FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

BT + ZIGBEE and WLAN DTS/UNII a/b/g/n MIMO

MODEL NUMBER: ID:082

FCC ID: DKN1018

REPORT NUMBER: 15U20805-E1

ISSUE DATE: AUGUST 10, 2015

Prepared for
Echostar Technologies, LLC
94 Inverness Terrace East
Englewood, CO 80112, U.S.A.

Prepared by
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	08/10/15	Initial Issue	P. ZHANG

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Echostar Technologies LLC

EUT DESCRIPTION: BT+ZIGBEE+WLAN DTS/UNII a/b/g/n MIMO

MODEL: ID: 082

SERIAL NUMBER: 208117-02-095 (Conducted) ; 208117-02-117 (Radiated)

DATE TESTED: JULY 23 – AUGUST 10, 2015

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

PENG ZHANG
CONSUMER TECHNOLOGY DIVISION
PROJECT LEAD
UL Verification Services Inc.

Tested By:

JUDE SEMANA
CONSUMER TECHNOLOGY DIVISION
LAB TECHNICIAN
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.

ANSI C63.10-2009 Deviation
Radiated spurious emission above 1GHz EUT height is 1.5m not 0.8m.

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(IC: 2324B-1)	☐ Chamber D(IC: 2324B-4)
☐ Chamber B(IC: 2324B-2)	☐ Chamber E(IC: 2324B-5)
☒ Chamber C(IC: 2324B-3)	☐ Chamber F(IC: 2324B-6)
	☐ Chamber G(IC: 2324B-7)
	☐ Chamber H(IC: 2324B-8)

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 18000 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 a BLUETOOTH, ZIGBEE and DTS/UNII a/b/g/n MIMO Sattellite setup box.

5.2. 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	Basic GFSK	-1.55	0.70
2402 - 2480	Enhanced 8PSK	0.90	1.23

Note: GFSK, Pi/4-DQPSK, 8PSK average Power are all investigated, The GFSK & 8PSK Power are the worst case. Testing is based on this mode to showing compliance. For average power data please refer to section 8.6.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Printed antenna, with a maximum gain of 0 dBi.

5.4. 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.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	HP	Elitebook 8570W	N/A	N/A
Router	NETGEAR	N150	N/A	N/A

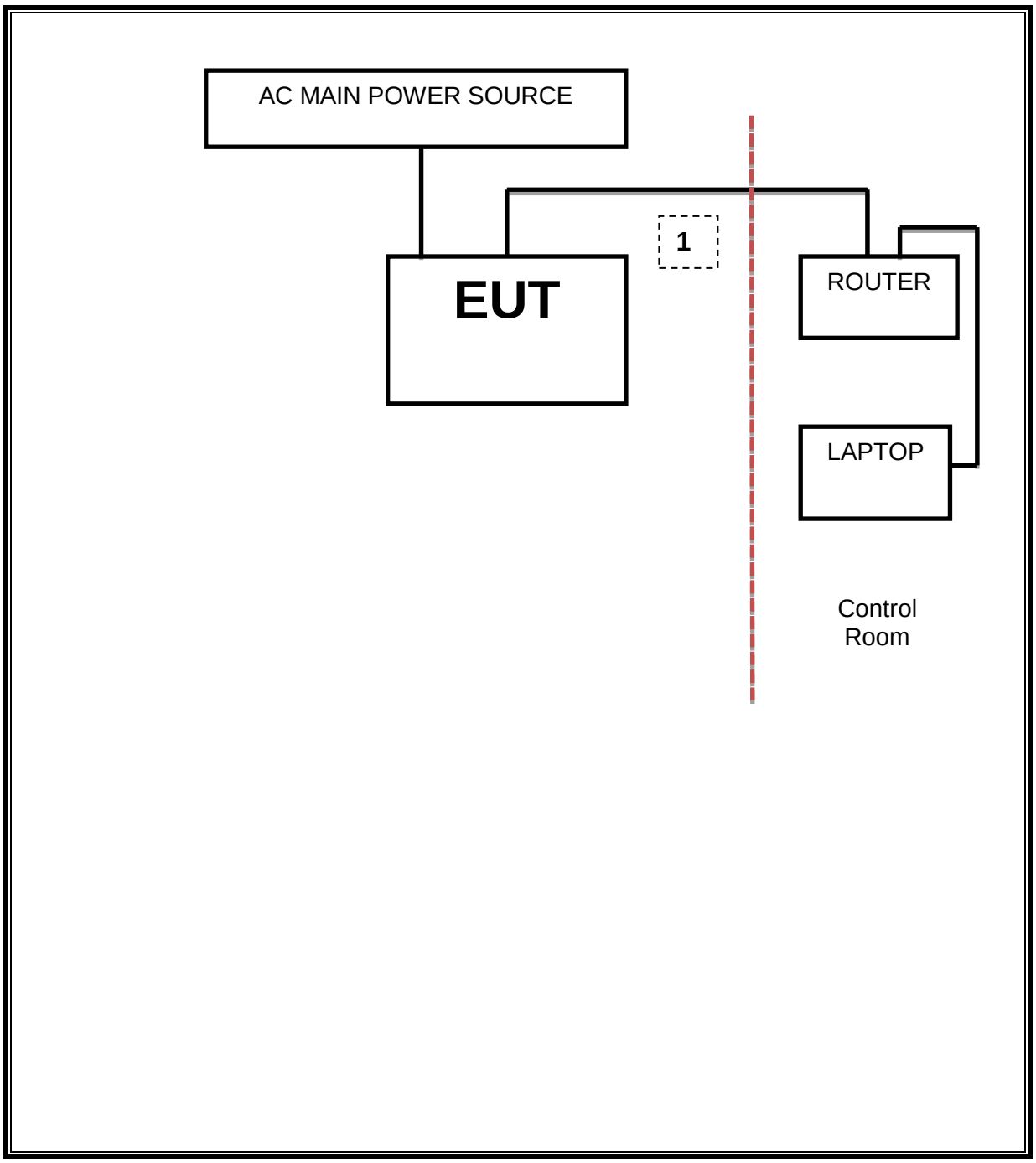
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	ethernet	1	RJ-45	un-shielded	5	N/A
2						N/A

TEST SETUP

EUT was set in the Hidden menu mode to enable BT communications.

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 Due**
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/13/16
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/15
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/15
RF Preamplifier, 100KHz -> 1300MHz	HP	TBD	C00825	06/01/16
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	T404	06/29/16
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/15
CBT Bluetooth Tester	R & S	CBT	T258	06/30/16
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/16
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014	
Conducted Software	UL	UL EMC	Ver 9.5, May 17 2012	
CLT Software	UL	UL RF	Ver 1.0, Feb 2 2015	
Antenna Port Software	UL	UL RF	Ver 2.1.1.1, Jan 20 2015	

7. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
2.1049	RSS-GEN 4.6	Occupied Band width (99%)	N/A	Conducted	Pass	1.2255 MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-47.15 dBm
15.247 (b)(1)	RSS-210 A8.4	TX conducted output power	<21dBm		Pass	0.90 dBm
15.247 (a)(1)	RSS-210 A8.1(b)	Hopping frequency separation	> 25KHz		Pass	1 MHz
15.247 (a)(1)(iii)	RSS-210 A8.1(d)	Number of Hopping channels	More than 15 non-overlapping channels		Pass	79
15.247 (a)(1)(iii)	RSS-210 A8.1(d)	Avg Time of Occupancy	< 0.4sec		Pass	0.28832sec
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	52.04 dBuV (AV)
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	44.67 dBuv/m

8. ANTENNA PORT TEST RESULTS

8.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

RESULTS

8.1.1. BASIC DATA RATE GFSK MODULATION

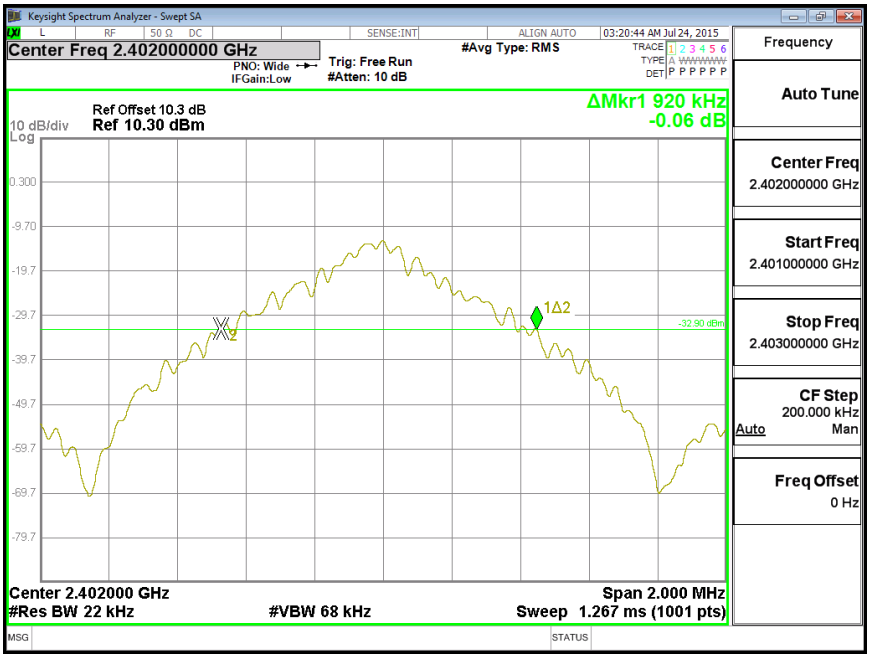
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.920	0.907
Middle	2441	0.934	0.848
High	2480	0.940	0.842
Worst		0.94	0.90743

8.1.1. ENHANCED DATA RATE 8PSK MODULATION

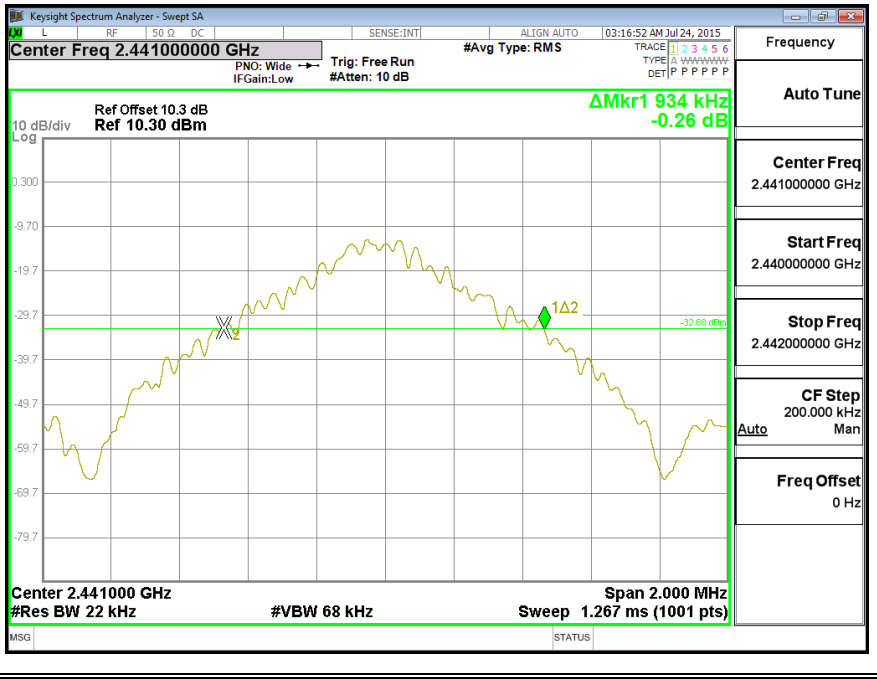
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.35	1.2255
Middle	2441	1.355	1.2209
High	2480	1.344	1.2122
Worst		1.355	1.2255

GFSK 20 dB BANDWIDTH

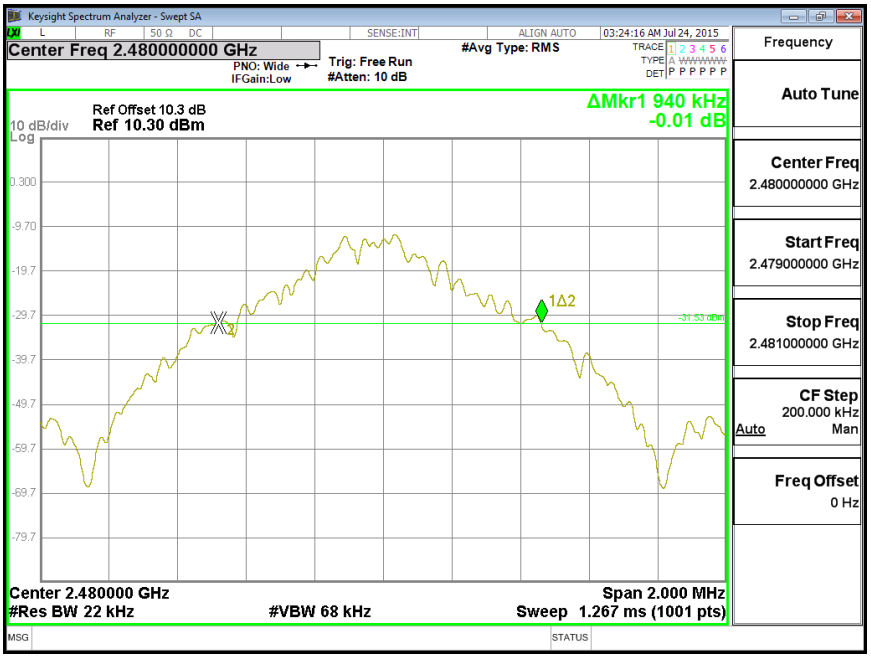
20 BANDWIDTH LOW CH



20 BANDWIDTH MID CH

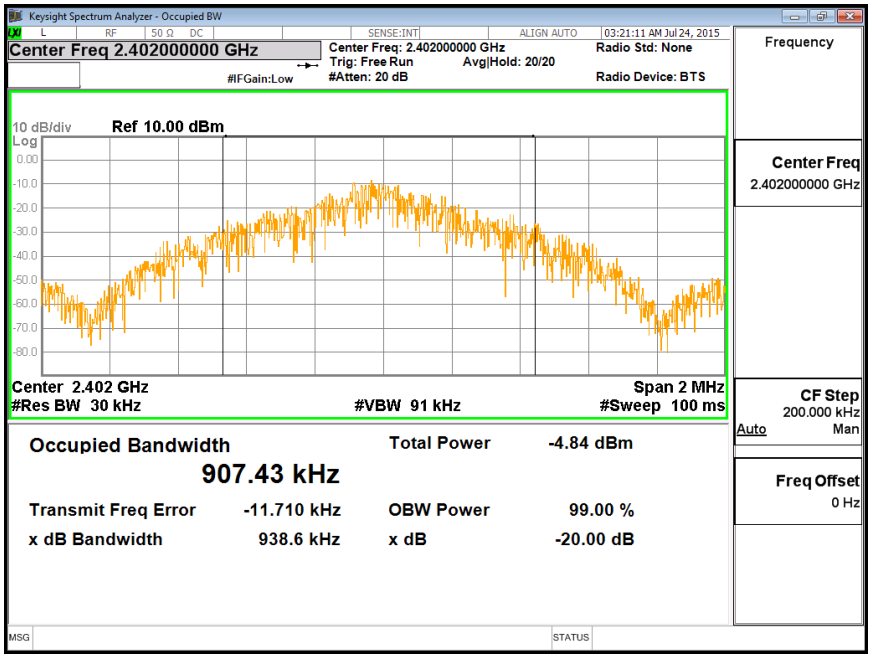


20 BANDWIDTH HIGH CH

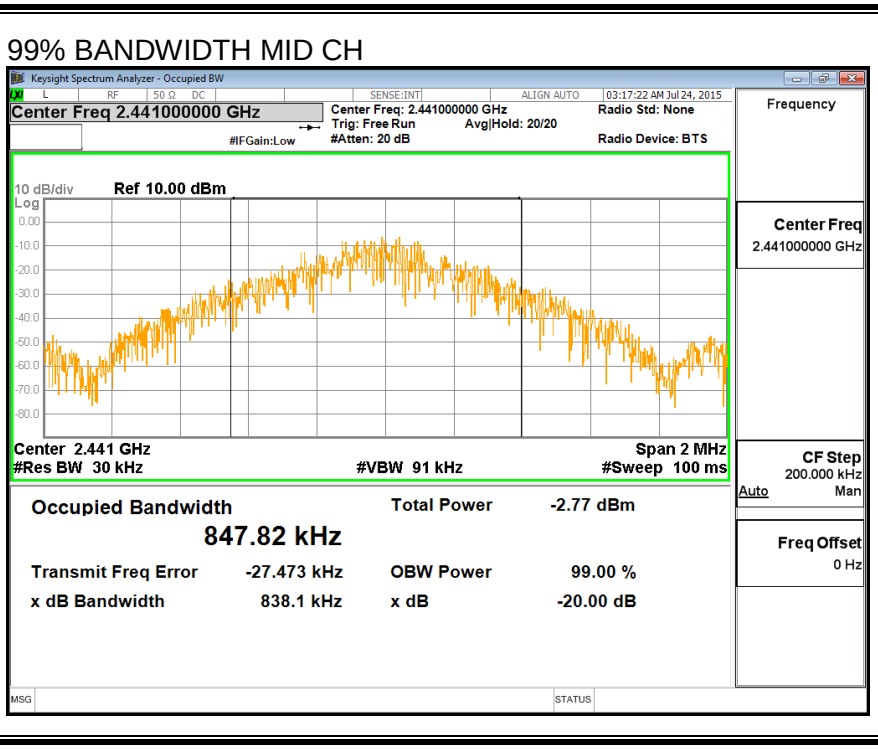


GFSK 99% BANDWIDTH

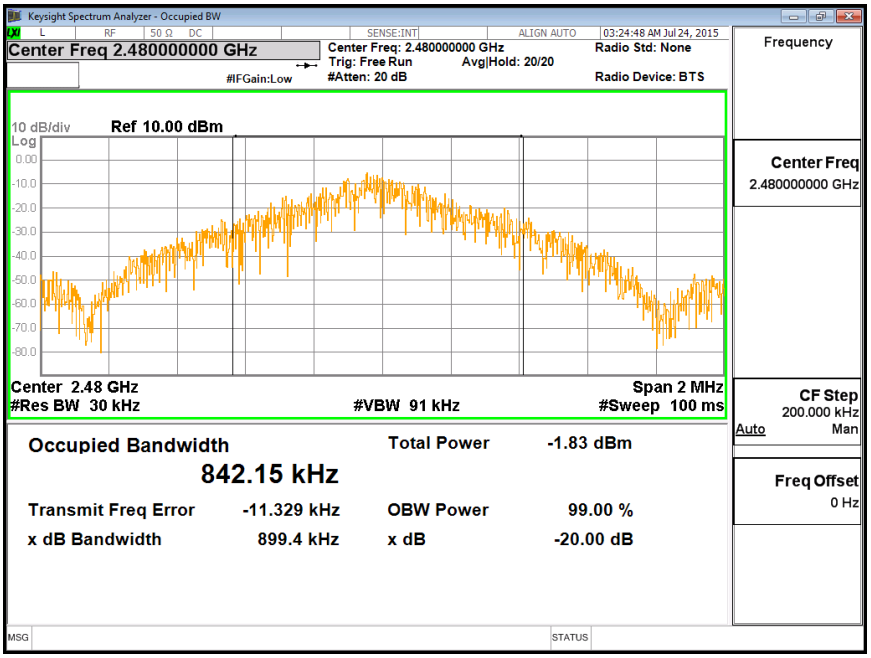
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH

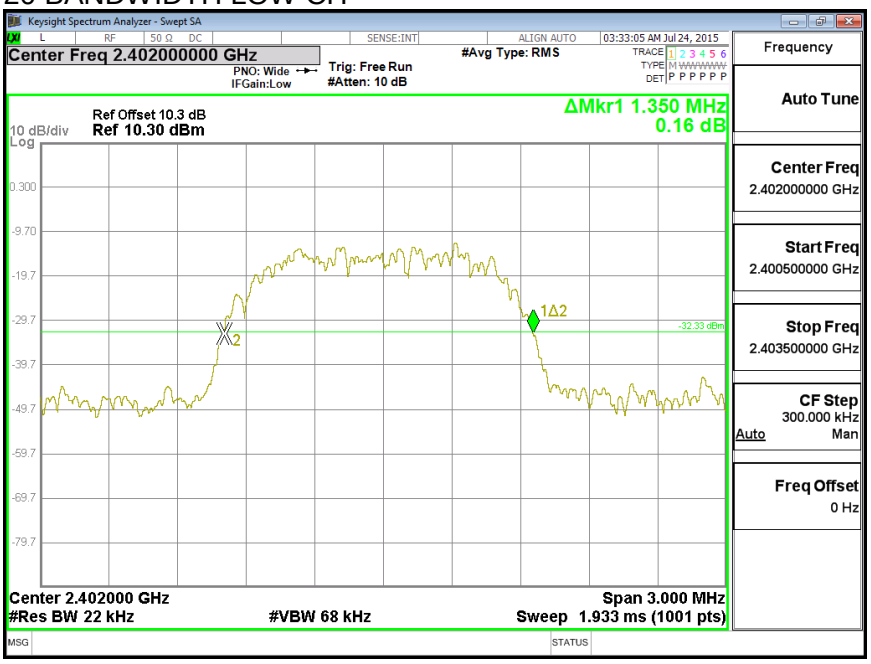


99% BANDWIDTH HIGH CH

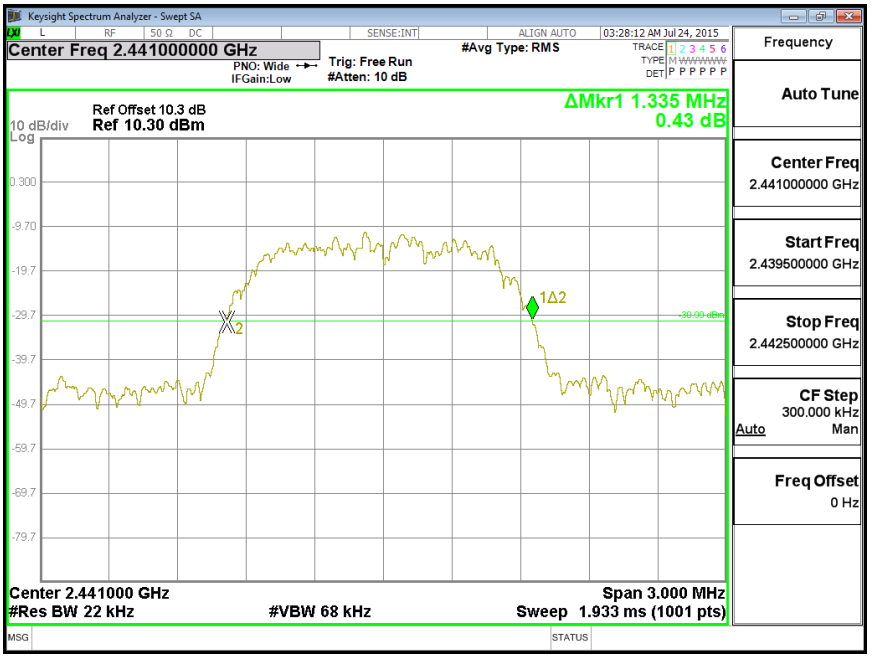


8PSK 20 dB BANDWIDTH

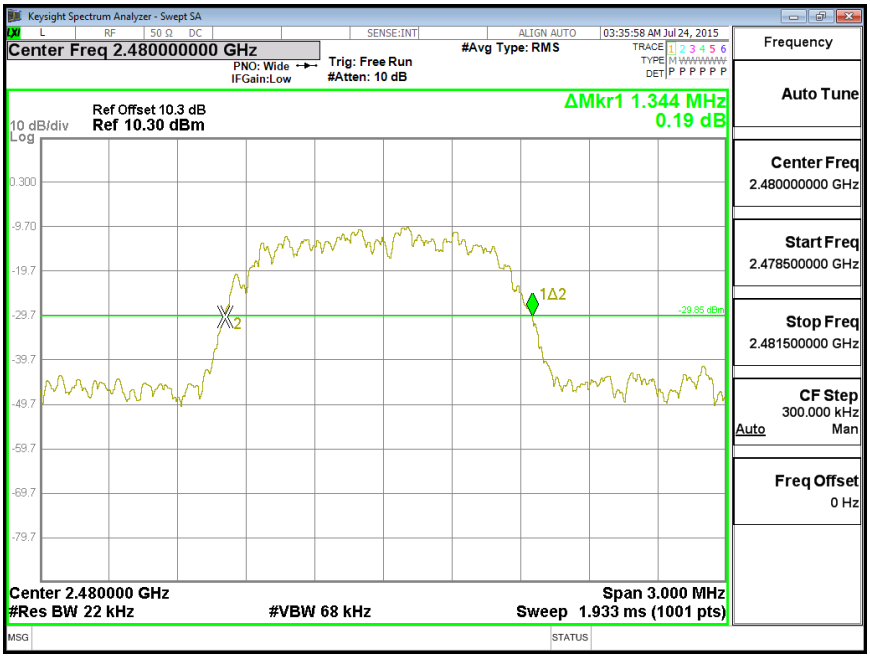
20 BANDWIDTH LOW CH



20 BANDWIDTH MID CH

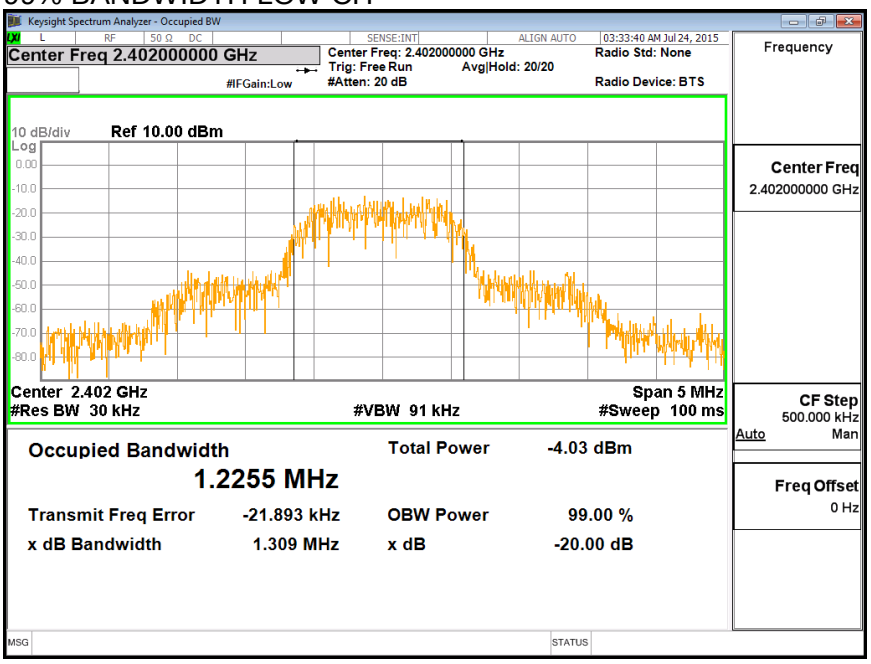


20 BANDWIDTH HIGH CH

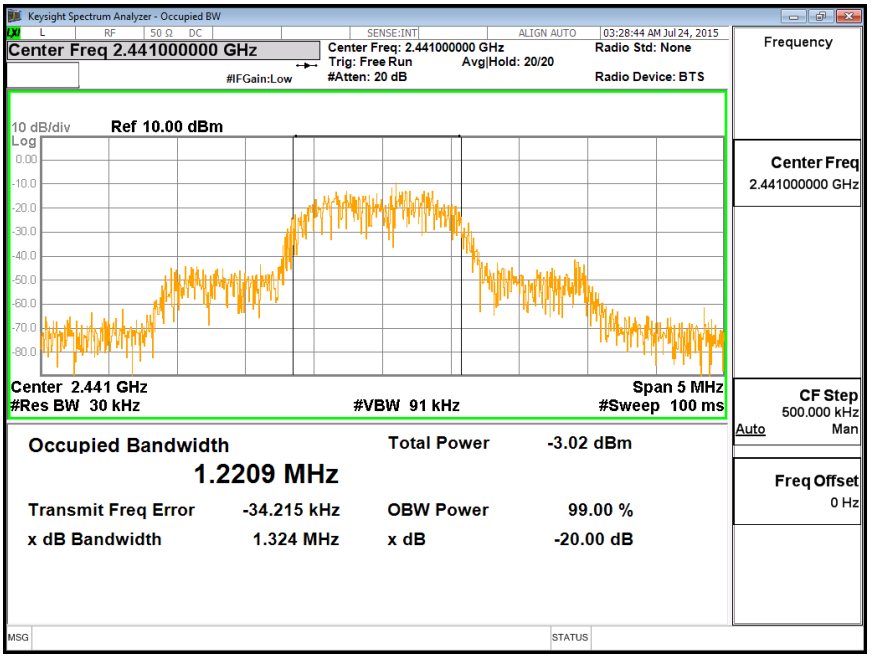


8PSK 99% BANDWIDTH

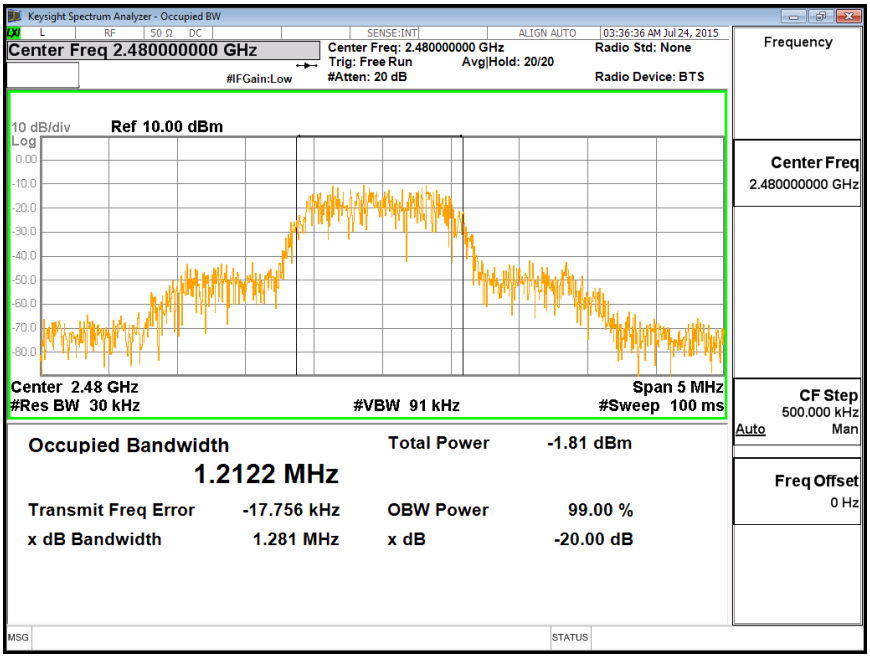
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



8.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

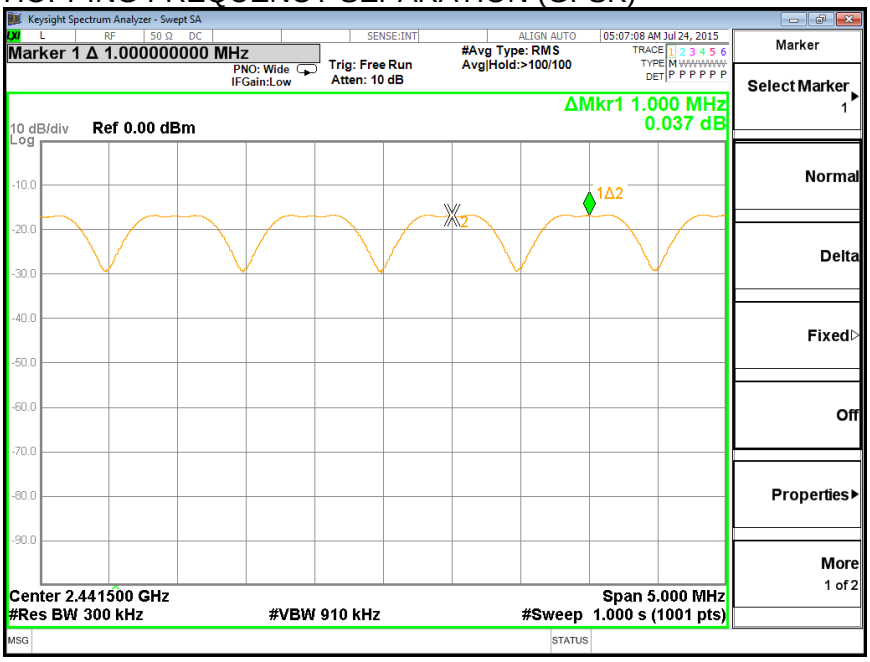
TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 900 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION

HOPPING FREQUENCY SEPARATION (GFSK)



8.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

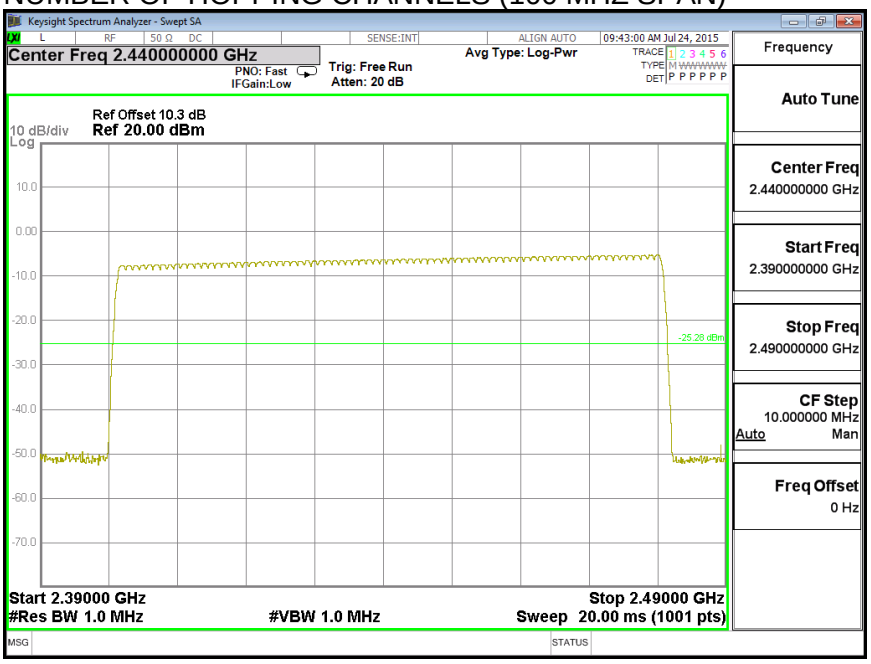
DA 00-705: The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

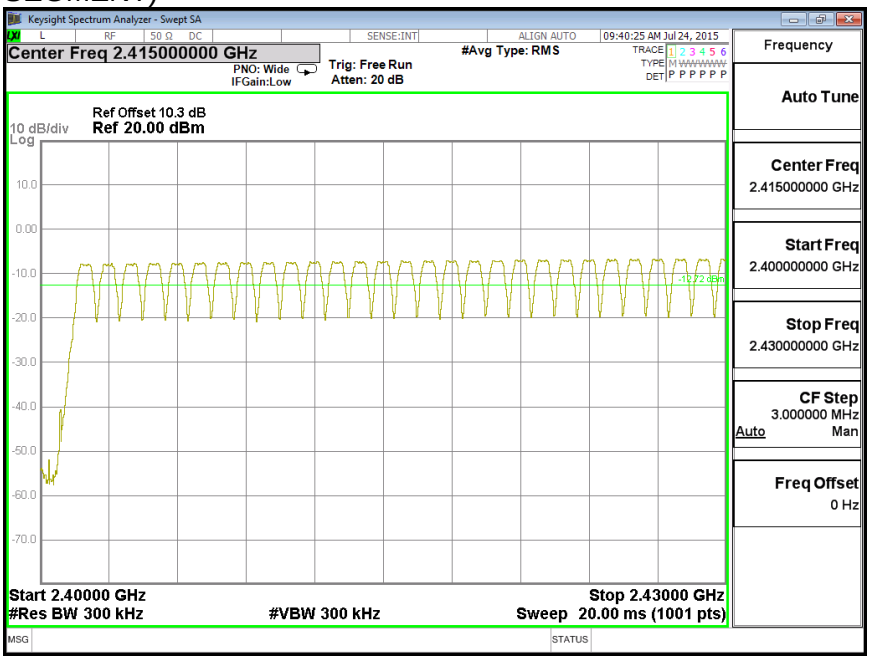
Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS

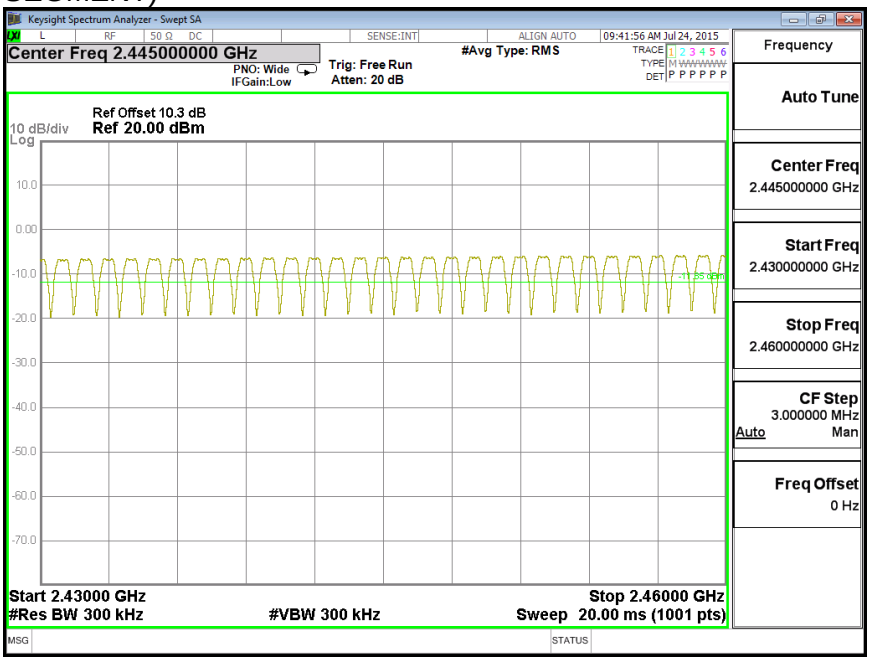
NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



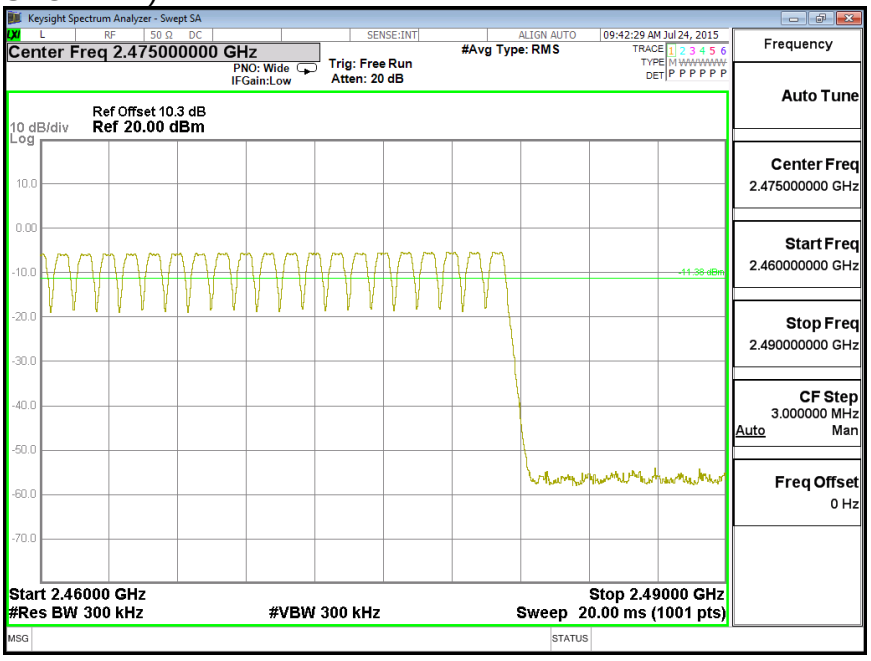
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, THIRD SEGMENT)



8.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

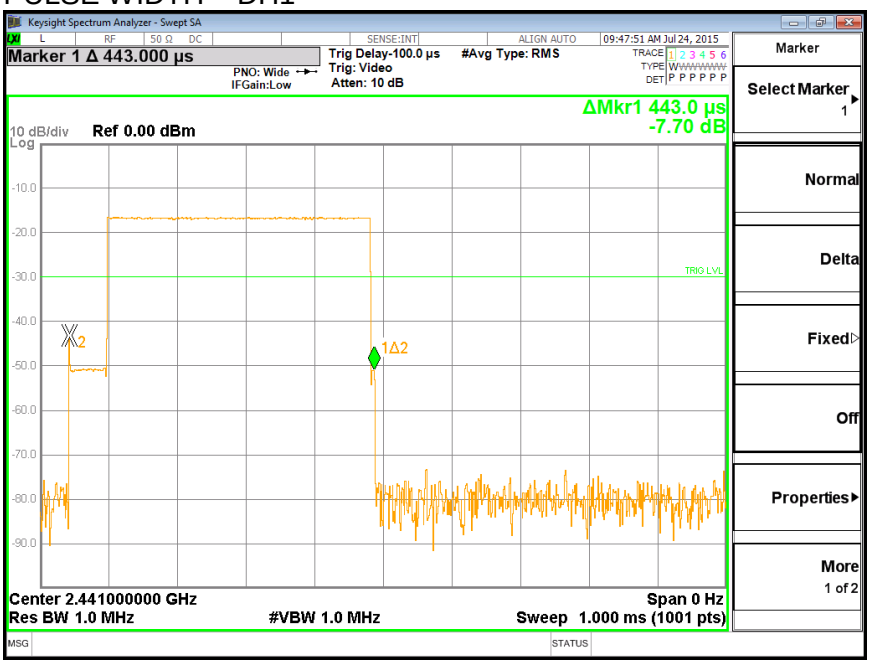
For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to 10 * (# of pulses in 0.8 s) * pulse width.

RESULTS

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.443	31	0.13733	0.4	-0.26267
DH3	1.696	17	0.28832	0.4	-0.11168
DH5	2.948	8	0.23584	0.4	-0.16416
DH Packet	Pulse Width (msec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.443	7.75	0.0343325	0.4	-0.36567
DH3	1.696	4.25	0.07208	0.4	-0.32792
DH5	2.948	2	0.05896	0.4	-0.34104

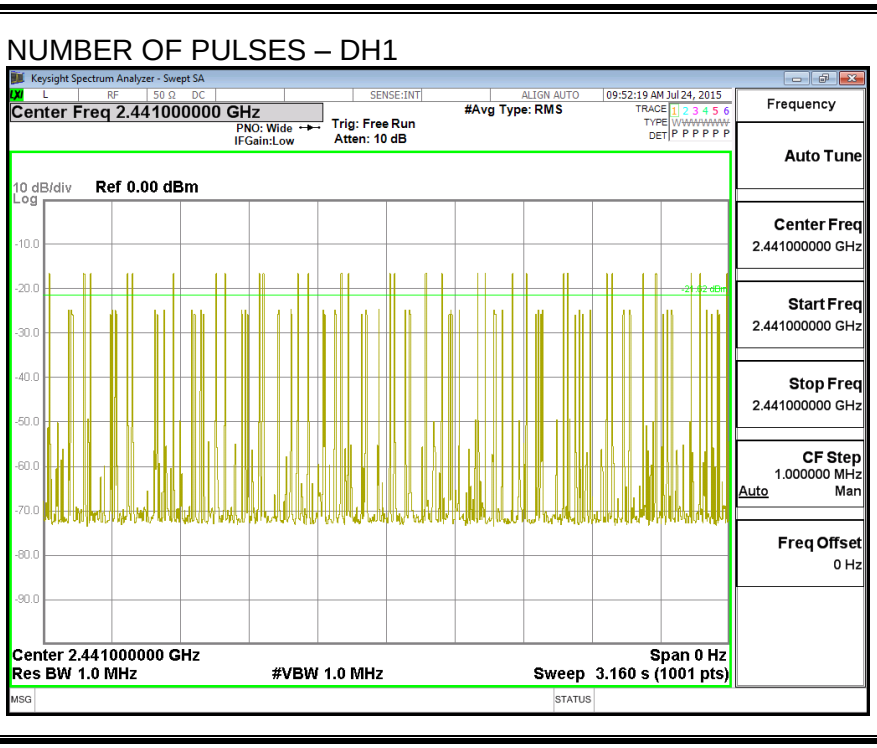
PULSE WIDTH - DH1

PULSE WIDTH – DH1



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1

NUMBER OF PULSES – DH1

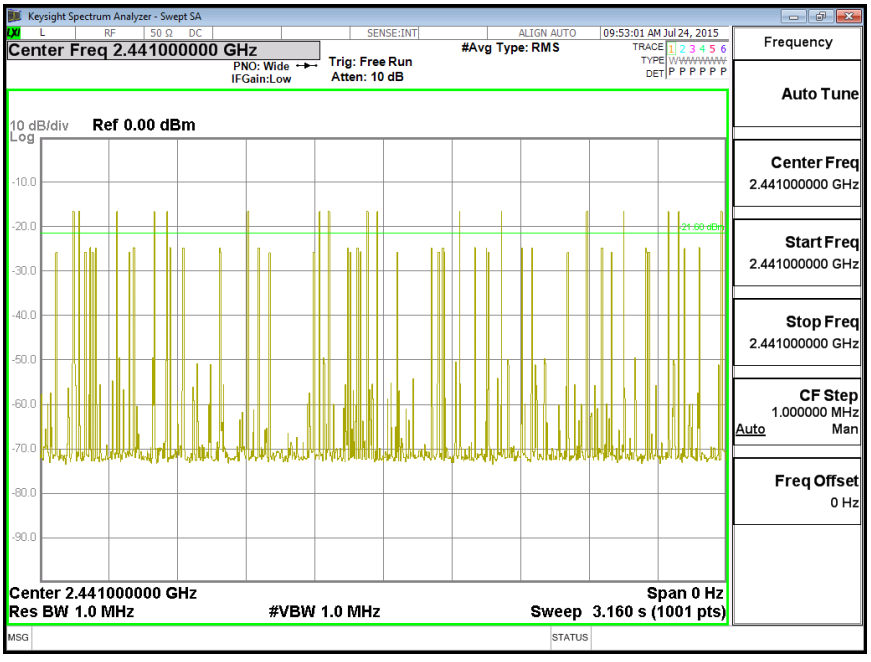


PULSE WIDTH – DH3

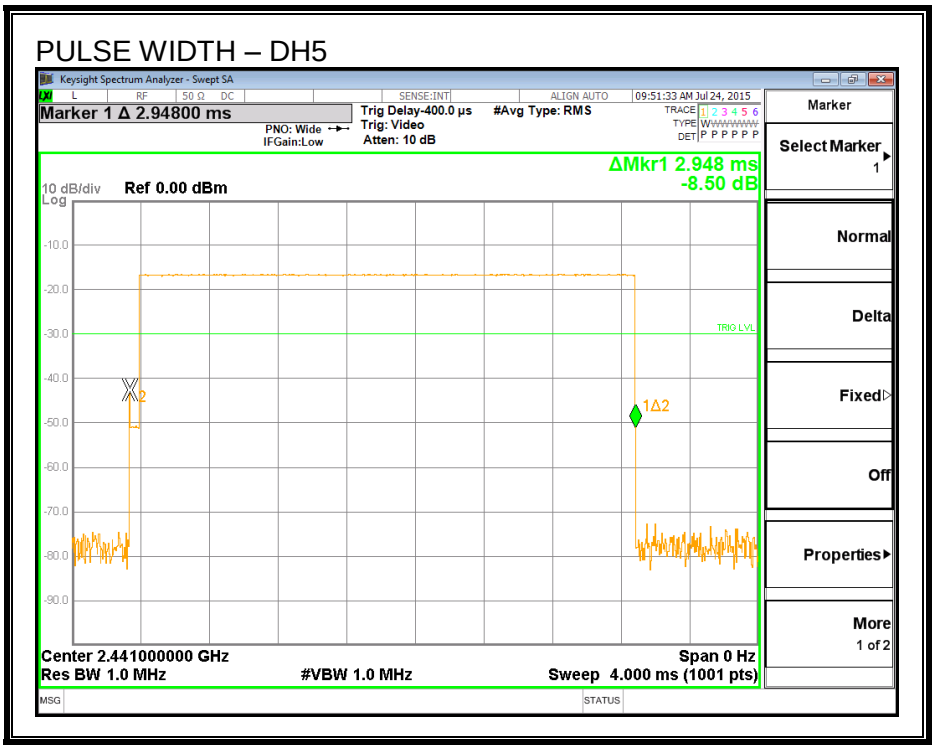
PULSE WIDTH – DH3

NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3

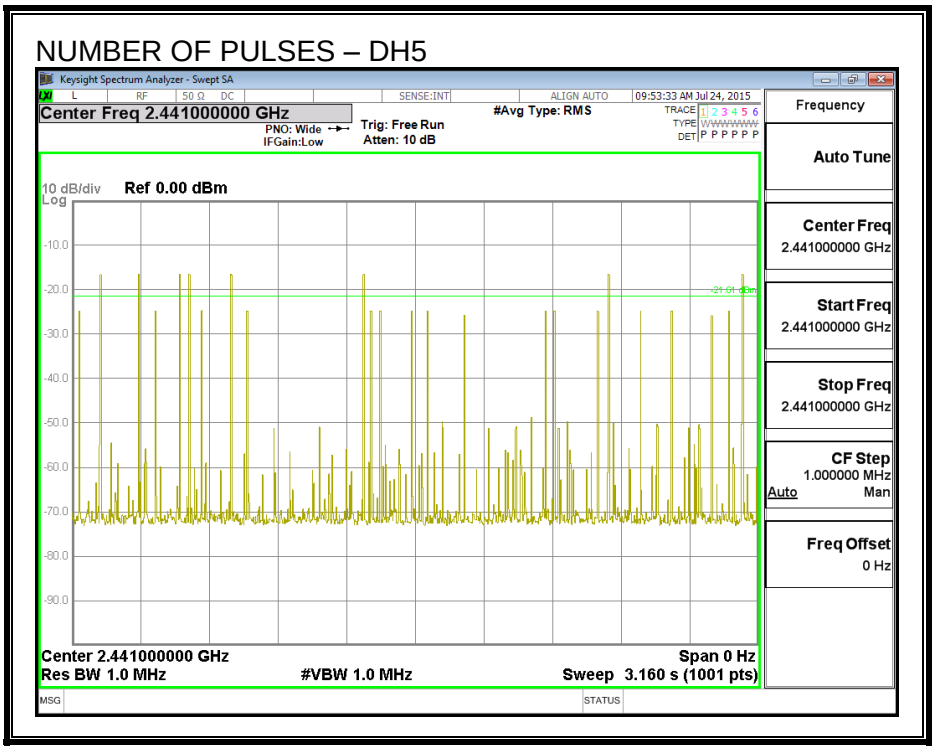
NUMBER OF PULSES – DH3



PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5



8.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

The maximum antenna gain is less than 6 dBi, therefore the limit is 21 dBm.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

8.5.1. BASIC DATA RATE GFSK MODULATION

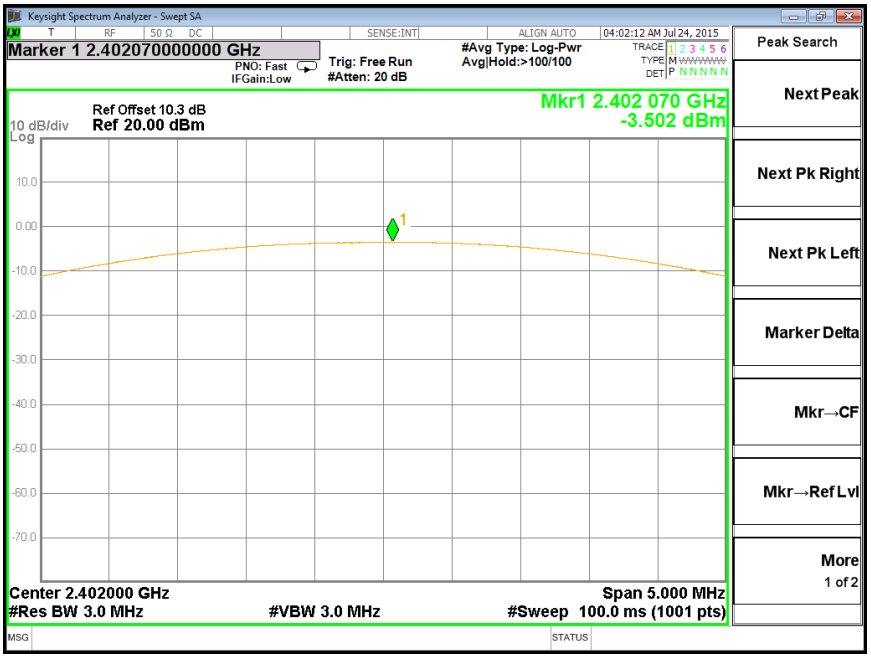
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-3.50	21	-24.50
Middle	2441	-2.42	21	-23.42
High	2480	-1.55	21	-22.55
Worst		-1.55		-22.55

8.5.2. ENHANCED DATA RATE 8PSK MODULATION

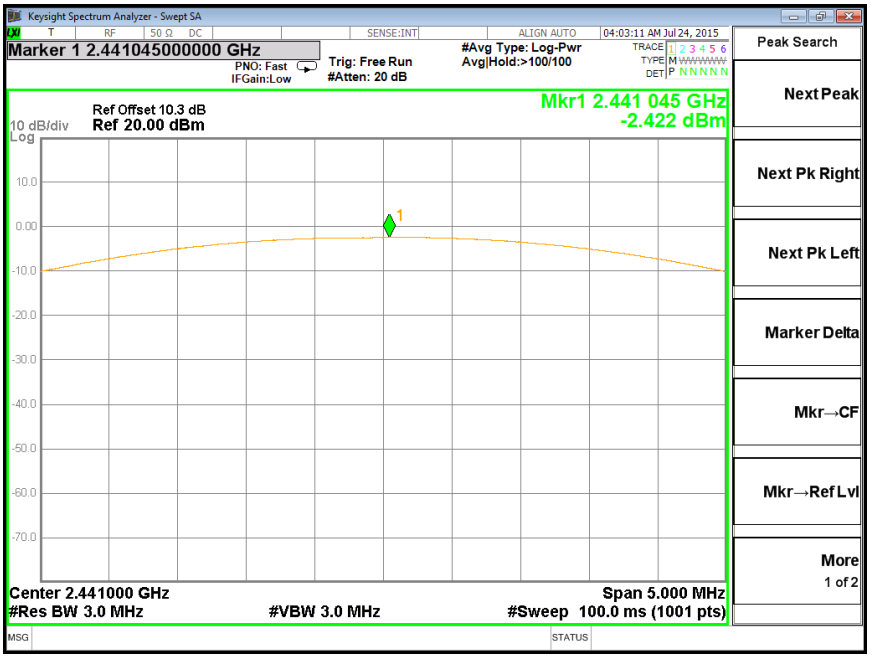
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-1.07	21	-22.07
Middle	2441	0.01	21	-20.99
High	2480	0.90	21	-20.10
Worst		0.90		-20.10

GFSK OUTPUT POWER

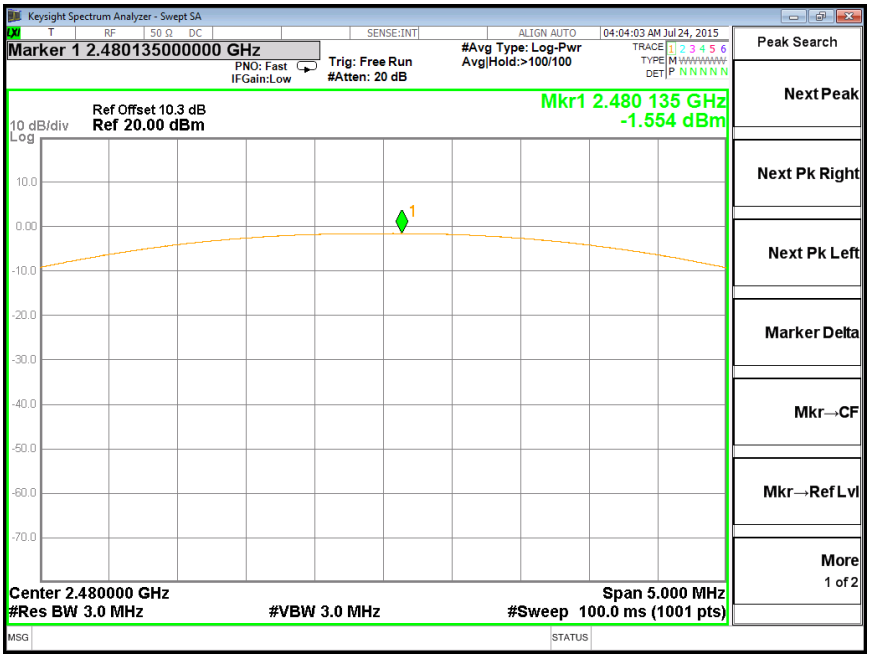
PEAK POWER LOW CH



PEAK POWER MID CH

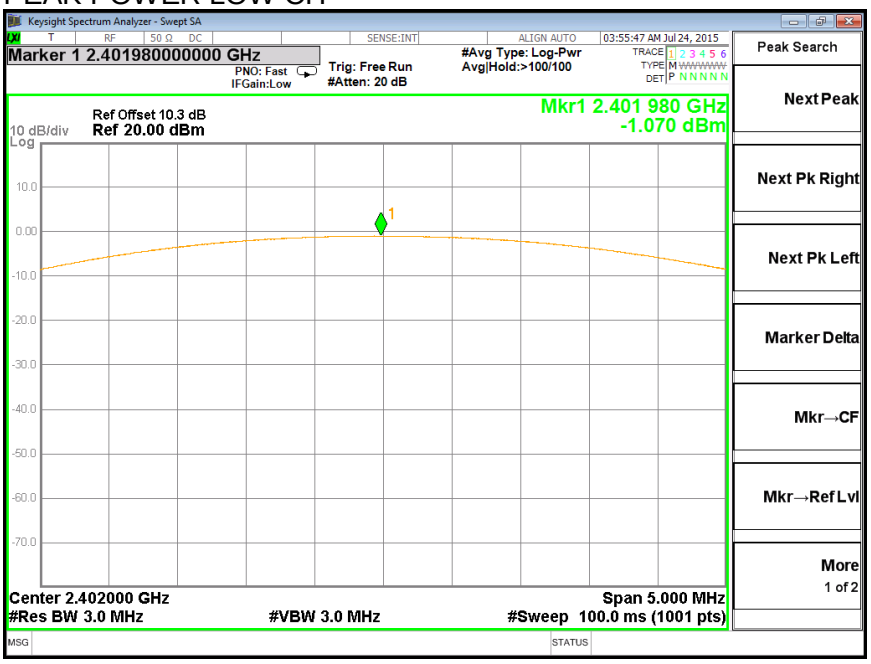


PEAK POWER HIGH CH

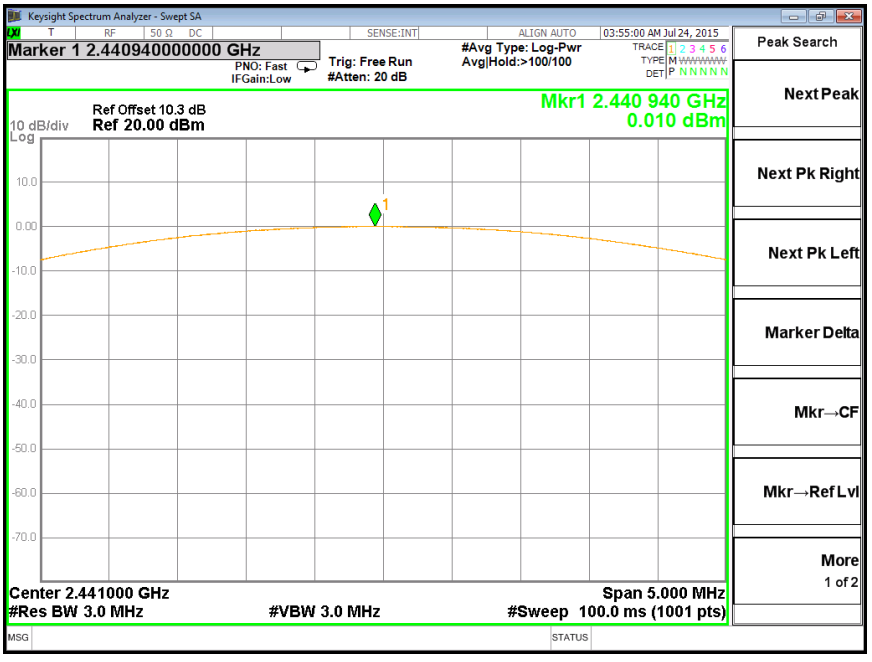


8PSK OUTPUT POWER

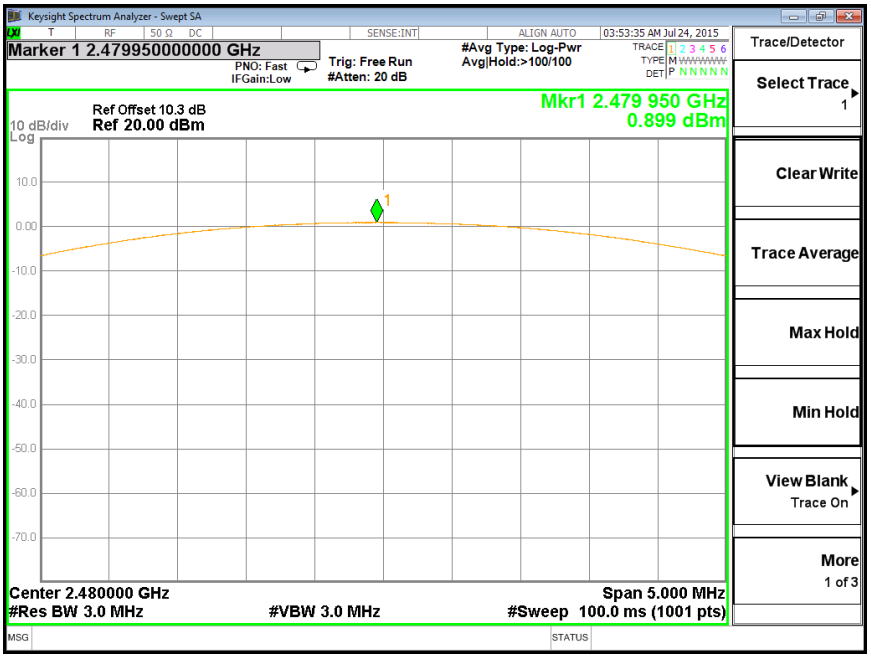
PEAK POWER LOW CH



PEAK POWER MID CH



PEAK POWER HIGH CH



8.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.7 dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

8.6.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-4.00
Middle	2441	-2.80
High	2480	-2.00
Worst		-2.00

8.6.2. DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-3.56
Middle	2441	-2.32
High	2480	-1.70
Worst		-1.70

8.6.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-3.56
Middle	2441	-2.30
High	2480	-1.65
Worst		-1.65

8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

Limit = -20 dBc

TEST PROCEDURE

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

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

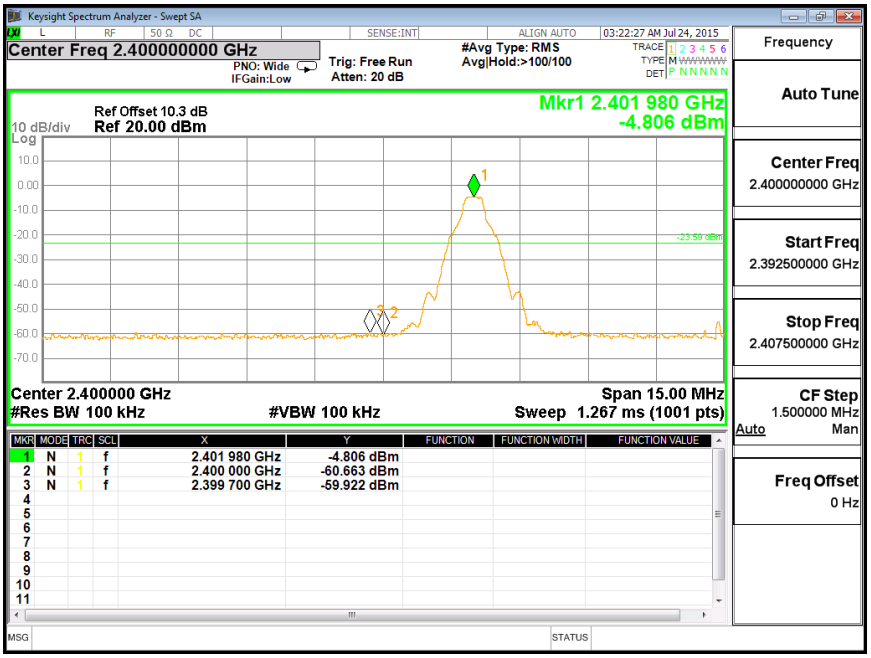
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

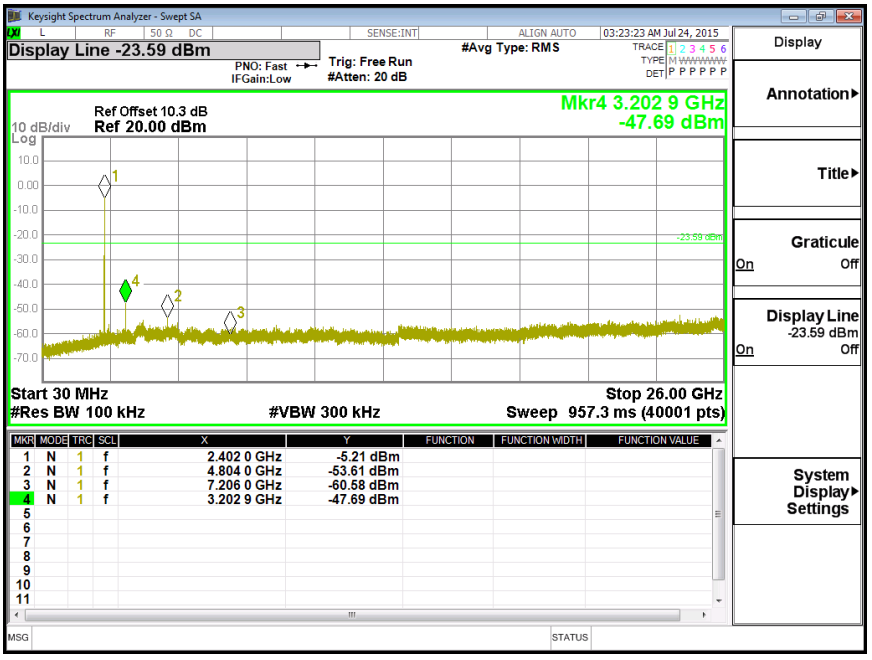
8.7.1. BASIC DATA RATE GFSK MODULATION

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE

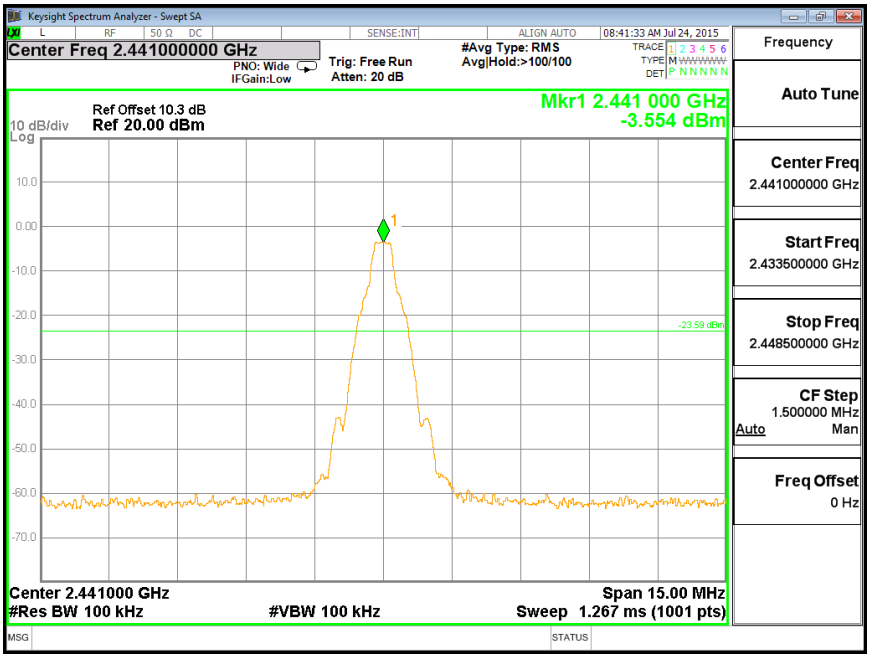


LOW CHANNEL SPURIOUS

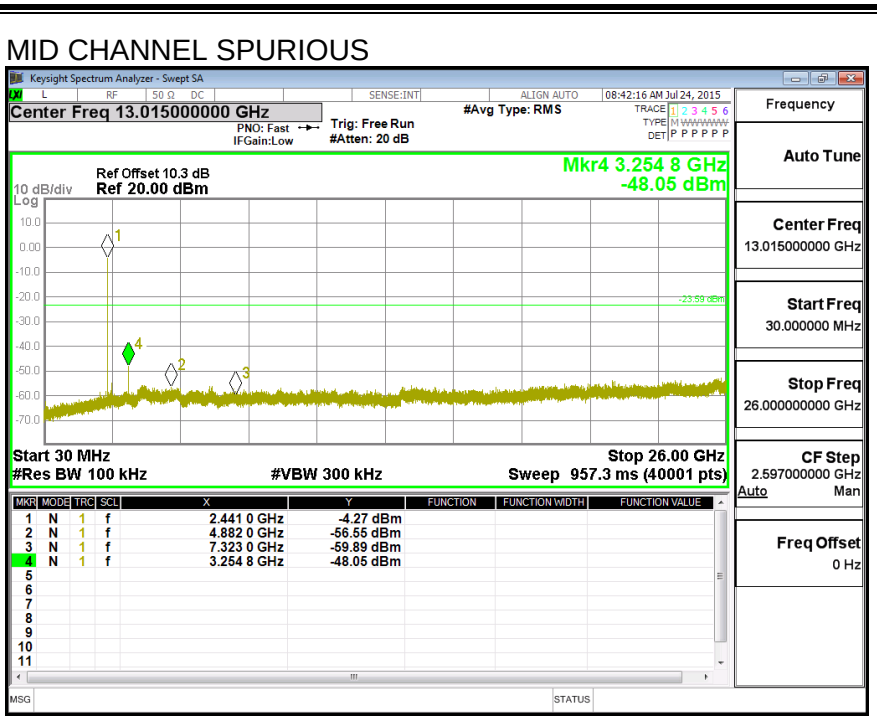


SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL REFERENCE

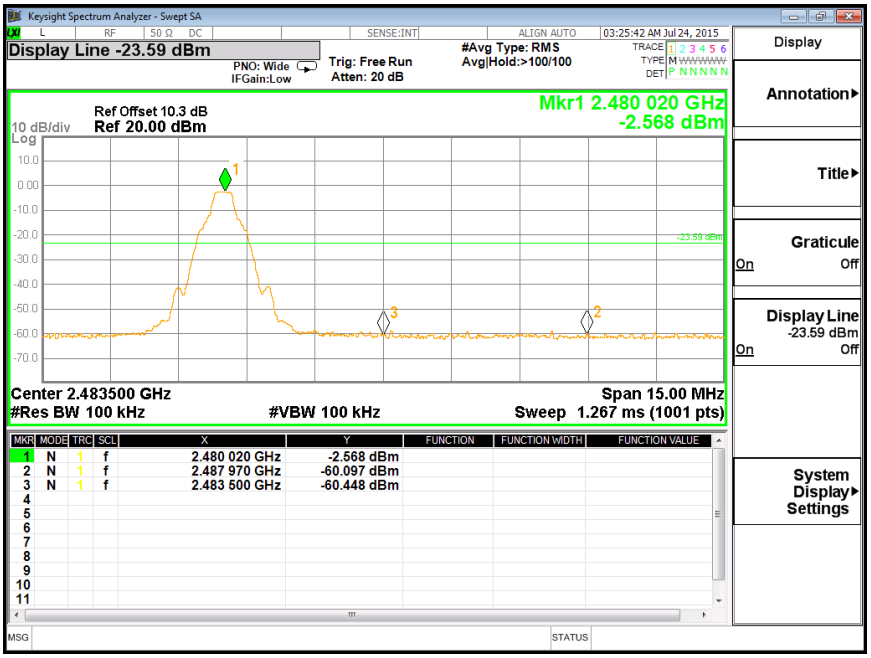


MID CHANNEL SPURIOUS

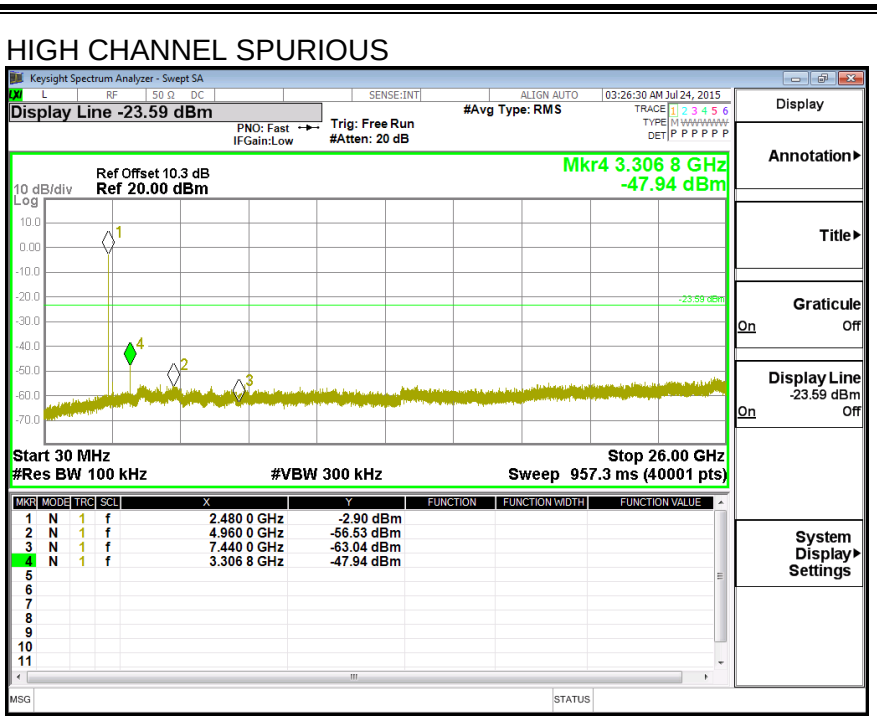


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE

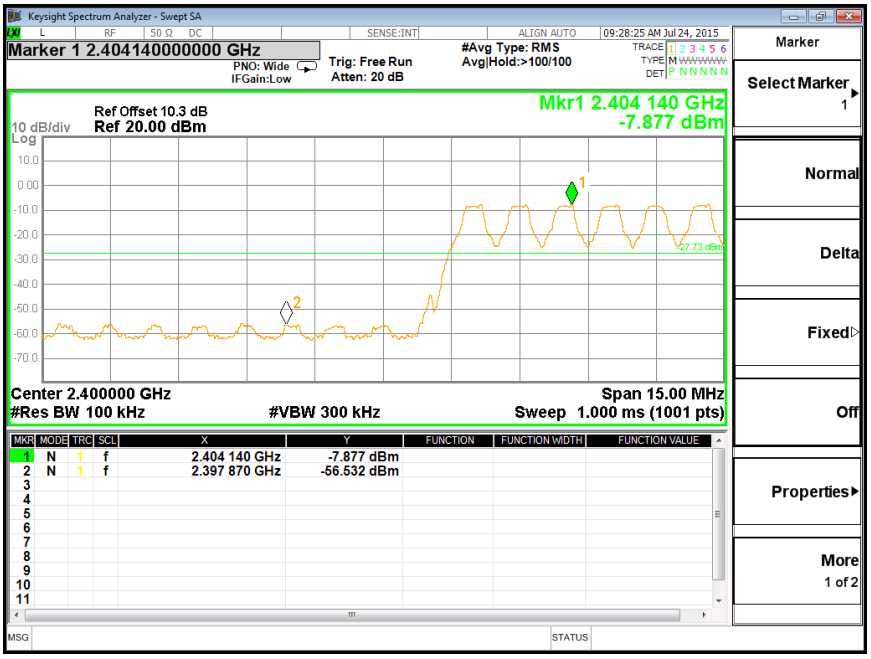


HIGH CHANNEL SPURIOUS

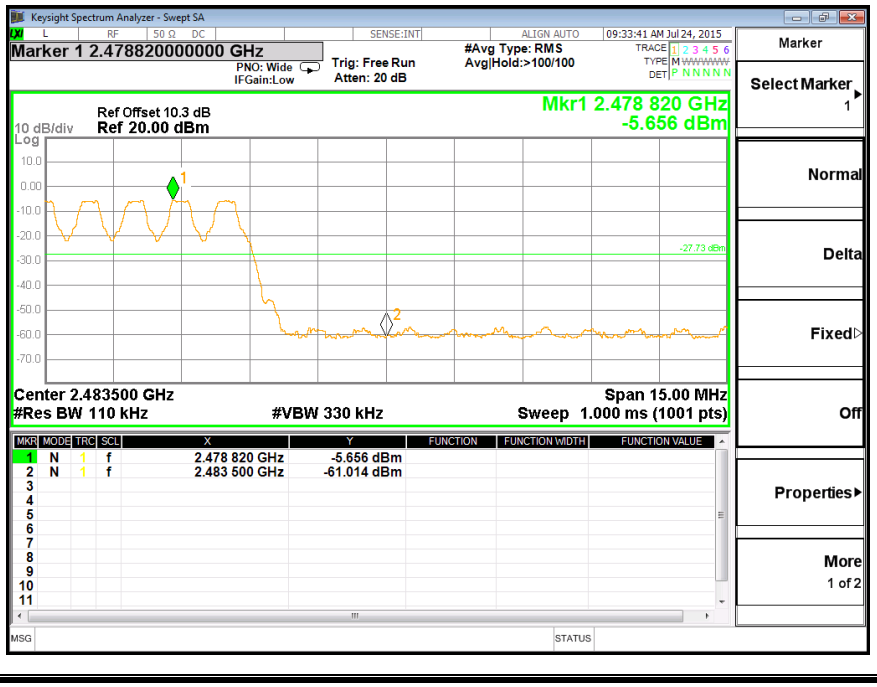


SPURIOUS BANDEDGE EMISSIONS WITH GFSK HOPPING ON

LOW BANDEDGE WITH HOPPING ON



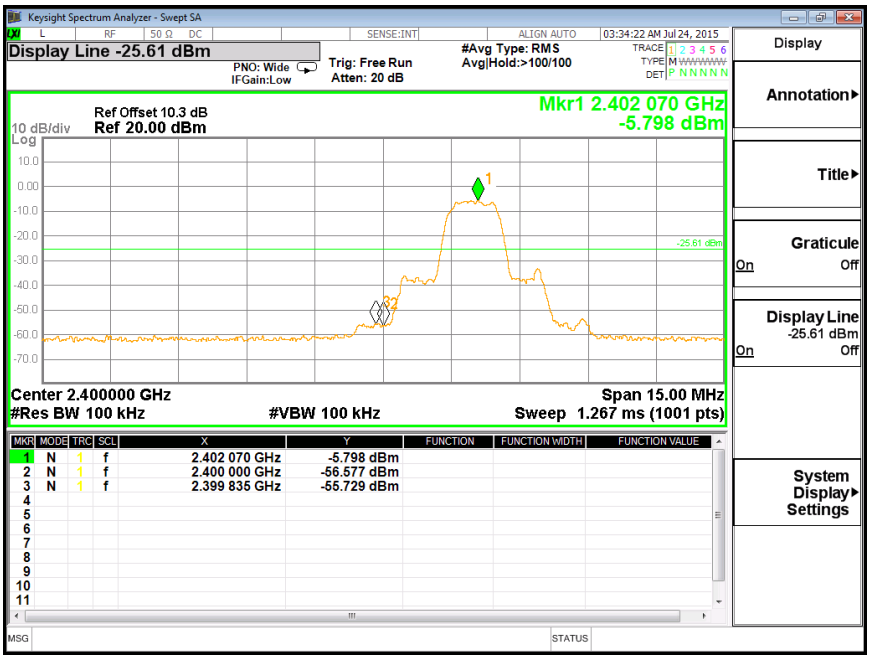
HIGH BANDEDGE WITH HOPPING ON



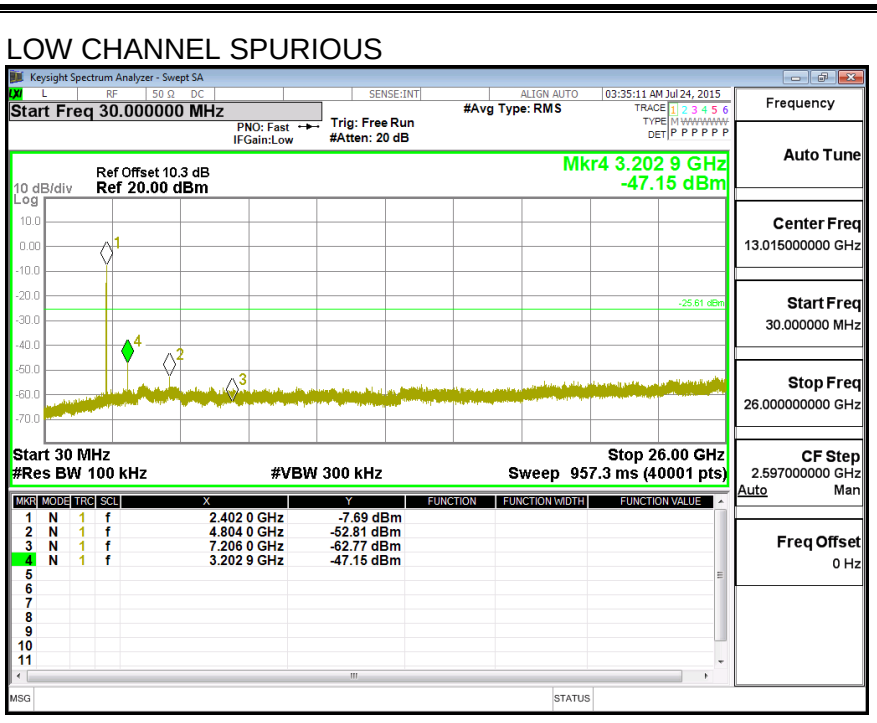
8.7.1. ENHANCED DATA RATE 8PSK MODULATION

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE

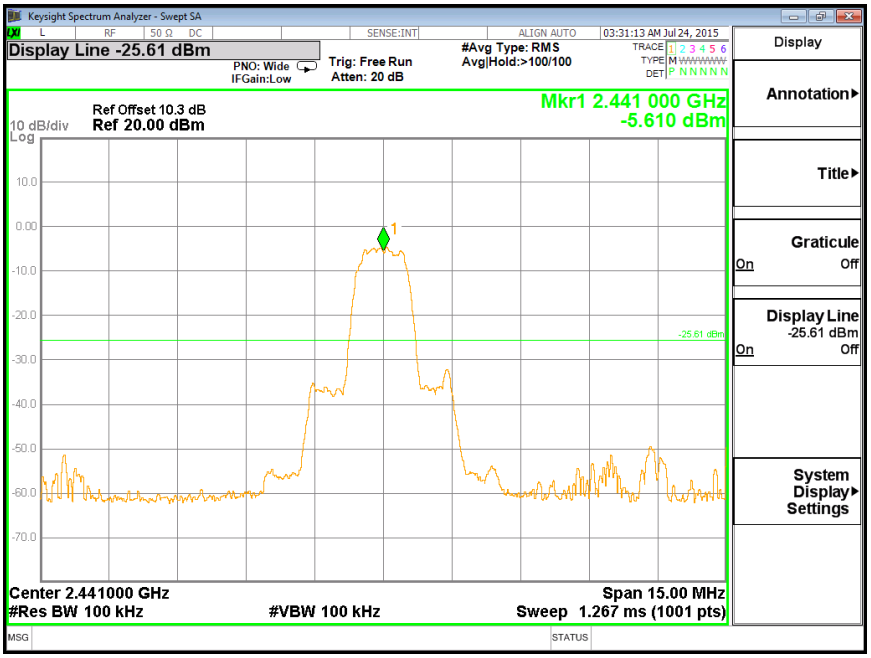


LOW CHANNEL SPURIOUS

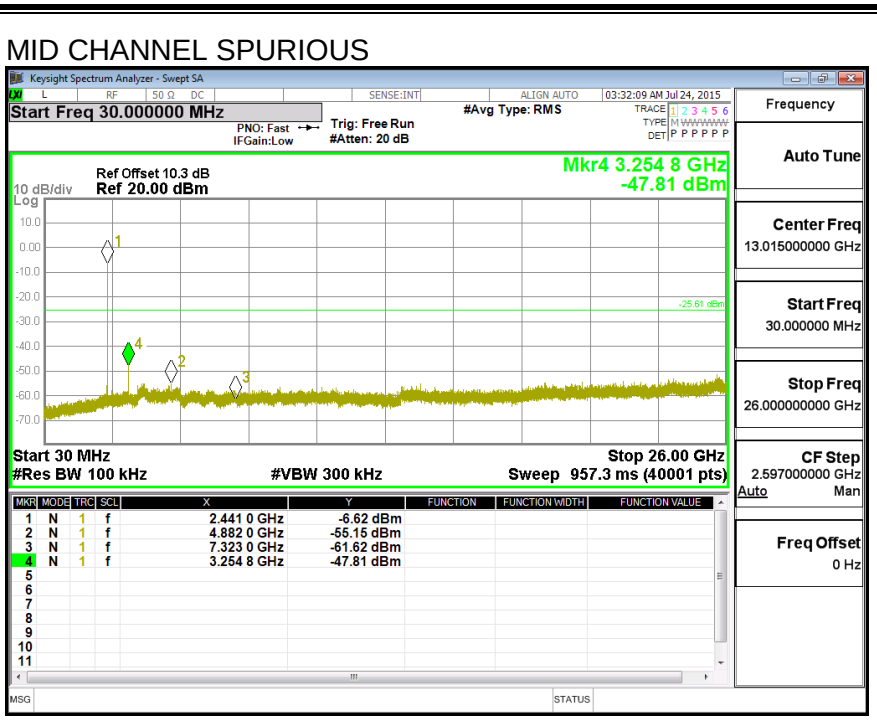


SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL REFERENCE

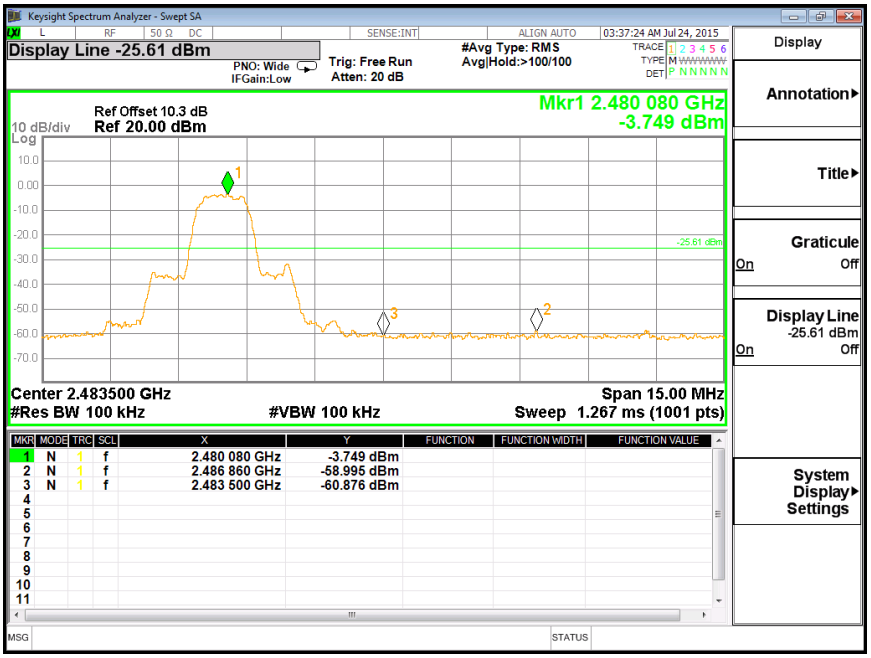


MID CHANNEL SPURIOUS

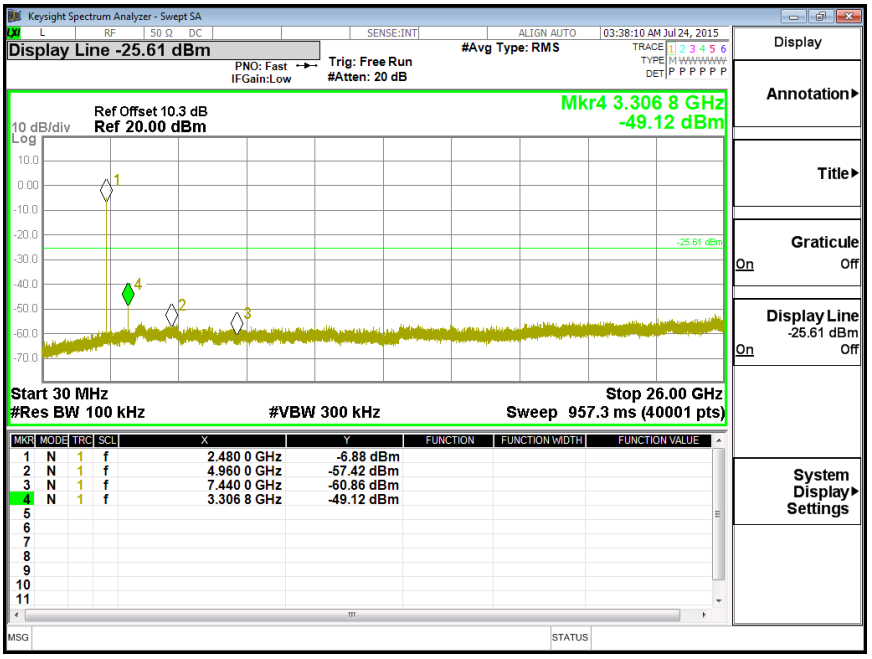


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE

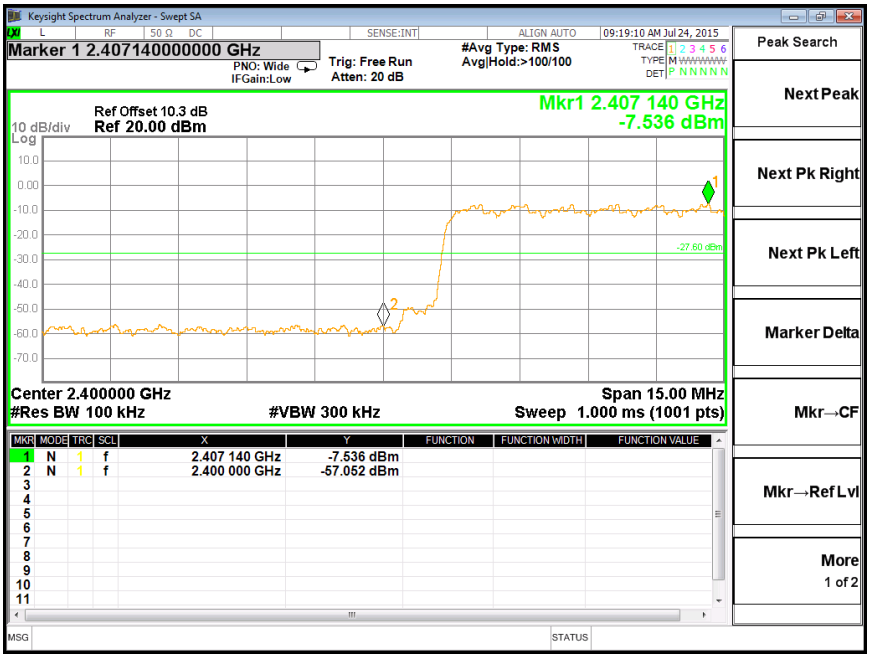


HIGH CHANNEL SPURIOUS

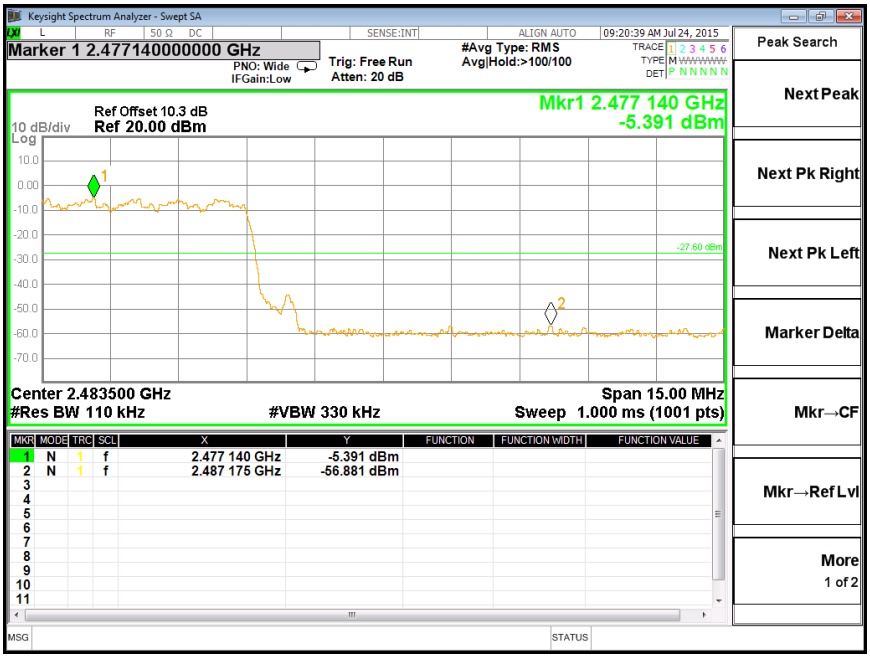


SPURIOUS BANDEDGE EMISSIONS WITH 8PSK HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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 for below 1GHz and 150cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. 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 band edge measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 1/T (on time) for average measurement.
GFSK = 1/T = 1 / 0.01 = 100Hz

The spectrum from 1GHzHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

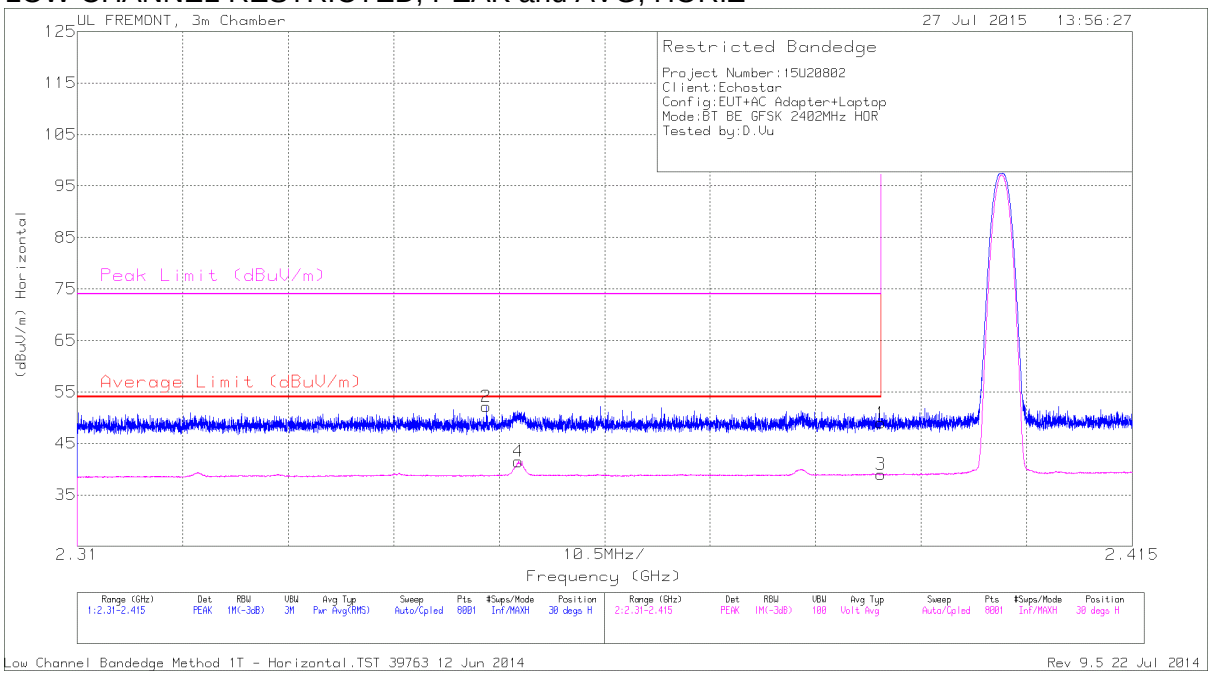
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL RESTRICTED, PEAK and AVG, HORIZ

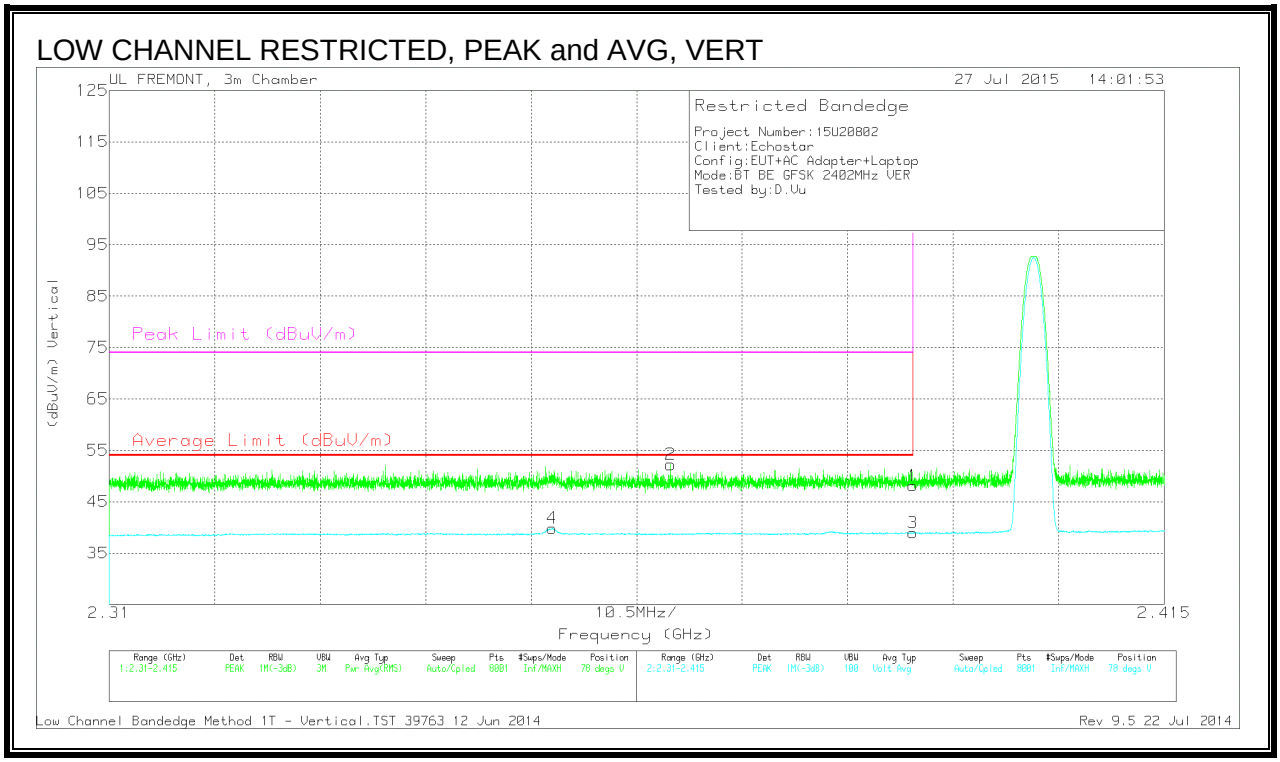


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.351	42.83	PK	31.8	-22.5	0	52.13	-	-	74	-21.87	30	104	H
4	2.354	32.09	VB1T	31.8	-22.4	0	41.49	54	-12.51	-	-	30	104	H
1	2.39	39.35	PK	32	-22.4	0	48.95	-	-	74	-25.05	30	104	H
3	2.39	29.4	VB1T	32	-22.4	0	39	54	-15	-	-	30	104	H

PK - Peak detector
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



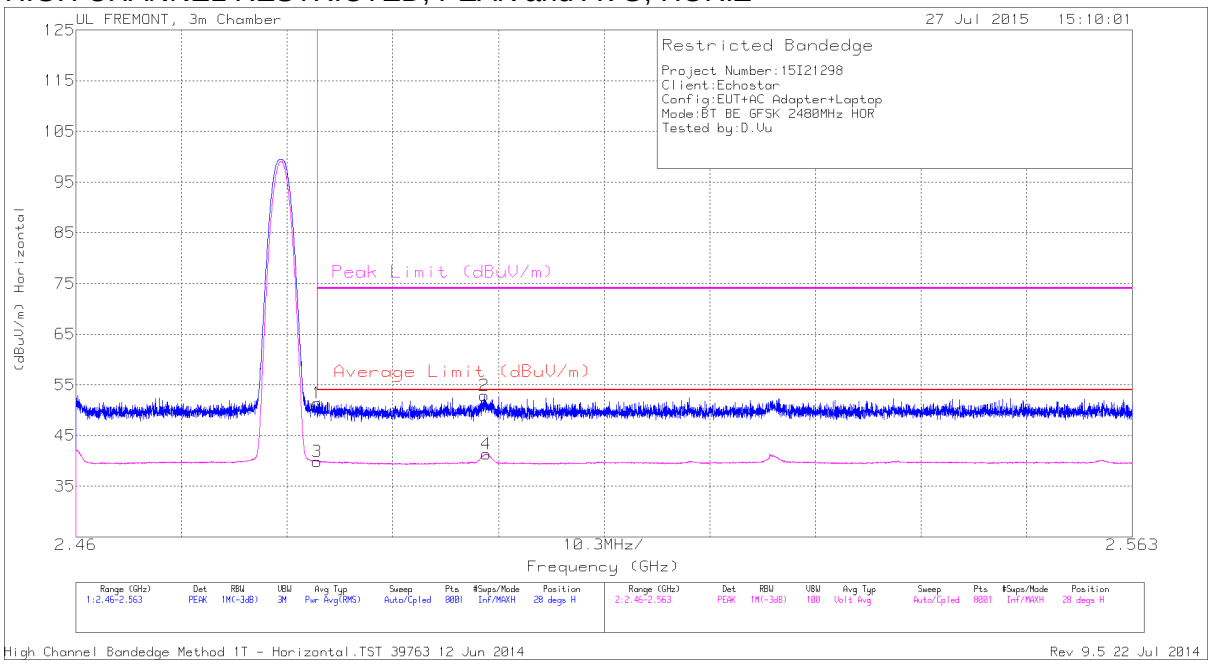
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	2.354	30.45	VB1T	31.8	-22.4	0	39.85	54	-14.15	-	-	78	105	V
2	2.366	42.84	PK	31.9	-22.5	0	52.24	-	-	74	-21.76	78	105	V
1	2.39	38.54	PK	32	-22.4	0	48.14	-	-	74	-25.86	78	105	V
3	2.39	29.34	VB1T	32	-22.4	0	38.94	54	-15.06	-	-	78	105	V

PK - Peak detector
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

HIGH CHANNEL RESTRICTED, PEAK and AVG, HORIZ



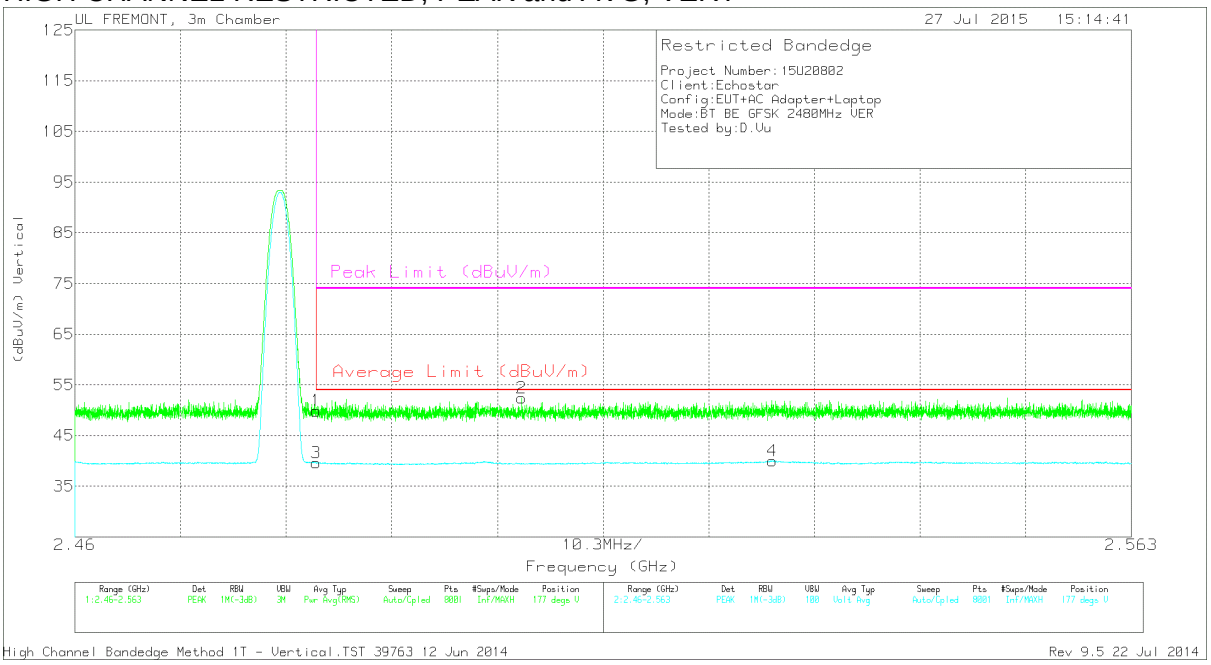
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	41.18	PK	32.3	-22.1	0	51.38	-	-	74	-22.62	28	182	H
3	2.484	29.68	VB1T	32.3	-22.1	0	39.88	54	-14.12	-	-	28	182	H
2	2.5	42.7	PK	32.3	-22.1	0	52.9	-	-	74	-21.1	28	182	H
4	2.5	31.15	VB1T	32.3	-22.1	0	41.35	54	-12.65	-	-	28	182	H

PK - Peak detector
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

HIGH CHANNEL RESTRICTED, PEAK and AVG, VERT



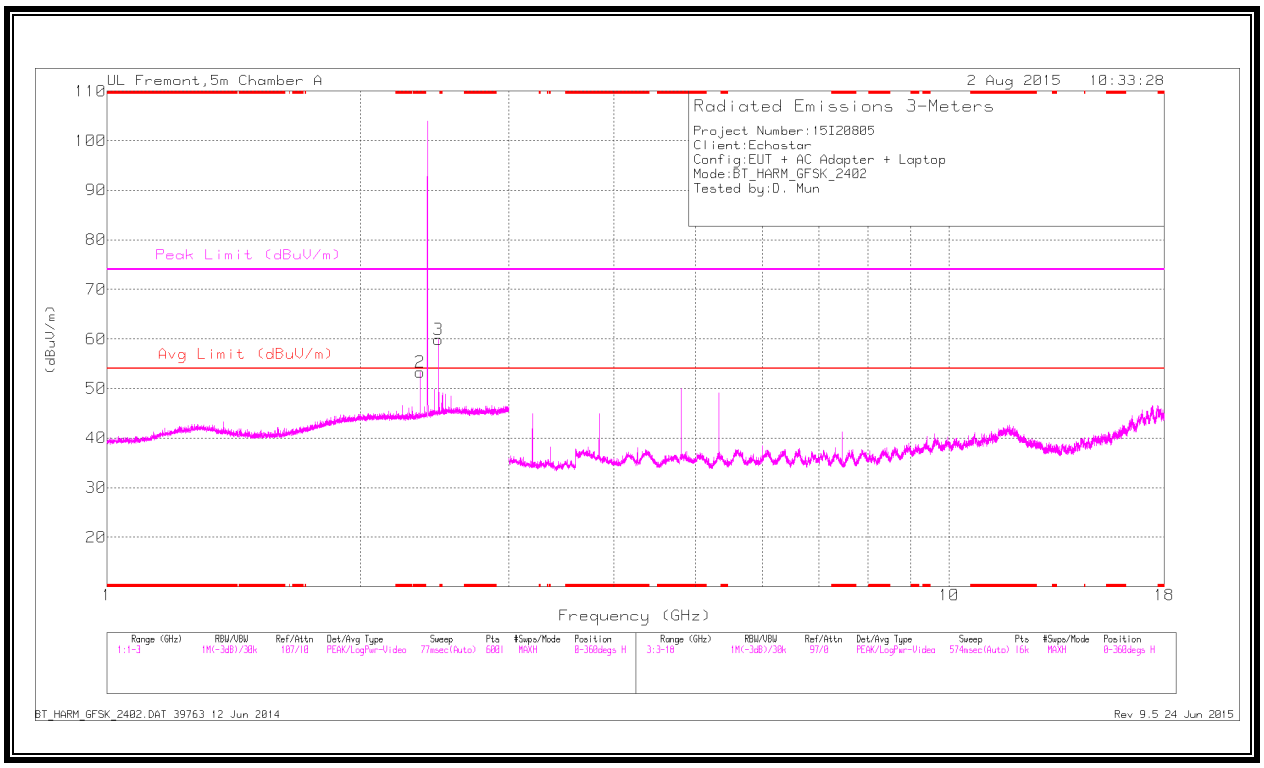
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	39.66	PK	32.3	-22.1	0	49.86	-	-	74	-24.14	177	120	V
3	2.484	29.38	VB1T	32.3	-22.1	0	39.58	54	-14.42	-	-	177	120	V
2	2.504	42.17	PK	32.3	-22.1	0	52.37	-	-	74	-21.63	177	120	V
4	2.528	29.57	VB1T	32.4	-22	0	39.97	54	-14.03	-	-	177	120	V

PK - Peak detector
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

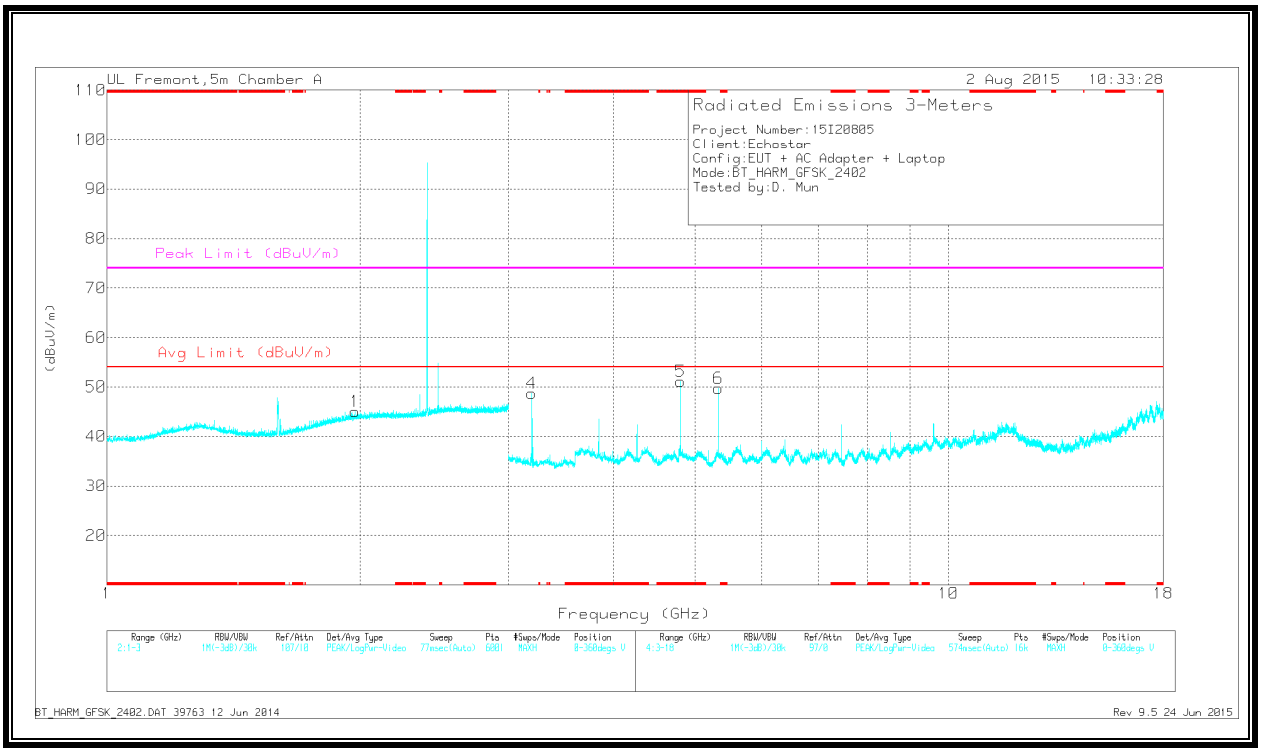
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.354	43.86	Avg	31.8	-22.4	0	53.26	54	-.74	-	-	0-360	100	H
5	* 4.804	46.58	Avg	34	-29.4	0	51.18	54	-2.82	-	-	0-360	100	V
1	1.972	36.21	Avg	31.4	-22.6	0	45.01	54	-8.99	-	-	0-360	100	V
3	2.475	49.81	Avg	32.3	-22.2	0	59.91			-	-	0-360	100	H
4	3.198	46.63	Avg	32.6	-30.5	0	48.73	54	-5.27	-	-	0-360	100	V
6	5.33	44.39	Avg	34.5	-29.1	0	49.79	54	-4.21	-	-	0-360	100	V

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

Avg - Video bandwidth < Resolution bandwidth

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.354	44.31	PK2	31.8	-22.4	53.71	-	-	74	-20.29	360	100	H
* 2.353	31.49	VA1T	31.8	-22.4	40.89	54	-13.11	-	-	360	100	H
* 4.805	41.23	PK2	34	-29.4	45.83	-	-	74	-28.17	360	100	V
* 4.804	28.82	VA1T	34	-29.4	33.42	54	-20.58	-	-	360	100	V
1.974	44.53	PK2	31.4	-22.6	53.33	-	-	74	-20.67	360	100	V
2.475	46.77	PK2	32.3	-22.2	56.87	-	-	74	-17.13	360	100	H
3.198	44.63	PK2	32.6	-30.5	46.73	-	-	74	-27.27	360	100	V
5.33	45.9	PK2	34.5	-29.1	51.3	-	-	74	-22.7	360	100	V

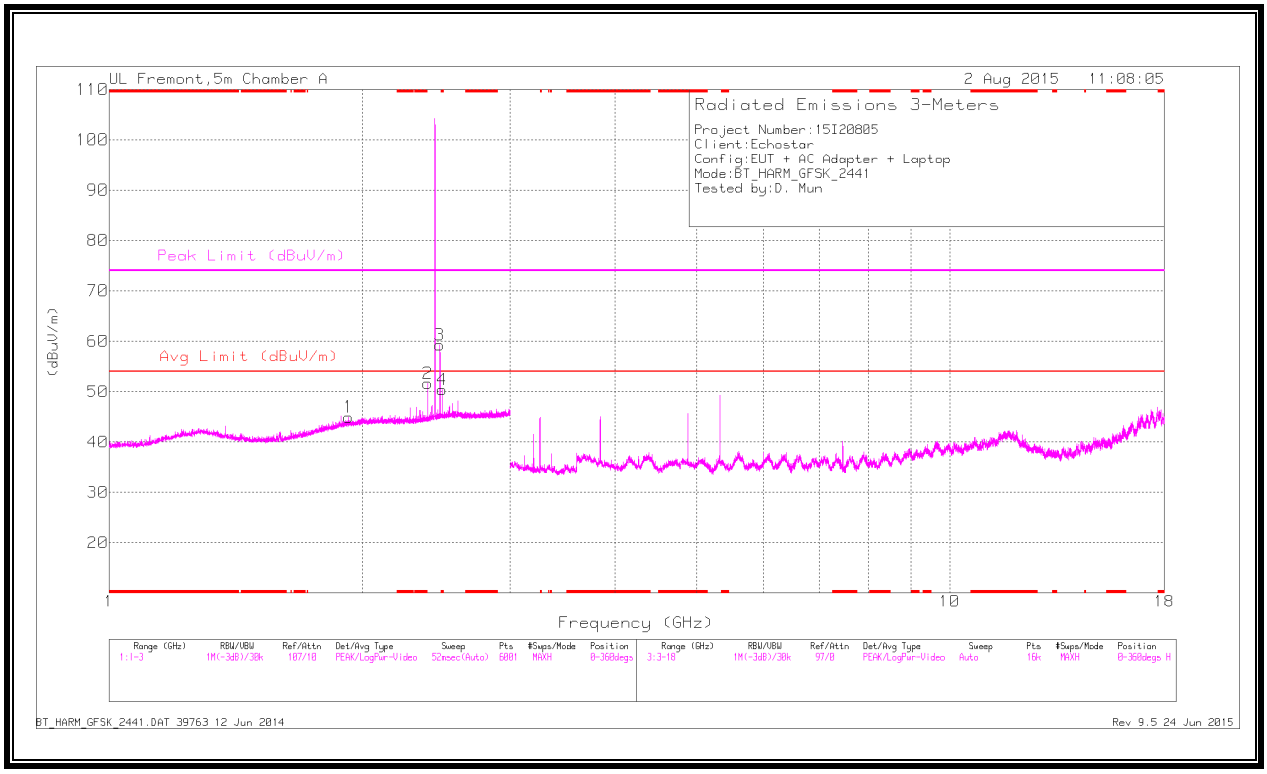
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

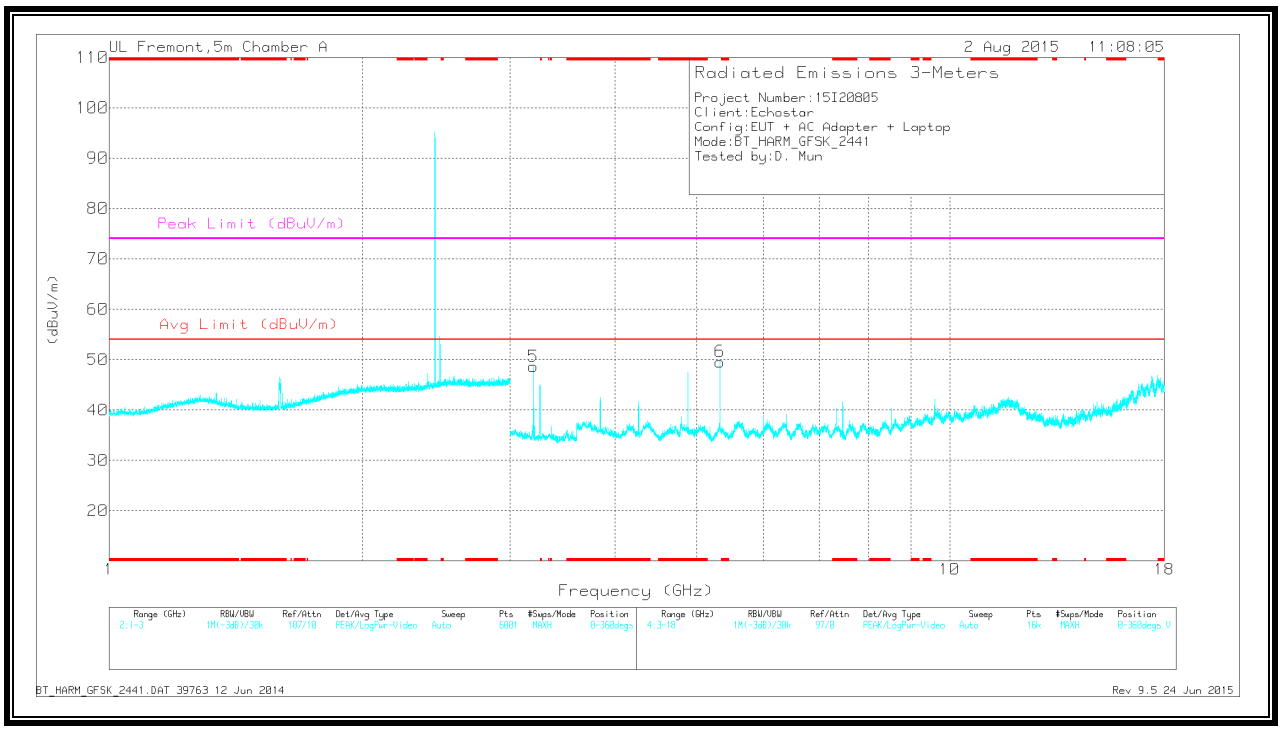
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

MID CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.489	40.27	Avg	32.3	-22.2	50.37	54	-3.63	-	-	0-360	100	H
1	1.926	36.35	Avg	31.2	-22.6	44.95	54	-9.05	-	-	0-360	100	H
2	2.393	42.05	Avg	32	-22.4	51.65	54	-2.35	-	-	0-360	100	H
3	2.475	49.15	Avg	32.3	-22.2	59.25			-	-	0-360	100	H
5	3.198	46.55	Avg	32.6	-30.5	48.65	54	-5.35	-	-	0-360	100	V
6	5.33	44.18	Avg	34.5	-29.1	49.58	54	-4.42	-	-	0-360	100	V

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

Avg - Video bandwidth < Resolution bandwidth

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.488	45.01	PK2	32.3	-22.2	55.11	-	-	74	-18.89	64	123	H
* 2.489	34.57	VA1T	32.3	-22.2	44.67	54	-9.33	-	-	64	123	H
1.926	44.3	PK2	31.2	-22.6	52.9	-	-	74	-21.1	0	100	H
2.392	44.32	PK2	32	-22.4	53.92	-	-	74	-20.08	0	100	H
2.475	52.05	PK2	32.3	-22.2	62.15	-	-	74	-11.85	129	100	H
2.475	52.02	PK2	32.3	-22.1	62.22	-	-	74	-11.78	129	100	H
3.198	47.68	PK2	32.6	-30.5	49.78	-	-	74	-24.22	64	100	V
5.33	44.65	PK2	34.5	-29.1	50.05	-	-	74	-23.95	64	100	V

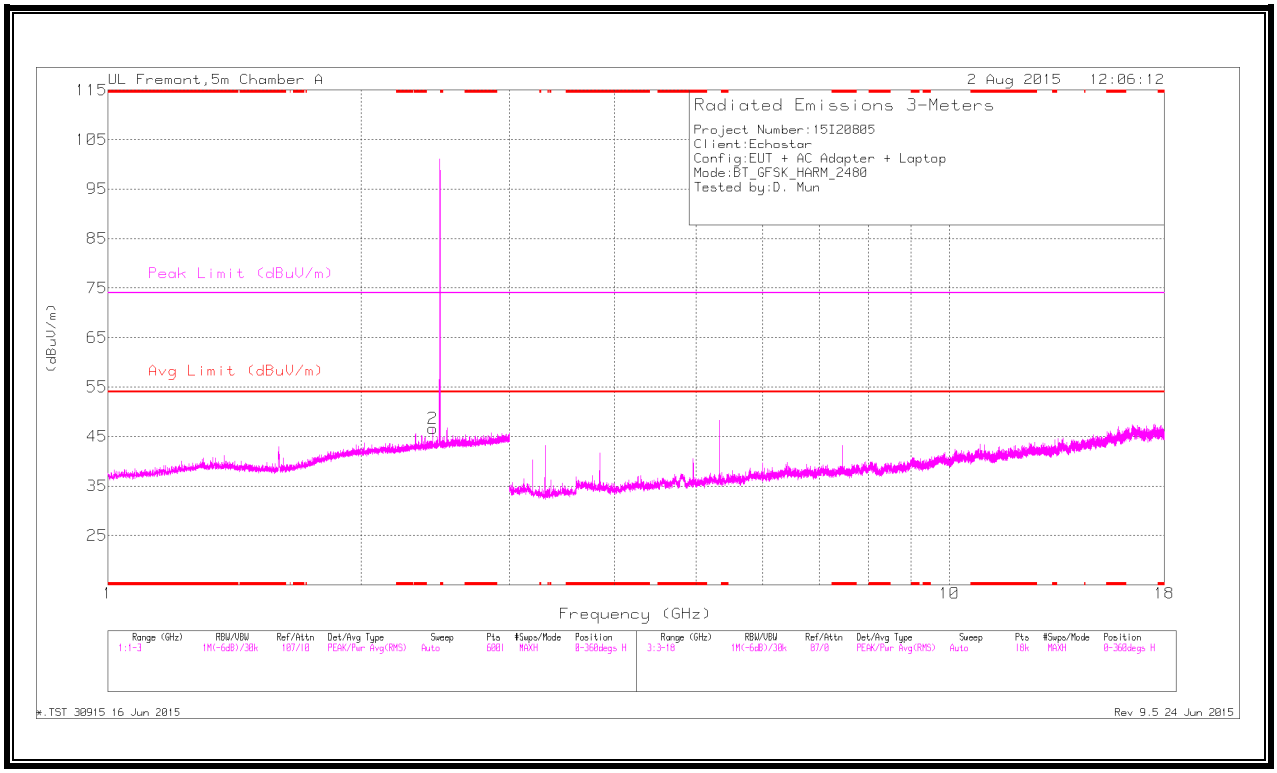
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

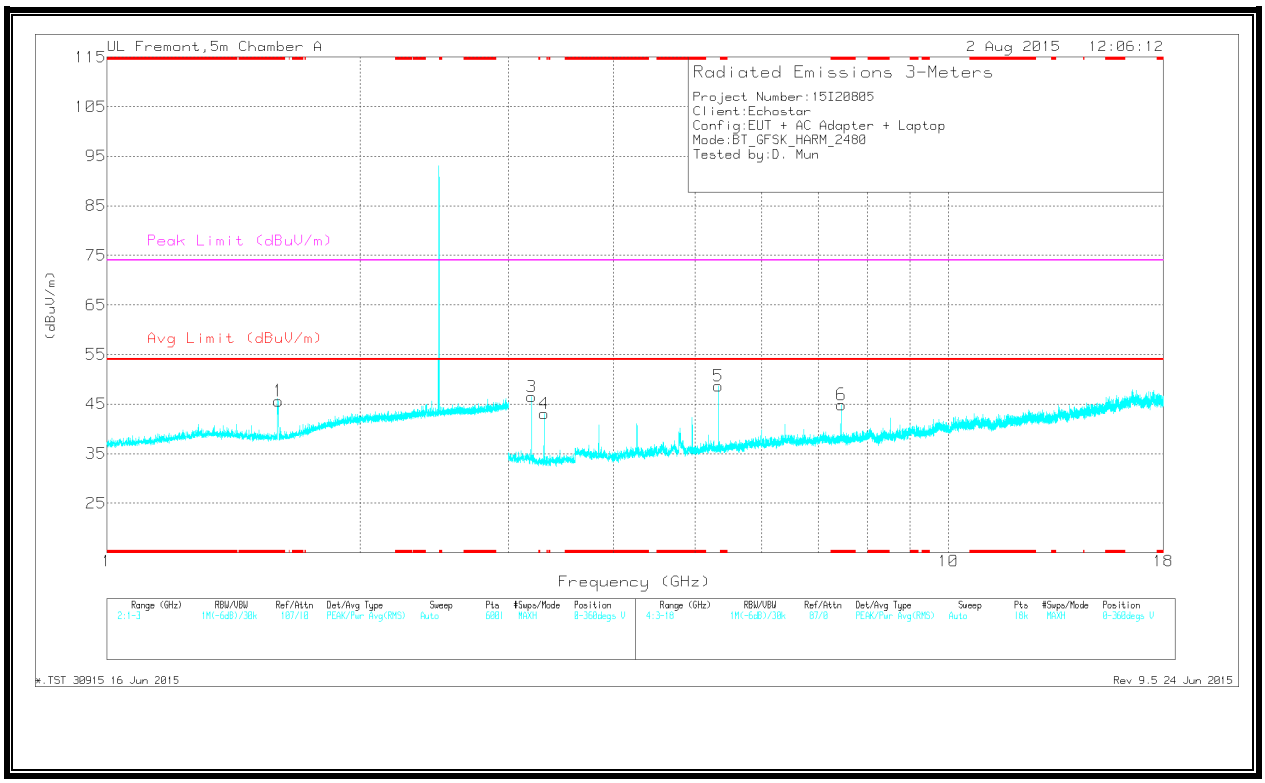
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HIGH CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/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	* 1.6	43.36	Pk	27.9	-25.6	45.66	-	-	74	-28.34	0-360	100	V
6	* 7.461	34.2	Pk	35.5	-24.8	44.9	-	-	74	-29.1	0-360	100	V
2	2.432	39.21	Pk	32	-24.6	46.61	-	-	-	-	0-360	100	H
3	3.197	45.55	Pk	32.7	-31.8	46.45	-	-	-	-	0-360	100	V
4	3.307	43.12	Pk	32.8	-32.8	43.12	-	-	-	-	0-360	100	V
5	5.33	43.82	Pk	34.6	-29.8	48.62	-	-	-	-	0-360	100	V

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

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.599	45.17	PK2	27.9	-25.6	47.47	-	-	74	-26.53	1	100	V
* 1.599	32.55	VA1T	27.9	-25.6	34.85	54	-19.15	-	-	1	100	V
* 7.462	38.93	PK2	35.5	-24.8	49.63	-	-	74	-24.37	1	100	V
* 7.461	30.27	VA1T	35.5	-24.8	40.97	54	-13.03	-	-	1	100	V
2.433	44.19	PK2	32	-24.6	51.59	-	-	74	-22.41	1	100	H
3.198	44.84	PK2	32.7	-31.8	45.74	-	-	74	-28.26	1	100	V
3.307	47.25	PK2	32.8	-32.8	47.25	-	-	74	-26.75	1	100	V
5.33	45.45	PK2	34.6	-29.8	50.25	-	-	74	-23.75	1	100	V

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

PK2 - KDB558074 Method: Maximum Peak

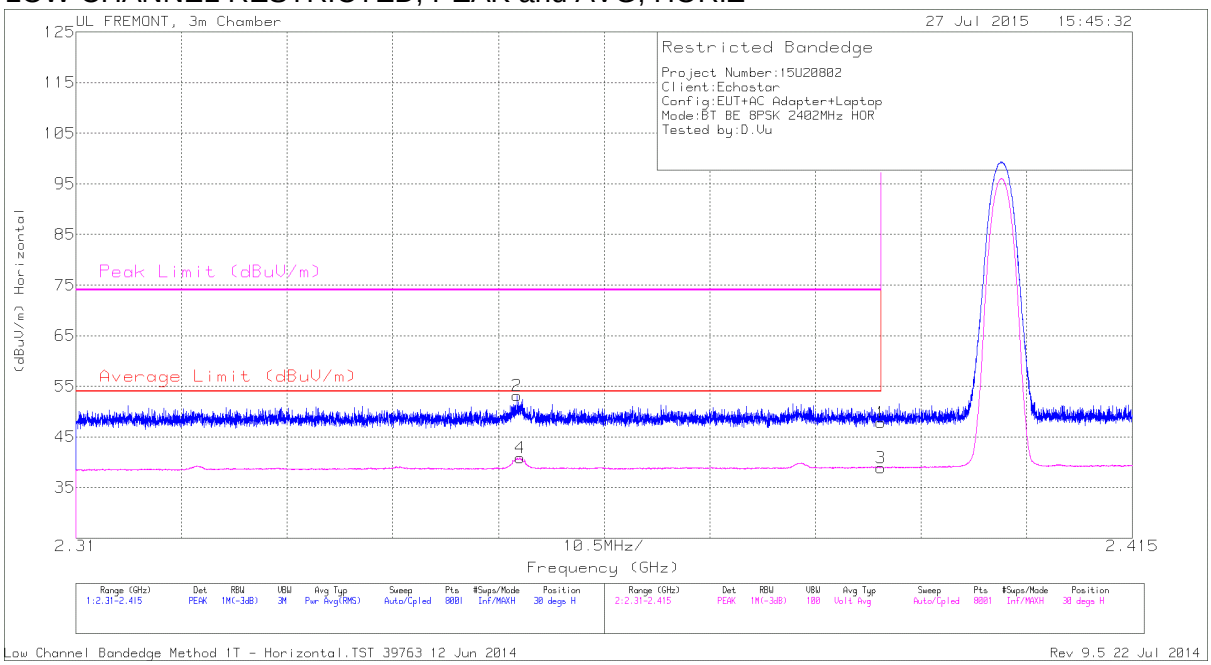
V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

9.2.2. ENHANCED DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL RESTRICTED, PEAK and AVG, HORIZ

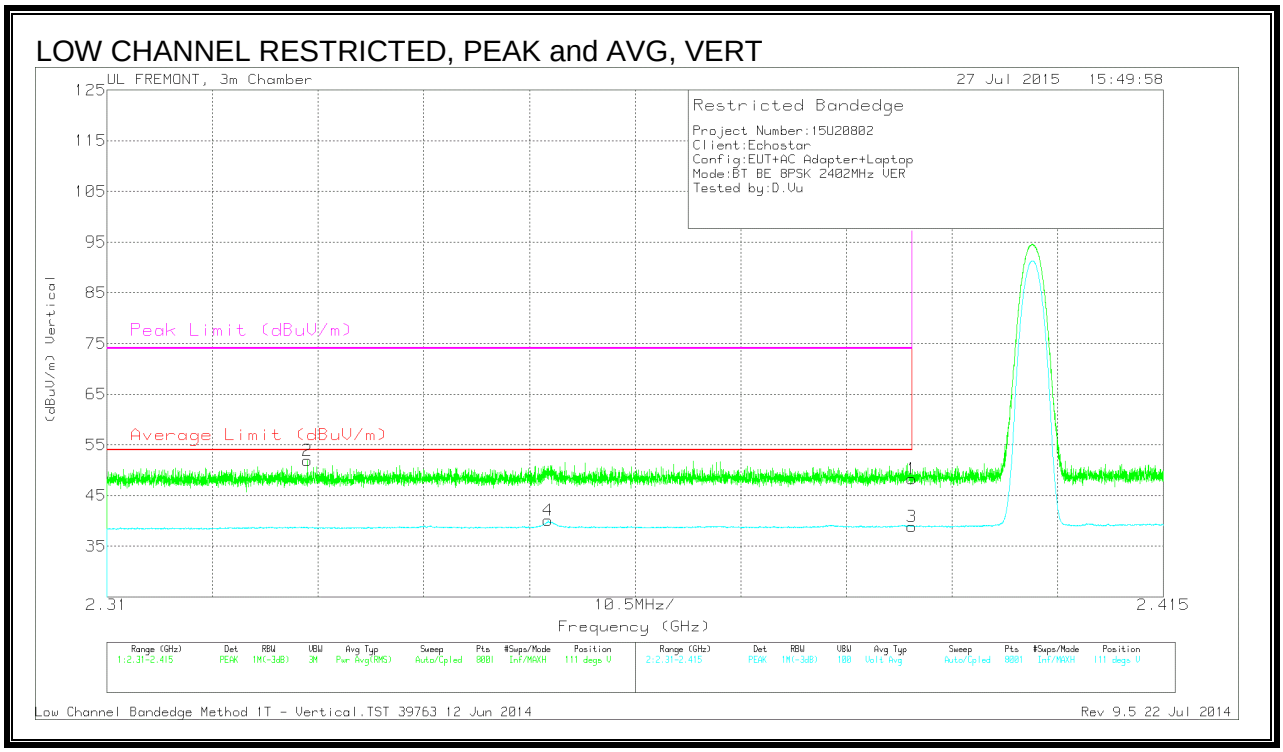


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.354	43.77	PK	31.8	-22.4	53.17	-	-	74	-20.83	30	103	H
4	2.354	31.48	VB1T	31.8	-22.4	40.88	54	-13.12	-	-	30	103	H
1	2.39	38.18	PK	32	-22.4	47.78	-	-	74	-26.22	30	103	H
3	2.39	29.22	VB1T	32	-22.4	38.82	54	-15.18	-	-	30	103	H

PK - Peak detector
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

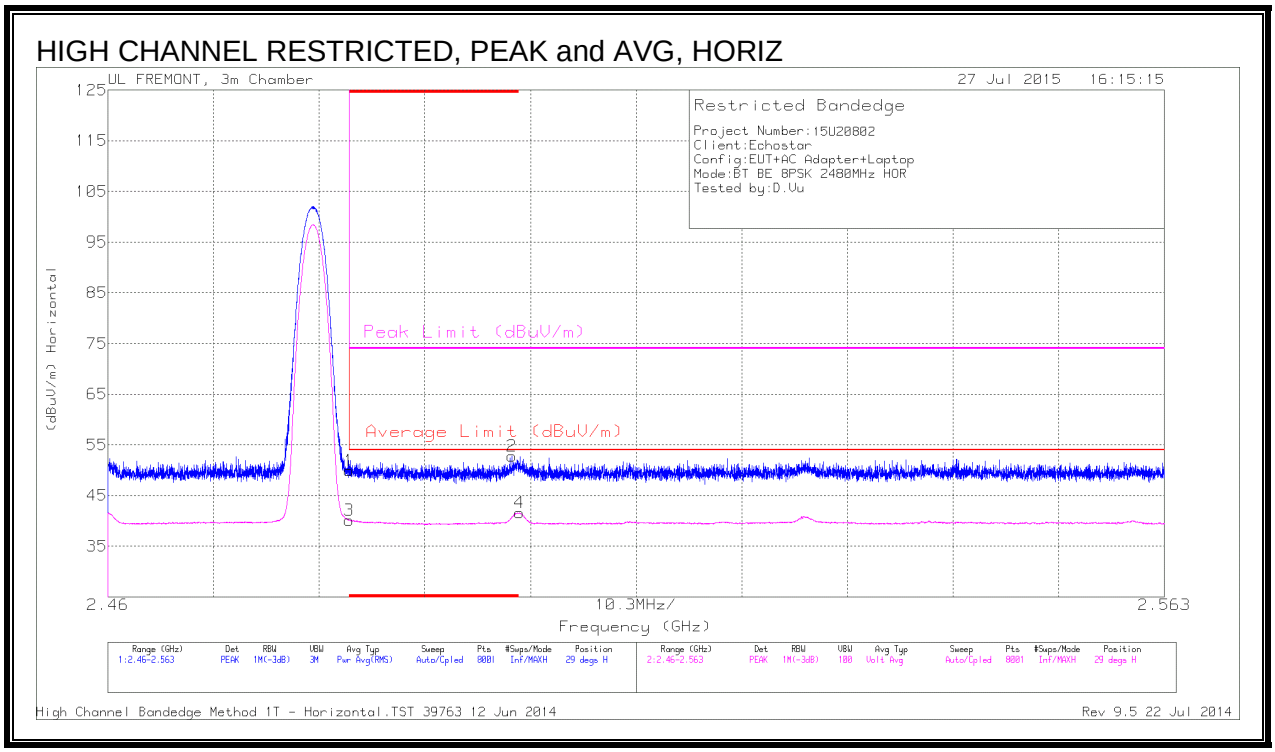


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.33	42.59	PK	31.7	-22.4	51.89	-	-	74	-22.11	111	100	V
4	2.354	30.74	VB1T	31.8	-22.4	40.14	54	-13.86	-	-	111	100	V
1	2.39	38.67	PK	32	-22.4	48.27	-	-	74	-25.73	111	100	V
3	2.39	29.32	VB1T	32	-22.4	38.92	54	-15.08	-	-	111	100	V

PK - Peak detector
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/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	* 2.484	39.72	PK	32.3	-22.1	49.92	-	-	74	-24.08	29	221	H
2	* 2.499	42.54	PK	32.3	-22.1	52.74	-	-	74	-21.26	29	221	H
3	* 2.484	29.91	VB1T	32.3	-22.1	40.11	54	-13.89	-	-	29	221	H
4	2.5	31.38	VB1T	32.3	-22.1	41.58	54	-12.42	-	-	29	221	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

HIGH CHANNEL RESTRICTED, PEAK and AVG, VERT

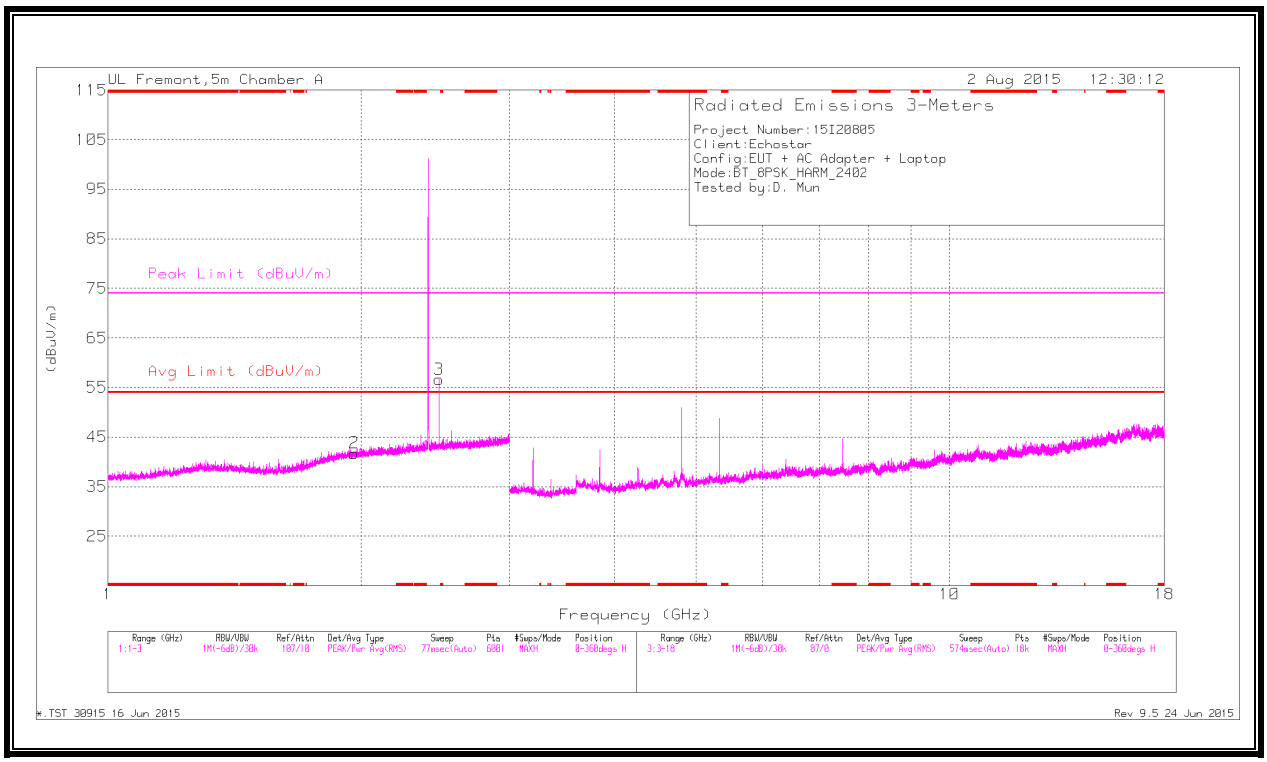
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/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	* 2.484	38.59	PK	32.3	-22.1	48.79	-	-	74	-25.21	198	220	V
3	* 2.484	29.43	VB1T	32.3	-22.1	39.63	54	-14.37	-	-	198	220	V
2	* 2.489	42.73	PK	32.3	-22.2	52.83	-	-	74	-21.17	198	220	V
4	2.528	29.64	VB1T	32.4	-22	40.04	54	-13.96	-	-	198	220	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK - Peak detector
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

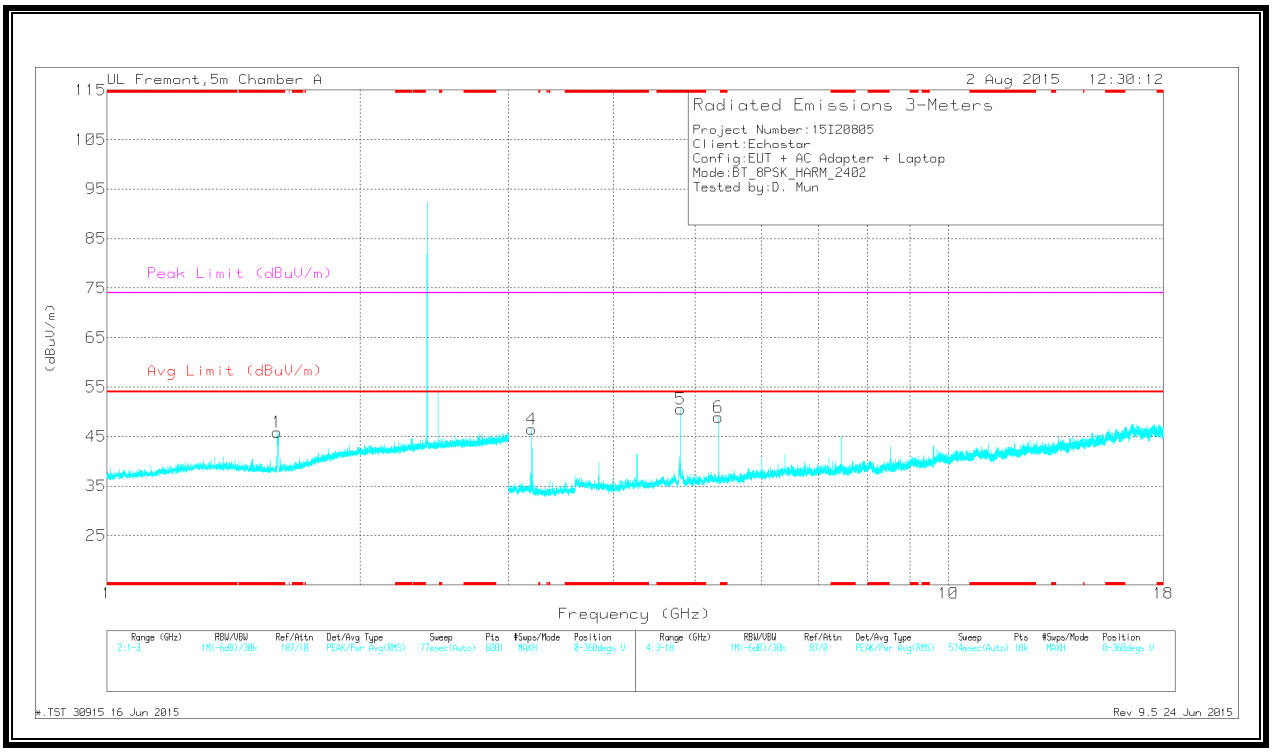
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/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	* 1.593	43.58	Pk	27.9	-25.6	45.88	-	-	74	-28.12	0-360	100	V
5	* 4.804	46.32	Pk	34	-29.8	50.52	-	-	74	-23.48	0-360	201	V
2	1.962	35.83	Pk	31	-25.1	41.73	-	-	-	-	0-360	100	H
3	2.475	49.06	Pk	32.1	-24.5	56.66	-	-	-	-	0-360	100	H
4	3.197	45.56	Pk	32.7	-31.8	46.46	-	-	-	-	0-360	100	V
6	5.33	44.05	Pk	34.6	-29.8	48.85	-	-	-	-	0-360	100	V

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

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.593	45.76	PK2	27.9	-25.6	48.06	-	-	74	-25.94	359	100	V
* 1.594	32.18	VA1T	27.9	-25.6	34.48	54	-19.52	-	-	359	100	V
* 4.804	48.06	PK2	34	-29.8	52.26	-	-	74	-21.74	359	202	V
* 4.804	40.38	VA1T	34	-29.8	44.58	54	-9.42	-	-	359	202	V
1.96	44.44	PK2	31	-25.1	50.34	-	-	74	-23.66	359	100	H
2.475	47.17	PK2	32.1	-24.5	54.77	-	-	74	-19.23	359	100	H
3.198	44.94	PK2	32.7	-31.8	45.84	-	-	74	-28.16	359	100	V
5.33	46.16	PK2	34.6	-29.8	50.96	-	-	74	-23.04	359	100	V

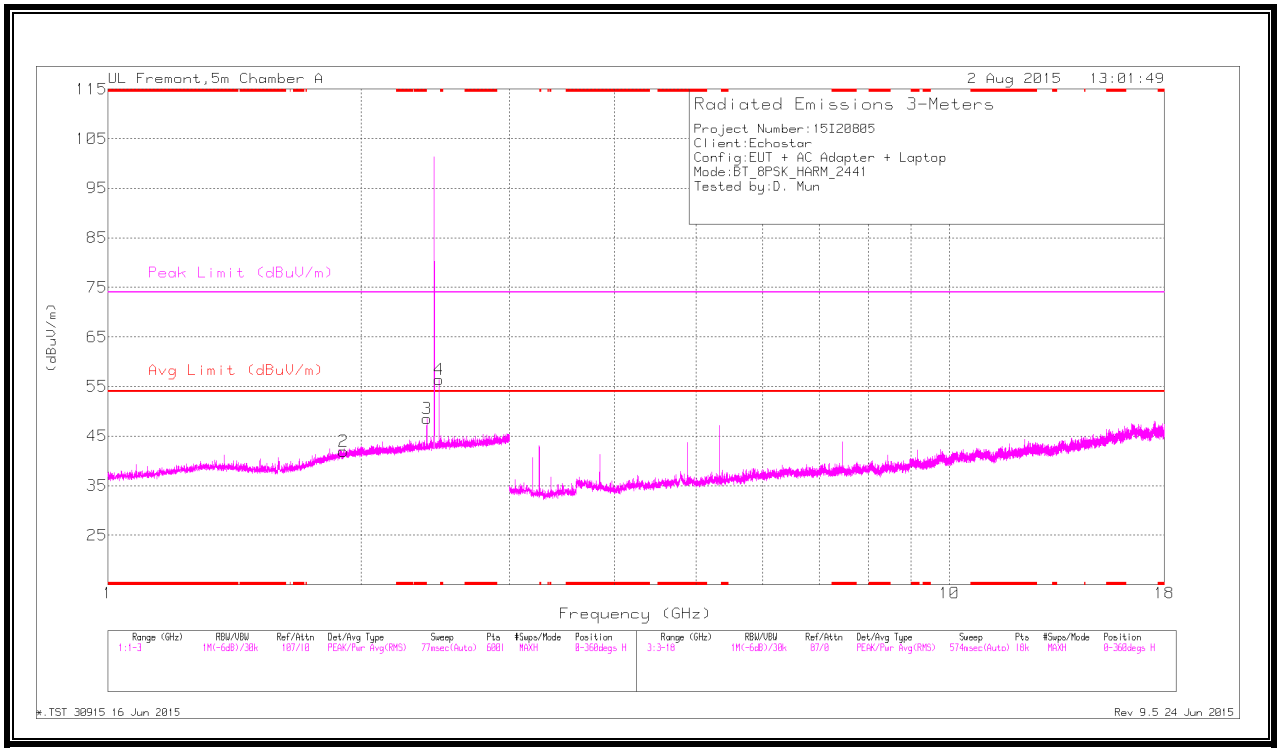
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

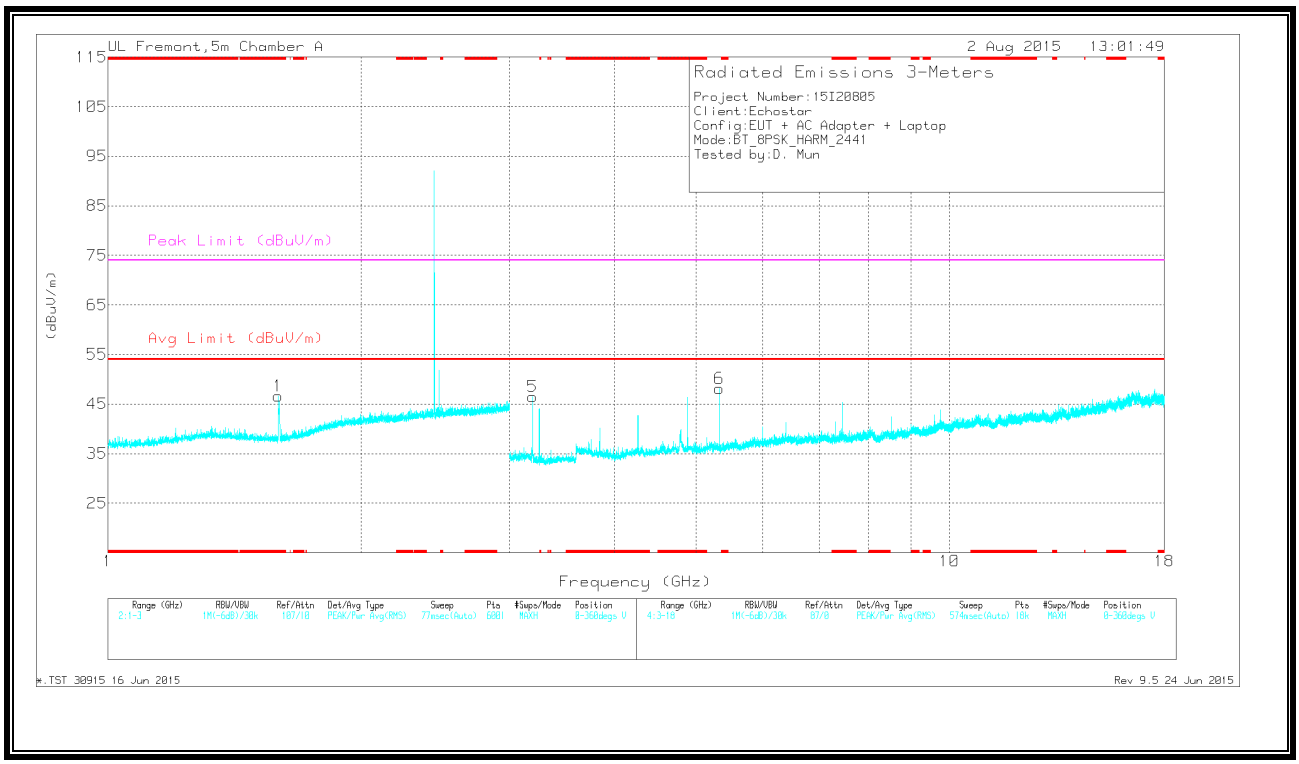
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

MID CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/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	* 1.593	44.26	Pk	27.9	-25.6	46.56	-	-	74	-27.44	0-360	100	V
2	1.905	36.34	Pk	30.8	-25.2	41.94	-	-	-	-	0-360	100	H
3	2.393	41.13	Pk	32	-24.6	48.53	-	-	-	-	0-360	100	H
4	2.475	48.74	Pk	32.1	-24.5	56.34	-	-	-	-	0-360	100	H
5	3.197	45.62	Pk	32.7	-31.8	46.52	-	-	-	-	0-360	100	V
6	5.33	43.36	Pk	34.6	-29.8	48.16	-	-	-	-	0-360	100	V

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

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.594	45.39	PK2	27.9	-25.6	47.69	-	-	74	-26.31	360	100	V
* 1.594	32.26	VA1T	27.9	-25.6	34.56	54	-19.44	-	-	360	100	V
1.905	44.38	PK2	30.8	-25.2	49.98	-	-	74	-24.02	360	100	H
2.392	44.99	PK2	32	-24.6	52.39	-	-	74	-21.61	360	100	H
2.475	46.98	PK2	32.1	-24.5	54.58	-	-	74	-19.42	360	100	H
3.198	44.77	PK2	32.7	-31.8	45.67	-	-	74	-28.33	360	100	V
5.33	45.92	PK2	34.6	-29.8	50.72	-	-	74	-23.28	360	100	V

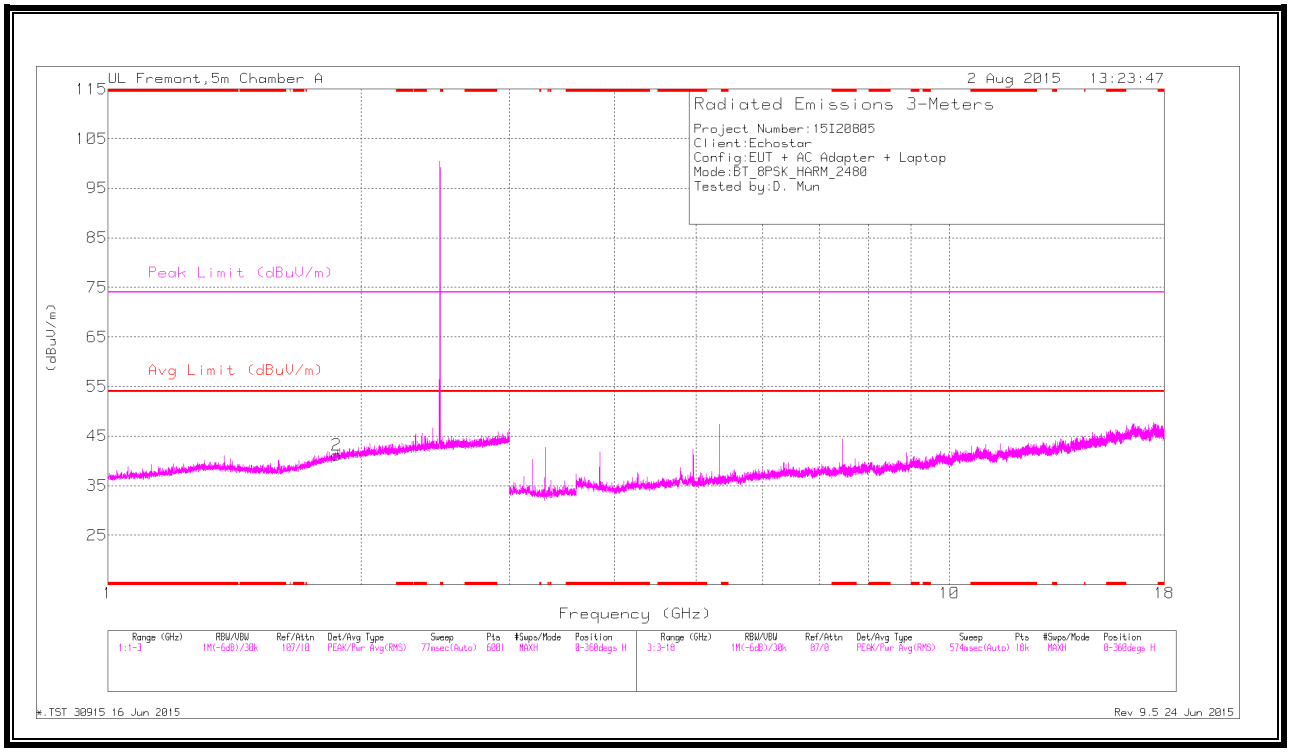
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

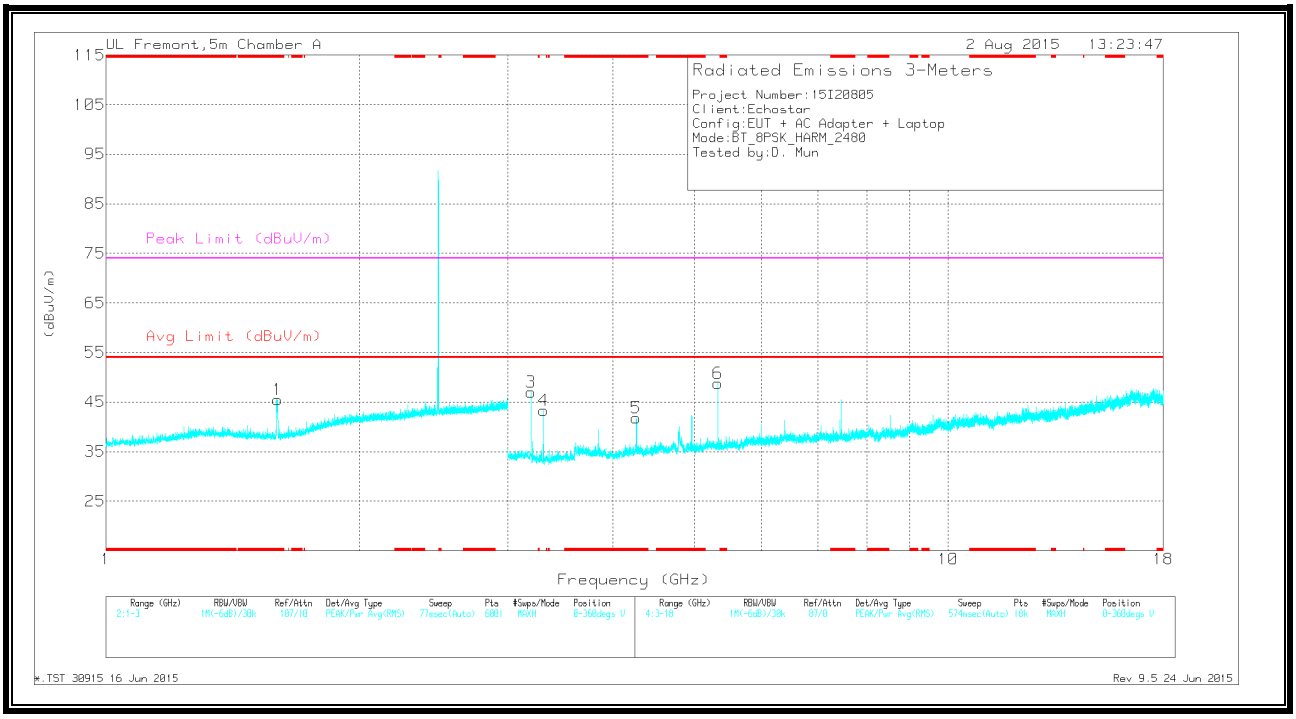
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HIGH CHANNEL
HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/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	* 1.598	43.17	Pk	27.9	-25.6	45.47	-	-	74	-28.53	0-360	100	V
5	* 4.263	38.87	Pk	33.4	-30.5	41.77	-	-	74	-32.23	0-360	100	V
2	1.871	35.77	Pk	30.6	-25.2	41.17	-	-	-	-	0-360	100	H
3	3.197	46.08	Pk	32.7	-31.8	46.98	-	-	-	-	0-360	100	V
4	3.307	43.34	Pk	32.8	-32.8	43.34	-	-	-	-	0-360	100	V
6	5.33	44	Pk	34.6	-29.8	48.8	-	-	-	-	0-360	100	V

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

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.598	45.79	PK2	27.9	-25.6	48.09	-	-	74	-25.91	360	100	V
* 1.597	32.46	VA1T	27.9	-25.6	34.76	54	-19.24	-	-	360	100	V
* 4.263	41.93	PK2	33.4	-30.5	44.83	-	-	74	-29.17	360	100	V
* 4.264	29.57	VA1T	33.4	-30.5	32.47	54	-21.53	-	-	360	100	V
1.869	44.43	PK2	30.6	-25.2	49.83	-	-	74	-24.17	360	100	H
3.198	44.93	PK2	32.7	-31.8	45.83	-	-	74	-28.17	360	100	V
3.306	47.55	PK2	32.8	-32.8	47.55	-	-	74	-26.45	360	100	V
5.33	45.59	PK2	34.6	-29.8	50.39	-	-	74	-23.61	360	100	V

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

PK2 - KDB558074 Method: Maximum Peak

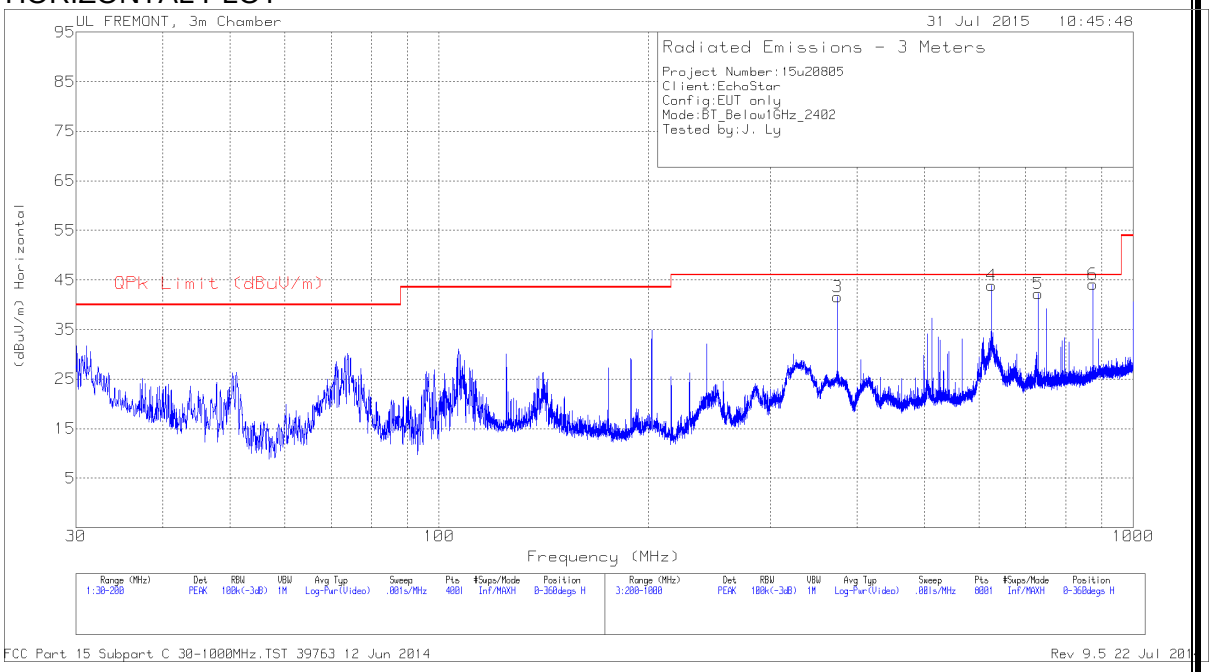
V1TV - U-NII: VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

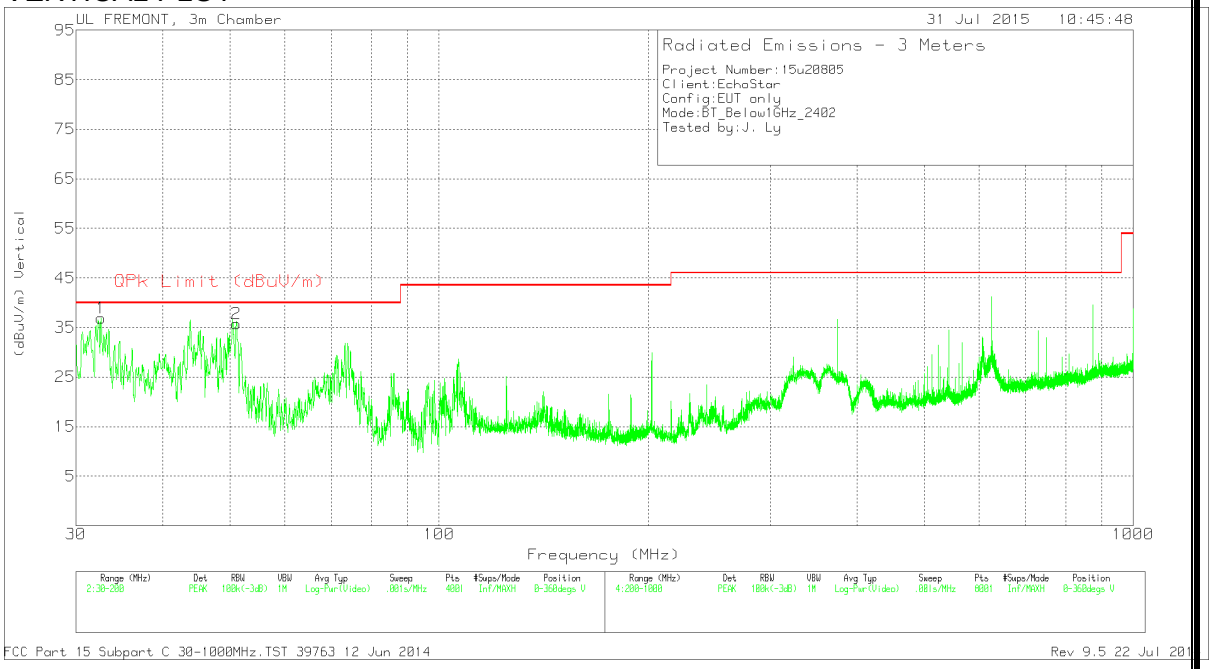
9.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	32.5925	44.11	PK	19.9	-27.1	36.91	40	-3.09	0-360	100	V
2	51.0375	54.87	PK	7.9	-27	35.77	40	-4.23	0-360	100	V
3	375	51.23	PK	15.1	-24.7	41.63	46.02	-4.39	0-360	100	H
4	625	49.46	PK	19	-24.6	43.86	46.02	-2.16	0-360	300	H
5	729	46.19	PK	19.9	-23.9	42.19	46.02	-3.83	0-360	100	H
6	875	45.19	PK	21.8	-22.9	44.09	46.02	-1.93	0-360	100	H

PK - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
625.0048	50.53	QP	19	-24.6	44.93	46.02	-1.09	258	139	H
729.0085	45.34	QP	19.9	-23.9	41.34	46.02	-4.68	127	102	H
874.9968	44.88	QP	21.8	-22.9	43.78	46.02	-2.24	140	101	H

QP - Quasi-Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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 C63.10.

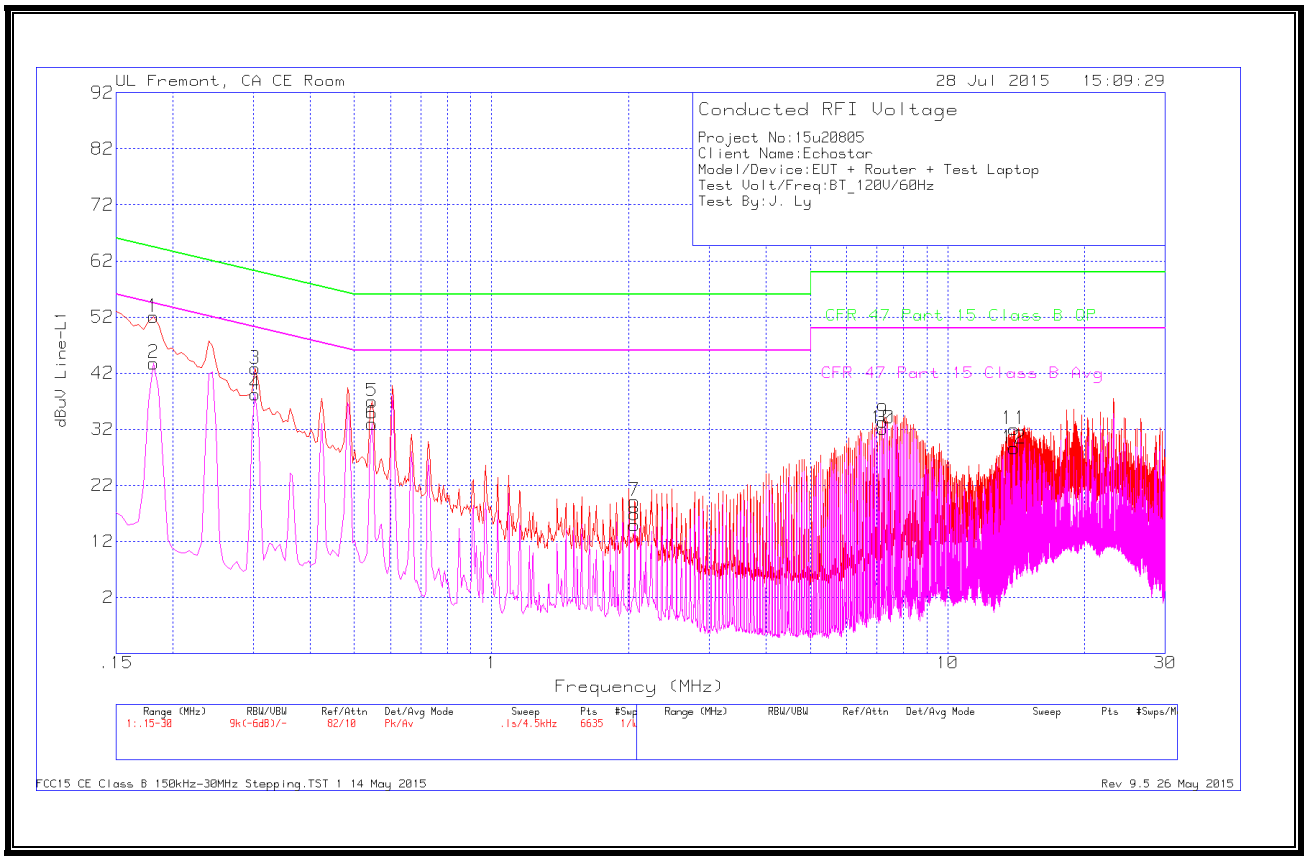
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 RESULTS



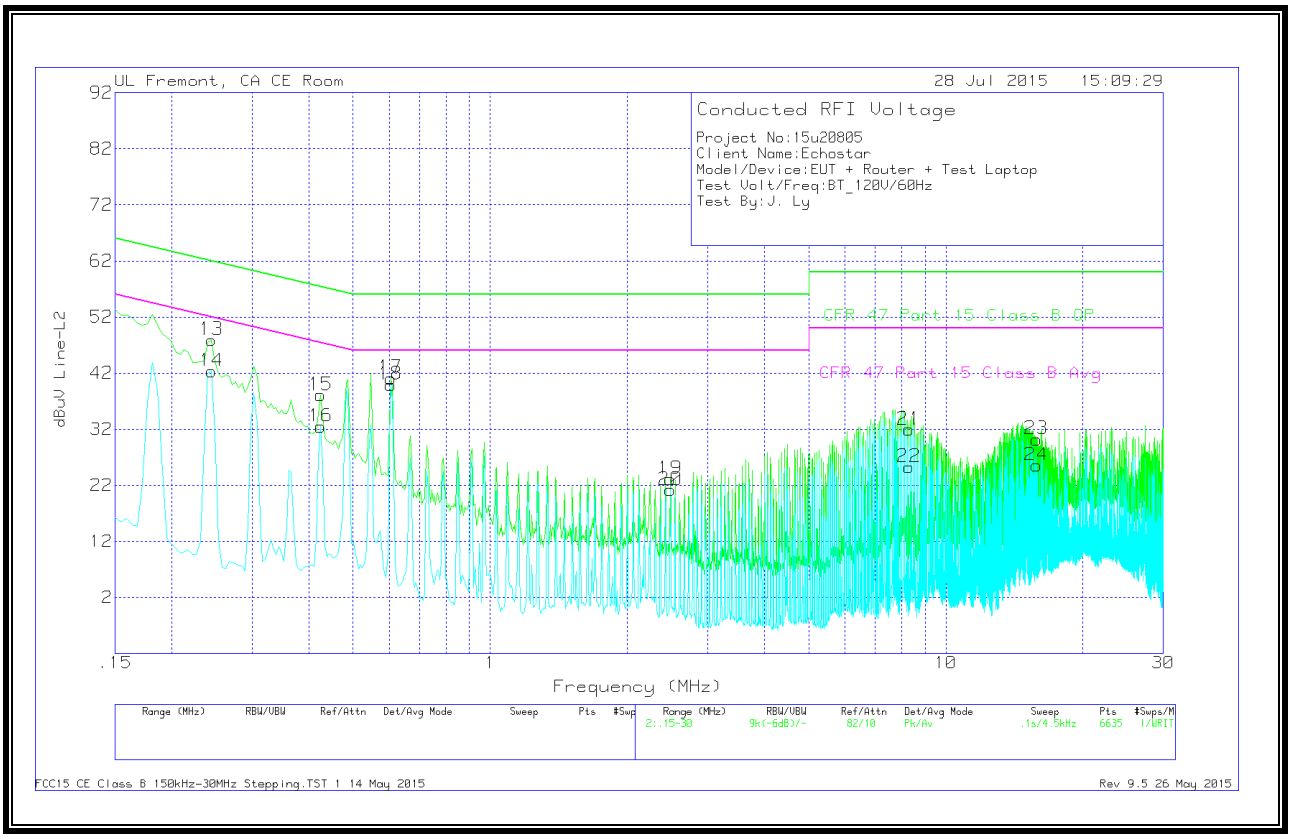
Trace Markers

Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
1	.1815	50.94	Pk	1.1	0	52.04	64.42	-12.38		
2	.1815	42.68	Av	1.1	0	43.78	-	-	54.42	-10.64
3	.303	42.3	Pk	.5	0	42.8	60.16	-17.36		
4	.303	37.71	Av	.5	0	38.21	-	-	50.16	-11.95
5	.546	36.69	Pk	.3	0	36.99	56	-19.01		
6	.546	32.66	Av	.3	0	32.96	-	-	46	-13.04
7	2.058	18.9	Pk	.2	.1	19.2	56	-36.8		
8	2.058	14.6	Av	.2	.1	14.9	-	-	46	-31.1
9	7.2105	33.02	Pk	.2	.1	33.32	60	-26.68		
10	7.2105	31.82	Av	.2	.1	32.12	-	-	50	-17.88
11	13.9965	31.62	Pk	.2	.2	32.02	60	-27.98		
12	13.9965	28.19	Av	.2	.2	28.59	-	-	50	-21.41

Pk - Peak detector
Av - Average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
13	.2445	47.11	Pk	.8	0	47.91	61.94	-14.03		
14	.2445	41.51	Av	.8	0	42.31	-	-	51.94	-9.63
15	.4245	37.68	Pk	.4	0	38.08	57.36	-19.28		
16	.4245	32.09	Av	.4	0	32.49	-	-	47.36	-14.87
17	.6045	40.79	Pk	.3	0	41.09	56	-14.91		
18	.6045	39.64	Av	.3	0	39.94	-	-	46	-6.06
19	2.4855	22.85	Pk	.2	.1	23.15	56	-32.85		
20	2.4855	20.87	Av	.2	.1	21.17	-	-	46	-24.83
21	8.304	31.63	Pk	.2	.1	31.93	60	-28.07		
22	8.304	24.95	Av	.2	.1	25.25	-	-	50	-24.75
23	15.81	29.71	Pk	.3	.2	30.21	60	-29.79		
24	15.81	25.05	Av	.3	.2	25.55	-	-	50	-24.45

Pk - Peak detector
Av - Average detection
FCC15 CE Class B 150kHz-30MHz Stepping.TST 1 14 May 2015
Rev 9.5 26 May 2015