FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1

CERTIFICATION TEST REPORT

FOR

WIRELESS HESDSET

MODEL NUMBER: A1722

FCC ID: BGC-A1722
IC: 579C-A1722

REPORT NUMBER: 16U23784-E2V3

ISSUE DATE: AUGUST 29, 2016

Prepared for
APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	08/22/2016	Initial Review	Chin Pang
V2	08/26/2016	Address TCB's Questions	Chin Pang
V3	08/29/2016	Add Below 1GHz and LC data	Chin Pang

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: WIRELESS HEADPHONE

MODEL: A1722

SERIAL NUMBER: CC4S30UKGQC9 (Conducted) CCS32F9GQC9 (Radiated)

DATE TESTED: AUGUST 06, 2016 - AUGUST 26, 2016

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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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	☒ Chamber D
☐ Chamber B	☒ Chamber E
☐ Chamber C	☒ Chamber F
	☒ Chamber G
	☐ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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
Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Radiated Disturbance,1000 to 18000 MHz	4.32 dB
Radiated Disturbance,18000 to 26000 MHz	4.45 dB
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 (left) is one of a pair of ear buds for left and right ears, with Bluetooth Radio. It has an integral battery, microphone and antenna. The rechargeable battery is not user accessible. It can change via bottom contacts and charge case. It is designed to work in conjunction with the right ear bud

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	12.72	18.71
2402 - 2480	DQPSK	12.65	18.41

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Band (GHz)	Antenna Gain (dBi)
2.4	-6.60

5.4. SOFTWARE AND FIRMWARE

The software installed in the EUT during testing was 9A217.

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5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case mode and channel used for 30-1000 MHz radiated emissions and AC line conducted emission were including AC/DC charger, mode and channel with the highest output power. EUT transmit with Case cover open while in charging mode

Above 1G radiated emission were performed with low, middle and high channels. And above 18GHz radiated emission were performed with the EUT only set to transmit at the channel with highest output power as worst-case scenario.

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

Data rates set for test were:

GFSK mode: DH5
DQPSK mode: 2-DH5

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Test Jig	Apple	Proto2 Controller ARM	920-01148-01	N/A
Laptop	Apple	MacBook AIR	C02P52H6G085	N/A
USB	Apple	N/A	N/A	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

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 (RADAITED BELOW 1 GHZ

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Un-shielded	1	N/A

I/O CABLES (AC LINE CONDUCTED: AC/DC ADAPTER)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Un-shielded	1	N/A

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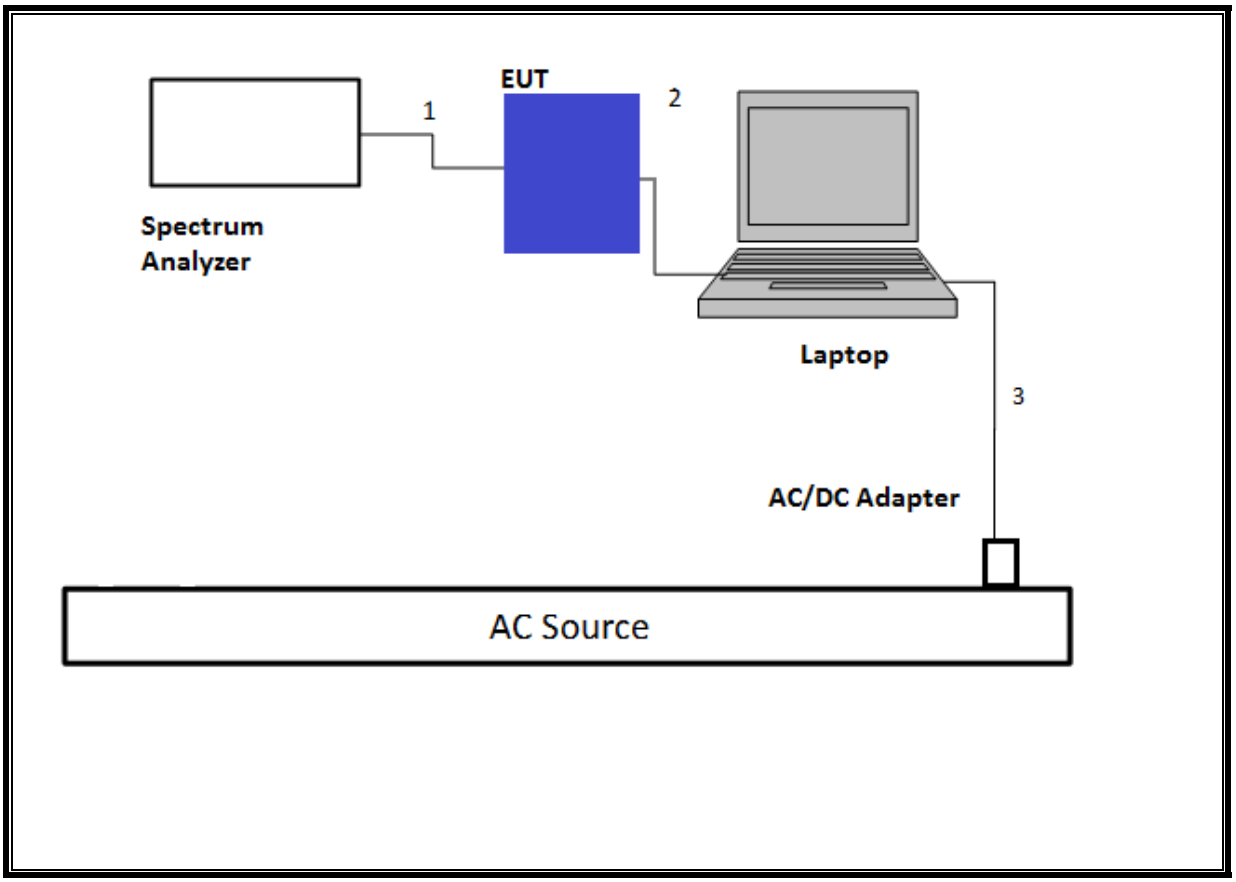
TEST SETUP- CONDUCTED PORT

The EUT was tested 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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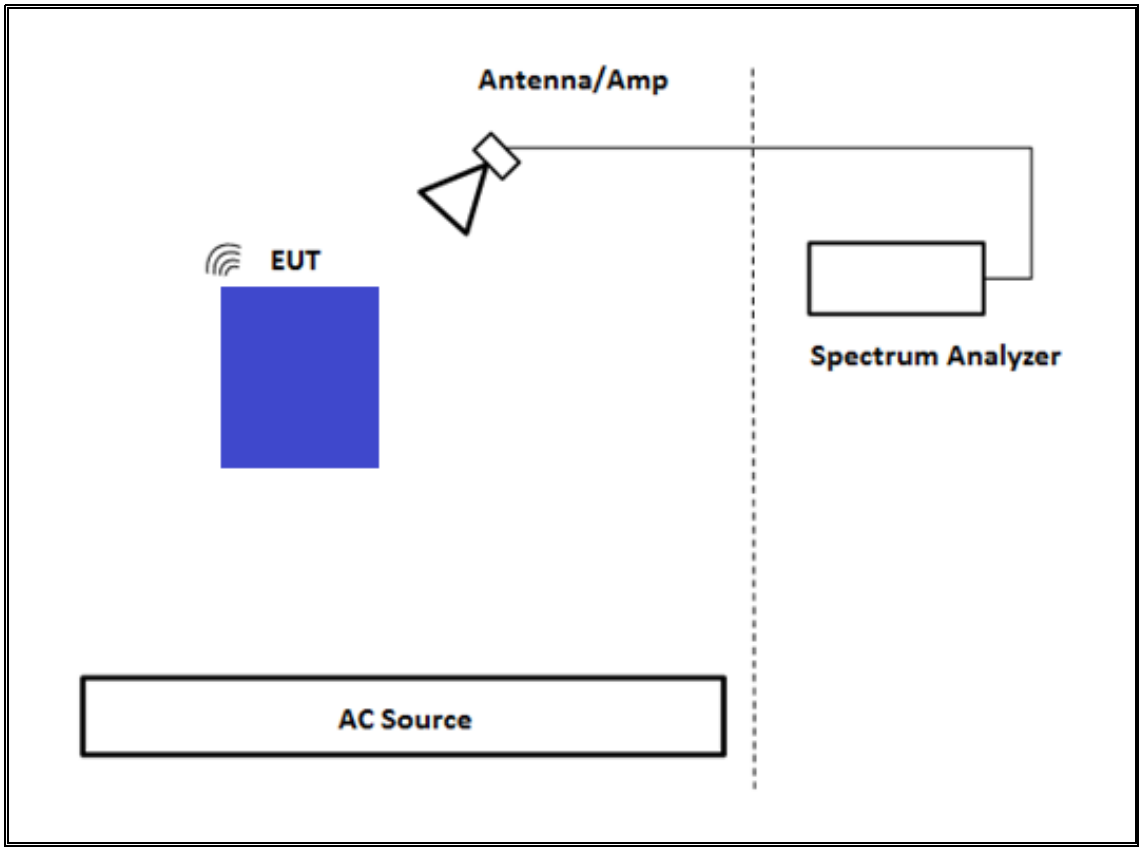
TEST SETUP- RADIATED-ABOVE 1 GHZ

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

SETUP DIAGRAM



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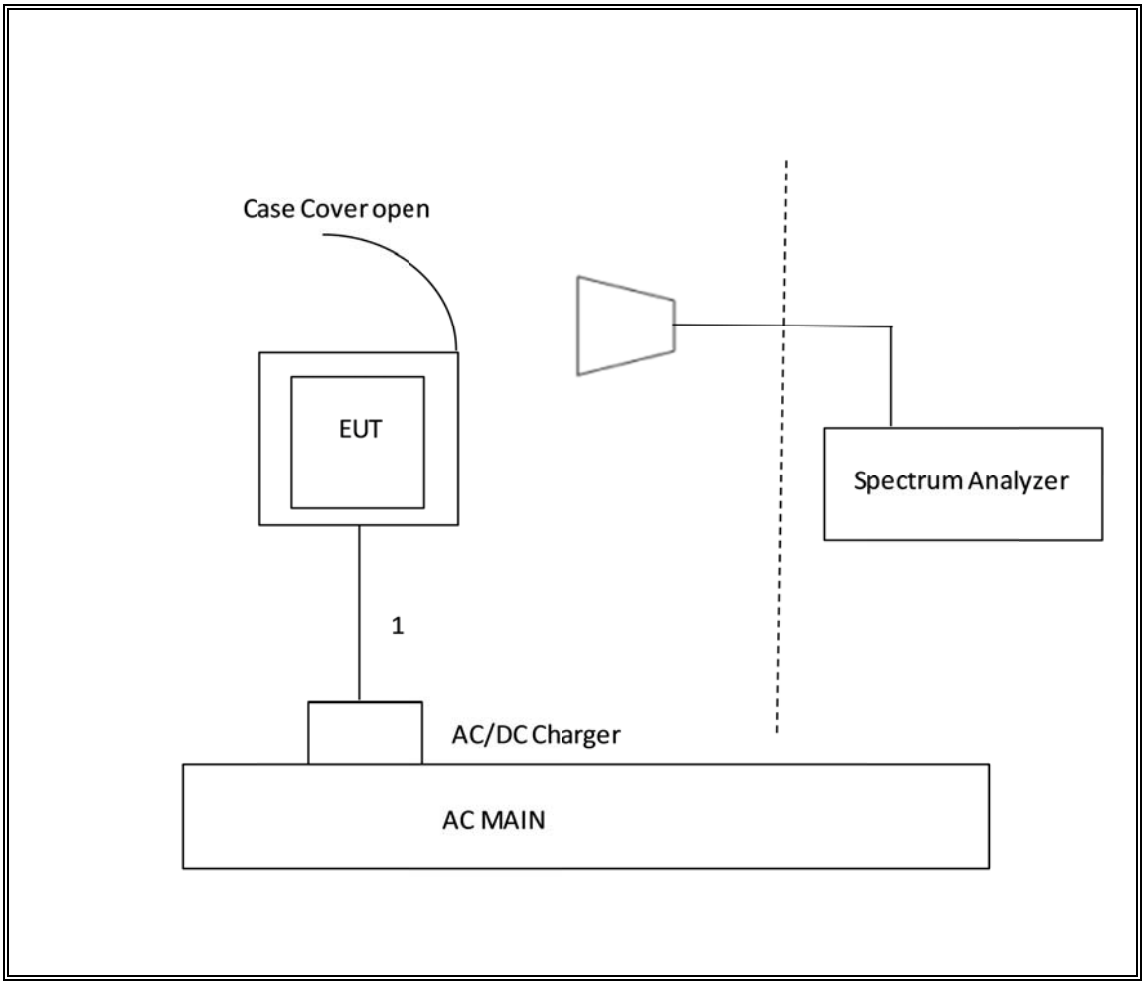
TEST SETUP- BELOW 1GHz

The EUT was tested with Case Cover open while charging and powered by AC/DC adapter via USB cable.

SETUP DIAGRAM



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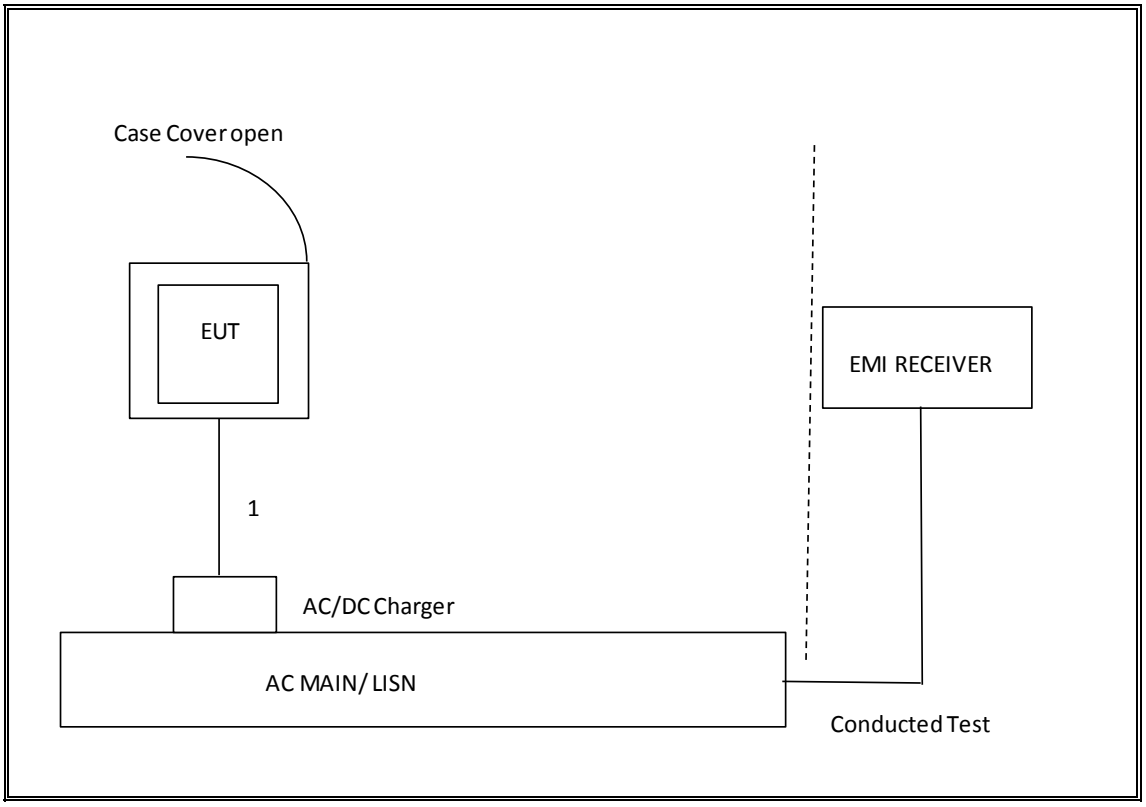
TEST SETUP- AC LINE CONDUCTED: AC/DC ADAPTER

The EUT was tested in charging capsule and powered by AC/DC adapter 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**	**T Number**	**Cal Due**
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T120	4/5/2017
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	T122	1/29/2017
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T173	6/17/2017
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	T341	10/14/2016
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T862	4/18/2017
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	T899	5/26/2017
Amplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	T491	5/31/2017
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T834	6/17/2017
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	T905	6/21/2017
Power Meter, P-series single channel	Agilent	N1911A	T1271	7/8/2017
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Agilent	N1921A	T1228	6/20/2017
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826	T447	6/16/2017
Spectrum Analyzer, 40 GHz	Agilent	N9030A	T340	11/15/2016
Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum	Keysight	8449B	T402	7/5/2017
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	6/8/2017
AC Source	Shaffner	NSG 1007	T134	9/11/2016
UL SOFTWARE				
* Radiated Software	UL	UL EMC	Ver 9.5, June 24, 2015	
* Conducted Software	UL	UL EMC	Ver 4.0, January 11, 2016	
* AC Line Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015	

Note: * indicates automation software version used in the compliance certification testing

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7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

RESULTS

ON TIME AND DUTY CYCLE

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Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
Bluetooth GFSK	100.000	100.000	1.000	100.00%	0.00	0.010
Bluetooth QPSK	100.000	100.000	1.000	100.00%	0.00	0.010

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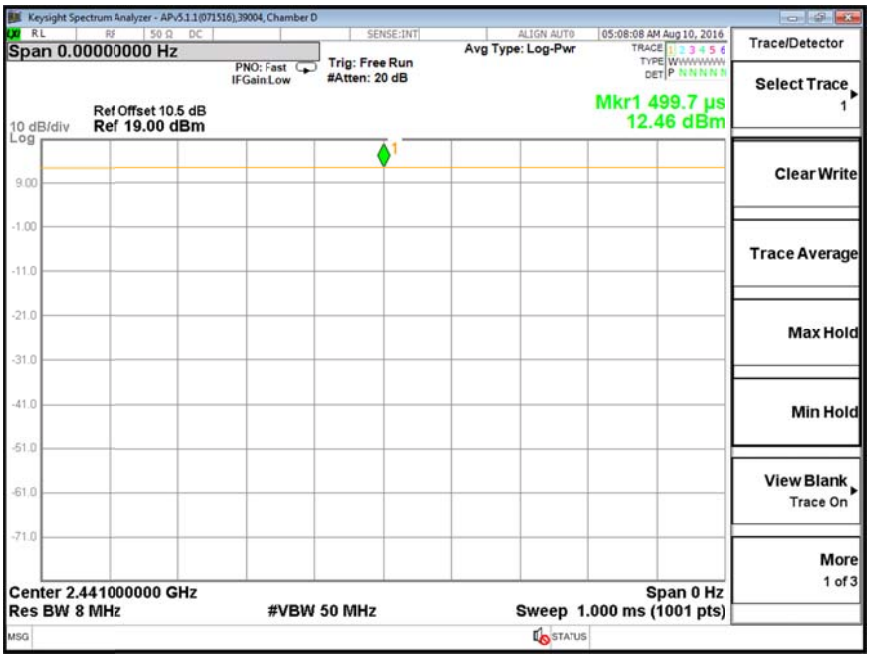
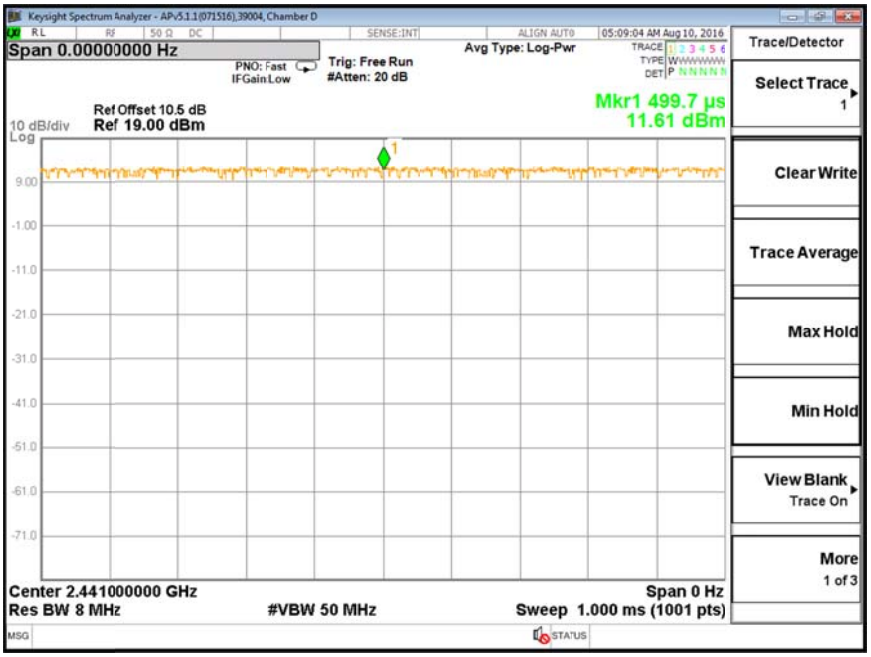
DUTY CYCLE PLOTS

HOPPING OFF

DUTY CYCLE GFSK MODE



DUTY CYCLE QPSK MODE



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7.2. BASIC DATA RATE GFSK MODULATION

7.2.1. 20 dB AND 99% BANDWIDTH

LIMIT

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 (KHz)	99% Bandwidth (KHz)
Low	2402	929.5	909.94
Middle	2441	940.5	911.57
High	2480	1020.0	888.62

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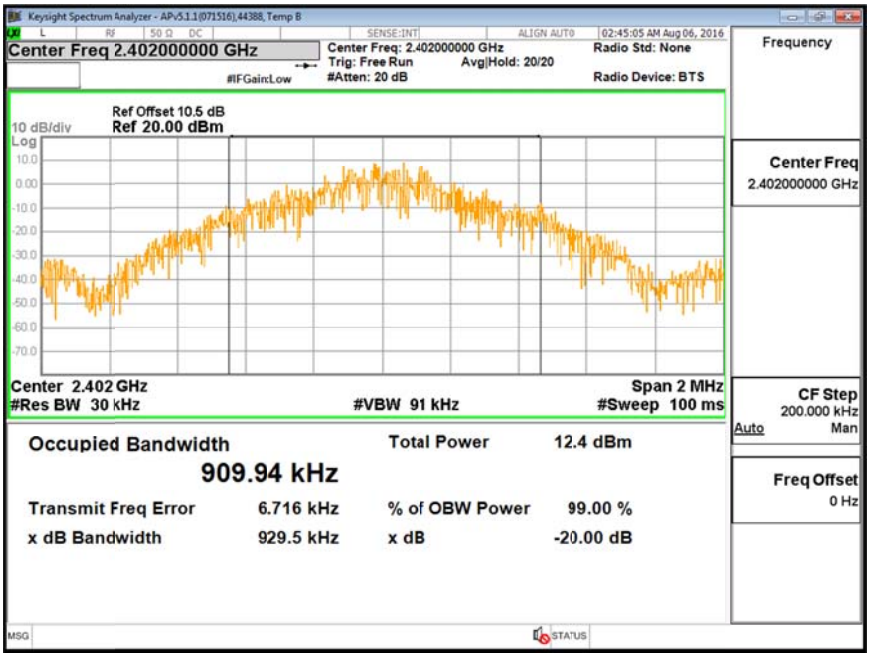
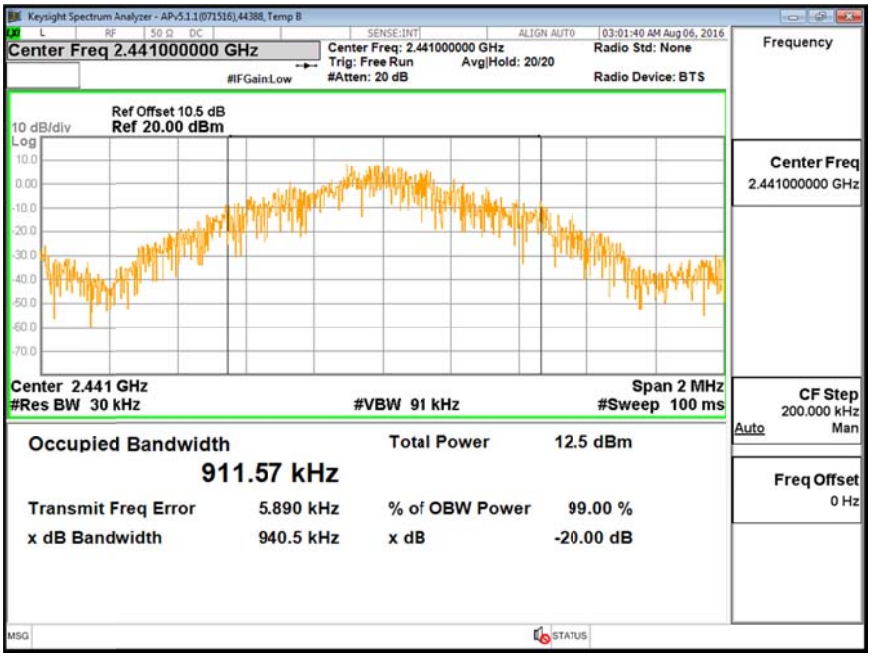
20 dB AND 99% BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH



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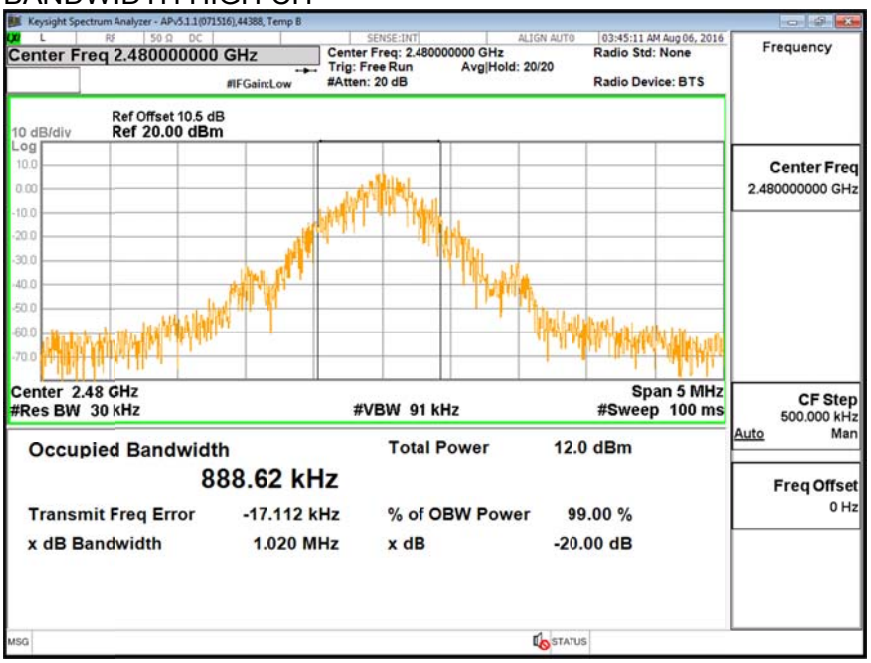
BANDWIDTH HIGH CH



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7.2.2. HOPPING FREQUENCY SEPARATION

LIMIT

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.

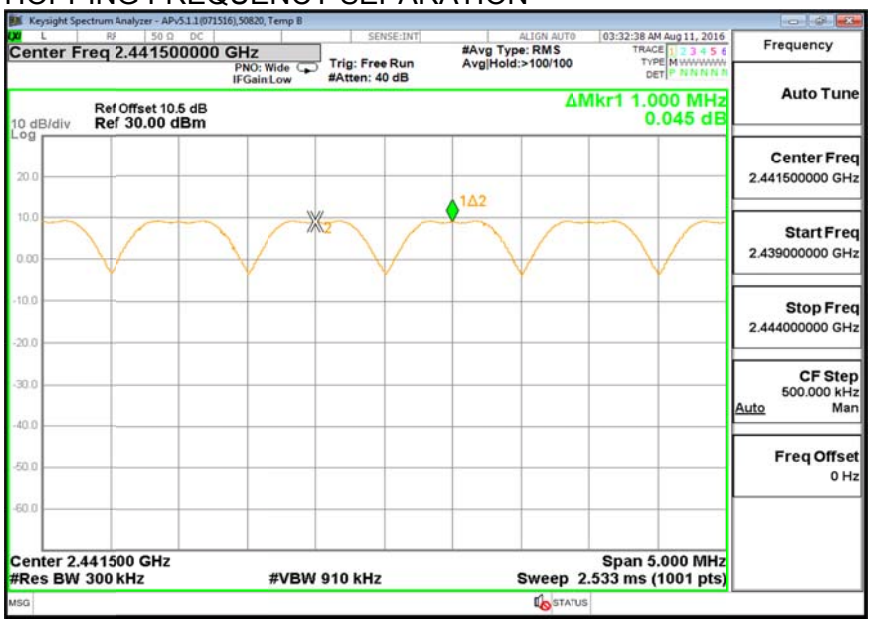
TEST PROCEDURE

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

HOPPING FREQUENCY SEPARATION



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7.2.3. NUMBER OF HOPPING CHANNELS

LIMIT

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.

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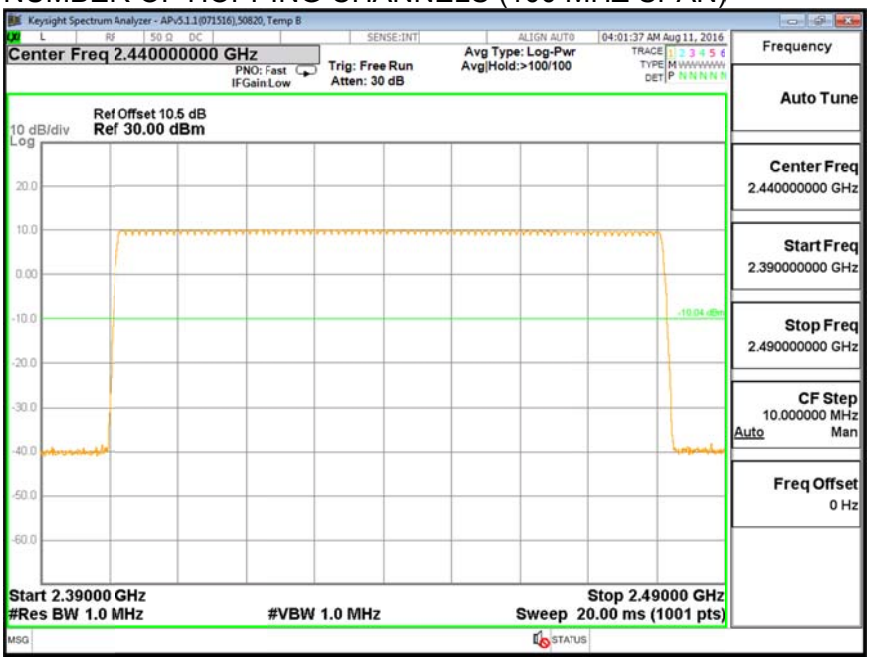
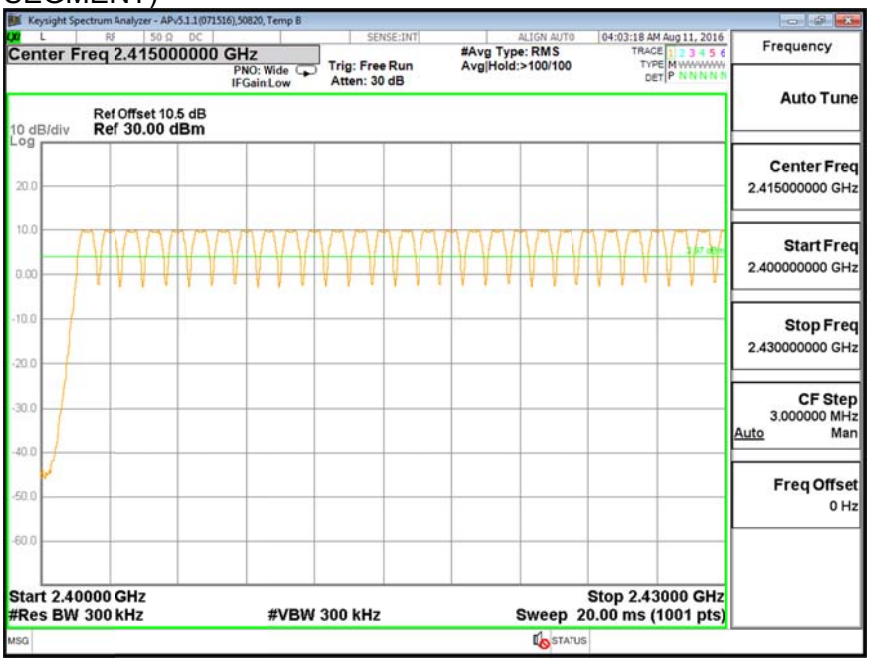
NUMBER OF HOPPING CHANNELS

NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



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



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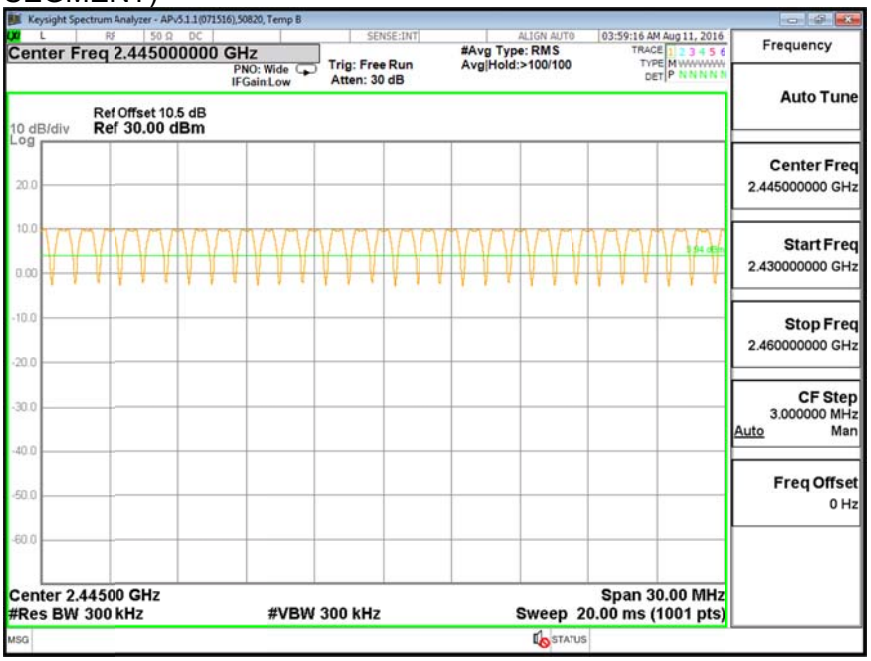
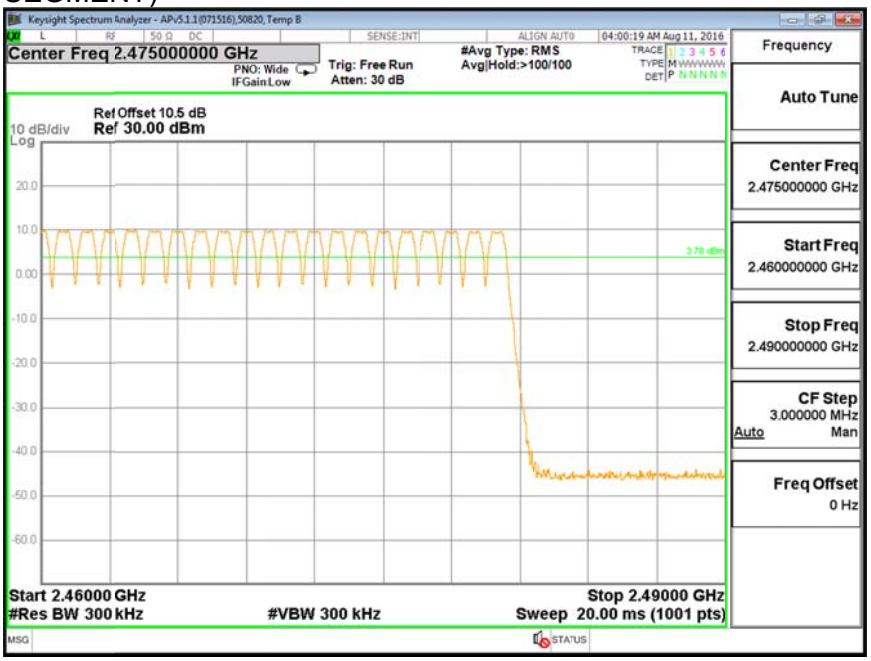
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



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



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7.2.4. AVERAGE TIME OF OCCUPANCY

LIMIT

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					
DH5	2.872	3	0.086	0.4	-0.314
DH Packet	Pulse Width (msec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH5	2.872	0.75	0.022	0.4	-0.378

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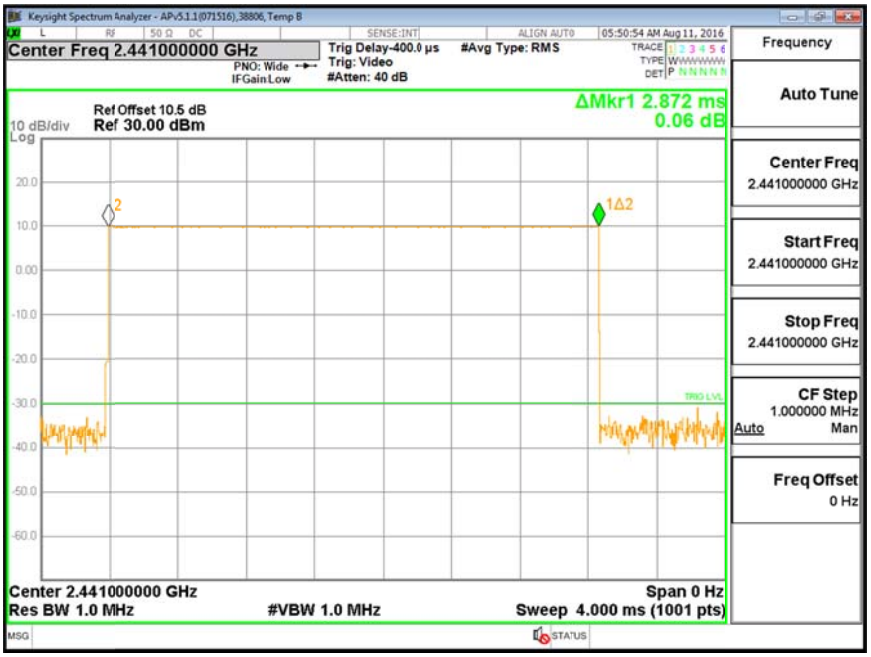
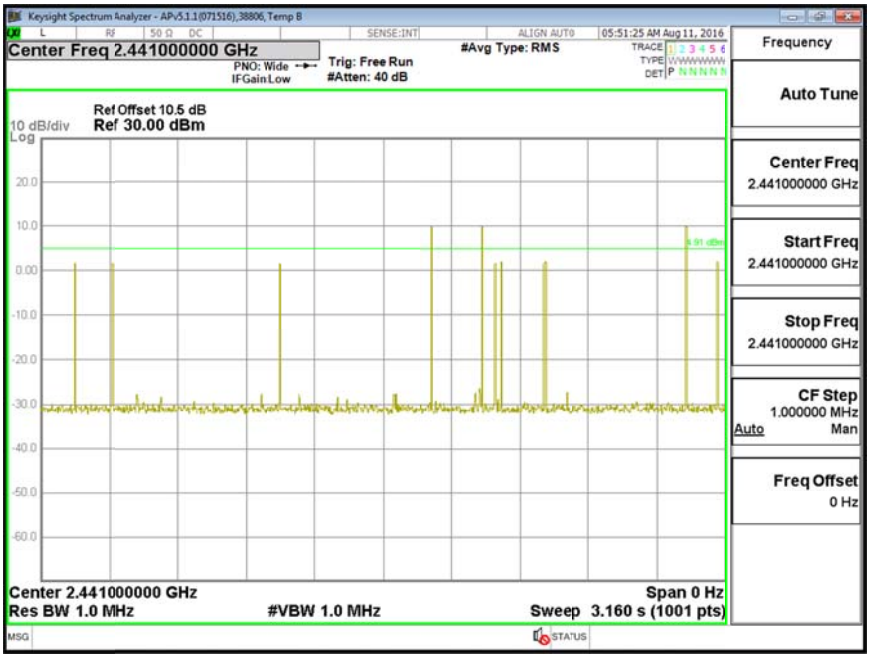
PULSE WIDTH – DH5

PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5

NUMBER OF PULSES – DH5



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7.2.5. OUTPUT POWER

LIMIT

§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 power meter.

RESULTS

ID:	50820	Date:	8/12/16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	12.70	30	-17.30
Middle	2441	12.68	30	-17.32
High	2480	12.72	30	-17.28

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7.2.6. AVERAGE POWER

LIMIT

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.

ID:	50820	Date:	8/12/16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	12.47
Middle	2441	12.45
High	2480	12.50

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7.2.7. 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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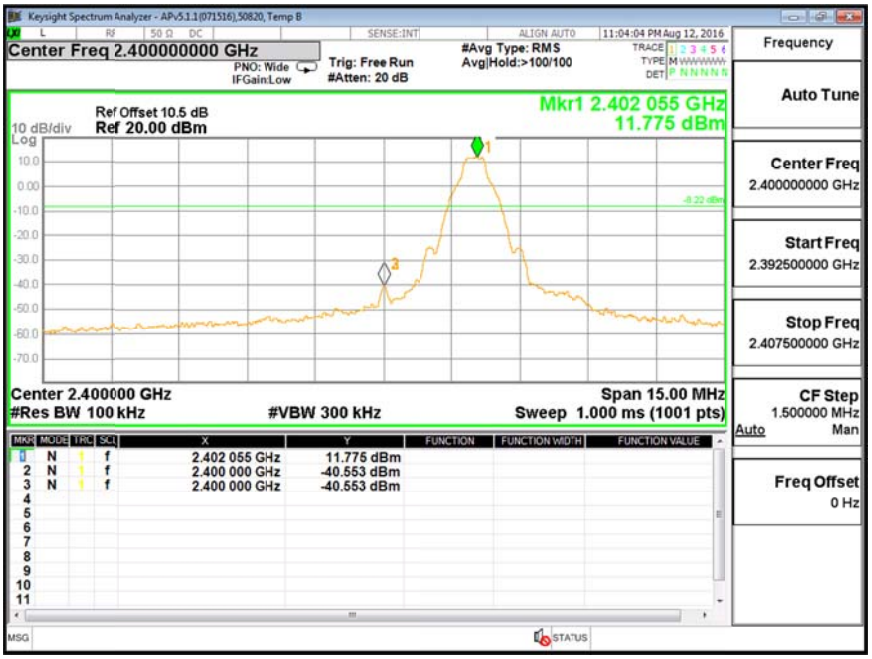
SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE



LOW CHANNEL SPURIOUS

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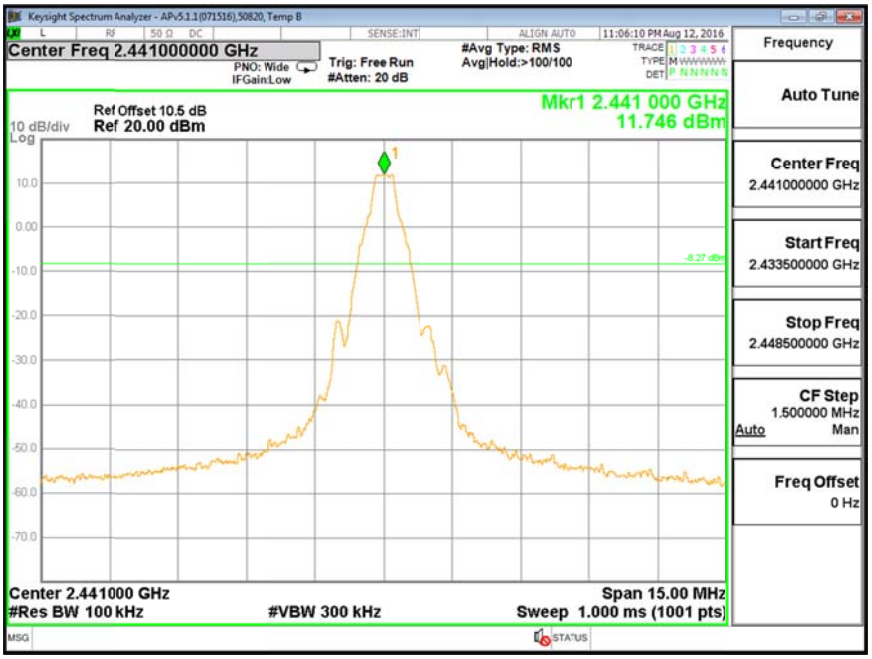
SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL



MID CHANNEL SPURIOUS

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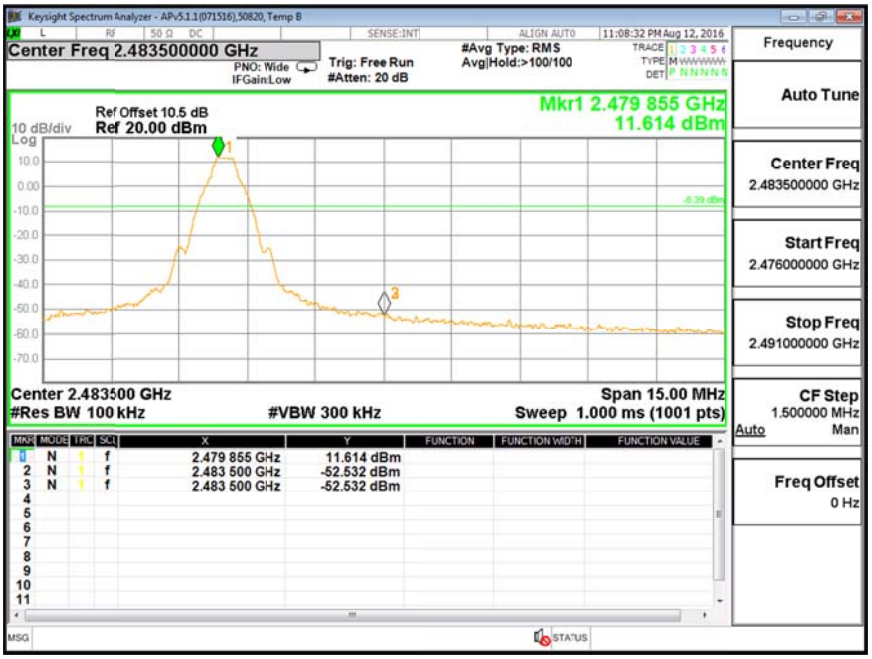
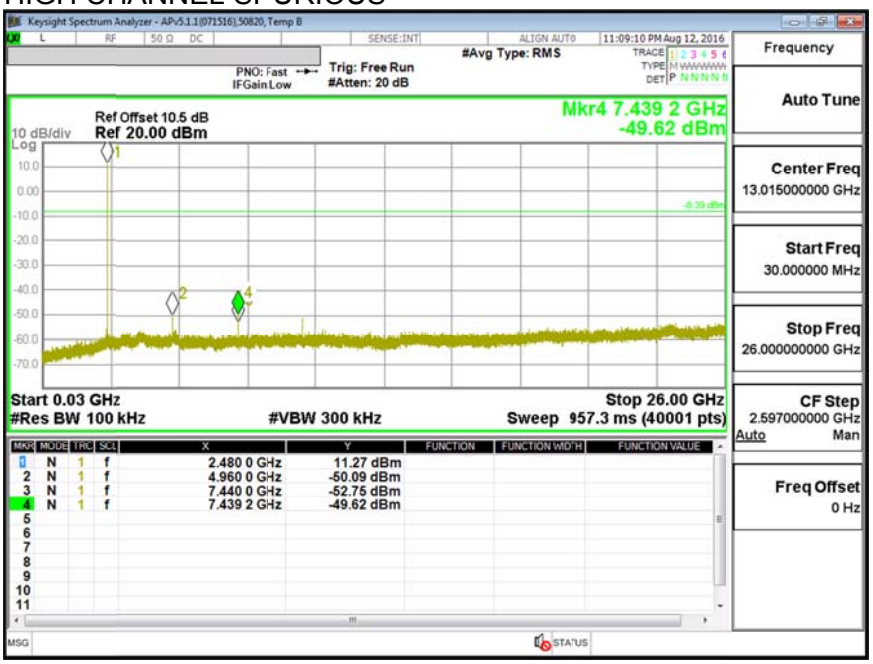
SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE



HIGH CHANNEL SPURIOUS



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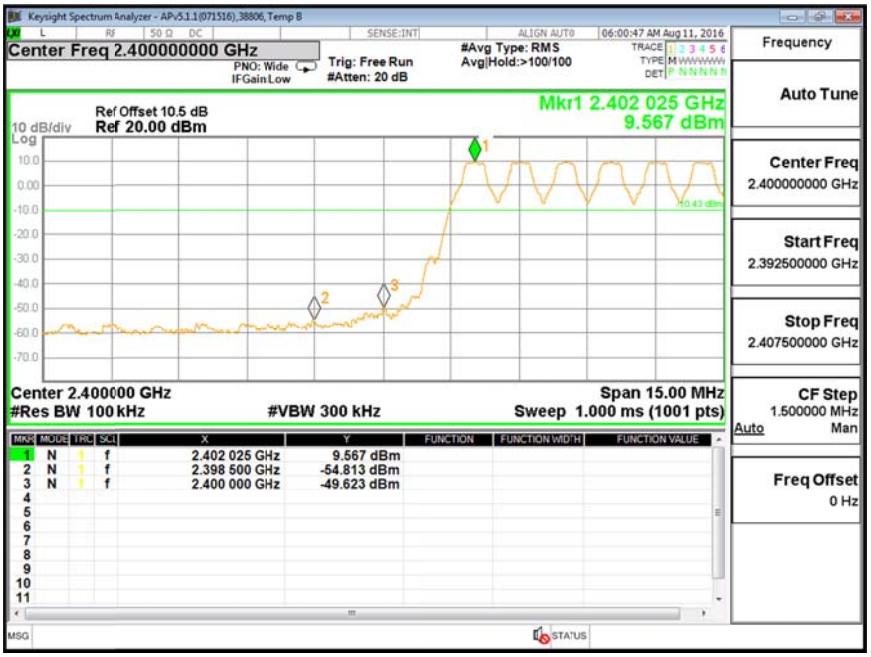
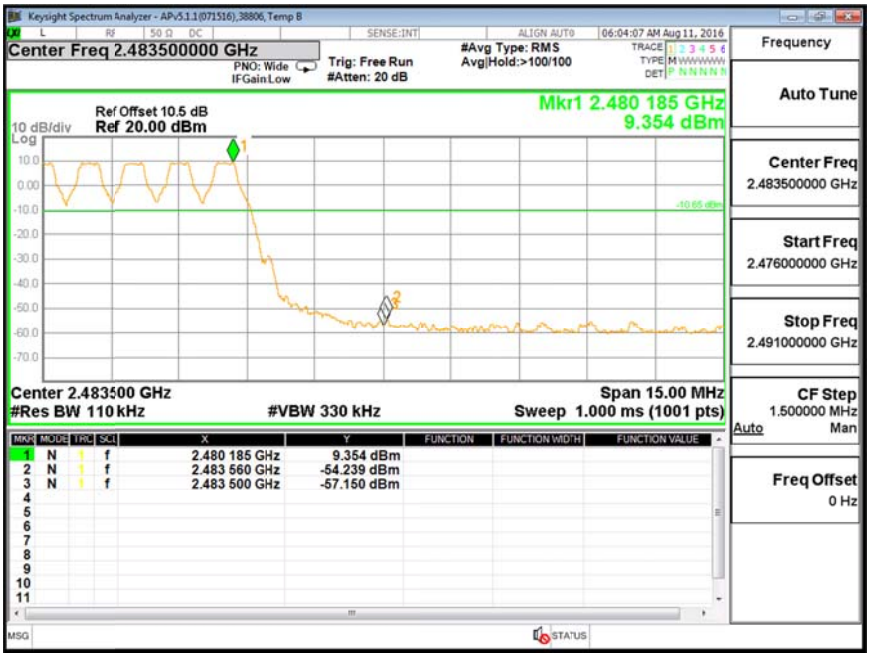
SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



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7.3. ENHANCED DATA RATE DQPSK MODULATION

7.3.1. 20 dB AND 99% BANDWIDTH

LIMIT

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 (KHz)	99% Bandwidth (KHz)
Low	2402	1355.00	1206.00
Middle	2441	1354.00	1204.60
High	2480	1360.00	1239.50

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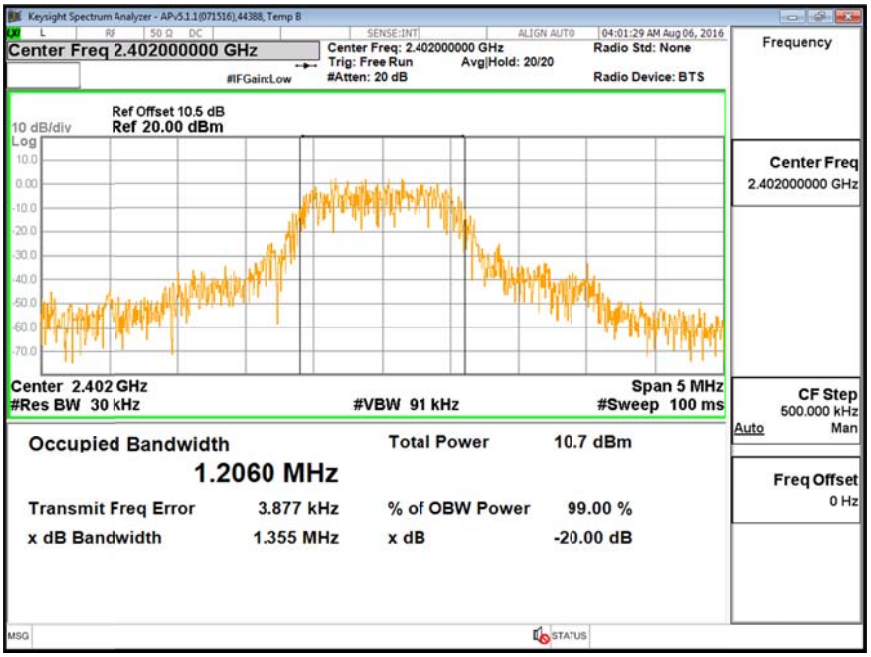
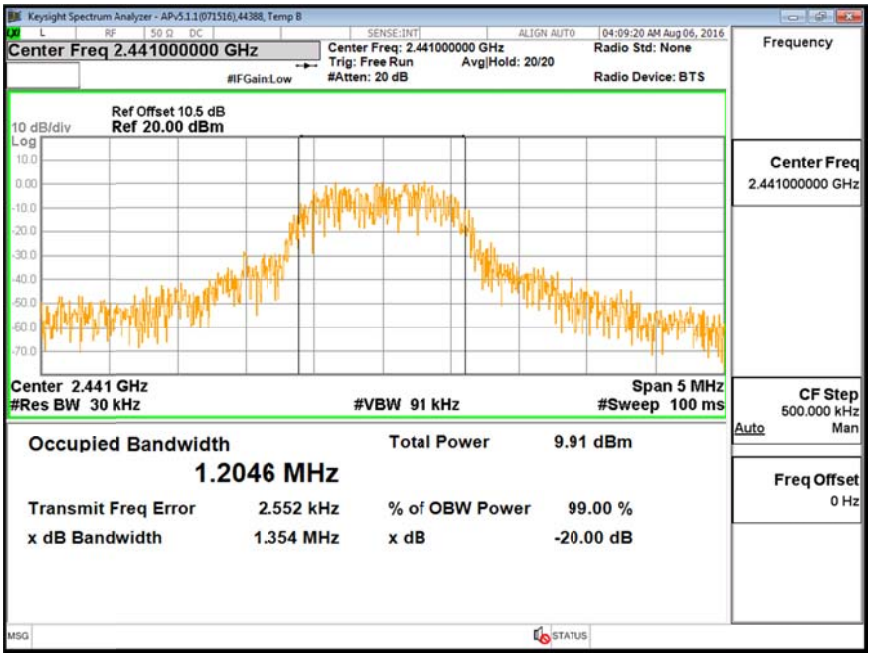
20 dB AND 99% BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH



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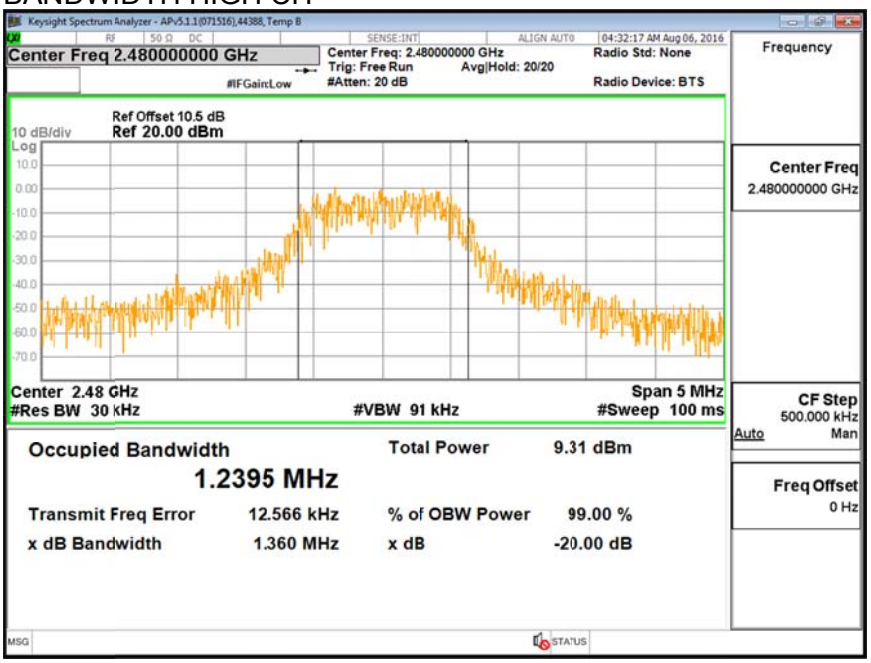
BANDWIDTH HIGH CH



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7.3.2. HOPPING FREQUENCY SEPARATION

LIMIT

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.

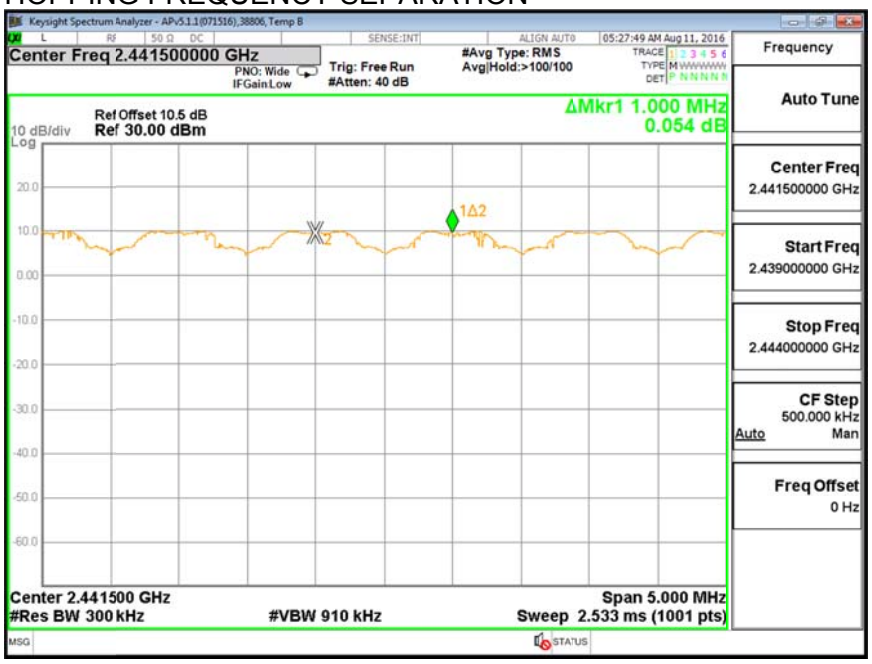
TEST PROCEDURE

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

HOPPING FREQUENCY SEPARATION



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7.3.3. NUMBER OF HOPPING CHANNELS

LIMIT

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.

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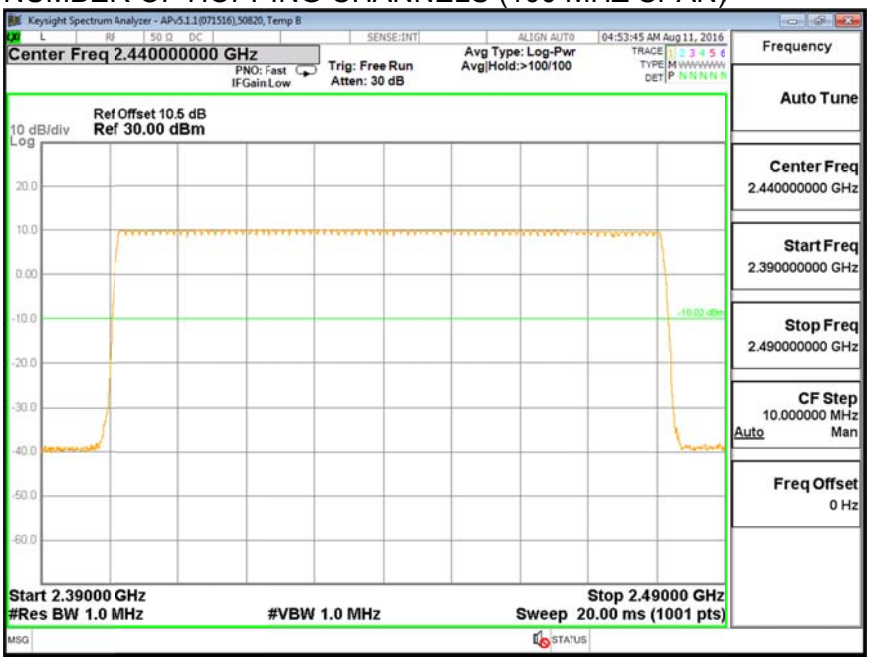
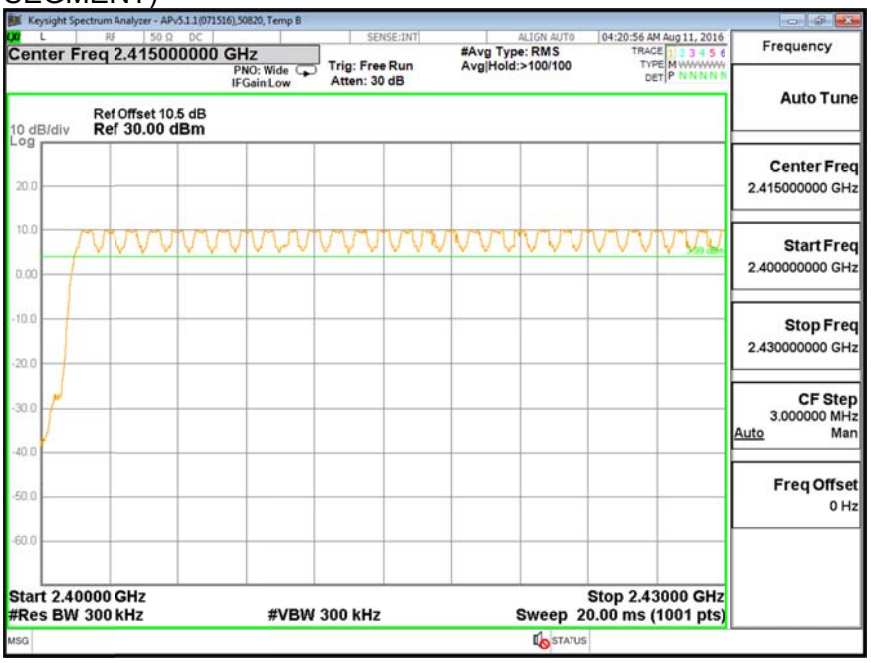
NUMBER OF HOPPING CHANNELS

NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



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



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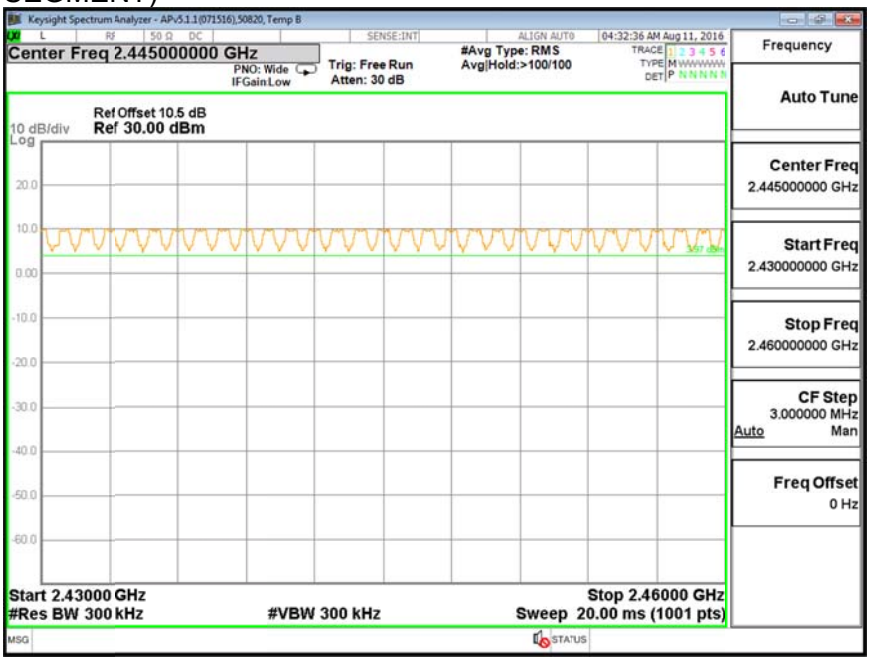
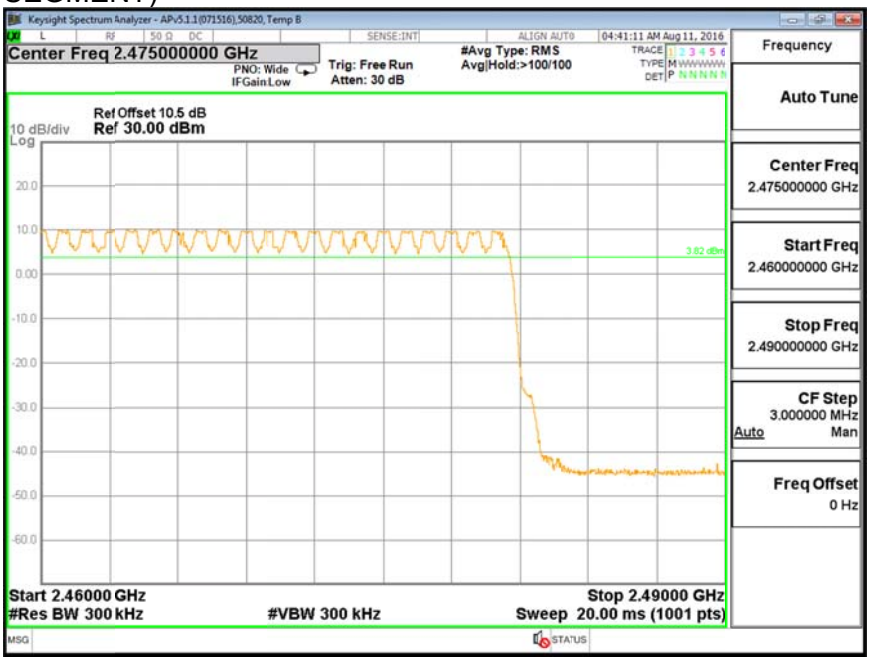
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



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



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7.3.4. AVERAGE TIME OF OCCUPANCY

LIMIT

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

QPSK (EDR) Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
2DH5	2.879	5	0.144	0.4	-0.256

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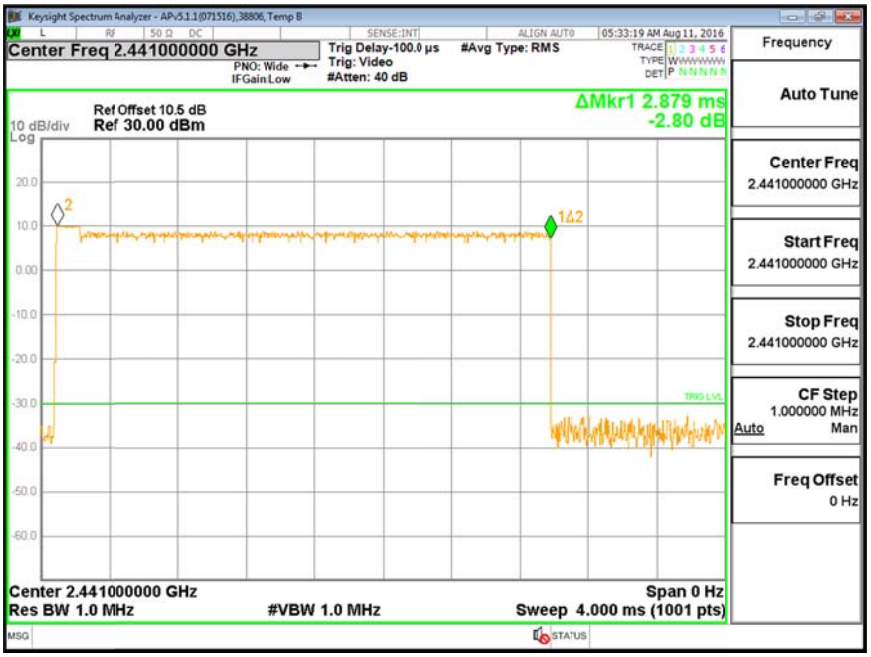
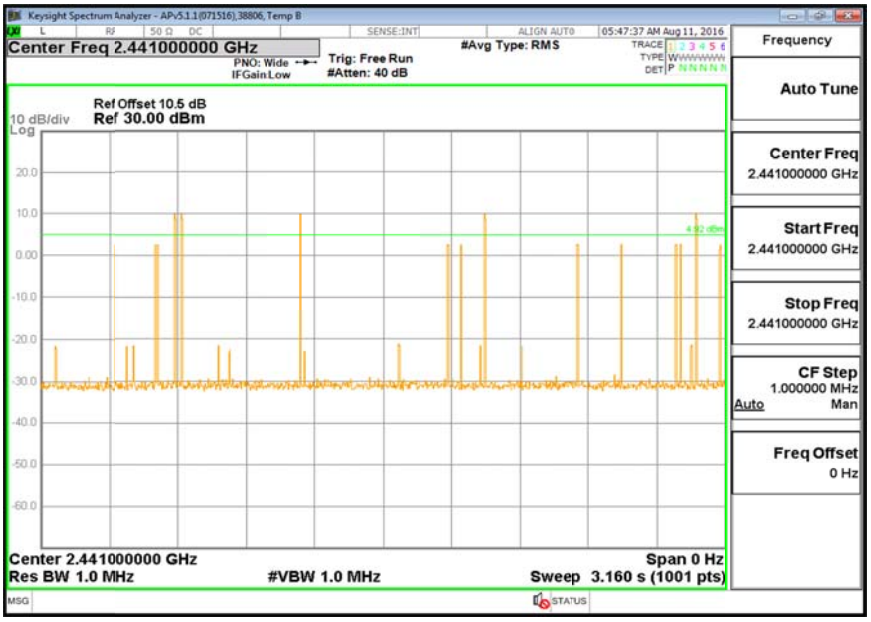
PULSE WIDTH – 2DH5

PULSE WIDTH – 2DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 2DH5

NUMBER OF PULSES – 2DH5



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7.3.5. OUTPUT POWER

LIMIT

§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 power meter.

RESULTS

ID:	50820	Date:	8/12/16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	12.65	21	-8.32
Middle	2441	12.60	21	-8.37
High	2480	12.58	21	-8.39

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7.3.6. AVERAGE POWER

LIMIT

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.

ID:	50820	Date:	8/12/16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	9.99
Middle	2441	9.98
High	2480	9.92

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7.3.7. 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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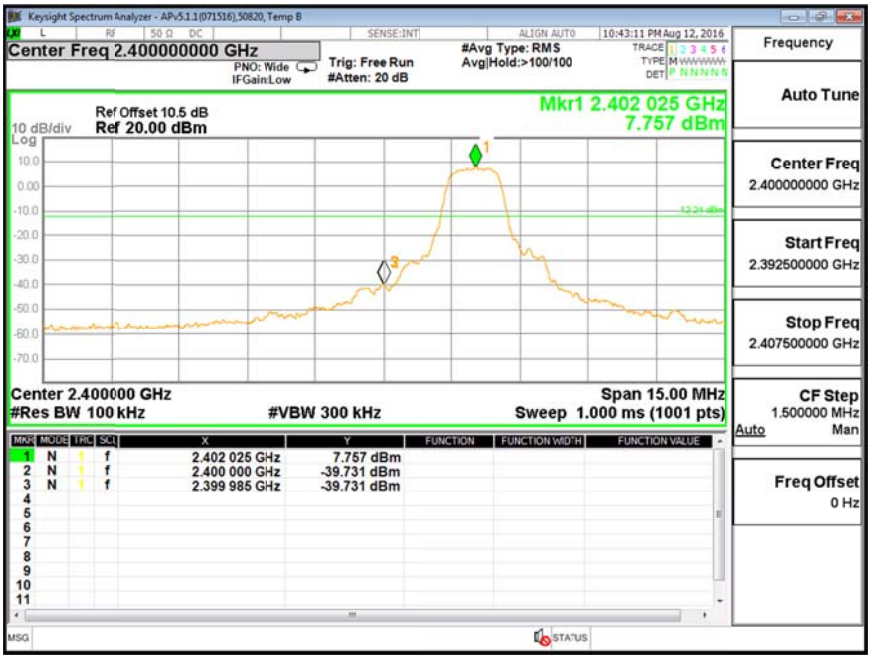
SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE



LOW CHANNEL SPURIOUS

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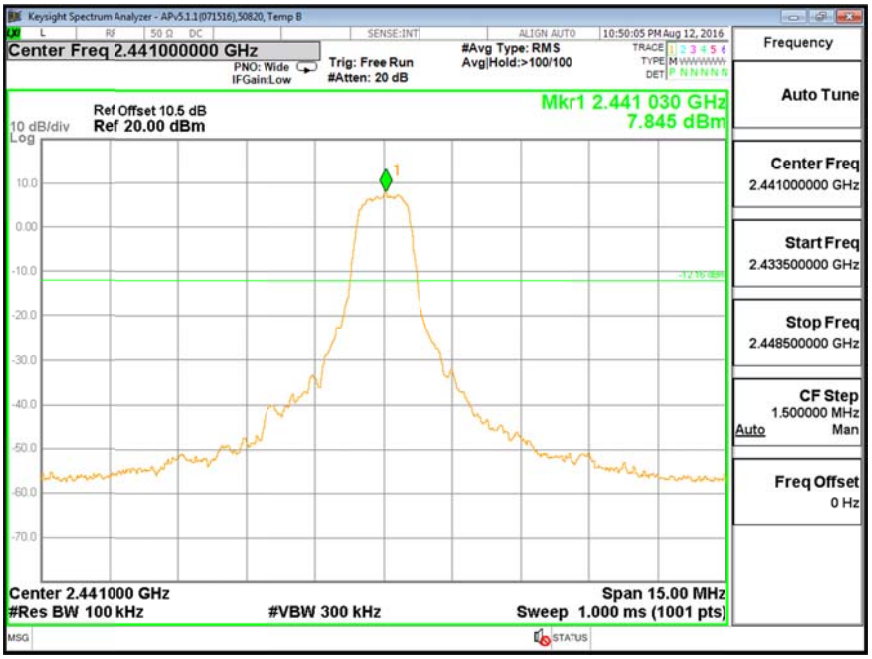
SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL



MID CHANNEL SPURIOUS

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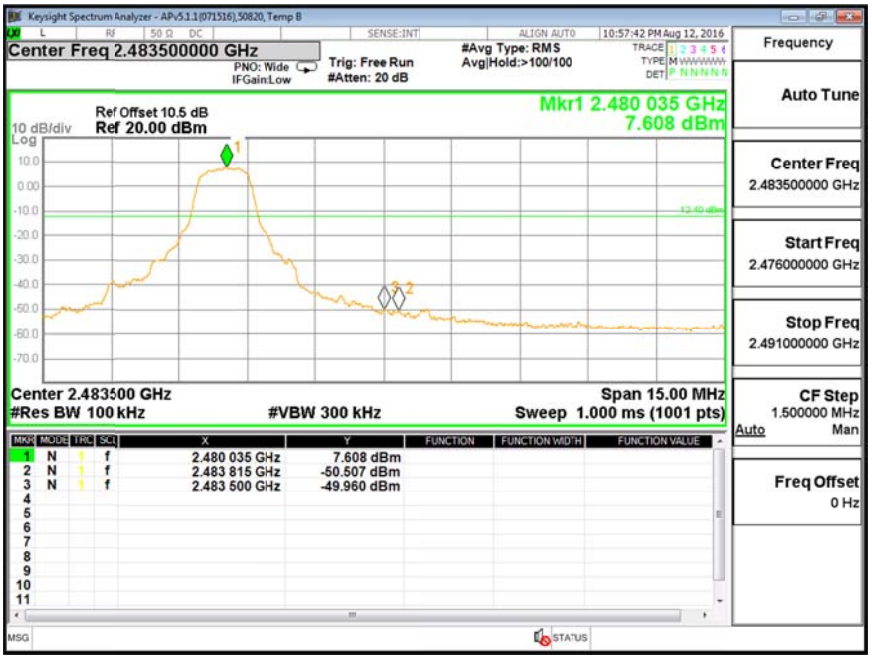
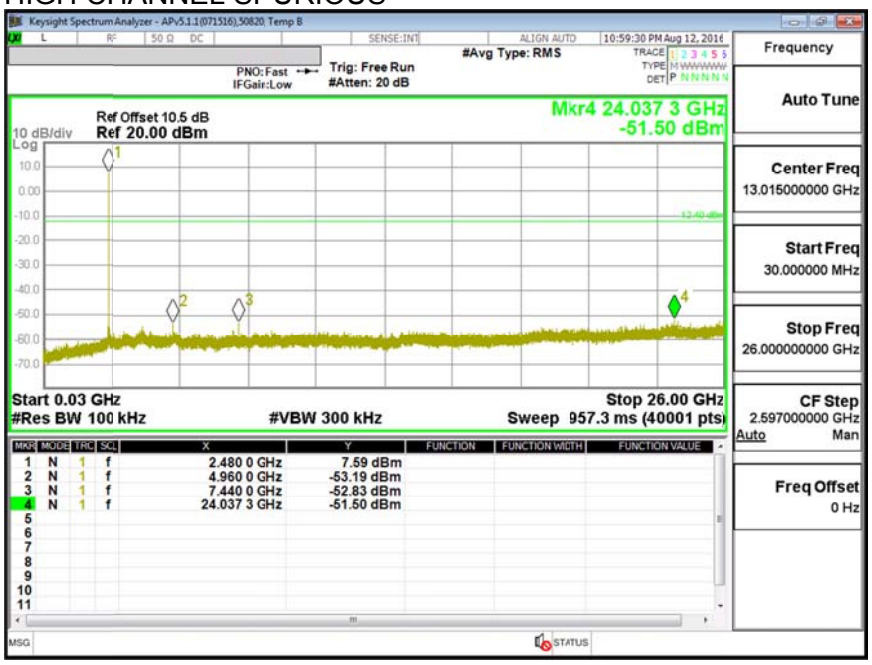
SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE



HIGH CHANNEL SPURIOUS



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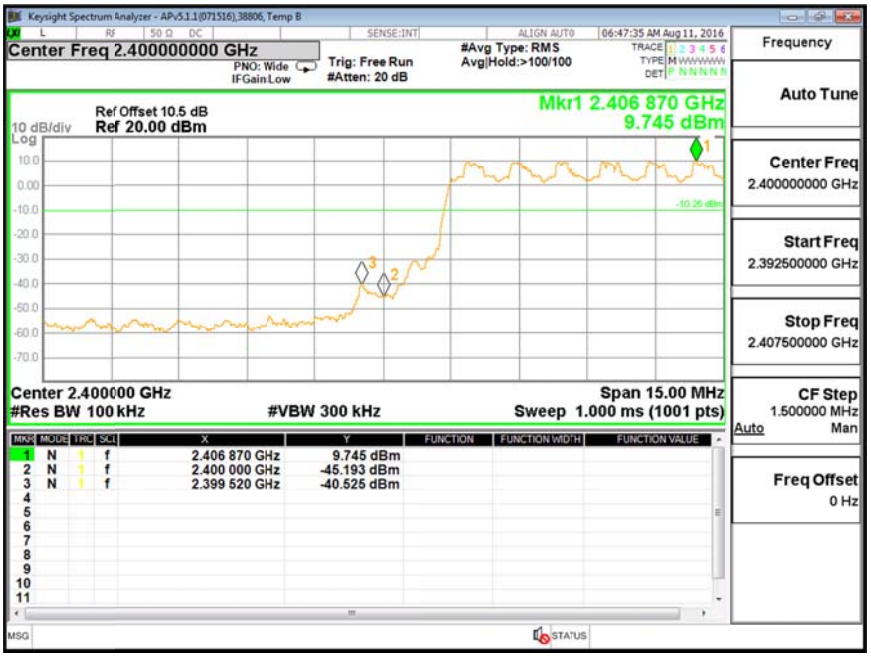
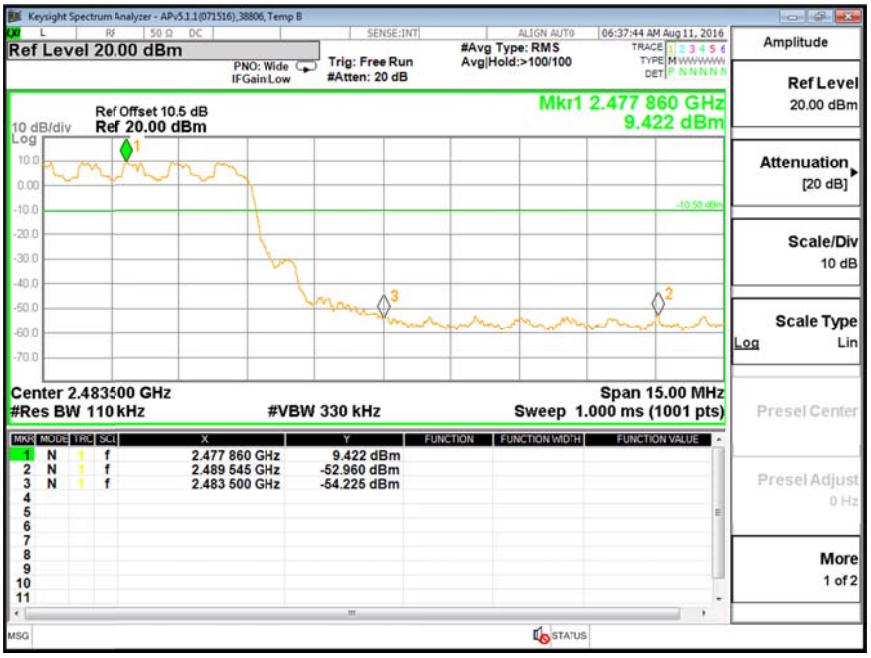
SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



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8. RADIATED TEST RESULTS

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

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

The 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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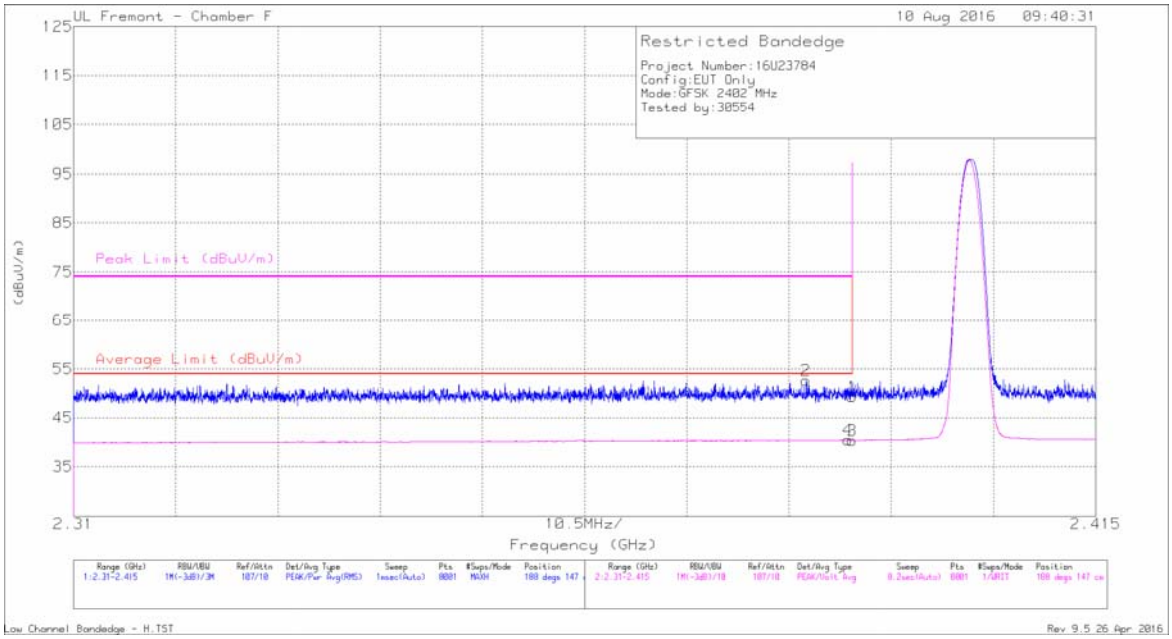
8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL HORIZONTAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	38.14	Pk	32.1	-20.9	49.34	-	-	74	-24.66	188	147	H
2	* 2.385	41.4	Pk	32.1	-20.9	52.6	-	-	74	-21.4	188	147	H
3	* 2.39	29.17	VA1T	32.1	-20.9	40.37	-	-	-	-	188	147	H
4	* 2.39	29.24	VA1T	32.1	-20.9	40.44	-	-	-	-	188	147	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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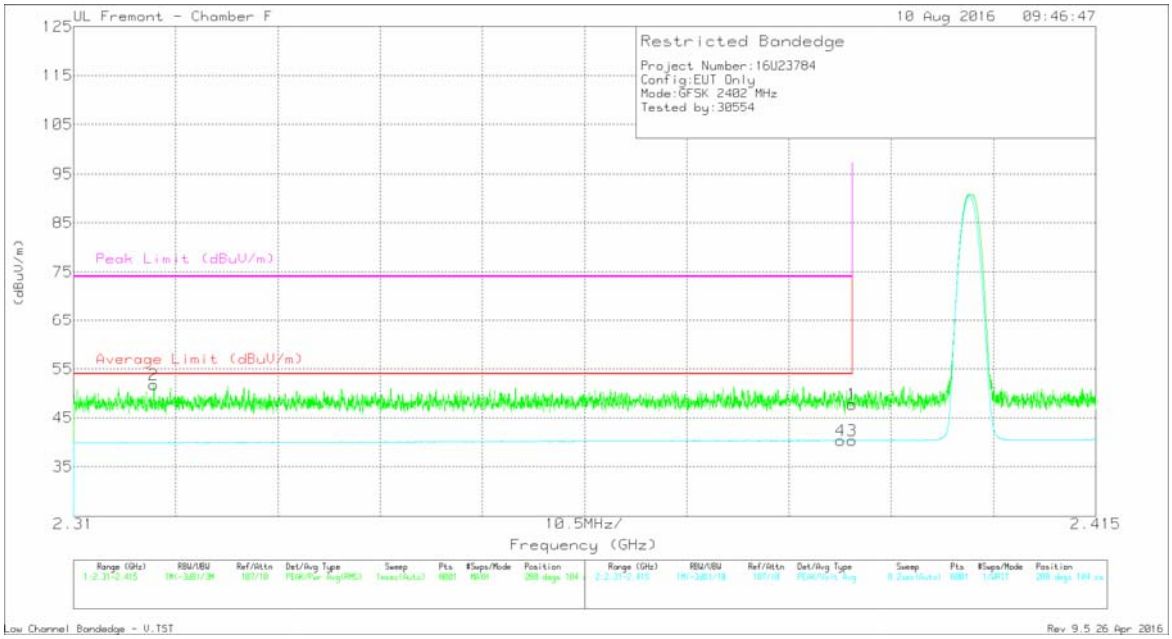
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

LOW CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	36.55	Pk	32.1	-20.9	47.75	-	-	74	-26.25	288	104	V
2	* 2.318	40.85	Pk	31.8	-20.9	51.75	-	-	74	-22.25	288	104	V
3	* 2.39	29.15	VA1T	32.1	-20.9	40.35	-	-	-	-	288	104	V
4	* 2.389	29.18	VA1T	32.1	-20.9	40.38	-	-	-	-	288	104	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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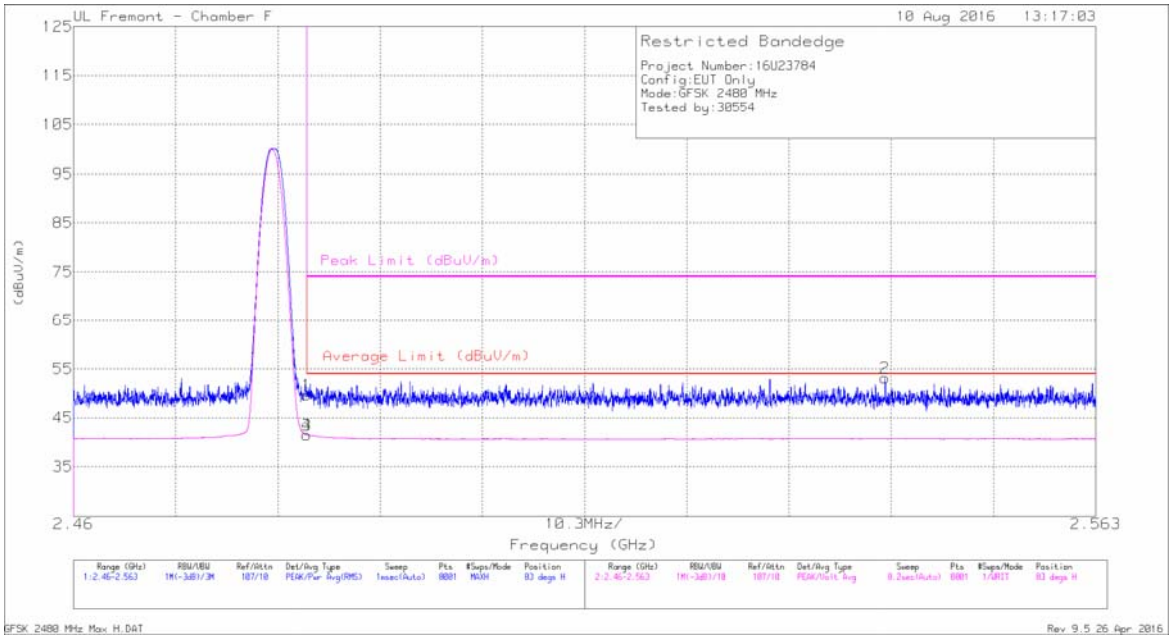
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

HIGH CHANNEL HORIZONTAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	38.42	Pk	32.3	-21	49.72	-	-	74	-24.28	83	149	H
2	2.542	41.87	Pk	32.2	-20.9	53.17	-	-	74	-20.83	83	149	H
3	* 2.484	30.2	VA1T	32.3	-21	41.5	-	-	-	-	83	149	H
4	* 2.484	30.2	VA1T	32.3	-21	41.5	-	-	-	-	83	149	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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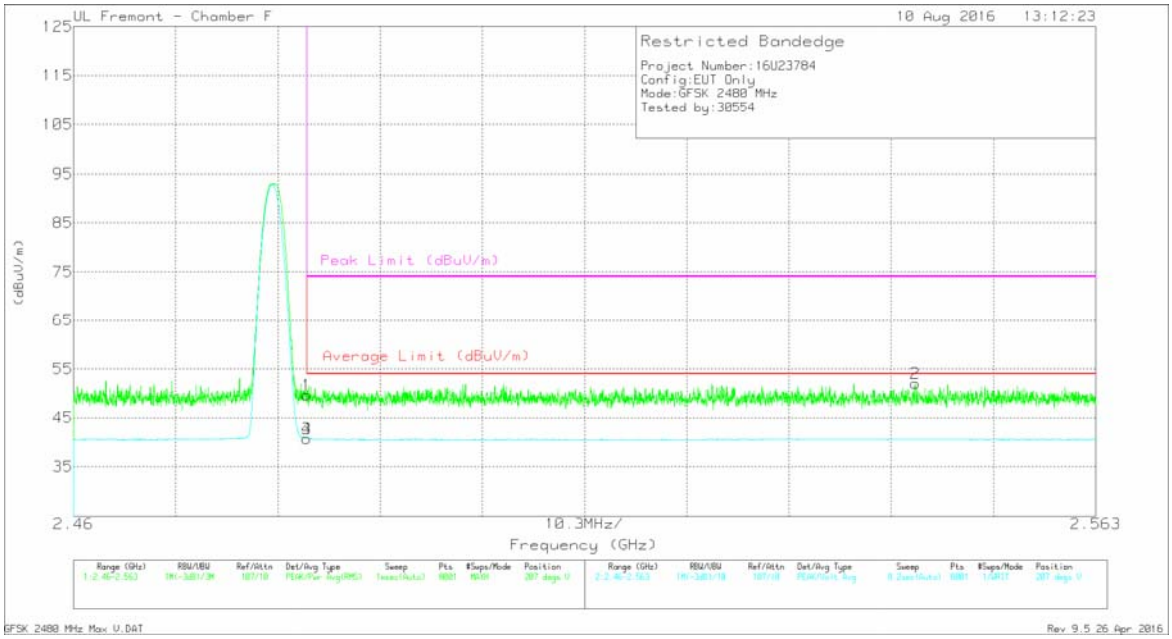
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

HIGH CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	38.36	Pk	32.3	-21	49.66	-	-	74	-24.34	207	102	V
2	2.545	40.74	Pk	32.2	-20.9	52.04	-	-	74	-21.96	207	102	V
3	* 2.484	29.43	VA1T	32.3	-21	40.73	-	-	-	-	207	102	V
4	* 2.484	29.44	VA1T	32.3	-21	40.74	-	-	-	-	207	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

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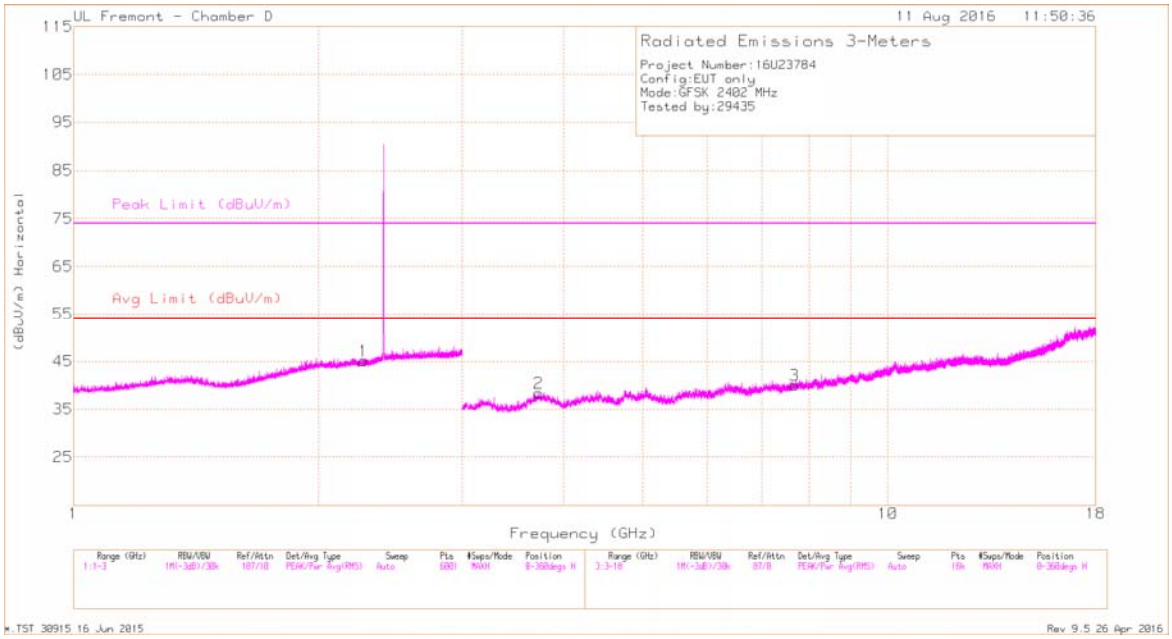
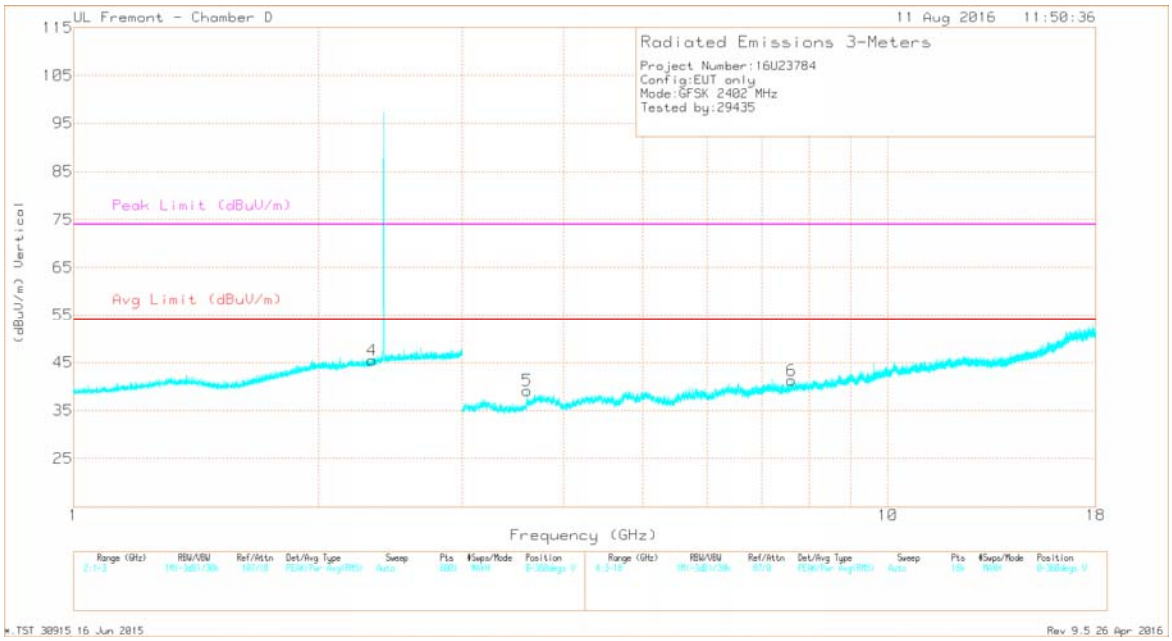
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



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DATA

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
1	* 2.269	40.25	PKFH	31.5	-20.8	50.95	-	-	74	-23.05	263	195	H
	* 2.269	28.98	VA1T	31.5	-20.8	39.68	54	-14.32	-	-	263	195	H
4	* 2.326	41.64	PKFH	31.6	-20.7	52.54	-	-	74	-21.46	196	271	V
	* 2.328	29.04	VA1T	31.6	-20.8	39.84	54	-14.16	-	-	196	271	V
3	* 7.681	35.92	PKFH	35.8	-24.3	47.42	-	-	74	-26.58	202	251	H
	* 7.68	23.45	VA1T	35.8	-24.3	34.95	54	-19.05	-	-	202	251	H
2	* 3.726	37.55	PKFH	33.5	-28.5	42.55	-	-	74	-31.45	179	311	H
	* 3.726	26.27	VA1T	33.5	-28.5	31.27	54	-22.73	-	-	179	311	H
5	* 3.603	37.36	PKFH	33.3	-28	42.66	-	-	74	-31.34	154	275	V
	* 3.603	27.13	VA1T	33.3	-28	32.43	54	-21.57	-	-	154	275	V
6	* 7.621	34.63	PKFH	35.8	-24.4	46.03	-	-	74	-27.97	195	306	V
	* 7.621	23.47	VA1T	35.8	-24.4	34.87	54	-19.13	-	-	195	306	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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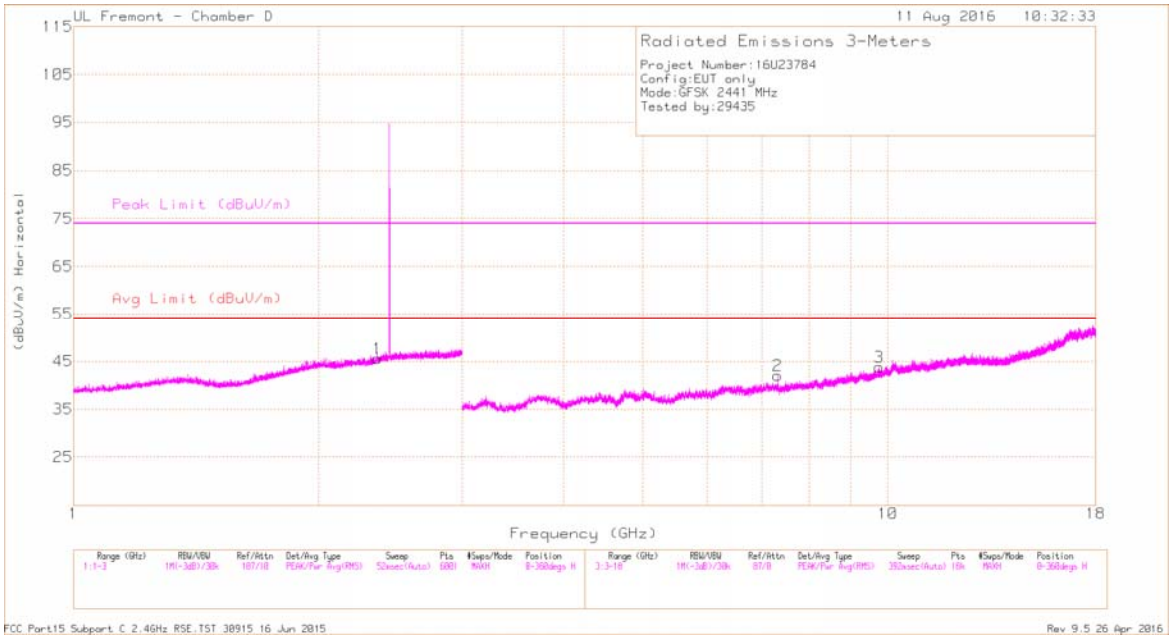
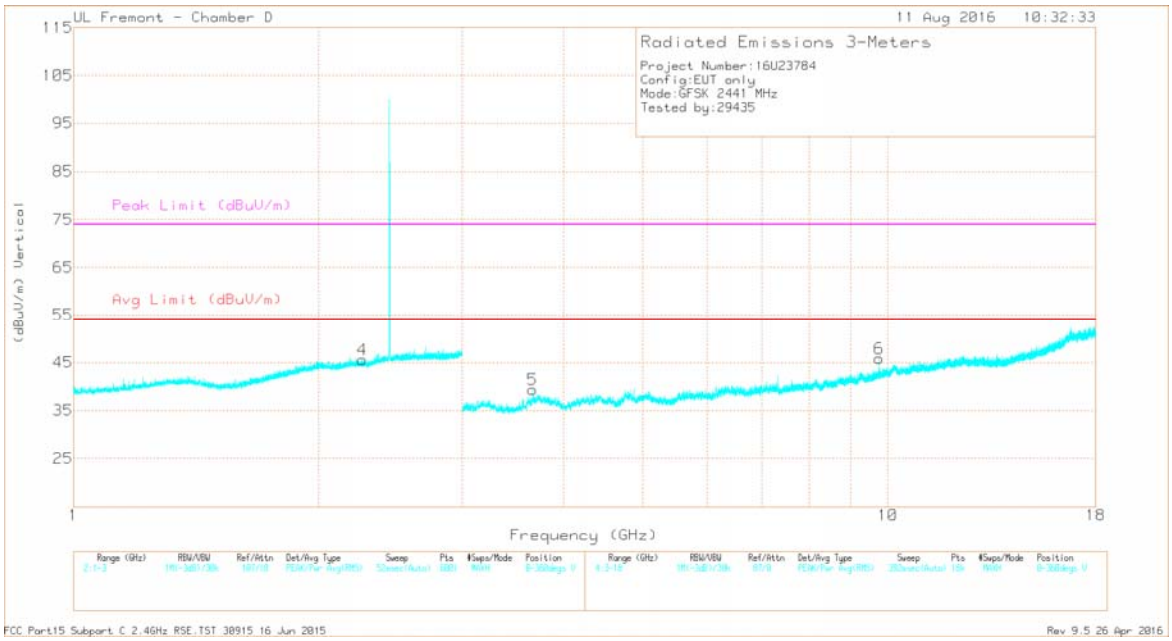
HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



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DATA

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
1	* 2.364	40.49	PKFH	31.9	-20.7	51.69	-	-	74	-22.31	173	163	H
	* 2.364	29.01	VA1T	31.9	-20.7	40.21	54	-13.79	-	-	173	163	H
4	* 2.266	40.98	PKFH	31.5	-20.8	51.68	-	-	74	-22.32	221	134	V
	* 2.265	28.99	VA1T	31.5	-20.7	39.79	54	-14.21	-	-	221	134	V
2	* 7.324	35.96	PKFH	35.6	-24.8	46.76	-	-	74	-27.24	255	174	H
	* 7.323	25.2	VA1T	35.6	-24.8	36	54	-18	-	-	255	174	H
5	* 3.662	39.41	PKFH	33.4	-28.9	43.91	-	-	74	-30.09	235	166	V
	* 3.662	28.8	VA1T	33.4	-28.9	33.3	54	-20.7	-	-	235	166	V
6	9.764	35.13	PKFH	36.9	-21.7	50.33	-	-	-	-	168	239	H
	9.764	24.13	VA1T	36.9	-21.7	39.33	-	-	-	-	168	239	H
3	9.764	36.08	PKFH	36.9	-21.7	51.28	-	-	-	-	161	130	V
	9.764	26.33	VA1T	36.9	-21.7	41.53	-	-	-	-	161	130	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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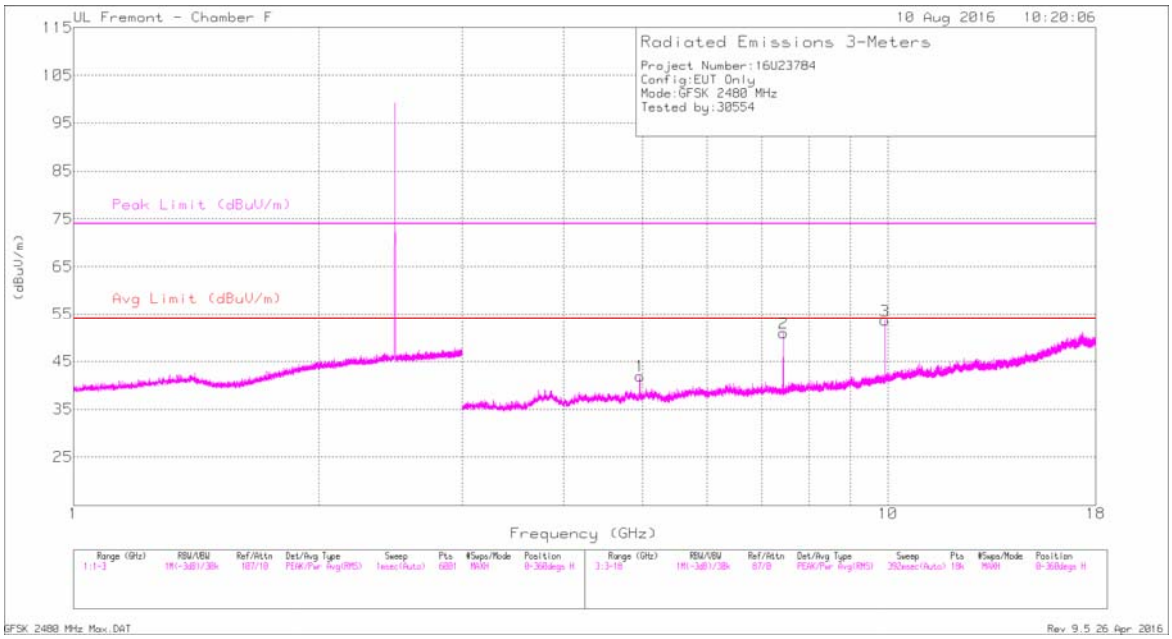
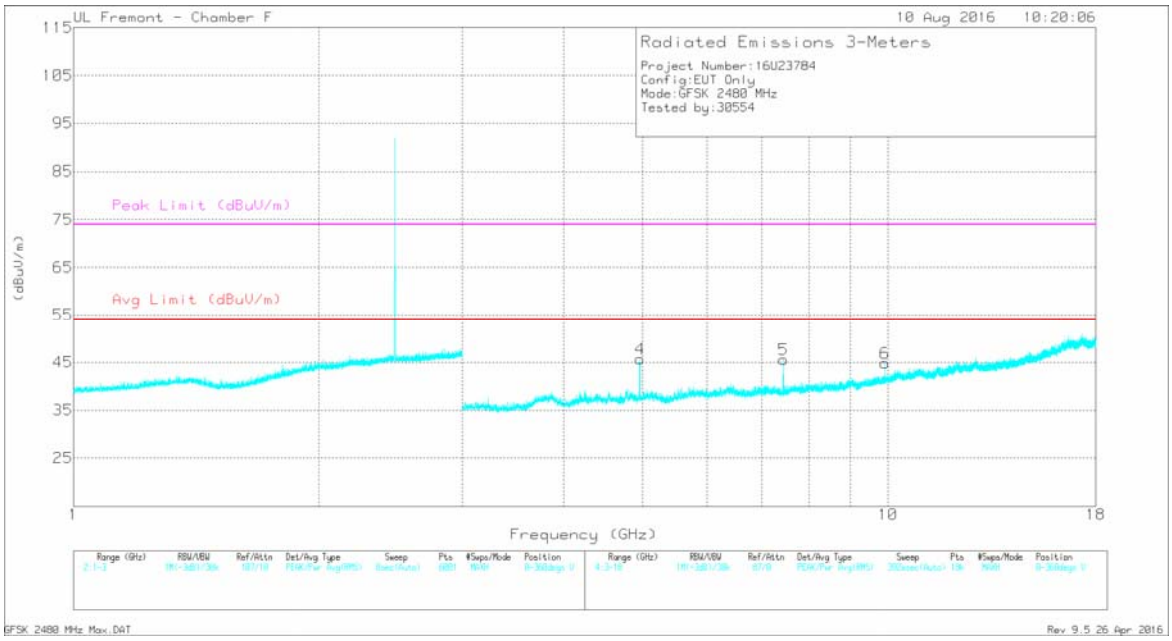
HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL 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)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.96	40.97	PKFH	34.2	-28.5	46.67	-	-	74	-27.33	71	108	H
	* 4.96	33.87	VA1T	34.2	-28.5	39.57	54	-14.43	-	-	71	108	H
2	* 7.44	44.15	PKFH	35.6	-25.8	53.95	-	-	74	-20.05	80	101	H
	* 7.44	39.65	VA1T	35.6	-25.8	49.45	54	-4.55	-	-	80	101	H
3	9.92	42.29	PKFH	37	-21.9	57.39	-	-	-	-	313	101	H
	9.92	36.78	VA1T	37	-21.9	51.88	-	-	-	-	313	101	H
4	* 4.96	43.17	PKFH	34.2	-28.5	48.87	-	-	74	-25.13	88	123	V
	* 4.96	38.18	VA1T	34.2	-28.5	43.88	54	-10.12	-	-	88	123	V
5	* 7.44	40.59	PKFH	35.6	-25.8	50.39	-	-	74	-23.61	258	108	V
	* 7.44	34.34	VA1T	35.6	-25.8	44.14	54	-9.86	-	-	258	108	V
6	9.92	35.82	PKFH	37	-21.9	50.92	-	-	-	-	29	102	V
	9.92	26.49	VA1T	37	-21.9	41.59	-	-	-	-	29	102	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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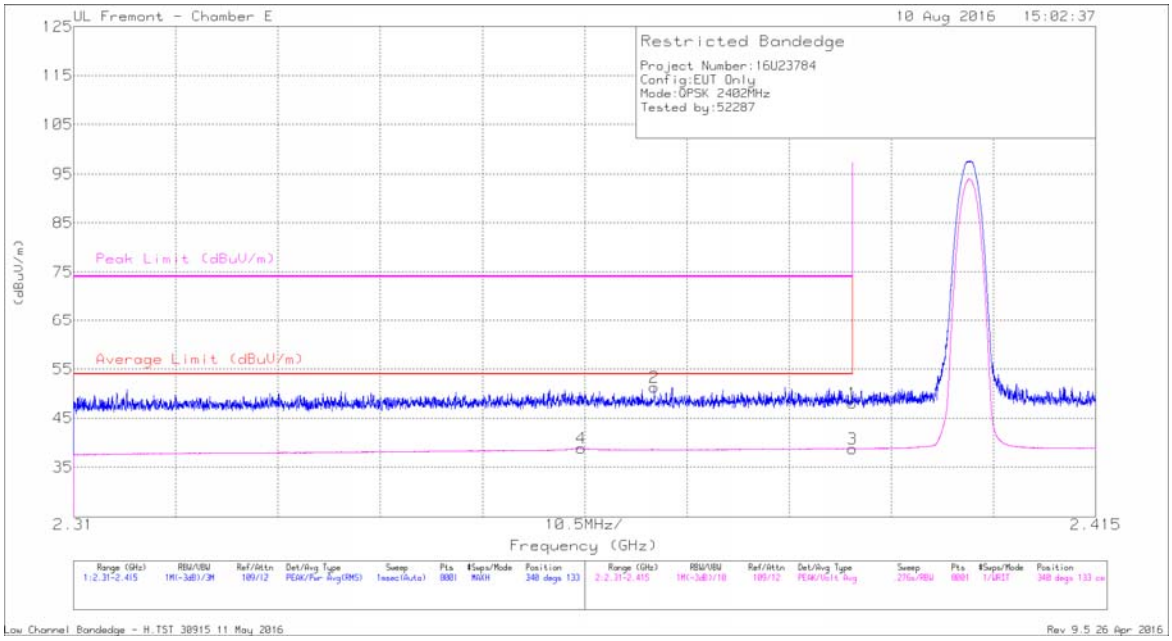
8.2.2. ENHANCED DATA RATE QPSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

LOW CHANNEL HORIZONTAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (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	35.91	Pk	32.1	-19.9	48.11	-	-	74	-25.89	340	133	H
2	* 2.37	39.31	Pk	32	-20	51.31	-	-	74	-22.69	340	133	H
3	* 2.39	26.5	VA1T	32.1	-19.9	38.7	54	-15.3	-	-	340	133	H
4	* 2.362	26.93	VA1T	31.9	-20	38.83	54	-15.17	-	-	340	133	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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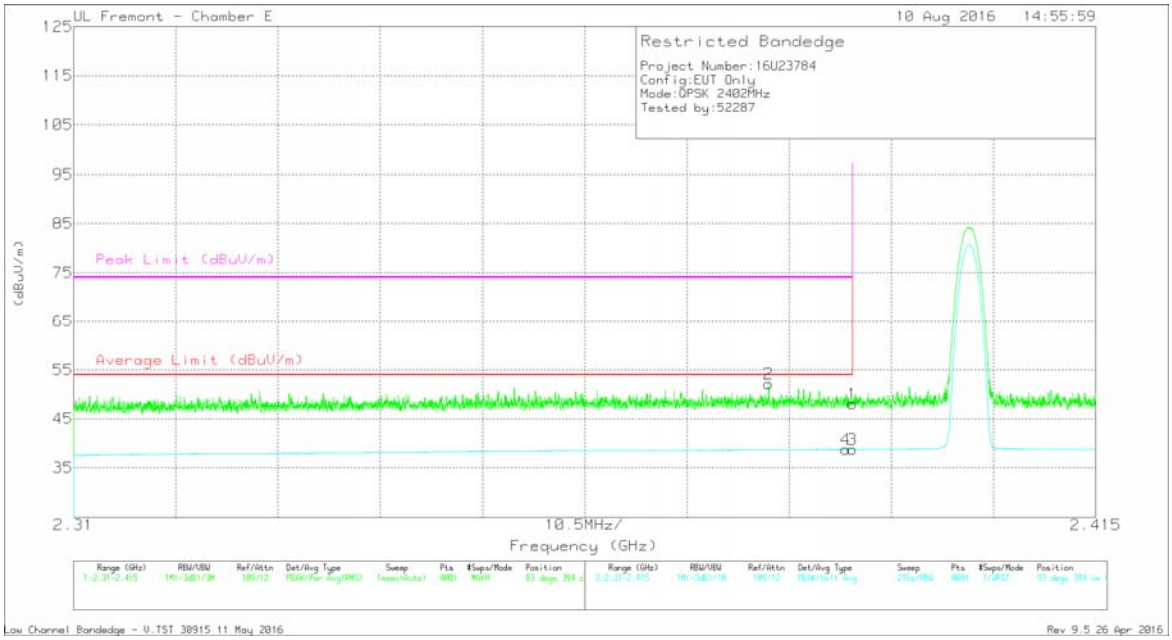
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

LOW CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (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	35.85	Pk	32.1	-19.9	48.05	-	-	74	-25.95	93	394	V
2	* 2.381	40.01	Pk	32	-19.9	52.11	-	-	74	-21.89	93	394	V
3	* 2.39	26.49	VA1T	32.1	-19.9	38.69	54	-15.31	-	-	93	394	V
4	* 2.389	26.54	VA1T	32.1	-19.9	38.74	54	-15.26	-	-	93	394	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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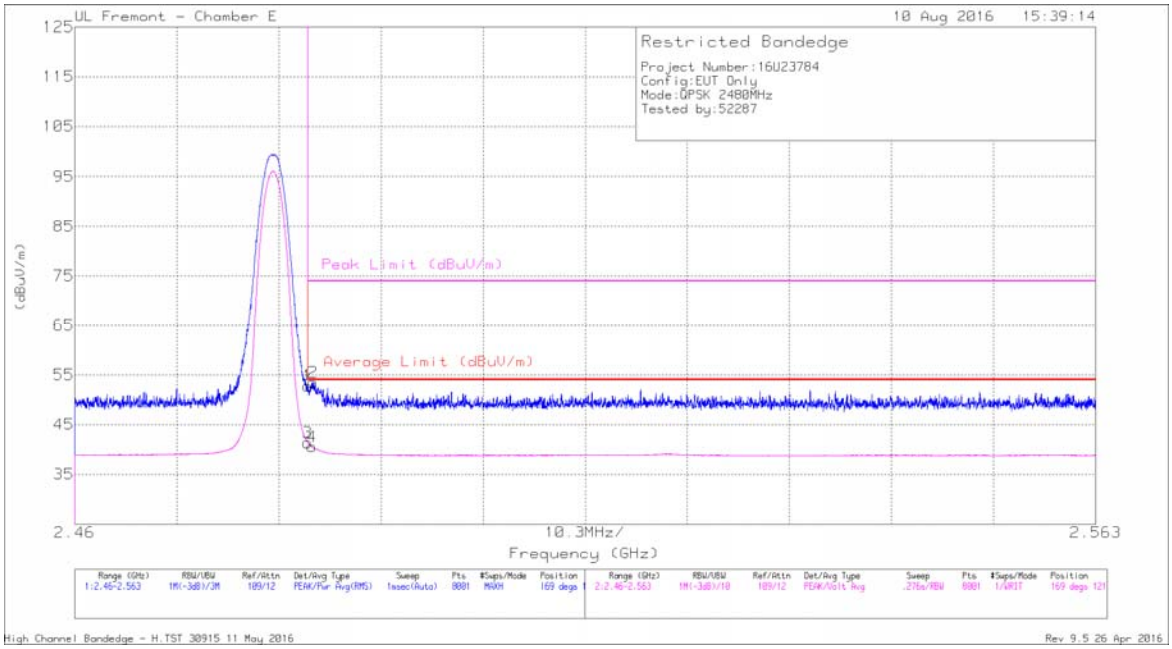
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

HIGH CHANNEL HORIZONTAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (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	52.83	-	-	74	-21.17	169	121	H
2	* 2.484	41.2	Pk	32.3	-20	53.5	-	-	74	-20.5	169	121	H
3	* 2.484	29.07	VA1T	32.3	-20	41.37	54	-12.63	-	-	169	121	H
4	* 2.484	28.22	VA1T	32.3	-20	40.52	54	-13.48	-	-	169	121	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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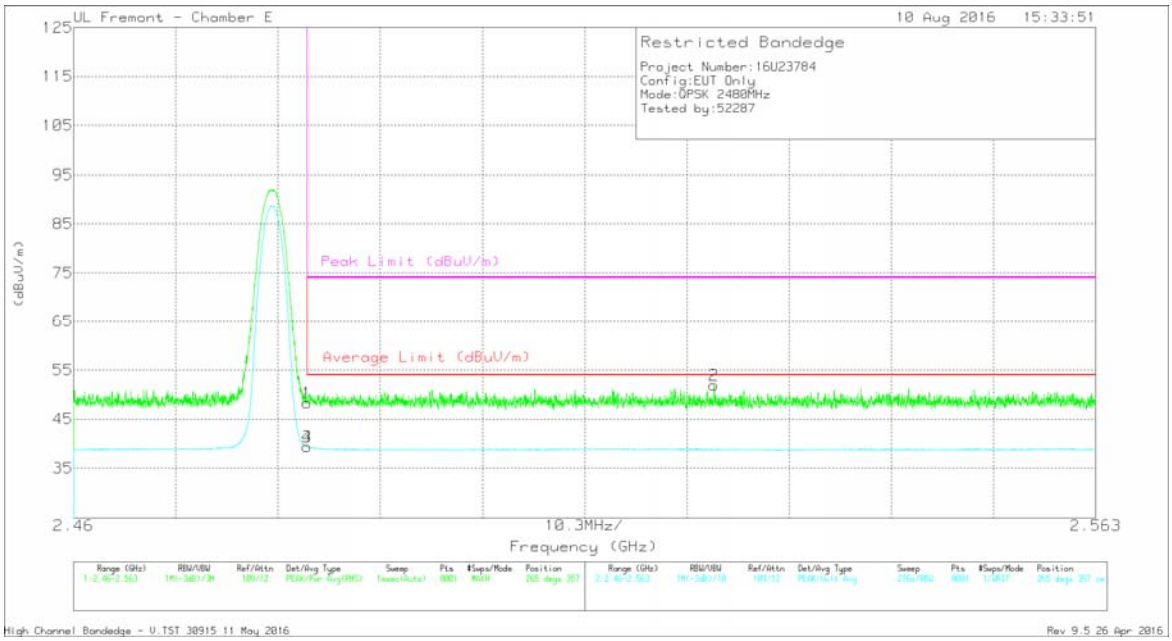
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

HIGH CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (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	35.99	Pk	32.3	-20	48.29	-	-	74	-25.71	265	357	V
2	2.525	39.58	Pk	32.4	-20.1	51.88	-	-	74	-22.12	265	357	V
3	* 2.484	27.06	VA1T	32.3	-20	39.36	54	-14.64	-	-	265	357	V
4	* 2.484	27.06	VA1T	32.3	-20	39.36	54	-14.64	-	-	265	357	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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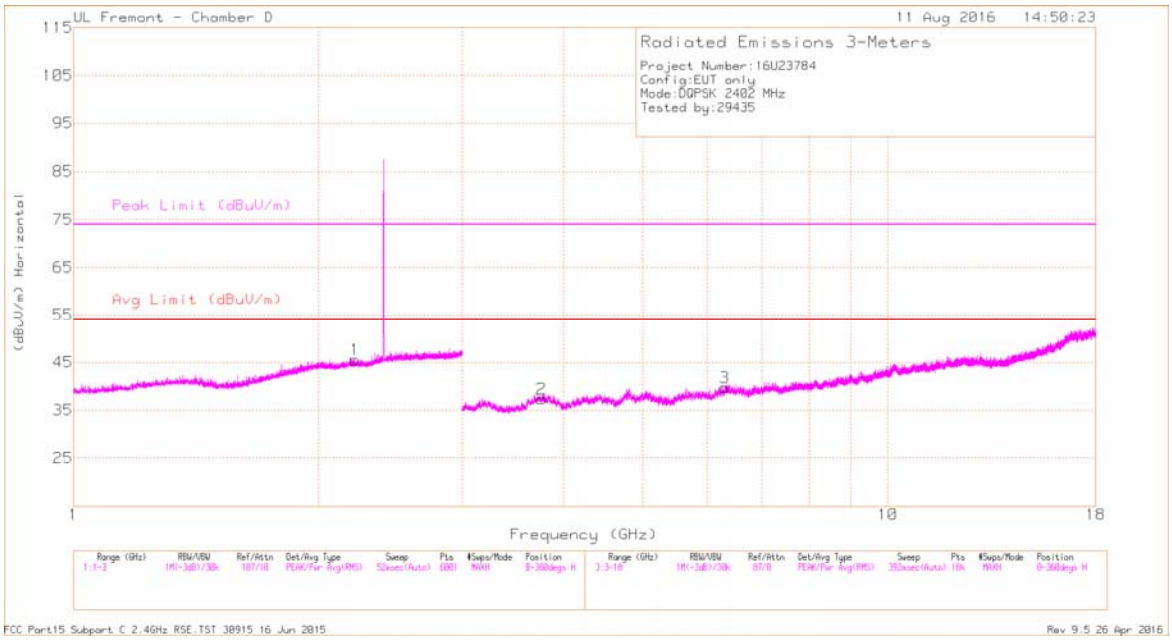
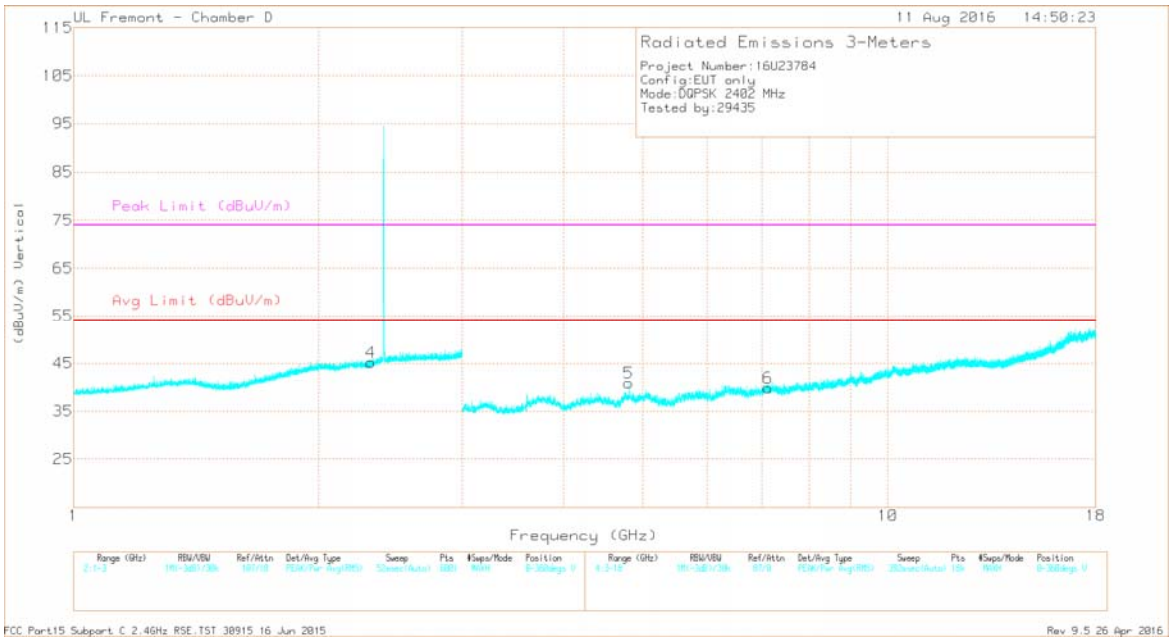
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



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DATA

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
1	* 2.218	39.91	PKFH	31.6	-20.8	50.71	-	-	74	-23.29	265	187	H
	* 2.216	28.94	VA1T	31.6	-20.8	39.74	54	-14.26	-	-	265	187	H
4	* 2.319	40.9	PKFH	31.5	-20.7	51.7	-	-	74	-22.3	180	227	V
	* 2.318	29.05	VA1T	31.5	-20.8	39.75	54	-14.25	-	-	180	227	V
2	* 3.755	36.95	PKFH	33.5	-28.2	42.25	-	-	74	-31.75	149	259	H
	* 3.755	25.7	VA1T	33.5	-28.2	31	54	-23	-	-	149	259	H
5	* 4.805	37.79	PKFH	34.1	-26.7	45.19	-	-	74	-28.81	210	273	V
	* 4.804	26.77	VA1T	34.1	-26.7	34.17	54	-19.83	-	-	210	273	V
3	6.309	24.58	VA1T	35.6	-25.8	34.38	-	-	-	-	214	308	H
	6.31	35.86	PKFH	35.6	-25.8	45.66	-	-	-	-	214	308	H
6	7.124	34.73	PKFH	35.8	-24.8	45.73	-	-	-	-	203	322	V
	7.126	23.65	VA1T	35.8	-24.9	34.55	-	-	-	-	203	322	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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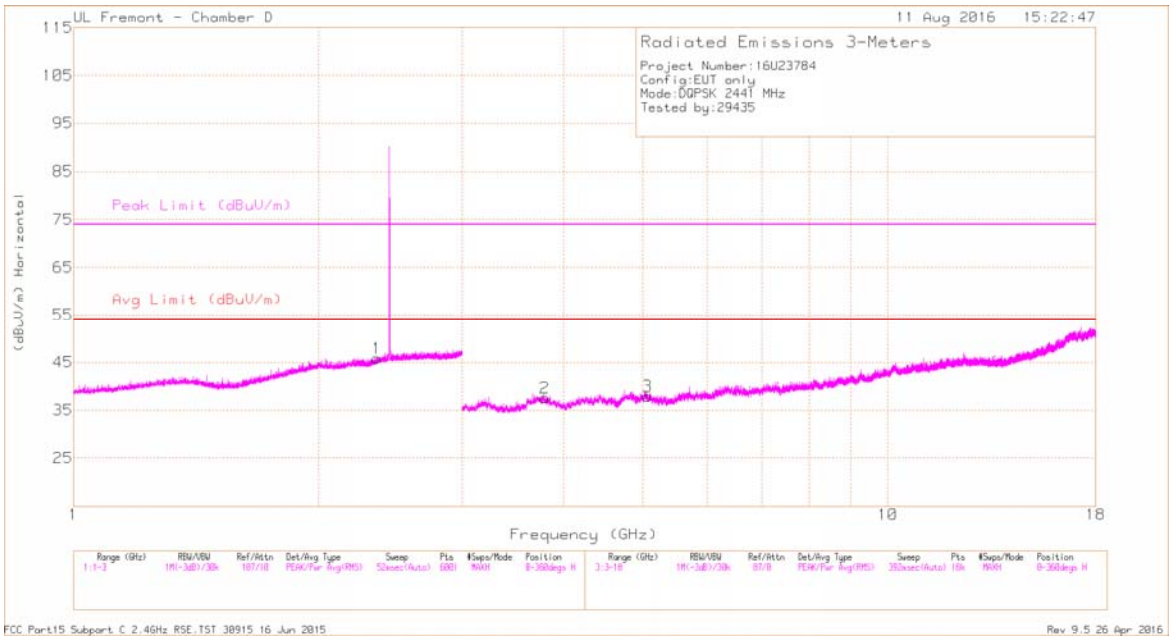
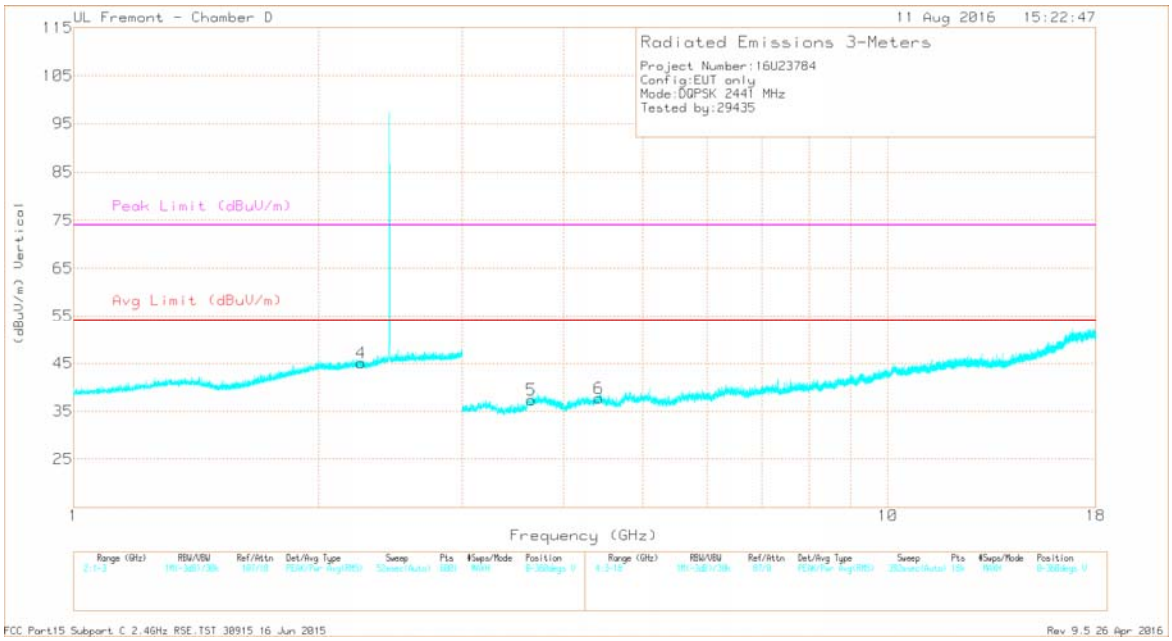
HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



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DATA

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
1	* 2.355	40.47	PKFH	31.8	-20.7	51.57	-	-	74	-22.43	283	165	H
	* 2.355	29.02	VA1T	31.8	-20.7	40.12	54	-13.88	-	-	283	165	H
4	* 2.255	40.87	PKFH	31.5	-20.8	51.57	-	-	74	-22.43	238	194	V
	* 2.256	29.32	VA1T	31.5	-20.8	40.02	54	-13.98	-	-	238	194	V
2	* 3.793	37.63	PKFH	33.5	-28.1	43.03	-	-	74	-30.97	272	163	H
	* 3.792	26.05	VA1T	33.5	-28.1	31.45	54	-22.55	-	-	272	163	H
3	* 5.063	37	PKFH	34	-26.6	44.4	-	-	74	-29.6	328	192	H
	* 5.065	25.09	VA1T	34	-26.6	32.49	54	-21.51	-	-	328	192	H
5	* 3.647	37.78	PKFH	33.4	-28.8	42.38	-	-	74	-31.62	339	226	V
	* 3.649	26.13	VA1T	33.4	-28.8	30.73	54	-23.27	-	-	339	226	V
6	4.419	37.22	PKFH	33.9	-27.4	43.72	-	-	-	-	182	251	V
	4.419	25.4	VA1T	33.9	-27.5	31.8	-	-	-	-	182	251	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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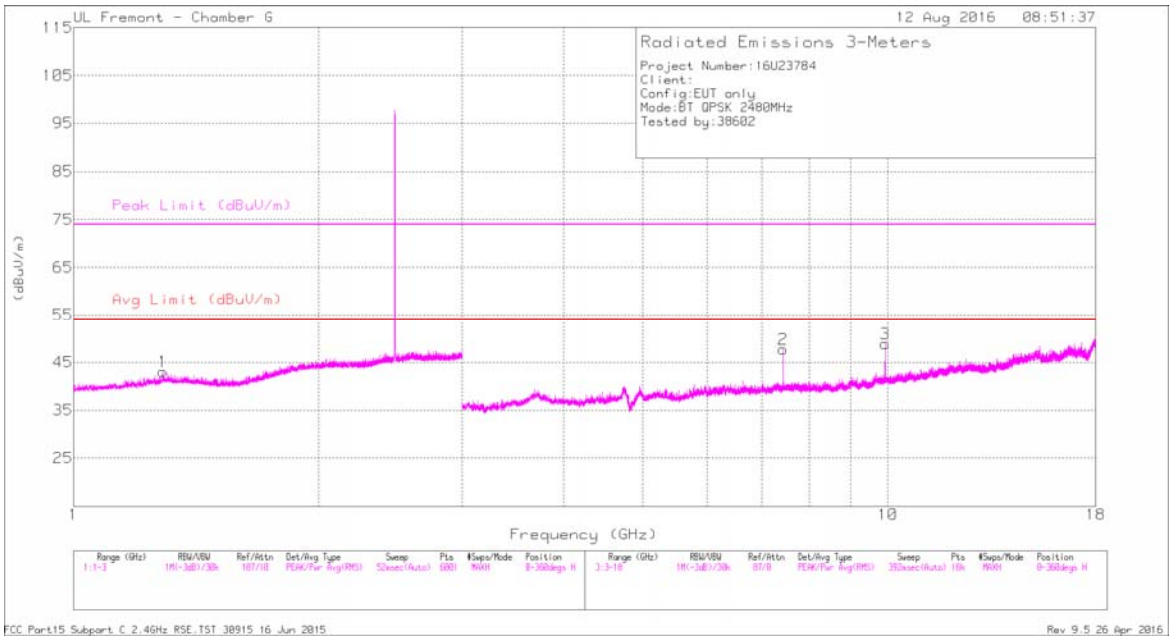
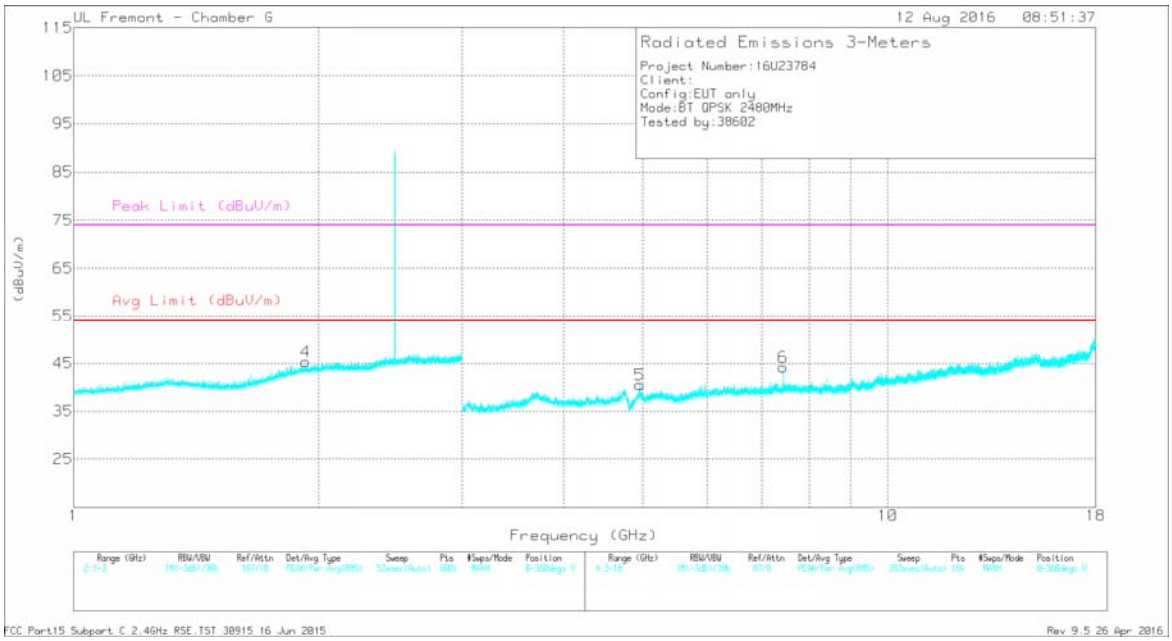
HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.287	44	PKFH	29.1	-25	48.1	-	-	74	-25.9	358	333	H
	* 1.288	32.27	VA1T	29.1	-25	36.37	54	-17.63	-	-	358	333	H
6	* 7.439	48.81	PKFH	35.9	-30.2	54.51	-	-	74	-19.49	208	104	H
2	* 7.44	40.9	VA1T	35.9	-30.2	46.6	54	-7.4	-	-	208	104	H
5	* 4.96	41.68	PKFH	34.6	-31.8	44.48	-	-	74	-29.52	205	322	V
	* 4.962	30.75	VA1T	34.6	-31.7	33.65	54	-20.35	-	-	205	322	V
	* 7.44	41.21	PKFH	35.9	-30.2	46.91	-	-	74	-27.09	101	314	V
	* 7.438	29.12	VA1T	35.9	-30.2	34.82	54	-19.18	-	-	101	314	V
4	1.929	44.09	PKFH	31.5	-24.3	51.29	-	-	-	-	167	225	V
	1.929	31.25	VA1T	31.5	-24.3	38.45	-	-	-	-	167	225	V
3	9.92	46.12	PKFH	37.1	-27.1	56.12	-	-	-	-	69	109	H
	9.92	35.18	VA1T	37.1	-27.1	45.18	-	-	-	-	69	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

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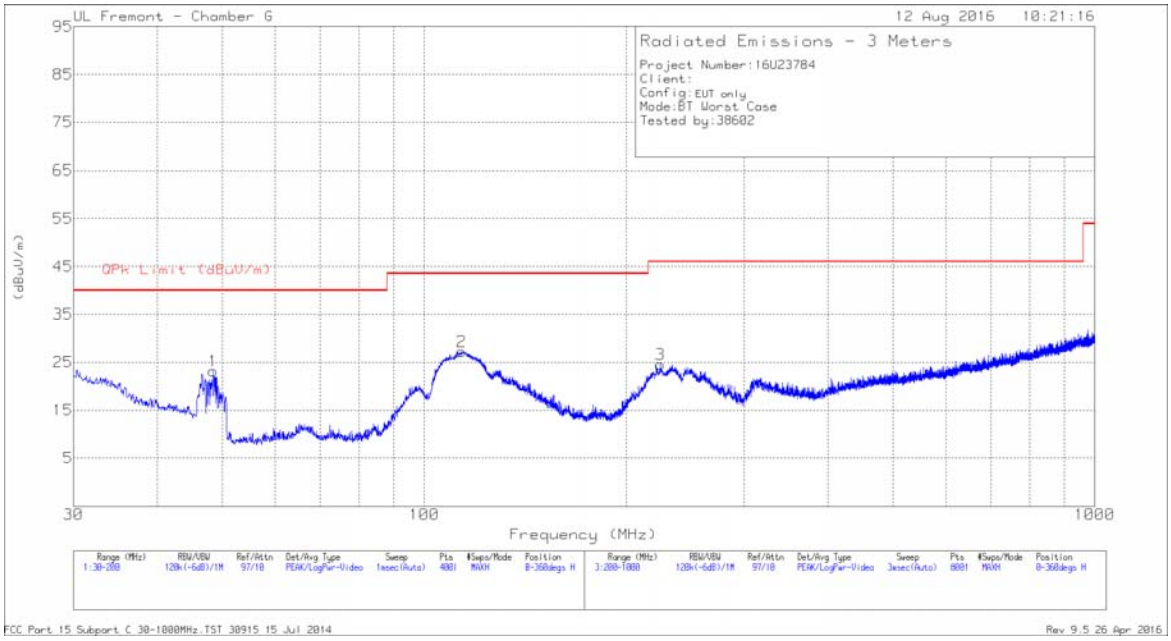
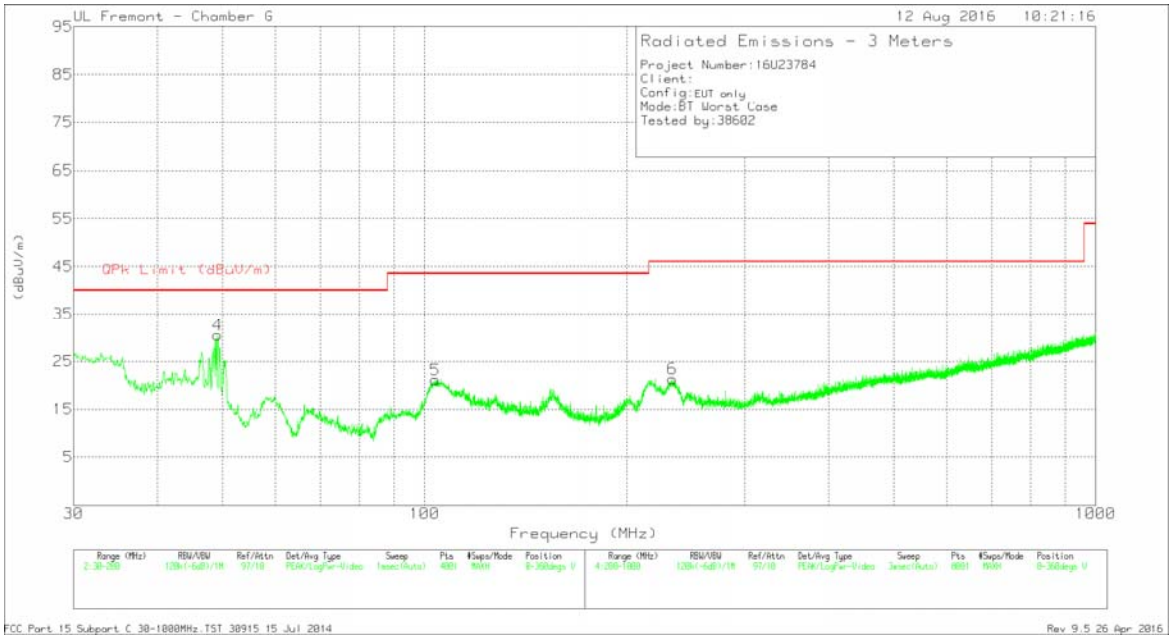
8.3. WORST-CASE BELOW 1 GHz

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 T900 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 113.767	40.56	Pk	17	-30.3	27.26	43.52	-16.2	0-360	299	H
1	48.487	42	Pk	12.2	-31	23.2	40	-16.8	0-360	299	H
4	49.21	49.71	Pk	11.8	-31	30.51	40	-9.49	0-360	100	V
5	103.822	36.46	Pk	15.1	-30.4	21.16	43.52	-22.3	0-360	100	V
3	225.1	39.33	Pk	14.7	-29.5	24.53	46.02	-21.4	0-360	100	H
6	233.9	35.65	Pk	15.1	-29.4	21.35	46.02	-24.6	0-360	100	V

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

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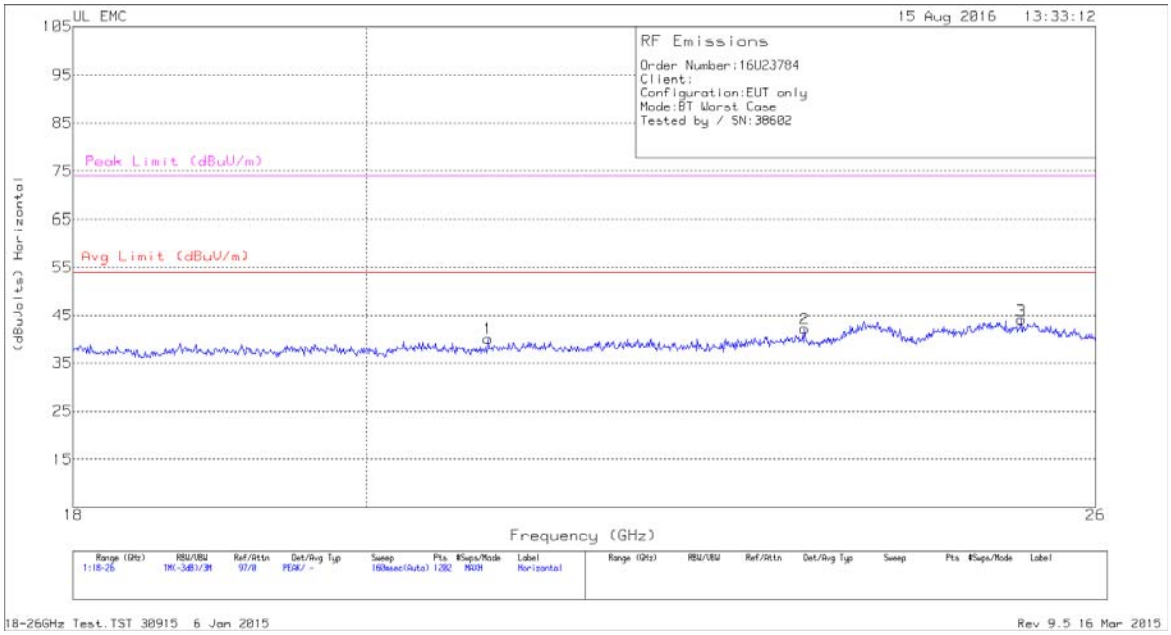
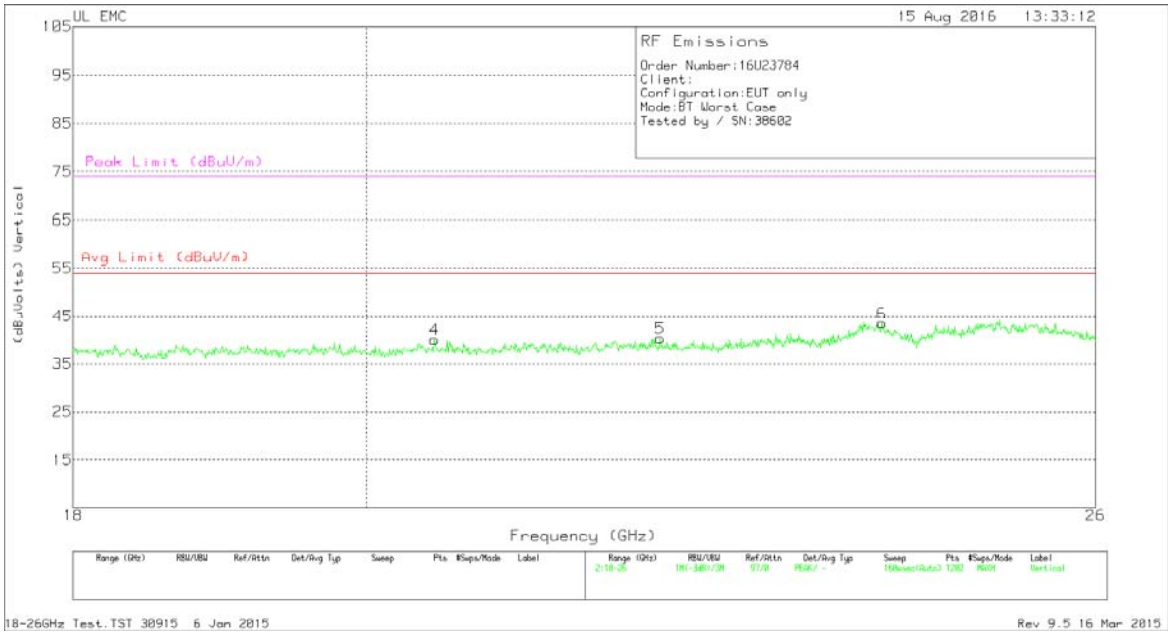
8.4. WORST-CASE ABOVE 18 GHz

SPURIOUS EMISSIONS 18 TO 26 GHz (WORST-CASE CONFIGURATION, HORIZONTAL & VERTICAL)





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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	20.898	41.7	Pk	33.1	-25.3	-9.5	40	54	-14	74	-34
2	23.415	42.37	Pk	33.7	-24.4	-9.5	42.1	54	-11.8	74	-31.8
3	25.314	43.7	Pk	34.3	-24.5	-9.5	44	54	-10	74	-30
4	20.498	41.7	Pk	32.9	-25.1	-9.5	40	54	-14	74	-34
5	22.23	40.93	Pk	33.5	-24.6	-9.5	40.3	54	-13.6	74	-33.6
6	24.075	43.4	Pk	34	-24.4	-9.5	43.5	54	-10.5	74	-30.5

Pk - Peak detector

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9. 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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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	.17025	37.34	Qp	0	0	10.1	47.44	64.95	-17.51	-	-
2	.17025	21.43	Ca	0	0	10.1	31.53	-	-	54.95	-23.42
3	.2535	34.29	Qp	0	0	10.1	44.39	61.64	-17.25	-	-
4	.2535	19.66	Ca	0	0	10.1	29.76	-	-	51.64	-21.88
5	.771	26.82	Qp	0	0	10.1	36.92	56	-19.08	-	-
6	.76987	20.24	Ca	0	0	10.1	30.34	-	-	46	-15.66
7	1.28513	18.63	Qp	0	.1	10.1	28.83	56	-27.17	-	-
8	1.284	11.04	Ca	0	.1	10.1	21.24	-	-	46	-24.76
9	5.24175	19.51	Qp	0	.1	10.1	29.71	60	-30.29	-	-
10	5.24175	13.04	Ca	0	.1	10.1	23.24	-	-	50	-26.76
11	18.213	17.99	Qp	0	.2	10.3	28.49	60	-31.51	-	-
12	18.22875	10.99	Ca	0	.2	10.3	21.49	-	-	50	-28.51

Qp - Quasi-Peak detector

Ca - CISPR average detection

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	.17025	38.68	Qp	0	0	10.1	48.78	64.95	-16.17	-	-
14	.17025	21.54	Ca	0	0	10.1	31.64	-	-	54.95	-23.31
15	.25575	35.24	Qp	0	0	10.1	45.34	61.57	-16.23	-	-
16	.25463	17.87	Ca	0	0	10.1	27.97	-	-	51.6	-23.63
17	.771	23.13	Qp	0	0	10.1	33.23	56	-22.77	-	-
18	.771	14.99	Ca	0	0	10.1	25.09	-	-	46	-20.91
19	1.2615	17.34	Qp	0	.1	10.1	27.54	56	-28.46	-	-
20	1.27275	7.14	Ca	0	.1	10.1	17.34	-	-	46	-28.66
21	5.24175	17.6	Qp	0	.1	10.1	27.8	60	-32.2	-	-
22	5.24175	11.47	Ca	0	.1	10.1	21.67	-	-	50	-28.33
23	18.2355	12.69	Qp	0	.2	10.3	23.19	60	-36.81	-	-
24	18.2355	4.84	Ca	0	.2	10.3	15.34	-	-	50	-34.66

Qp - Quasi-Peak detector

Ca - CISPR average detection

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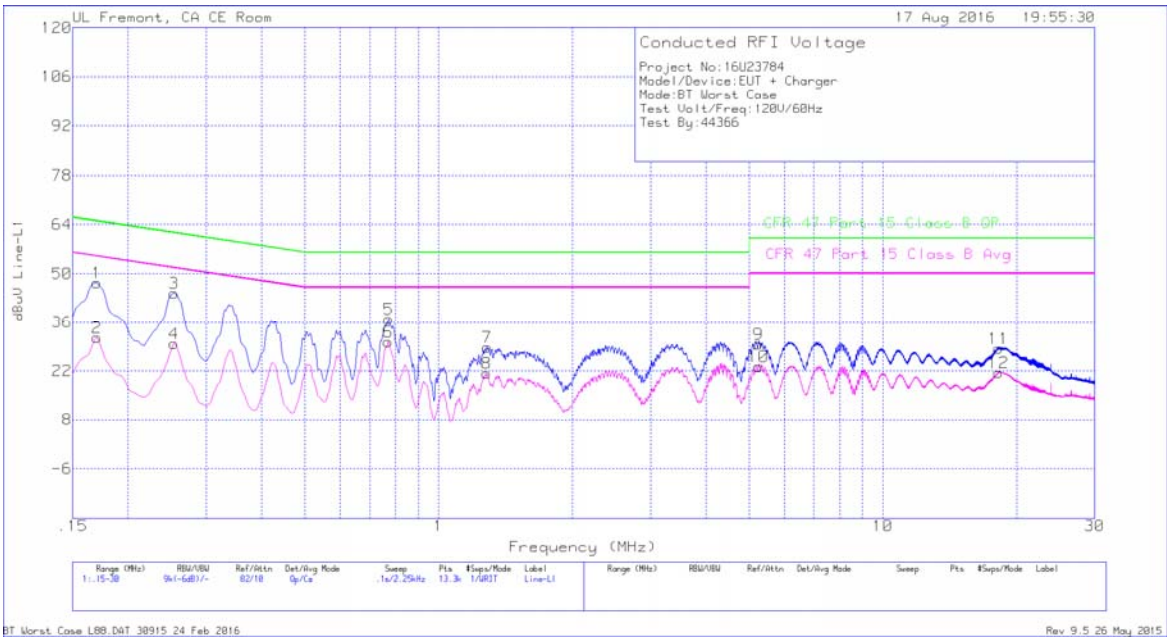
LINE 1 RESULTS



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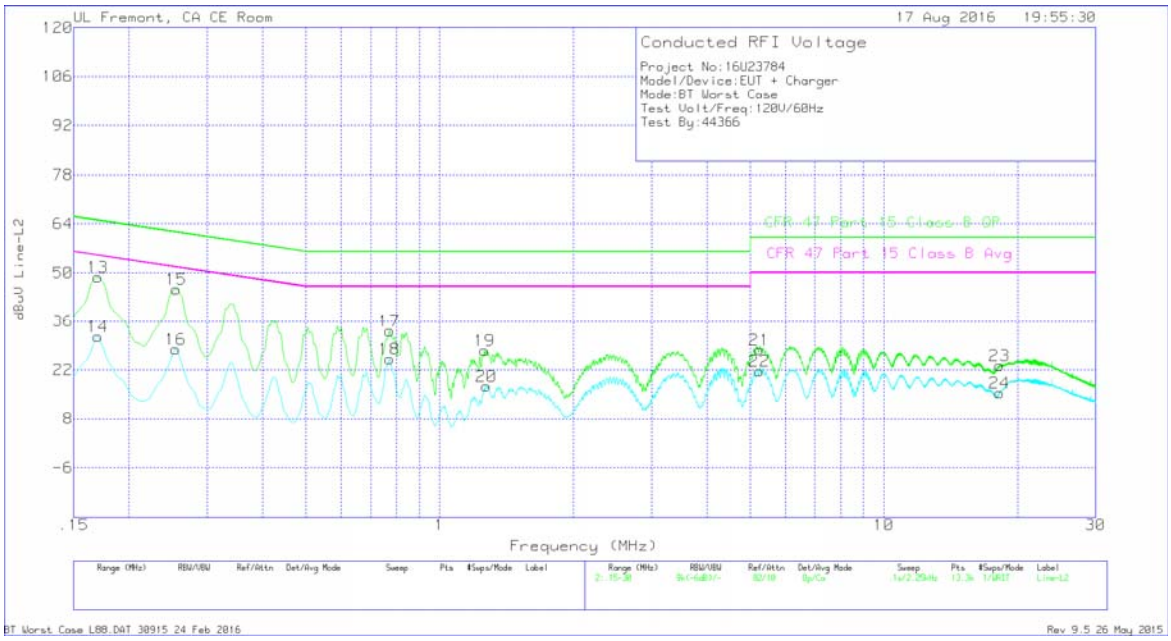
LINE 2 RESULTS



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