FCC 47 CFR PART 15 SUBPART C

INDUSTRY CANADA RSS-247 ISSUE 1

CERTIFICATION TEST REPORT

FOR

BT, BLE and 802.11 a/b/g/n RADIO MODULE

MODEL NUMBER: CONAPPWM

FCC ID: MHI-CONAPPWM
IC ID: 3681C-CONAPPWM

REPORT NUMBER: 16U22930-E1V2

ISSUE DATE: 9/1/2016

Prepared for
CARD ACCESS, INC.
11778 SOUTH ELECTION RD. #260
DRAPER, UT 84020, U.S.A.

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	04/05/16	Initial Issue	C. Vergonio
V2	09/01/16	Updated Section 5.4, Section 9.3 and Section 11.	C. Vergonio

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	CARD ACCESS INC. 11778 SOUTH ELECTION RD. #260 DRAPER, UT 84020, USA
EUT DESCRIPTION:	BT, BLE and 802.11 a/b/g/n RADIO MODULE
MODEL:	CONAPPWM
SERIAL NUMBER:	427258, 427299, 427300
DATE TESTED:	MARCH 1 – AUGUST 31, 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 revision 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.

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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.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a BT, BLE and 802.11 a/b/g/n RADIO MODULE.

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	3.50	2.24
2402 - 2480	Enhanced 8PSK	5.65	3.67

Note: GFSK, Pi/4-DQPSK, 8PSK average Power are all investigated, The GFSK & 8PSK Power are the worst case. Testing is based on this mode of showing compliance. For average power data, please refer to section 8.7.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an PIFA antenna, with a maximum gain of -0.5dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

Below 1GHz Radiated emission and power line conducted emission were performed with the EUT set to transmit on the channel with higher output power as worst-case scenario.

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

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	TRIAD	WSU120-0700	N/A	N/A
Laptop	Lenovo	T430	PB-05HPL	N/A
Laptop AC Adapter	Lenovo	ADLX90NLT2A	11S45N0707Z1ZL7436RDM2	N/A

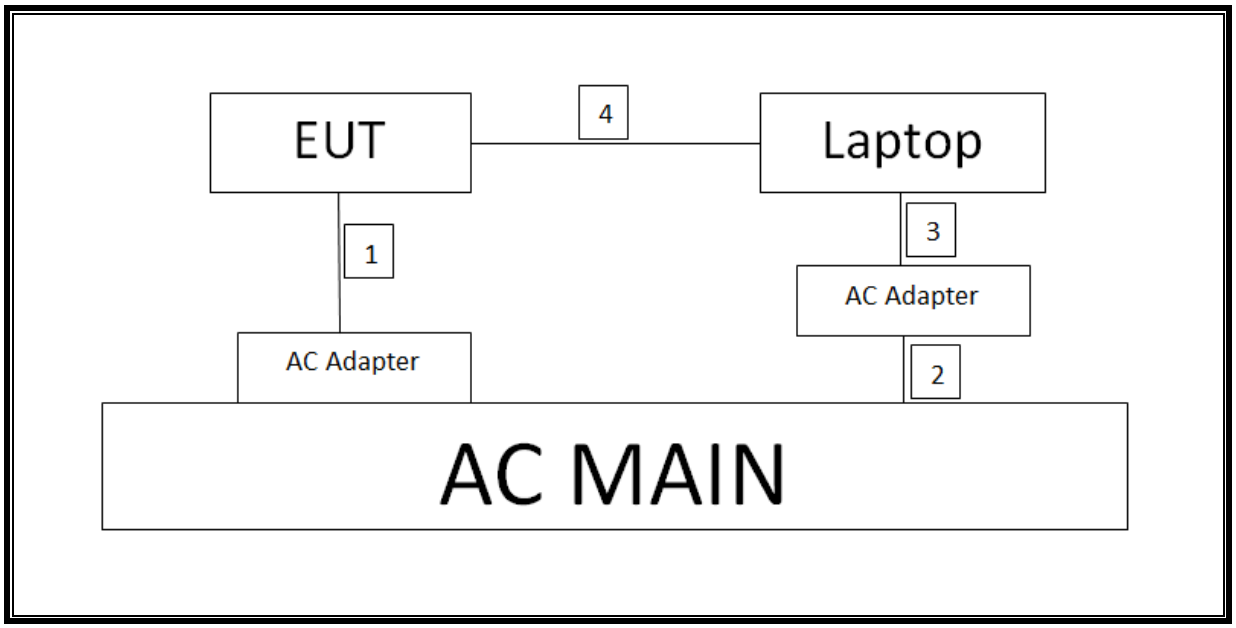
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC/DC	1	US115V/12V	Unshielded	1	
2	AC	1	US115V	Unshielded	1	
3	DC	1	20Vdc	Unshielded	1.5	Ferrite on Laptop end
4	Com	1	USB/Serial	Unshielded	1.5	

TEST SETUP

EUT was set via software to enable transmit Bluetooth communications.

SETUP DIAGRAM FOR TESTS



Note: For radiated testing, the unit was test stand alone with AC adapter

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**
Amplifier, 1-18GHz	Miteq	AFS42-00101800-25-S-42	493	03/09/17
Amplifier, 1-18GHz	Miteq	AFS42-00101800-25-S-42	1165	07/20/16
Amplifier, 1-8GHz, 35 dB	Miteq	AMF-4D-01000800-30-29P	1156	03/09/17
Amplifier, 1-8GHz, 35 dB	Miteq	AMF-4D-01000800-30-29P	1172	07/20/16
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	130	09/01/16
Antenna, Horn, 18GHz	ETS Lindgren	3117	345	02/22/17
Antenna, Horn, 18GHz	ETS Lindgren	3117	346	02/22/17
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	447	05/12/16
ESR7 EMI Test Receiver 7GHz	Rohde & Schwarz	ESR	1436	12/19/16
High Pass Filter 3GHz	Micro-Tronics	HPS17543	485	03/09/17
High Pass Filter 3GHz	Micro-Tronics	HPS17543	486	07/20/16
High Pass Filter 6GHz	Micro-Tronics	HPS17542	483	03/09/17
High Pass Filter 6GHz	Micro-Tronics	HPS17542	484	07/20/16
LISN, 30 MHz	FCC	FCC-LISN-50/250-25-2	1310	09/16/17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	482	03/09/17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	481	07/20/16
Peak / Average Power Sensor	Keysight	N1921A	750	09/17/16
Peak Power Meter	Agilent / HP	N1911A	1268	07/06/17
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	88	04/07/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	404	06/29/16
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	99	06/10/16
Spectrum Analyzer, PXA, 3 Hz to 44 GHz	Keysight	N9030A	PRE0126777	12/21/16
Spectrum Analyzer, PXA, 3 Hz to 44 GHz	Keysight	N9030A	907	01/06/17
Spectrum Analyzer, PXA, 3 Hz to 44 GHz	Keysight	N9030A	1210	01/07/17

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Ver 9.5, June 24, 2015
Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015
Antenna Port Software	UL	UL RF	Ver 4.2, Feb 2, 2015

7. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049	RSS-GEN 6.6	Occupied Bandwidth (99%)	N/A	Conducted	Pass
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass
15.247 (b)(1)	RSS-247 5.4.2	TX conducted output power	<21dBm		Pass
15.247 (a)(1)	RSS-247 5.1.2	Hopping frequency separation	> 25KHz		Pass
15.247 (a)(1)(iii)	RSS-247 5.1.4	Number of Hopping Channels	More than 15 non-overlapping channels		Pass
15.247 (a)(1)(iii)	RSS-247 5.1.4	Avg Time of Occupancy	< 0.4sec		Pass
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass
15.205, 15.209	RSS-GEN 8.9/7	Radiated Spurious Emission	< 54dBuV/m		Pass

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME, DUTY CYCLE

LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

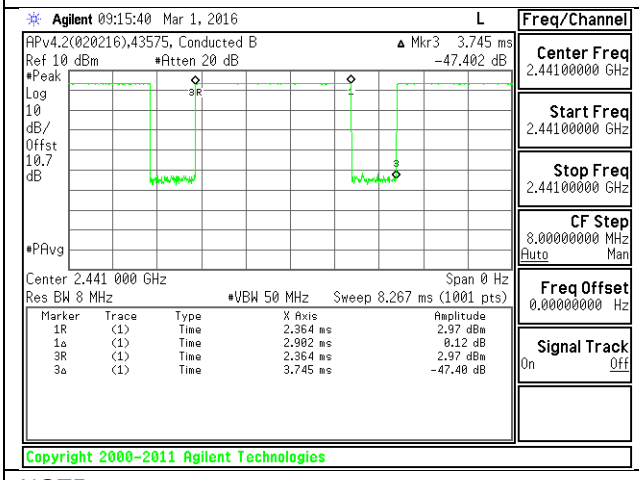
RESULTS

ON TIME AND DUTY CYCLE RESULTS

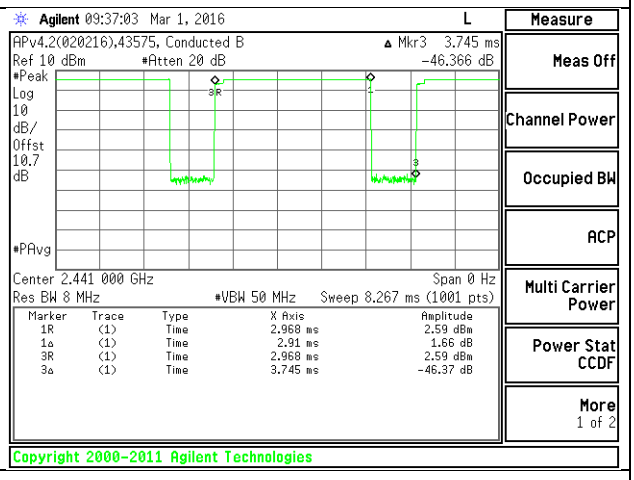
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
GFSK	2.902	3.745	0.775	77.49%	1.11	0.345
8PSK	2.91	3.745	0.777	77.70%	1.10	0.344

DUTY CYCLE PLOTS

GFSK



8PSK



NOTE: --

8.2. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

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

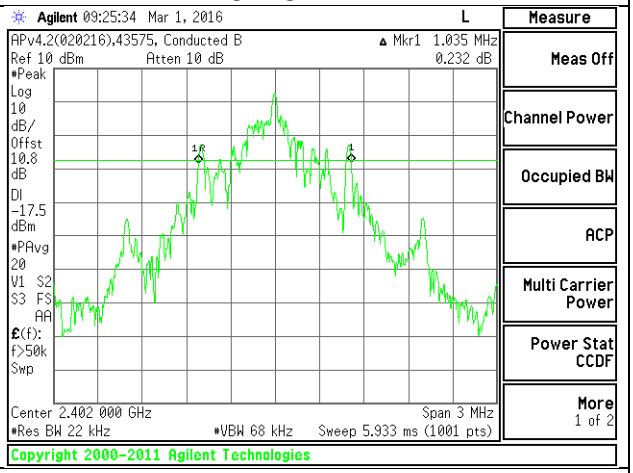
RESULTS

8.2.1. GFSK 20 dB BANDWIDTH PLOTS AND TABLE

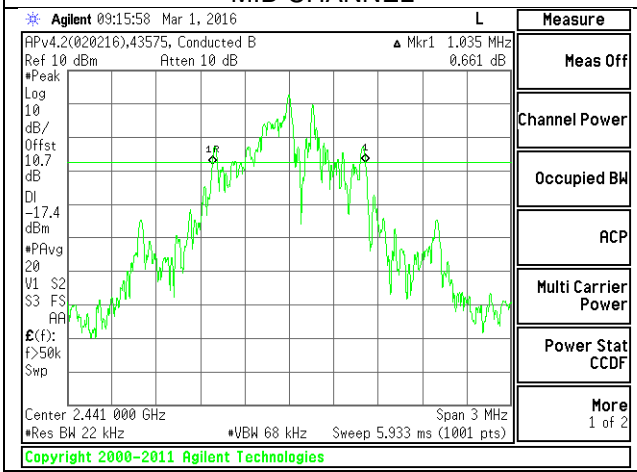
TEST RESULT TABLE

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.035
Middle	2441	1.035
High	2480	1.035

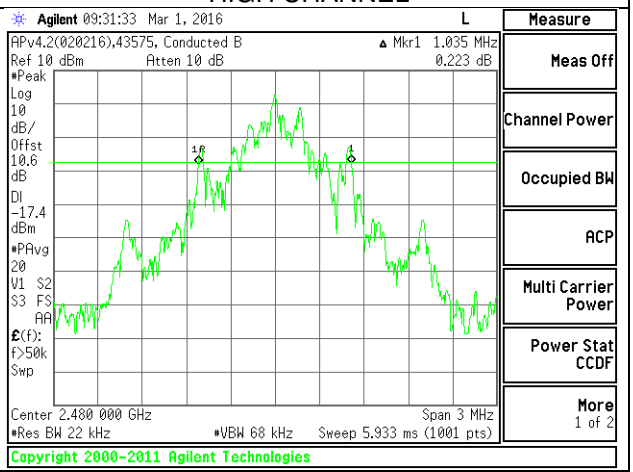
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

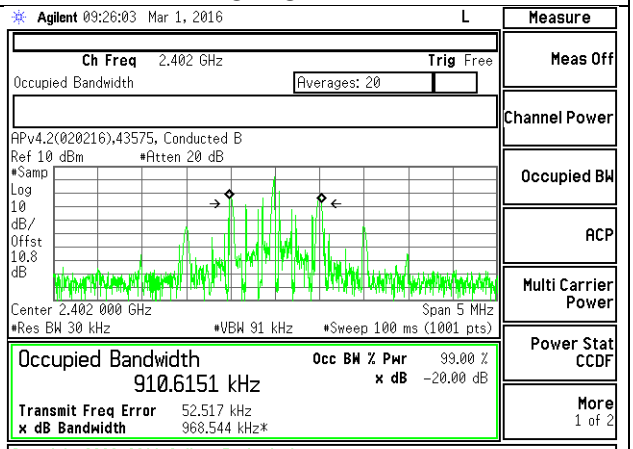


8.2.2. GFSK 99% BANDWIDTH PLOTS AND TABLE

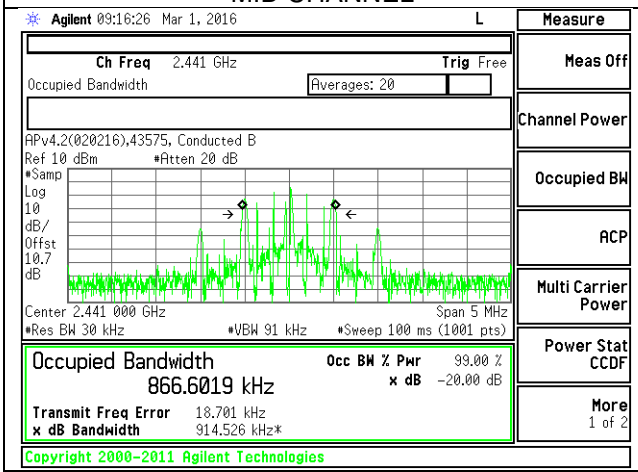
TEST RESULT TABLE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	0.911
Middle	2441	0.867
High	2480	0.878

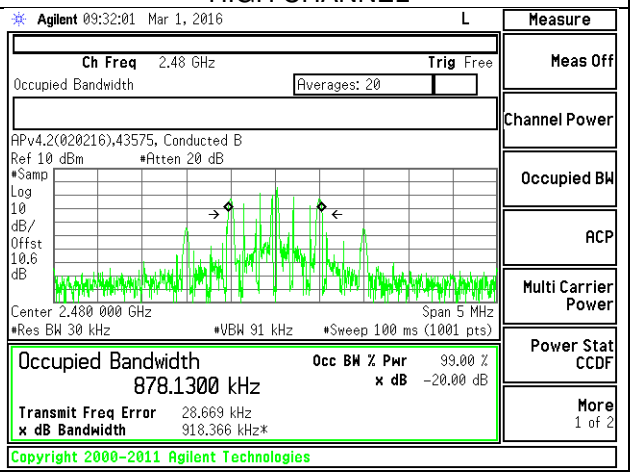
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

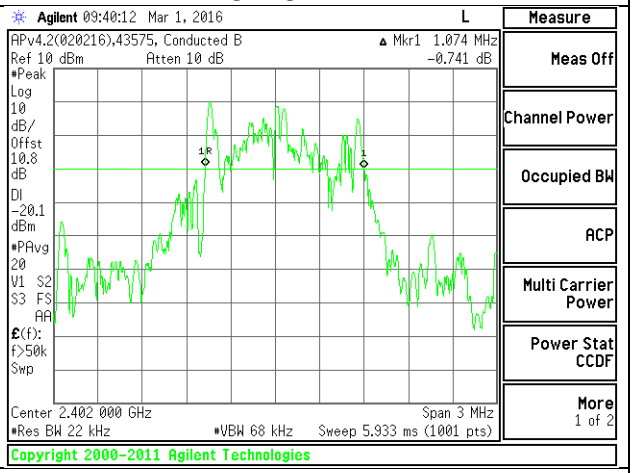


8.2.3. 8PSK 20 dB BANDWIDTH PLOTS AND TABLE

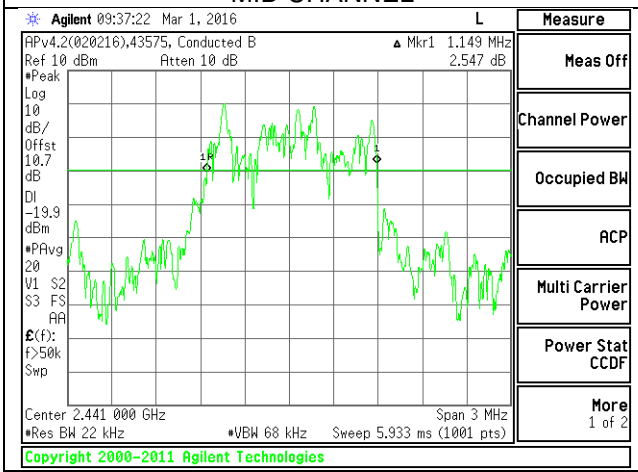
TEST RESULT TABLE

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.074
Middle	2441	1.149
High	2480	1.173

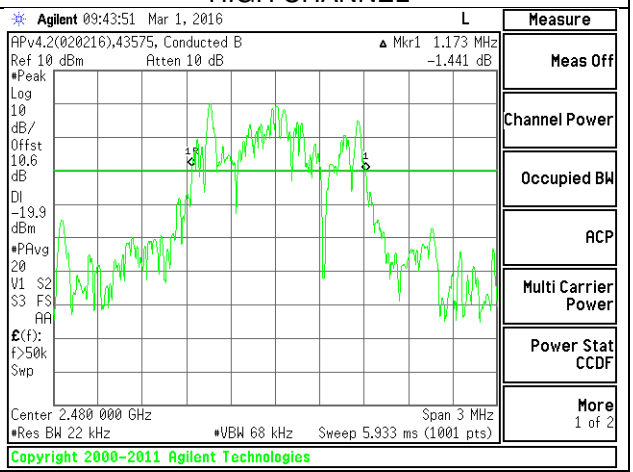
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

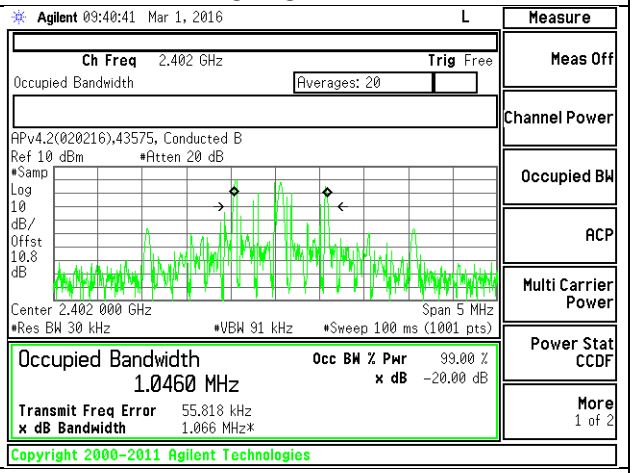


8.2.4. 8PSK 99% BANDWIDTH PLOTS AND TABLE

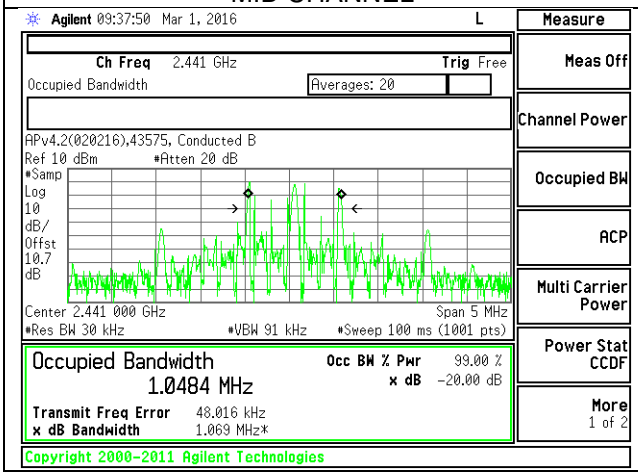
TEST RESULT TABLE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.046
Middle	2441	1.048
High	2480	1.045

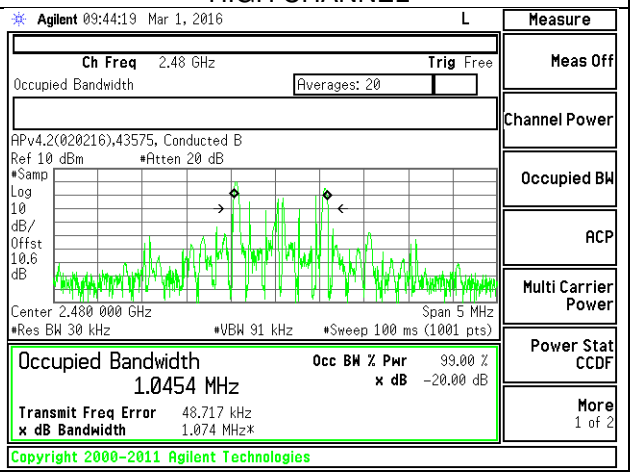
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.3. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)
IC RSS-247 5.1(1)

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.

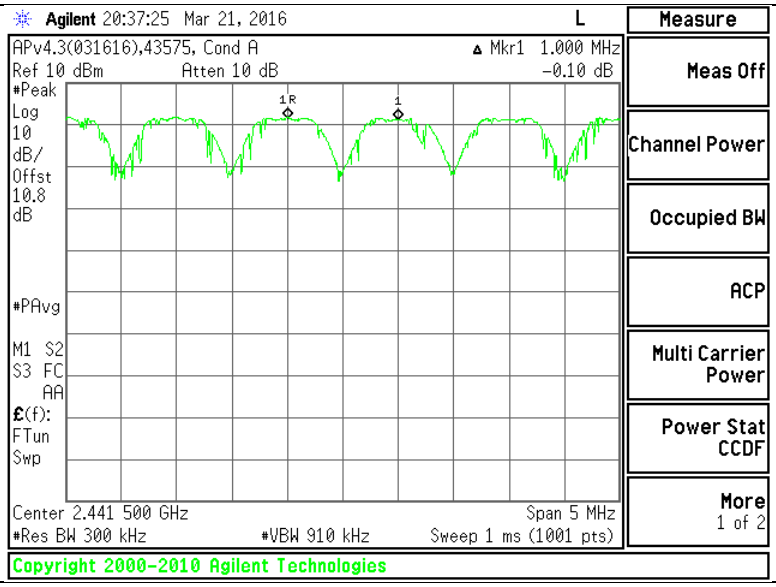
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 910 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION PLOT



NOTE: Hopping Frequency Separation is 1 MHz

8.4. 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

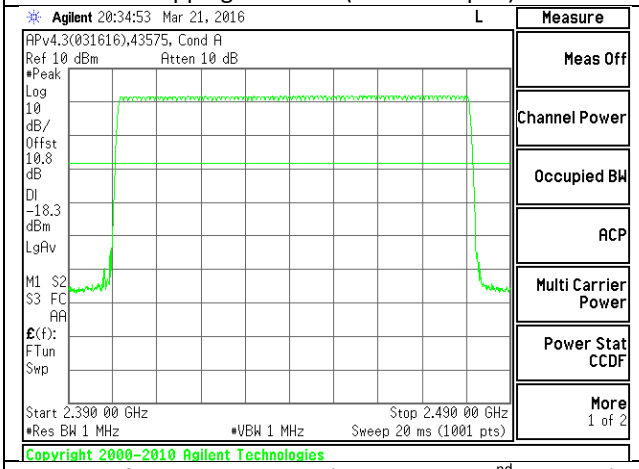
DA 00-705: The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

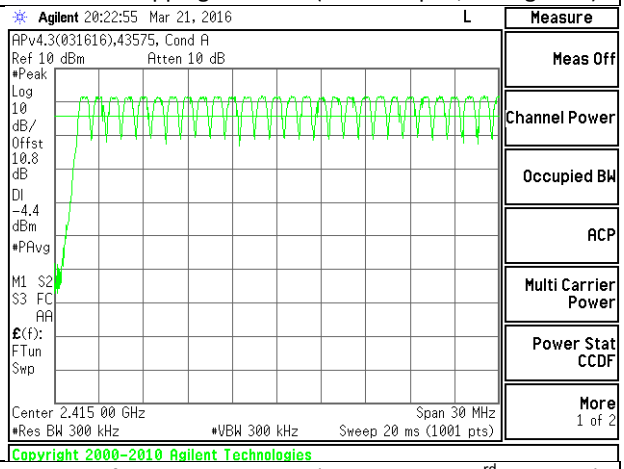
Normal Mode: 79 Channels observed.

8.4.1. NUMBER OF HOPPING CHANNELS PLOTS

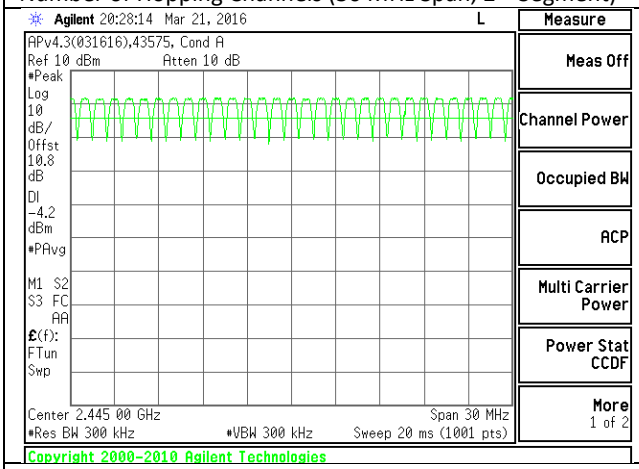
Number of Hopping Channels (100 MHz Span)



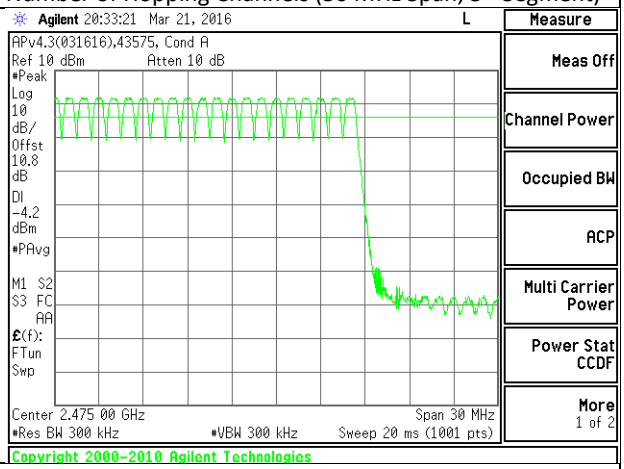
Number of Hopping Channels (30 MHz Span, 1st Segment)



Number of Hopping Channels (30 MHz Span, 2nd Segment)



Number of Hopping Channels (30 MHz Span, 3rd Segment)



NOTE: 79 Channels observed.

8.5. 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

AVERAGE TIME OF OCCUPANCY

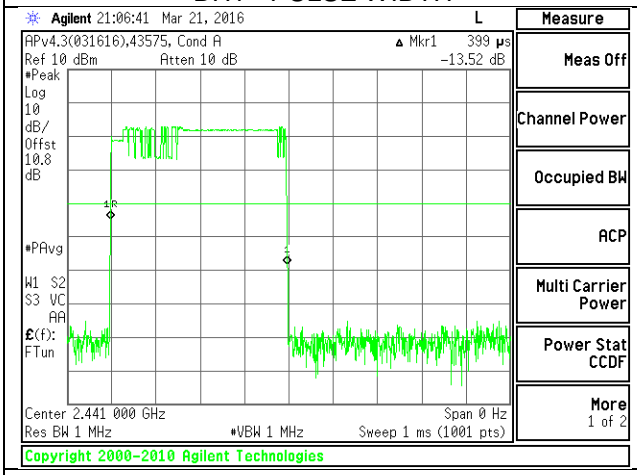
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.399	30	0.1197	0.4	-0.2803
DH3	1.656	20	0.3312	0.4	-0.0688
DH5	2.908	10	0.2908	0.4	-0.1092

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	0.399	7.5	0.02993	0.4	-0.3701
DH3	1.656	5	0.08280	0.4	-0.3172
DH5	2.908	2.5	0.07270	0.4	-0.3273

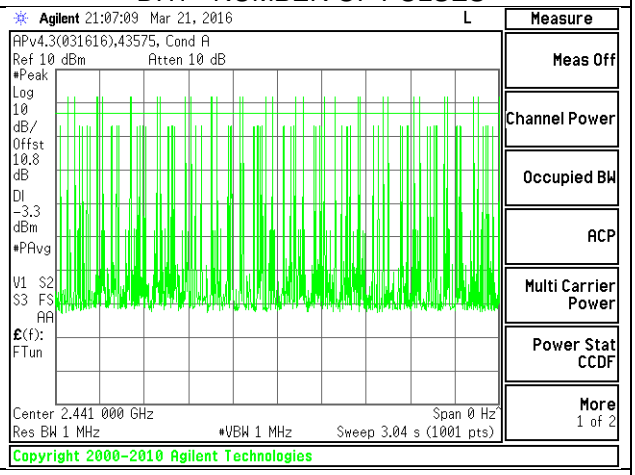
NOTE: --

Pulse Width and Number of Pulses in 3.16 Seconds Period Plots

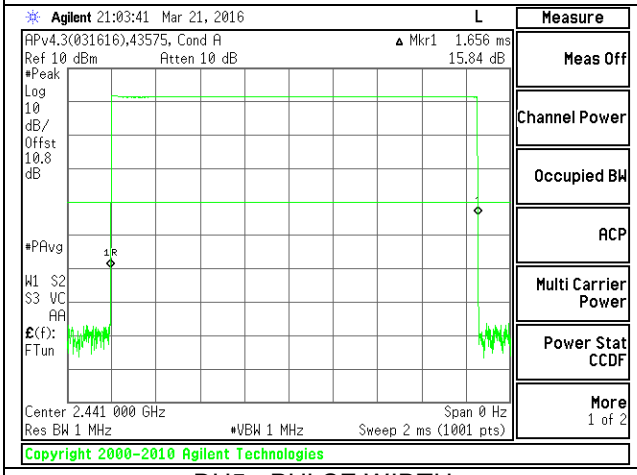
DH1 - PULSE WIDTH



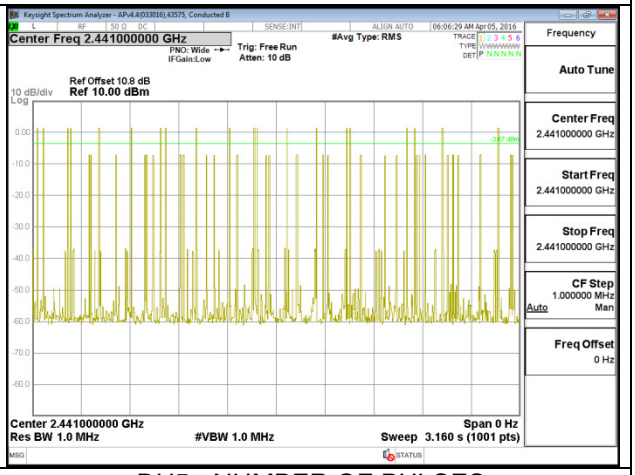
DH1 - NUMBER OF PULSES



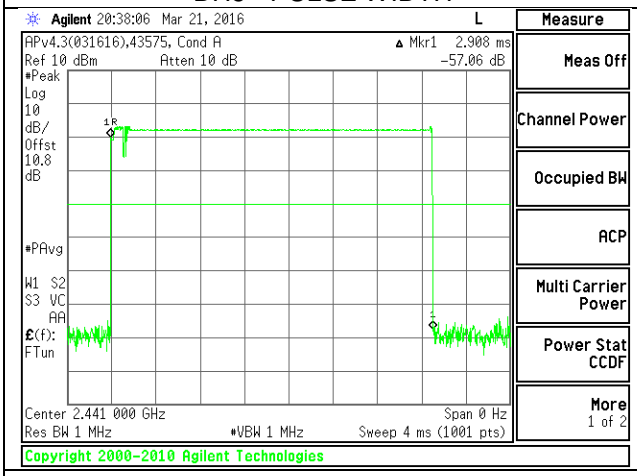
DH3 - PULSE WIDTH



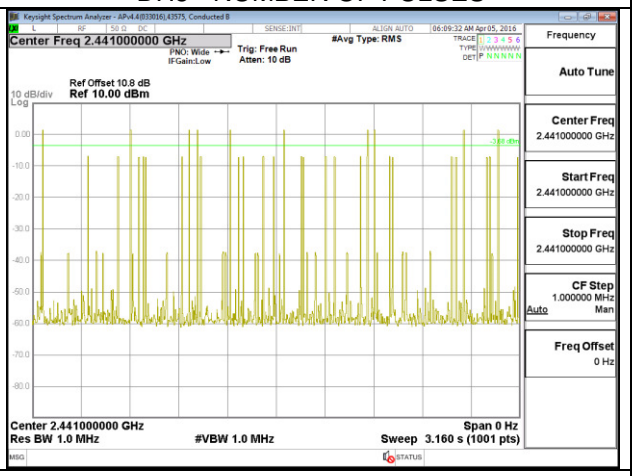
DH3 - NUMBER OF PULSES



DH5 - PULSE WIDTH



DH5 - NUMBER OF PULSES



NOTE: --

8.6. OUTPUT POWER

LIMIT

§15.247 (b) (1)
RSS-247 5.4(1)

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

TEST PROCEDURE

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

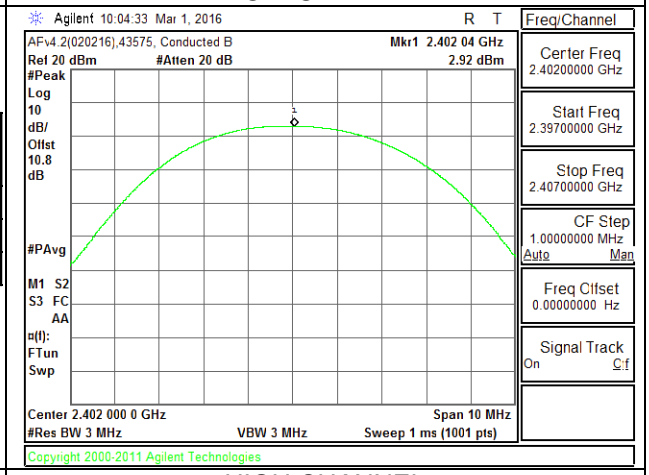
RESULTS

8.6.1. GFSK OUTPUT POWER PLOTS AND TABLE

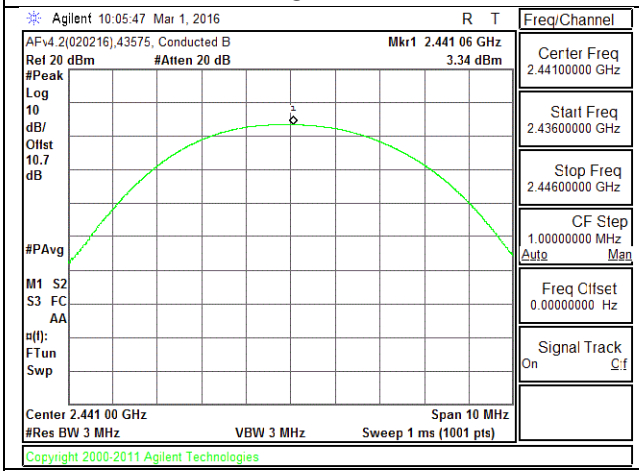
TEST RESULT TABLE

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	2.92	21	-18.08
Middle	2441	3.34	21	-17.66
High	2480	3.50	21	-17.50

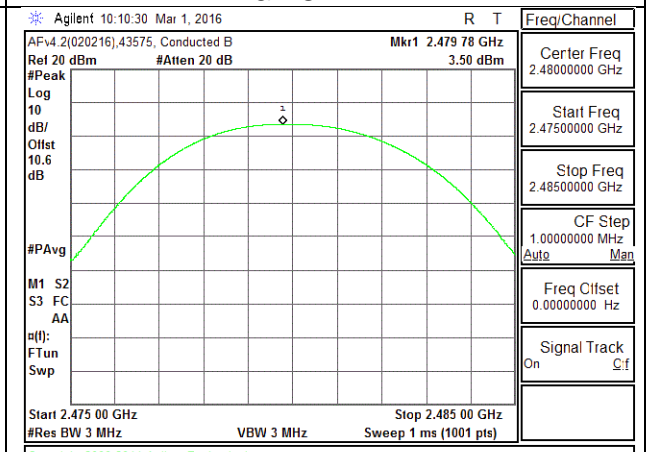
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



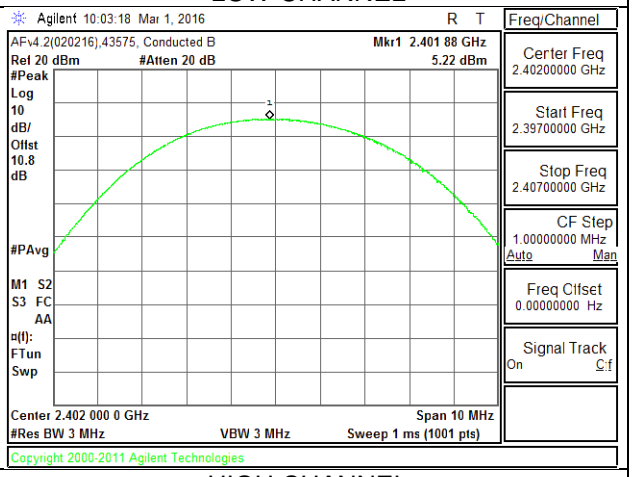
NOTE:

8.6.2. 8PSK OUTPUT POWER PLOTS AND TABLE

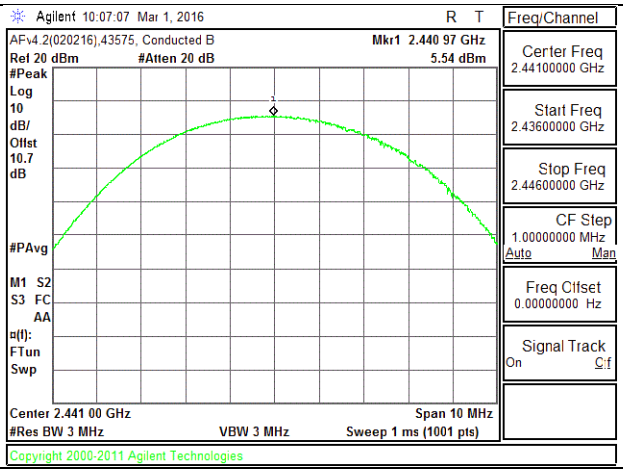
TEST RESULT TABLE

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	5.22	21	-15.78
Middle	2441	5.54	21	-15.46
High	2480	5.65	21	-15.35

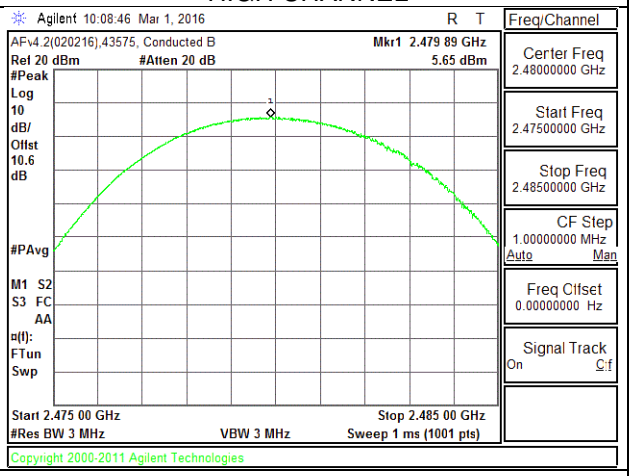
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



NOTE:

8.7. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

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

RESULTS

The cable assembly insertion loss of 10.6 dB (including 10 dB pad and 0.6 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

BASIC DATA RATE GFSK

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	2.8
Middle	2441	2.9
High	2480	2.8

ENHANCED DATA RATE 8DPSK

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	2.9
Middle	2441	3.1
High	2480	3.0

DATA RATE PI/4-DQPSK

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	2.8
Middle	2441	2.9
High	2480	2.7

NOTE: --

8.8. 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.

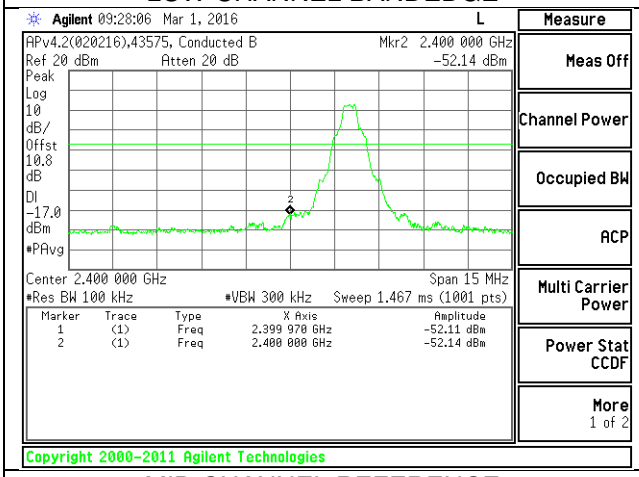
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

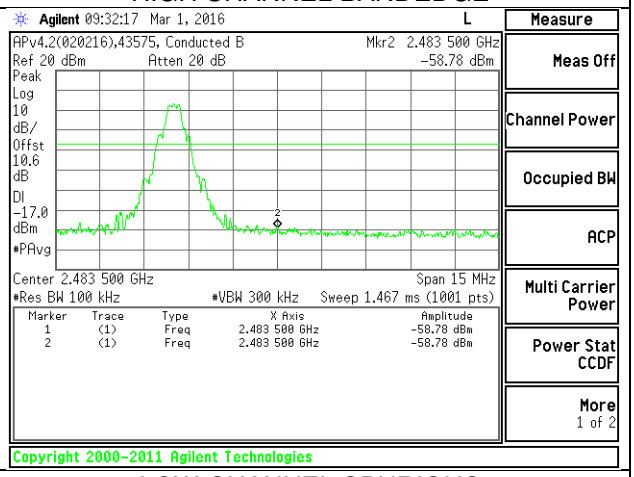
8.8.1. BASIC DATA RATE GFSK MODULATION NON-HOPPING MODE

BANDEDGE AND SPURIOUS EMISSIONS PLOTS

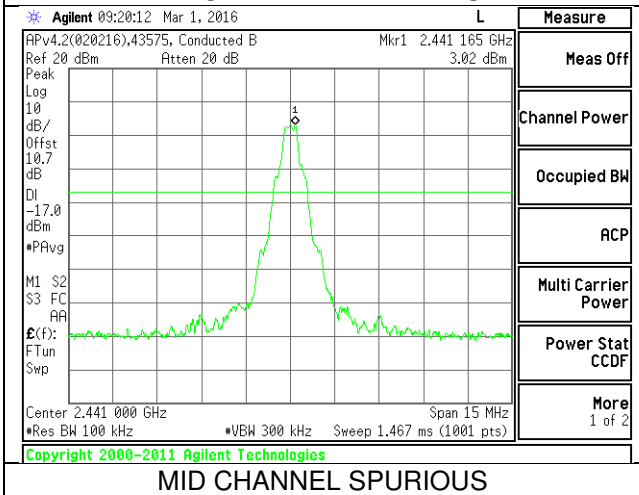
LOW CHANNEL BANDEDGE



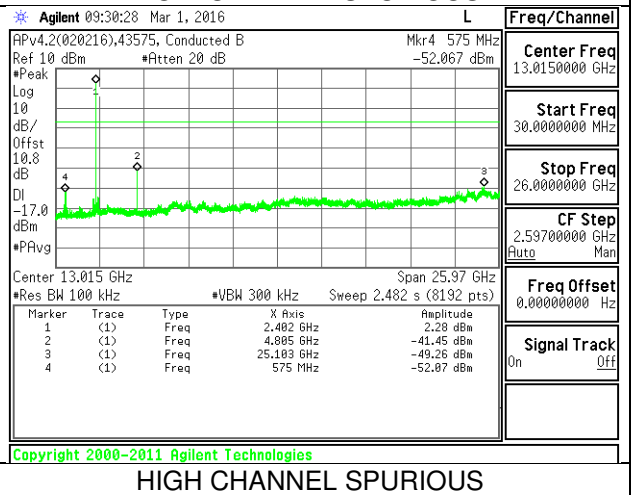
HIGH CHANNEL BANDEDGE



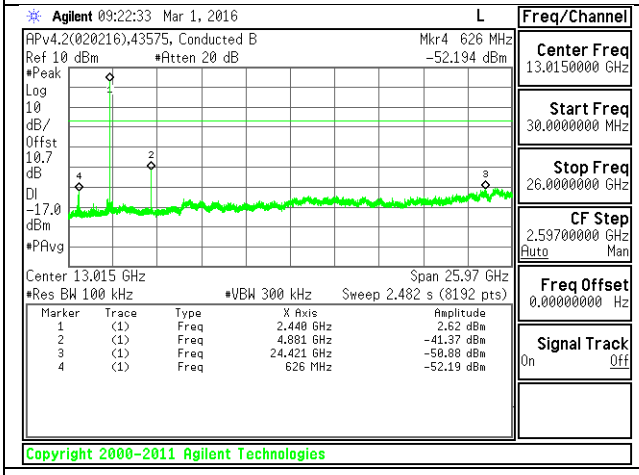
MID CHANNEL REFERENCE



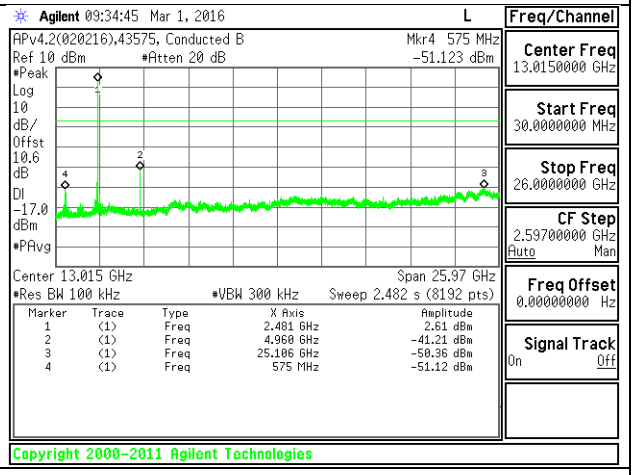
LOW CHANNEL SPURIOUS



MID CHANNEL SPURIOUS



HIGH CHANNEL SPURIOUS

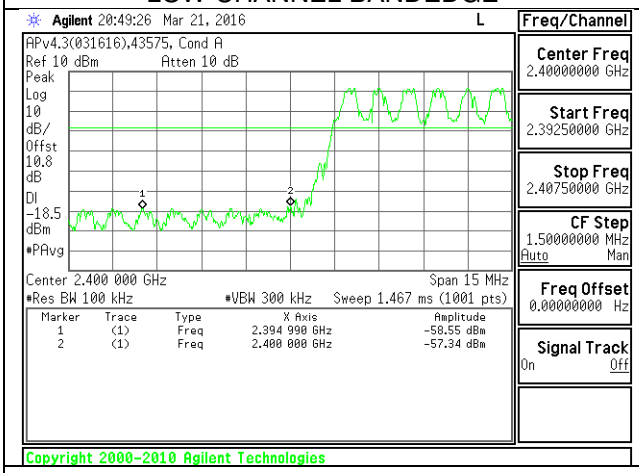


NOTE: Each channel was verified, and it appears that middle channel is worst and was selected as the reference limit for all channels.

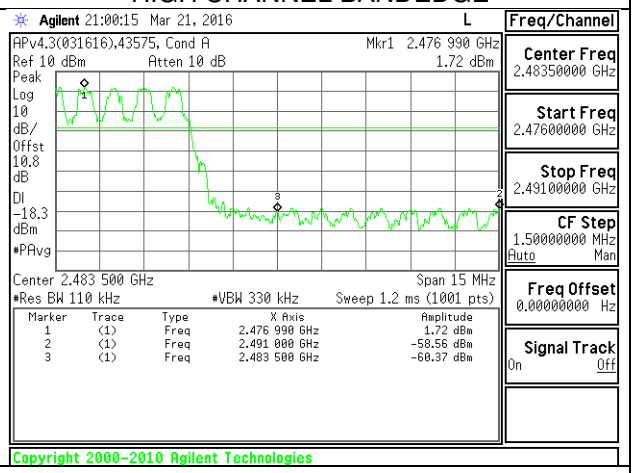
8.8.2. BASIC DATA RATE GFSK MODULATION HOPPING MODE

SPURIOUS BANDEDGE EMISSIONS PLOTS

LOW CHANNEL BANDEDGE



HIGH CHANNEL BANDEDGE

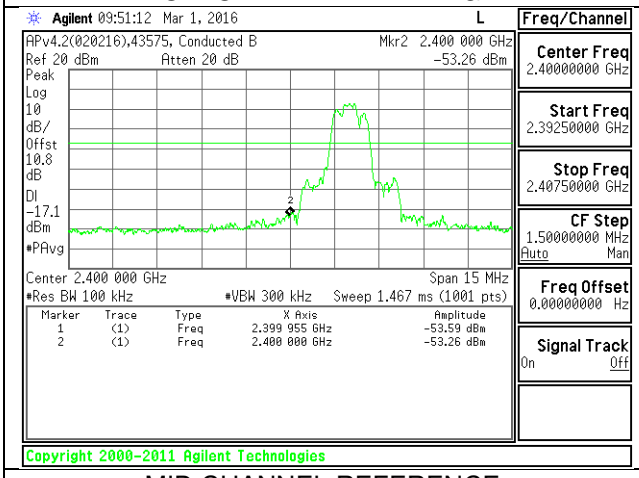


NOTE:--

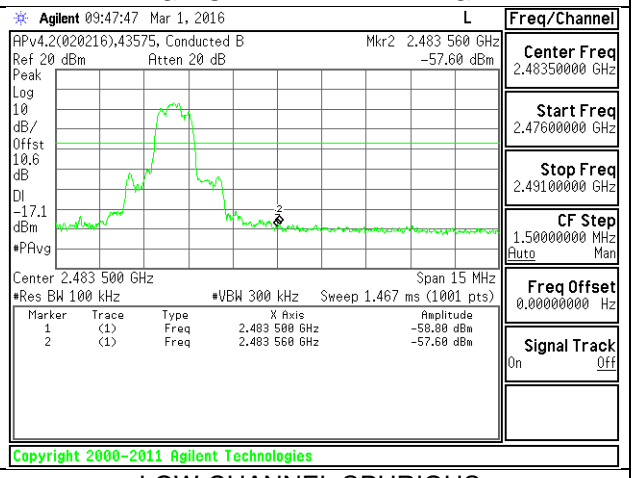
8.8.3. ENHANCED DATA RATE 8PSK MODULATION NON-HOPPING MODE

BANDEDGE AND SPURIOUS EMISSIONS PLOTS

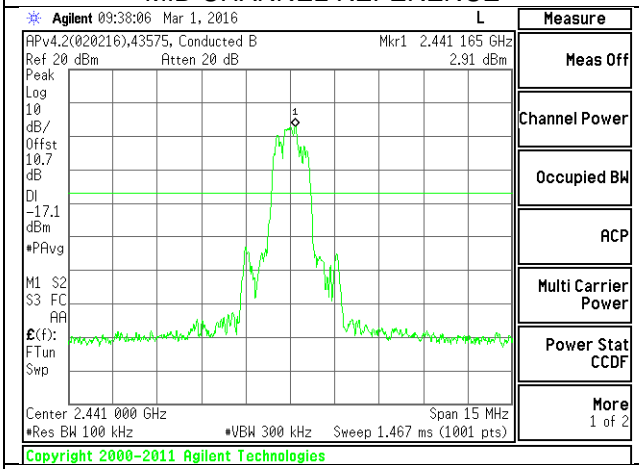
LOW CHANNEL BANDEDGE



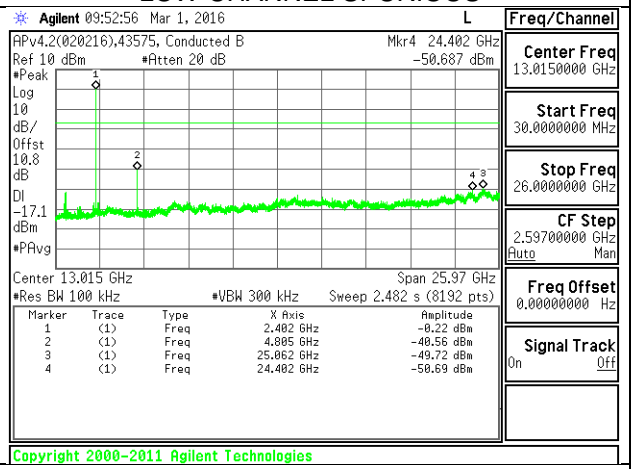
HIGH CHANNEL BANDEDGE



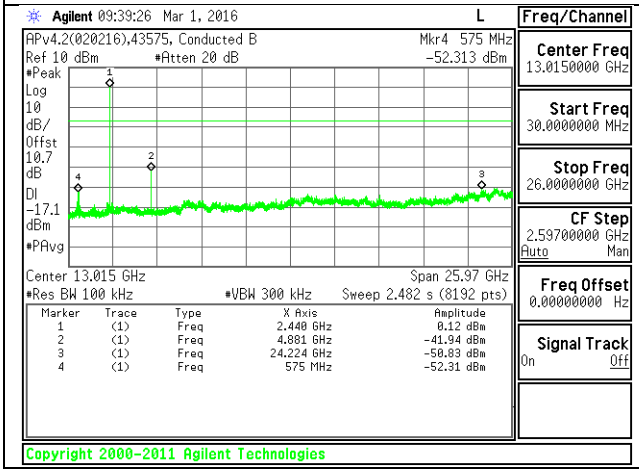
MID CHANNEL REFERENCE



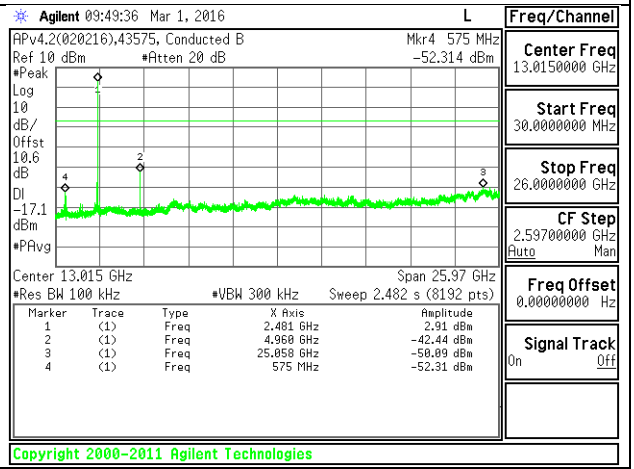
LOW CHANNEL SPURIOUS



MID CHANNEL SPURIOUS



HIGH CHANNEL SPURIOUS

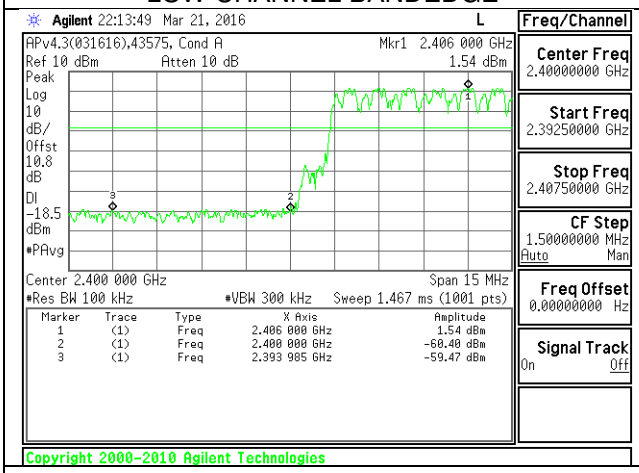


NOTE: Each channel was verified, and it appears that middle channel is worst and was selected as the reference limit for all channels.

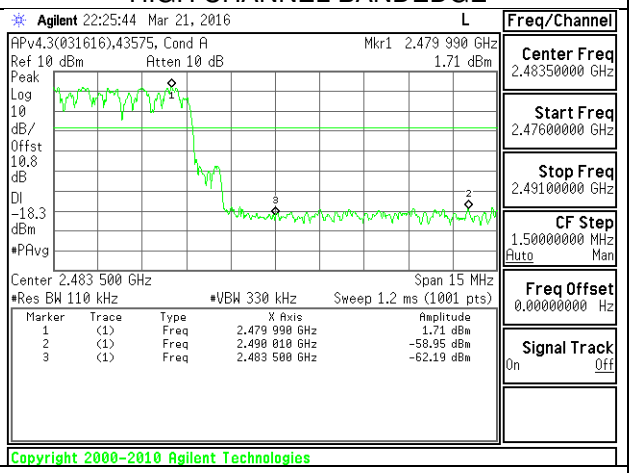
8.8.4. ENHANCED DATA RATE 8PSK MODULATION HOPPING MODE

SPURIOUS BANDEDGE EMISSIONS PLOTS

LOW CHANNEL BANDEDGE



HIGH CHANNEL BANDEDGE



NOTE:--

9. RADIATED EMISSION TEST

LIMITS

FCC §15.205 and §15.209
IC RSS-GEN Clause 8.9 (Transmitter)

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

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

For band edge measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 1/T (on time) for average measurement.

GFSK = 1/T = 1 / 0.002902S = 360Hz.
8PSK = 1/T =1 / 0.002910S = 360Hz

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

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

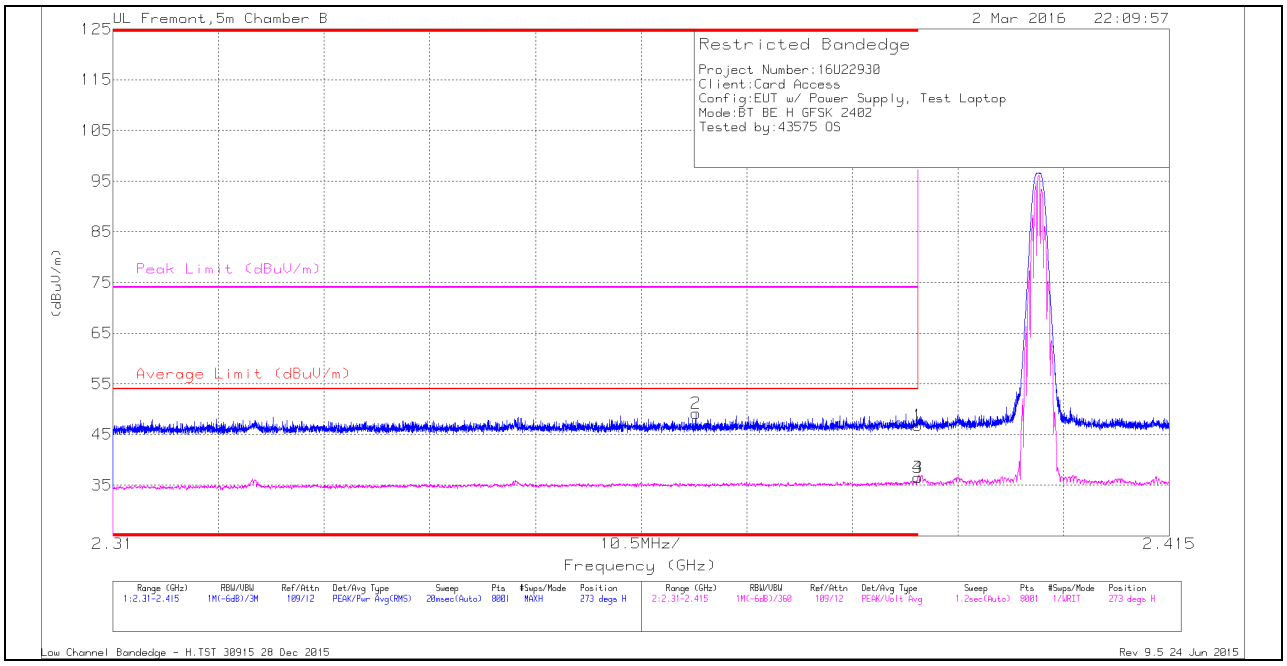
RESULTS

9.1. TRANSMITTER ABOVE 1 GHz

9.1.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

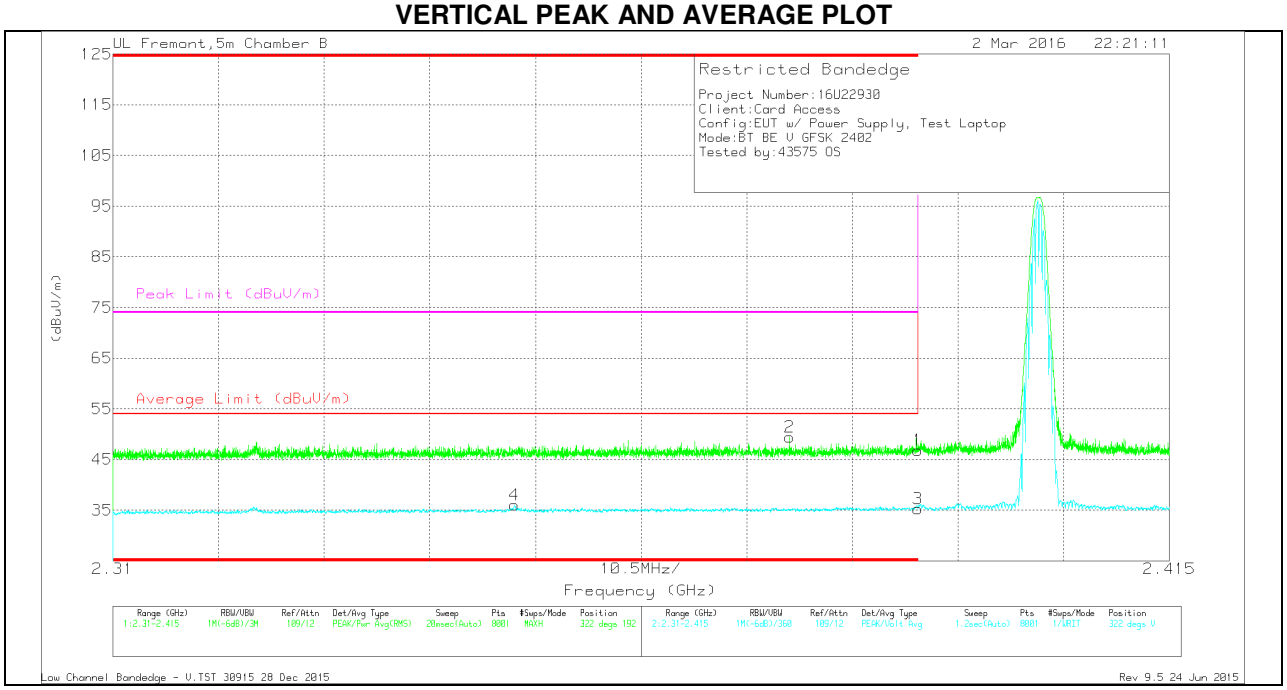
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.368	39.02	Pk	32	-21.9	49.12	-	-	74	-24.88	273	190	H
1	* 2.39	36.6	Pk	32.1	-21.9	46.8	-	-	74	-27.2	273	190	H
3	* 2.39	26.29	VA1T	32.1	-21.9	36.49	54	-17.51	-	-	273	190	H
4	* 2.39	26.28	VA1T	32.1	-21.9	36.48	54	-17.52	-	-	273	190	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

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

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL 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
4	* 2.35	25.97	VA1T	31.9	-21.9	35.97	54	-18.03	-	-	322	192	V
2	* 2.377	39.23	Pk	32.1	-21.9	49.43	-	-	74	-24.57	322	192	V
1	* 2.39	36.57	Pk	32.1	-21.9	46.77	-	-	74	-27.23	322	192	V
3	* 2.39	25.1	VA1T	32.1	-21.9	35.3	54	-18.7	-	-	322	192	V

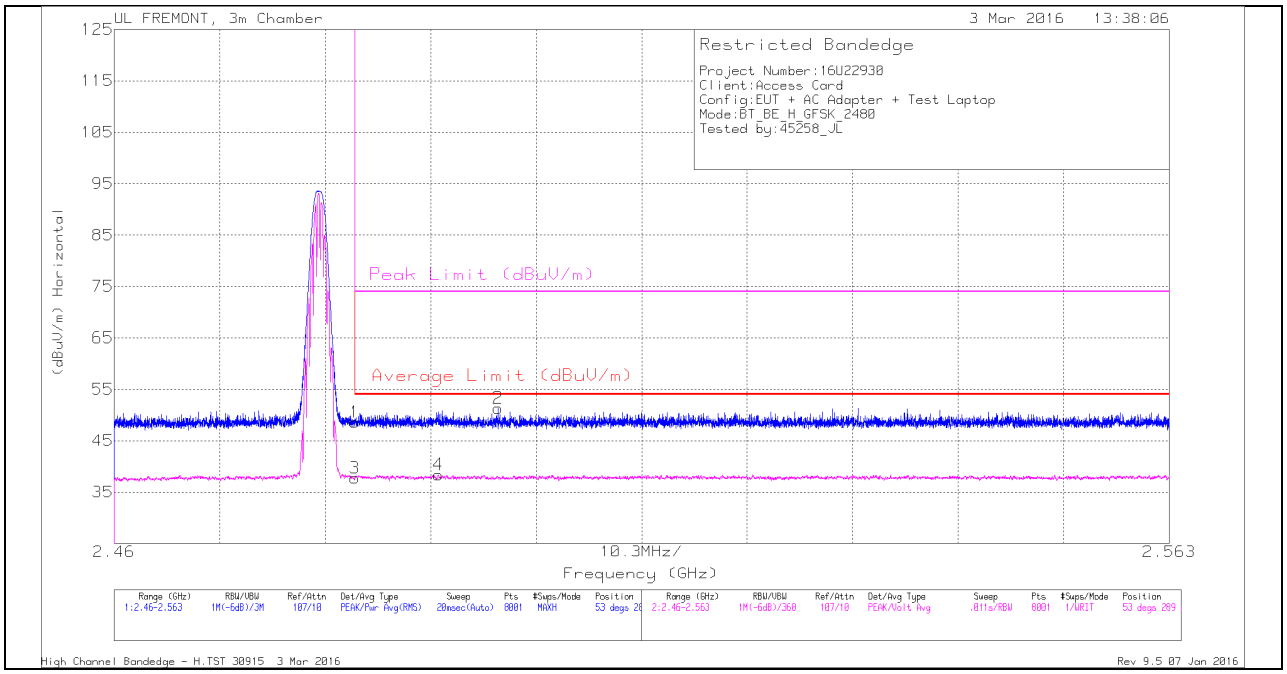
* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

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

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

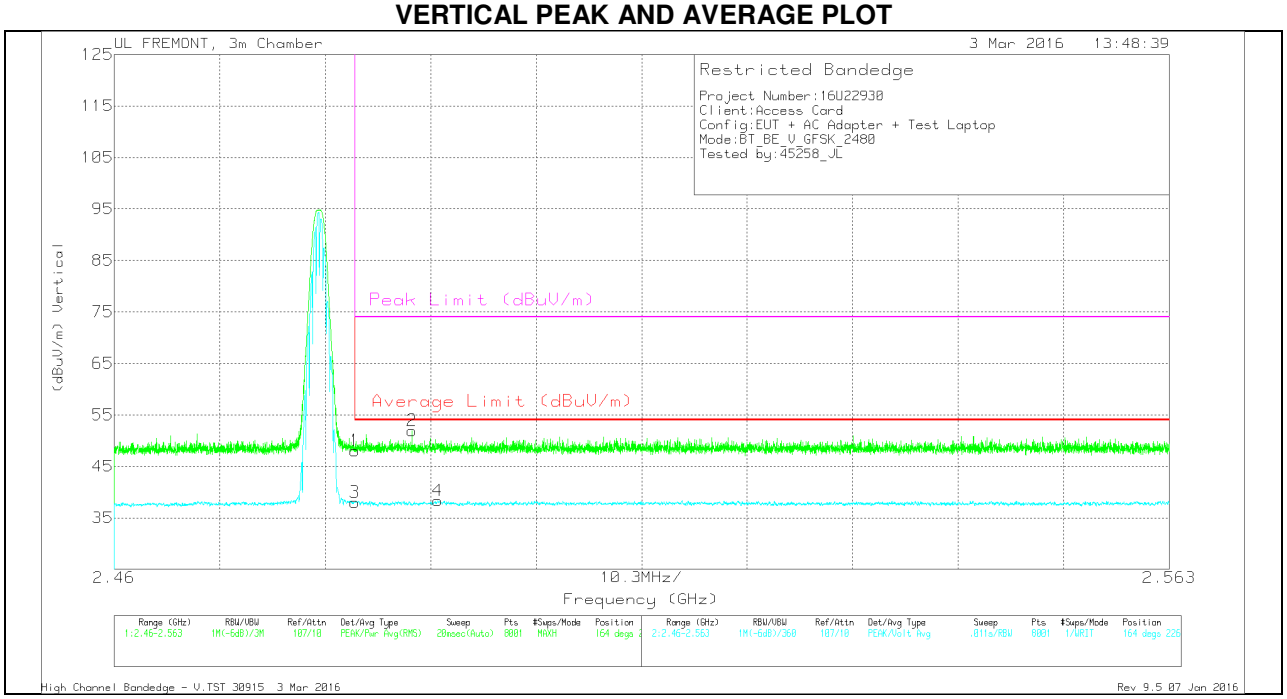
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	38.3	Pk	32.3	-22	48.6	-	-	74	-25.4	53	289	H
3	2.484	27.43	VA1T	32.3	-22	37.73	54	-16.27	-	-	53	289	H
4	2.492	27.97	VA1T	32.3	-21.9	38.37	54	-15.63	-	-	53	289	H
2	2.497	41.03	Pk	32.3	-22	51.33	-	-	74	-22.67	53	289	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

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

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	37.73	Pk	32.3	-22	48.03	-	-	74	-25.97	164	226	V
3	2.484	27.72	VA1T	32.3	-22	38.02	54	-15.98	-	-	164	226	V
2	2.489	41.63	Pk	32.3	-22	51.93	-	-	74	-22.07	164	226	V
4	2.492	27.93	VA1T	32.3	-21.9	38.33	54	-15.67	-	-	164	226	V

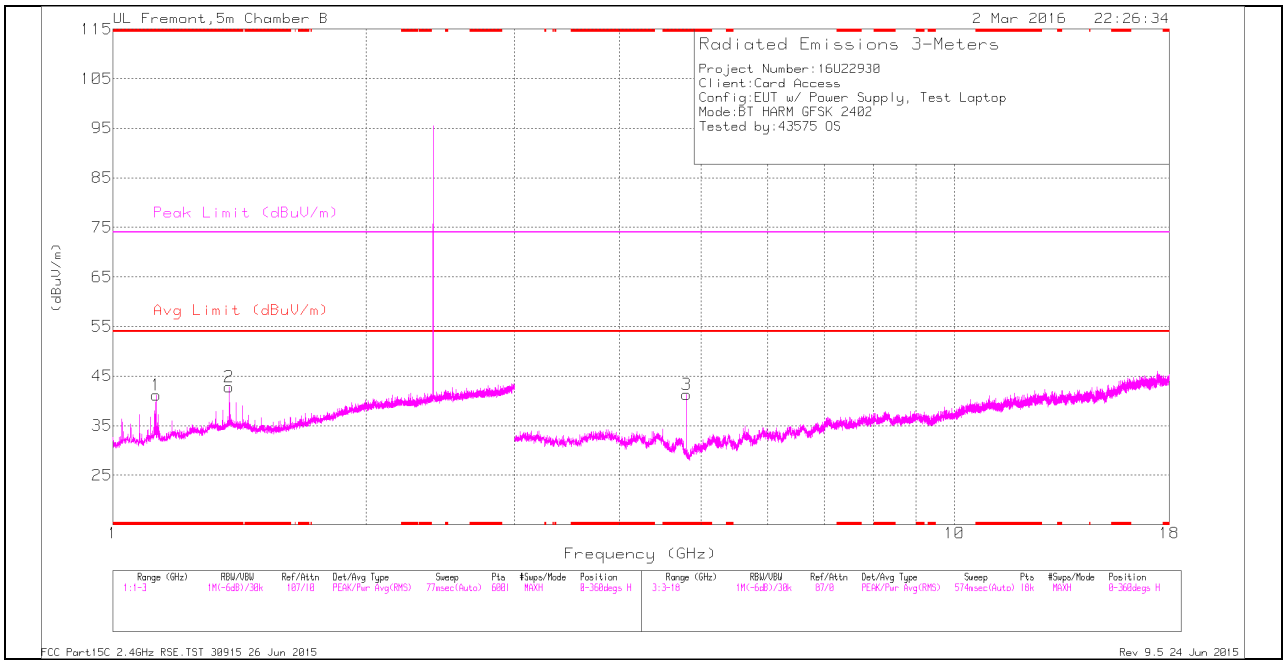
* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

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

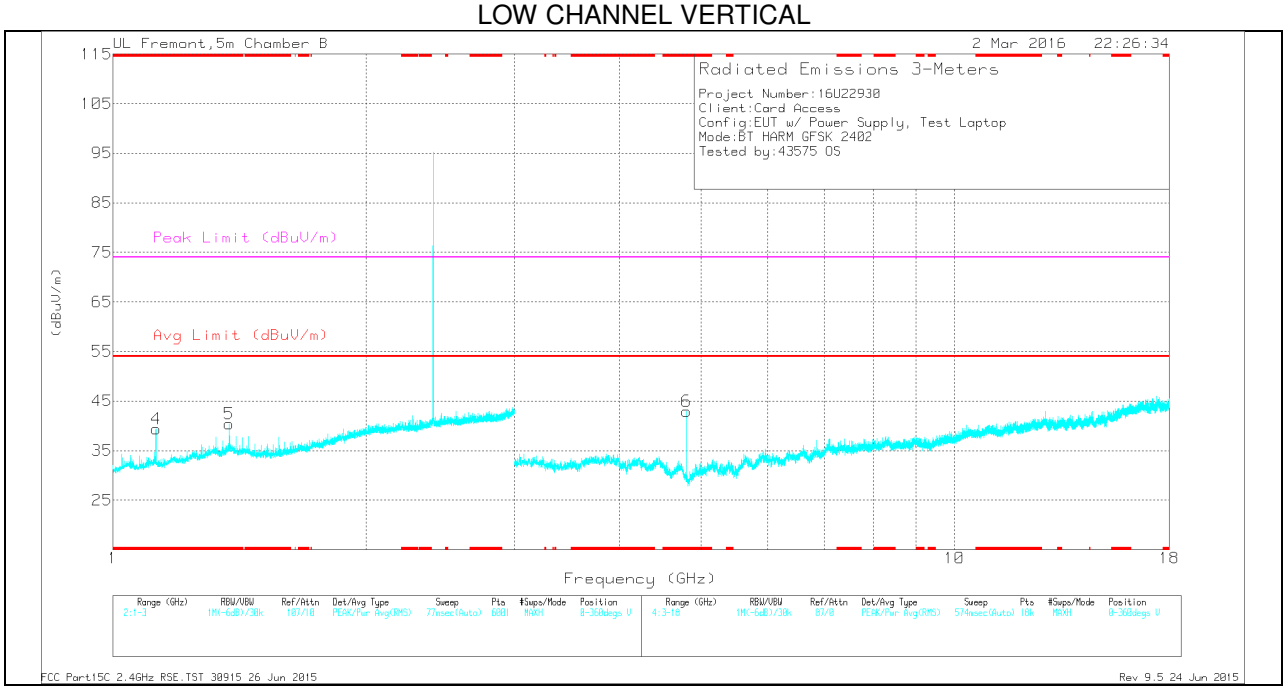
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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

LOW CHANNEL VERTICAL



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

LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.125	36.6	Pk	28.1	-23.5	41.2	-	-	74	-32.8	0-360	200	H
4	* 1.125	34.83	Pk	28.1	-23.5	39.43	-	-	74	-34.57	0-360	200	V
2	* 1.375	35.86	Pk	29.2	-22.3	42.76	-	-	74	-31.24	0-360	200	H
5	* 1.375	33.55	Pk	29.2	-22.3	40.45	-	-	74	-33.55	0-360	200	V
3	* 4.804	38.23	Pk	34	-31	41.23	-	-	74	-32.77	0-360	199	H
6	* 4.804	39.97	Pk	34	-31	42.97	-	-	74	-31.03	0-360	101	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

RADIATED EMISSIONS

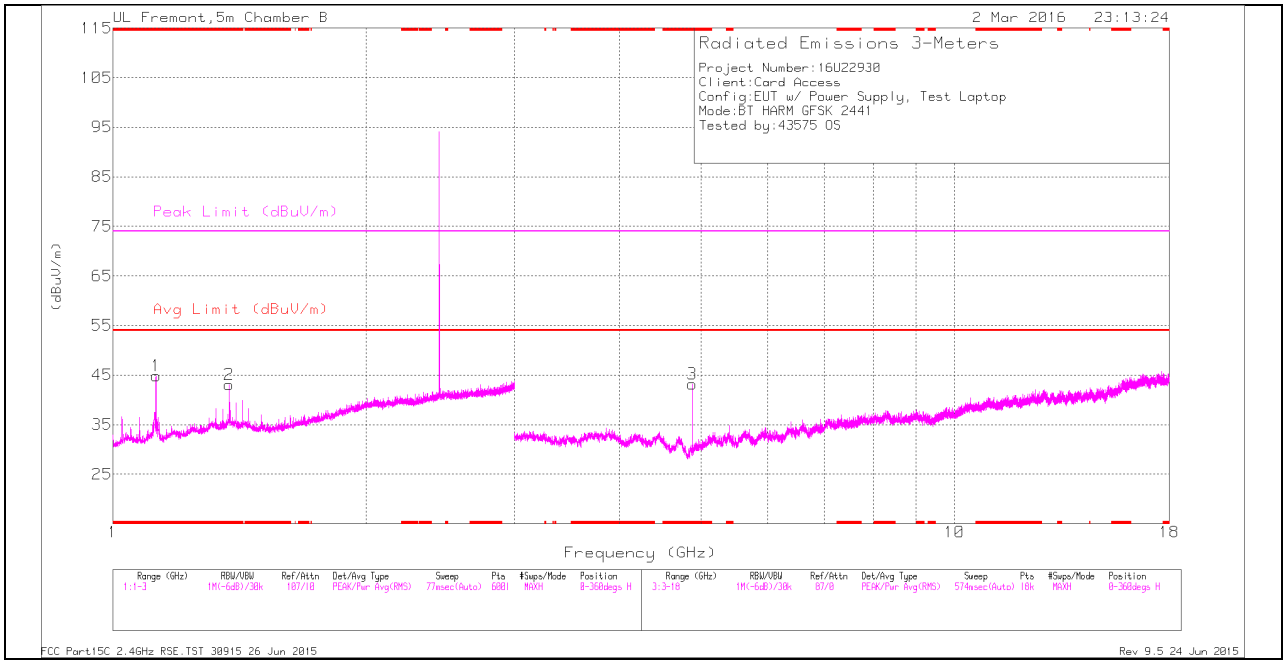
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.125	45.5	PK2	28.1	-23.5	50.1	-	-	74	-23.9	66	195	H
* 1.125	33.76	VA1T	28.1	-23.5	38.36	54	-15.64	-	-	66	195	H
* 1.375	40.22	PK2	29.2	-22.3	47.12	-	-	74	-26.88	71	199	H
* 1.375	33.44	VA1T	29.2	-22.3	40.34	54	-13.66	-	-	71	199	H
* 1.125	46.49	PK2	28.1	-23.5	51.09	-	-	74	-22.91	121	331	V
* 1.125	32.96	VA1T	28.1	-23.5	37.56	54	-16.44	-	-	121	331	V
* 1.375	40.43	PK2	29.2	-22.3	47.33	-	-	74	-26.67	47	131	V
* 1.375	31.08	VA1T	29.2	-22.3	37.98	54	-16.02	-	-	47	131	V
* 4.804	46.71	PK2	34	-31	49.71	-	-	74	-24.29	44	217	H
* 4.804	41.86	VA1T	34	-31	44.86	54	-9.14	-	-	44	217	H
* 4.804	45.48	PK2	34	-31	48.48	-	-	74	-25.52	58	211	V
* 4.804	38.6	VA1T	34	-31	41.6	54	-12.4	-	-	58	211	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

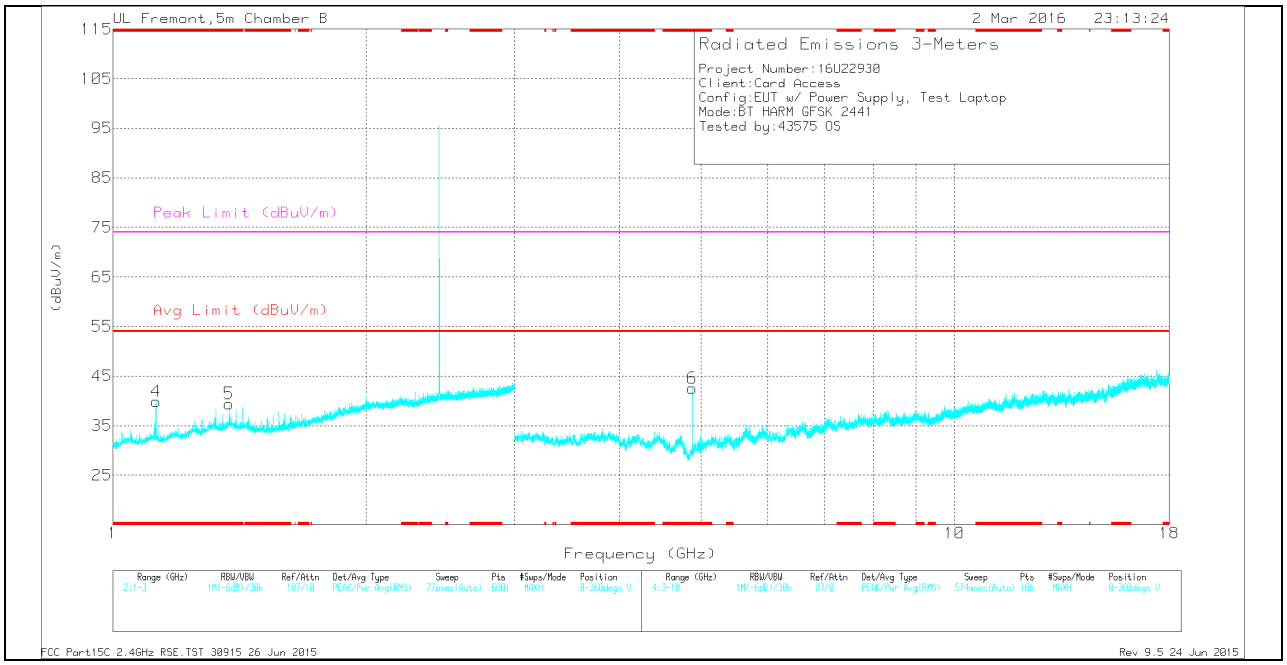
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

MID CHANNEL HORIZONTAL



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

MID CHANNEL VERTICAL



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

MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.125	40.2	Pk	28.1	-23.5	44.8	-	-	74	-29.2	0-360	200	H
2	* 1.375	36.15	Pk	29.2	-22.3	43.05	-	-	74	-30.95	0-360	200	H
4	* 1.125	35.3	Pk	28.1	-23.5	39.9	-	-	74	-34.1	0-360	101	V
5	* 1.375	32.54	Pk	29.2	-22.3	39.44	-	-	74	-34.56	0-360	101	V
3	* 4.882	41.65	Pk	34.1	-32.6	43.15	-	-	74	-30.85	0-360	199	H
6	* 4.882	41.06	Pk	34.1	-32.6	42.56	-	-	74	-31.44	0-360	199	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RADIATED EMISSIONS

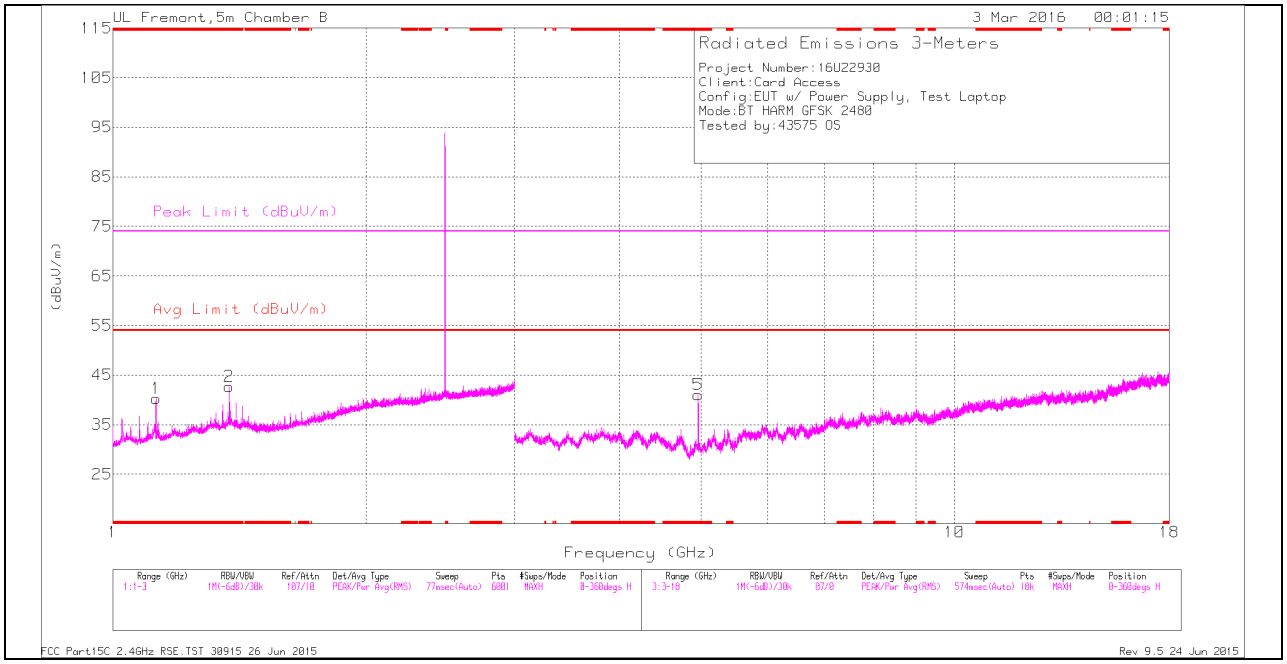
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.125	47.56	PK2	28.1	-23.5	52.16	-	-	74	-21.84	327	218	H
* 1.125	34.85	VA1T	28.1	-23.5	39.45	54	-14.55	-	-	327	218	H
* 1.375	41.09	PK2	29.2	-22.3	47.99	-	-	74	-26.01	63	118	H
* 1.375	34.1	VA1T	29.2	-22.3	41	54	-13	-	-	63	118	H
* 1.125	40.58	PK2	28.1	-23.5	45.18	-	-	74	-28.82	145	330	V
* 1.125	28.19	VA1T	28.1	-23.5	32.79	54	-21.21	-	-	145	330	V
* 1.375	39.74	PK2	29.2	-22.3	46.64	-	-	74	-27.36	51	211	V
* 1.375	29.5	VA1T	29.2	-22.3	36.4	54	-17.6	-	-	51	211	V
* 4.882	43.85	PK2	34.1	-32.6	45.35	-	-	74	-28.65	48	222	H
* 4.882	40.38	VA1T	34.1	-32.6	41.88	54	-12.12	-	-	48	222	H
* 4.882	45.27	PK2	34.1	-32.6	46.77	-	-	74	-27.23	59	218	V
* 4.882	41.12	VA1T	34.1	-32.6	42.62	54	-11.38	-	-	59	218	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

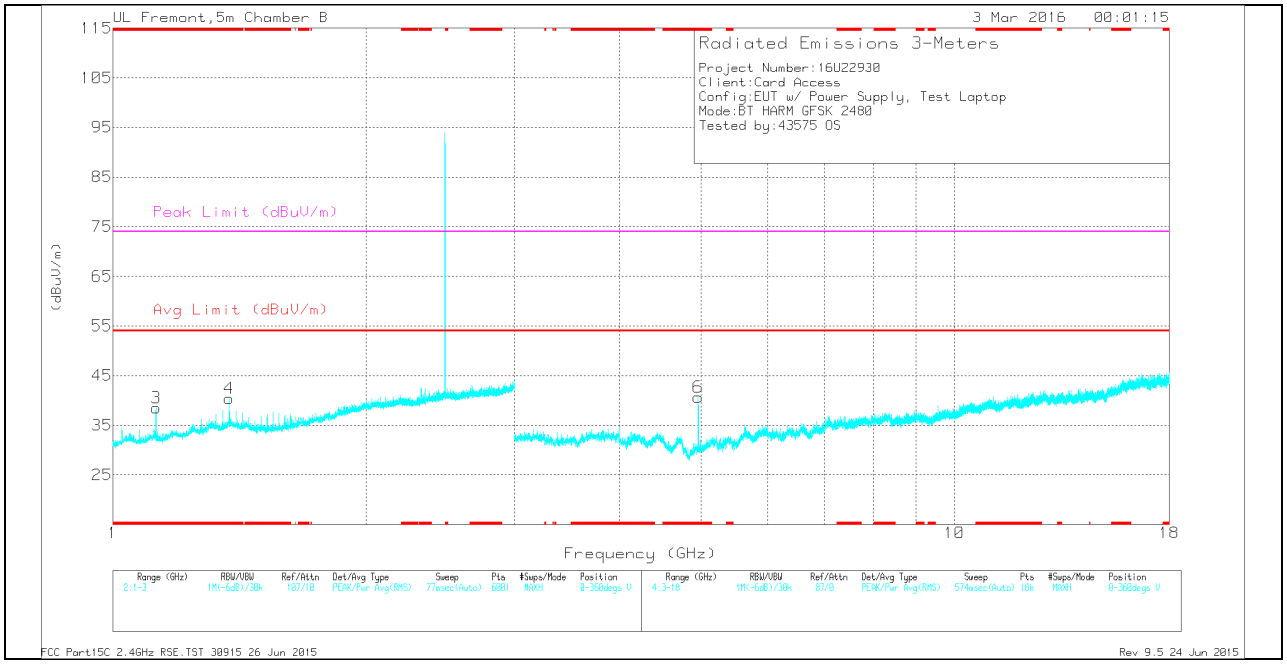
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HIGH CHANNEL HORIZONTAL



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

HIGH CHANNEL VERTICAL



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

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.125	35.7	Pk	28.1	-23.5	40.3	-	-	74	-33.7	0-360	199	H
2	* 1.375	35.73	Pk	29.2	-22.3	42.63	-	-	74	-31.37	0-360	199	H
3	* 1.125	33.95	Pk	28.1	-23.5	38.55	-	-	74	-35.45	0-360	199	V
4	* 1.375	33.45	Pk	29.2	-22.3	40.35	-	-	74	-33.65	0-360	199	V
5	* 4.96	38.71	Pk	34.2	-31.9	41.01	-	-	74	-32.99	0-360	101	H
6	* 4.96	38.31	Pk	34.2	-31.9	40.61	-	-	74	-33.39	0-360	199	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

RADIATED EMISSIONS

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
* 1.125	48.21	PK2	28.1	-23.5	52.81	-	-	74	-21.19	300	367	H
* 1.125	36.43	VA1T	28.1	-23.5	41.03	54	-12.97	-	-	300	367	H
* 1.375	41.05	PK2	29.2	-22.3	47.95	-	-	74	-26.05	52	200	H
* 1.375	32.93	VA1T	29.2	-22.3	39.83	54	-14.17	-	-	52	200	H
* 1.125	45.86	PK2	28.1	-23.5	50.46	-	-	74	-23.54	128	340	V
* 1.124	27.68	VA1T	28.1	-23.5	32.28	54	-21.72	-	-	128	340	V
* 1.375	40.15	PK2	29.2	-22.3	47.05	-	-	74	-26.95	226	233	V
* 1.375	29.21	VA1T	29.2	-22.3	36.11	54	-17.89	-	-	226	233	V
* 4.96	43.83	PK2	34.2	-31.9	46.13	-	-	74	-27.87	79	389	H
* 4.96	38.56	VA1T	34.2	-31.9	40.86	54	-13.14	-	-	79	389	H
* 4.96	42.1	PK2	34.2	-31.9	44.4	-	-	74	-29.6	271	190	V
* 4.96	36.76	VA1T	34.2	-31.9	39.06	54	-14.94	-	-	271	190	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

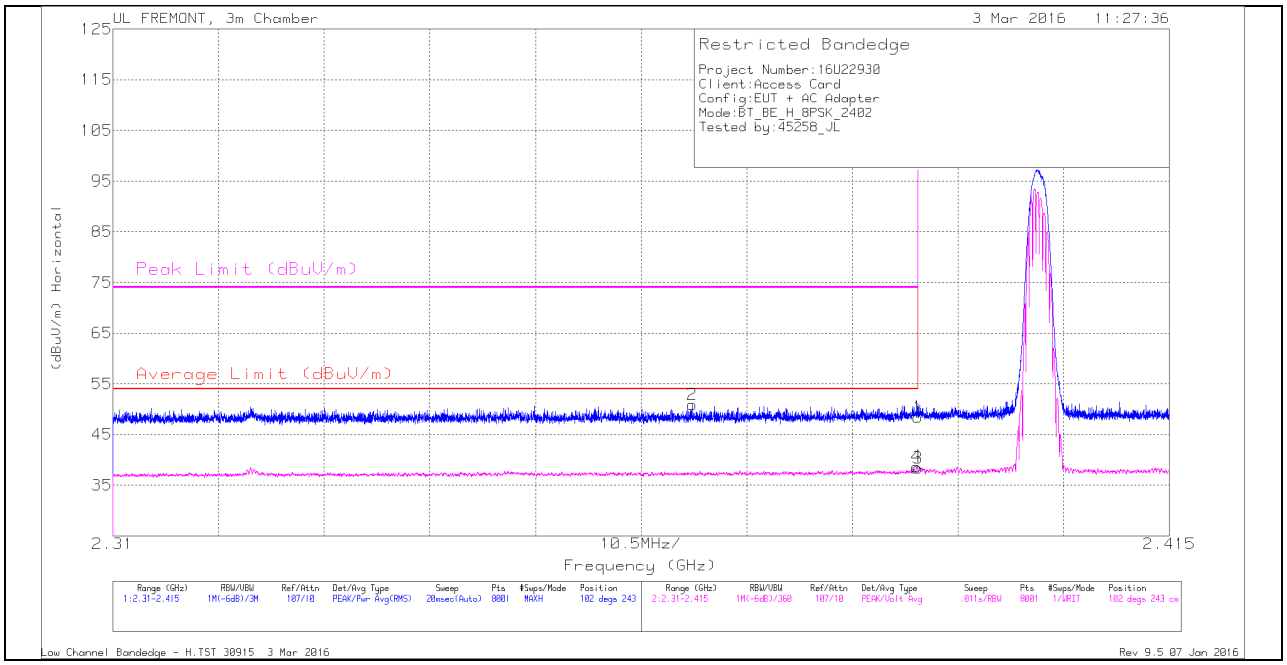
PK2 - KDB558074 Method: Maximum Peak

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

9.1.2. ENHANCED DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT

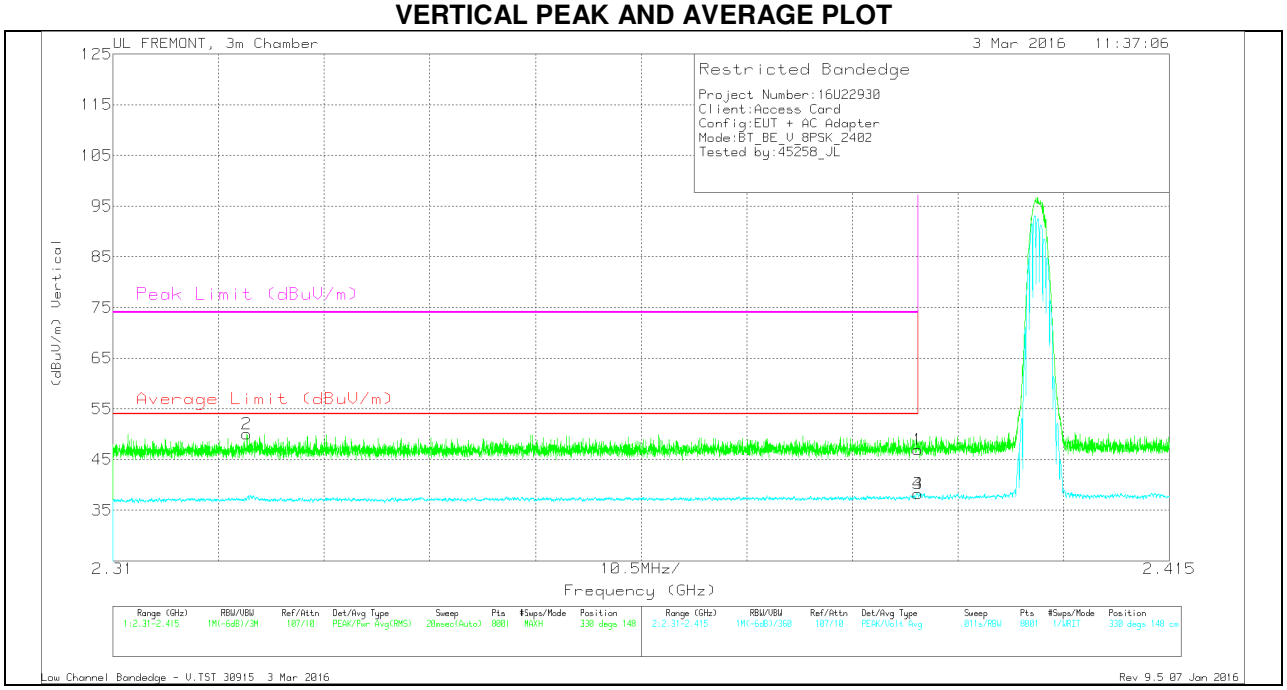


HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.368	41.32	Pk	31.9	-22.3	50.92	-	-	74	-23.08	102	243	H
1	2.39	38.68	Pk	32	-22.2	48.48	-	-	74	-25.52	102	243	H
3	2.39	28.58	VA1T	32	-22.2	38.38	54	-15.62	-	-	102	243	H
4	2.39	28.88	VA1T	32	-22.2	38.68	54	-15.32	-	-	102	243	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL PEAK AND AVERAGE PLOT



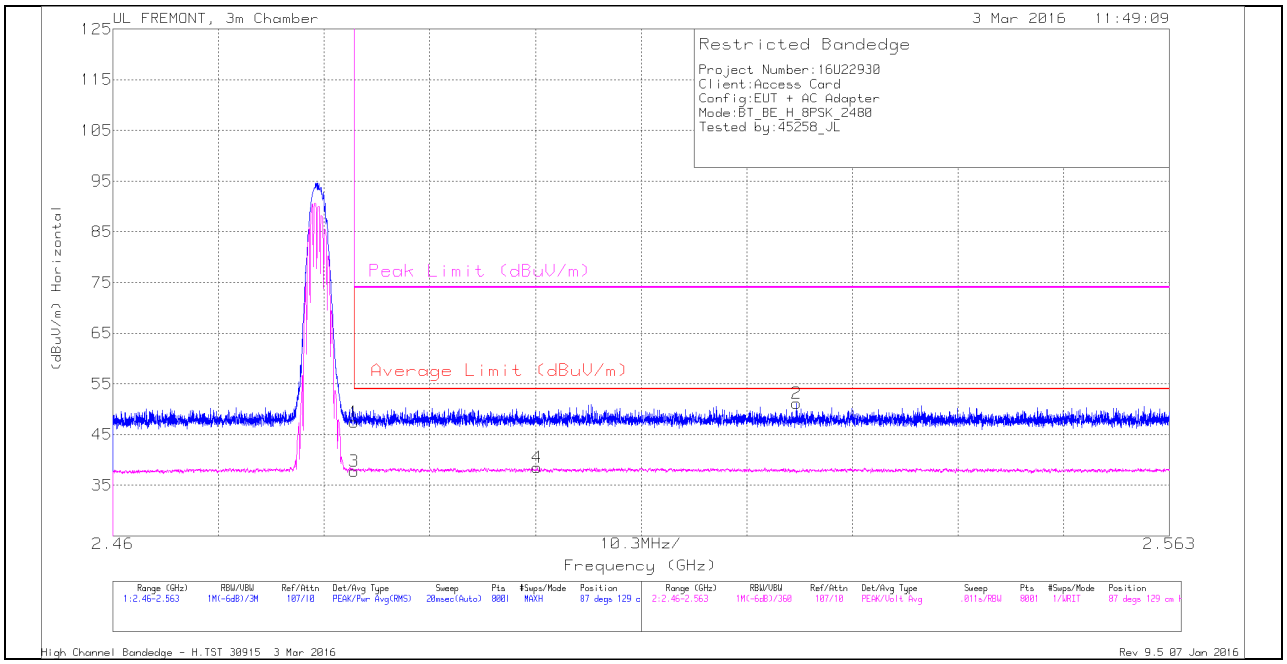
VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.323	40.7	Pk	31.7	-22.3	50.1	-	-	74	-23.9	330	148	V
1	2.39	37.13	Pk	32	-22.2	46.93	-	-	74	-27.07	330	148	V
3	2.39	28.44	VA1T	32	-22.2	38.24	54	-15.76	-	-	330	148	V
4	2.39	28.42	VA1T	32	-22.2	38.22	54	-15.78	-	-	330	148	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT

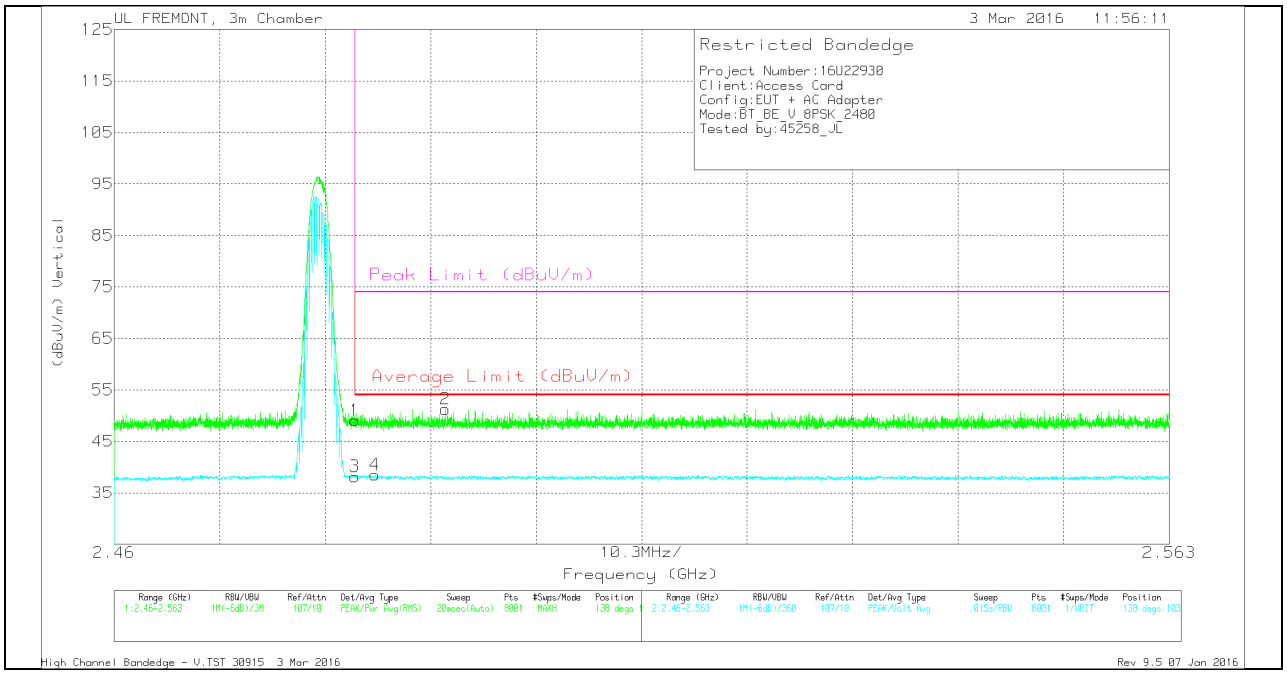


HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	37.18	Pk	32.3	-22	47.48	-	-	74	-26.52	87	129	H
3	2.484	27.45	VA1T	32.3	-22	37.75	54	-16.25	-	-	87	129	H
4	2.501	28.07	VA1T	32.3	-21.9	38.47	54	-15.53	-	-	87	129	H
2	2.527	40.77	Pk	32.4	-22	51.17	-	-	74	-22.83	87	129	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL PEAK AND AVERAGE PLOT



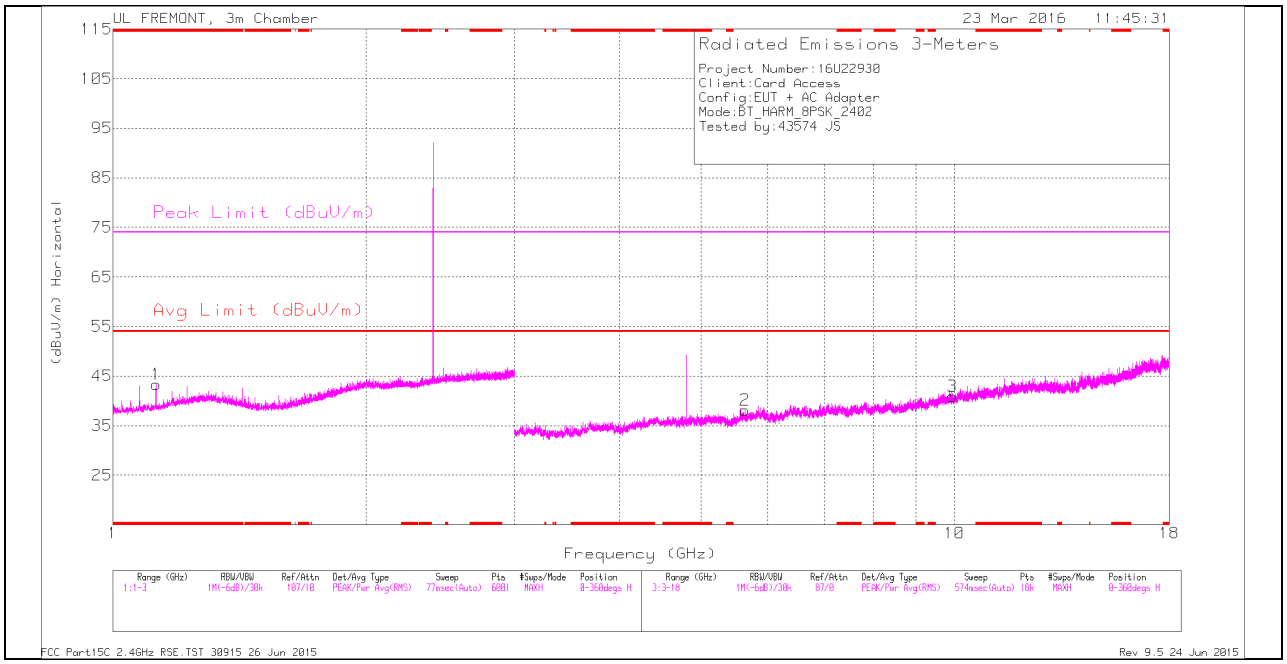
VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	38.78	Pk	32.3	-22	49.08	-	-	74	-24.92	138	103	V
3	2.484	27.86	VA1T	32.3	-22	38.16	54	-15.84	-	-	138	103	V
4	2.485	28.19	VA1T	32.3	-22	38.49	54	-15.51	-	-	138	103	V
2	2.492	40.86	Pk	32.3	-21.9	51.26	-	-	74	-22.74	138	103	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

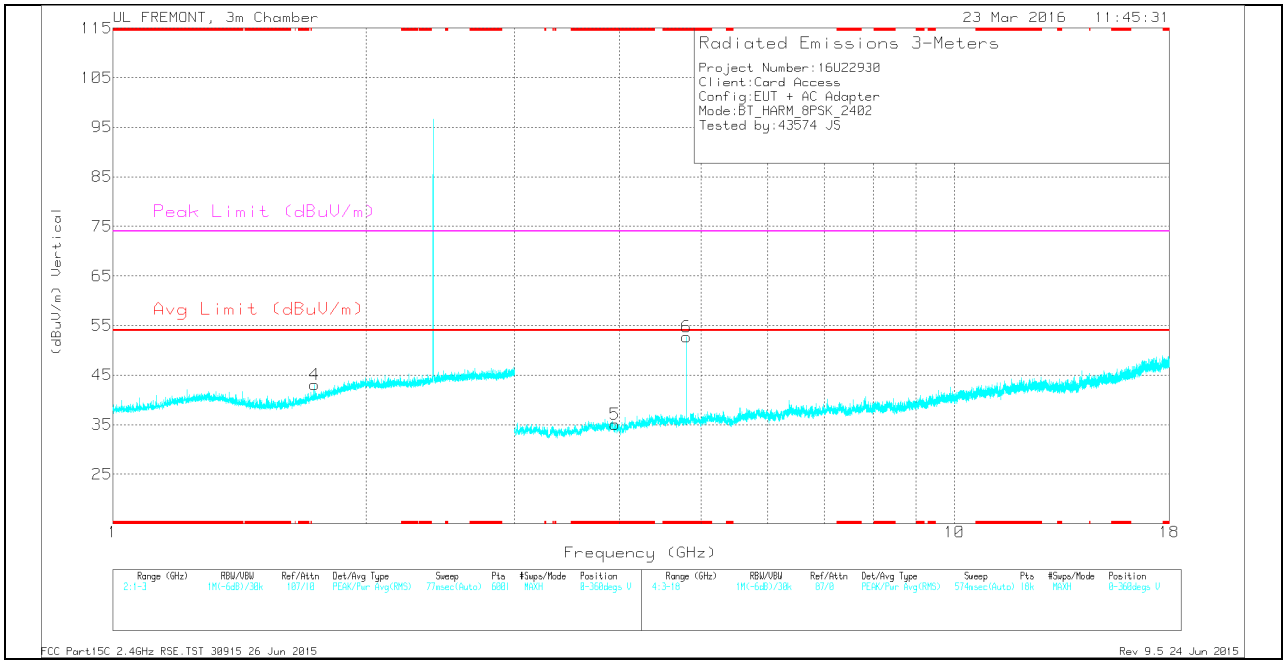
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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

LOW CHANNEL VERTICAL



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

LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.125	38.39	Pk	28.2	-23.3	0	43.29	-	-	74	-30.71	0-360	200	H
5	* 3.947	32.22	Pk	33	-30.2	0	35.02	-	-	74	-38.98	0-360	100	V
6	* 4.804	47.66	Pk	34.2	-29.1	0	52.76	-	-	74	-21.24	0-360	200	V
4	1.737	36.22	Pk	29.5	-22.7	0	43.02	-	-	-	-	0-360	100	V
2	5.642	31.79	Pk	34.7	-28.4	0	38.09	-	-	-	-	0-360	100	H
3	9.951	27.05	Pk	37.1	-23.3	0	40.85	-	-	-	-	0-360	100	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

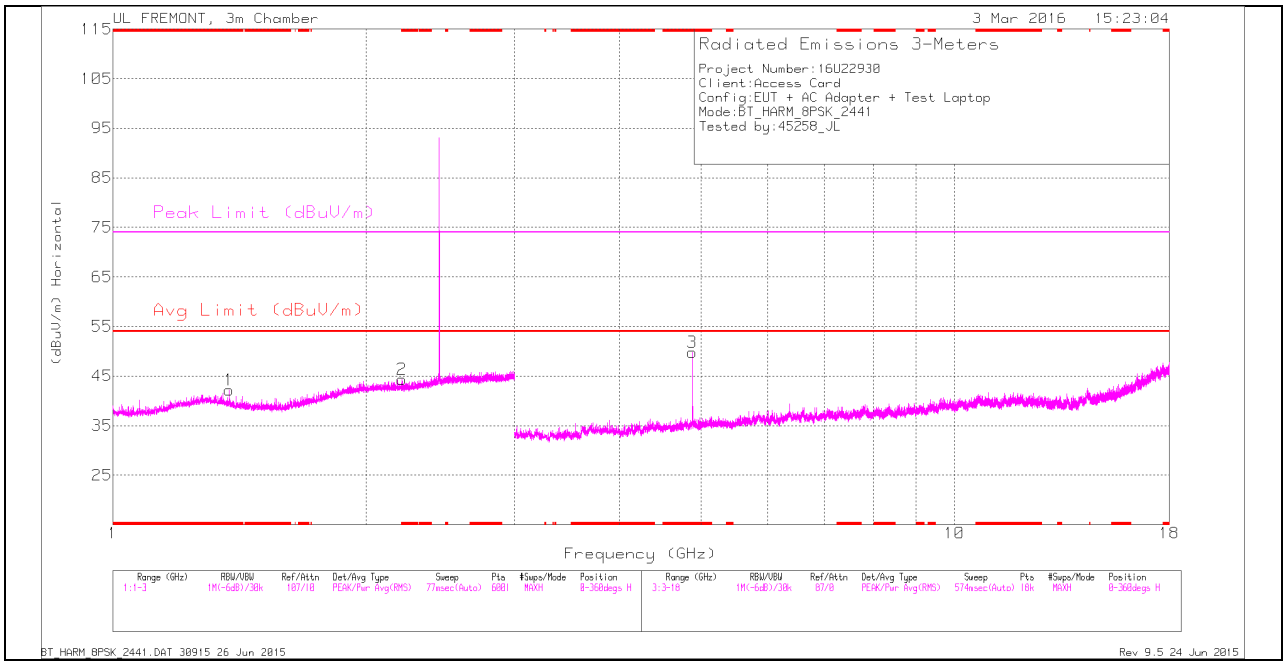
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.125	31.47	VA1T	28.2	-23.3	36.37	54	-17.63	-	-	360	200	H
* 1.125	35.79	PK2	28.2	-23.3	40.69	-	-	74	-33.31	360	200	H
* 3.947	36.03	PK2	33	-30.2	38.83	-	-	74	-35.17	360	100	V
* 3.946	28.18	VA1T	33	-30.2	30.98	54	-23.02	-	-	360	100	V
* 4.804	42.73	PK2	34.2	-29.1	47.83	-	-	74	-26.17	6	303	V
* 4.804	39.68	VA1T	34.2	-29.1	44.78	54	-9.22	-	-	6	303	V
1.736	29.76	VA1T	29.5	-22.7	36.56	54	-17.44	-	-	360	100	V
1.737	36.19	PK2	29.5	-22.7	42.99	-	-	74	-31.01	360	100	V
5.643	35.3	PK2	34.7	-28.4	41.6	-	-	74	-32.4	360	100	H
5.644	27.14	VA1T	34.7	-28.4	33.44	54	-20.56	-	-	360	100	H
9.951	22.89	VA1T	37.1	-23.3	36.69	54	-17.31	-	-	360	100	H
9.952	31.46	PK2	37.1	-23.3	45.26	-	-	74	-28.74	360	100	H

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

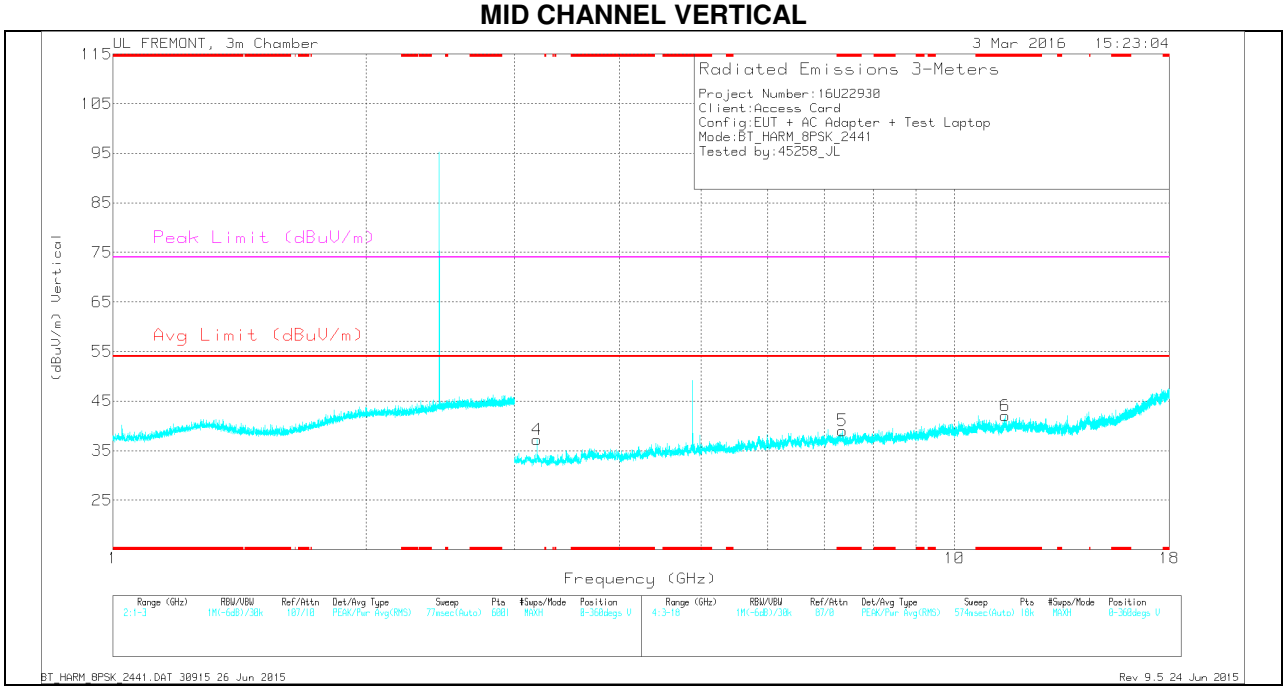
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

MID CHANNEL HORIZONTAL



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

MID CHANNEL VERTICAL



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

MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.375	36.42	Pk	28.9	-23.1	0	42.22	-	-	74	-31.78	0-360	100	H
2	* 2.206	35.16	Pk	31.4	-22.2	0	44.36	-	-	74	-29.64	0-360	200	H
3	* 4.882	44.62	Pk	34	-28.8	0	49.82	-	-	74	-24.18	0-360	100	H
5	* 7.364	30.06	Pk	35.6	-26.6	0	39.06	-	-	74	-34.94	0-360	200	V
6	* 11.49	26.49	Pk	38.4	-22.8	0	42.09	-	-	74	-31.91	0-360	100	V
4	3.192	34.74	Pk	32.6	-30.1	0	37.24	-	-	-	-	0-360	100	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

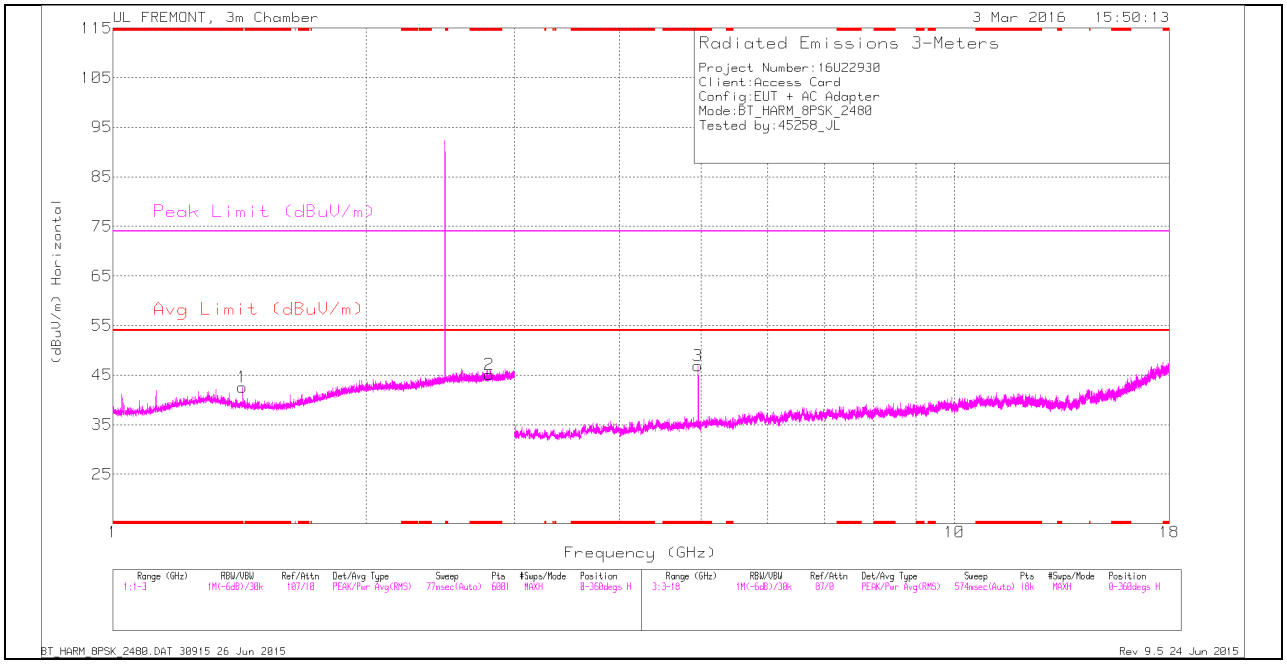
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.375	38.92	PK2	28.9	-23.1	44.72	-	-	74	-29.28	332	178	H
* 1.375	28.53	VA1T	28.9	-23.1	34.33	54	-19.67	-	-	332	178	H
* 2.207	38.52	PK2	31.4	-22.2	47.72	-	-	74	-26.28	299	192	H
* 2.207	27.64	VA1T	31.4	-22.2	36.84	54	-17.16	-	-	299	192	H
* 4.882	49.27	PK2	34	-28.8	54.47	-	-	74	-19.53	84	127	H
* 4.882	44.79	VA1T	34	-28.8	49.99	54	-4.01			133	120	H
* 7.364	33.67	PK2	35.6	-26.6	42.67	-	-	74	-31.33	162	201	V
* 7.363	22.84	VA1T	35.6	-26.6	31.84	54	-22.16	-	-	162	201	V
* 11.49	30.85	PK2	38.4	-22.8	46.45	-	-	74	-27.55	95	140	V
* 11.488	19.33	VA1T	38.4	-22.7	35.03	54	-18.97	-	-	95	140	V
3.19	25.57	VA1T	32.6	-30.1	28.07	54	-25.93	-	-	91	249	V
3.192	37	PK2	32.6	-30.1	39.5	-	-	74	-34.5	91	249	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

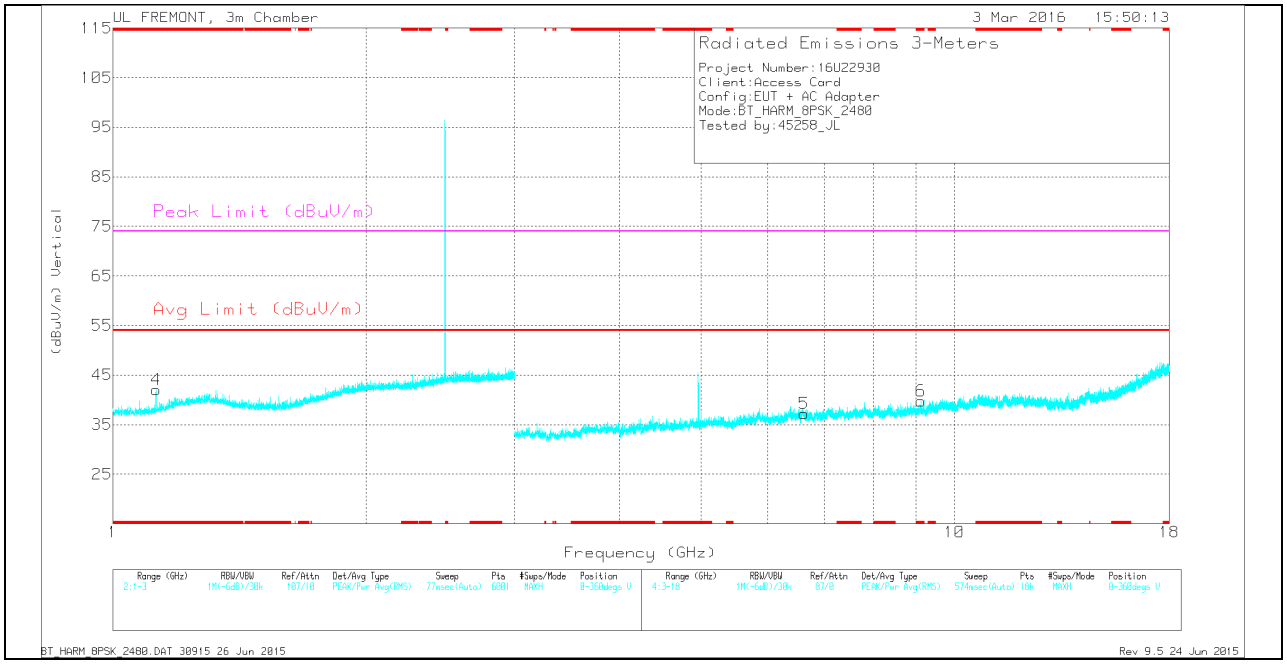
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HIGH CHANNEL HORIZONTAL



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

HIGH CHANNEL VERTICAL



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

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.425	37.18	Pk	28.5	-23.1	42.58	-	-	74	-31.42	0-360	100	H
2	* 2.798	34.27	Pk	32.6	-21.8	45.07	-	-	74	-28.93	0-360	100	H
4	* 1.125	37.65	Pk	27.7	-23.3	42.05	-	-	74	-31.95	0-360	200	V
3	* 4.959	42.31	Pk	34	-29.4	46.91	-	-	74	-27.09	0-360	100	H
6	* 9.124	28.01	Pk	36.1	-24.4	39.71	-	-	74	-34.29	0-360	200	V
5	6.631	28.76	Pk	35.6	-27.1	37.26	-	-	-	-	0-360	100	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.423	40.93	PK2	28.5	-23.1	46.33	-	-	74	-27.67	39	100	H
* 1.425	32.71	VA1T	28.5	-23.1	38.11	54	-15.89	-	-	39	100	H
* 2.799	38.55	PK2	32.6	-21.8	49.35	-	-	74	-24.65	75	135	H
* 2.797	27.85	VA1T	32.6	-21.8	38.65	54	-15.35	-	-	75	135	H
* 1.126	39.41	PK2	27.8	-23.3	43.91	-	-	74	-30.09	126	281	V
* 1.127	28.05	VA1T	27.8	-23.3	32.55	54	-21.45	-	-	126	281	V
* 4.959	45.74	PK2	34	-29.4	50.34	-	-	74	-23.66	62	100	H
* 4.96	41.94	VA1T	34	-29.4	46.54	54	-7.46	-	-	62	100	H
* 9.122	32.17	PK2	36.1	-24.4	43.87	-	-	74	-30.13	321	127	V
* 9.123	20.93	VA1T	36.1	-24.4	32.63	54	-21.37	-	-	321	127	V
6.63	22.9	VA1T	35.6	-27.1	31.4	54	-22.6	-	-	119	305	V
6.631	33.39	PK2	35.6	-27.1	41.89	-	-	74	-32.11	119	305	V

* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

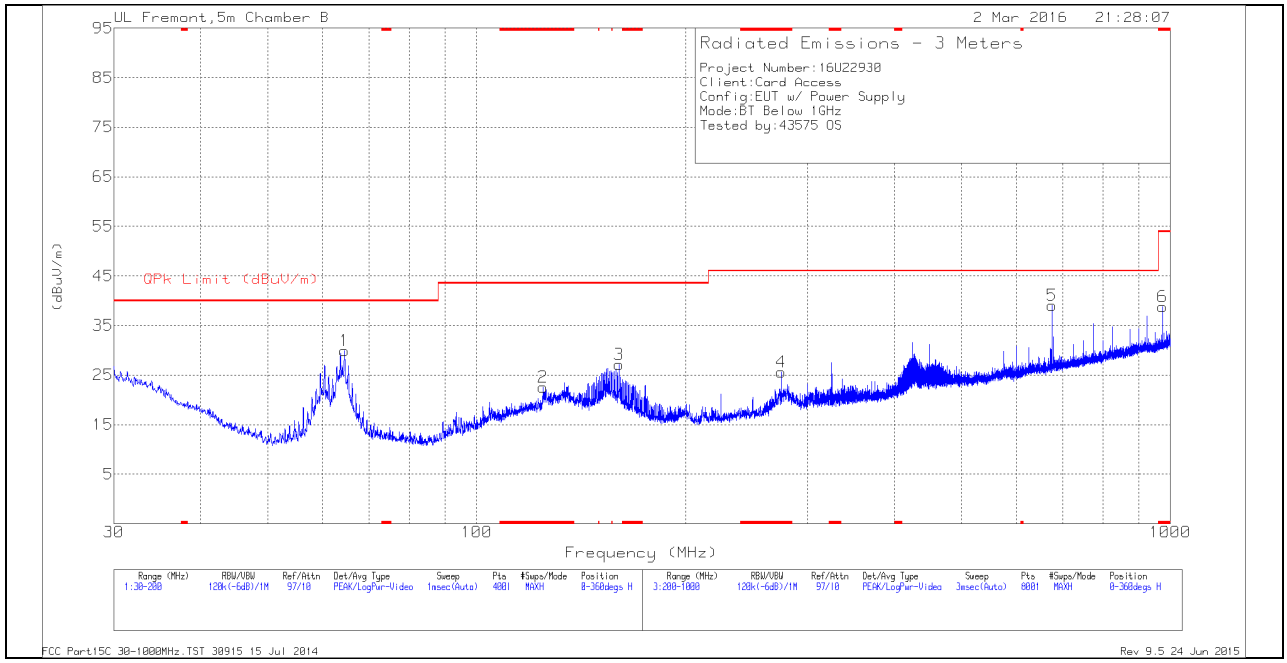
PK2 - KDB558074 Method: Maximum Peak

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

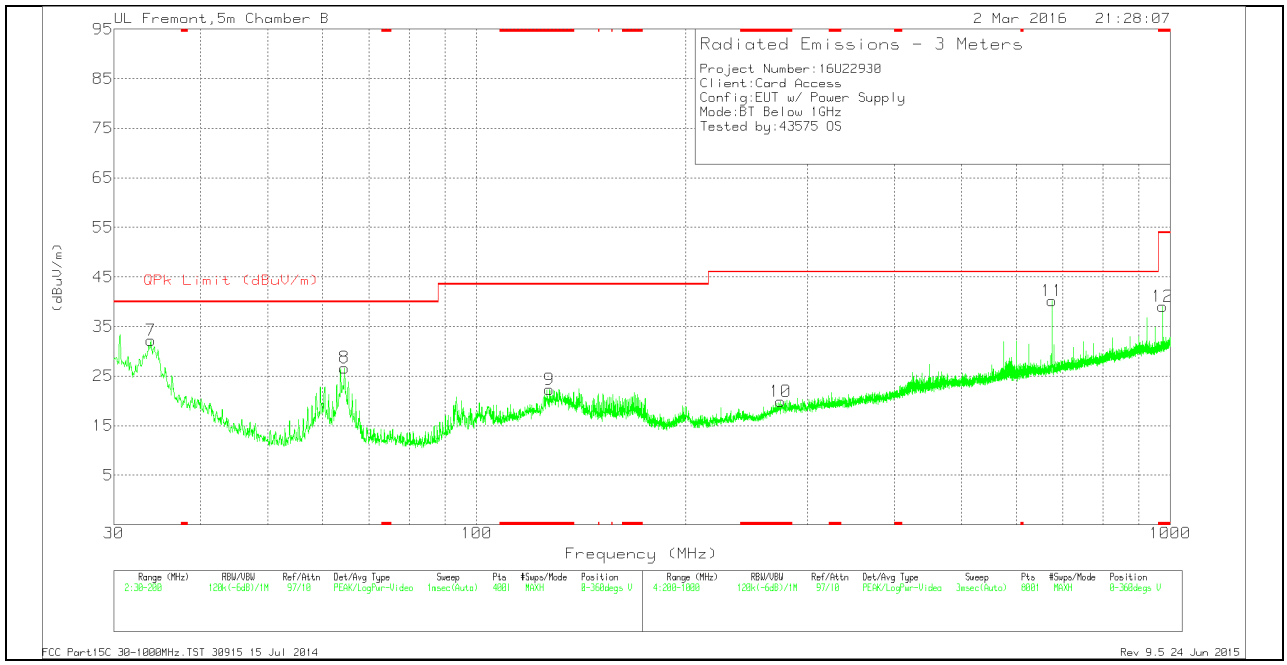
9.2. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



BELOW 1 GHz TABLE

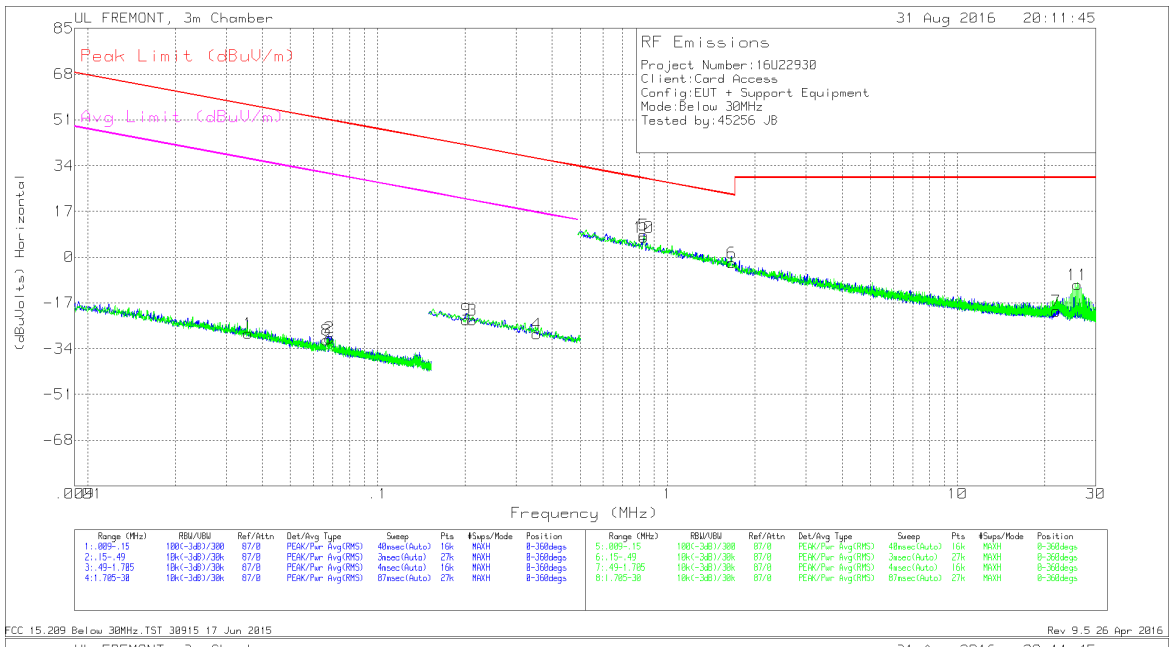
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 124.6475	32.56	Pk	17.8	-27.8	22.56	43.52	-20.96	0-360	299	H
9	* 127.41	32.32	Pk	17.8	-27.8	22.32	43.52	-21.2	0-360	101	V
4	* 275	34.62	Pk	17.3	-26.3	25.62	46.02	-20.4	0-360	101	H
6	* 975	35.21	Pk	27	-23.4	38.81	53.97	-15.16	0-360	101	H
10	* 274.1	29.02	Pk	17.3	-26.4	19.92	46.02	-26.1	0-360	199	V
12	* 975	35.47	Pk	27	-23.4	39.07	53.97	-14.9	0-360	101	V
7	33.91	38.71	Pk	22.4	-28.9	32.21	40	-7.79	0-360	101	V
1	64.51	46.52	Pk	11.9	-28.5	29.92	40	-10.08	0-360	399	H
8	64.51	43.28	Pk	11.9	-28.5	26.68	40	-13.32	0-360	101	V
3	160.4325	38.55	Pk	16.1	-27.5	27.15	43.52	-16.37	0-360	199	H
5	674.9	40.89	Pk	23.8	-25.6	39.09	46.02	-6.93	0-360	199	H
11	675	42.04	Pk	23.8	-25.6	40.24	46.02	-5.78	0-360	101	V

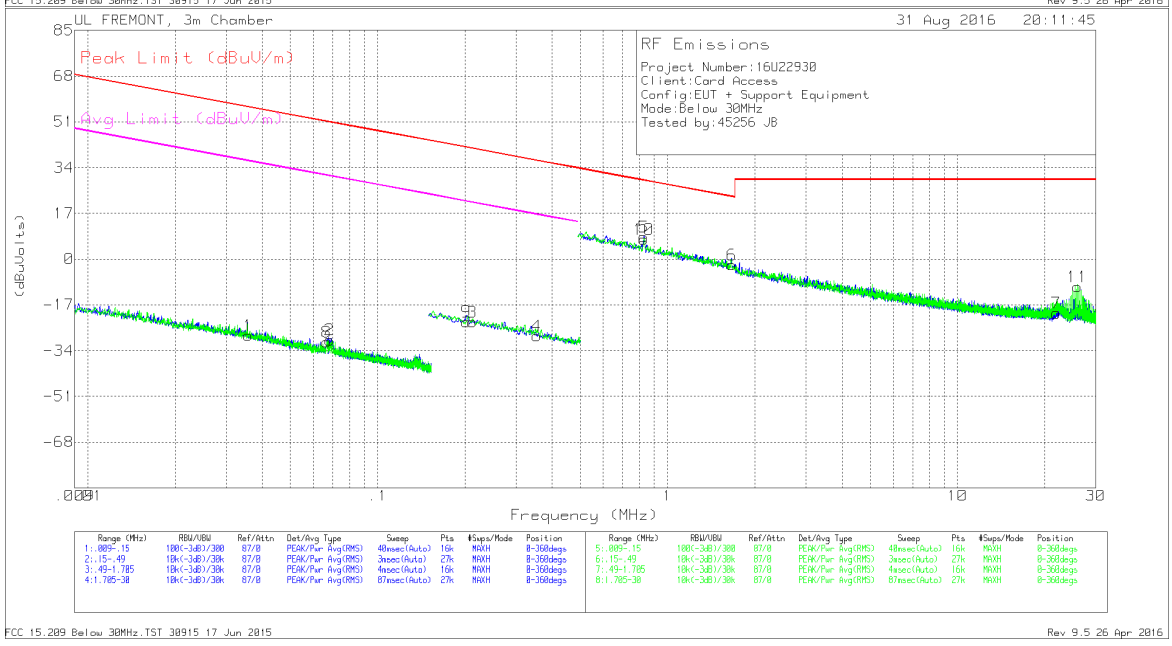
* - indicates frequency in CFR15.205/IC 8.10 Restricted Band

Pk - Peak detector

9.3. WORST-CASE BELOW 30 MHz

SPURIOUS EMISSIONS BELOW 30 MHz





Note: The anechoic chamber has been properly calibrated so that the measurement results correspond to what would be obtained from an open field sites.

BELOW 30 MHz TABLE

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.03572	37.74	Pk	12.5	1.4	-80	-28.36	56.55	-84.91	36.55	-64.91	0-360
8	.06665	36.7	Pk	11	1.4	-80	-30.9	51.13	-82.03	31.13	-62.03	0-360
2	.06831	37.57	Pk	11	1.4	-80	-30.03	50.91	-80.94	30.91	-60.94	0-360
9	.20214	44.44	Pk	10.8	1.5	-80	-23.26	41.49	-64.75	21.49	-44.75	0-360
3	.21212	44.38	Pk	10.8	1.5	-80	-23.32	41.07	-64.39	21.07	-44.39	0-360
4	.35393	39.25	Pk	10.7	1.5	-80	-28.55	36.63	-65.18	16.63	-45.18	0-360

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 30m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
5	.82767	36.23	Pk	10.6	1.5	-40	8.33	29.25	-20.92	-	-	0-360
10	.82767	35.17	Pk	10.6	1.5	-40	7.27	29.25	-21.98	-	-	0-360
6	1.66504	25.52	Pk	10.8	1.5	-40	-2.18	23.18	-25.36	-	-	0-360
7	21.90992	8.41	Pk	9.8	1.7	-40	-20.09	29.54	-49.63	-	-	0-360
11	25.93371	19.12	Pk	9	1.7	-40	-10.18	29.54	-39.72	-	-	0-360

Pk - Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50

*Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

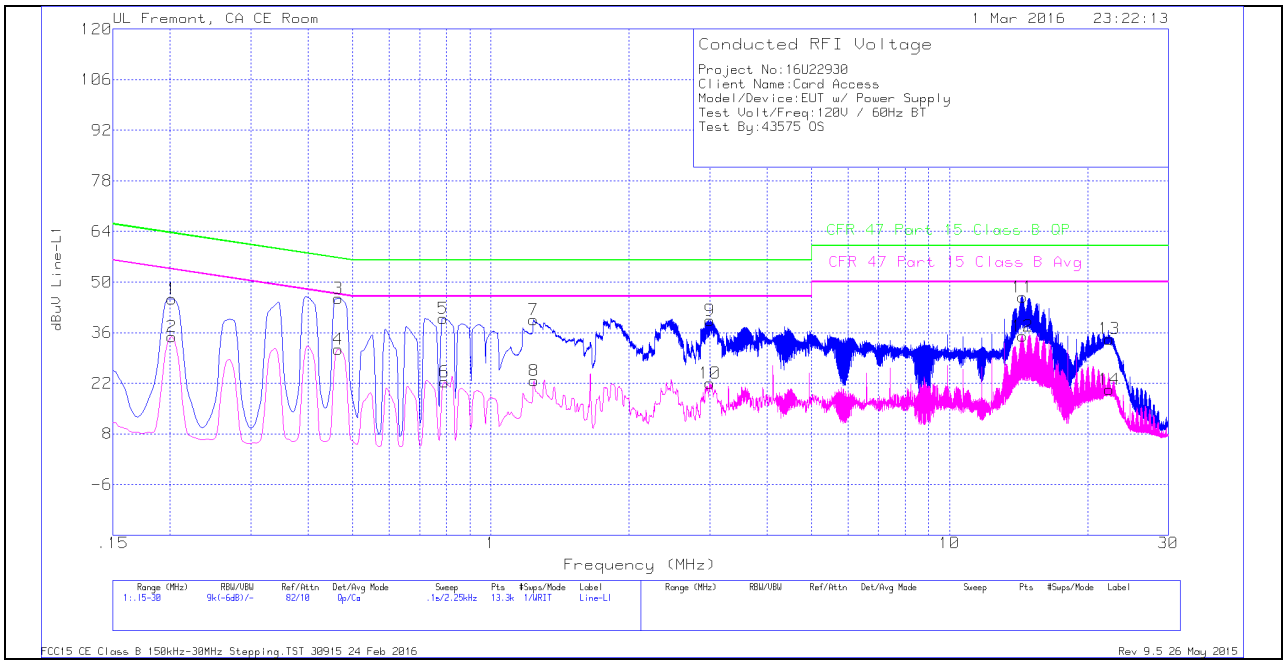
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULT

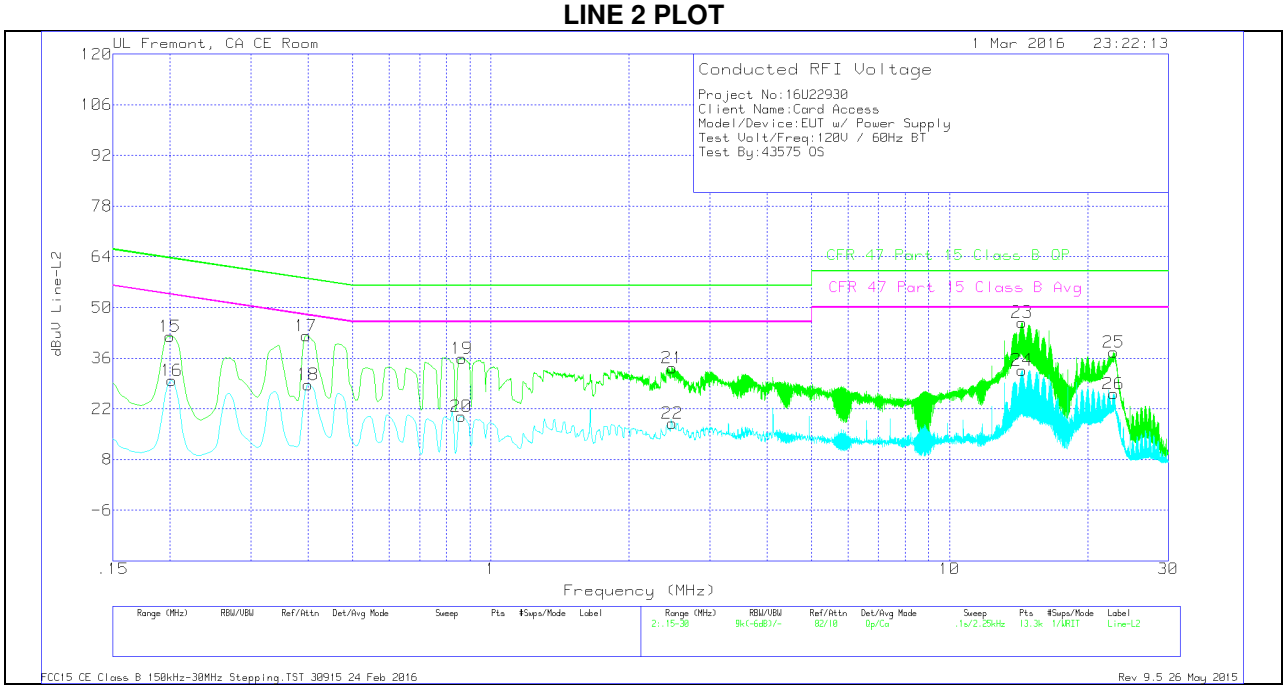
Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T1310 IL 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	.20175	35.24	Qp	0	0	10.1	45.34	63.54	-18.2	-	-
2	.20175	24.83	Ca	0	0	10.1	34.93	-	-	53.54	-18.61
3	.465	35.43	Qp	0	0	10.1	45.53	56.6	-11.07	-	-
4	.465	21.3	Ca	0	0	10.1	31.4	-	-	46.6	-15.2
5	.78675	29.82	Qp	0	0	10.1	39.92	56	-16.08	-	-
6	.79125	12.2	Ca	0	0	10.1	22.3	-	-	46	-23.7
7	1.239	29.42	Qp	0	0	10.1	39.52	56	-16.48	-	-
8	1.24125	12.55	Ca	0	0	10.1	22.65	-	-	46	-23.35
9	3.00075	29.14	Qp	0	.1	10.1	39.34	56	-16.66	-	-
10	3.00075	11.74	Ca	0	.1	10.1	21.94	-	-	46	-24.06
11	14.43975	35.42	Qp	0	.2	10.2	45.82	60	-14.18	-	-
12	14.43975	24.63	Ca	0	.2	10.2	35.03	-	-	50	-14.97
13	22.30575	23.57	Qp	0	.3	10.4	34.27	60	-25.73	-	-
14	22.2855	9.54	Ca	0	.3	10.4	20.24	-	-	50	-29.76

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 PLOT



LINE 2 RESULT

Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T1310 IL 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)
15	.1995	31.94	Qp	0	0	10.1	42.04	63.63	-21.59	-	-
16	.20175	19.74	Ca	0	0	10.1	29.84	-	-	53.54	-23.7
17	.39525	32.05	Qp	0	0	10.1	42.15	57.95	-15.8	-	-
18	.39975	18.6	Ca	0	0	10.1	28.7	-	-	47.86	-19.16
19	.8655	25.78	Qp	0	0	10.1	35.88	56	-20.12	-	-
20	.86325	9.85	Ca	0	0	10.1	19.95	-	-	46	-26.05
21	2.48775	23.05	Qp	0	.1	10.1	33.25	56	-22.75	-	-
22	2.48775	7.85	Ca	0	.1	10.1	18.05	-	-	46	-27.95
23	14.39925	35.41	Qp	.1	.2	10.2	45.91	60	-14.09	-	-
24	14.39925	22.2	Ca	.1	.2	10.2	32.7	-	-	50	-17.3
25	22.80075	26.92	Qp	0	.3	10.4	37.62	60	-22.38	-	-
26	22.76025	15.5	Ca	0	.3	10.4	26.2	-	-	50	-23.8

Qp - Quasi-Peak detector

Ca - CISPR average detection