

7.7. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

7.7.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

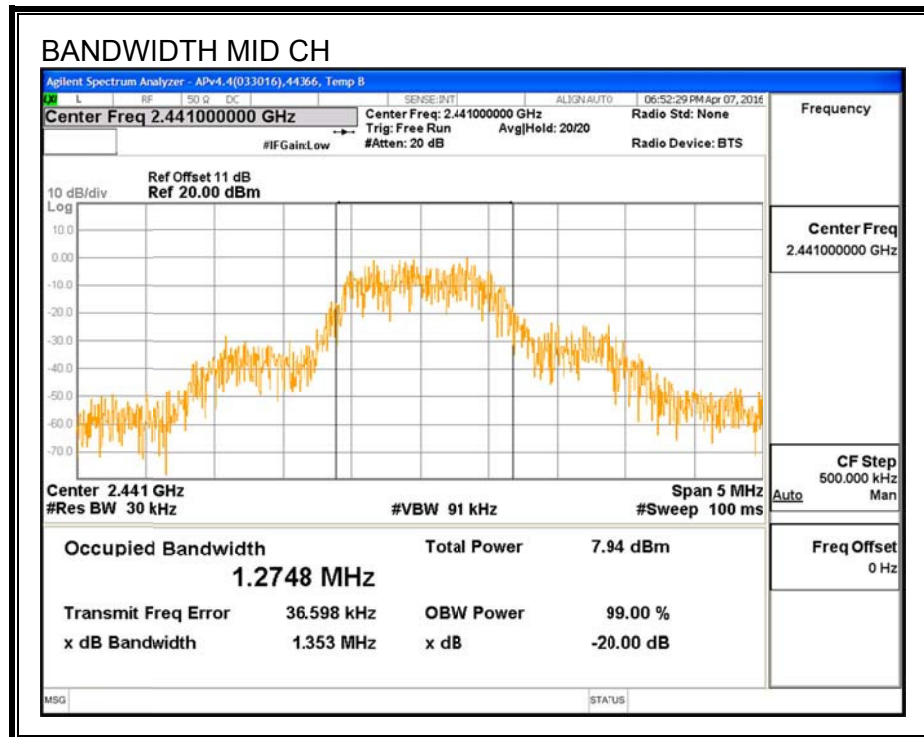
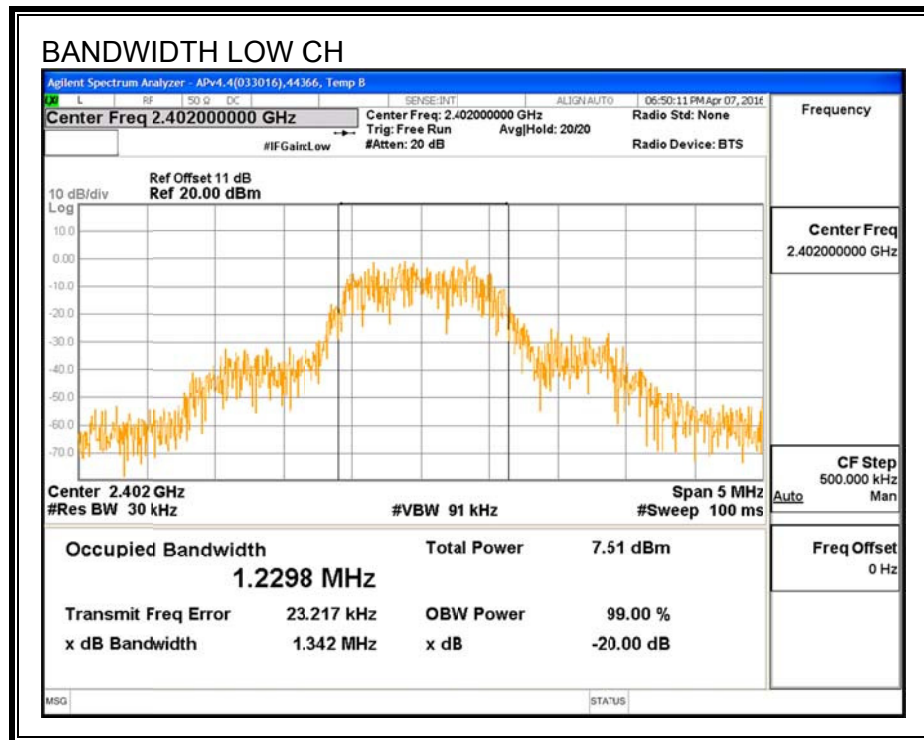
TEST PROCEDURE

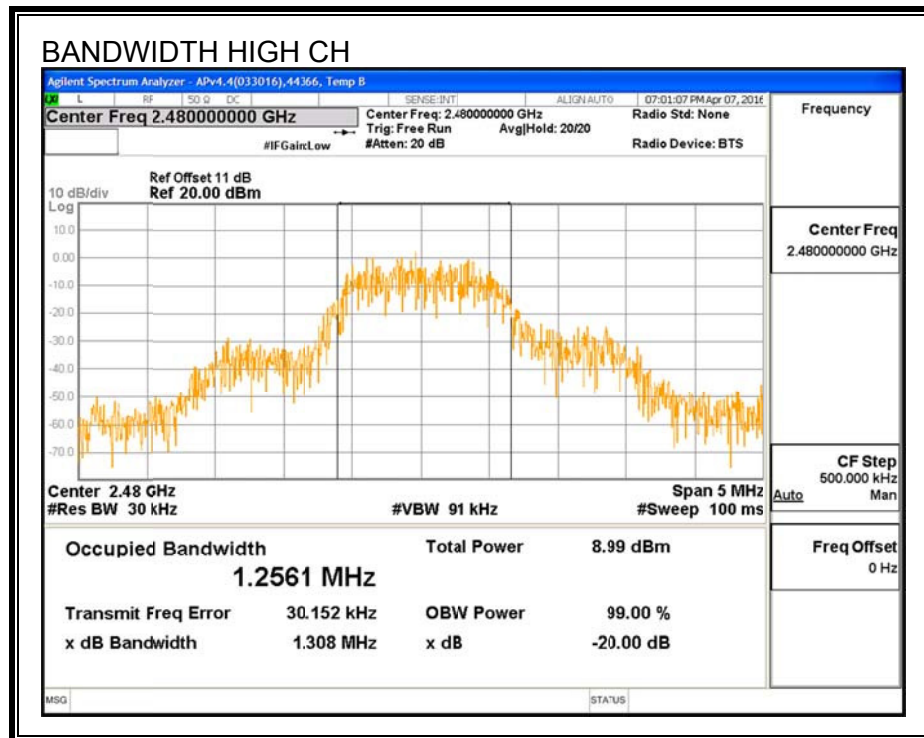
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.342	1.2298
Middle	2441	1.353	1.2748
High	2480	1.308	1.2561

20 dB AND 99% BANDWIDTH





7.7.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-247 (5.1) (2)

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

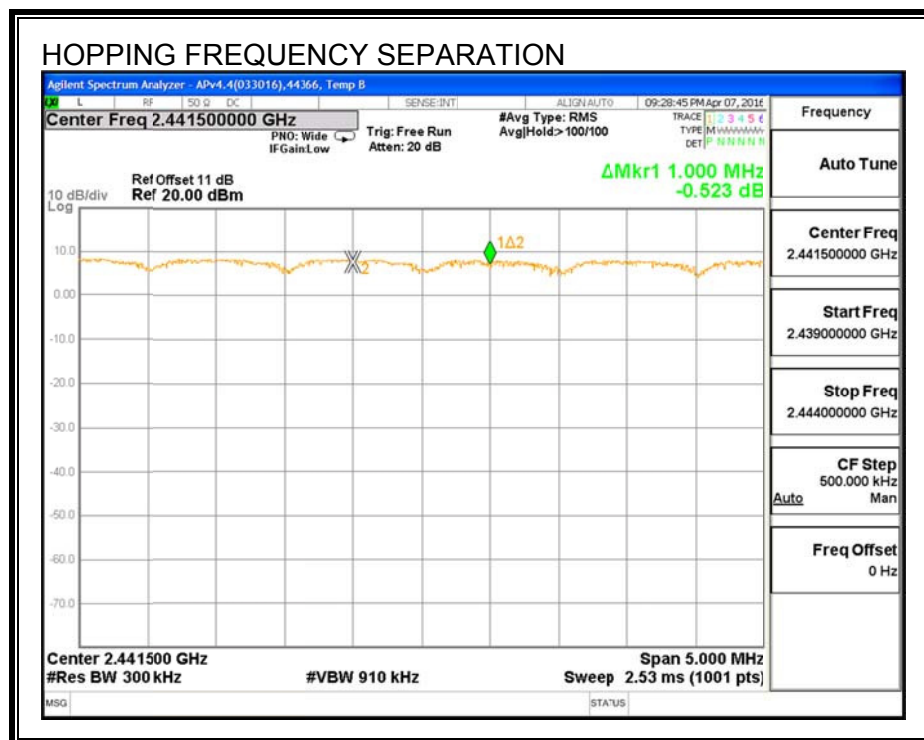
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

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

RESULTS

HOPPING FREQUENCY SEPARATION



7.7.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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

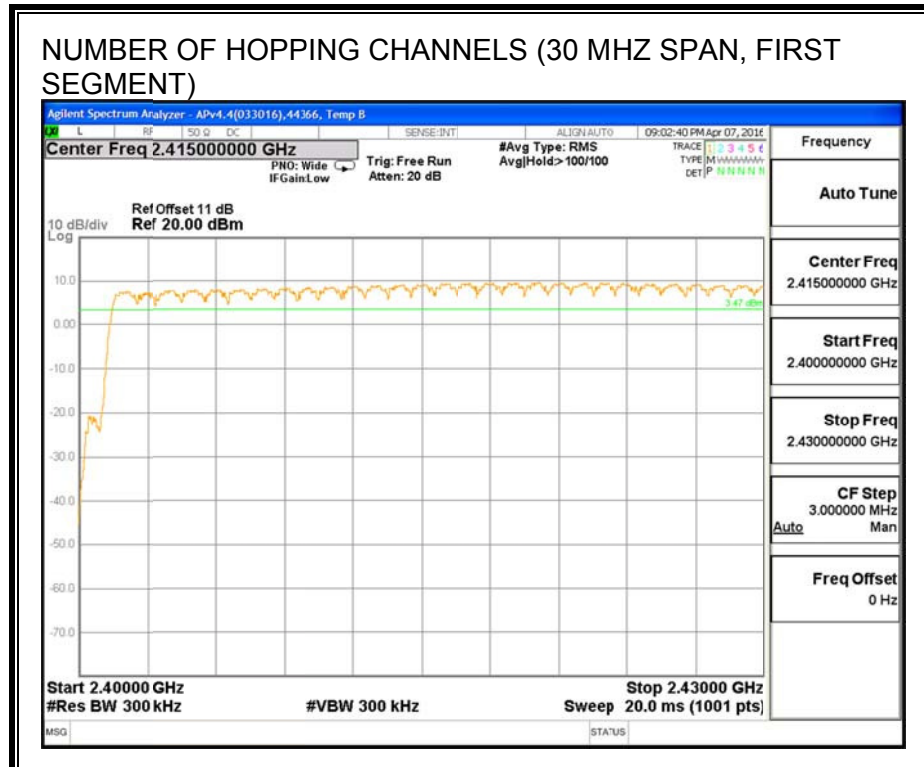
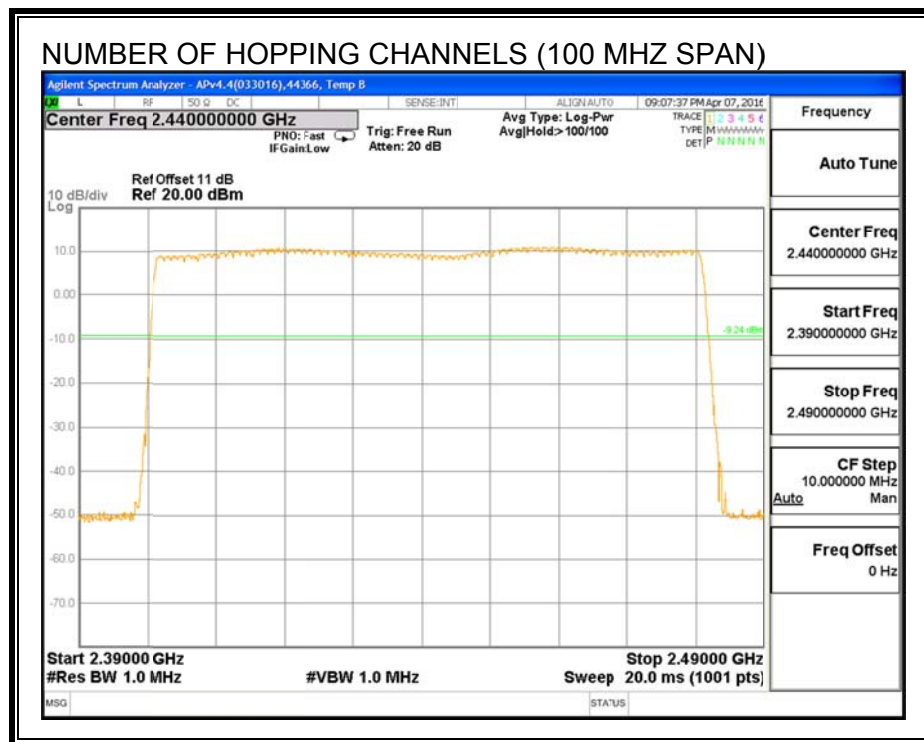
TEST PROCEDURE

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

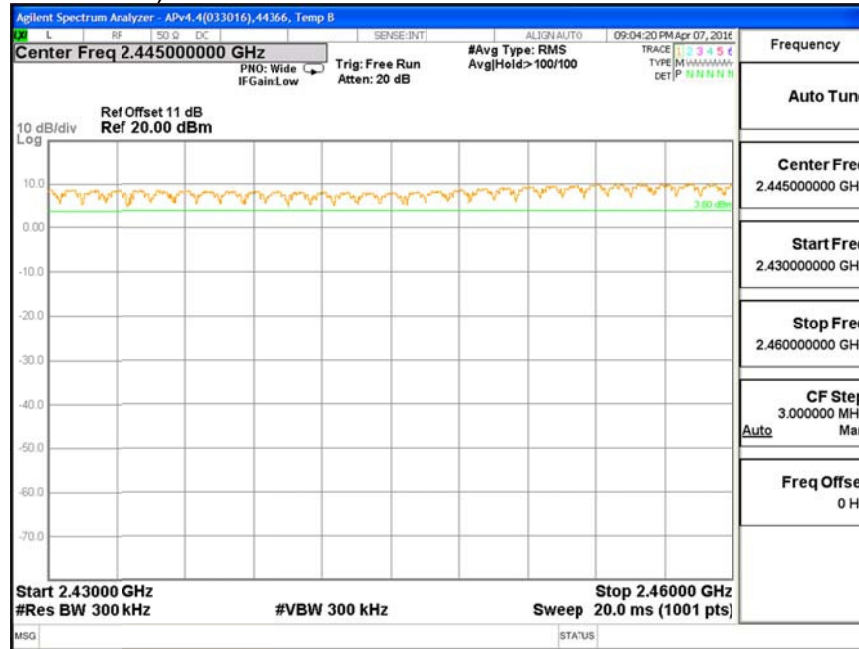
RESULTS

Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS



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



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



7.7.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

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

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

RESULTS

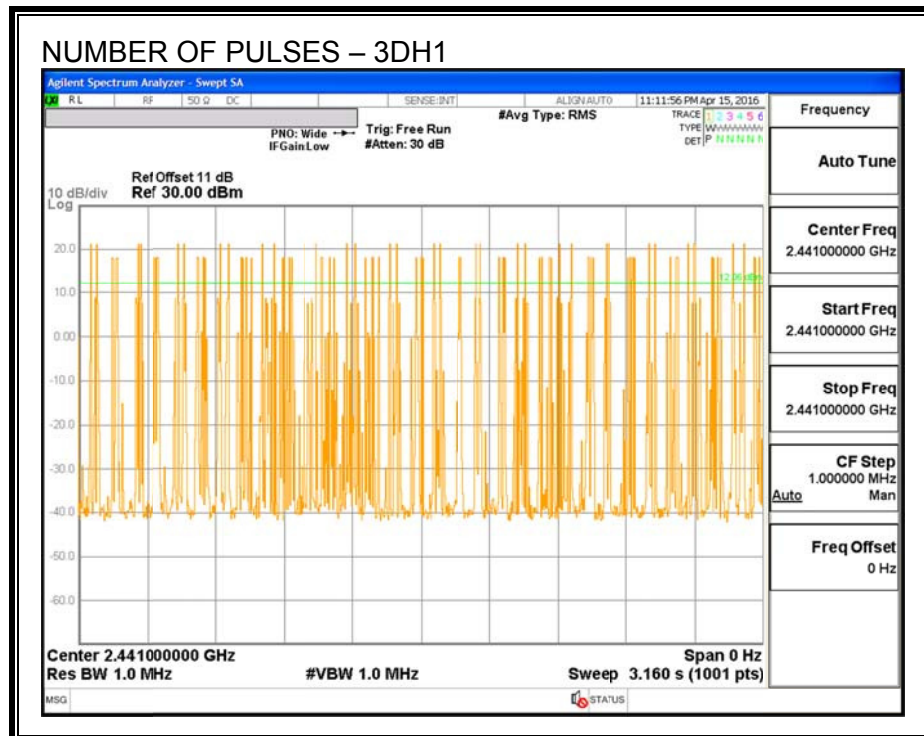
8PSK (EDR) Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
3DH1	0.401	32	0.128	0.4	-0.272
3DH3	1.652	17	0.281	0.4	-0.119
3DH5	2.904	11	0.319	0.4	-0.081

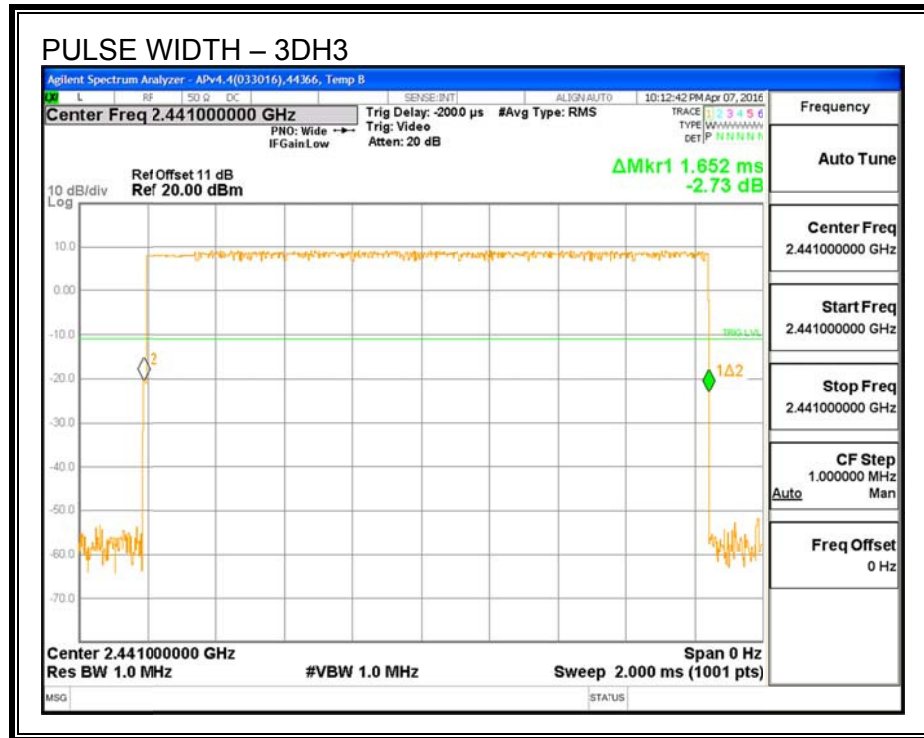
PULSE WIDTH - 3DH1



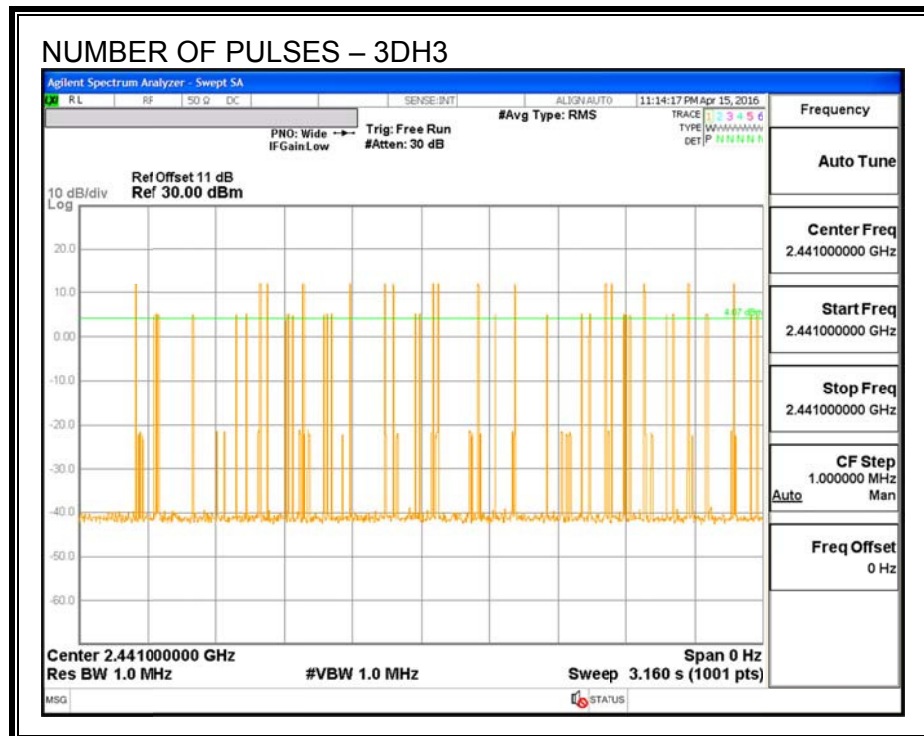
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH1



PULSE WIDTH – 3DH3



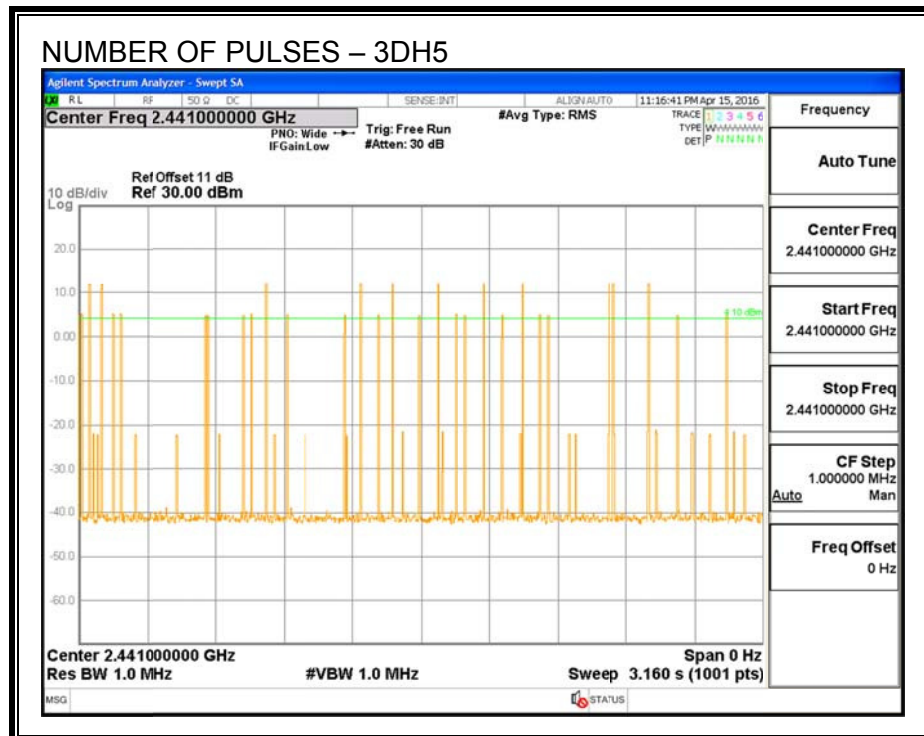
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH3



PULSE WIDTH – 3DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH5



7.7.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-247 (5.4) (2)

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

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

TEST PROCEDURE

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

RESULTS

ID:	44388	Date:	6/27/16
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Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.28	21	-11.69
Middle	2441	9.58	21	-11.39
High	2480	9.37	21	-11.60

7.7.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

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

ID:	44388	Date:	6/27/16
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Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	7.22
Middle	2441	7.41
High	2480	7.38

7.7.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

Limit = -20 dBc

TEST PROCEDURE

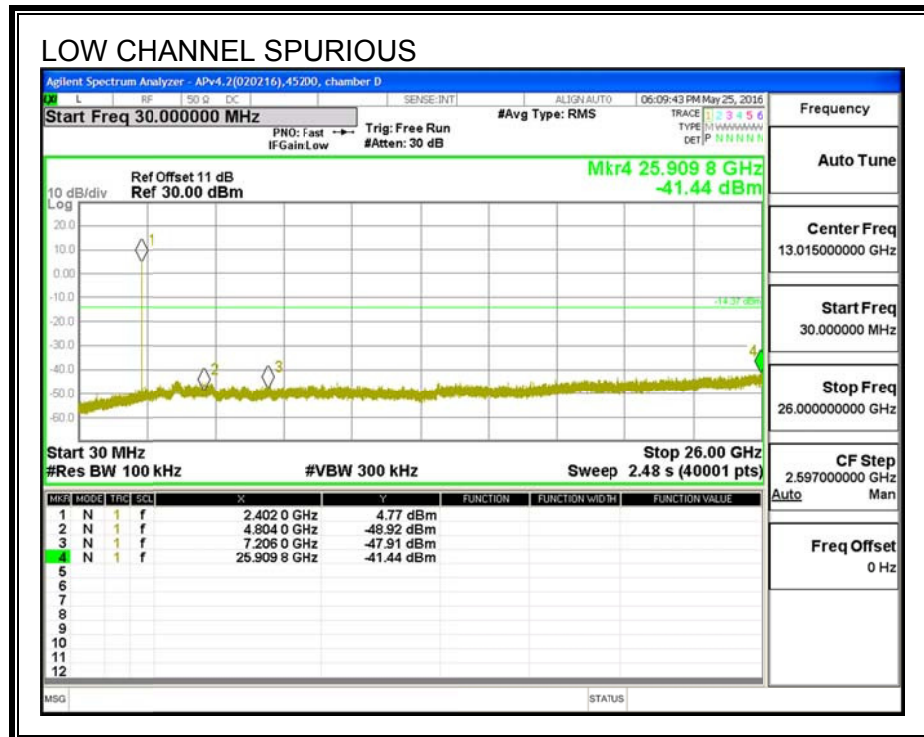
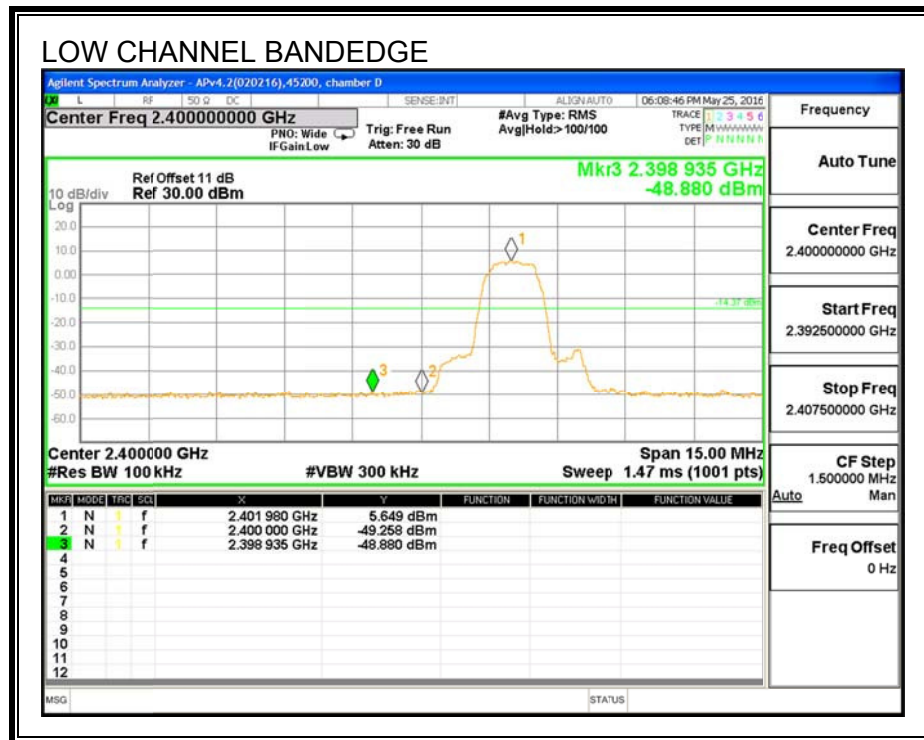
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

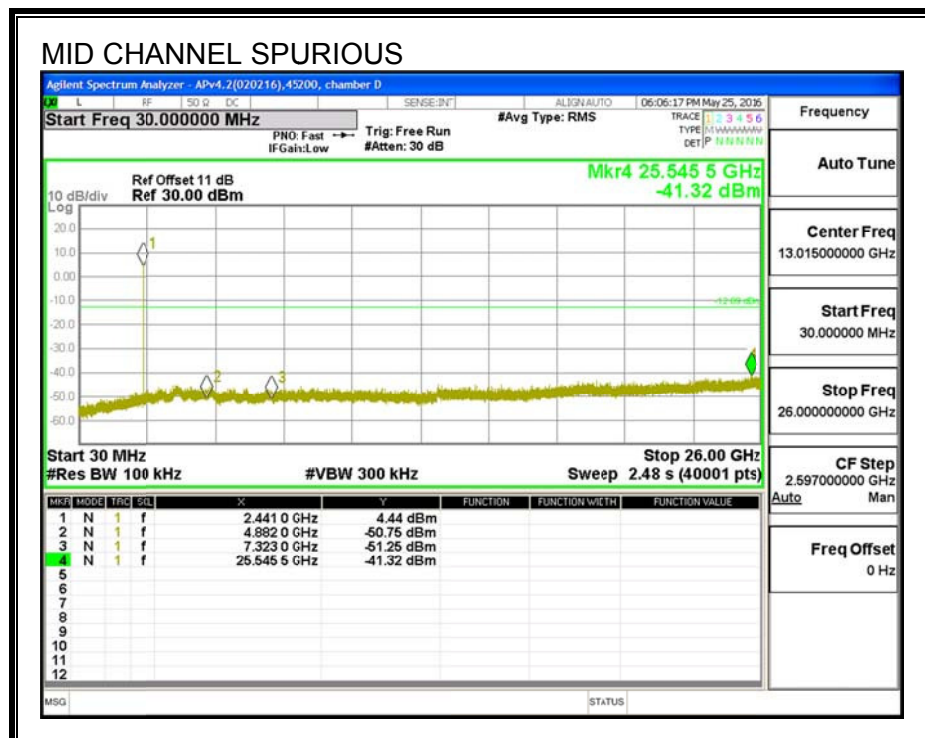
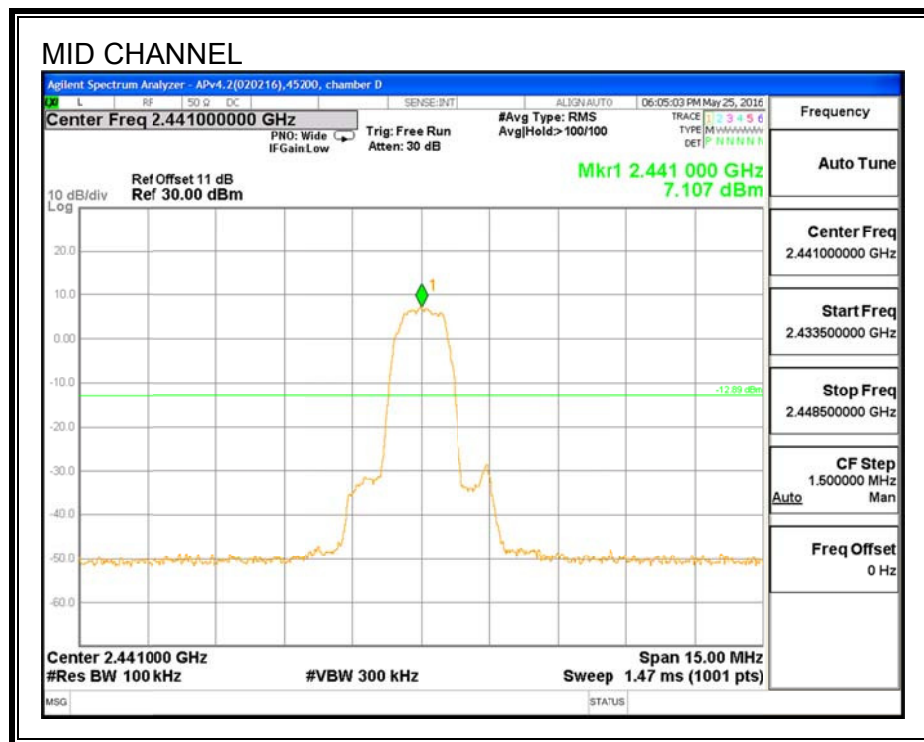
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

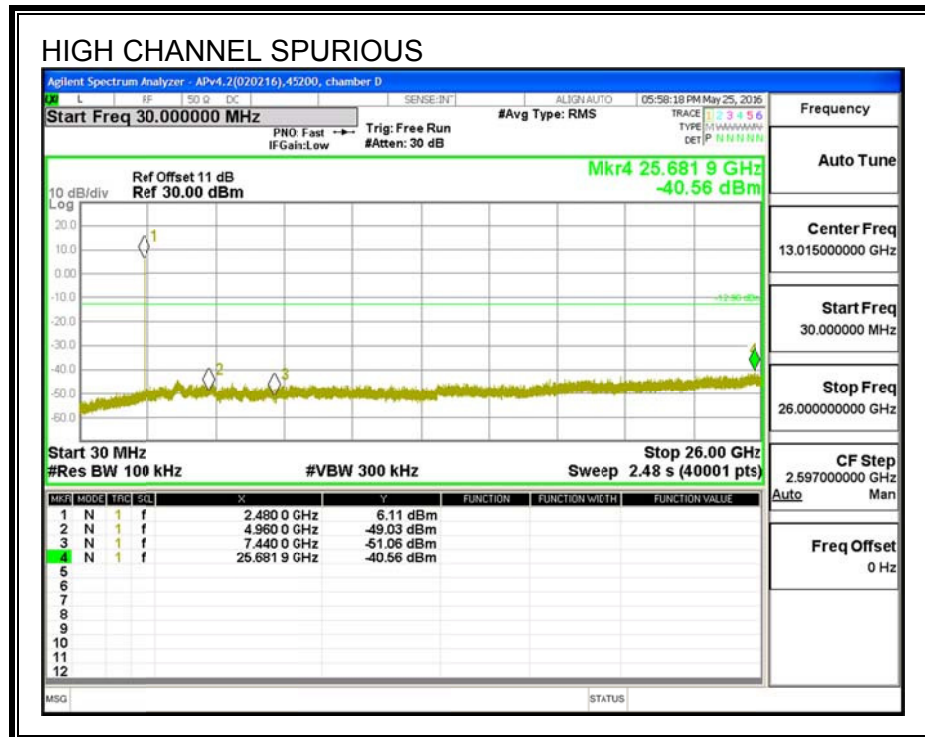
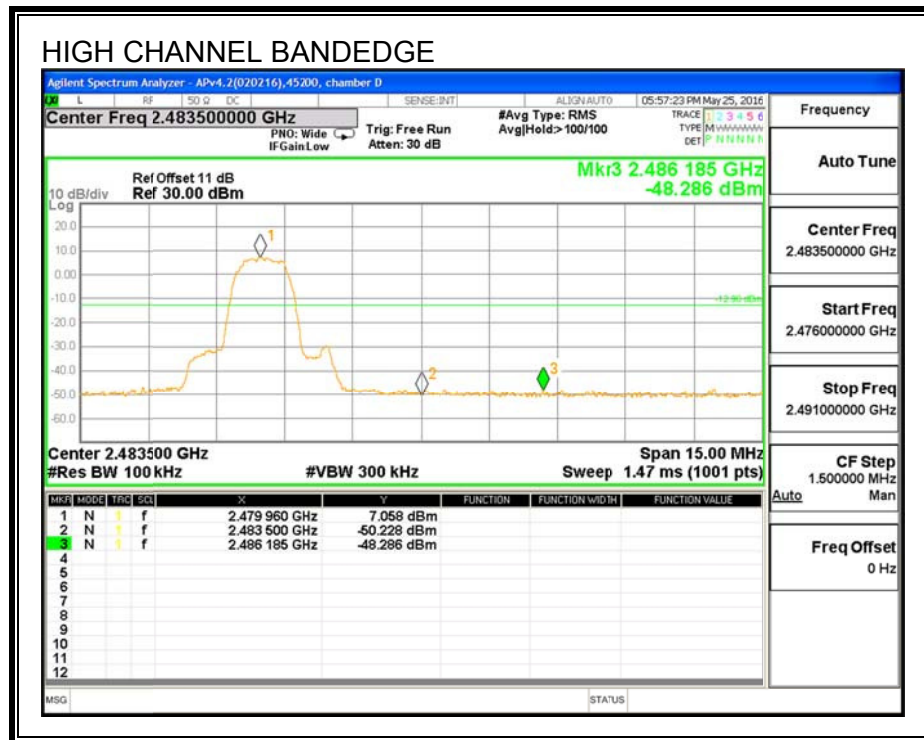
SPURIOUS EMISSIONS, LOW CHANNEL



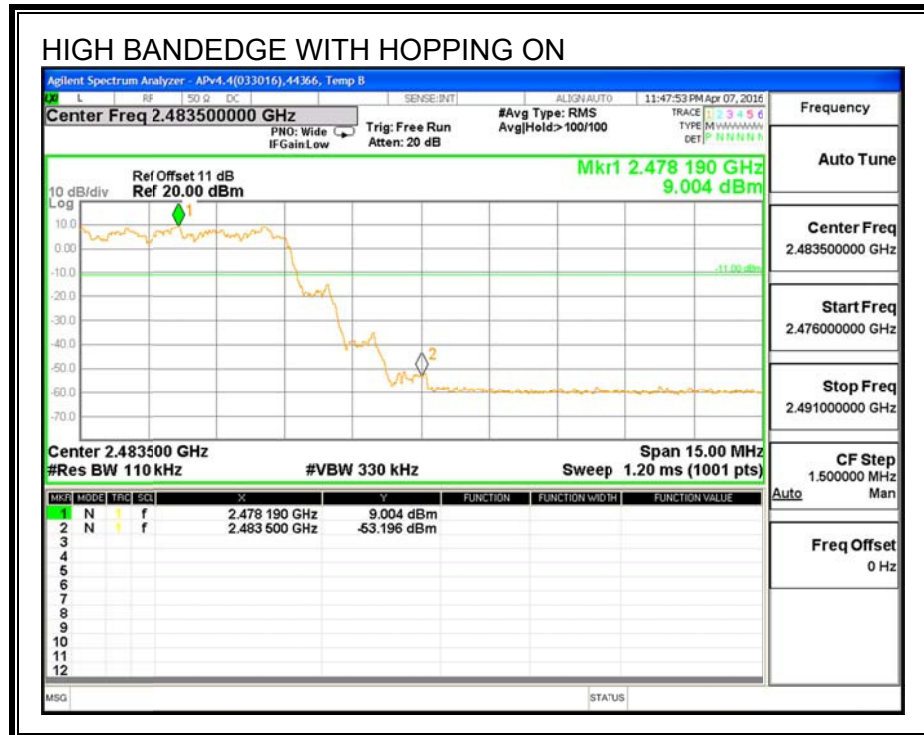
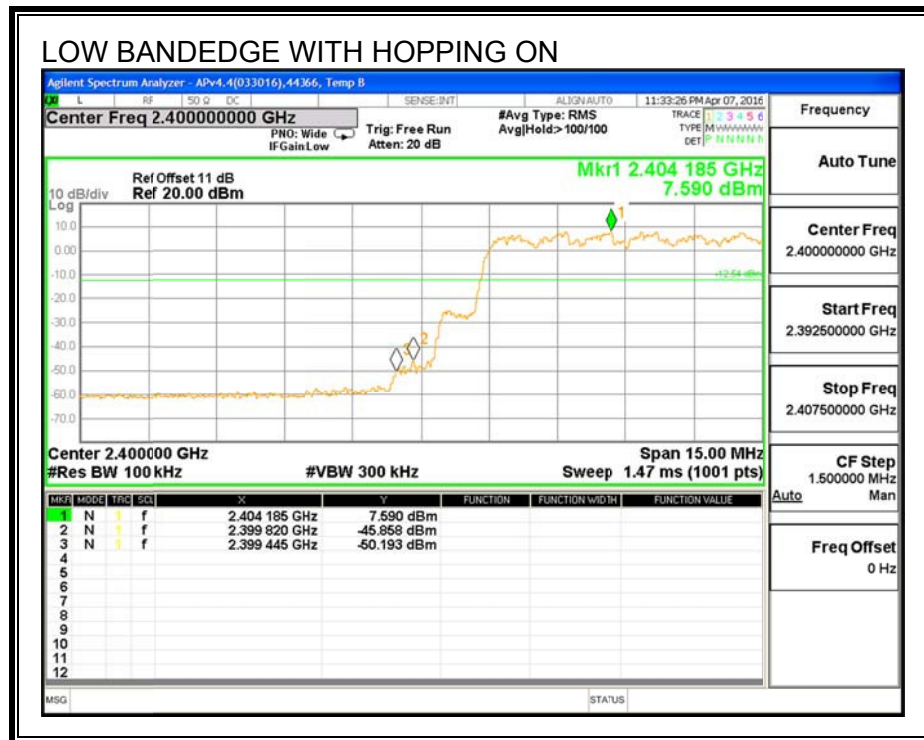
SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

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

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

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

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

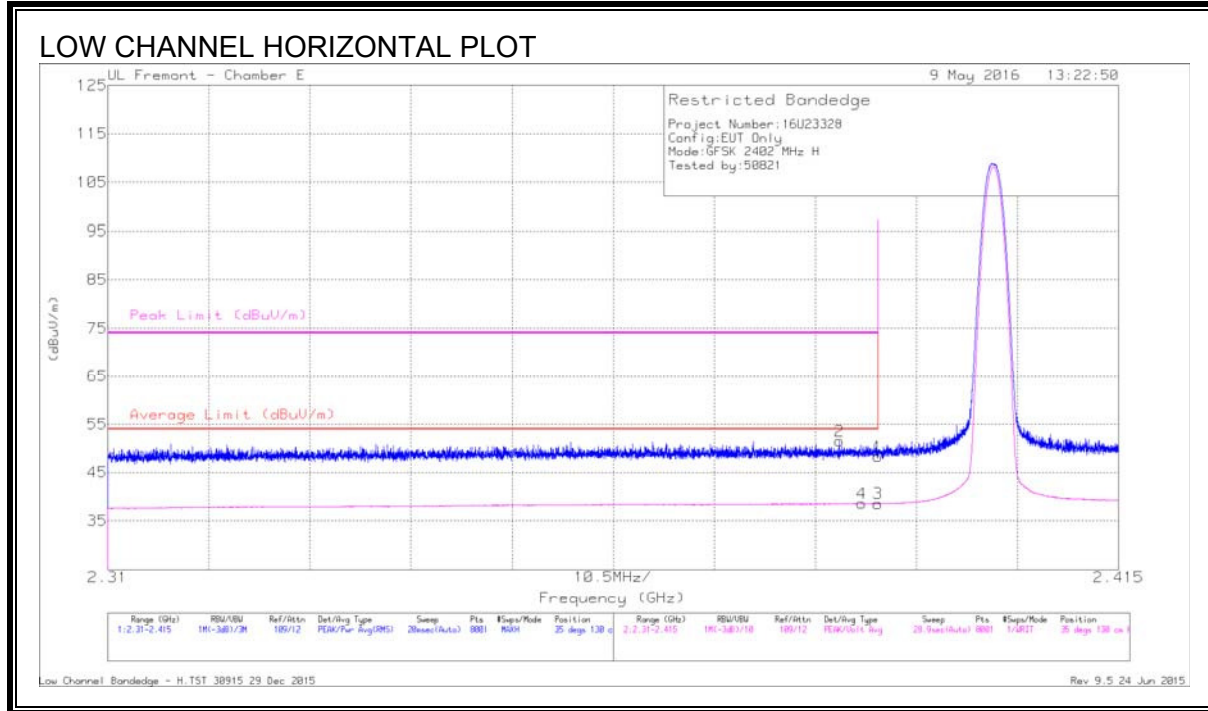
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

RESULTS

8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cb/ Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	36.12	Pk	32.1	-19.9	48.32	-	-	74	-25.68	35	130	H
2	* 2.386	39.38	Pk	32.1	-19.9	51.58	-	-	74	-22.42	35	130	H
3	* 2.39	26.36	VA1T	32.1	-19.9	38.56	54	-15.44	-	-	35	130	H
4	* 2.388	26.39	VA1T	32.1	-19.9	38.59	54	-15.41	-	-	35	130	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

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

UL Fremont - Chamber E

9 May 2016 13:33:54

Restricted Bandedge

Project Number: 16U23328
Config: EUT Only
Mode: GFSK 2.482 MHz U
Tested by: 50821

Peak Limit (dBuV/m)

Average Limit (dBuV/m)

dBuV/m

Frequency (GHz)

2.31 2.415

10.5MHz/

Range (GHz)	RBW/VBW	Ref/Att	Det/Avg Type	Sweep	Pls	#Seps/Mode	Position	Range (GHz)	RBW/VBW	Ref/Att	Det/Avg Type	Sweep	Pts	#Seps/Mode	Position
1.2-2.5-4.5	100-300/10	100/12	Peak/Per Avg (RMS)	200sec/Auto/1	100	100	100	2.3-2.5-4.5	100-300/10	100/12	Peak/Per Avg	200sec/Auto/1	100	100	100

Low Channel Bandedge - U.TST.30915.29 Dec. 2015

Rev 9.5 24 Jun 2015

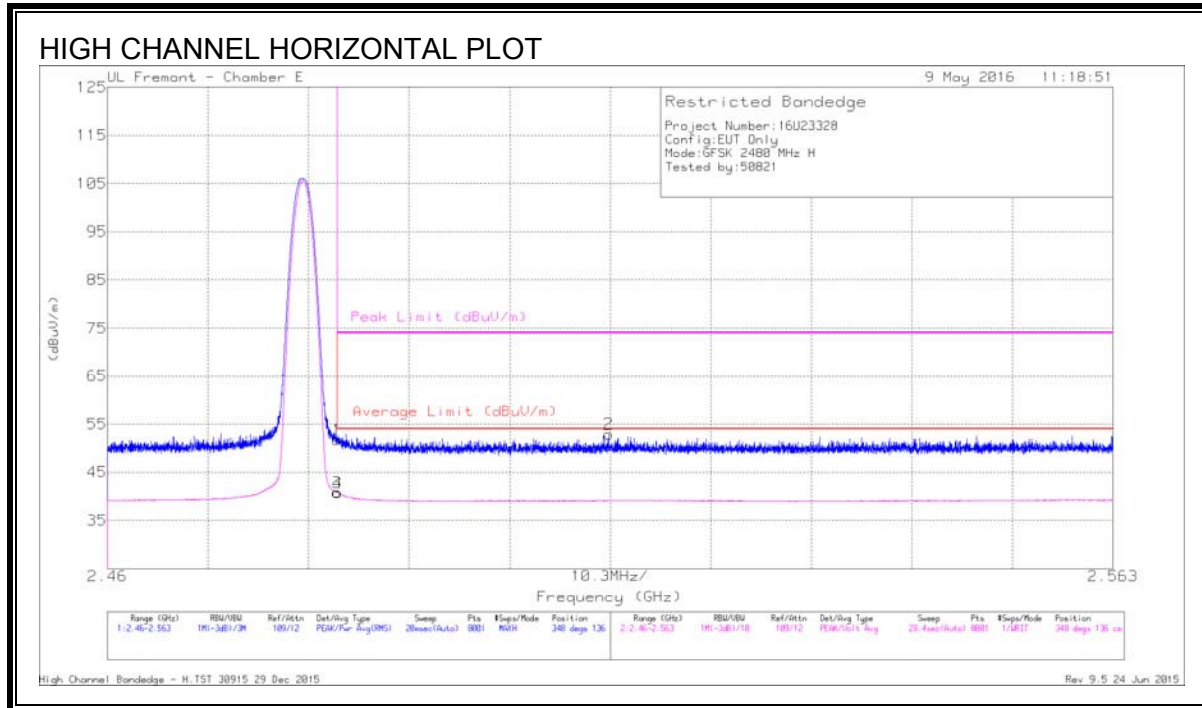
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/FI tr/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	* 2.382	39.72	Pk	32	-19.9	51.82	-	-	74	-22.18	157	288	V
4	* 2.387	26.38	VA1T	32.1	-19.9	38.58	54	-15.42	-	-	157	288	V
1	* 2.39	36.92	Pk	32.1	-19.9	49.12	-	-	74	-24.88	157	288	V
3	* 2.39	26.34	VA1T	32.1	-19.9	38.54	54	-15.46	-	-	157	288	V

Pk - Peak detector

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

RESTRICTED BANDEGE (HIGH CHANNEL, HORIZONTAL)



DATA

Trace Markers

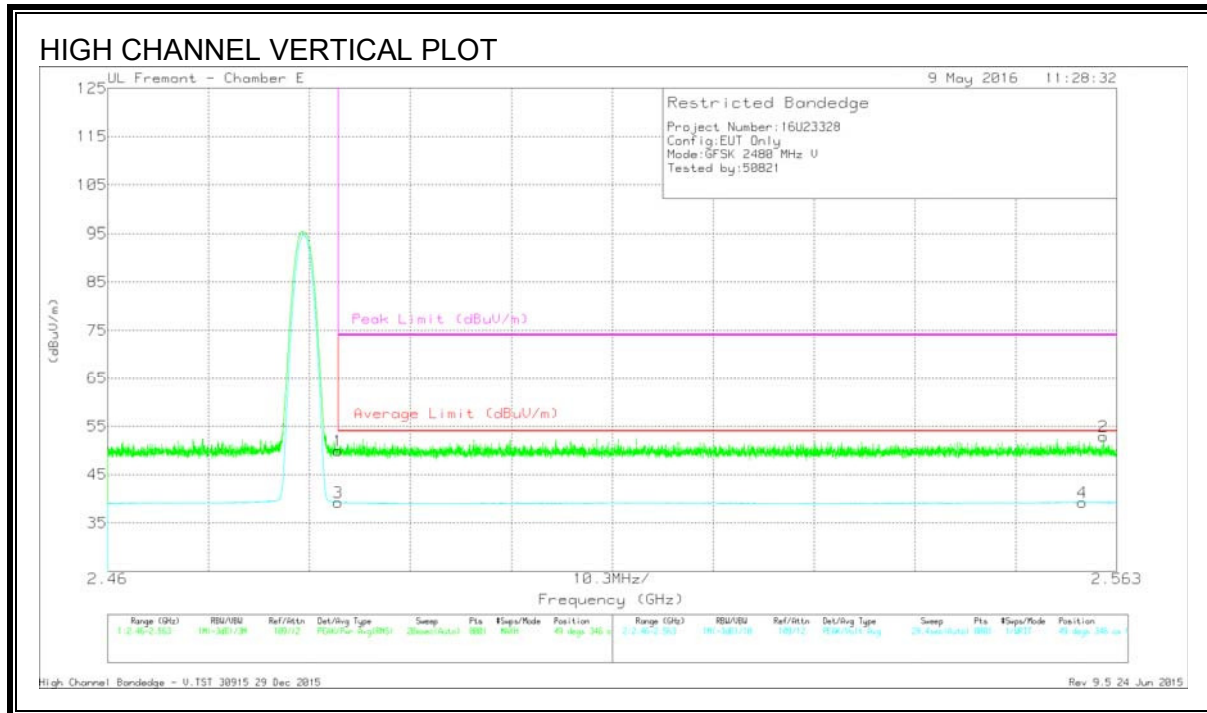
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.46	Pk	32.3	-20	51.76	-	-	74	-22.24	348	136	H
3	* 2.484	28.54	VA1T	32.3	-20	40.84	54	-13.16	-	-	348	136	H
4	* 2.484	28.48	VA1T	32.3	-20	40.78	54	-13.22	-	-	348	136	H
2	2.511	40.76	Pk	32.3	-20.1	52.96	-	-	74	-21.04	348	136	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

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

RESTRICTED BANDEGE (HIGH CHANNEL, VERTICAL)



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/FI tr/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	37.62	Pk	32.3	-20	49.92	-	-	74	-24.08	49	346	V
3	* 2.484	26.96	VA1T	32.3	-20	39.26	54	-14.74	-	-	49	346	V
4	2.56	26.87	VA1T	32.5	-20.1	39.27	54	-14.73	-	-	49	346	V
2	2.562	40.58	Pk	32.5	-20.2	52.88	-	-	74	-21.12	49	346	V

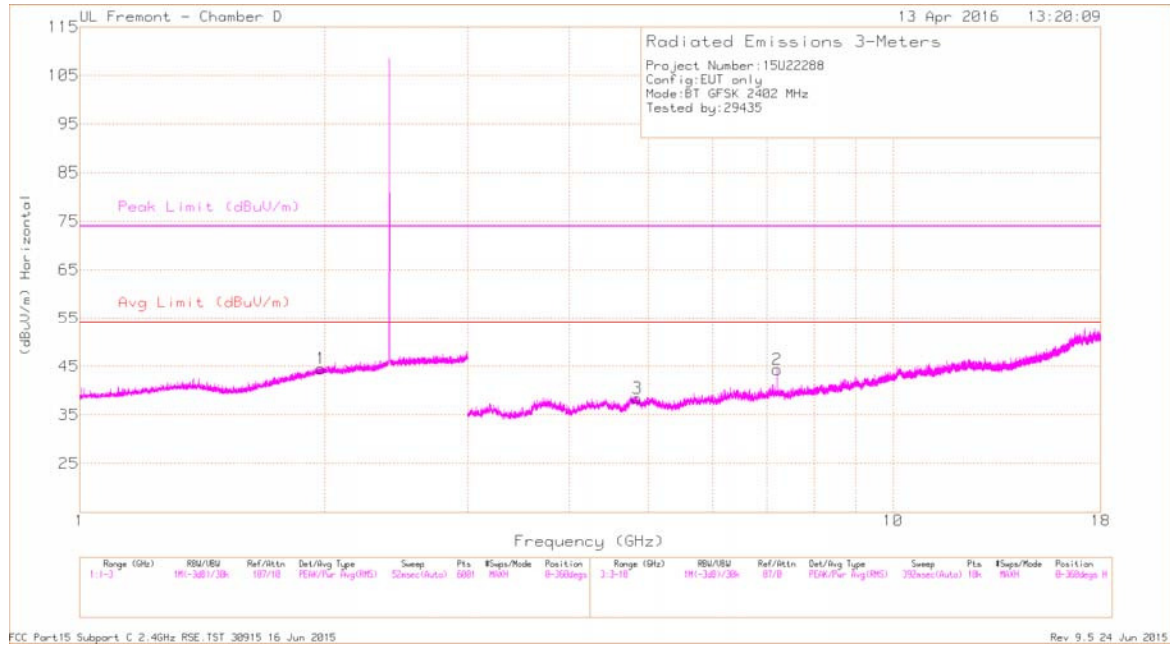
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

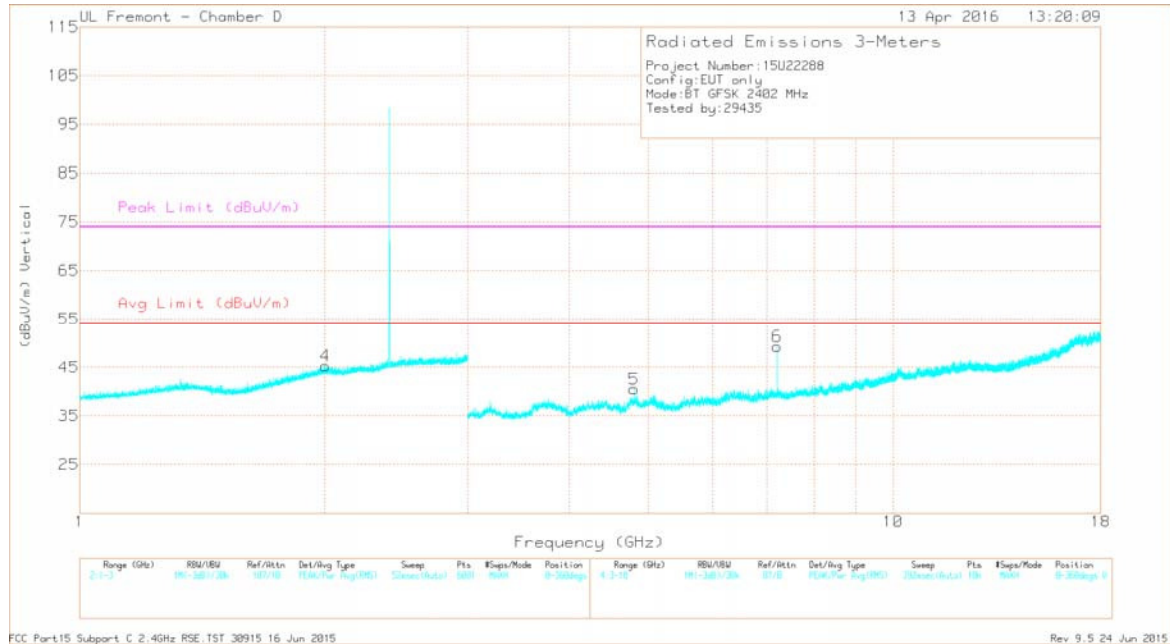
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 4.845	37.69	PK2	34.1	-27.6	44.19	-	-	74	-29.81	1	299	H
	* 4.845	24.88	VA1T	34.1	-27.6	31.38	54	-22.62	-	-	1	299	H
5	* 4.805	39.28	PK2	34.1	-26.7	46.68	-	-	74	-27.32	354	213	V
	* 4.804	28.82	VA1T	34.1	-26.7	36.22	54	-17.78	-	-	354	213	V
1	1.98	42.3	PK2	31.4	-21.2	52.5	-	-	-	-	250	160	H
	1.98	28.4	VA1T	31.4	-21.2	38.6	-	-	-	-	250	160	H
4	2.005	28.45	VA1T	31.6	-21.2	38.85	-	-	-	-	270	211	V
	2.006	41.63	PK2	31.6	-21.2	52.03	-	-	-	-	270	211	V
2	7.206	40.15	PK2	35.7	-24.6	51.25	-	-	-	-	54	318	H
	7.206	32.31	VA1T	35.7	-24.6	43.41	-	-	-	-	54	318	H
6	7.206	43.1	PK2	35.7	-24.6	54.2	-	-	-	-	177	267	V
	7.206	37.38	VA1T	35.7	-24.6	48.48	-	-	-	-	177	267	V

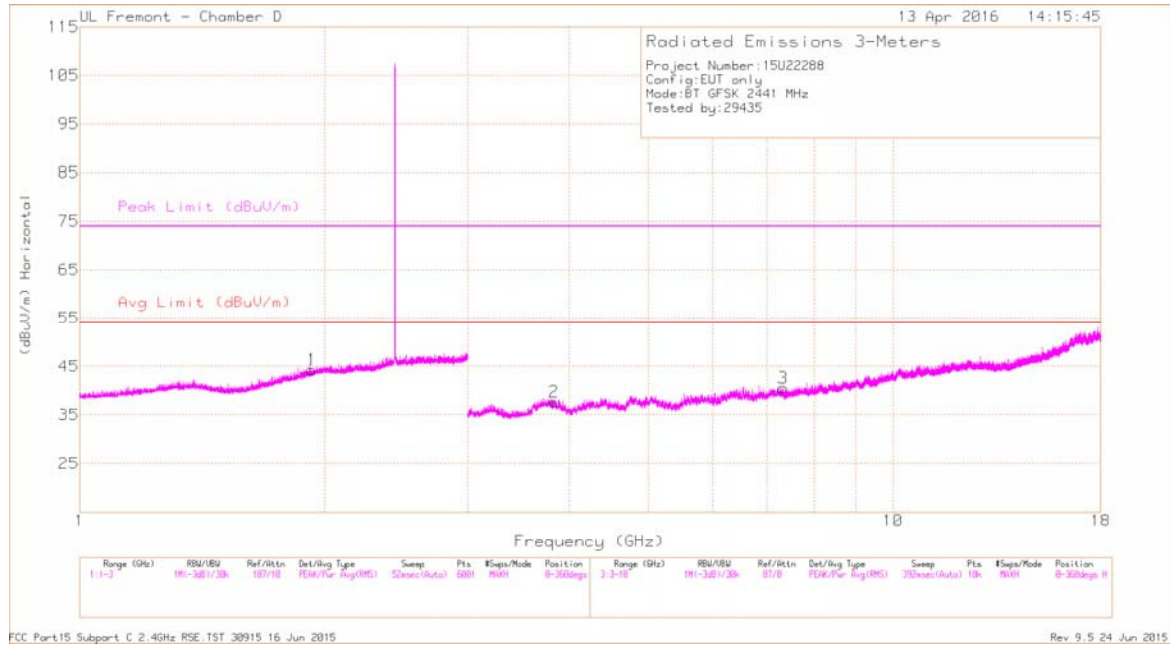
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

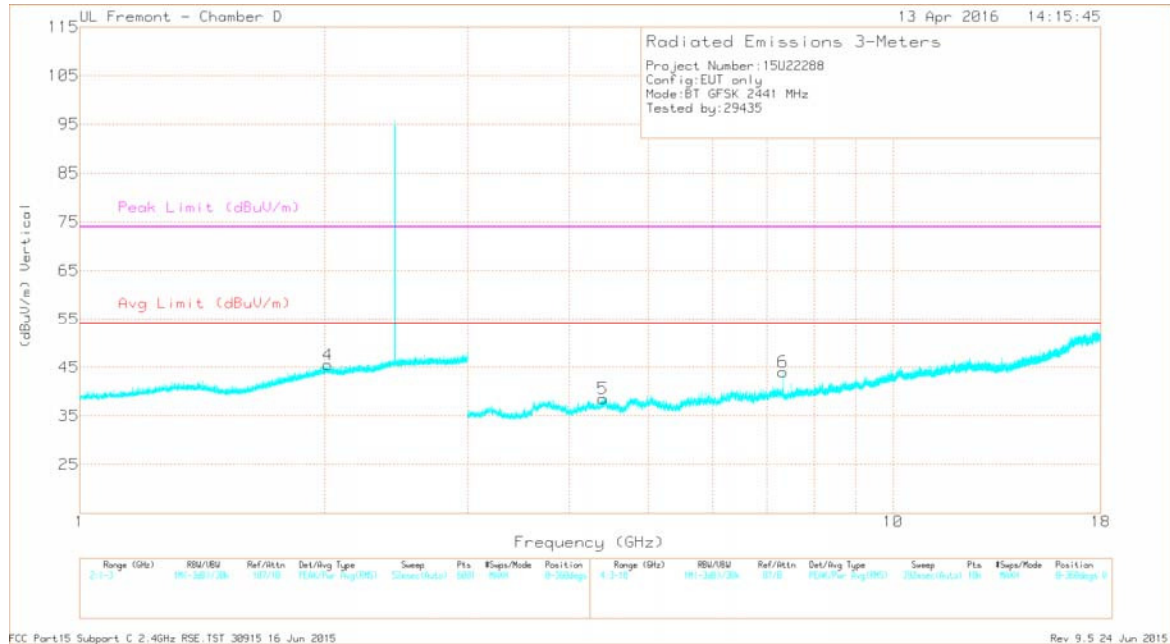
VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



DATA

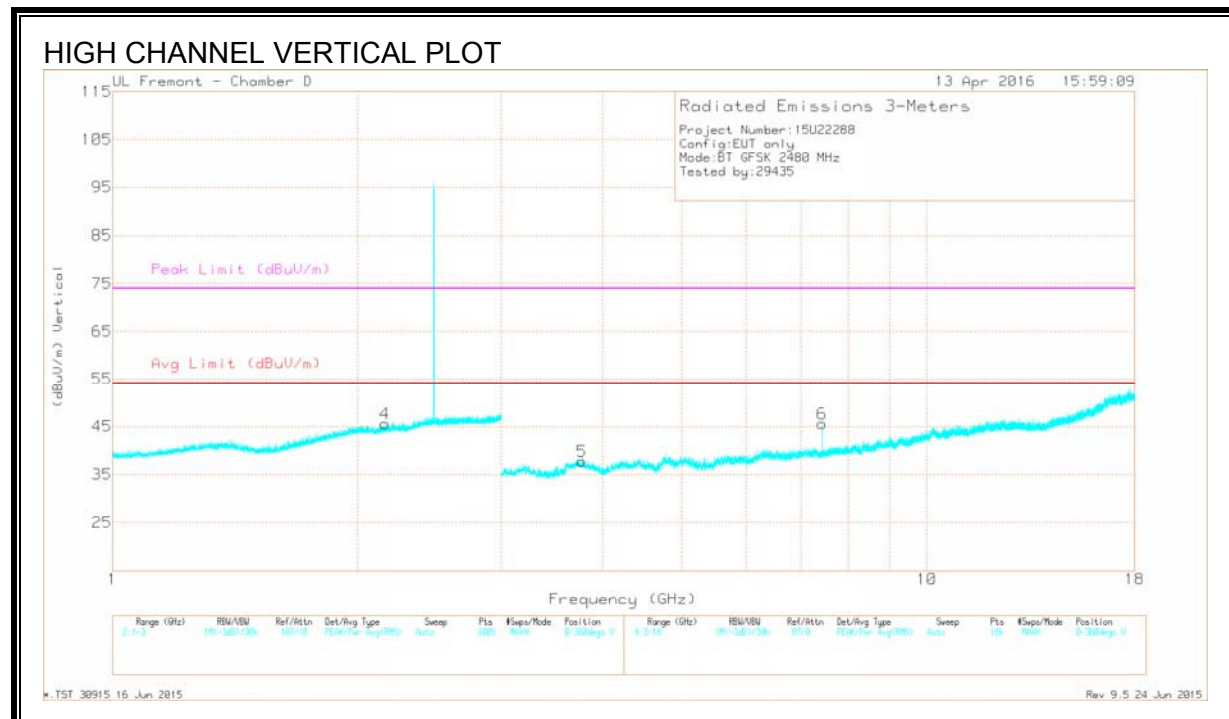
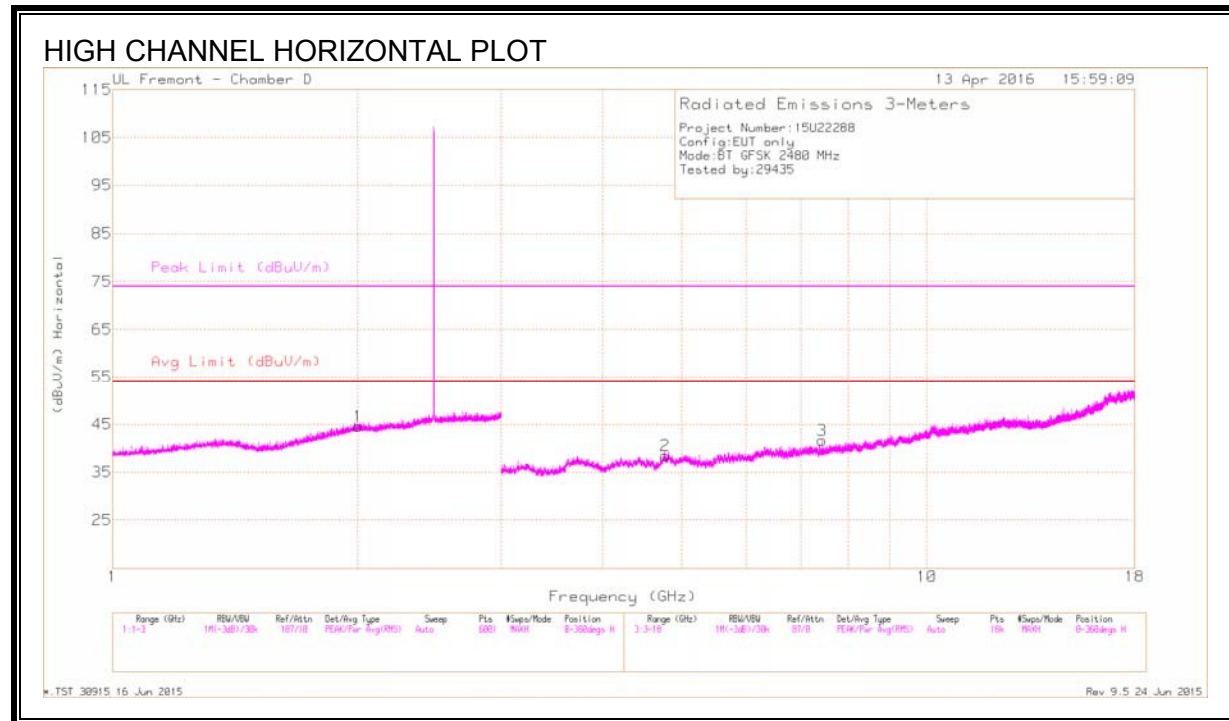
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 3.829	38.84	PK2	33.5	-28.4	43.94	-	-	74	-30.06	277	145	H
	* 3.831	26.04	VA1T	33.5	-28.4	31.14	54	-22.86	-	-	277	145	H
3	* 7.323	38.92	PK2	35.6	-24.8	49.72	-	-	74	-24.28	21	393	H
	* 7.323	29.5	VA1T	35.6	-24.8	40.3	54	-13.7	-	-	21	393	H
5	* 4.398	38.03	PK2	33.9	-27.9	44.03	-	-	74	-29.97	206	266	V
	* 4.398	24.87	VA1T	33.9	-27.9	30.87	54	-23.13	-	-	206	266	V
6	* 7.323	39.36	PK2	35.6	-24.8	50.16	-	-	74	-23.84	10	205	V
	* 7.323	30.66	VA1T	35.6	-24.8	41.46	54	-12.54	-	-	10	205	V
1	1.931	41.87	PK2	31.1	-21.2	51.77	-	-	-	-	231	180	H
	1.931	28.42	VA1T	31.1	-21.2	38.32	-	-	-	-	231	180	H
4	2.018	41.86	PK2	31.5	-21.1	52.26	-	-	-	-	295	199	V
	2.018	28.52	VA1T	31.5	-21.1	38.92	-	-	-	-	295	199	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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

HARMONICS AND SPURIOUS EMISSIONS



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fitr/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	* 4.77	37.6	PK2	34	-26.4	45.2	-	-	74	-28.8	101	150	H
	* 4.774	24.73	VA1T	34	-26.4	32.33	54	-21.67	-	-	101	150	H
3	* 7.441	37.84	PK2	35.6	-24.2	49.24	-	-	74	-24.76	115	111	H
	* 7.44	26.96	VA1T	35.6	-24.2	38.36	54	-15.64	-	-	115	111	H
5	* 3.767	38.09	PK2	33.5	-28	43.59	-	-	74	-30.41	130	220	V
	* 3.771	25.48	VA1T	33.5	-28	30.98	54	-23.02	-	-	130	220	V
6	* 7.44	39.37	PK2	35.6	-24.2	50.77	-	-	74	-23.23	133	195	V
	* 7.44	31.76	VA1T	35.6	-24.2	43.16	54	-10.84	-	-	133	195	V
1	2.004	41.52	PK2	31.6	-21.2	51.92	-	-	-	-	239	381	H
	2.005	28.52	VA1T	31.6	-21.2	38.92	-	-	-	-	239	381	H
4	2.162	41.69	PK2	31.4	-20.8	52.29	-	-	-	-	200	293	V
	2.162	28.41	VA1T	31.4	-20.8	39.01	-	-	-	-	200	293	V

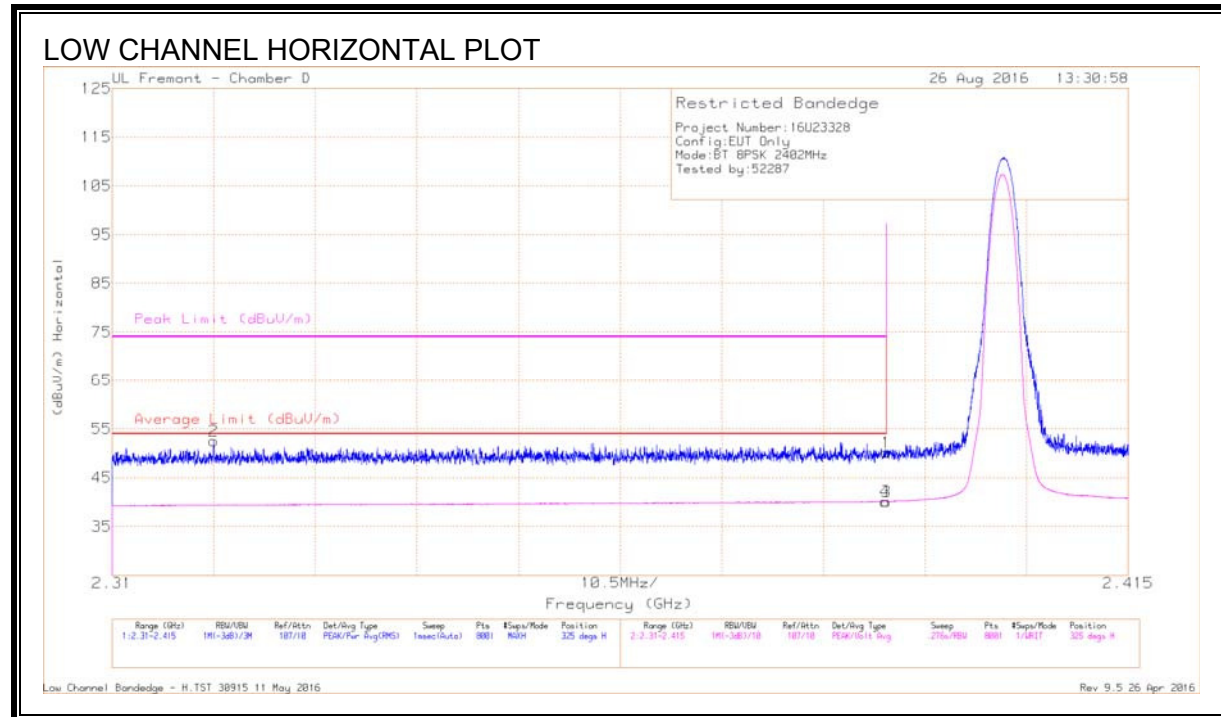
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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

8.2.2. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dBm)	Amp/Cb/Filt/P ad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	38.62	Pk	32.1	-20.6	50.12	-	-	74	-23.88	325	113	H
2	* 2.32	41.66	Pk	31.6	-20.7	52.56	-	-	74	-21.44	325	113	H
3	* 2.39	28.59	VA1T	32.1	-20.6	40.09	54	-13.91	-	-	325	112	H
4	* 2.39	28.65	VA1T	32.1	-20.6	40.15	54	-13.85	-	-	325	112	H

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

Pk - Peak detector

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

LOW CHANNEL VERTICAL PLOT

UL Fremont - Chamber D

26 Aug 2016 13:37:56

Restricted Bandedge

Project Number: 16U23328
Config: EUT Only
Mode: 8T 8FSK 2482MHz
Tested by: 52287

Peak Limit (dBuV/m)

Average Limit (dBuV/m)

2

3

10.5MHz/
Frequency (GHz)

Range (GHz)	RBW/VBW	Ref/Att	Det/Avg Type	Sweep	PLS	#Seps/Mode	Position
1.2 31.2 415	100/300/30	100/10	Peak/Avg Avg (RMS)	10000/Hz	8000	8000	207 steps

Range (GHz)	RBW/VBW	Ref/Att	Det/Avg Type	Sweep	Pts	#Seps/Mode	Position
2.2 31.2 415	100/300/30	100/10	Peak/Avg Avg	2000/Hz	8000	1-8000	207 steps

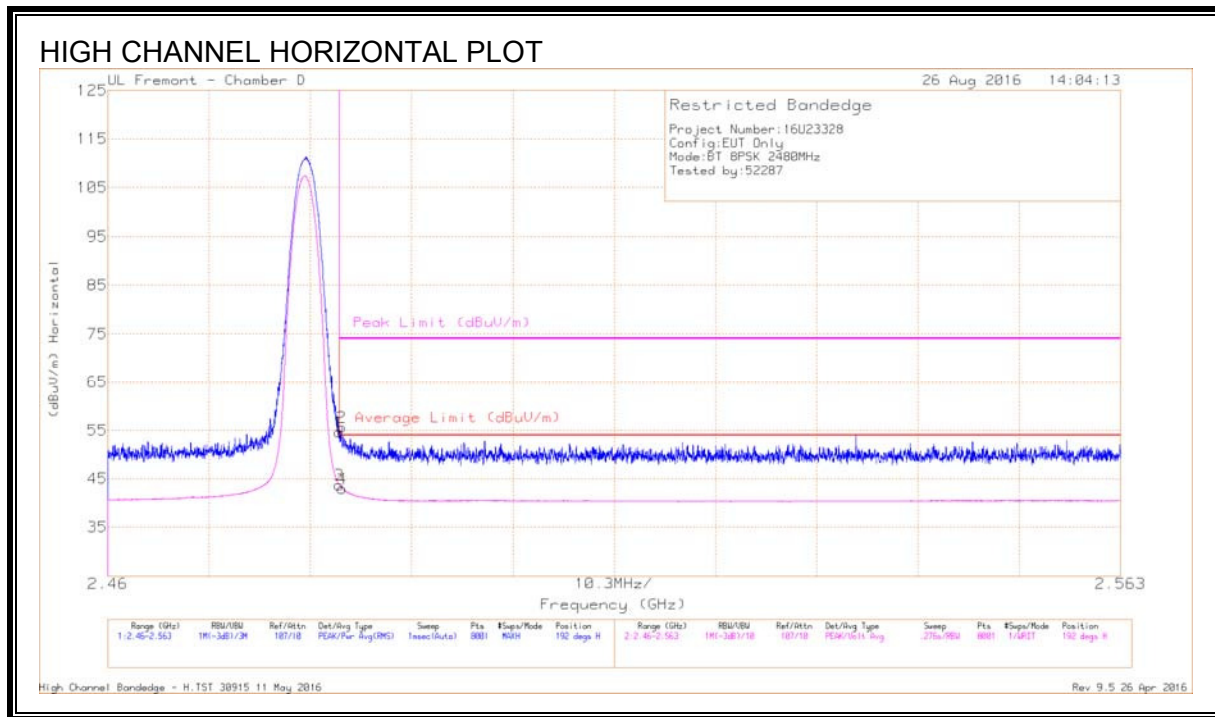
Low Channel Bandedge - U.TST 38915.11 May 2016

Rev 9.5 26 Apr 2016

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cb/I/Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.352	42.03	Pk	31.8	-20.7	53.13	-	-	74	-20.87	287	391	V
1	* 2.39	39.16	Pk	32.1	-20.6	50.66	-	-	74	-23.34	287	391	V
3	* 2.39	28.65	VA1T	32.1	-20.6	40.15	54	-13.85	-	-	287	391	V
4	* 2.39	28.66	VA1T	32.1	-20.6	40.16	54	-13.84	-	-	287	391	V

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

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	42.84	Pk	32.3	-20.5	54.64	-	-	74	-19.36	192	113	H
2	* 2.484	43.82	Pk	32.3	-20.5	55.62	-	-	74	-18.38	192	113	H
3	* 2.484	31.93	VA1T	32.3	-20.5	43.73	54	-10.27	-	-	192	113	H
4	* 2.484	31.15	VA1T	32.3	-20.5	42.95	54	-11.05	-	-	192	113	H

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

Pk - Peak detector

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

UL Fremont - Chamber D

26 Aug 2016 14:08:51

Restricted Bandedge

Project Number: 16U23328
 Config: EUT Only
 Mode: BT BPSK 2480MHz
 Tested by: 52287

Peak Limit (dBU/m)

Average Limit (dBU/m)

2

9

10.3MHz/

Frequency (GHz)

Range (GHz)	RBW/VBW	Ref/Attn	Det/Avg Type	Sweep	Pls	ESaps/Mode	Position	Range (GHz)	RBW/VBW	Ref/Attn	Det/Avg Type	Sweep	Pls	ESaps/Mode	Position
1.246-2.563	1M/300K/3M	107/10	PKSAP/Par Avg/RES	Trace/Out/1	0001	0001	100 degs U	2.246-2.563	1M/300K/3M	107/10	PKSAP/Par Avg	Trace/Out/1	0001	1/001	100 degs U

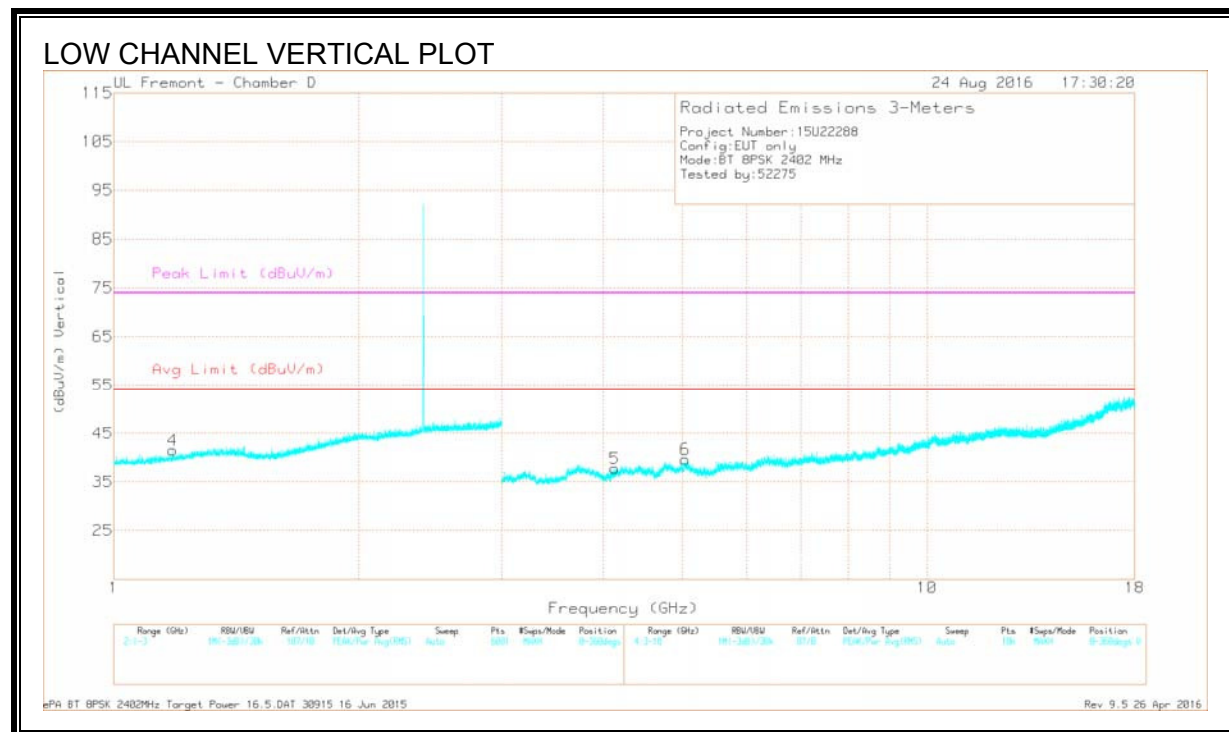
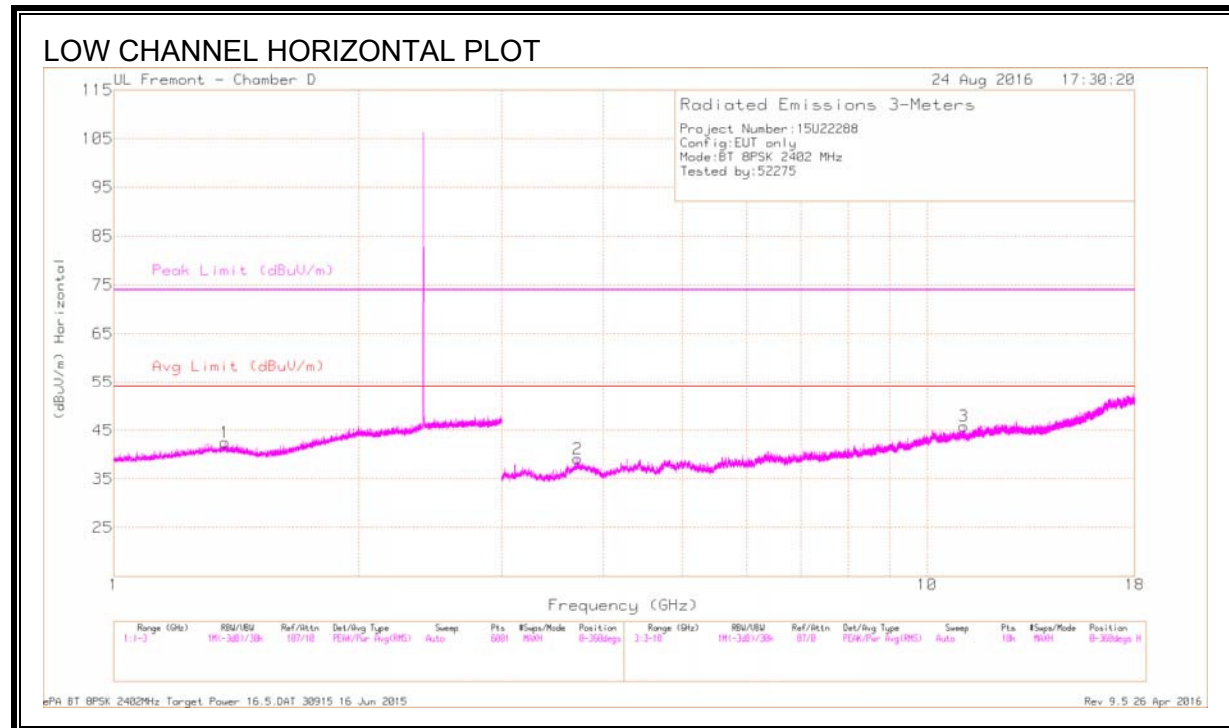
High Channel Bandedge - U.TST 30915 11 May 2016

Rev 9.5 26 Apr 2016

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	38.32	Pk	32.3	-20.5	50.12	-	-	74	-23.88	180	369	V
3	* 2.484	29.73	VA1T	32.3	-20.5	41.53	54	-12.47	-	-	180	369	V
4	* 2.484	29.62	VA1T	32.3	-20.5	41.42	54	-12.58	-	-	180	369	V
2	2.533	41.1	Pk	32.3	-20.5	52.9	-	-	74	-21.1	180	369	V

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

HARMONICS AND SPURIOUS EMISSIONS



DATA

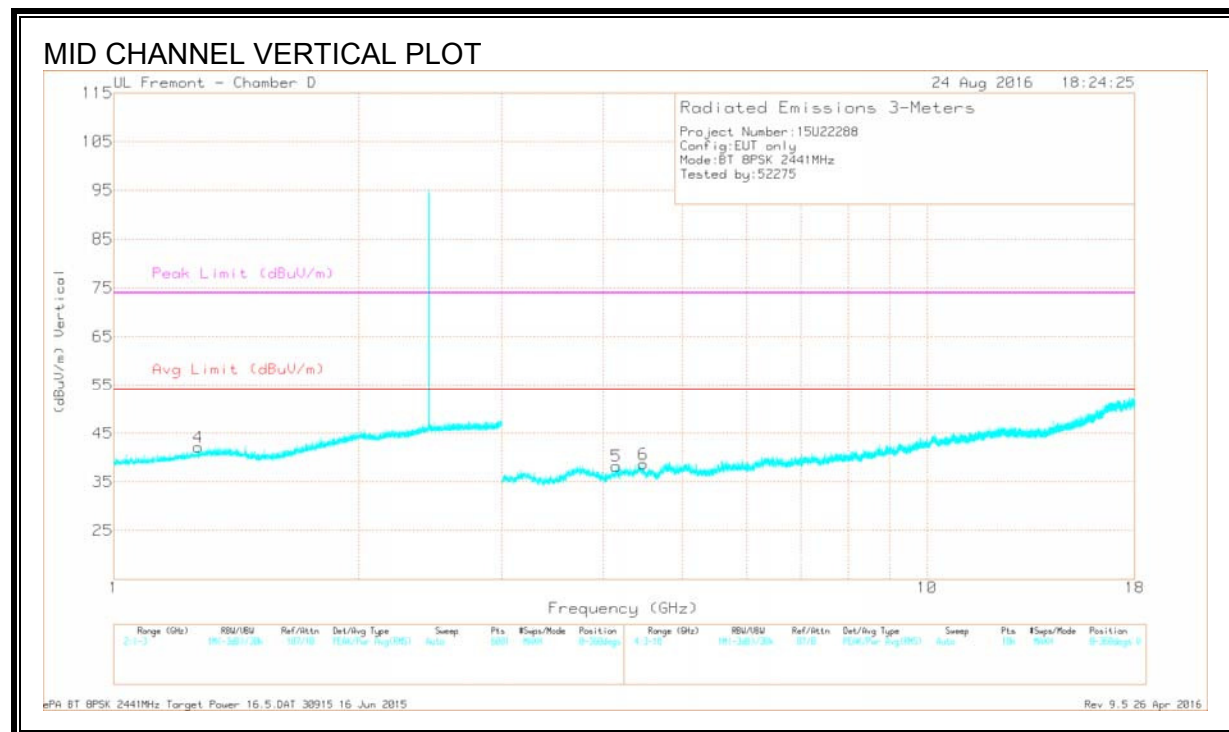
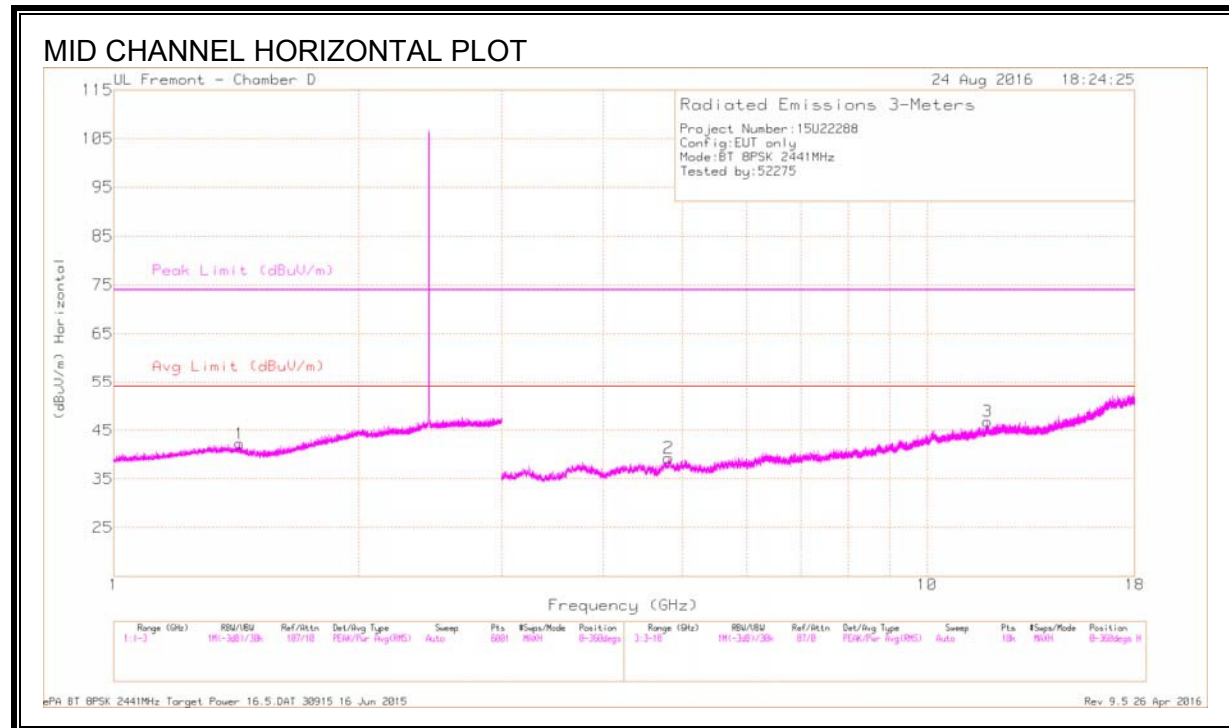
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/P ad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.372	41.73	PKFH	28.9	-22	48.63	-	-	74	-25.37	142	110	H
	* 1.371	29.42	VA1T	28.9	-22	36.32	54	-17.68	-	-	142	110	H
4	* 1.183	40.81	PKFH	28.1	-22.3	46.61	-	-	74	-27.39	200	353	V
	* 1.181	29.26	VA1T	28.1	-22.3	35.06	54	-18.94	-	-	200	353	V
2	* 3.72	38.44	PKFH	33.5	-28.6	43.34	-	-	74	-30.66	125	301	H
	* 3.723	26.3	VA1T	33.5	-28.6	31.2	54	-22.8	-	-	125	301	H
3	* 11.095	34	PKFH	38	-20.8	51.2	-	-	74	-22.8	67	287	H
	* 11.094	21.77	VA1T	38	-20.8	38.97	54	-15.03	-	-	67	287	H
5	* 4.132	37.42	PKFH	33.5	-27.9	43.02	-	-	74	-30.98	156	361	V
	* 4.129	25.55	VA1T	33.5	-27.9	31.15	54	-22.85	-	-	156	361	V
6	* 5.047	36.21	PKFH	34	-26.4	43.81	-	-	74	-30.19	100	213	V
	* 5.045	25.18	VA1T	34	-26.3	32.88	54	-21.12	-	-	100	213	V

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

PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak

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

HARMONICS AND SPURIOUS EMISSIONS



DATA

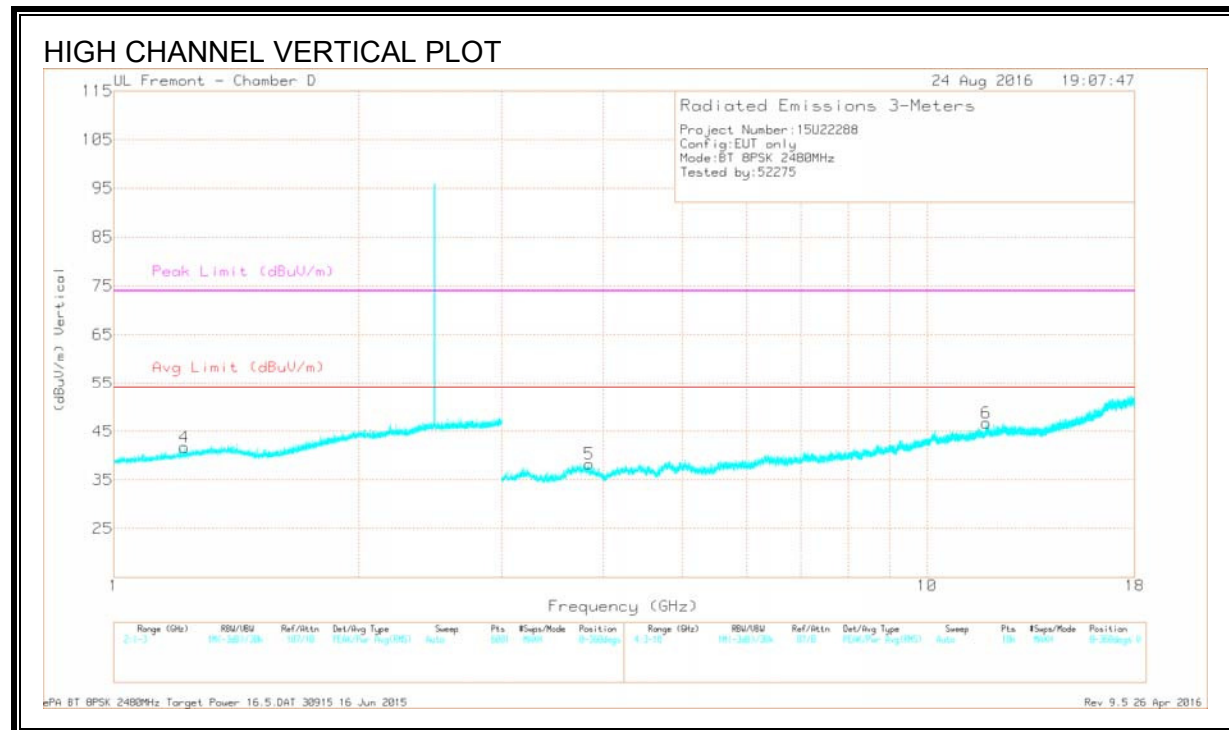
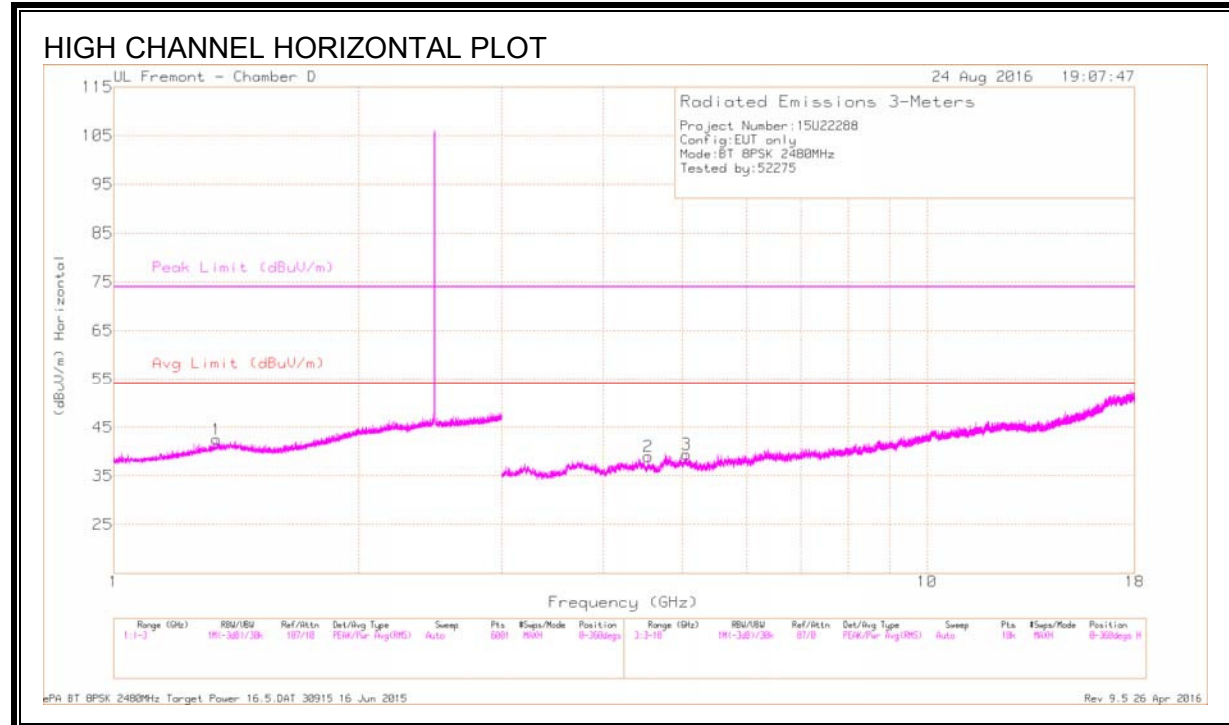
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Fitr/P ad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 1.271	40.1	PKFH	28.7	-22.2	46.6	-	-	74	-27.4	25	199	V
	* 1.269	29.29	VA1T	28.7	-22.1	35.89	54	-18.11	-	-	25	199	V
2	* 4.812	37.11	PKFH	34.1	-26.8	44.41	-	-	74	-29.59	123	260	H
	* 4.811	25.27	VA1T	34.1	-26.8	32.57	54	-21.43	-	-	123	260	H
3	* 11.867	32.76	PKFH	38.8	-20.2	51.36	-	-	74	-22.64	358	157	H
	* 11.865	21.81	VA1T	38.8	-20.2	40.41	54	-13.59	-	-	358	157	H
5	* 4.15	37.47	PKFH	33.5	-27.8	43.17	-	-	74	-30.83	221	178	V
	* 4.151	25.89	VA1T	33.5	-27.8	31.59	54	-22.41	-	-	221	178	V
1	1.428	40.77	PKFH	28.7	-21.8	47.67	-	-	-	-	100	213	H
	1.43	29.13	VA1T	28.6	-21.9	35.83	-	-	-	-	100	213	H
6	4.479	36.61	PKFH	33.9	-27.4	43.11	-	-	-	-	65	305	V
	4.48	25.36	VA1T	33.9	-27.4	31.86	-	-	-	-	65	305	V

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

PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak

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

HARMONICS AND SPURIOUS EMISSIONS



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.337	40.3	PKFH	28.9	-22	47.2	-	-	74	-26.8	65	305	H
	* 1.338	29.13	VA1T	28.9	-22	36.03	54	-17.97	-	-	65	305	H
4	* 1.22	41.23	PKFH	28.3	-22.2	47.33	-	-	74	-26.67	16	106	V
	* 1.22	29.25	VA1T	28.3	-22.2	35.35	54	-18.65	-	-	16	106	V
2	* 4.545	37.07	PKFH	34	-27.7	43.37	-	-	74	-30.63	135	156	H
	* 4.545	25.71	VA1T	34	-27.7	32.01	54	-21.99	-	-	135	156	H
3	* 5.063	36.29	PKFH	34	-26.5	43.79	-	-	74	-30.21	279	211	H
	* 5.064	25.06	VA1T	34	-26.5	32.56	54	-21.44	-	-	279	211	H
5	* 3.844	37.67	PKFH	33.5	-28.5	42.67	-	-	74	-31.33	303	105	V
	* 3.842	26.43	VA1T	33.5	-28.5	31.43	54	-22.57	-	-	303	105	V
6	* 11.824	33.24	PKFH	38.7	-20.4	51.54	-	-	74	-22.46	348	131	V
	* 11.821	21.88	VA1T	38.7	-20.4	40.18	54	-13.82	-	-	348	131	V

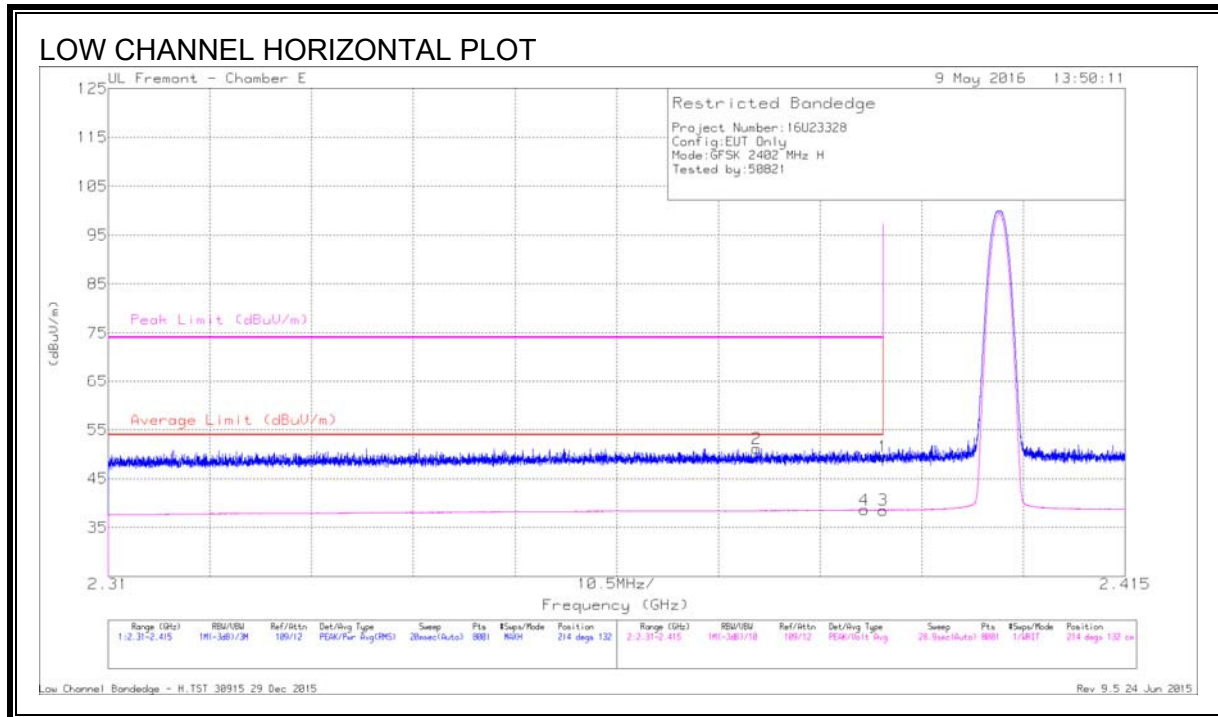
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak

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

8.2.3. LOW POWER BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



DATA

Trace Markers

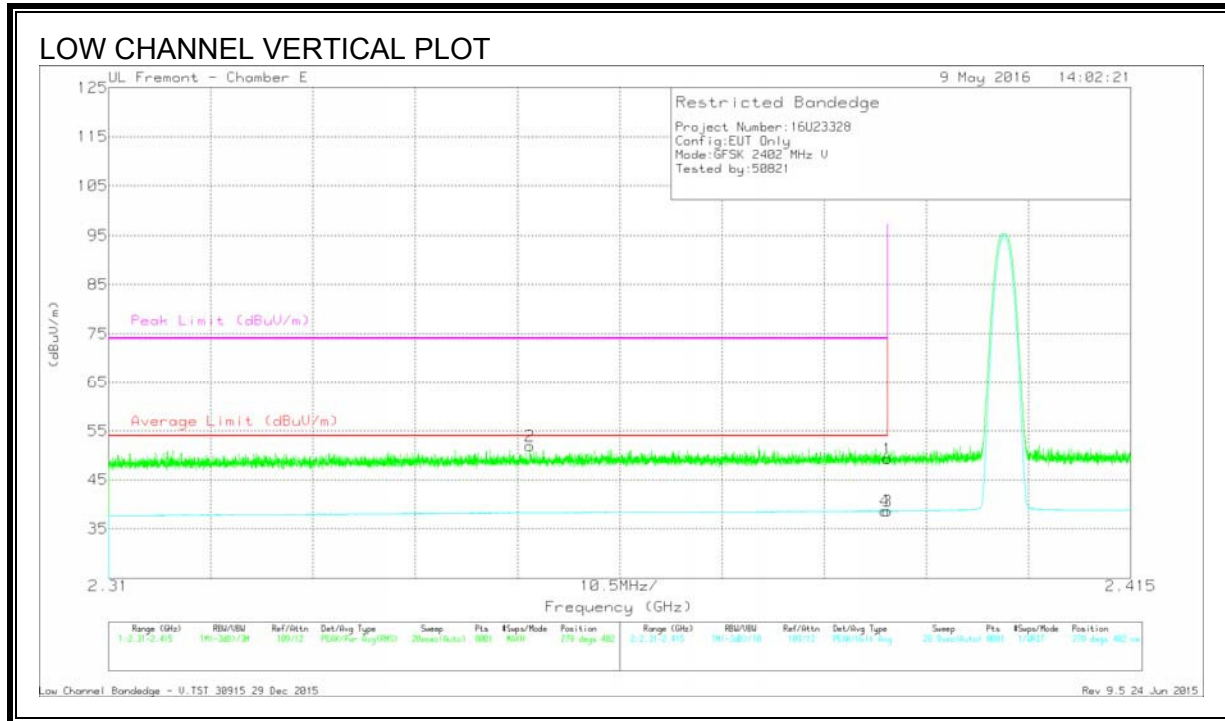
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.377	39.2	Pk	32	-20	51.2	-	-	74	-22.8	214	132	H
4	* 2.388	26.4	VA1T	32.1	-19.9	38.6	54	-15.4	-	-	214	132	H
1	* 2.39	37.35	Pk	32.1	-19.9	49.55	-	-	74	-24.45	214	132	H
3	* 2.39	26.36	VA1T	32.1	-19.9	38.56	54	-15.44	-	-	214	132	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

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

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



DATA

Trace Markers

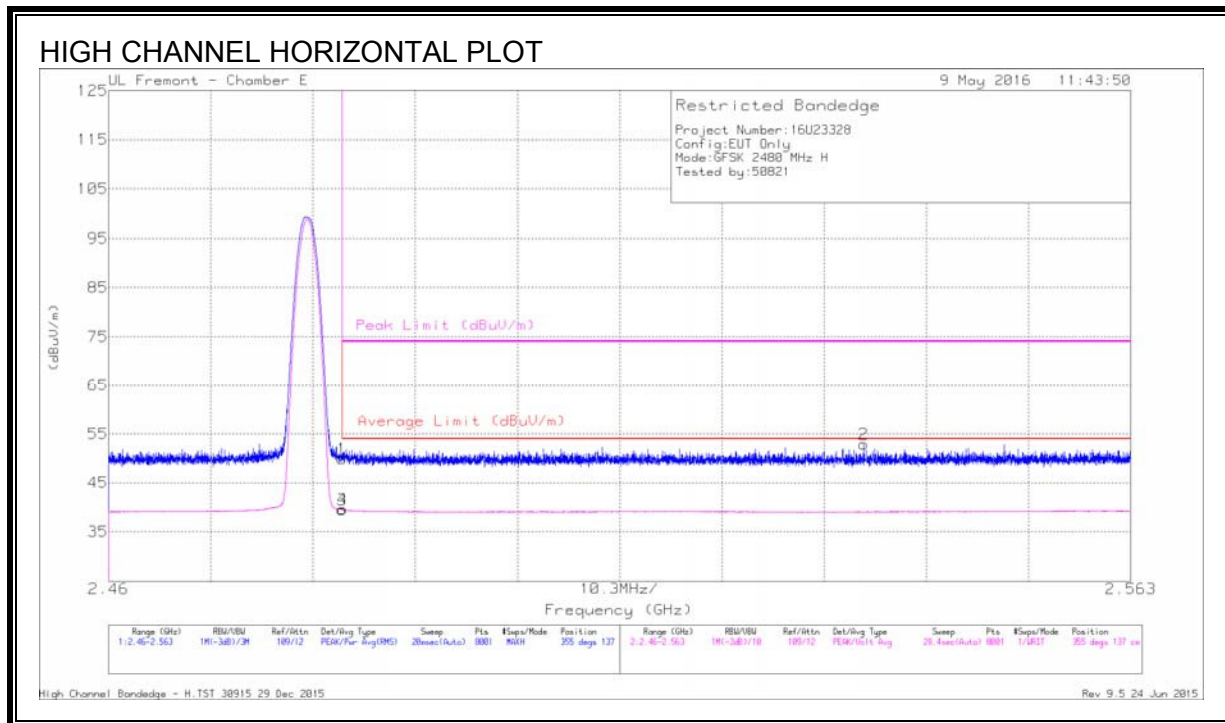
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.353	40.2	Pk	31.8	-20.1	51.9	-	-	74	-22.1	279	402	V
1	* 2.39	37.14	Pk	32.1	-19.9	49.34	-	-	74	-24.66	279	402	V
3	* 2.39	26.38	VA1T	32.1	-19.9	38.58	54	-15.42	-	-	279	402	V
4	* 2.39	26.41	VA1T	32.1	-19.9	38.61	54	-15.39	-	-	279	402	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

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

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



DATA

Trace Markers

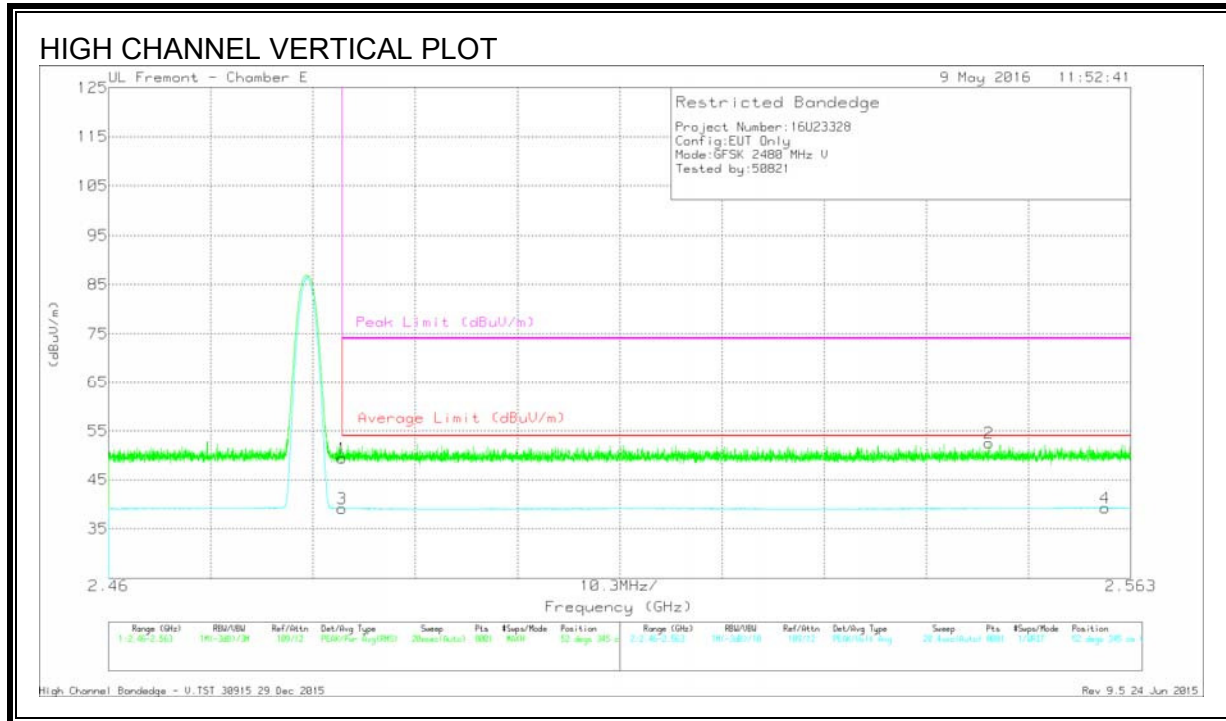
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	37.58	Pk	32.3	-20	49.88	-	-	74	-24.12	355	137	H
3	* 2.484	27.24	VA1T	32.3	-20	39.54	54	-14.46	-	-	355	137	H
4	* 2.484	27.28	VA1T	32.3	-20	39.58	54	-14.42	-	-	355	137	H
2	2.536	40.71	Pk	32.4	-20.2	52.91	-	-	74	-21.09	355	137	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

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

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarity
1	* 2.484	37.07	Pk	32.3	-20	49.37	-	-	74	-24.63	52	345	V
3	* 2.484	26.81	VA1T	32.3	-20	39.11	54	-14.89	-	-	52	345	V
2	2.549	40.38	Pk	32.4	-20.2	52.58	-	-	74	-21.42	52	345	V
4	2.56	26.85	VA1T	32.5	-20.1	39.25	54	-14.75	-	-	52	345	V

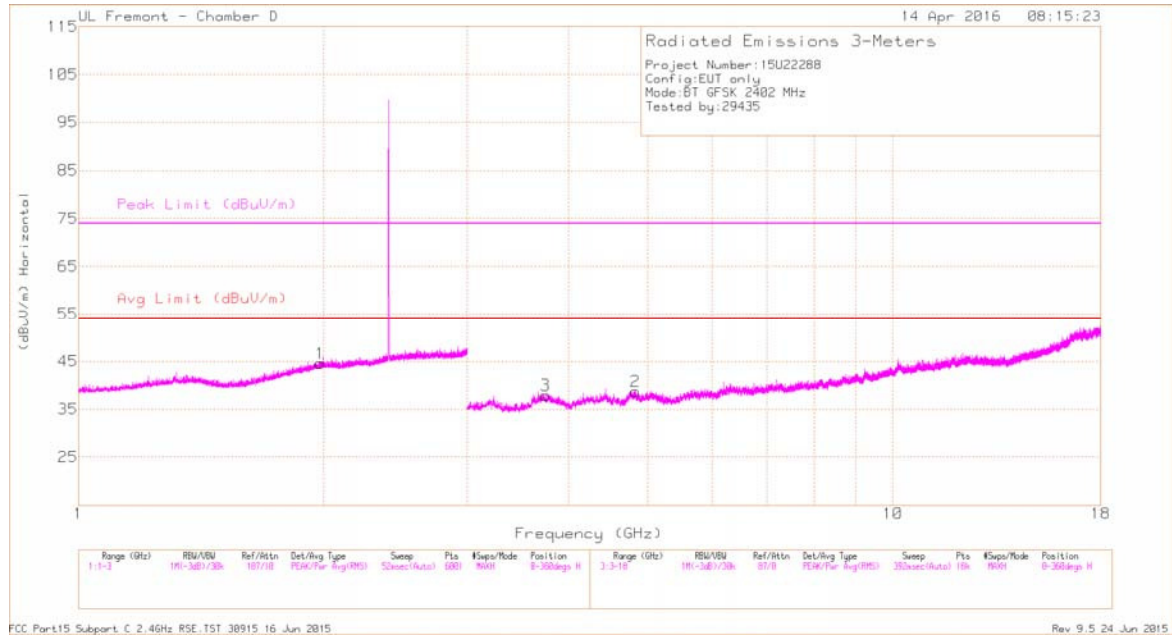
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

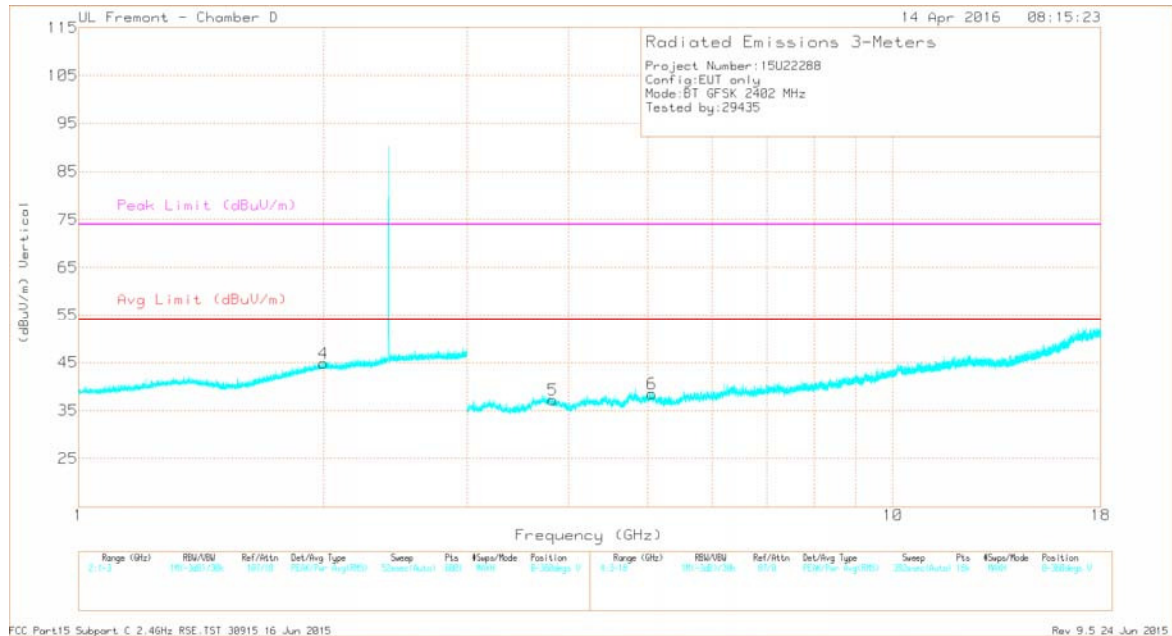
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fitr/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	* 4.83	38.47	PK2	34.1	-27.2	45.37	-	-	74	-28.63	209	118	H
	* 4.831	25.15	VA1T	34.1	-27.2	32.05	54	-21.95	-	-	209	118	H
3	* 3.748	38.49	PK2	33.5	-28.2	43.79	-	-	74	-30.21	209	221	H
	* 3.746	25.49	VA1T	33.5	-28.3	30.69	54	-23.31	-	-	209	221	H
5	* 3.823	39.01	PK2	33.5	-28.3	44.21	-	-	74	-29.79	190	256	V
	* 3.823	26.05	VA1T	33.5	-28.3	31.25	54	-22.75	-	-	190	256	V
6	* 5.06	37.69	PK2	34	-26.6	45.09	-	-	74	-28.91	165	270	V
	* 5.06	24.63	VA1T	34	-26.6	32.03	54	-21.97	-	-	165	270	V
1	1.979	28.5	VA1T	31.4	-21.2	38.7	-	-	-	-	65	156	H
	1.982	41.83	PK2	31.5	-21.2	52.13	-	-	-	-	65	156	H
4	2	41.51	PK2	31.6	-21.2	51.91	-	-	-	-	90	181	V
	2.002	28.53	VA1T	31.6	-21.2	38.93	-	-	-	-	90	181	V

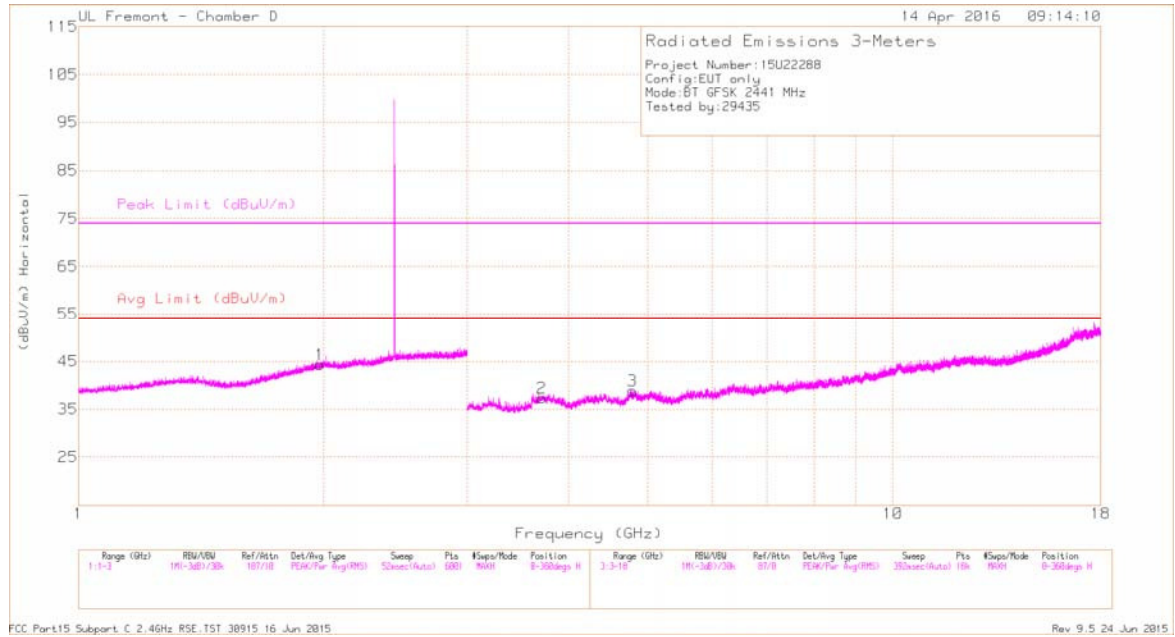
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

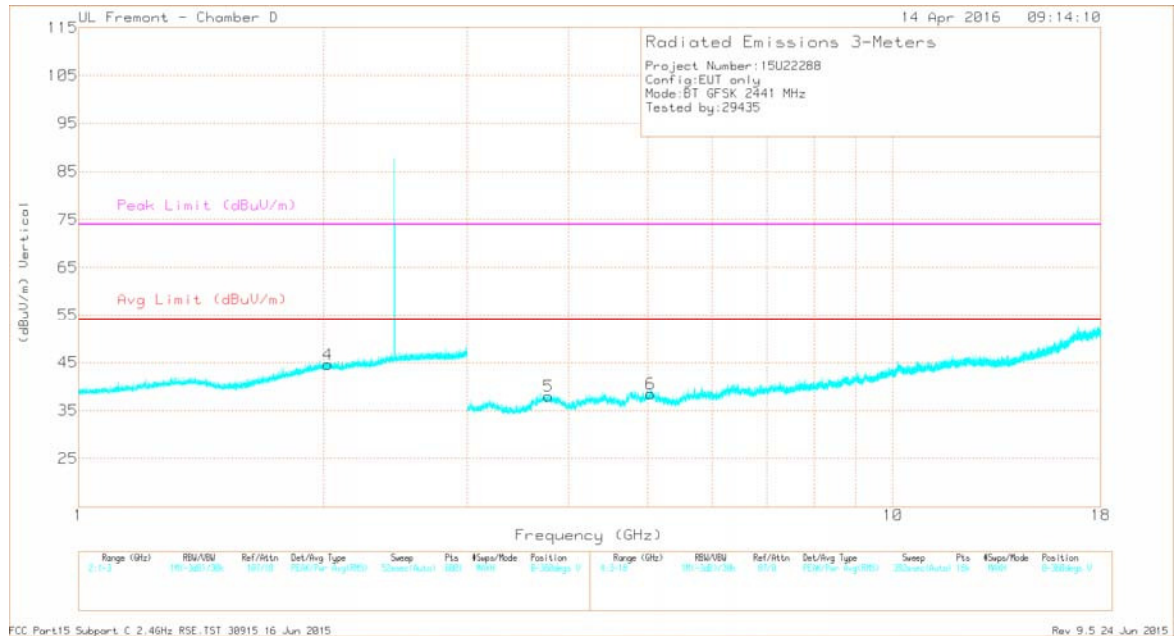
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL HORIZONTAL PLOT



MID CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fitr/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	* 3.708	39.15	PK2	33.5	-28.7	43.95	-	-	74	-30.05	130	206	H
	* 3.706	25.88	VA1T	33.5	-28.8	30.58	54	-23.42	-	-	130	206	H
3	* 4.791	37.35	PK2	34	-26.6	44.75	-	-	74	-29.25	170	241	H
	* 4.787	24.48	VA1T	34	-26.6	31.88	54	-22.12	-	-	170	241	H
5	* 3.78	39.09	PK2	33.5	-28	44.59	-	-	74	-29.41	190	260	V
	* 3.78	25.66	VA1T	33.5	-28	31.16	54	-22.84	-	-	190	260	V
6	* 5.045	38.05	PK2	34	-26.3	45.75	-	-	74	-28.25	210	290	V
	* 5.046	24.79	VA1T	34	-26.3	32.49	54	-21.51	-	-	210	290	V
1	1.979	28.49	VA1T	31.4	-21.2	38.69	-	-	-	-	80	230	H
	1.98	41.82	PK2	31.4	-21.2	52.02	-	-	-	-	80	230	H
4	2.022	41.56	PK2	31.5	-21.1	51.96	-	-	-	-	100	230	V
	2.023	28.56	VA1T	31.5	-21.1	38.96	-	-	-	-	100	230	V

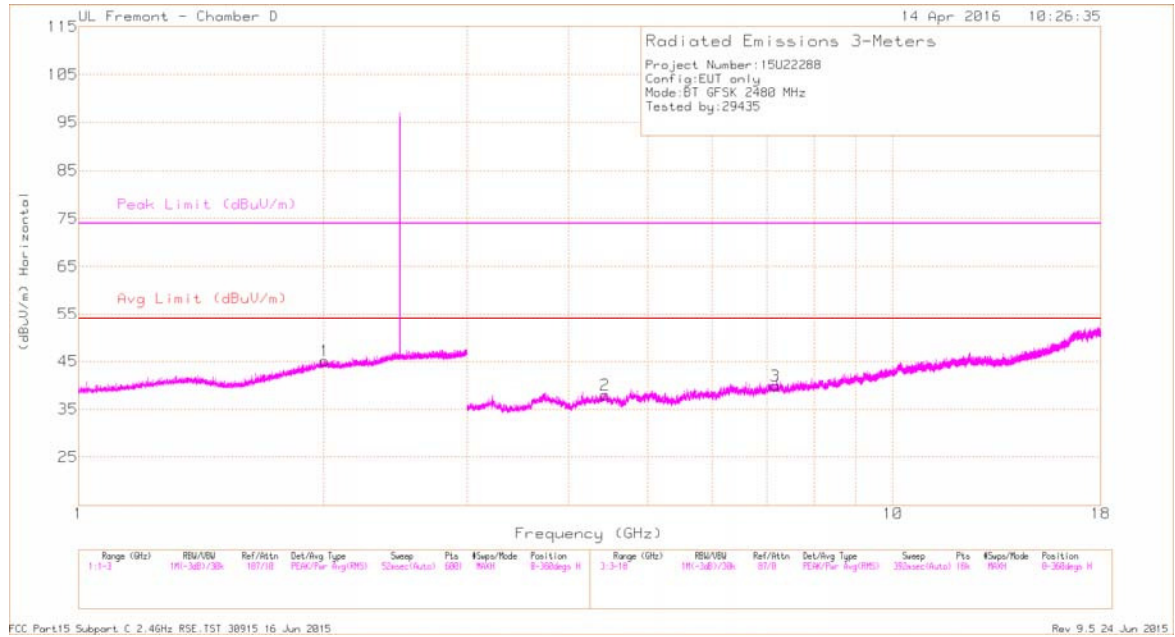
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

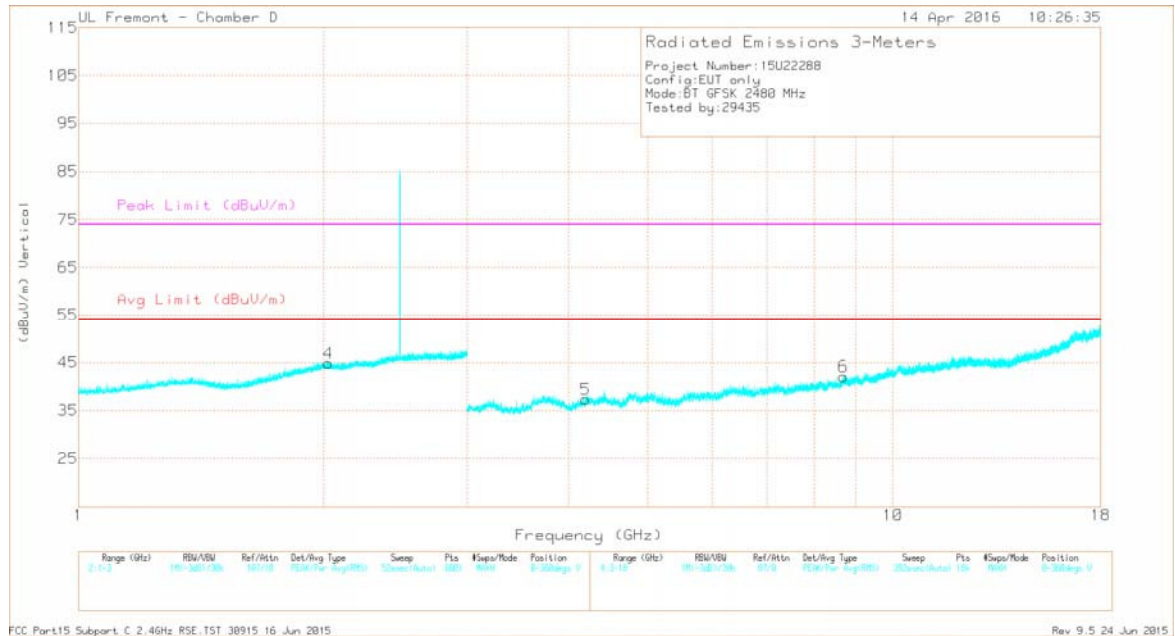
VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT



HIGH CHANNEL VERTICAL PLOT



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 4.195	37.31	PK2	33.5	-27.6	43.21	-	-	74	-30.79	186	201	V
	* 4.194	24.77	VA1T	33.5	-27.6	30.67	54	-23.33	-	-	186	201	V
1	2.005	41.73	PK2	31.6	-21.2	52.13	-	-	-	-	300	121	H
	2.006	28.5	VA1T	31.6	-21.2	38.9	-	-	-	-	300	121	H
4	2.029	42.5	PK2	31.4	-21.1	52.8	-	-	-	-	250	160	V
	2.029	28.49	VA1T	31.4	-21.1	38.79	-	-	-	-	250	160	V
2	4.43	25.09	VA1T	33.9	-27.3	31.69	-	-	-	-	230	180	H
	4.432	38.92	PK2	33.9	-27.3	45.52	-	-	-	-	230	180	H
3	7.169	23.18	VA1T	35.7	-24.8	34.08	-	-	-	-	205	164	H
	7.172	36.17	PK2	35.7	-24.8	47.07	-	-	-	-	205	164	H
6	8.699	34.55	PK2	36	-21.7	48.85	-	-	-	-	186	231	V
	8.7	21.67	VA1T	36	-21.7	35.97	-	-	-	-	186	231	V

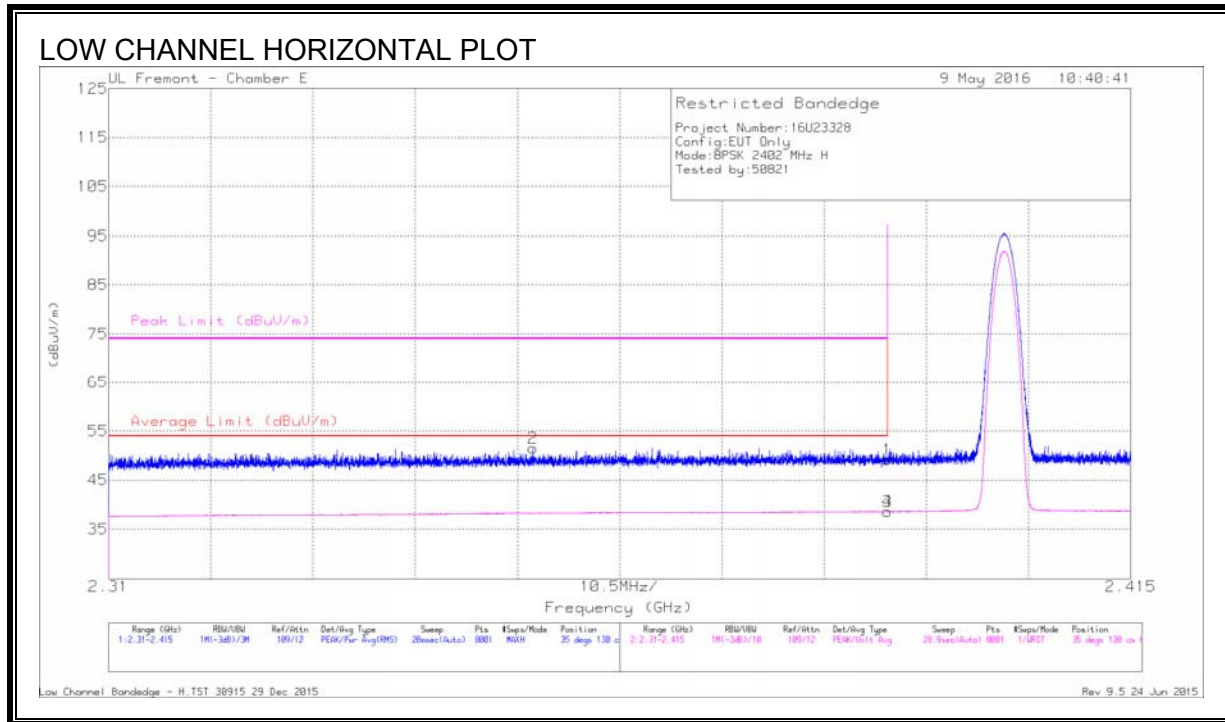
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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

8.2.4. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



DATA

Trace Markers

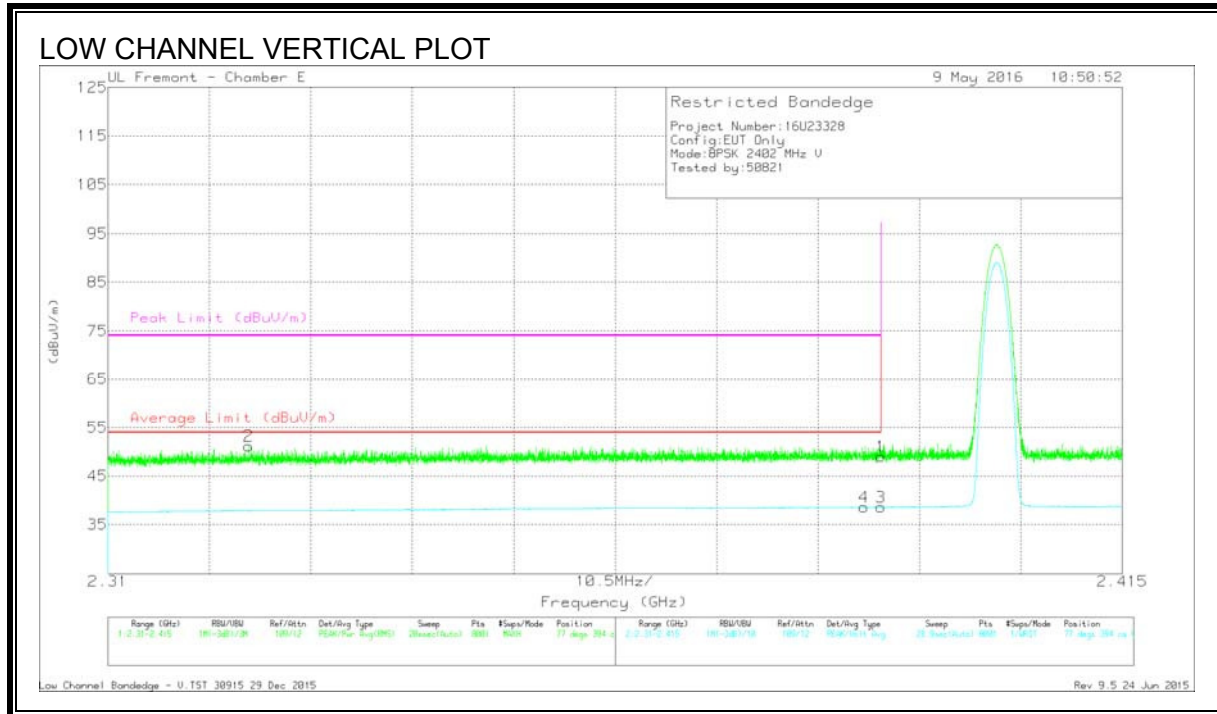
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.354	39.81	Pk	31.8	-20.1	51.51	-	-	74	-22.49	35	130	H
1	* 2.39	37.02	Pk	32.1	-19.9	49.22	-	-	74	-24.78	35	130	H
3	* 2.39	26.39	VA1T	32.1	-19.9	38.59	54	-15.41	-	-	35	130	H
4	* 2.39	26.39	VA1T	32.1	-19.9	38.59	54	-15.41	-	-	35	130	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

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

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



DATA

Trace Markers

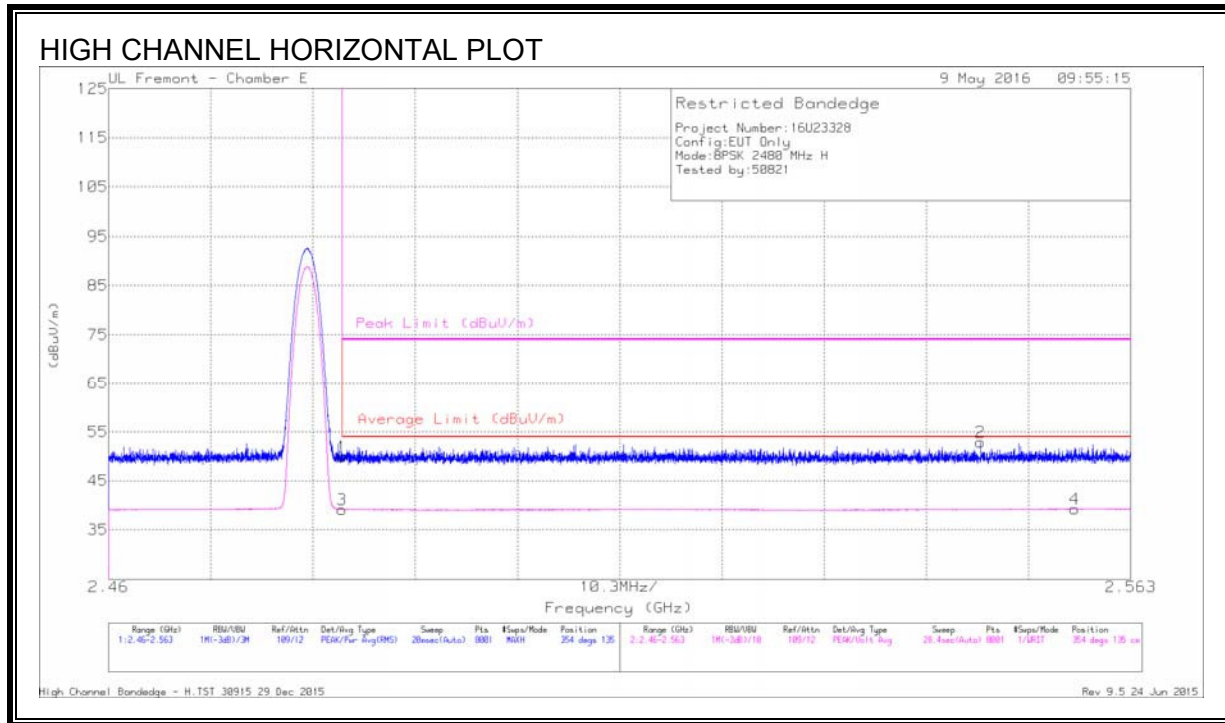
Marker	Frequency (GHz)	Meter Reading (dBUV)	Det	AF T711 (dB/m)	Amp/C bl/Filtr/ Pad (dB)	Corrected Reading (dBUV/m)	Average Limit (dBUV/m)	Margin (dB)	Peak Limit (dBUV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.325	39.72	Pk	31.6	-20.1	51.22	-	-	74	-22.78	77	394	V
4	* 2.388	26.39	VA1T	32.1	-19.9	38.59	54	-15.41	-	-	77	394	V
1	* 2.39	36.89	Pk	32.1	-19.9	49.09	-	-	74	-24.91	77	394	V
3	* 2.39	26.38	VA1T	32.1	-19.9	38.58	54	-15.42	-	-	77	394	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

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

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



DATA

Trace Markers

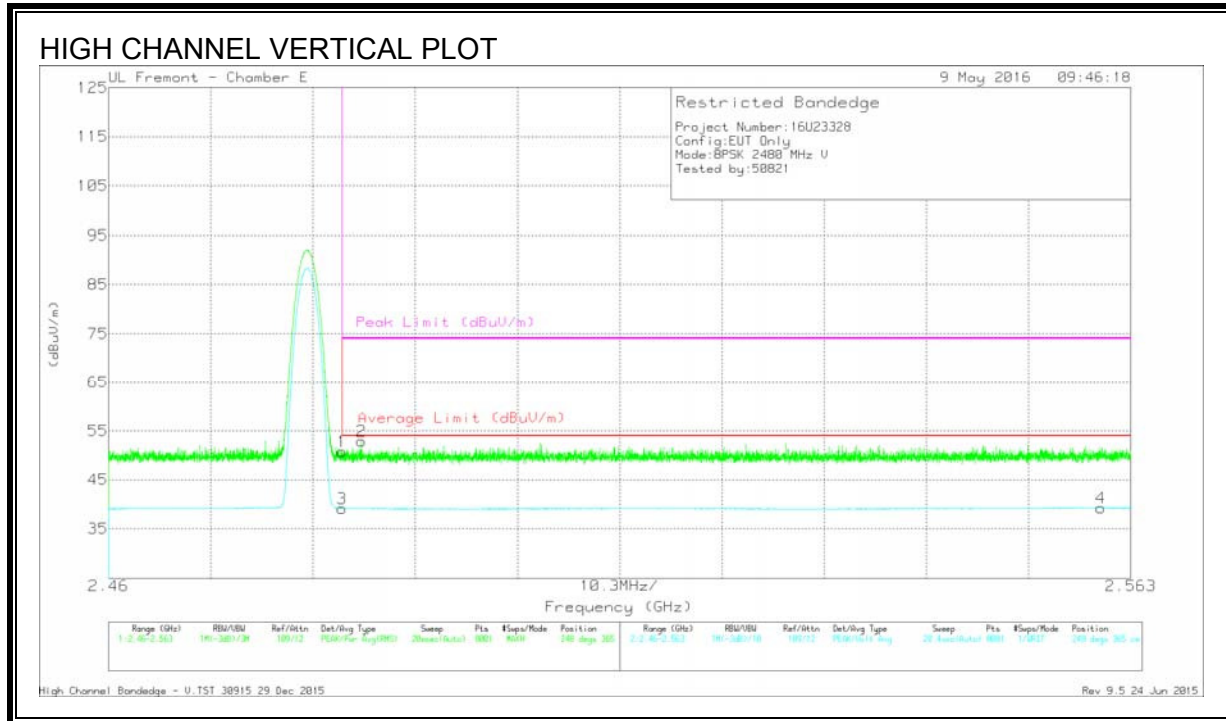
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cb/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	37.67	Pk	32.3	-20	49.97	-	-	74	-24.03	354	135	H
3	* 2.484	26.86	VA1T	32.3	-20	39.16	54	-14.84	-	-	354	135	H
2	2.548	40.66	Pk	32.4	-20.2	52.86	-	-	74	-21.14	354	135	H
4	2.557	26.99	VA1T	32.4	-20.1	39.29	54	-14.71	-	-	354	135	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

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

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBUV)	Det	AF T711 (dB/m)	Amp/Cb/Filtr/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	38.49	Pk	32.3	-20	50.79	-	-	74	-23.21	248	365	V
3	* 2.484	26.83	VA1T	32.3	-20	39.13	54	-14.87	-	-	248	365	V
2	* 2.485	40.65	Pk	32.3	-20.1	52.85	-	-	74	-21.15	248	365	V
4	2.56	26.87	VA1T	32.5	-20.1	39.27	54	-14.73	-	-	248	365	V

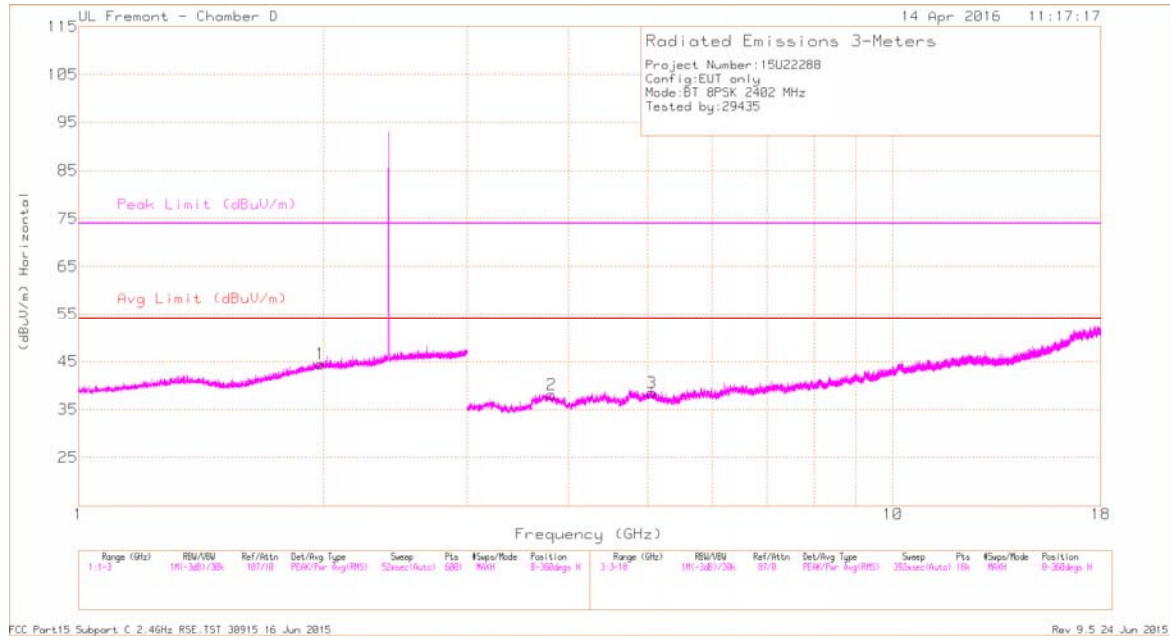
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

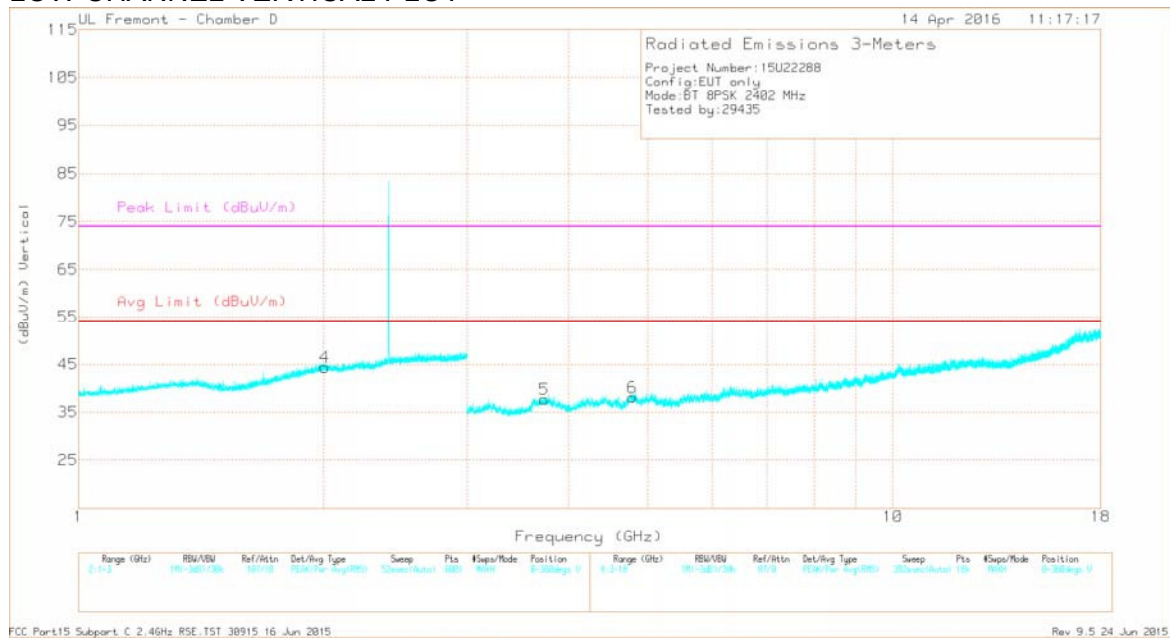
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT



LOW CHANNEL VERTICAL PLOT



DATA

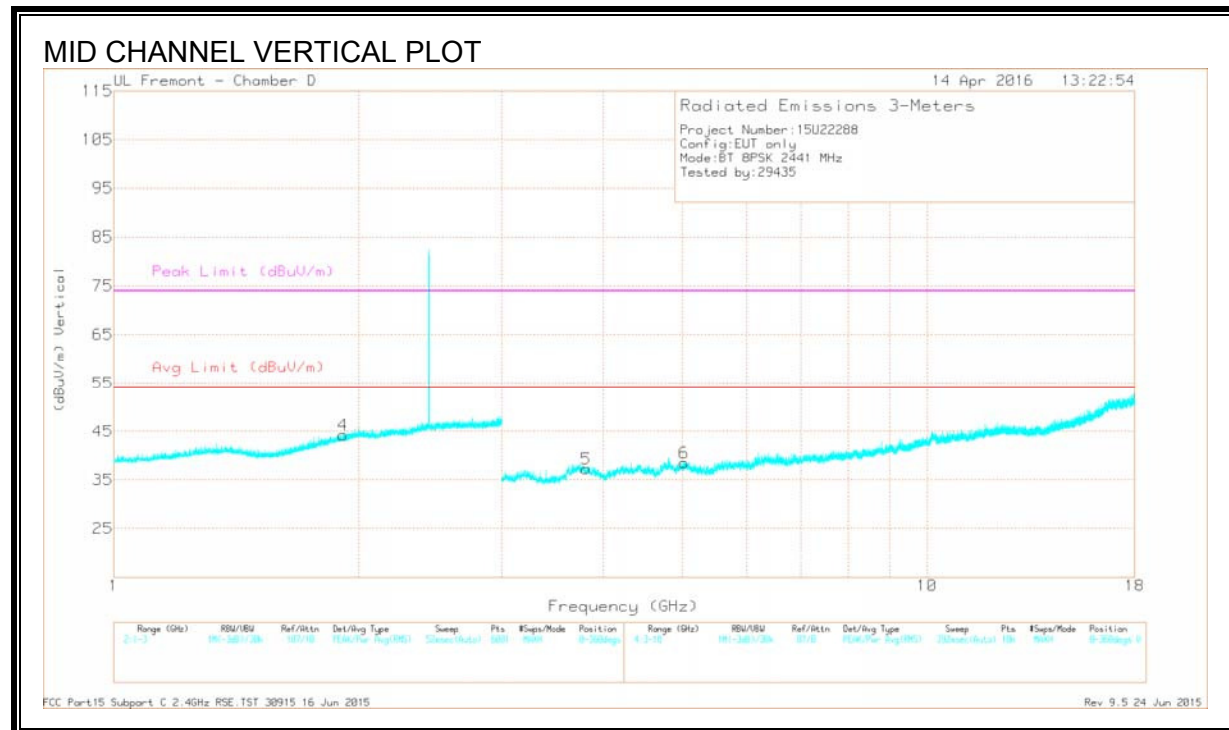
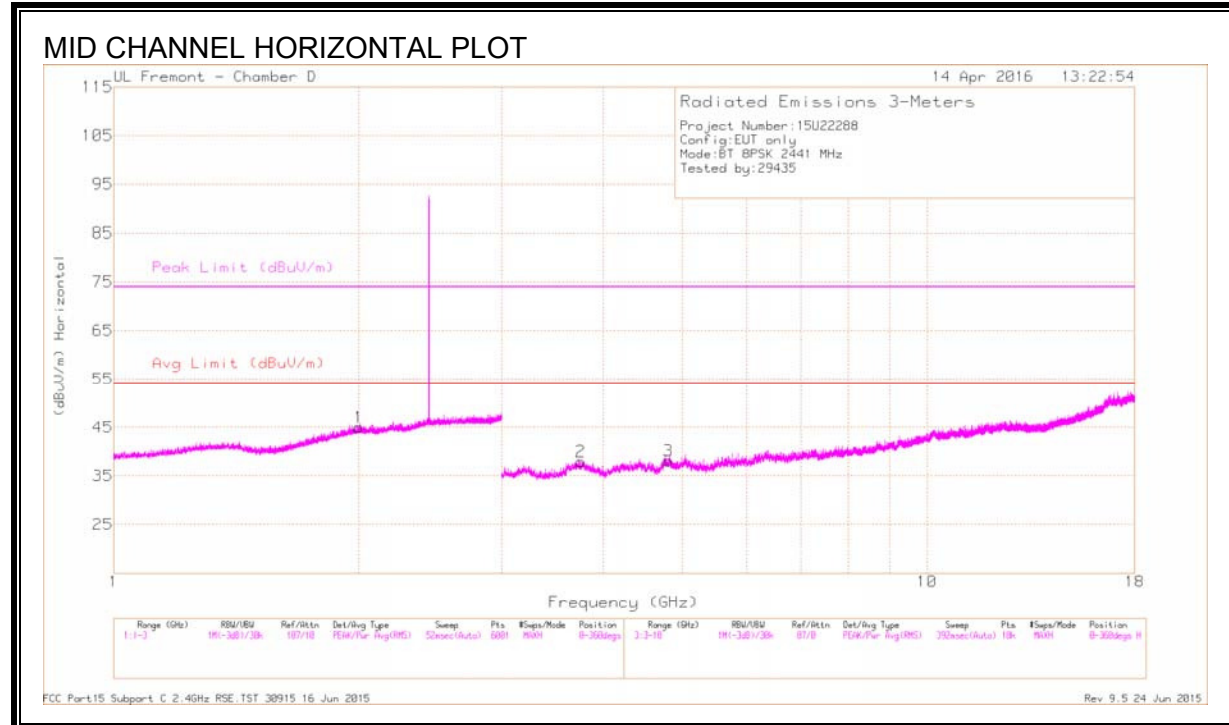
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 3.811	38.63	PK2	33.6	-28.3	43.93	-	-	74	-30.07	270	220	H
	* 3.812	25.91	VA1T	33.6	-28.3	31.21	54	-22.79	-	-	270	220	H
3	* 5.063	37.39	PK2	34	-26.5	44.89	-	-	74	-29.11	240	184	H
	* 5.063	24.73	VA1T	34	-26.5	32.23	54	-21.77	-	-	240	184	H
5	* 3.731	38.73	PK2	33.5	-28.4	43.83	-	-	74	-30.17	191	130	V
	* 3.729	25.85	VA1T	33.5	-28.5	30.85	54	-23.15	-	-	191	130	V
6	* 4.787	37.69	PK2	34	-26.6	45.09	-	-	74	-28.91	140	182	V
	* 4.787	24.51	VA1T	34	-26.6	31.91	54	-22.09	-	-	140	182	V
1	1.979	28.45	VA1T	31.4	-21.2	38.65	-	-	-	-	330	201	H
	1.982	41.78	PK2	31.5	-21.2	52.08	-	-	-	-	330	201	H
4	2.008	28.53	VA1T	31.6	-21.2	38.93	-	-	-	-	290	191	V
	2.009	41.59	PK2	31.5	-21.1	51.99	-	-	-	-	290	191	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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

HARMONICS AND SPURIOUS EMISSIONS



DATA

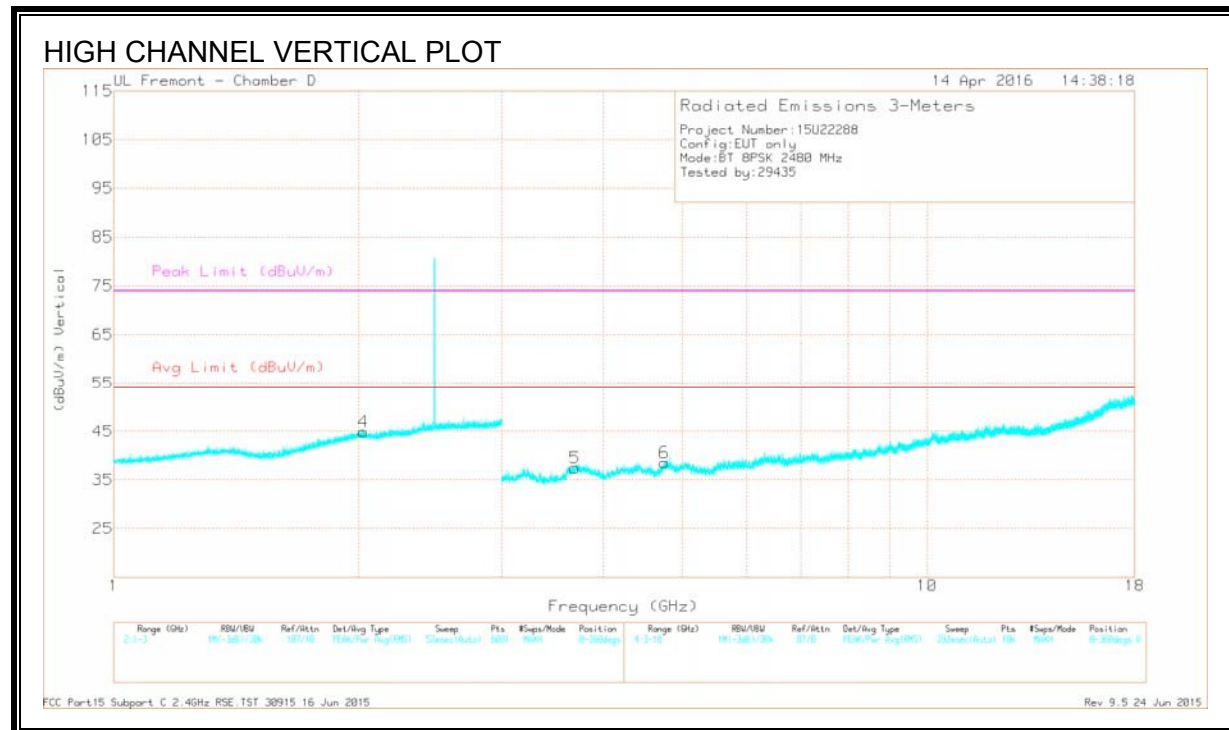
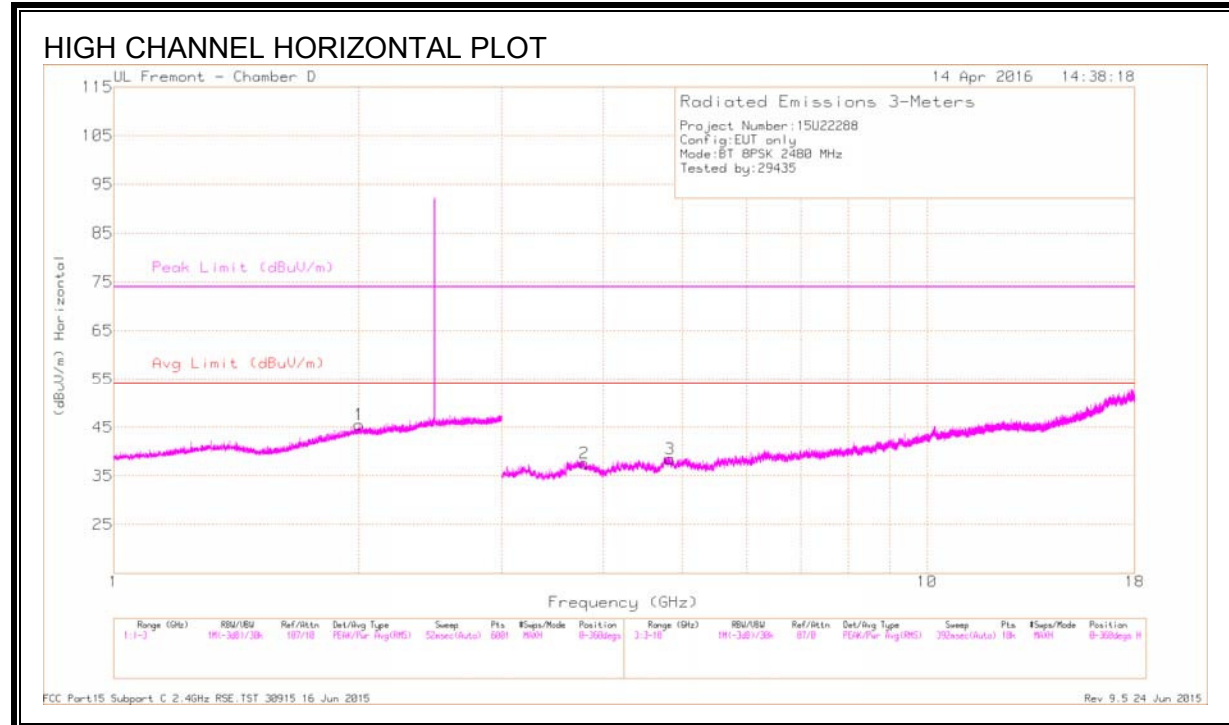
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 3.75	38.02	PK2	33.5	-28.2	43.32	-	-	74	-30.68	120	210	H
	* 3.748	25.13	VA1T	33.5	-28.2	30.43	54	-23.57	-	-	120	210	H
3	* 4.807	37.25	PK2	34.1	-26.8	44.55	-	-	74	-29.45	130	251	H
	* 4.807	24.41	VA1T	34.1	-26.8	31.71	54	-22.29	-	-	130	251	H
5	* 3.813	38.57	PK2	33.6	-28.3	43.87	-	-	74	-30.13	160	184	V
	* 3.813	25.56	VA1T	33.6	-28.3	30.86	54	-23.14	-	-	160	184	V
6	* 5.026	37.39	PK2	34	-26.4	44.99	-	-	74	-29.01	190	140	V
	* 5.024	24.36	VA1T	34	-26.5	31.86	54	-22.14	-	-	190	140	V
4	1.915	28.47	VA1T	31	-21.2	38.27	-	-	-	-	110	150	V
	1.916	41.95	PK2	31	-21.2	51.75	-	-	-	-	110	150	V
1	2.001	41.73	PK2	31.6	-21.2	52.13	-	-	-	-	98	141	H
	2.004	28.47	VA1T	31.6	-21.2	38.87	-	-	-	-	98	141	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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

HARMONICS AND SPURIOUS EMISSIONS



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fitr/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	* 3.791	38.32	PK2	33.5	-28.1	43.72	-	-	74	-30.28	250	116	H
	* 3.792	25.64	VA1T	33.5	-28.1	31.04	54	-22.96	-	-	250	116	H
3	* 4.833	37.72	PK2	34.1	-27.3	44.52	-	-	74	-29.48	220	183	H
	* 4.831	25.13	VA1T	34.1	-27.2	32.03	54	-21.97	-	-	220	183	H
5	* 3.689	38.66	PK2	33.5	-28.9	43.26	-	-	74	-30.74	250	151	V
	* 3.692	25.78	VA1T	33.5	-28.9	30.38	54	-23.62	-	-	250	151	V
6	* 4.751	37.77	PK2	34	-26.5	45.27	-	-	74	-28.73	210	171	V
	* 4.755	25.26	VA1T	34	-26.4	32.86	54	-21.14	-	-	210	171	V
1	2.005	41.77	PK2	31.6	-21.2	52.17	-	-	-	-	290	120	H
	2.005	28.5	VA1T	31.6	-21.2	38.9	-	-	-	-	290	120	H
4	2.026	41.64	PK2	31.5	-21.1	52.04	-	-	-	-	271	130	V
	2.029	28.49	VA1T	31.4	-21.1	38.79	-	-	-	-	271	130	V

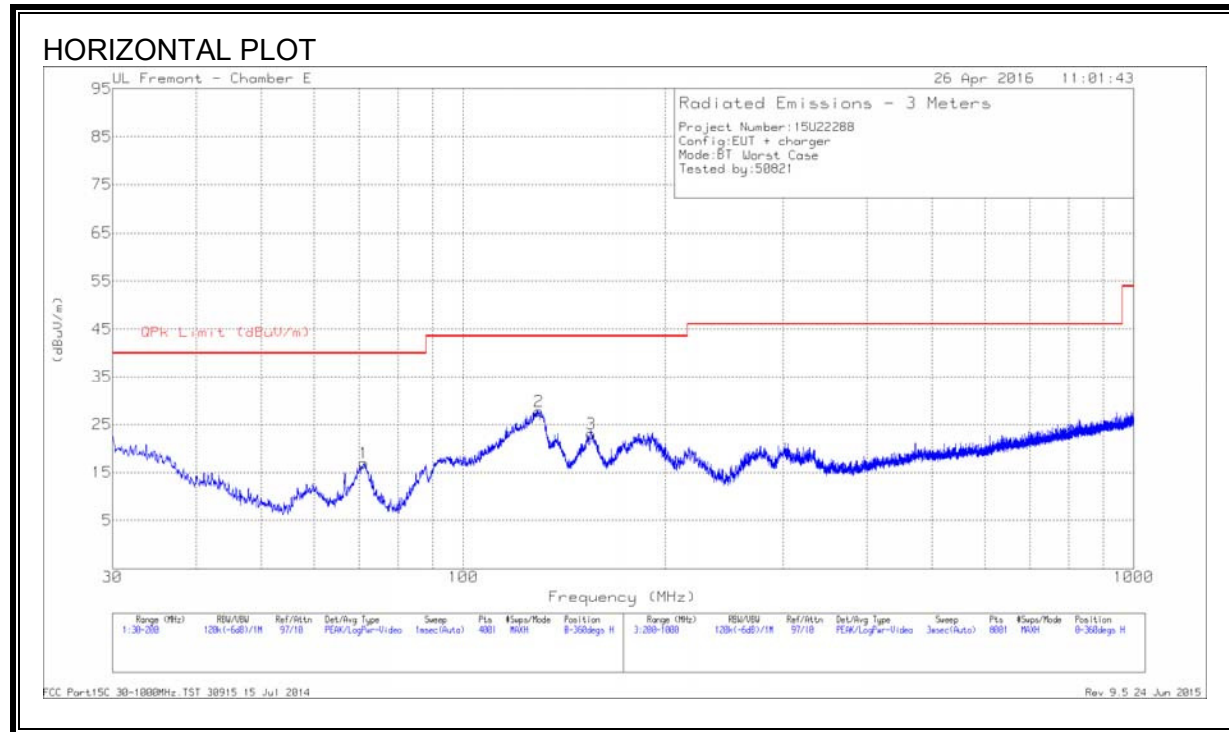
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

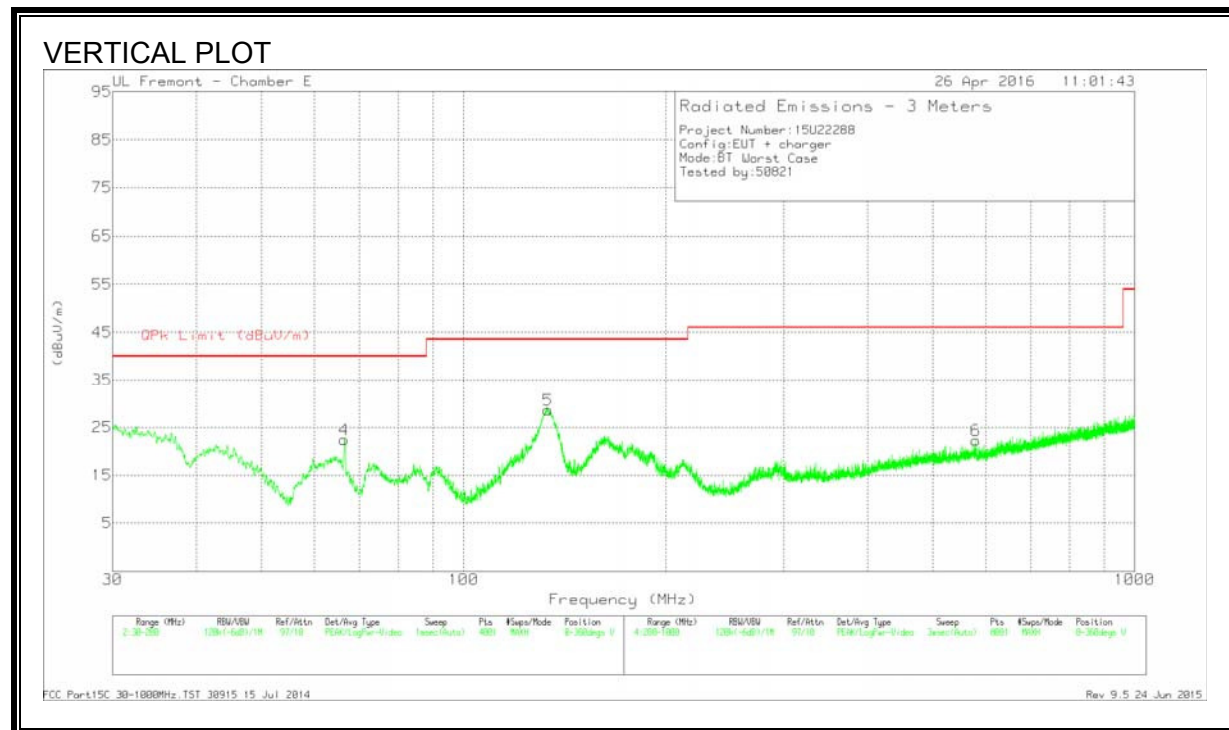
VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

8.3. WORST-CASE BELOW 1 GHz

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



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



DATA

Trace Markers

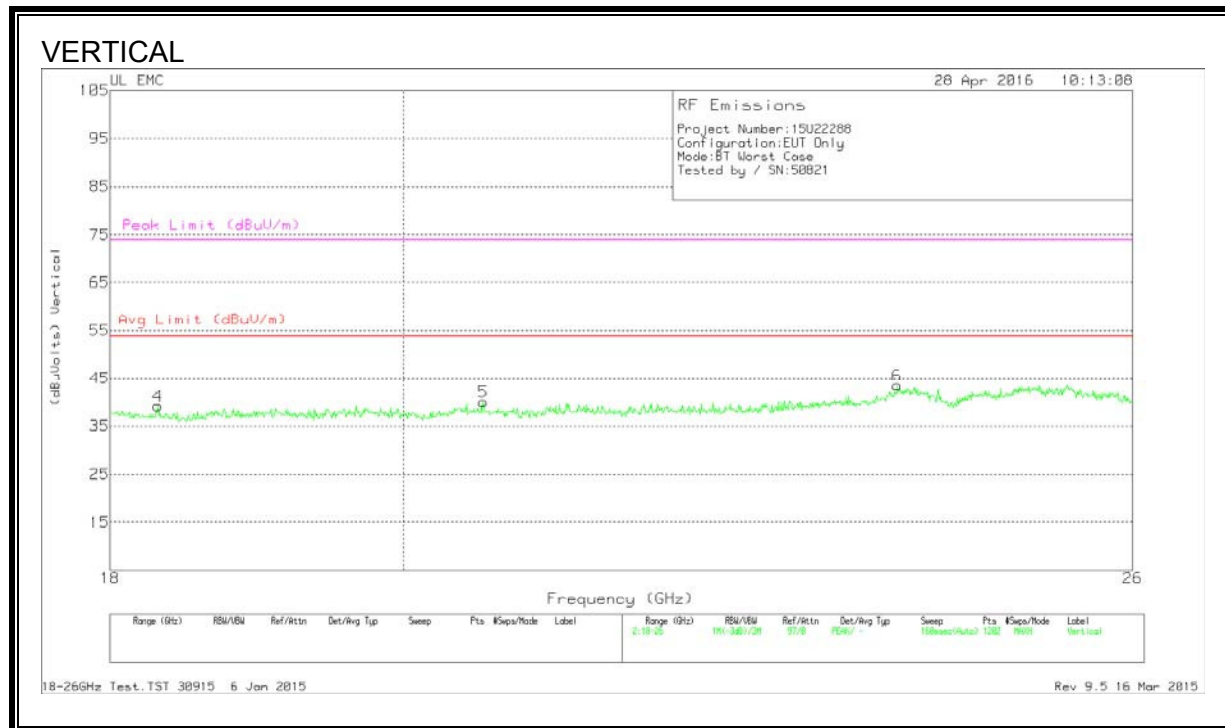
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 129.62	41.07	Pk	17.9	-31.2	27.77	43.52	-15.75	0-360	201	H
5	* 133.615	42.18	Pk	17.6	-31.1	28.68	43.52	-14.84	0-360	100	V
4	66.4013	42.17	Pk	11.8	-31.5	22.47	40	-17.53	0-360	100	V
1	71.1825	36.52	Pk	12	-31.5	17.02	40	-22.98	0-360	201	H
3	155.3325	37.87	Pk	16.2	-31	23.07	43.52	-20.45	0-360	201	H
6	580.3	29.24	Pk	22.6	-29.5	22.34	46.02	-23.68	0-360	301	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

8.4. WORST-CASE ABOVE 18 GHz

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



Data

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T477 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.999	41.13	Pk	32.5	-24.8	-9.5	39.333	54	-14.67	74	-34.67
2	22.276	40.8	Pk	33.3	-24.6	-9.5	40	54	-14	74	-34
3	22.996	42.23	Pk	33.1	-25	-9.5	40.83	54	-13.17	74	-33.17
4	18.313	41.67	Pk	32.3	-25.3	-9.5	39.17	54	-14.83	74	-34.83
5	20.585	41.9	Pk	33.1	-25.5	-9.5	40	54	-14	74	-34
6	23.888	43.3	Pk	33.7	-24	-9.5	43.5	54	-10.5	74	-30.5

Pk - Peak detector

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	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

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

WORST EMISSIONS

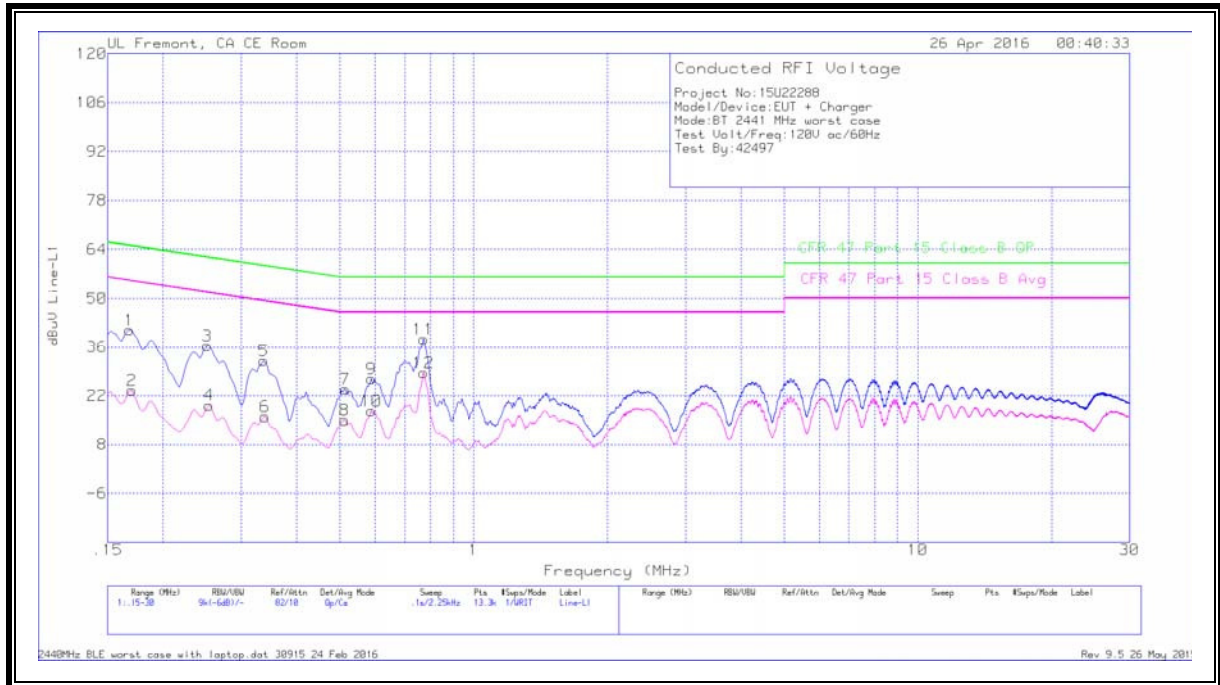
Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.168	29.61	Qp	1.2	0	10.1	40.91	65.06	-24.15	-	-
2	.17025	12.2	Ca	1.2	0	10.1	23.5	-	-	54.95	-31.45
3	.25125	25.58	Qp	.7	0	10.1	36.38	61.72	-25.34	-	-
4	.2535	8.52	Ca	.7	0	10.1	19.32	-	-	51.64	-32.32
5	.33675	21.48	Qp	.5	0	10.1	32.08	59.28	-27.2	-	-
6	.339	5.42	Ca	.5	0	10.1	16.02	-	-	49.23	-33.21
7	.5145	13.53	Qp	.3	0	10.1	23.93	56	-32.07	-	-
8	.51225	4.58	Ca	.3	0	10.1	14.98	-	-	46	-31.02
9	.58875	16.48	Qp	.3	0	10.1	26.88	56	-29.12	-	-
10	.58875	7.27	Ca	.3	0	10.1	17.67	-	-	46	-28.33
11	.771	27.95	Qp	.3	0	10.1	38.35	56	-17.65	-	-
12	.771	18.28	Ca	.3	0	10.1	28.68	-	-	46	-17.32

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	.168	30.19	Qp	1.3	0	10.1	41.59	65.06	-23.47	-	-
14	.17025	12.8	Ca	1.2	0	10.1	24.1	-	-	54.95	-30.85
15	.25125	25.83	Qp	.7	0	10.1	36.63	61.72	-25.09	-	-
16	.2535	9.62	Ca	.7	0	10.1	20.42	-	-	51.64	-31.22
17	.33675	20.72	Qp	.5	0	10.1	31.32	59.28	-27.96	-	-
18	.339	5.99	Ca	.5	0	10.1	16.59	-	-	49.23	-32.64
19	.51225	15.13	Qp	.4	0	10.1	25.63	56	-30.37	-	-
20	.51225	4.99	Ca	.4	0	10.1	15.49	-	-	46	-30.51
21	.58875	16.06	Qp	.3	0	10.1	26.46	56	-29.54	-	-
22	.58875	7.94	Ca	.3	0	10.1	18.34	-	-	46	-27.66
23	.76875	28.84	Qp	.3	0	10.1	39.24	56	-16.76	-	-
24	.771	18.61	Ca	.3	0	10.1	29.01	-	-	46	-16.99

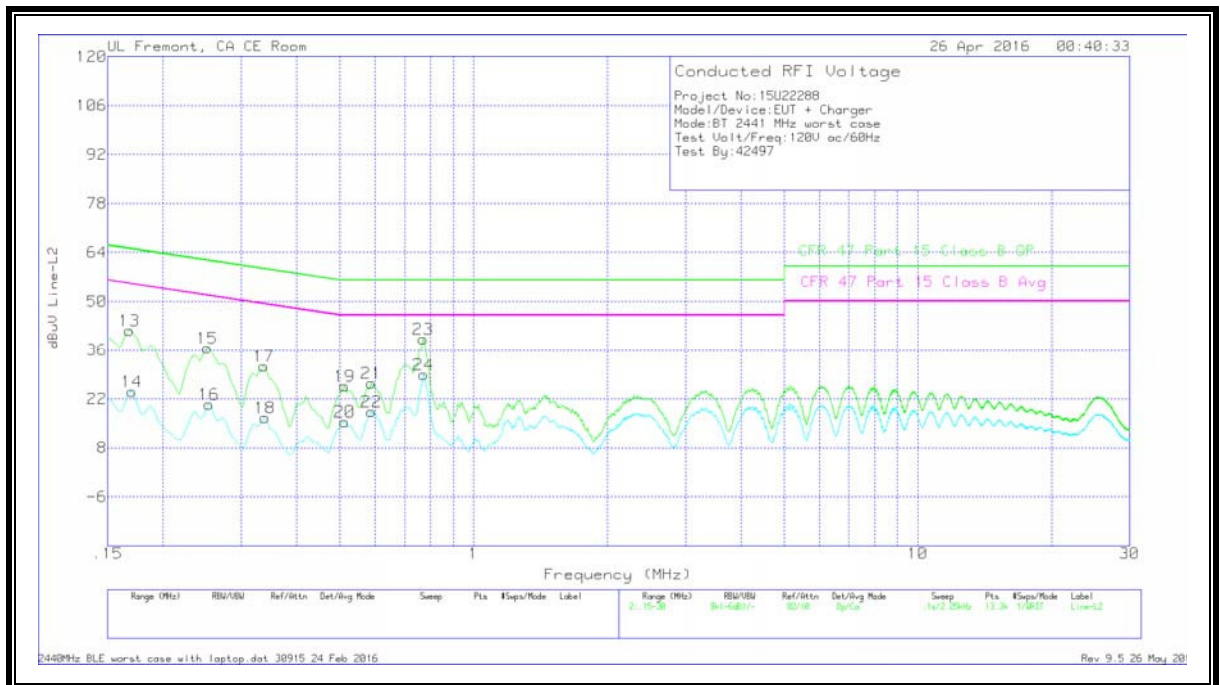
Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 1 RESULTS



LINE 2 RESULTS



9.2. EUT POWERED BY HOST PC VIA USB CABLE

WORST EMISSIONS

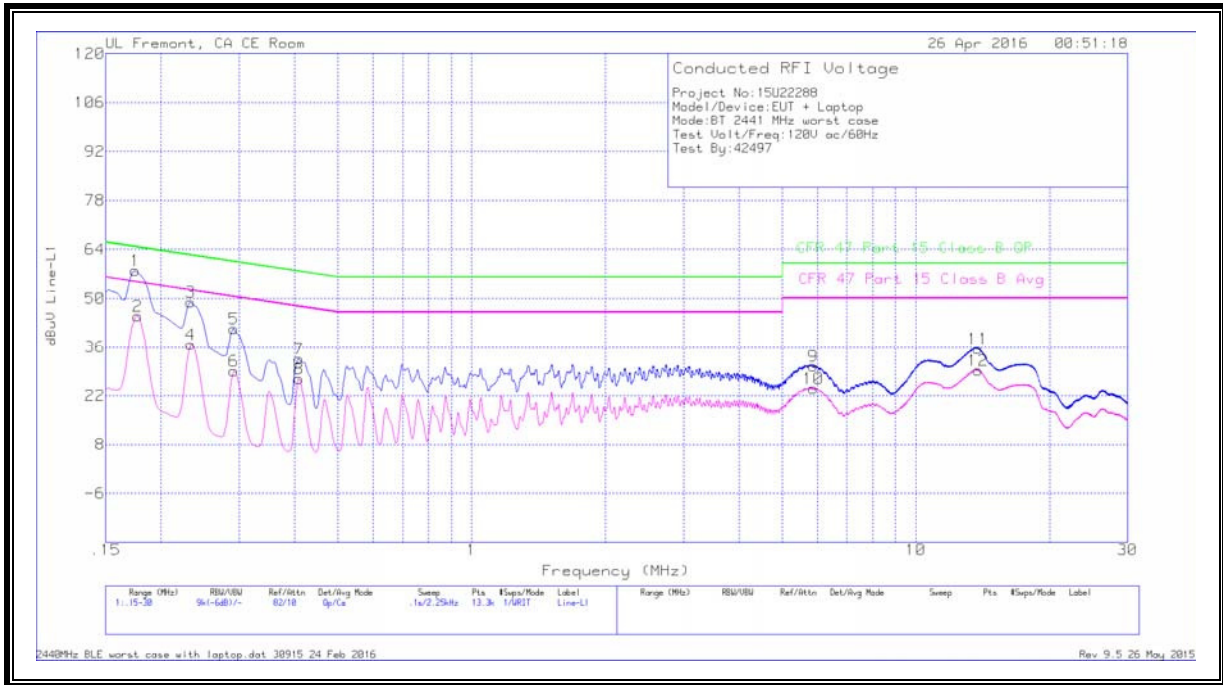
Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.17475	46.75	Qp	1.1	0	10.1	57.95	64.73	-6.78	-	-
2	.177	33.74	Ca	1.1	0	10.1	44.94	-	-	54.63	-9.69
3	.23325	38.02	Qp	.8	0	10.1	48.92	62.33	-13.41	-	-
4	.23325	25.84	Ca	.8	0	10.1	36.74	-	-	52.33	-15.59
5	.29175	30.56	Qp	.6	0	10.1	41.26	60.47	-19.21	-	-
6	.29175	18.4	Ca	.6	0	10.1	29.1	-	-	50.47	-21.37
7	.40875	22.12	Qp	.4	0	10.1	32.62	57.67	-25.05	-	-
8	.40875	16.41	Ca	.4	0	10.1	26.91	-	-	47.67	-20.76
9	5.8695	20.03	Qp	.2	.1	10.2	30.53	60	-29.47	-	-
10	5.8695	13.58	Ca	.2	.1	10.2	24.08	-	-	50	-25.92
11	13.821	24.96	Qp	.2	.2	10.2	35.56	60	-24.44	-	-
12	13.7985	18.78	Ca	.2	.2	10.2	29.38	-	-	50	-20.62

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	.17475	47.09	Qp	1.2	0	10.1	58.39	64.73	-6.34	-	-
14	.177	33.9	Ca	1.2	0	10.1	45.2	-	-	54.63	-9.43
15	.23325	37.2	Qp	.8	0	10.1	48.1	62.33	-14.23	-	-
16	.23325	26.12	Ca	.8	0	10.1	37.02	-	-	52.33	-15.31
17	.29175	30.94	Qp	.6	0	10.1	41.64	60.47	-18.83	-	-
18	.29175	21.62	Ca	.6	0	10.1	32.32	-	-	50.47	-18.15
19	.40875	22.22	Qp	.4	0	10.1	32.72	57.67	-24.95	-	-
20	.40875	17.06	Ca	.4	0	10.1	27.56	-	-	47.67	-20.11
21	5.3655	21.62	Qp	.2	.1	10.1	32.02	60	-27.98	-	-
22	5.35763	13.43	Ca	.2	.1	10.1	23.83	-	-	50	-26.17
23	14.064	24.16	Qp	.2	.2	10.2	34.76	60	-25.24	-	-
24	14.08425	18.66	Ca	.2	.2	10.2	29.26	-	-	50	-20.74

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 1 RESULTS



LINE 2 RESULTS

