



CERTIFICATION TEST REPORT

Report Number. : 11692709-E5V1

Applicant : QUALCOMM TECHNOLOGIES, INC.
5770 MOREHOUSE DRIVE,
SAN DIEGO, CA 92121, USA

FCC ID : J9C2NET2LTE
IC : 2723A-2NET2LTE

Model Number : QCL-HUB-2.0-US

EUT Description : WIRELESS DATA HUB

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS – 247 ISSUE 2

Date Of Issue:

September 15, 2017

Prepared by:

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	09/15/17	Initial Review	--

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: QUALCOMM TECHNOLOGIES, INC.
5770 MOREHOUSE DRIVE,
SAN DIEGO, CA 92121 USA

EUT DESCRIPTION: WIRELESS DATA HUB

SERIAL NUMBER: QUALC001TN10M1RP74, QUALC001TN10M1RN3C

DATE TESTED: JULY 28 to AUGUST 07, 2017

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 Issue 2	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
UL Verification Services Inc. By:



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PROGRAM MANAGER
UL VERIFICATION SERVICES INC.

Prepared By:



TOM CHEN
LABORATORY ENGINEER
UL VERIFICATION SERVICES INC.

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 2.

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: 22541-1)
☒ Chamber B(IC: 2324B-2)	☐ Chamber E(IC: 22541-2)
☒ Chamber C(IC: 2324B-3)	☐ Chamber F(IC: 22541-3)
	☐ Chamber G(IC: 22541-4)
	☐ Chamber H(IC: 22541-5)

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>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
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%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

This EUT is a 2net2 device (LTE North American Version AT&T) that has the following radio modules:

- Wistron WWAN module, M14Q2FG.
- Qualcomm Unlicensed Module, QCA WCN 3660.

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	11.10	12.88
2402 - 2480	Enhanced 8PSK	11.00	12.59

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Monopole antenna with a maximum gain of 2.1dBi.

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was adb Ver.1.0.26, QRCT Ver.3.0.84.0

5.5. WORST-CASE CONFIGURATION AND MODE

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

Radiated emission below 1 GHz, above 18 GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Worst-case data rates were:

GFSK mode: DH5

8PSK mode: 3-DH5

DQPSK mode has been verified to have the lowest power.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

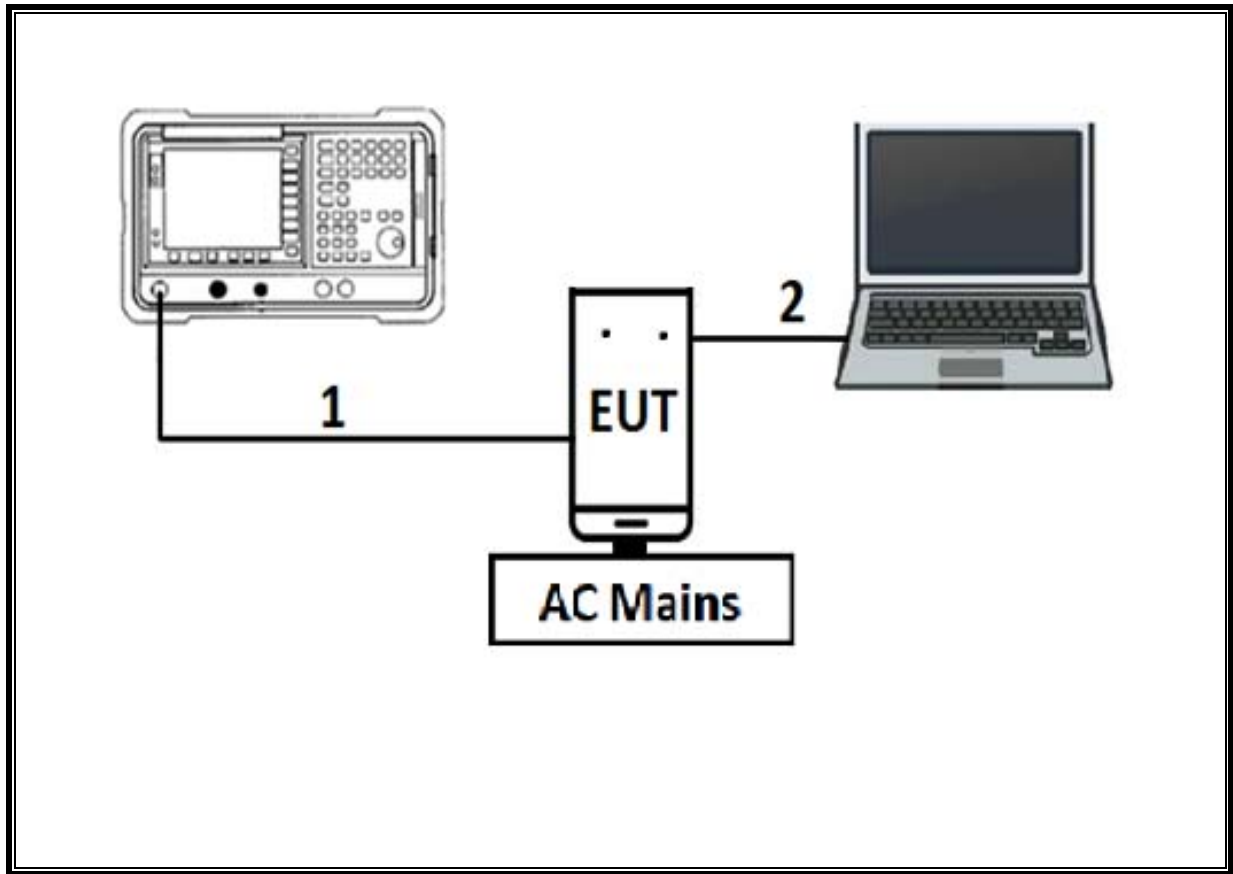
Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	HP	PPP012D-S	WCNXF0AAR4QOCS	N/A
Laptop	HP	EliteBook 6930p	2CE00821BZ	N/A

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	RF	Shielded	0.2	To Spectrum Analyzer
2	USB	1	USB	Un-shielded	1m	Laptop to EUT

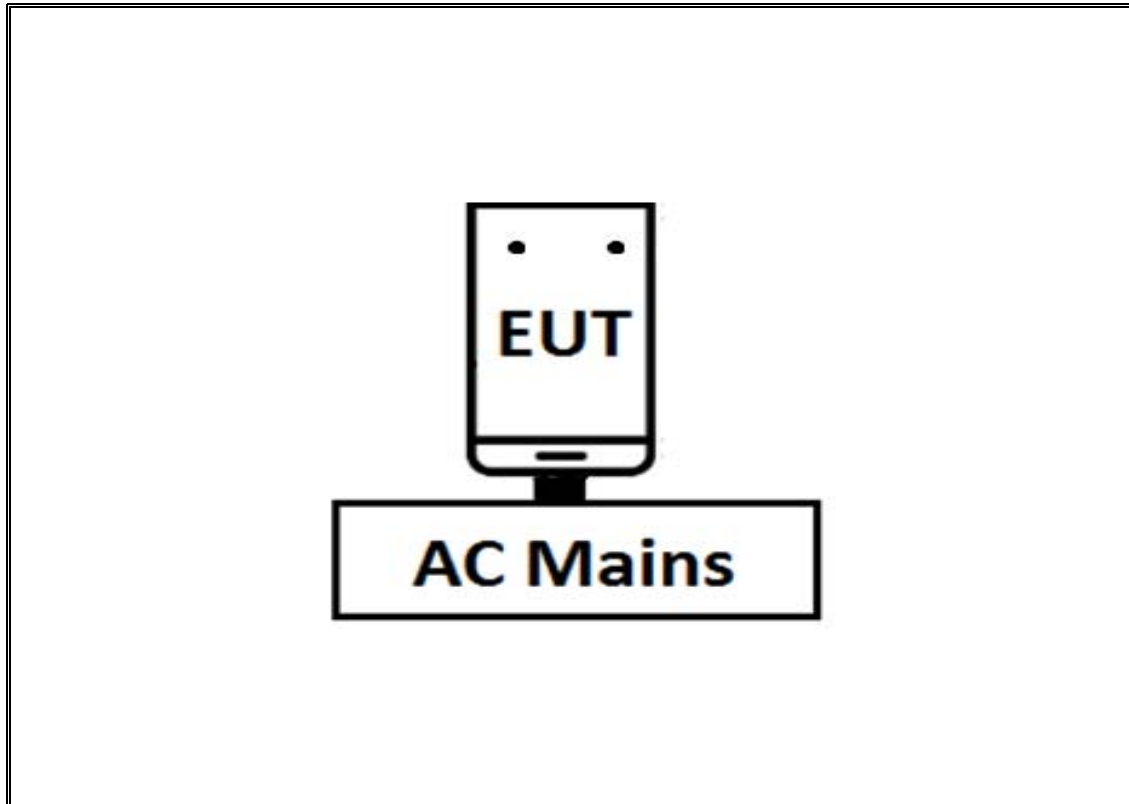
TEST SETUP- CONDUCTED PORT

SETUP DIAGRAM



TEST SETUP- RADIATED-ABOVE 1 GHZ and AC LINE CONDUCTED TESTS

SETUP DIAGRAM



6. TEST AND MEASUREMENT EQUIPMENT

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Antenna, Broadband Hybrid, 30MHz to 2000MHz w/4dB Pad	Sunol Sciences Corp.	JB3	T477	06/22/2018
Antenna, Active Loop 9kHz-30MHz	ETS-Lindgren	6502	T1683	02/17/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T712	01/30/2018
Antenna, Horn 18-26.5GHz	ARA	MWH-1826/B	T449	06/12/2018
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1264	07/08/2018
Power Sensor, P – series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T413	06/20/2018
Amplifier, 1-26.5GHz	MITEQ	AFS42-00101800-25-S-42	T1165	08/01/2017
Amplifier, 1-26.5GHz	Agilent (Keysight) Technologies	8449B	T404	07/05/2018
Amplifier, 10kHz-1GHz	Agilent (Keysight) Technologies	8447D	T15	08/26/2017
Amplifier, 1-8 GHz	MITEQ	AMF-4D-01000800-30-29P	T1170	04/28/2018
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Agilent (Keysight) Technologies	E4440A	T908	04/13/2018
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T907	01/23/2018
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Agilent (Keysight) Technologies	E9030A	T905	01/11/2018
LISN	FISCHER	FCC-LISN-50/250-25-2-01	T1310	06/08/2018

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Ver 9.5, Apr 26, 2016
Antenna Port Software	UL	UL RF	Ver 6.8, June 08, 2017

7. ANTENNA PORT TEST RESULTS

ON TIME AND DUTY CYCLE

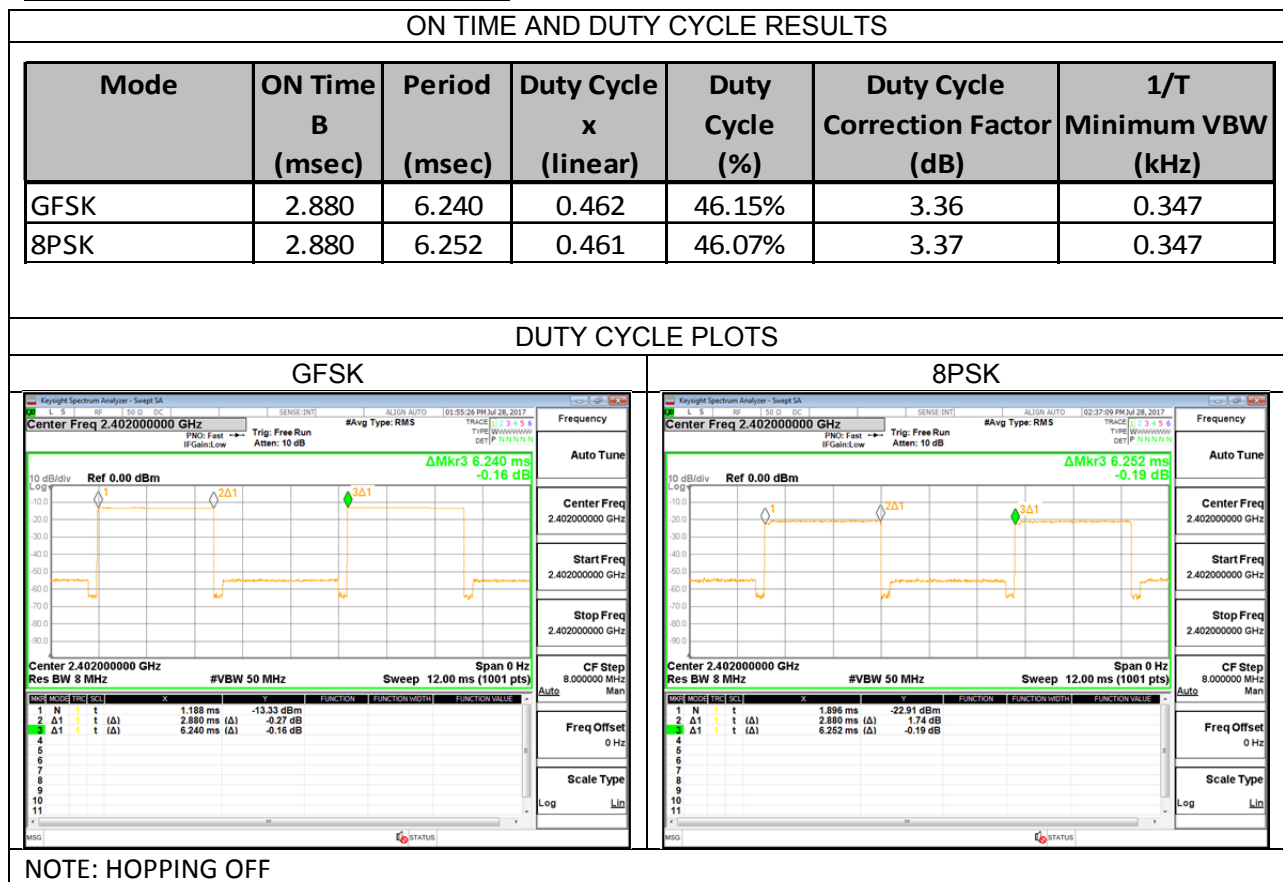
LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS



7.1. BASIC DATA RATE GFSK MODULATION

7.1.1. 20 dB BANDWIDTH

LIMITS

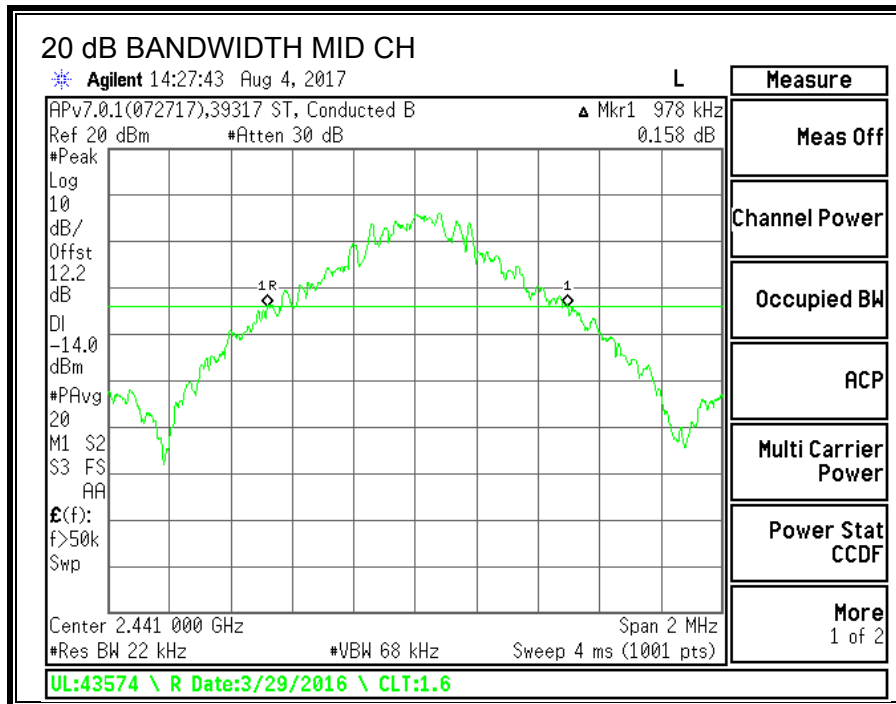
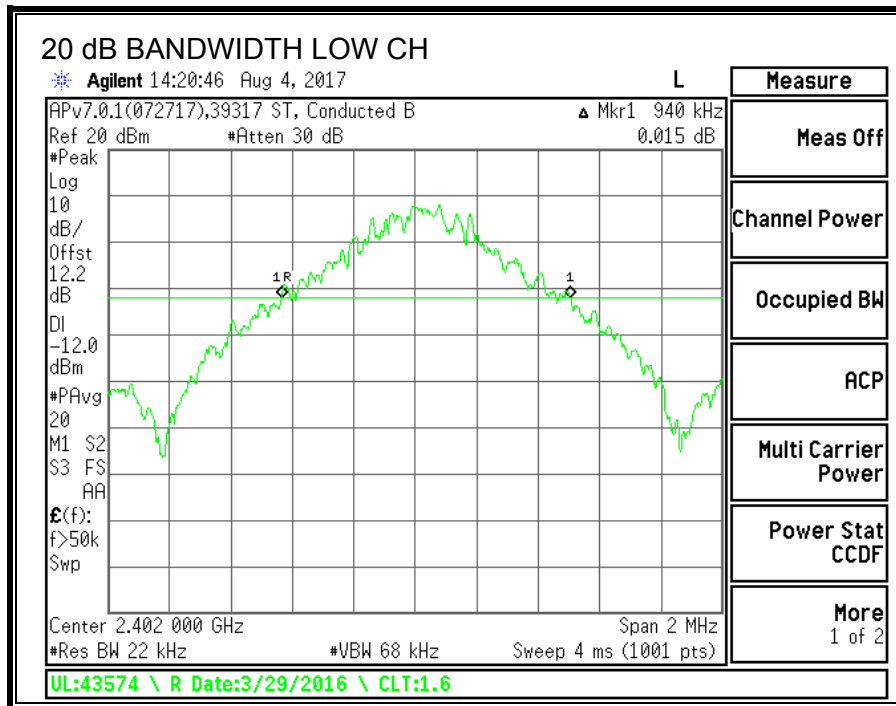
None; for reporting purposes only.

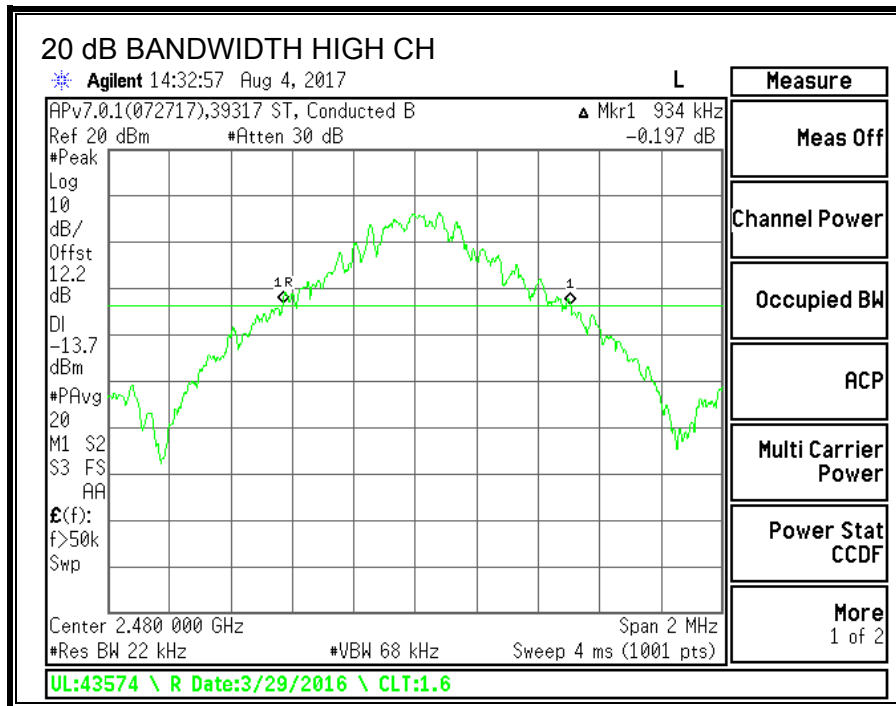
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (KHz)
Low	2402	940
Middle	2441	978
High	2480	934





7.1.2. 99% BANDWIDTH

LIMITS

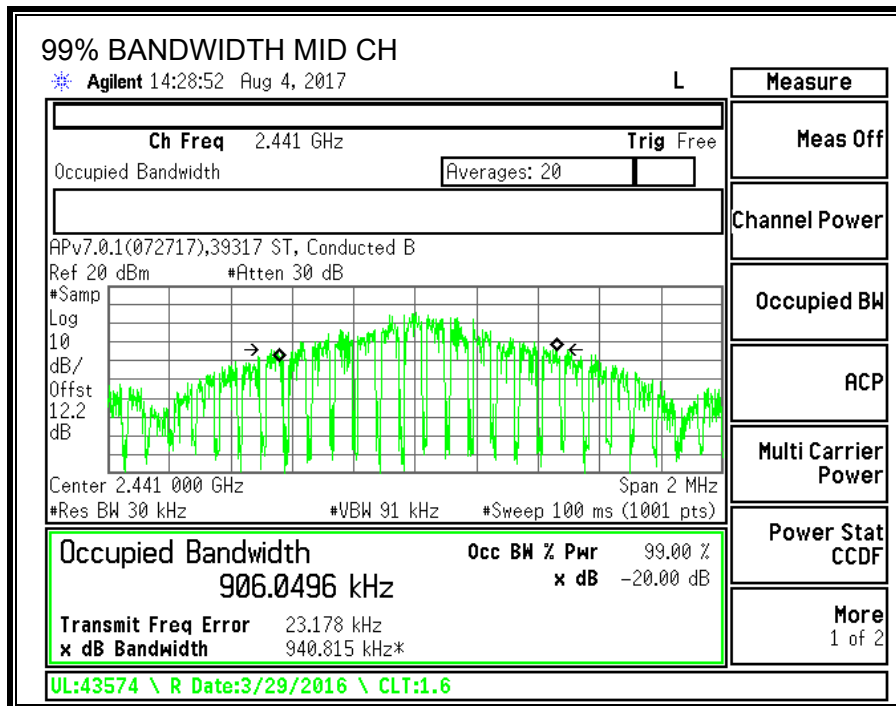
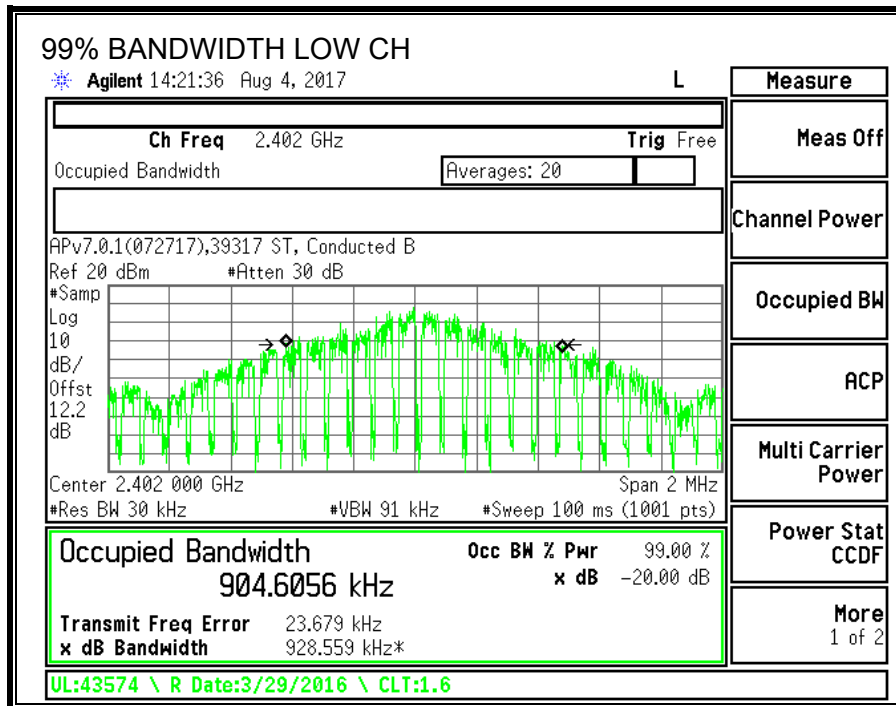
None; for reporting purposes only.

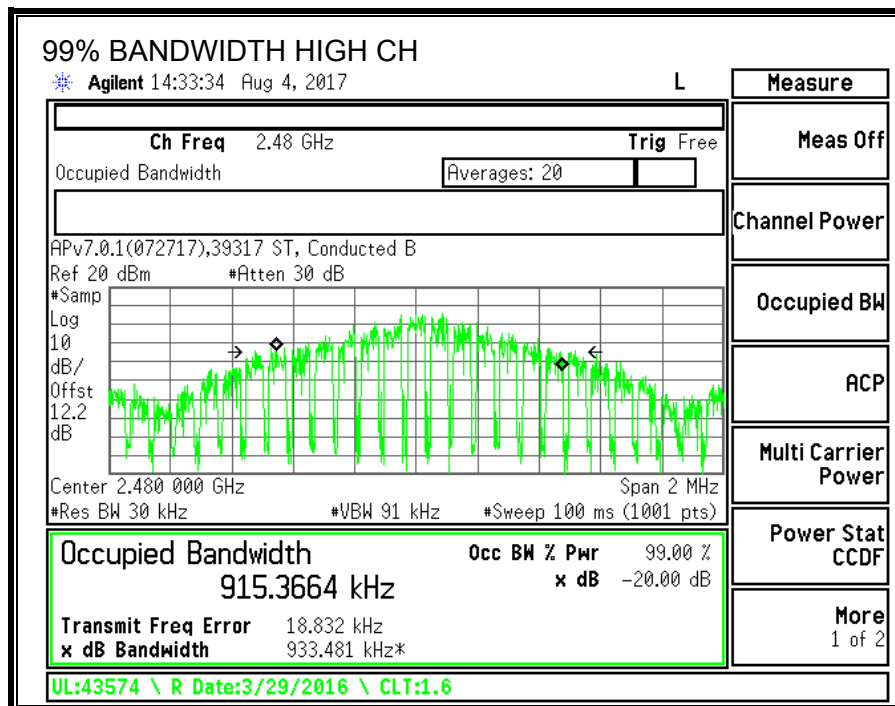
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 1 to 3% of the 99% bandwidth and 1% of the Span. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (KHz)
Low	2402	904.6056
Middle	2441	906.0496
High	2480	915.3664





7.1.3. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)
IC RSS-247 (5.1) (b)

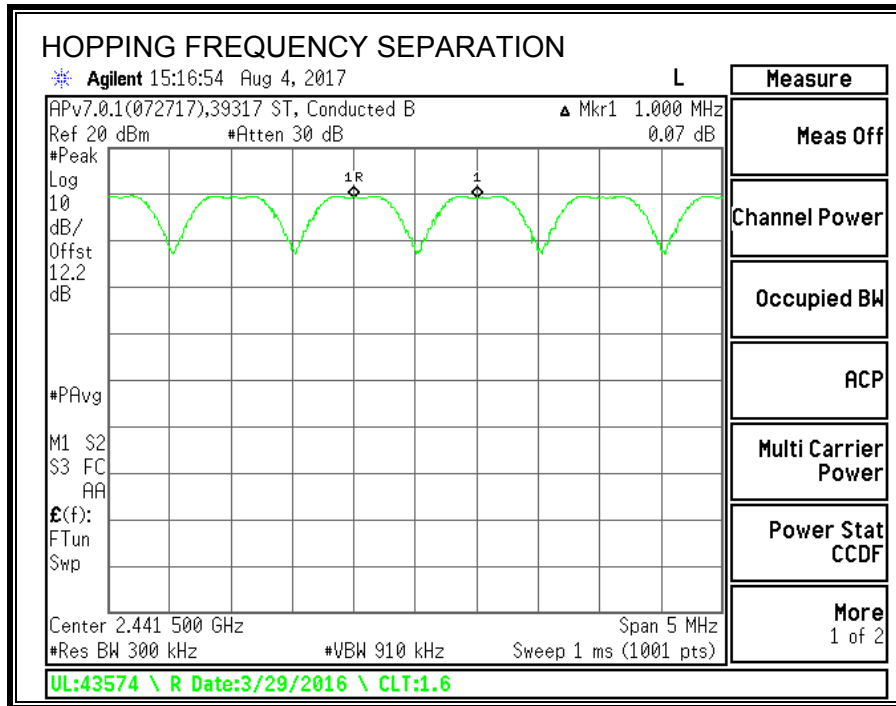
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

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



7.1.4. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)
IC RSS-247 (5.1) (d)

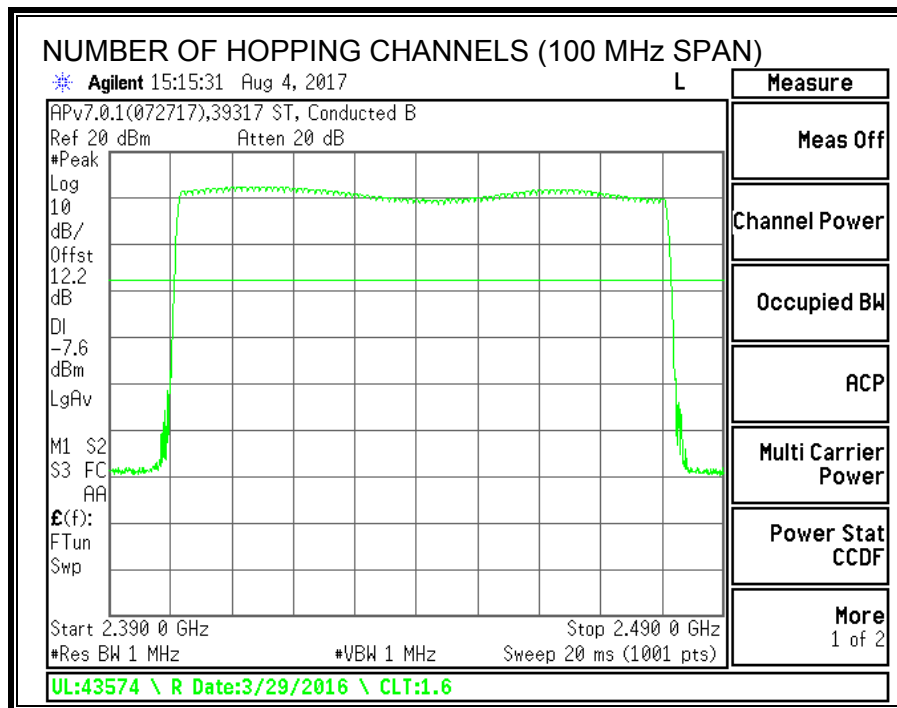
Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

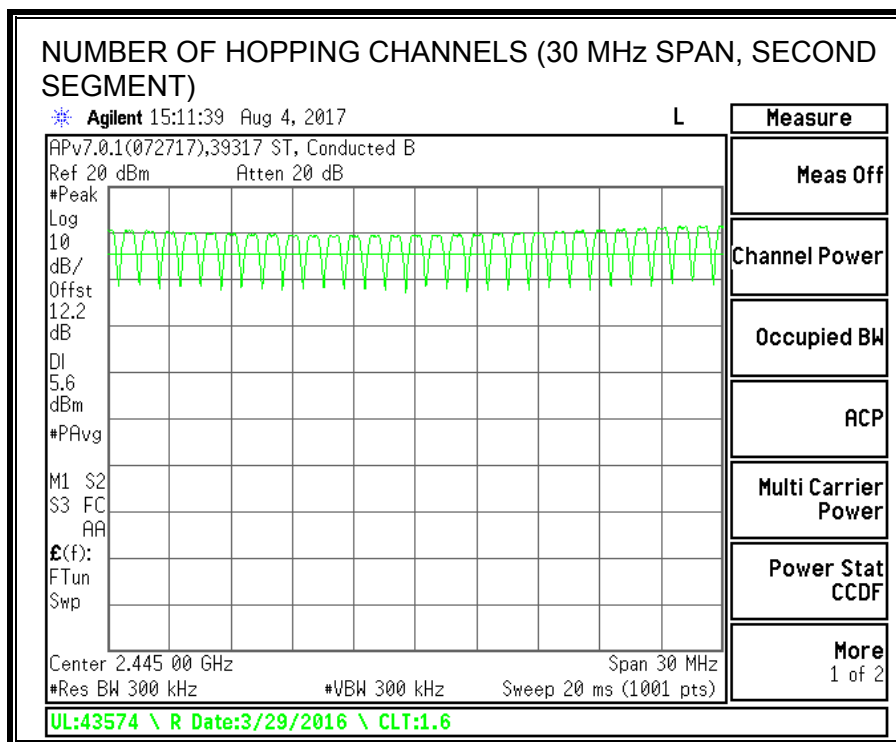
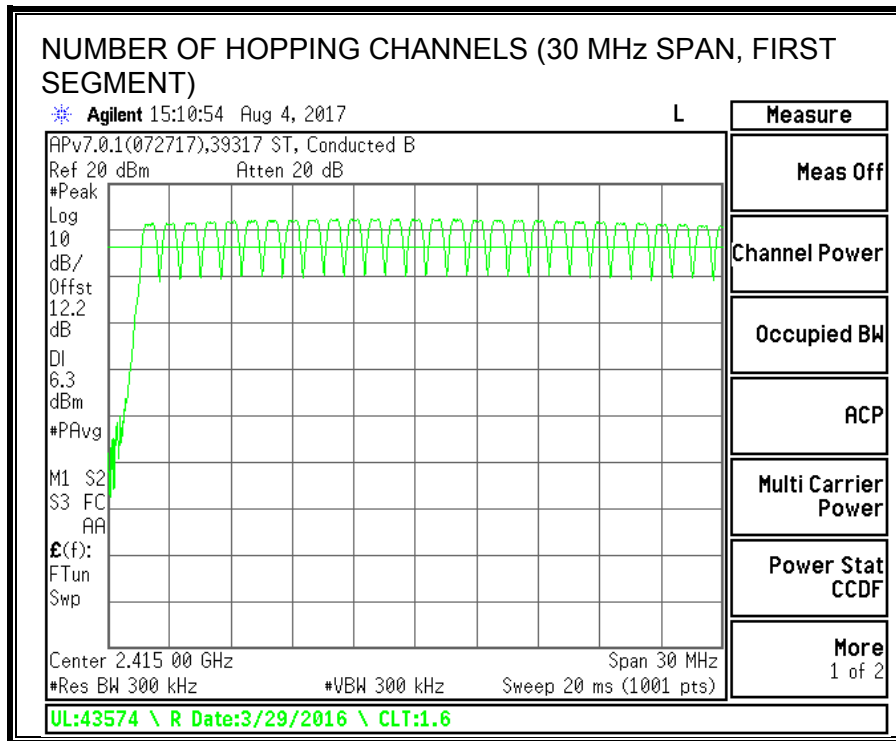
TEST PROCEDURE

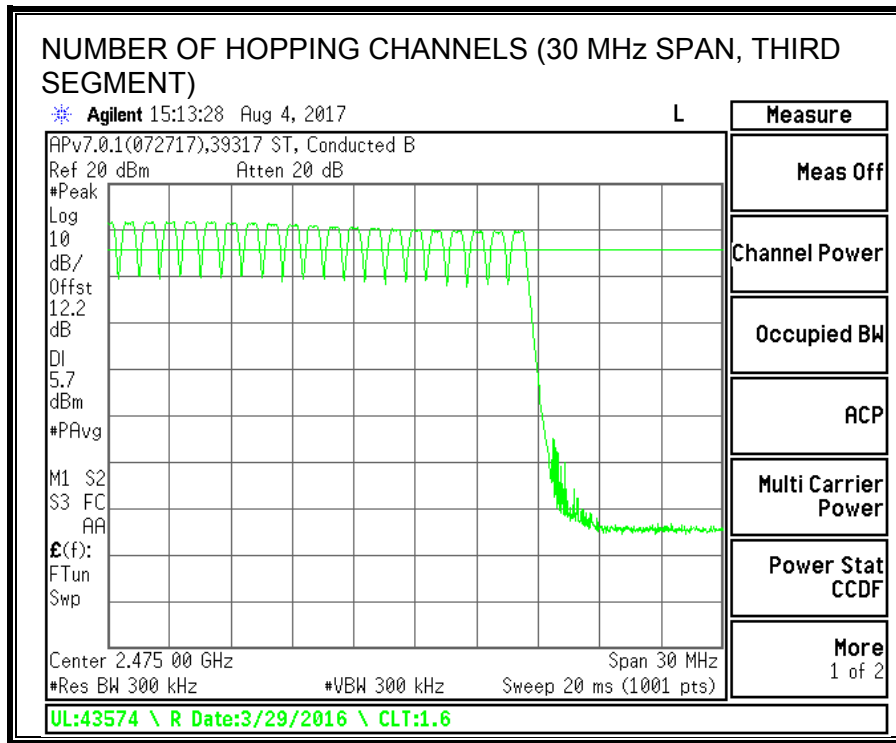
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

Normal Mode: 79 Channels observed.







7.1.5. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)
IC RSS-247 (5.1) (d)

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

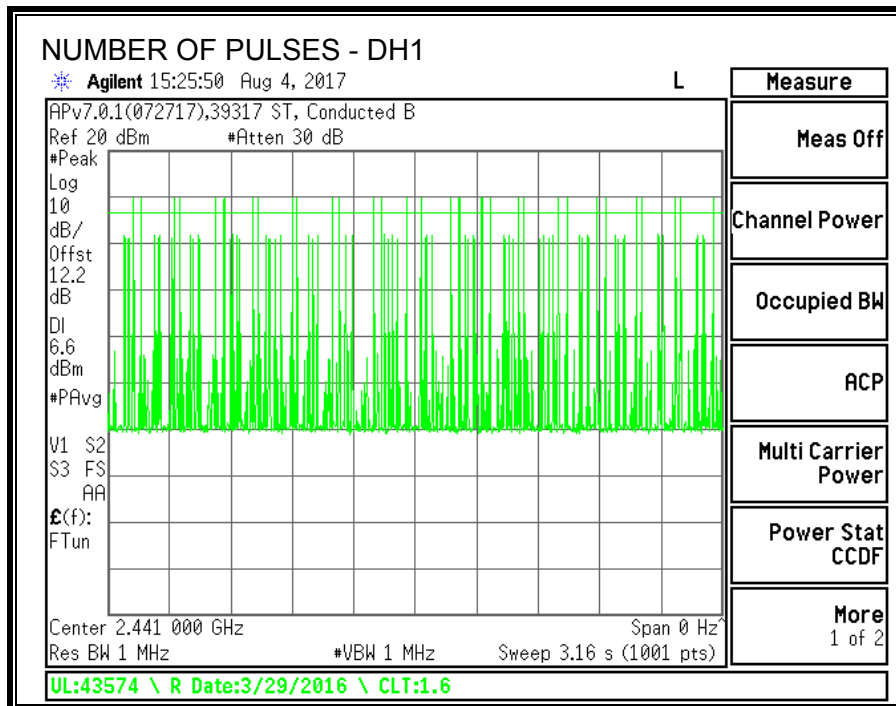
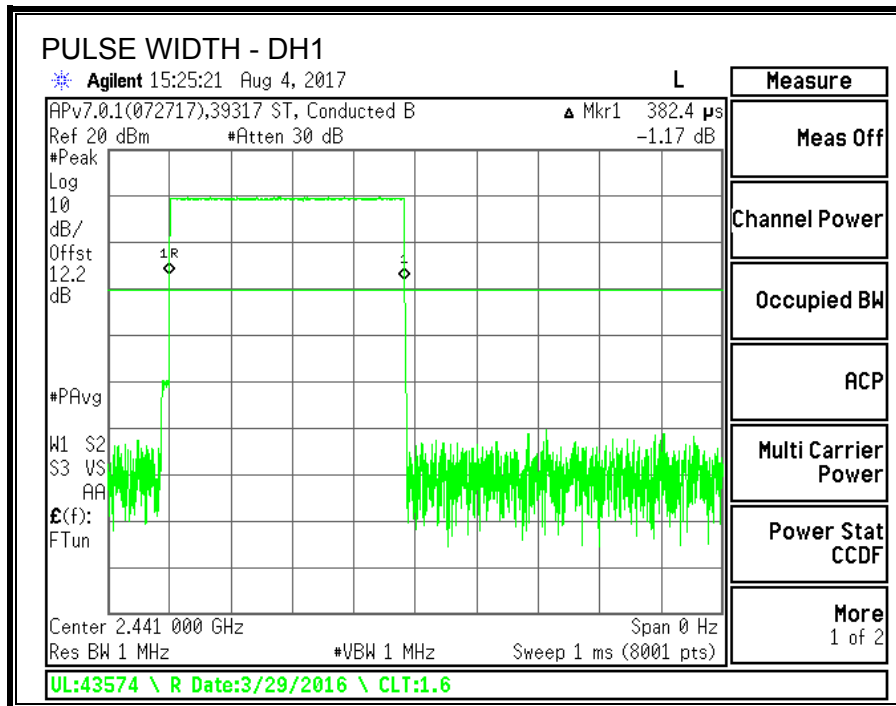
The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

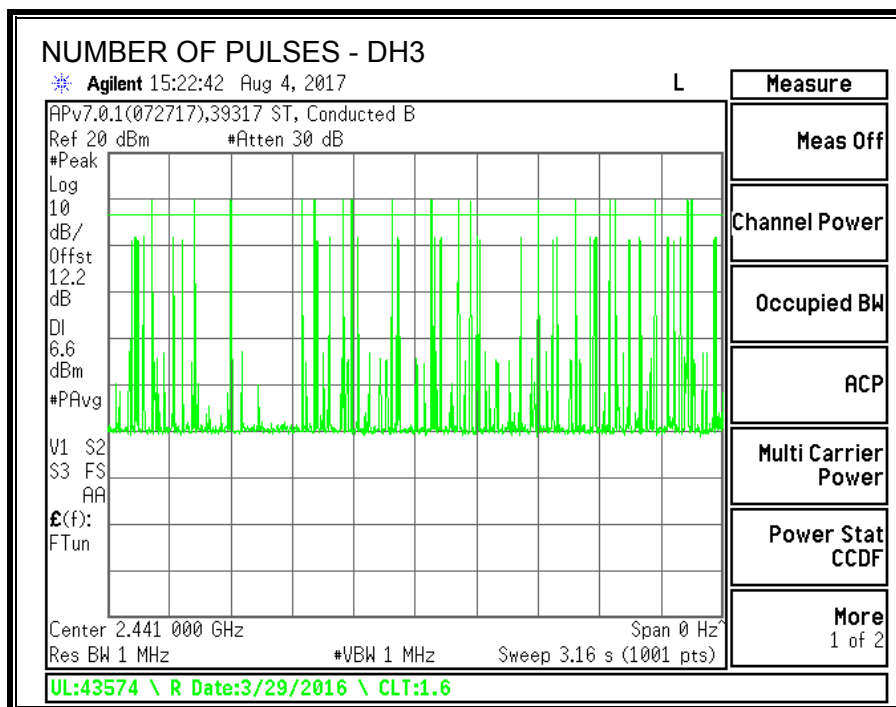
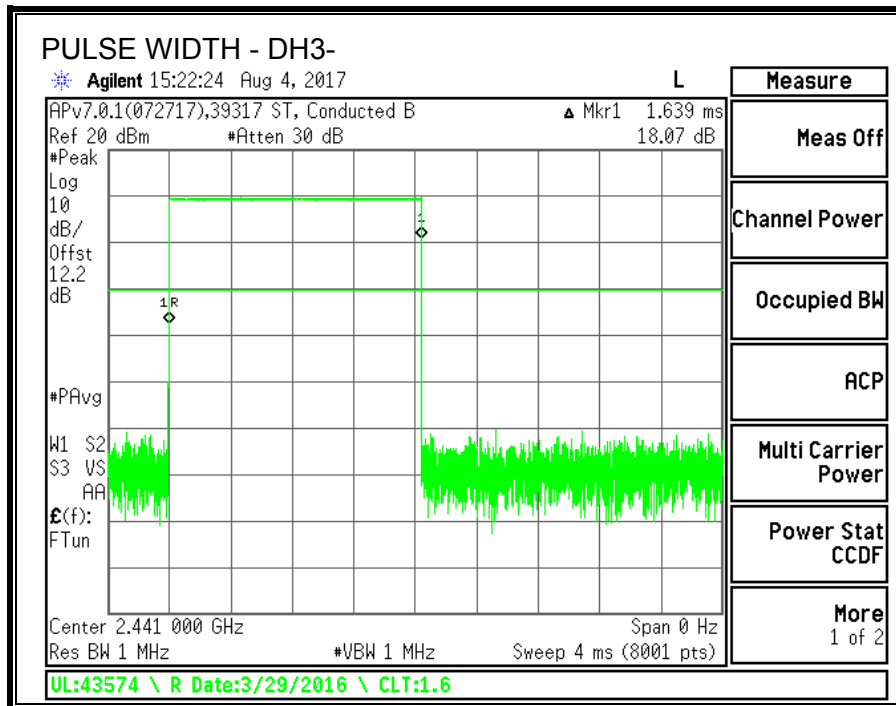
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

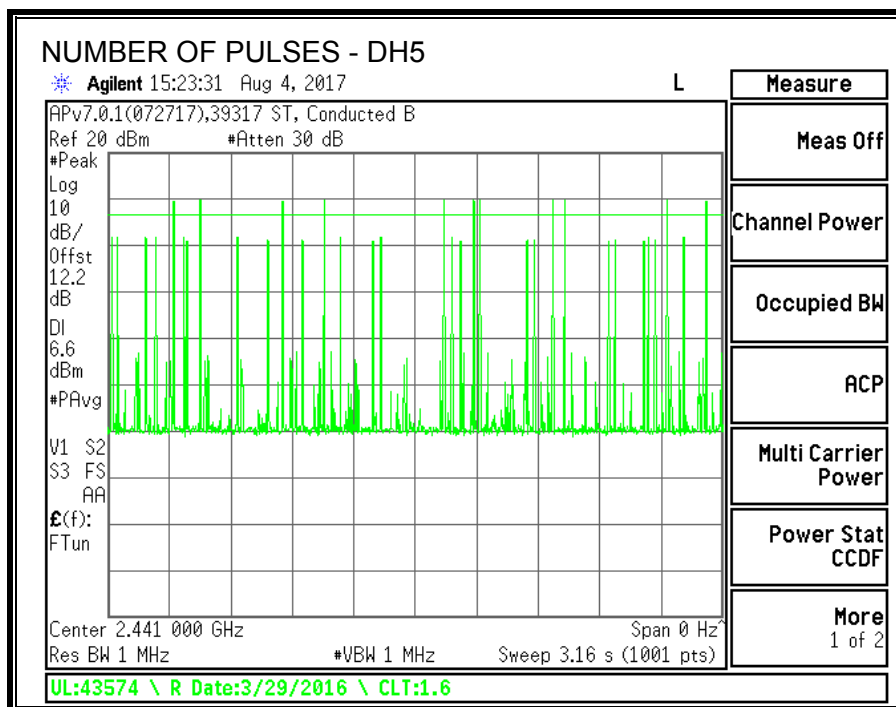
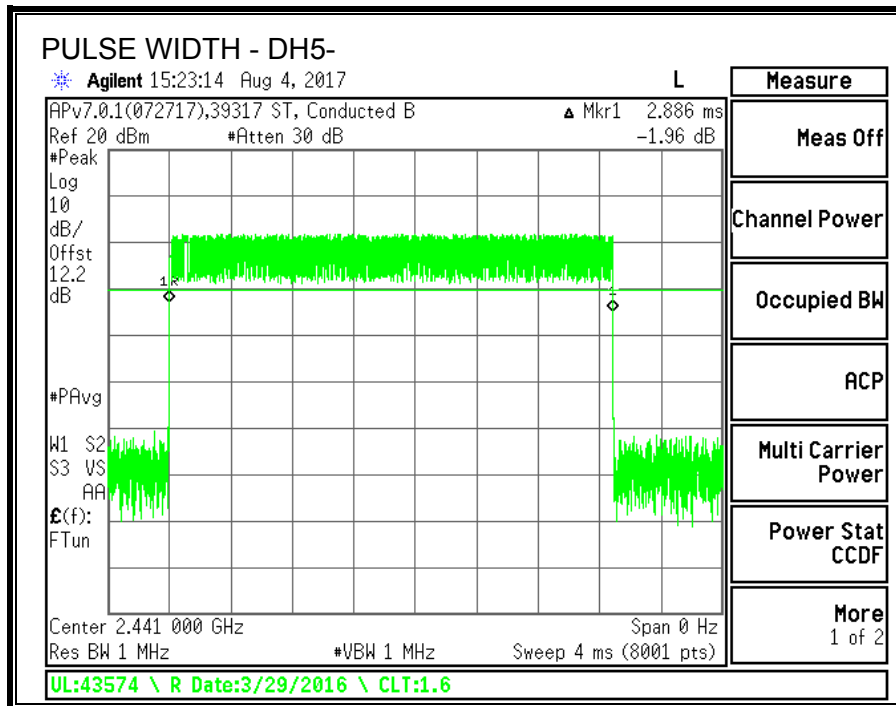
For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to $10 * (\# \text{ of pulses in } 0.8 \text{ s}) * \text{pulse width}$.

RESULTS

AVERAGE TIME OF OCCUPANCY					
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	0.3824	31	0.1185	0.4	-0.2815
DH3	1.6390	18	0.2950	0.4	-0.1050
DH5	2.8860	11	0.3175	0.4	-0.0825
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.3824	7.75	0.0296	0.4	-0.3704
DH3	1.6390	4.5	0.0738	0.4	-0.3262
DH5	2.8860	2.75	0.0794	0.4	-0.3206
NOTE: --					







7.1.6. OUTPUT POWER

LIMITS

§15.247 (b) (1)
RSS-247 (5.4) (b)

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

TEST PROCEDURE

The transmitter output is connected to a Bluetooth tester.

RESULTS

The cable assembly insertion loss of 11.6 dB (including 10 dB pad and 1.6 dB cable) was entered as an offset in the Bluetooth tester to allow for direct reading of power.

TEST ENGINEER:	29435	Date:	07/31/2017
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Channel	Frequency (MHz)	Output Power (dBm)
Low	2402	11.10
Middle	2441	9.80
High	2480	9.70

7.1.7. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

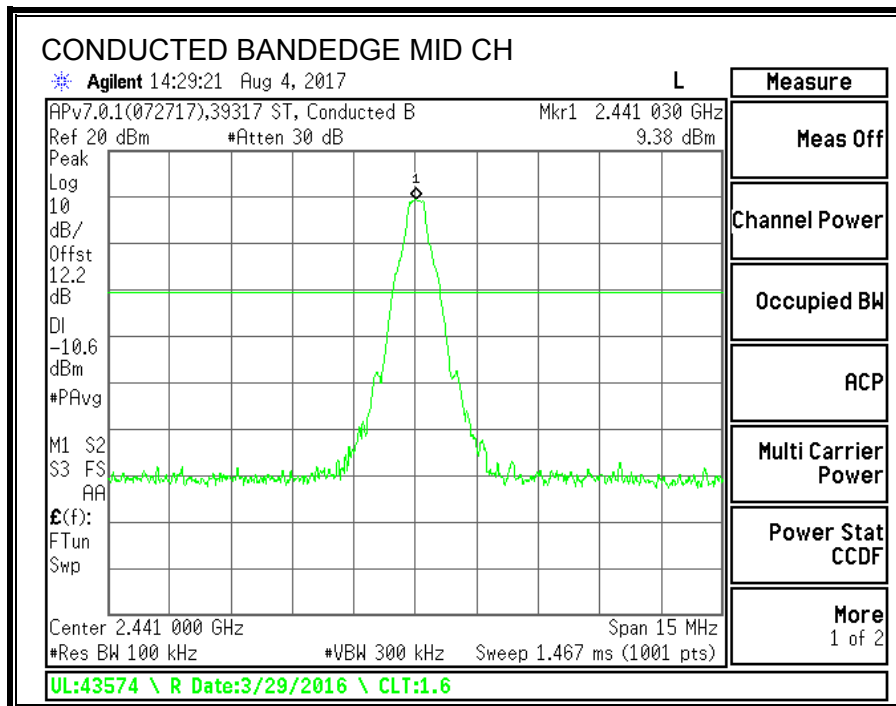
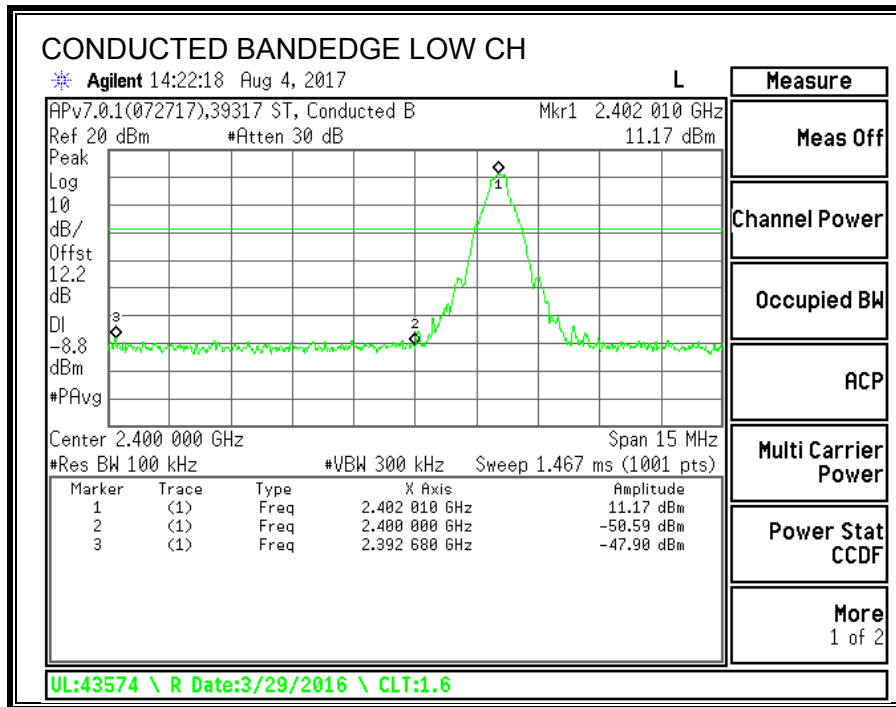
Limit = -20 dBc

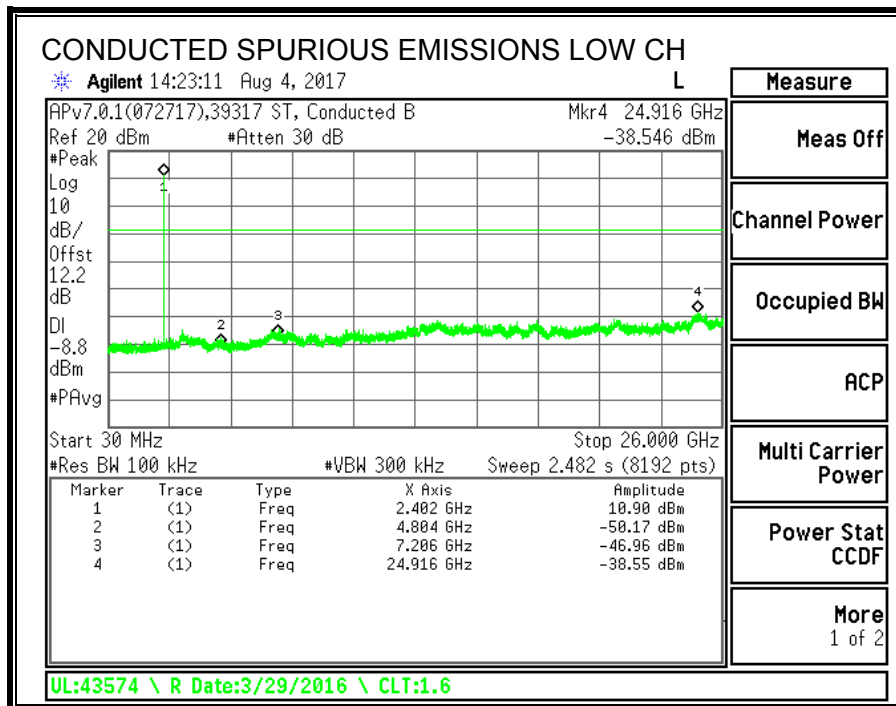
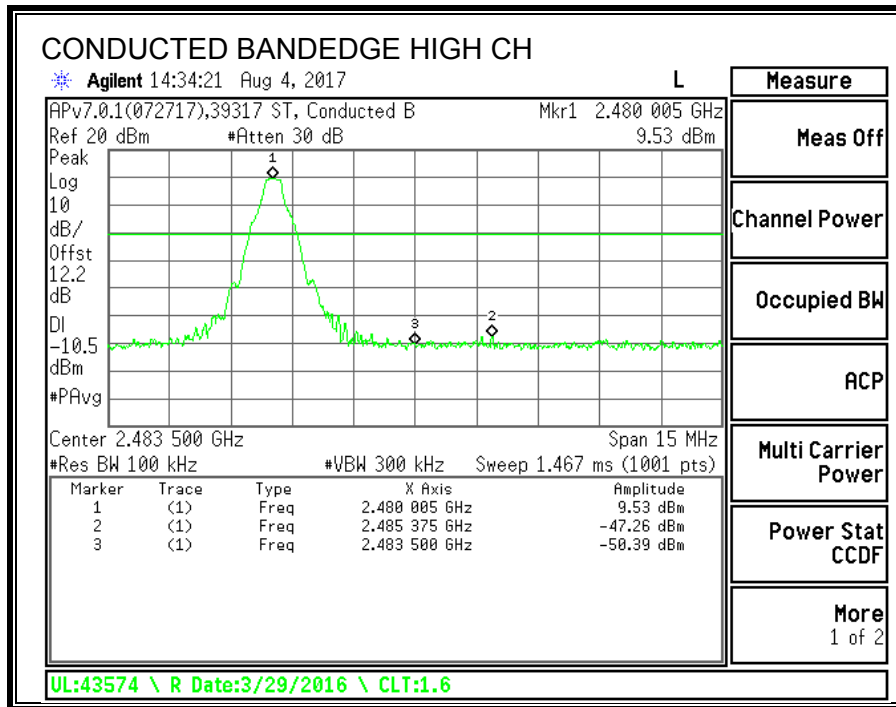
TEST PROCEDURE

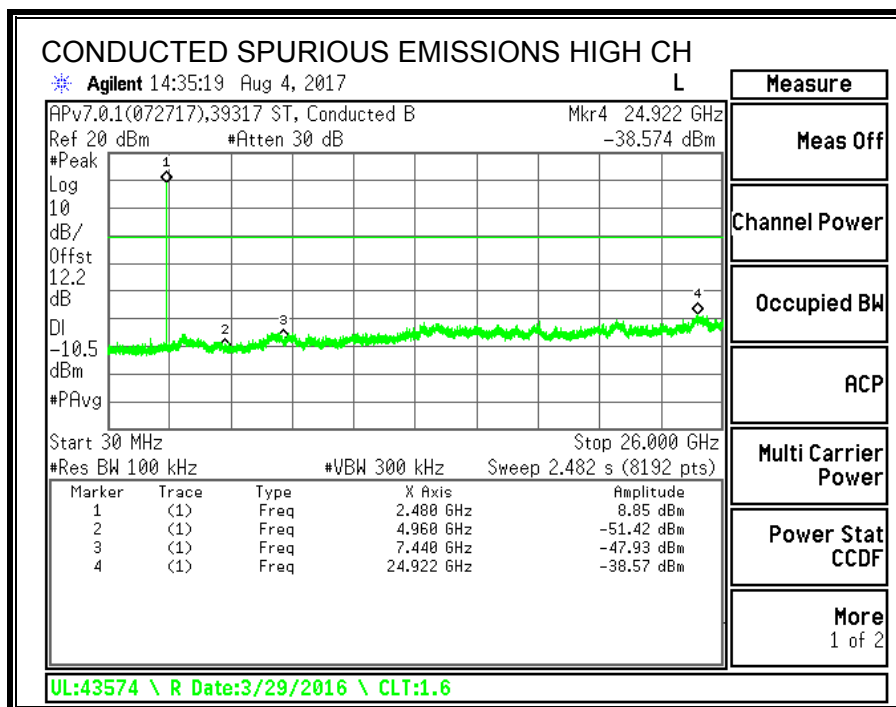
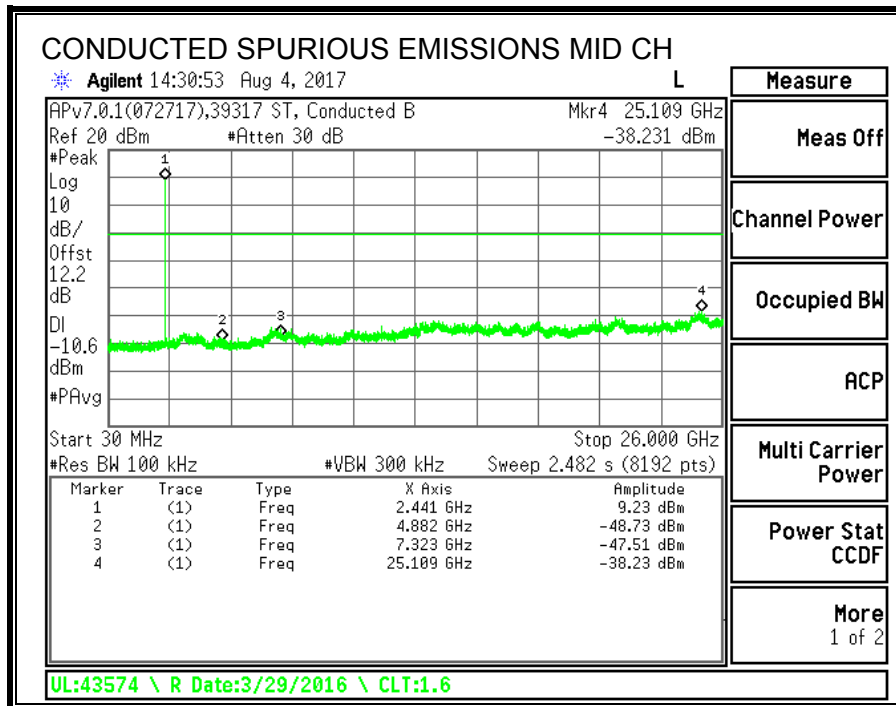
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

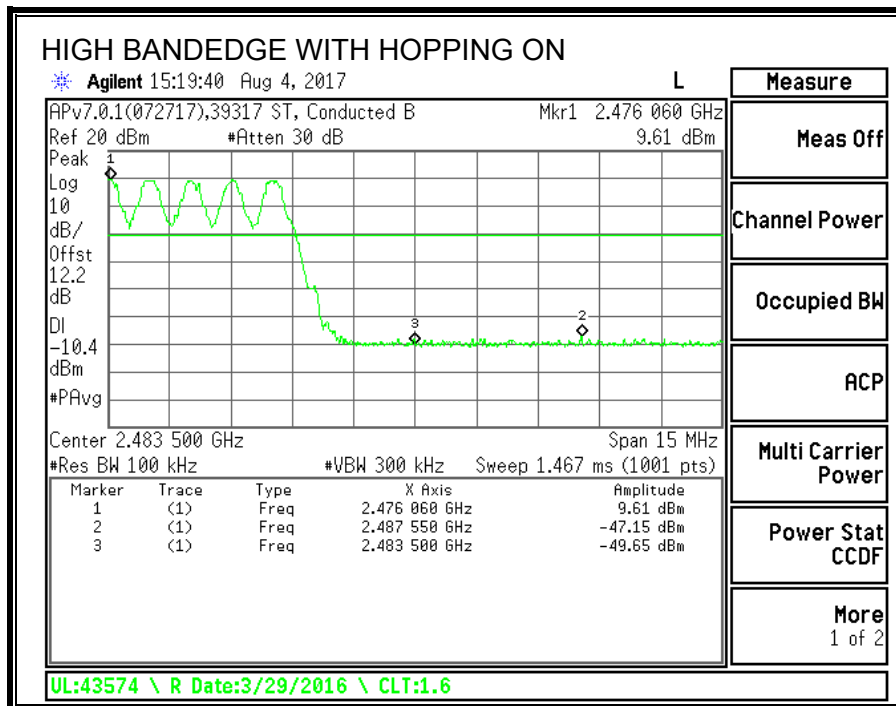
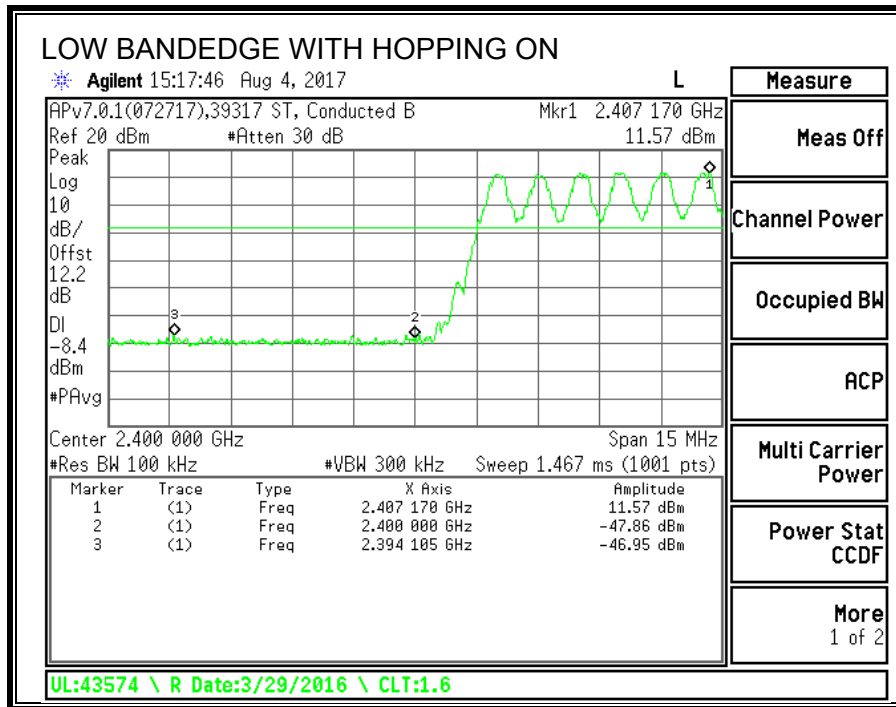
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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









7.2. ENHANCED DATA RATE 8PSK MODULATION

7.2.1. 20 dB BANDWIDTH

LIMITS

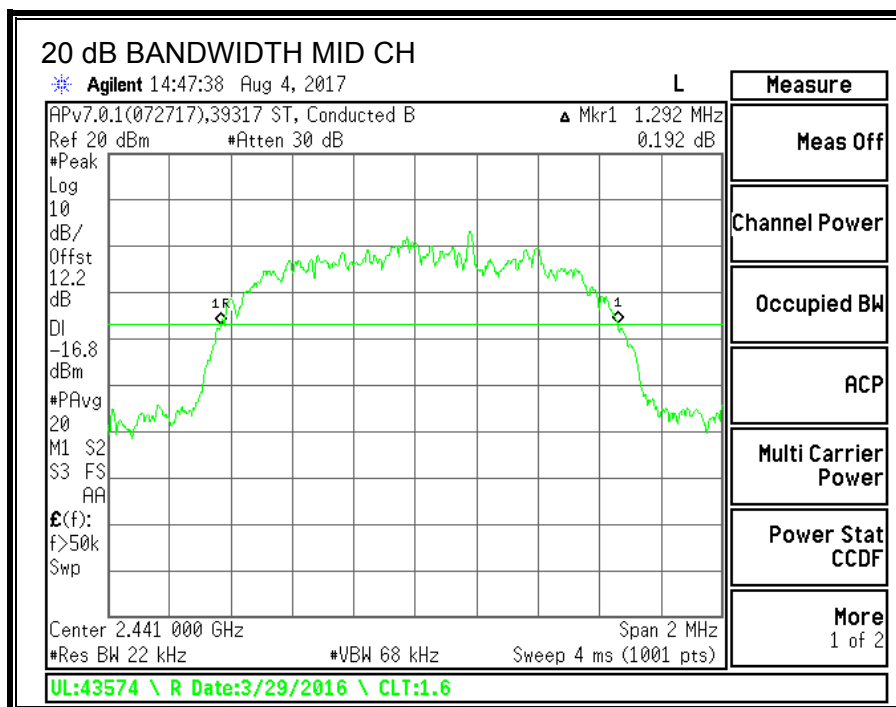
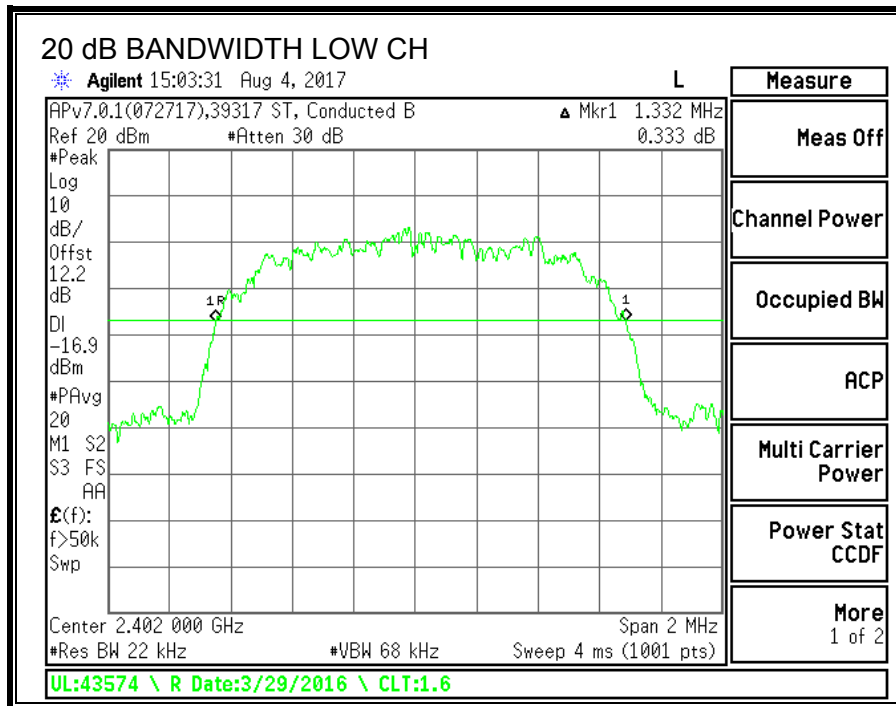
None; for reporting purposes only.

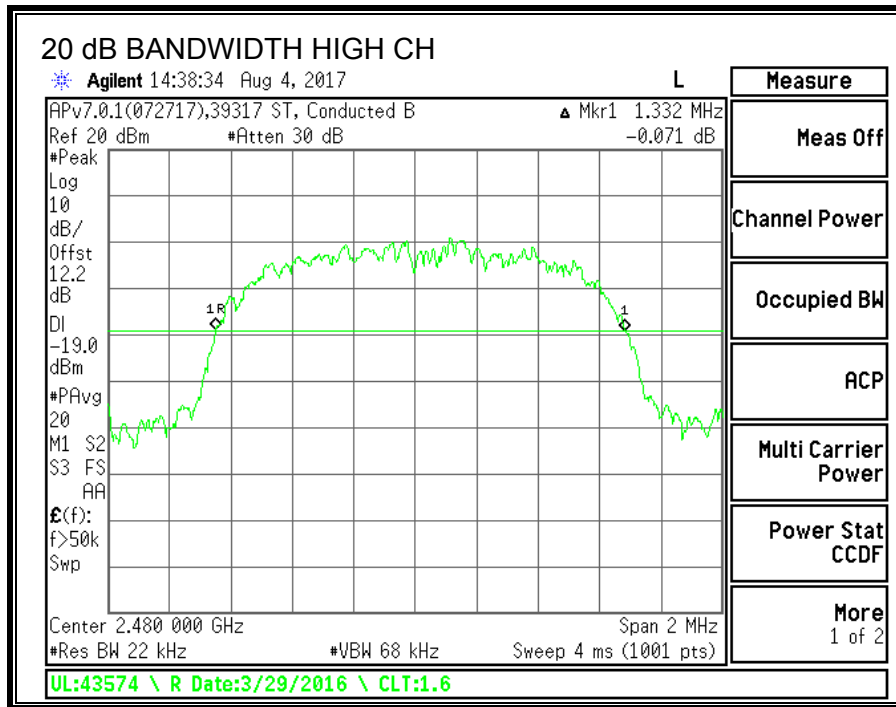
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.332
Middle	2441	1.292
High	2480	1.332





7.2.2. 99% BANDWIDTH

LIMITS

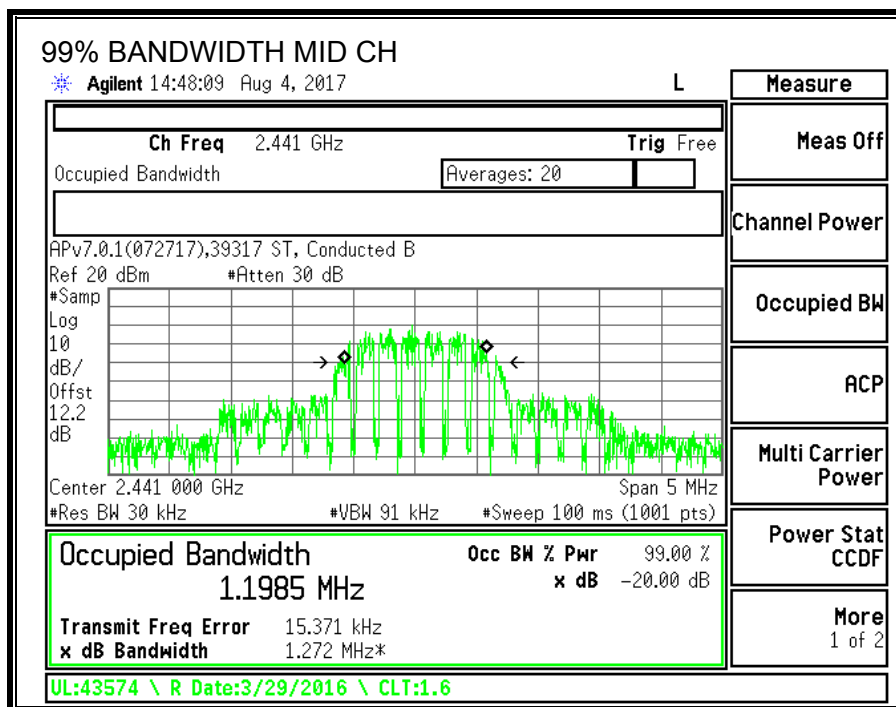
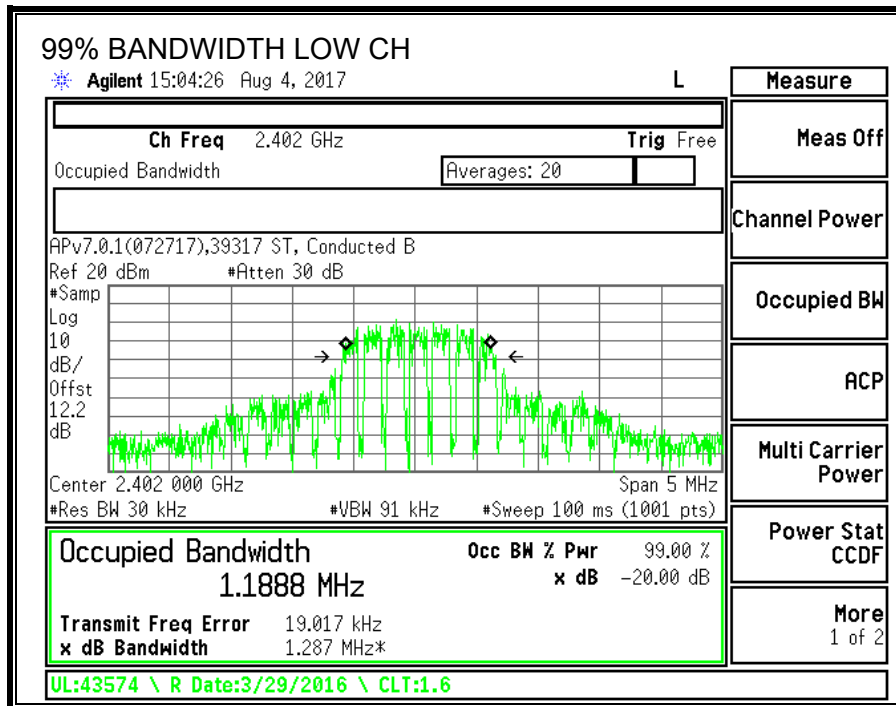
None; for reporting purposes only.

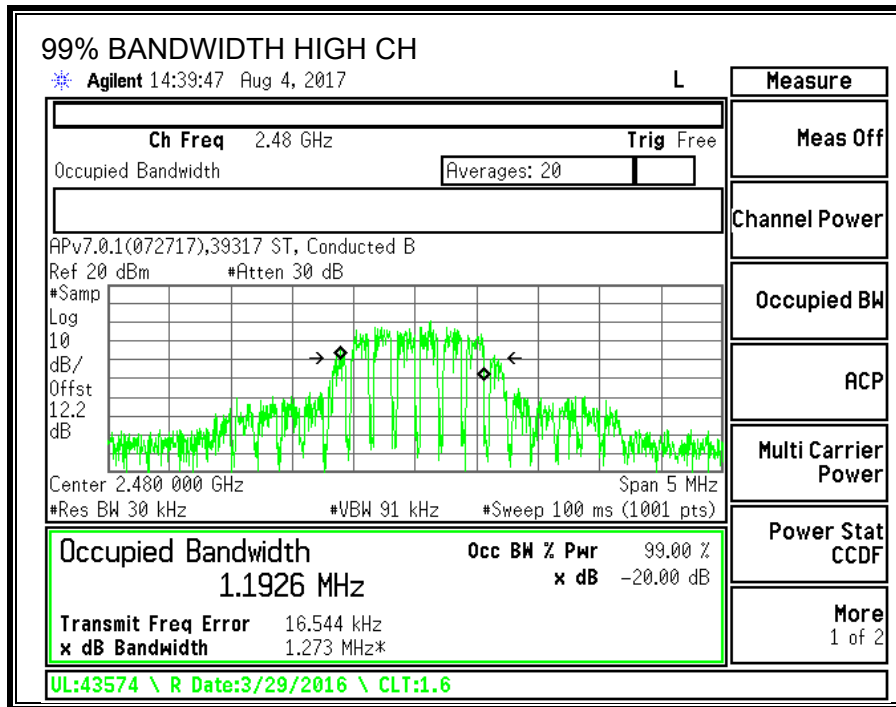
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 1 to 3% of the 99% bandwidth and 1% of the Span. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.1888
Middle	2441	1.1985
High	2480	1.1926





7.2.3. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)
IC RSS-247 (5.1) (b)

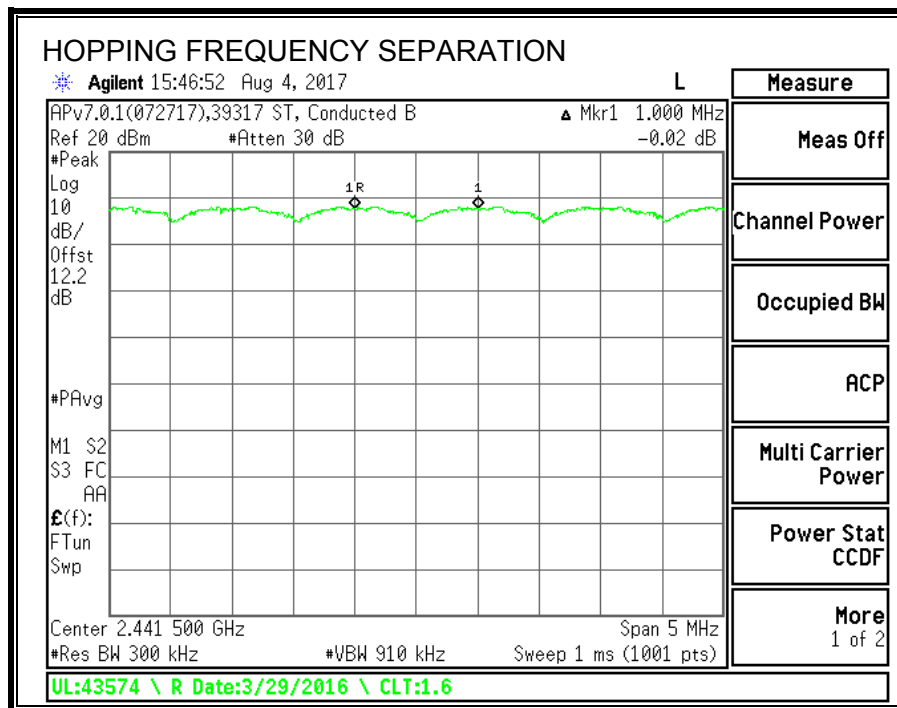
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

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



7.2.4. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)
IC RSS-247 (5.1) (d)

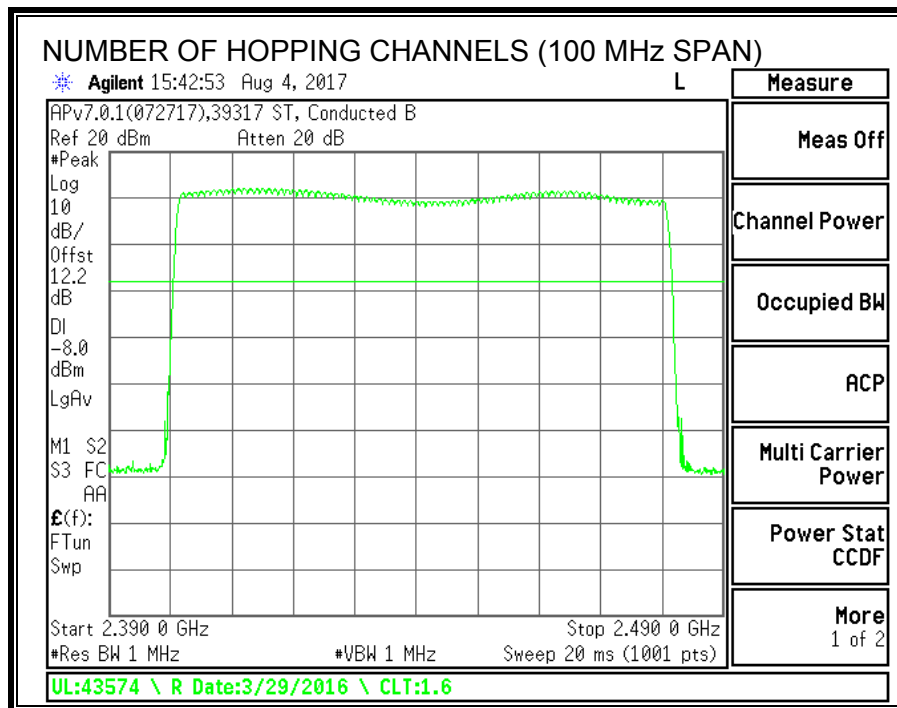
Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

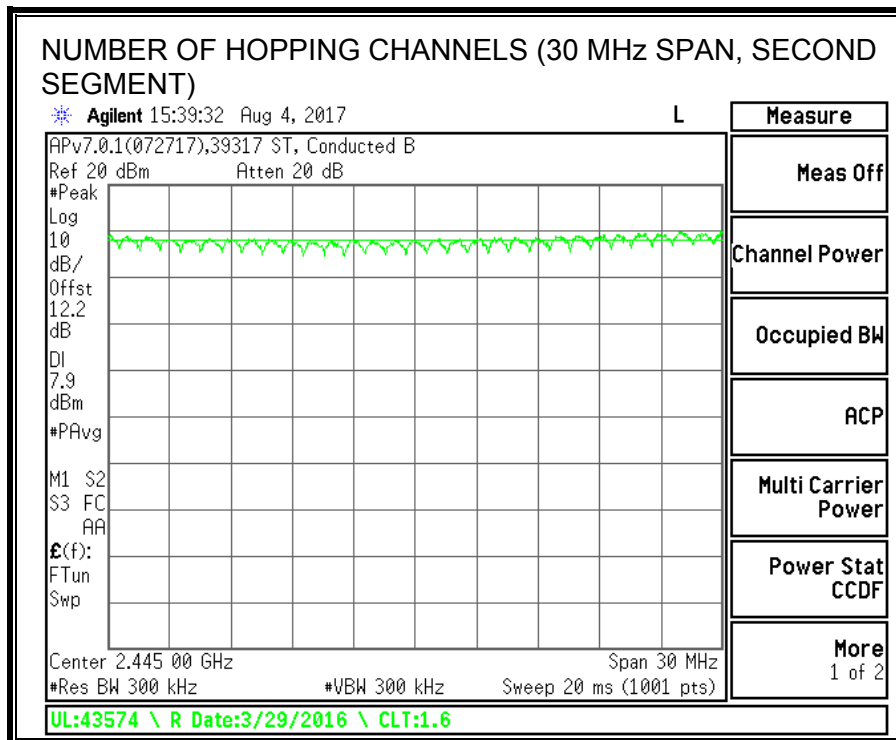
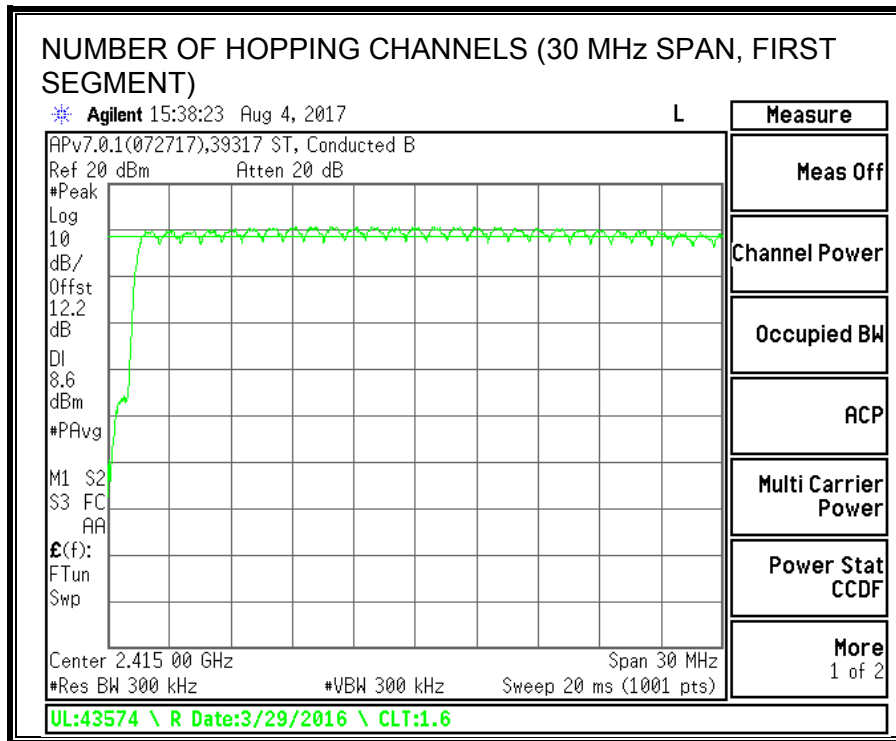
TEST PROCEDURE

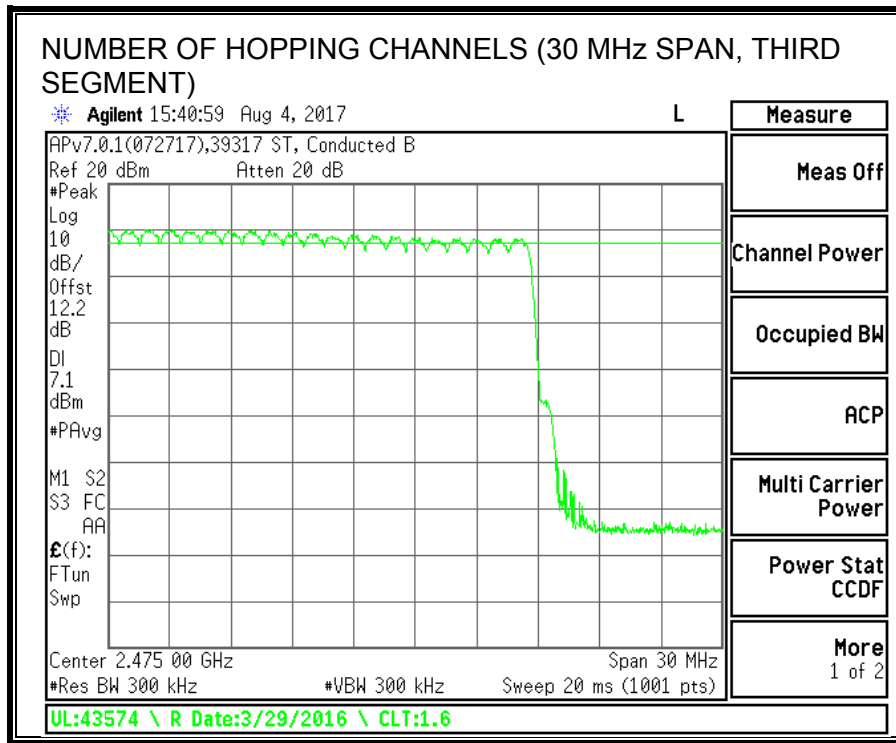
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

Normal Mode: 79 Channels observed.







7.2.5. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)
IC RSS-247 (5.1) (d)

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.

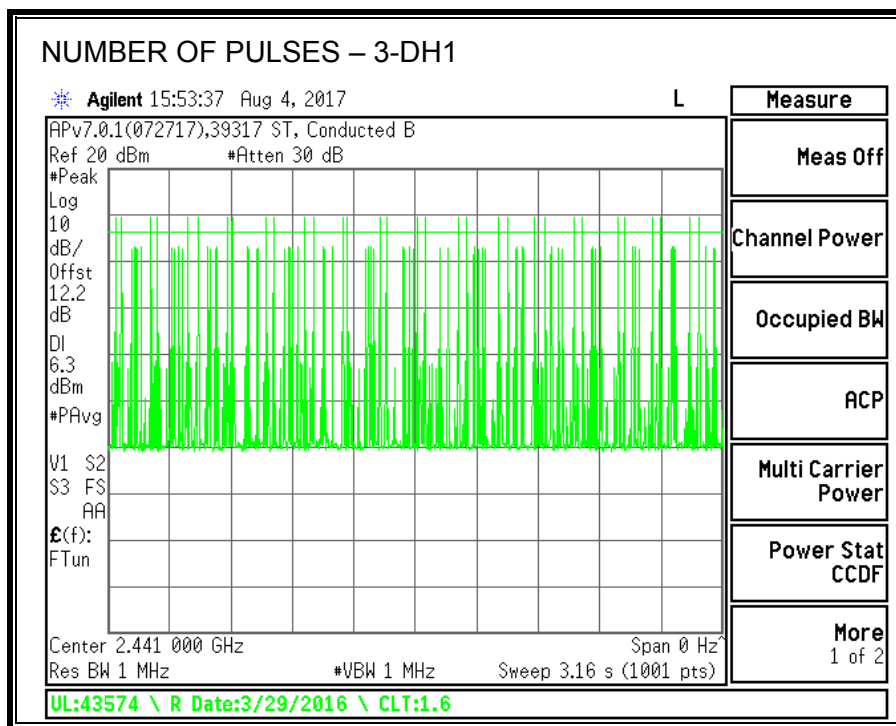
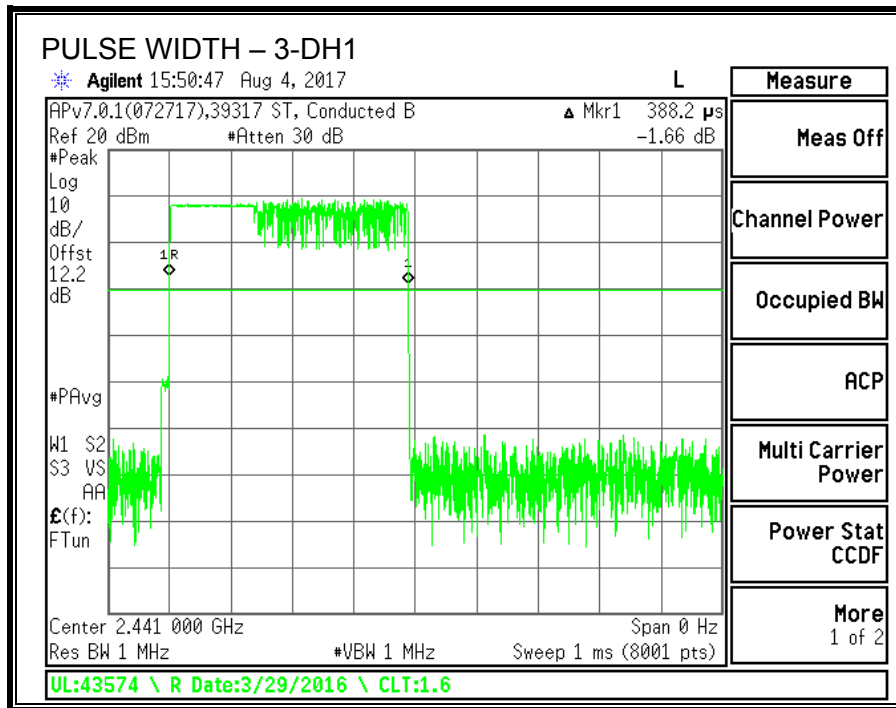
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

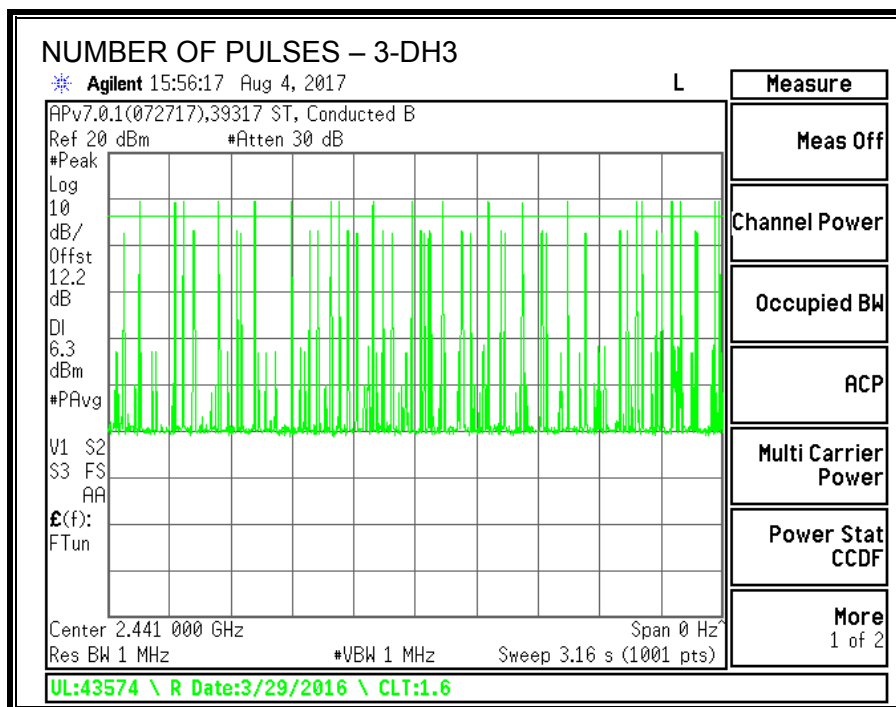
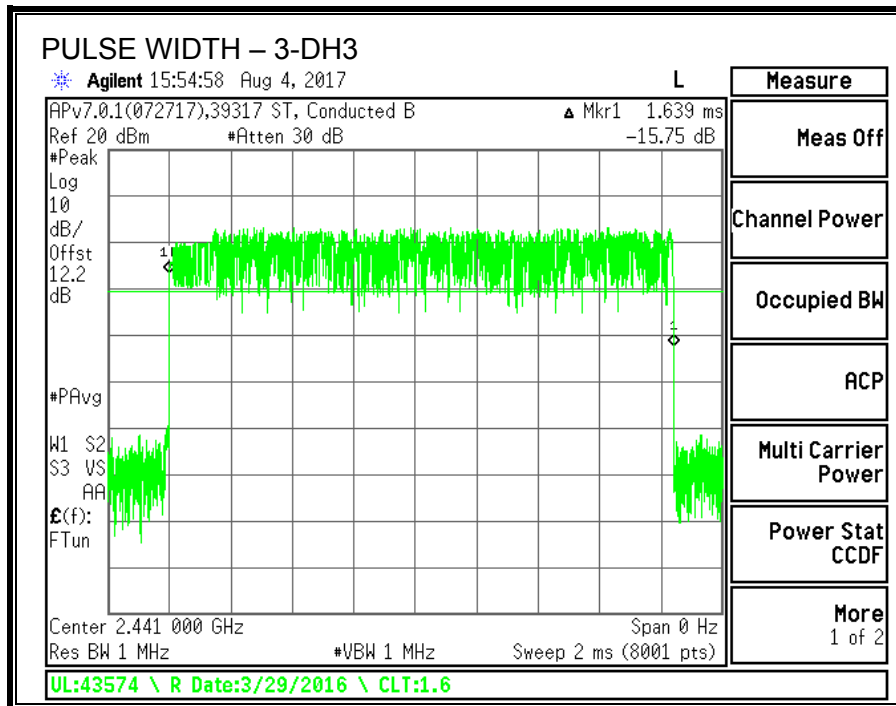
For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to $10 * (\# \text{ of pulses in } 0.8 \text{ s}) * \text{pulse width}$.

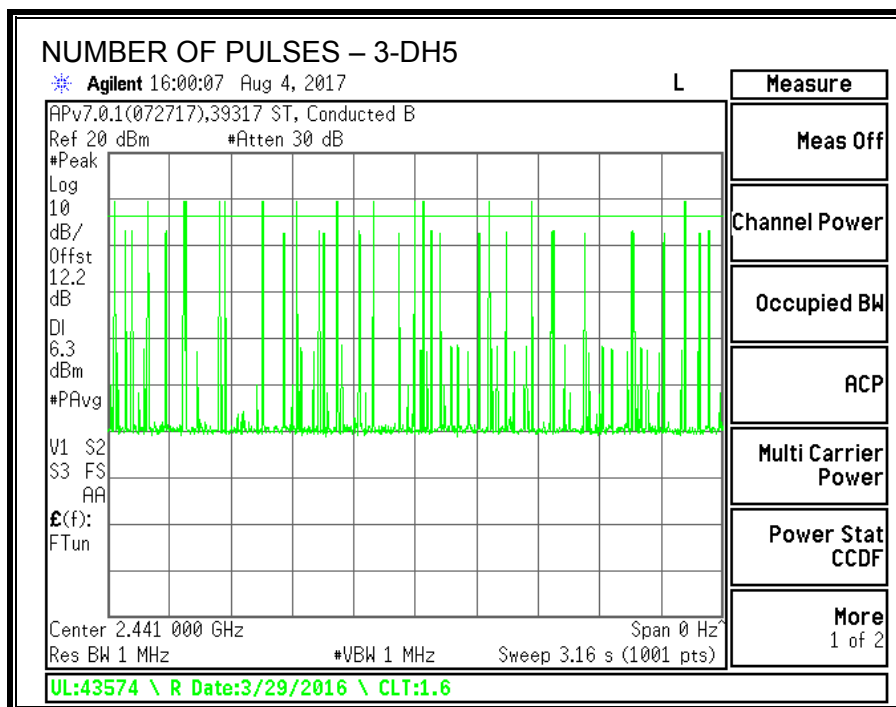
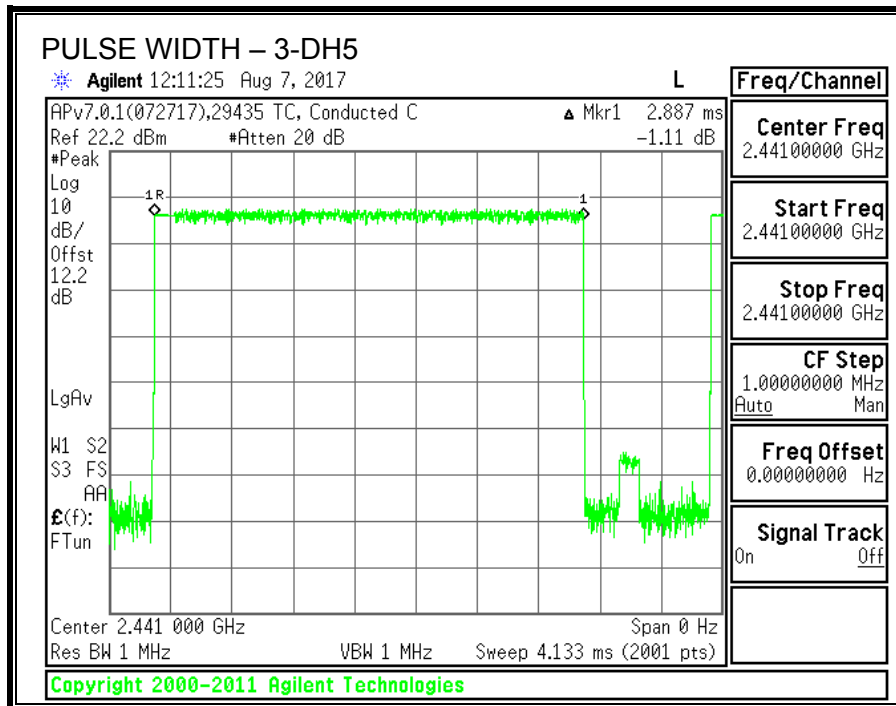
RESULTS

AVERAGE TIME OF OCCUPANCY					
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
8PSK Normal Mode					
3-DH1	0.3882	32	0.1242	0.4	-0.2758
3-DH3	1.6390	20	0.3278	0.4	-0.0722
3-DH5	2.8870	13	0.3753	0.4	-0.0247
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
8PSK AFH Mode					
3-DH1	0.388	8	0.03106	0.4	-0.3689
3-DH3	1.639	5	0.08195	0.4	-0.3181
3-DH5	2.887	3.25	0.09383	0.4	-0.3062

NOTE: --







7.2.6. OUTPUT POWER

LIMITS

§15.247 (b) (1)
RSS-247 (5.4) (b)

The maximum antenna gain is less than 6 dBi, therefore the limit is 20.97 dBm.

TEST PROCEDURE

The transmitter output is connected to a Bluetooth tester.

RESULTS

TEST ENGINEER:	29435	Date:	07/31/2017
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Channel	Frequency (MHz)	Output Power (dBm)
Low	2402	11.00
Middle	2441	10.10
High	2480	10.20

7.2.7. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

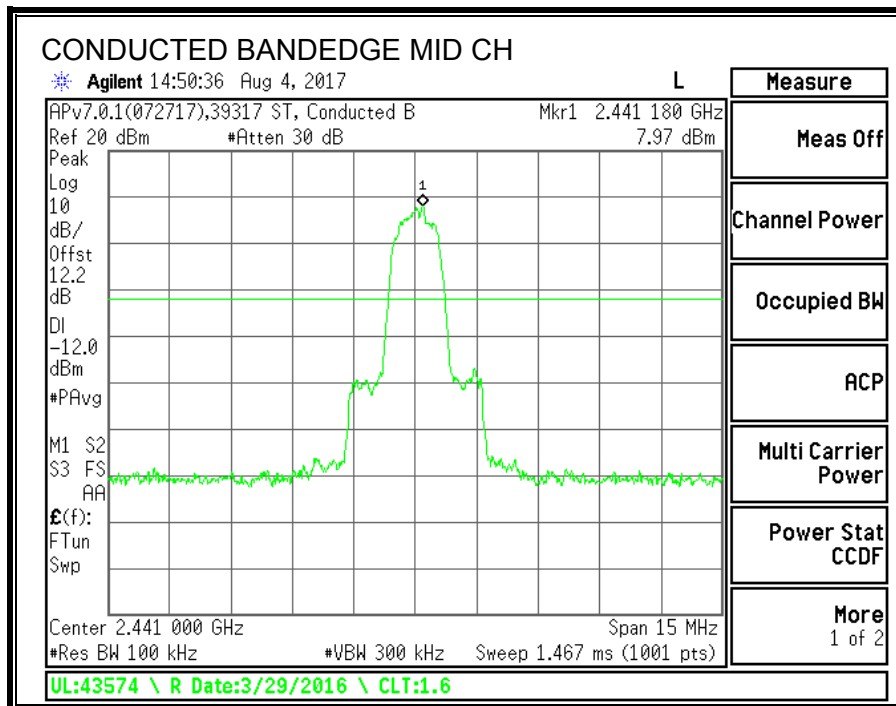
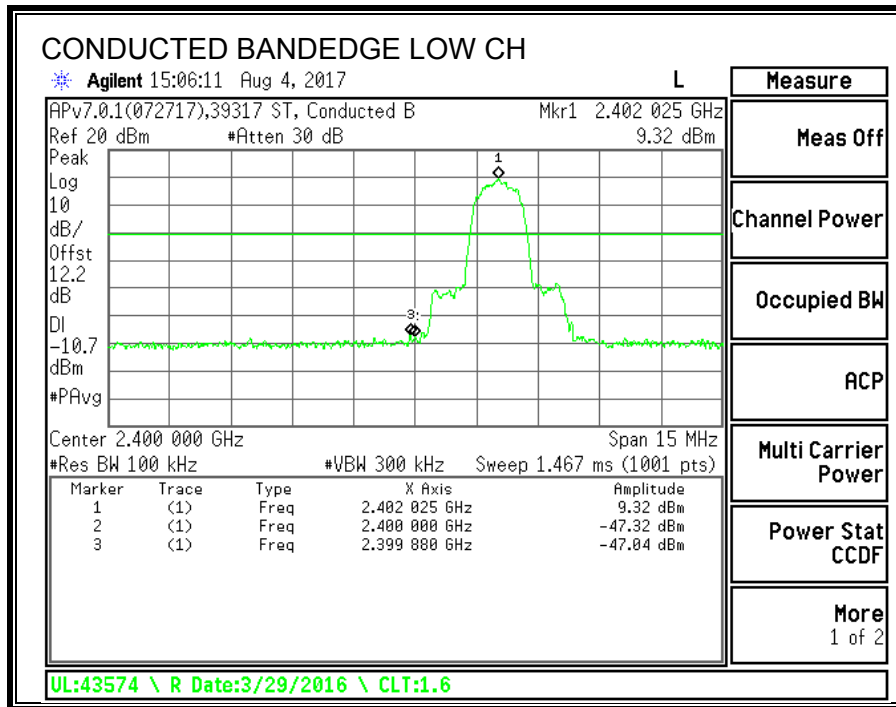
Limit = -20 dBc

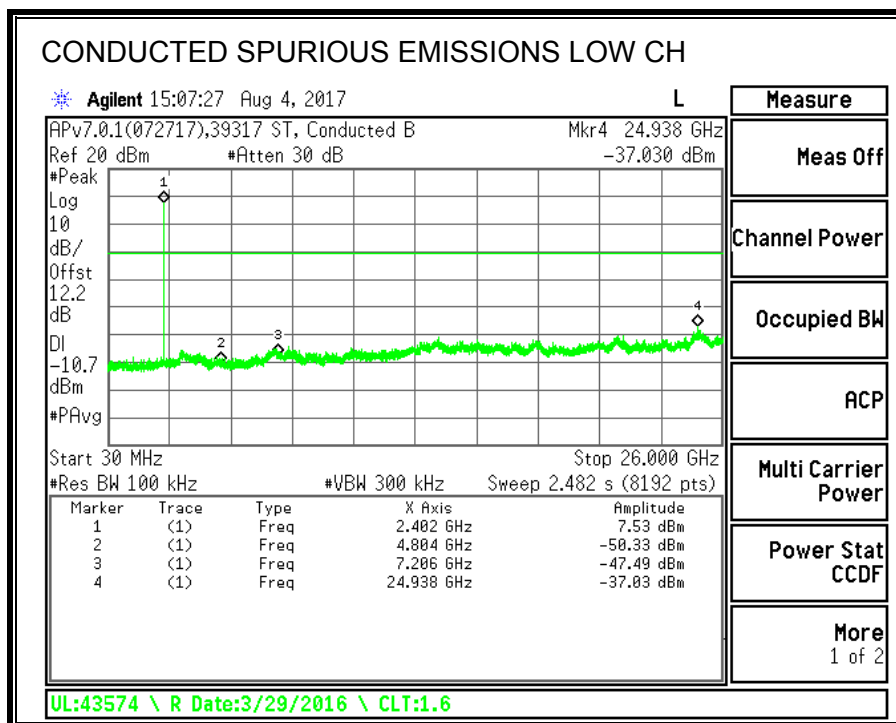
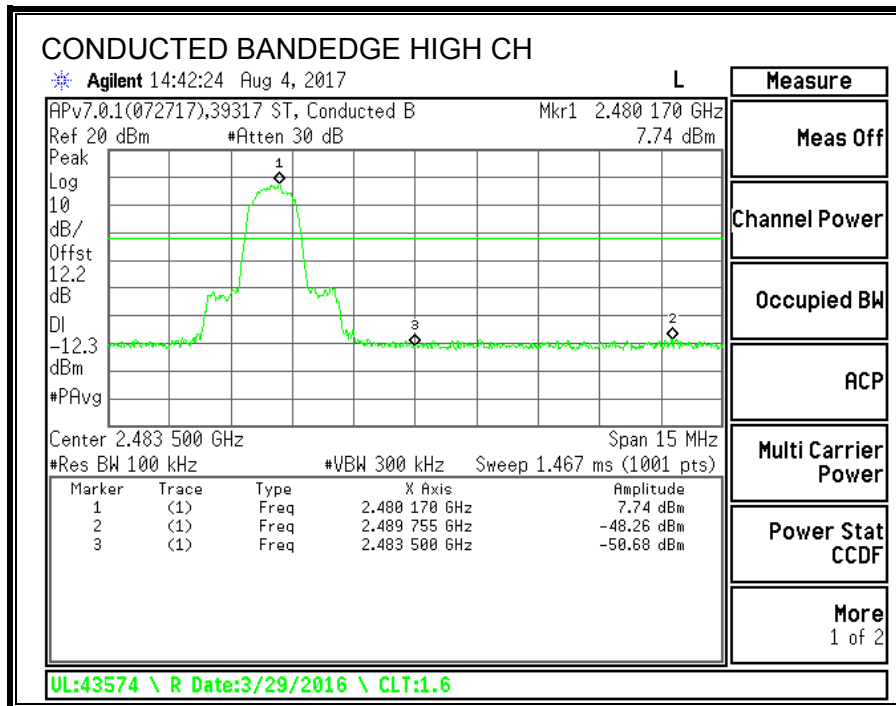
TEST PROCEDURE

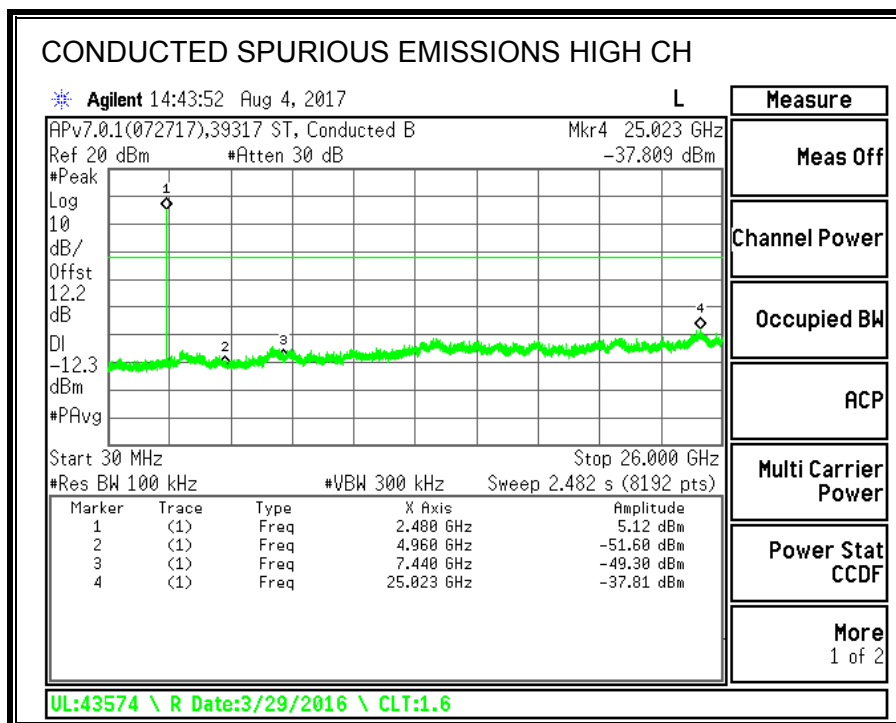
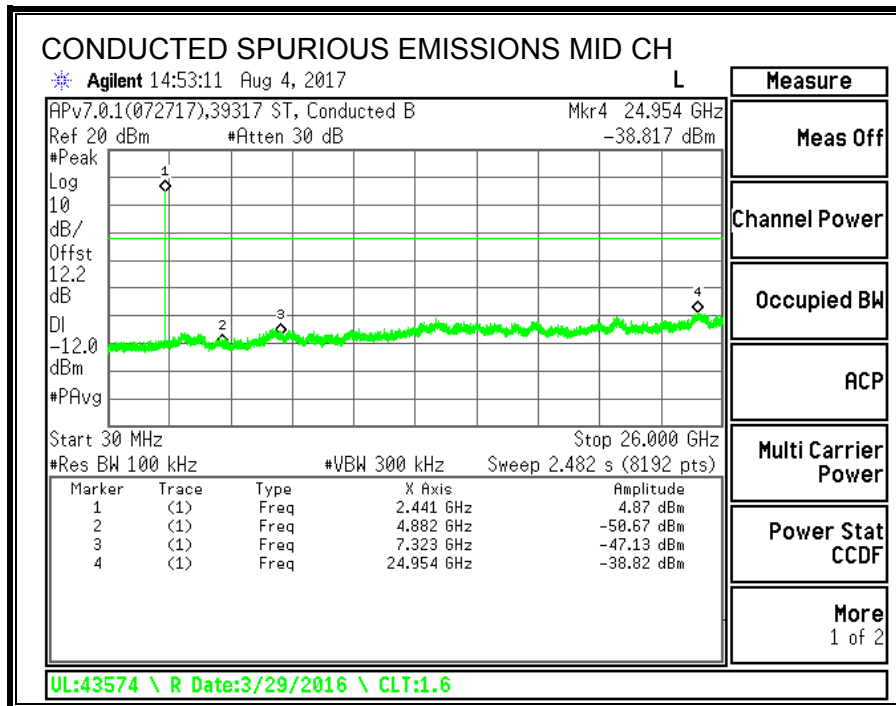
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

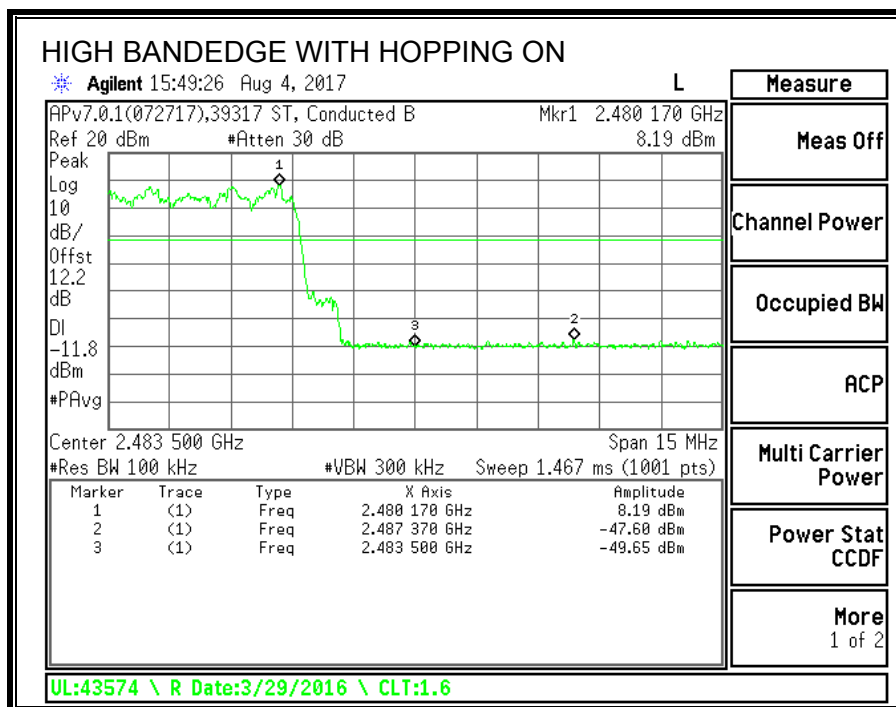
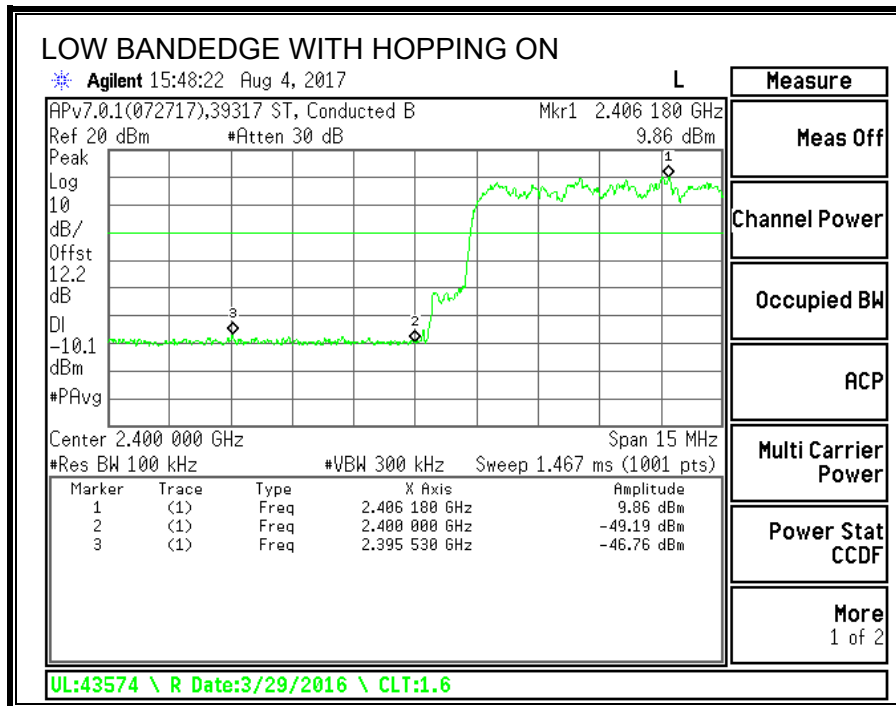
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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









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
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
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 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.

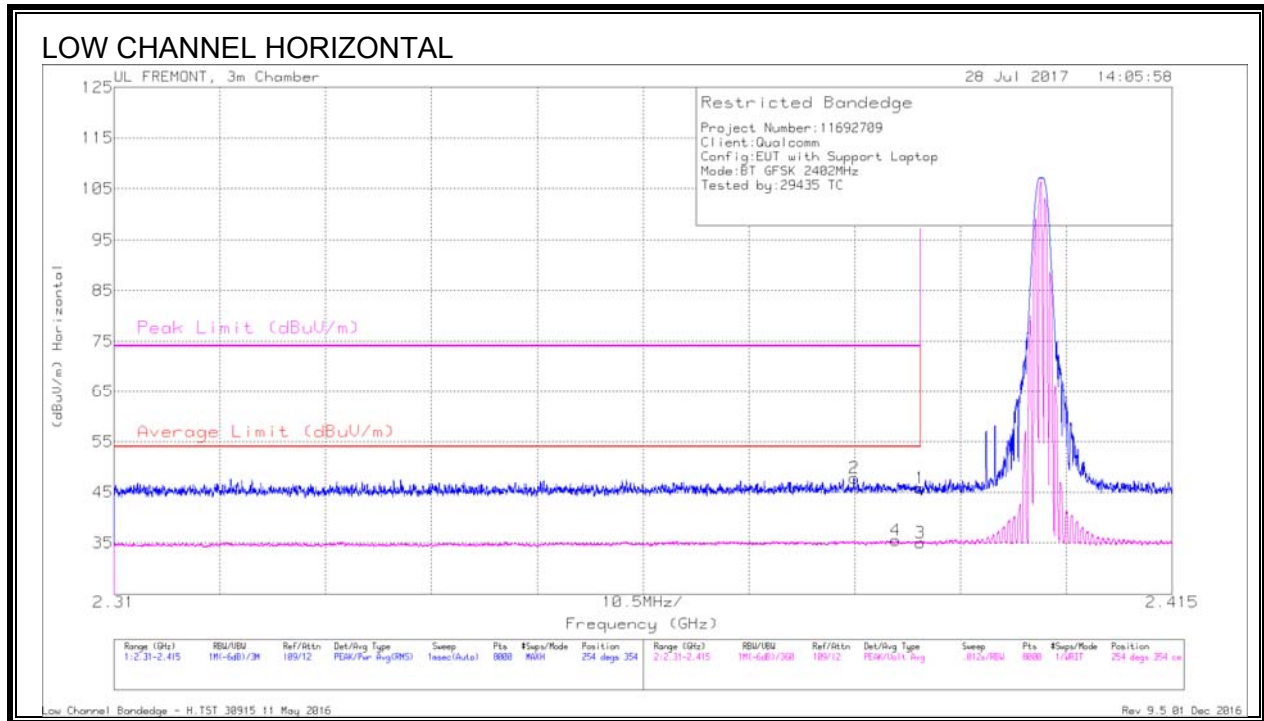
The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

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

8.2. BASIC DATA RATE GFSK MODULATION

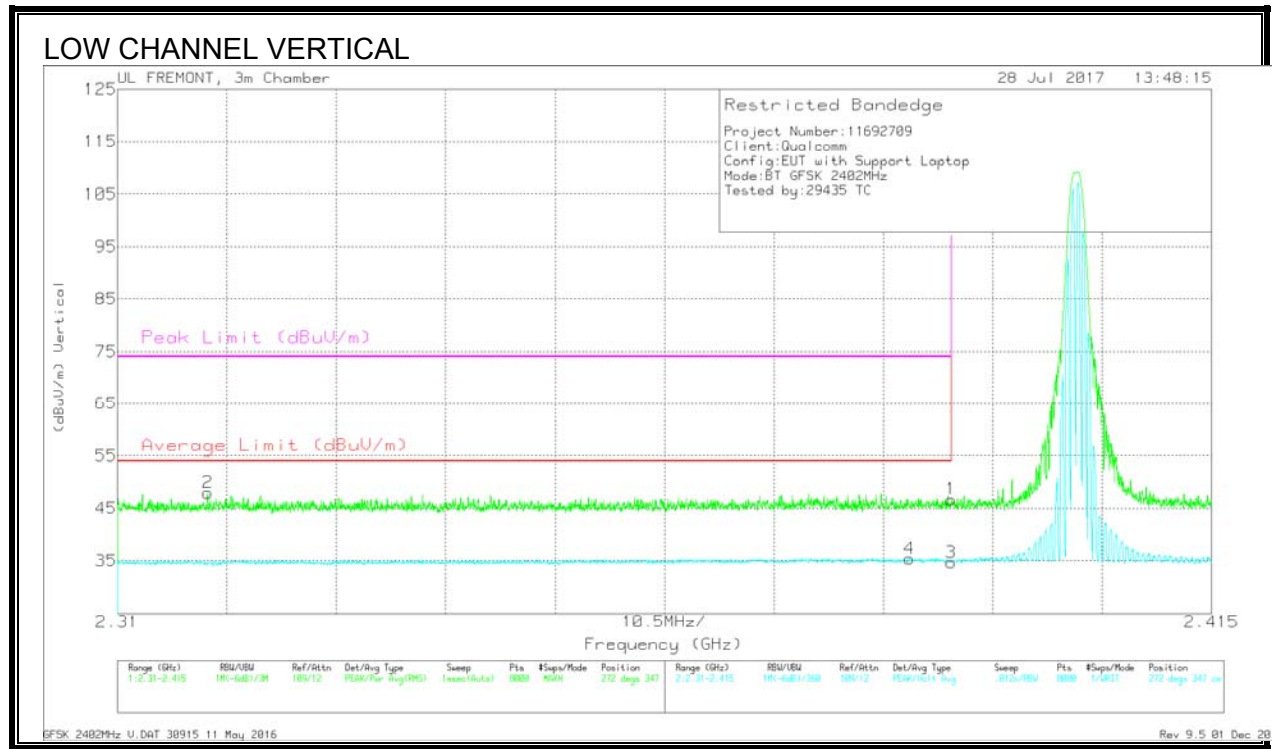
8.2.1. RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pa d (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.383	38.27	Pk	31.9	-22.4	47.77	-	-	74	-26.23	254	354	H
4	2.388	25.96	VA1T	31.9	-22.4	35.46	54	-18.54	-	-	254	354	H
1	2.39	36.55	Pk	31.9	-22.6	45.85	-	-	74	-28.15	254	354	H
3	2.39	25.7	VA1T	31.9	-22.6	35	54	-19	-	-	254	354	H

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

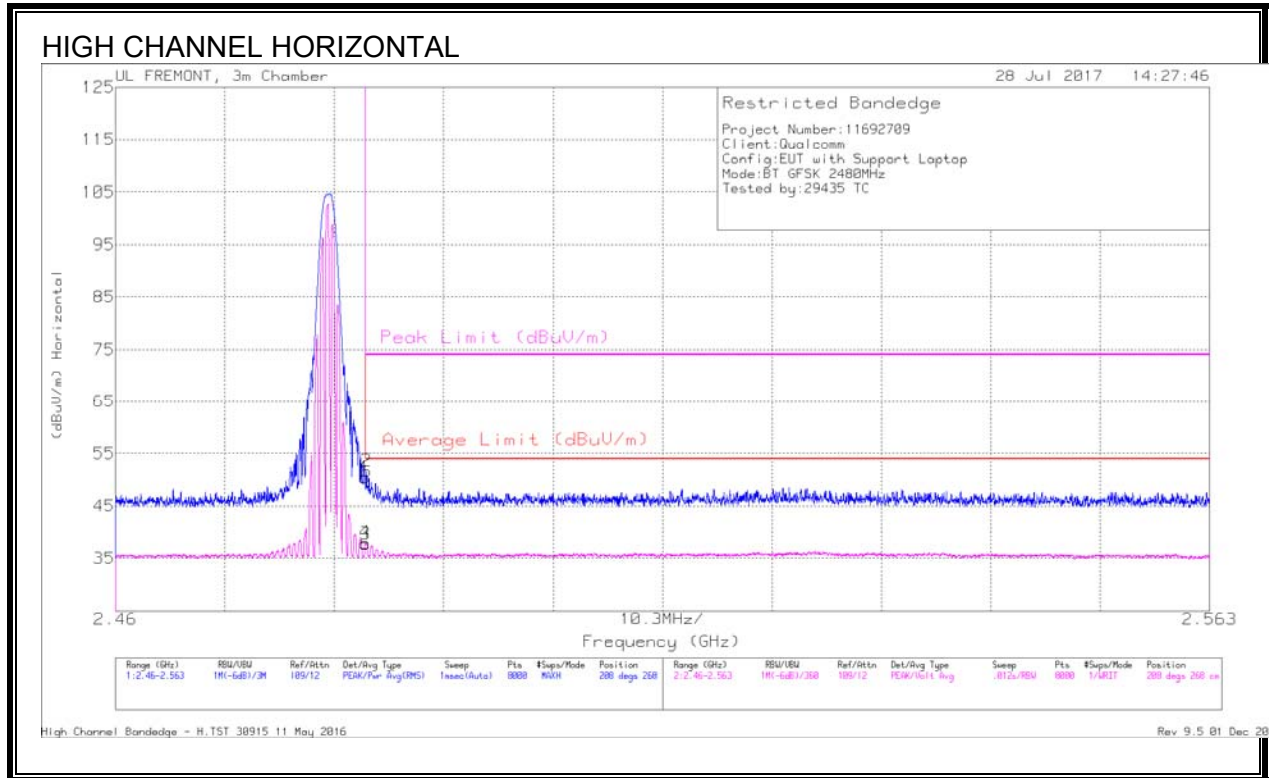


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cb/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.319	38.77	Pk	31.8	-22.6	47.97	-	-	74	-26.03	272	347	V
4	2.386	26.04	VA1T	31.9	-22.5	35.44	54	-18.56	-	-	272	347	V
1	2.39	37.42	Pk	31.9	-22.6	46.72	-	-	74	-27.28	272	347	V
3	2.39	25.38	VA1T	31.9	-22.6	34.68	54	-19.32	-	-	272	347	V

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

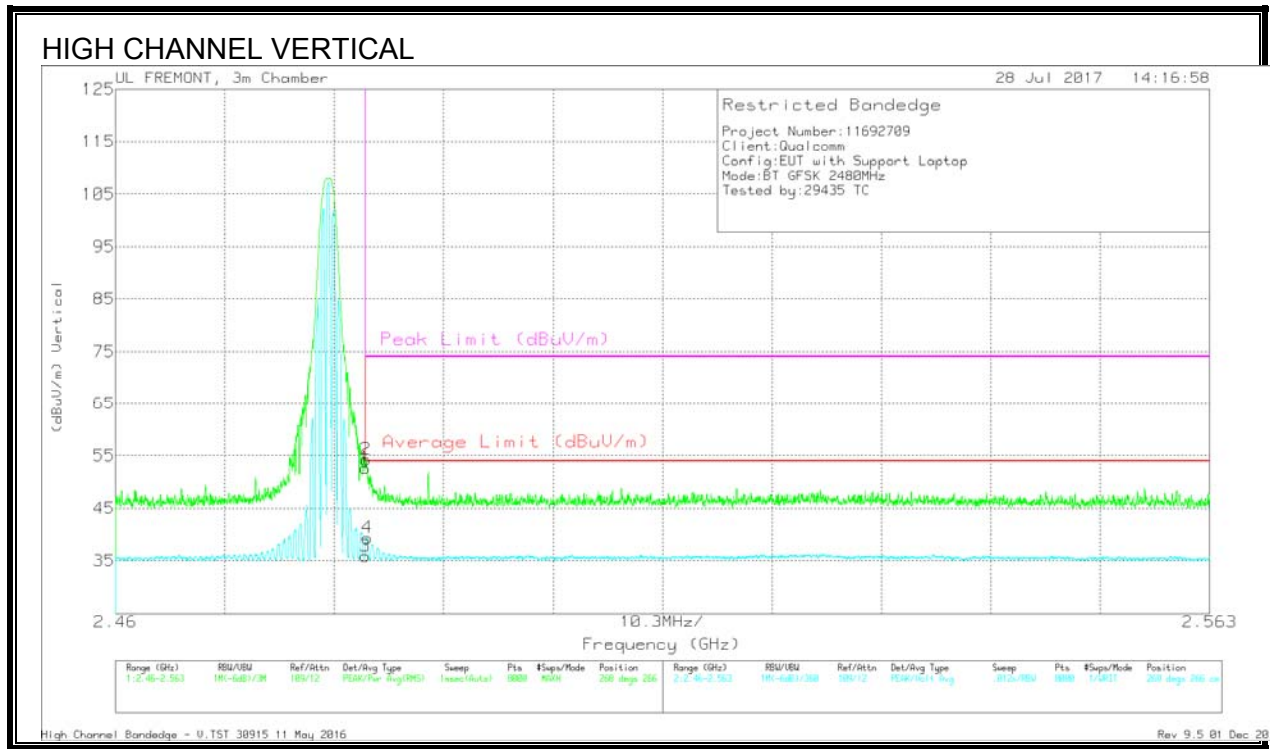
8.2.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cb/Ftr/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	40.69	Pk	32.4	-22.7	50.39	-	-	74	-23.61	208	268	H
2	2.484	41.99	Pk	32.4	-22.7	51.69	-	-	74	-22.31	208	268	H
3	2.484	28.04	VA1T	32.4	-22.7	37.74	54	-16.26	-	-	208	268	H
4	2.484	28.24	VA1T	32.4	-22.7	37.94	54	-16.06	-	-	208	268	H

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration



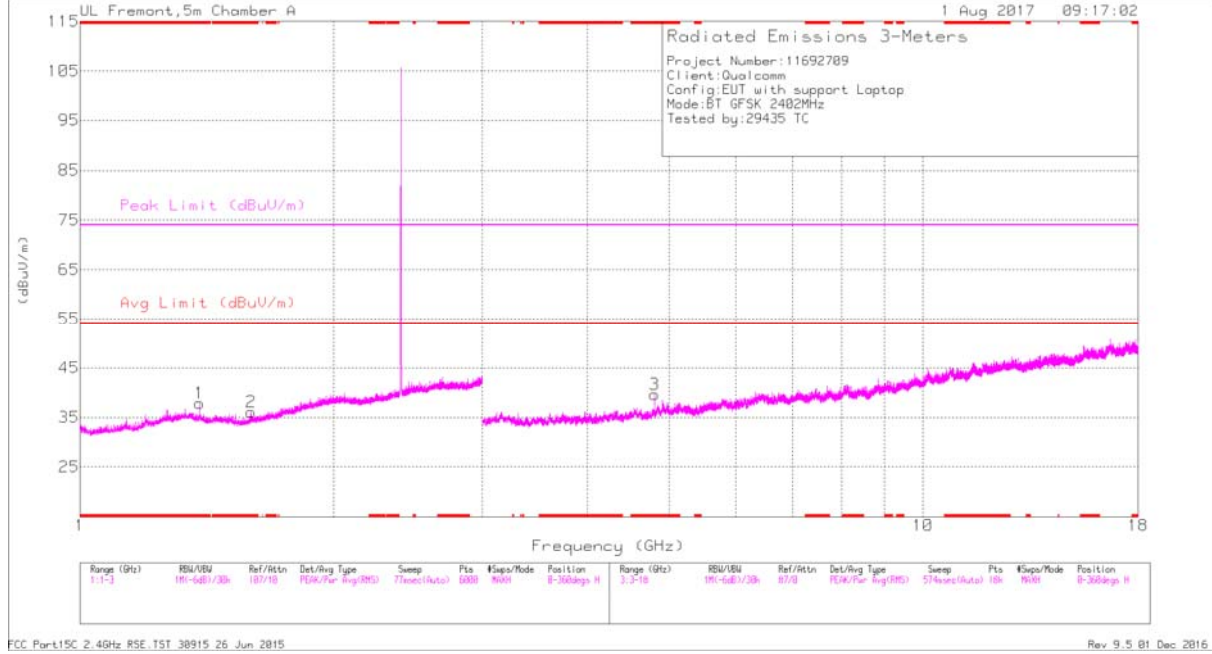
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	42.97	Pk	32.4	-22.7	52.67	-	-	74	-21.33	268	266	V
2	2.484	44.53	Pk	32.4	-22.7	54.23	-	-	74	-19.77	268	266	V
3	2.484	26.19	VA1T	32.4	-22.7	35.89	54	-18.11	-	-	268	266	V
4	2.484	29.65	VA1T	32.4	-22.7	39.35	54	-14.65	-	-	268	266	V

Pk - Peak detector

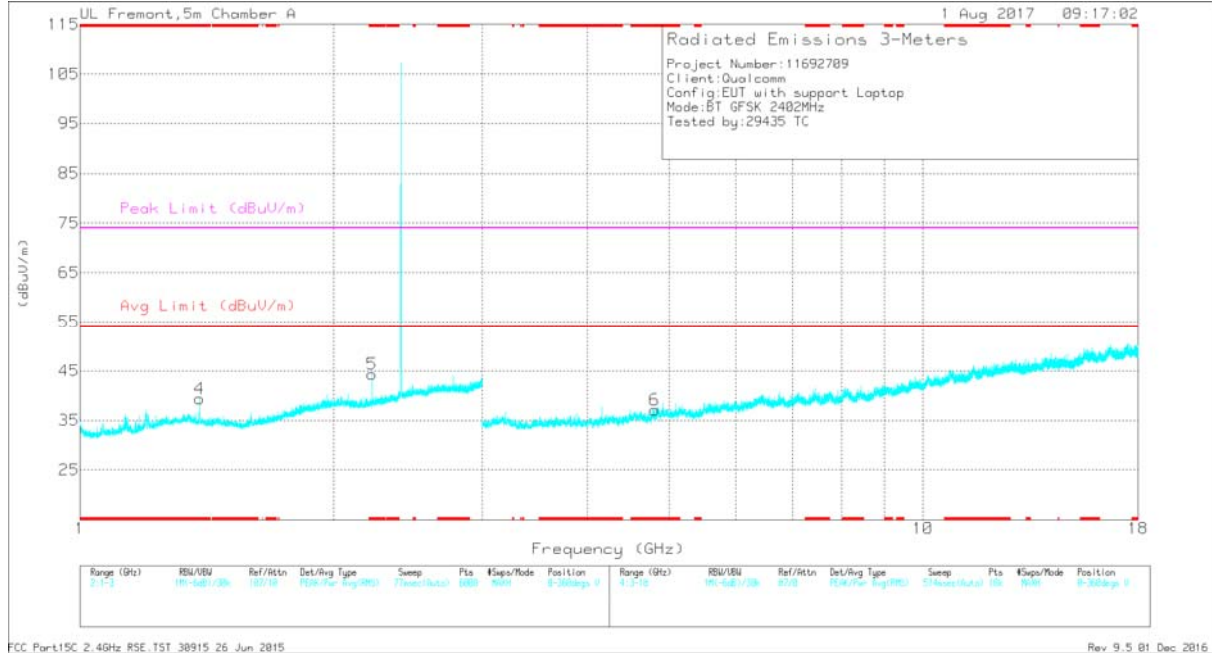
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

8.2.3. HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



Radiated Emissions

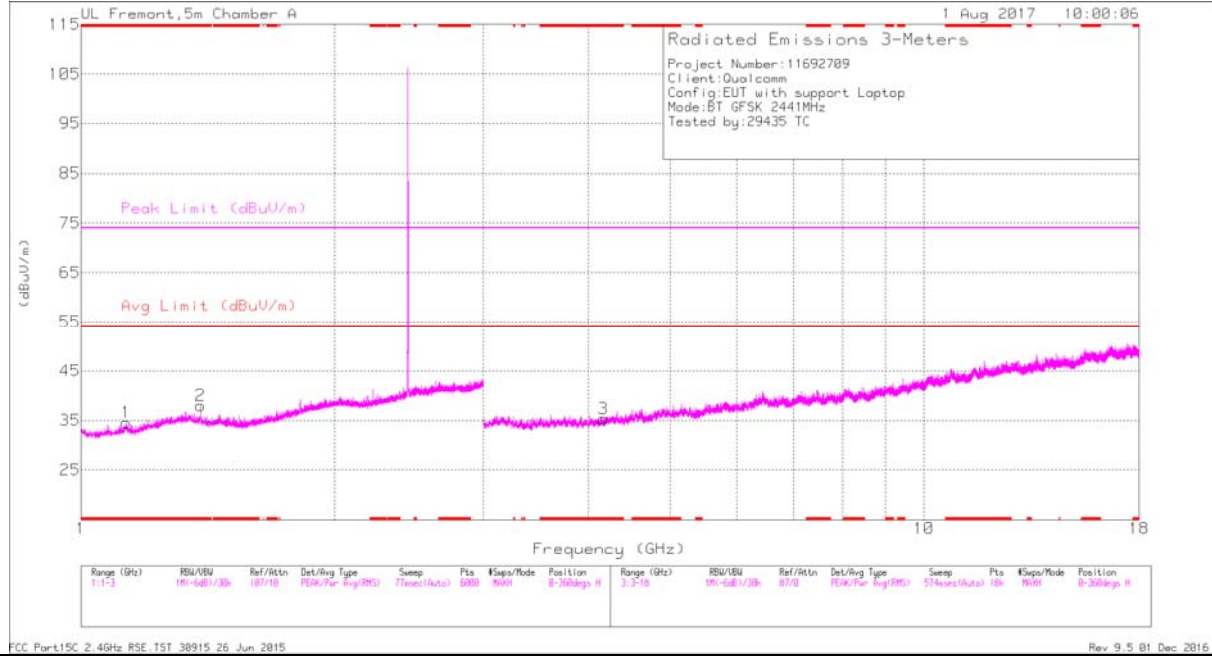
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.386	38.31	PK2	28.9	-23.4	43.81	-	-	74	-30.19	353	114	H
* 1.386	28.46	VA1T	28.9	-23.4	33.96	54	-20.04	-	-	353	114	H
* 1.594	41.66	PK2	28.1	-23.2	46.56	-	-	74	-27.44	91	374	H
* 1.594	25.56	VA1T	28.1	-23.2	30.46	54	-23.54	-	-	91	374	H
* 1.386	37	PK2	28.9	-23.4	42.5	-	-	74	-31.5	102	134	V
* 1.386	24.33	VA1T	28.9	-23.4	29.83	54	-24.17	-	-	102	134	V
* 2.22	39.75	PK2	31.3	-23.3	47.75	-	-	74	-26.25	340	107	V
* 2.222	24.07	VA1T	31.3	-23.4	31.97	54	-22.03	-	-	340	107	V
* 4.802	36.34	PK2	34.2	-27.6	42.94	-	-	74	-31.06	289	161	H
* 4.804	23.57	VA1T	34.2	-27.7	30.07	54	-23.93	-	-	289	161	H
* 4.804	36.3	PK2	34.2	-27.7	42.8	-	-	74	-31.2	358	241	V
* 4.804	23.77	VA1T	34.2	-27.7	30.27	54	-23.73	-	-	358	241	V

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

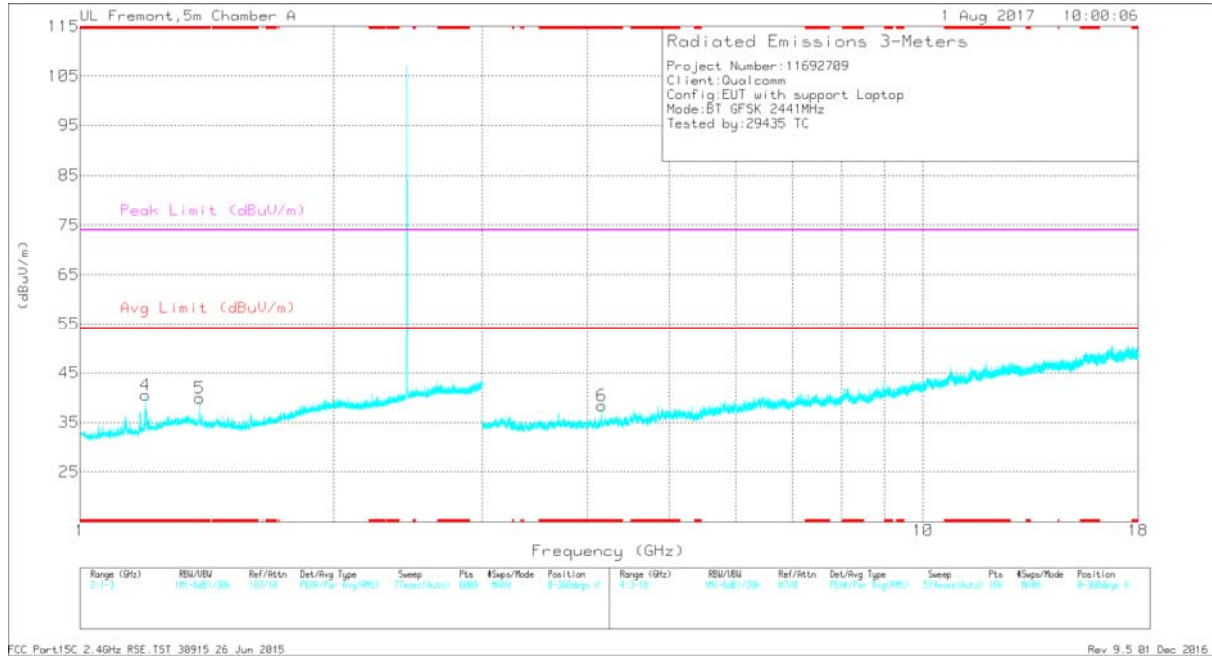
PK2 - KDB558074 Method: Maximum Peak

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

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



Radiated Emissions

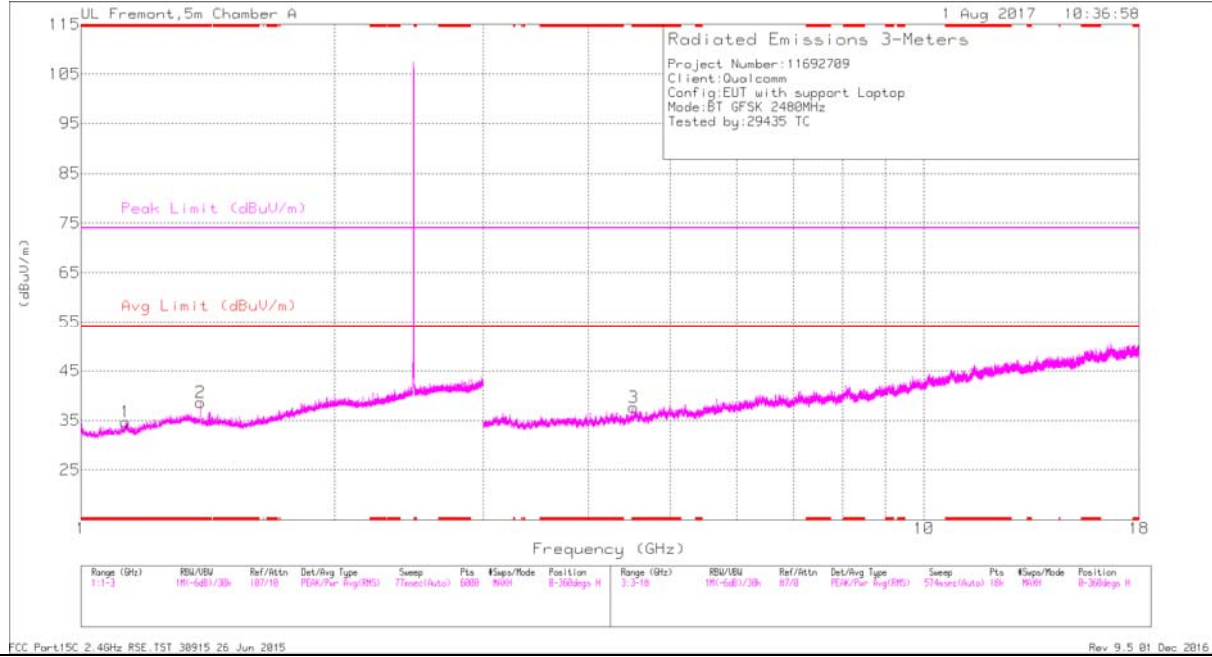
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.13	36.78	PK2	27.7	-23.7	40.78	-	-	74	-33.22	350	151	H
* 1.134	23.84	VA1T	27.7	-23.6	27.94	54	-26.06	-	-	350	151	H
* 1.386	37.64	PK2	28.9	-23.4	43.14	-	-	74	-30.86	269	199	H
* 1.386	26.2	VA1T	28.9	-23.4	31.7	54	-22.3	-	-	269	199	H
* 1.195	46.08	PK2	28.1	-23.6	50.58	-	-	74	-23.42	14	257	V
* 1.196	24.63	VA1T	28.2	-23.6	29.23	54	-24.77	-	-	14	257	V
* 1.386	38.91	PK2	28.9	-23.4	44.41	-	-	74	-29.59	360	192	V
* 1.386	30.12	VA1T	28.9	-23.4	35.62	54	-18.38	-	-	360	192	V
* 4.161	36.71	PK2	33.4	-29	41.11	-	-	74	-32.89	306	186	H
* 4.162	24.62	VA1T	33.4	-29	29.02	54	-24.98	-	-	306	186	H
* 4.158	40.88	PK2	33.4	-29	45.28	-	-	74	-28.72	19	213	V
* 4.158	29.39	VA1T	33.4	-29	33.79	54	-20.21	-	-	19	213	V

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

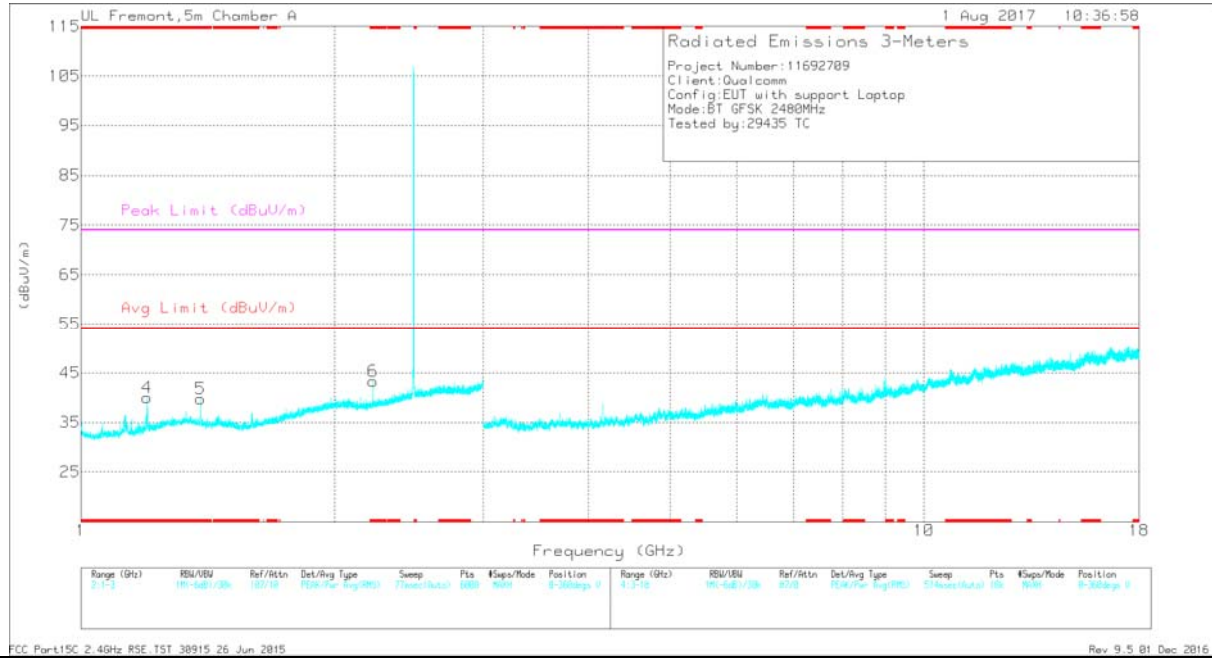
PK2 - KDB558074 Method: Maximum Peak

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

HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.131	36.58	PK2	27.7	-23.7	40.58	-	-	74	-33.42	335	114	H
* 1.131	23.48	VA1T	27.7	-23.7	27.48	54	-26.52	-	-	335	114	H
* 1.386	38.97	PK2	28.9	-23.4	44.47	-	-	74	-29.53	345	198	H
* 1.386	28.92	VA1T	28.9	-23.4	34.42	54	-19.58	-	-	345	198	H
* 1.199	43.65	PK2	28.2	-23.6	48.25	-	-	74	-25.75	342	206	V
* 1.2	25.01	VA1T	28.2	-23.6	29.61	54	-24.39	-	-	342	206	V
* 1.386	40.26	PK2	28.9	-23.4	45.76	-	-	74	-28.24	356	108	V
* 1.386	31.94	VA1T	28.9	-23.4	37.44	54	-16.56	-	-	356	108	V
* 2.22	40.29	PK2	31.3	-23.3	48.29	-	-	74	-25.71	328	107	V
* 2.22	32.26	VA1T	31.3	-23.3	40.26	54	-13.74	-	-	328	107	V
* 4.524	36.23	PK2	33.9	-28	42.13	-	-	74	-31.87	130	140	H
* 4.526	24.19	VA1T	33.9	-28	30.09	54	-23.91	-	-	130	140	H

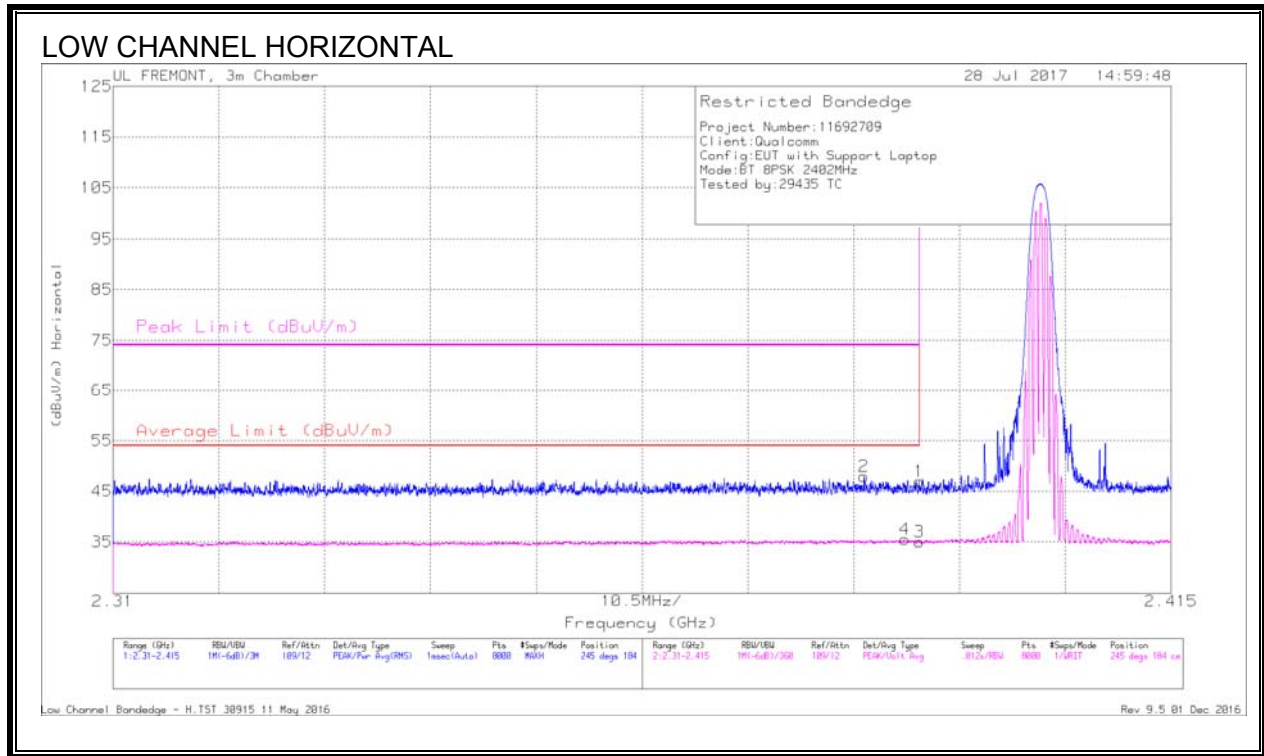
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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

8.3. ENHANCED DATA RATE 8PSK MODULATION

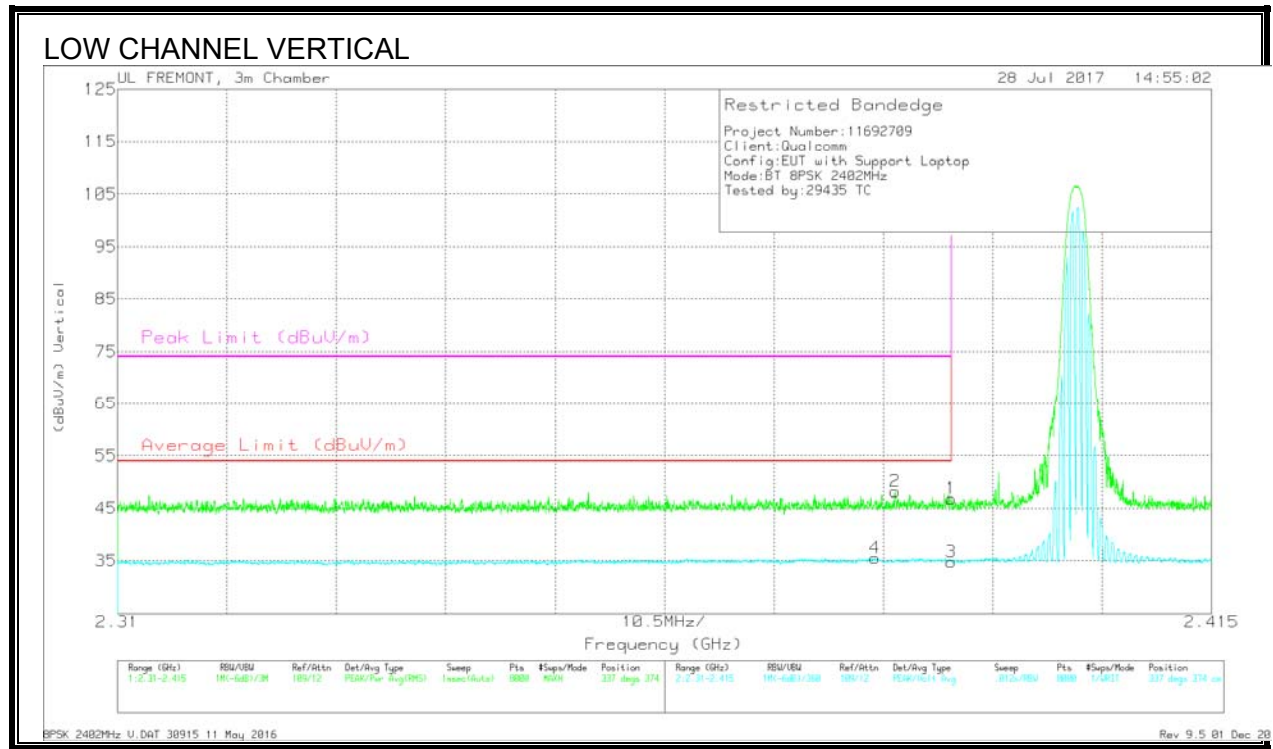
8.3.1. RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pa d (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	38.59	Pk	31.9	-22.6	47.89	-	-	74	-26.11	245	184	H
4	2.389	26.08	VA1T	31.9	-22.5	35.48	54	-18.52	-	-	245	184	H
1	2.39	37.66	Pk	31.9	-22.6	46.96	-	-	74	-27.04	245	184	H
3	2.39	25.75	VA1T	31.9	-22.6	35.05	54	-18.95	-	-	245	184	H

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

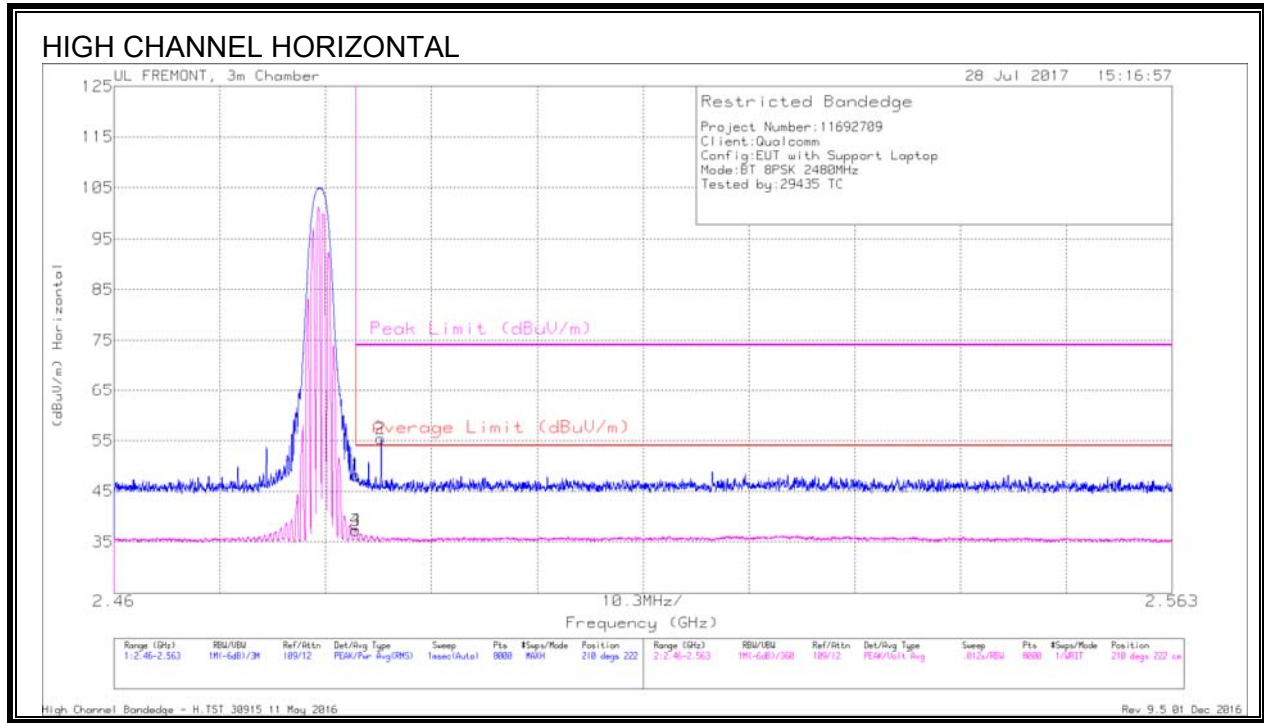


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	2.383	25.97	VA1T	31.9	-22.4	35.47	54	-18.53	-	-	337	374	V
2	2.385	38.9	Pk	31.9	-22.6	48.2	-	-	74	-25.8	337	374	V
1	2.39	37.49	Pk	31.9	-22.6	46.79	-	-	74	-27.21	337	374	V
3	2.39	25.51	VA1T	31.9	-22.6	34.81	54	-19.19	-	-	337	374	V

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

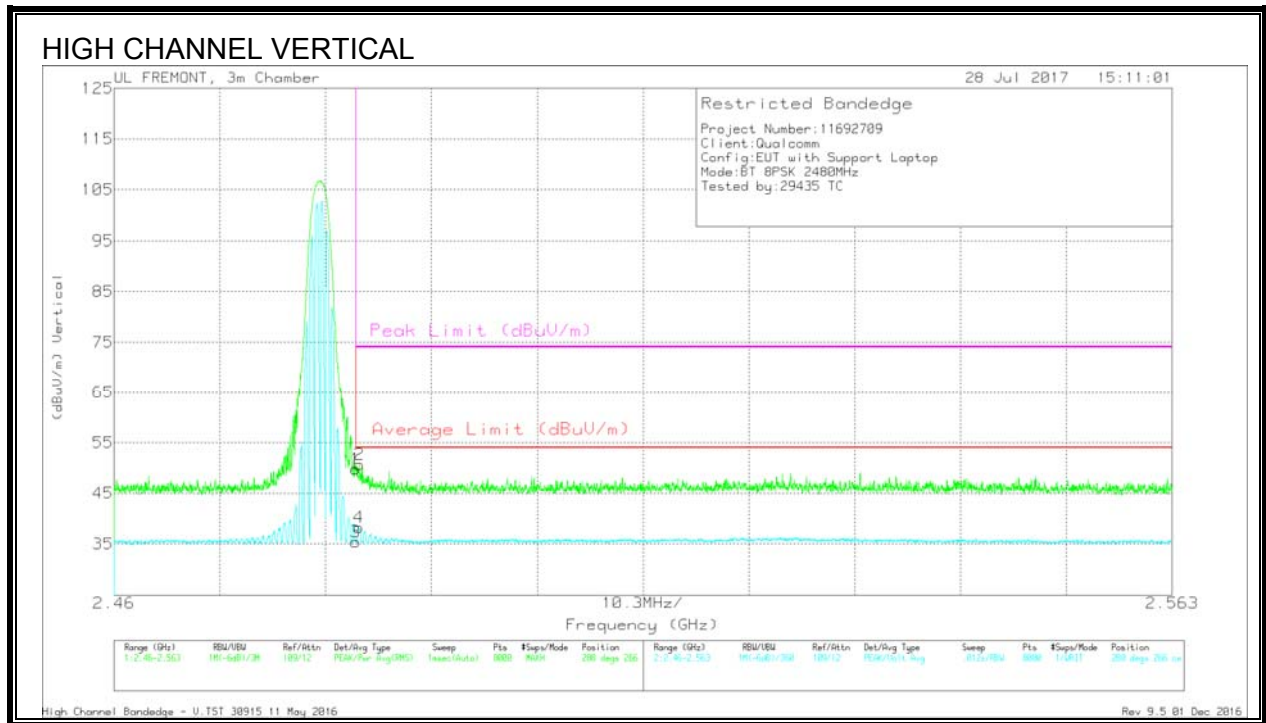
8.3.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Ftr/Pa d (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	38.54	Pk	32.4	-22.7	48.24	-	-	74	-25.76	210	222	H
3	2.484	27.6	VA1T	32.4	-22.7	37.3	54	-16.7	-	-	210	222	H
4	2.484	27.62	VA1T	32.4	-22.7	37.32	54	-16.68	-	-	210	222	H
2	2.486	45.64	Pk	32.4	-22.7	55.34	-	-	74	-18.66	210	222	H

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

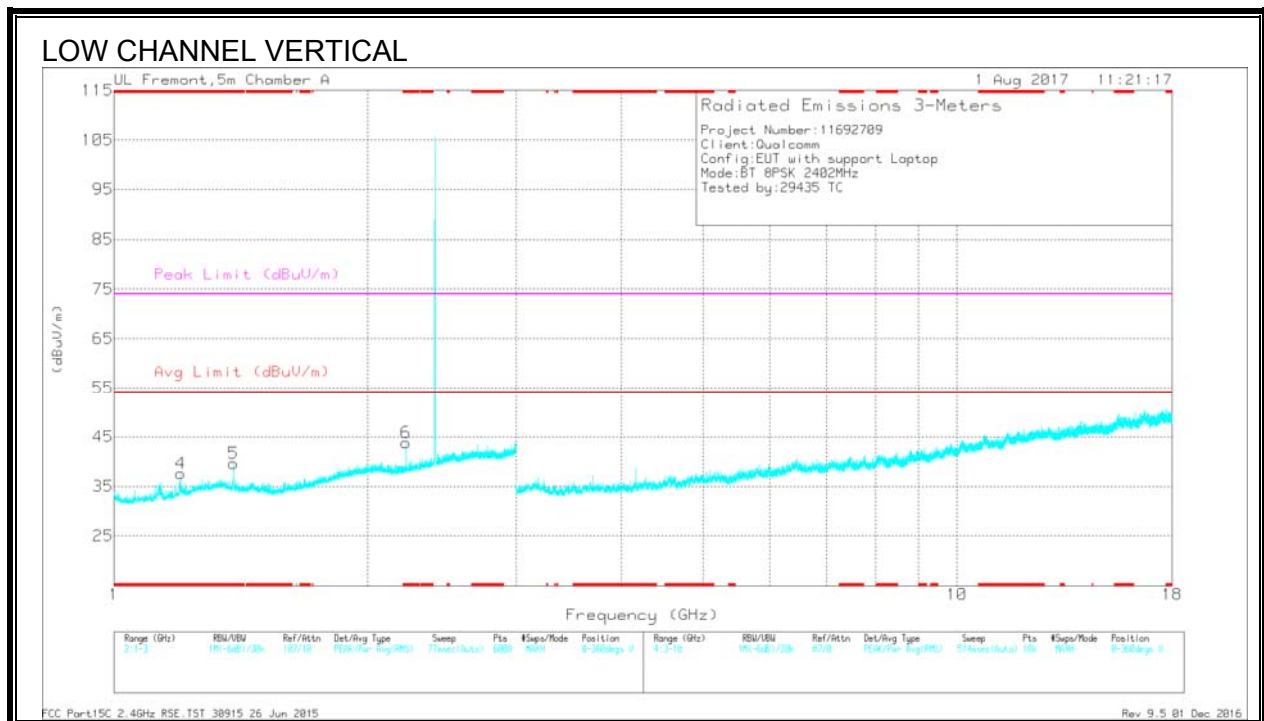
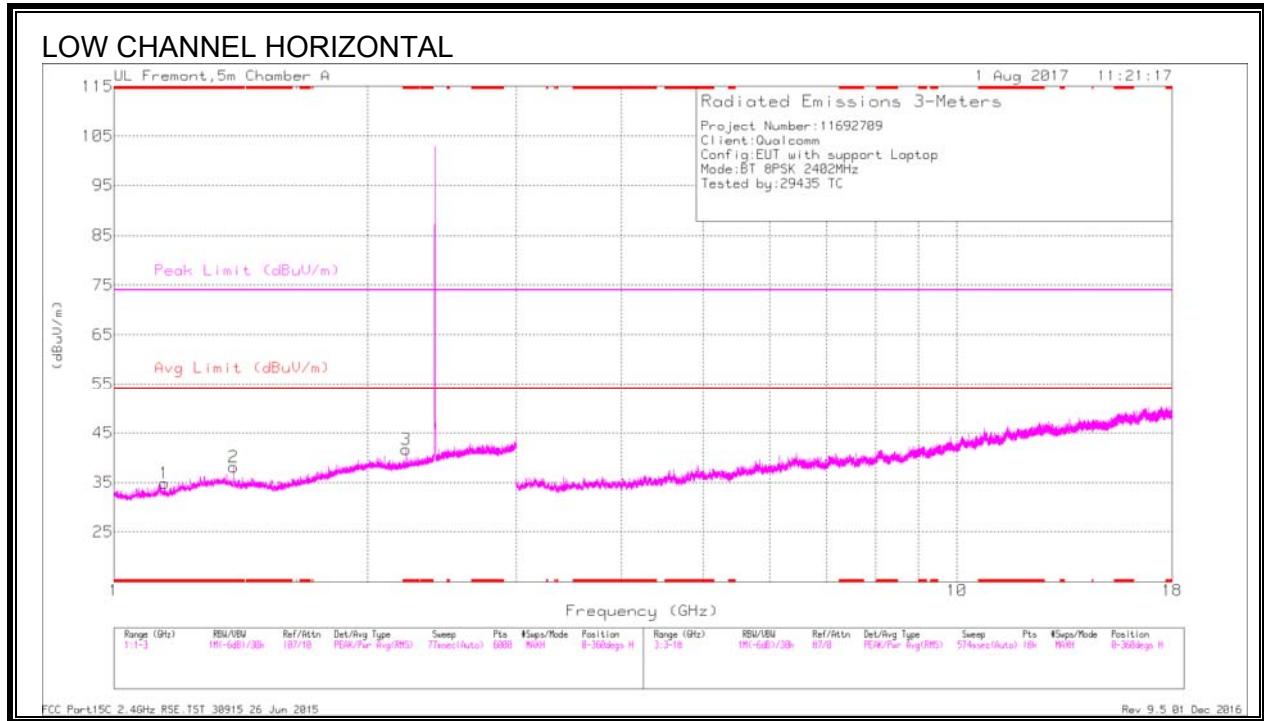


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	40.05	Pk	32.4	-22.7	49.75	-	-	74	-24.25	288	266	V
2	2.484	41	Pk	32.4	-22.7	50.7	-	-	74	-23.3	288	266	V
3	2.484	25.72	VA1T	32.4	-22.7	35.42	54	-18.58	-	-	288	266	V
4	2.484	28.6	VA1T	32.4	-22.7	38.3	54	-15.7	-	-	288	266	V

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

8.3.3. HARMONICS AND SPURIOUS EMISSIONS



Radiated Emissions

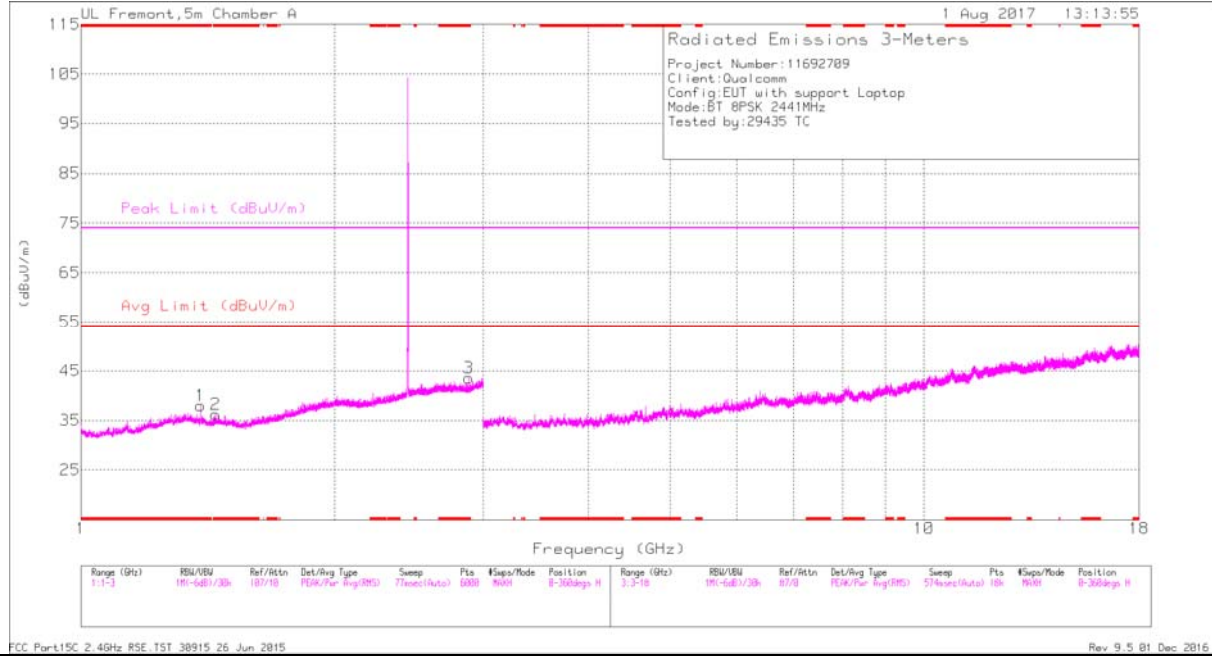
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.15	36.43	PK2	27.6	-23.6	40.43	-	-	74	-33.57	286	333	H
* 1.15	25.51	VA1T	27.6	-23.6	29.51	54	-24.49	-	-	286	333	H
* 1.386	38.85	PK2	28.9	-23.4	44.35	-	-	74	-29.65	338	201	H
* 1.386	29.29	VA1T	28.9	-23.4	34.79	54	-19.21	-	-	338	201	H
* 2.22	38.61	PK2	31.3	-23.3	46.61	-	-	74	-27.39	241	240	H
* 2.22	28.66	VA1T	31.3	-23.3	36.66	54	-17.34	-	-	241	240	H
* 1.199	46.62	PK2	28.2	-23.6	51.22	-	-	74	-22.78	3	261	V
* 1.2	24.53	VA1T	28.2	-23.6	29.13	54	-24.87	-	-	3	261	V
* 1.386	40.14	PK2	28.9	-23.4	45.64	-	-	74	-28.36	360	110	V
* 1.386	31.73	VA1T	28.9	-23.4	37.23	54	-16.77	-	-	360	110	V
* 2.22	40.99	PK2	31.3	-23.3	48.99	-	-	74	-25.01	332	105	V
* 2.22	34.97	VA1T	31.3	-23.3	42.97	54	-11.03	-	-	332	105	V

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

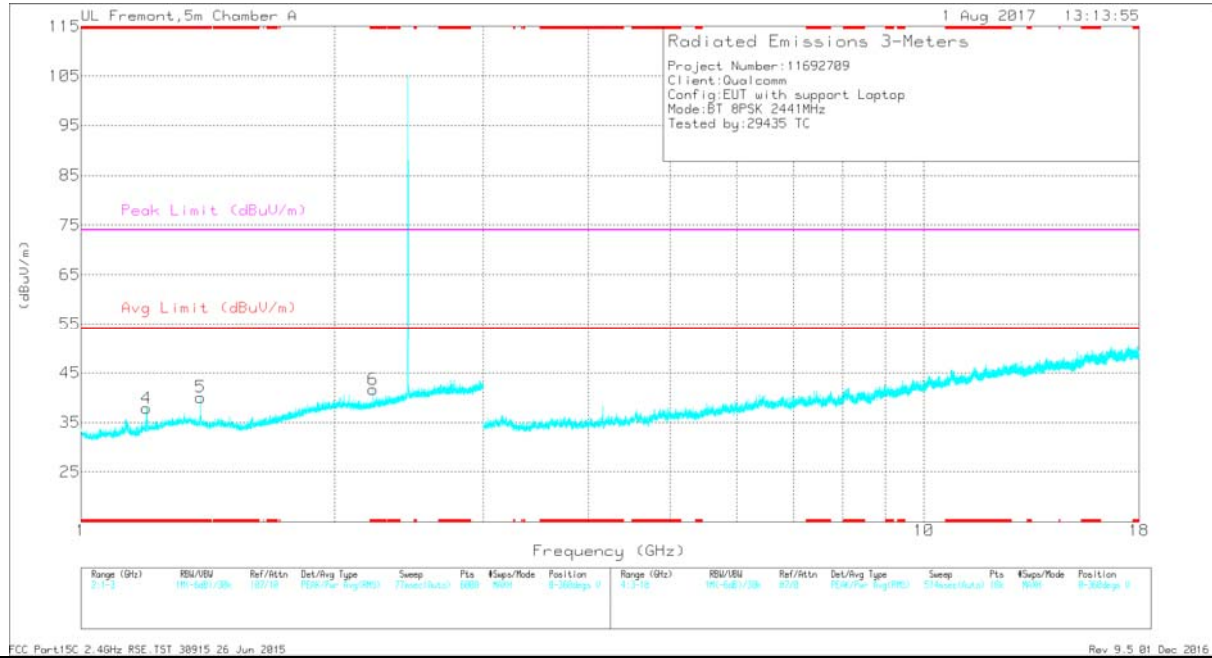
PK2 - KDB558074 Method: Maximum Peak

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

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



Radiated Emissions

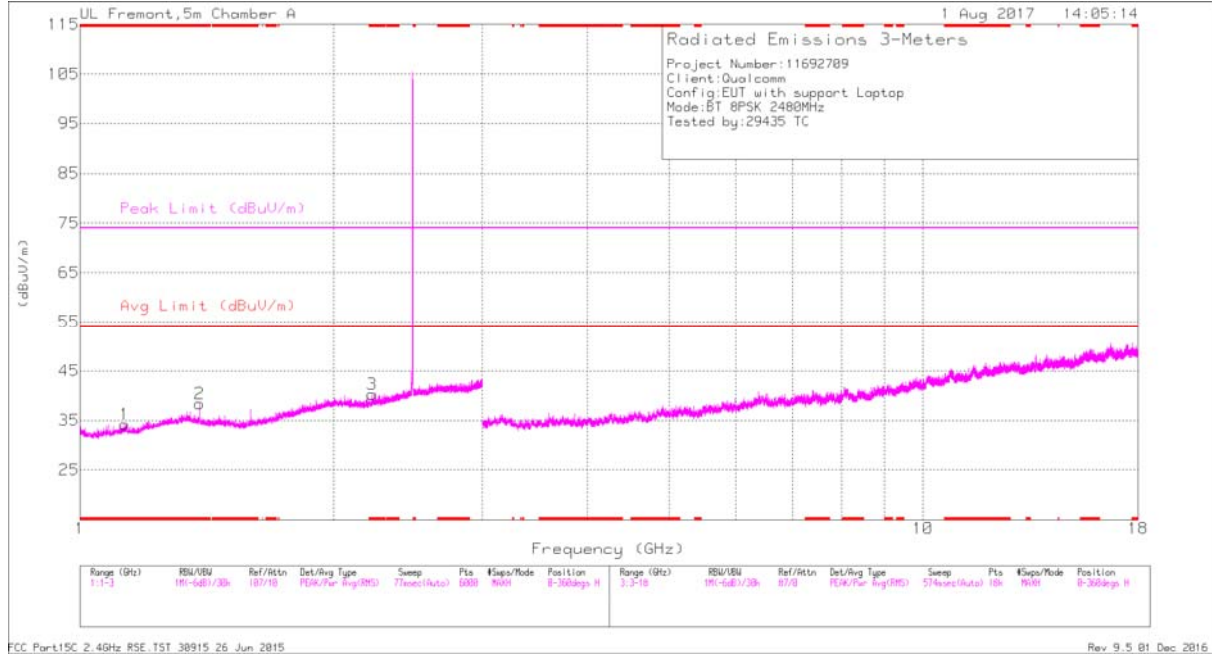
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/P ad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.386	38.34	PK2	28.9	-23.4	43.84	-	-	74	-30.16	343	202	H
* 1.386	29.62	VA1T	28.9	-23.4	35.12	54	-18.88	-	-	343	202	H
* 1.444	36.35	PK2	28.7	-23.3	41.75	-	-	74	-32.25	185	286	H
* 1.445	23.12	VA1T	28.7	-23.3	28.52	54	-25.48	-	-	185	286	H
* 2.883	37.38	PK2	32.2	-21.8	47.78	-	-	74	-26.22	305	252	H
* 2.884	24.44	VA1T	32.2	-21.9	34.74	54	-19.26	-	-	305	252	H
* 1.196	42.3	PK2	28.2	-23.6	46.9	-	-	74	-27.1	175	233	V
* 1.196	24.23	VA1T	28.2	-23.6	28.83	54	-25.17	-	-	175	233	V
* 1.386	39.82	PK2	28.9	-23.4	45.32	-	-	74	-28.68	352	106	V
* 1.386	31.33	VA1T	28.9	-23.4	36.83	54	-17.17	-	-	352	106	V
* 2.22	38.86	PK2	31.3	-23.3	46.86	-	-	74	-27.14	261	205	V
* 2.22	24.28	VA1T	31.3	-23.3	32.28	54	-21.72	-	-	261	205	V

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

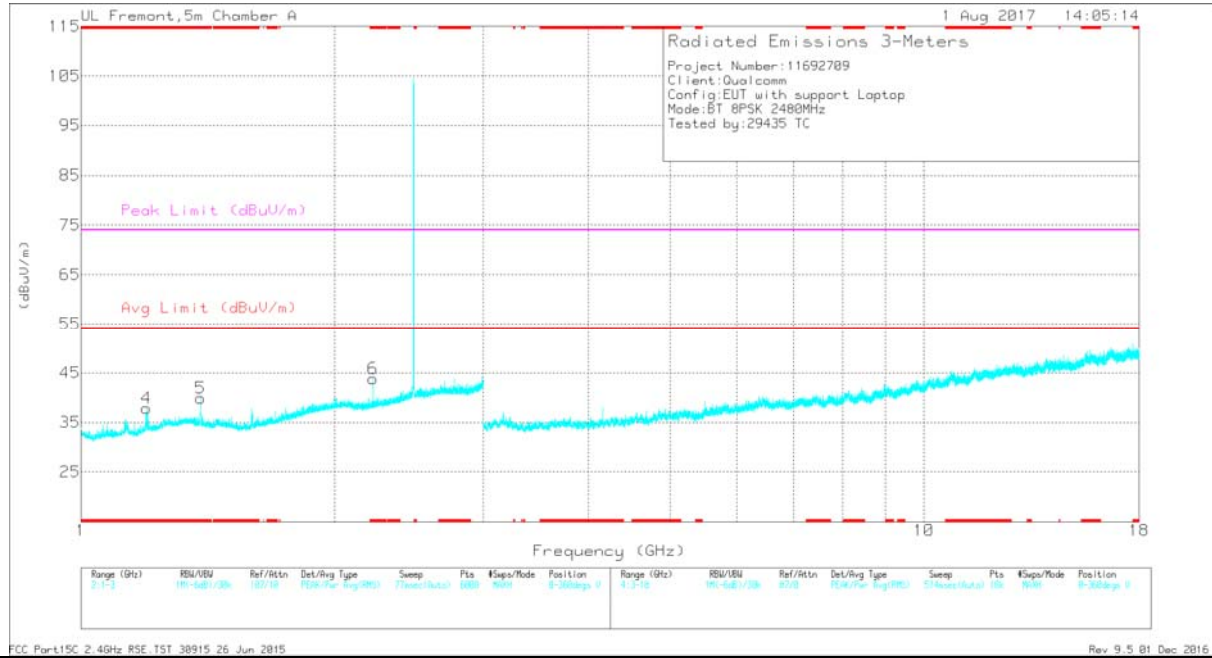
PK2 - KDB558074 Method: Maximum Peak

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

HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.129	36.7	PK2	27.7	-23.7	40.7	-	-	74	-33.3	354	273	H
* 1.129	23.46	VA1T	27.7	-23.7	27.46	54	-26.54	-	-	354	273	H
* 1.386	38.72	PK2	28.9	-23.4	44.22	-	-	74	-29.78	341	209	H
* 1.386	29.37	VA1T	28.9	-23.4	34.87	54	-19.13	-	-	341	209	H
* 2.22	38.29	PK2	31.3	-23.3	46.29	-	-	74	-27.71	232	109	H
* 2.22	29.85	VA1T	31.3	-23.3	37.85	54	-16.15	-	-	232	109	H
* 1.197	46.05	PK2	28.2	-23.6	50.65	-	-	74	-23.35	15	238	V
* 1.196	26.33	VA1T	28.2	-23.6	30.93	54	-23.07	-	-	15	238	V
* 1.386	39.72	PK2	28.9	-23.4	45.22	-	-	74	-28.78	356	107	V
* 1.386	31.68	VA1T	28.9	-23.4	37.18	54	-16.82	-	-	356	107	V
* 2.22	38.53	PK2	31.3	-23.4	46.43	-	-	74	-27.57	315	215	V
* 2.219	24.13	VA1T	31.3	-23.4	32.03	54	-21.97	-	-	315	215	V

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

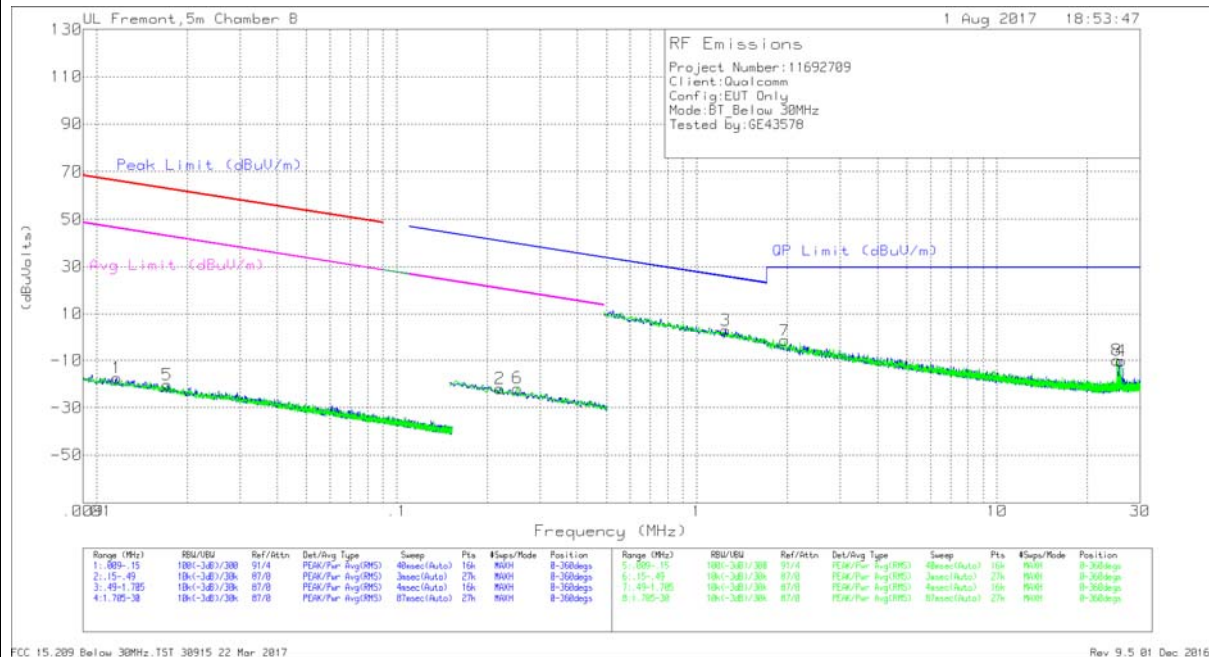
PK2 - KDB558074 Method: Maximum Peak

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

8.4. WORST-CASE BELOW 30 MHz

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL AND VERTICAL PLOTS



NOTE: KDB 414788 OATS and Chamber Correlation Justification

- Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.
- OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.01166	43.35	Pk	17.8	1.4	-80	-17.45	66.25	-83.7	46.25	-63.7	-	-	-	-	0-360
5	.01715	42.68	Pk	15.6	1.4	-80	-20.32	62.9	-83.22	42.9	-63.22	-	-	-	-	0-360
2	.22059	44.89	Pk	11.6	1.5	-80	-22.01	-	-	-	-	40.74	-62.75	20.74	-42.75	0-360
6	.25225	45.09	Pk	11.6	1.5	-80	-21.81	-	-	-	-	39.58	-61.39	19.58	-41.39	0-360

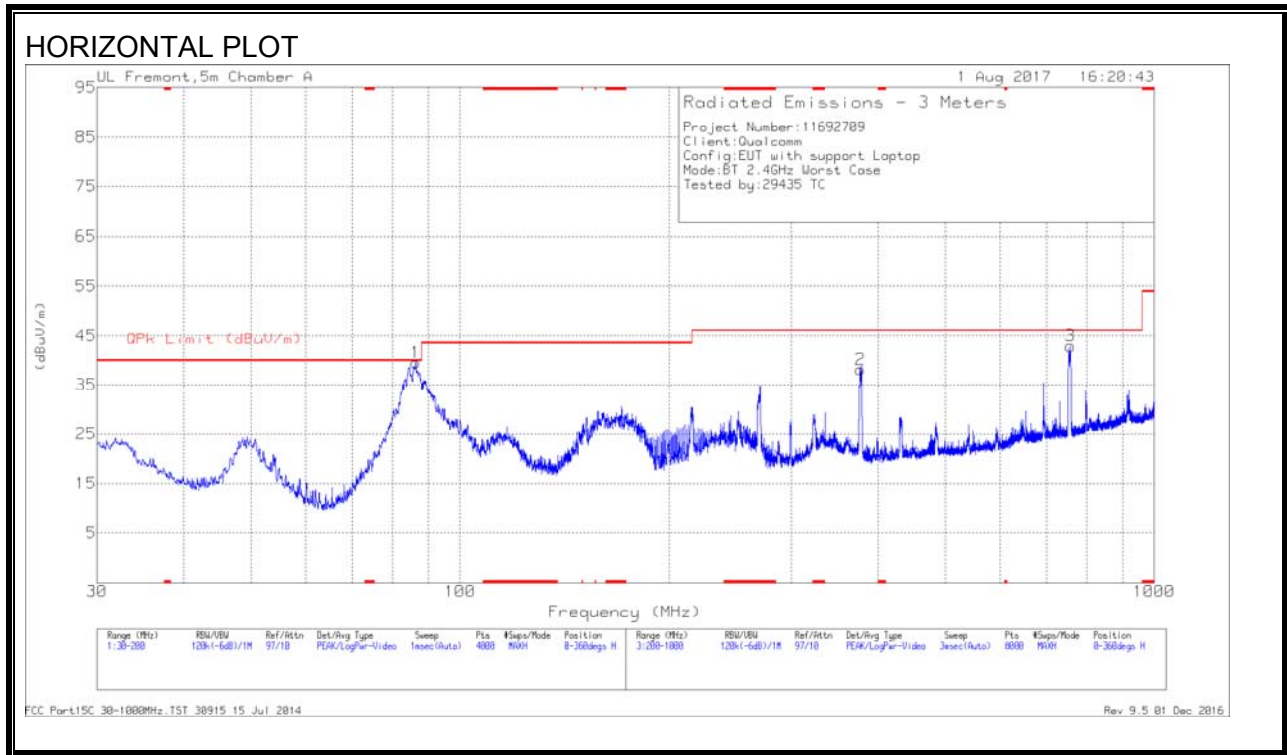
Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
3	1.24635	29.87	Pk	11.6	1.5	-40	2.97	25.71	-22.74	0-360
7	1.96333	25.43	Pk	11.7	1.5	-40	-1.37	29.5	-30.87	0-360
8	25.12256	19.34	Pk	9	1.7	-40	-9.96	29.5	-39.46	0-360
4	25.8865	19.08	Pk	8.9	1.7	-40	-10.32	29.5	-39.82	0-360

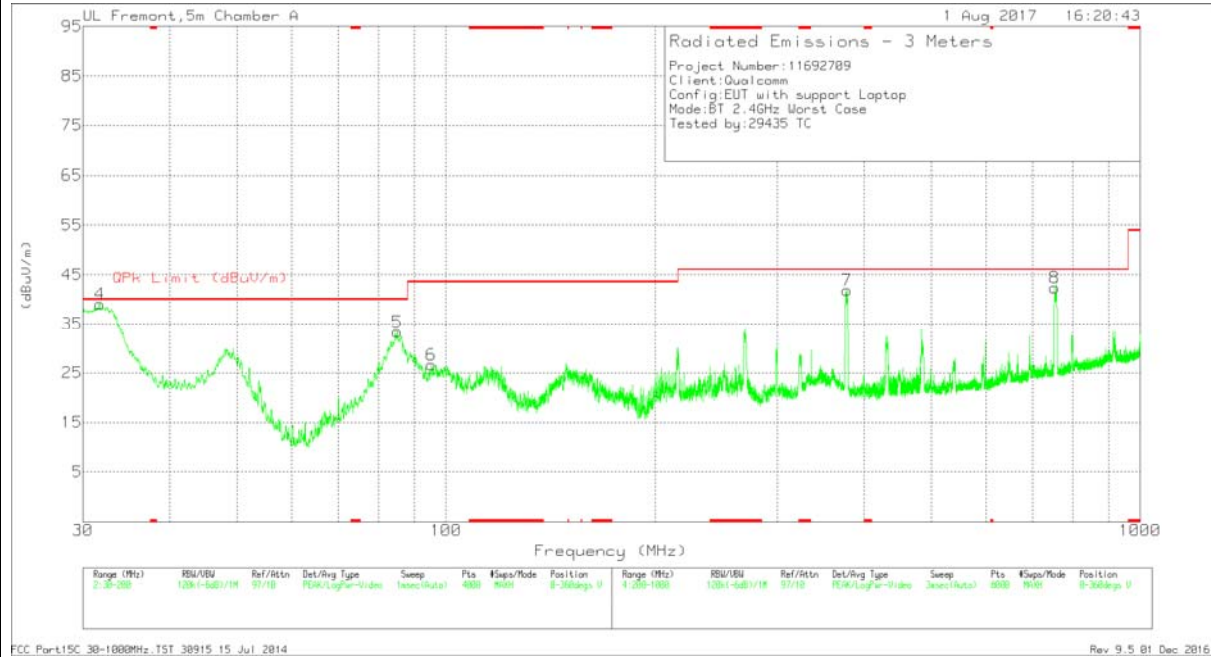
Pk - Peak detector

8.5. WORST- CASE (30 - 1000 MHz)

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



VERTICAL PLOT



DATA

Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	31.5982	46.94	Pk	23.1	-31.2	38.84	40	-1.16	342	103	V
	31.5982	42.96	Qp	23.1	-31.2	34.86	40	-5.14	342	103	V
5	85.1368	52.62	Pk	11.4	-30.7	33.32	40	-6.68	0-360	100	V
1	86.4018	58.37	Pk	11.4	-30.7	39.07	40	-.93	303	200	H
	86.4018	50.44	Qp	11.4	-30.7	31.14	40	-8.86	303	200	H
6	95.2969	44.28	Pk	12.9	-30.6	26.58	43.52	-16.94	0-360	100	V
2	377.4231	48.25	Pk	19	-29.1	38.15	46.02	-7.87	0-360	200	H
7	378.4938	51.17	Pk	19	-29.1	41.07	46.02	-4.95	338	203	V
	378.4938	46.73	Qp	19	-29.1	36.63	46.02	-9.39	338	203	V
8	753.154	46.2	Pk	24.8	-28.1	42.9	46.02	-3.12	0	226	V
	753.154	42.65	Qp	24.8	-28.1	39.35	46.02	-6.67	0	226	V
3	756.9479	45.37	Pk	24.8	-28	42.17	46.02	-3.85	31	282	H
	756.9479	41.69	Qp	24.8	-28	38.49	46.02	-7.53	31	282	H

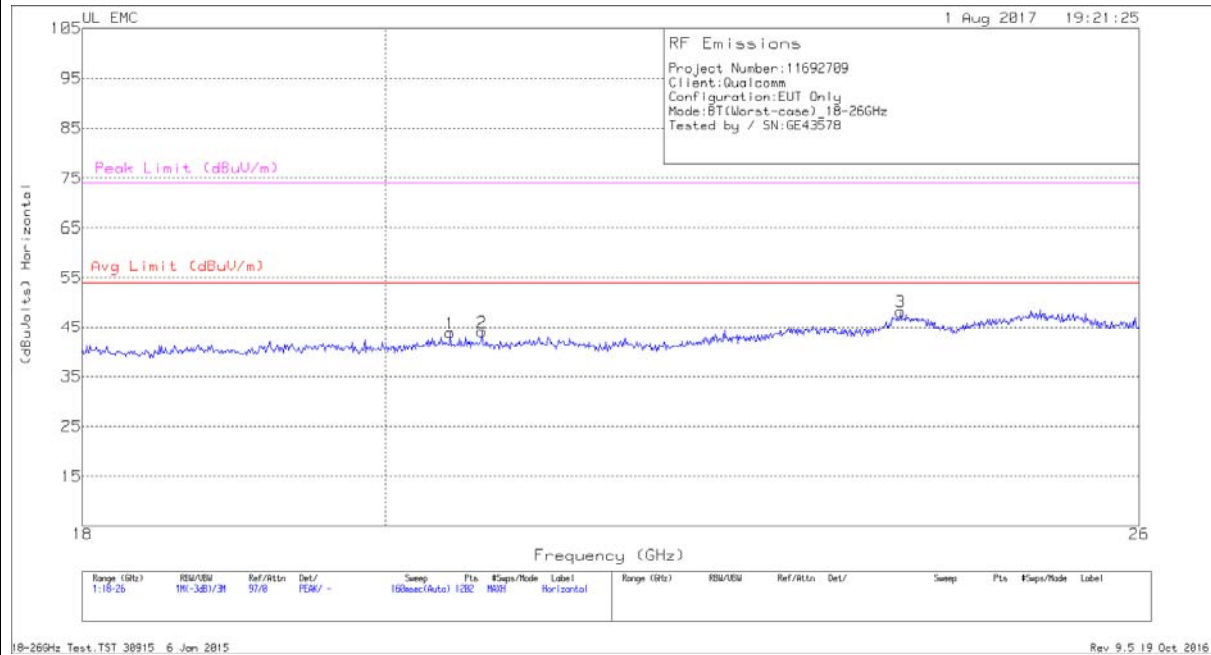
Pk - Peak detector

Qp - Quasi-Peak detector

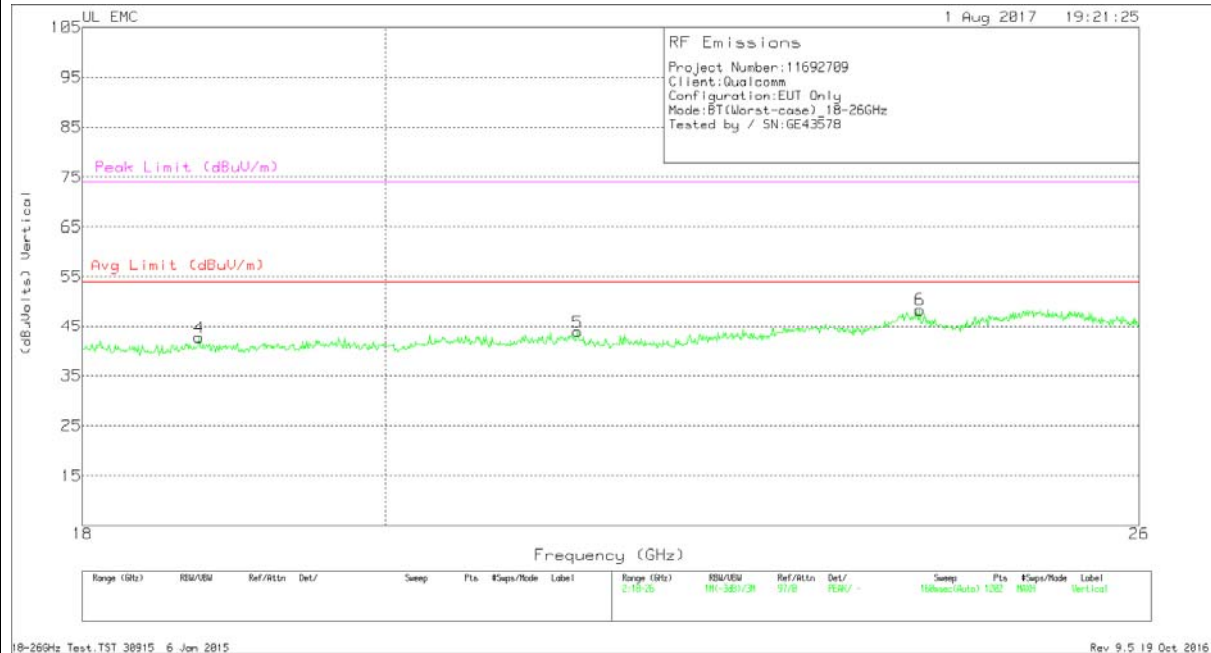
8.6. WORST-CASE ABOVE 18 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



Data

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T449 AF (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	20.458	42.13	Pk	33.1	-21.9	-9.5	43.83	54	-10.17	74	-30.17
2	20.684	42.2	Pk	33	-21.7	-9.5	44	54	-10	74	-30
3	23.928	43.67	Pk	33.9	-19.9	-9.5	48.17	54	-5.83	74	-25.83
4	18.746	41.77	Pk	32.3	-21.9	-9.5	42.67	54	-11.33	74	-31.33
5	21.384	41.93	Pk	33.1	-21.7	-9.5	43.83	54	-10.17	74	-30.17
6	24.088	44.23	Pk	33.9	-20.3	-9.5	48.33	54	-5.67	74	-25.67

Pk - Peak detector

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

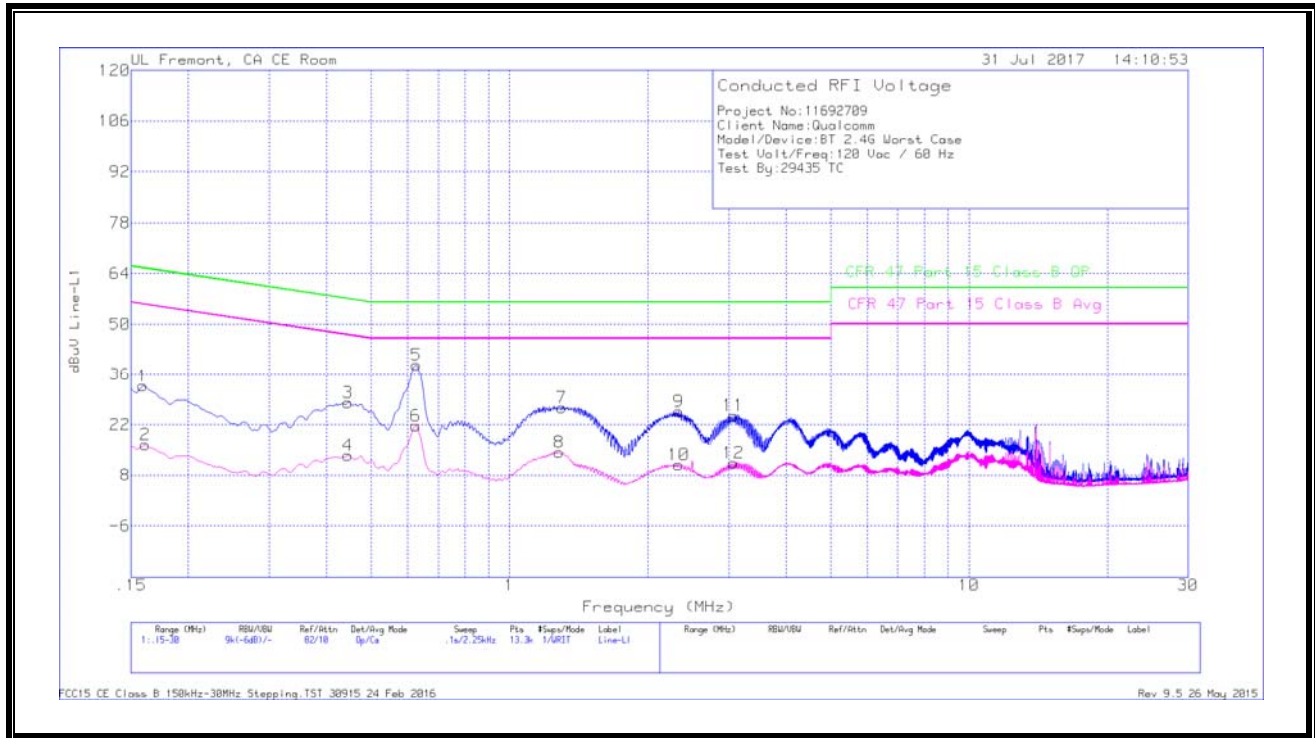
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

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

LINE 1 RESULTS



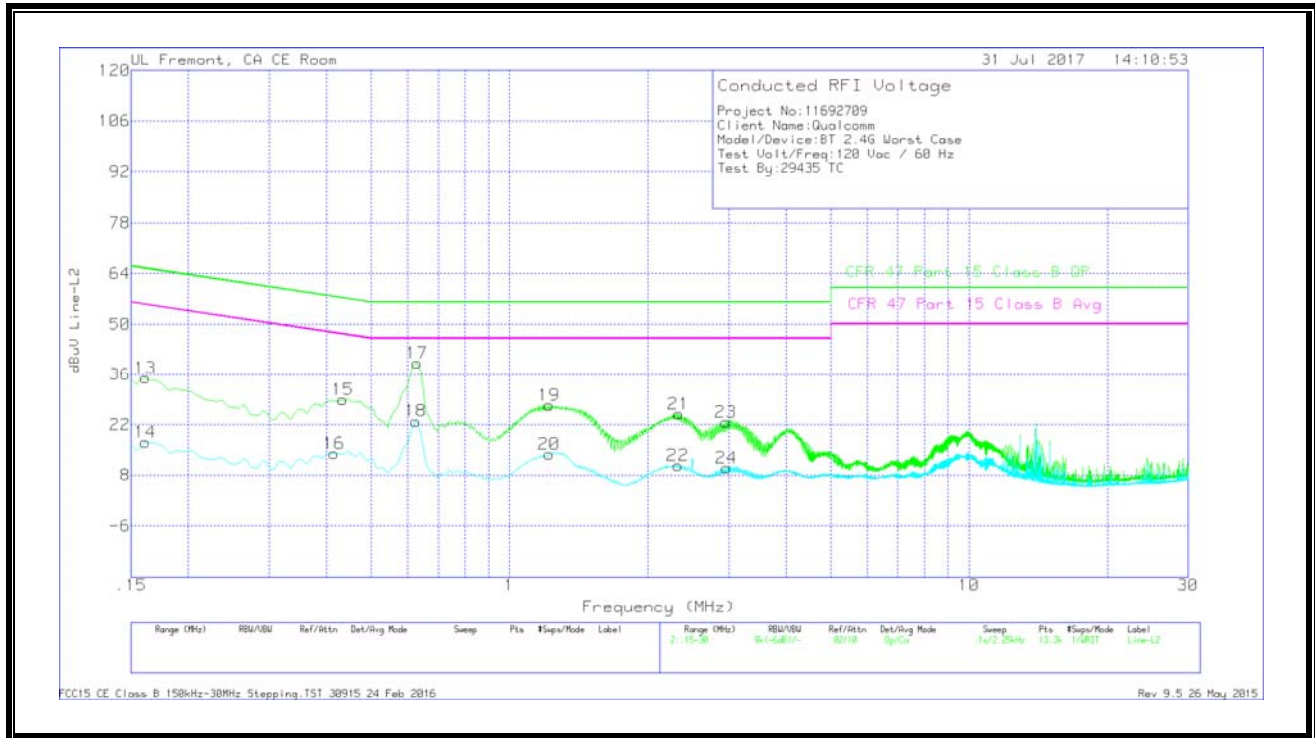
WORST EMISSIONS

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	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	.159	22.42	Qp	.1	.1	10.1	32.72	65.52	-32.8	-	-
2	.16125	6.11	Ca	.1	.1	10.1	16.41	-	-	55.4	-38.99
3	.44475	17.93	Qp	0	.1	10.1	28.13	56.97	-28.84	-	-
4	.44475	3.36	Ca	0	.1	10.1	13.56	-	-	46.97	-33.41
5	.627	28.55	Qp	0	.1	10.1	38.75	56	-17.25	-	-
6	.62475	11.51	Ca	0	.1	10.1	21.71	-	-	46	-24.29
7	1.2975	16.55	Qp	0	.1	10.1	26.75	56	-29.25	-	-
8	1.28175	4.13	Ca	0	.1	10.1	14.33	-	-	46	-31.67
9	2.3325	15.47	Qp	0	.1	10.1	25.67	56	-30.33	-	-
10	2.3325	.74	Ca	0	.1	10.1	10.94	-	-	46	-35.06
11	3.06938	14.33	Qp	0	.1	10.1	24.53	56	-31.47	-	-
12	3.07163	1.16	Ca	0	.1	10.1	11.36	-	-	46	-34.64

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 RESULTS



WORST EMISSIONS

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables C2&C3	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	.16125	24.81	Qp	0	.1	10.1	35.01	65.4	-30.39	-	-
14	.16125	6.96	Ca	0	.1	10.1	17.16	-	-	55.4	-38.24
15	.4335	18.84	Qp	0	.1	10.1	29.04	57.19	-28.15	-	-
16	.4155	3.85	Ca	0	.1	10.1	14.05	-	-	47.54	-33.49
17	.62925	29.08	Qp	0	.1	10.1	39.28	56	-16.72	-	-
18	.62475	12.77	Ca	0	.1	10.1	22.97	-	-	46	-23.03
19	1.21875	17.14	Qp	0	.1	10.1	27.34	56	-28.66	-	-
20	1.21875	3.68	Ca	0	.1	10.1	13.88	-	-	46	-32.12
21	2.3325	14.71	Qp	0	.1	10.1	24.91	56	-31.09	-	-
22	2.3235	.47	Ca	0	.1	10.1	10.67	-	-	46	-35.33
23	2.96025	12.5	Qp	0	.1	10.1	22.7	56	-33.3	-	-
24	2.9625	-.13	Ca	0	.1	10.1	10.07	-	-	46	-35.93

Qp - Quasi-Peak detector

Ca - CISPR average detection