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

BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT

FOR

HANDHELD COMPUTING DEVICE

MODEL NUMBER: 1573

FCC ID: C3K1573
IC: 3048A-1573

REPORT NUMBER: 13U15414-16

ISSUE DATE: NOVEMBER 10, 2013

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
-	11/10/13	Initial Issue	T. LEE

TABLE OF CONTENTS

ATTESTATION OF TEST RESULTS

COMPANY NAME: MICROSOFT CORPORATION
ONE MICROSOFT WAY,
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EUT DESCRIPTION: HANDHELD COMPUTING DEVICE WITH WWAN, 802.11 A/B/G/N WLAN AND BLUETOOTH RADIOS

MODEL: 1573

SERIAL NUMBER: 001925433252

DATE TESTED: OCTOBER 23, 2013 – OCTOBER 29, 2013

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

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

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Tested By:

JOE VANG
EMC ENGINEER
UL VERIFICATION SERVICES

1. TEST METHODOLOGY

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

2. FACILITIES AND ACCREDITATION

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

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

3. CALIBRATION AND UNCERTAINTY

3.1. 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.

3.2. 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

3.3. 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%.

4. EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF EUT

The EUT is a handheld computing device with WWAN, 802.11 a/b/g/n WLAN and Bluetooth radios.

4.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE	2.47	1.77

4.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a monopole antenna, with a maximum gain of 3.1 dBi.

4.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Window RT 8.1 Preview Build 943

The test utility software used during testing was Laptool 189.1.0.9.0\ WIFI Tool.exe

4.5. 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 zZ orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

Conducted measurement was conducted on Model 1572 under FCC ID C3K1572. Model 1572 are identical to Model 1573 except Model 1573 includes the WWAN radio.

4.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
USB Ethernet Adaptor	CISCO	USB 300M	CU90MC02233	DoC
Laptop	Lenovo	L420	7854CT0	DoC
AC Adaptor (laptop)	Lenovo	92P1156	111S92P1156ZDXN272091	N/A

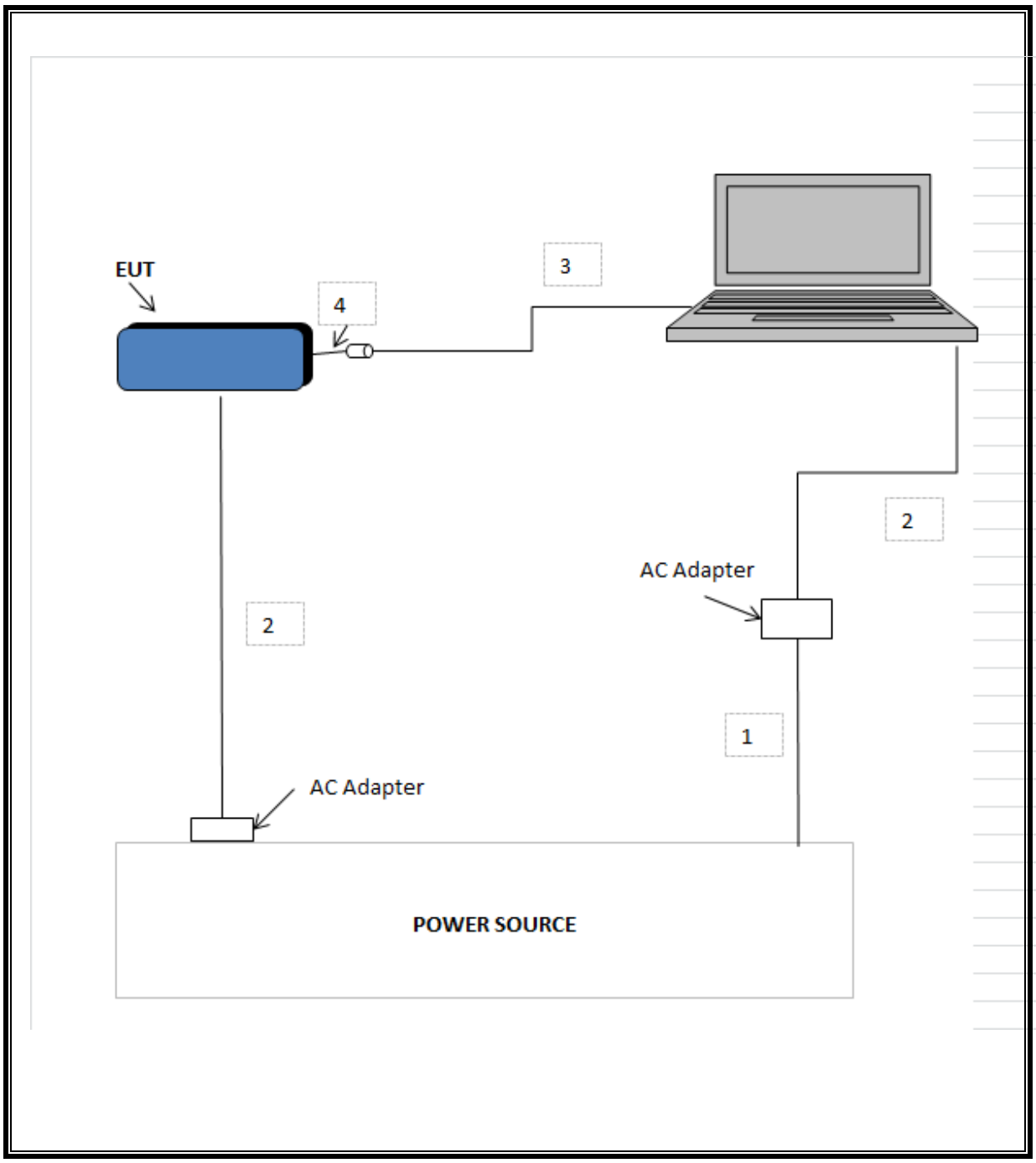
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	AC	Unshielded	1.8	AC adapter
2	USB	1	USB	Unshielded	0.1	USB to Ethernet adapter
3	DC	1	DC	Unshielded	1.8	
4	Ethernet	1	RJ 45	Unshielded	7.62	Connects to USB adapter

TEST SETUP

The EUT is a standalone wireless handheld computing device. Test software exercised the wireless module installed within the device under test.

SETUP DIAGRAM FOR TESTS



4.7. TEST AND MEASUREMENT EQUIPMENT

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

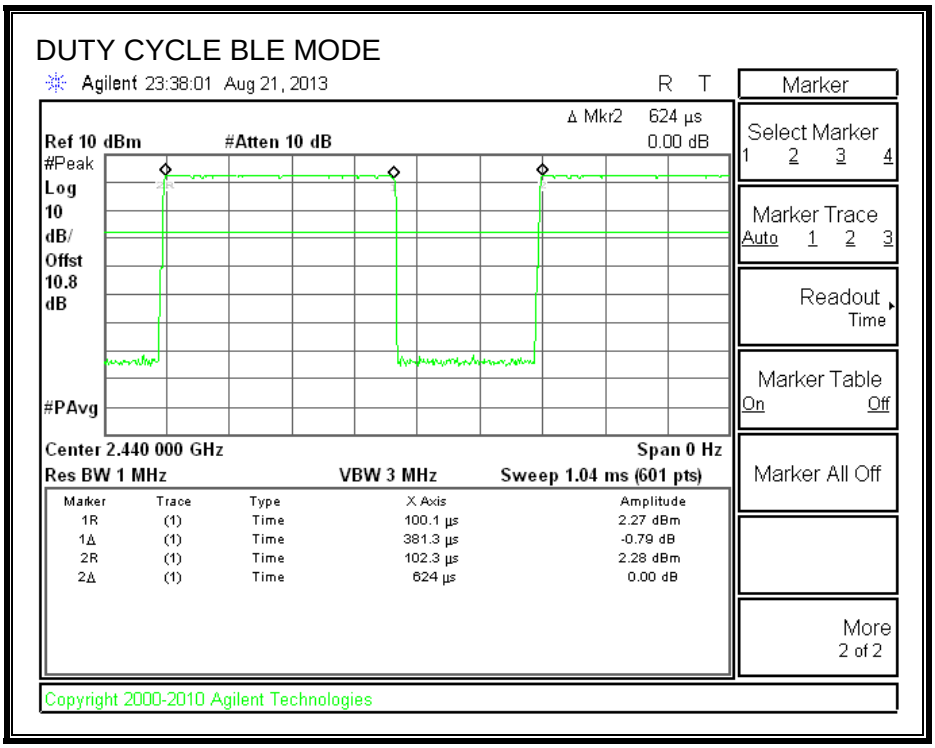
Test Equipment List					
Description	**Manufacturer**	**Model**	**Asset**	**Cal Date**	**Cal Due**
Bilog 30-1000MHz	Sunol	JB1	C01011	02/07/12	03/28/14
LISN, 30 MHz	FCC	LISN-50/250-25-	N02625	01/14/13	01/14/14
Power meter	Agilent	N119A	T198	06/25/12	12/13/13
Power Sensor	Agilent	E9323A	T397	06/26/12	04/02/14
Spectrum Analyzer, 26 GHz	Agilent / HP	E4440A	C01176	10/21/12	12/13/13
Spectrum Analyzer	Agilent	N9030A	F00128	2/22/2013	2/22/2014
Horn Antenna, 1-18GHz	ETS Lindgren	3117	F00133	2/19/2013	2/19/2014
Antenna, Biconolog, 30MHz-1	Sunol Sciences	JB3	F00168	3/7/2013	3/7/2014
High Pass Filter, fc: 3.0GHz, 50	Micro-Tronics	HPM17543	F00180	8/24/2013	8/24/2014
Low Pass Filter, fc: 5GHz, 50 O	Micro-Tronics	LPS17541	F00174	8/24/2013	8/24/2014
RF PreAmplifier, 1-18GHz	Miteq	To Be Determine	F00353	8/24/2013	8/24/2014
Amplifier	Sonoma	310	F00008	11/6/2012	11/6/2013

4.7.1. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS LIMITS

None; for reporting purposes only.

4.7.2. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
BLE	0.381	0.624	0.611	61.1%	2.14



5. ANTENNA PORT TEST RESULTS

5.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

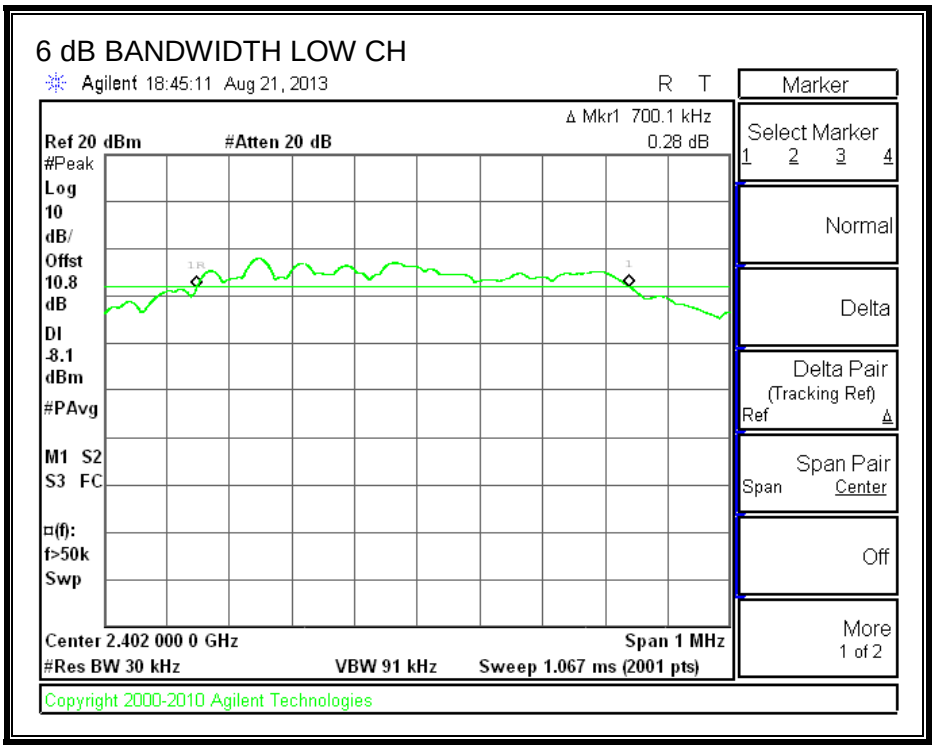
TEST PROCEDURE

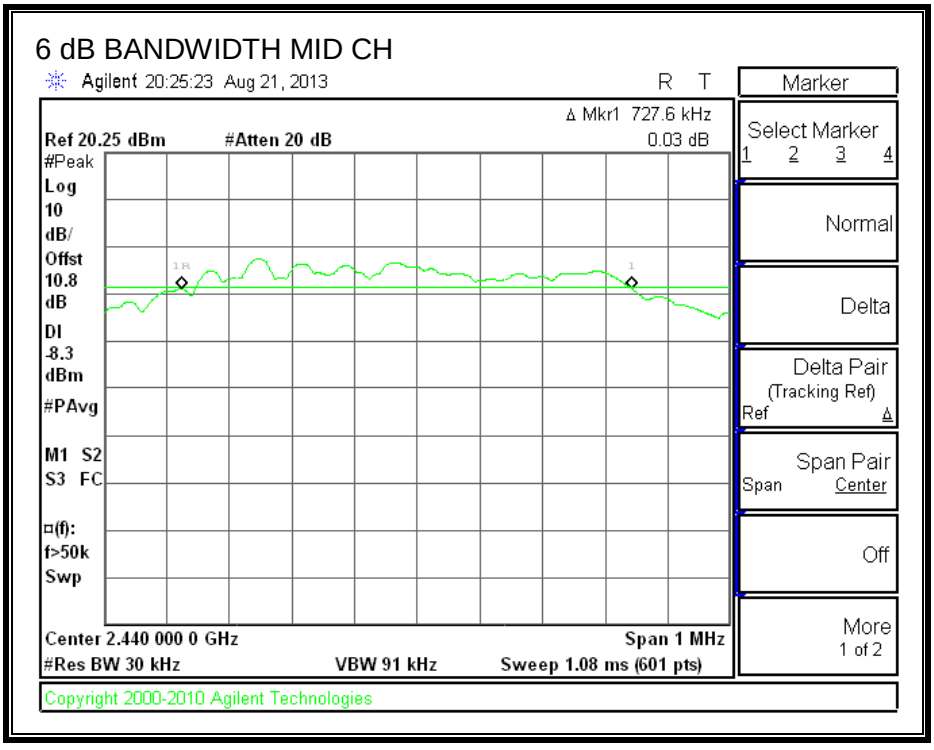
KDB 558074 D01 v02 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”.

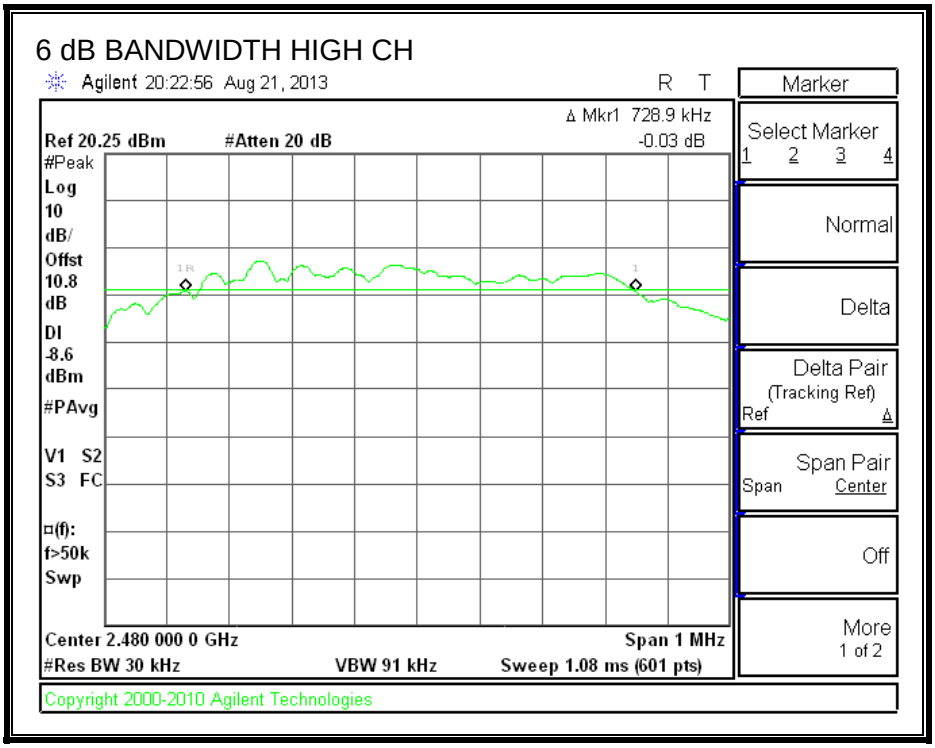
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (MHz)
Low	2402	700.1000	0.5
Middle	2440	727.6000	0.5
High	2480	728.9000	0.5

6 dB BANDWIDTH







5.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

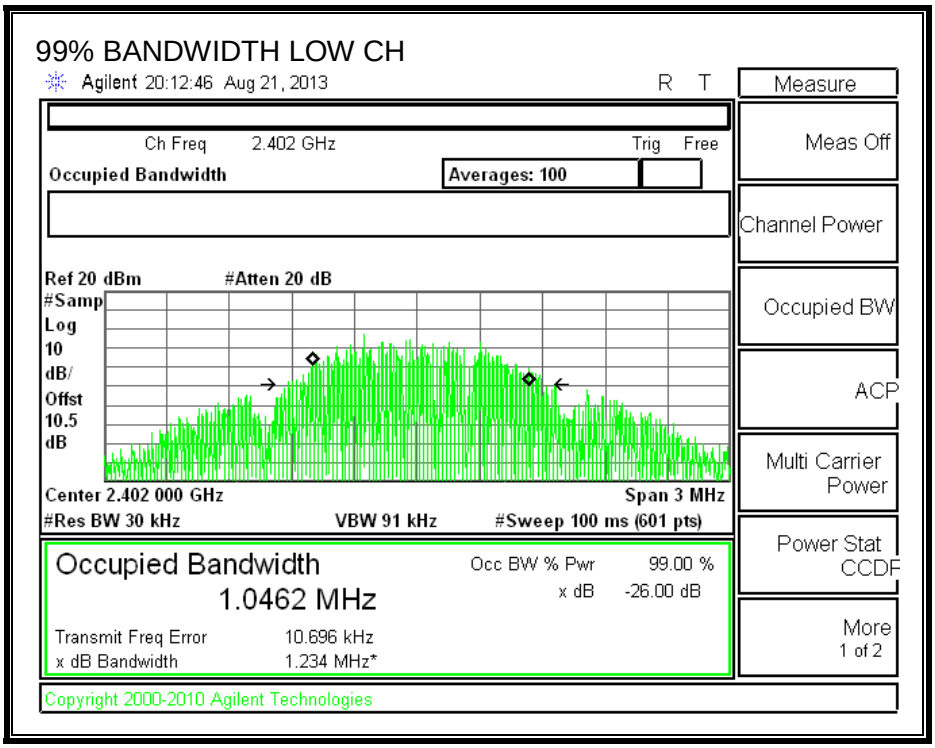
TEST PROCEDURE

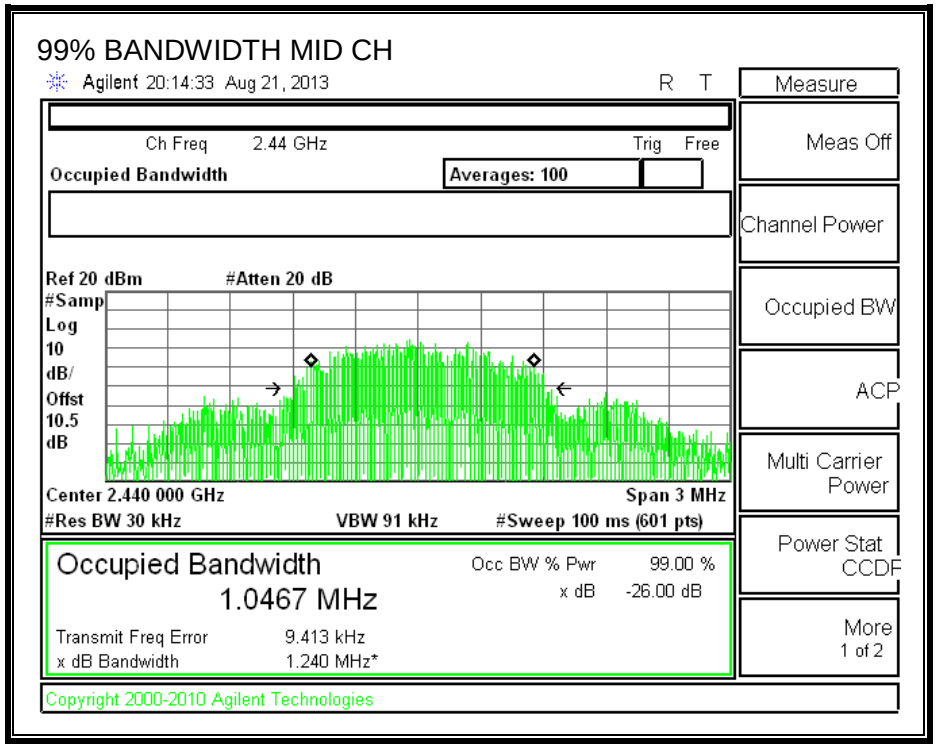
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

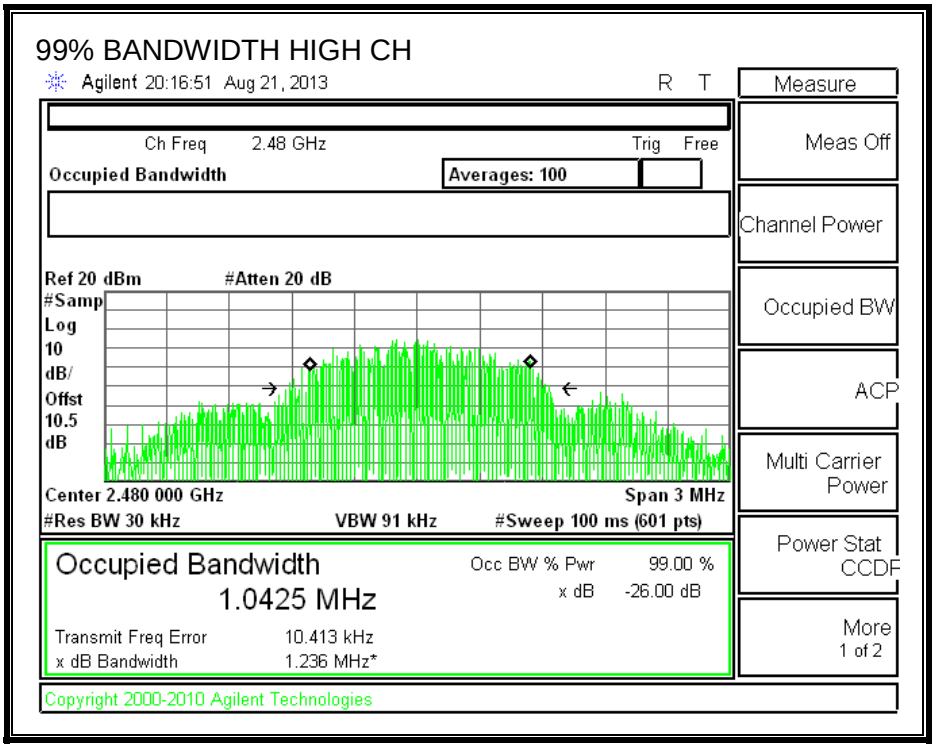
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0462
Middle	2440	1.0467
High	2480	1.0425

99% BANDWIDTH







5.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

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

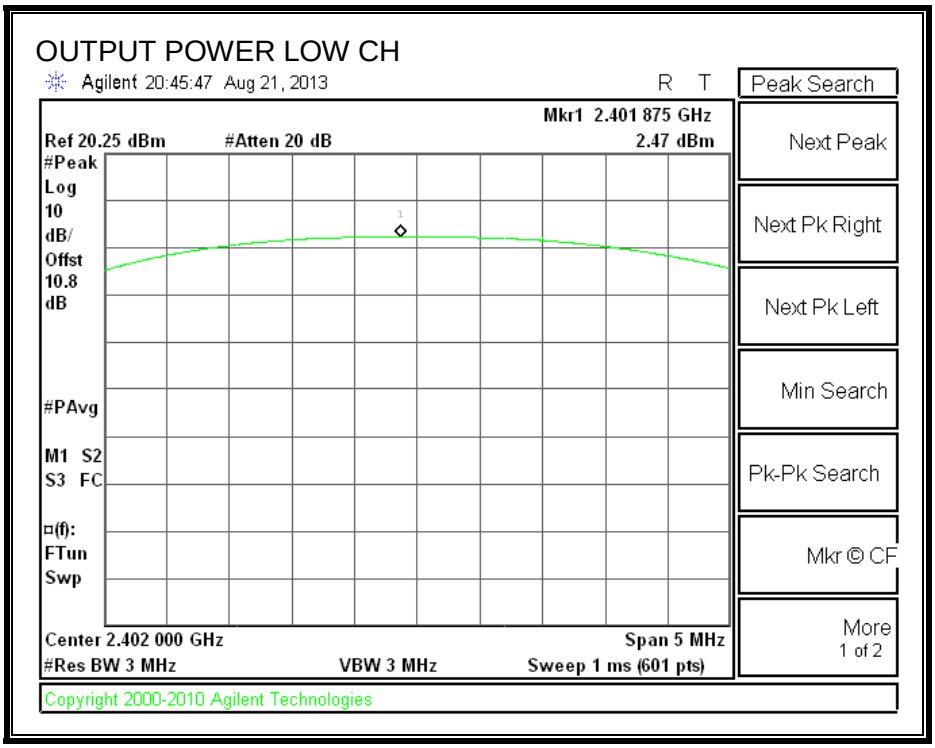
TEST PROCEDURE

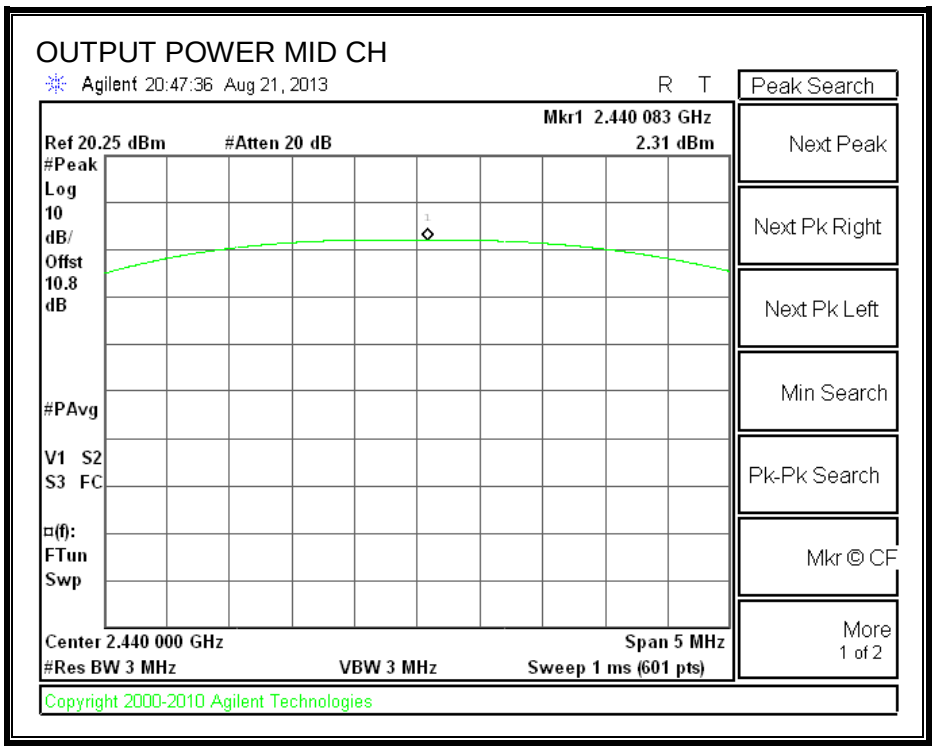
KDB 558074 D01 v02 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”.

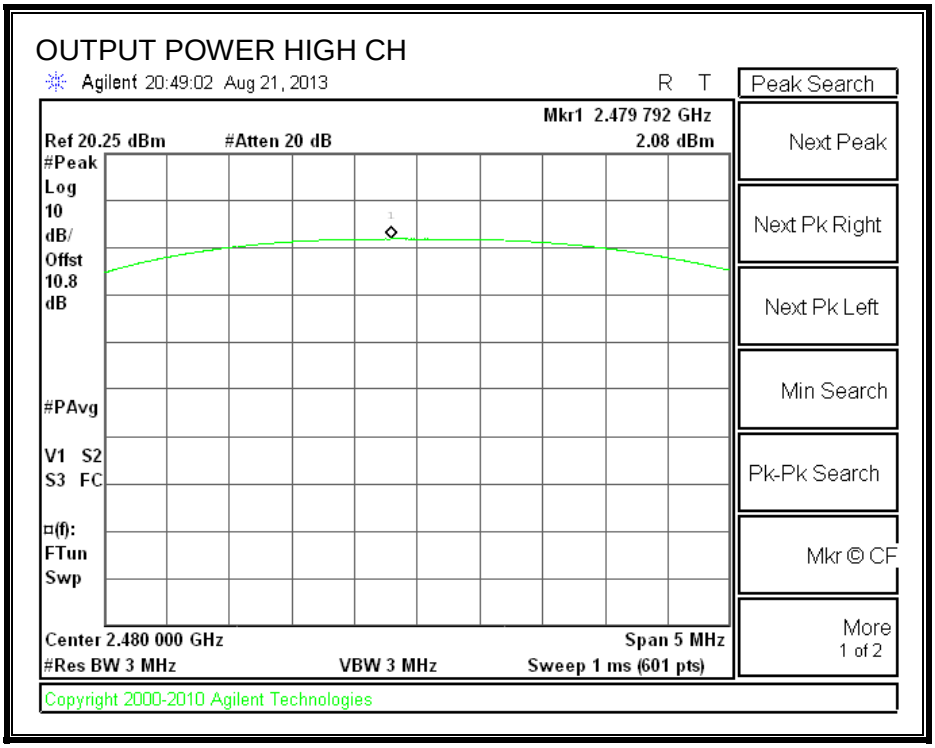
RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	2.47	30	-27.530
Middle	2440	2.31	30	-27.690
High	2480	2.08	30	-27.920

OUTPUT POWER







5.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.75 dB (including 10 dB pad and 0.75 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	2.29
Middle	2440	2.14
High	2480	1.96

5.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

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

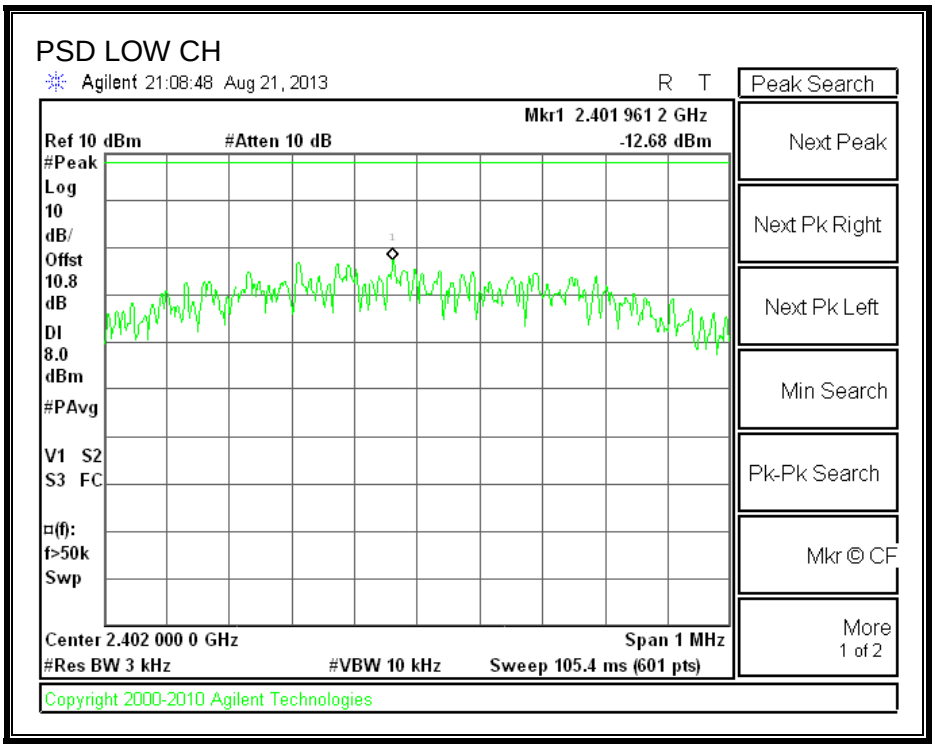
TEST PROCEDURE

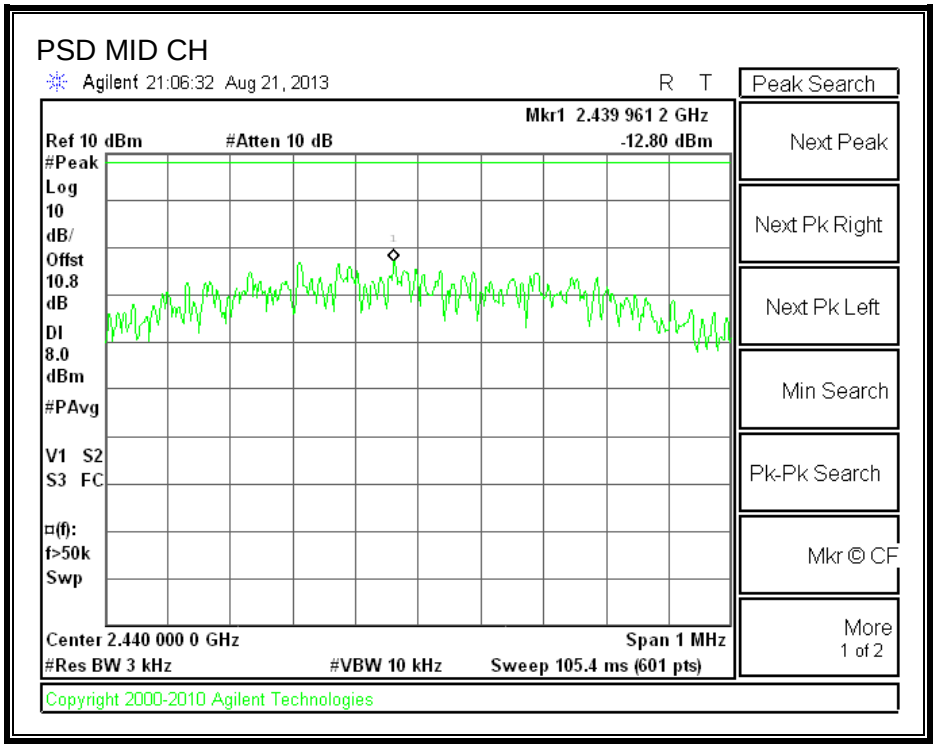
KDB 558074 D01 v02 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”.

RESULTS

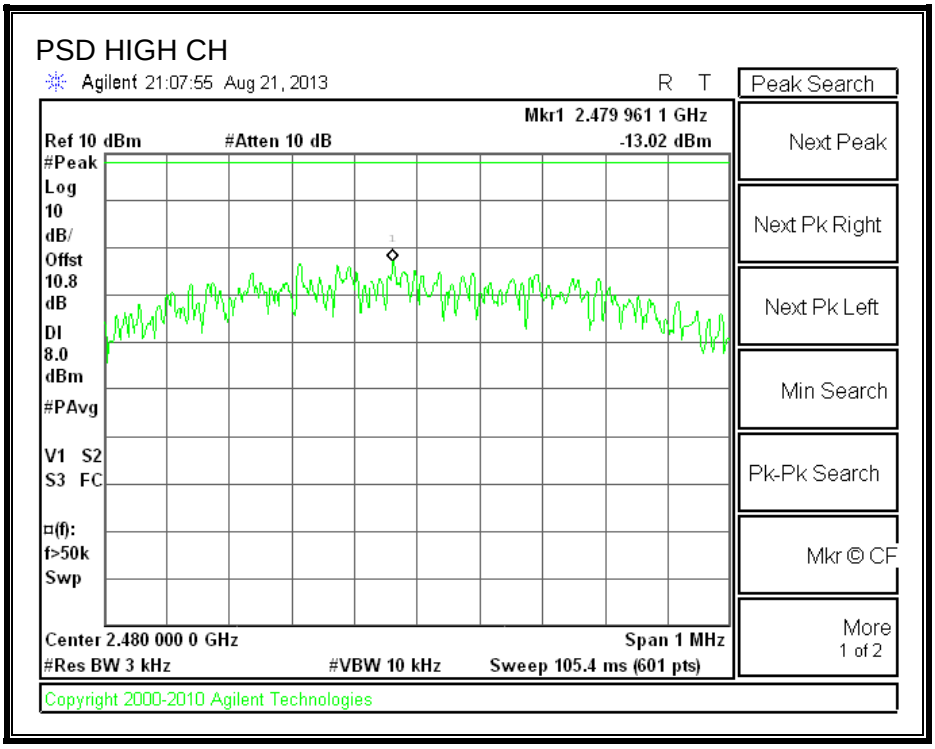
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-10.85	8	-18.85
Middle	2440	-11.52	8	-19.52
High	2480	-12.27	8	-20.27

POWER SPECTRAL DENSITY





PSD HIGH CH



5.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

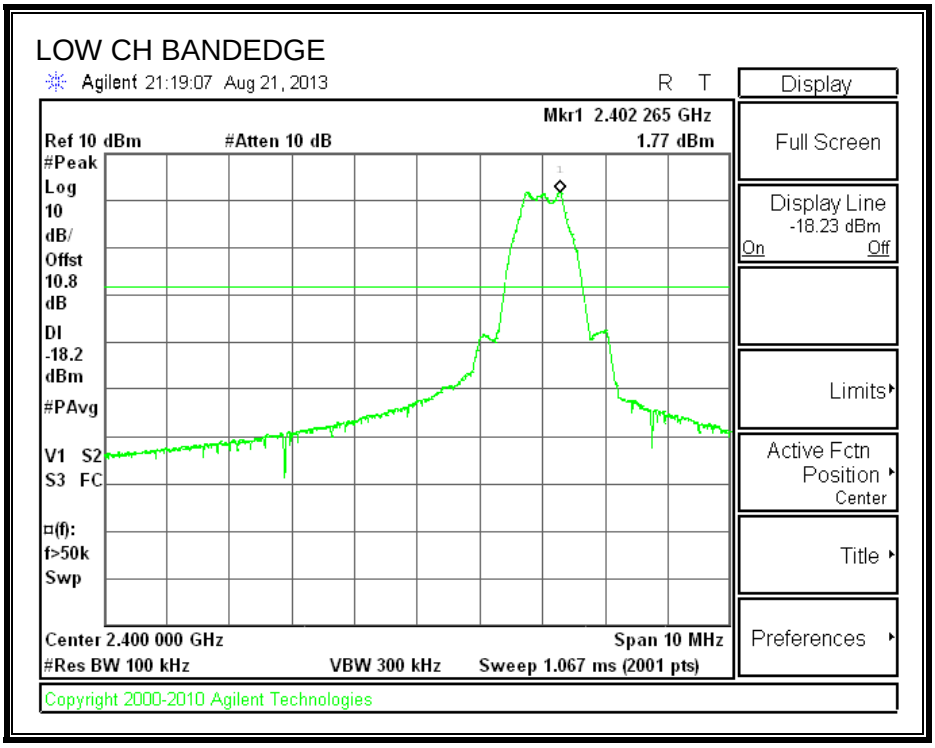
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

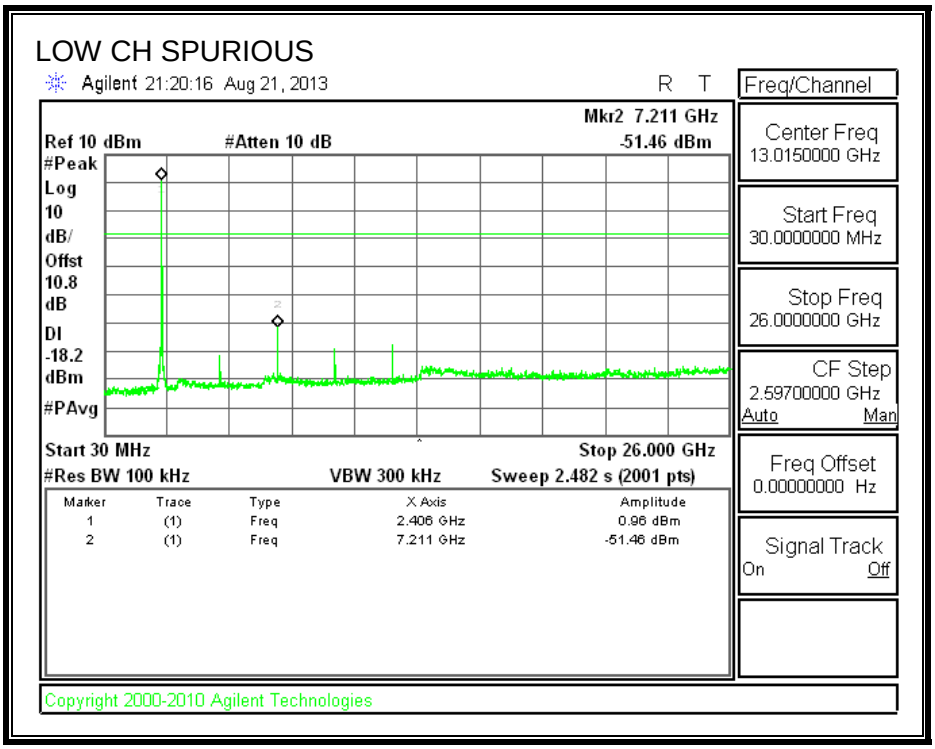
TEST PROCEDURE

KDB 558074 D01 v02 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247”.

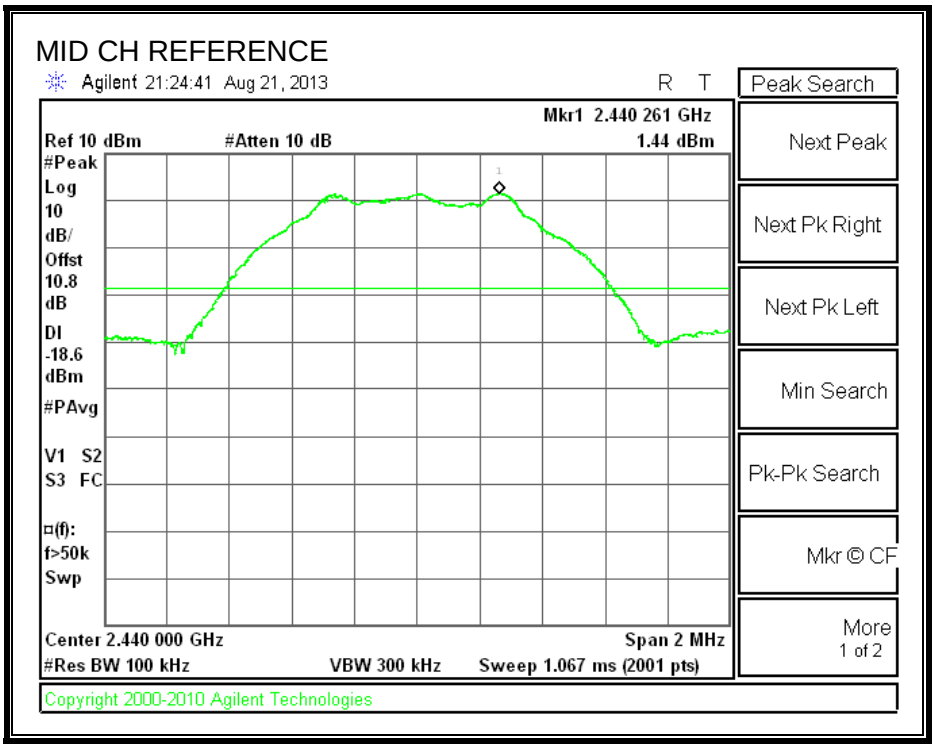
RESULTS

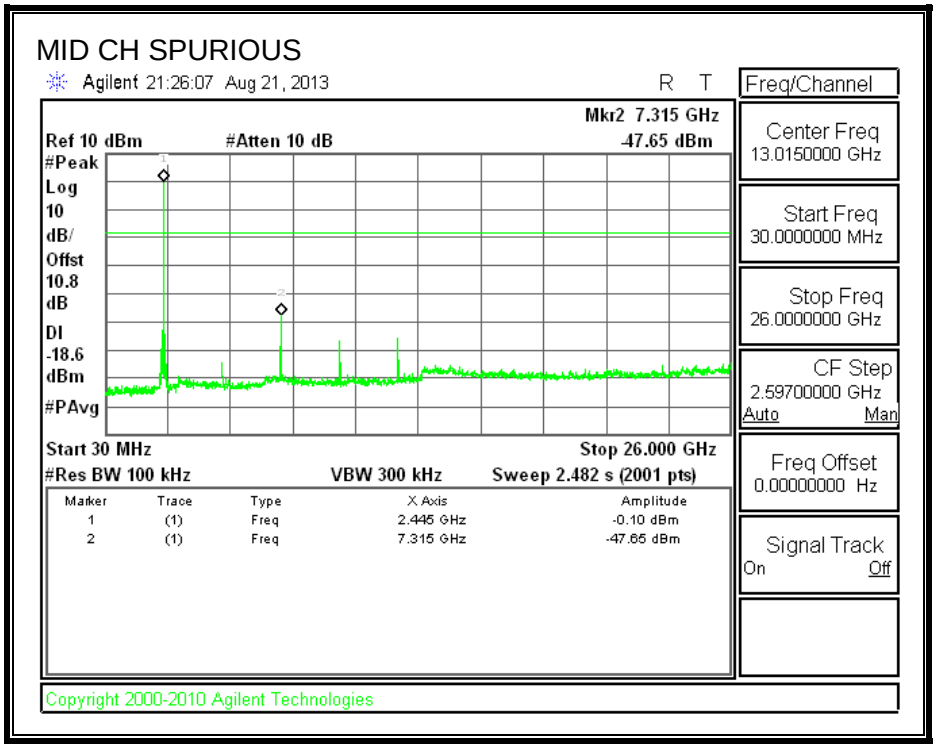
SPURIOUS EMISSIONS, LOW CHANNEL



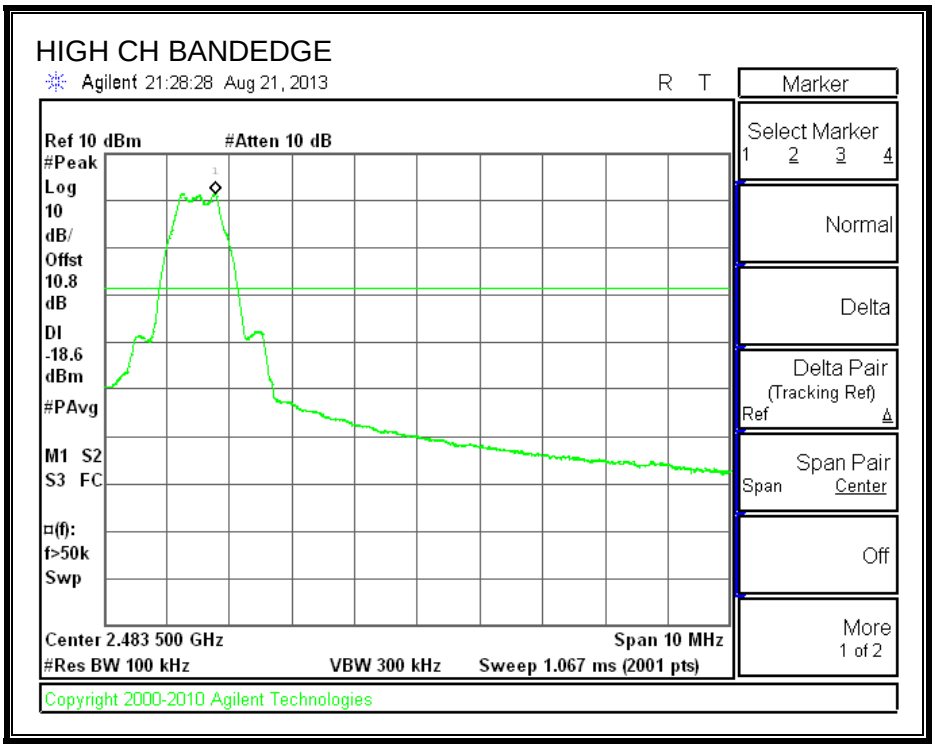


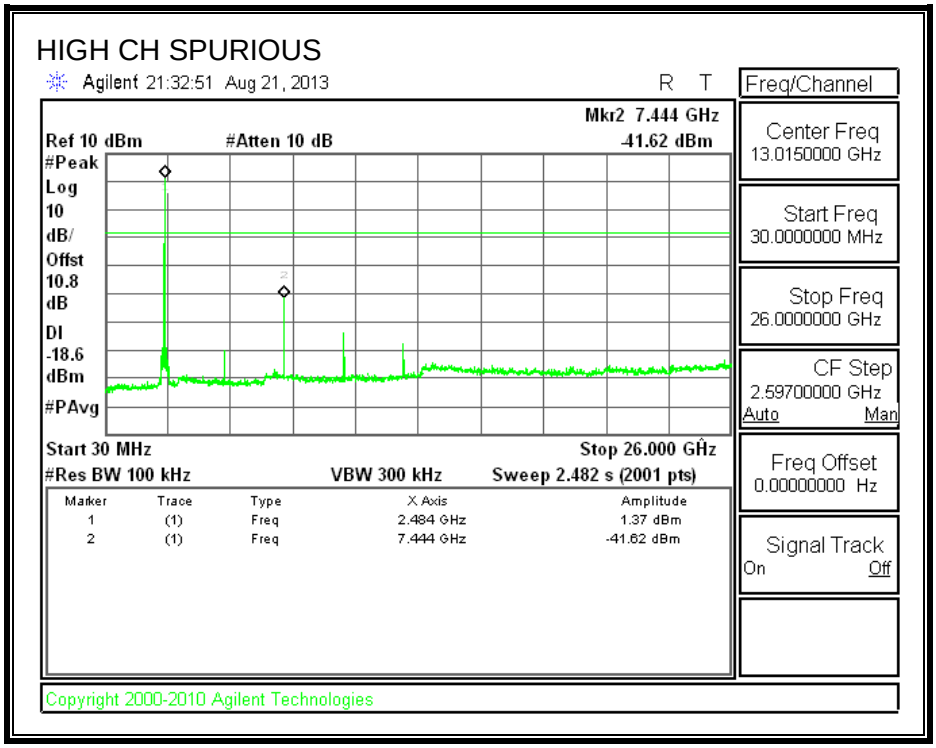
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





6. RADIATED TEST RESULTS

6.1. 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. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

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

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, video bandwidth is set to 3 MHz, then Peak detection mode is set for peak measurements and Avg detection mode is used for average measurements.

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

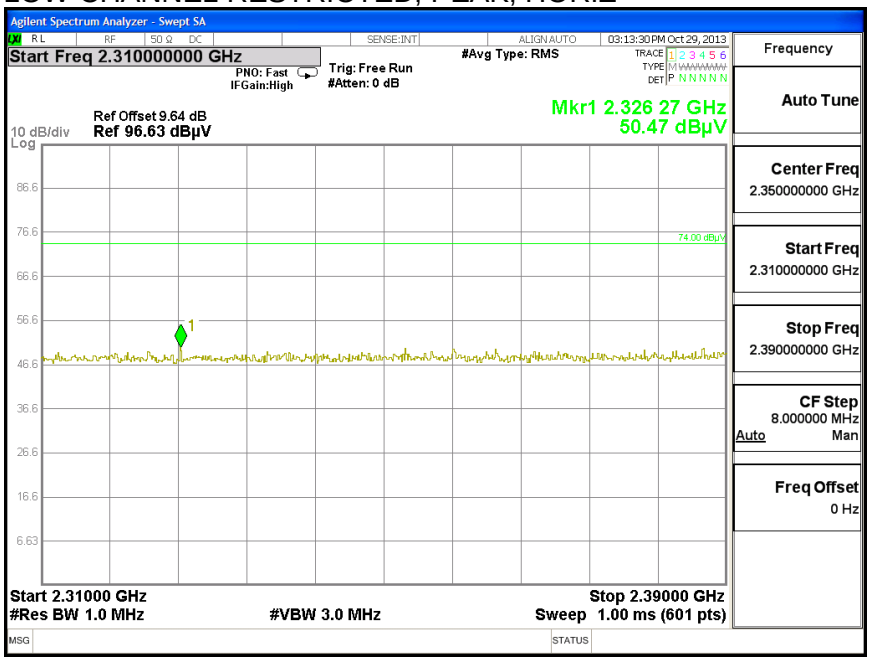
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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.

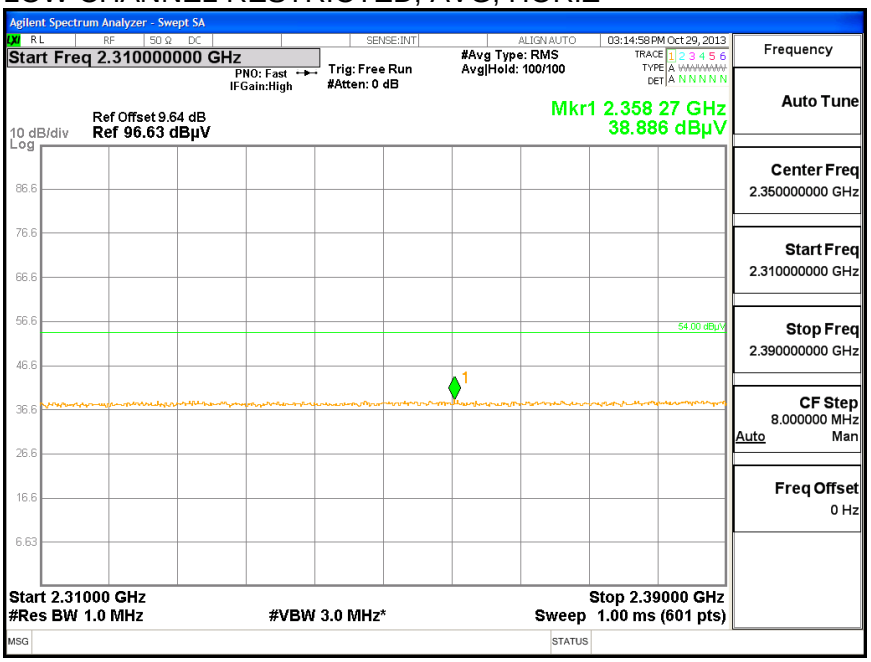
6.2. TX ABOVE 1 GHz FOR BLUETOOTH LOW ENERGY MODE

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL RESTRICTED, PEAK, HORIZ



LOW CHANNEL RESTRICTED, AVG, HORIZ



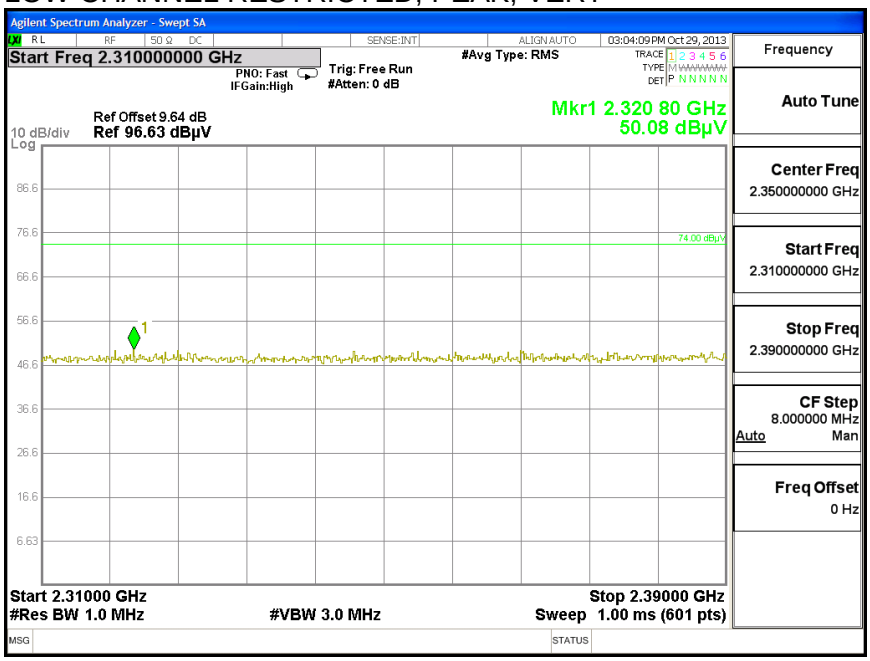
AVERAGE FIELD STRENGTH CALCULATION:

AVG Field Strength = Avg Reading + Duty Cycle Correction Factor
= 38.886 dBuV/m +2.14 dBm
= 41.026 dBuVm

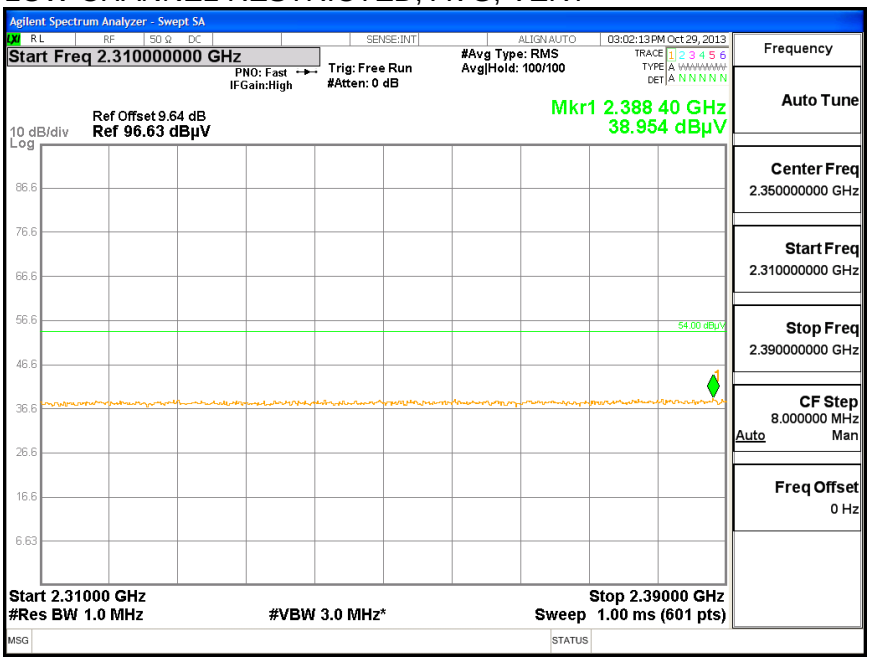
AVG Margin = AVE Reading – AVE Power Limit
= 41.026 dBuV/m – 54 dBuV/m
= -12.974 dBm

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

LOW CHANNEL RESTRICTED, PEAK, VERT



LOW CHANNEL RESTRICTED, AVG, VERT

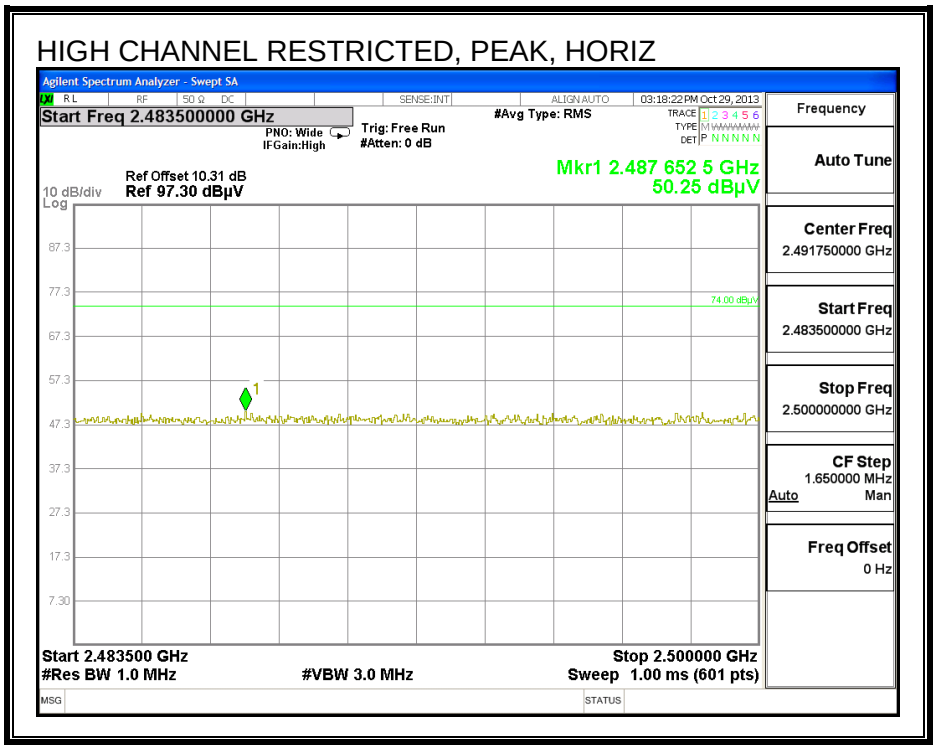


AVERAGE FIELD STRENGTH CALCULATION:

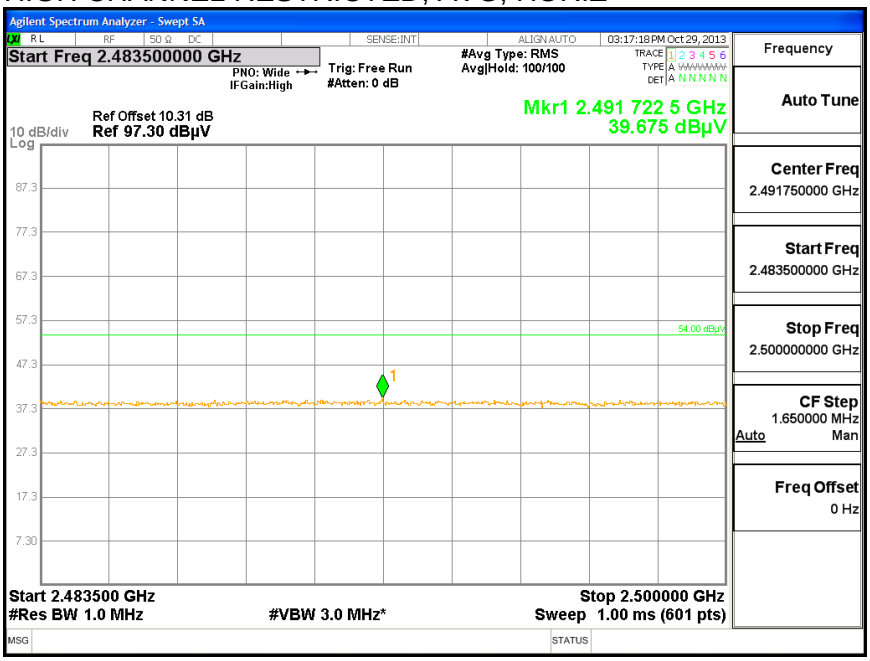
AVG Field Strength = Avg Reading + Duty Cycle Correction Factor
= 38.954 dBuV/m +2.14 dBm
= 41.094 dBuV/m

AVG Margin = AVE Reading – AVE Power Limit
= 41.094 dBuV/m – 54 dBuV/m
= -12.906 dBm

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



HIGH CHANNEL RESTRICTED, AVG, HORIZ



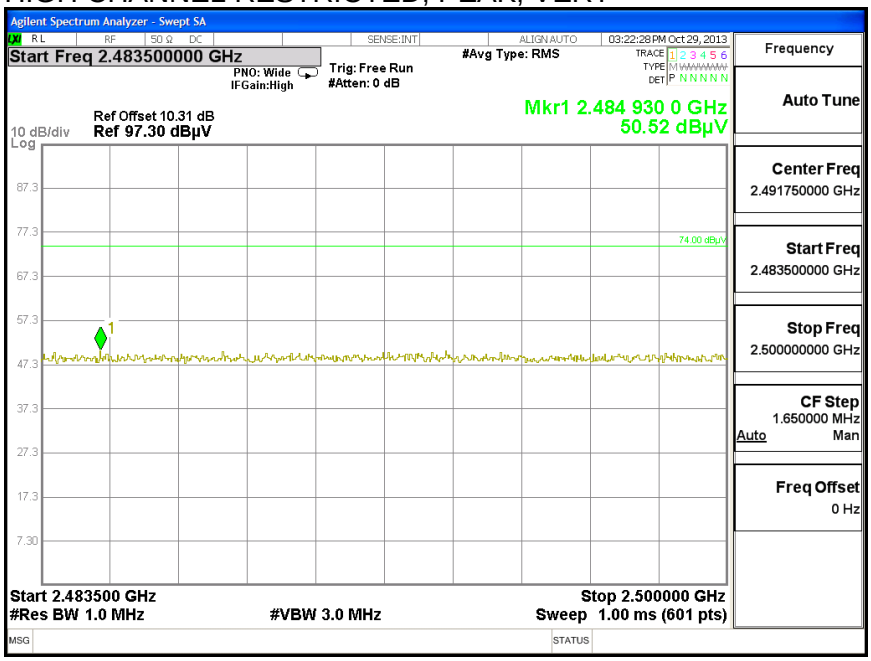
AVERAGE FIELD STRENGTH CALCULATION:

AVG Field Strength = Avg Reading + Duty Cycle Correction Factor
= 39.675 dBuV/m +2.14 dBm
= 41.815 dBuV/m

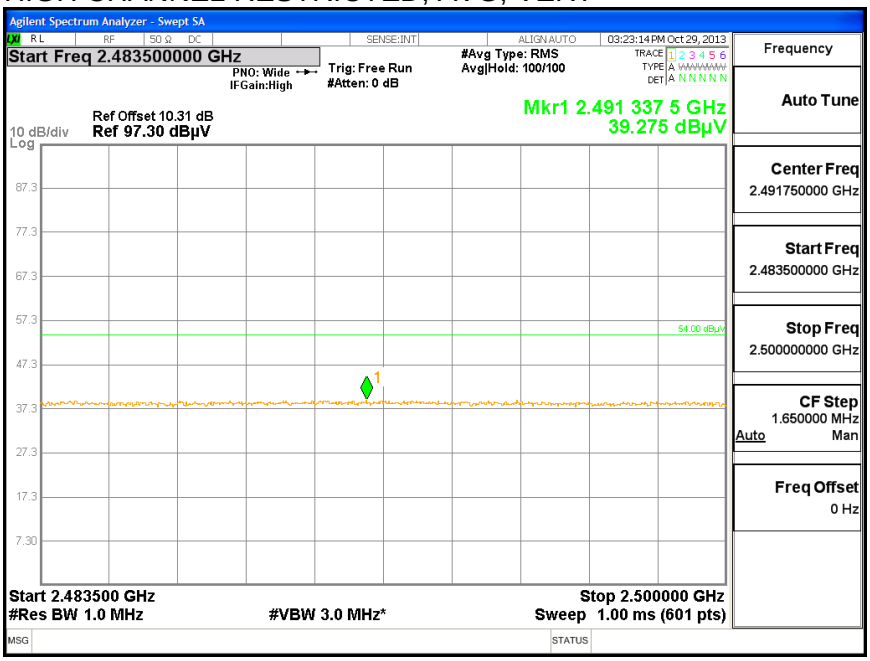
AVG Margin = AVE Reading – AVE Power Limit
= 41.815 dBuV/m – 54 dBuV/m
= -12.185 dBm

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

HIGH CHANNEL RESTRICTED, PEAK, VERT



HIGH CHANNEL RESTRICTED, AVG, VERT



AVERAGE FIELD STRENGTH CALCULATION:

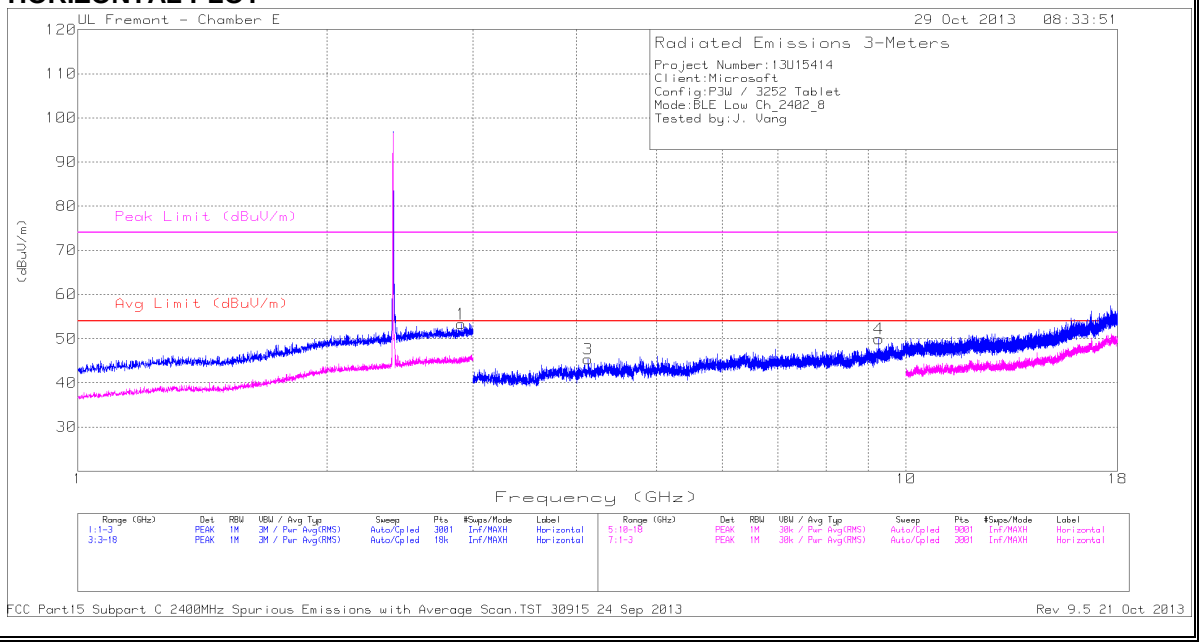
AVG Field Strength = Avg Reading + Duty Cycle Correction Factor
= 39.275 dBuV/m +2.14 dBm
= 41.415 dBuV/m

AVG Margin = AVE Reading – AVE Power Limit
= 41.415 dBuV/m – 54 dBuV/m
= -12.585 dBm

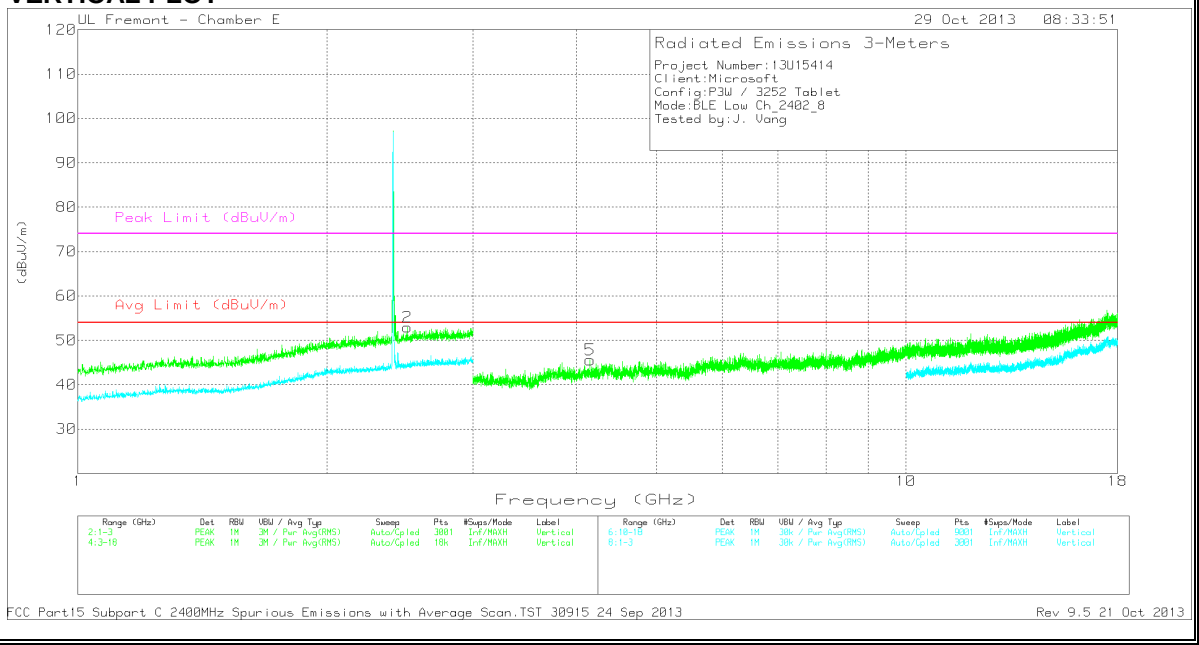
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL, 2402 MHz

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/10dB Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.903	44.35	PK	33.2	-24.2	53.35	53.97	-.62	74	-20.65	0-360	101	H
2	2.499	44.68	PK	32.7	-24.4	52.98	53.97	-.99	74	-21.02	0-360	101	V
6	2.904	36.67	Avg	33.2	-24.2	45.67	53.97	-8.3	-	-	0-360	199	H
7	2.498	36.6	Avg	32.7	-24.4	44.9	53.97	-9.07	-	-	0-360	100	V

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	4.131	42.79	PK	33.9	-31.3	45.39	53.97	-8.58	74	-28.61	0-360	101	H
4	9.273	37.68	PK	37.1	-24.8	49.98	53.97	-3.99	74	-24.02	0-360	101	H
5	4.154	43.37	PK	33.9	-31.7	45.57	53.97	-8.4	74	-28.43	0-360	100	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.273	22.25	Av	37.1	-24.8	34.55	53.97	-19.42	-	-	262	390	H

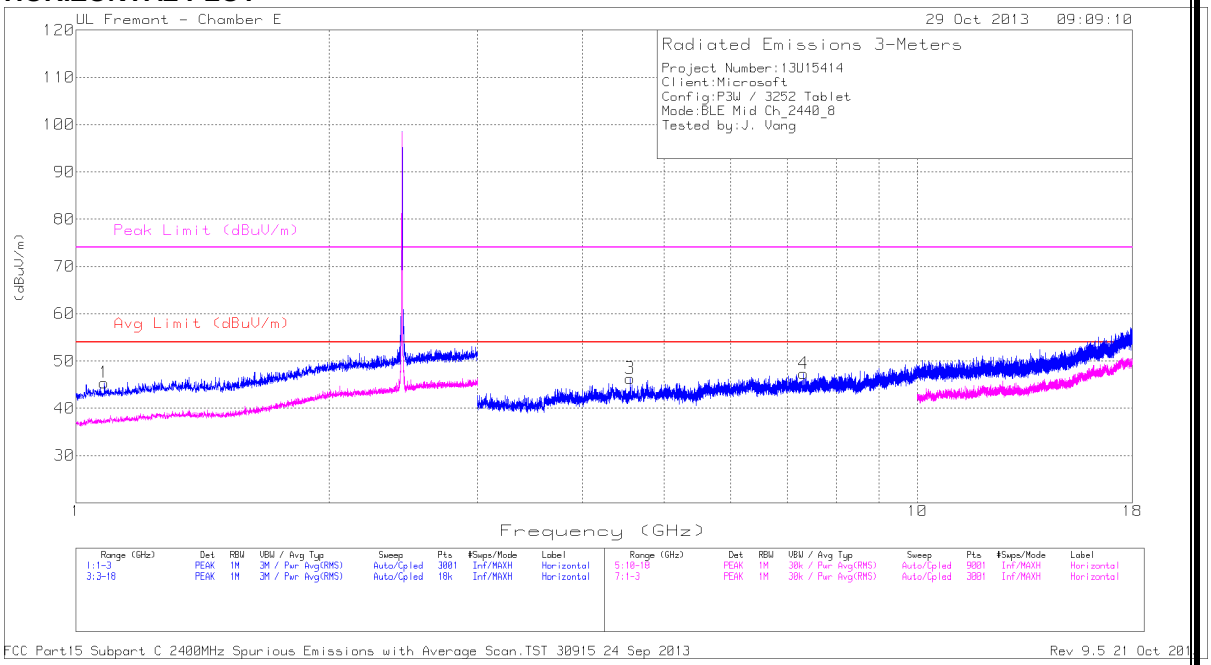
PK - Peak detector

Av - average detection

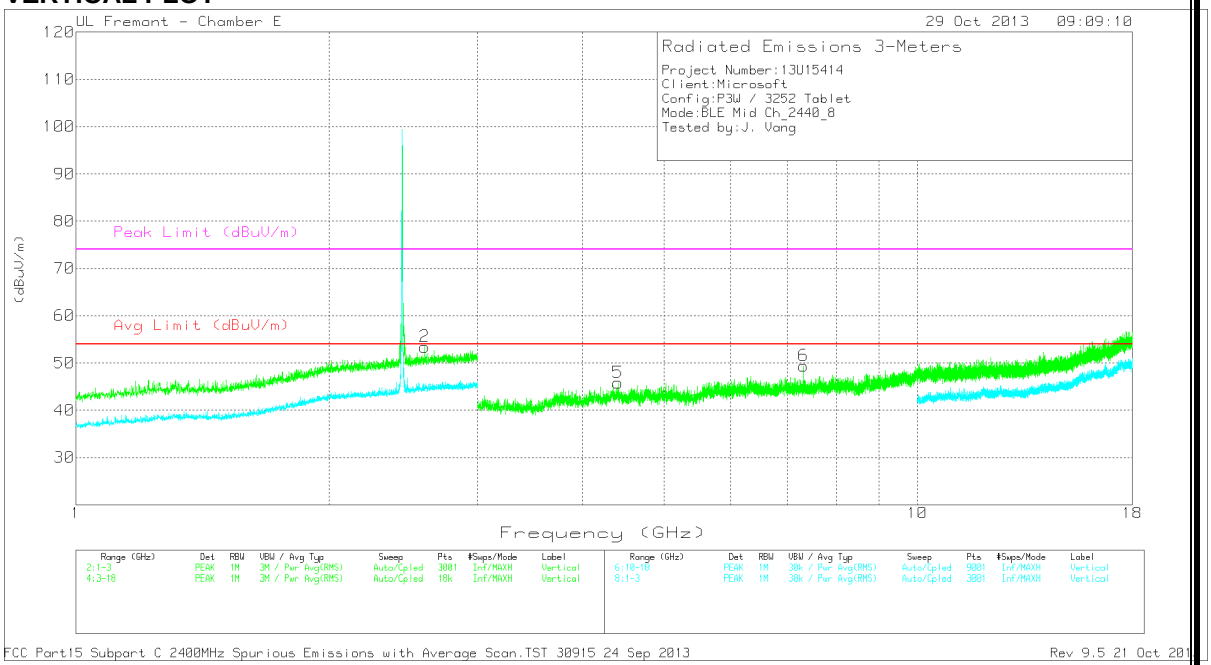
Avg - Video bandwidth < Resolution bandwidth

MID CHANNEL, 2440 MHz

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/10dB Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.081	44.89	PK	28.5	-28	45.39	53.97	-8.58	74	-28.61	0-360	101	H
2	2.597	44.71	PK	32.9	-24.2	53.41	53.97	-.56	74	-20.59	0-360	100	V
7	1.079	37.43	Avg	28.4	-28	37.83	53.97	-16.14	-	-	0-360	101	H
8	2.599	36.83	Avg	32.9	-24.2	45.53	53.97	-8.44	-	-	0-360	199	V

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	4.557	43.49	PK	34.3	-31.5	46.29	53.97	-7.68	74	-27.71	0-360	100	H
4	7.32	39.54	PK	36	-28.2	47.34	53.97	-6.63	74	-26.66	0-360	199	H
5	4.406	42.22	PK	34.2	-30.6	45.82	53.97	-8.15	74	-28.18	0-360	100	V
6	7.32	41.61	PK	36	-28.2	49.41	53.97	-4.56	74	-24.59	0-360	100	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
7.319	31.69	Av	36	-28.2	39.49	53.97	-14.48	-	-	351	368	V

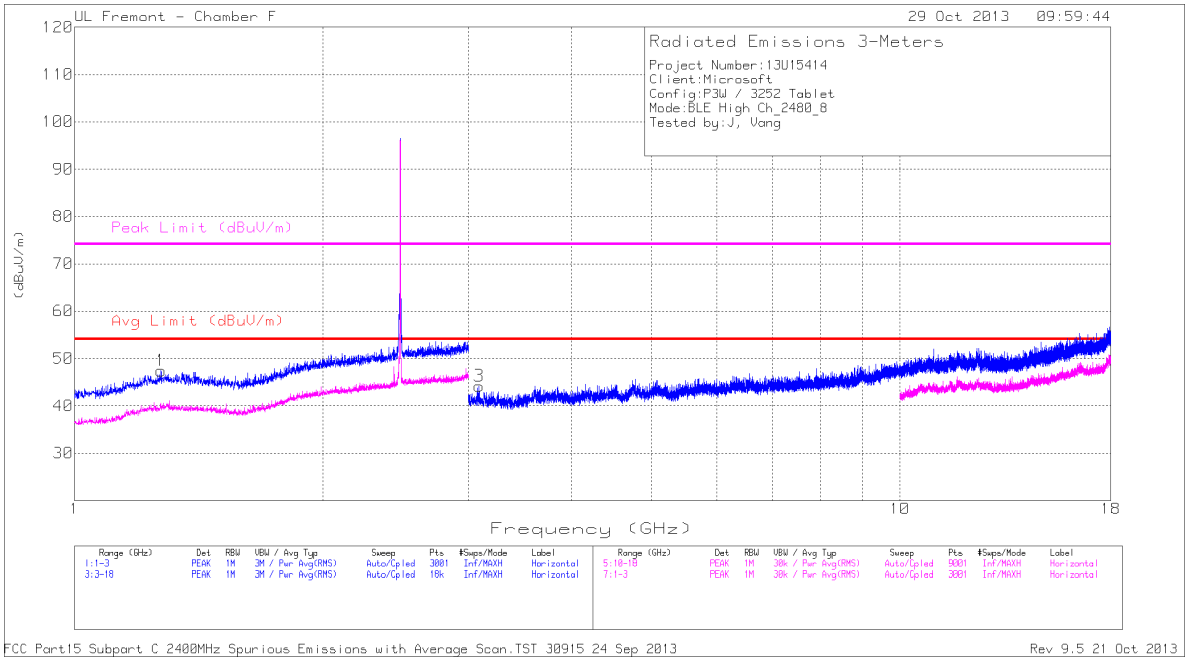
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

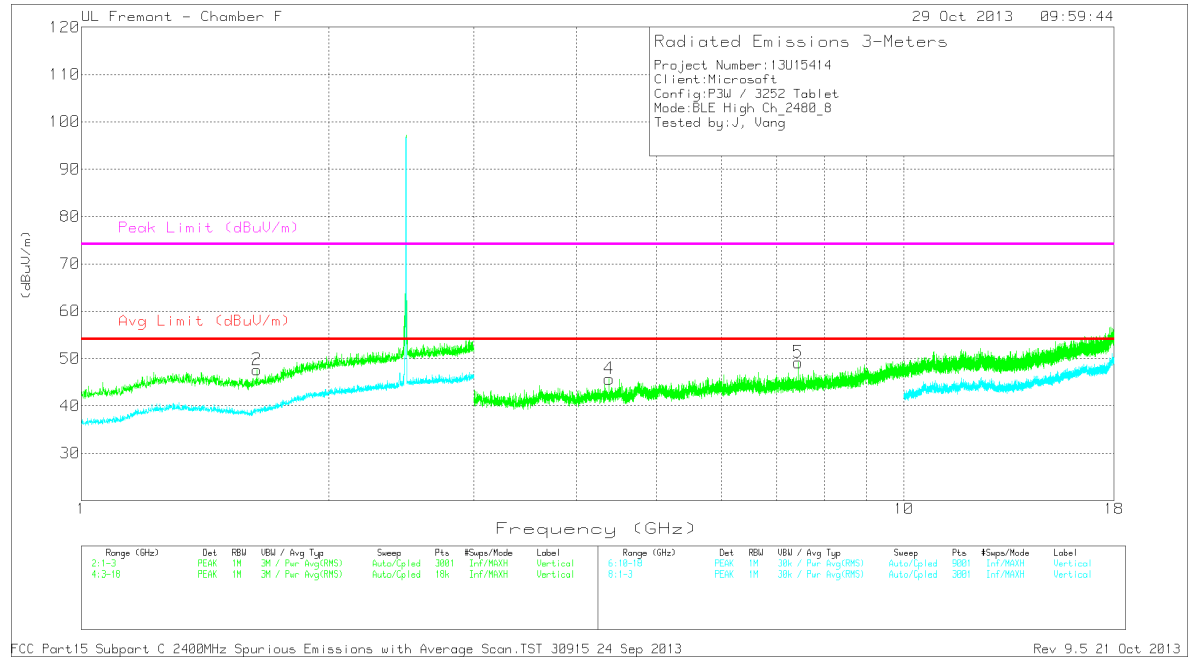
Av - average detection

HIGH CHANNEL, 2480 MHz

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/10dB Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.273	42.42	PK	29.8	-24.8	47.42	53.97	-6.55	74	-26.58	0-360	199	H
2	1.635	42.93	PK	28.3	-23.6	47.63	53.97	-6.34	74	-26.37	0-360	200	V
6	1.271	35.54	Avg	29.8	-24.8	40.54	53.97	-13.43	-	-	0-360	100	H
7	1.636	34.55	Avg	28.4	-23.6	39.35	53.97	-14.62	-	-	0-360	200	V

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	3.091	40.45	PK	33.3	-29.6	44.15	53.97	-9.82	74	-29.85	0-360	100	H
4	4.382	41.41	PK	33.6	-29.3	45.71	53.97	-8.26	74	-28.29	0-360	200	V
5	7.44	39.58	PK	35.8	-26.2	49.18	53.97	-4.79	74	-24.82	0-360	200	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/3GHz HPF	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
7.439	28.68	Av	35.8	-26.2	38.28	53.97	-15.69	-	-	40	304	V

PK - Peak detector

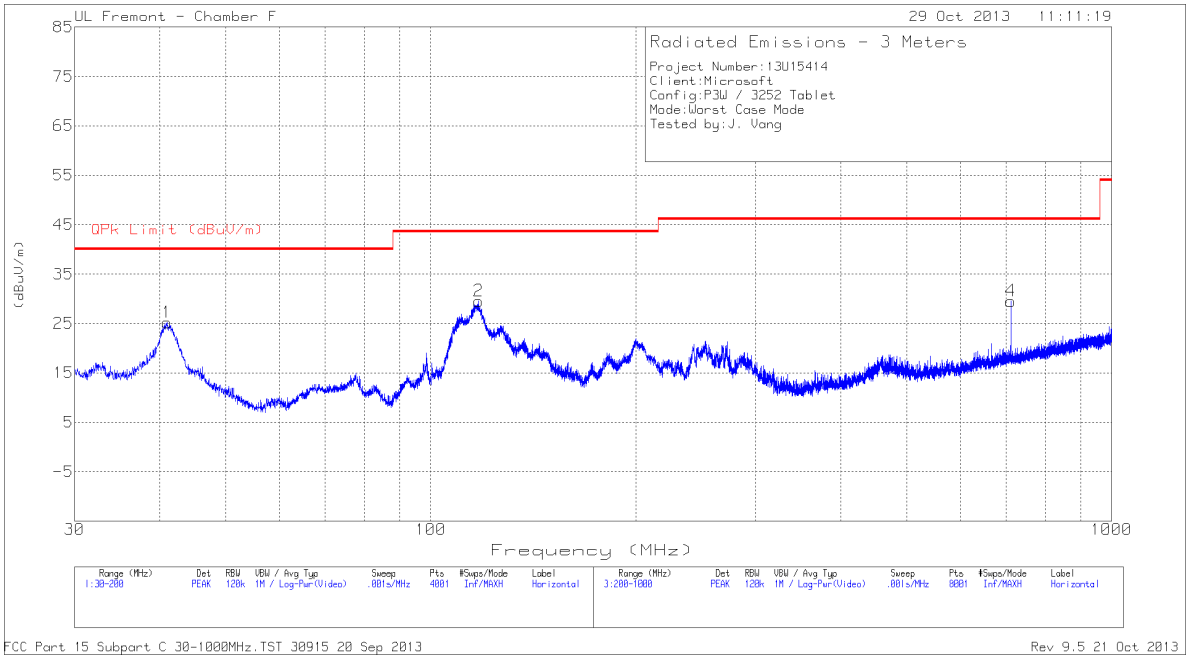
Av - average detection

Avg - Video bandwidth < Resolution bandwidth

WORST-CASE BELOW 1 GHz

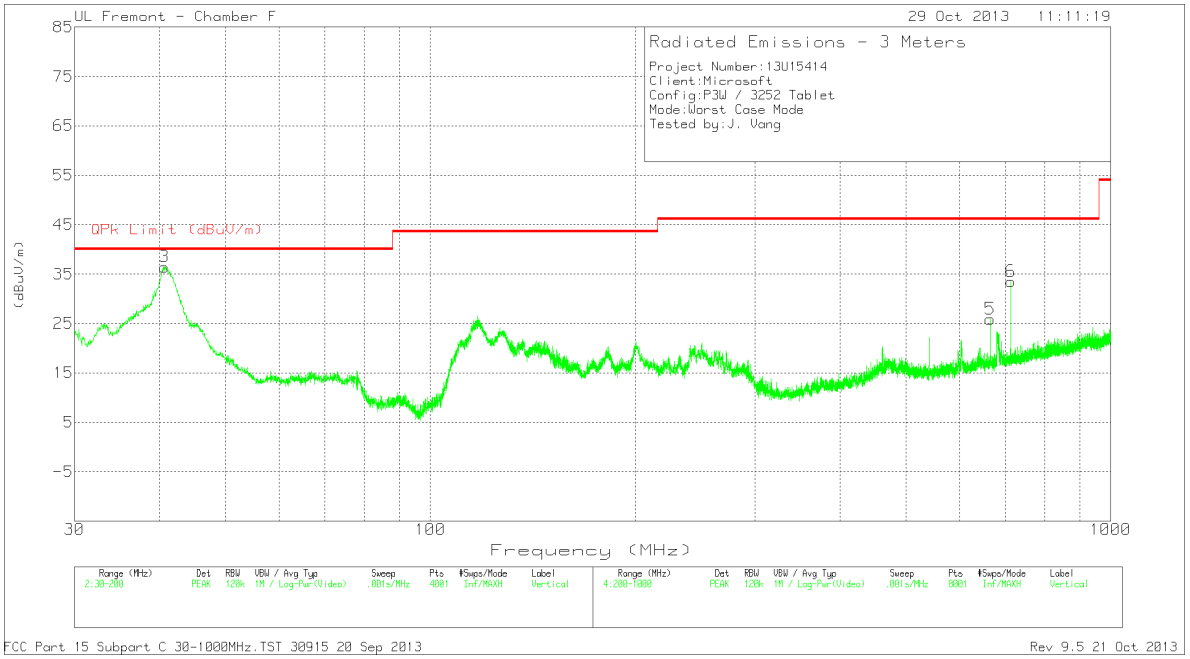
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



HORIZONTAL & VERTICAL DATA

Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T122 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	41.0075	44.09	PK	13.1	-32	25.19	40	-14.81	0-360	300	H
2	117.635	47.01	PK	13.9	-31.4	29.51	43.52	-14.01	0-360	300	H
3	40.6675	55.15	PK	13.3	-32	36.45	40	-3.55	0-360	100	V
4	711.2	39.02	PK	20.4	-29.9	29.52	46.02	-16.5	0-360	100	H
5	665.1	36.07	PK	19.8	-30	25.87	46.02	-20.15	0-360	100	V
6	713.1	42.88	PK	20.4	-29.8	33.48	46.02	-12.54	0-360	100	V

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T122 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
40.9181	51.03	QP	13.2	-32	32.23	40	-7.77	140	136	V

PK - Peak detector

QP - Quasi-Peak detector

7. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

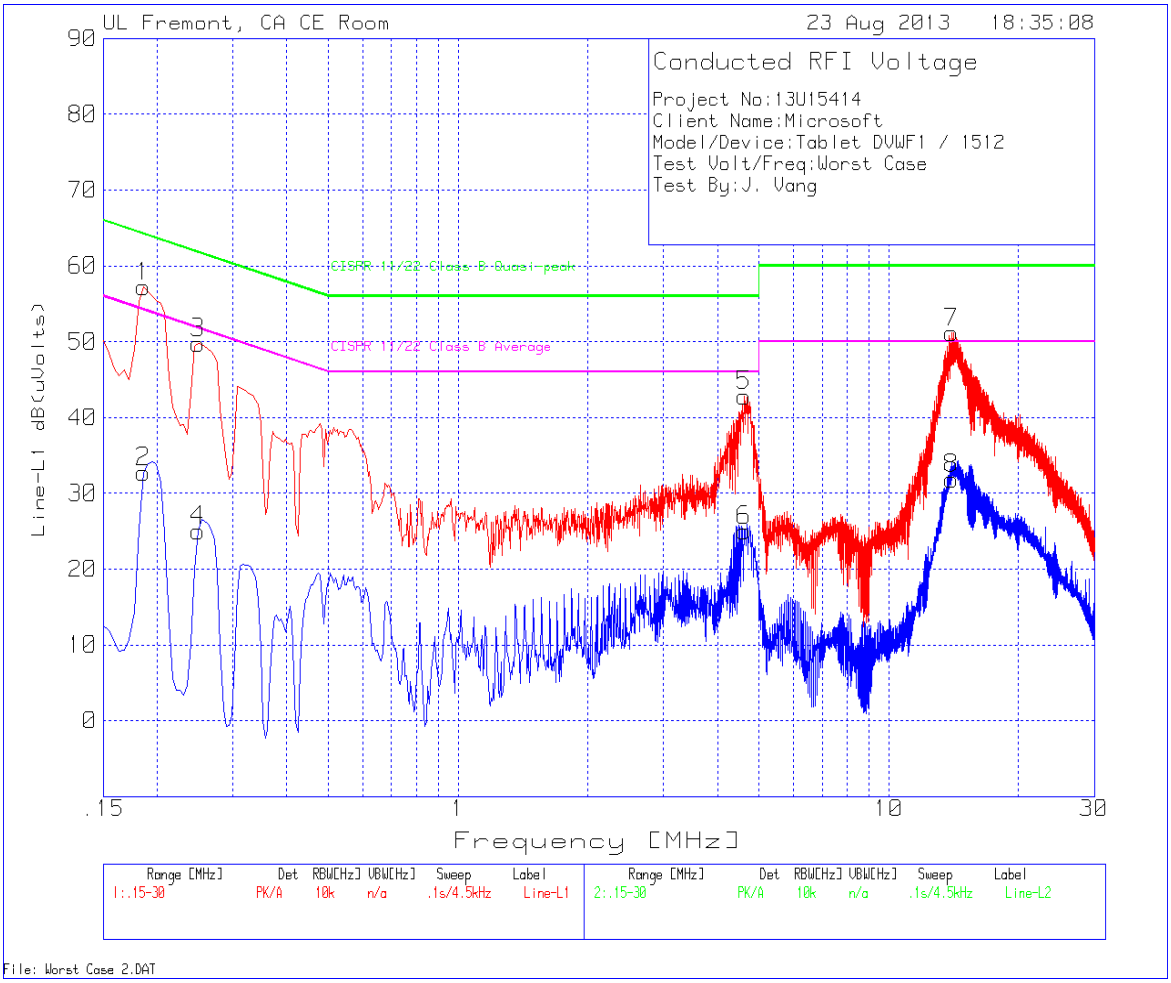
* Decreases with the logarithm of the frequency.

TEST PROCEDURE

ANSI C63.4

RESULTS

LINE 1 RESULTS



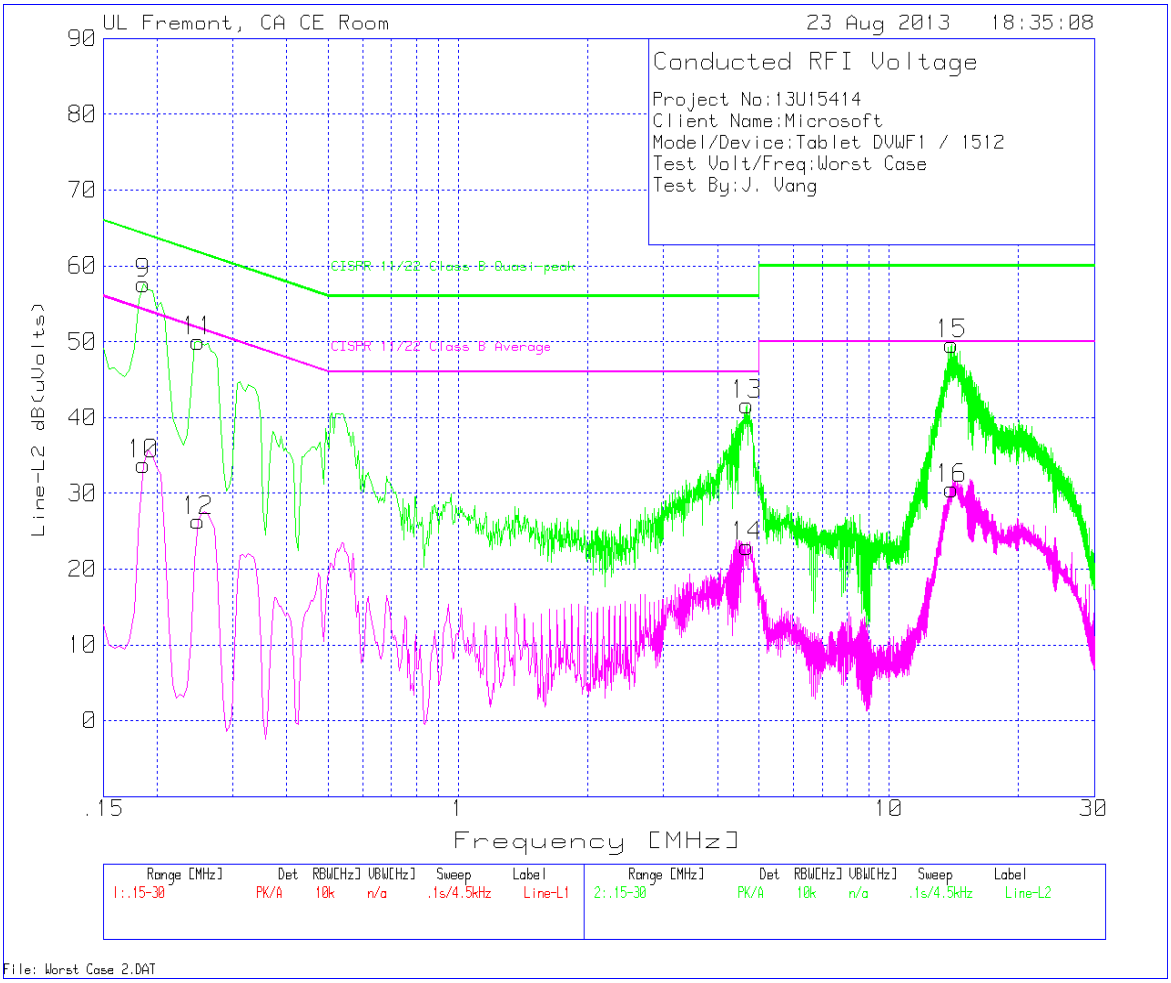
DATA SUMMARY

Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
1	.186	57.09	PK	.1	0	57.19	64.2	-7.01	-	-
2	.186	32.63	Av	.1	0	32.73	-	-	54.2	-21.47
3	.249	49.72	PK	.1	0	49.82	61.8	-11.98	-	-
4	.249	24.89	Av	.1	0	24.99	-	-	51.8	-26.81
5	4.623	42.61	PK	.1	.1	42.81	56	-13.19	-	-
6	4.623	24.77	Av	.1	.1	24.97	-	-	46	-21.03
7	14.0145	50.73	PK	.2	.2	51.13	60	-8.87	-	-
8	14.0145	31.43	Av	.2	.2	31.83	-	-	50	-18.17

PK - Peak detector
Av - average detection

LINE 2 RESULTS



DATA SUMMARY

Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
9	.186	57.51	PK	.1	0	57.61	64.2	-6.59	-	-
10	.186	33.68	Av	.1	0	33.78	-	-	54.2	-20.42
11	.249	49.88	PK	.1	0	49.98	61.8	-11.82	-	-
12	.249	26.27	Av	.1	0	26.37	-	-	51.8	-25.43
13	4.6905	41.47	PK	.1	.1	41.67	56	-14.33	-	-
14	4.6905	22.75	Av	.1	.1	22.95	-	-	46	-23.05
15	14.0055	49.21	PK	.2	.2	49.61	60	-10.39	-	-
16	14.0055	30.18	Av	.2	.2	30.58	-	-	50	-19.42

PK - Peak detector
Av - average detection