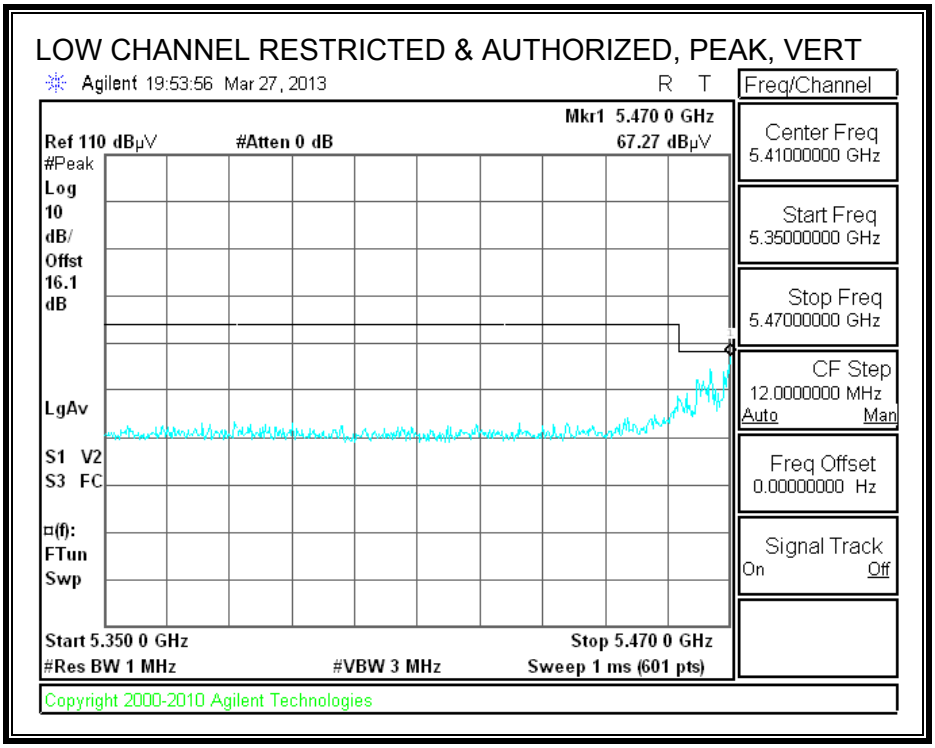


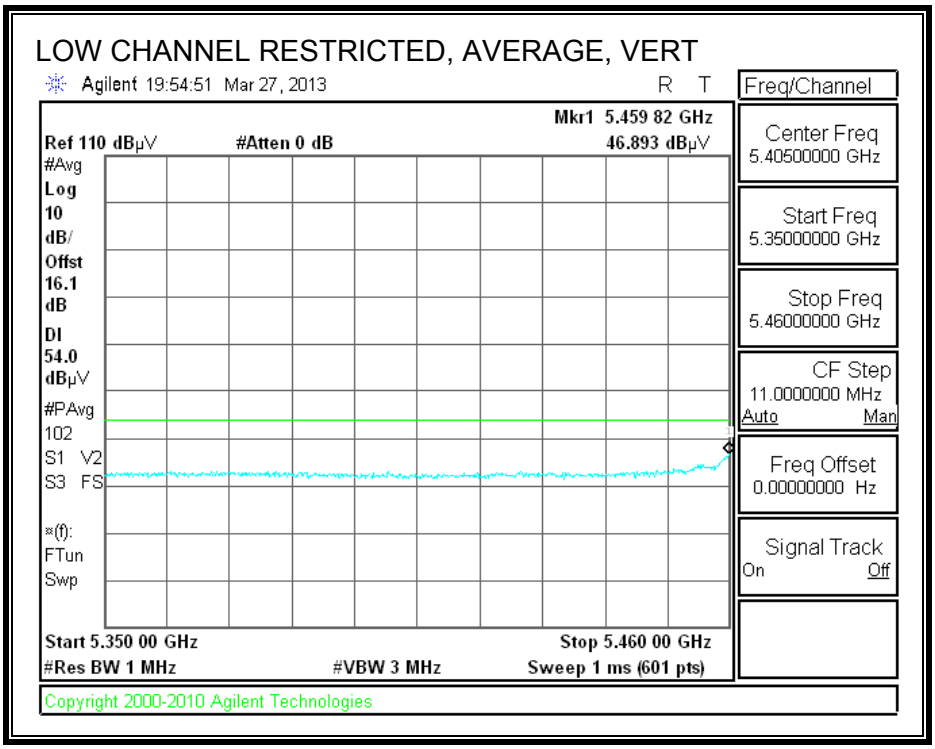
9.2.5. **TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.6 GHz BAND**

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)



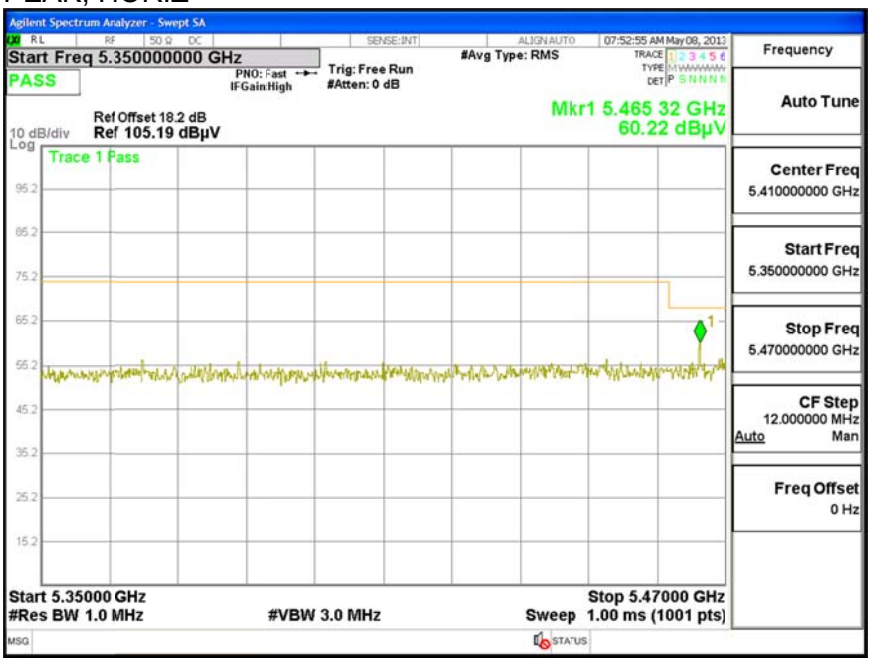




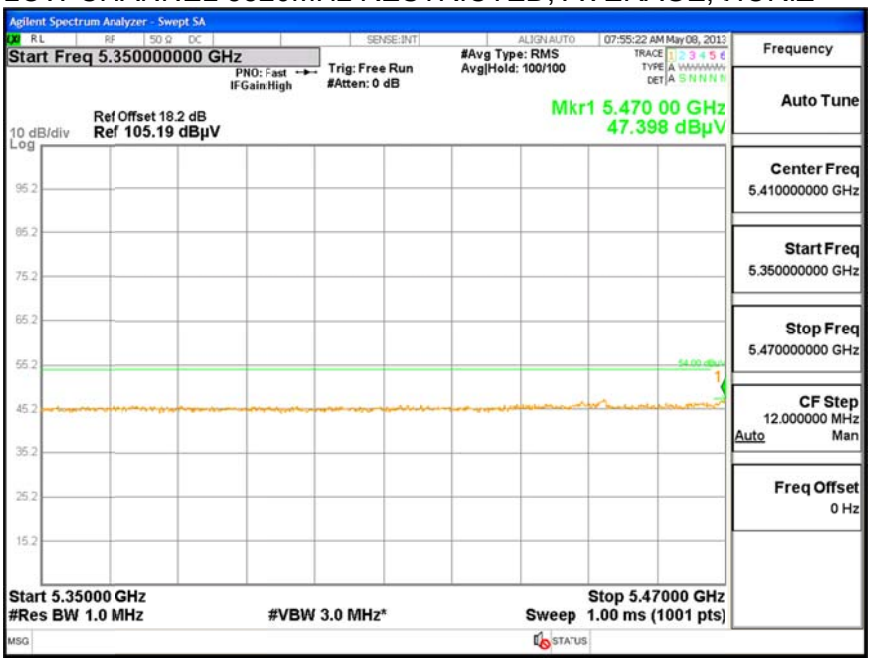


RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL 5520MHz)

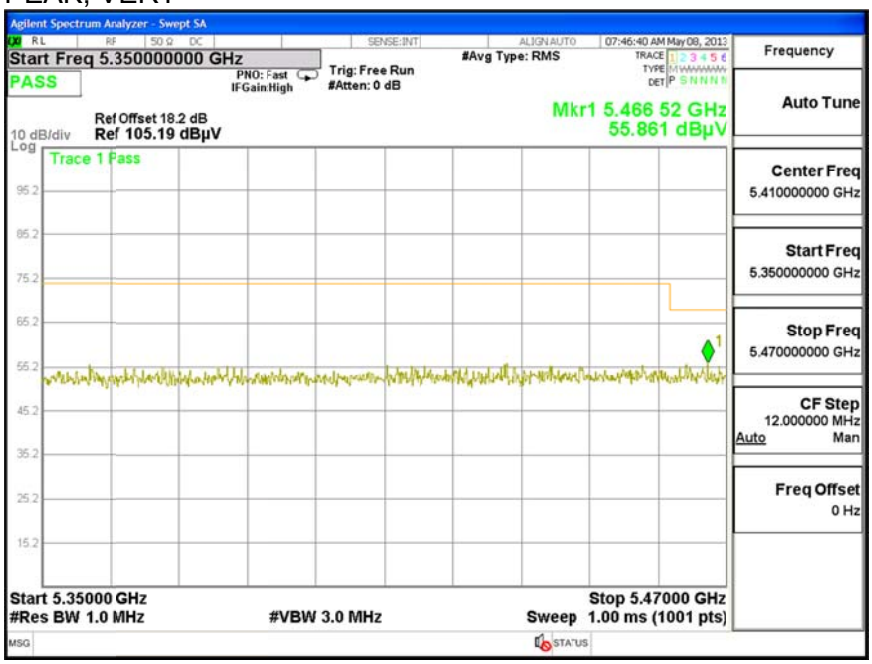
LOW CHANNEL 5520MHz RESTRICTED & AUTHORIZED, PEAK, HORIZ



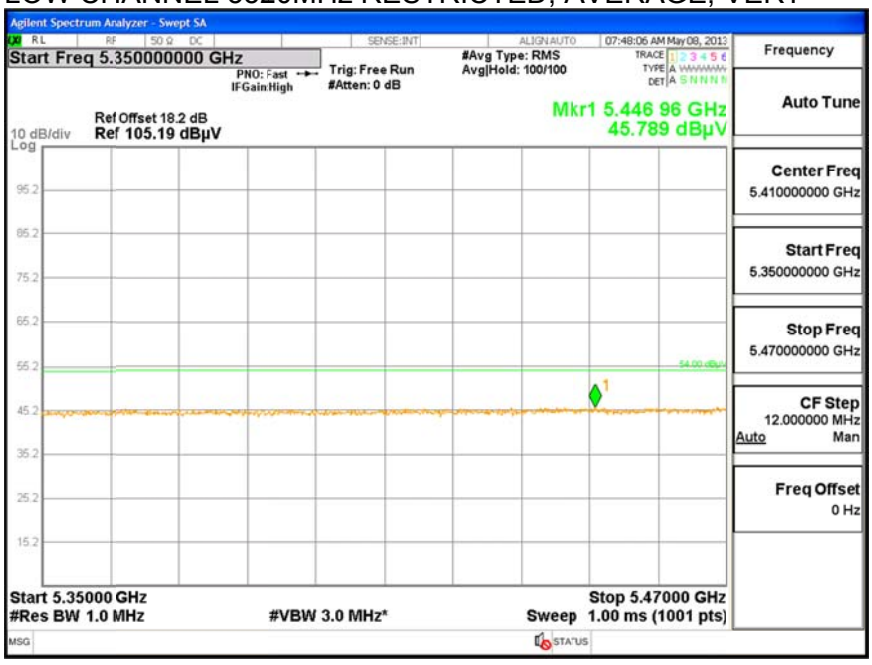
LOW CHANNEL 5520MHz RESTRICTED, AVERAGE, HORIZ



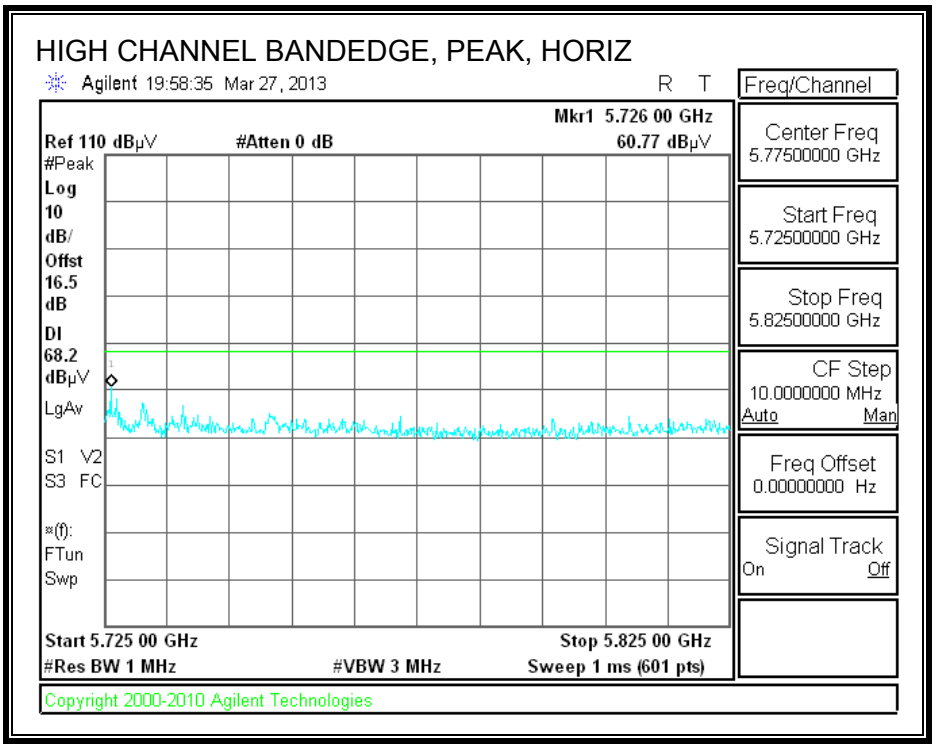
LOW CHANNEL 5520MHz RESTRICTED & AUTHORIZED, PEAK, VERT

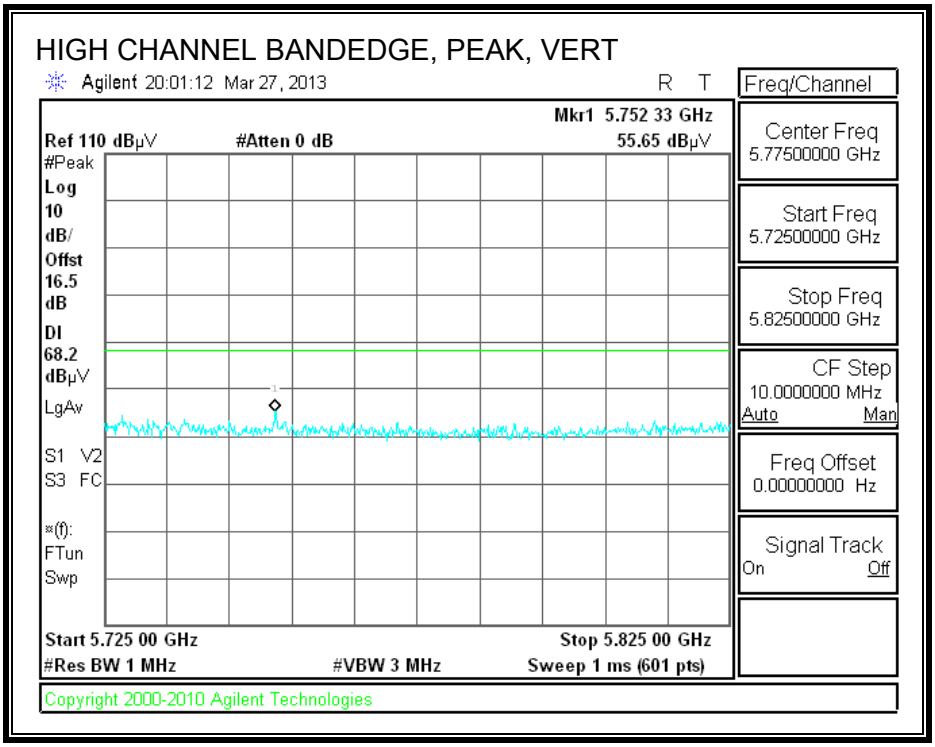


LOW CHANNEL 5520MHz RESTRICTED, AVERAGE, VERT



AUTHORIZED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

LOW CH

Project :13u14860

Model / Config:1525

Mode:Tx 11n20 5.5Ghz low ch

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?	
1	1946.627	43.66	PK	31.40	-35.00	4.20	0.10	44.36	54.0	-9.6	74.0	-29.6	100	Horz	N	
2	2599.700	42.76	PK	32.60	-35.10	4.80	0.10	45.16	54.0	-8.8	74.0	-28.8	100	Horz	N	
3	3698.051	40.68	PK	33.70	-34.90	5.90	0.00	45.38	54.0	-8.6	74.0	-28.6	200	Horz	Y	
10	5508.846	41.58	PK	34.90	-34.90	7.60	1.00	50.18	-	-	-	-	200	Horz	N	(Fundamental)
4	7088.756	37.96	PK	35.90	-35.00	8.70	0.20	47.76	54.0	-6.2	74.0	-26.2	200	Horz	N	
8	8244.478	37.37	PK	36.10	-35.20	9.40	0.20	47.87	54.0	-6.1	74.0	-26.1	100	Horz	Y	
5	1834.483	43.81	PK	30.70	-35.10	4.00	0.10	43.51	54.0	-10.5	74.0	-30.5	200	Vert	N	
6	3886.057	40.59	PK	33.90	-34.90	6.10	0.10	45.79	54.0	-8.2	74.0	-28.2	100	Vert	Y	
11	5492.354	43.89	PK	34.90	-34.90	7.60	1.00	52.49	-	-	-	-	200	Vert	N	(Fundamental)
7	7322.939	36.37	PK	35.90	-35.00	8.90	0.20	46.37	54.0	-7.6	74.0	-27.6	200	Vert	Y	
9	7634.000	35.27	PK1	36.10	-35.10	9.10	0.40	45.77	-	-	74.0	-28.2	190	Vert	Y	
	7634.240	25.71	AD1	36.10	-35.10	9.10	0.40	36.21	54.0	-17.8	-	-	190	Vert	Y	

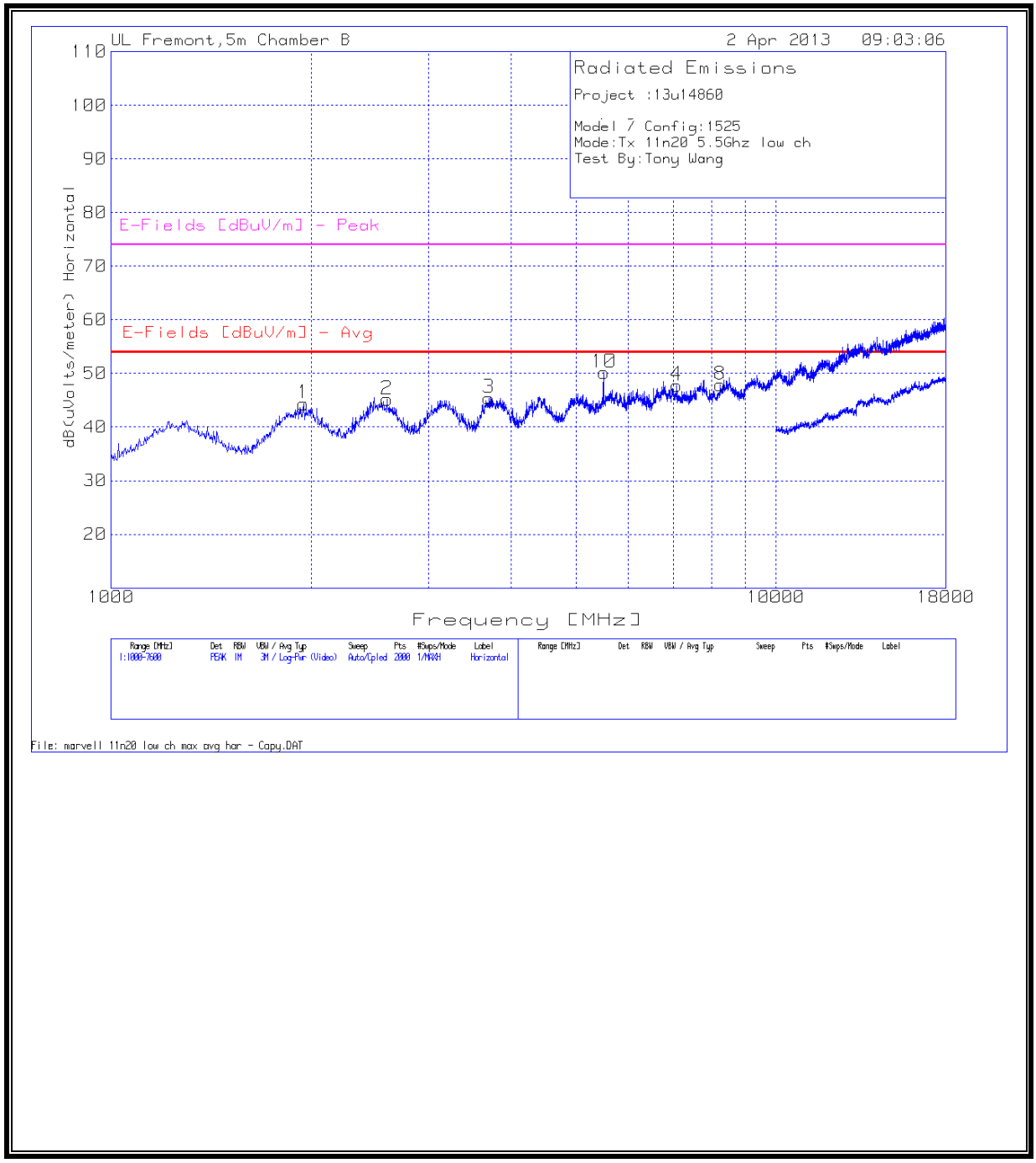
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

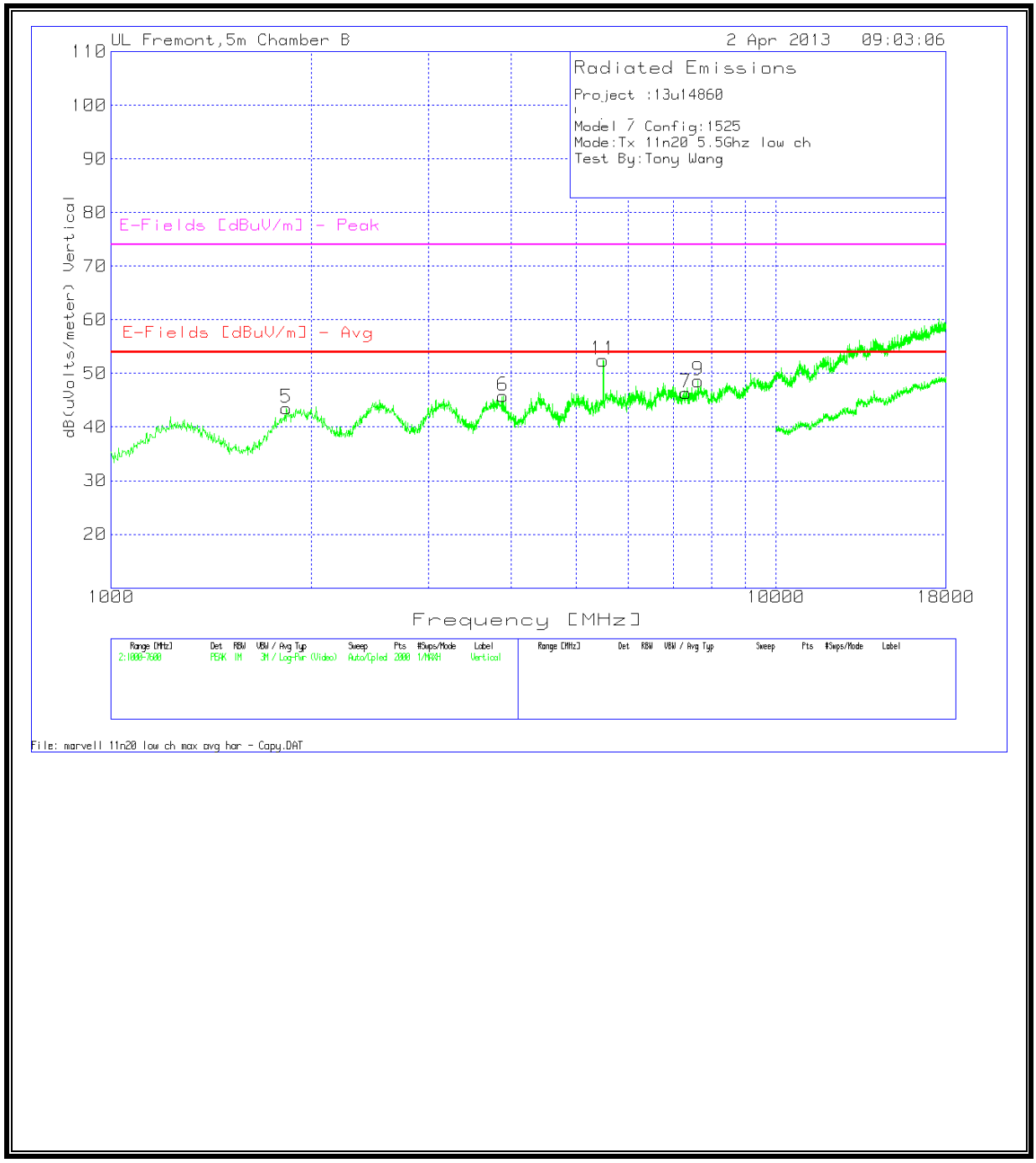
HARMONICS AND SPURIOUS EMISSIONS

LOW CH



HARMONICS AND SPURIOUS EMISSIONS

LOW CH



HARMONICS AND SPURIOUS EMISSIONS

MID CH

Project :13U14860

Model / Config:1525

Mode:Tx 11n20 5.5Ghz mid ch set14

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?	
1	2029.085	41.81	PK	31.80	-35.00	4.20	0.10	42.91	54.0	-11.1	74.0	-31.1	200	Horz	N	
2	2520.540	42.37	PK	32.50	-35.00	4.80	0.20	44.87	54.0	-9.1	74.0	-29.1	200	Horz	N	
3	3800.300	40.17	PK	33.80	-34.90	6.00	0.20	45.27	54.0	-8.7	74.0	-28.7	200	Horz	Y	
11	5588.006	40.73	PK	35.00	-34.90	7.60	1.00	49.43	-	-	-	-	200	Horz	N	(Fundamental)
4	6260.870	36.90	PK	36.00	-35.00	8.10	0.20	46.20	54.0	-7.8	74.0	-27.8	100	Horz	N	
9	7865.067	36.80	PK	36.20	-35.10	9.20	0.40	47.50	54.0	-6.5	74.0	-26.5	200	Horz	N	
5	1986.207	42.53	PK	31.70	-35.00	4.20	0.10	43.53	54.0	-10.4	74.0	-30.5	100	Vert	N	
8	2190.705	36.94	PK	32.00	-35.00	4.40	0.10	38.44	54.0	-15.5	74.0	-35.6	100	Vert	N	
6	3064.768	41.14	PK	33.20	-35.20	5.30	0.10	44.54	54.0	-9.4	74.0	-29.5	100	Vert	N	
7	4417.091	39.07	PK	34.40	-34.90	6.60	0.20	45.37	54.0	-8.6	74.0	-28.6	200	Vert	N	
12	5584.708	44.86	PK	35.00	-34.90	7.60	1.00	53.56	-	-	-	-	200	Vert	N	(Fundamental)
10	8208.096	36.80	PK	36.10	-35.20	9.40	0.50	47.60	54.0	-6.4	74.0	-26.4	200	Vert	Y	

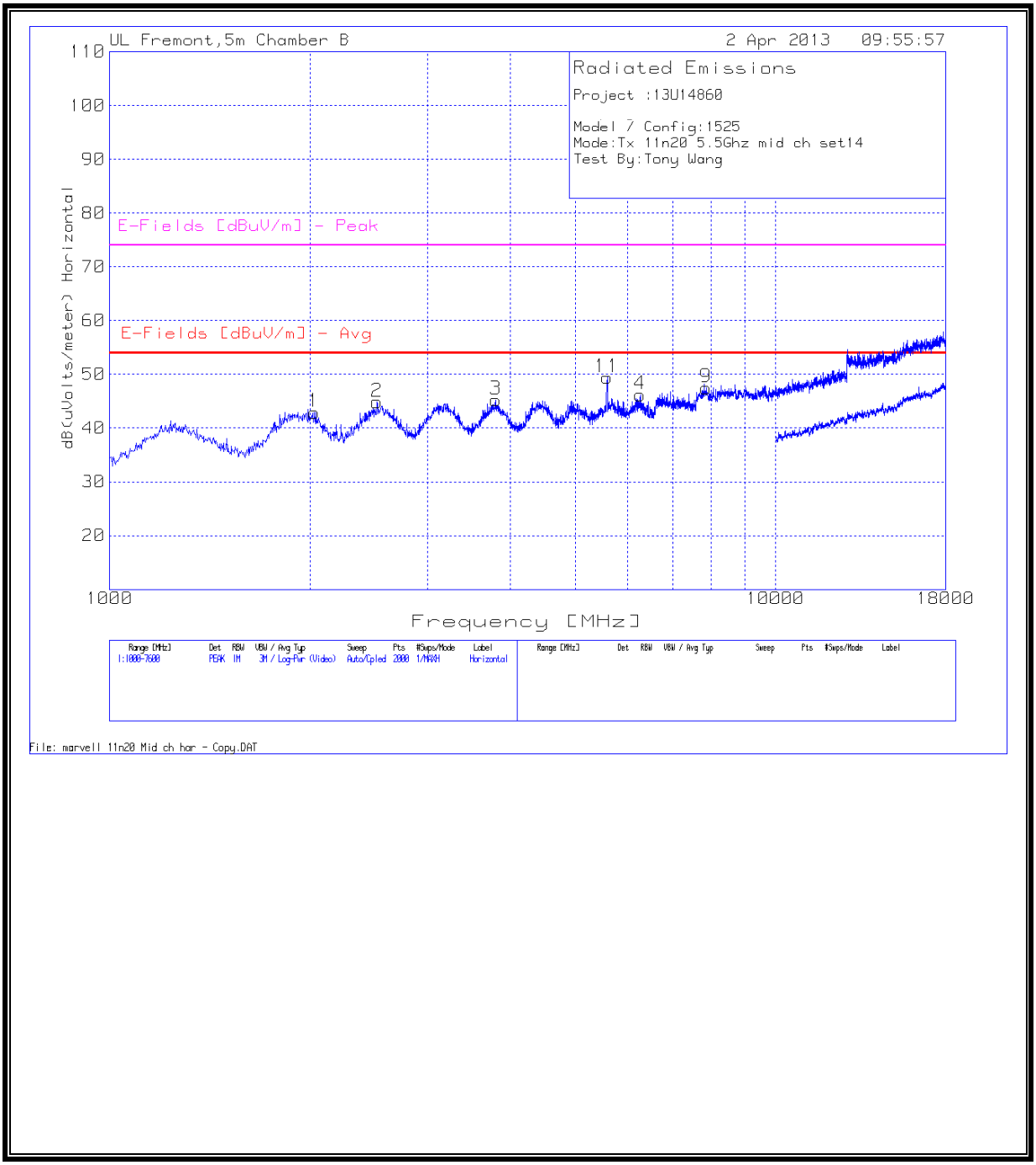
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

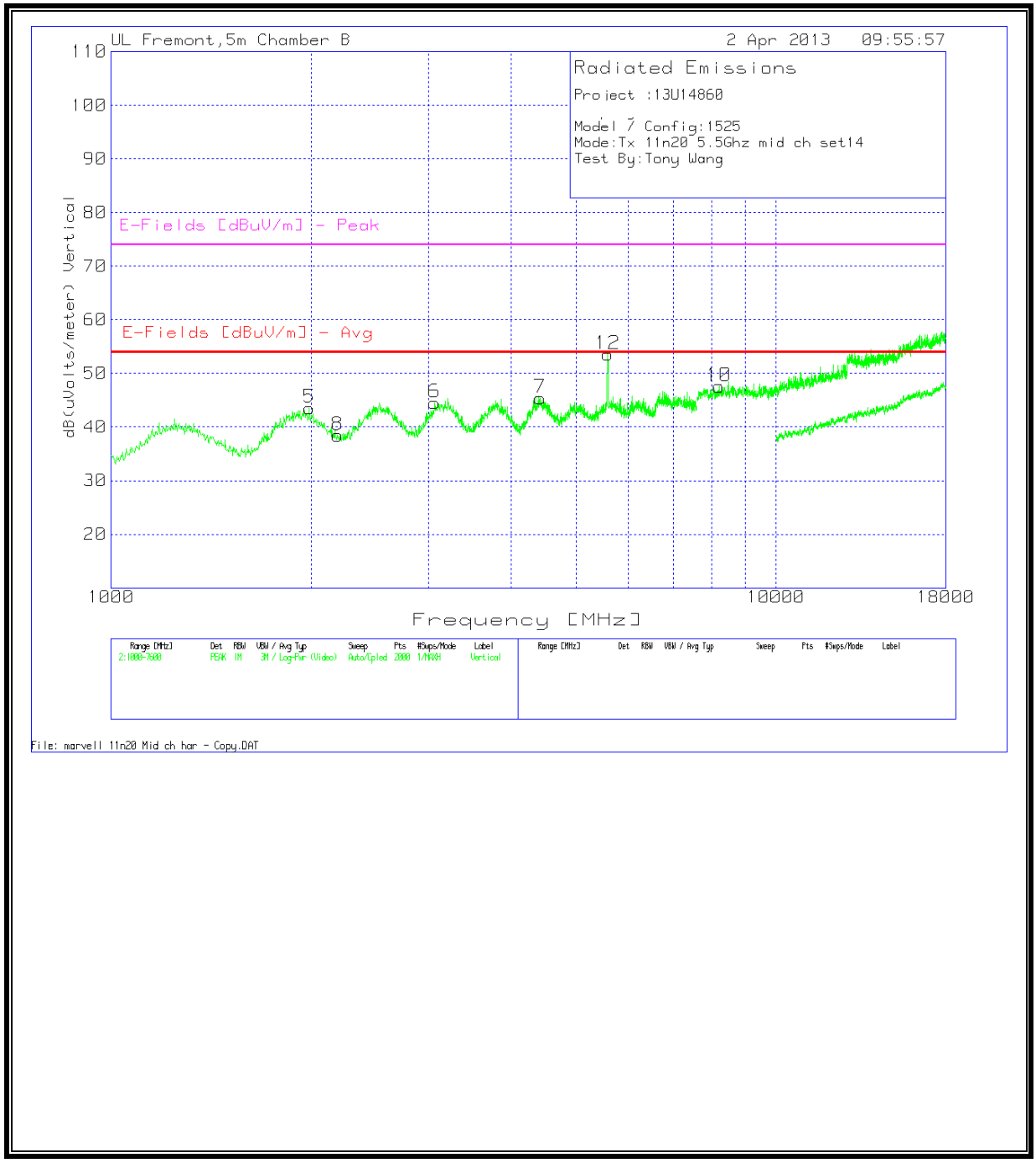
HARMONICS AND SPURIOUS EMISSIONS

MID CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

MID CH Vertical



HARMONICS AND SPURIOUS EMISSIONS

HIGH CH

Project :13U14860

Model / Config:1525

Mode:11n20 5.5ghz High ch set14

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m]	Margin [dB]	Height [cm]	Polarity	Restricted Band?	
1	1907.046	43.96	PK	31.20	-35.00	4.10	0.10	44.36	54.0	-9.6	74.0	-29.6	100	Horz	N	
2	2573.313	42.60	PK	32.60	-35.10	4.80	0.20	45.10	54.0	-8.9	74.0	-28.9	200	Horz	N	
3	3780.510	40.38	PK	33.80	-34.90	6.00	0.10	45.38	54.0	-8.6	74.0	-28.6	200	Horz	Y	
4	5007.496	38.84	PK	34.60	-34.90	7.20	0.20	45.94	54.0	-8.0	74.0	-28.1	200	Horz	Y	
12	5680.360	39.79	PK	35.10	-34.90	7.70	0.90	48.59	-	-	-	-	200	Horz	N	(Fundamental)
9	7709.145	36.80	PK	36.20	-35.10	9.10	0.40	47.40	54.0	-6.6	74.0	-26.6	100	Horz	Y	
5	1841.079	44.25	PK	30.70	-35.10	4.00	0.10	43.95	54.0	-10.0	74.0	-30.1	100	Vert	N	
6	2490.855	42.49	PK	32.50	-35.00	4.70	0.20	44.89	54.0	-9.1	74.0	-29.1	100	Vert	Y	
7	4394.003	39.19	PK	34.30	-34.90	6.60	0.20	45.39	54.0	-8.6	74.0	-28.6	200	Vert	Y	
8	5116.342	37.63	PK	34.70	-34.90	7.30	0.30	45.03	54.0	-8.9	74.0	-29.0	200	Vert	Y	
10	5690.255	44.84	PK	35.10	-34.90	7.70	0.90	53.64	-	-	-	-	200	Vert	N	(Fundamental)
11	8072.964	36.39	PK	36.10	-35.20	9.30	0.50	47.09	54.0	-6.9	74.0	-26.9	100	Vert	Y	

PK - Peak detector

PK1 - KDB 789033 v01r02 G)5) Method: Peak

AD1 - KDB 789033 v01r02 G)6) Method: AD Primary Power Average

VB1 - KDB 789033 v01r02 G)6) Method: VB Alternative Reduced Video

PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak

MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

MAv2 - KDB558074 v02 10.2.3.3/8.2.2 Option 2 Slow Sweep RMS Average

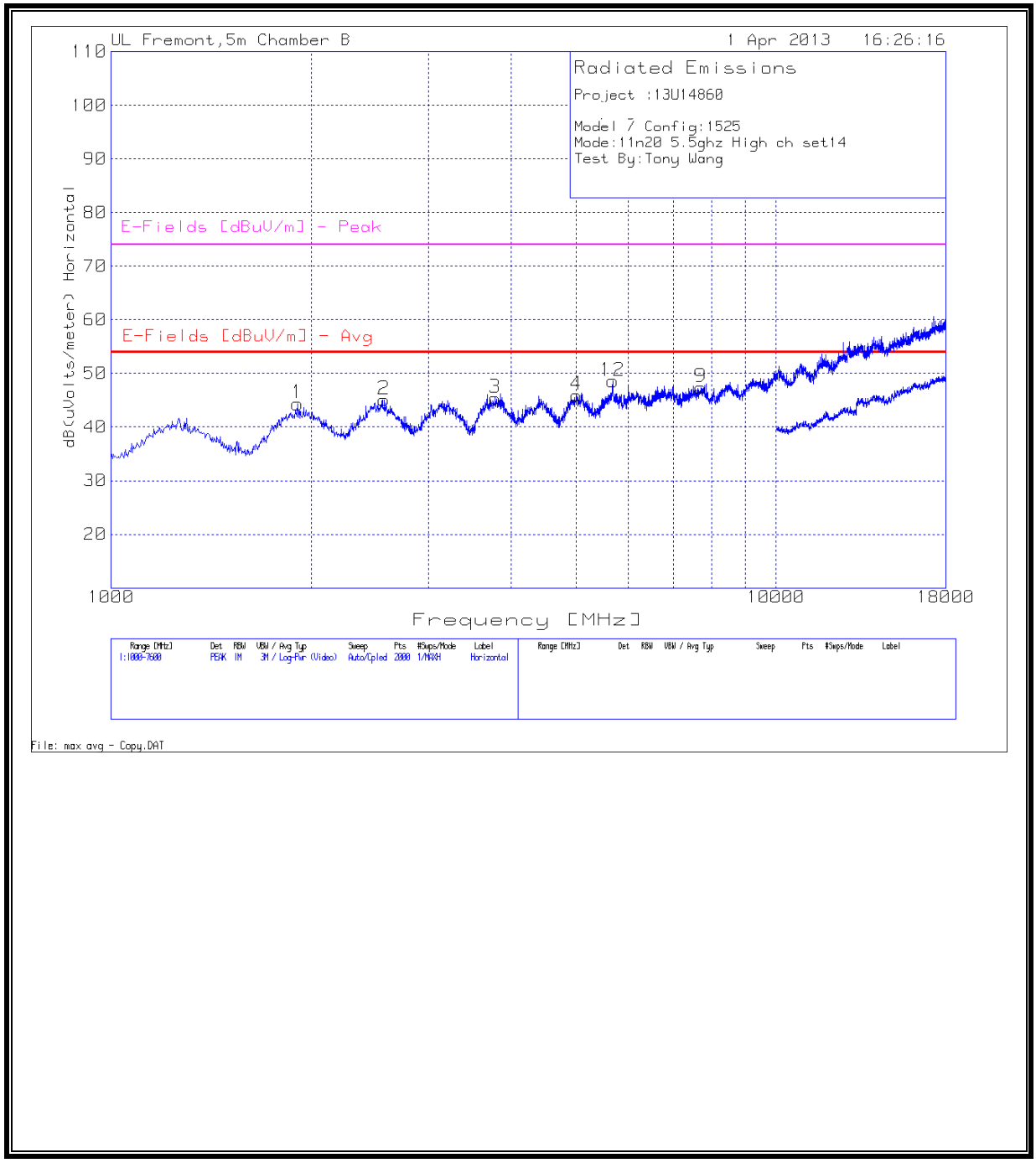
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

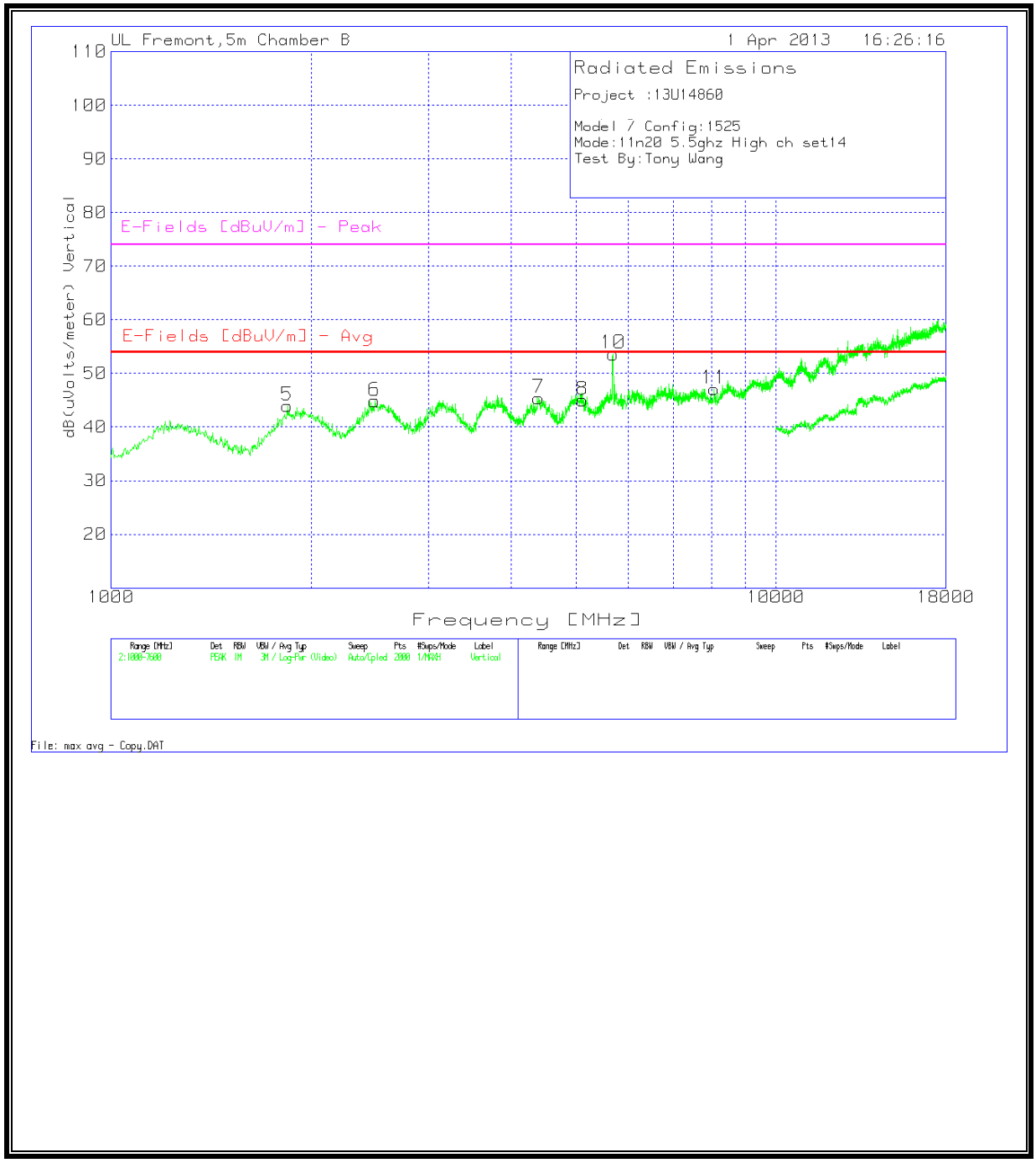
HARMONICS AND SPURIOUS EMISSIONS

HIGH CH Horizontal



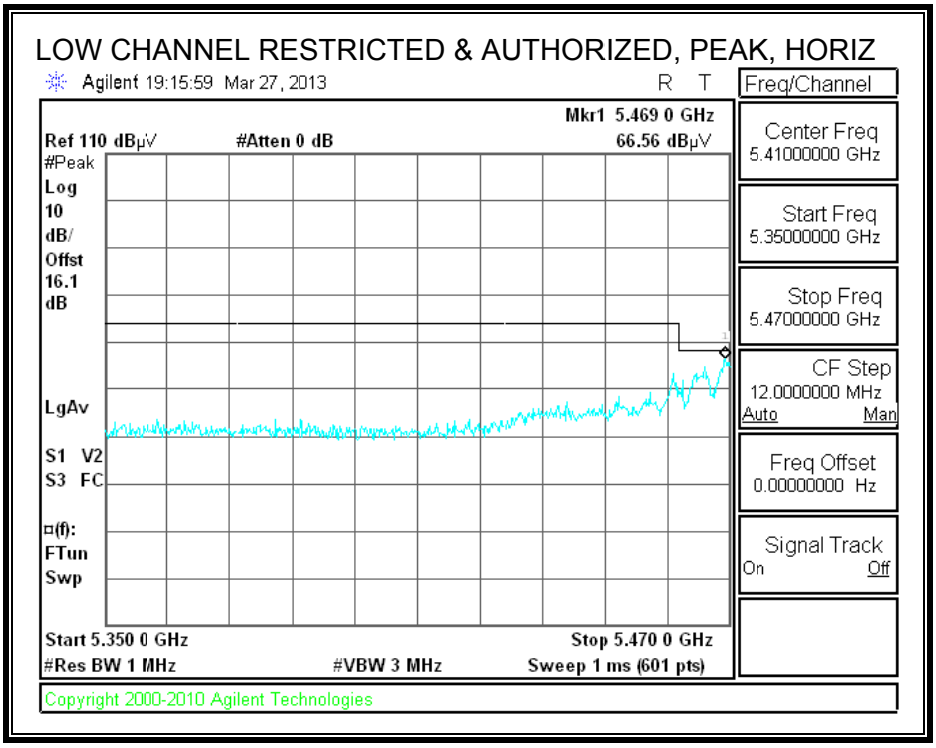
HARMONICS AND SPURIOUS EMISSIONS

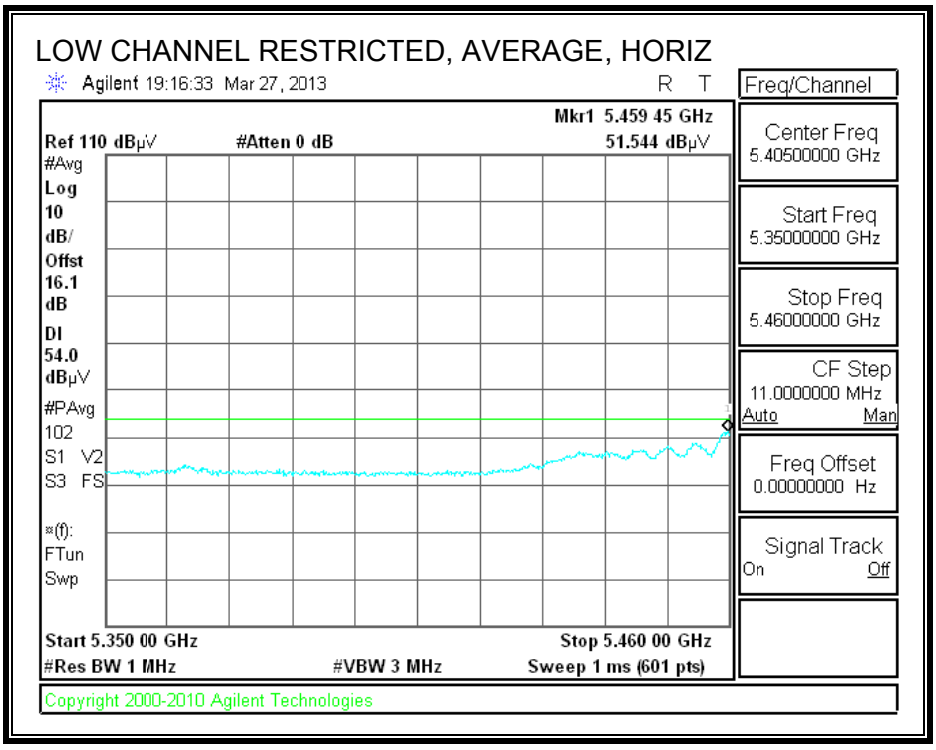
HIGH CH Vertical



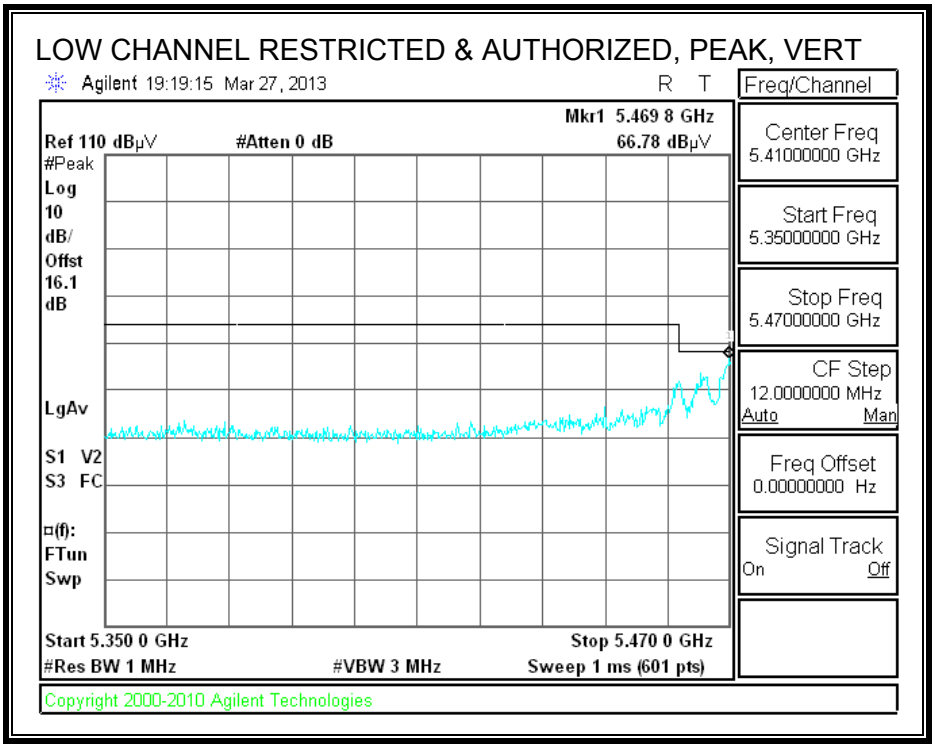
9.2.6. **TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.6 GHz BAND**

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)

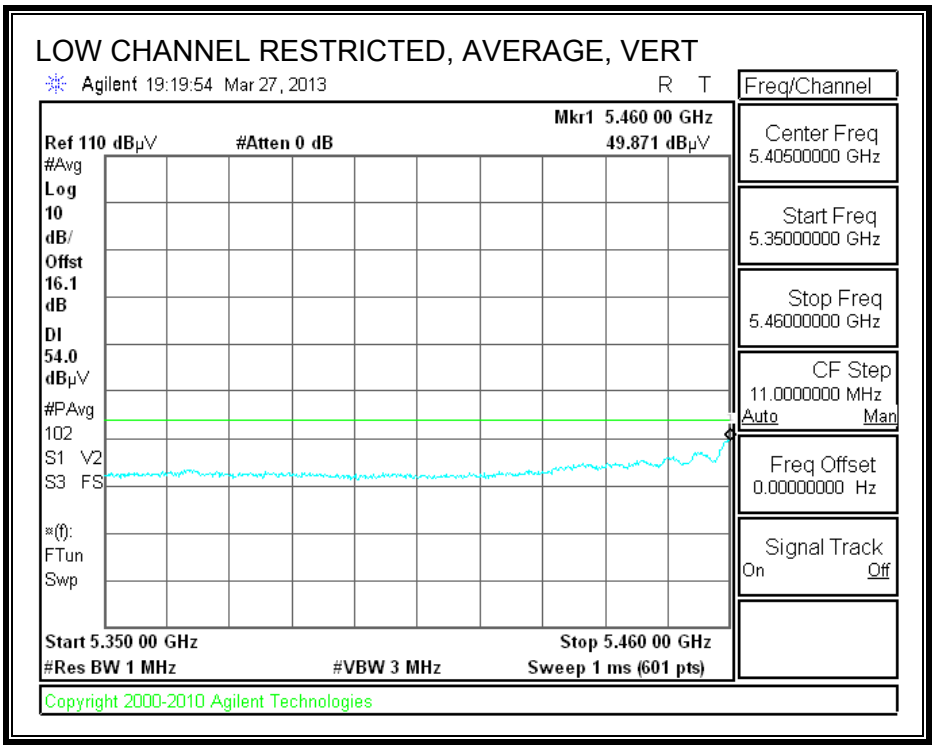




LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

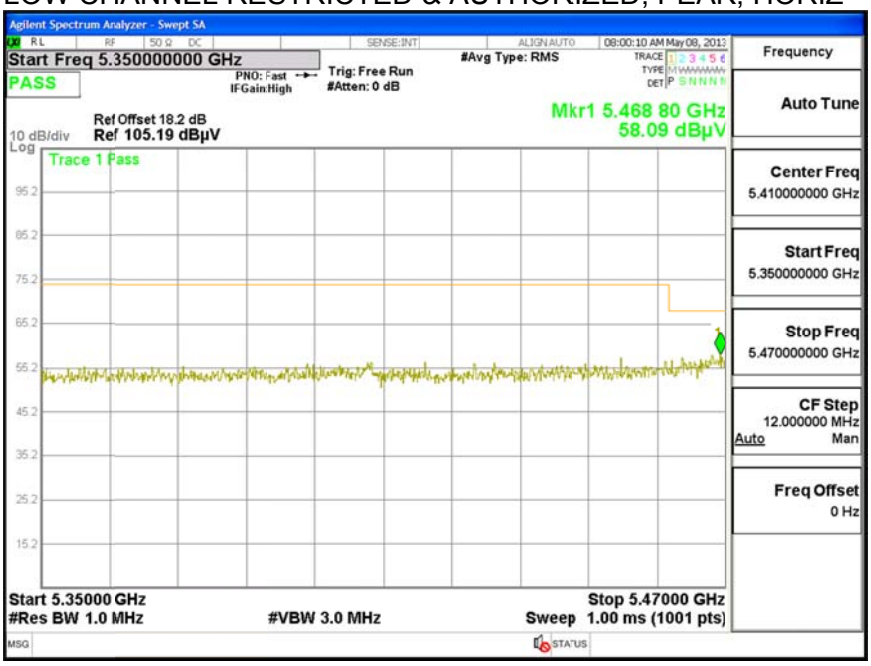


LOW CHANNEL RESTRICTED, AVERAGE, VERT

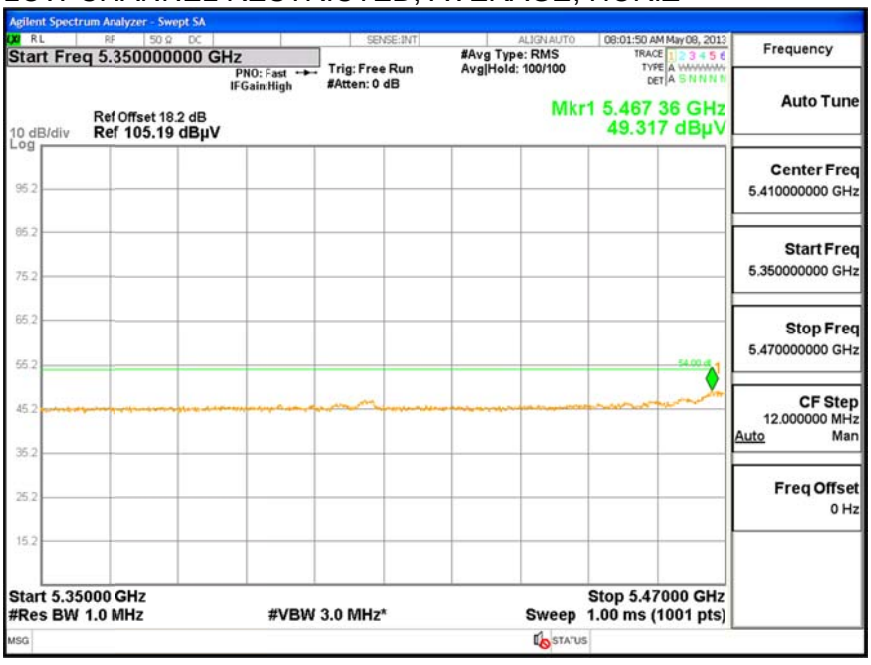


RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL, 5550MHz)

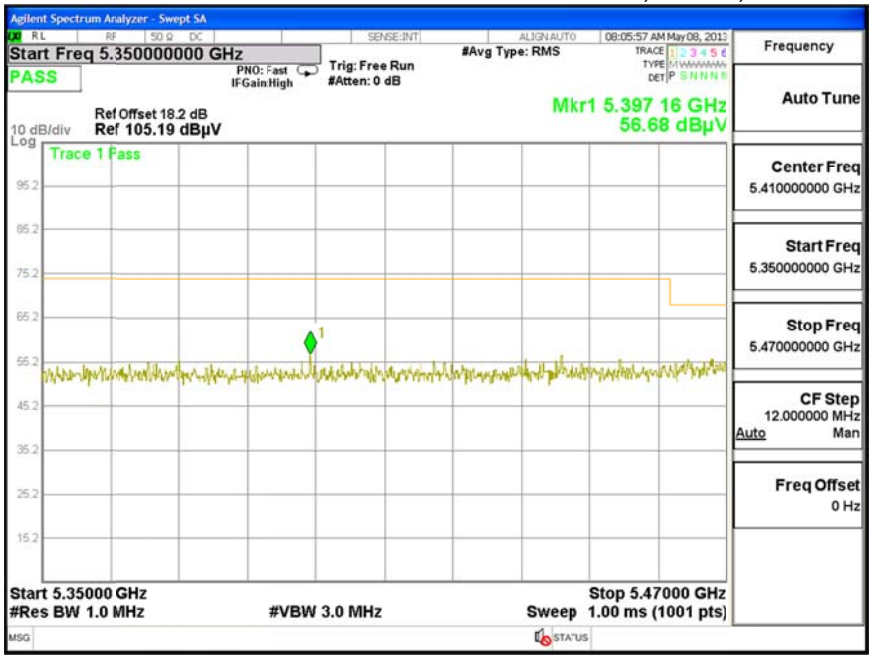
LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, HORIZ



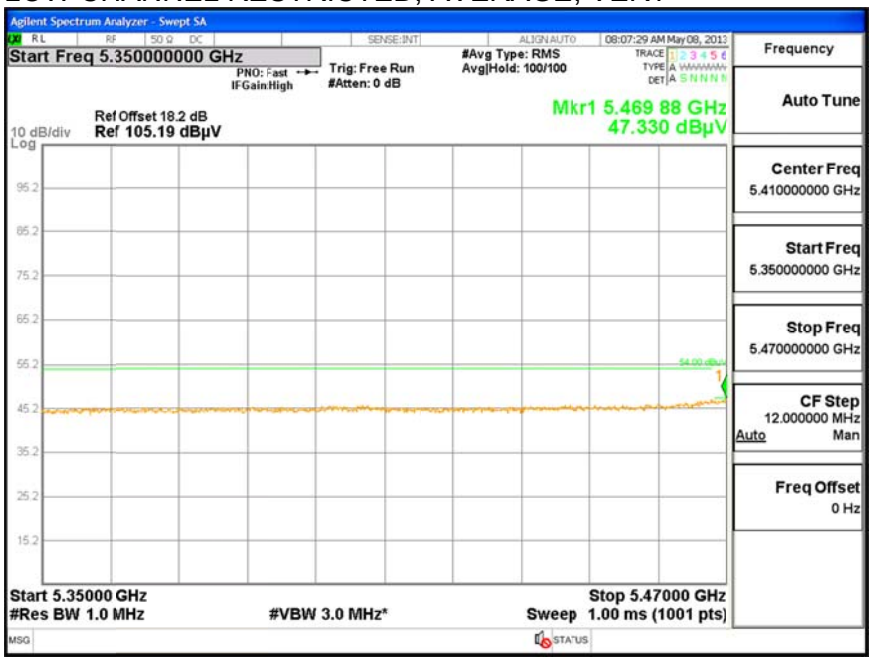
LOW CHANNEL RESTRICTED, AVERAGE, HORIZ



LOW CHANNEL RESTRICTED & AUTHORIZED, PEAK, VERT

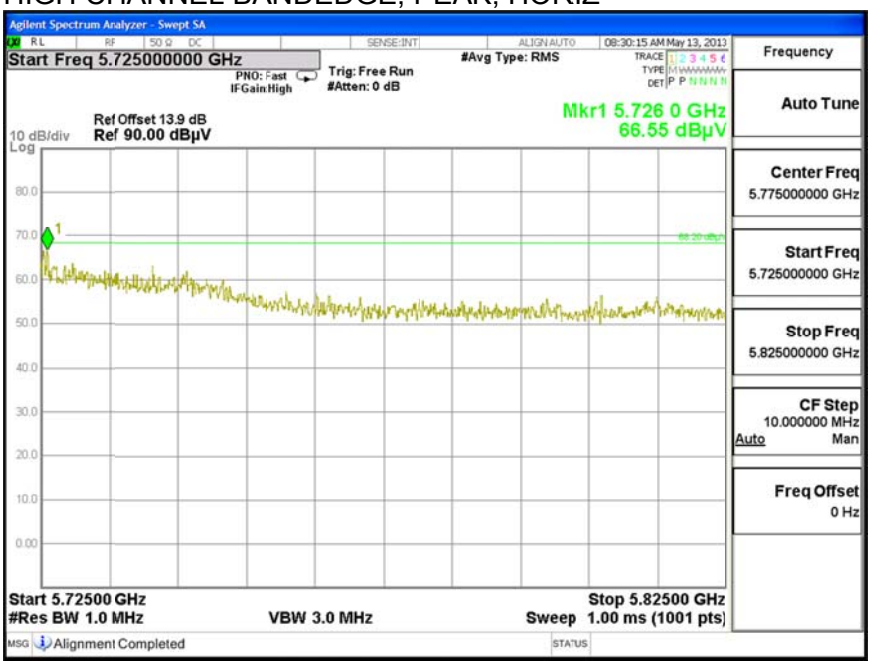


LOW CHANNEL RESTRICTED, AVERAGE, VERT

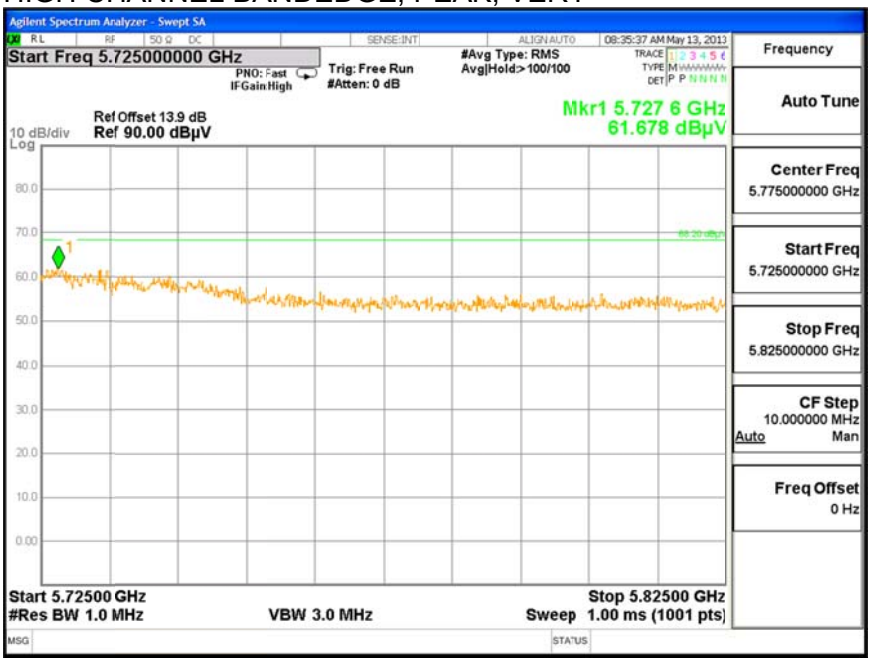


AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, PEAK, HORIZ



HIGH CHANNEL BANDEDGE, PEAK, VERT



HARMONICS AND SPURIOUS EMISSIONS

LOW CH

Project :13U14860

Model / Config:1525

Mode:Tx 11n40 5.5Ghz low ch set13

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m	Margin [dB]	Height [cm]	Polarity	Restricted Band?
1	1893.853	43.60	PK	31.10	-35.00	4.10	0.10	43.90	54.0	-10.1	74.0	-30.1	200	Horz	N
2	2490.855	42.97	PK	32.50	-35.00	4.70	0.20	45.37	54.0	-8.6	74.0	-28.6	200	Horz	Y
3	3648.576	39.67	PK	33.60	-35.00	5.90	0.20	44.37	54.0	-9.6	74.0	-29.6	100	Horz	Y
4	4492.954	39.20	PK	34.50	-34.90	6.70	0.20	45.70	54.0	-8.3	74.0	-28.3	100	Horz	N
8	8093.753	37.14	PK	36.10	-35.20	9.30	0.10	47.44	54.0	-6.5	74.0	-26.6	200	Horz	Y
10	12662.669	23.31	PK	39.20	-32.30	11.90	0.30	42.41	54.0	-11.6	74.0	-31.6	100	Horz	Y
5	2589.805	41.83	PK	32.60	-35.10	4.80	0.10	44.23	54.0	-9.7	74.0	-29.8	200	Vert	N
6	3820.090	39.69	PK	33.80	-34.90	6.10	0.20	44.89	54.0	-9.1	74.0	-29.1	200	Vert	Y
7	6148.726	36.68	PK	36.00	-34.90	8.10	0.20	46.08	54.0	-7.9	74.0	-27.9	200	Vert	N
9	8436.782	37.12	PK	36.20	-35.20	9.60	0.20	47.92	54.0	-6.1	74.0	-26.1	200	Vert	Y
11	13006.497	23.07	PK	39.20	-31.80	12.10	0.30	42.87	54.0	-11.1	74.0	-31.1	200	Vert	N

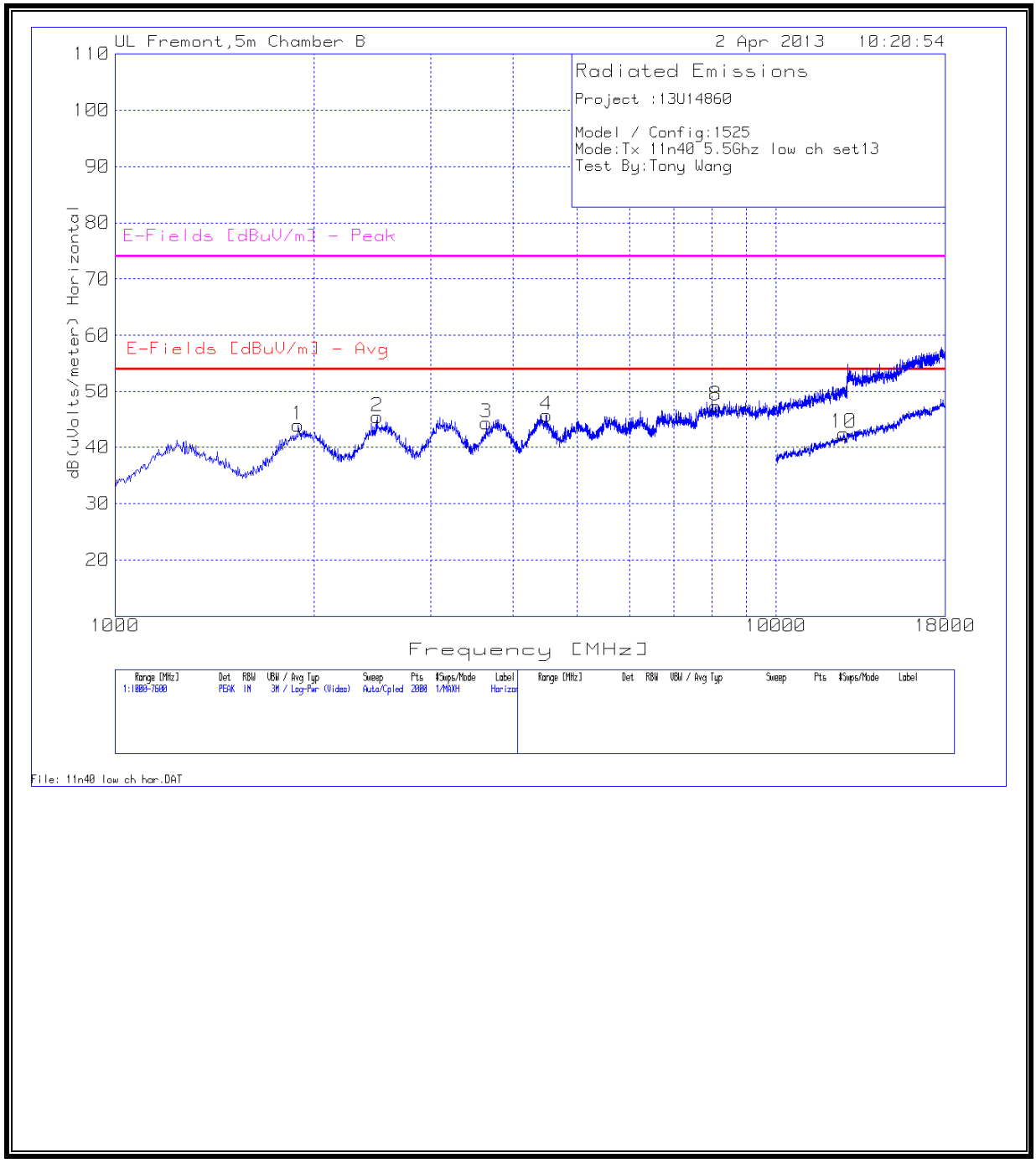
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

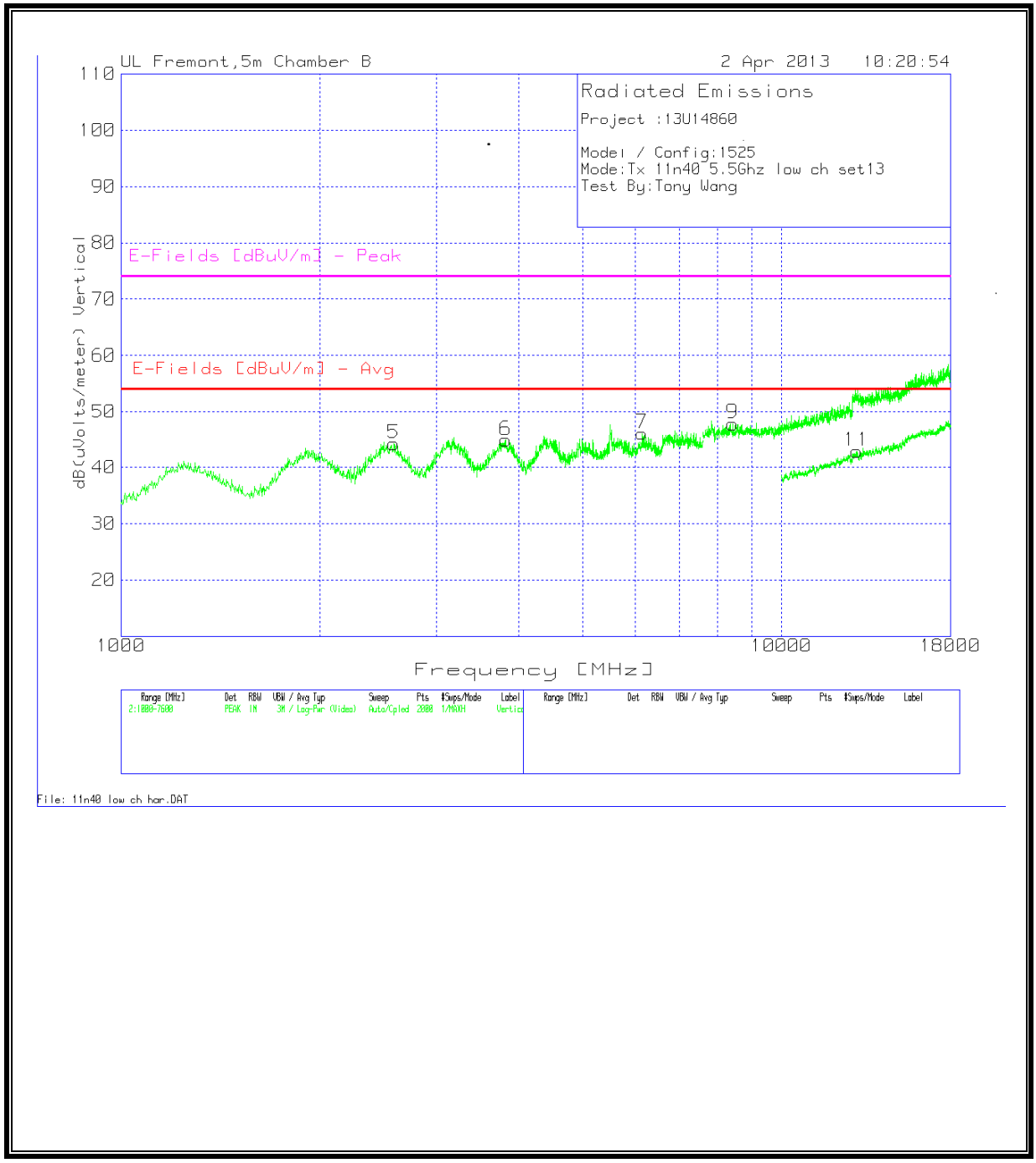
HARMONICS AND SPURIOUS EMISSIONS

LOW CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

LOW CH Vertical



HARMONICS AND SPURIOUS EMISSIONS

MID CH

Project :13U14860

Model / Config:1525

Mode:Tx 11n40 5.5Ghz Mid ch set13

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m]	Margin [dB]	Height [cm]	Polarity	Restricted Band?
1	1956.522	42.93	PK	31.50	-35.00	4.20	0.10	43.73	54.0	-10.2	74.0	-30.3	100	Horz	N
2	2461.169	42.73	PK	32.40	-35.00	4.70	0.10	44.93	54.0	-9.0	74.0	-29.1	200	Horz	N
3	3843.178	40.23	PK	33.80	-34.90	6.10	0.10	45.33	54.0	-8.6	74.0	-28.7	100	Horz	Y
4	5657.271	36.22	PK	35.10	-34.90	7.70	1.00	45.12	54.0	-8.9	74.0	-28.9	100	Horz	N
9	8062.569	36.65	PK	36.10	-35.20	9.30	0.60	47.45	54.0	-6.5	74.0	-26.6	100	Horz	Y
11	12046.977	23.54	PK	39.20	-33.30	11.60	0.20	41.24	54.0	-12.7	74.0	-32.8	200	Horz	Y
5	1903.748	43.74	PK	31.10	-35.00	4.10	0.10	44.04	54.0	-9.9	74.0	-30.0	200	Vert	N
6	2530.435	41.78	PK	32.50	-35.00	4.80	0.10	44.18	54.0	-9.8	74.0	-29.8	200	Vert	N
7	3711.244	40.12	PK	33.70	-34.90	6.00	0.00	44.92	54.0	-9.1	74.0	-29.1	200	Vert	Y
8	6237.781	36.50	PK	36.00	-34.90	8.10	0.20	45.90	54.0	-8.1	74.0	-28.1	100	Vert	N
10	8185.910	35.81	PK1	36.10	-35.20	9.40	0.50	46.61	-	-	74.0	-27.4	104	Vert	Y
	8188.400	25.59	AD1	36.10	-35.20	9.40	0.50	36.39	54.0	-17.6	-	-	104	Vert	Y
12	12154.923	23.89	PK	39.20	-33.10	11.60	0.20	41.79	54.0	-12.2	74.0	-32.2	100	Vert	Y

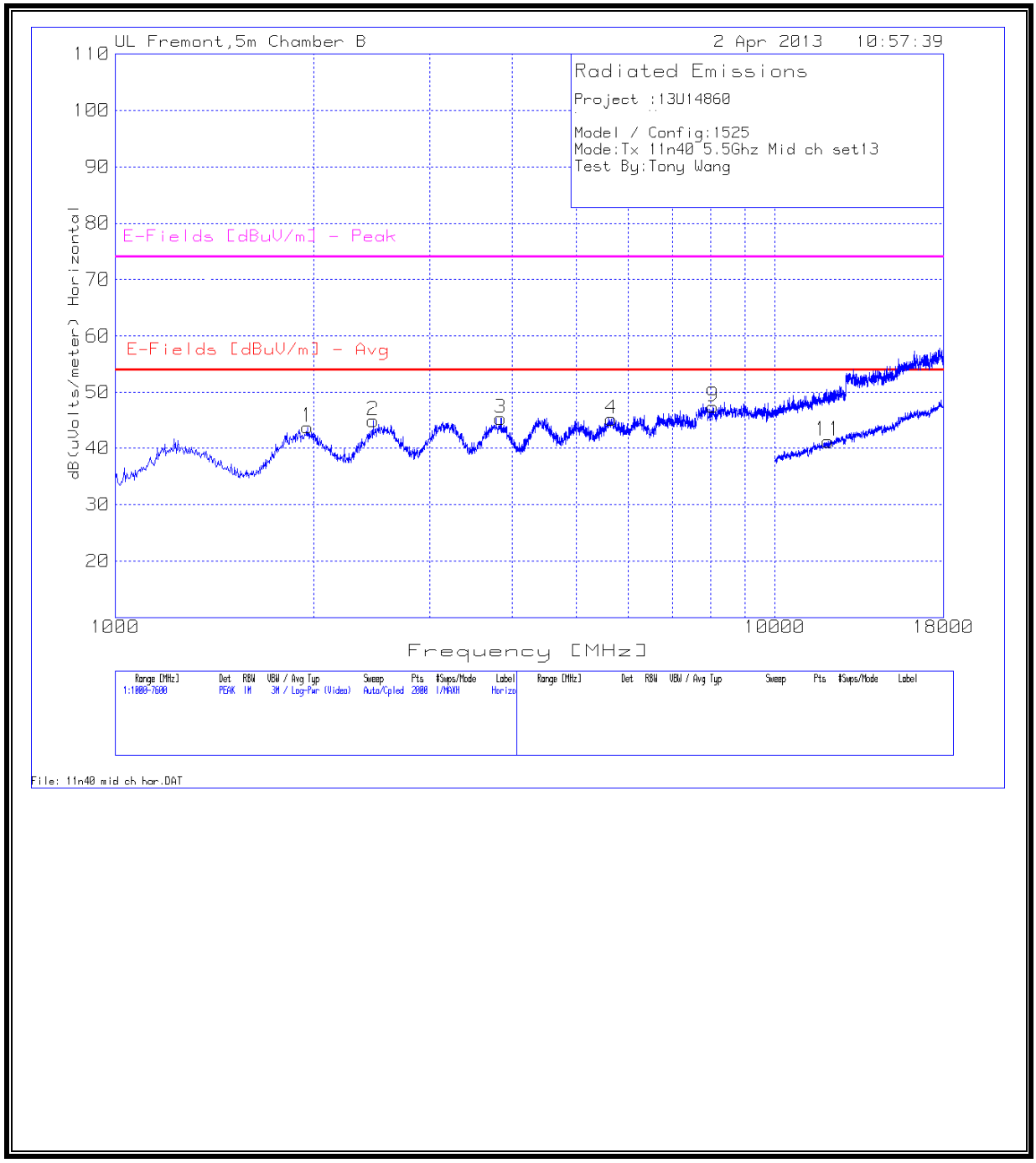
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

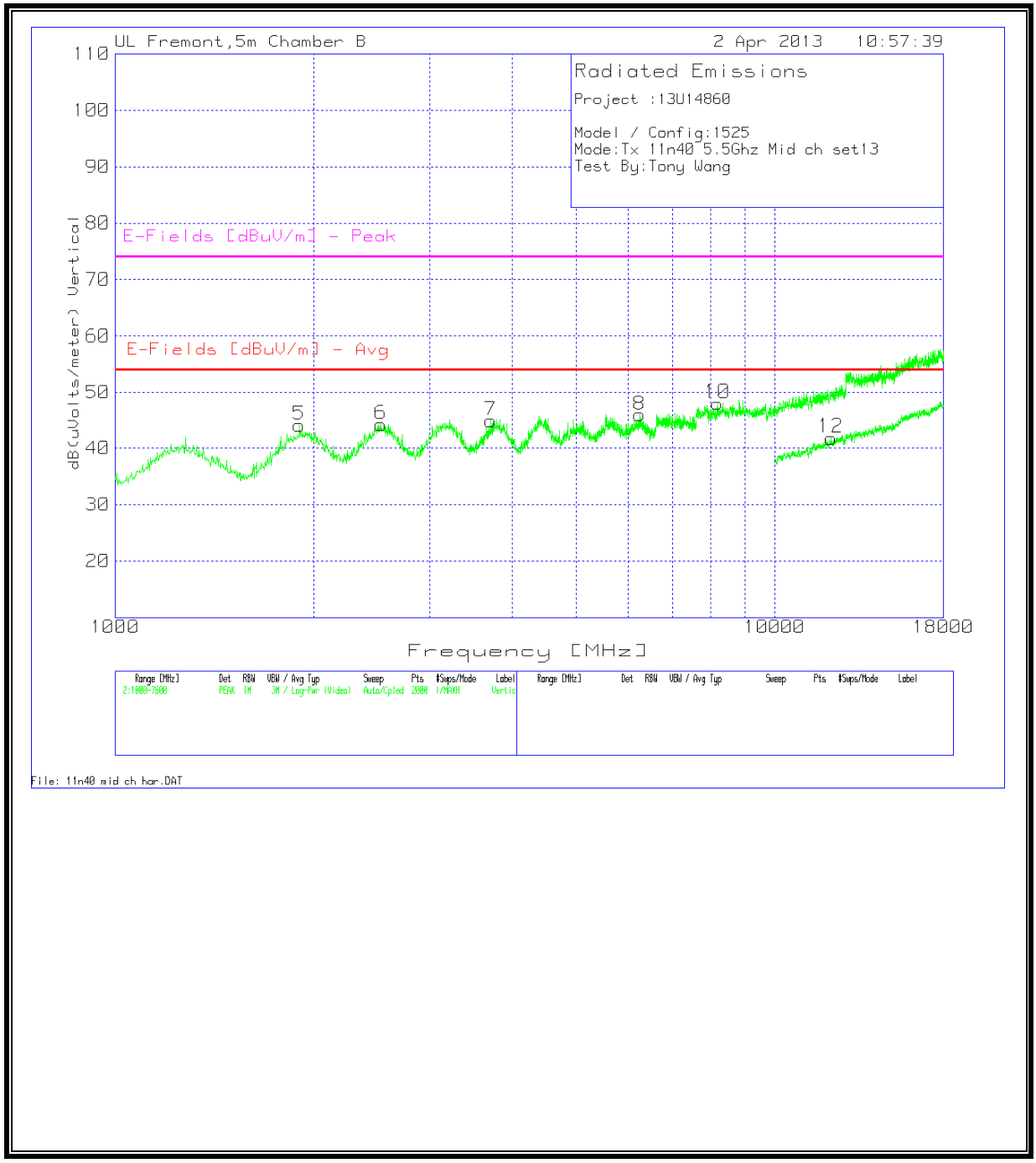
HARMONICS AND SPURIOUS EMISSIONS

MID CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

MID CH Vertical



HARMONICS AND SPURIOUS EMISSIONS

HIGH CH

Project :13U14860

Model / Config:1525

Mode:Tx 11n40 5.5Ghz High ch set13

Test By:Tony Wang

Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T345 Antenna Factor [dB/m]	T145 Preamp [dB]	Cable Factor [dB]	BRF [dB]	Field Strength [dBuV/m]	FCC Part 15C 15.209 Avg Limit [dBuV/m]	Margin [dB]	FCC Part 15C Peak Limit [dBuV/m]	Margin [dB]	Height [cm]	Polarity	Restricted Band?
5	1920.240	42.43	PK	31.30	-35.00	4.10	0.10	42.93	54.0	-11.0	74.0	-31.1	200	Horz	N
1	1973.013	42.96	PK	31.60	-35.00	4.20	0.10	43.86	54.0	-10.1	74.0	-30.1	200	Horz	N
6	2500.750	41.78	PK	32.50	-35.00	4.70	0.10	44.08	54.0	-9.9	74.0	-29.9	200	Horz	N
2	2606.297	41.91	PK	32.60	-35.10	4.80	0.10	44.31	54.0	-9.7	74.0	-29.7	104	Horz	N
3	3744.228	40.66	PK	33.80	-34.90	6.00	0.00	45.56	54.0	-8.4	74.0	-28.4	200	Horz	Y
4	5911.244	35.45	PK	35.70	-34.90	7.90	0.60	44.75	54.0	-9.2	74.0	-29.3	104	Horz	N
7	6168.516	35.16	PK	36.00	-34.90	8.10	0.20	44.56	54.0	-9.4	74.0	-29.4	200	Horz	N
8	8504.348	36.63	PK	36.20	-35.20	9.60	0.20	47.43	54.0	-6.5	74.0	-26.6	200	Horz	N
10	12614.693	23.46	PK	39.20	-32.40	11.90	0.20	42.36	54.0	-11.6	74.0	-31.6	200	Horz	Y
9	8566.717	36.76	PK	36.30	-35.20	9.60	0.30	47.76	54.0	-6.2	74.0	-26.2	100	Vert	N
11	12842.579	23.01	PK	39.20	-32.00	12.00	0.00	42.21	54.0	-11.8	74.0	-31.8	200	Vert	N

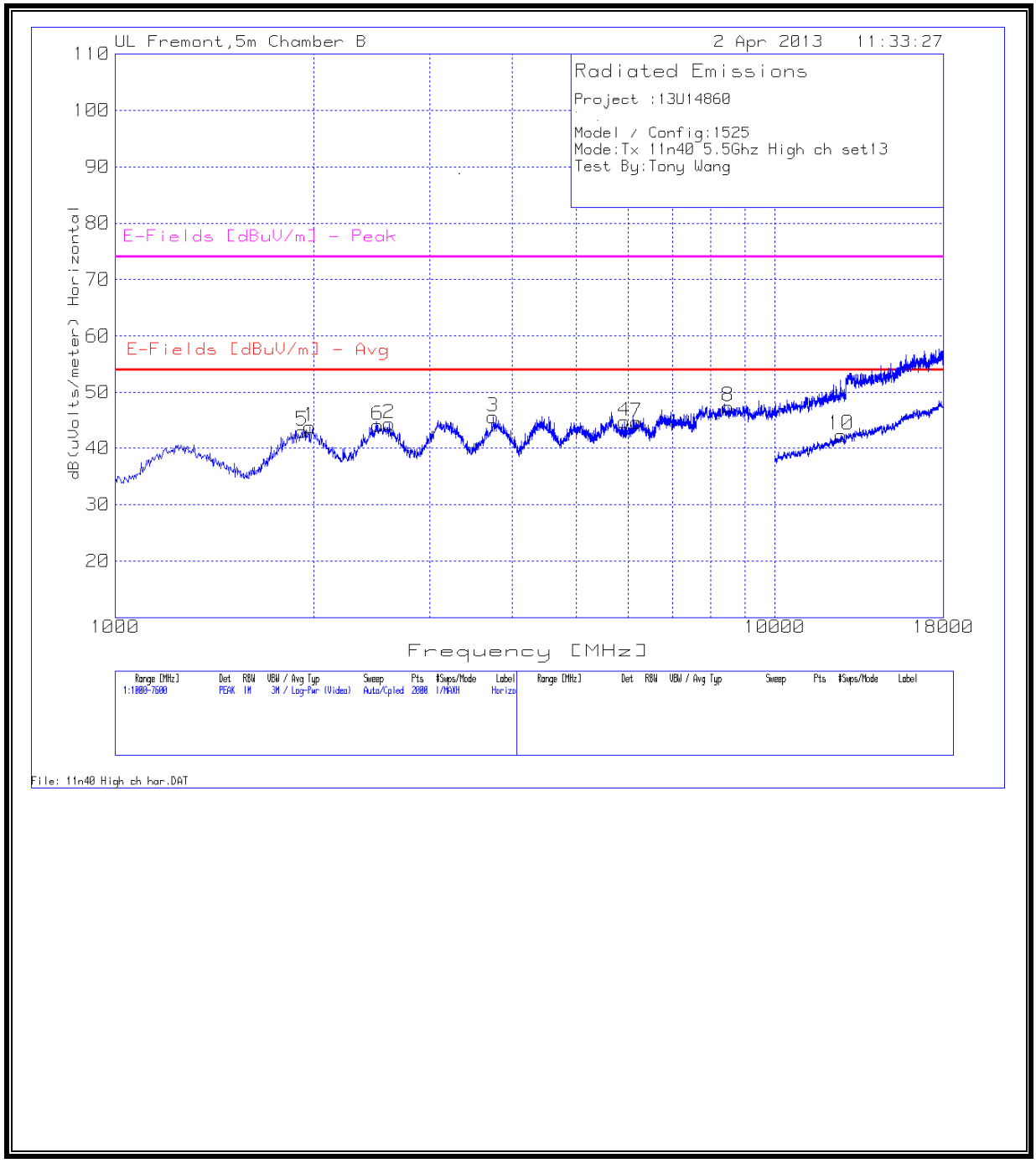
Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

2) There was no signal from EUT above the system noise floor up to 40 GHz.

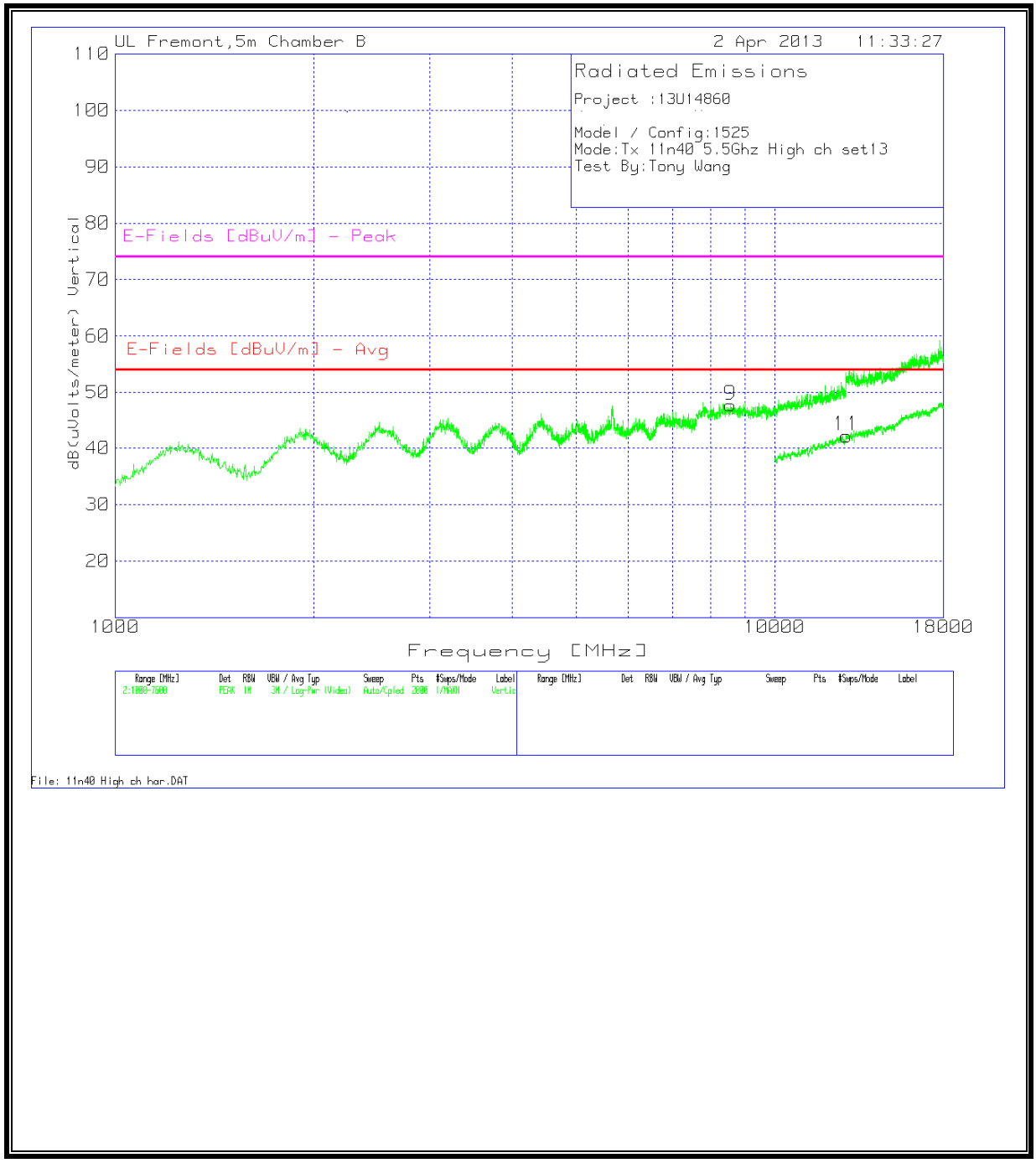
HARMONICS AND SPURIOUS EMISSIONS

High CH Horizontal



HARMONICS AND SPURIOUS EMISSIONS

HIGH CH Vertical



9.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL AND VERTICAL DATA

Project :13U14860

Model / Config:1525
Mode:TX 5Ghz worst case
Test By:Tony Wang

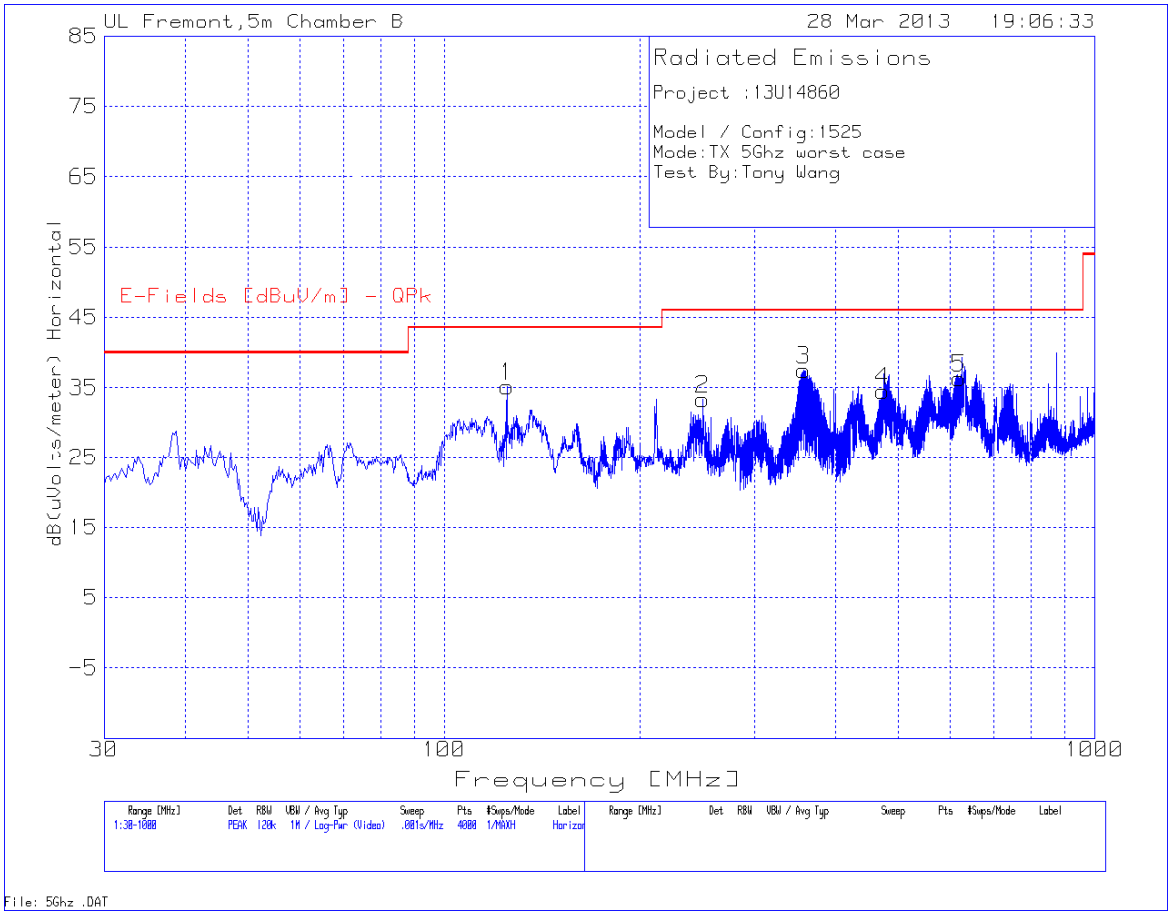
Marker No.	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T243 Antenna Factor [dB/m]	T10 Preamp/Cable Gain/loss [dB]	Field Strength [dBuV/m]	FCC 15.209 QP Limit [dBuV/m]	Margin [dB]	Height [cm]	Polarity	Restricted Band?
1	124.989	49.02	PK	14.10	-28.00	35.1	43.5	-8.4	200	Horz	Y
2	249.783	48.79	PK	11.50	-26.90	33.4	46.0	-12.6	200	Horz	Y
3	357.372	49.32	PK	14.50	-26.30	37.5	46.0	-8.5	100	Horz	N
4	473.200	43.57	PK	17.40	-26.40	34.6	46.0	-11.5	200	Horz	N
5	619.318	43.27	PK	19.10	-26.00	36.4	46.0	-9.7	100	Horz	N
6	41.056	52.17	QP	12.70	-29.00	35.9	40.0	-4.1	101	Vert	N
7	42.931	53.14	QP	11.30	-28.90	35.5	40.0	-4.5	101	Vert	N
8	70.374	54.61	QP	7.90	-28.70	33.8	40.0	-6.2	101	Vert	N
9	281.284	48.90	PK	13.40	-26.60	35.7	46.0	-10.3	200	Vert	Y
10	424.979	45.27	PK	16.40	-26.50	35.2	46.0	-10.9	200	Vert	N

Notes:

1) The PK limit of 74 dBuV/m and the AVG limit of 54 dBuV/m only apply in restricted bands, outside restricted bands the limit is 68.3dBuV/m (-27dBm/MHz eirp). The plots and discrete measurements all show peak emissions are below 54dBuV/m from 1- 10 GHz, above 10 GHz emissions exceed the 54dBuV/m but are below 68dBuV/m.

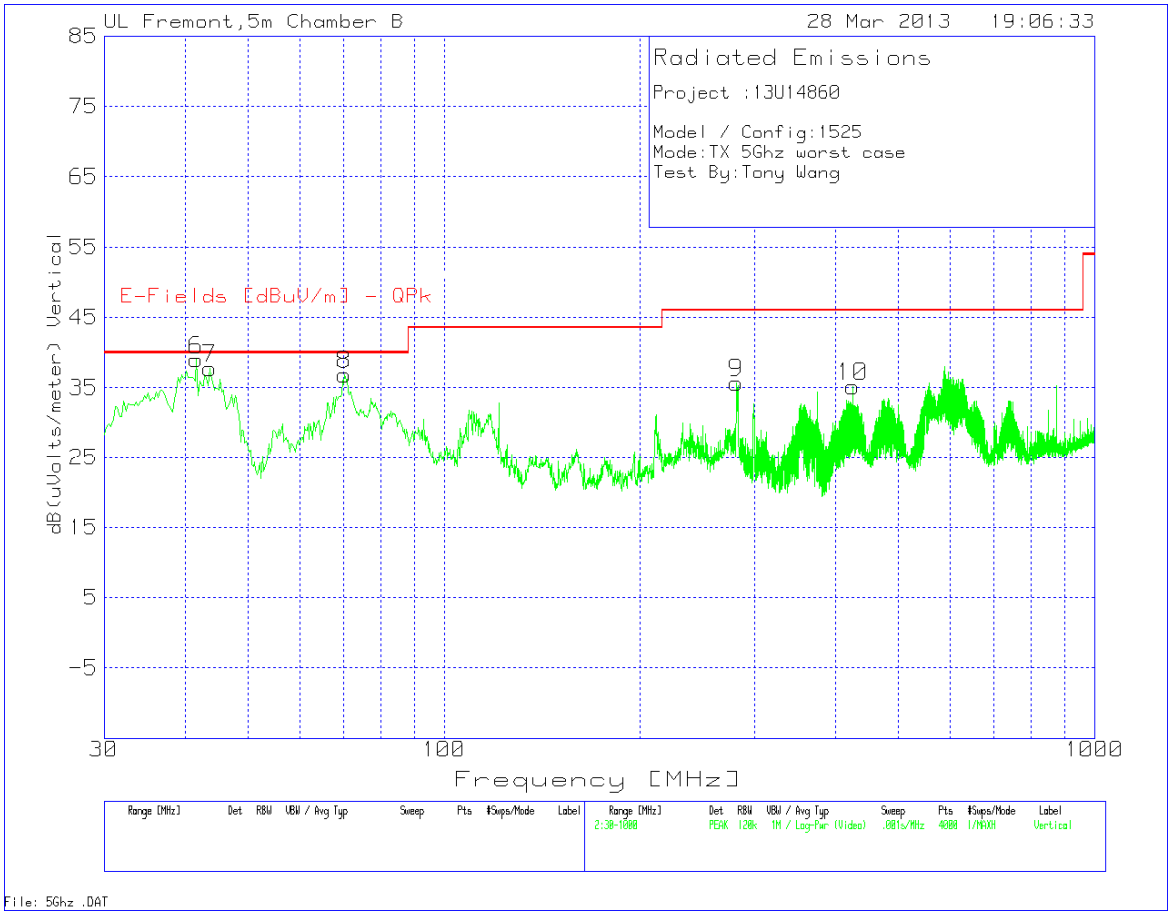
2) There was no signal from EUT above the system noise floor up to 40 GHz.

HORIZONTAL PLOT



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

VERTICAL PLOT



10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

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

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

RESULTS

6 WORST EMISSIONS

Project No:13u14860

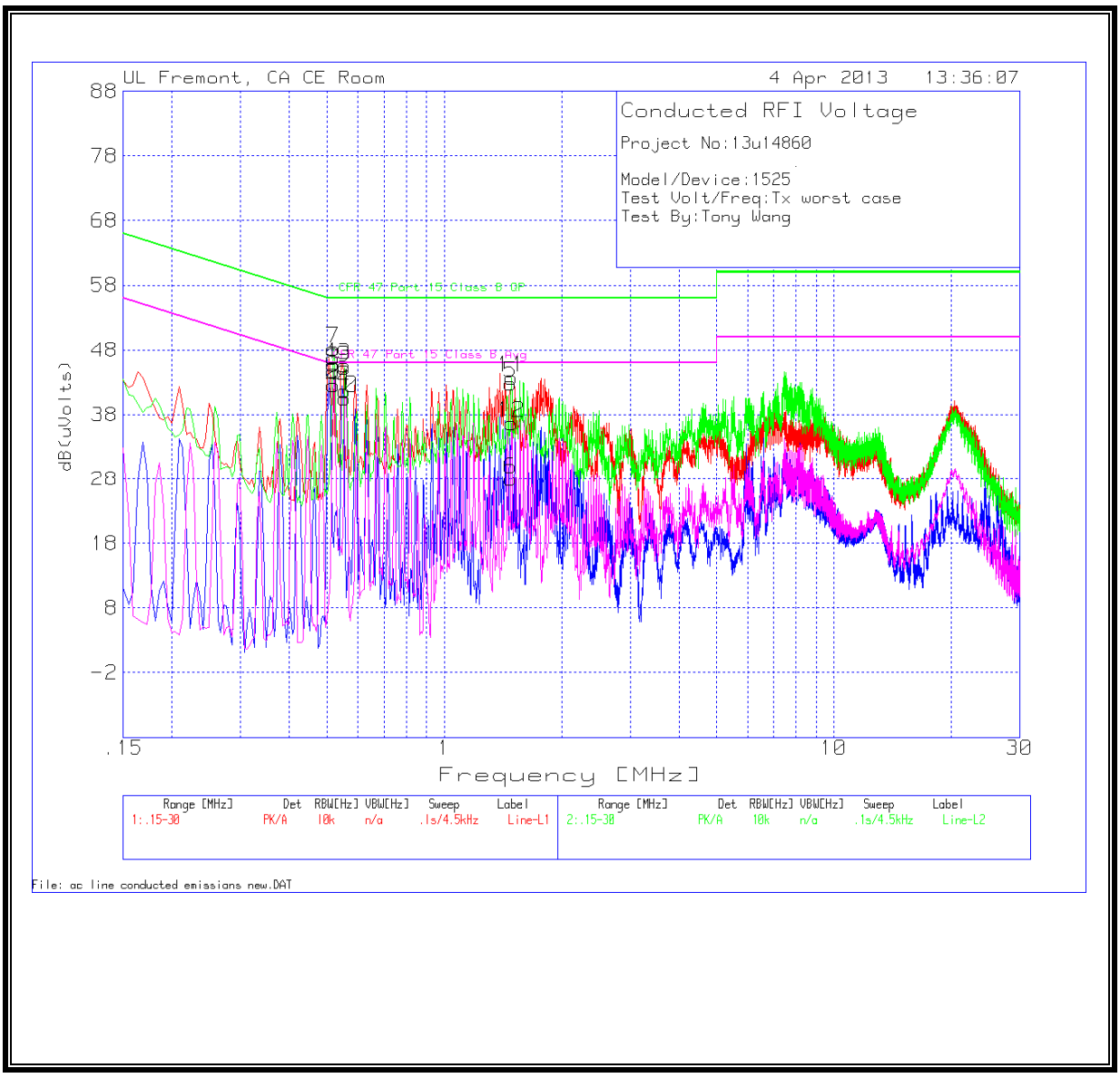
Model/Device:1525

Test Volt/Freq:Tx worst case

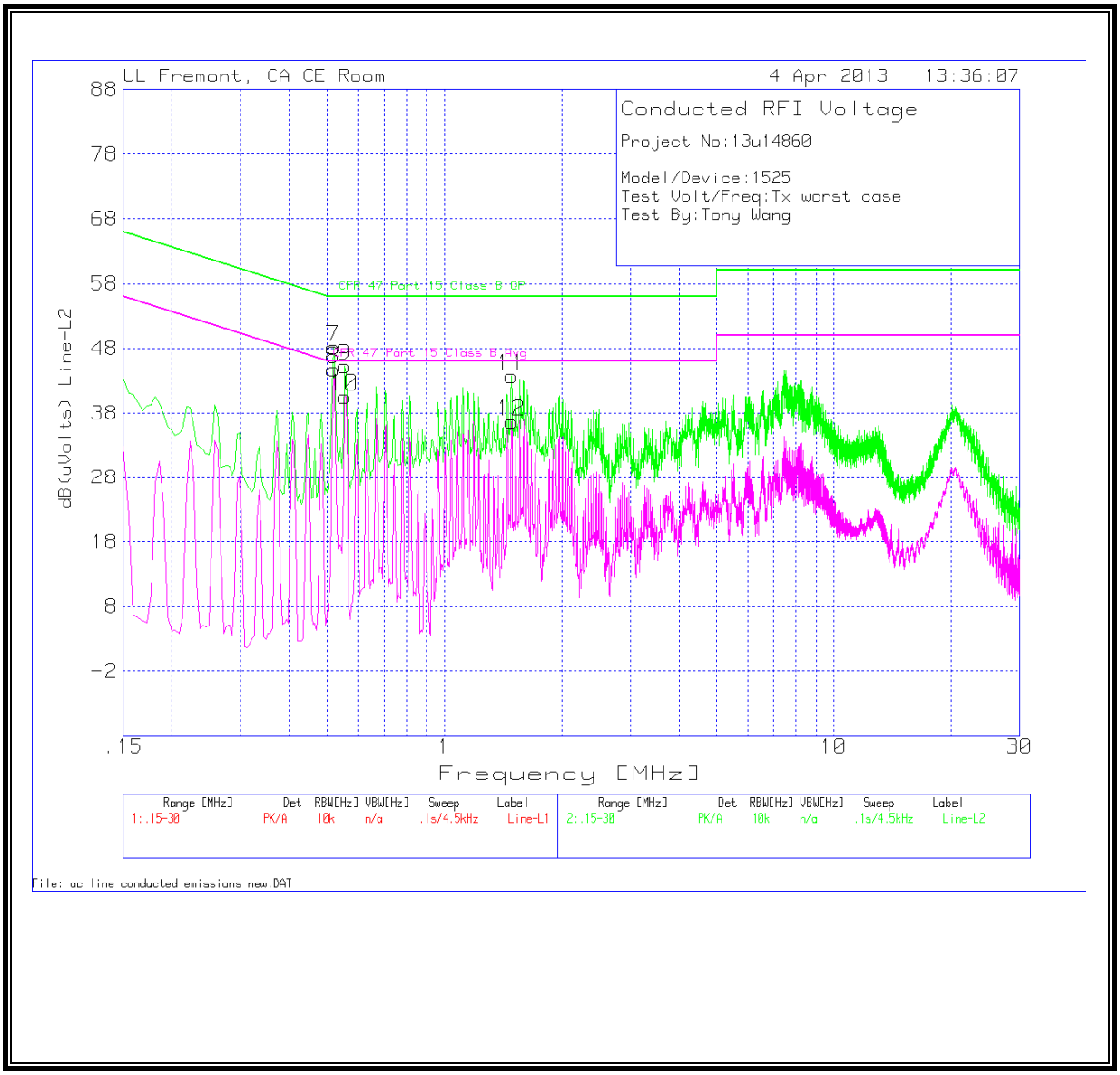
Test By:Tony Wang

Conductor	Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	T24 Voltage Correction Factor [dB]	Cables 1&3 Loss [dB]	RF Line Voltage [dBuV]	CFR 47 Part 15 Class B QP [dBuV]	Margin [dB]	CFR 47 Part 15 Class B Avg [dBuV]	Margin [dB]
Line L1	0.519	45.67	PK	0.10	0.00	45.77	56.0	-10.2	-	-
Line L1	0.519	42.44	Av	0.10	0.00	42.54	-	-	46.0	-3.5
Line L1	0.555	45.53	PK	0.10	0.00	45.63	56.0	-10.4	-	-
Line L1	0.555	41.56	Av	0.10	0.00	41.66	-	-	46.0	-4.3
Line L1	1.478	42.59	PK	0.10	0.10	42.79	56.0	-13.2	-	-
Line L1	1.478	27.78	Av	0.10	0.10	27.98	-	-	46.0	-18.0
Line L2	0.519	48.10	PK	0.10	0.00	48.20	56.0	-7.8	-	-
Line L2	0.519	44.72	Av	0.10	0.00	44.82	-	-	46.0	-1.2
Line L2	0.555	45.21	PK	0.10	0.00	45.31	56.0	-10.7	-	-
Line L2	0.555	40.50	Av	0.10	0.00	40.60	-	-	46.0	-5.4
Line L2	1.487	43.51	PK	0.10	0.10	43.71	56.0	-12.3	-	-
Line L2	1.487	36.55	Av	0.10	0.10	36.75	-	-	46.0	-9.3

LINE 1 RESULTS



LINE 2 RESULTS



11. DYNAMIC FREQUENCY SELECTION

11.1. OVERVIEW

11.1.1. LIMITS

INDUSTRY CANADA

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

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

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

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

FCC

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

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

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

Table 2: Applicability of DFS requirements during normal operation

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

Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

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

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period
The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows: For the Short pulse radar Test Signals this instant is the end of the *Burst*. For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated. For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission. The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.	

Table 5 – Short Pulse Radar Test Waveforms

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

Table 6 – Long Pulse Radar Test Signal

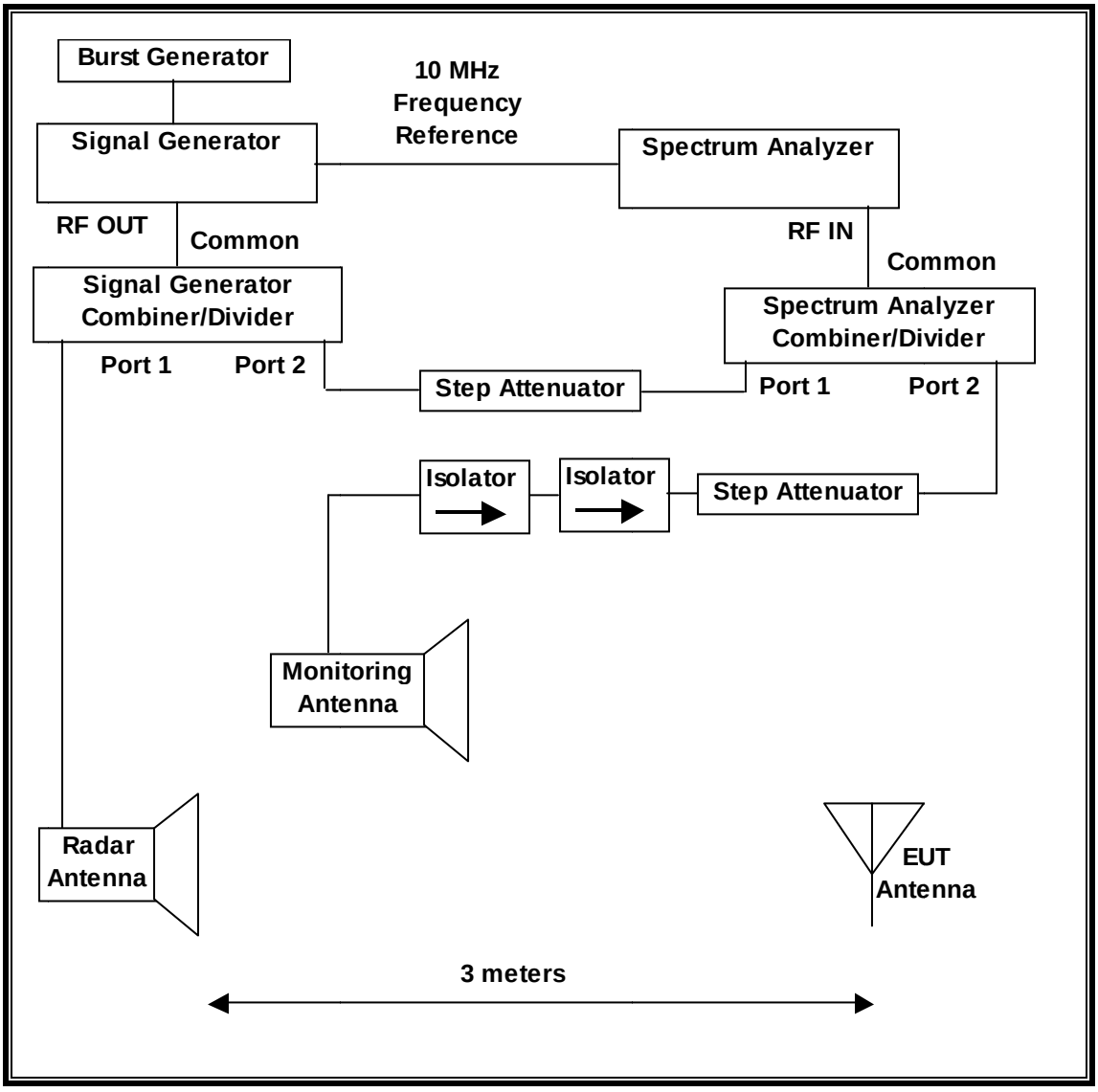
Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000-2000	80%	30

Table 7 – Frequency Hopping Radar Test Signal

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

11.1.2. TEST AND MEASUREMENT SYSTEM

RADIATED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

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

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

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

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

SYSTEM CALIBRATION

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

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

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

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

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

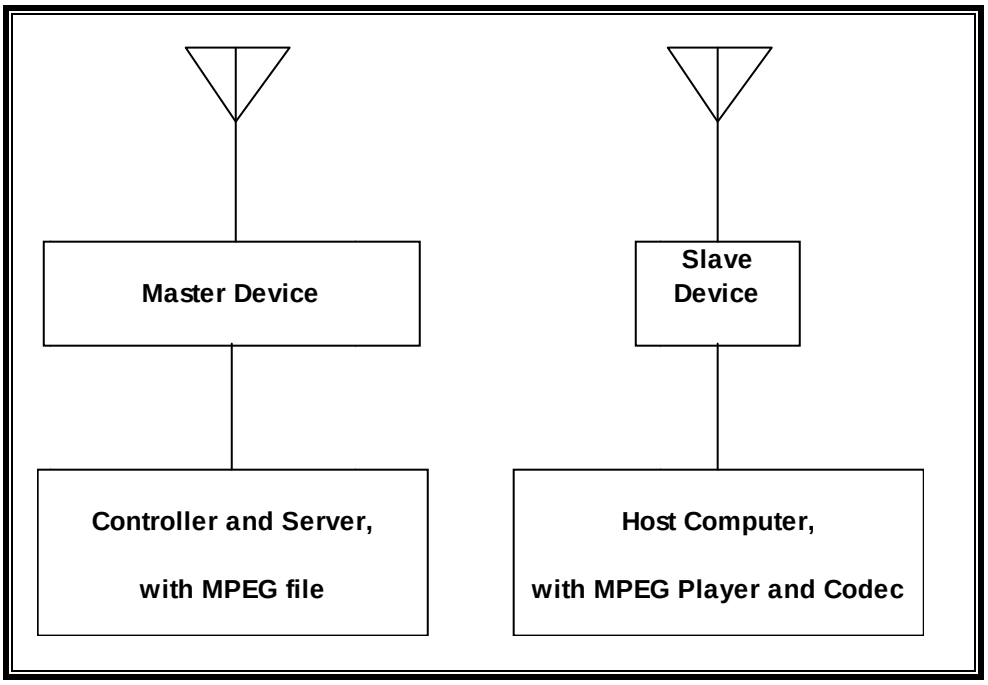
TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/18/13
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	11/20/13

11.1.3. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Wireless Access Point	Cisco	AIR-AP1252AG-A-K9	FTX120690N2	LDK102061
AC Adapter (AP)	Delta Electronics	EADP-45BB B	DTH112490BD	DoC
Notebook PC (Controller/Server)	Dell	PP18L	10657517725	DoC
AC Adapter (Controller/Server PC)	Dell	LA65SN0-00	CN-ODF263-71615-6AU-1019	DoC
Notebook PC (Host)	Dell	Latitude E6410	38526661945	DoC
AC Adapter (Host PC)	Lite On Technology	PA-1650-05D	CN-05U092-71615-4AC-0ED8	DoC

11.1.4. DESCRIPTION OF EUT

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

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 22.23 dBm EIRP in the 5250-5350 MHz band and 21.24 dBm EIRP in the 5470-5725 MHz band.

The only antenna assembly consists of 2 antennas with individual gains of 3.38 dBi and 3.43 dBi in the 5250-5350 MHz band and 3.38 dBi and 3.43 dBi in the 5470-5725 MHz band.

Two antennas are utilized to meet the diversity and MIMO operational requirements.

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

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

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

WLAN traffic exceeding the transmitter minimum activity ratio of 30% is generated by streaming the compressed video file “6 ½ Magic Hours” from the Master to the Slave in full motion video using VLC revision 2.0.6 media player.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

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

The software installed in the access point is revision 12.4(25d)JA1.

UNIFORM CHANNEL SPREADING

This requirement is not applicable to Slave radio devices.

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

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

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

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

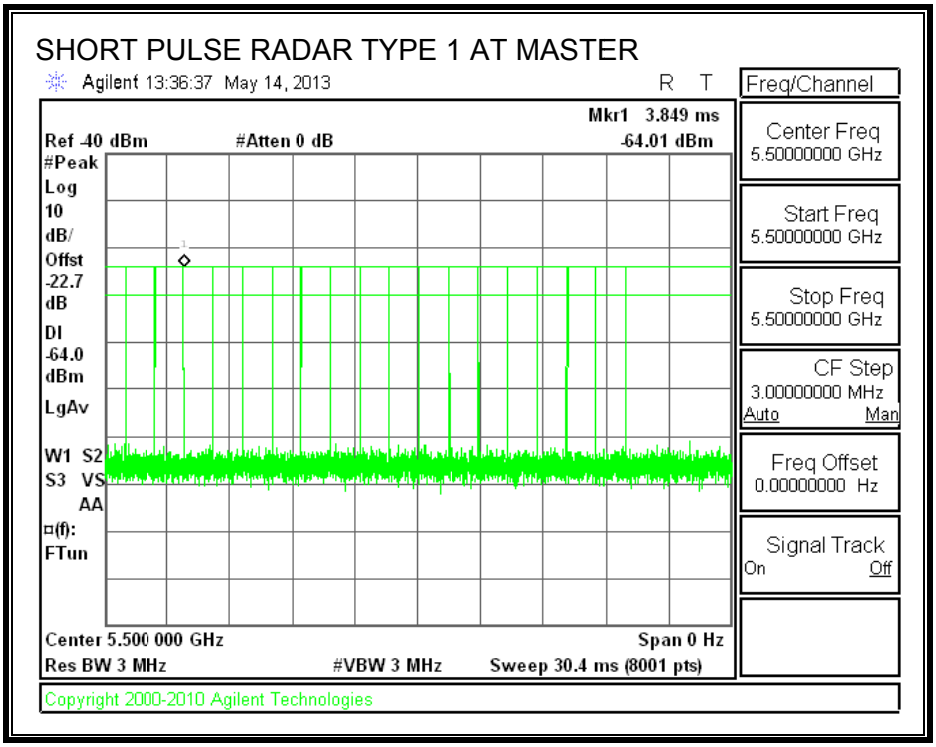
11.2. RESULTS FOR NETWORK RADIO 20 MHz BANDWIDTH

11.2.1. TEST CHANNEL

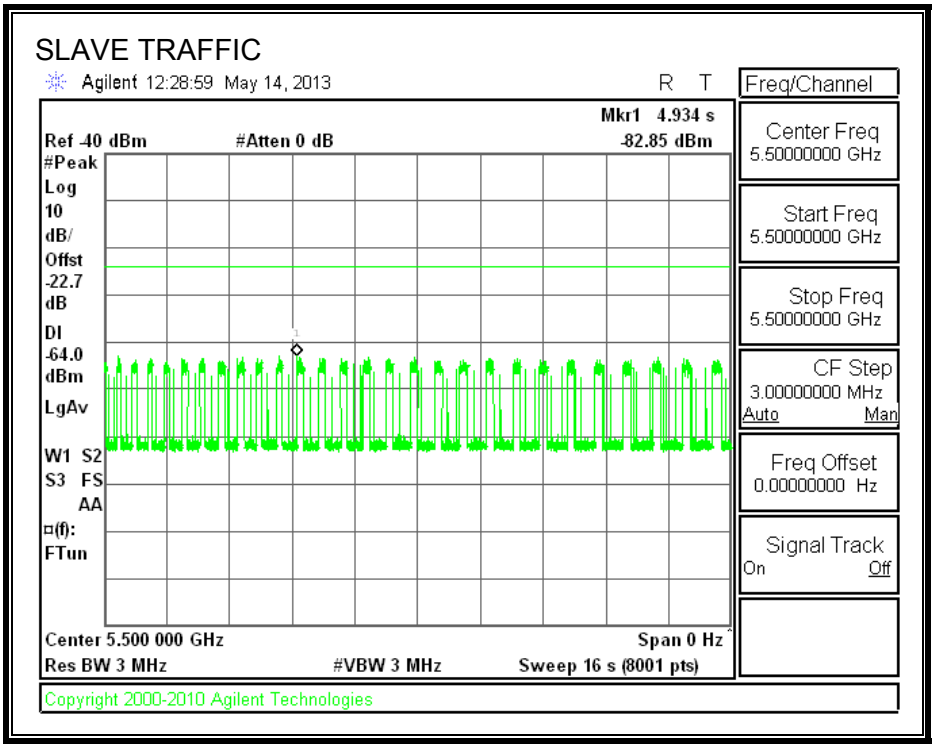
All tests were performed at a channel center frequency of 5500 MHz.

11.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



TRAFFIC



11.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

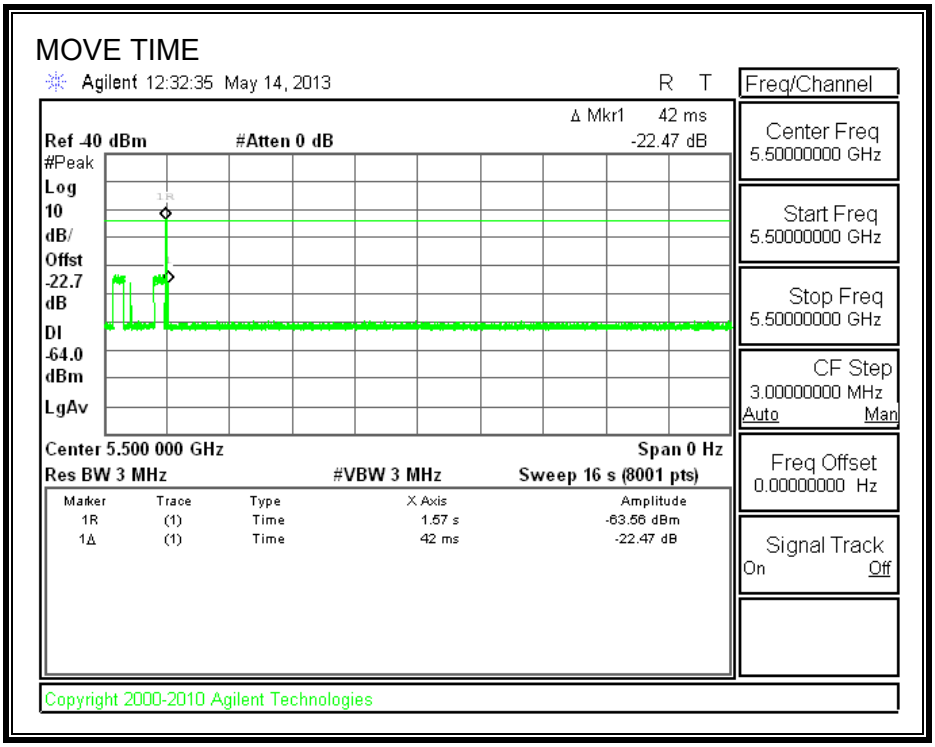
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

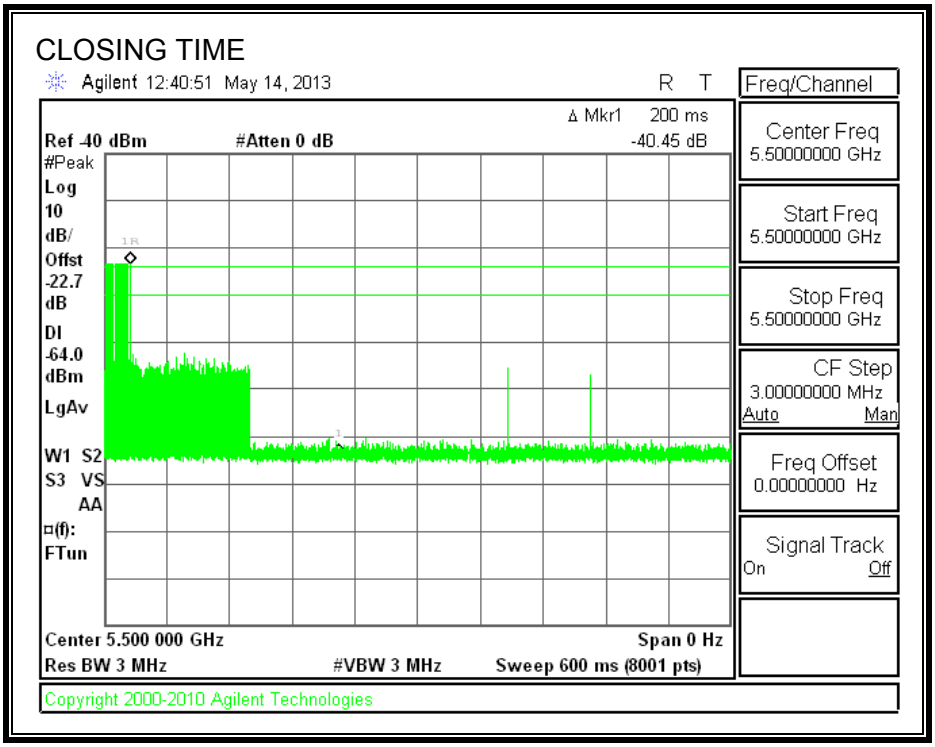
Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	0.042	10

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

MOVE TIME

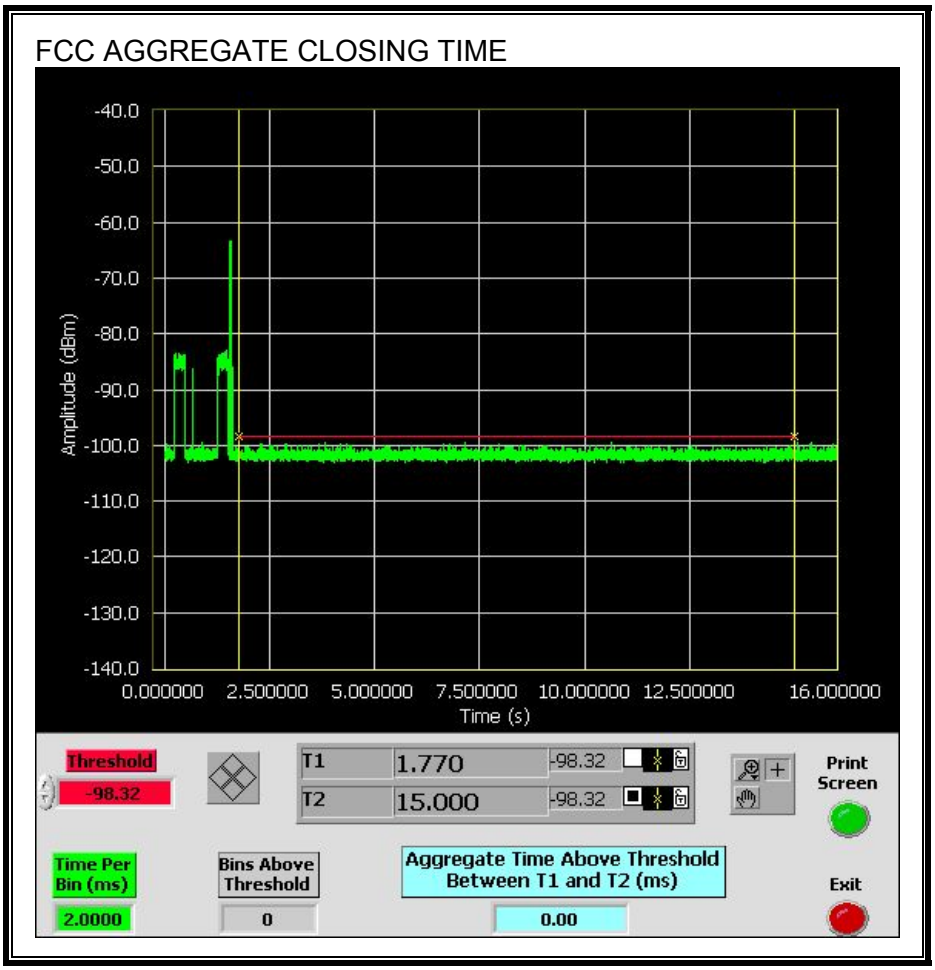


CHANNEL CLOSING TIME



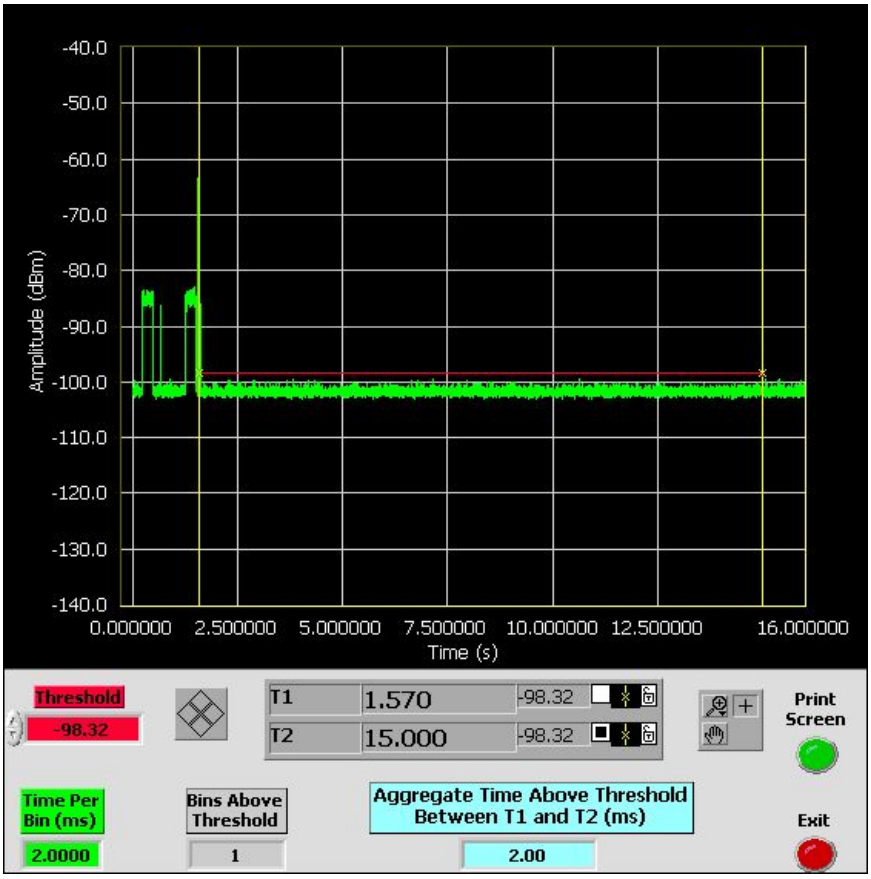
AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the FCC aggregate monitoring period.



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

IC AGGREGATE CLOSING TIME



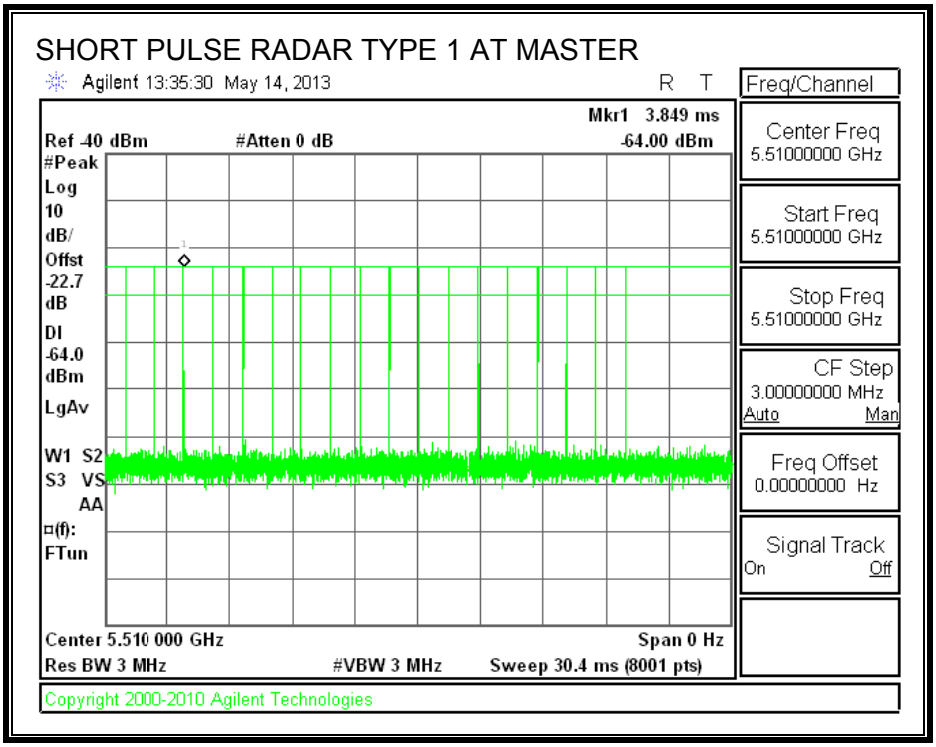
11.3. RESULTS FOR NETWORK RADIO 40 MHz BANDWIDTH

11.3.1. TEST CHANNEL

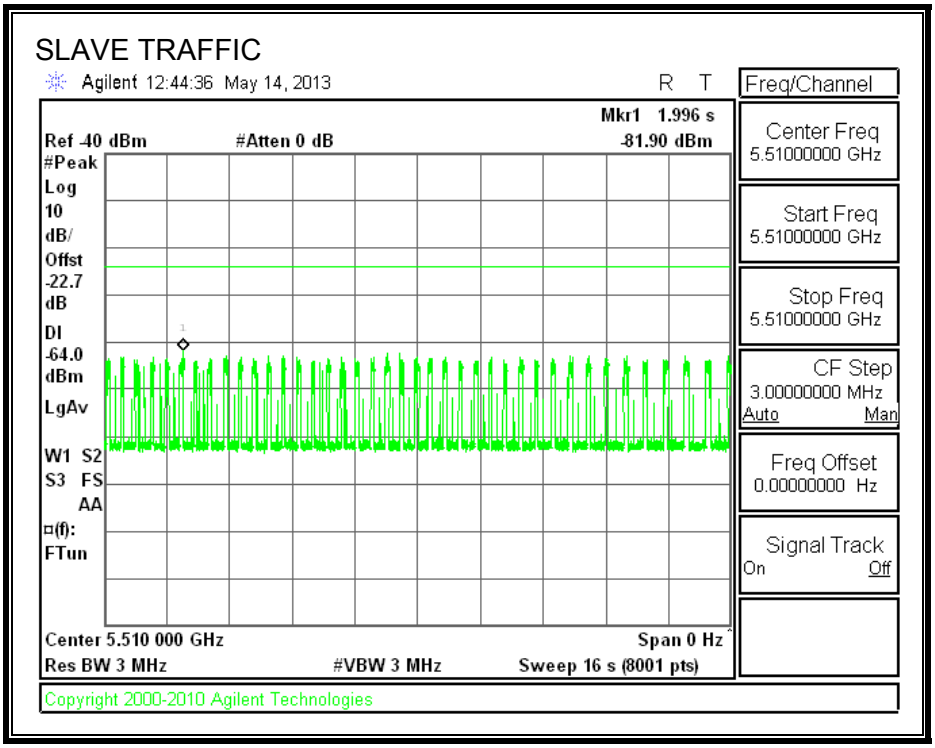
All tests were performed at a channel center frequency of 5510 MHz.

11.3.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



TRAFFIC



11.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.3.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

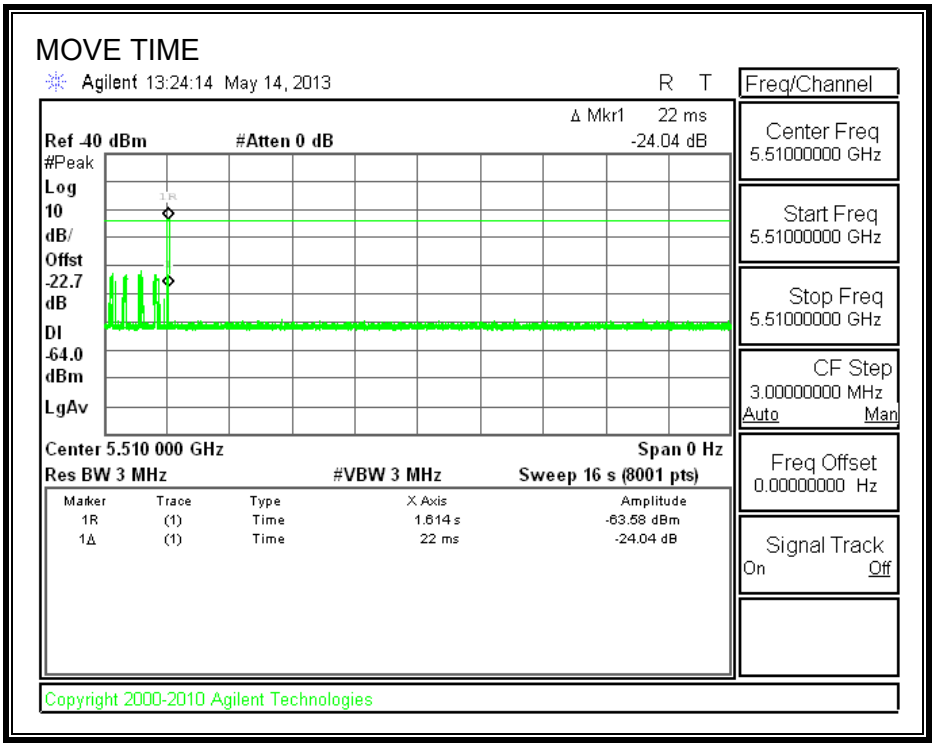
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

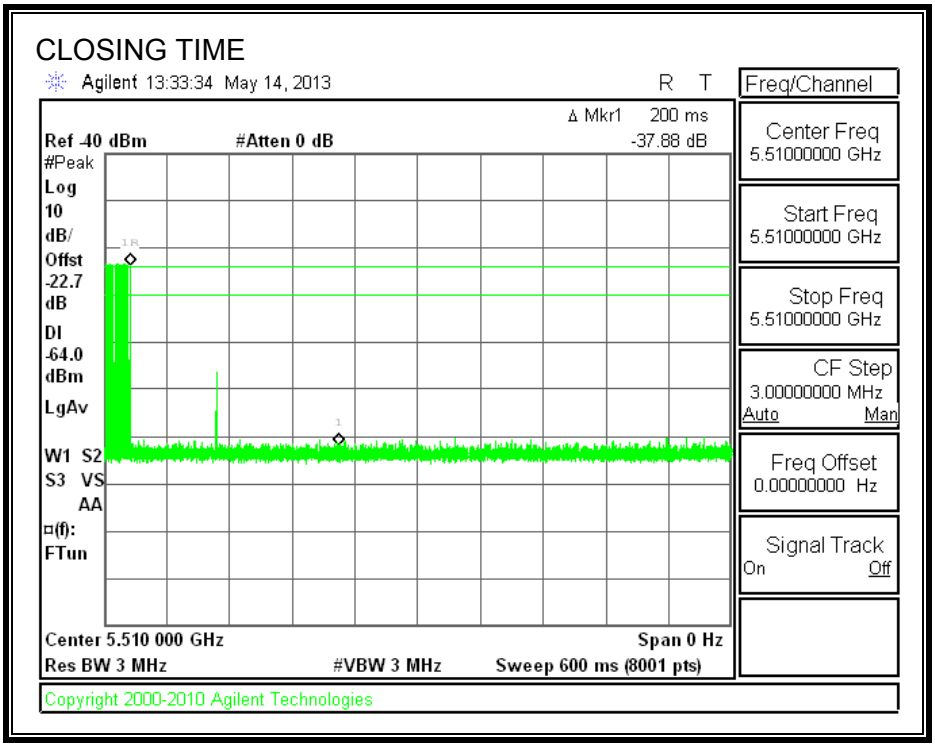
Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	0.022	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	0.0	60
IC	4.0	260

MOVE TIME



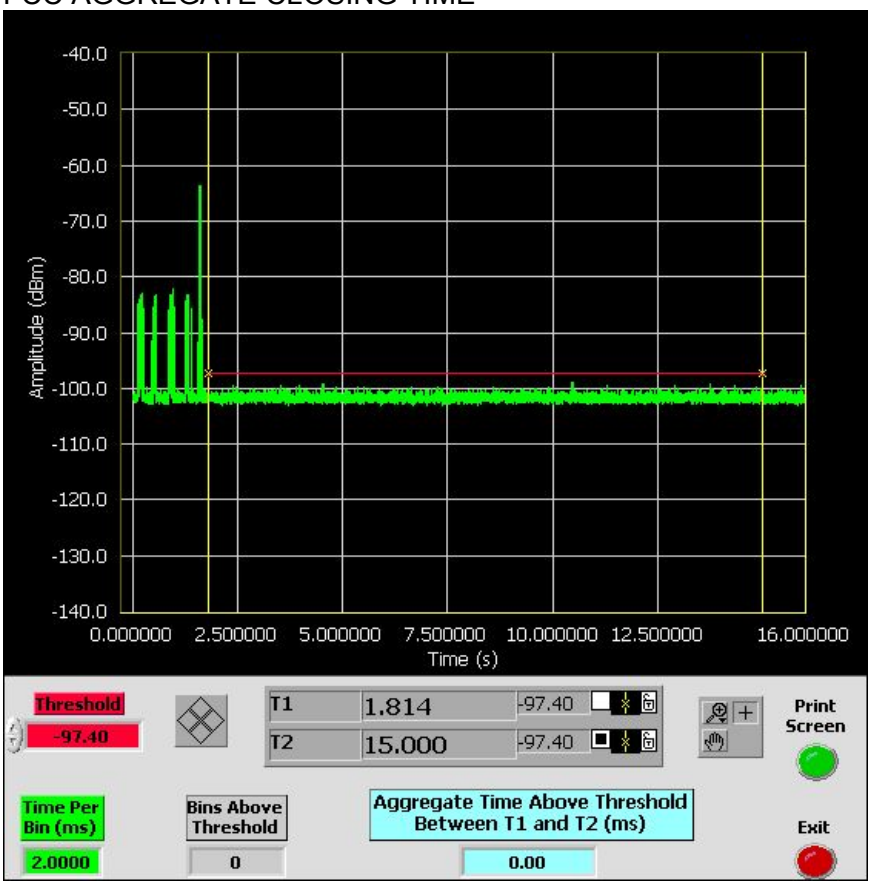
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

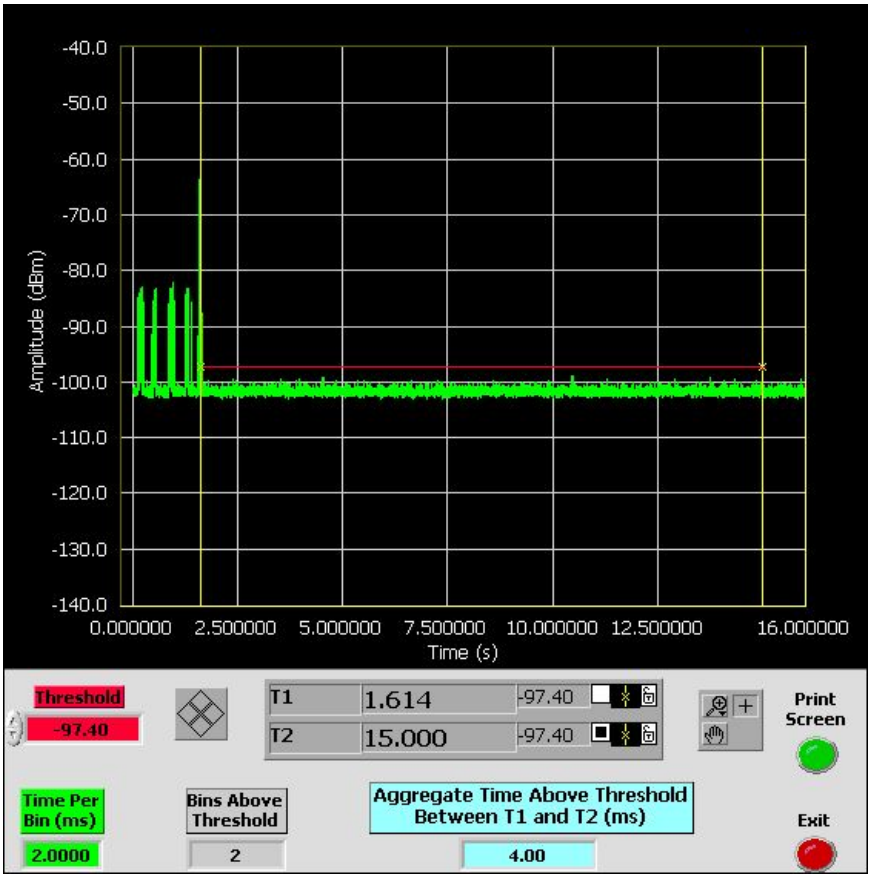
No transmissions are observed during the FCC aggregate monitoring period.

FCC AGGREGATE CLOSING TIME



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

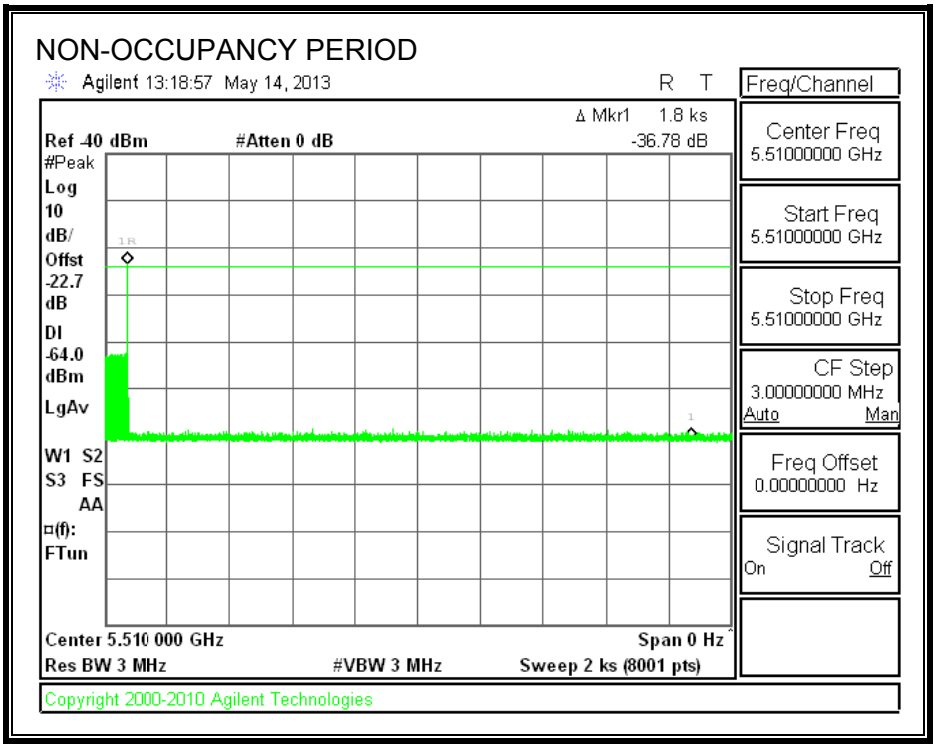
IC AGGREGATE CLOSING TIME



11.3.5. NON-OCCUPANCY PERIOD

RESULTS

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



13. MAXIMUM PERMISSIBLE RF EXPOSURE

13.1. 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/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30

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/cm^2)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	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 occupational/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 exposed, 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.

13.2. 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 Exposed 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	$280/f$	$2.19/f$		6
10–30	28	$2.19/f$		6
30–300	28	0.073	2*	6
300–1 500	$1.585f^{0.5}$	$0.0042f^{0.5}$	$f/150$	6
1 500–15 000	61.4	0.163	10	6
15 000–150 000	61.4	0.163	10	$616\,000/f^{1.2}$
150 000–300 000	$0.158f^{0.5}$	$4.21 \times 10^{-4}f^{0.5}$	$6.67 \times 10^{-5}f$	$616\,000/f^{1.2}$

* 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/m^2 is equivalent to 1 mW/cm^2.
3. A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

13.3. EQUATIONS

POWER DENSITY

Power density is given by:

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

Where

S = Power density in mW/cm^2
EIRP = Equivalent Isotropic Radiated Power in mW
D = Separation distance in cm

Power density in units of mW/cm^2 is converted to units of W/m^2 by multiplying by 10.

DISTANCE

Distance is given by:

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

Where

D = Separation distance in cm
EIRP = Equivalent Isotropic Radiated Power in mW
S = Power density in mW/cm^2

SOURCE-BASED DUTY CYCLE

Where applicable (for example, multi-slot cell phone applications) a duty cycle factor may be applied.

Source-based time-averaged EIRP = (DC / 100) * EIRP

Where

DC = Duty Cycle in %, as applicable
EIRP = Equivalent Isotropic Radiated Power in W

MIMO AND COLOCATED TRANSMITTERS (IDENTICAL LIMIT FOR ALL TRANSMITTERS)

For multiple chain devices, and colocated transmitters operating simultaneously in frequency bands where the limit is identical, the total power density is calculated using the total EIRP obtained by summing the EIRP (in linear units) of each transmitter.

Total EIRP = (EIRP1) + (EIRP2) + ... + (EIRPn)

where

EIRPx = Source-based time-averaged EIRP of chain x or transmitter x

The total EIRP is then used to calculate the Power Density or the Distance as applicable.

MIMO AND COLOCATED TRANSMITTERS

For multiple colocated transmitters operating simultaneously in frequency bands where different limits apply:

The Power Density at the specified separation distance is calculated for each transmitter chain or transmitter.

The fraction of the exposure limit is calculated for each chain or transmitter as
(Power Density of chain or transmitter) / (Limit applicable to that chain or transmitter).

The fractions are summed.

Compliance is established if the sum of the fractions is less than or equal to one.

13.4. LIMITS AND IC EXEMPTION

VARIABLE LIMITS

For mobile radio equipment operating in the cellular phone band, the lowest power density limit is calculated using the lowest frequency:

824 MHz / 1500 = 0.55 mW/cm^2 (FCC)
824 MHz / 150 = 5.5 W/m^2 (IC).

FIXED LIMITS

For operation in the PCS band, the 2.4 GHz band and the 5 GHz bands:

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

INDUSTRY CANADA EXEMPTION

RSS-102 Clause 2.5.2 RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 1.5 GHz and the maximum e.i.r.p. of the device is equal to or less than 2.5 W;
- at or above 1.5 GHz and the maximum e.i.r.p. of the device is equal to or less than 5 W.

13.5. RF EXPOSURE RESULTS

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

Calculation for the Network Radio

Multiple chain or colocated transmitters									
Band	**Mode**	**Chain for MIMO**	**Separatio Distance (cm)**	**Output Power (dBm)**	**Antenna Gain (dBi)**	**Duty Cycle (%)**	**EIRP (mW)**	**FCC Power Density (mW/cm^2)**	**IC Density (W/m^2)**
5 GHz	WLAN	1		17.50	3.38	100.0	122.5		
5 GHz	WLAN	2		17.50	3.43	100.0	123.9		
Combined			20				491.5	0.098	0.98

Worst Case calculation of both Radios

Multiple chain or colocated transmitters									
Band	**Mode**	**Chain for MIMO**	**Separatio Distance (cm)**	**Output Power (dBm)**	**Antenna Gain (dBi)**	**Duty Cycle (%)**	**EIRP (mW)**	**FCC Power Density (mW/cm^2)**	**IC Density (W/m^2)**
5 GHz	Accesso ry WLAN	1		11.50	3.14	100.0	29.1		
2.4 GHz	Network WLAN	2		17.50	3.38	100.0	122.5		
2.4 GHz	Network WLAN	3		17.50	4.61	100.0	162.6		
Combined			20				331.2	0.066	0.66

The device operates above 1.5 GHz with a maximum EIRP less than or equal to 5 Watts as a mobile device with a minimum separation distance of 20 cm, therefore it is exempt from routine RF Exposure Evaluation under RSS-102.