FCC CFR47 PART 15 SUBPART C

INDUSTRY CANADA RSS-247 ISSUE 1

BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT

FOR

BLUETOOTH, BLE & 802.11 a/b/g/n Measuring Device

MODEL NUMBER: IKE-IK04-L

FCC ID: 2ACBG4000

IC ID: 11952A-4000

REPORT NUMBER: 16U22614-E1V1

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Revision History

Rev.	Issue Date	Revisions	Revised By
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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS 5

2. TEST METHODOLOGY 6

3. FACILITIES AND ACCREDITATION 6

4. CALIBRATION AND UNCERTAINTY 7

4.1. MEASURING INSTRUMENT CALIBRATION 7

4.2. SAMPLE CALCULATION 7

4.3. MEASUREMENT UNCERTAINTY 7

5. EQUIPMENT UNDER TEST 8

5.1. DESCRIPTION OF EUT 8

5.2. MAXIMUM OUTPUT POWER 8

5.3. DESCRIPTION OF AVAILABLE ANTENNAS 8

5.4. WORST-CASE CONFIGURATION AND MODE 8

5.5. DESCRIPTION OF TEST SETUP 9

6. TEST AND MEASUREMENT EQUIPMENT 11

7. SUMMARY TABLE 12

8. ANTENNA PORT TEST RESULTS 13

8.1. ON TIME, DUTY CYCLE 13

8.2. 20 dB AND 99% BANDWIDTH 14

8.2.1. GFSK 20 dB BANDWIDTH PLOTS and TABLE 15
8.2.2. GFSK 99% BANDWIDTH PLOTS AND TABLE 16
8.2.3. 8PSK 20 dB BANDWIDTH PLOTS and TABLE 17
8.2.4. 8PSK 99% BANDWIDTH PLOTS AND TABLE 18

8.3. HOPPING FREQUENCY SEPARATION 19

8.4. NUMBER OF HOPPING CHANNELS 20

8.4.1. NUMBER OF HOPPING CHANNELS PLOTS 21

8.5. AVERAGE TIME OF OCCUPANCY 22

8.5.1. Pulse Width and Number of Pulses in 3.16 Seconds Period Plots 23

8.6. OUTPUT POWER 24

8.7. AVERAGE POWER 27

8.7.1. BASIC DATA RATE GFSK MODULATION 27
8.7.2. DATA RATE PI/4-DQPSK MODULATION 27
8.7.3. ENHANCED DATA RATE 8PSK MODULATION 27

8.8. CONDUCTED SPURIOUS EMISSIONS 28

8.8.1. BASIC DATA RATE GFSK MODULATION NON-HOPPING MODE 29
8.8.2. BASIC DATA RATE GFSK MODULATION HOPPING MODE 30
8.8.3. ENHANCED DATA RATE 8PSK MODULATION NON-HOPPING MODE 31

8.8.4. ENHANCED DATA RATE 8PSK MODULATION HOPPING MODE 32

9. RADIATED TEST RESULTS.....33

9.1. LIMITS AND PROCEDURE.....33

9.2. TRANSMITTER ABOVE 1 GHz.....34

9.2.1. BASIC DATA RATE GFSK MODULATION.....34

9.2.2. ENHANCED DATA RATE 8PSK MODULATION 47

9.3. WORST-CASE BELOW 1 GHz.....60

10. AC POWER LINE CONDUCTED EMISSIONS.....63

11. SETUP PHOTOS.....66

END OF REPORT 67

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: IkeGPS

EUT DESCRIPTION: Bluetooth, BLE & 802.11 a/b/g/n Measuring Device

MODEL: IKE-IK04-L

SERIAL NUMBER: DVT2 UNIT37 (Radiated), DVT2 UNIT46 (Conducted)

DATE TESTED: February 22 – March 16, 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, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 9KHz to 30 MHz	2.14 dB
Radiated Disturbance, 30 to 1000 MHz	4.98 dB
Radiated Disturbance,1000 to 6000 MHz	3.86 dB
Radiated Disturbance,6000 to 18000 MHz	4.23 dB
Radiated Disturbance,18000 to 26000 MHz	5.30 dB
Radiated Disturbance,26000 to 40000 MHz	5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth, BLE, and 802.11 a/b/g/n Measuring Device.

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	6.34	4.31
2402 - 2480	Enhanced 8PSK	5.33	3.41

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

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPC antenna, with a maximum gain of 0.79dBi.

5.4. SOFTWARE and HARDWARE

The test utility software and hardware used during testing was Software Version: 1.0 and Hardware Version: 1.0.

5.5. WORST-CASE CONFIGURATION AND MODE

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

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

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	IkeGPS	ASSA41w2-050250	N/A	N/A

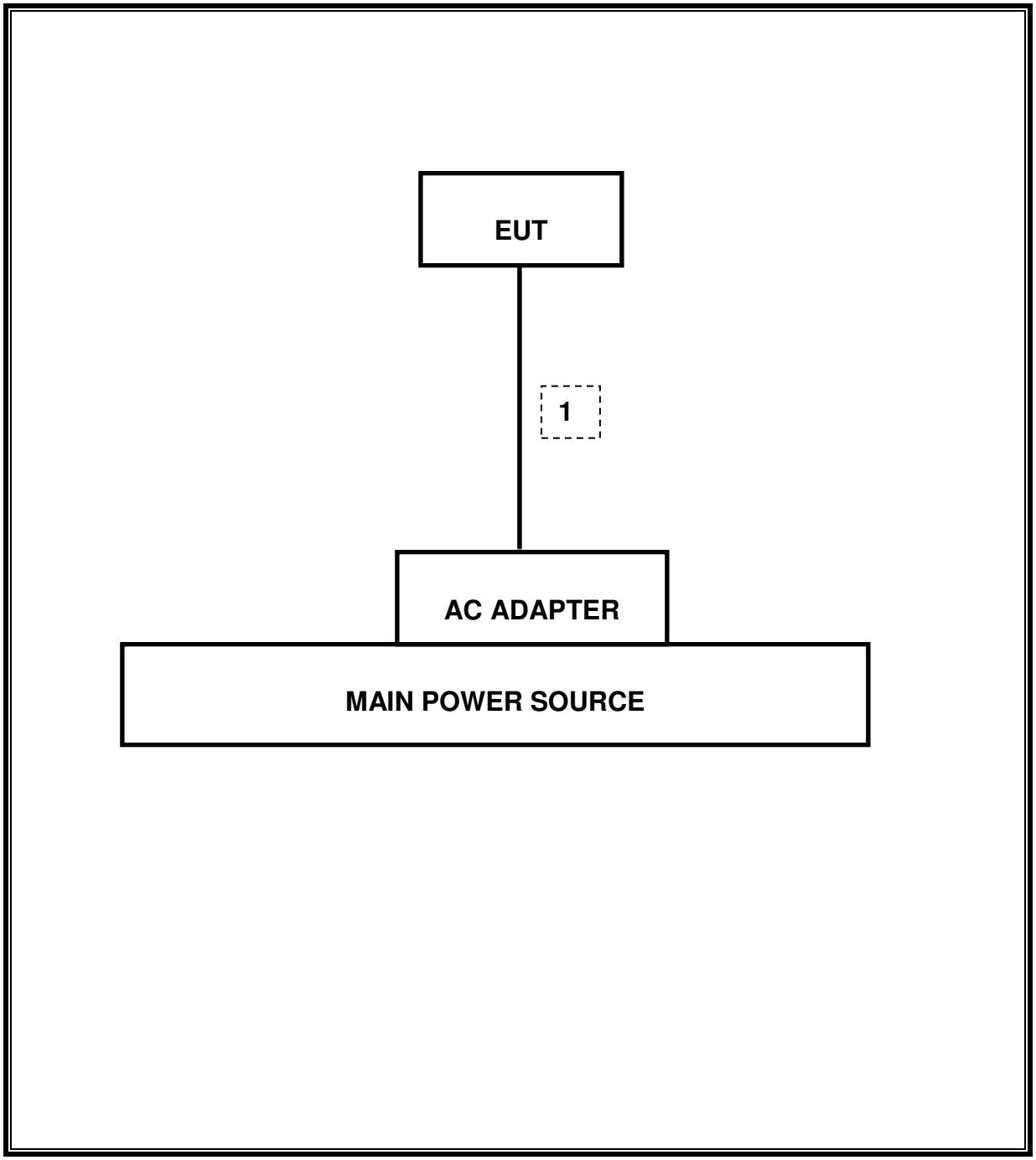
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	USB	Unshielded	1.5	N/A

TEST SETUP

EUT was tested stand alone and set in the Engineering Test menu mode to enable BT communications.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**T Number**	**Cal Due**
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	130	09/01/16
Antenna, Horn, 18GHz	EMCO	3115	59	11/18/16
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	447	05/12/16
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	123	10/22/16
Spectrum Analyzer, PXA, 3 Hz to 44 GHz	Keysight	N9030A	907	06/11/16
EMI Test Receiver, 9 KHz to 7 GHz	Rohde & Schwarz	ECSI7	284	09/10/16
Peak Power Meter	Agilent / HP	N1914A	254	06/08/16
Peak / Average Power Sensor	Keysight	E9323A	338	04/16/16
LISN, 30 MHz	Solar	8012-50-R-24-BNC	28	7/28/2016
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	160	CNR
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	417	05/04/16
High Pass Filter 6GHz	Micro-Tronics	HPS17542	893	04/25/16
High Pass Filter 3GHz	Micro-Tronics	HPS17543	898	04/25/16

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 3.9.1, Dec 28, 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 Band width (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(1)	TX conducted output power	<21dBm		Pass
15.247 (a)(1)	RSS-247 5.1 (1)	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	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

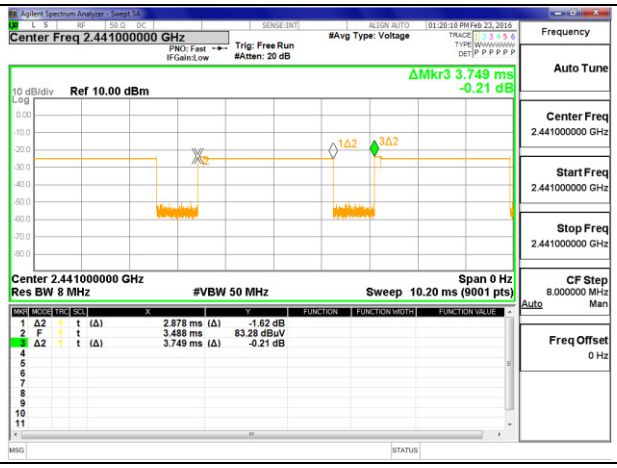
ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
GFSK	2.873	3.750	0.766	76.61%	1.16	0.348
8PSK	2.878	3.749	0.768	76.77%	1.15	0.347

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.

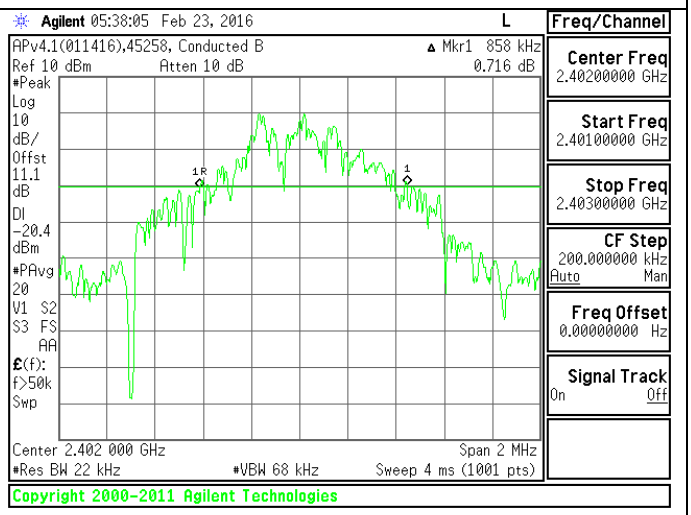
RESULTS

8.2.1. GFSK 20 dB BANDWIDTH PLOTS and TABLE

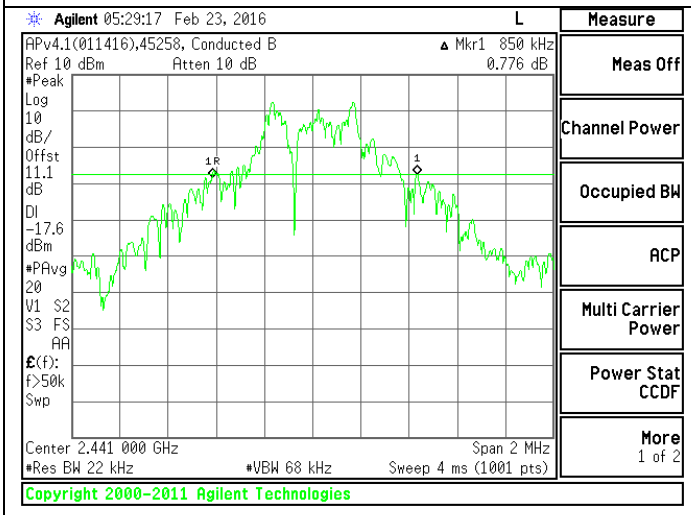
TEST RESULT TABLE

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	0.858
Middle	2441	0.850
High	2480	0.842

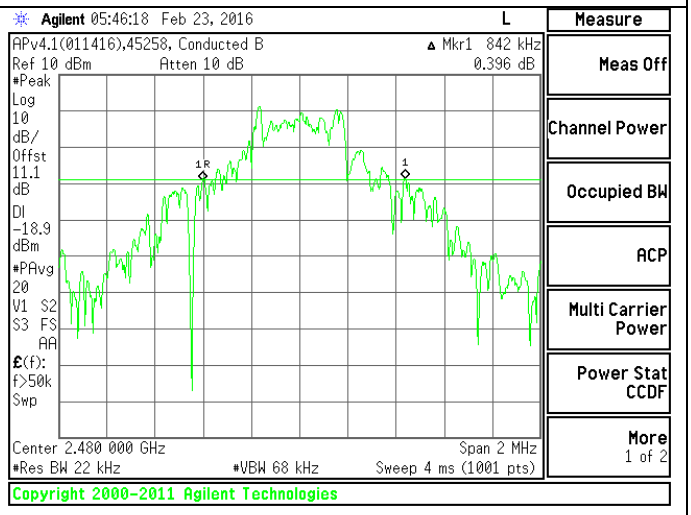
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

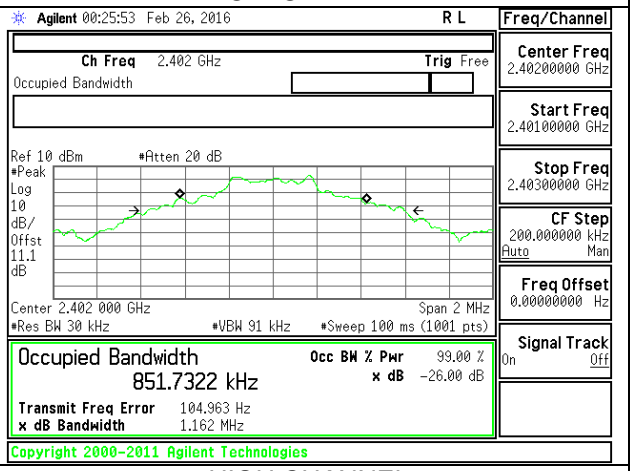


8.2.2. GFSK 99% BANDWIDTH PLOTS AND TABLE

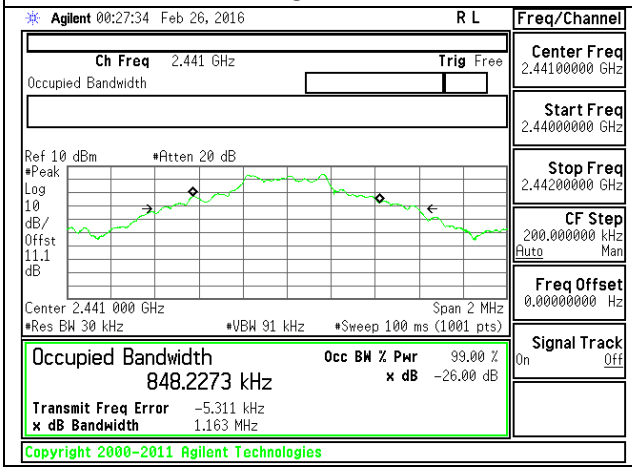
TEST RESULT TABLE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	0.852
Middle	2441	0.848
High	2480	0.850

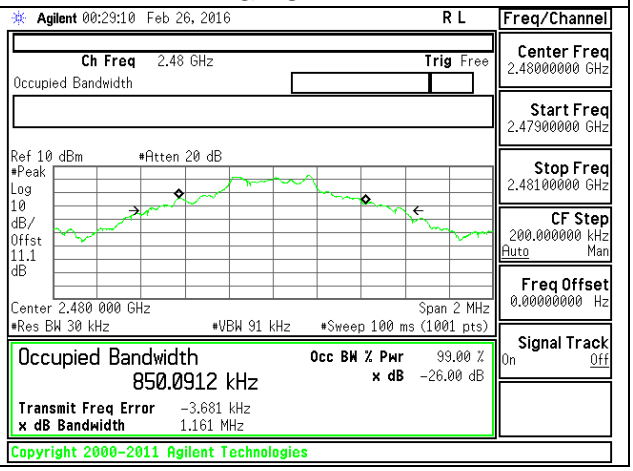
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

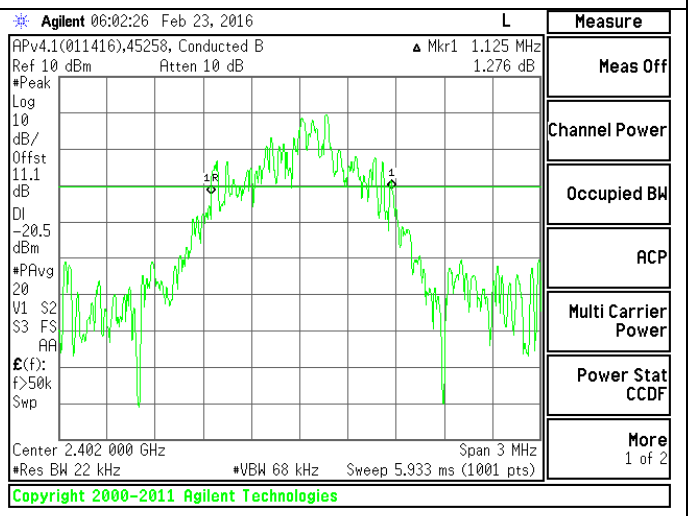


8.2.3. 8PSK 20 dB BANDWIDTH PLOTS and TABLE

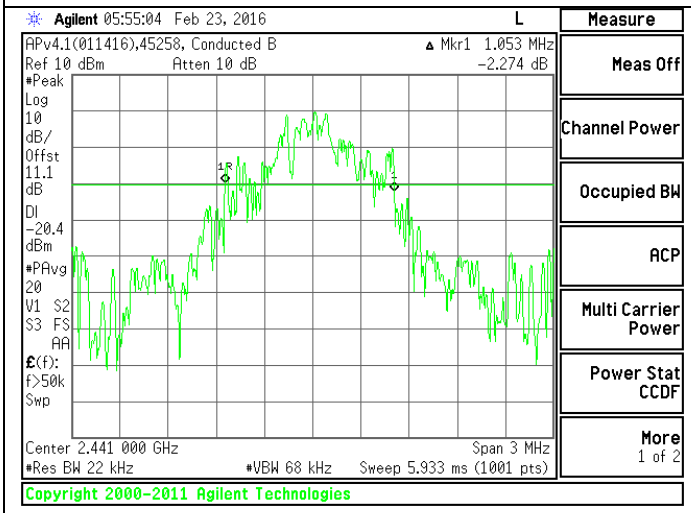
TEST RESULT TABLE

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.125
Middle	2441	1.053
High	2480	1.077

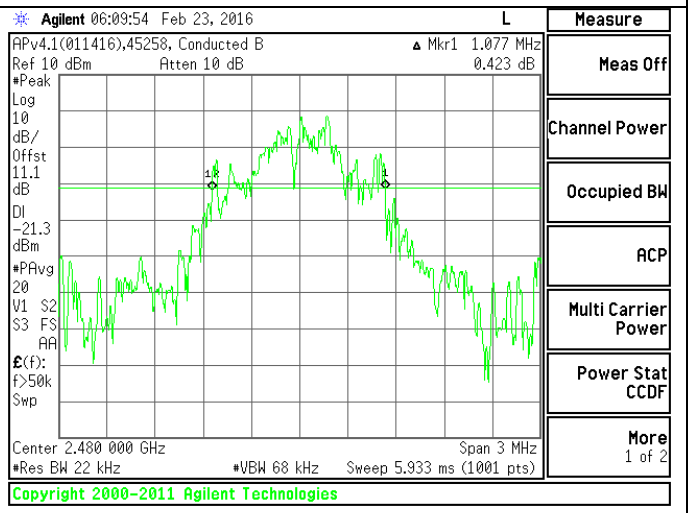
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

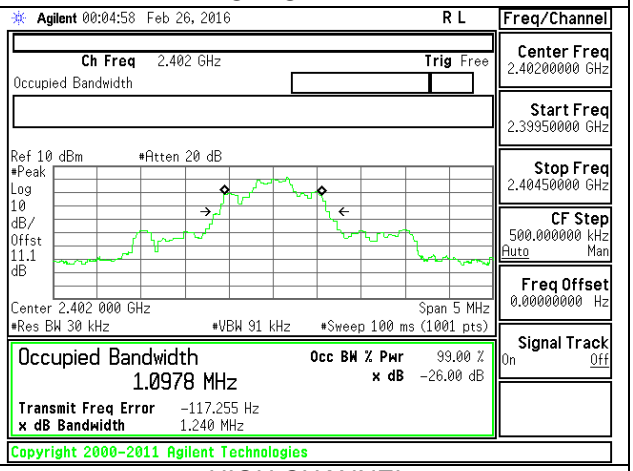


8.2.4. 8PSK 99% BANDWIDTH PLOTS AND TABLE

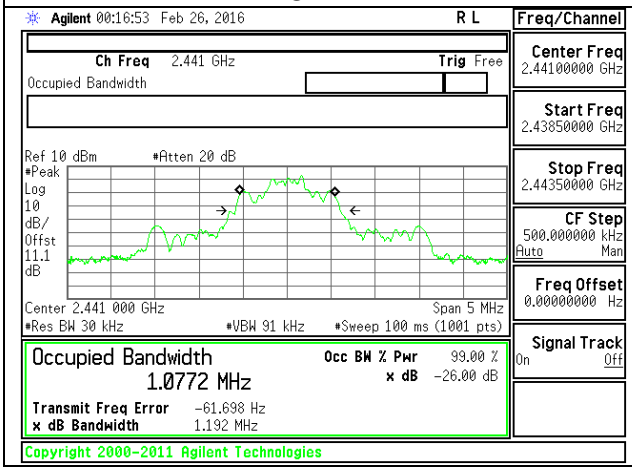
TEST RESULT TABLE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.098
Middle	2441	1.077
High	2480	1.076

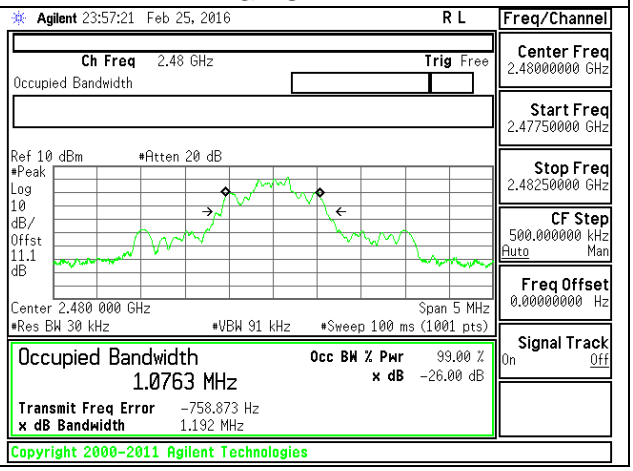
LOW CHANNEL



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 hoping channel, whichever is greater.

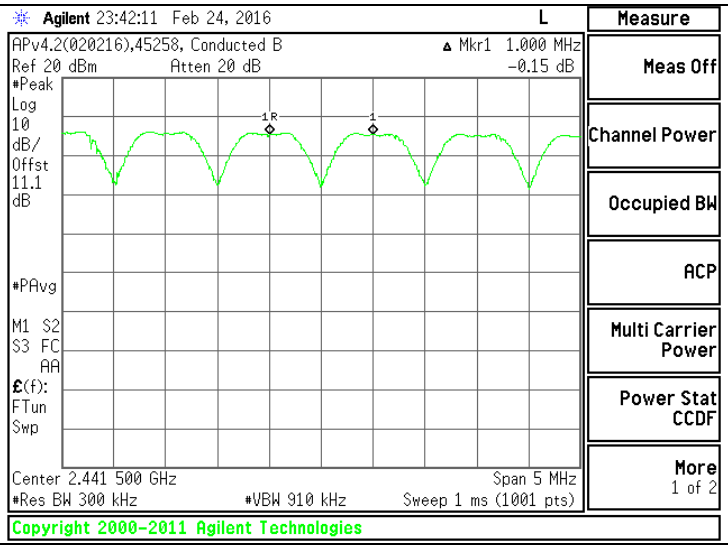
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

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

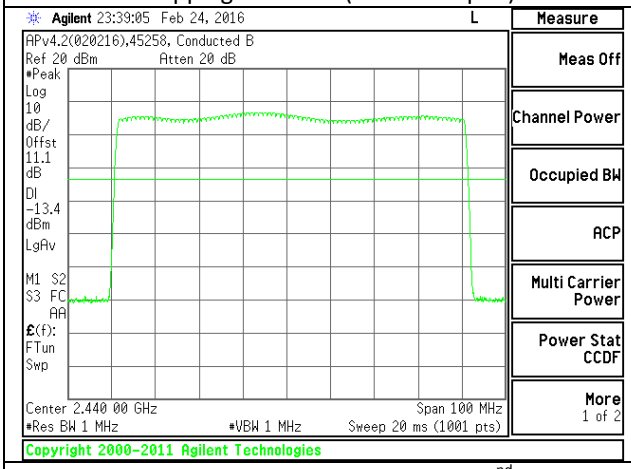
DA 00-705: The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

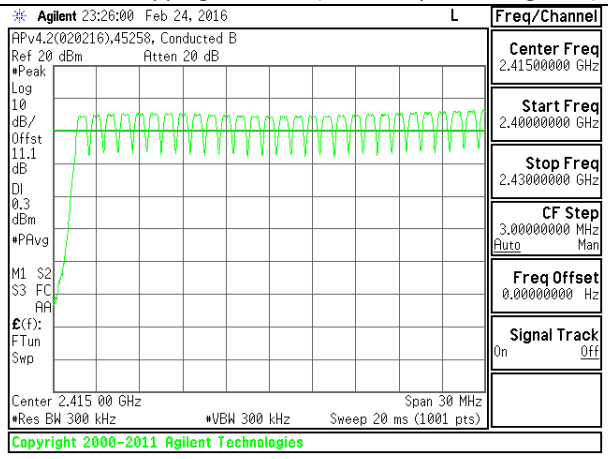
Normal Mode: 79 Channels observed.

8.4.1. NUMBER OF HOPPING CHANNELS PLOTS

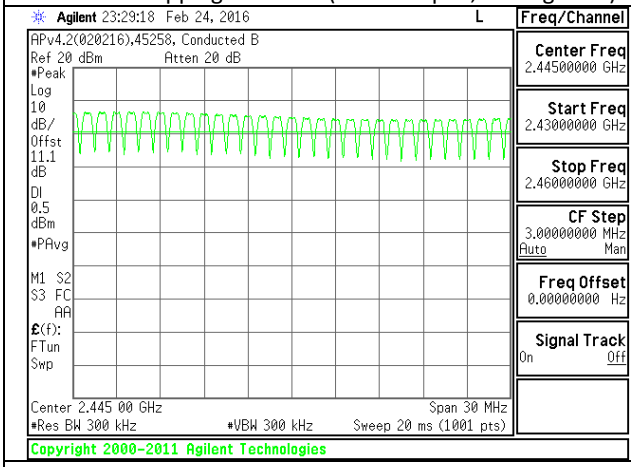
Number of Hopping Channels (100 MHz Span)



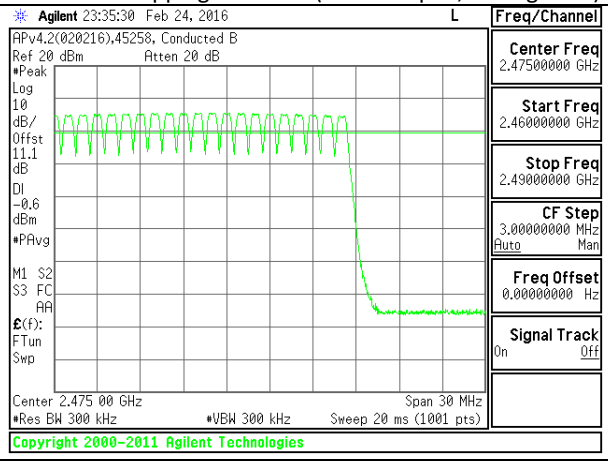
Number of Hopping Channels (30 MHz Span, 1st Segment)



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



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



NOTE: --

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

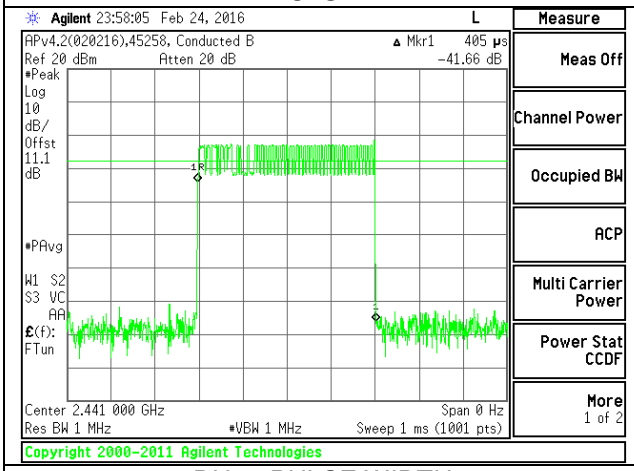
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.405	31	0.12555	0.4	-0.27445
DH3	1.656	15	0.2484	0.4	-0.1516
DH5	2.884	10	0.2884	0.4	-0.1116

DH Packet	Pulse Width (msec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.405	7.75	0.0313875	0.4	-0.36861
DH3	1.656	3.75	0.0621	0.4	-0.3379
DH5	2.884	2.5	0.0721	0.4	-0.3279

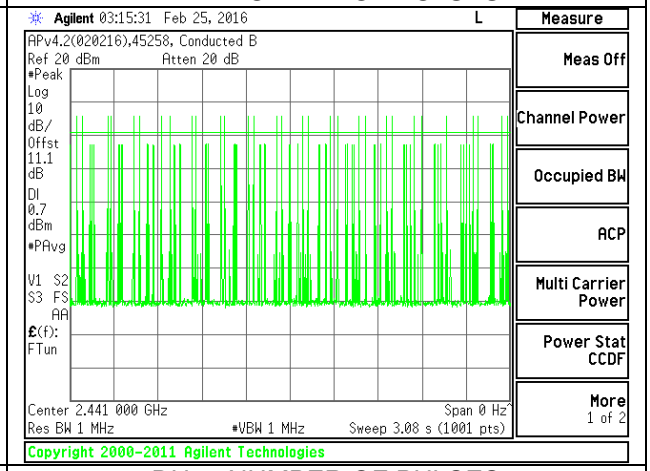
NOTE: --

8.5.1. Pulse Width and Number of Pulses in 3.16 Seconds Period Plots

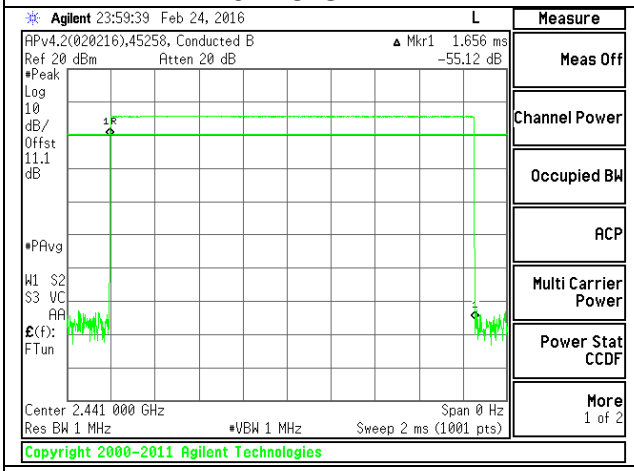
DH1 - PULSE WIDTH



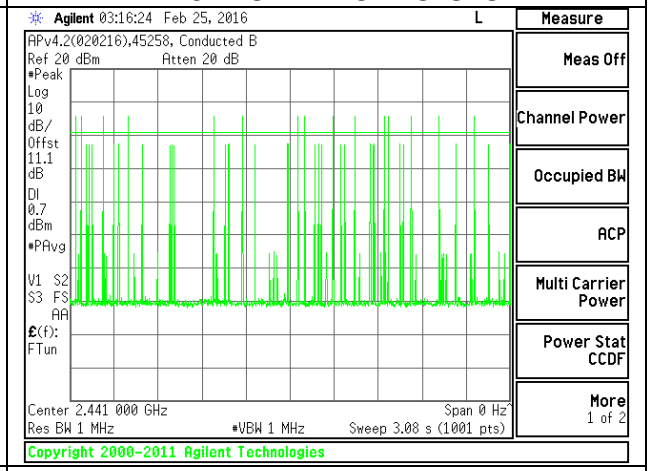
DH1 - NUMBER OF PULSES



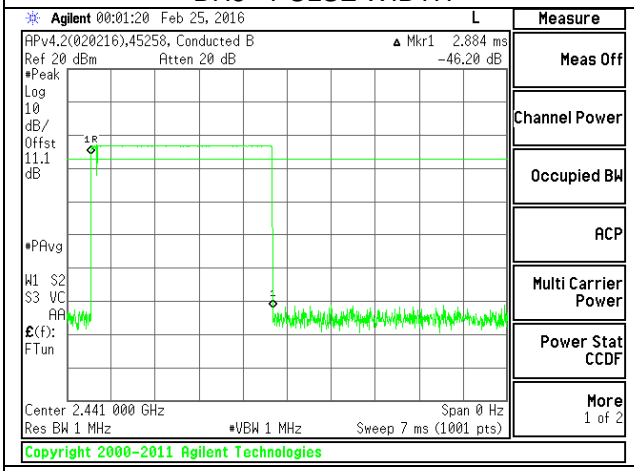
DH3 - PULSE WIDTH



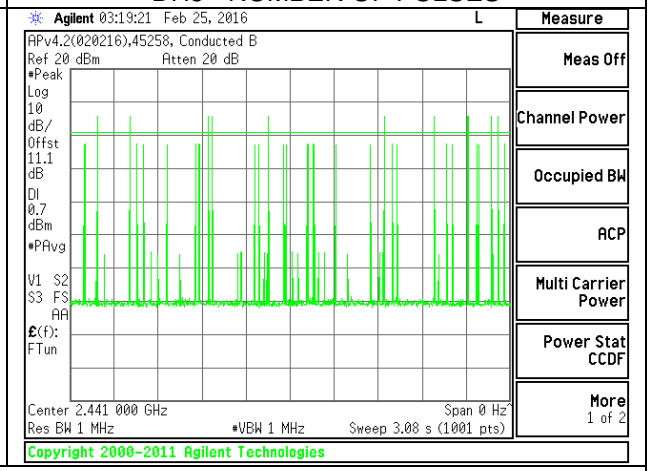
DH3 - NUMBER OF PULSES



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.

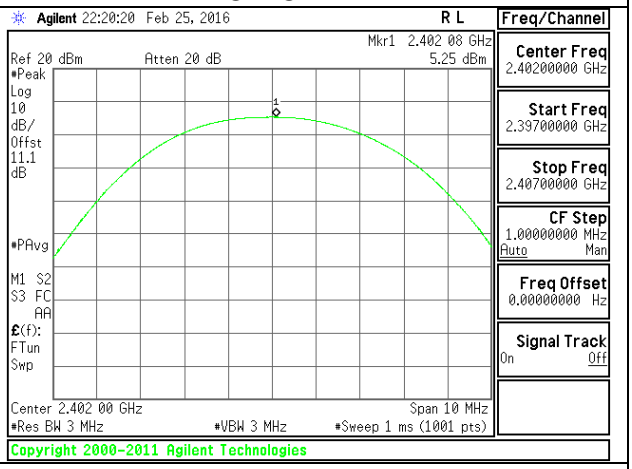
RESULTS

8.6.1. GFSK OUTPUT POWER PLOTS AND TABLE

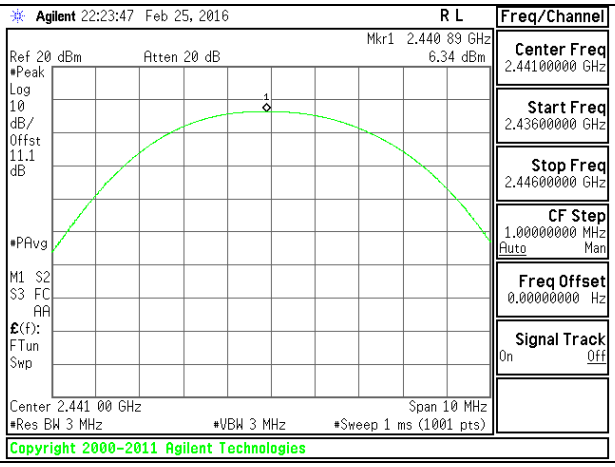
TEST RESULT TABLE

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	5.25	21	-15.75
Middle	2441	6.34	21	-14.66
High	2480	5.24	21	-15.76

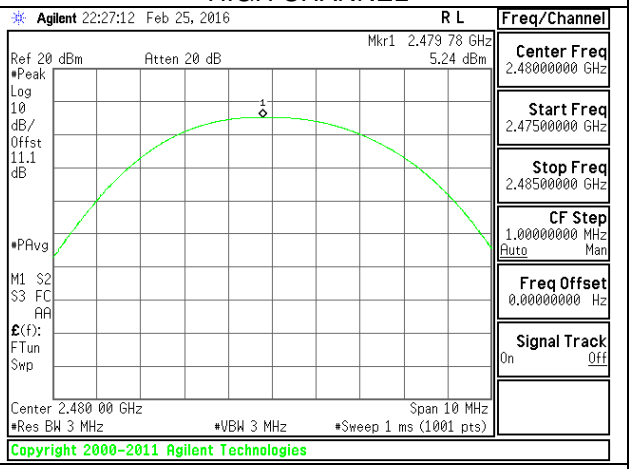
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



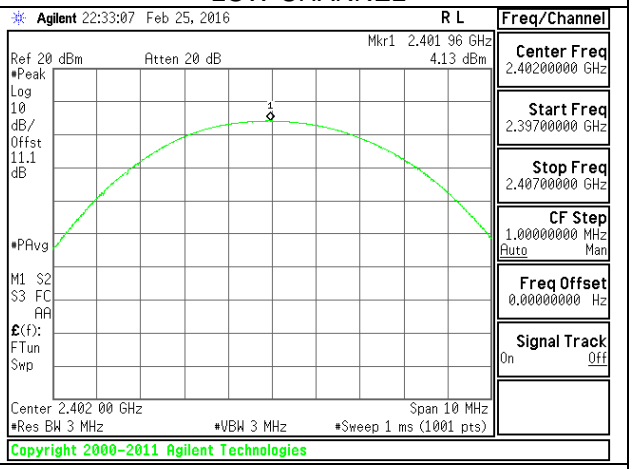
NOTE:

8.6.1. 8PSK OUTPUT POWER PLOTS AND TABLE

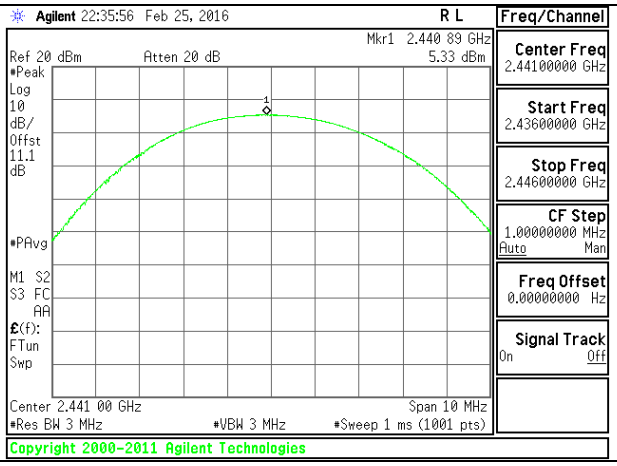
TEST RESULT TABLE

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	4.13	21	-16.87
Middle	2441	5.33	21	-15.67
High	2480	4.19	21	-16.81

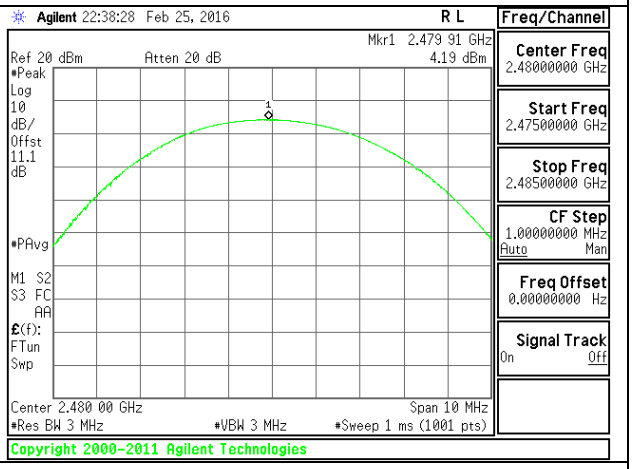
LOW CHANNEL



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

8.7.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	4.75
Middle	2441	5.83
High	2480	4.75

8.7.2. DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	2.12
Middle	2441	3.23
High	2480	2.05

8.7.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	2.19
Middle	2441	3.24
High	2480	2.06

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.

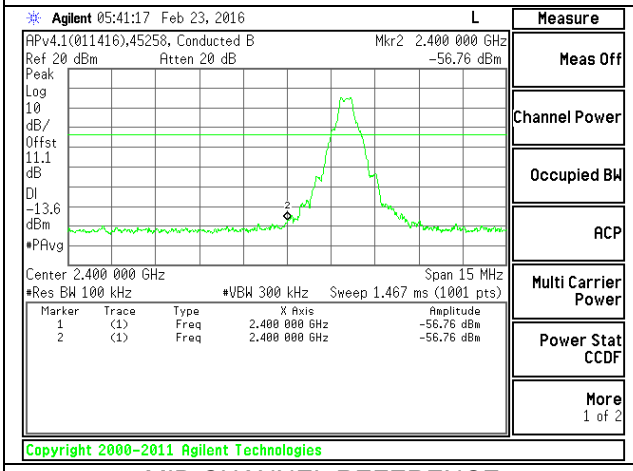
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

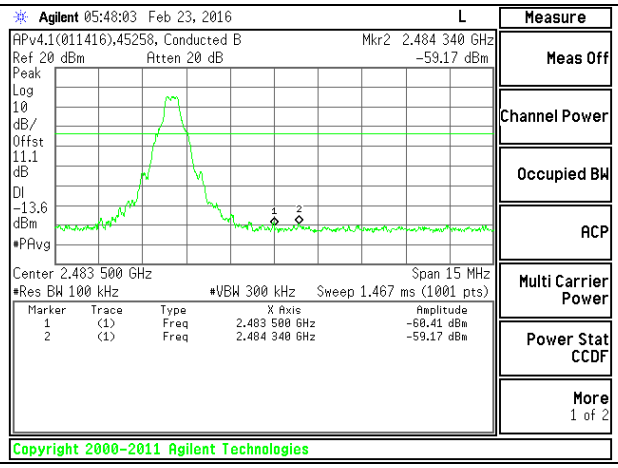
8.8.1. BASIC DATA RATE GFSK MODULATION NON-HOPPING MODE

BANDEDGE AND SPURIOUS EMISSIONS PLOTS

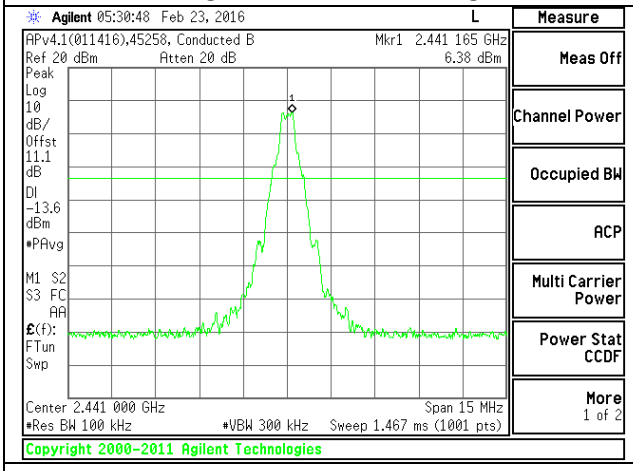
LOW CHANNEL BANDEDGE



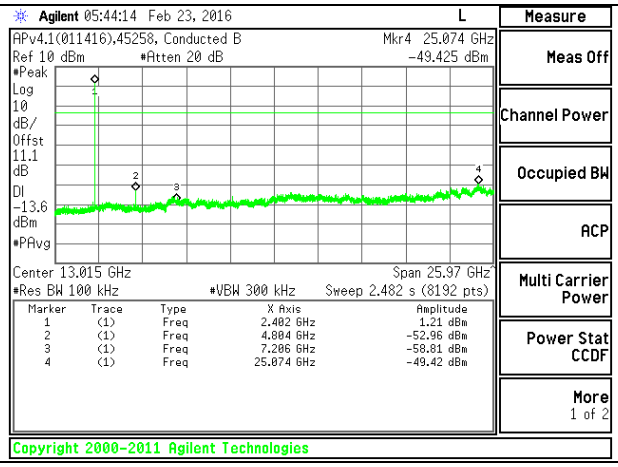
HIGH CHANNEL BANDEDGE



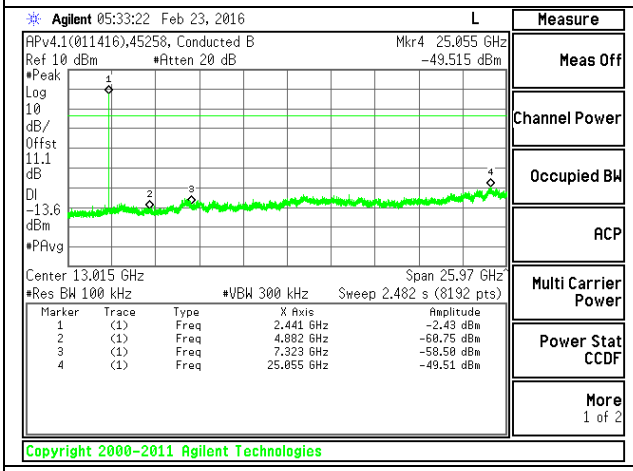
MID CHANNEL REFERENCE



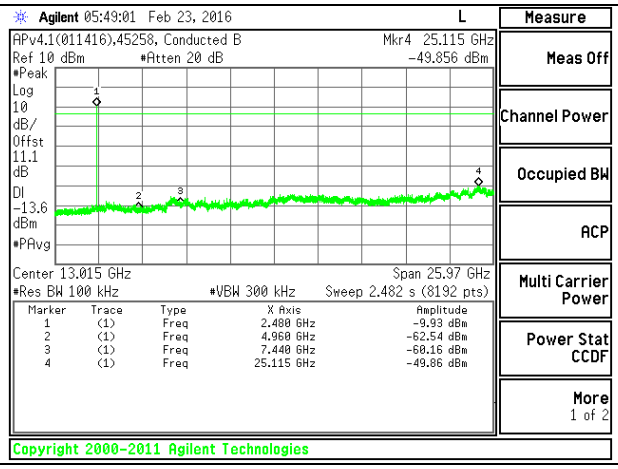
LOW CHANNEL SPURIOUS



MID CHANNEL SPURIOUS



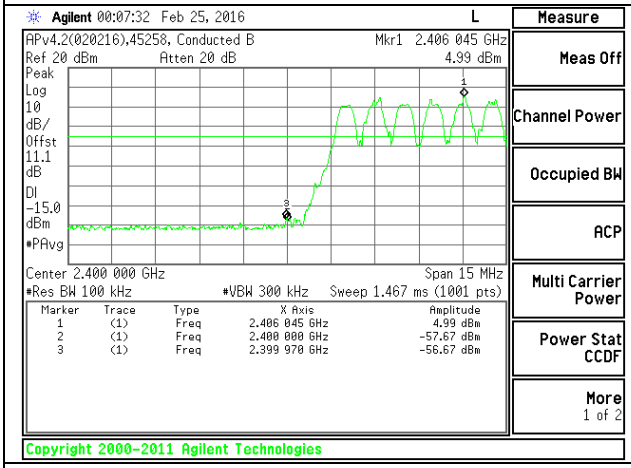
HIGH CHANNEL SPURIOUS



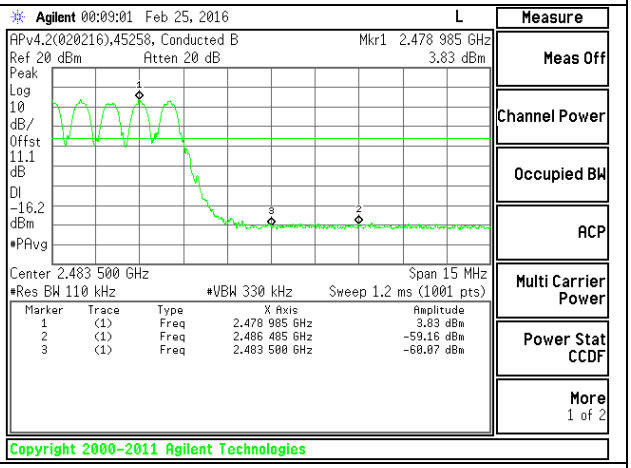
NOTE: Each channel was verified, and it appears that middle channel is worst and was selected as the reference limit for all channels.

8.8.2. BASIC DATA RATE GFSK MODULATION HOPPING MODE
SPURIOUS BANDEDGE EMISSIONS PLOTS

LOW CHANNEL BANDEDGE



HIGH CHANNEL BANDEDGE

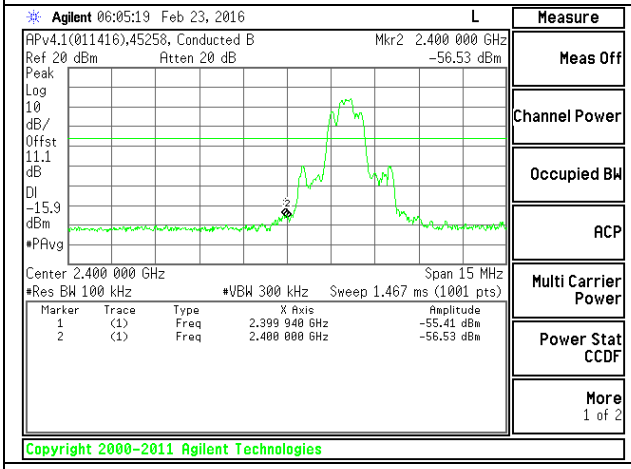


NOTE:--

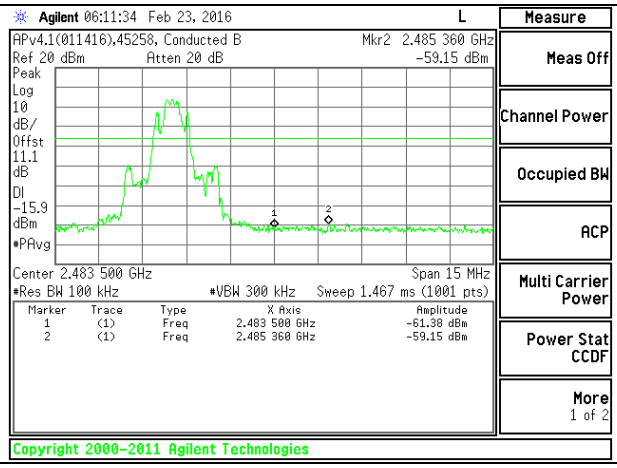
8.8.3. ENHANCED DATA RATE 8PSK MODULATION NON-HOPPING MODE

BANDEDGE AND SPURIOUS EMISSIONS PLOTS

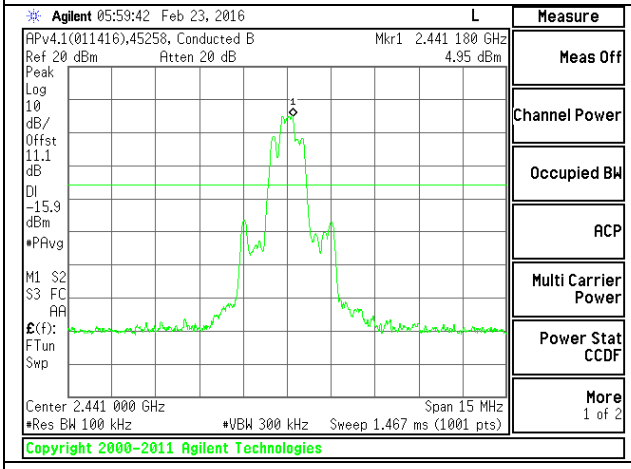
LOW CHANNEL BANDEDGE



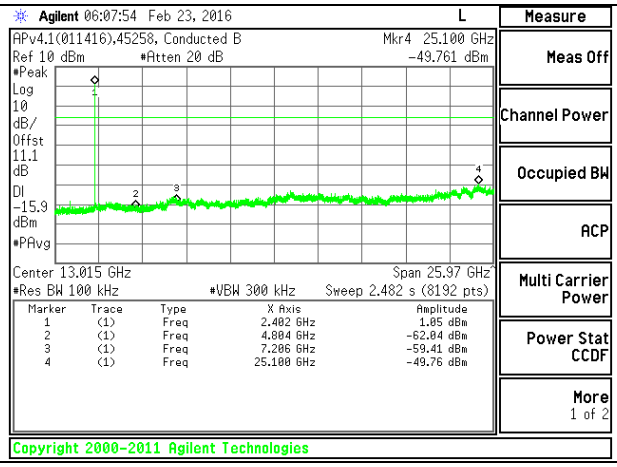
HIGH CHANNEL BANDEDGE



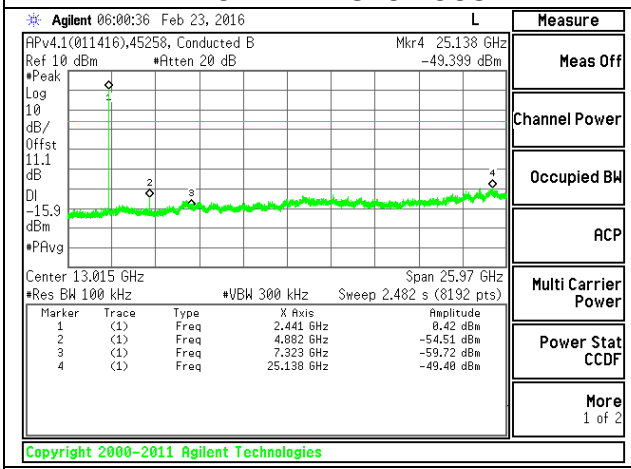
MID CHANNEL REFERENCE



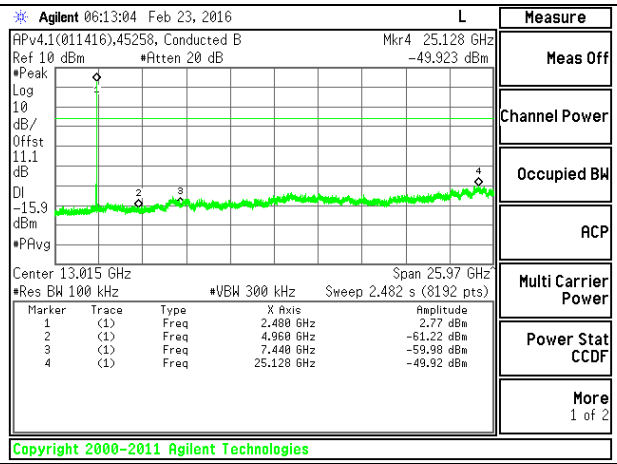
LOW CHANNEL SPURIOUS



MID CHANNEL SPURIOUS



HIGH CHANNEL SPURIOUS

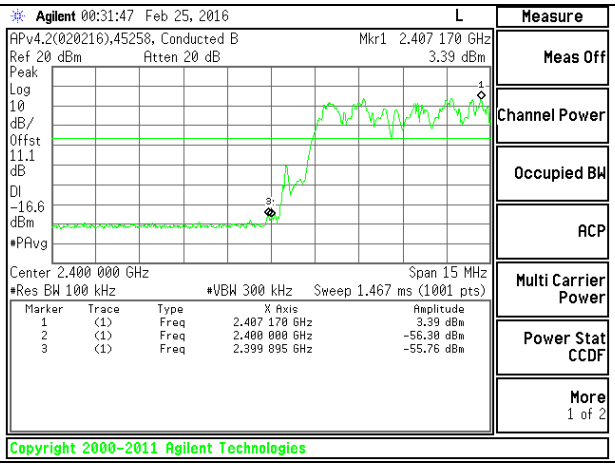


NOTE: Each channel was verified, and it appears that middle channel is worst and was selected as the reference limit for all channels.

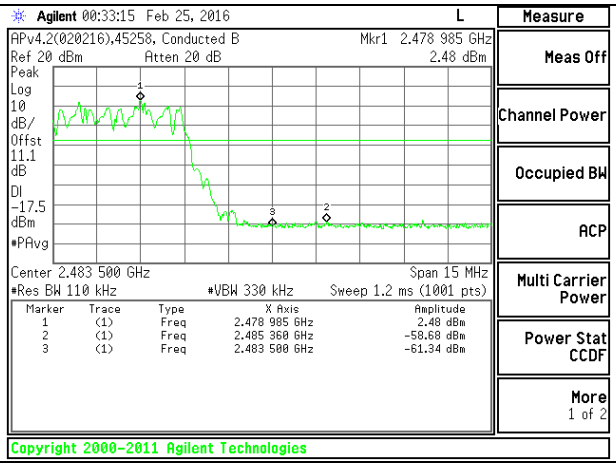
8.8.4. ENHANCED DATA RATE 8PSK MODULATION HOPPING MODE

SPURIOUS BANDEDGE EMISSIONS PLOTS

LOW CHANNEL BANDEDGE



HIGH CHANNEL BANDEDGE



NOTE:--

9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

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 / 0.002873S = 360Hz.
8PSK = 1/T =1 / 0.002878S = 360Hz

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

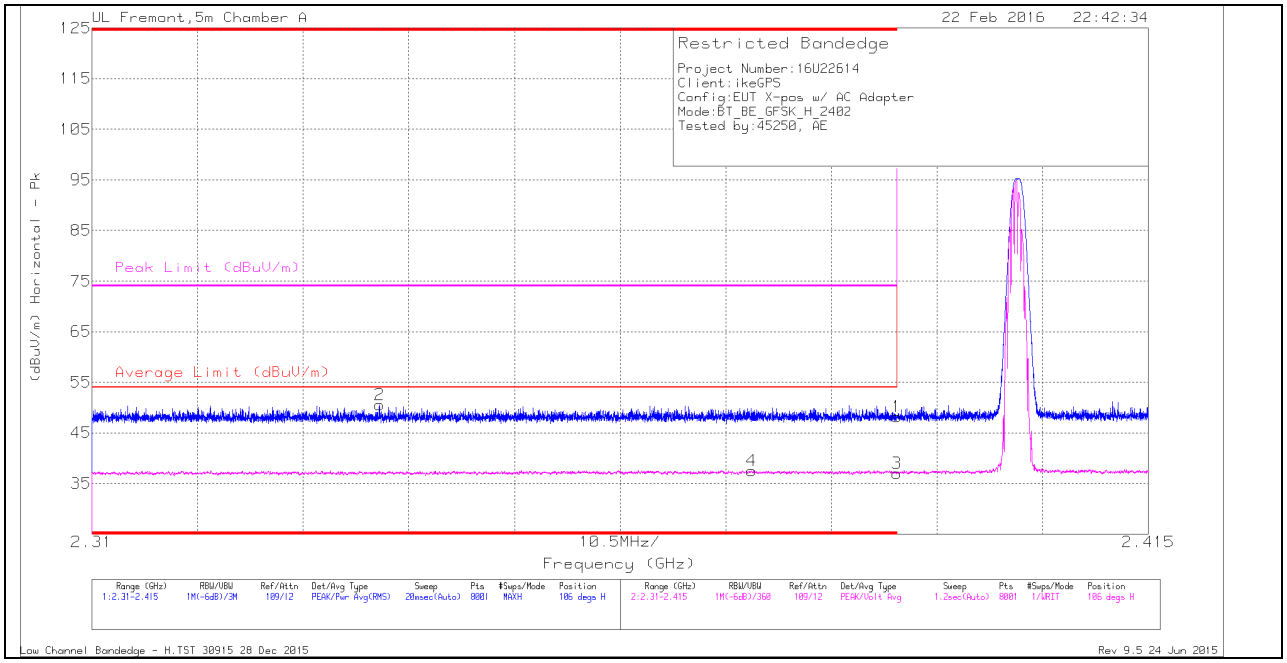
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

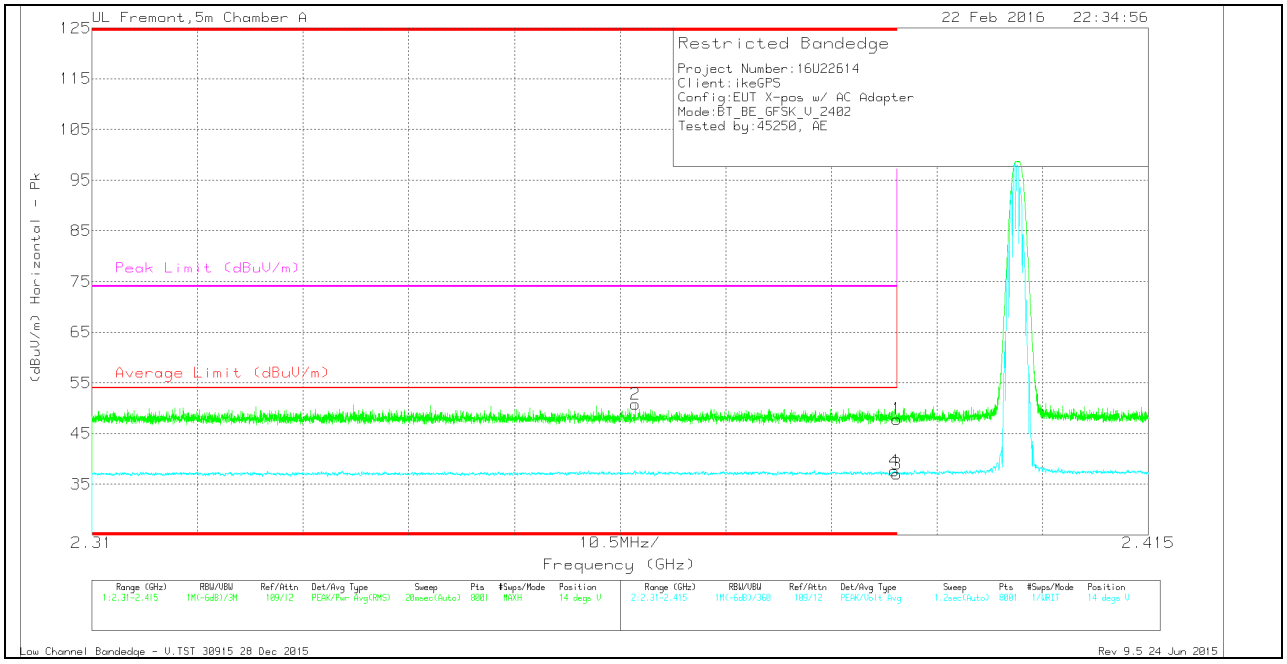
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.339	38.47	Pk	31.9	-19.8	50.57	-	-	74	-23.43	106	128	H
4	* 2.376	25.46	VA1T	31.9	-19.8	37.56	54	-16.44	-	-	106	128	H
1	* 2.39	36.07	Pk	32	-19.9	48.17	-	-	74	-25.83	106	128	H
3	* 2.39	24.95	VA1T	32	-19.9	37.05	54	-16.95	-	-	106	128	H

* - indicates frequency in CFR15.205/IC8.10 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 T136 (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	* 2.364	38.72	Pk	31.9	-19.8	50.82	-	-	74	-23.18	14	165	V
1	* 2.39	35.77	Pk	32	-19.9	47.87	-	-	74	-26.13	14	165	V
3	* 2.39	24.96	VA1T	32	-19.9	37.06	54	-16.94	-	-	14	165	V
4	* 2.39	25.52	VA1T	32	-19.9	37.62	54	-16.38	-	-	14	165	V

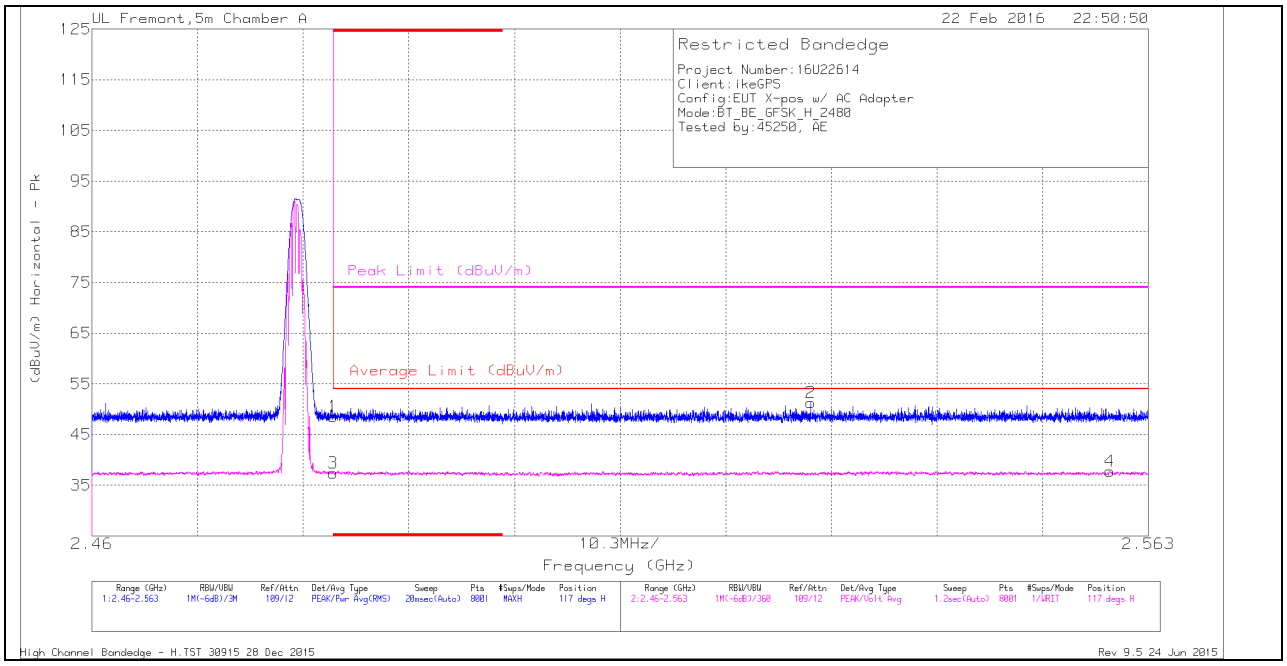
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

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

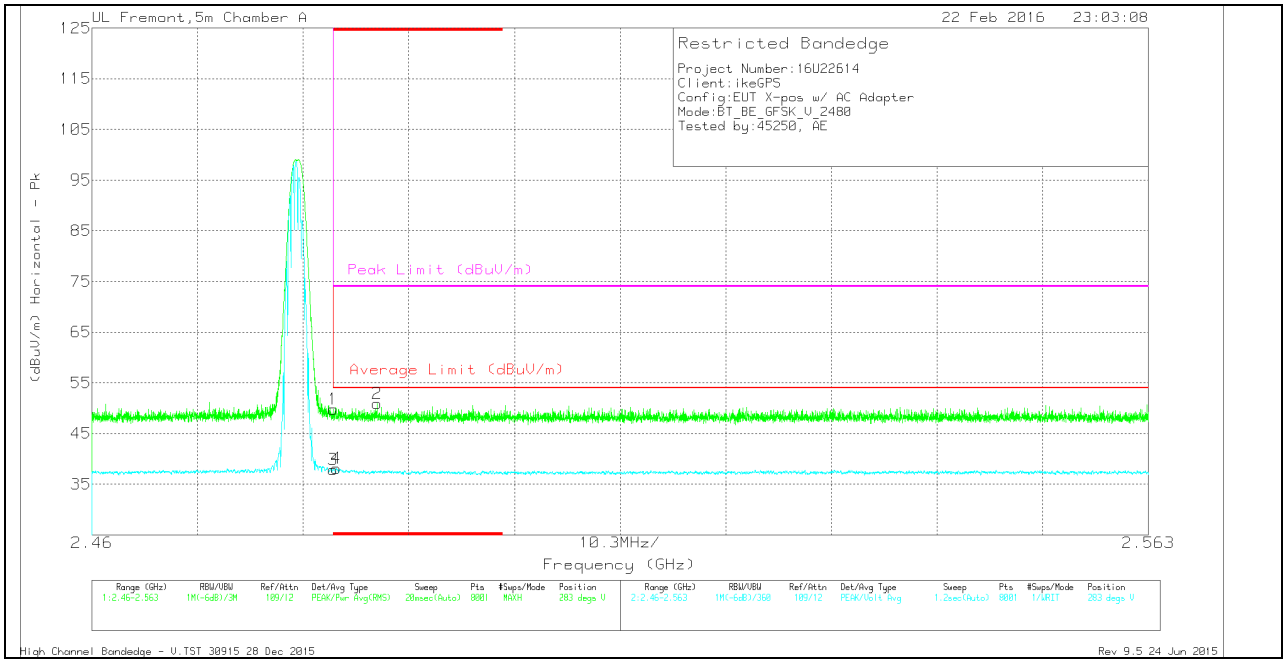
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	36.4	Pk	32.1	-20	48.5	-	-	74	-25.5	117	204	H
3	* 2.484	25.25	VA1T	32.1	-20	37.35	54	-16.65	-	-	117	204	H
2	2.53	39.28	Pk	32.1	-20.1	51.28	-	-	74	-22.72	117	204	H
4	2.559	25.75	VA1T	32.2	-20.2	37.75	54	-16.25	-	-	117	204	H

* - indicates frequency in CFR15.205/IC8.10 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 T136 (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	37.65	Pk	32.1	-20	49.75	-	-	74	-24.25	283	209	V
3	* 2.484	25.8	VA1T	32.1	-20	37.9	54	-16.1	-	-	283	209	V
4	* 2.484	25.97	VA1T	32.1	-20	38.07	54	-15.93	-	-	283	209	V
2	* 2.488	38.77	Pk	32.1	-20	50.87	-	-	74	-23.13	283	209	V

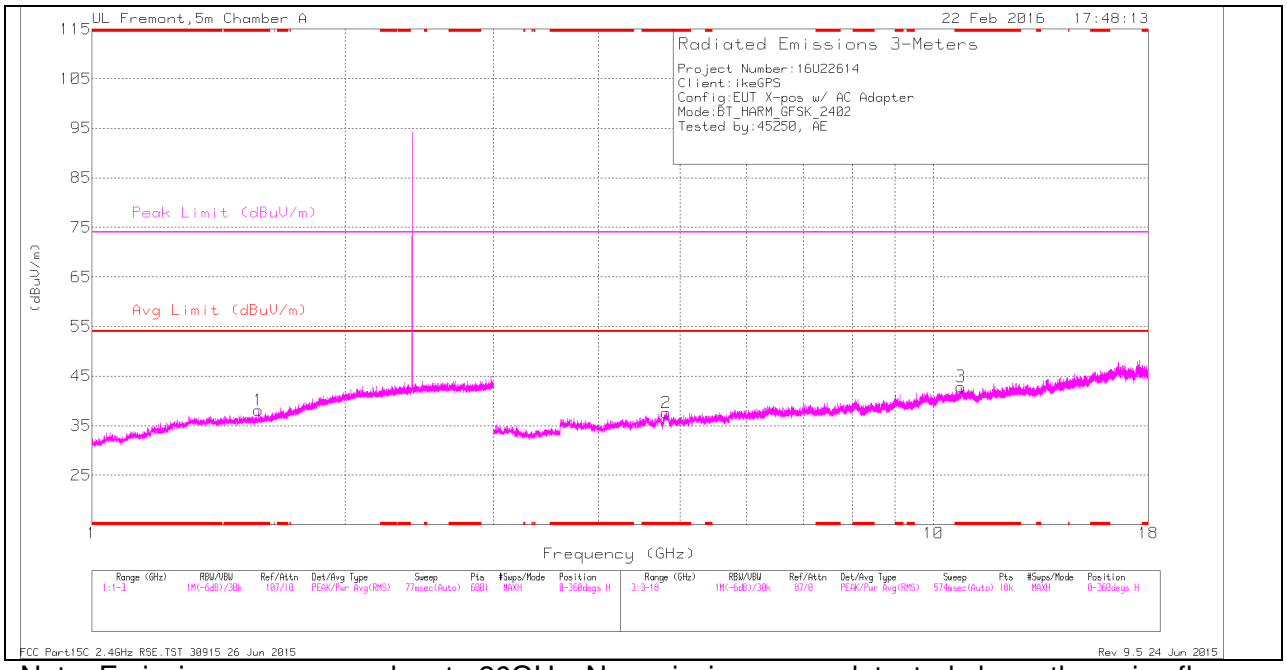
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

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

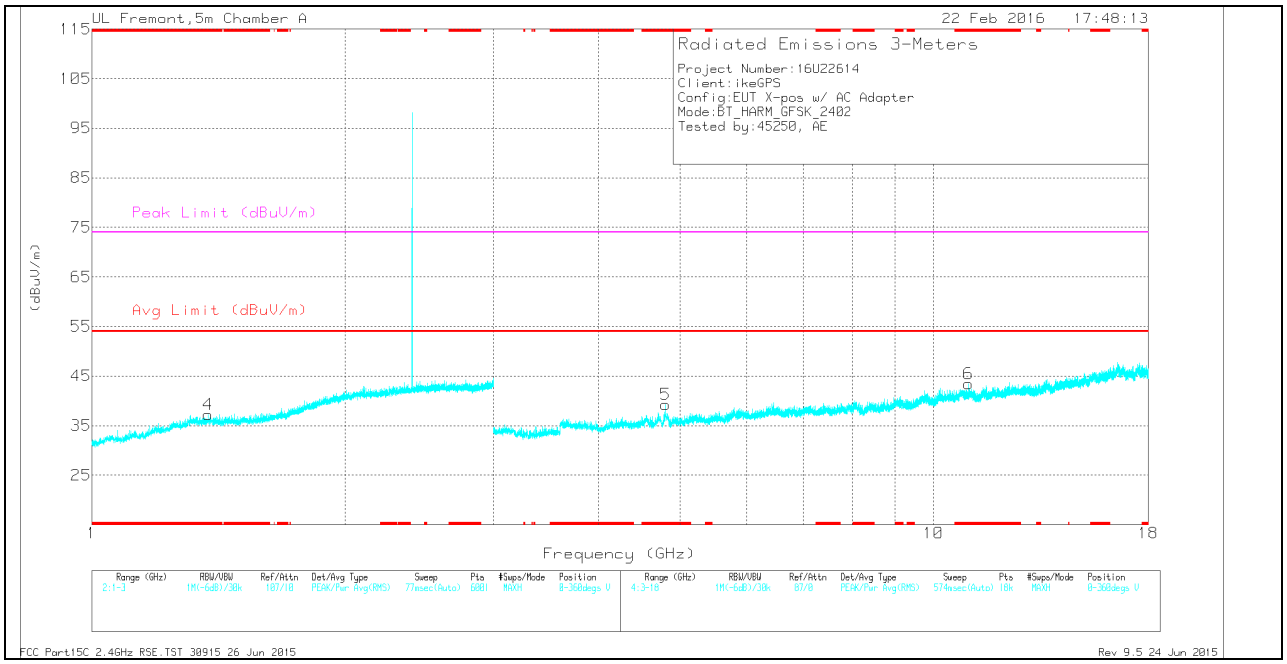
HARMONICS AND SPURIOUS EMISSIONS

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 T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.578	30.08	Pk	28	-20	38.08	-	-	74	-35.92	0-360	100	H
4	* 1.374	29.56	Pk	28.6	-20.9	37.26	-	-	74	-36.74	0-360	100	V
2	* 4.815	33.44	Pk	33.9	-29.7	37.64	-	-	74	-36.36	0-360	100	H
3	* 10.787	26.77	Pk	37.8	-21.7	42.87	-	-	74	-31.13	0-360	100	H
5	* 4.804	35.04	Pk	34	-29.8	39.24	-	-	74	-34.76	0-360	200	V
6	* 10.998	27.99	Pk	37.8	-22.3	43.49	-	-	74	-30.51	0-360	200	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

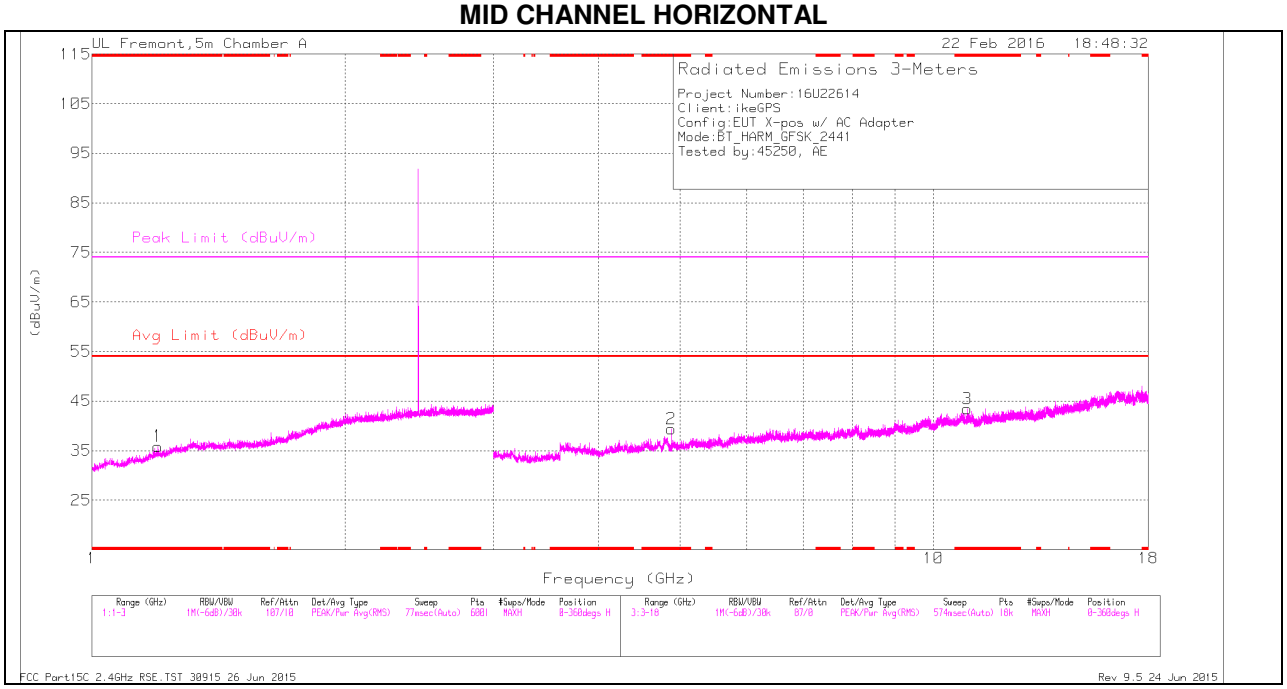
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.579	37.06	PK2	28	-20	45.06	-	-	74	-28.94	300	166	H
* 1.579	26.13	VA1T	28	-20	34.13	54	-19.87	-	-	300	166	H
* 1.375	36.61	PK2	28.6	-20.9	44.31	-	-	74	-29.69	177	224	V
* 1.372	25.92	VA1T	28.6	-20.9	33.62	54	-20.38	-	-	177	224	V
* 4.813	41.25	PK2	33.9	-29.8	45.35	-	-	74	-28.65	211	195	H
* 4.816	31.02	VA1T	33.9	-29.7	35.22	54	-18.78	-	-	211	195	H
* 10.787	33.94	PK2	37.8	-21.7	50.04	-	-	74	-23.96	117	184	H
* 10.789	23.49	VA1T	37.8	-21.7	39.59	54	-14.41	-	-	117	184	H
* 4.804	41.11	PK2	34	-29.8	45.31	-	-	74	-28.69	121	222	V
* 4.804	30.87	VA1T	34	-29.8	35.07	54	-18.93	-	-	121	222	V
* 10.998	34.36	PK2	37.8	-22.3	49.86	-	-	74	-24.14	22	147	V
* 10.997	23.79	VA1T	37.8	-22.3	39.29	54	-14.71	-	-	22	147	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

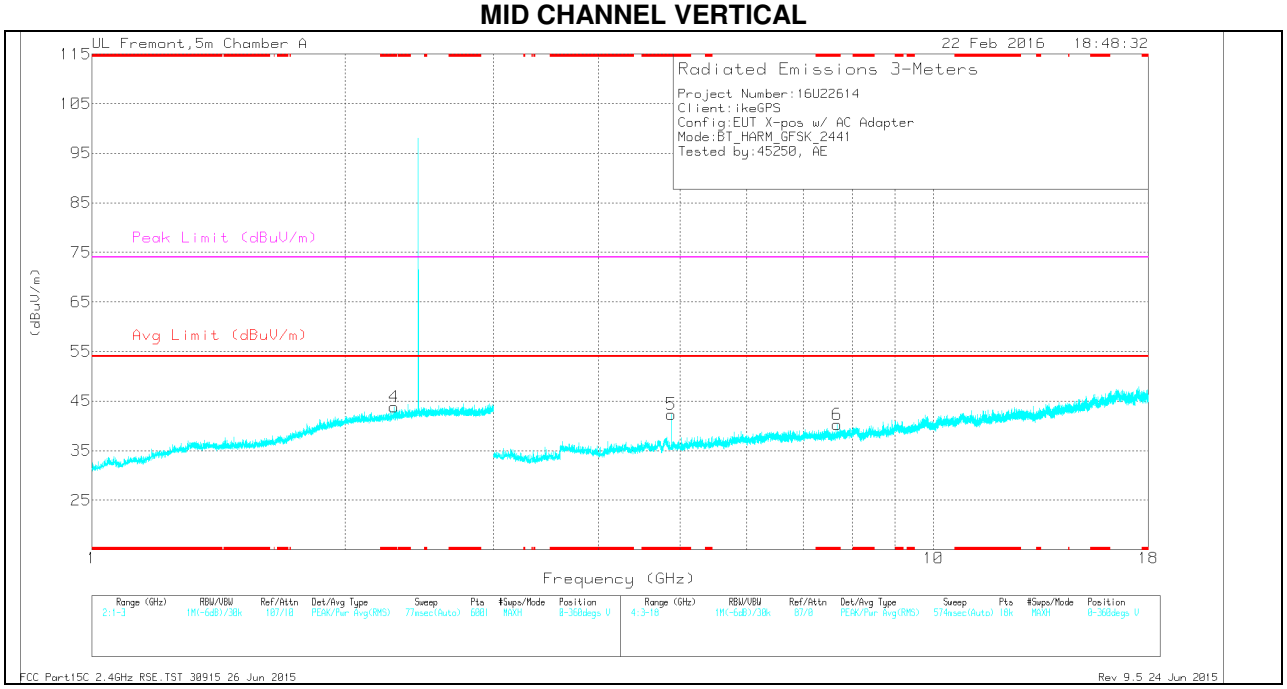
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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 T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.197	29.79	Pk	28	-21.9	35.89	-	-	74	-38.11	0-360	201	H
4	* 2.286	31.63	Pk	31.8	-19.6	43.83	-	-	74	-30.17	0-360	200	V
2	* 4.882	34.78	Pk	33.9	-29.3	39.38	-	-	74	-34.62	0-360	100	H
3	* 10.968	27.93	Pk	37.8	-22.3	43.43	-	-	74	-30.57	0-360	201	H
5	* 4.882	37.76	Pk	33.9	-29.3	42.36	-	-	74	-31.64	0-360	100	V
6	* 7.688	30.36	Pk	35.7	-25.8	40.26	-	-	74	-33.74	0-360	100	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

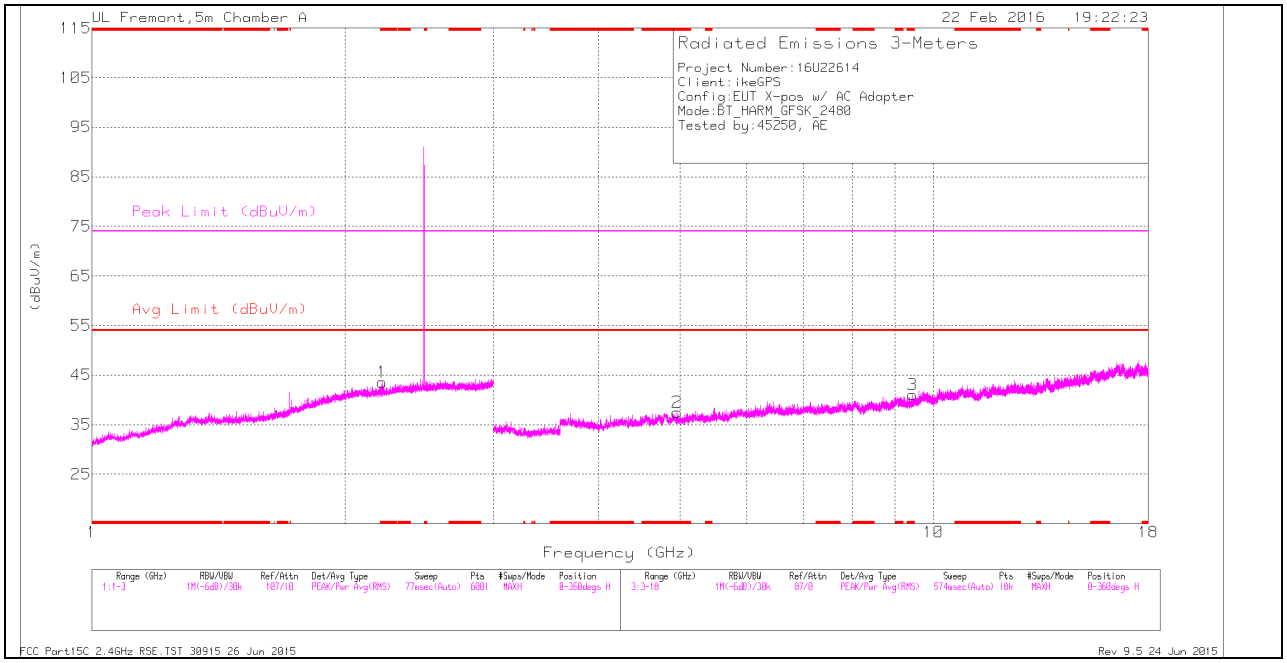
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.198	36.62	PK2	28	-21.8	42.82	-	-	74	-31.18	38	191	H
* 1.196	23.76	VA1T	28	-21.9	29.86	54	-24.14	-	-	38	191	H
* 2.285	37.35	PK2	31.8	-19.6	49.55	-	-	74	-24.45	93	229	V
* 2.285	24.89	VA1T	31.8	-19.6	37.09	54	-16.91	-	-	93	229	V
* 4.881	40.94	PK2	33.9	-29.3	45.54	-	-	74	-28.46	50	166	H
* 4.882	31.63	VA1T	33.9	-29.3	36.23	54	-17.77	-	-	50	166	H
* 10.967	34.28	PK2	37.8	-22.3	49.78	-	-	74	-24.22	138	189	H
* 10.97	21.82	VA1T	37.8	-22.3	37.32	54	-16.68	-	-	138	189	H
* 4.882	43.59	PK2	33.9	-29.3	48.19	-	-	74	-25.81	287	106	V
* 4.882	36.92	VA1T	33.9	-29.3	41.52	54	-12.48	-	-	287	106	V
* 7.688	37.34	PK2	35.7	-25.8	47.24	-	-	74	-26.76	322	130	V
* 7.686	24.48	VA1T	35.7	-25.8	34.38	54	-19.62	-	-	322	130	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

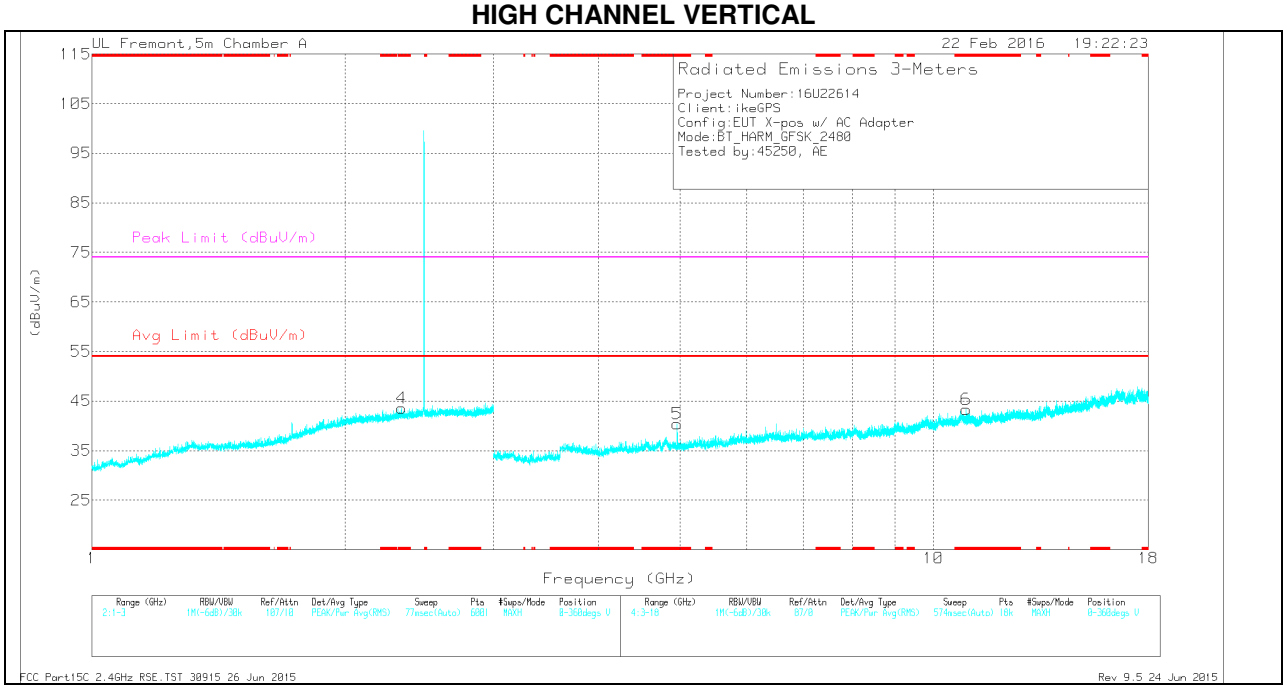
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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 T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.214	31.63	Pk	31.4	-19.5	43.53	-	-	74	-30.47	0-360	201	H
4	* 2.332	31.43	Pk	31.9	-19.8	43.53	-	-	74	-30.47	0-360	200	V
2	* 4.96	33.67	Pk	33.9	-30.1	37.47	-	-	74	-36.53	0-360	201	H
3	* 9.439	28.16	Pk	36.5	-23.6	41.06	-	-	74	-32.94	0-360	100	H
5	* 4.96	36.64	Pk	33.9	-30.1	40.44	-	-	74	-33.56	0-360	100	V
6	* 10.939	27.83	Pk	37.8	-22.3	43.33	-	-	74	-30.67	0-360	200	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.214	37.71	PK2	31.4	-19.5	49.61	-	-	74	-24.39	287	211	H
* 2.214	24.83	VA1T	31.4	-19.5	36.73	54	-17.27	-	-	287	211	H
* 2.331	38.28	PK2	31.9	-19.8	50.38	-	-	74	-23.62	144	187	V
* 2.334	25.17	VA1T	31.9	-19.8	37.27	54	-16.73	-	-	144	187	V
* 4.961	41.18	PK2	33.9	-30.1	44.98	-	-	74	-29.02	51	165	H
* 4.96	30.3	VA1T	33.9	-30.1	34.1	54	-19.9	-	-	51	165	H
* 9.44	35.26	PK2	36.5	-23.6	48.16	-	-	74	-25.84	102	124	H
* 9.438	22.48	VA1T	36.5	-23.6	35.38	54	-18.62	-	-	102	124	H
* 4.96	43.26	PK2	33.9	-30.1	47.06	-	-	74	-26.94	288	106	V
* 4.96	35.34	VA1T	33.9	-30.1	39.14	54	-14.86	-	-	288	106	V
* 10.937	34.08	PK2	37.8	-22.3	49.58	-	-	74	-24.42	155	140	V
* 10.94	21.81	VA1T	37.8	-22.3	37.31	54	-16.69	-	-	155	140	V

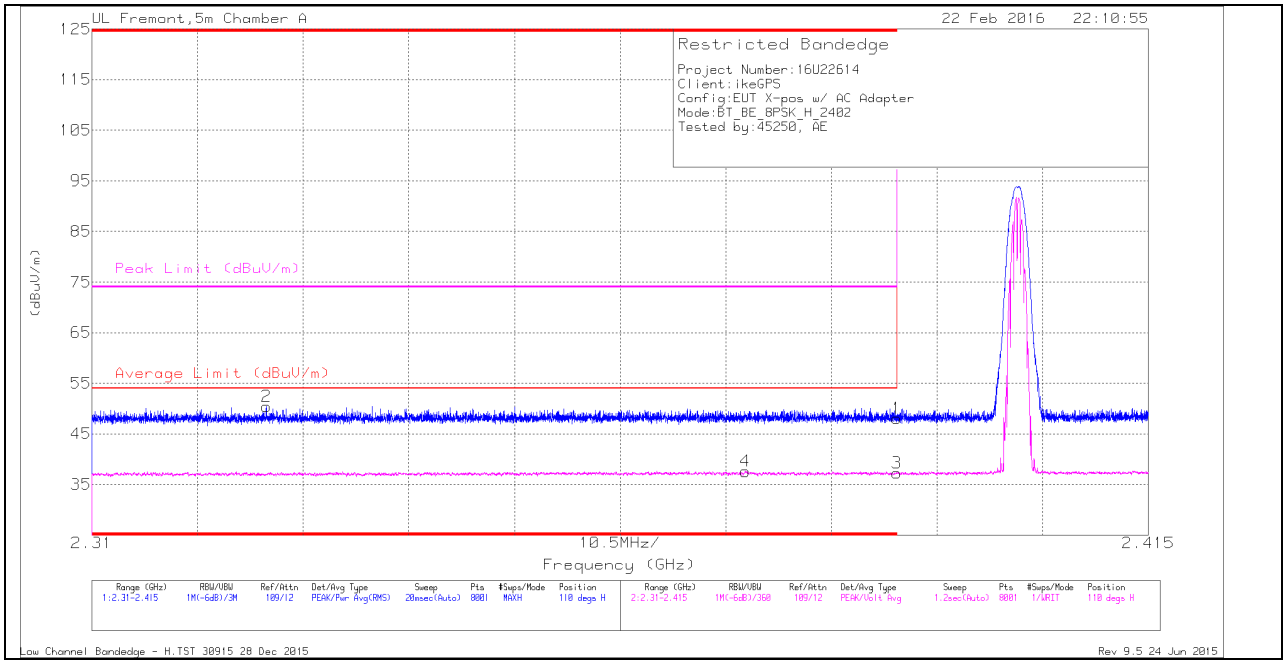
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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

9.2.2. ENHANCED DATA RATE 8PSK MODULATION
RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

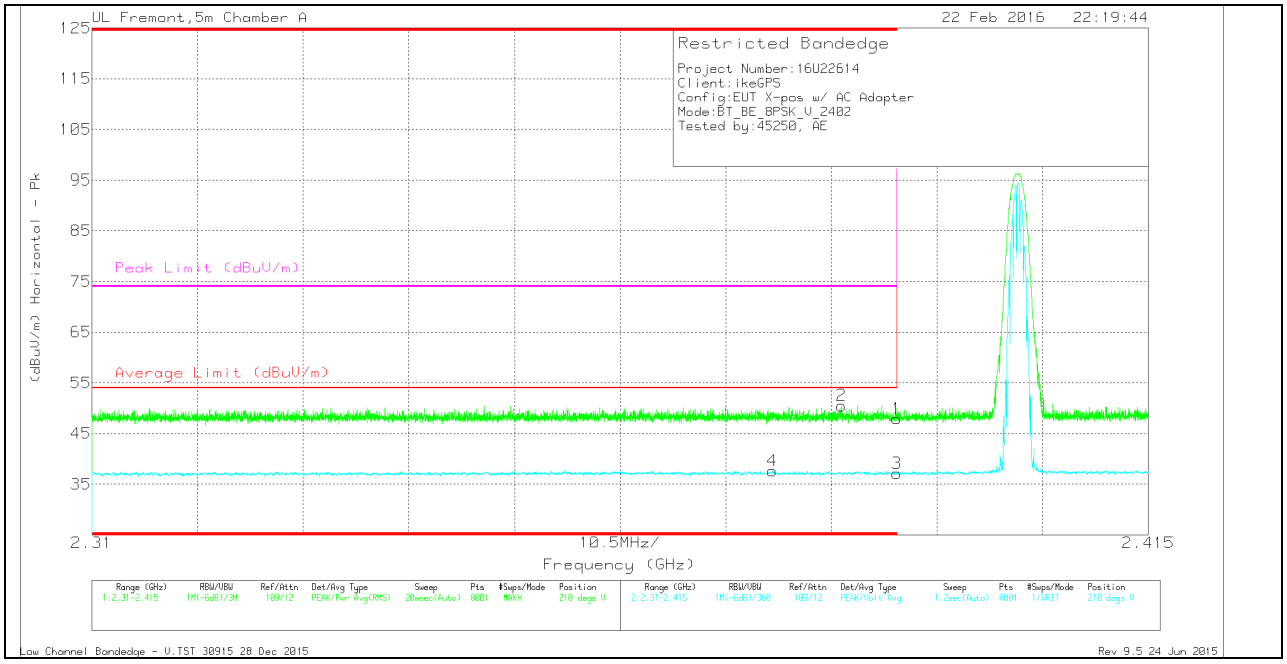
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	35.95	Pk	32	-19.9	48.05	-	-	74	-25.95	110	122	H
2	* 2.327	38.26	Pk	31.9	-19.7	50.46	-	-	74	-23.54	110	122	H
3	* 2.39	25.16	VA1T	32	-19.9	37.26	54	-16.74	-	-	110	122	H
4	* 2.375	25.47	VA1T	31.9	-19.8	37.57	54	-16.43	-	-	110	122	H

* - indicates frequency in CFR15.205/IC8.10 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 T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	35.86	Pk	32	-19.9	47.96	-	-	74	-26.04	210	138	V
2	* 2.385	38.48	Pk	31.9	-19.9	50.48	-	-	74	-23.52	210	138	V
3	* 2.39	24.99	VA1T	32	-19.9	37.09	54	-16.91	-	-	210	138	V
4	* 2.378	25.55	VA1T	31.9	-19.8	37.65	54	-16.35	-	-	210	138	V

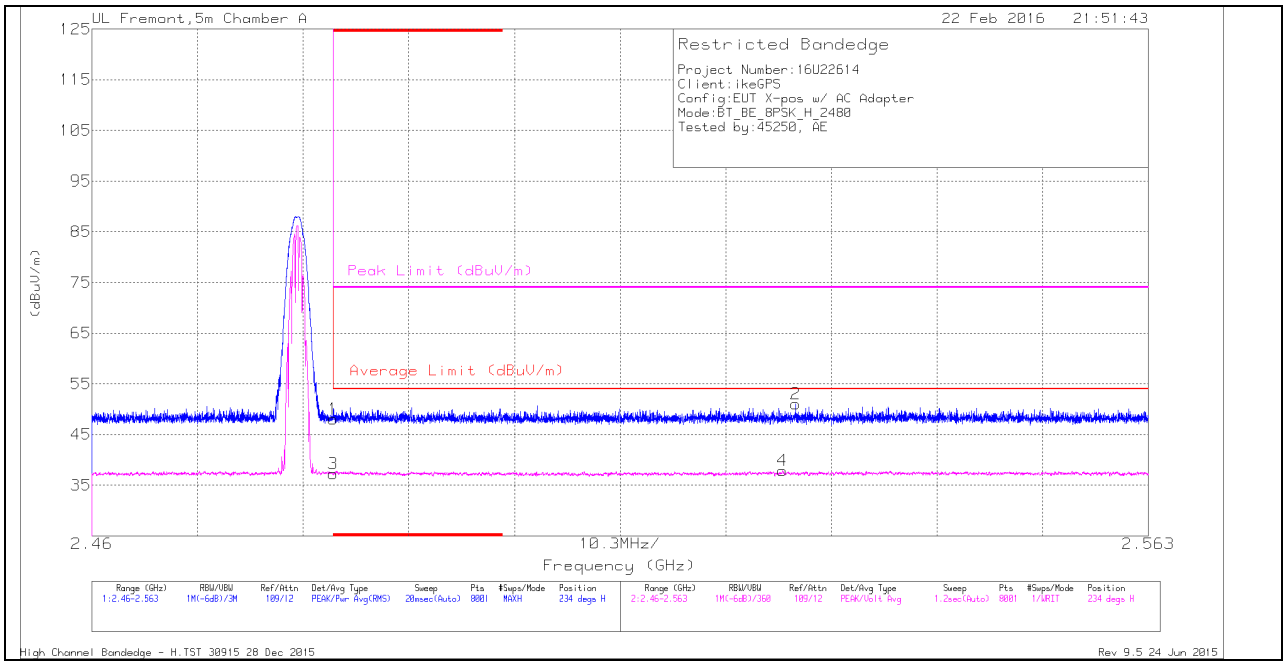
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

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

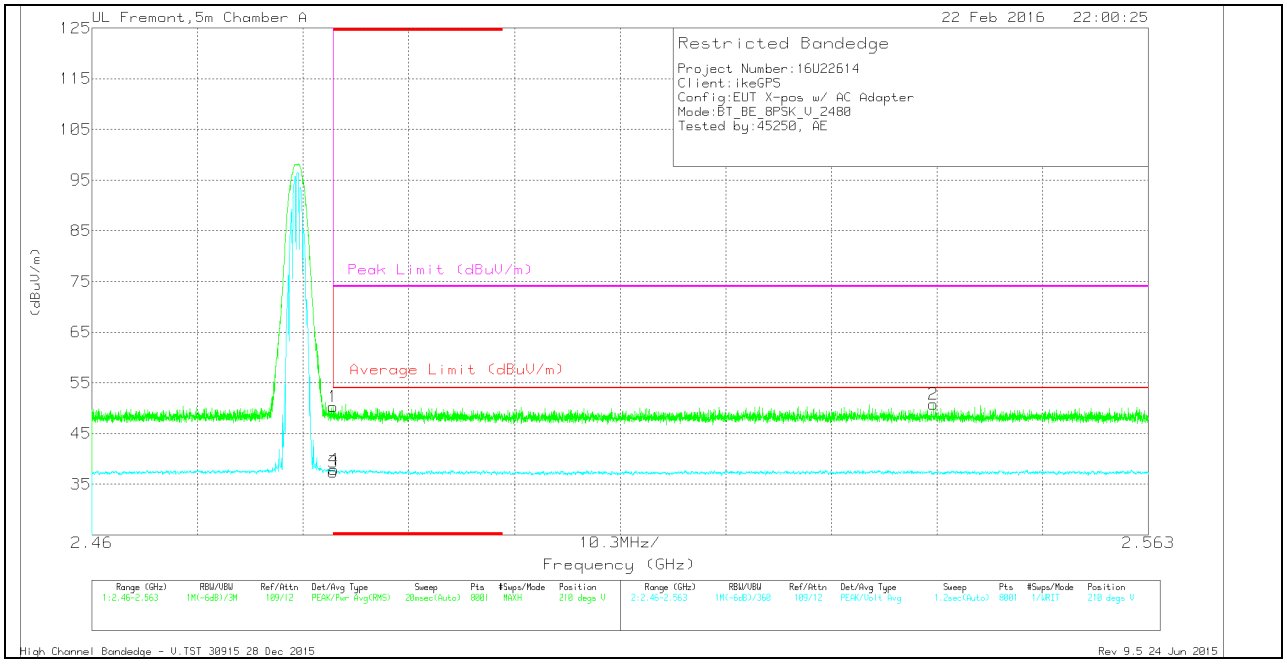
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	35.97	Pk	32.1	-20	48.07	-	-	74	-25.93	234	101	H
3	* 2.484	25.13	VA1T	32.1	-20	37.23	54	-16.77	-	-	234	101	H
4	2.527	25.85	VA1T	32.1	-20.1	37.85	54	-16.15	-	-	234	101	H
2	2.529	39	Pk	32.1	-20.1	51	-	-	74	-23	234	101	H

* - indicates frequency in CFR15.205/IC8.10 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 T136 (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	38.24	Pk	32.1	-20	50.34	-	-	74	-23.66	210	134	V
3	* 2.484	25.31	VA1T	32.1	-20	37.41	54	-16.59	-	-	210	134	V
4	* 2.484	25.8	VA1T	32.1	-20	37.9	54	-16.1	-	-	210	134	V
2	2.542	38.72	Pk	32.2	-20.1	50.82	-	-	74	-23.18	210	134	V

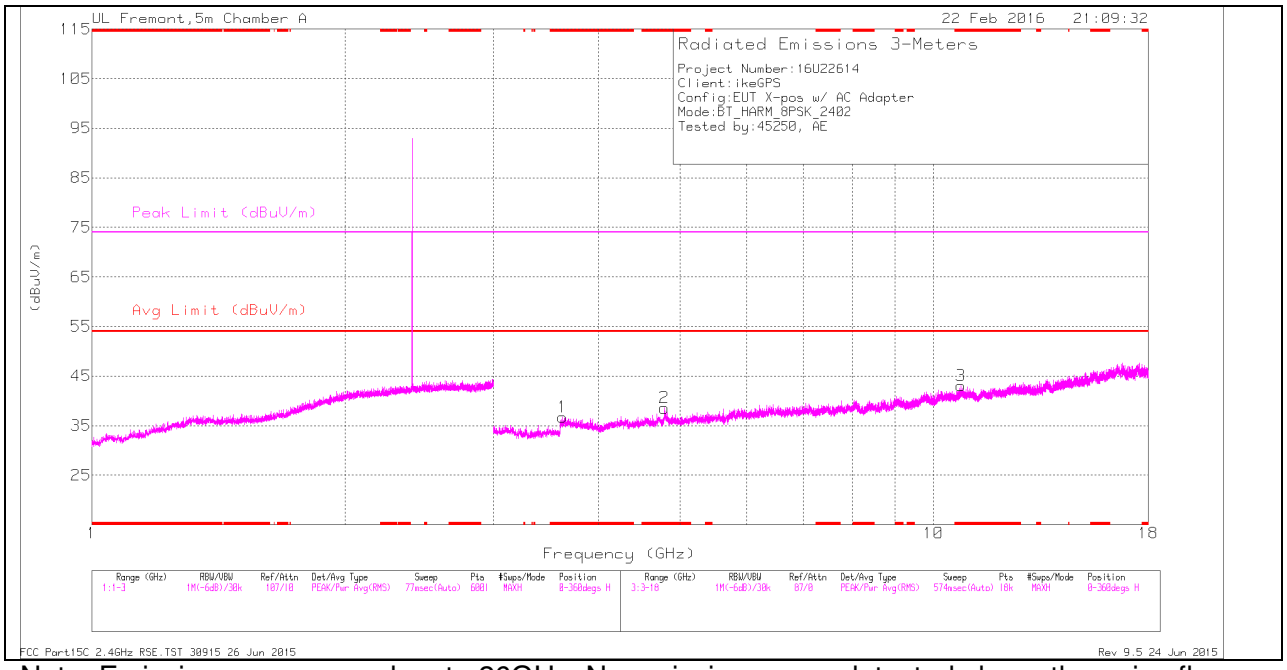
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

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

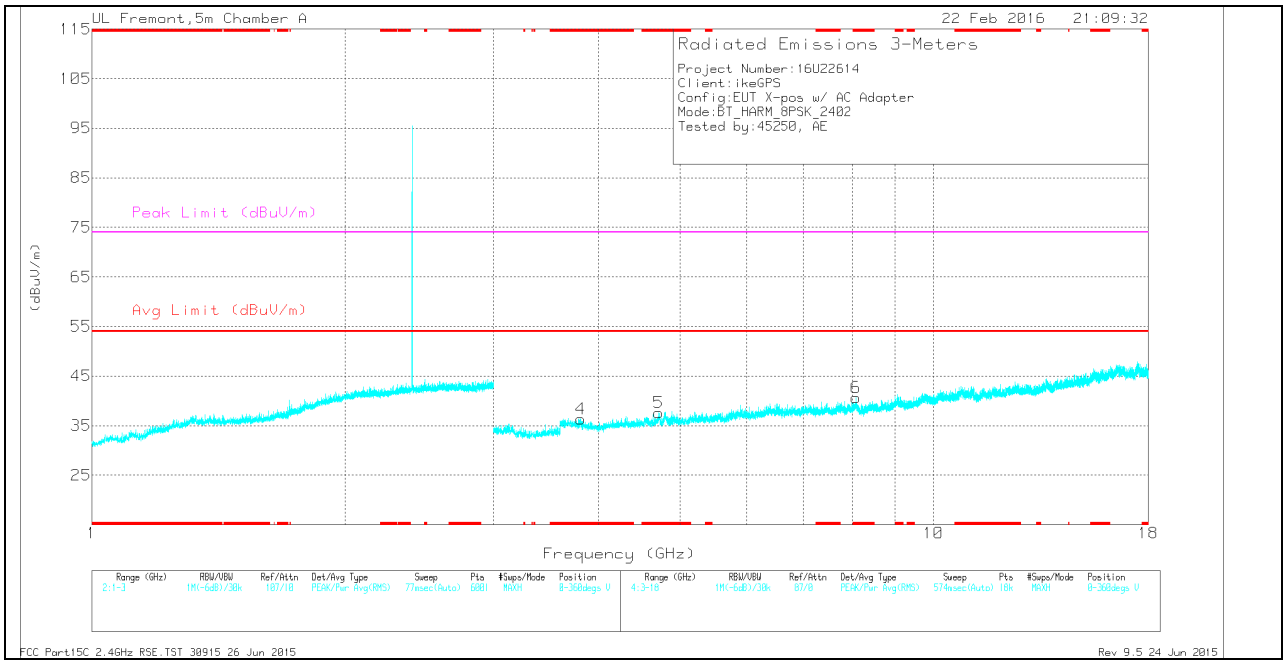
HARMONICS AND SPURIOUS EMISSIONS

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 T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.626	35.68	Pk	33.1	-32.1	36.68	-	-	74	-37.32	0-360	201	H
2	* 4.791	34.46	Pk	34	-29.9	38.56	-	-	74	-35.44	0-360	201	H
3	* 10.786	26.95	Pk	37.8	-21.7	43.05	-	-	74	-30.95	0-360	100	H
4	* 3.81	34.75	Pk	33.4	-31.8	36.35	-	-	74	-37.65	0-360	100	V
5	* 4.718	34.26	Pk	34.1	-30.7	37.66	-	-	74	-36.34	0-360	100	V
6	* 8.091	28.95	Pk	35.7	-24	40.65	-	-	74	-33.35	0-360	100	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

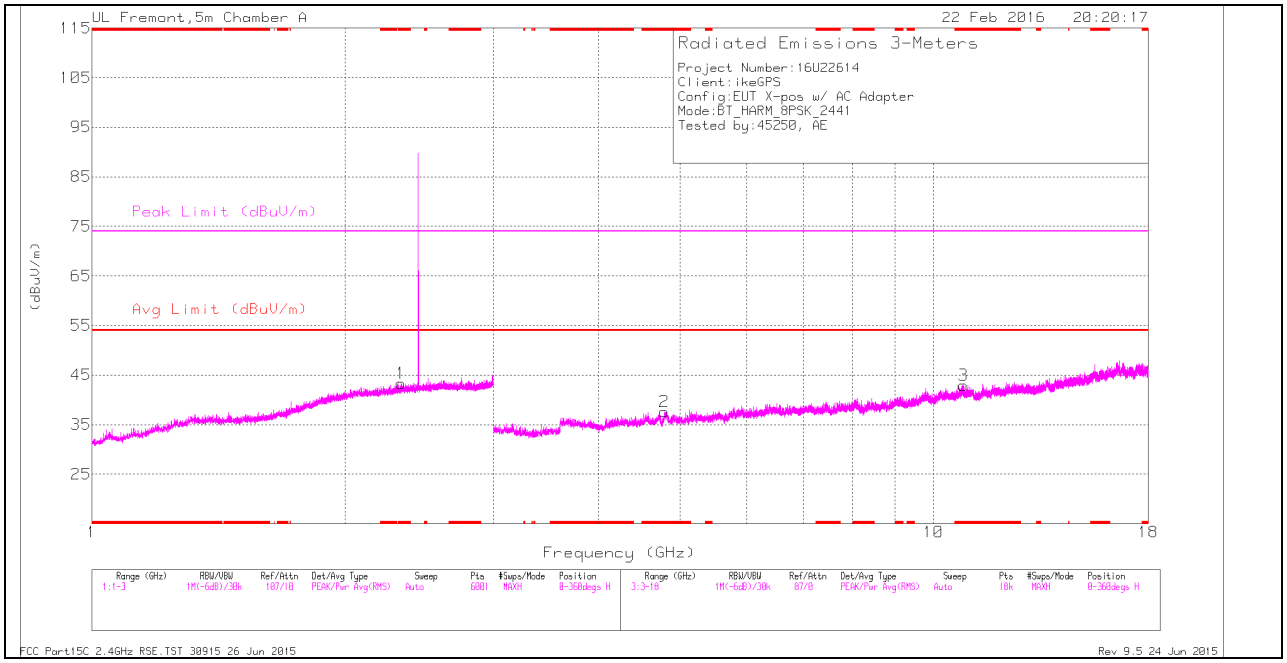
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.624	42.51	PK2	33.1	-32.1	43.51	-	-	74	-30.49	282	187	H
* 3.624	29.8	VA1T	33.1	-32.1	30.8	54	-23.2	-	-	282	187	H
* 4.791	40.83	PK2	34	-29.9	44.93	-	-	74	-29.07	189	233	H
* 4.789	28.64	VA1T	34	-29.9	32.74	54	-21.26	-	-	189	233	H
* 10.785	34.32	PK2	37.8	-21.7	50.42	-	-	74	-23.58	123	196	H
* 10.785	21.66	VA1T	37.8	-21.7	37.76	54	-16.24	-	-	123	196	H
* 3.809	42.49	PK2	33.4	-31.8	44.09	-	-	74	-29.91	177	139	V
* 3.811	29.63	VA1T	33.4	-31.8	31.23	54	-22.77	-	-	177	139	V
* 4.718	42.44	PK2	34.1	-30.7	45.84	-	-	74	-28.16	81	114	V
* 4.72	29.47	VA1T	34.1	-30.7	32.87	54	-21.13	-	-	81	114	V
* 8.091	35.96	PK2	35.7	-24	47.66	-	-	74	-26.34	21	154	V
* 8.09	23.72	VA1T	35.7	-24	35.42	54	-18.58	-	-	21	154	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

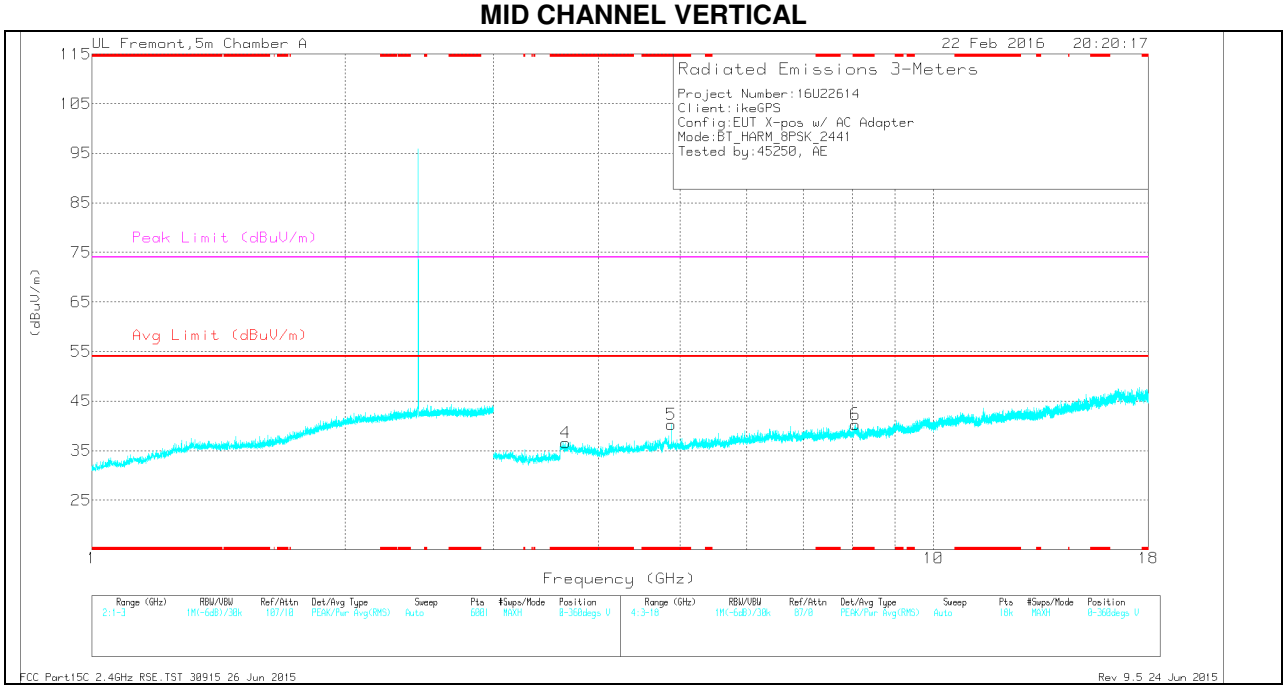
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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 T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.329	31.23	Pk	31.9	-19.8	43.33	-	-	74	-30.67	0-360	201	H
2	* 4.791	33.56	Pk	34	-29.9	37.66	-	-	74	-36.34	0-360	201	H
3	* 10.852	27.04	Pk	37.8	-21.9	42.94	-	-	74	-31.06	0-360	100	H
4	* 3.653	35.31	Pk	33.2	-31.9	36.61	-	-	74	-37.39	0-360	100	V
5	* 4.882	35.69	Pk	33.9	-29.3	40.29	-	-	74	-33.71	0-360	100	V
6	* 8.081	28.53	Pk	35.7	-23.9	40.33	-	-	74	-33.67	0-360	200	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

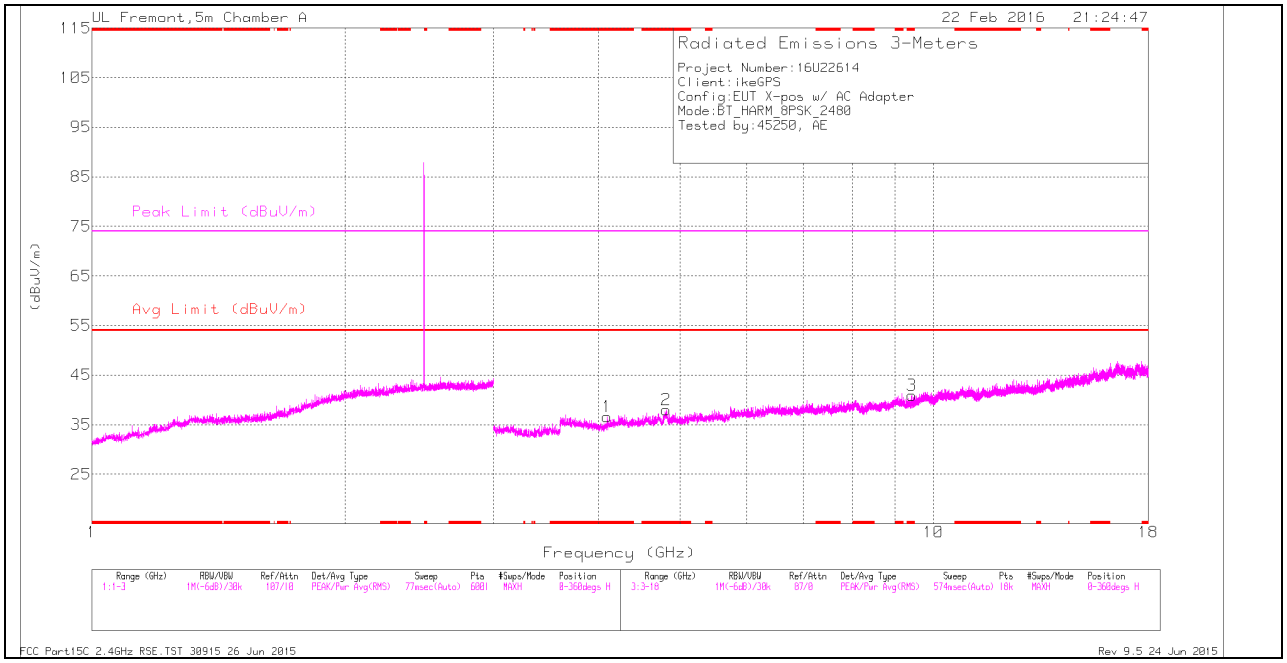
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.33	37.75	PK2	31.9	-19.8	49.85	-	-	74	-24.15	57	172	H
* 2.328	25.11	VA1T	31.9	-19.7	37.31	54	-16.69	-	-	57	172	H
* 4.791	40.84	PK2	34	-29.9	44.94	-	-	74	-29.06	125	189	H
* 4.789	28.72	VA1T	34	-29.9	32.82	54	-21.18	-	-	125	189	H
* 10.851	33.71	PK2	37.8	-21.8	49.71	-	-	74	-24.29	180	142	H
* 10.854	21.67	VA1T	37.8	-21.9	37.57	54	-16.43	-	-	180	142	H
* 3.654	42.07	PK2	33.2	-31.9	43.37	-	-	74	-30.63	123	114	V
* 3.653	29.81	VA1T	33.2	-31.9	31.11	54	-22.89	-	-	123	114	V
* 4.882	41.61	PK2	33.9	-29.3	46.21	-	-	74	-27.79	291	102	V
* 4.882	31.81	VA1T	33.9	-29.3	36.41	54	-17.59	-	-	291	102	V
* 8.081	36.24	PK2	35.7	-23.9	48.04	-	-	74	-25.96	235	142	V
* 8.082	23.56	VA1T	35.7	-23.9	35.36	54	-18.64	-	-	235	142	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

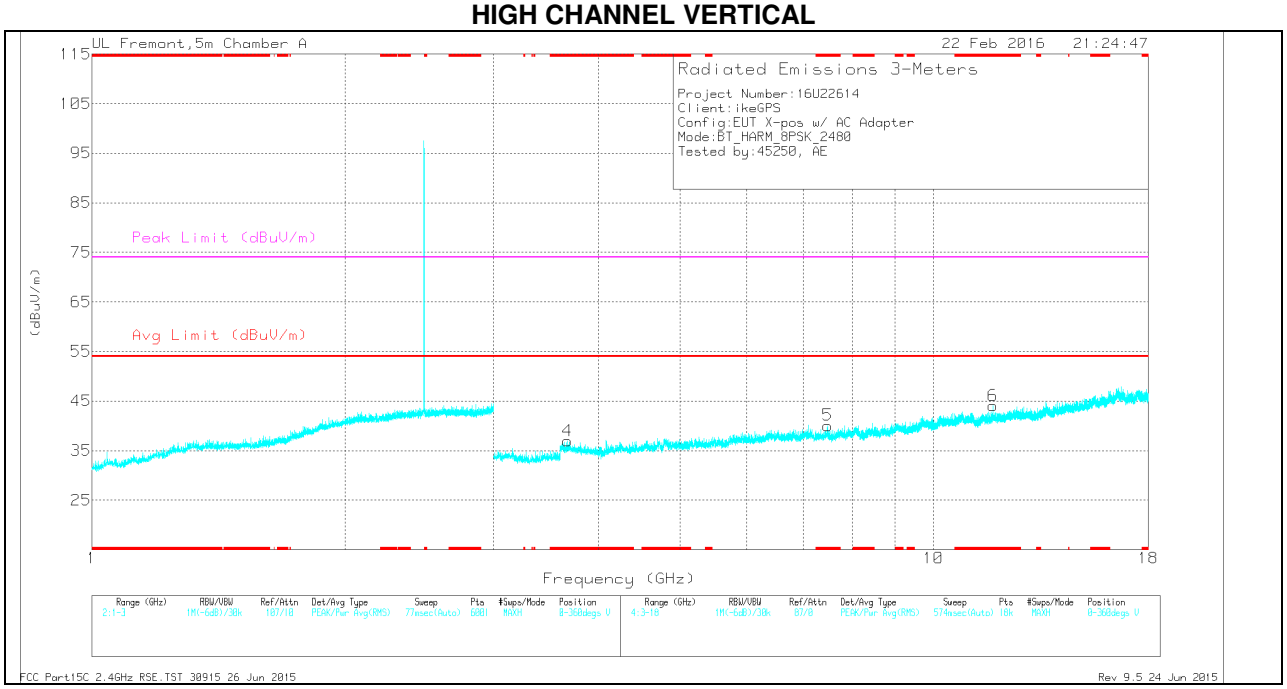
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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 T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.095	34.71	Pk	33.3	-31.4	36.61	-	-	74	-37.39	0-360	201	H
2	* 4.817	33.74	Pk	33.9	-29.7	37.94	-	-	74	-36.06	0-360	201	H
3	* 9.42	28.11	Pk	36.4	-23.6	40.91	-	-	74	-33.09	0-360	100	H
4	* 3.675	35.41	Pk	33.2	-31.6	37.01	-	-	74	-36.99	0-360	200	V
5	* 7.488	29.48	Pk	35.5	-24.9	40.08	-	-	74	-33.92	0-360	100	V
6	* 11.762	27.74	Pk	38.3	-22	44.04	-	-	74	-29.96	0-360	100	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.095	41.64	PK2	33.3	-31.4	43.54	-	-	74	-30.46	30	165	H
* 4.093	29.12	VA1T	33.3	-31.4	31.02	54	-22.98	-	-	30	165	H
* 4.815	41.18	PK2	33.9	-29.7	45.38	-	-	74	-28.62	180	240	H
* 4.816	28.91	VA1T	33.9	-29.7	33.11	54	-20.89	-	-	180	240	H
* 9.42	34.9	PK2	36.4	-23.6	47.7	-	-	74	-26.3	163	148	H
* 9.418	22.65	VA1T	36.4	-23.6	35.45	54	-18.55	-	-	163	148	H
* 3.676	42.85	PK2	33.2	-31.6	44.45	-	-	74	-29.55	217	166	V
* 3.676	29.89	VA1T	33.2	-31.6	31.49	54	-22.51	-	-	217	166	V
* 7.487	36.16	PK2	35.5	-24.9	46.76	-	-	74	-27.24	290	122	V
* 7.487	23.9	VA1T	35.5	-24.9	34.5	54	-19.5	-	-	290	122	V
* 11.763	34.1	PK2	38.3	-22	50.4	-	-	74	-23.6	360	104	V
* 11.762	21.73	VA1T	38.3	-22	38.03	54	-15.97	-	-	360	104	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

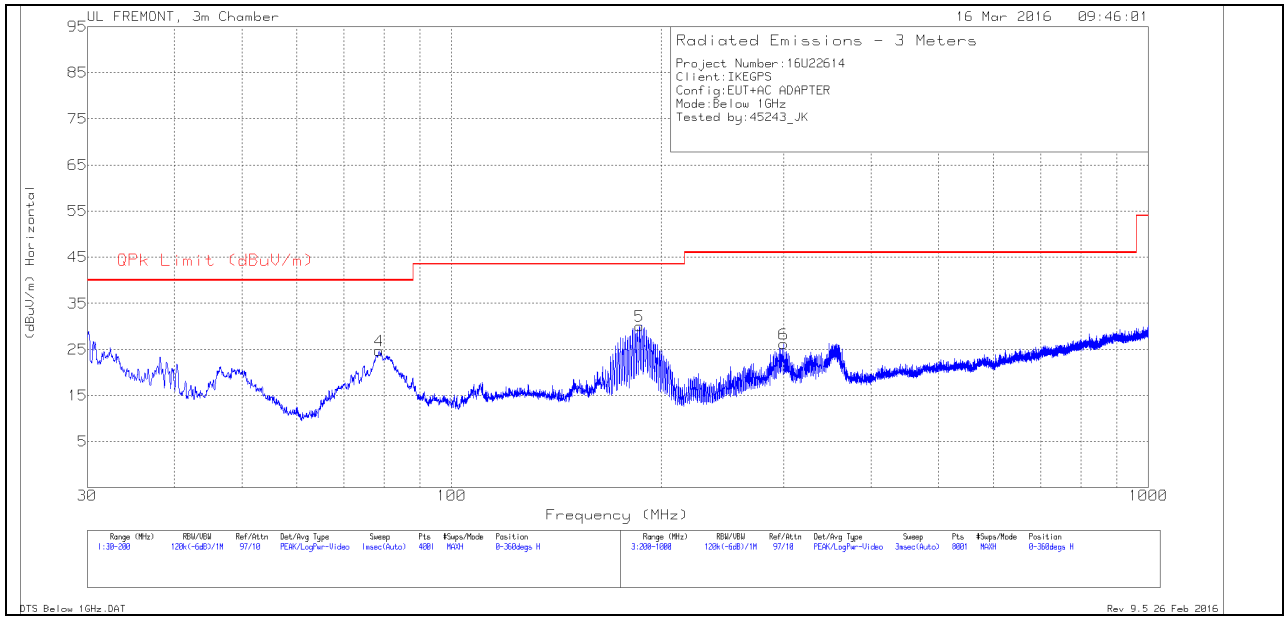
PK2 - KDB558074 Method: Maximum Peak

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

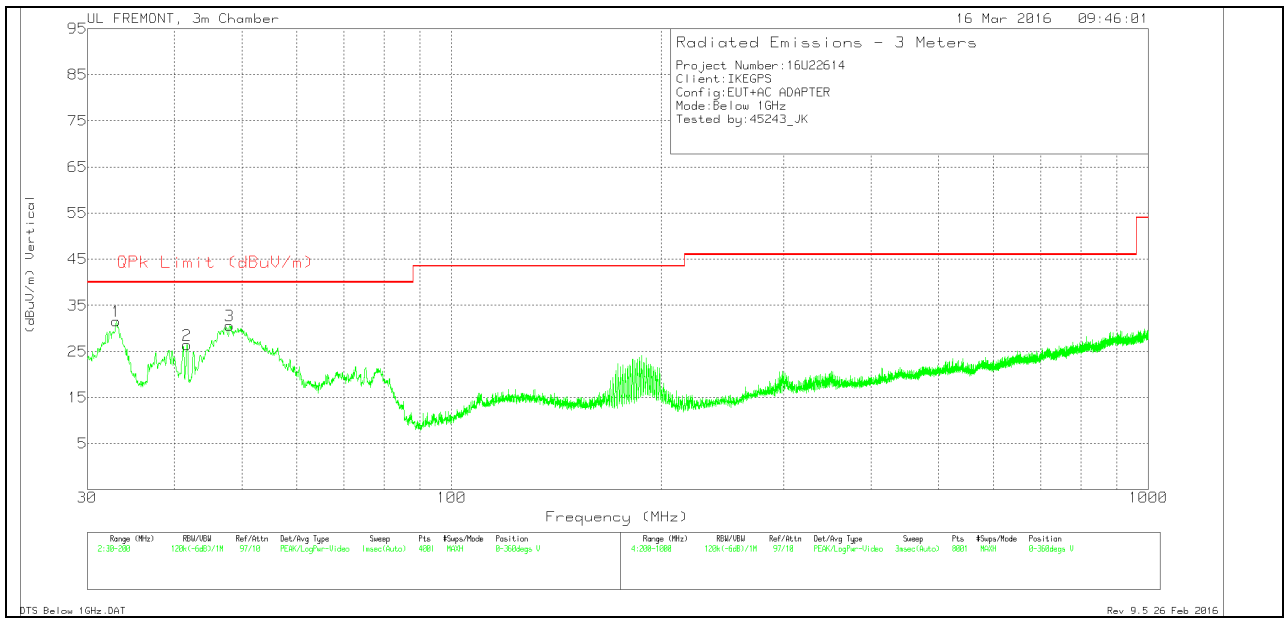
9.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



BELOW 1 GHz TABLE

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	33.0175	39.14	Pk	19.5	-27.1	31.54	40	-8.46	0-360	100	V
2	41.73	40.52	Pk	13	-27.1	26.42	40	-13.58	0-360	100	V
3	48.02	48.5	Pk	9	-26.9	30.6	40	-9.4	0-360	100	V
4	78.705	43.23	Pk	8.1	-26.6	24.73	40	-15.27	0-360	400	H
5	186.06	44.33	Pk	11	-25.3	30.03	43.52	-13.49	0-360	100	H
6	299.7	37.5	Pk	13.1	-24.4	26.2	46.02	-19.82	0-360	100	H

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

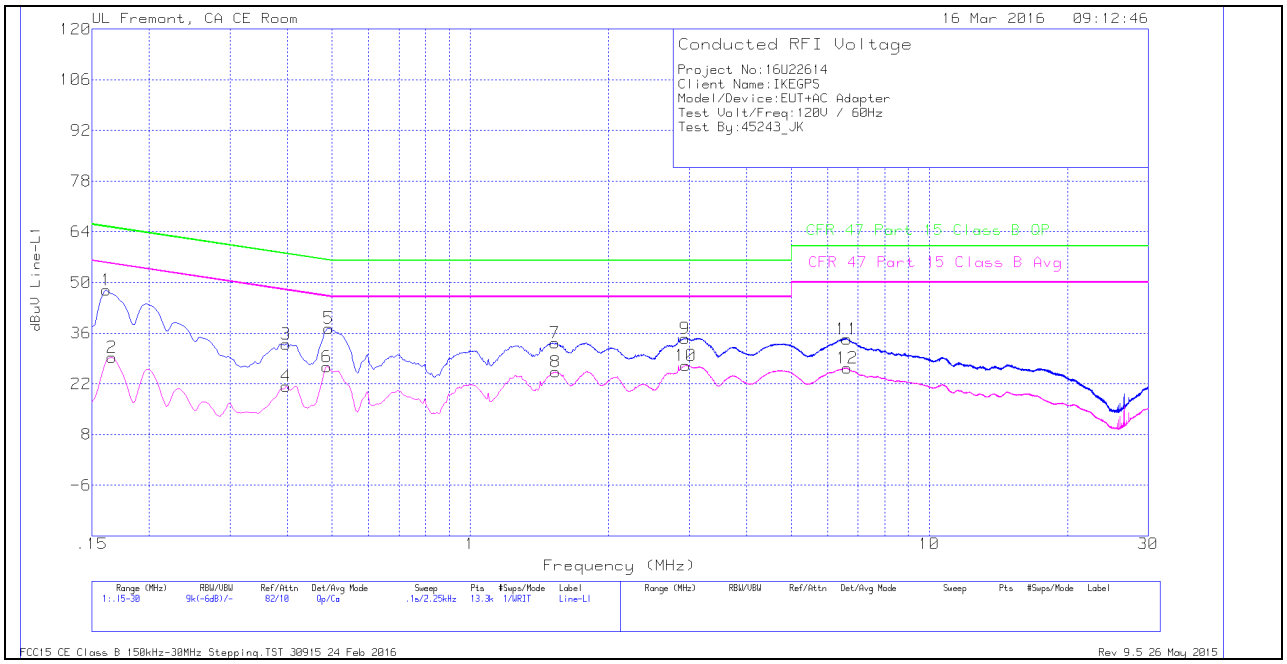
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



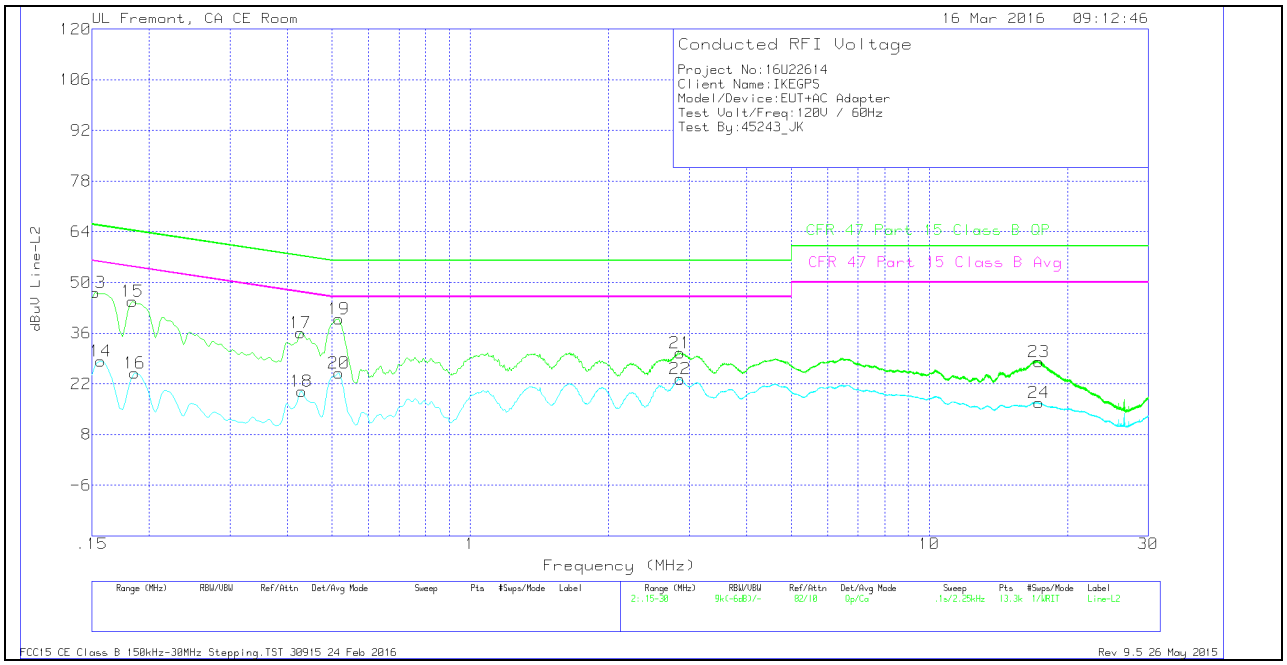
LINE 1 RESULTS

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 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	.16125	36.54	Qp	1.3	0	10.1	47.94	65.4	-17.46	-	-
2	.16575	17.98	Ca	1.2	0	10.1	29.28	-	-	55.17	-25.89
3	.3975	22.46	Qp	.4	0	10.1	32.96	57.91	-24.95	-	-
4	.3975	10.88	Ca	.4	0	10.1	21.38	-	-	47.91	-26.53
5	.492	26.89	Qp	.4	0	10.1	37.39	56.13	-18.74	-	-
6	.4875	16.28	Ca	.4	0	10.1	26.78	-	-	46.21	-19.43
7	1.5315	22.88	Qp	.2	.1	10.1	33.28	56	-22.72	-	-
8	1.536	14.84	Ca	.2	.1	10.1	25.24	-	-	46	-20.76
9	2.9355	24.18	Qp	.2	.1	10.1	34.58	56	-21.42	-	-
10	2.94563	16.71	Ca	.2	.1	10.1	27.11	-	-	46	-18.89
11	6.61538	23.87	Qp	.2	.1	10.2	34.37	60	-25.63	-	-
12	6.6165	15.82	Ca	.2	.1	10.2	26.32	-	-	50	-23.68

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 PLOT



LINE 2 RESULTS

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 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)
13	.15225	35.69	Qp	1.5	0	10.1	47.29	65.88	-18.59	-	-
14	.15675	16.76	Ca	1.4	0	10.1	28.26	-	-	55.63	-27.37
15	.18375	33.63	Qp	1.1	0	10.1	44.83	64.31	-19.48	-	-
16	.186	13.71	Ca	1.1	0	10.1	24.91	-	-	54.21	-29.3
17	.42675	25.59	Qp	.4	0	10.1	36.09	57.32	-21.23	-	-
18	.429	9.35	Ca	.4	0	10.1	19.85	-	-	47.27	-27.42
19	.51675	29.36	Qp	.4	0	10.1	39.86	56	-16.14	-	-
20	.51675	14.48	Ca	.4	0	10.1	24.98	-	-	46	-21.02
21	2.86575	20.12	Qp	.2	.1	10.1	30.52	56	-25.48	-	-
22	2.868	12.92	Ca	.2	.1	10.1	23.32	-	-	46	-22.68
23	17.32875	17.35	Qp	.3	.2	10.3	28.15	60	-31.85	-	-
24	17.331	5.94	Ca	.3	.2	10.3	16.74	-	-	50	-33.26

Qp - Quasi-Peak detector

Ca - CISPR average detection