



**FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8**

**CLASS II PERMISSIVE CHANGE
BT TEST REPORT***

FOR

802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card

MODEL NUMBER: BCM94360CD

**FCC ID: QDS-BRCM1070
IC: 4324A-BRCM1070**

REPORT NUMBER: 14U17358-1, Revision A

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Prepared for

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SUNNYVALE, CA 94086, U.S.A.**

Prepared by

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*Testing was performed based on client's test plan, file's name "X51 New Host J78
Regression Radiated Test Plan_4_2_14"



NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	04/10/14	Initial Issue	F. Ibrahim
A	04/28/14	Corrected typos in sections 8.2.1 and 8.2.2 Added a note to section 5.2	F. Ibrahim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, U.S.A.

EUT DESCRIPTION: 802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card

MODEL: BCM94360CD

SERIAL NUMBER: C863194009ZF6RY3W

DATE TESTED: April 03 to April 07, 2014

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	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:



FRANK IBRAHIM
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UL Verification Services Inc.

Tested By:



FRANCISCO GUARNERO
LAB ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

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

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A	☐ Chamber D
☐ Chamber B	☒ Chamber E
☐ Chamber C	☐ Chamber F

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card.

The radio module is manufactured by Broadcom.

5.2. MAXIMUM OUTPUT POWER

The measured average power values were within ± 0.5 dB of the original values. Refer to original report number "12U14669-2" for all antenna port results.

Note: due to higher AG (6.56 dBi), the power limit is reduced by 0.56 dB, however, the original power values are passing by a margin greater than 10 dB, therefore, the EUT is claimed to still comply with the power limitation requirement.

5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The change filed under this application is the addition of the following WiFi/BT antennas:

1. Amphenol/ Molex (Host 4)

	Gain of antenna (dBi)			
	604-7572 WF1/ Bluetooth	604-7575 WF2	604-7573 WF3	604-7574 WF4
2.4-2.484 GHz	3.29	4.32	4.77	3.72
5.15-5.25 GHz	N/A	4.83	2.84	1.18
5.25-5.35 GHz	N/A	4.52	3.21	1.48
5.5-5.7 GHz	N/A	4.72	2.09	2.85
5.725-5.85 GHz	N/A	4.86	1.95	3.09

Antenna to RF ports mapping:

WF1/BT	A3
WF2	A2
WF3	A1
WF4	A0

2. Amphenol/ Molex (Host 5)

	Gain of antenna (dBi)			
	604-7827 WF1/ Bluetooth	604-7828 WF2	604-7829 WF3	604-7830 WF4
2.4-2.484 GHz	6.56	3.38	5.33	5.90
5.15-5.25 GHz	N/A	4.15	3.19	3.08
5.25-5.35 GHz	N/A	3.91	2.55	3.48
5.5-5.7 GHz	N/A	4.56	1.88	3.17
5.725-5.85 GHz	N/A	4.42	0.42	2.68

Antenna to RF ports mapping:

WF1/BT	A3
WF2	A2
WF3	A1
WF4	A0

For BT testing, the antenna with higher gain 6.56 dBi (604-7827 WF1/ Bluetooth) was selected as worst-case antenna to cover the other antenna from host 4.

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, Ver. 5.1.0.1400

The test utility software used during testing was Broadcom Bluetooth, Ver.: 1.8.4.1

5.5. WORST-CASE CONFIGURATION AND MODE

The EUT was tested as an external module installed in a test jig board connected to a host Laptop PC. The EUT was oriented in a flat orientation, similar to the orientation it would have in real installations; see setup photos for details.

For BT testing, the antenna with higher gain 6.56 dBi (604-7827 WF1/ Bluetooth) was selected as worst-case antenna to cover the other antenna from host 4.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	HP	DV6000	CNF7120G34	DoC
AC Adapter	HP	PA-1900-08R1	599830ALLUB6N1	N/A
Adapter Board	Broadcom	BCM94331CSAD	1514447	N/A

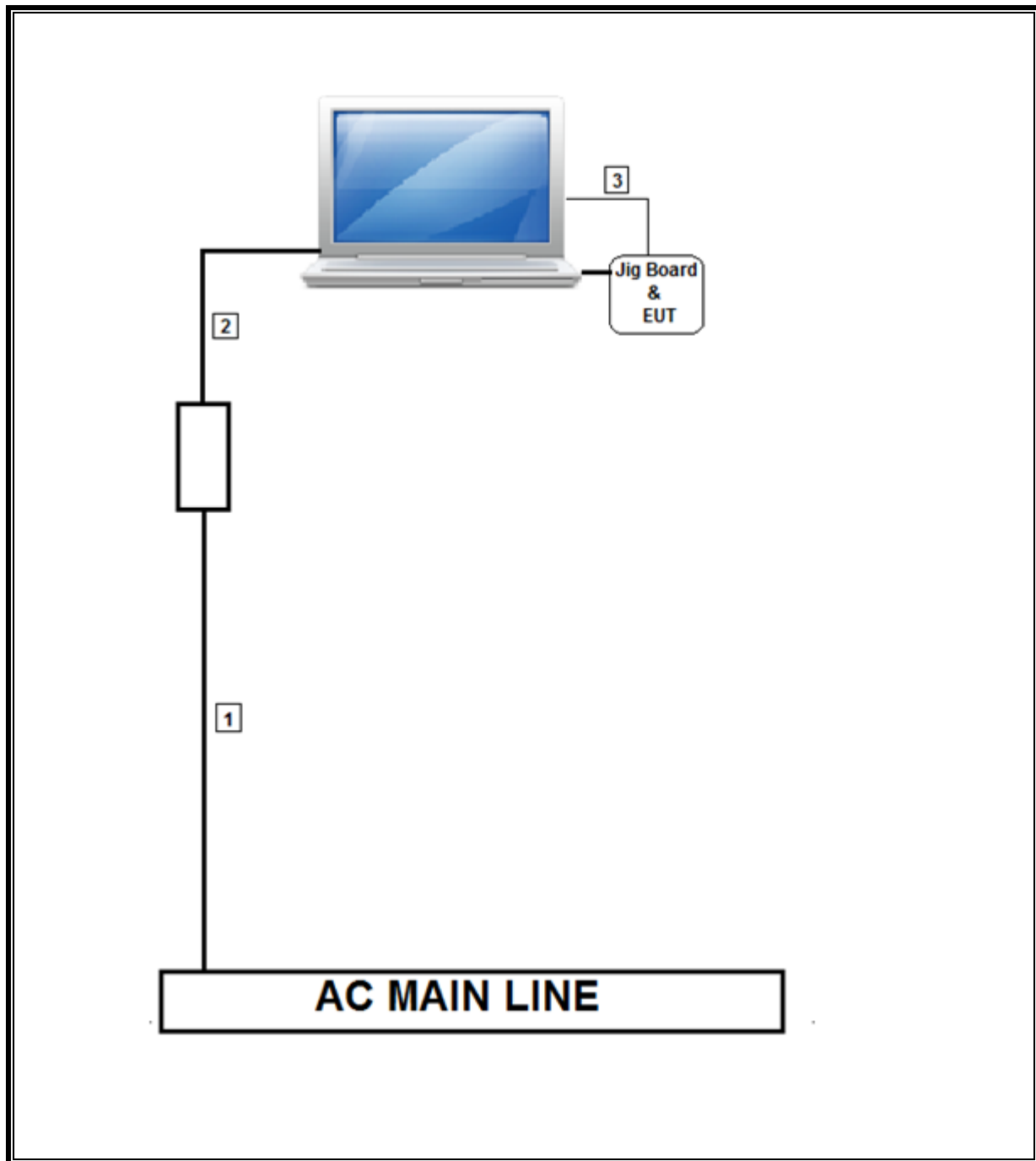
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US 115V	Un-Shielded	1.0m	NA
2	DC	1	DC	Un-Shielded	0.8m	NA
3	USB	1	USB	Un-Shielded	0.8m	NA

TEST SETUP

The EUT was tested as an external module that installed on an USB to test JIG board connected to a host Laptop PC via USB cable. Test software exercised the radio card.

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
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01161	05/07/13	05/07/14
PXA Signal Analyzer	Agilent	N9030A	T339	12/10/13	12/10/14
Horn Antenna, 1GHz-18GHz	ETS Lindgren	3117	T119	01/06/14	01/06/15
Antenna, Horn, 18 GHz	EMCO	3115	C01218	01/18/14	01/18/15
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/13	11/14/14
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01016	08/22/13	08/22/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	10/19/13	10/19/14
Peak Power Meter	Agilent / HP	N1911A	T377	04/22/13	04/22/14
Power Meter Sensor	Agilent / HP	N1921A	T309	12/12/13	12/12/14
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/16/14	01/16/15
5GHz Low Pass Filter	Micro-Tronics	LPS17541	F00219	06/26/13	06/26/14
3GHz High Pass Filter	Micro-Tronics	HPS17542	F00222	06/26/13	06/26/14
6GHz High Pass Filter	Micro-Tronics	HPM17543	F00224	06/26/13	06/26/14

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

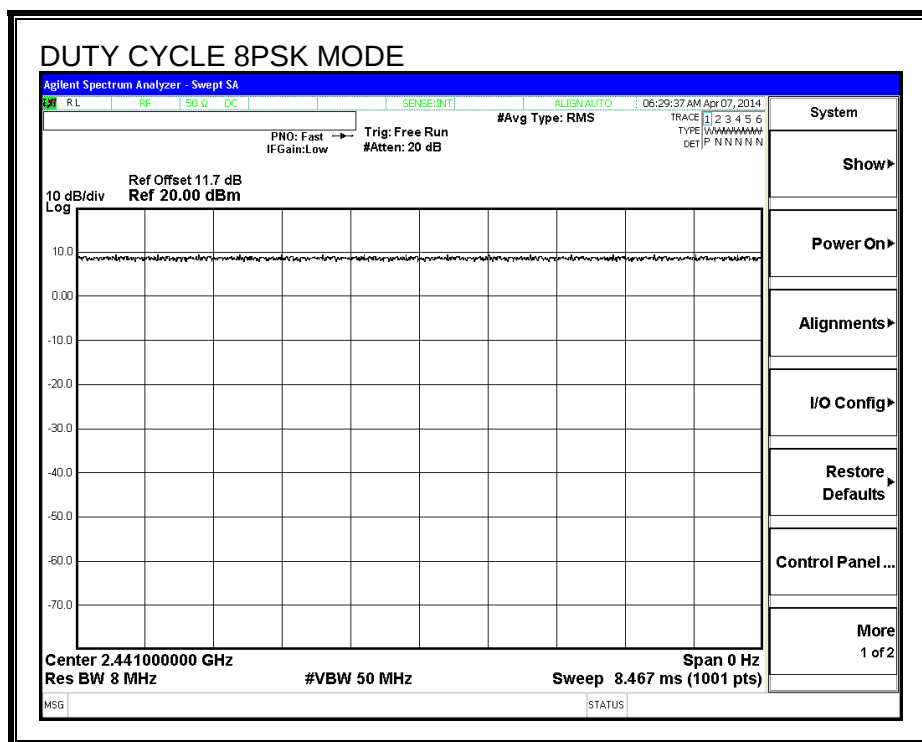
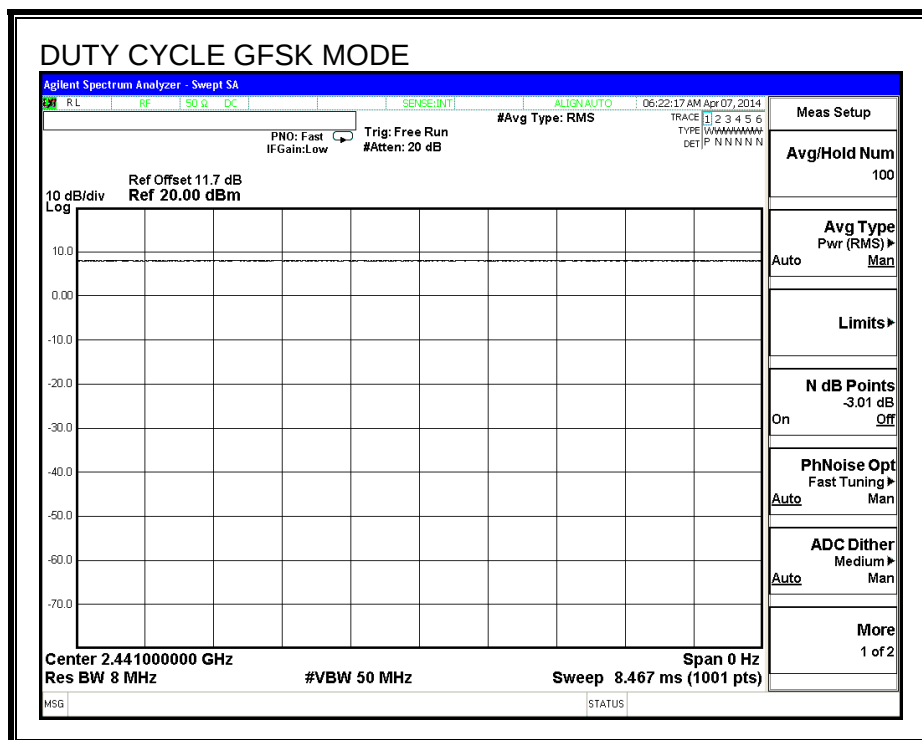
KDB 558074 Zero-Span Spectrum Analyzer Method.

7.1.1. 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/B Minimum VBW (kHz)
2.4 GHz band (Hopping OFF)						
Bluetooth GFSK	100.000	100.000	1.000	100.00%	0.00	0.010
Bluetooth 8PSK	100.000	100.000	1.000	100.00%	0.00	0.010

7.1.2. DUTY CYCLE PLOTS

HOPPING OFF



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

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

TEST PROCEDURE

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

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

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and is set to 100 KHz RBW / 300 KHz VBW for average measurements.

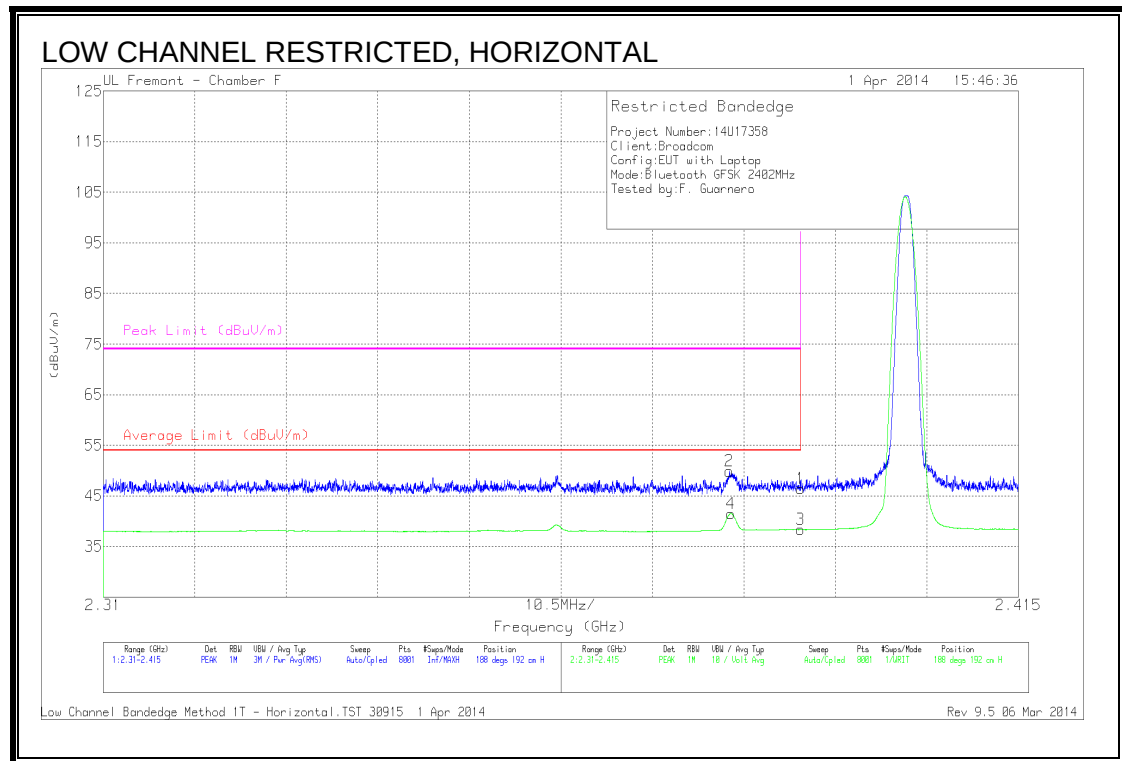
The spectrum from 18GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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

8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	37.68	PK	32.6	-23.8	46.48	-	-	74	-27.52	188	192	H
2	* 2.382	41.06	PK	32.6	-23.8	49.86	-	-	74	-24.14	188	192	H
3	* 2.39	29.54	Avg	32.6	-23.8	38.34	54	-15.66	-	-	188	192	H
4	* 2.382	32.73	Avg	32.6	-23.8	41.53	54	-12.47	-	-	188	192	H

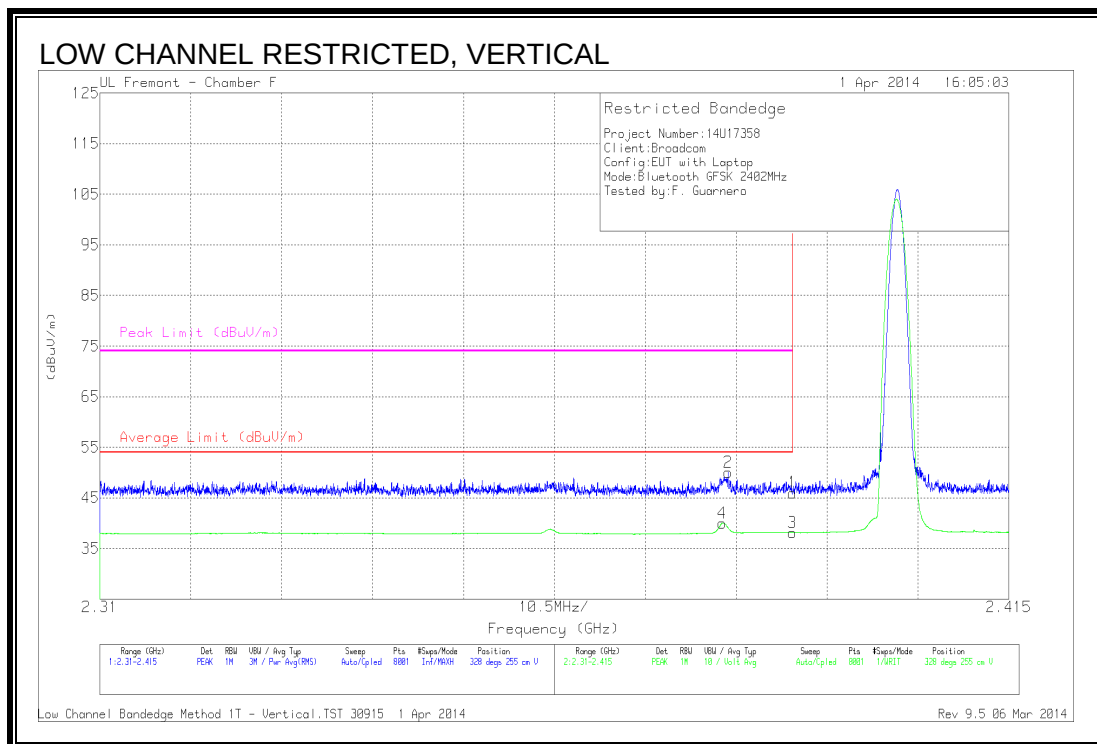
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

Low Channel Bandedge Method 1T - Horizontal.TST 30915 1 Apr 2014

Rev 9.5 06 Mar 2014



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 2.39	29.32	Avg	32.6	-23.8	38.12	54	-15.88	-	-	328	255	V
4	* 2.382	31.2	Avg	32.6	-23.8	40	54	-14	-	-	328	255	V
1	* 2.39	37.21	PK	32.6	-23.8	46.01	-	-	74	-27.99	328	255	V
2	* 2.383	41.19	PK	32.6	-23.8	49.99	-	-	74	-24.01	328	255	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

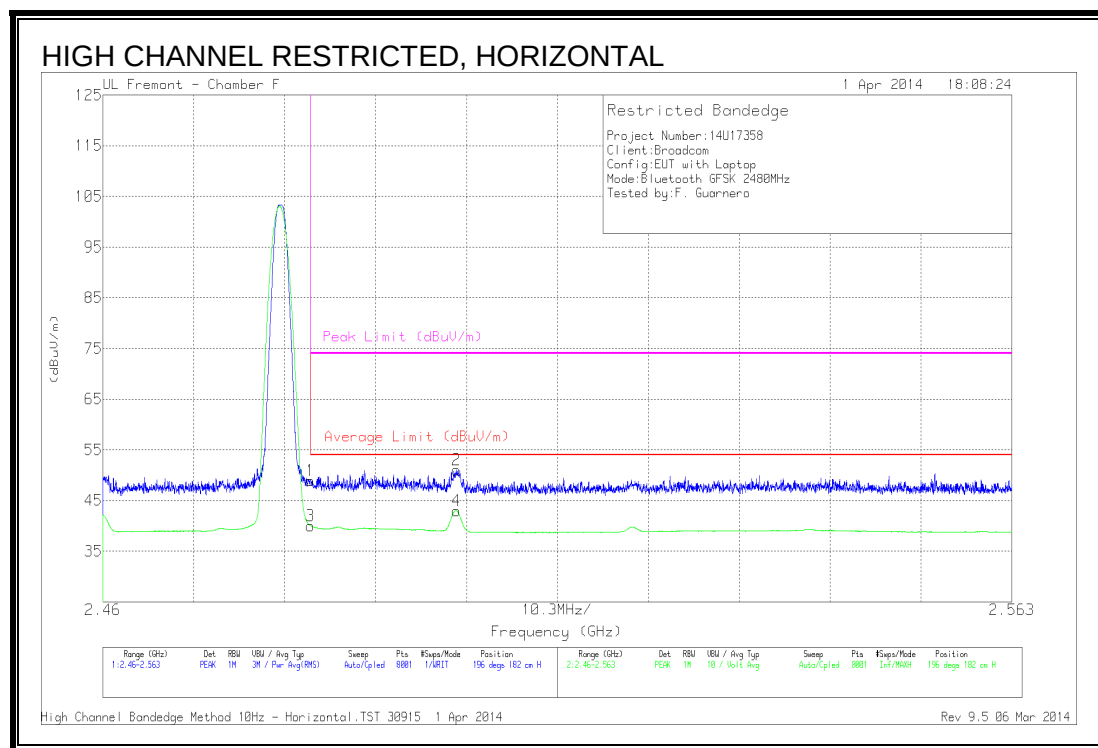
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

Low Channel Bandedge Method 1T - Vertical.TST 30915 1 Apr 2014

Rev 9.5 06 Mar 2014

RESTRICTED BANDEDGE (HIGH CHANNEL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/F lter/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 2.484	30.34	Avg	32.7	-23	40.04	54	-13.96	-	-	196	182	H
4	2.5	33.38	Avg	32.7	-23.1	42.98	54	-11.02	-	-	196	182	H
1	* 2.484	39.27	PK	32.7	-23	48.97	-	-	74	-25.03	196	182	H
2	2.5	41.38	PK	32.7	-23.1	50.98	-	-	74	-23.02	196	182	H

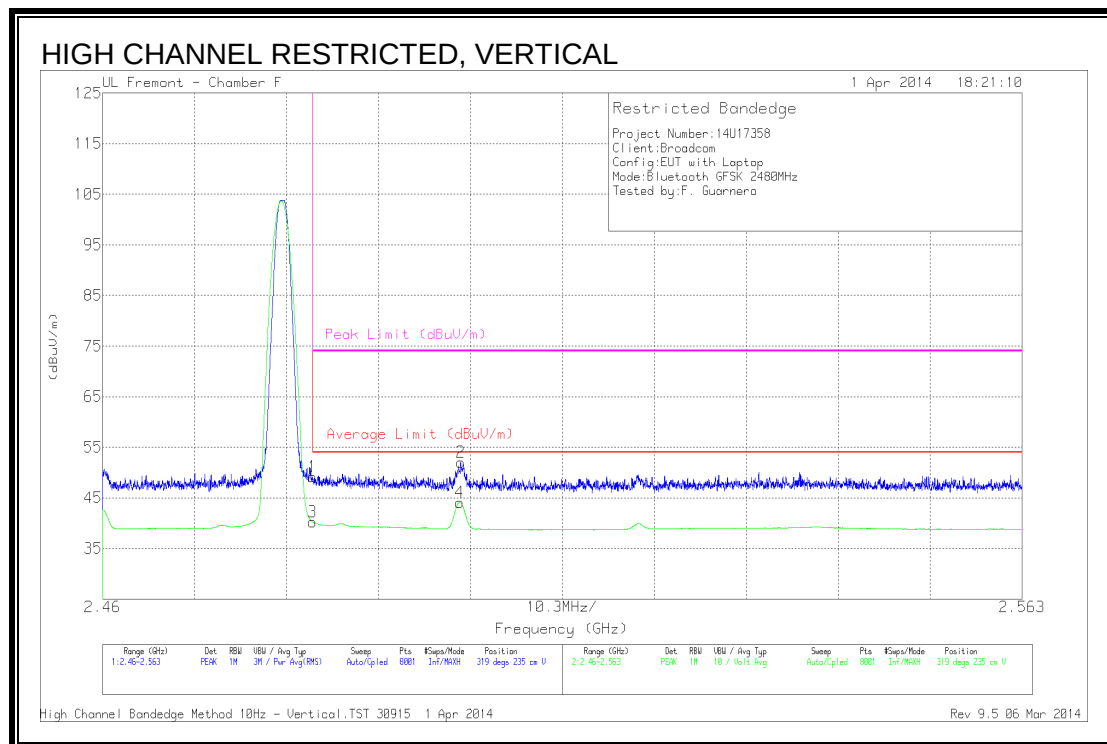
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

High Channel Bandedge Method 10Hz - Horizontal.TST 30915 1 Apr 2014

Rev 9.5 06 Mar 2014



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/F lter/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 2.484	30.58	Avg	32.7	-23	40.28	54	-13.72	-	-	319	235	V
4	* 2.5	34.5	Avg	32.7	-23.1	44.1	54	-9.9	-	-	319	235	V
1	* 2.484	39.42	PK	32.7	-23	49.12	-	-	74	-24.88	319	235	V
2	2.5	42.45	PK	32.7	-23.1	52.05	-	-	74	-21.95	319	235	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

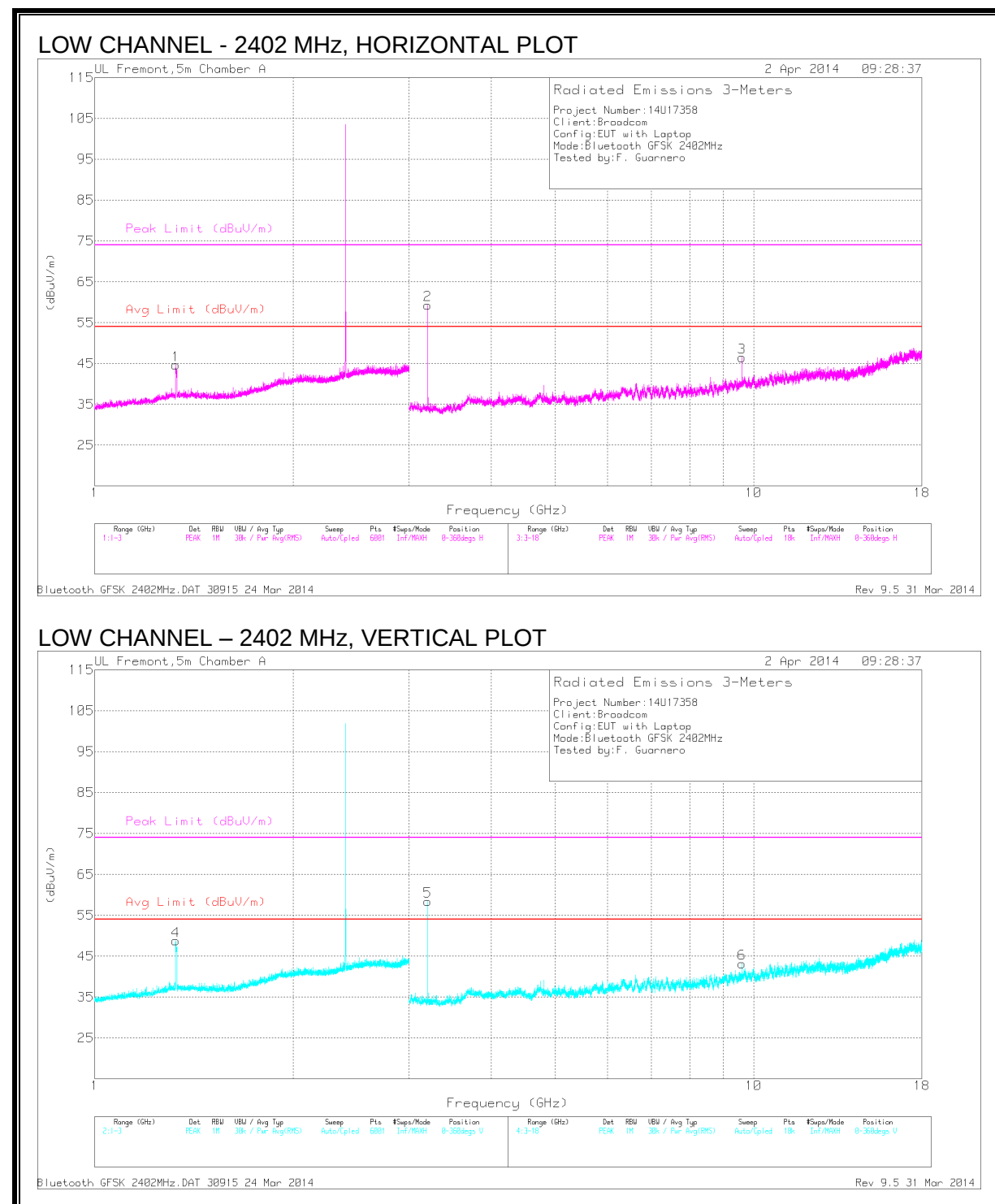
Avg - Video bandwidth < Resolution bandwidth

High Channel Bandedge Method 10Hz - Vertical.TST 30915 1 Apr 2014

Rev 9.5 06 Mar 2014

HARMONICS AND SPURIOUS EMISSIONS

GFSK, LOW CHANNEL 2402MHz



GFSK, LOW CHANNEL 2402MHz, DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.328	42.56	PK	29	-26.9	44.66	-	-	74	-29.34	0-360	203	H
4	* 1.328	46.65	PK	29	-26.9	48.75	-	-	74	-25.25	0-360	101	V
2	3.202	58.62	PK	32.8	-32.1	59.32	-	-	-	-	0-360	100	H
5	3.202	57.73	PK	32.8	-32.1	58.43	-	-	-	-	0-360	200	V
6	9.607	30.51	PK	37	-24.3	43.21	-	-	-	-	0-360	200	V
3	9.608	33.89	PK	37	-24.4	46.49	-	-	-	-	0-360	100	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.33	48.22	PK3	29	-26.8	50.42	-	-	74	-23.58	259	199	H
* 1.329	34.88	VB10	29	-26.8	37.08	54	-16.92	-	-	259	199	H
* 4.946	43.64	PK1	34.1	-21.7	56.04	-	-	74	-17.96	266	310	H
* 4.942	33.73	AD1	34.1	-21.8	46.03	54	-7.97	-	-	266	310	H
* 1.328	51.96	PK3	29	-26.9	54.06	-	-	74	-19.94	229	130	V
* 1.329	39.06	VB10	29	-26.8	41.26	54	-12.74	-	-	229	130	V
* 4.882	46.33	PK3	34	-30.8	49.53	-	-	74	-24.47	152	184	V
* 4.882	38.02	VB10	34	-30.9	41.12	54	-12.88	-	-	152	184	V
3.203	60.45	PK3	32.8	-32.1	61.15	-	-	-	-	174	107	H
3.203	58.88	PK3	32.8	-32.1	59.58	-	-	-	-	152	173	V
9.608	43.58	PK3	37	-24.4	56.18	-	-	-	-	156	102	H
9.608	40.81	PK3	37	-24.4	53.41	-	-	-	-	2	222	V
9.766	41.57	PK3	37.1	-25.4	53.27	-	-	-	-	119	229	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK1 - KDB789033 Method: Peak

AD1 - KDB789033 Method: AD Primary Power Average

PK3 - FHSS Method: Maximum Peak

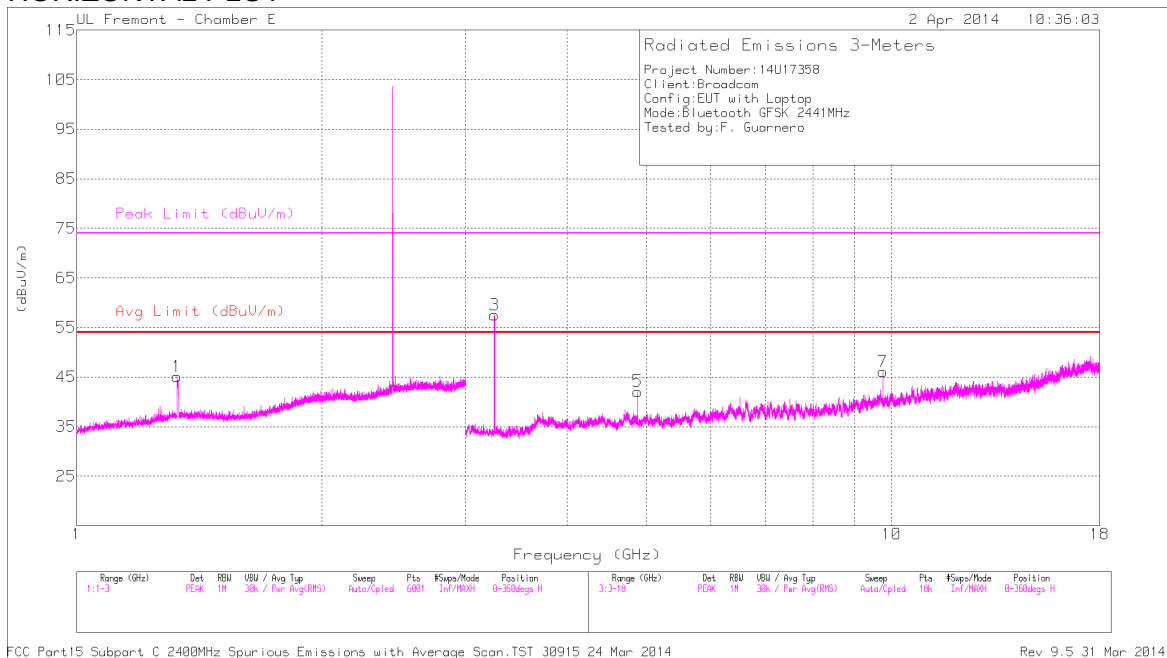
VB10Hz - FHSS Method: 10Hz Video Bandwidth

Bluetooth GFSK 2402MHz.DAT 30915 24 Mar 2014

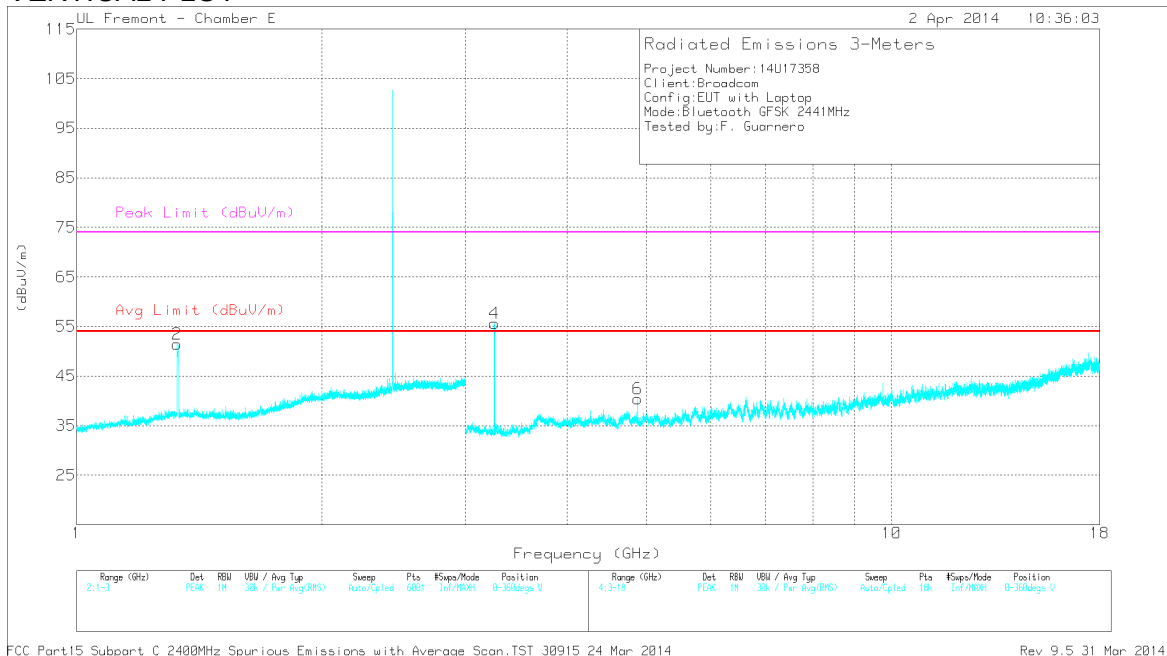
Rev 9.5 31 Mar 2014

GFSK, MID CHANNEL 2441MHZ

HORIZONTAL PLOT



VERTICAL PLOT



GFSK, MID CHANNEL 2441MHz, DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.328	42.95	PK	29	-26.9	45.05	-	-	74	-28.95	0-360	200	H
2	* 1.328	49.29	PK	29	-26.9	51.39	-	-	74	-22.61	0-360	101	V
5	* 4.882	39.01	PK	34	-30.9	42.11	-	-	74	-31.89	0-360	101	H
6	* 4.882	37.21	PK	34	-30.8	40.41	-	-	74	-33.59	0-360	200	V
3	3.255	57.03	PK	32.8	-32.3	57.53	-	-	-	-	0-360	101	H
4	3.255	55.18	PK	32.8	-32.3	55.68	-	-	-	-	0-360	200	V
7	9.764	34.37	PK	37.1	-25.4	46.07	-	-	-	-	0-360	101	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.332	49.54	PK3	29	-26.8	51.74	-	-	74	-22.26	188	105	H
* 1.33	36.59	VB10	29	-26.8	38.79	54	-15.21	-	-	188	105	H
* 1.329	54.19	PK3	29	-26.8	56.39	-	-	74	-17.61	237	117	V
* 1.329	41.33	VB10	29	-26.8	43.53	54	-10.47	-	-	237	117	V
* 4.882	46.59	PK3	34	-30.9	49.69	-	-	74	-24.31	134	117	H
* 4.882	39.79	VB10	34	-30.9	42.89	54	-11.11	-	-	134	117	H
* 4.882	46.33	PK3	34	-30.8	49.53	-	-	74	-24.47	152	184	V
* 4.882	38.02	VB10	34	-30.9	41.12	54	-12.88	-	-	152	184	V
3.255	58.1	PK3	32.8	-32.3	58.6	-	-	-	-	171	106	H
3.255	57.96	PK3	32.8	-32.3	58.46	-	-	-	-	146	170	V
9.766	41.57	PK3	37.1	-25.4	53.27	-	-	-	-	119	229	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

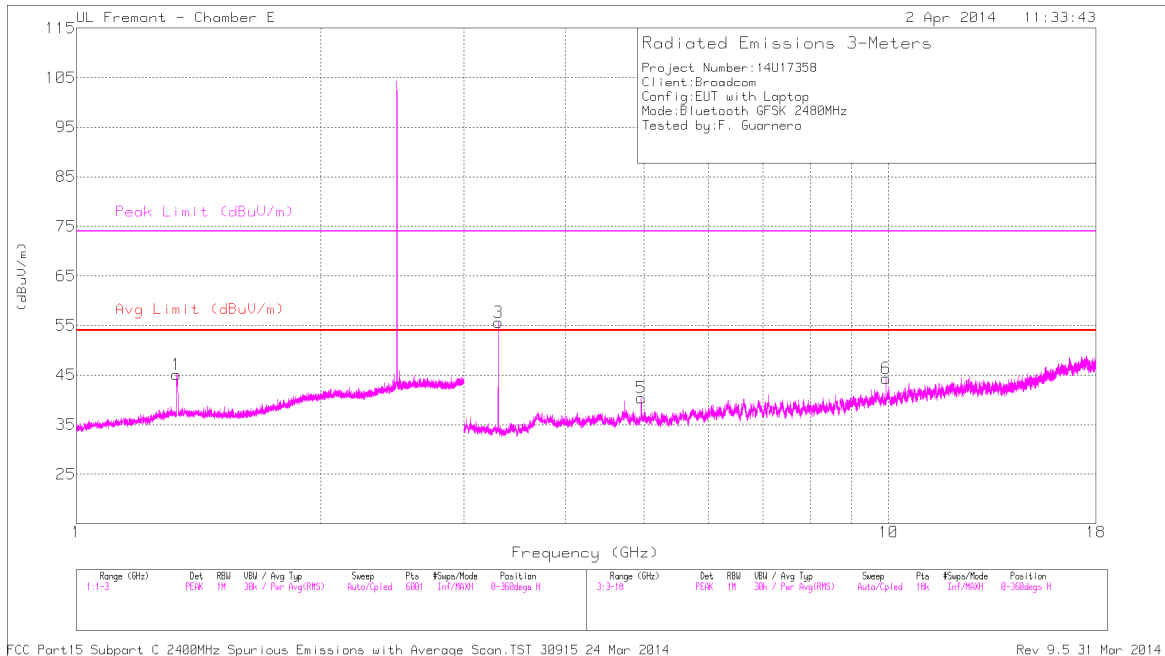
VB10Hz - FHSS Method: 10Hz Video Bandwidth

FCC Part15 Subpart C 2400MHz Spurious Emissions with Average Scan.TST 30915 24 Mar 2014

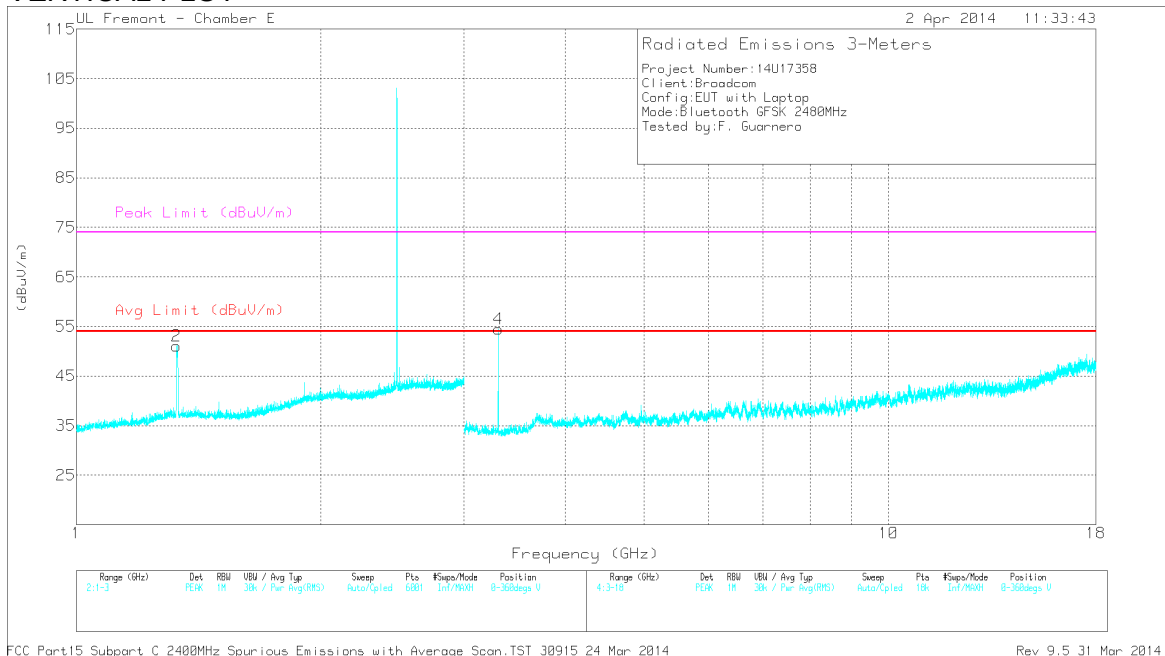
Rev 9.5 31 Mar 2014

GFSK, HIGH CHANNEL 2480MHz

HORIZONTAL PLOT



VERTICAL PLOT



HIGH CHANNEL 2480MHz, DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.328	43.05	PK	29	-26.9	45.15	-	-	74	-28.85	0-360	201	H
2	* 1.328	48.91	PK	29	-26.9	51.01	-	-	74	-22.99	0-360	101	V
5	* 4.96	36.84	PK	34.1	-30.5	40.44	-	-	74	-33.56	0-360	101	H
3	3.307	54.78	PK	32.8	-31.9	55.68	-	-	-	-	0-360	101	H
4	3.307	53.6	PK	32.8	-31.9	54.5	-	-	-	-	0-360	199	V
6	9.92	31.99	PK	37.1	-24.8	44.29	-	-	-	-	0-360	101	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.33	49.89	PK3	29	-26.8	52.09	-	-	74	-21.91	187	107	H
* 1.332	36.82	VB10	29	-26.8	39.02	54	-14.98	-	-	187	107	H
* 1.328	54.22	PK3	29	-26.9	56.32	-	-	74	-17.68	240	119	V
* 1.329	41.55	VB10	29	-26.8	43.75	54	-10.25	-	-	240	119	V
* 4.96	45.33	PK3	34.1	-30.5	48.93	-	-	74	-25.07	158	103	H
* 4.96	34.16	VB10	34.1	-30.5	37.76	54	-16.24	-	-	158	103	H
3.307	56.53	PK3	32.8	-31.9	57.43	-	-	-	-	172	103	H
3.307	56.03	PK3	32.8	-31.9	56.93	-	-	-	-	147	159	V
9.92	41.47	PK3	37.1	-24.8	53.77	-	-	-	-	158	103	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

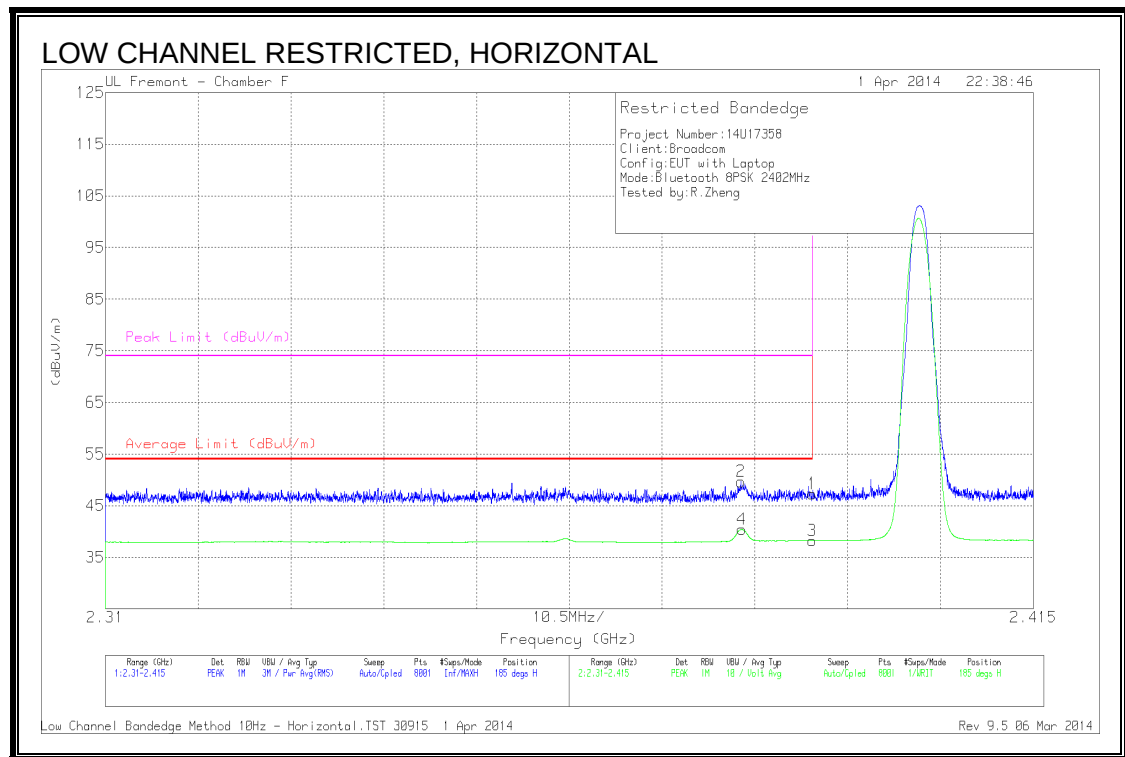
VB10Hz - FHSS Method: 10Hz Video Bandwidth

FCC Part15 Subpart C 2400MHz Spurious Emissions with Average Scan.TST 30915 24 Mar 2014

Rev 9.5 31 Mar 2014

8.2.2. ENHANCED DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	38.49	PK	32.6	-23.8	47.29	-	-	74	-26.71	185	271	H
2	* 2.382	40.87	PK	32.6	-23.8	49.67	-	-	74	-24.33	185	271	H
3	* 2.39	29.42	Avg	32.6	-23.8	38.22	54	-15.78	-	-	185	271	H
4	* 2.382	31.61	Avg	32.6	-23.8	40.41	54	-13.59	-	-	185	271	H

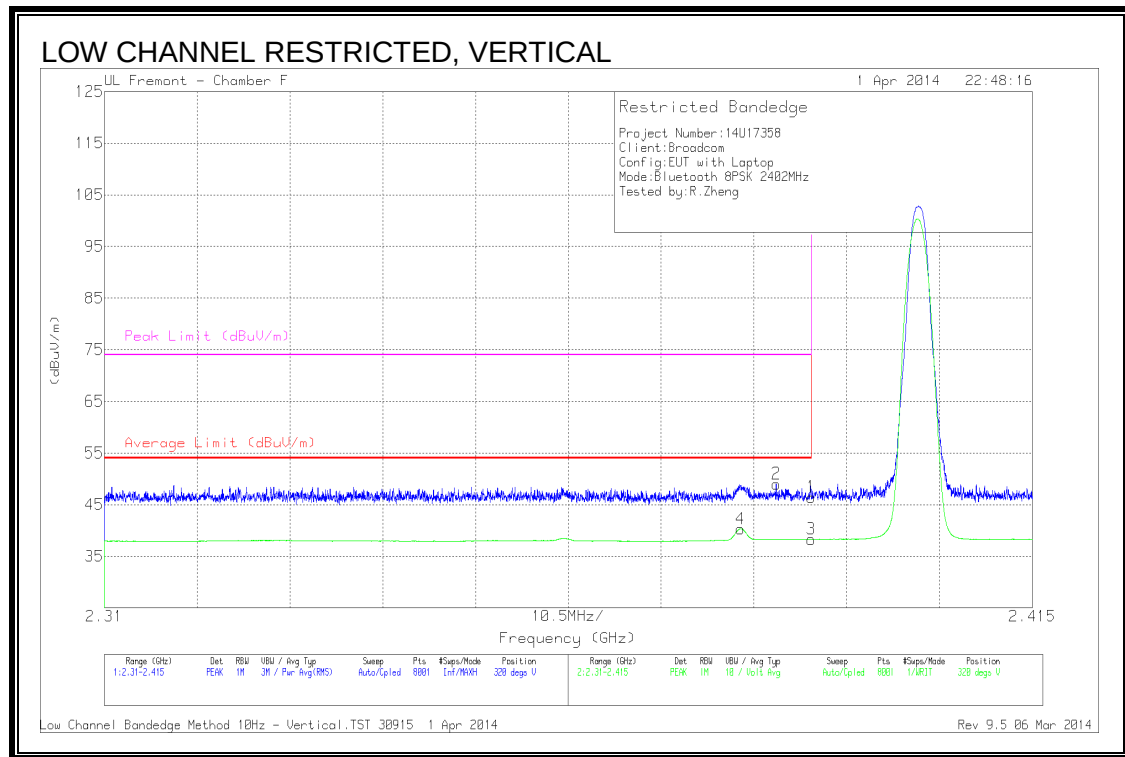
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

Low Channel Bandedge Method 10Hz - Horizontal.TST 30915 1 Apr 2014

Rev 9.5 06 Mar 2014



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/F lter/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 2.39	29.5	Avg	32.6	-23.8	38.3	54	-15.7	-	-	320	256	V
4	* 2.382	31.5	Avg	32.6	-23.8	40.3	54	-13.7	-	-	320	256	V
1	* 2.39	37.66	PK	32.6	-23.8	46.46	-	-	74	-27.54	320	256	V
2	* 2.386	40.23	PK	32.6	-23.8	49.03	-	-	74	-24.97	320	256	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

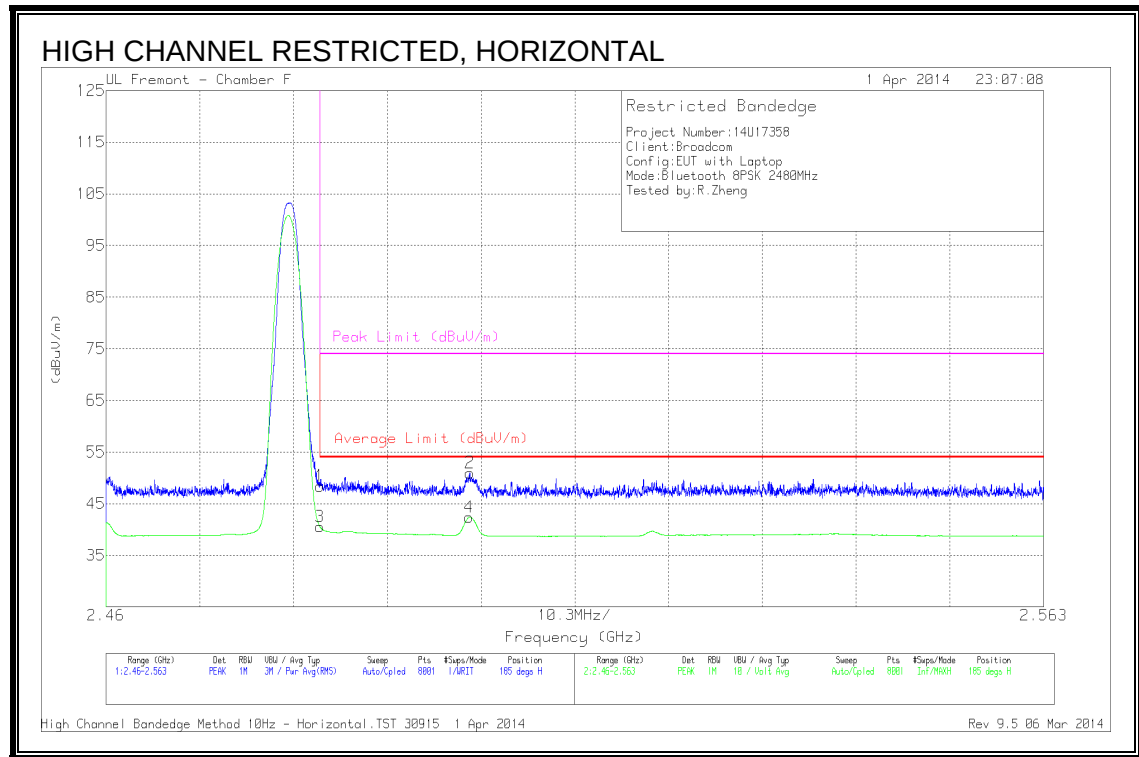
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

Low Channel Bandedge Method 10Hz - Vertical.TST 30915 1 Apr 2014

Rev 9.5 06 Mar 2014

RESTRICTED BANDEDGE (HIGH CHANNEL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/F lter/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 2.484	30.84	Avg	32.7	-23	40.54	54	-13.46	-	-	185	280	H
4	* 2.5	32.79	Avg	32.7	-23.1	42.39	54	-11.61	-	-	185	280	H
1	* 2.484	38.7	PK	32.7	-23	48.4	-	-	74	-25.6	185	280	H
2	* 2.5	41.38	PK	32.7	-23.1	50.98	-	-	74	-23.02	185	280	H

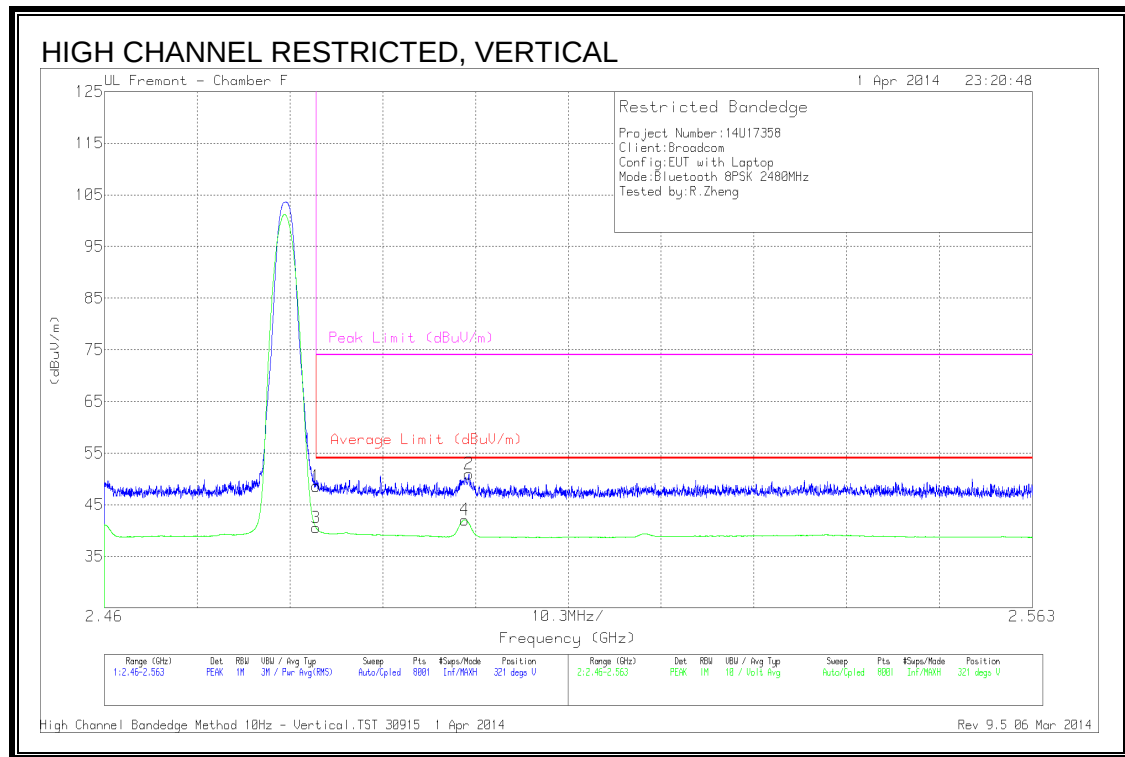
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

High Channel Bandedge Method 10Hz - Horizontal.TST 30915 1 Apr 2014

Rev 9.5 06 Mar 2014



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/F lter/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 2.484	30.82	Avg	32.7	-23	40.52	54	-13.48	-	-	321	278	V
4	2.5	32.47	Avg	32.7	-23.1	42.07	54	-11.93	-	-	321	278	V
1	* 2.484	38.88	PK	32.7	-23	48.58	-	-	74	-25.42	321	278	V
2	2.5	41.38	PK	32.7	-23.1	50.98	-	-	74	-23.02	321	278	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

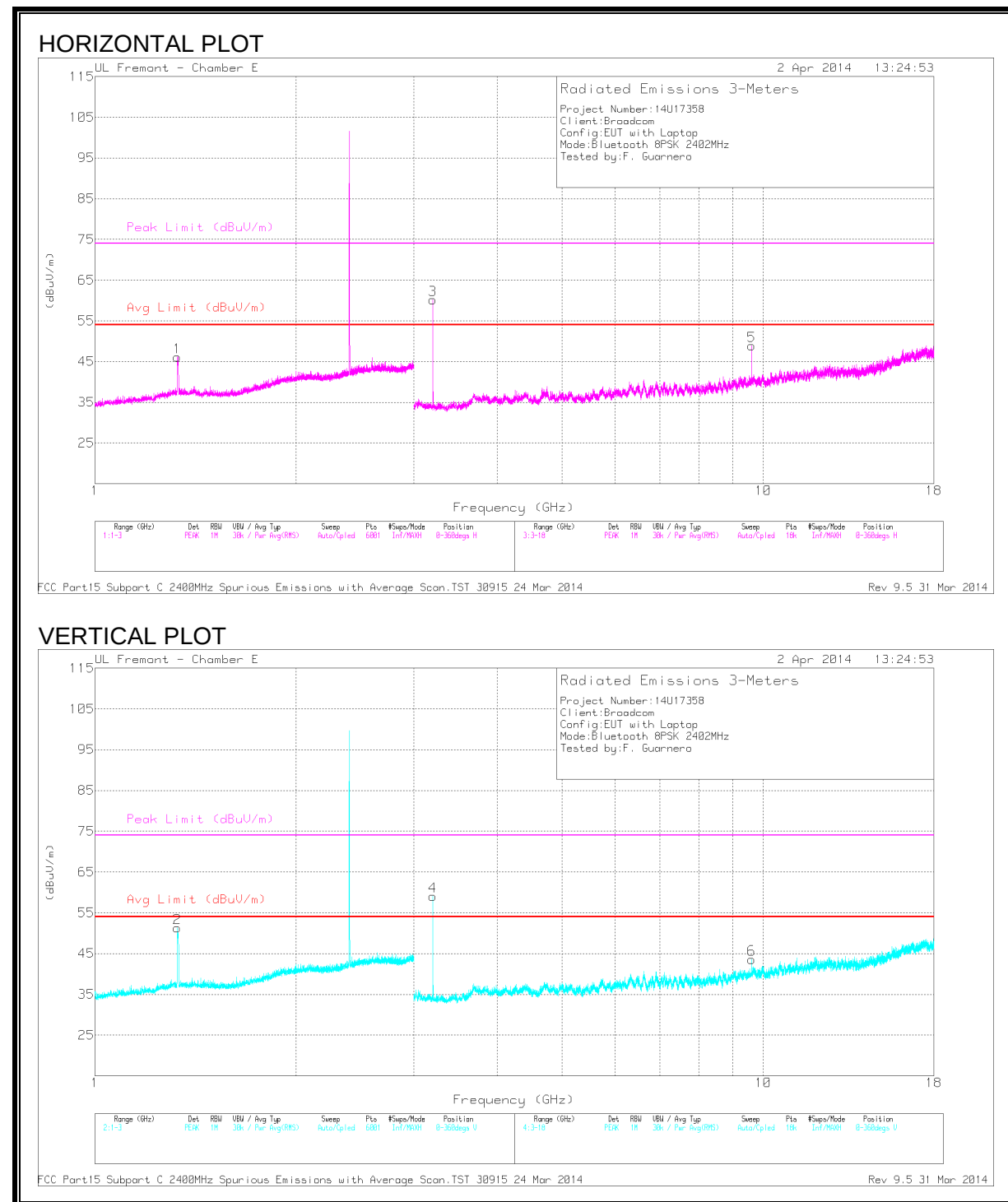
Avg - Video bandwidth < Resolution bandwidth

High Channel Bandedge Method 10Hz - Vertical.TST 30915 1 Apr 2014

Rev 9.5 06 Mar 2014

HARMONICS AND SPURIOUS EMISSIONS

8PSK, LOW CHANNEL 2402MHZ



8PSK, LOW CHANNEL 2402MHz, DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.328	43.98	PK	29	-26.9	46.08	-	-	74	-27.92	0-360	200	H
2	* 1.328	49.13	PK	29	-26.8	51.33	-	-	74	-22.67	0-360	101	V
3	3.202	59.5	PK	32.8	-32.1	60.2	-	-	-	-	0-360	101	H
4	3.202	58.3	PK	32.8	-32.1	59	-	-	-	-	0-360	200	V
5	9.608	36.35	PK	37	-24.4	48.95	-	-	-	-	0-360	101	H
6	9.608	31.03	PK	37	-24.4	43.63	-	-	-	-	0-360	101	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.327	50.38	PK3	29	-26.9	52.48	-	-	74	-21.52	191	188	H
* 1.329	37.53	VB10	29	-26.8	39.73	54	-14.27	-	-	191	188	H
* 1.333	54.78	PK3	29	-26.8	56.98	-	-	74	-17.02	242	112	V
* 1.329	42.01	VB10	29	-26.8	44.21	54	-9.79	-	-	242	112	V
3.203	55.18	PK3	32.8	-32.1	55.88	-	-	-	-	242	112	H
3.203	52.58	PK3	32.8	-32.1	53.28	-	-	-	-	242	112	V
9.608	41.72	PK3	37	-24.4	54.32	-	-	-	-	149	102	H
9.608	41.72	PK3	37	-24.4	54.32	-	-	-	-	15	102	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

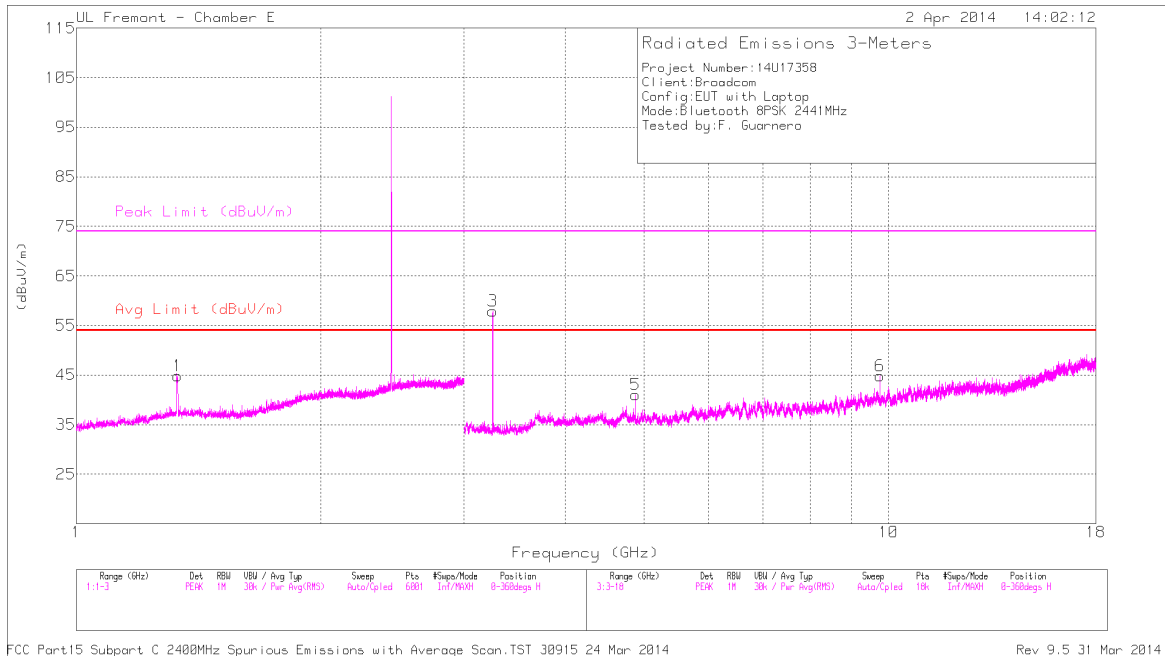
VB10Hz - FHSS Method: 10Hz Video Bandwidth

FCC Part15 Subpart C 2400MHz Spurious Emissions with Average Scan.TST 30915 24 Mar 2014

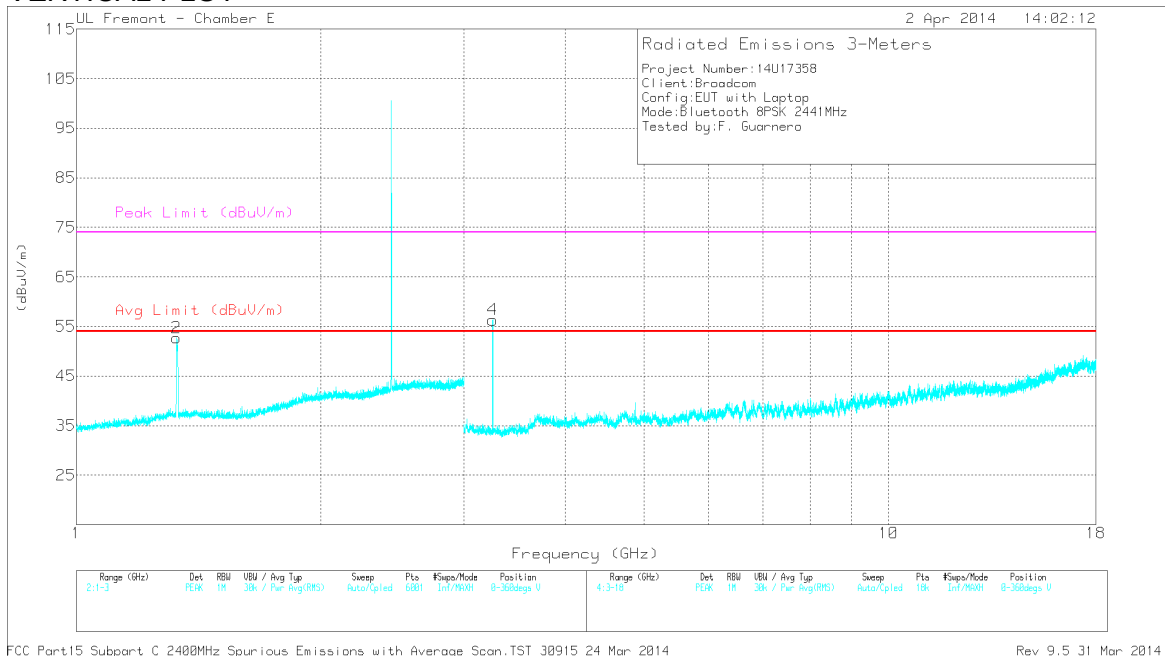
Rev 9.5 31 Mar 2014

8PSK, MID CHANNEL 2441MHz

HORIZONTAL PLOT



VERTICAL PLOT



8PSK, MID CHANNEL 2441MHz, DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.333	42.65	PK	29	-26.8	44.85	-	-	74	-29.15	0-360	199	H
2	* 1.328	50.56	PK	29	-26.9	52.66	-	-	74	-21.34	0-360	101	V
5	* 4.882	37.91	PK	34	-30.9	41.01	-	-	74	-32.99	0-360	101	H
3	3.255	57.41	PK	32.8	-32.3	57.91	-	-	-	-	0-360	101	H
4	3.255	55.83	PK	32.8	-32.3	56.33	-	-	-	-	0-360	200	V
6	9.764	33.17	PK	37.1	-25.4	44.87	-	-	-	-	0-360	101	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.329	50.32	PK3	29	-26.8	52.52	-	-	74	-21.48	190	180	H
* 1.329	37.66	VB10	29	-26.8	39.86	54	-14.14	-	-	190	180	H
* 1.33	54.79	PK3	29	-26.8	56.99	-	-	74	-17.01	237	115	V
* 1.329	42.21	VB10	29	-26.8	44.41	54	-9.59	-	-	237	115	V
* 4.882	45.26	PK3	34	-30.9	48.36	-	-	74	-25.64	135	123	H
* 4.882	36.48	VB10	34	-30.9	39.58	54	-14.42	-	-	135	123	H
3.255	59.27	PK3	32.8	-32.3	59.77	-	-	-	-	173	102	H
3.255	57.67	PK3	32.8	-32.3	58.17	-	-	-	-	149	200	V
9.764	39.55	PK3	37.1	-25.4	51.25	-	-	-	-	154	102	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

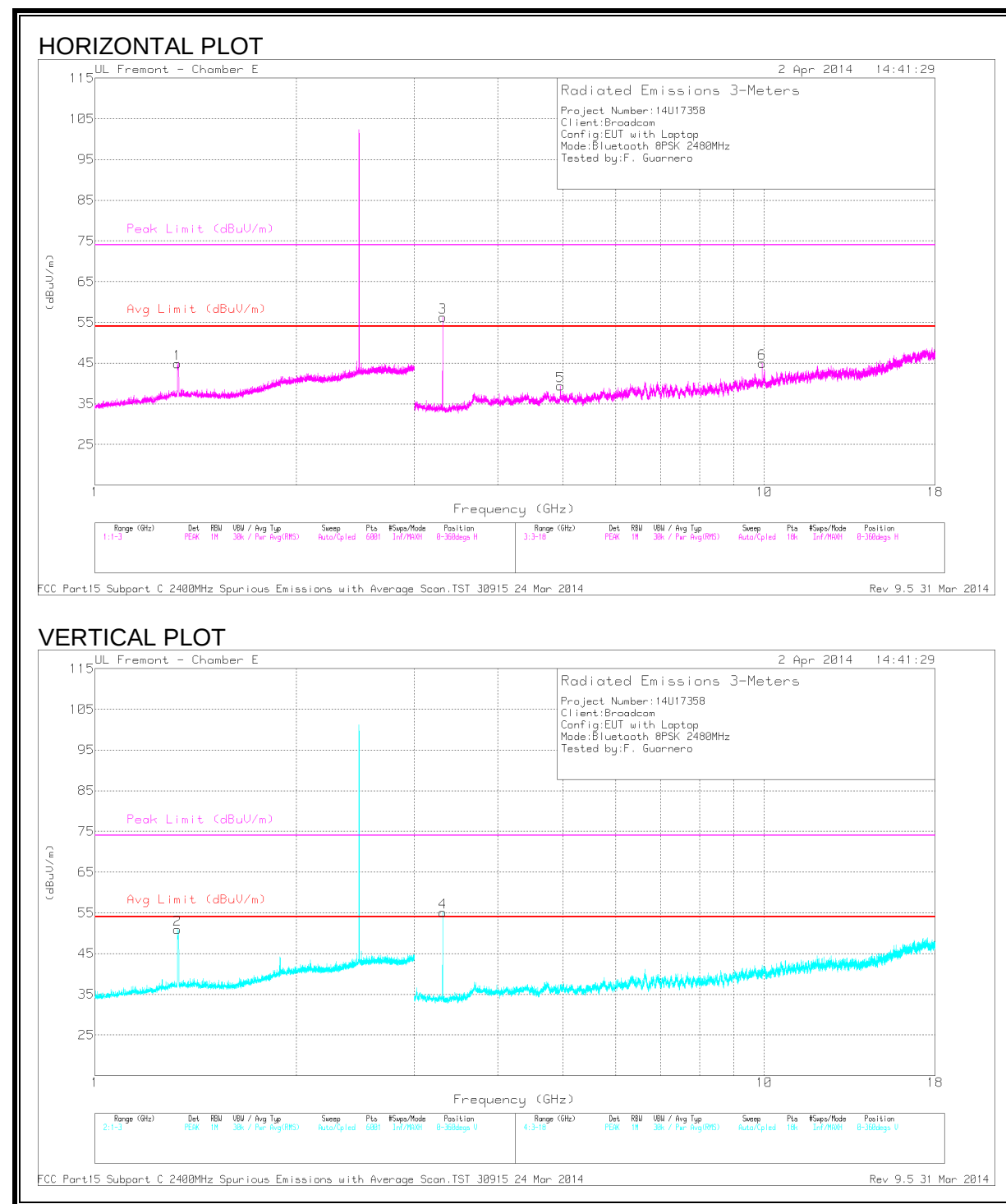
PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

FCC Part15 Subpart C 2400MHz Spurious Emissions with Average Scan.TST 30915 24 Mar 2014

Rev 9.5 31 Mar 2014

8PSK, HIGH CHANNEL 2480MHZ



8PSK, HIGH CHANNEL 2480MHz, DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.327	42.75	PK	29	-26.9	44.85	-	-	74	-29.15	0-360	102	H
2	* 1.328	48.76	PK	29	-26.8	50.96	-	-	74	-23.04	0-360	101	V
5	* 4.96	35.8	PK	34.1	-30.5	39.4	-	-	74	-34.6	0-360	101	H
3	3.307	55.38	PK	32.8	-31.9	56.28	-	-	-	-	0-360	101	H
4	3.307	54.19	PK	32.8	-31.9	55.09	-	-	-	-	0-360	200	V
6	9.92	32.72	PK	37.1	-24.8	45.02	-	-	-	-	0-360	101	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.331	49.37	PK3	29	-26.8	51.57	-	-	74	-22.43	201	187	H
* 1.328	36.51	VB10	29	-26.8	38.71	54	-15.29	-	-	201	187	H
* 1.331	53.9	PK3	29	-26.8	56.1	-	-	74	-17.9	236	116	V
* 1.329	41.05	VB10	29	-26.8	43.25	54	-10.75	-	-	236	116	V
* 4.96	44.54	PK3	34.1	-30.5	48.14	-	-	74	-25.86	184	199	H
* 4.96	33.03	VB10	34.1	-30.5	36.63	54	-17.37	-	-	184	199	H
3.307	57.03	PK3	32.8	-31.9	57.93	-	-	-	-	171	102	H
3.307	56.11	PK3	32.8	-31.9	57.01	-	-	-	-	148	200	V
9.918	40.34	PK3	37.1	-24.8	52.64	-	-	-	-	134	102	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

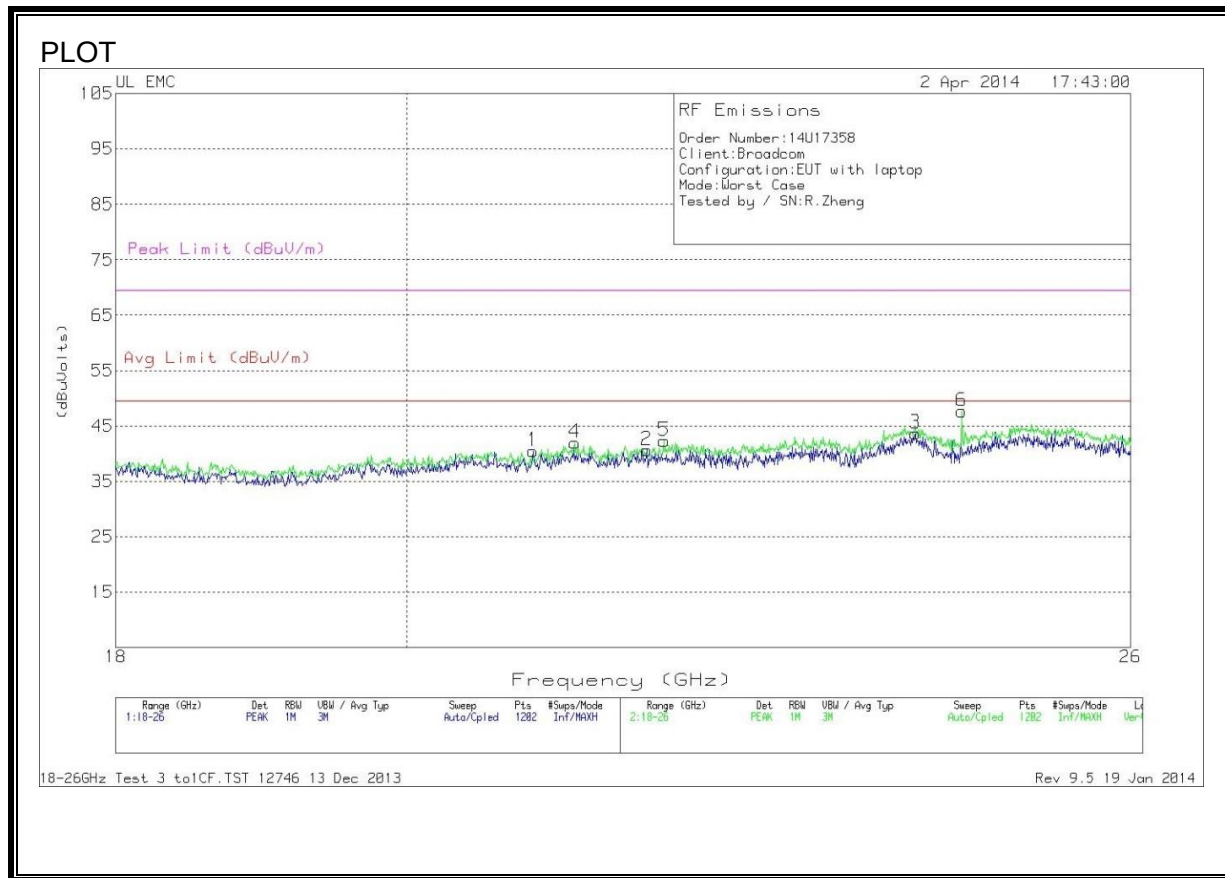
VB10Hz - FHSS Method: 10Hz Video Bandwidth

FCC Part15 Subpart C 2400MHz Spurious Emissions with Average Scan.TST 30915 24 Mar 2014

Rev 9.5 31 Mar 2014

8.3. WORST-CASE SPURIOUS EMISSION 18 – 26 GHz

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



Trace Markers

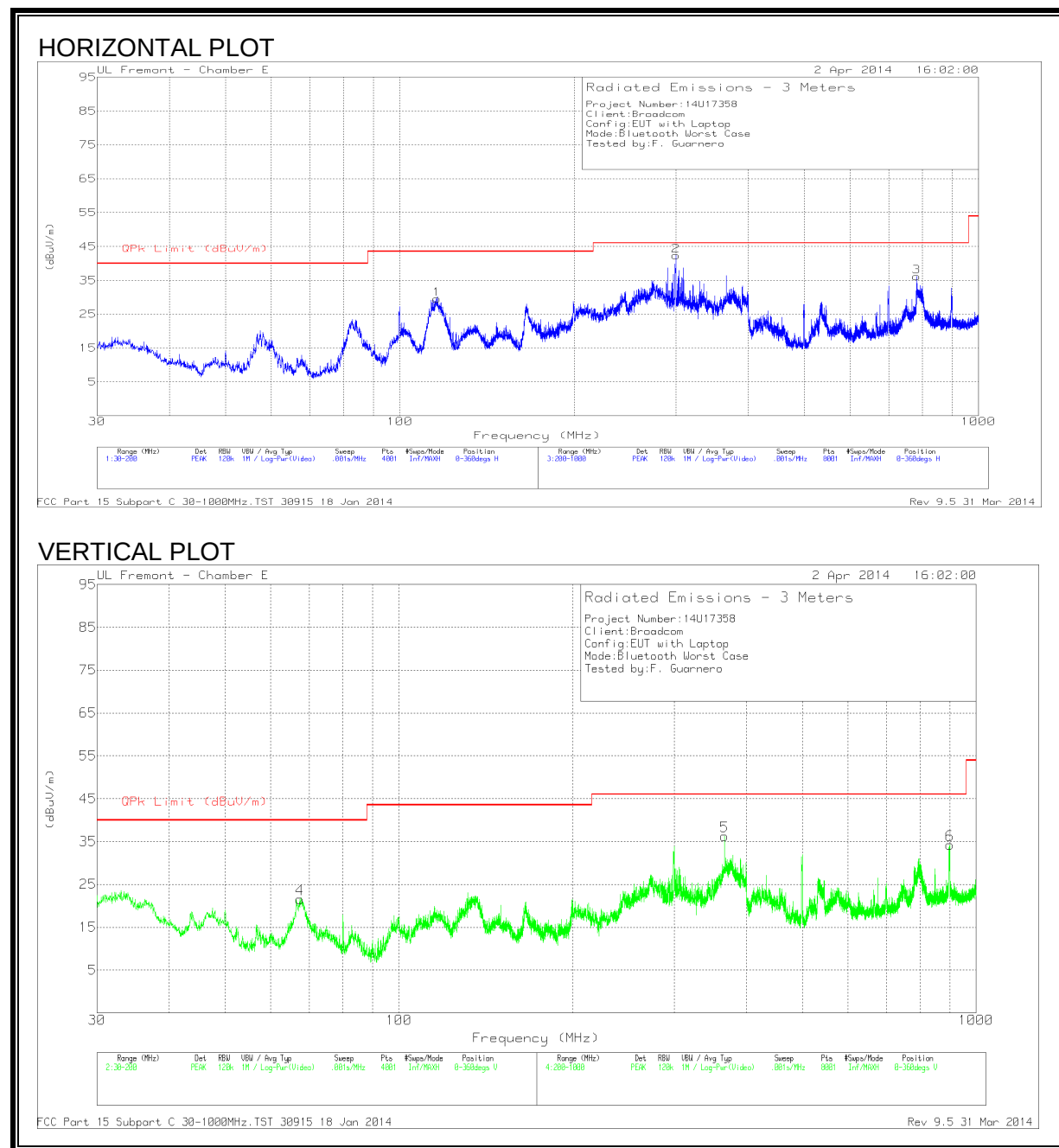
Marker	Frequency (GHz)	Meter Reading (dBUV)	Det	AF T89 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBUVolts)	Avg Limit (dBUV/m)	Margin (dB)	Peak Limit (dBUV/m)	PK Margin (dB)
1	20.938	41.4	PK	32.9	-24.3	-9.5	40.5	49.5	-9	69.5	-29
2	21.817	40.97	PK	33.3	-24.1	-9.5	40.67	49.5	-8.83	69.5	-28.83
3	24.048	42.37	PK	33.6	-22.8	-9.5	43.67	49.5	-5.83	69.5	-25.83
4	21.257	42.3	PK	33	-23.8	-9.5	42	49.5	-7.5	69.5	-27.5
5	21.957	42.43	PK	33.3	-23.9	-9.5	42.33	49.5	-7.167	69.5	-27.17
6	24.455	46.37	PK	33.8	-23	-9.5	47.67	49.5	-1.83	69.5	-21.83

PK - Peak detector

18-26GHz Test 3 to1CF.TST 12746 13 Dec 2013 Rev 9.5 19 Jan 2014

8.4. WORST-CASE BELOW 1 GHz

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



WORST CASE BELOW 1GHz – DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 15.9775	47.29	PK	13.6	-31.4	29.49	43.52	-14.03	0-360	301	H
4	67.4425	44.42	PK	8	-30.9	21.52	40	-18.48	0-360	100	V
2	300	59.34	PK	13.3	-30.3	42.34	46.02	-3.68	0-360	100	H
5	366.7	51.45	PK	14.9	-30.1	36.25	46.02	-9.77	0-360	100	V
3	781.2	43.89	PK	21.2	-29	36.09	46.02	-9.93	0-360	100	H
6	899.8	40.44	PK	22.2	-28.4	34.24	46.02	-11.78	0-360	201	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
300.008	58.24	QP	13.3	-30.3	41.24	46.02	-4.78	38	112	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

QP - Quasi-Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 18 Jan 2014

Rev 9.5 31 Mar 2014