CERTIFICATION TEST REPORT

Report Number. : 16U23814-E2V2

Applicant	:	APPLE, INC. 1 INFINITE LOOP CUPERTINO, CA 95014, U.S.A.
Model	:	A1823
FCC ID	:	BCGA1823
IC	:	579C-A1823
EUT Description	:	TABLET DEVICE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C INDUSTRY CANADA RSS - 247 ISSUE 1

Date Of Issue:
February 10, 2017

Prepared by:
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	01/24/2017	Initial Review	Chin Pang
V2	02/10/2017	Address TCB Questions	Francisco Guarnero

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: TABLET DEVICE

MODEL: A1823

SERIAL NUMBER: F9FSQ00QHNC9 (CONDUCTED),
F9FSQ00MHNC9 (RADIATED)

DATE TESTED: NOVEMBER 10, 2016 - JANUARY 20, 2017

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 Issue 1	Pass
INDUSTRY CANADA RSS-GEN Issue 4	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
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Prepared By:

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Test Engineer
UL VERIFICATION SERVICES INC.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 1.

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)

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

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.

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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
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a tablet with multimedia functions (music, application support, and video), Cellular GSM/GPRS/EGPRS/CDMA2000 1xRTT/1x Advanced/EVDO Rev.A/WCDMA /HSPA+/DC-HSDPA/LTE FDD & TDD/TD-SCDMA radio, IEEE 802.11a/b/g/n/ac radio, and Bluetooth radio. The rechargeable battery is not user accessible.

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	17.28	53.46
	DQPSK	16.65	46.24
	Enhanced 8PSK	16.80	47.86

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Band (GHz)	Antenna Gain (dBi)
2.4	1.91

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 14E232.

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5.5. WORST-CASE CONFIGURATION AND MODE

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

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

Worst-case data rates were:

GFSK mode: DH5
8PSK mode: 3-DH5

DQPSK mode has been verified to have the lowest power.

For simultaneous transmission of multiple channels from the same antenna in the 2.4GHz and 5GHz bands, tests were conducted for various configurations having the highest power. No noticeable new emission was found.

There are two vendors of the WiFi/Bluetooth radio modules: variant 1 and variant 2. The Wi-Fi/Bluetooth radio modules have the same mechanical outline (e.g., the same package dimension and pin-out layout), use the same on-board antenna matching circuit, have an identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances.

Baseline testing was performed on the two variants to determine the worst case on all conducted power and radiated emissions.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Apple	A1286	7313700NAGW	N/A
Laptop AC/DC adapter	Apple	A1343	C062172045DDJ94A6	N/A
Earphone	Apple	NA	NA	N/A
EUT AC/DC adapter	Apple	A1357	W010A051	N/A

I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	SMA	Un-Shielded	0.2	To spectrum Analyzer
2	USB	1	USB	Shielded	1	N/A
3	AC	1	AC	Un-shielded	2	N/A

I/O CABLES (RADIATED ABOVE 1 GHZ)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
None Used						

I/O CABLES (RADIATED BELOW 1 GHZ AND AC LINE CONDUCTED: AC/DC ADAPTER CONFIGURATION)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Earphone Jack	1	3.5mm Audio	Shielded	0.9	N/A
2	USB	1	USB	shielded	1	N/A

I/O CABLES (AC LINE CONDUCTED: LAPTOP CONFIGUARTION)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Earphone Jack	1	3.5mm Audio	Shielded	0.9	N/A
2	USB	1	USB	Shielded	1	N/A
3	AC	1	AC	Un-shielded	2	N/A

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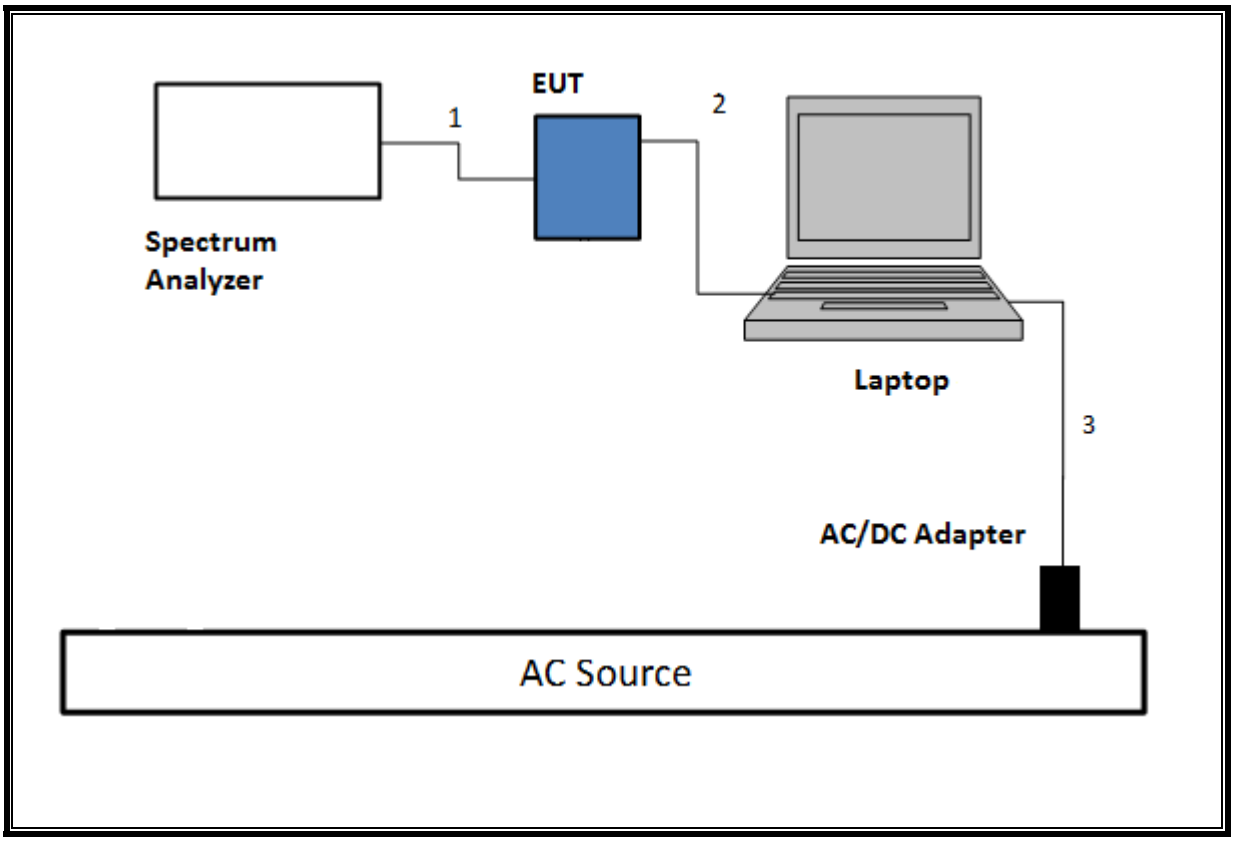
TEST SETUP - CONDUCTED TESTS

The EUT was connected to a host Laptop via USB cable adapter and spectrum analyzer to antenna port. Test software exercised the EUT.

SETUP DIAGRAM



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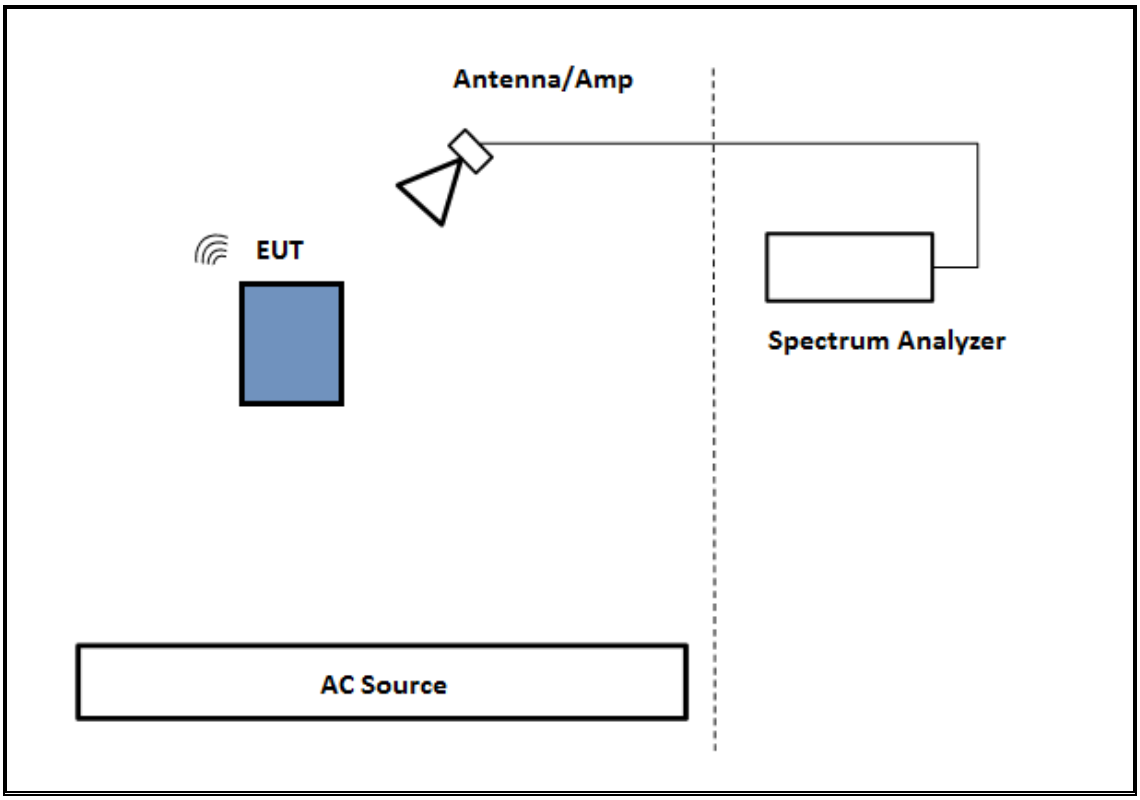
TEST SETUP- RADIATED-ABOVE 1 GHZ

The EUT was powered by battery. Test software exercised the EUT.

SETUP DIAGRAM



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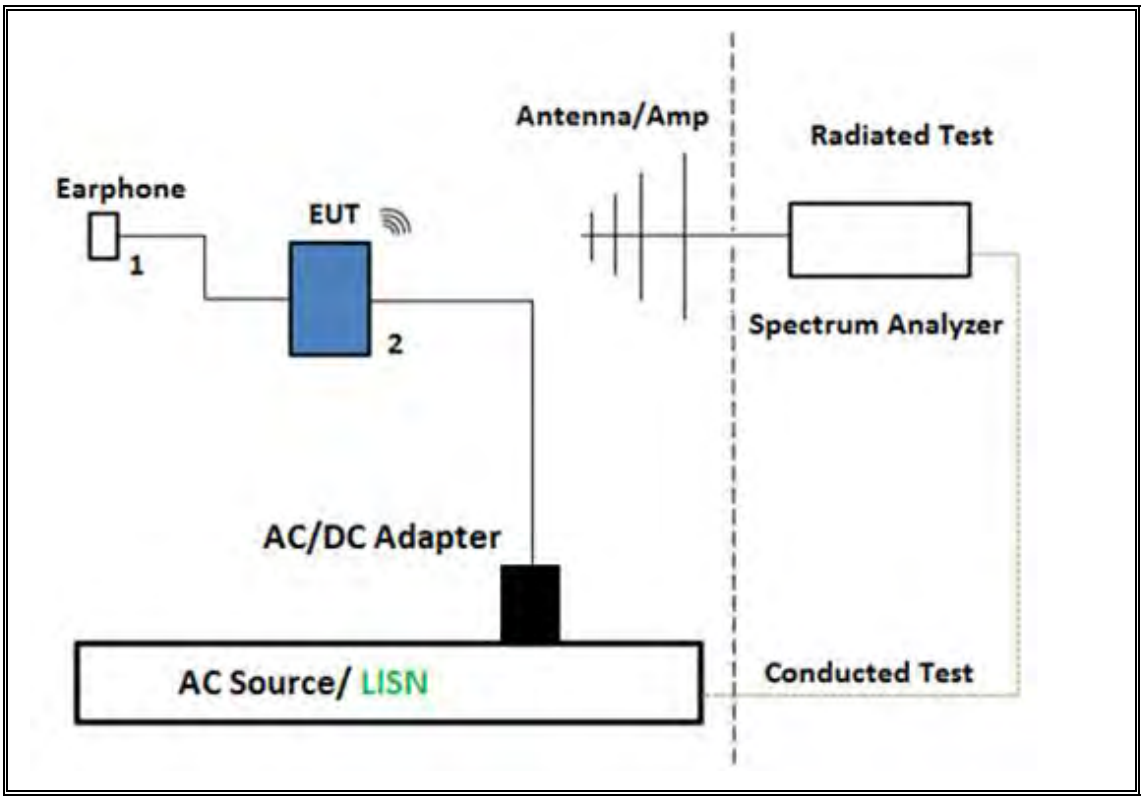
TEST SETUP- BELOW 1GHz

The EUT was powered by AC/DC adapter and connected with earphone. Test software exercised the EUT.

SETUP DIAGRAM



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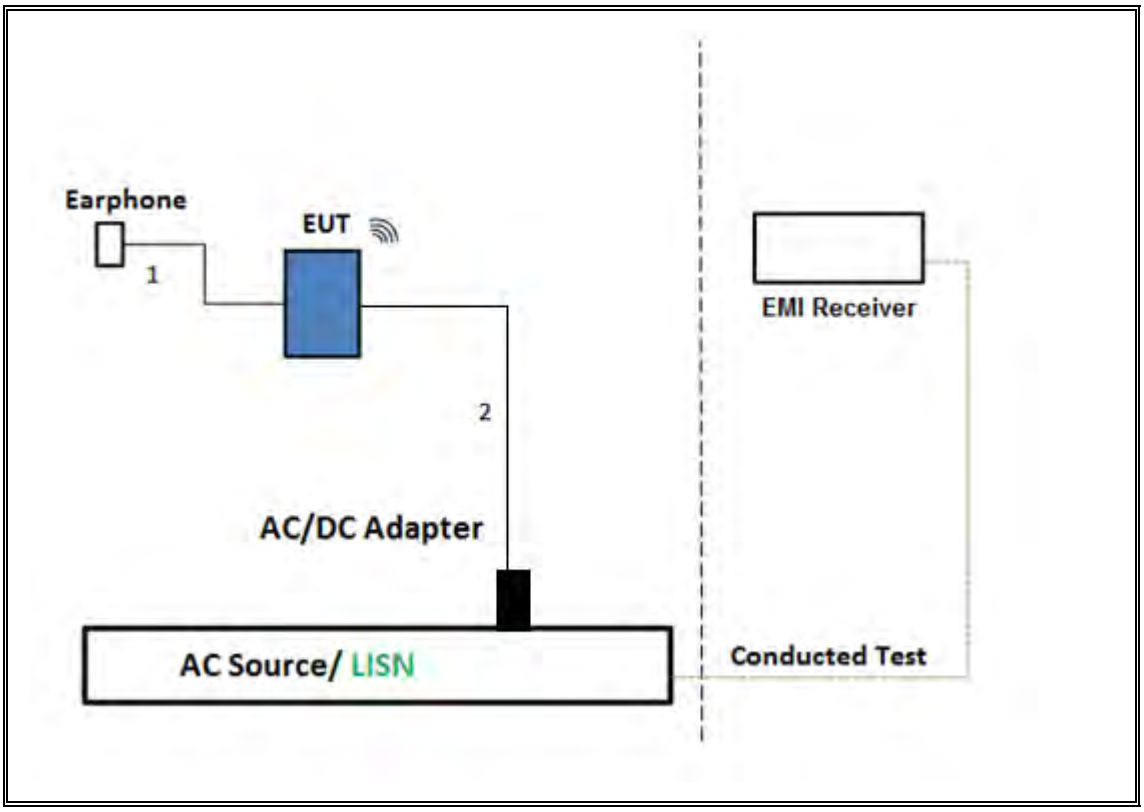
TEST SETUP- AC LINE CONDUCTED: AC/DC ADAPTER CONFIGURATION

The EUT was tested with earphone connected and powered by AC/DC adapter via USB cable. Test software exercised the EUT.

SETUP DIAGRAM



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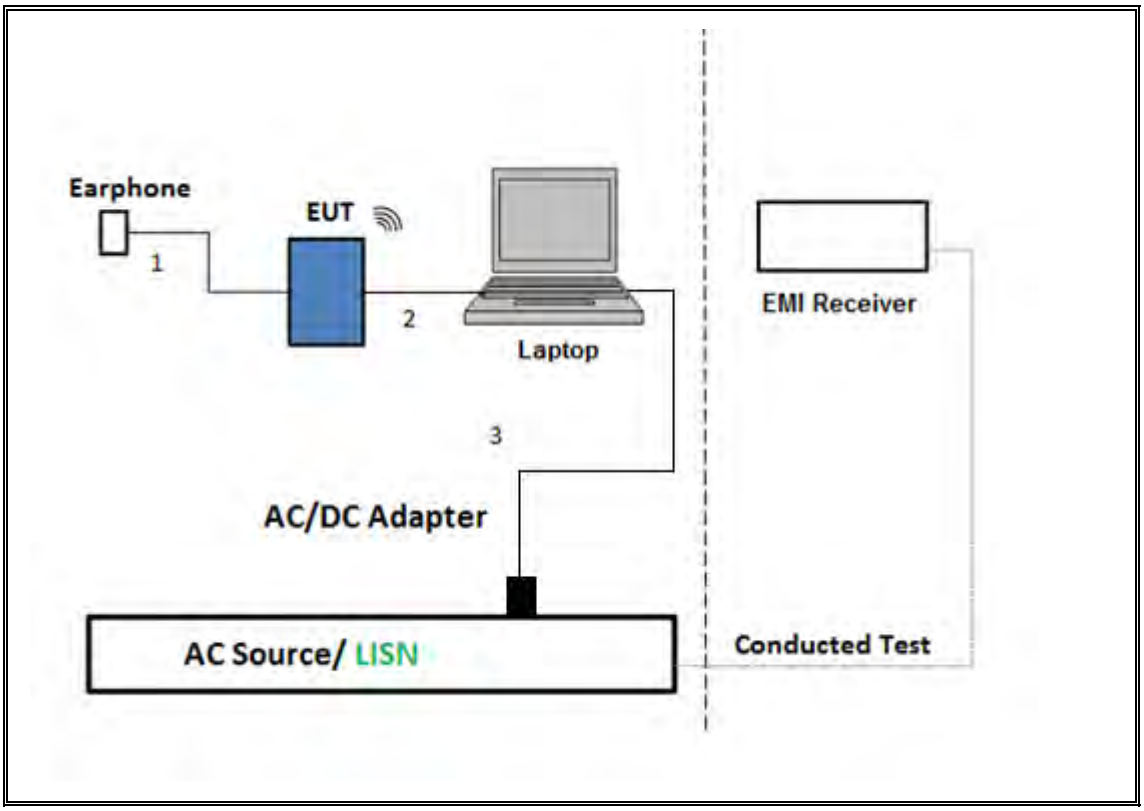
TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION

The EUT was tested with earphone connected and powered by host PC via USB cable. Test software exercised the EUT.

SETUP DIAGRAM



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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, Horn 1-18GHz	ETS Lindgren	3117	T344	02/22/2017
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	T407	04/04/2017
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T286	05/04/2017
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T740	11/29/2017
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T340	12/14/2017
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T120	04/05/2017
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	T122	01/29/2017
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T742	11/29/2017
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T173	06/17/2017
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T341	10/25/2017
Power Meter, P-series single channel	Keysight	N1912A	T1244	05/03/2017
Power Sensor	Keysight	N1921A	T1225	04/07/2017
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T339	09/22/2017
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1210	06/30/2017
Spectrum Analyzer	Keysight	8564E	T106	09/07/2017
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	T447	06/16/2017
Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum	Keysight	8449B	T402	07/05/2017
AC Line Conducted				
*EMI Test Receiver 9Khz-7GHz	Rohde & Schwarz	ESCI7	T1436	12/19/2016
LISN for Conducted Emissions CISPR-16	Fischer	50/250-25-2-01	T1310	06/08/2017
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, April 26, 2016	
Conducted Software	UL	UL EMC	Ver 5.4, October 13, 2016	
AC Line Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015	

NOTE: *testing is completed before equipment calibration expiration date.

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7. MEASUREMENT METHODS

On Time and Duty Cycle: ANSI C63.10-2013 Section 11.6

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Carrier Frequency Separation: ANSI C63.10-2013 Section 7.8.2

Number of Hopping Frequencies: ANSI C63.10-2013 Section 7.8.3

Time of Occupancy (Dwell Time): ANSI C63.10-2013 Section 7.8.4

Peak Output Power: ANSI C63.10-2013 Section 7.8.5

Conducted Spurious Emissions: ANSI C63.10-2013 Section 7.8.8

Conducted Band-Edge: ANSI C63.10-2013 Section 6.10.4

Radiated Spurious Emissions 30-1000MHz: ANSI C63.10-2013 Section 6.3 and 6.5

Radiated Spurious Emissions above 1GHz: ANSI C63.10-2013 Section 6.3 and 6.6

Radiated Band-edge: ANSI C63.10-2013 Section 6.10.5

AC Power-line conducted emissions: ANSI C63.10-2013, Section 6.2.

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8. ANTENNA PORT TEST RESULTS

ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

ANSI C63.10, Section 11.6 : Zero-Span Spectrum Analyzer Method.

8.1. 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)
GFSK High Power	1.000	1.000	1.000	100.00%	0.00	0.010
8PSK High Power	1.000	1.000	1.000	100.00%	0.00	0.010
GFSK Low Power	1.000	1.000	1.000	100.00%	0.00	0.010
8PSK Low Power	1.000	1.000	1.000	100.00%	0.00	0.010

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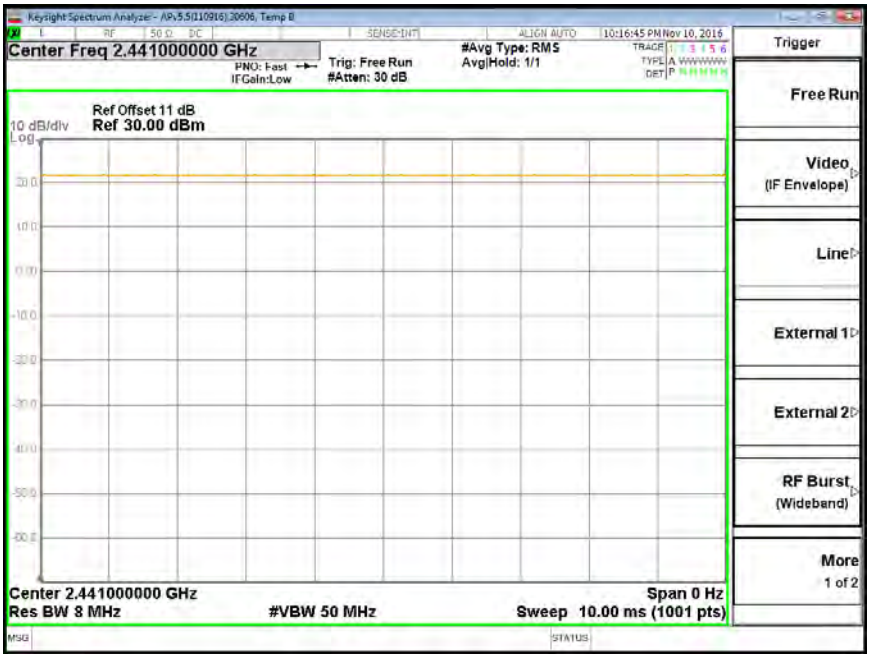
8.2. DUTY CYCLE PLOTS

8.2.1. HIGH POWER MODE

DUTY CYCLE GFSK MODE



DUTY CYCLE 8PSK MODE

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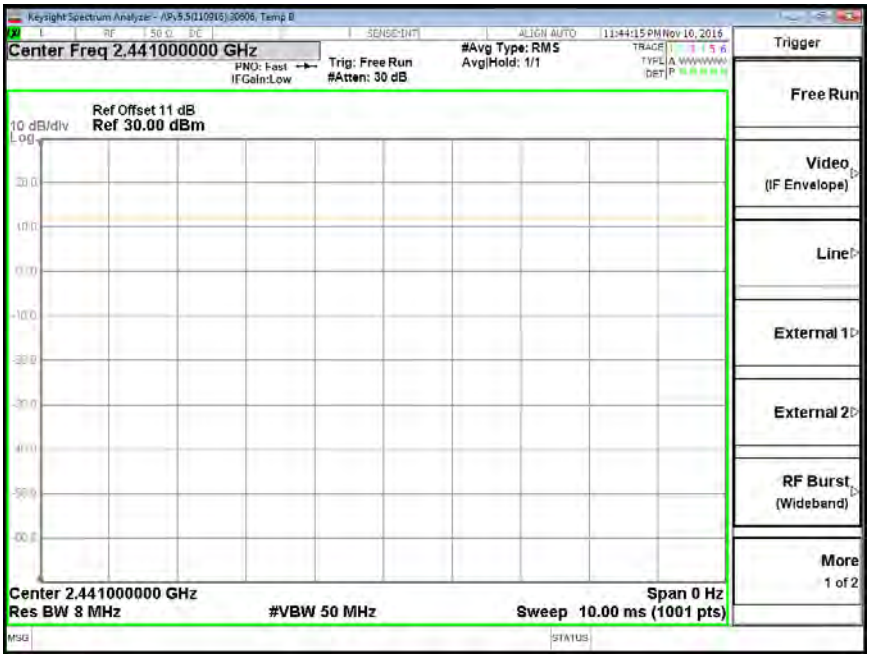
8.2.2. LOW POWER MODE

DUTY CYCLE GFSK MODE



DUTY CYCLE 8PSK MODE

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8.3. HIGH POWER BASIC DATA RATE GFSK MODULATION

8.3.1. 20 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

Channel	Frequency (MHz)	99% Bandwidth (KHz)	20 dB Bandwidth (KHz)
Low	2402	926.01	951.2
Middle	2441	866.92	848.2
High	2480	918.68	1.022

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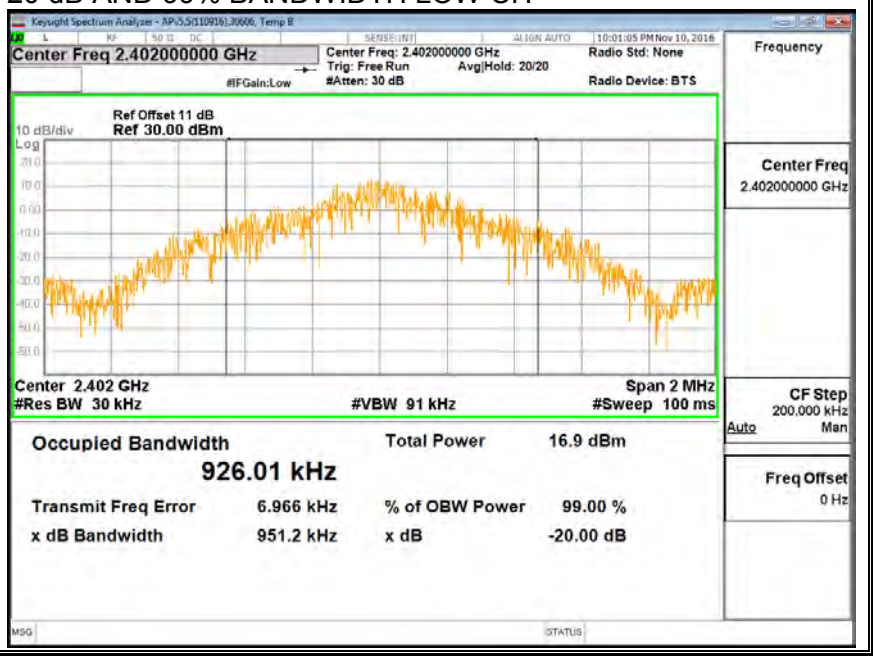
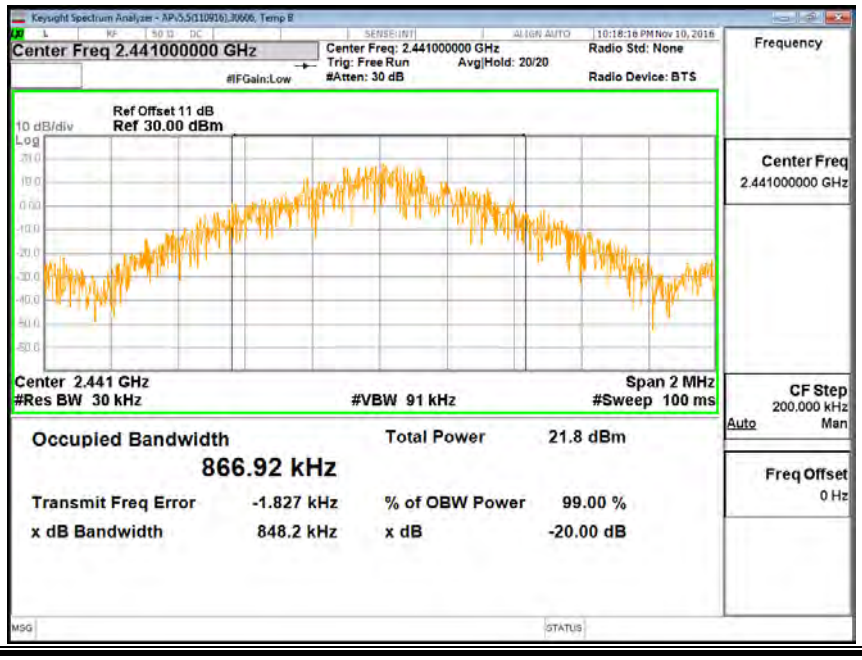
20 dB AND 99% BANDWIDTH LOW CH



20 dB AND 99% BANDWIDTH MID CH



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47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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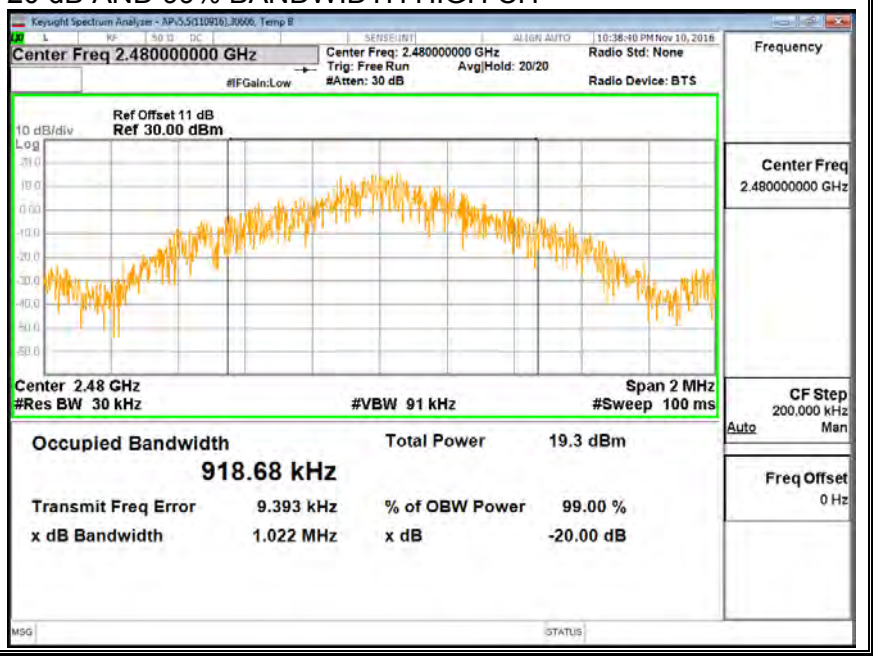
20 dB AND 99% BANDWIDTH HIGH CH



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8.3.2. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)

IC RSS-247 (5.1) (2)

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.

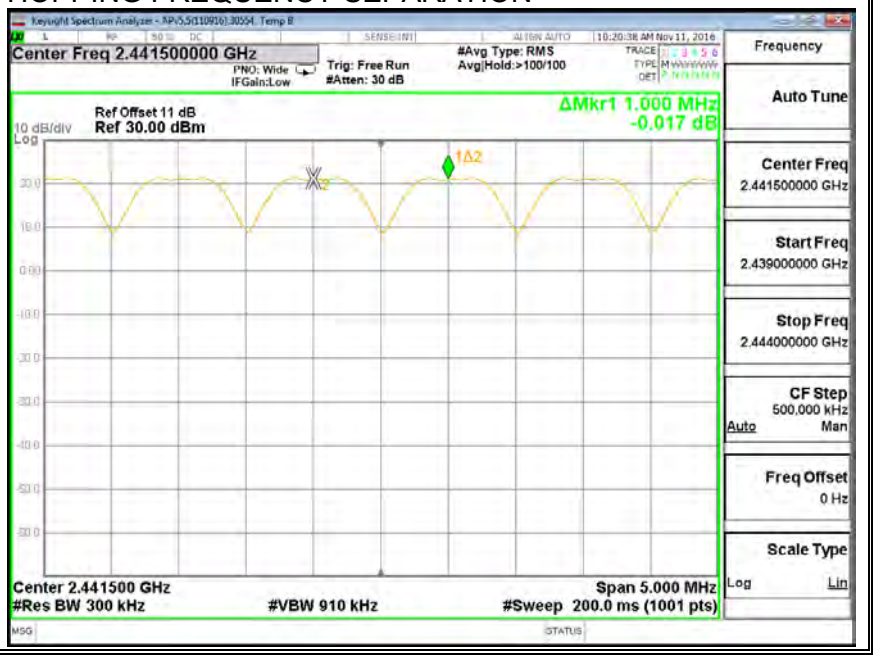
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 910 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



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8.3.3. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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

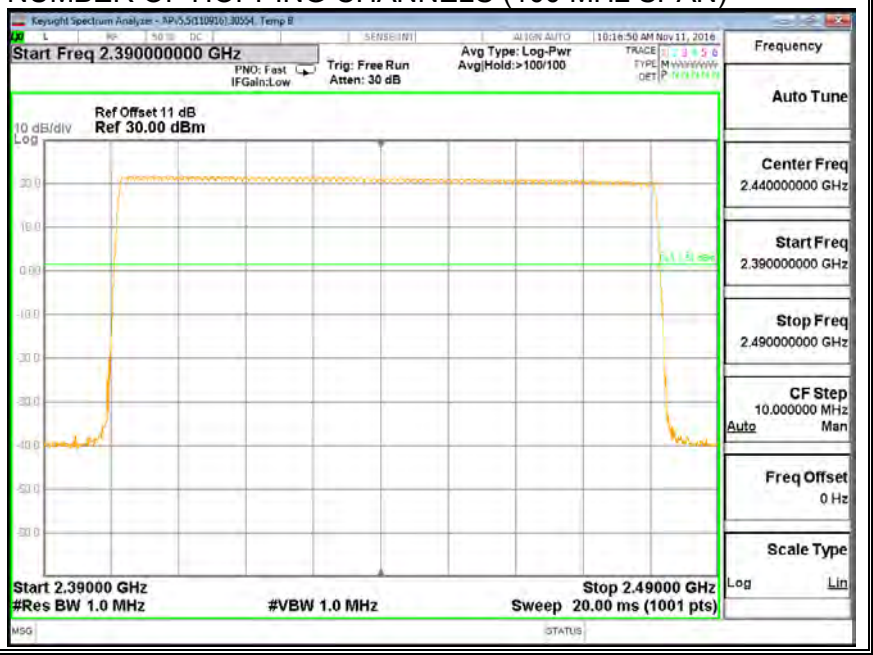
TEST PROCEDURE

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 (100 MHz SPAN)



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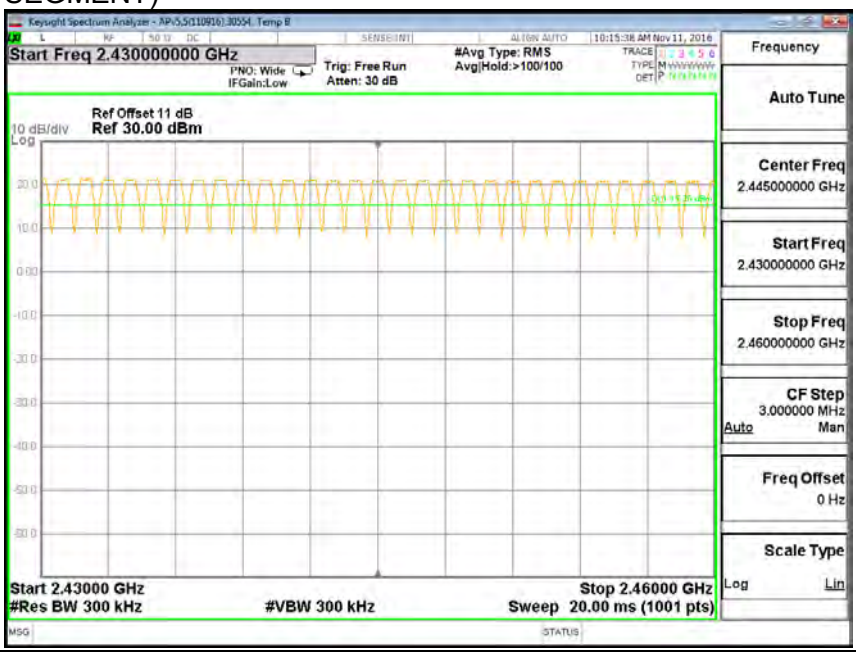
NUMBER OF HOPPING CHANNELS (30 MHz SPAN, FIRST SEGMENT)

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



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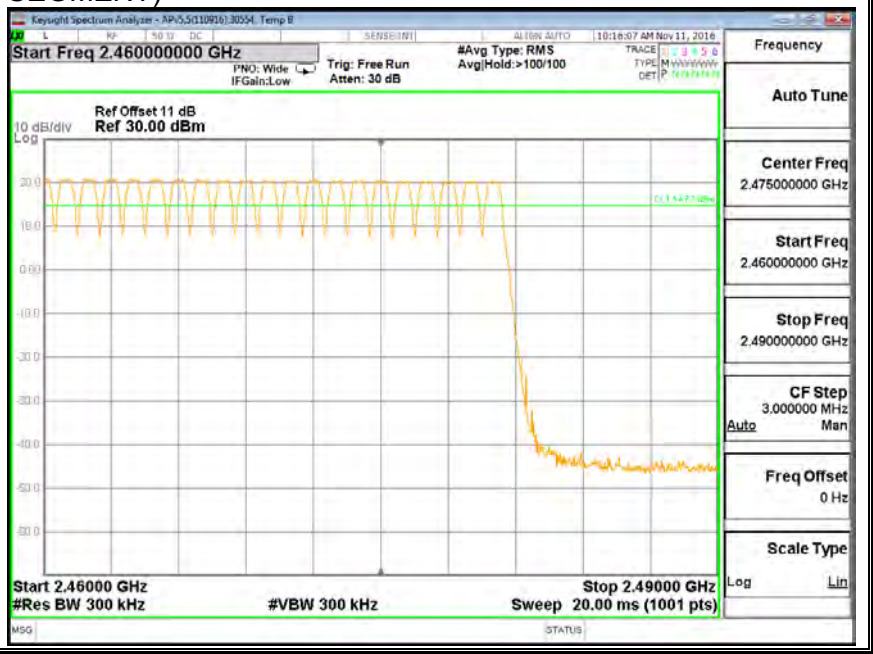
NUMBER OF HOPPING CHANNELS (30 MHz SPAN, THIRD SEGMENT)



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8.3.4. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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	0.394	30	0.118	0.4	-0.282
DH3	1.642	14	0.230	0.4	-0.170
DH5	2.892	9	0.260	0.4	-0.140
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	0.394	7.5	0.030	0.4	-0.370
DH3	1.642	3.5	0.057	0.4	-0.343
DH5	2.892	2.25	0.065	0.4	-0.335

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PULSE WIDTH - DH1

NUMBER OF PULSES - DH1

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PULSE WIDTH - DH3

NUMBER OF PULSES - DH3

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PULSE WIDTH - DH5

NUMBER OF PULSES - DH5

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8.3.5. OUTPUT POWER

ID:	30606	Date:	1/18/17

LIMITS

§15.247 (b) (1)

RSS-247 (5.4) (2)

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

TEST PROCEDURE

The transmitter output is connected to a wideband peak and average power meter.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	16.62	30	-13.38
Middle	2441	16.74	30	-13.26
High	2480	17.28	30	-12.72

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8.3.6. AVERAGE POWER

ID:	30606	Date:	1/18/17

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	16.35
Middle	2441	16.56
High	2480	16.97

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8.3.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

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

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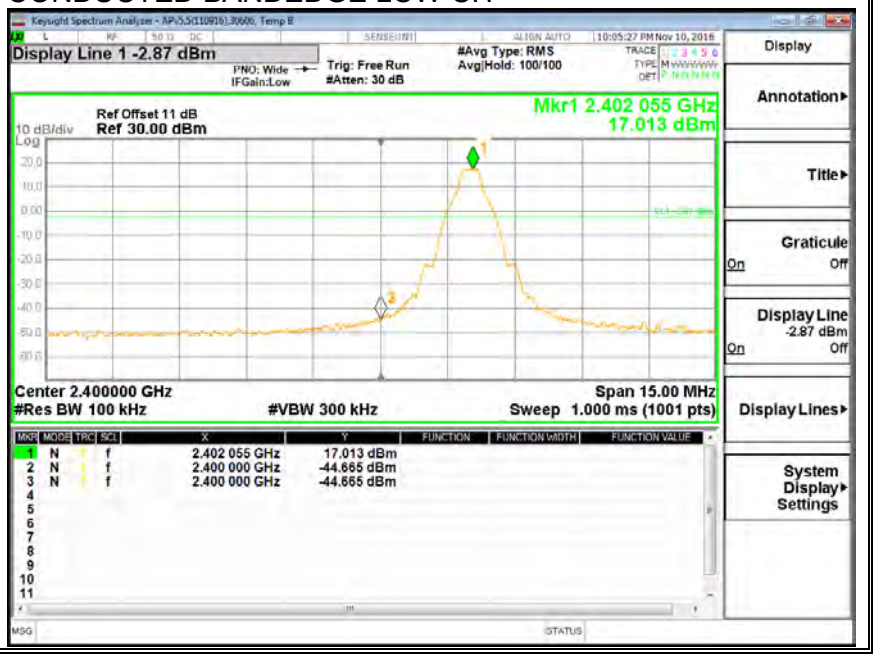
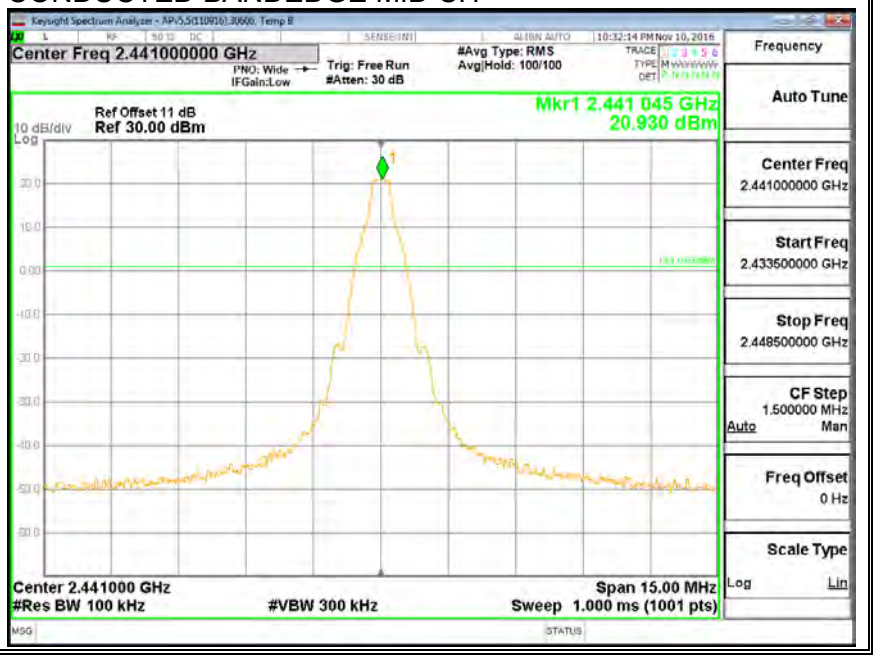
CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

CONDUCTED BANDEDGE LOW CH



CONDUCTED BANDEDGE MID CH



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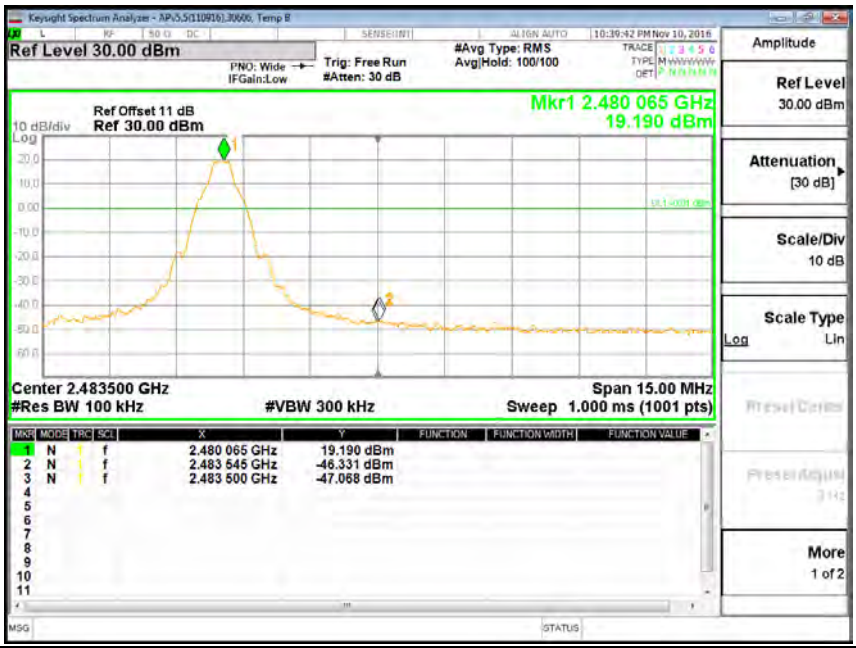
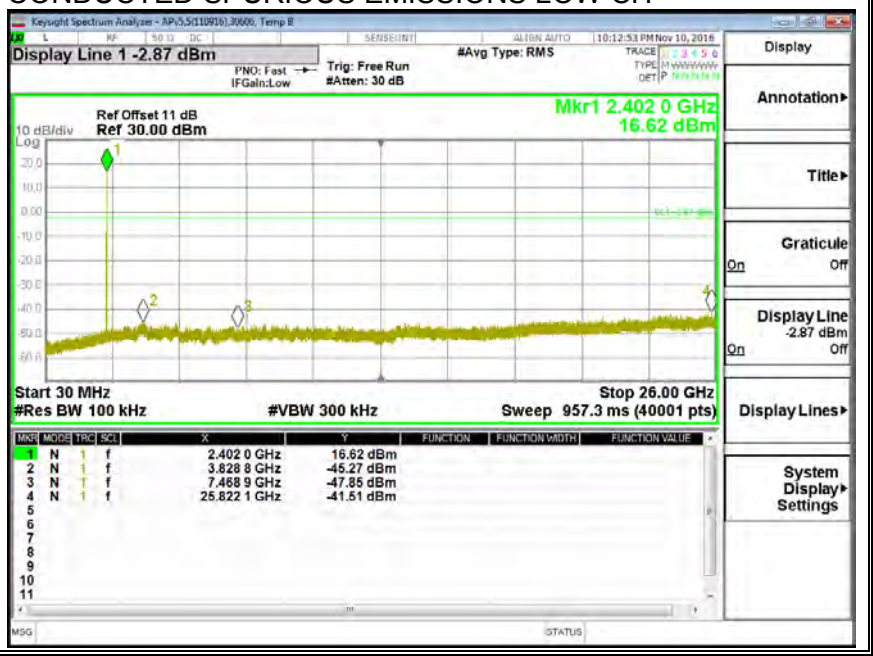
CONDUCTED BANDEDGE HIGH CH



CONDUCTED SPURIOUS EMISSIONS LOW CH



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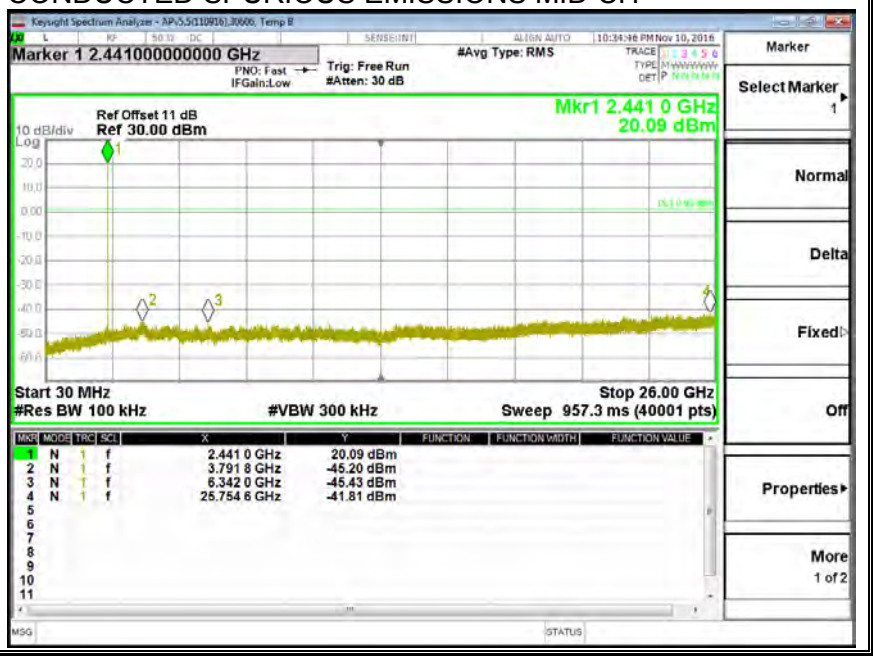
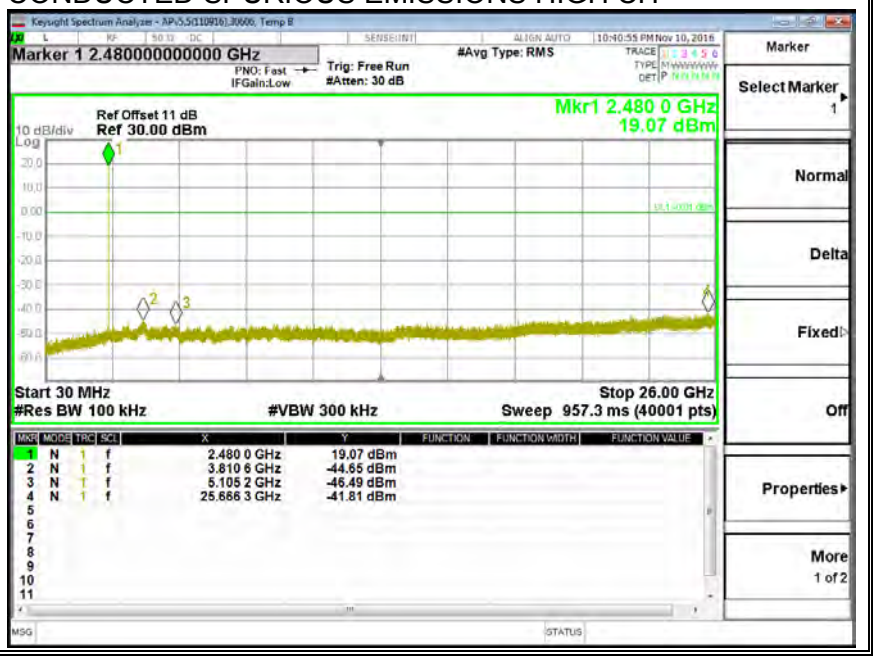
CONDUCTED SPURIOUS EMISSIONS MID CH



CONDUCTED SPURIOUS EMISSIONS HIGH CH



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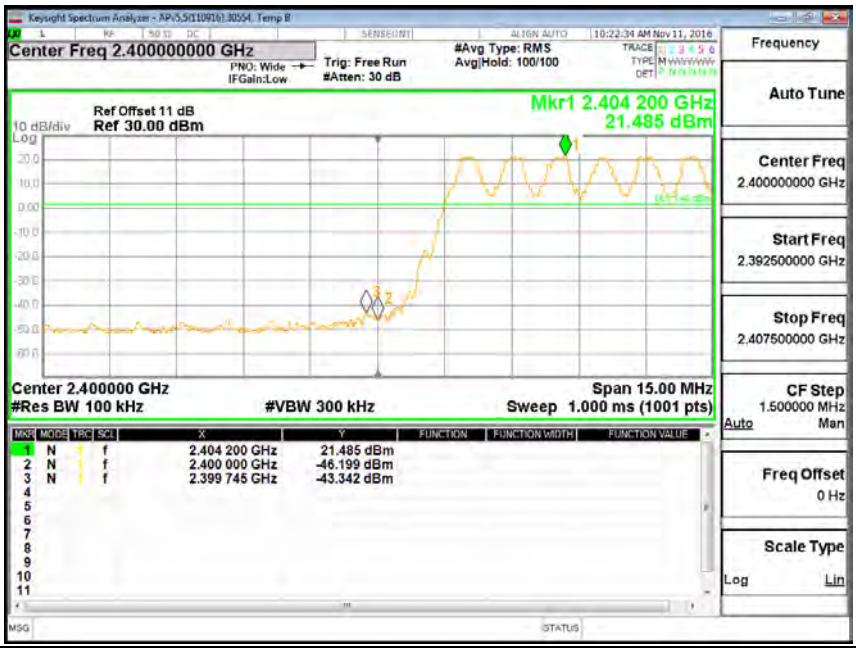
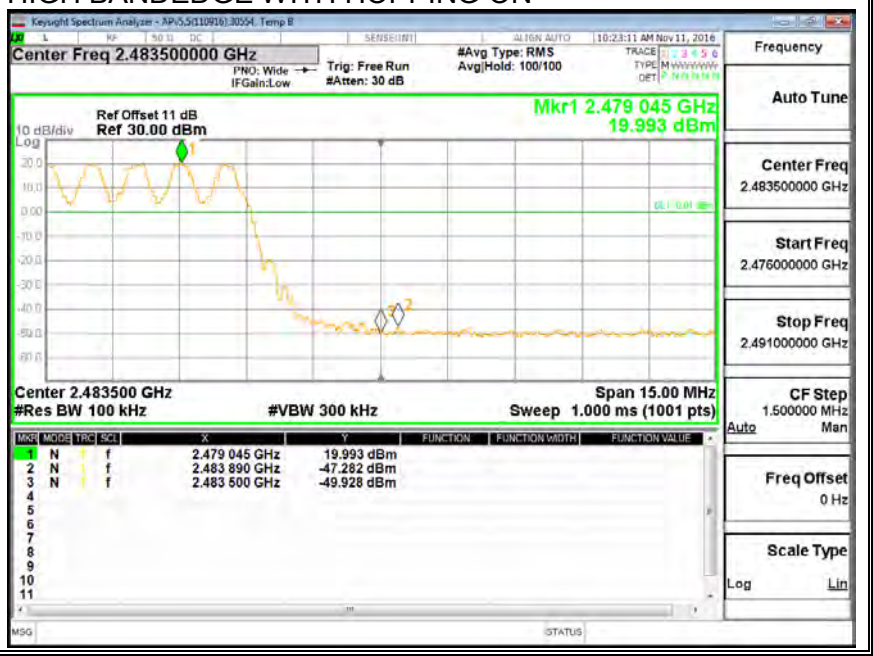
LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



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8.4. HIGH POWER ENHANCED DATA RATE QPSK MODULATION

8.4.1. OUTPUT POWER

ID:	30606	Date:	1/18/17

LIMITS

§15.247 (b) (1)

RSS-247 (5.4) (2)

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

The transmitter output is connected to a wideband peak and average power meter.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	16.46	21	-4.64
Middle	2441	16.53	21	-4.47
High	2480	16.65	21	-4.35

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8.4.2. AVERAGE POWER

ID:	30606	Date:	1/18/17

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	14.30
Middle	2441	14.35
High	2480	14.40

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8.5. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

8.5.1. 20 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

Channel	Frequency (MHz)	99 dB Bandwidth (MHz)	20dB Bandwidth (MHz)
Low	2402	1.2317	1.327
Middle	2441	1.1884	1.306
High	2480	1.2290	1.352

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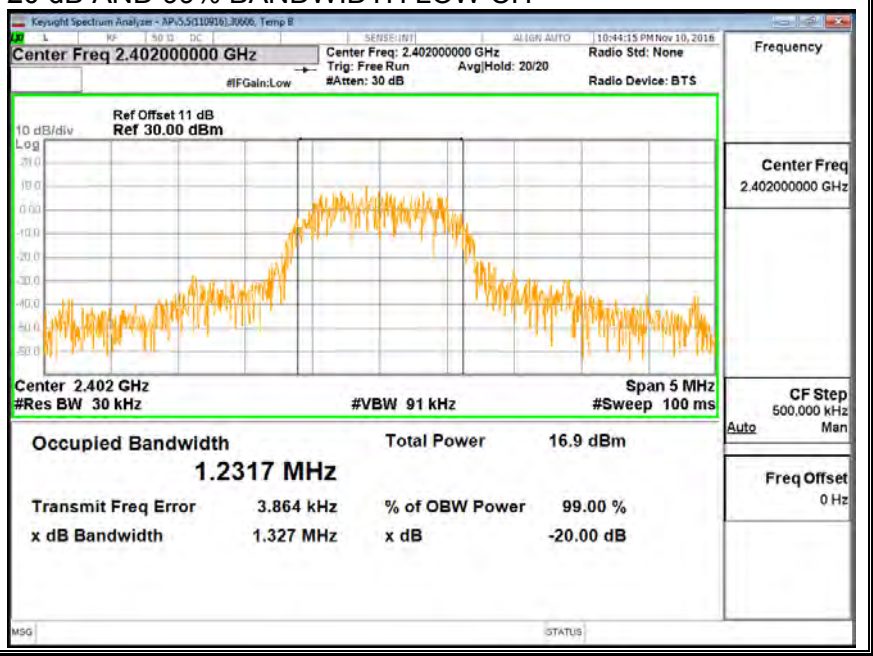
20 dB AND 99% BANDWIDTH LOW CH



20 dB AND 99% BANDWIDTH MID CH

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20 dB AND 99% BANDWIDTH HIGH CH

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8.5.2. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)

IC RSS-247 (5.1) (2)

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.

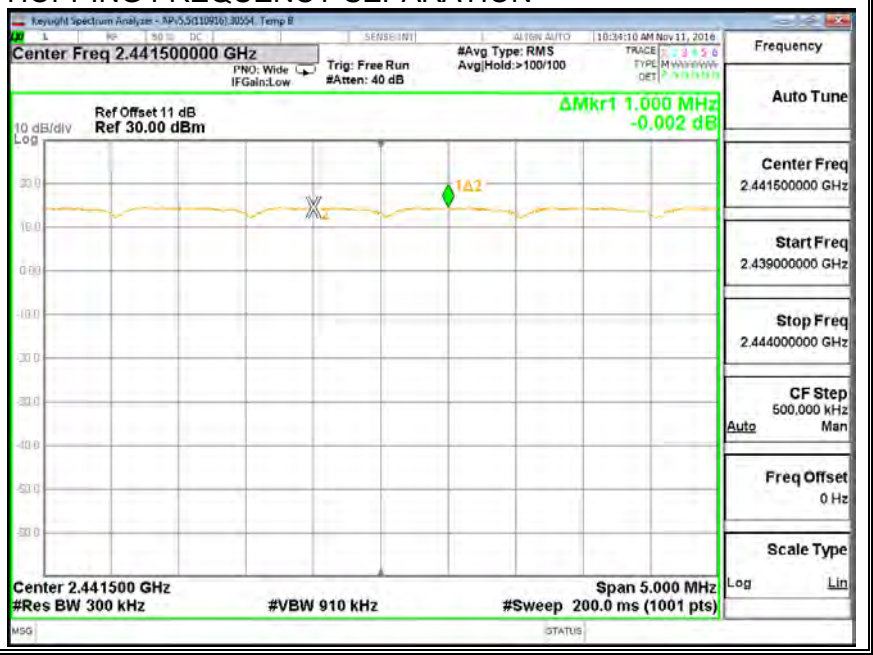
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 910 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



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8.5.3. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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

TEST PROCEDURE

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 (100 MHz SPAN)

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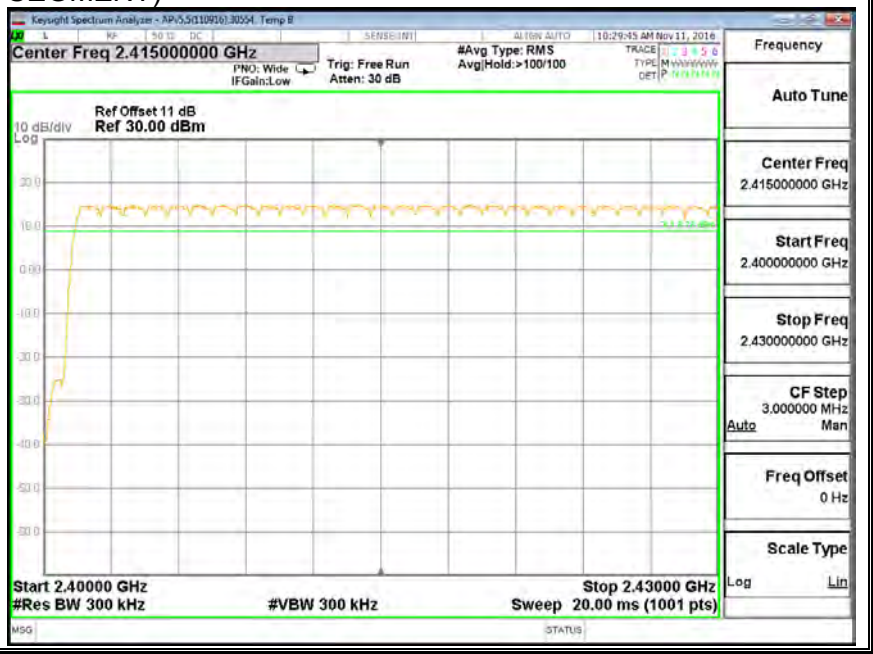
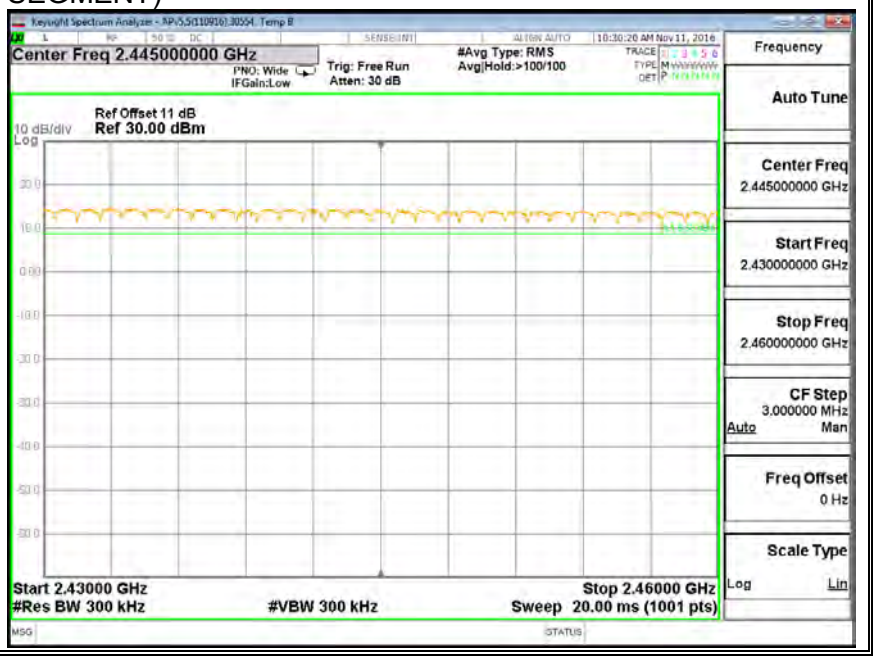
NUMBER OF HOPPING CHANNELS (30 MHz SPAN, FIRST SEGMENT)



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



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

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8.5.4. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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.

RESULTS

8PSK (EDR) Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
3DH1	0.392	30	0.118	0.4	-0.282
3DH3	1.642	17	0.279	0.4	-0.121
3DH5	2.896	12	0.348	0.4	-0.052

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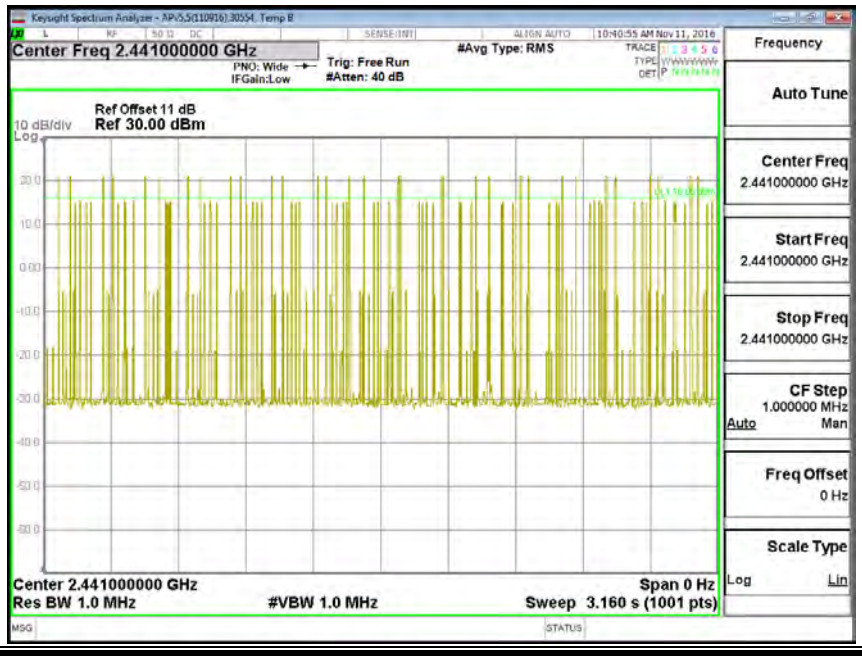
PULSE WIDTH - DH1

NUMBER OF PULSES - DH1



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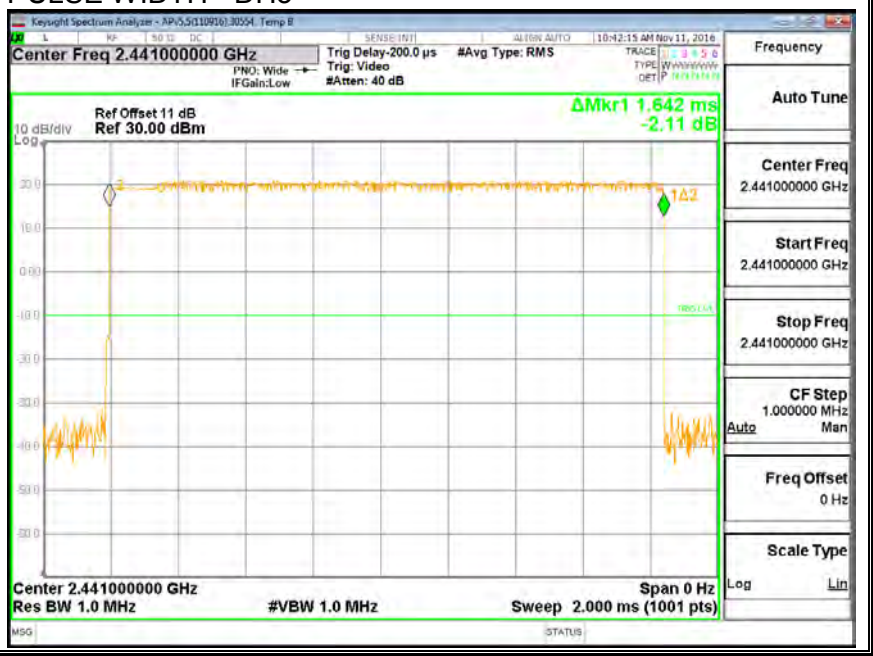
PULSE WIDTH - DH3



NUMBER OF PULSES - DH3

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PULSE WIDTH - DH5

NUMBER OF PULSES - DH5

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8.5.5. OUTPUT POWER

ID:	30606	Date:	1/18/17

LIMITS

§15.247 (b) (1)

RSS-247 (5.4) (2)

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

The transmitter output is connected to a wideband peak and average power meter.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	16.70	21	-4.30
Middle	2441	16.74	21	-4.26
High	2480	16.80	21	-4.20

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8.5.6. AVERAGE POWER

ID:	30606	Date:	1/18/17

LIMITS

None; for reporting purposes only.

TEST PROCEDUR

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	14.40
Middle	2441	14.42
High	2480	14.50

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8.5.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

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

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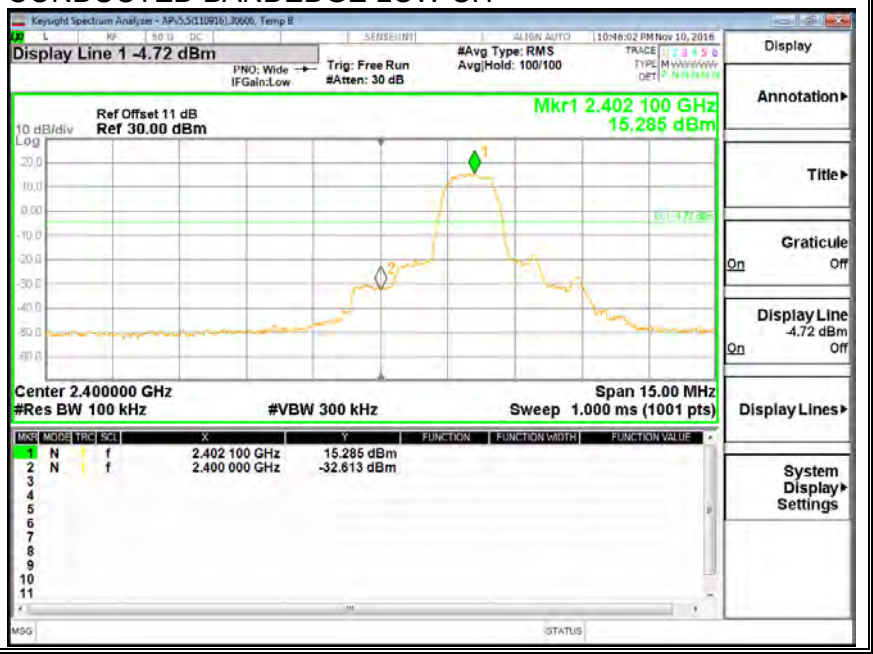
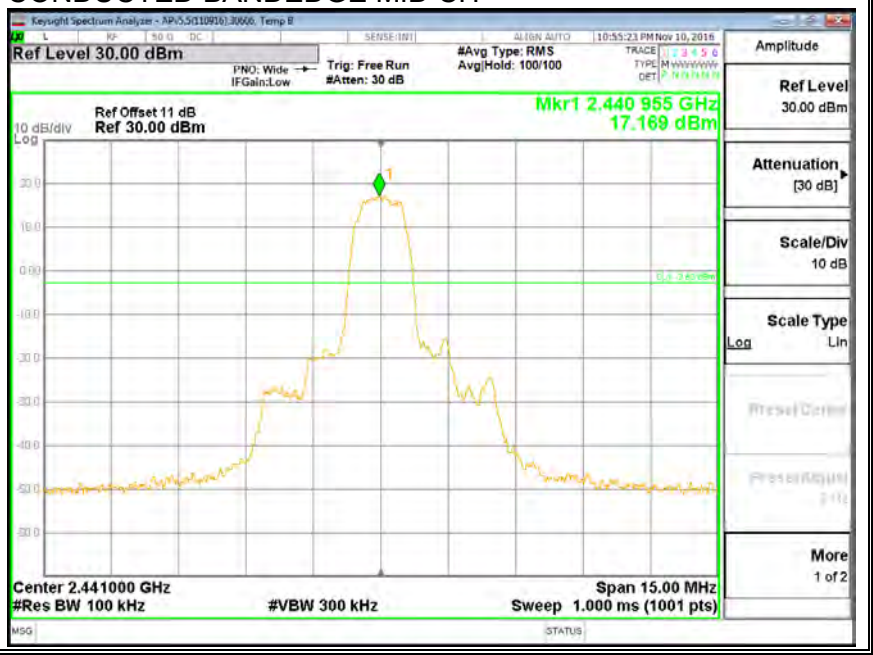
CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

CONDUCTED BANDEDGE LOW CH



CONDUCTED BANDEDGE MID CH



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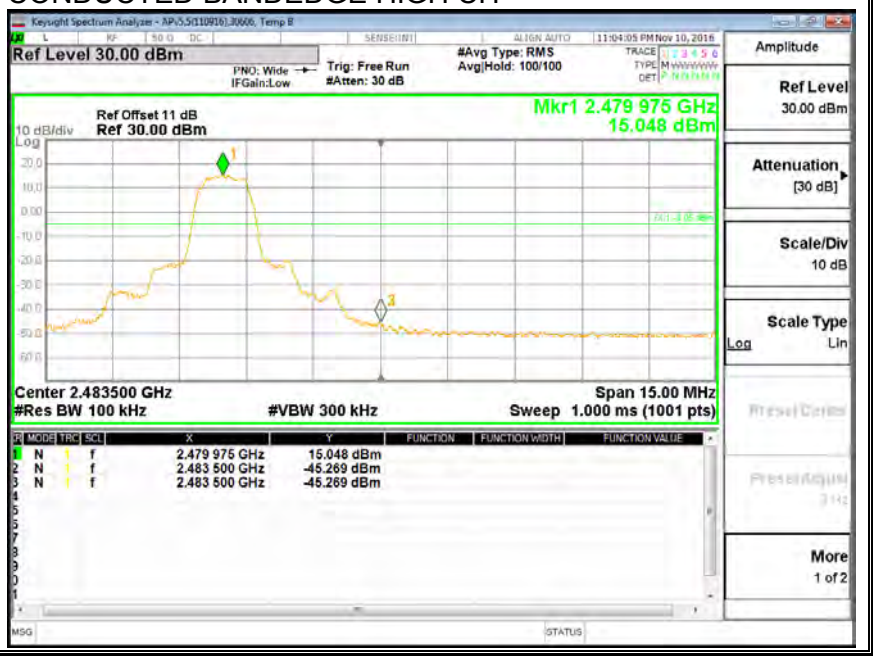
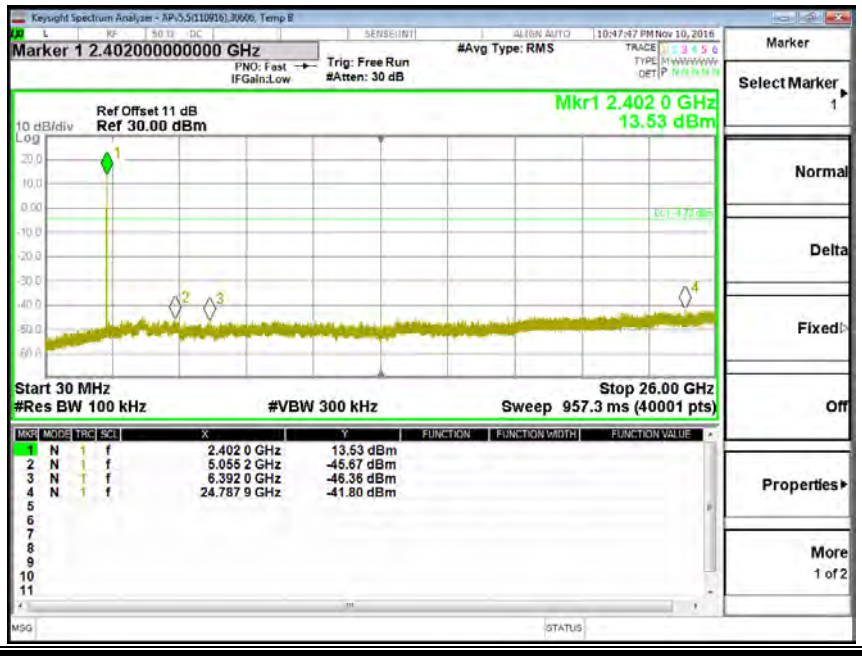
CONDUCTED BANDEDGE HIGH CH



CONDUCTED SPURIOUS EMISSIONS LOW CH



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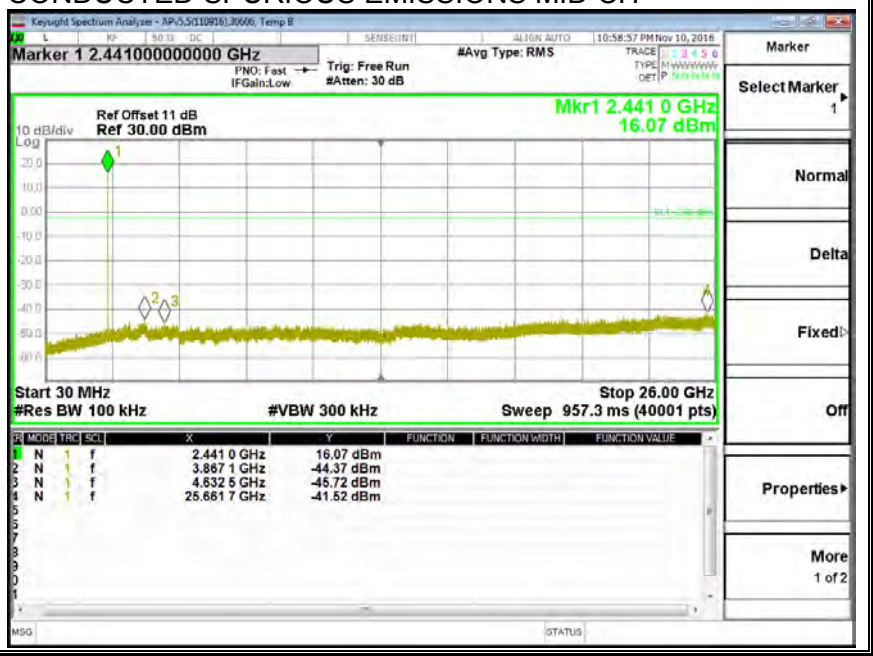
CONDUCTED SPURIOUS EMISSIONS MID CH



CONDUCTED SPURIOUS EMISSIONS HIGH CH

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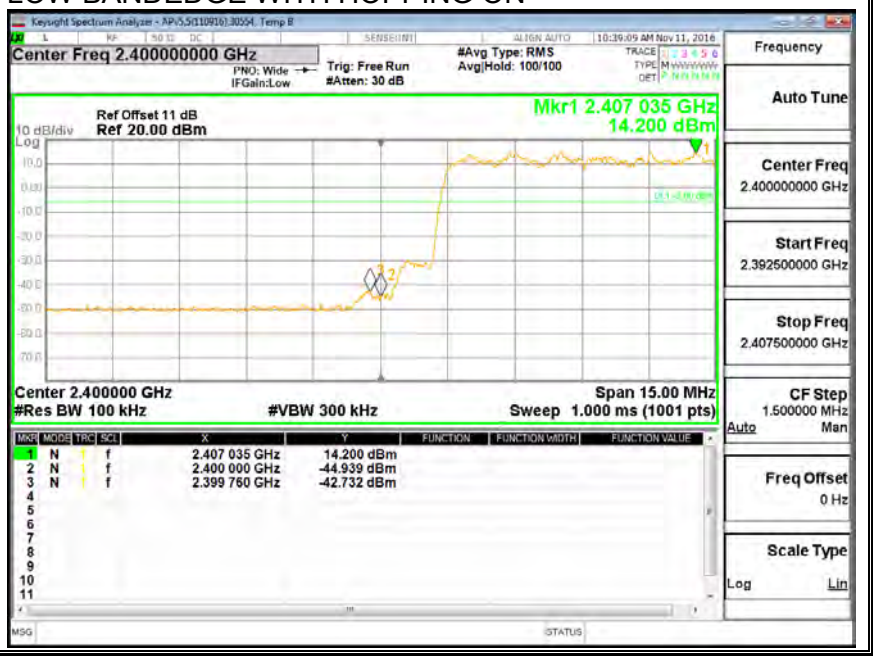
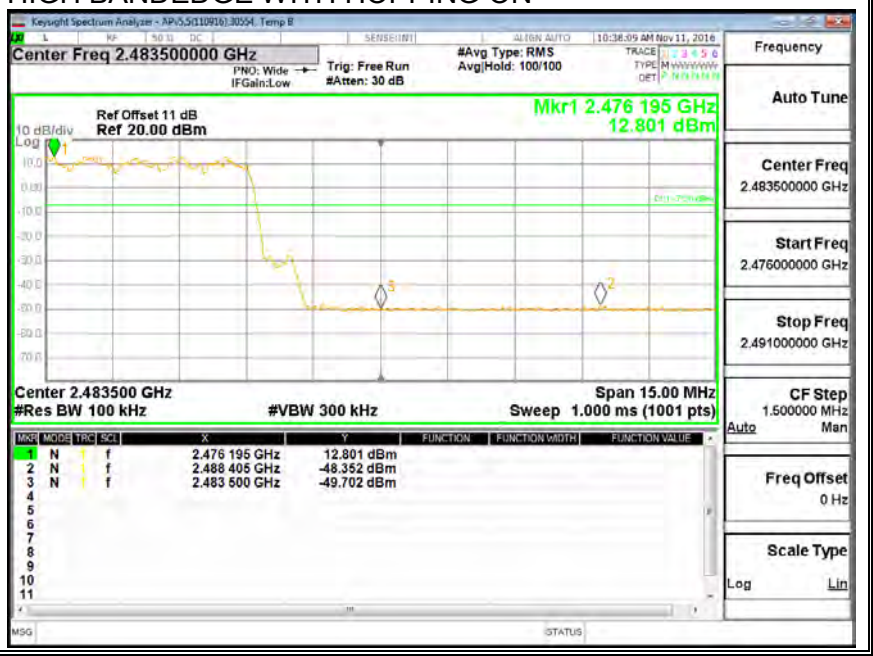
LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



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8.6. LOW POWER BASIC DATA RATE GFSK MODULATION

8.6.1. 20 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

Channel	Frequency (MHz)	99% Bandwidth (KHz)	20 dB Bandwidth (KHz)
Low	2402	900.38	941.3
Middle	2441	911.11	938.8
High	2480	883.66	852.8

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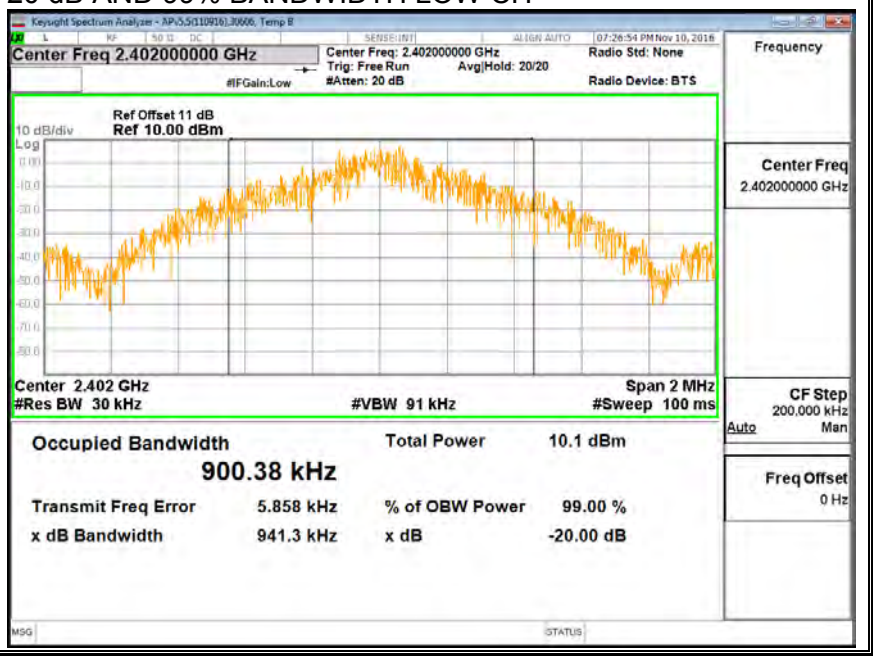
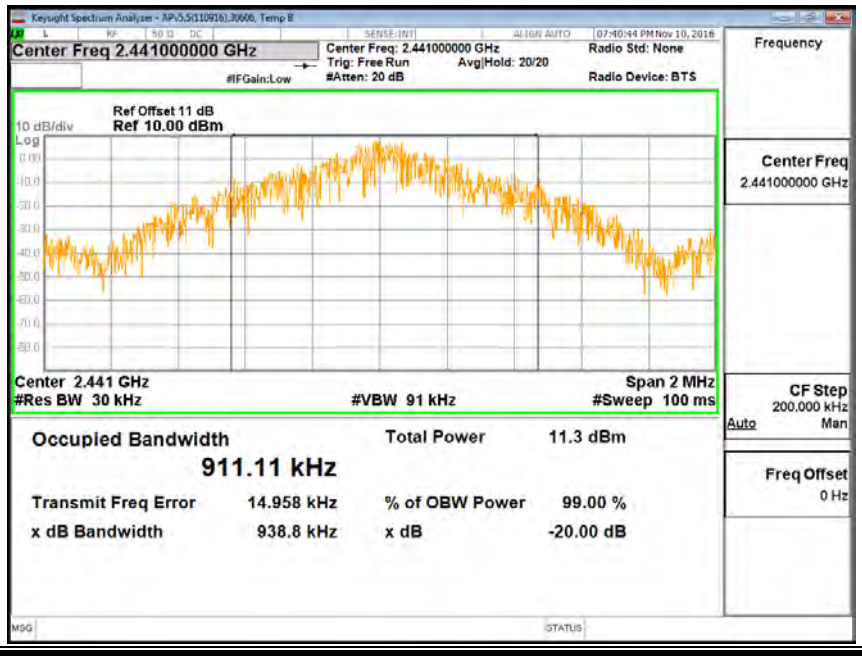
20 dB AND 99% BANDWIDTH LOW CH



20 dB AND 99% BANDWIDTH MID CH



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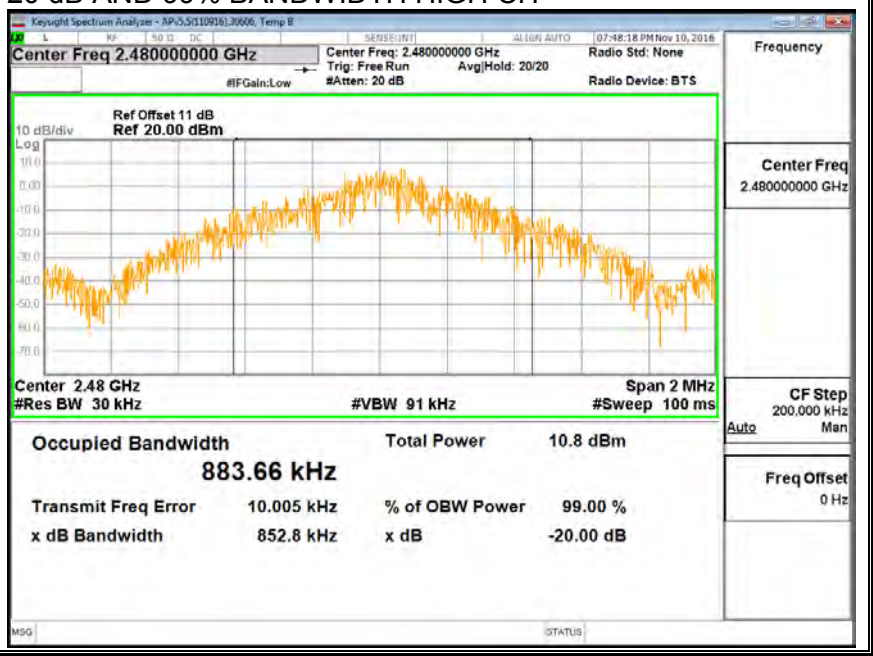
20 dB AND 99% BANDWIDTH HIGH CH



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8.6.2. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)

IC RSS-247 (5.1) (2)

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.

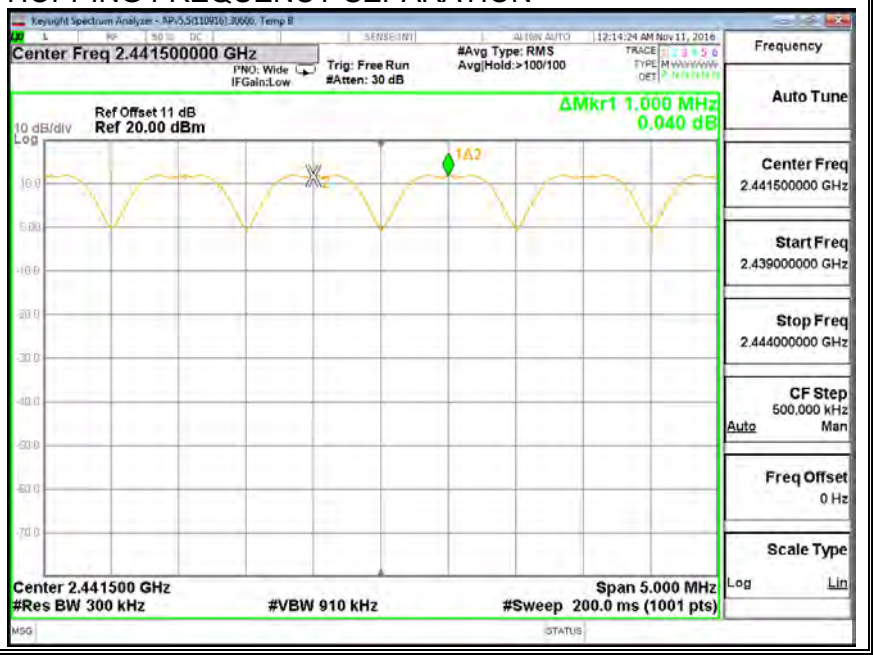
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 910 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



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8.6.3. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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

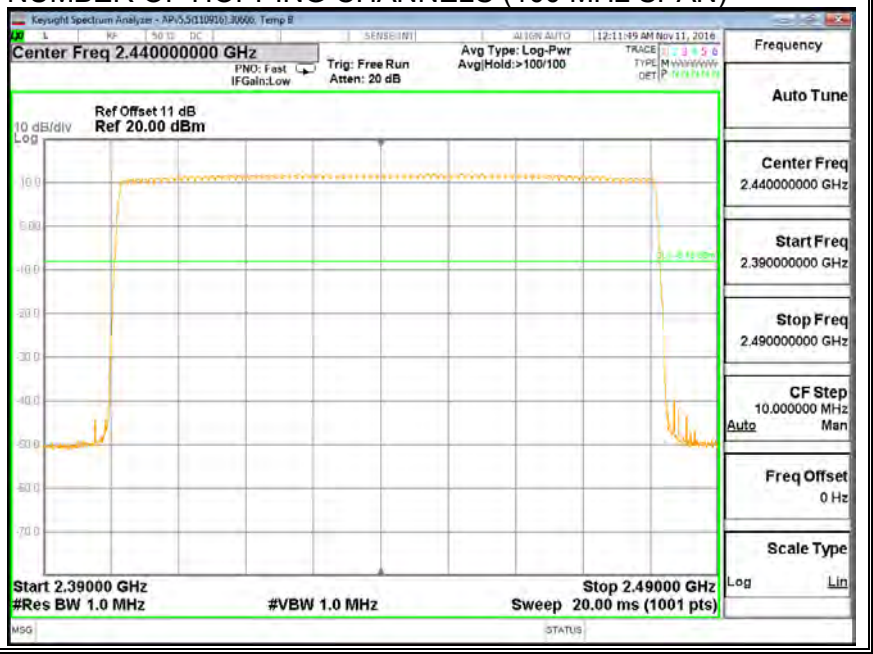
TEST PROCEDURE

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 (100 MHz SPAN)



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

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

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

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8.6.4. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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	0.393	32	0.126	0.4	-0.274
DH3	1.64	6	0.098	0.4	-0.302
DH5	2.896	6	0.174	0.4	-0.226
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	0.393	8	0.031	0.4	-0.369
DH3	1.64	1.5	0.025	0.4	-0.375
DH5	2.896	1.5	0.043	0.4	-0.357

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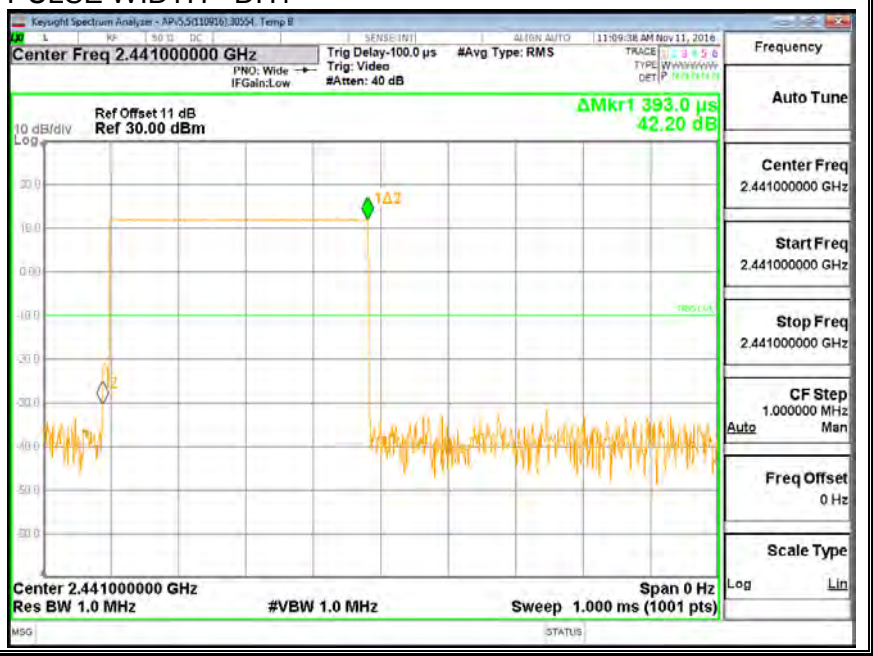
PULSE WIDTH - DH1



NUMBER OF PULSES - DH1

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PULSE WIDTH - DH3

NUMBER OF PULSES - DH3

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PULSE WIDTH - DH5

NUMBER OF PULSES - DH5

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8.6.5. OUTPUT POWER

ID:	30606	Date:	1/18/17

LIMITS

§15.247 (b) (1)

RSS-247 (5.4) (2)

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

TEST PROCEDURE

The transmitter output is connected to a wideband peak and average power meter.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.23	30	-19.77
Middle	2441	10.19	30	-19.81
High	2480	10.21	30	-19.79

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8.6.6. AVERAGE POWER

ID:	30606	Date:	1/18/17

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	9.86
Middle	2441	9.74
High	2480	9.78

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8.6.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

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

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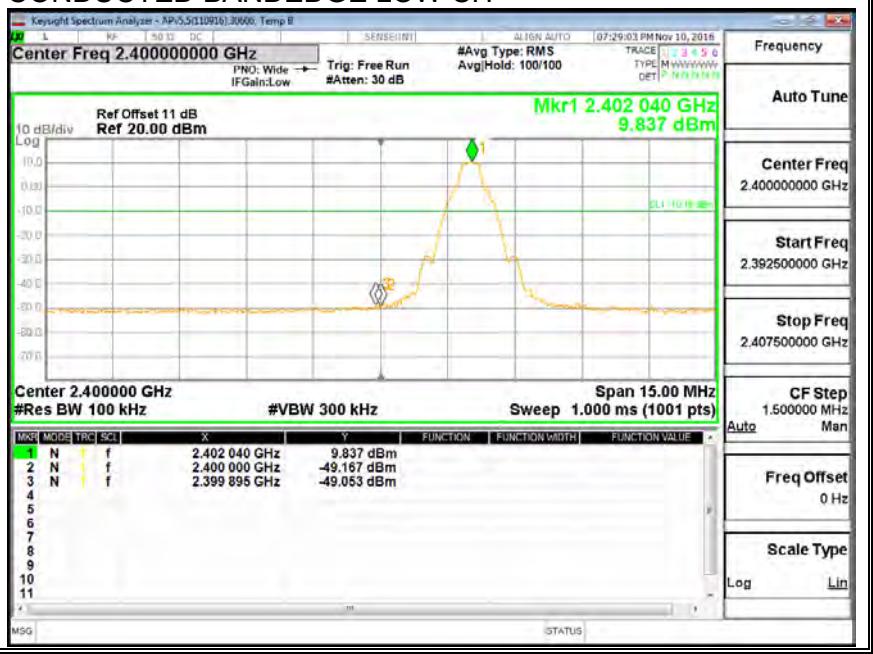
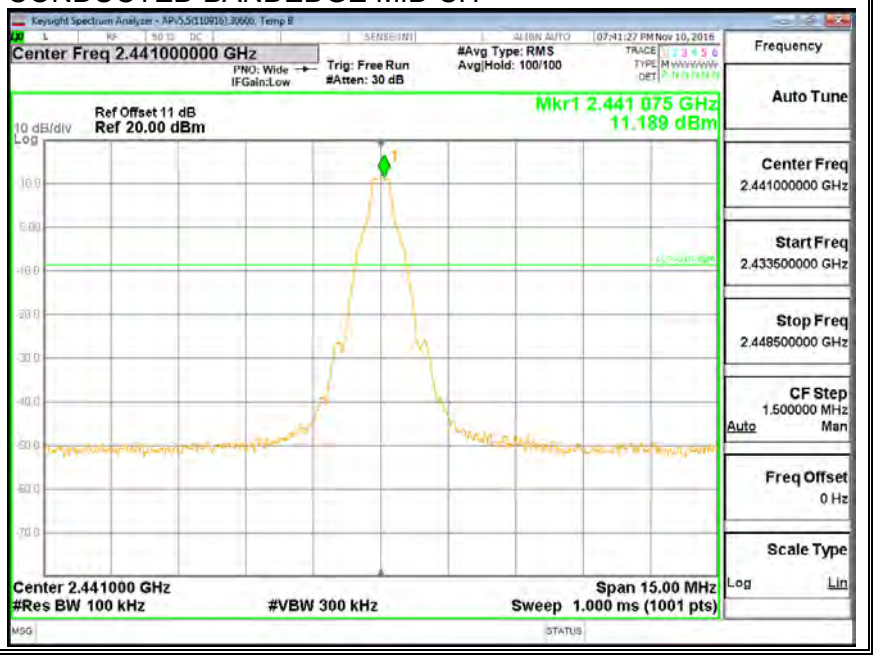
CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

CONDUCTED BANDEDGE LOW CH



CONDUCTED BANDEDGE MID CH



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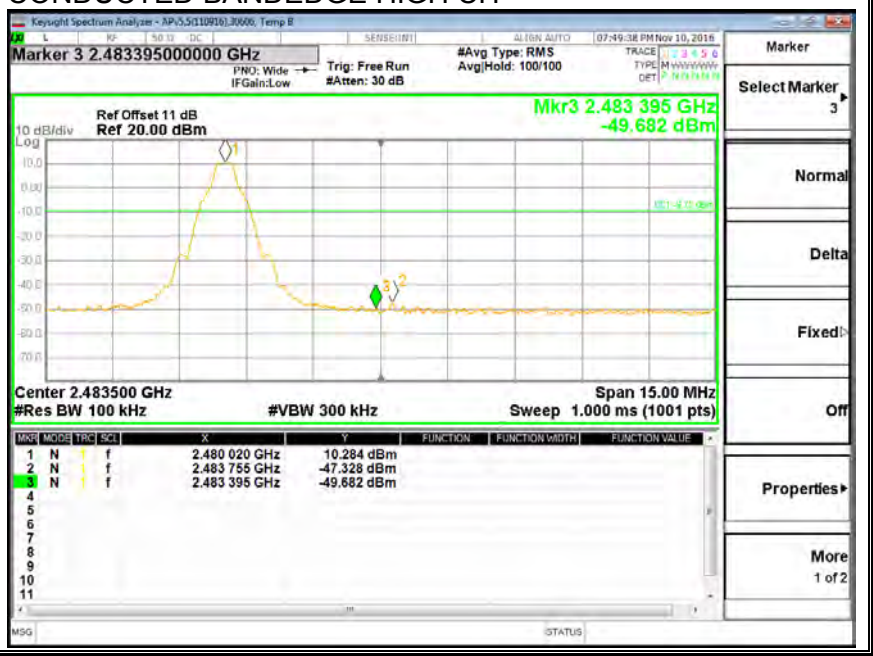
CONDUCTED BANDEDGE HIGH CH



CONDUCTED SPURIOUS EMISSIONS LOW CH

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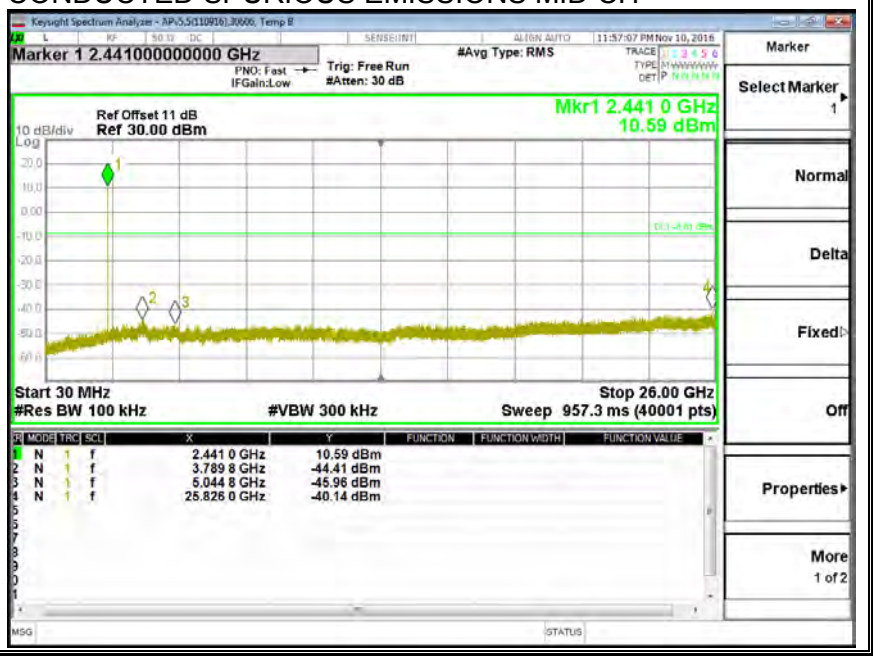
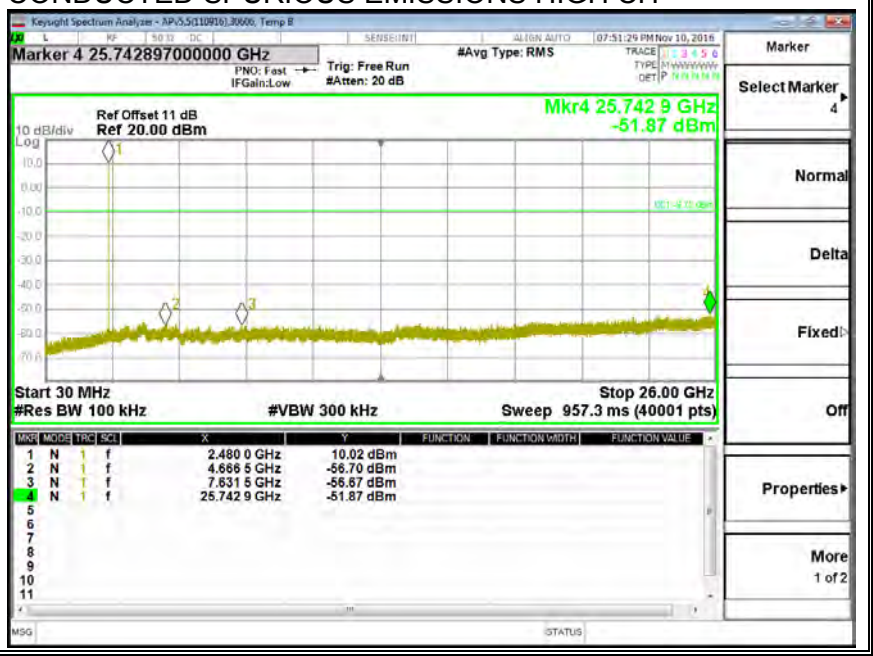
CONDUCTED SPURIOUS EMISSIONS MID CH



CONDUCTED SPURIOUS EMISSIONS HIGH CH



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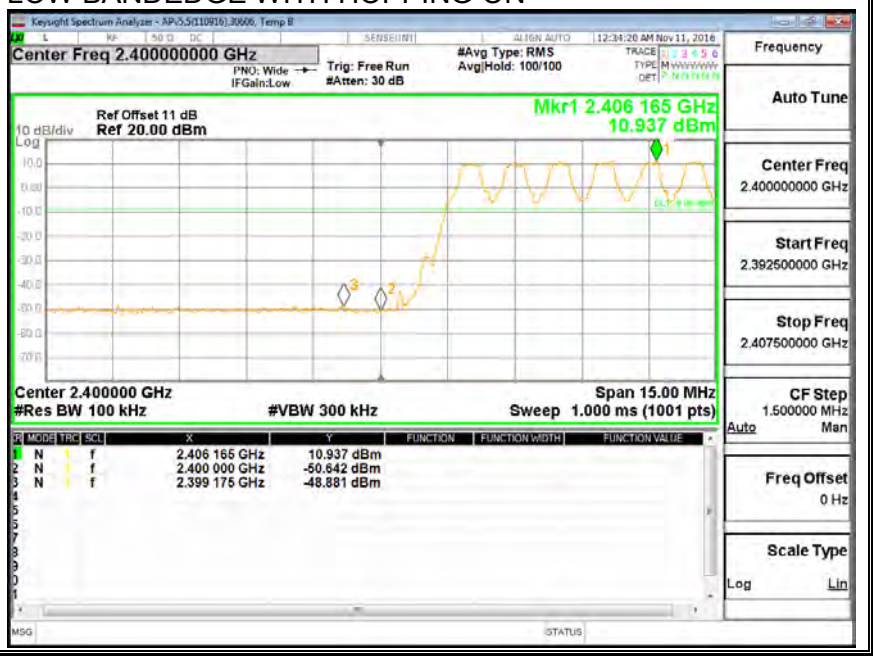
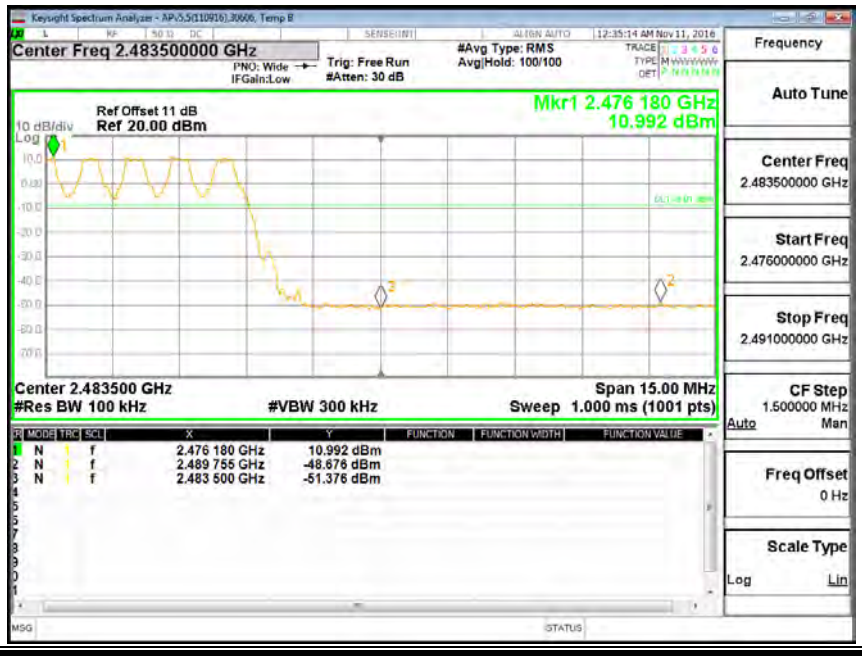
LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



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8.7. LOW POWER ENHANCED DATA RATE QPSK MODULATION

8.7.1. OUTPUT POWER

ID:	38806	Date:	1/4/17

LIMITS

§15.247 (b) (1)

RSS-247 (5.4) (2)

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

The transmitter output is connected to a wideband peak and average power meter.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.45	21	-11.55
Middle	2441	9.25	21	-11.75
High	2480	9.60	21	-11.40

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8.7.2. AVERAGE POWER

ID:	30606	Date:	1/18/17

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	7.30
Middle	2441	7.20
High	2480	7.40

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8.8. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

8.8.1. 20 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.320	1.2281
Middle	2441	1.363	1.2692
High	2480	1.386	1.2769

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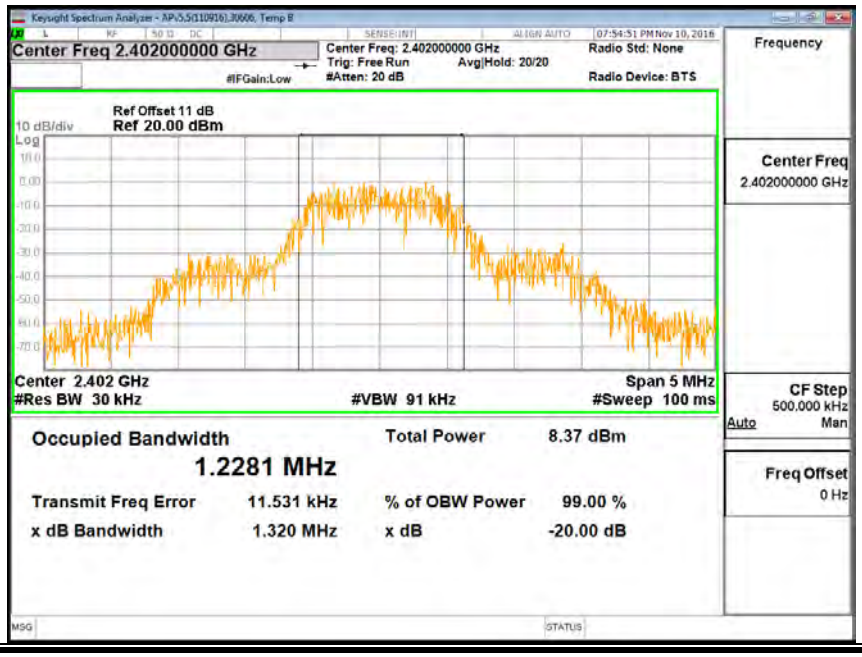
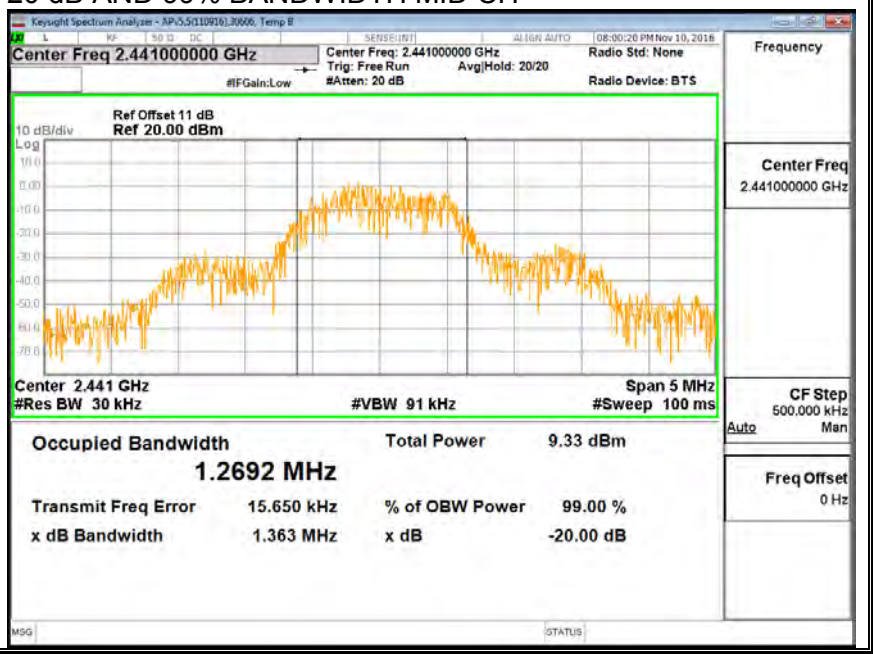
20 dB AND 99% BANDWIDTH LOW CH



20 dB AND 99% BANDWIDTH MID CH



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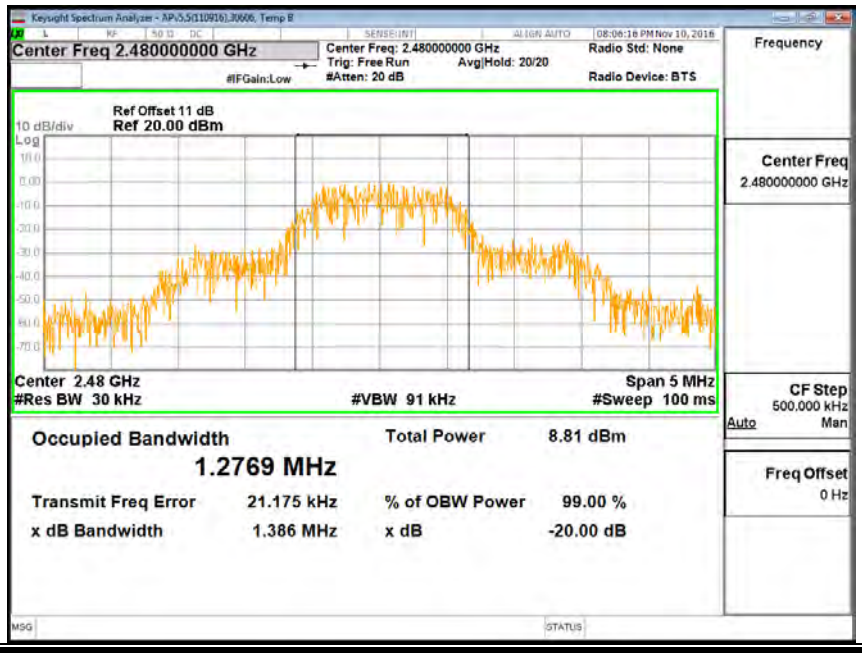
20 dB AND 99% BANDWIDTH HIGH CH



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8.8.2. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)

IC RSS-247 (5.1) (2)

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.

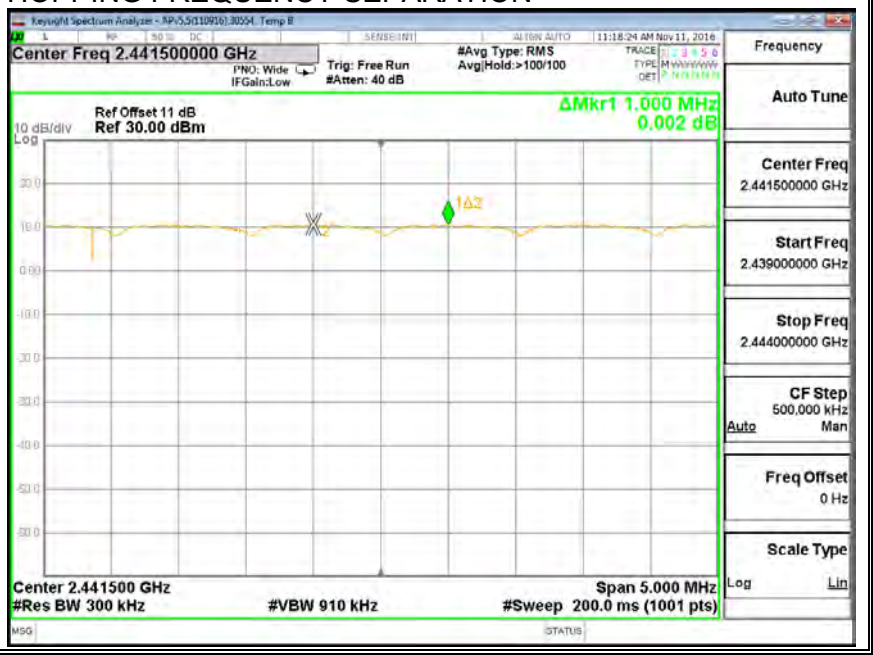
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 910 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



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8.8.3. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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

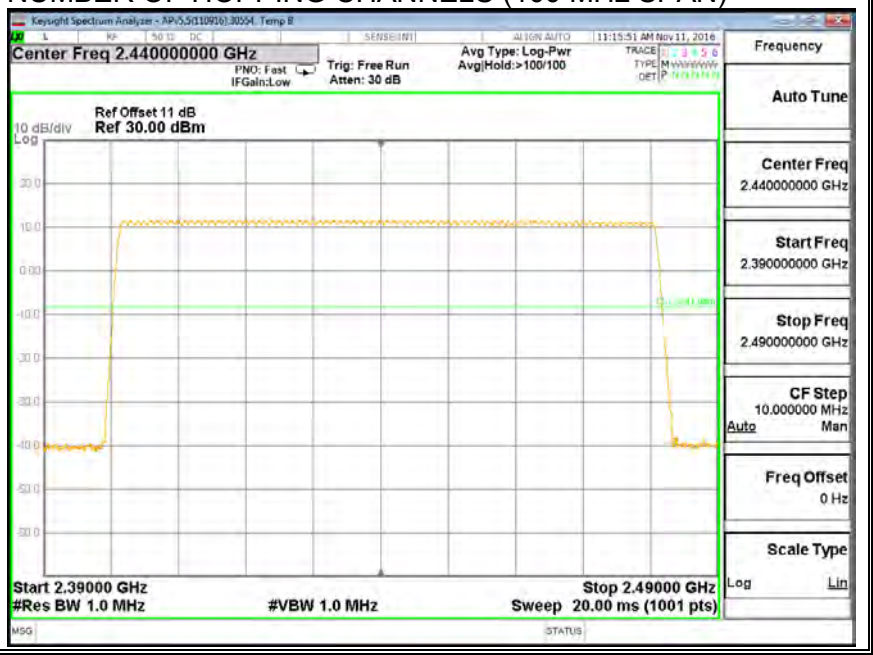
TEST PROCEDURE

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 (100 MHz SPAN)



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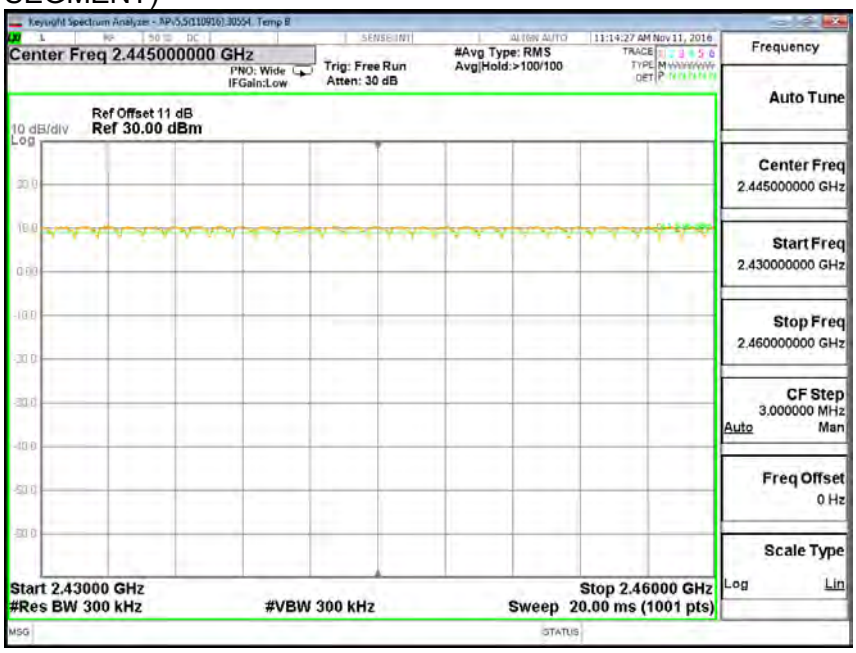
NUMBER OF HOPPING CHANNELS (30 MHz SPAN, FIRST SEGMENT)

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



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

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8.8.4. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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

8PSK (EDR) Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
3DH1	0.364	27	0.098	0.4	-0.302
3DH3	1.642	16	0.263	0.4	-0.137
3DH5	2.896	10	0.290	0.4	-0.110

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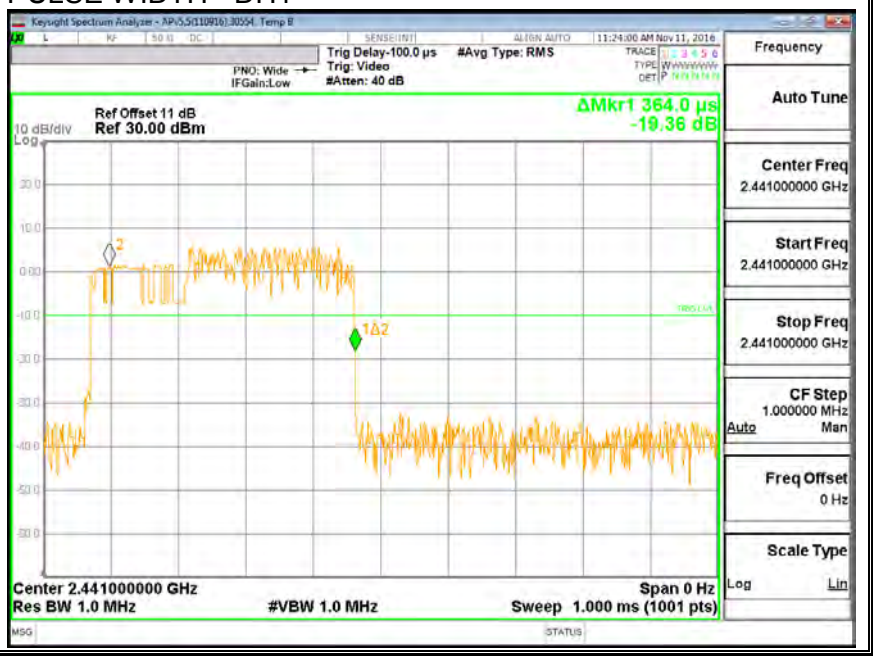
PULSE WIDTH - DH1



NUMBER OF PULSES - DH1

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PULSE WIDTH - DH3

NUMBER OF PULSES - DH3

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PULSE WIDTH - DH5

NUMBER OF PULSES - DH5

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8.8.5. OUTPUT POWER

ID:	30606	Date:	1/18/17

LIMITS

§15.247 (b) (1)

RSS-247 (5.4) (2)

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

The transmitter output is connected to a wideband peak and average power meter.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.55	21	-11.45
Middle	2441	9.40	21	-11.60
High	2480	9.70	21	-11.30

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8.8.6. AVERAGE POWER

ID:	30606	Date:	1/18/17

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	7.40
Middle	2441	7.30
High	2480	7.45

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8.8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

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

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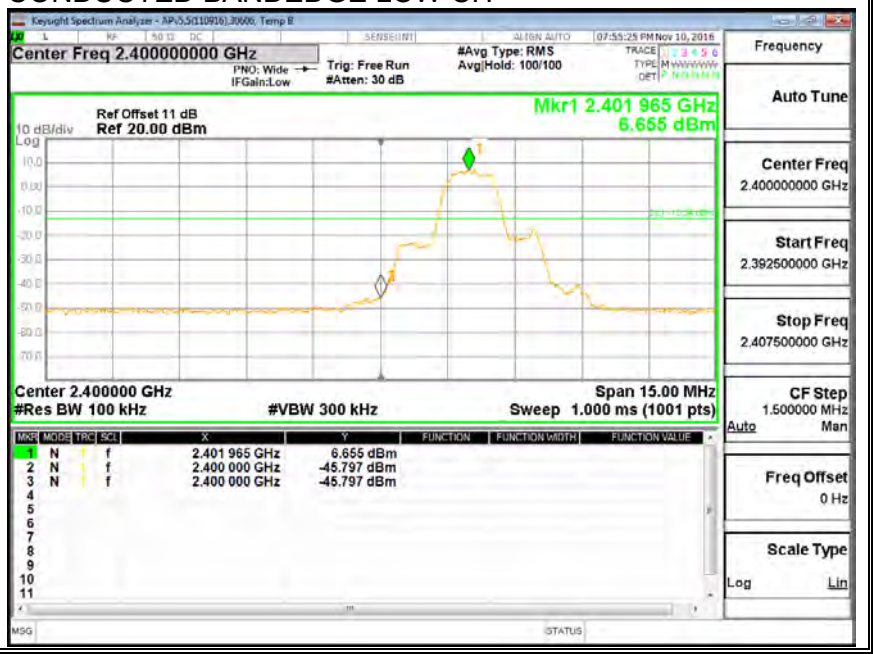
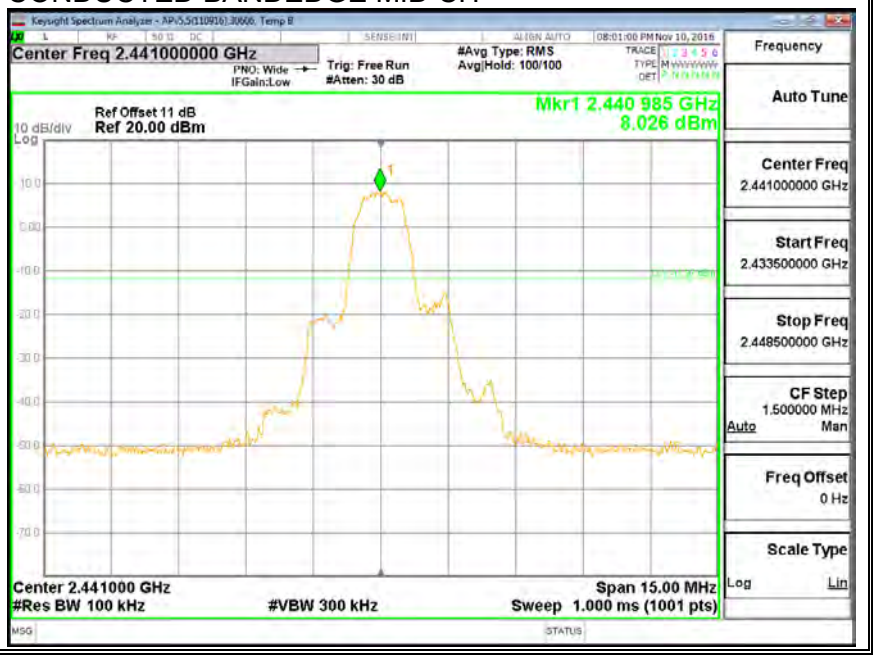
CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

CONDUCTED BANDEDGE LOW CH



CONDUCTED BANDEDGE MID CH



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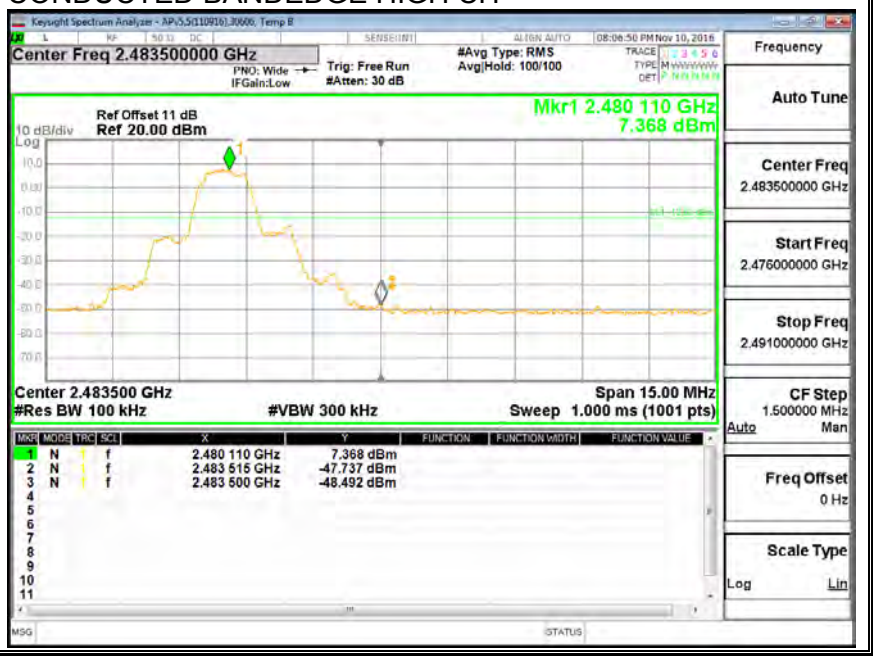
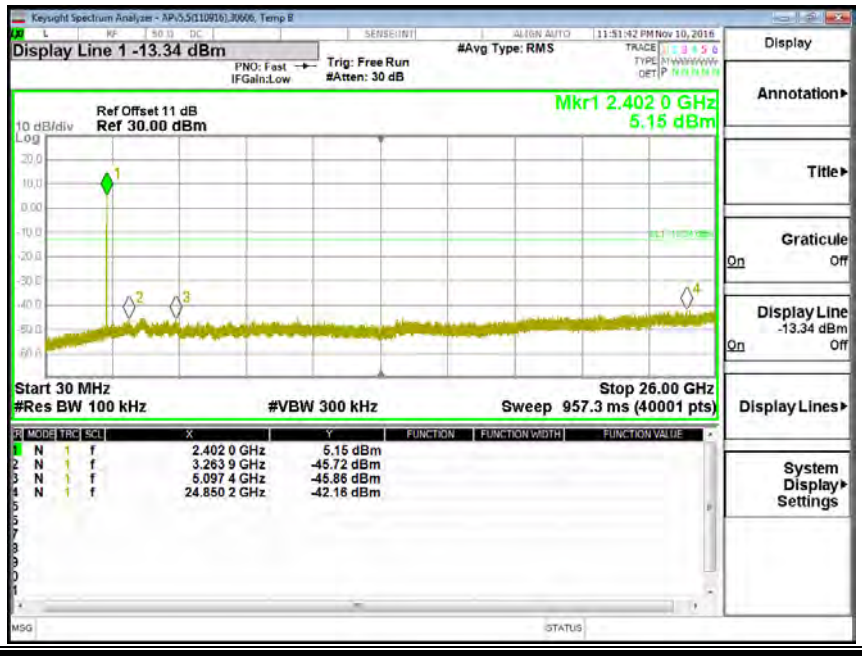
CONDUCTED BANDEDGE HIGH CH



CONDUCTED SPURIOUS EMISSIONS LOW CH



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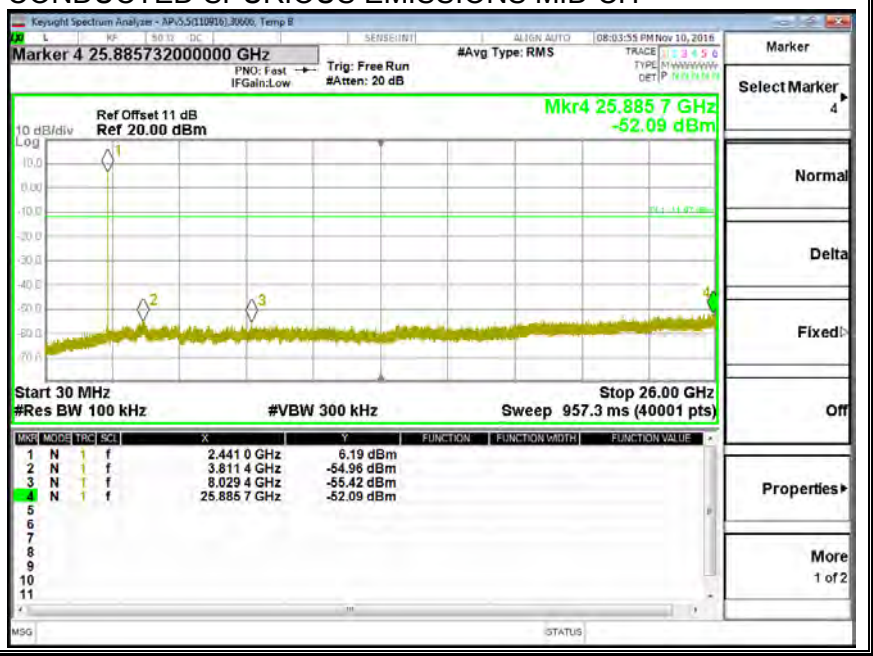
CONDUCTED SPURIOUS EMISSIONS MID CH



CONDUCTED SPURIOUS EMISSIONS HIGH CH

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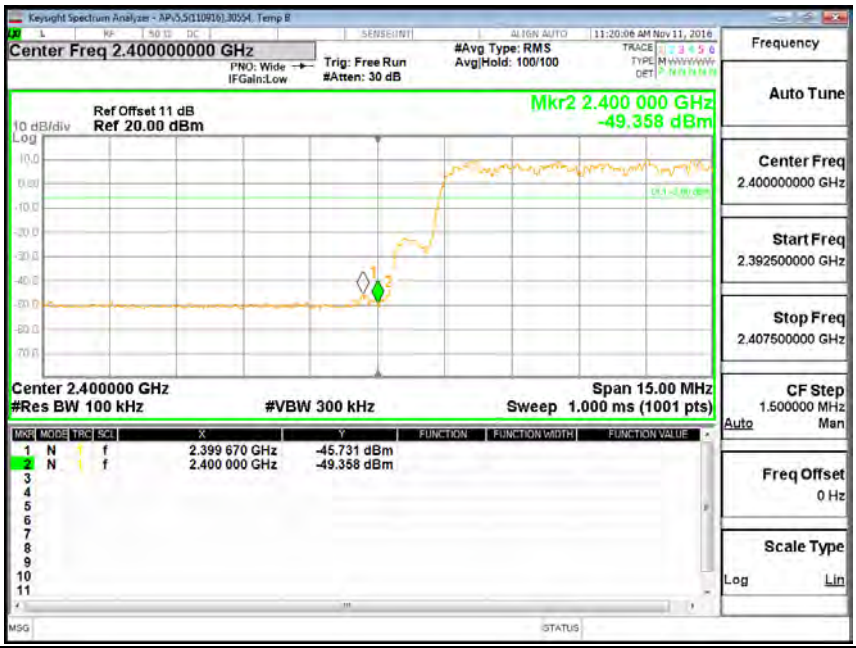
LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON

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9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

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 measurement below 1GHz; 1.5 m above the ground plane for measurement 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 pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final scans above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T (10 Hz) video bandwidth with peak detector for average measurements.

PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak→ this is a note from Radiated automation software. When the frequency is below 1G, software is using RB=100kHz; when the frequency is above 1G, software is using RB=1MHz.

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

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

RESULTS

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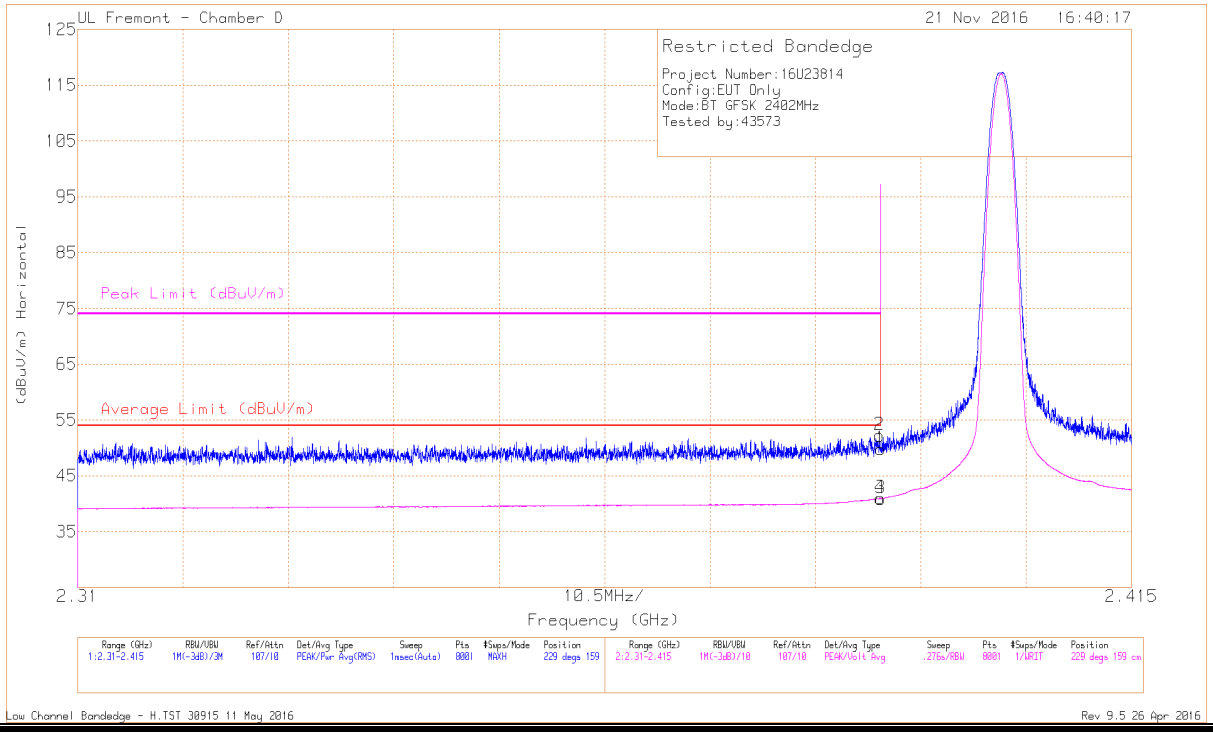
9.2. HIGH POWER BASIC DATA RATE GFSK MODULATION

9.2.1. RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	* 2.39	38.29	Pk	32.1	-20.6	49.79	-	-	74	-24.21	229	159	H
2	* 2.39	40.72	Pk	32.1	-20.6	52.22	-	-	74	-21.78	229	159	H
3	* 2.39	29.42	VA1T	32.1	-20.6	40.92	54	-13.08	-	-	229	159	H
4	* 2.39	29.43	VA1T	32.1	-20.6	40.93	54	-13.07	-	-	229	159	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
Low Channel Bandedge - H.TST 30915 11 May 2016
Rev 9.5 26 Apr 2016

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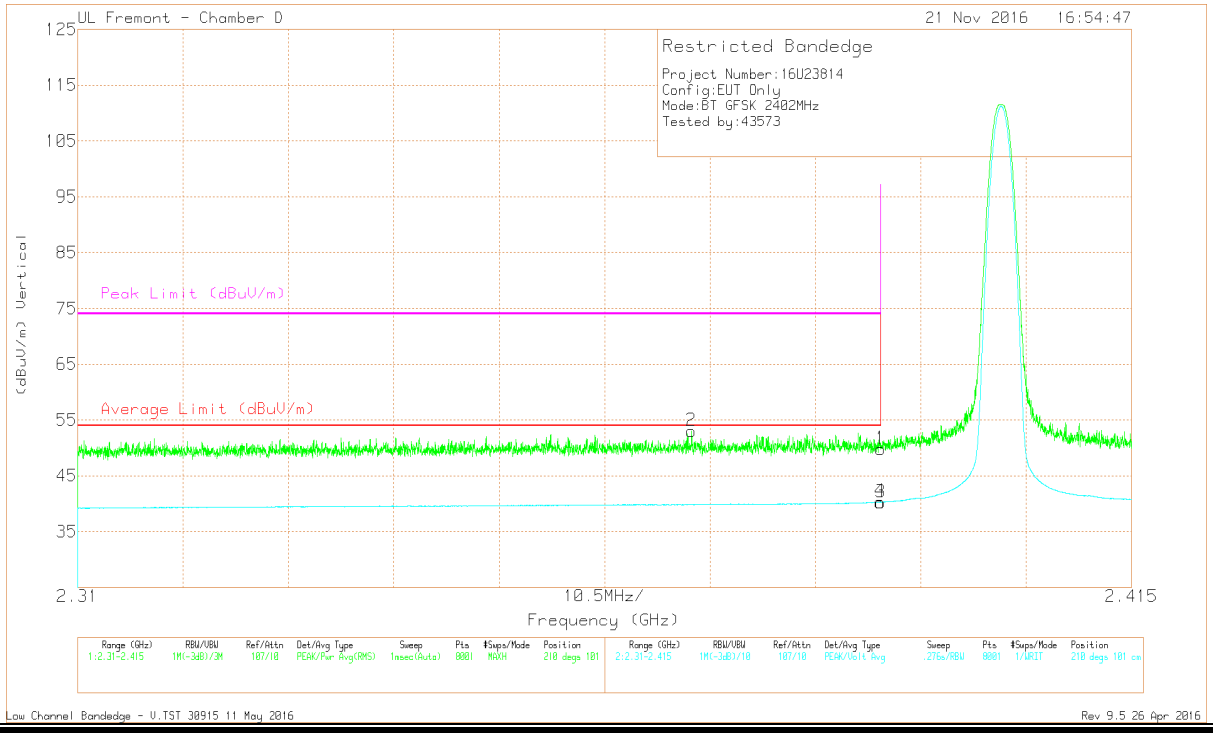
LOW CHANNEL VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	* 2.371	41.67	Pk	32	-20.7	52.97	-	-	74	-21.03	210	101	V
1	* 2.39	38.3	Pk	32.1	-20.6	49.8	-	-	74	-24.2	210	101	V
3	* 2.39	28.77	VA1T	32.1	-20.6	40.27	54	-13.73	-	-	210	101	V
4	* 2.39	28.8	VA1T	32.1	-20.6	40.3	54	-13.7	-	-	210	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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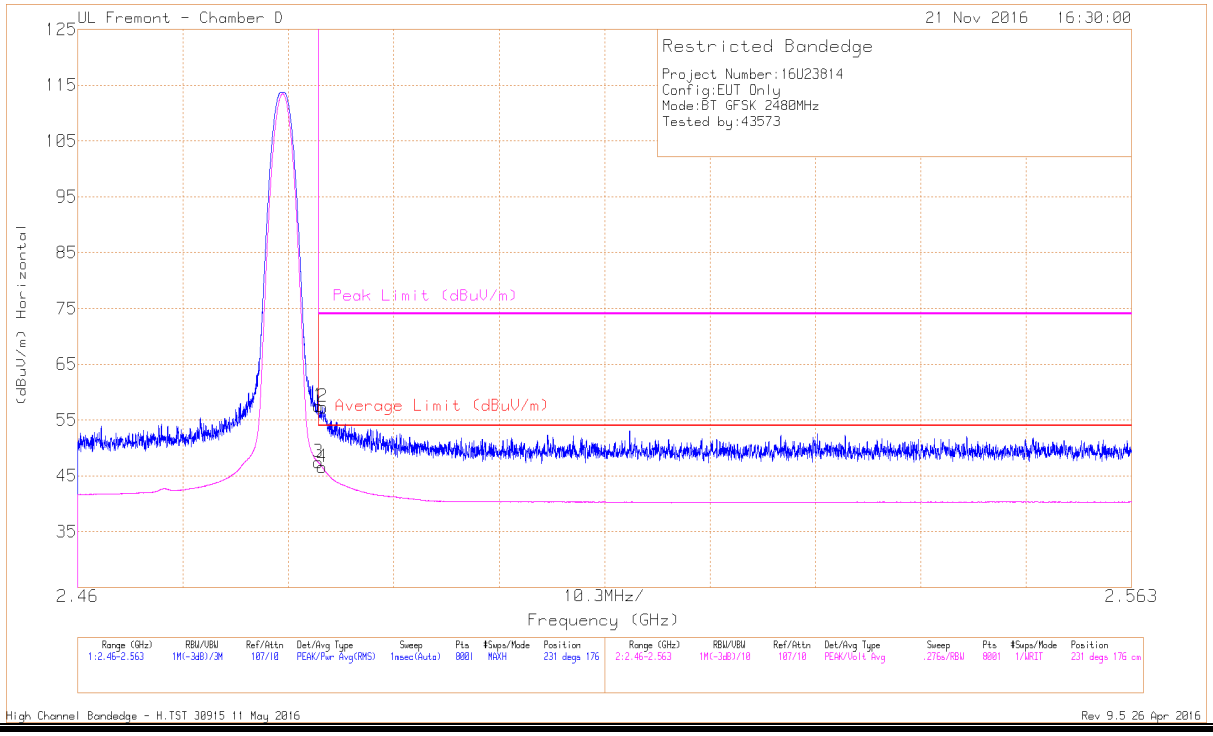
9.2.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fltr/ Pad (dB)	Correcte d Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	45.7	Pk	32.3	-20.5	57.5	-	-	74	-16.5	231	176	H
2	* 2.484	45.51	Pk	32.3	-20.5	57.31	-	-	74	-16.69	231	176	H
3	* 2.484	35.59	VA1T	32.3	-20.5	47.39	54	-6.61	-	-	231	176	H
4	* 2.484	34.74	VA1T	32.3	-20.5	46.54	54	-7.46	-	-	231	176	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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Rev 9.5 26 Apr 2016

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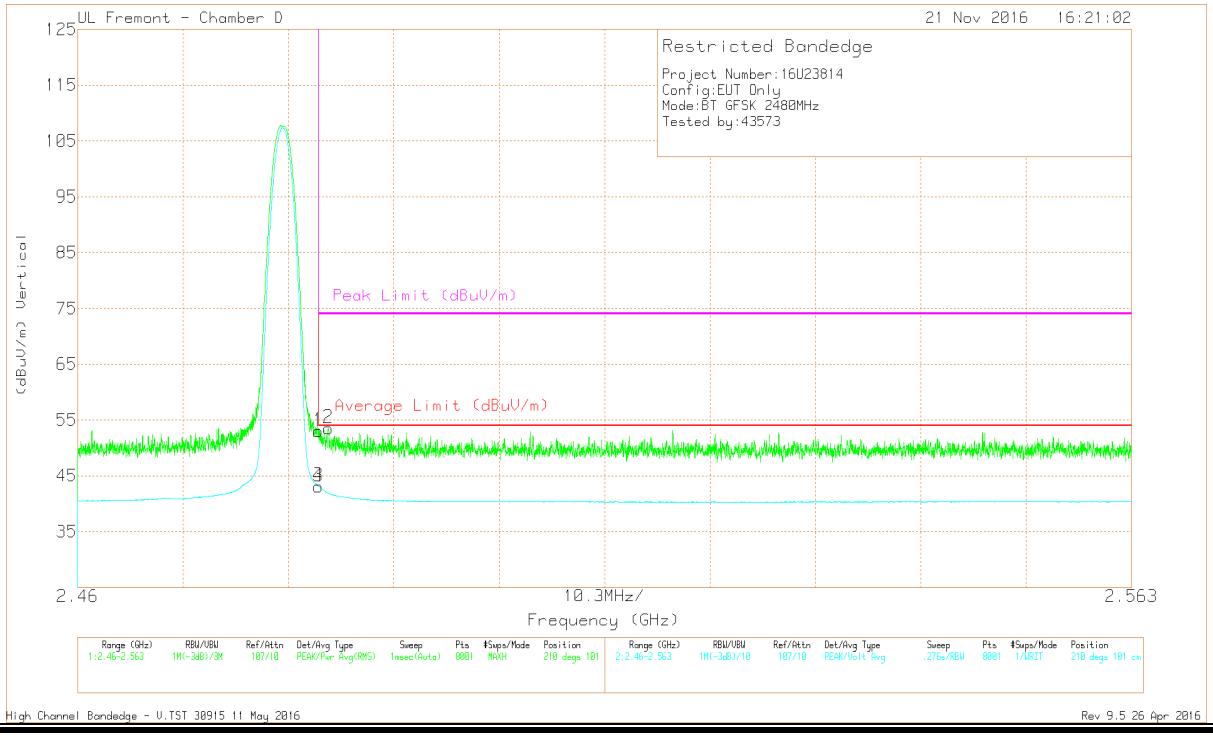
HIGH CHANNEL VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	41.28	Pk	32.3	-20.5	53.08	-	-	74	-20.92	210	101	V
3	* 2.484	31.35	VA1T	32.3	-20.5	43.15	54	-10.85	-	-	210	101	V
4	* 2.484	31.33	VA1T	32.3	-20.5	43.13	54	-10.87	-	-	210	101	V
2	* 2.485	41.78	Pk	32.3	-20.5	53.58	-	-	74	-20.42	210	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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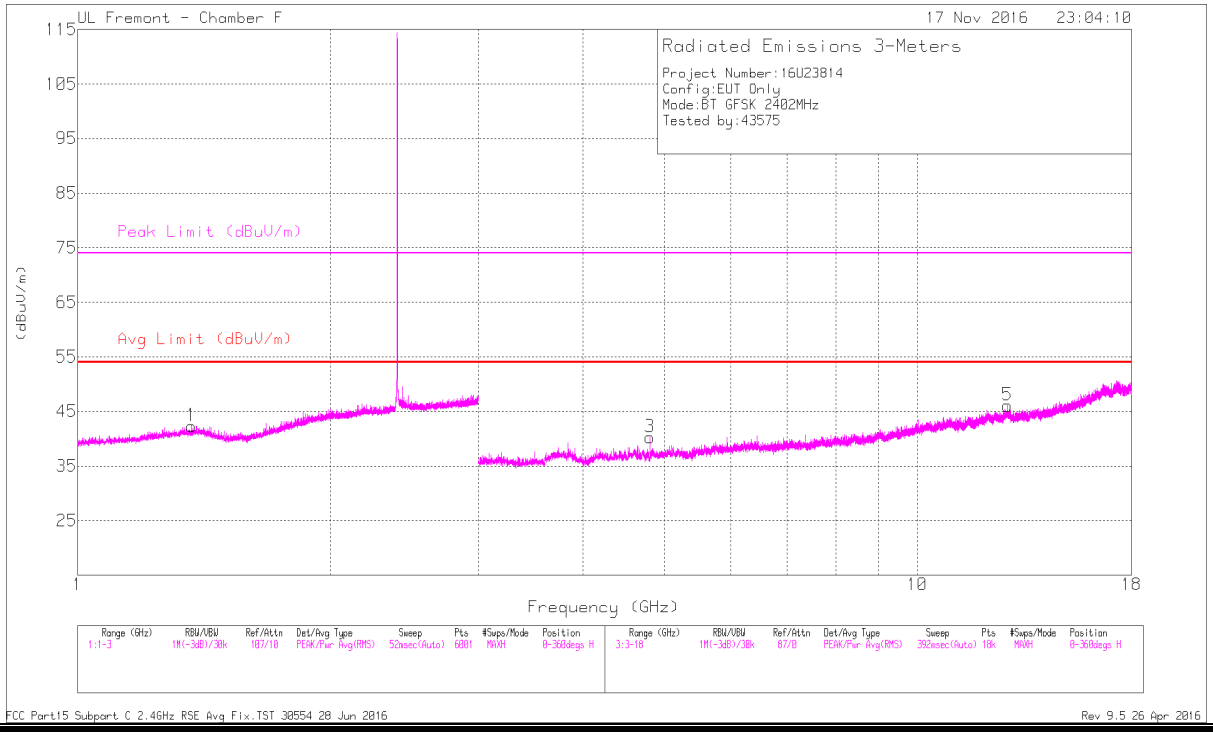
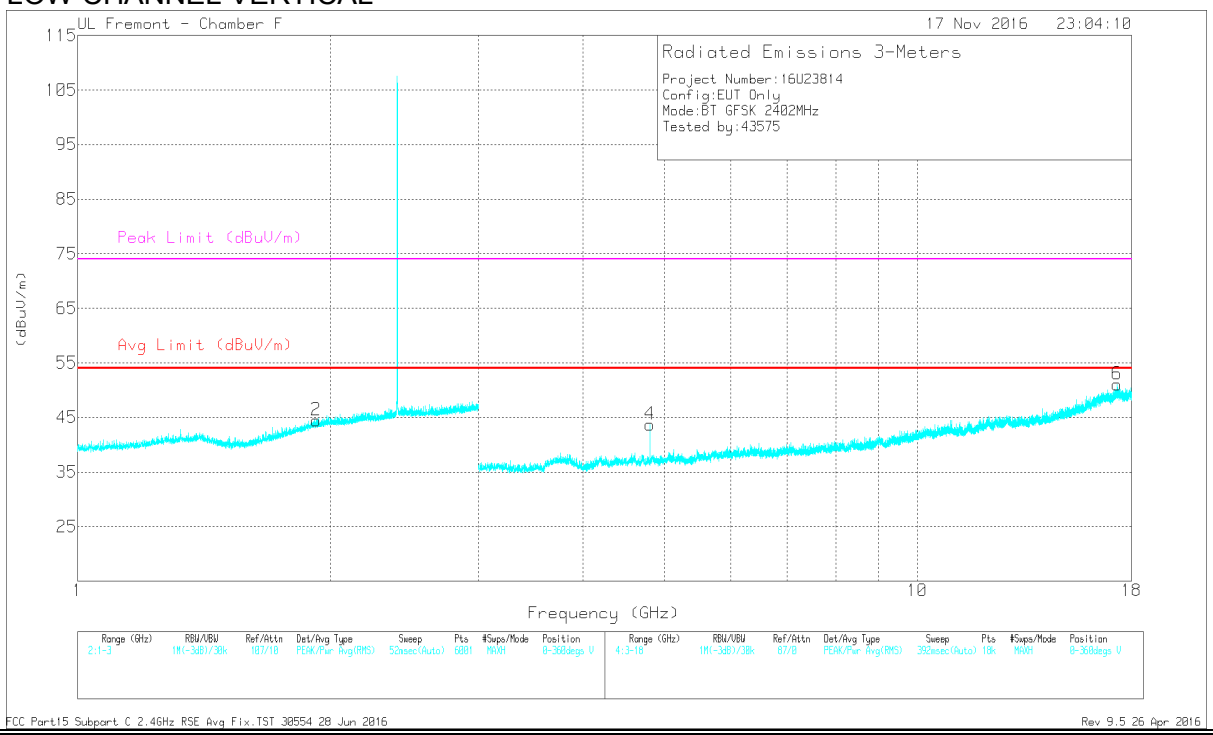
9.2.3. HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	* 1.368	41.04	PKFH	29.2	-22.1	48.14	-	-	74	-25.86	181	248	H
	* 1.369	29.13	VA1T	29.2	-22.1	36.23	54	-17.77	-	-	181	248	H
2	1.925	41.19	PKFH	31.1	-21.4	50.89	-	-	-	-	107	400	V
	1.925	29.08	VA1T	31.1	-21.4	38.78	-	-	-	-	107	400	V
3	* 4.803	39.65	PKFH	34	-27.6	46.05	-	-	74	-27.95	57	129	H
	* 4.804	31.87	VA1T	34	-27.6	38.27	54	-15.73	-	-	57	129	H
4	12.802	34.79	PKFH	39.3	-22.5	51.59	-	-	-	-	250	243	H
	12.802	23.06	VA1T	39.3	-22.5	39.86	-	-	-	-	250	243	H
5	* 4.804	42.18	PKFH	34	-27.6	48.58	-	-	74	-25.42	299	137	V
	* 4.804	37.82	VA1T	34	-27.6	44.22	54	-9.78	-	-	299	137	V
6	17.316	34.44	PKFH	41.2	-18.6	57.04	-	-	-	-	96	155	V
	17.315	22.4	VA1T	41.2	-18.6	45	-	-	-	-	96	155	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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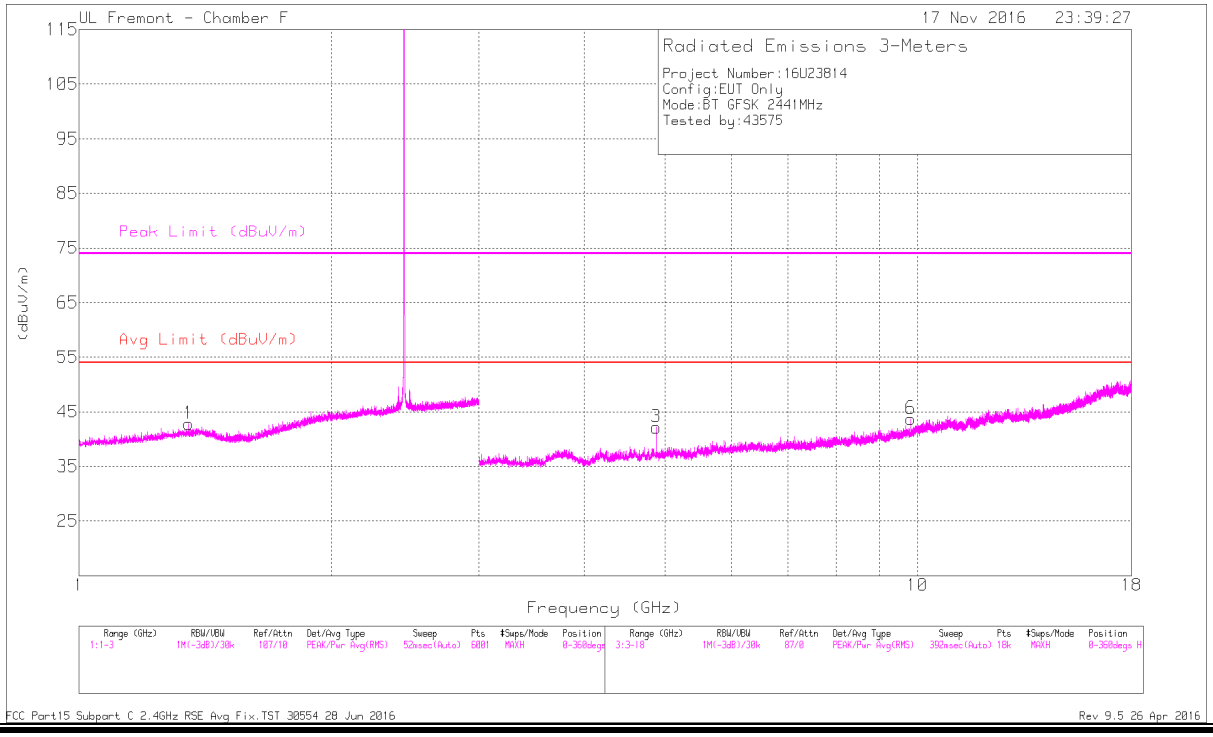
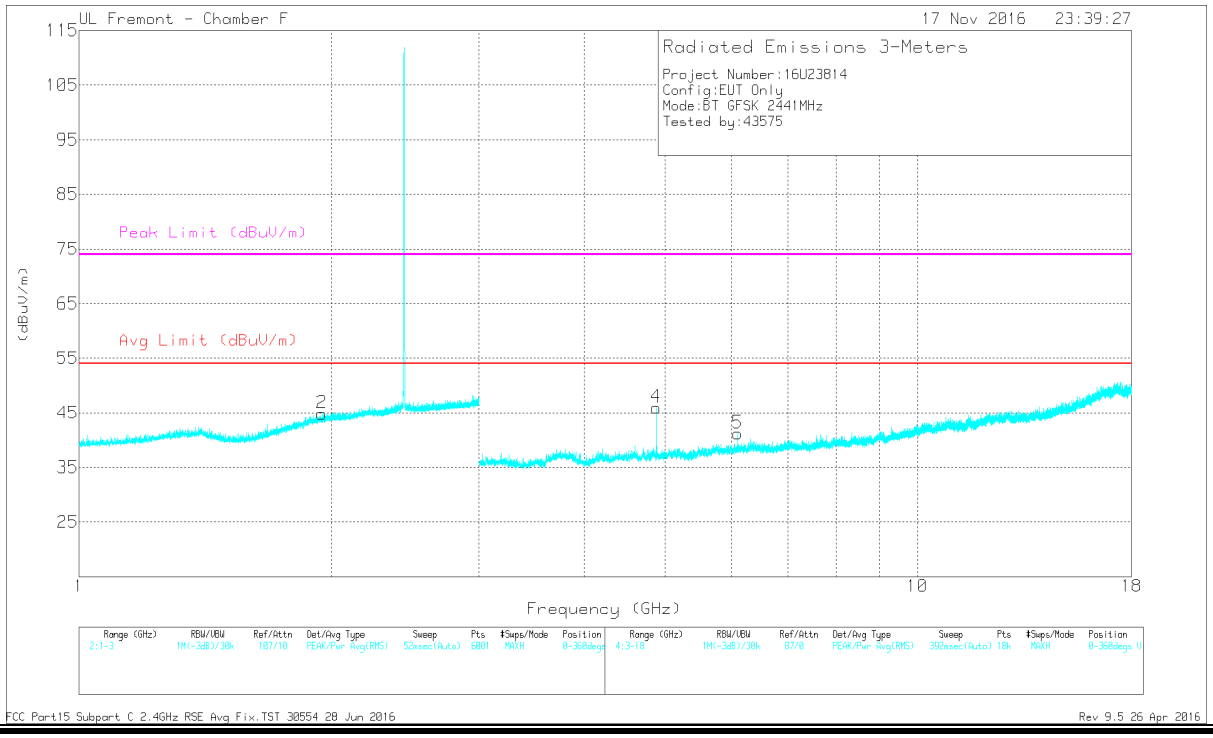
MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	* 1.35	40.62	PKFH	29.1	-22.1	47.62	-	-	74	-26.38	295	211	H
	* 1.35	29.08	VA1T	29.1	-22.1	36.08	54	-17.92	-	-	295	211	H
2	1.949	40.7	PKFH	31.2	-21.4	50.5	-	-	-	-	131	357	V
	1.948	29.05	VA1T	31.2	-21.4	38.85	-	-	-	-	131	357	V
3	* 4.882	39.69	PKFH	34.1	-27.8	45.99	-	-	74	-28.01	60	163	H
	* 4.882	32.93	VA1T	34.1	-27.8	39.23	54	-14.77	-	-	60	163	H
4	9.818	34.36	PKFH	36.8	-22.4	48.76	-	-	-	-	130	203	H
	9.817	21.81	VA1T	36.8	-22.4	36.21	-	-	-	-	130	203	H
5	* 4.882	44.54	PKFH	34.1	-27.8	50.84	-	-	74	-23.16	296	123	V
	* 4.882	39.75	VA1T	34.1	-27.8	46.05	54	-7.95	-	-	296	123	V
6	6.105	36.2	PKFH	35.5	-26.9	44.8	-	-	-	-	265	285	V
	6.105	24.96	VA1T	35.5	-26.9	33.56	-	-	-	-	265	285	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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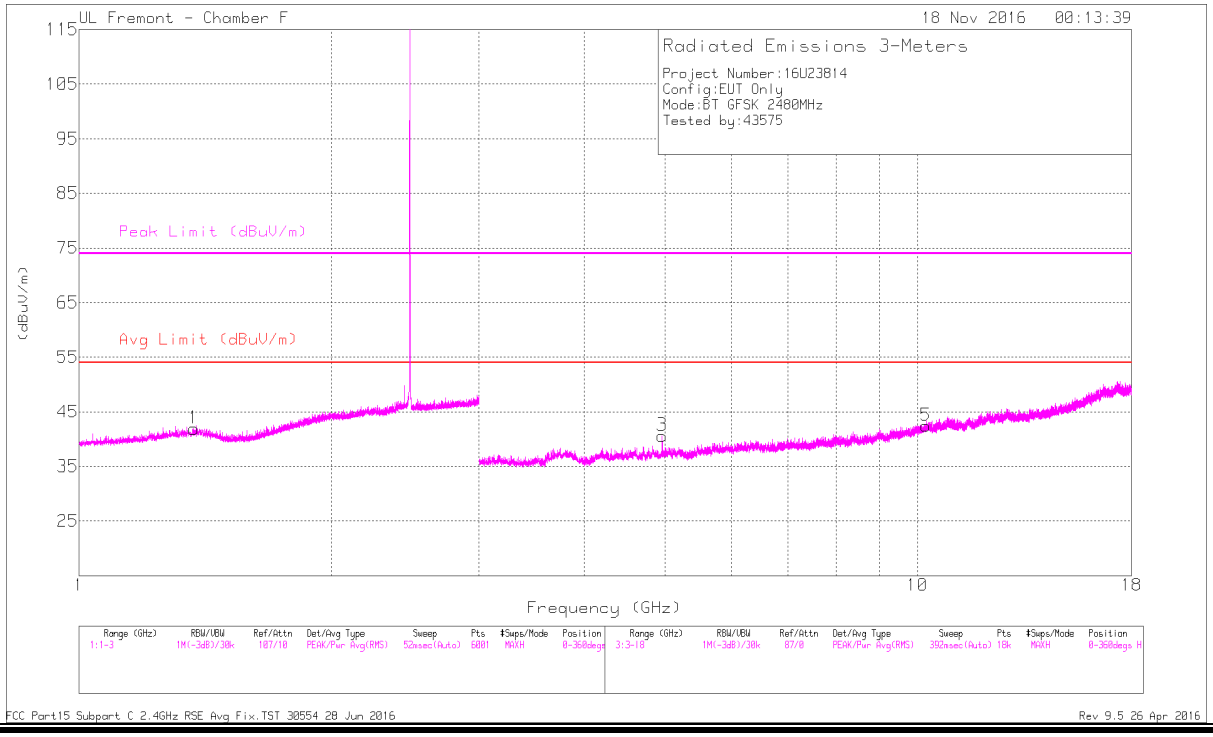
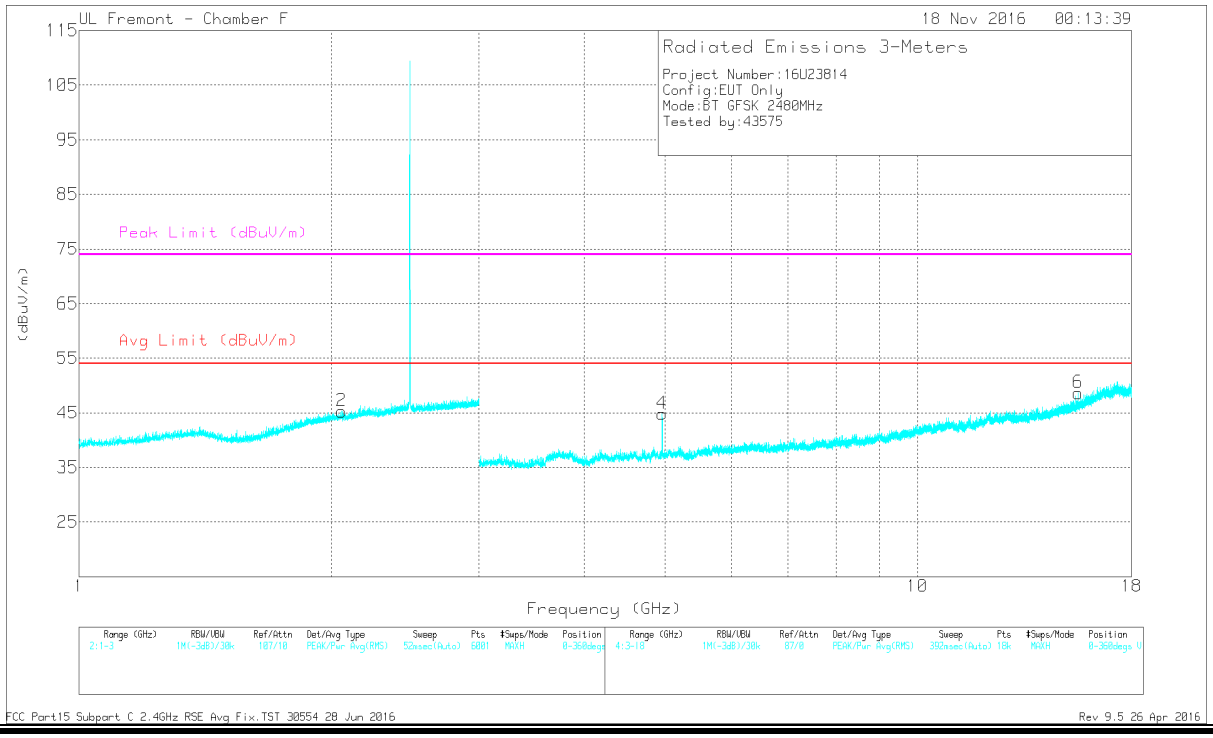
HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	* 1.371	41.03	PKFH	29.2	-22.1	48.13	-	-	74	-25.87	74	383	H
	* 1.371	29.13	VA1T	29.2	-22.1	36.23	54	-17.77	-	-	74	383	H
2	2.055	40.63	PKFH	31.5	-21.4	50.73	-	-	-	-	358	260	V
	2.055	29.19	VA1T	31.5	-21.4	39.29	-	-	-	-	358	260	V
3	* 4.96	41.07	PKFH	34.2	-28.5	46.77	-	-	74	-27.23	217	107	H
	* 4.96	32.52	VA1T	34.2	-28.5	38.22	54	-15.78	-	-	217	107	H
4	10.232	33.99	PKFH	37.2	-21.8	49.39	-	-	-	-	255	209	H
	10.229	21.79	VA1T	37.2	-21.8	37.19	-	-	-	-	255	209	H
5	* 4.96	44.11	PKFH	34.2	-28.5	49.81	-	-	74	-24.19	115	131	V
	* 4.96	38.34	VA1T	34.2	-28.5	44.04	54	-9.96	-	-	115	131	V
6	* 15.549	34.36	PKFH	40.6	-22.1	52.86	-	-	74	-21.14	97	400	V
	* 15.548	23.51	VA1T	40.6	-22.1	42.01	54	-11.99	-	-	97	400	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
FCC Part15 Subpart C 2.4GHz RSE Avg Fix.TST 30554 28 Jun 2016
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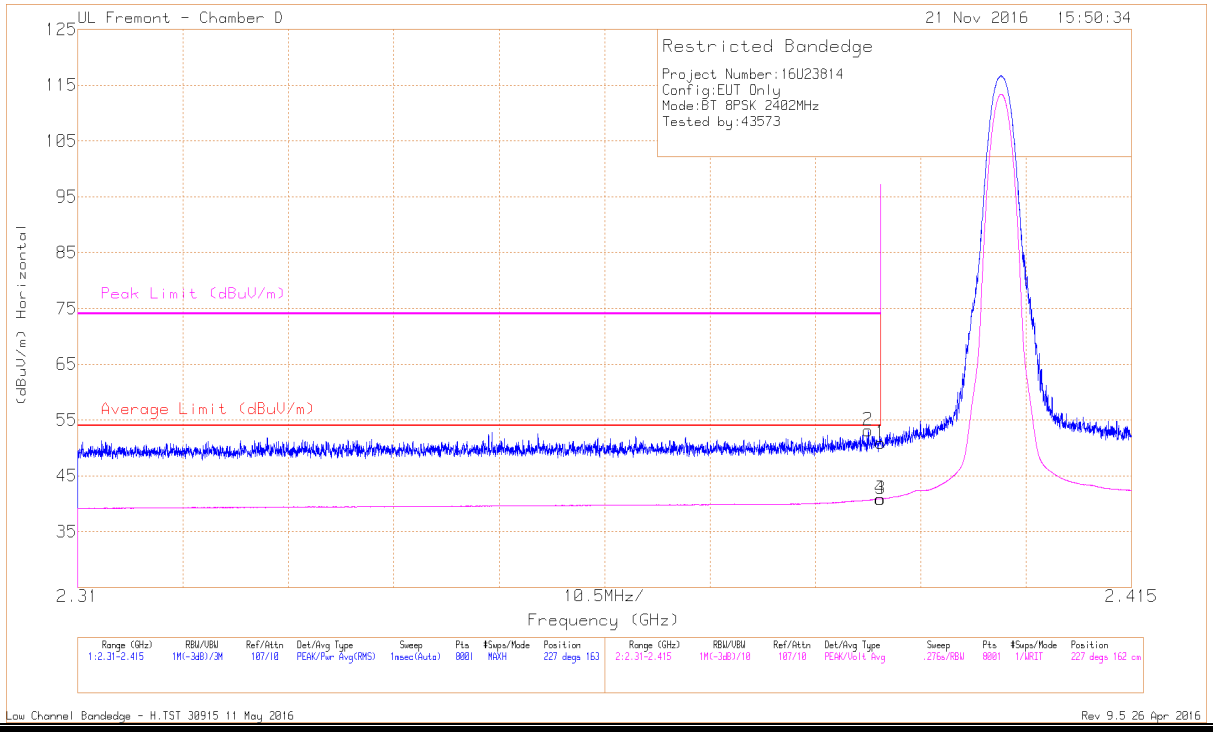
9.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

9.3.1. RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	* 2.389	41.63	Pk	32.1	-20.6	53.13	-	-	74	-20.87	227	163	H
1	* 2.39	39.37	Pk	32.1	-20.6	50.87	-	-	74	-23.13	227	163	H
3	* 2.39	29.34	VA1T	32.1	-20.6	40.84	54	-13.16	-	-	227	162	H
4	* 2.39	29.35	VA1T	32.1	-20.6	40.85	54	-13.15	-	-	227	162	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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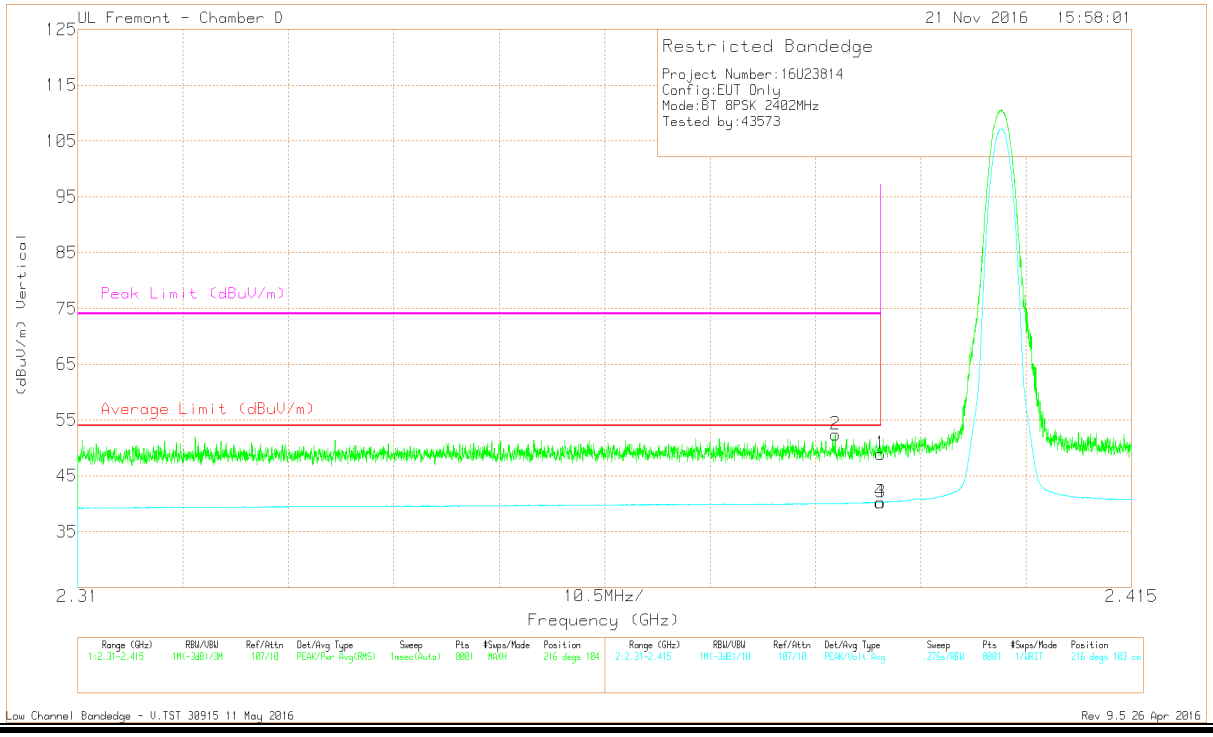
LOW CHANNEL VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	* 2.385	40.87	Pk	32.1	-20.6	52.37	-	-	74	-21.63	216	104	V
1	* 2.39	37.44	Pk	32.1	-20.6	48.94	-	-	74	-25.06	216	104	V
3	* 2.39	28.73	VA1T	32.1	-20.6	40.23	54	-13.77	-	-	216	103	V
4	* 2.39	28.78	VA1T	32.1	-20.6	40.28	54	-13.72	-	-	216	103	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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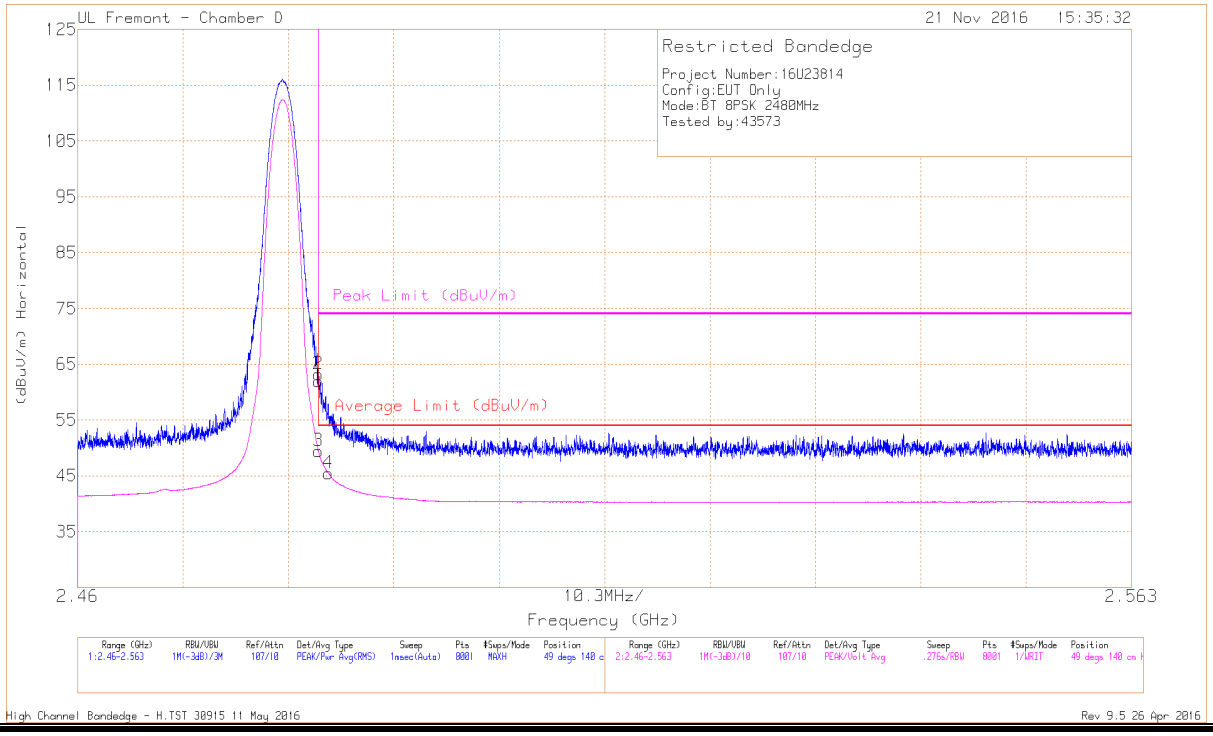
9.3.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	50.21	Pk	32.3	-20.5	62.01	-	-	74	-11.99	49	140	H
2	* 2.484	51.43	Pk	32.3	-20.5	63.23	-	-	74	-10.77	49	140	H
3	* 2.484	37.63	VA1T	32.3	-20.5	49.43	54	-4.57	-	-	49	140	H
4	* 2.485	33.62	VA1T	32.3	-20.5	45.42	54	-8.58	-	-	49	140	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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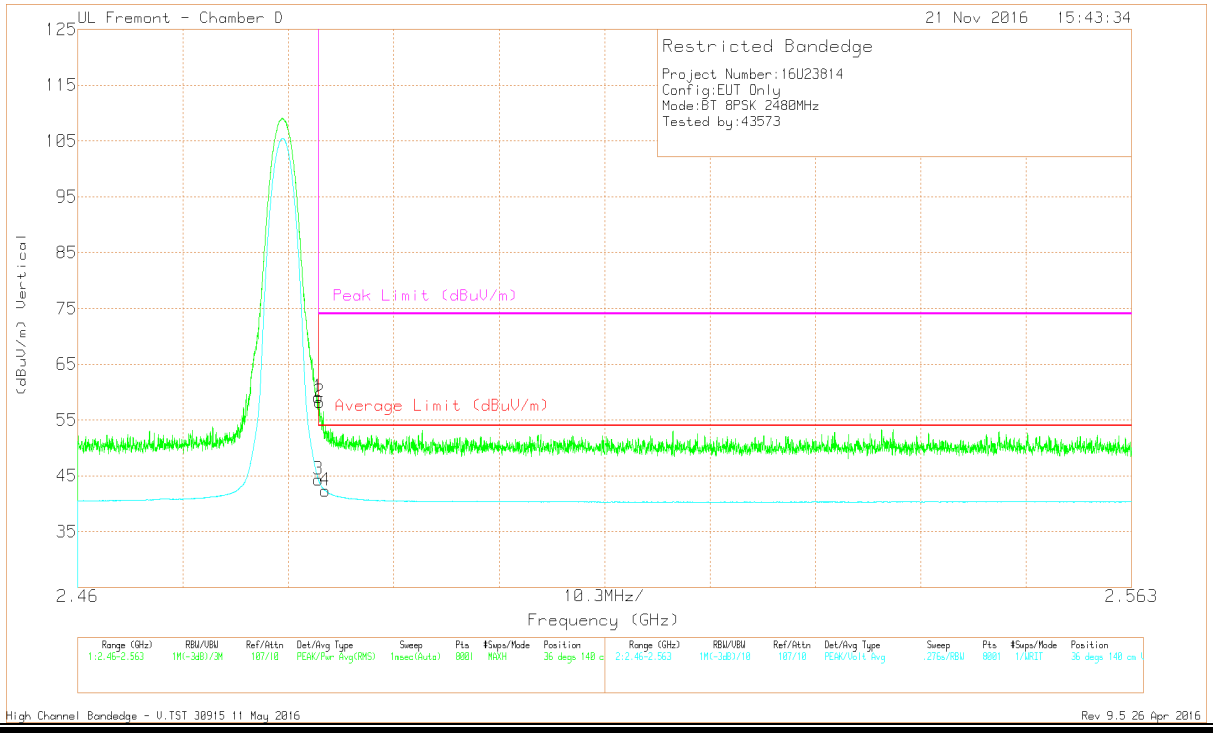
HIGH CHANNEL VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	47.34	Pk	32.3	-20.5	59.14	-	-	74	-14.86	36	140	V
2	* 2.484	46.44	Pk	32.3	-20.5	58.24	-	-	74	-15.76	36	140	V
3	* 2.484	32.53	VA1T	32.3	-20.5	44.33	54	-9.67	-	-	36	140	V
4	* 2.484	30.53	VA1T	32.3	-20.5	42.33	54	-11.67	-	-	36	140	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
High Channel Bandedge - V.TST 30915 11 May 2016
Rev 9.5 26 Apr 2016

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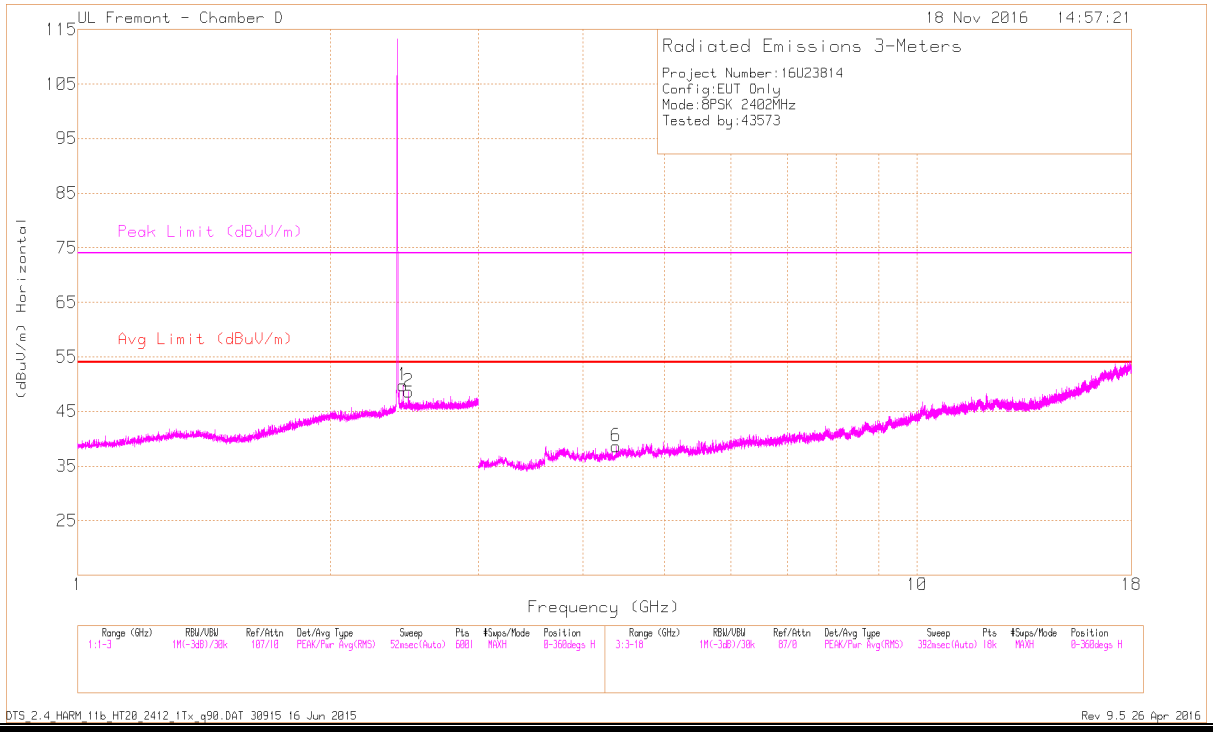
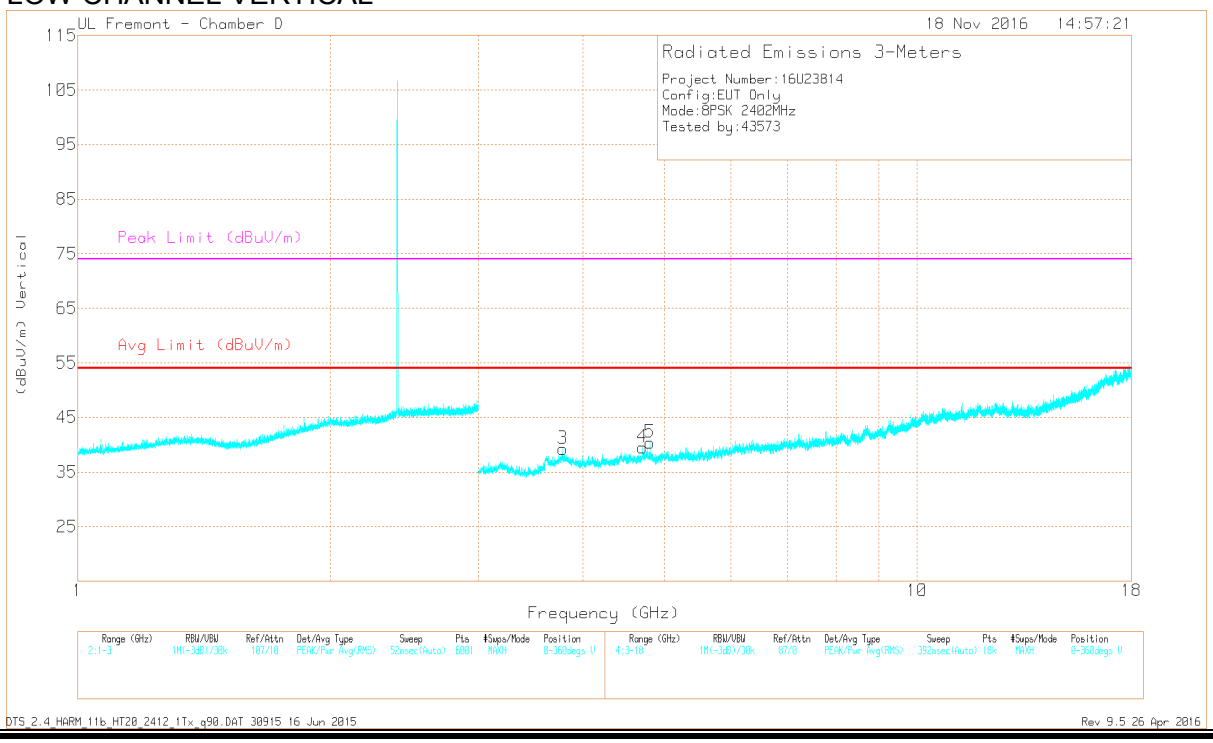
9.3.3. HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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
6	* 4.382	37.7	PKFH	33.9	-28.1	43.5	-	-	74	-30.5	89	159	H
	* 4.38	26.8	VA1T	33.9	-28	32.7	54	-21.3	-	-	89	159	H
3	* 3.782	38.71	PKFH	33.5	-28	44.21	-	-	74	-29.79	324	254	V
	* 3.781	27.47	VA1T	33.5	-28	32.97	54	-21.03	-	-	324	254	V
4	* 4.706	38.57	PKFH	34	-27.2	45.37	-	-	74	-28.63	205	213	V
	* 4.707	26.59	VA1T	34	-27.1	33.49	54	-20.51	-	-	205	213	V
5	* 4.804	38.22	PKFH	34.1	-26.7	45.62	-	-	74	-28.38	44	169	V
	* 4.804	27.05	VA1T	34.1	-26.7	34.45	54	-19.55	-	-	44	169	V
1	2.439	43.81	PKFH	32.2	-20.6	55.41	-	-	-	-	216	177	H
	2.439	34.93	VA1T	32.2	-20.6	46.53	-	-	-	-	216	177	H
2	2.477	43.79	PKFH	32.3	-20.6	55.49	-	-	-	-	215	109	H
	2.477	31.66	VA1T	32.3	-20.6	43.36	-	-	-	-	215	109	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
DTS_2.4_HARM_11b_HT20_2412_1Tx_q90.DAT 30915 16 Jun 2015
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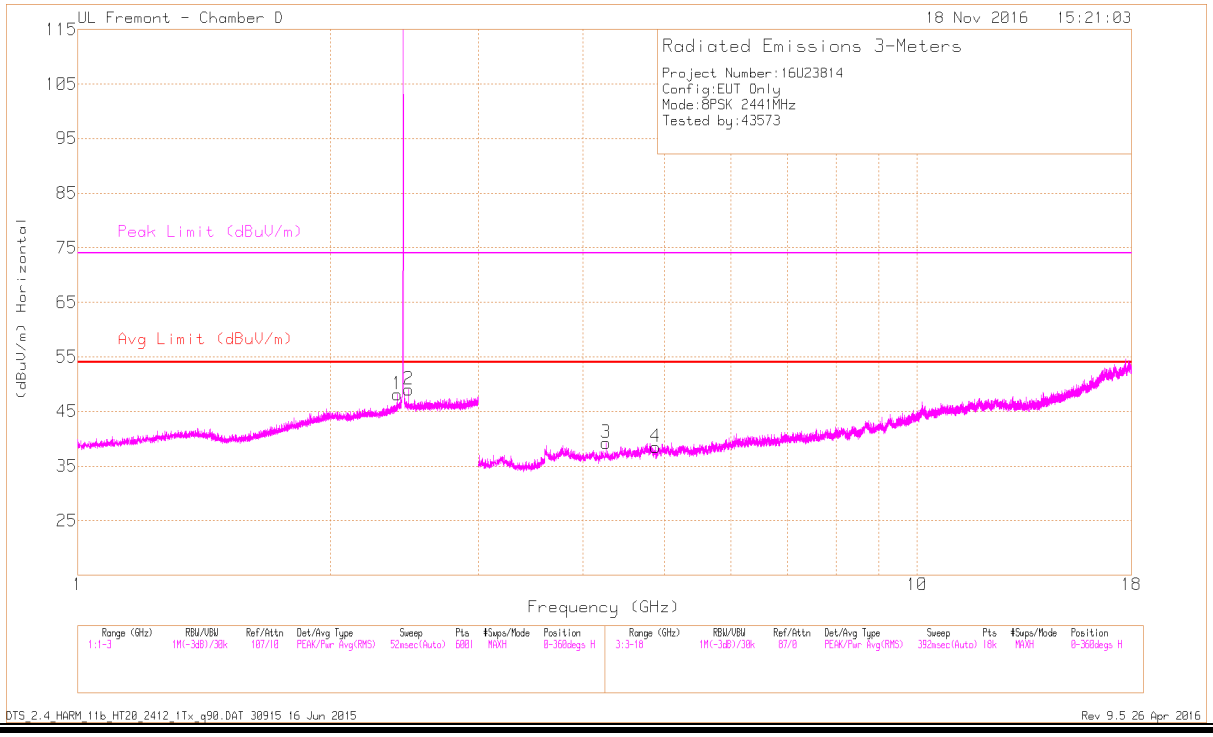
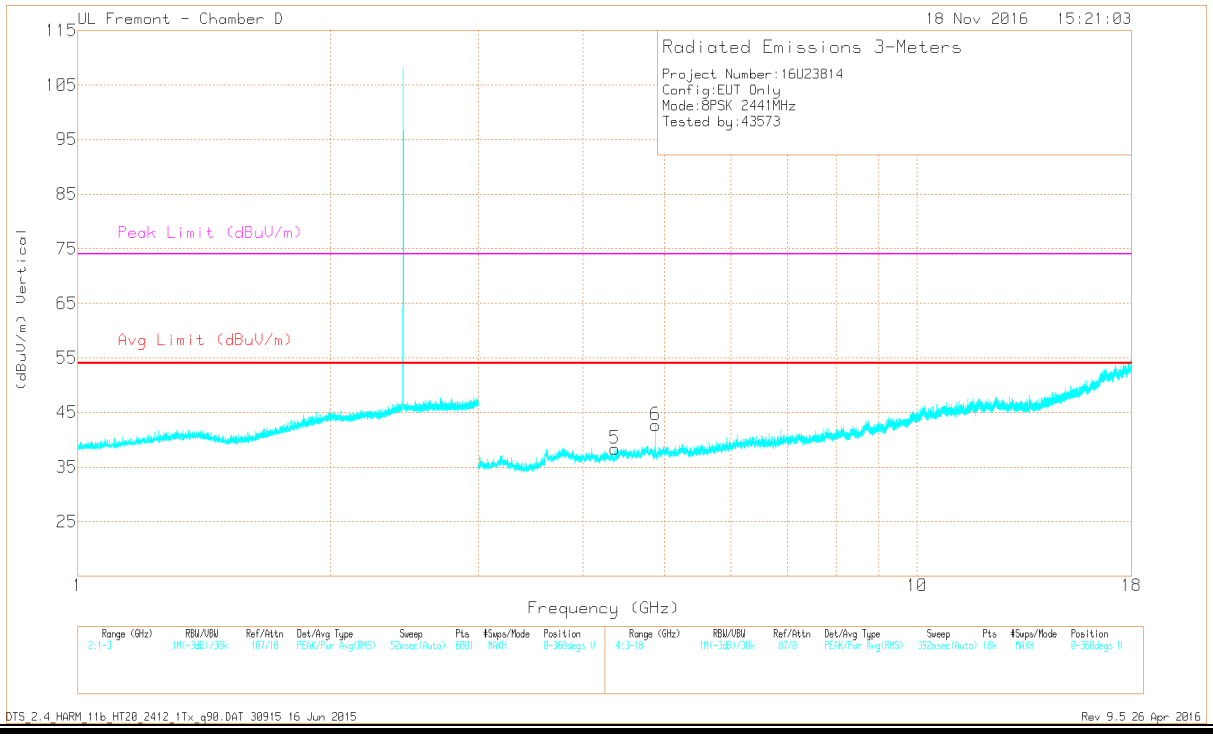
MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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
3	* 4.26	37.6	PKFH	33.5	-27.5	43.6	-	-	74	-30.4	125	169	H
	* 4.264	26.63	VA1T	33.5	-27.6	32.53	54	-21.47	-	-	125	169	H
4	* 4.881	39.71	PKFH	34.1	-27.9	45.91	-	-	74	-28.09	178	399	H
	* 4.882	30.83	VA1T	34.1	-27.9	37.03	54	-16.97	-	-	178	399	H
5	* 4.361	38.09	PKFH	33.8	-28.3	43.59	-	-	74	-30.41	253	230	V
	* 4.36	26.81	VA1T	33.8	-28.3	32.31	54	-21.69	-	-	253	230	V
6	* 4.882	41.98	PKFH	34.1	-28	48.08	-	-	74	-25.92	84	175	V
	* 4.882	34.68	VA1T	34.1	-27.9	40.88	54	-13.12	-	-	84	175	V
1	2.404	40.63	PKFH	32.2	-20.6	52.23	-	-	-	-	220	126	H
	2.404	29.52	VA1T	32.2	-20.6	41.12	-	-	-	-	220	126	H
2	2.478	33.33	VA1T	32.3	-20.6	45.03	-	-	-	-	163	122	H
	2.479	44.72	PKFH	32.3	-20.6	56.42	-	-	-	-	163	122	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
DTS_2.4_HARM_11b_HT20_2412_1Tx_q90.DAT 30915 16 Jun 2015
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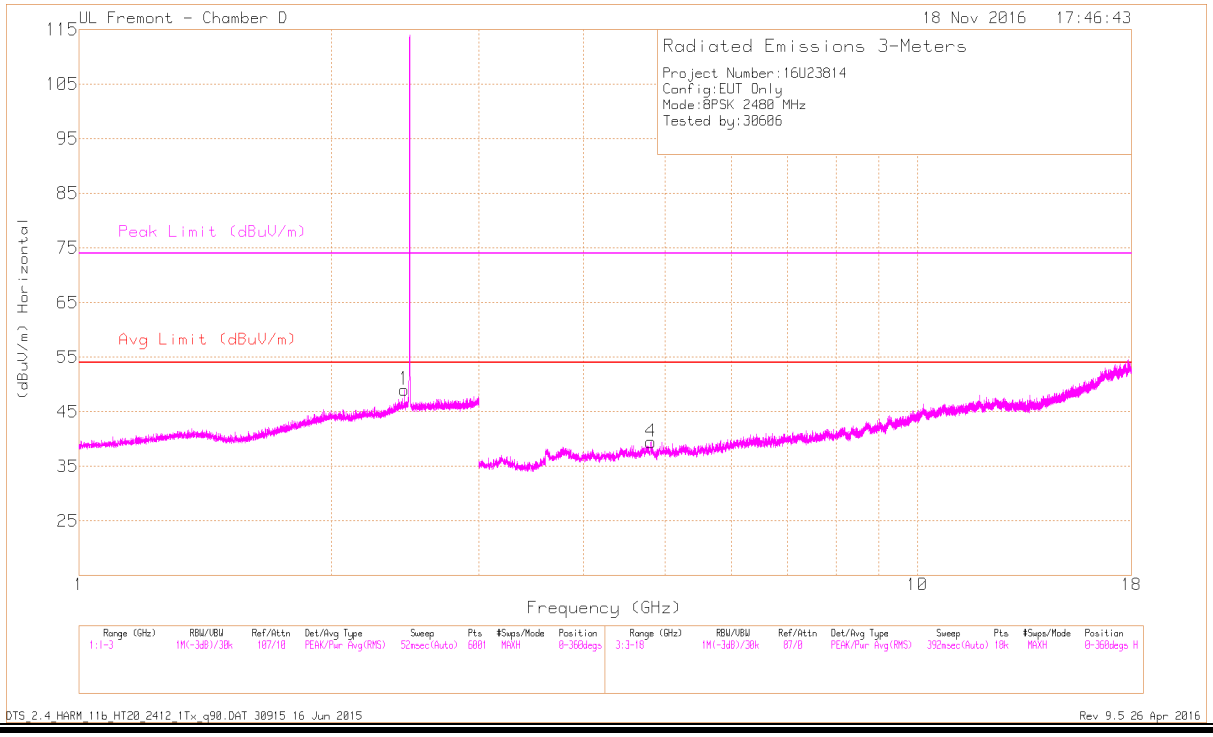
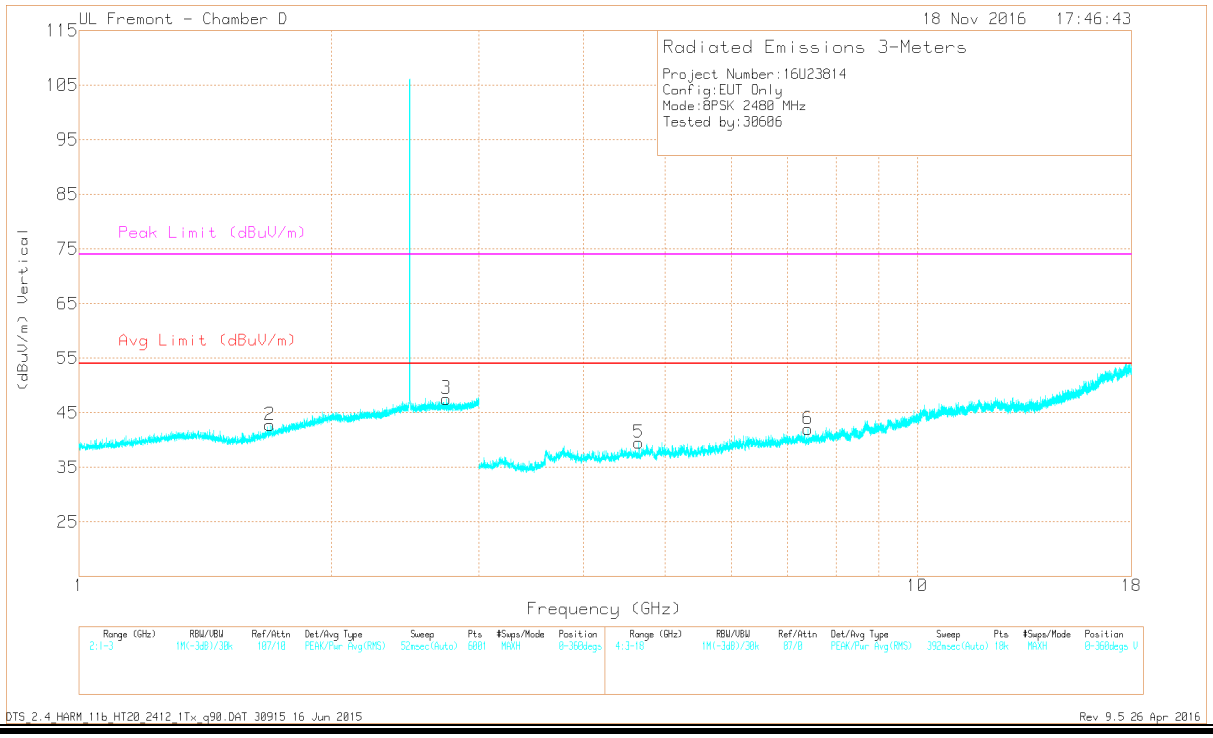
HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	* 1.689	41.01	PKFH	29	-21.5	48.51	-	-	74	-25.49	281	262	V
	* 1.692	28.98	VA1T	29	-21.5	36.48	54	-17.52	-	-	281	262	V
3	* 2.743	40.01	PKFH	32.4	-20.3	52.11	-	-	74	-21.89	360	278	V
	* 2.745	28.96	VA1T	32.4	-20.2	41.16	54	-12.84	-	-	360	278	V
4	* 4.809	37.47	PKFH	34.1	-26.8	44.77	-	-	74	-29.23	35	131	H
	* 4.813	26.4	VA1T	34.1	-26.8	33.7	54	-20.3	-	-	35	131	H
5	* 4.654	38.61	PKFH	34.1	-28.1	44.61	-	-	74	-29.39	180	319	V
	* 4.654	27.12	VA1T	34.1	-28.1	33.12	54	-20.88	-	-	180	319	V
6	* 7.405	35.63	PKFH	35.6	-24.7	46.53	-	-	74	-27.47	284	112	V
	* 7.405	24.08	VA1T	35.6	-24.6	35.08	54	-18.92	-	-	284	112	V
1	2.443	43.76	PKFH	32.2	-20.6	55.36	-	-	-	-	219	204	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
DTS_2.4_HARM_11b_HT20_2412_1Tx_q90.DAT 30915 16 Jun 2015
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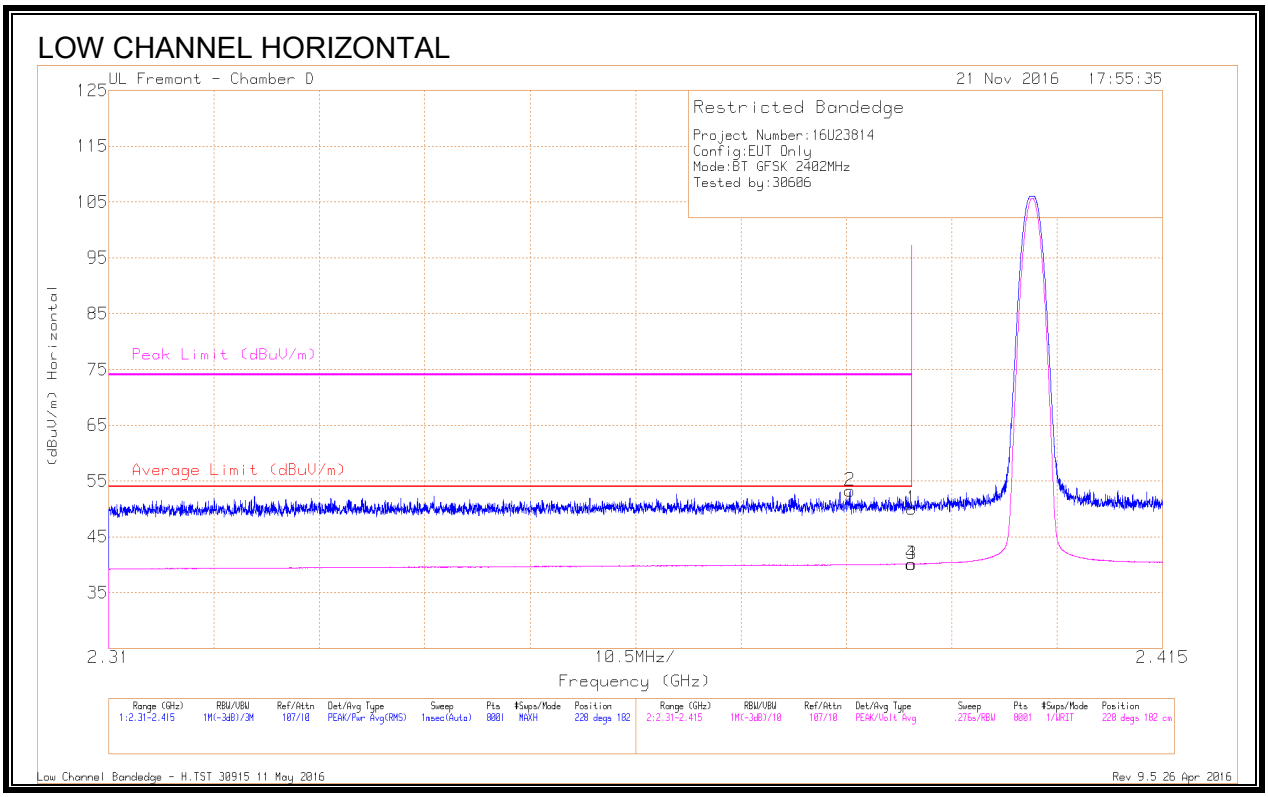
9.4. LOW POWER BASIC DATA RATE GFSK MODULATION

9.4.1. RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	* 2.384	41.76	Pk	32.1	-20.6	53.26	-	-	74	-20.74	228	182	H
1	* 2.39	38.53	Pk	32.1	-20.6	50.03	-	-	74	-23.97	228	182	H
3	* 2.39	28.62	VA1T	32.1	-20.6	40.12	54	-13.88	-	-	228	182	H
4	* 2.39	28.66	VA1T	32.1	-20.6	40.16	54	-13.84	-	-	228	182	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
Low Channel Bandedge - H.TST 30915 11 May 2016
Rev 9.5 26 Apr 2016

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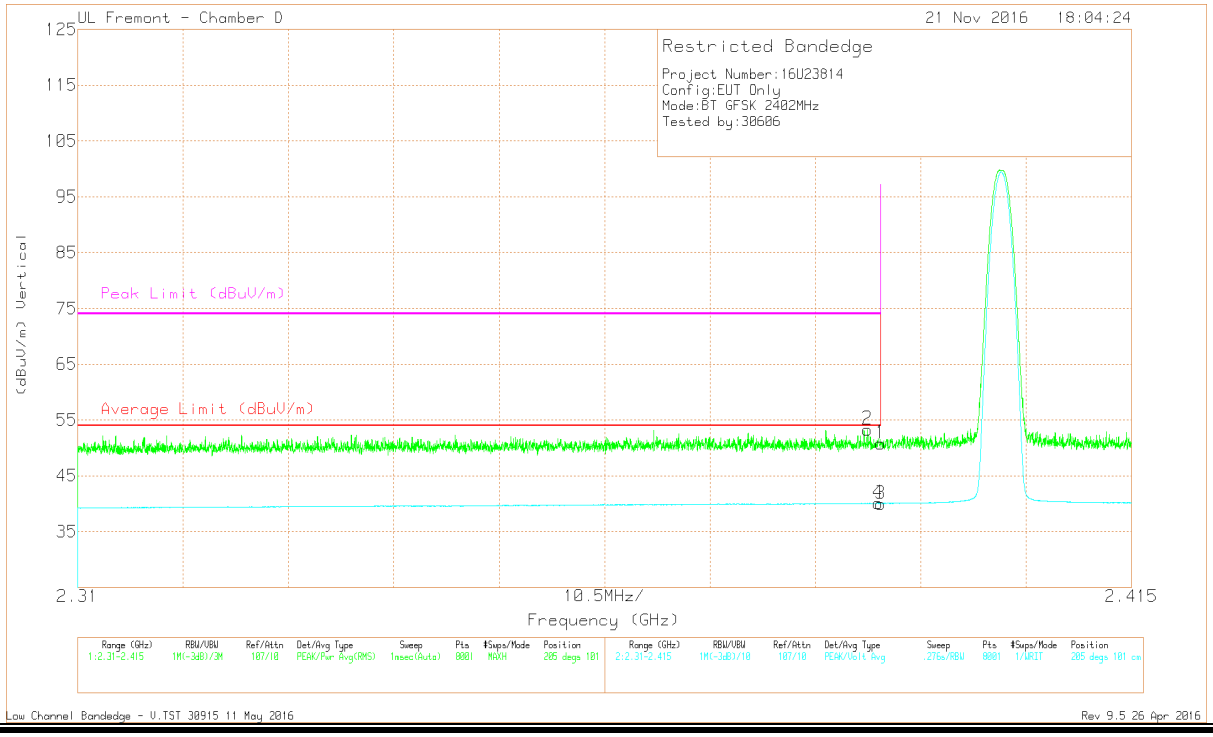
LOW CHANNEL VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	* 2.389	41.83	Pk	32.1	-20.6	53.33	-	-	74	-20.67	205	101	V
1	* 2.39	39.35	Pk	32.1	-20.6	50.85	-	-	74	-23.15	205	101	V
3	* 2.39	28.53	VA1T	32.1	-20.6	40.03	54	-13.97	-	-	205	101	V
4	* 2.39	28.58	VA1T	32.1	-20.6	40.08	54	-13.92	-	-	205	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
Low Channel Bandedge - V.TST 30915 11 May 2016
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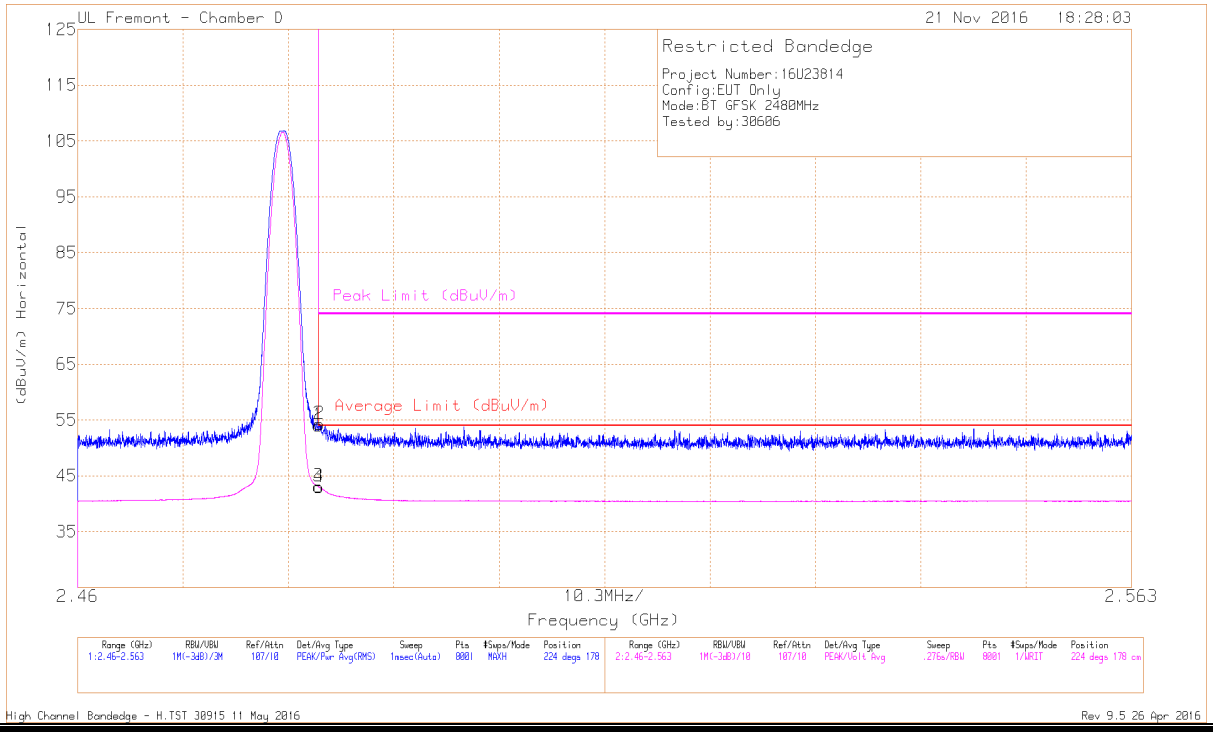
9.4.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	42.22	Pk	32.3	-20.5	54.02	-	-	74	-19.98	224	178	H
2	* 2.484	42.43	Pk	32.3	-20.5	54.23	-	-	74	-19.77	224	178	H
3	* 2.484	31.29	VA1T	32.3	-20.5	43.09	54	-10.91	-	-	224	178	H
4	* 2.484	31.19	VA1T	32.3	-20.5	42.99	54	-11.01	-	-	224	178	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
High Channel Bandedge - H.TST 30915 11 May 2016
Rev 9.5 26 Apr 2016

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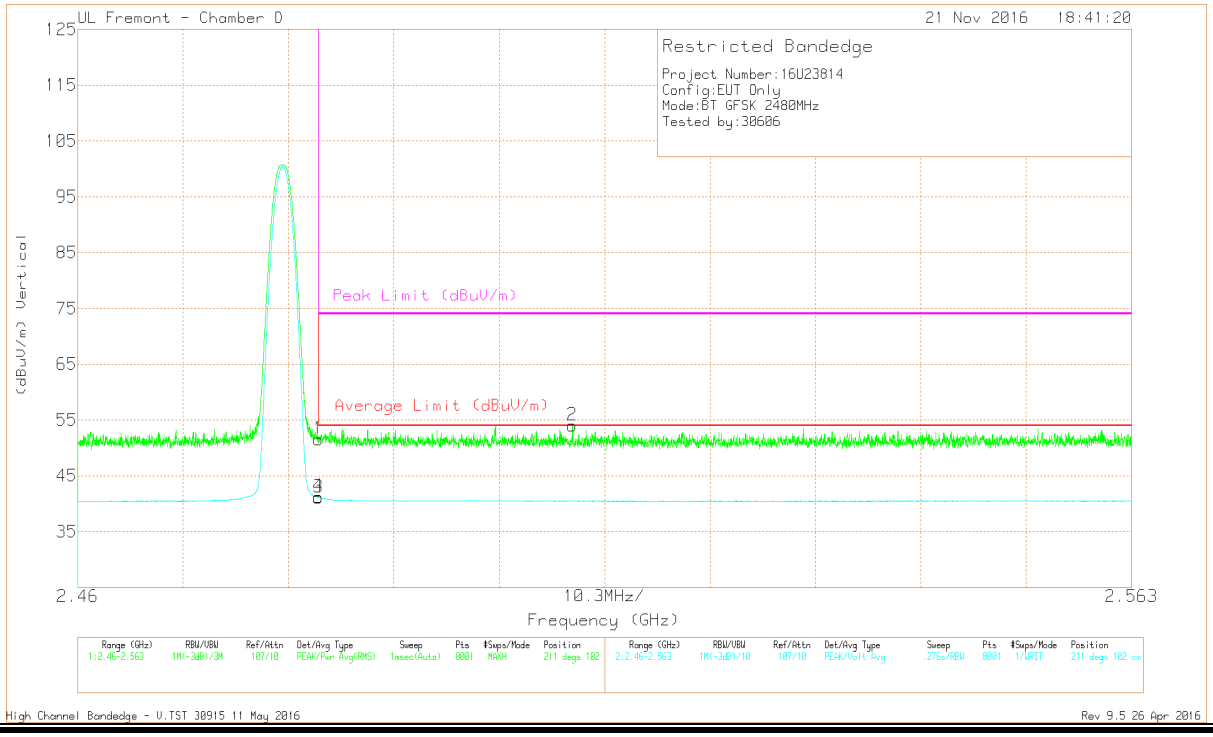
HIGH CHANNEL VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	39.71	Pk	32.3	-20.5	51.51	-	-	74	-22.49	211	102	V
3	* 2.484	29.36	VA1T	32.3	-20.5	41.16	54	-12.84	-	-	211	102	V
4	* 2.484	29.38	VA1T	32.3	-20.5	41.18	54	-12.82	-	-	211	102	V
2	2.508	42.23	Pk	32.3	-20.5	54.03	-	-	74	-19.97	211	102	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
High Channel Bandedge - V.TST 30915 11 May 2016
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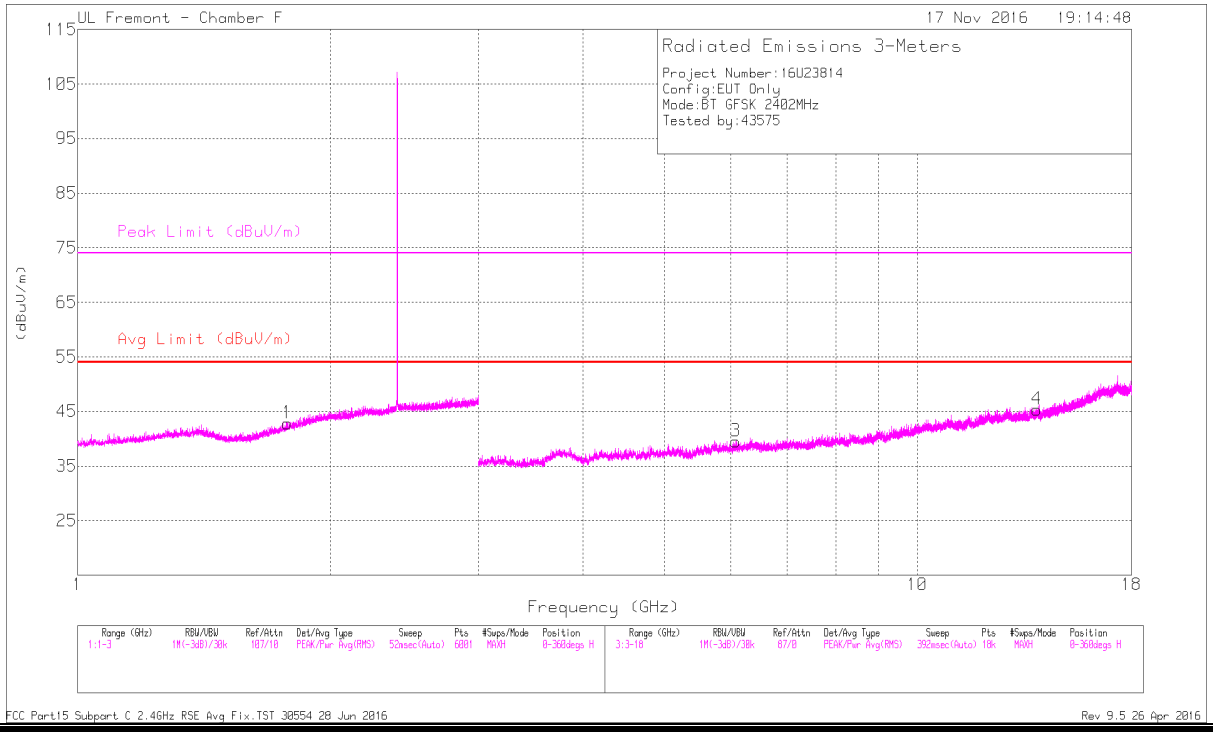
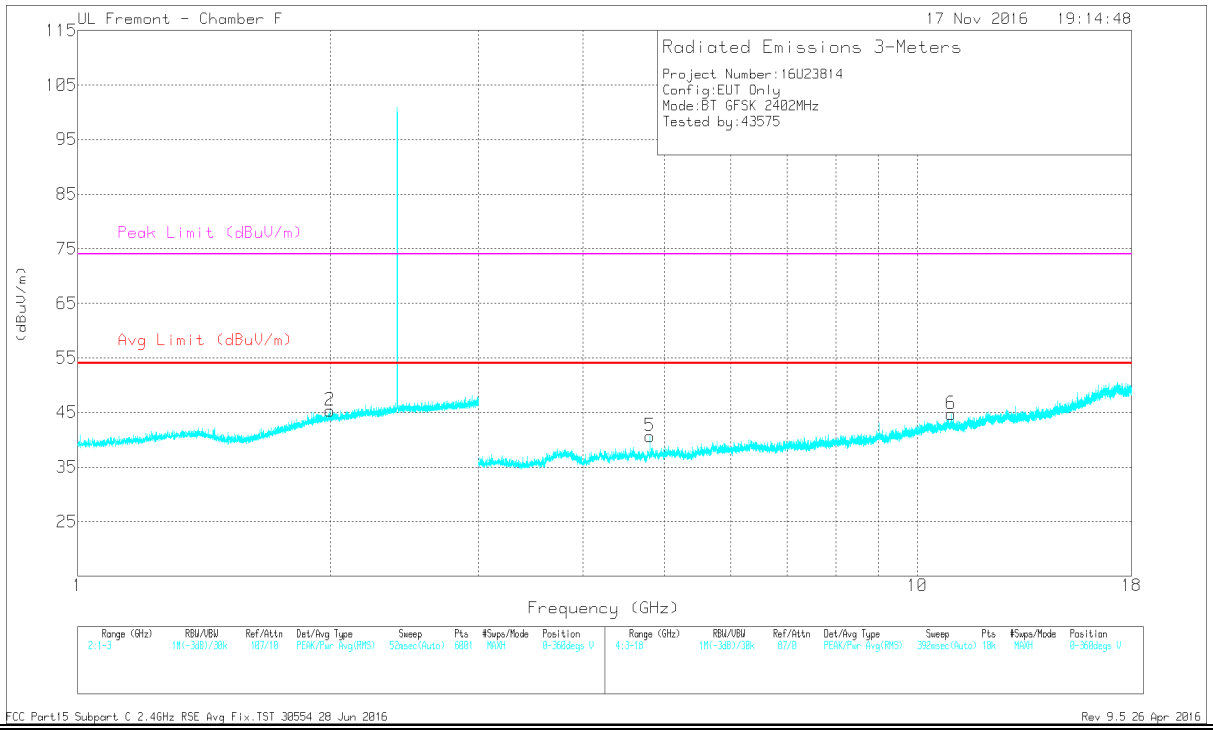
9.4.3. HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	1.778	40.06	PKFH	29.8	-21.6	48.26	-	-	-	-	151	372	H
	1.775	29.08	VA1T	29.8	-21.6	37.28	-	-	-	-	151	372	H
2	1.999	41.08	PKFH	31.5	-21.4	51.18	-	-	-	-	34	344	V
	1.998	29.12	VA1T	31.5	-21.4	39.22	-	-	-	-	34	344	V
3	6.074	36.44	PKFH	35.5	-26.9	45.04	-	-	-	-	107	367	H
	6.073	24.93	VA1T	35.5	-26.9	33.53	-	-	-	-	107	367	H
4	13.892	35.27	PKFH	38.8	-22.4	51.67	-	-	-	-	335	115	H
	13.888	23.8	VA1T	38.8	-22.4	40.2	-	-	-	-	335	115	H
5	* 4.804	40.3	PKFH	34	-27.6	46.7	-	-	74	-27.3	65	154	V
	* 4.804	33.42	VA1T	34	-27.6	39.82	54	-14.18	-	-	65	154	V
6	* 10.979	33.19	PKFH	37.9	-21.4	49.69	-	-	74	-24.31	122	311	V
	* 10.981	21.74	VA1T	37.9	-21.4	38.24	54	-15.76	-	-	122	311	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
FCC Part15 Subpart C 2.4GHz RSE Avg Fix.TST 30554 28 Jun 2016
Rev 9.5 26 Apr 2016

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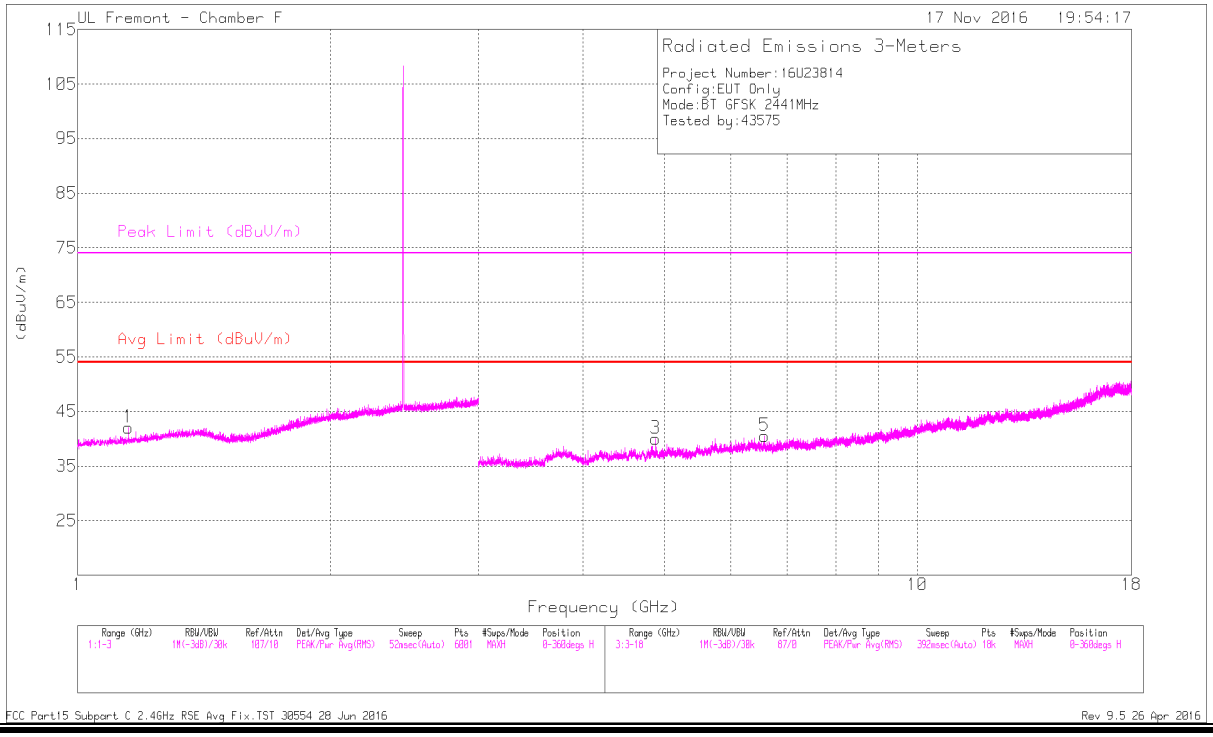
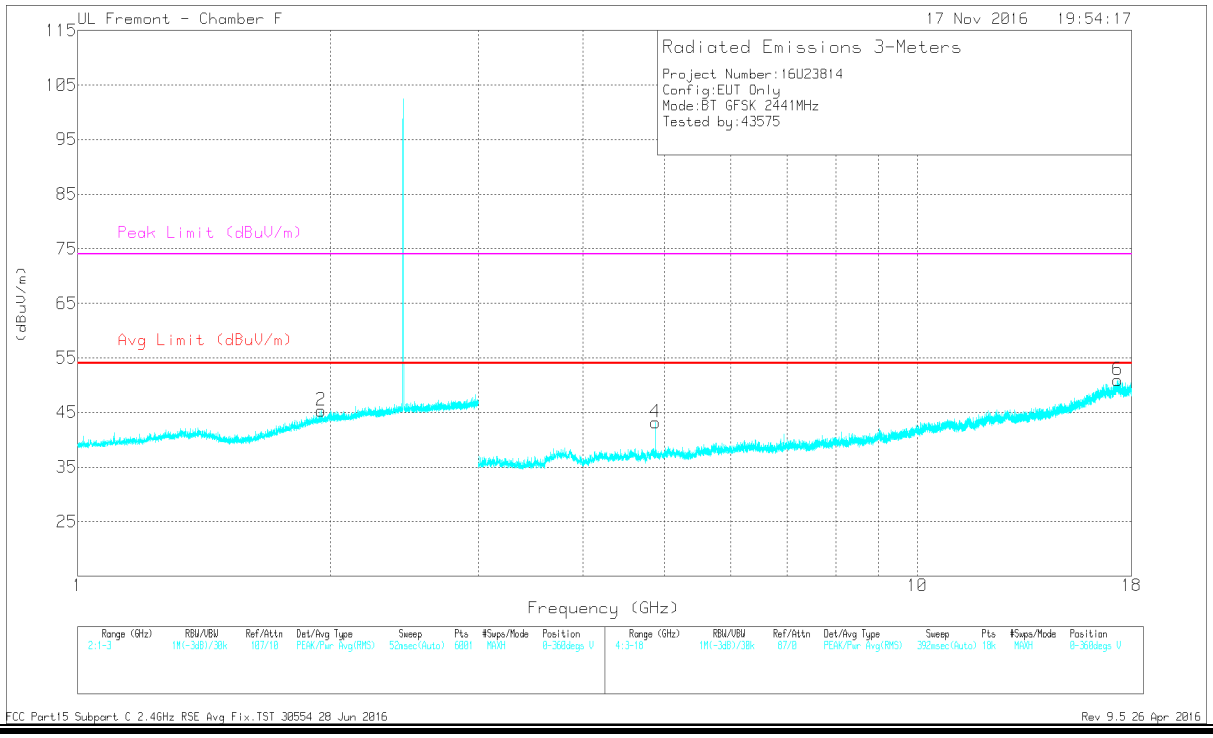
MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	* 1.148	40.83	PKFH	28.1	-22.6	46.33	-	-	74	-27.67	120	329	H
	* 1.151	29.53	VA1T	28.1	-22.6	35.03	54	-18.97	-	-	120	329	H
2	1.952	41.02	PKFH	31.2	-21.4	50.82	-	-	-	-	252	234	V
	1.951	29.02	VA1T	31.2	-21.4	38.82	-	-	-	-	252	234	V
3	* 4.882	38.99	PKFH	34.1	-27.8	45.29	-	-	74	-28.71	210	111	H
	* 4.882	30.89	VA1T	34.1	-27.8	37.19	54	-16.81	-	-	210	111	H
4	6.576	36.56	PKFH	35.4	-26.8	45.16	-	-	-	-	5	358	H
	6.577	25.18	VA1T	35.4	-26.8	33.78	-	-	-	-	5	358	H
5	* 4.882	41.77	PKFH	34.1	-27.8	48.07	-	-	74	-25.93	119	134	V
	* 4.882	35.21	VA1T	34.1	-27.8	41.51	54	-12.49	-	-	119	134	V
6	17.32	33.87	PKFH	41.2	-18.7	56.37	-	-	-	-	3	217	V
	17.321	22.61	VA1T	41.2	-18.7	45.11	-	-	-	-	3	217	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
FCC Part15 Subpart C 2.4GHz RSE Avg Fix.TST 30554 28 Jun 2016
Rev 9.5 26 Apr 2016

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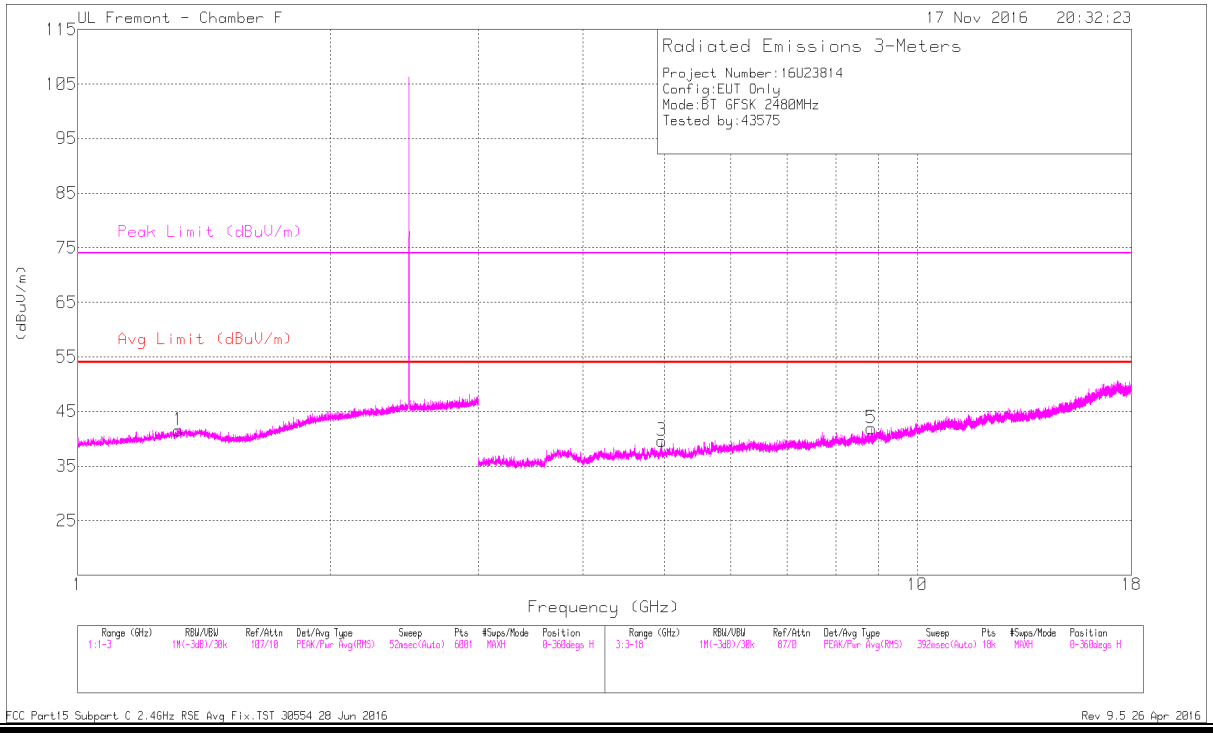
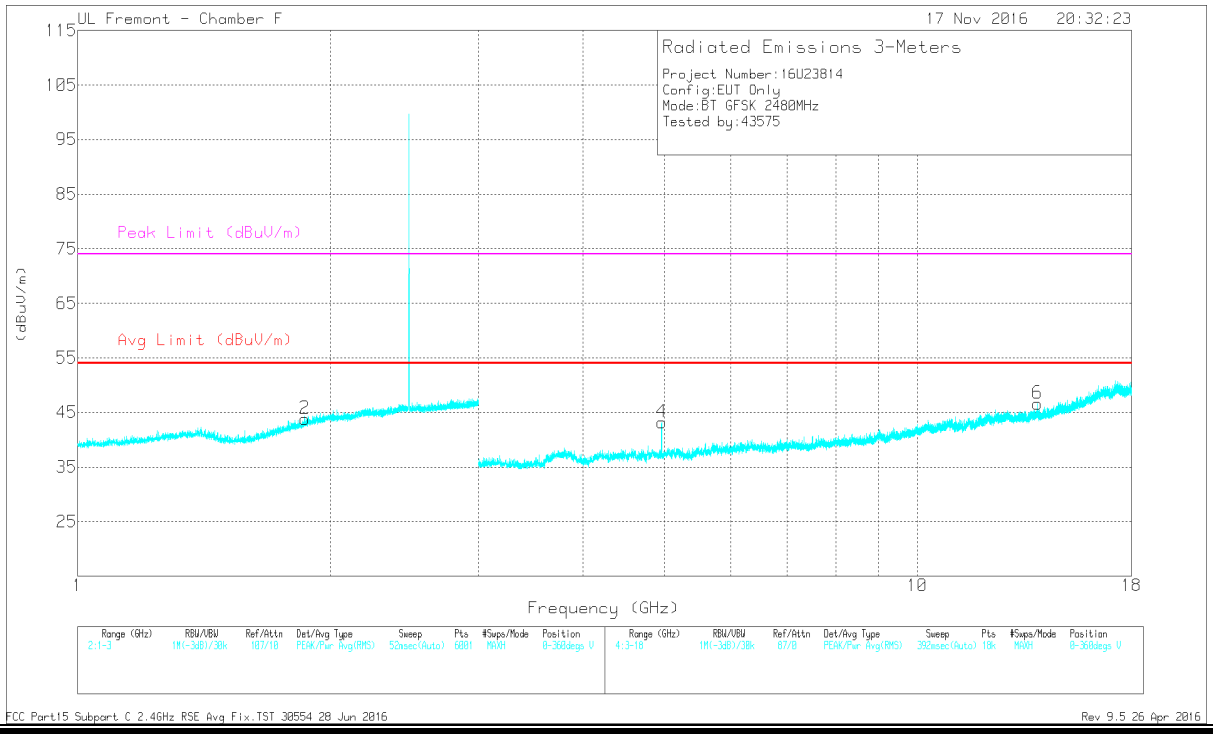
HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	* 1.318	40.97	PKFH	29	-22.1	47.87	-	-	74	-26.13	31	137	H
	* 1.32	29.23	VA1T	29	-22.1	36.13	54	-17.87	-	-	31	137	H
2	1.868	40.4	PKFH	30.6	-21.5	49.5	-	-	-	-	357	232	V
	1.865	29.07	VA1T	30.6	-21.5	38.17	-	-	-	-	357	232	V
3	* 4.96	39.02	PKFH	34.2	-28.5	44.72	-	-	74	-29.28	80	124	H
	* 4.96	29.77	VA1T	34.2	-28.5	35.47	54	-18.53	-	-	80	124	H
4	8.816	34.28	PKFH	35.9	-23.7	46.48	-	-	-	-	218	191	H
	8.817	22.81	VA1T	35.9	-23.7	35.01	-	-	-	-	218	191	H
5	* 4.96	42.7	PKFH	34.2	-28.5	48.4	-	-	74	-25.6	295	111	V
	* 4.96	36.78	VA1T	34.2	-28.5	42.48	54	-11.52	-	-	295	111	V
6	13.902	34.9	PKFH	38.8	-22.4	51.3	-	-	-	-	12	112	V
	13.9	23.71	VA1T	38.8	-22.4	40.11	-	-	-	-	12	112	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
FCC Part15 Subpart C 2.4GHz RSE Avg Fix.TST 30554 28 Jun 2016
Rev 9.5 26 Apr 2016

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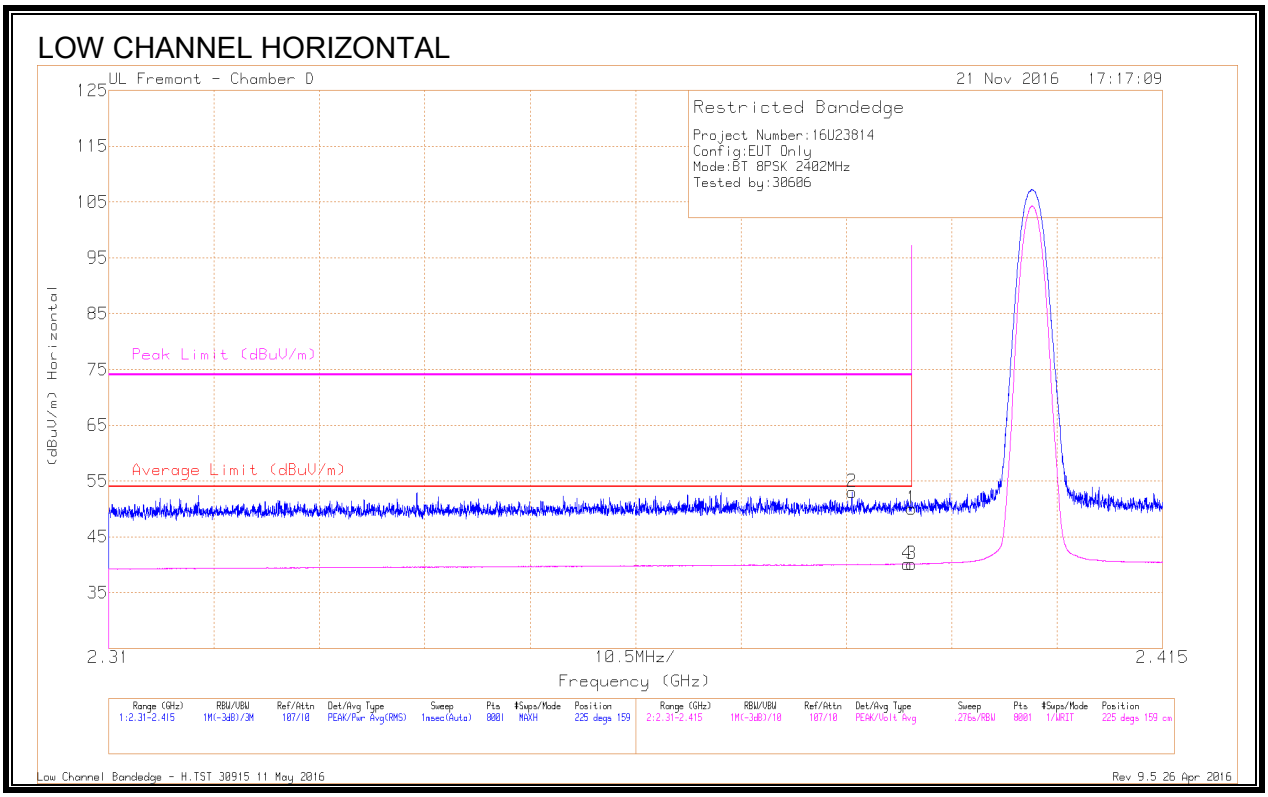
9.5. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

9.5.1. RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	* 2.384	41.56	Pk	32.1	-20.6	53.06	-	-	74	-20.94	225	159	H
1	* 2.39	38.55	Pk	32.1	-20.6	50.05	-	-	74	-23.95	225	159	H
3	* 2.39	28.63	VA1T	32.1	-20.6	40.13	54	-13.87	-	-	225	159	H
4	* 2.39	28.64	VA1T	32.1	-20.6	40.14	54	-13.86	-	-	225	159	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
Low Channel Bandedge - H.TST 30915 11 May 2016
Rev 9.5 26 Apr 2016

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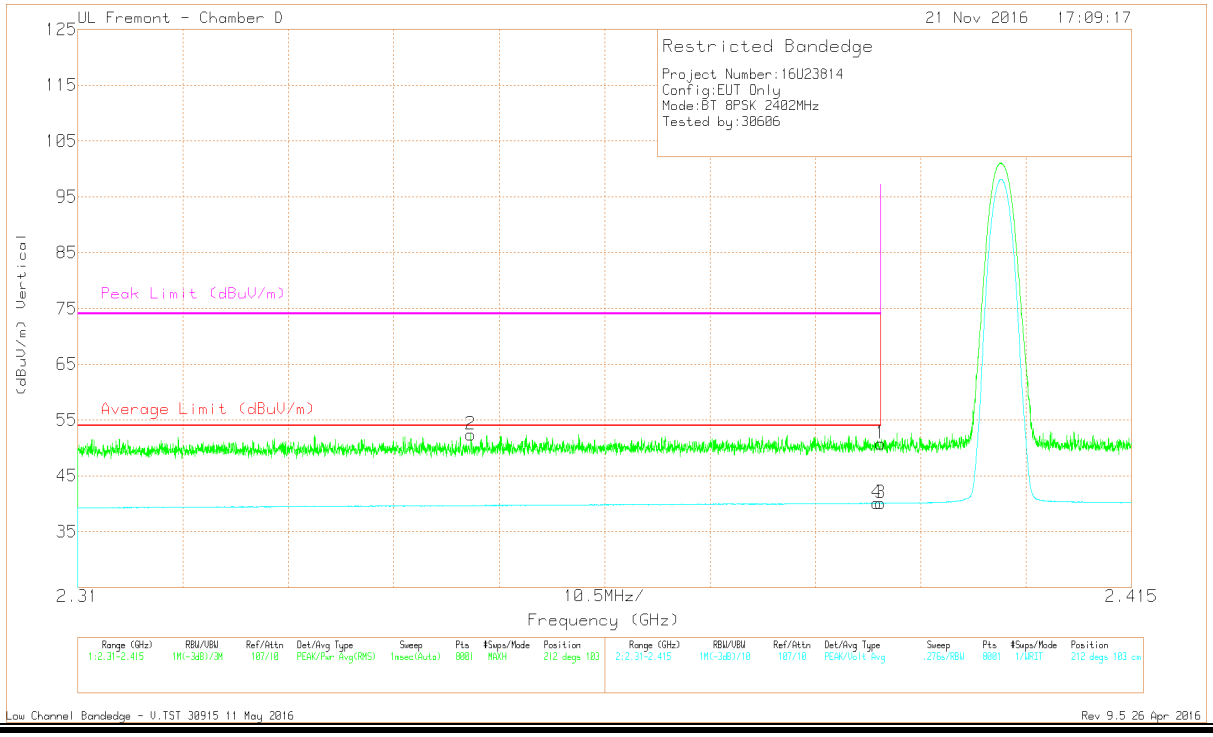
LOW CHANNEL VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	* 2.349	41.27	Pk	31.8	-20.7	52.37	-	-	74	-21.63	212	103	V
1	* 2.39	39.32	Pk	32.1	-20.6	50.82	-	-	74	-23.18	212	103	V
3	* 2.39	28.58	VA1T	32.1	-20.6	40.08	54	-13.92	-	-	212	103	V
4	* 2.39	28.6	VA1T	32.1	-20.6	40.1	54	-13.9	-	-	212	103	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
Low Channel Bandedge - V.TST 30915 11 May 2016
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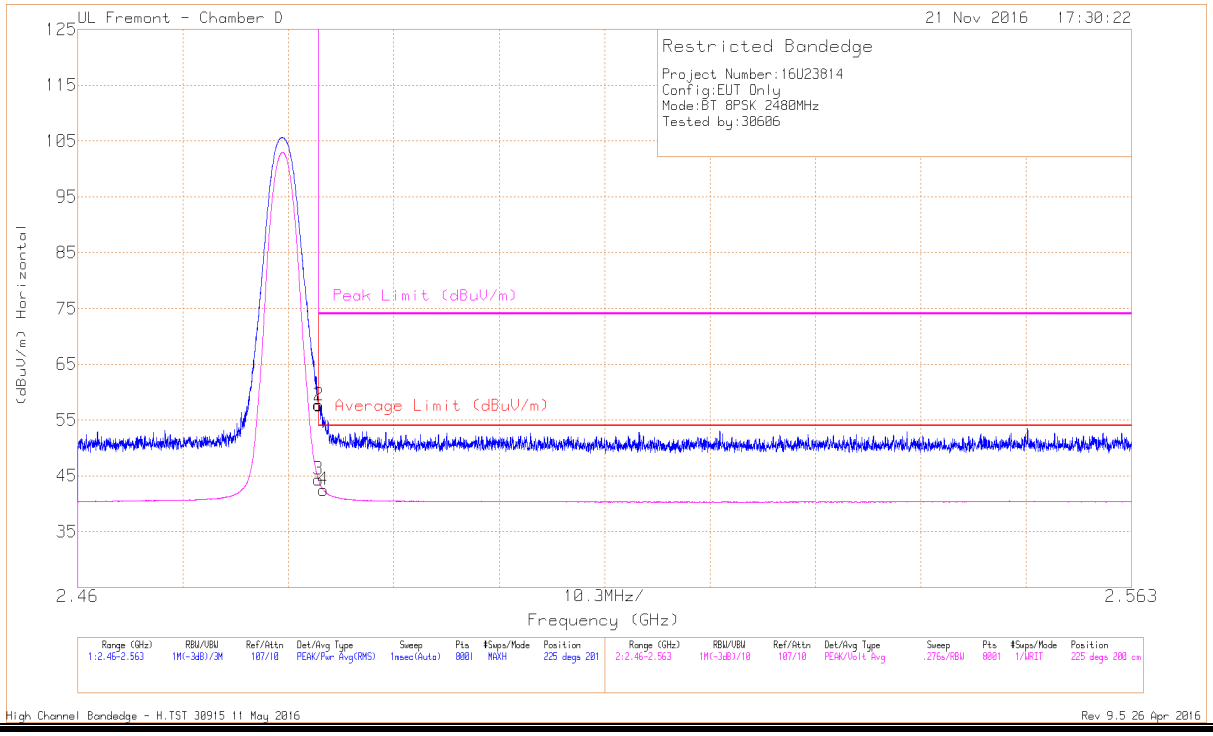
9.5.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	45.96	Pk	32.3	-20.5	57.76	-	-	74	-16.24	225	201	H
2	* 2.484	45.84	Pk	32.3	-20.5	57.64	-	-	74	-16.36	225	201	H
3	* 2.484	32.49	VA1T	32.3	-20.5	44.29	54	-9.71	-	-	225	200	H
4	* 2.484	30.63	VA1T	32.3	-20.5	42.43	54	-11.57	-	-	225	200	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
High Channel Bandedge - H.TST 30915 11 May 2016
Rev 9.5 26 Apr 2016

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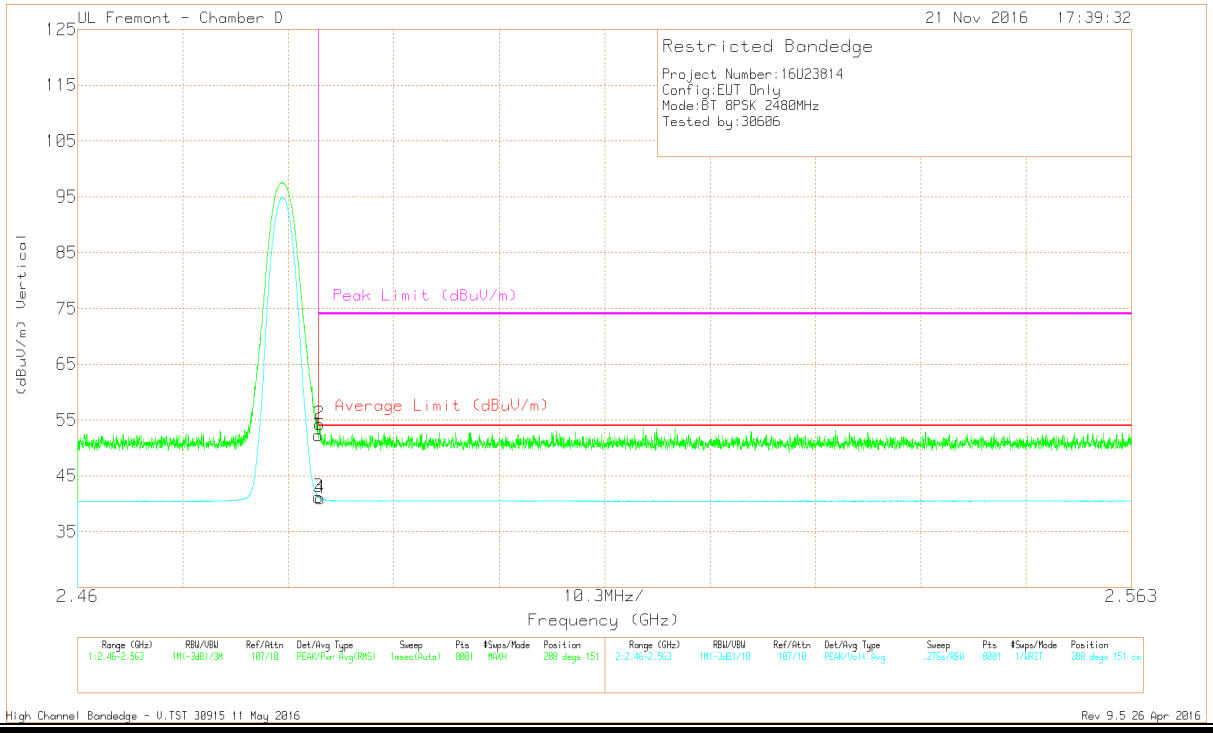
HIGH CHANNEL VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	40.53	Pk	32.3	-20.5	52.33	-	-	74	-21.67	288	151	V
2	* 2.484	42.44	Pk	32.3	-20.5	54.24	-	-	74	-19.76	288	151	V
3	* 2.484	29.45	VA1T	32.3	-20.5	41.25	54	-12.75	-	-	288	151	V
4	* 2.484	29.17	VA1T	32.3	-20.5	40.97	54	-13.03	-	-	288	151	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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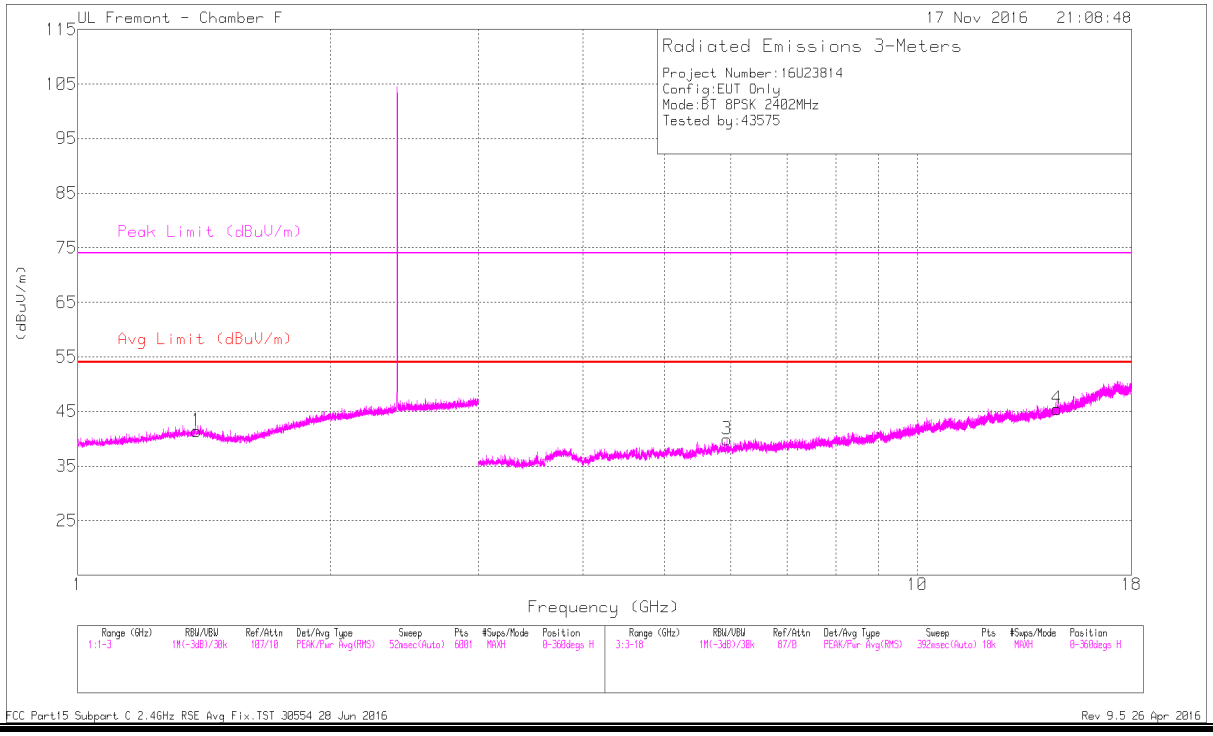
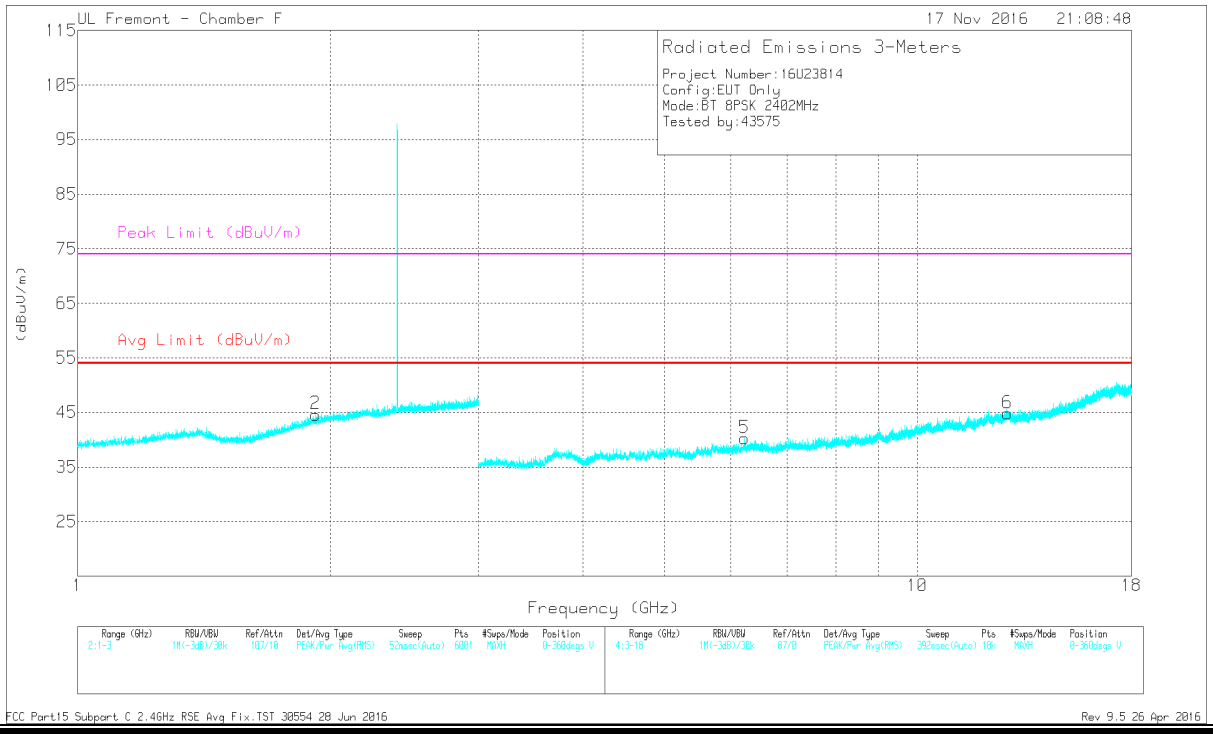
9.5.3. HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	* 1.386	40.99	PKFH	29.2	-22.1	48.09	-	-	74	-25.91	113	400	H
	* 1.387	29.21	VA1T	29.3	-22.1	36.41	54	-17.59	-	-	113	400	H
2	1.921	39.71	PKFH	31.1	-21.4	49.41	-	-	-	-	161	369	V
	1.922	29.05	VA1T	31.1	-21.4	38.75	-	-	-	-	161	369	V
3	5.934	38.04	PKFH	35.4	-27.9	45.54	-	-	-	-	173	106	H
	5.933	26.15	VA1T	35.4	-27.9	33.65	-	-	-	-	173	106	H
4	14.667	36.39	PKFH	39.7	-23.2	52.89	-	-	-	-	349	118	H
	14.667	24.17	VA1T	39.7	-23.2	40.67	-	-	-	-	349	118	H
5	6.229	38.15	PKFH	35.4	-27.2	46.35	-	-	-	-	352	122	V
	6.228	25.45	VA1T	35.4	-27.2	33.65	-	-	-	-	352	122	V
6	12.805	34.34	PKFH	39.3	-22.4	51.24	-	-	-	-	350	384	V
	12.806	23.02	VA1T	39.3	-22.4	39.92	-	-	-	-	350	384	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
FCC Part15 Subpart C 2.4GHz RSE Avg Fix.TST 30554 28 Jun 2016
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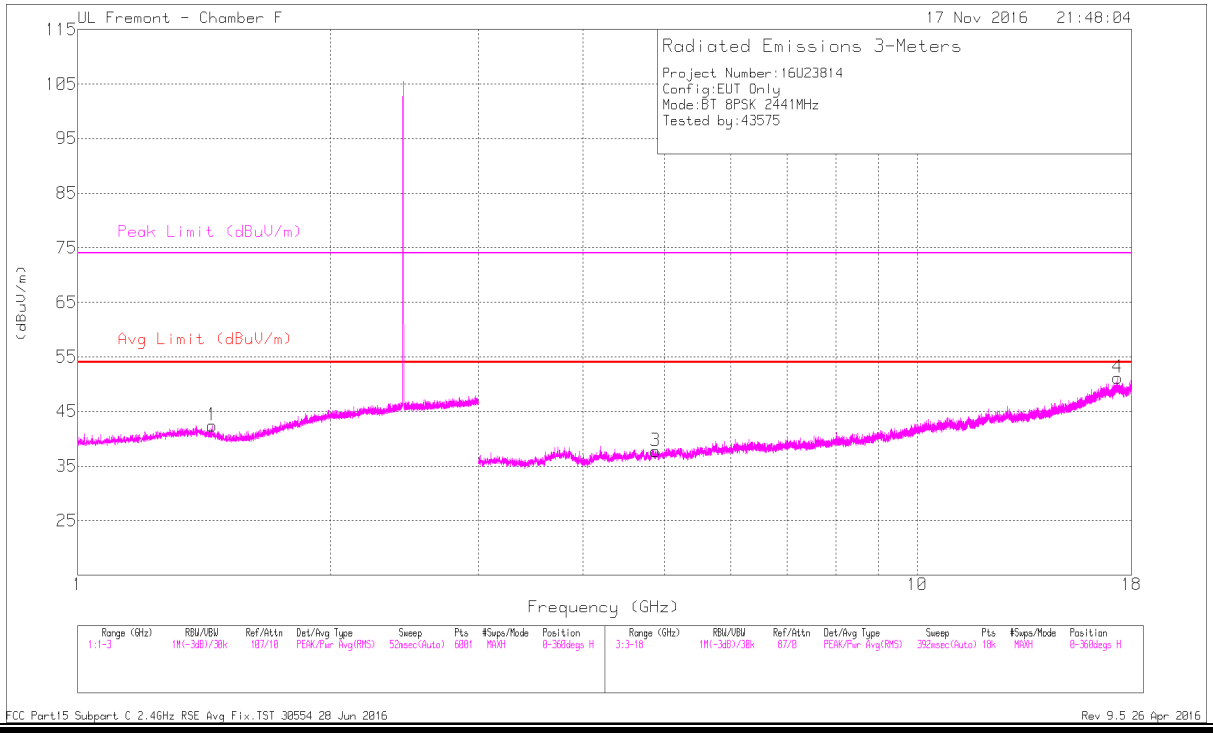
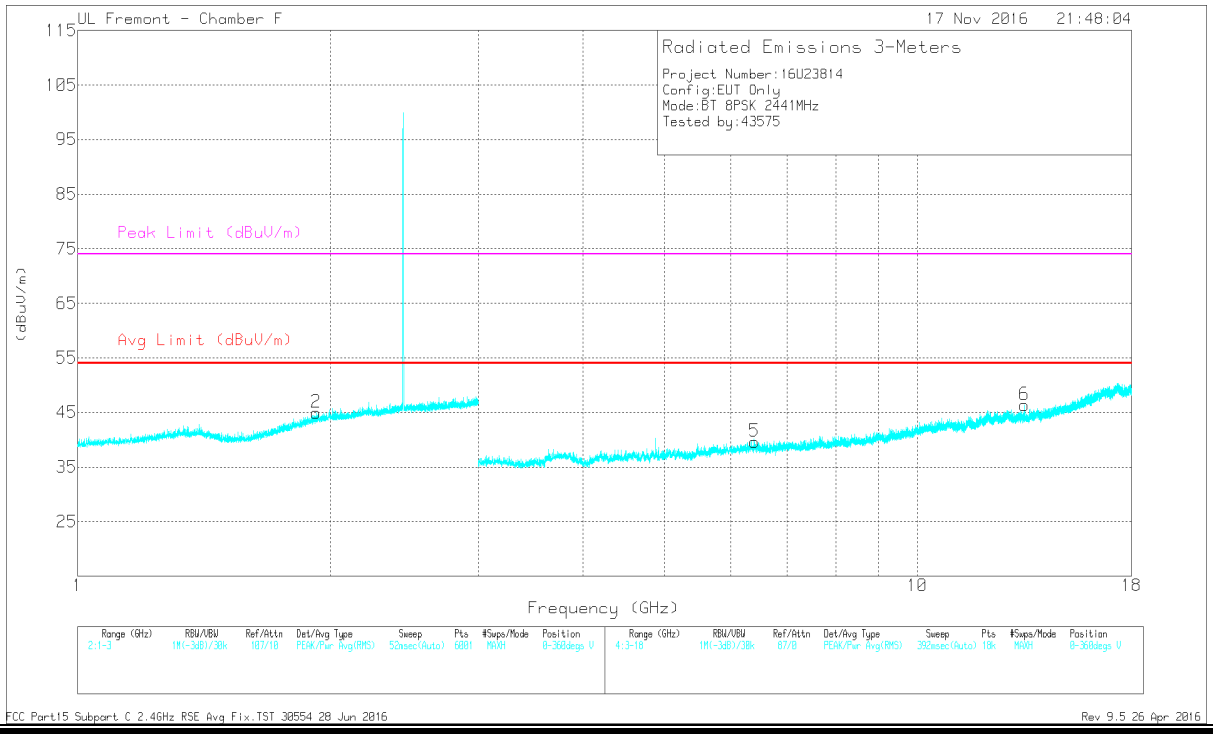
MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	* 1.446	41.39	PKFH	28.7	-22	48.09	-	-	74	-25.91	312	237	H
	* 1.446	29.19	VA1T	28.7	-22	35.89	54	-18.11	-	-	312	237	H
2	1.924	40.65	PKFH	31.1	-21.4	50.35	-	-	-	-	247	261	V
	1.925	29.06	VA1T	31.1	-21.4	38.76	-	-	-	-	247	261	V
3	* 4.882	37.93	PKFH	34.1	-27.8	44.23	-	-	74	-29.77	36	114	H
	* 4.882	27.69	VA1T	34.1	-27.8	33.99	54	-20.01	-	-	36	114	H
4	17.323	33.83	PKFH	41.2	-18.8	56.23	-	-	-	-	26	258	H
	17.324	22.58	VA1T	41.2	-18.8	44.98	-	-	-	-	26	258	H
5	6.405	36.33	PKFH	35.4	-27	44.73	-	-	-	-	343	264	V
	6.401	25.42	VA1T	35.4	-27.1	33.72	-	-	-	-	343	264	V
6	13.429	35.81	PKFH	39	-23.1	51.71	-	-	-	-	8	146	V
	13.428	23.51	VA1T	39	-23.1	39.41	-	-	-	-	8	146	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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Rev 9.5 26 Apr 2016

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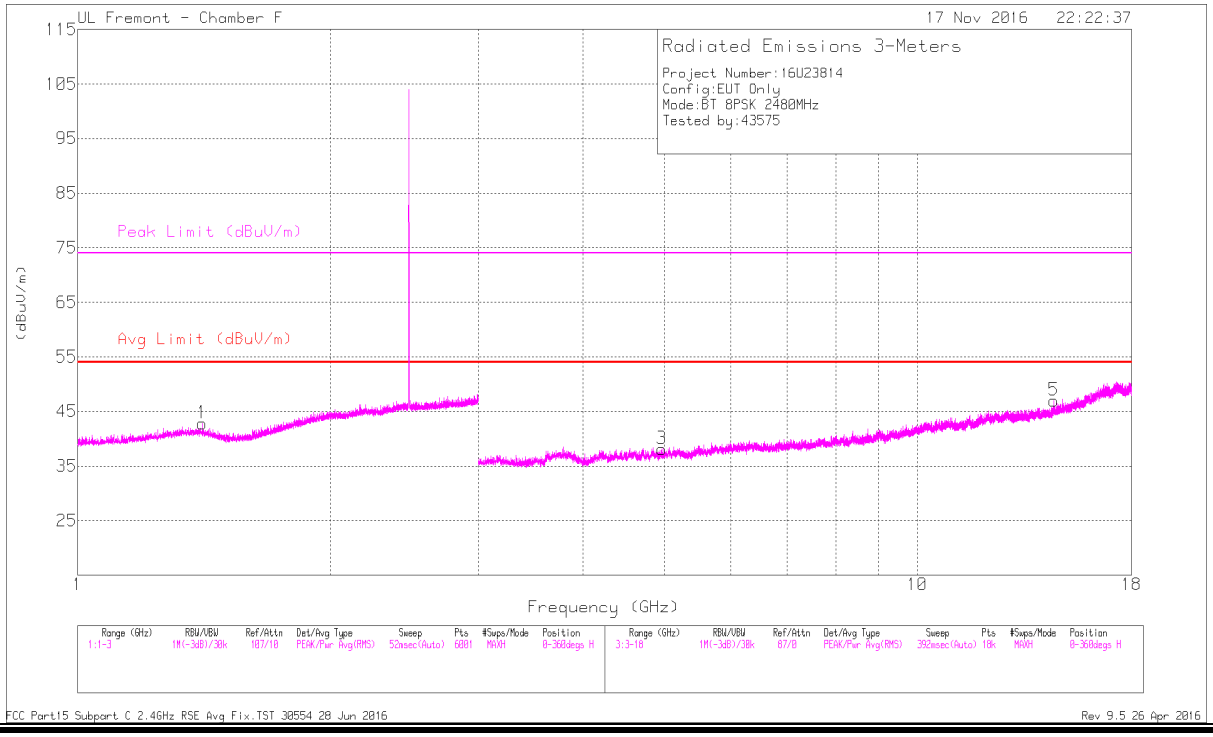
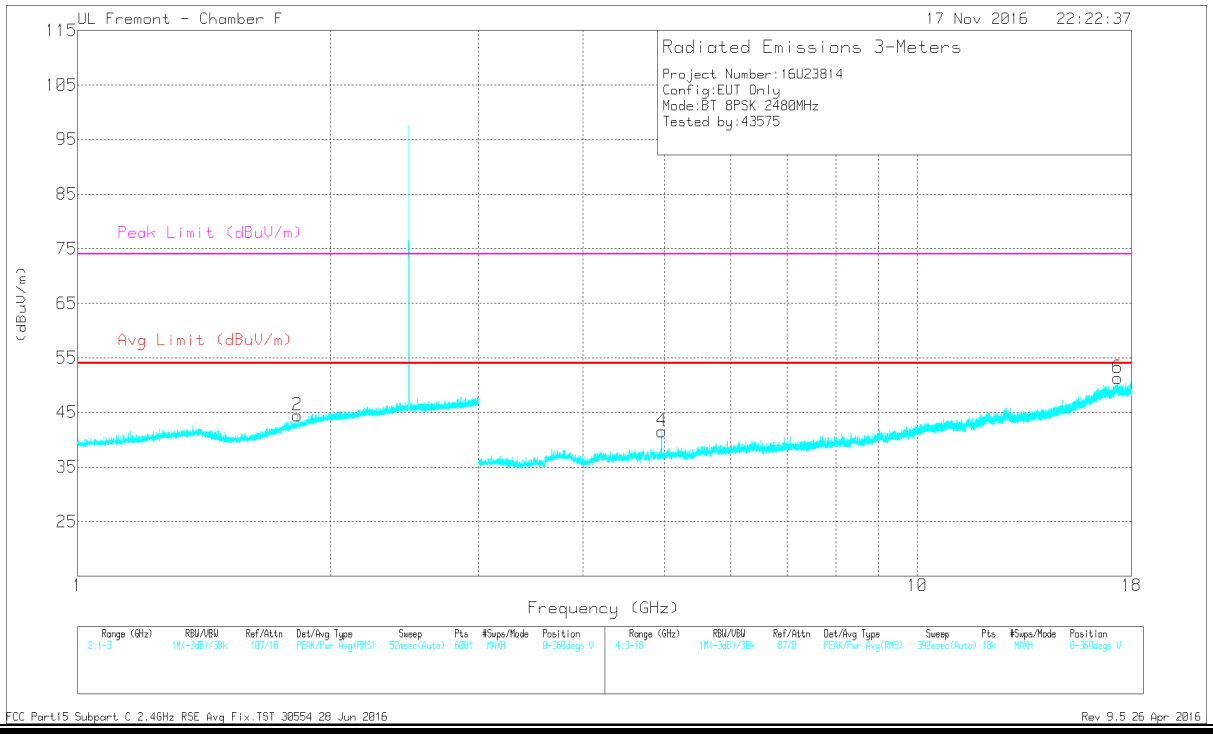
HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	* 1.408	39.94	PKFH	29.2	-22	47.14	-	-	74	-26.86	356	145	H
	* 1.407	29.13	VA1T	29.2	-22	36.33	54	-17.67	-	-	356	145	H
2	1.826	40.84	PKFH	30.3	-21.5	49.64	-	-	-	-	278	211	V
	1.825	29.05	VA1T	30.3	-21.5	37.85	-	-	-	-	278	211	V
3	* 4.959	38.96	PKFH	34.2	-28.5	44.66	-	-	74	-29.34	23	101	H
	* 4.96	28.8	VA1T	34.2	-28.5	34.5	54	-19.5	-	-	23	101	H
4	14.536	36.03	PKFH	39.6	-23.3	52.33	-	-	-	-	345	388	H
	14.538	24.23	VA1T	39.6	-23.3	40.53	-	-	-	-	345	388	H
5	* 4.959	40.65	PKFH	34.2	-28.5	46.35	-	-	74	-27.65	265	100	V
	* 4.96	32.14	VA1T	34.2	-28.5	37.84	54	-16.16	-	-	265	100	V
6	17.32	34.78	PKFH	41.2	-18.7	57.28	-	-	-	-	15	260	V
	17.321	22.57	VA1T	41.2	-18.7	45.07	-	-	-	-	15	260	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration
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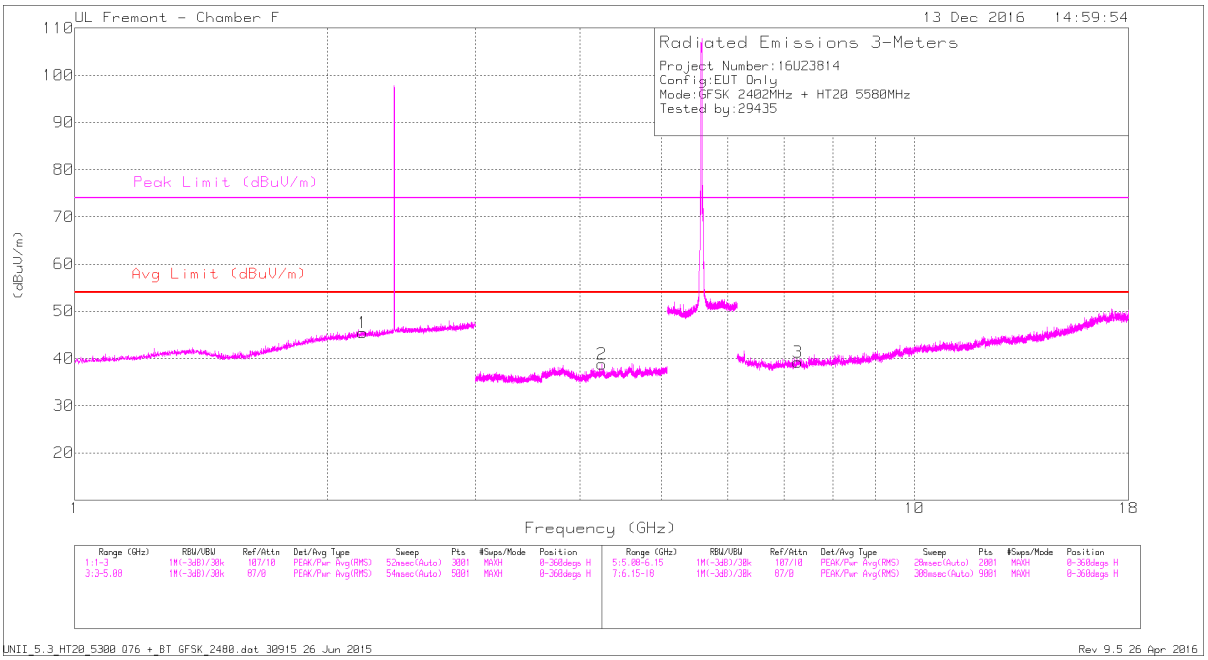
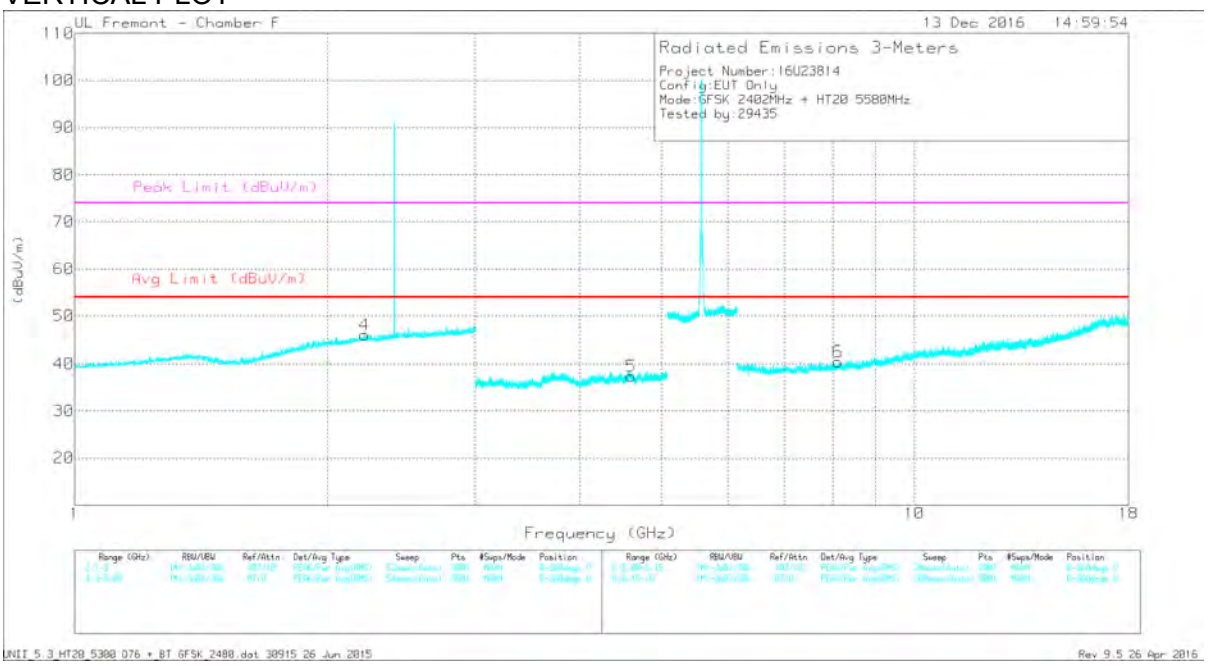
9.6. WORST CASE CO-LOCATION

BLUETOOTH AND 802.11 HT20 2Tx CDD MODE IN THE 5.6GHz BAND

HORIZONTAL PLOT



VERTICAL PLOT



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.2	41.54	PK-U	31.9	-21	52.44	53.97	-1.53	74	-21.56	130	360	H
	2.199	30.4	ADR	31.9	-21	41.3	53.97	-12.67	-	-	130	360	H
4	* 2.216	41.48	PK-U	31.9	-21	52.38	53.97	-1.59	74	-21.62	170	267	V
	* 2.216	30.19	ADR	31.9	-21	41.09	53.97	-12.88	-	-	170	267	V
2	* 4.249	38.46	PK-U	33.7	-28.1	44.06	53.97	-9.91	74	-29.94	90	144	H
	* 4.248	27.4	ADR	33.7	-28.1	33	53.97	-20.97	-	-	90	144	H
5	* 4.603	37.81	PK-U	34.1	-27.8	44.11	53.97	-9.86	74	-29.89	24	236	V
	* 4.603	27.14	ADR	34.1	-27.8	33.44	53.97	-20.53	-	-	24	236	V
3	* 7.261	36.13	PK-U	35.5	-25.3	46.33	53.97	-7.64	74	-27.67	9	201	H
	* 7.262	25.51	ADR	35.5	-25.3	35.71	53.97	-18.26	-	-	9	201	H
6	* 8.114	36.74	PK-U	35.7	-24.7	47.74	53.97	-6.23	74	-26.26	189	392	V
	* 8.115	25.07	ADR	35.7	-24.7	36.07	53.97	-17.9	-	-	189	392	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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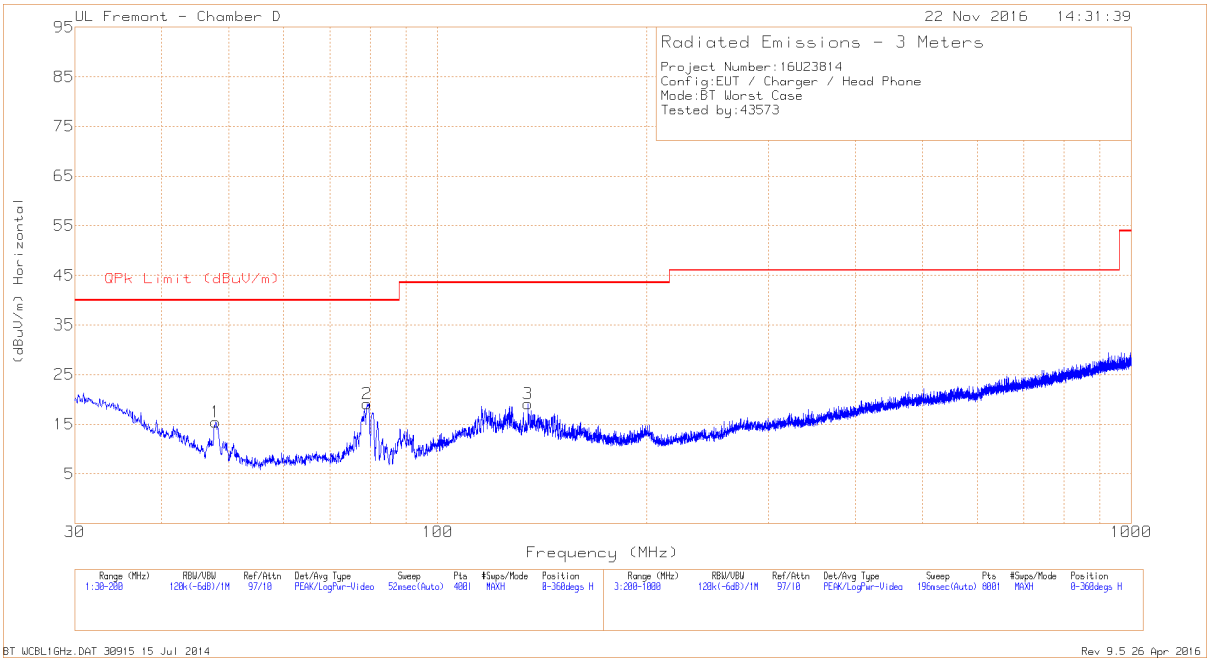
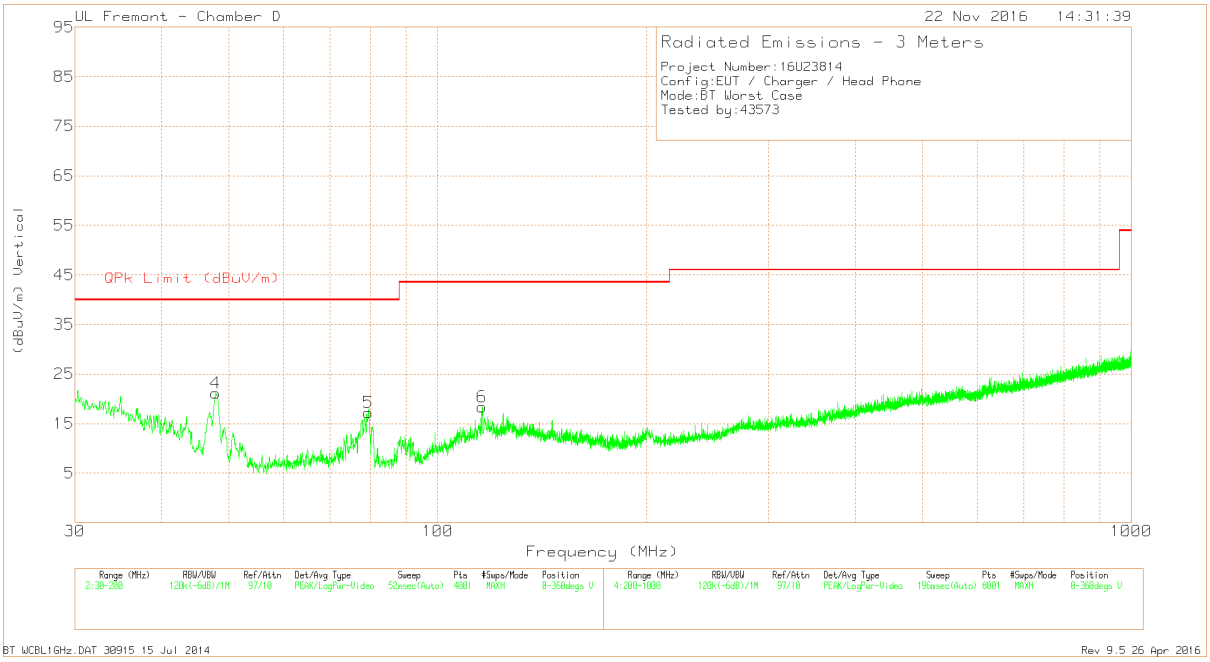
9.7. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



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DATA

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
3	* 135.018	32.7	Pk	17.5	-31.1	19.1	43.52	-24.42	0-360	199	H
6	* 115.978	31.91	Pk	17.6	-31.2	18.31	43.52	-25.21	0-360	100	V
1	47.8925	34.27	Pk	12.9	-31.7	15.47	40	-24.53	0-360	299	H
4	47.8925	39.95	Pk	12.9	-31.7	21.15	40	-18.85	0-360	100	V
2	79.1725	38.92	Pk	11.7	-31.5	19.12	40	-20.88	0-360	399	H
5	79.47	36.99	Pk	11.7	-31.5	17.19	40	-22.81	0-360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

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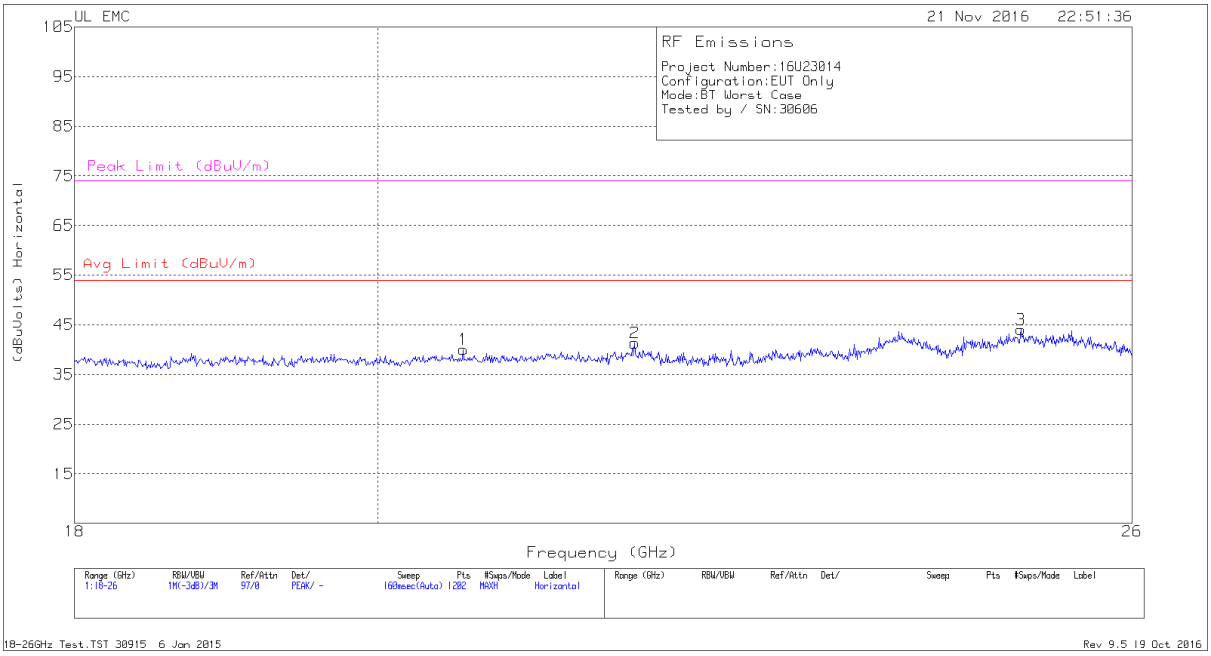
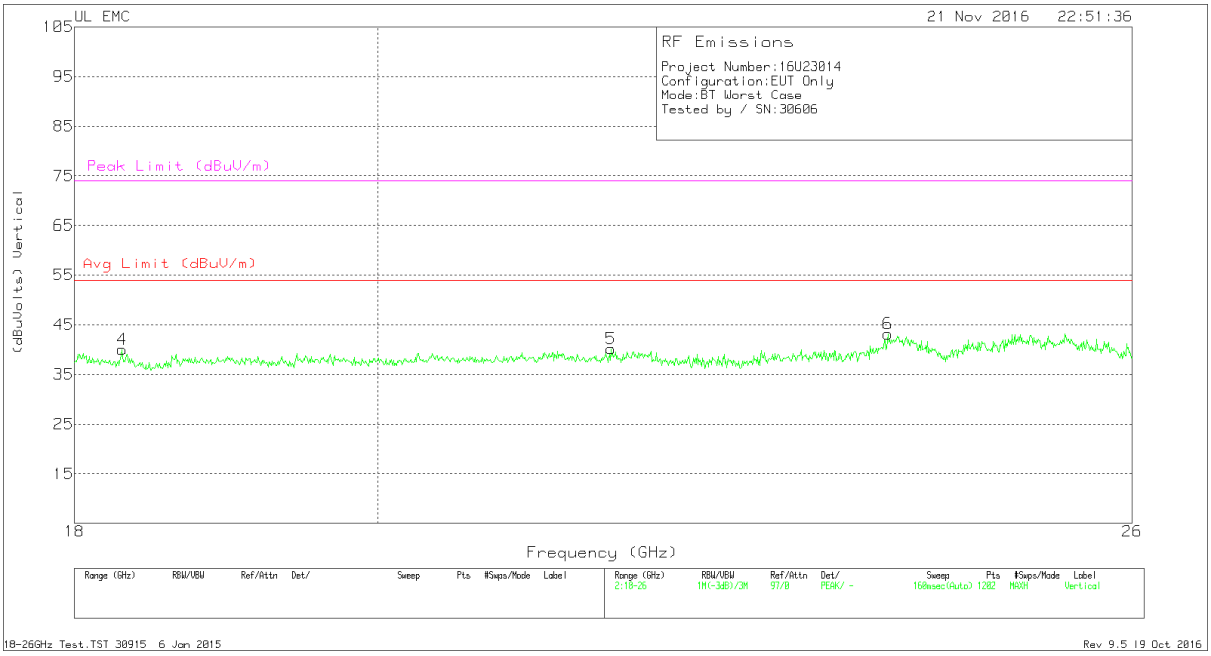
9.8. WORST-CASE ABOVE 18 GHz

SPURIOUS EMISSIONS 18 TO 26 GHz (WORST-CASE CONFIGURATION)

HORIZONTAL PLOT



VERTICAL PLOT



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Data

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T449 (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	20.604	42.1	Pk	32.9	-25.5	-9.5	40	54	-14	74	-34
2	21.87	42.23	Pk	33.3	-24.7	-9.5	41.33	54	-12.67	74	-32.67
3	25.014	43.8	Pk	34.2	-24.5	-9.5	44	54	-10	74	-30
4	18.3	42.3	Pk	32.4	-25.2	-9.5	40	54	-14	74	-34
5	21.69	41.07	Pk	33.2	-24.6	-9.5	40.17	54	-13.83	74	-33.83
6	23.882	42.87	Pk	33.9	-24.1	-9.5	43.17	54	-10.83	74	-30.83

Pk - Peak detector

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10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	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

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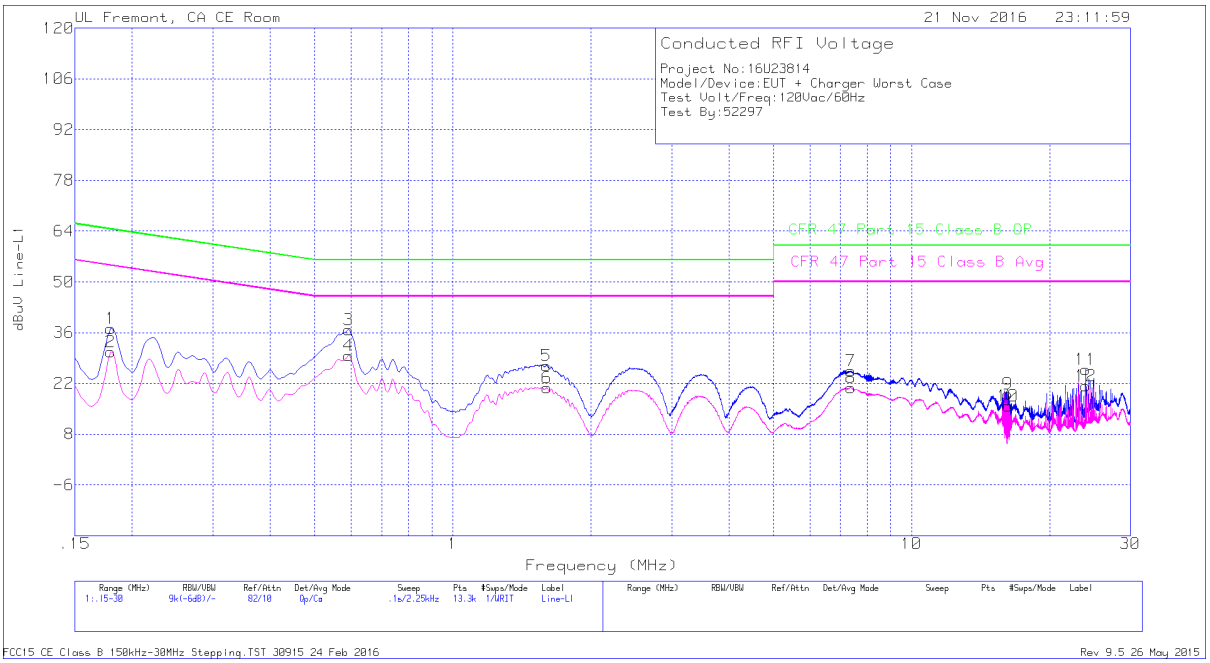
10.1. EUT POWERED BY AC/DC ADAPTER VIA USB CABLE

LINE 1 RESULTS



WORST EMISSIONS

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables 1&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	17925	26.97	Qp	0	0	10.1	37.07	64.52	-27.45	-	-
2	17925	20.66	Ca	0	0	10.1	30.76	-	-	54.52	-23.76
3	59325	26.67	Qp	0	0	10.1	36.77	56	-19.23	-	-
4	59325	19.63	Ca	0	0	10.1	29.73	-	-	46	-16.27
5	1.599	16.64	Qp	0	.1	10.1	26.84	56	-29.16	-	-
6	1.60238	10.65	Ca	0	.1	10.1	20.85	-	-	46	-25.15
7	7.38375	15.14	Qp	0	.1	10.2	25.44	60	-34.56	-	-
8	7.38488	10.57	Ca	0	.1	10.2	20.87	-	-	50	-29.13
9	16.215	8.58	Qp	0	.2	10.3	19.08	60	-40.92	-	-
10	16.215	5.18	Ca	0	.2	10.3	15.68	-	-	50	-34.32
11	24	14.98	Qp	.1	.2	10.5	25.78	60	-34.22	-	-
12	24	10.45	Ca	.1	.2	10.5	21.25	-	-	50	-28.75

Qp - Quasi-Peak detector
Ca - CISPR average detection

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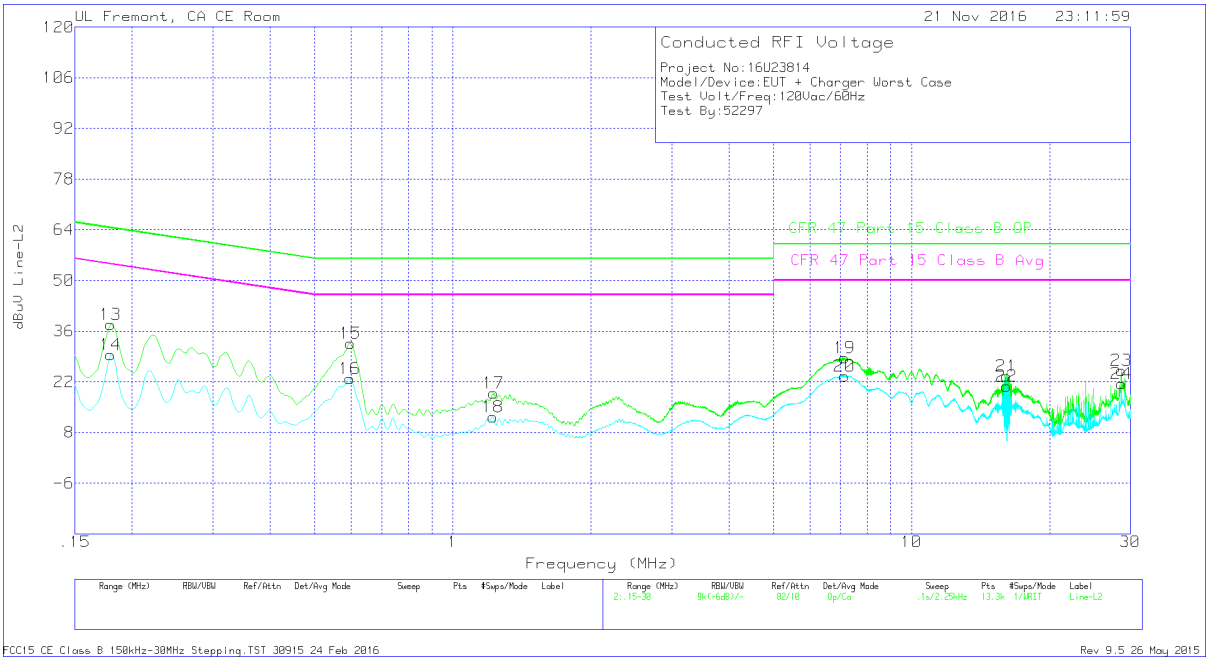
LINE 2 RESULTS



WORST EMISSIONS

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables 2&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.17925	27.8	Qp	0	0	10.1	37.9	64.52	-26.62	-	-
14	.17925	19.41	Ca	0	0	10.1	29.51	-	-	54.52	-25.01
15	.59775	22.55	Qp	0	0	10.1	32.65	56	-23.35	-	-
16	.5955	12.74	Ca	0	0	10.1	22.84	-	-	46	-23.16
17	1.22775	8.63	Qp	0	.1	10.1	18.83	56	-37.17	-	-
18	1.22325	2.03	Ca	0	.1	10.1	12.23	-	-	46	-33.77
19	7.1565	18.36	Qp	0	.1	10.2	28.66	60	-31.34	-	-
20	7.152	13.33	Ca	0	.1	10.2	23.63	-	-	50	-26.37
21	16.1048	13.1	Qp	0	.2	10.3	23.6	60	-36.4	-	-
22	16.1048	10.31	Ca	0	.2	10.3	20.81	-	-	50	-29.19
23	28.689	14.32	Qp	.1	.3	10.4	25.12	60	-34.88	-	-
24	28.689	10.74	Ca	.1	.3	10.4	21.54	-	-	50	-28.46

Qp - Quasi-Peak detector
Ca - CISPR average detection

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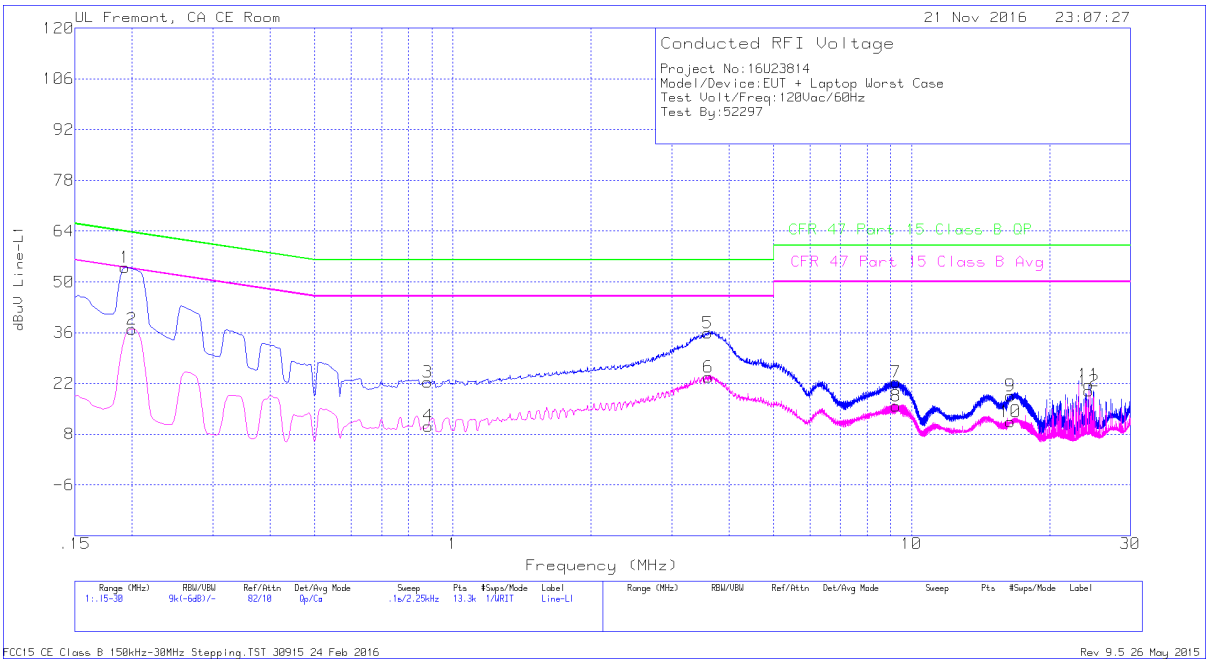
10.2. EUT POWERED BY HOST PC VIA USB CABLE

LINE 1 RESULTS



WORST EMISSIONS

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables 1&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.19275	43.92	Qp	0	0	10.1	54.02	63.92	-9.9	-	-
2	.1995	26.85	Ca	0	0	10.1	36.95	-	-	53.63	-16.68
3	.88125	12.24	Qp	0	0	10.1	22.34	56	-33.66	-	-
4	.8835	.18	Ca	0	0	10.1	10.28	-	-	46	-35.72
5	3.5925	25.68	Qp	0	.1	10.1	35.88	56	-20.12	-	-
6	3.6015	13.49	Ca	0	.1	10.1	23.69	-	-	46	-22.31
7	9.258	12.13	Qp	0	.1	10.2	22.43	60	-37.57	-	-
8	9.26475	5.4	Ca	0	.1	10.2	15.7	-	-	50	-34.3
9	16.4288	8.12	Qp	0	.2	10.3	18.62	60	-41.38	-	-
10	16.4276	.99	Ca	0	.2	10.3	11.49	-	-	50	-38.51
11	24.3533	10.83	Qp	.1	.2	10.5	21.63	60	-38.37	-	-
12	24.3533	9.13	Ca	.1	.2	10.5	19.93	-	-	50	-30.07

Qp - Quasi-Peak detector
Ca - CISPR average detection

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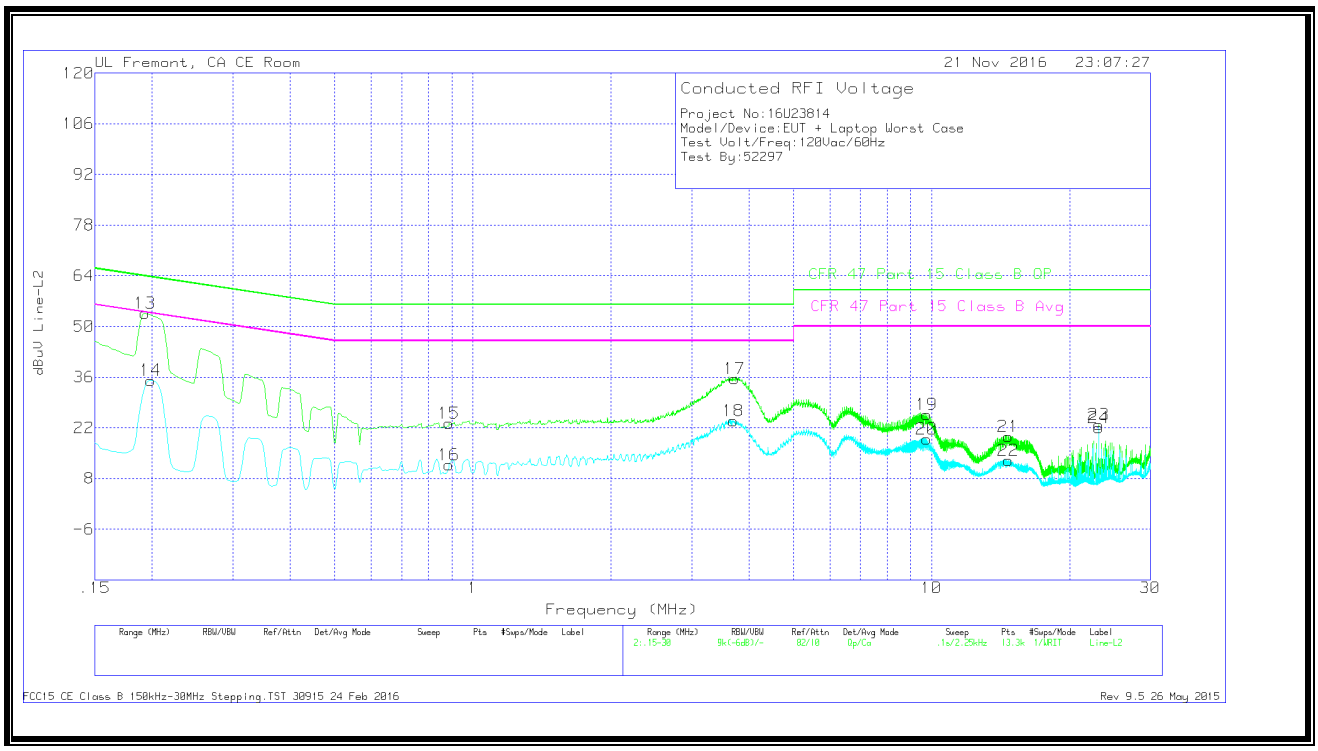
LINE 2 RESULTS



WORST EMISSIONS

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables 2&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.19275	43.56	Qp	0	0	10.1	53.66	63.92	-10.26	-	-
14	.19838	25.03	Ca	0	0	10.1	35.13	-	-	53.68	-18.55
15	.888	13.08	Qp	0	0	10.1	23.18	56	-32.82	-	-
16	.888	1.63	Ca	0	0	10.1	11.73	-	-	46	-34.27
17	3.72075	25.44	Qp	0	.1	10.1	35.64	56	-20.36	-	-
18	3.70275	13.73	Ca	0	.1	10.1	23.93	-	-	46	-22.07
19	9.7665	15.27	Qp	0	.2	10.2	25.67	60	-34.33	-	-
20	9.7575	8.42	Ca	0	.2	10.2	18.82	-	-	50	-31.18
21	14.712	9.11	Qp	.1	.2	10.2	19.61	60	-40.39	-	-
22	14.7075	2.48	Ca	.1	.2	10.2	12.98	-	-	50	-37.02
23	23.1315	12.23	Qp	.1	.2	10.4	22.93	60	-37.07	-	-
24	23.1315	11.31	Ca	.1	.2	10.4	22.01	-	-	50	-27.99

Qp - Quasi-Peak detector
Ca - CISPR average detection

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