

8.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

NCC LP0002 3.10.1.5(1)

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.

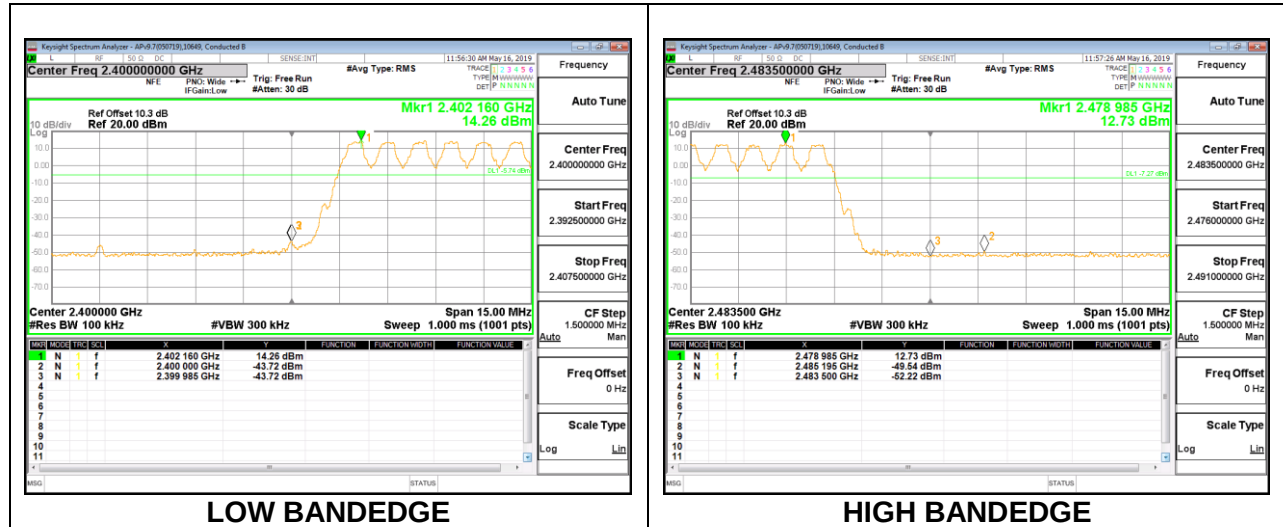
RESULTS

8.8.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

SPURIOUS EMISSIONS, NON-HOPPING



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

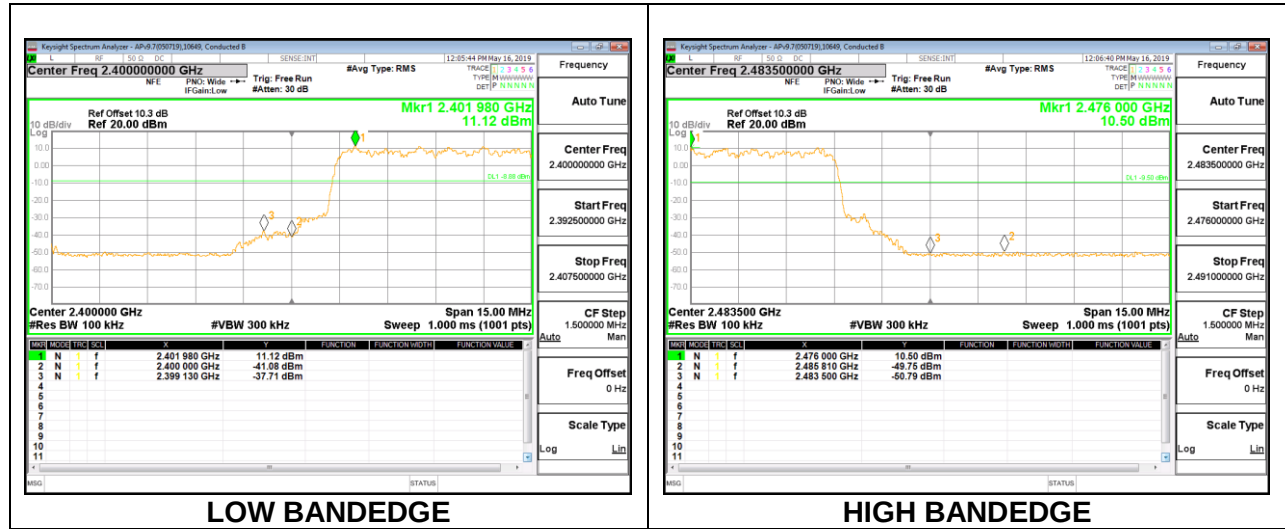


8.8.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

SPURIOUS EMISSIONS, NON-HOPPING



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



9. RADIATED TEST RESULTS

LIMITS

NCC LP0002 §2.7 and §2.8

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

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

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

For 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 measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements.

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

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

For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.

KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

KDB 558074 D01 15.247 Meas Guidance v05r01

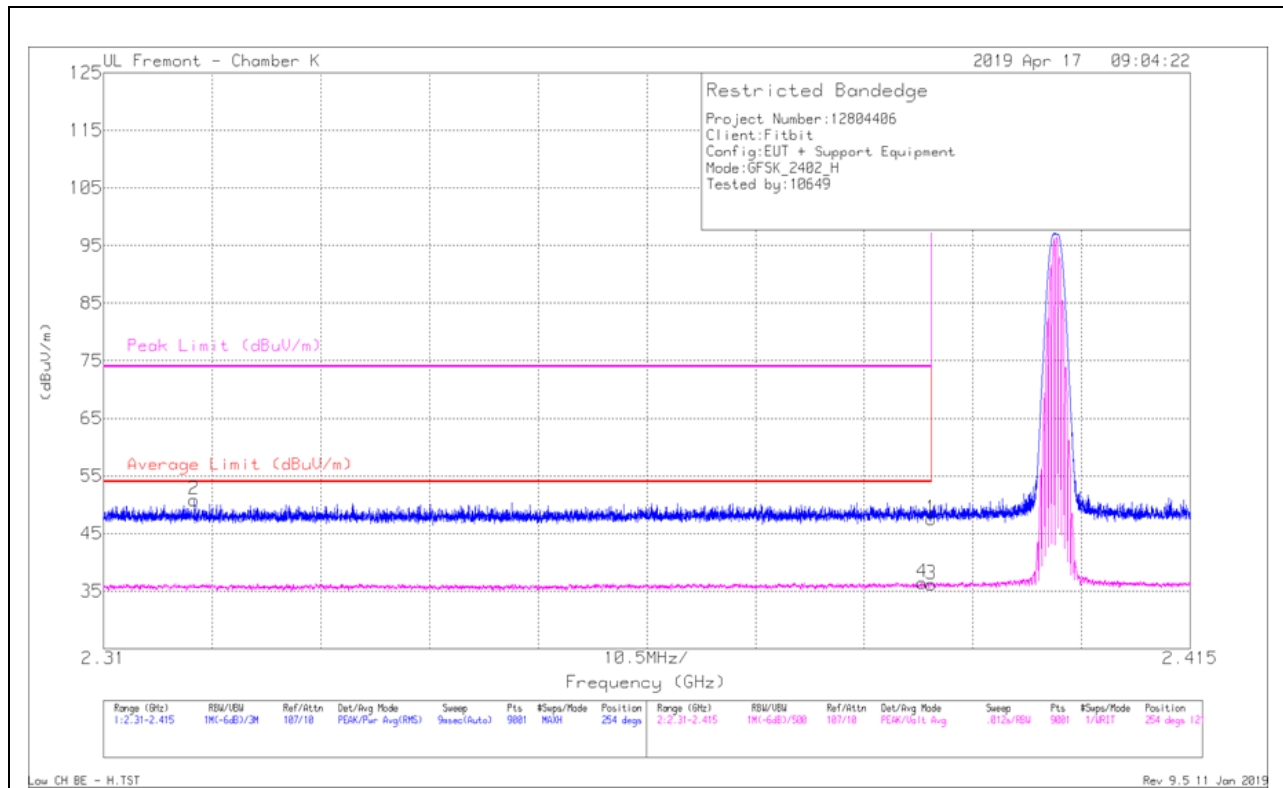
Use of a duty cycle correction factor (DCCF) is permitted for calculating average radiated field strength emission levels for an FHSS device in 15.247. This DCCF can be applied when the field strength limit (e.g., within a Government Restricted band) and the conditions specified in Section 15.35(c) can be satisfied. The average radiated field strength is calculated by subtracting the DCCF from the maximum radiated field strength level as determined through measurement. The maximum radiated field strength level represents the worst-case (maximum amplitude) RMS measurement of the emission(s) during continuous transmission (i.e., not including any time intervals during which the transmitter is off or is transmitting at a reduced power level). It is also acceptable to apply the DCCF to a measurement performed with a peak detector instead of the specified RMS power averaging detector. Note that Section 15.35(c) specifies that the DCCF shall represent the worst-case (greatest duty cycle) over any 100 msec transmission period.

9.1. TRANSMITTER ABOVE 1 GHz

9.1.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



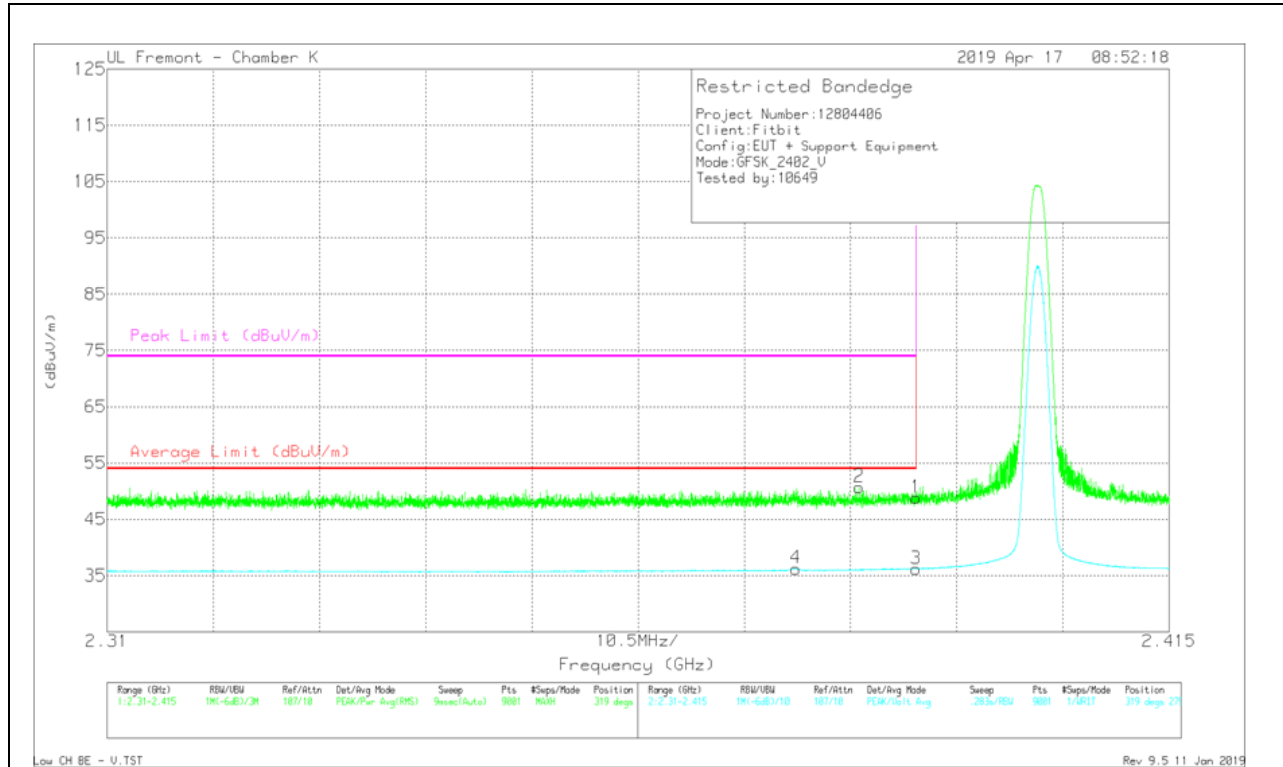
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Ampl/Cbl/Filt /Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.39	Pk	31.9	-24.7	47.59	-	-	74	-26.41	254	121	H
2	* 2.319	43.77	Pk	31.7	-24.6	50.87	-	-	74	-23.13	254	121	H
3	* 2.39	29.01	VA1T	31.9	-24.7	36.21	54	-17.79	-	-	254	121	H
4	* 2.389	29.29	VA1T	31.9	-24.7	36.49	54	-17.51	-	-	254	121	H

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

Pk - Peak detector

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

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Ampl/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	* 2.39	41.63	Pk	31.9	-24.7	48.83	-	-	74	-25.17	319	279	V
2	* 2.384	43.4	Pk	31.9	-24.6	50.7	-	-	74	-23.3	319	279	V
3	* 2.39	28.98	VA1T	31.9	-24.7	36.18	54	-17.82	-	-	319	279	V
4	* 2.378	29.15	VA1T	31.8	-24.7	36.25	54	-17.75	-	-	319	279	V

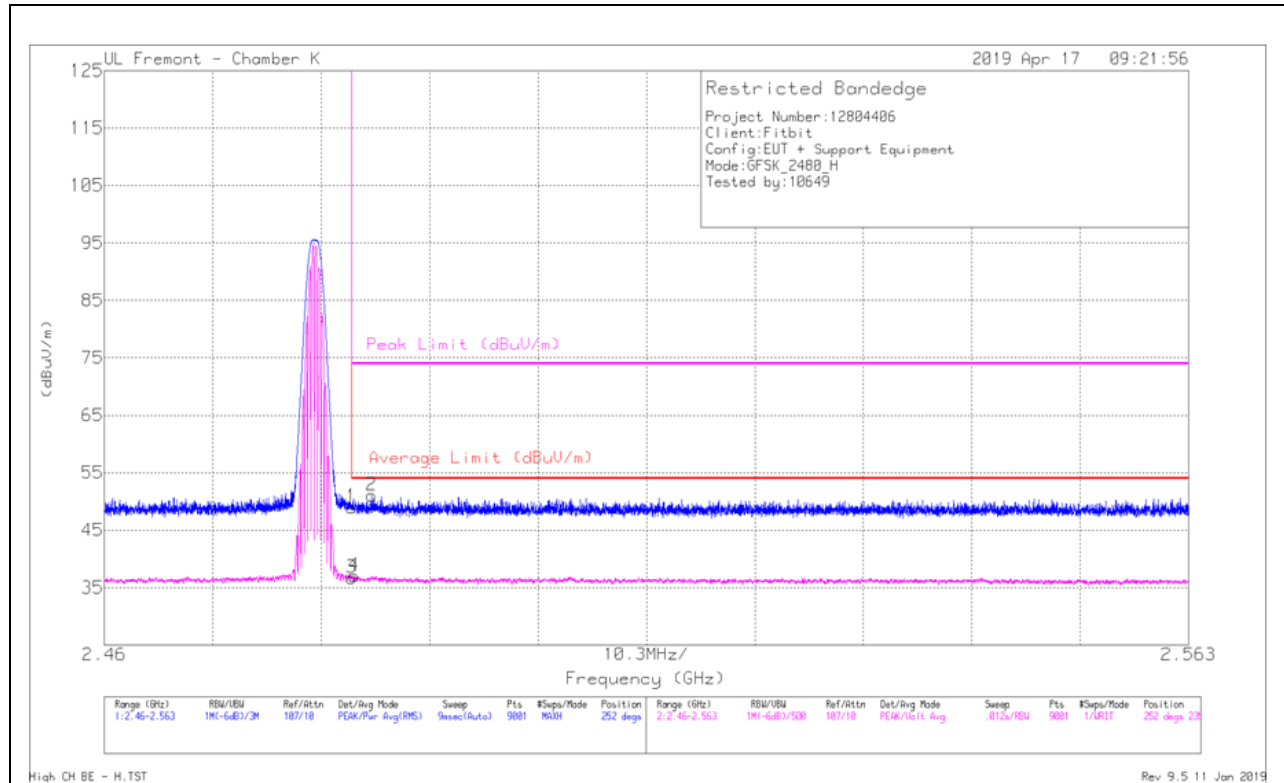
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

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

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



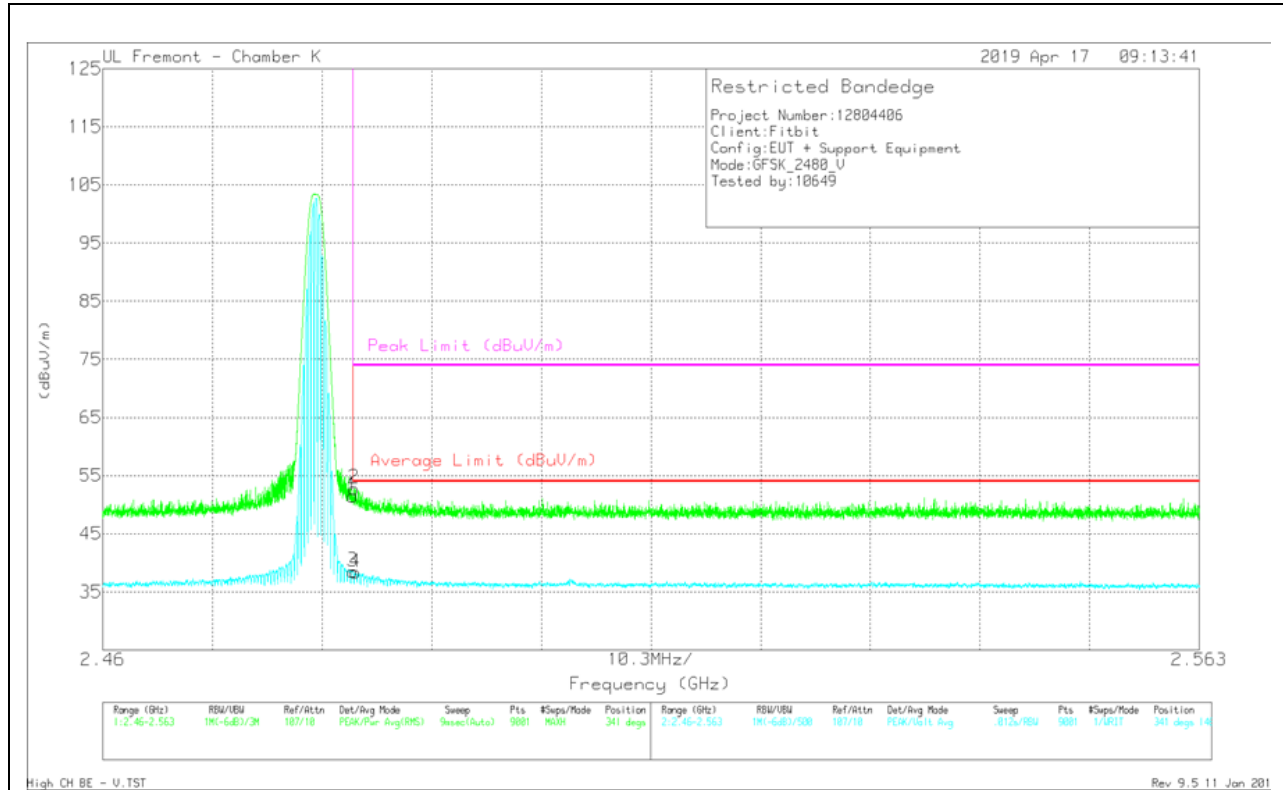
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.49	Pk	32.3	-24.8	48.99	-	-	74	-25.01	252	235	H
2	* 2.485	43.54	Pk	32.3	-24.8	51.04	-	-	74	-22.96	252	235	H
3	* 2.484	29.15	VA1T	32.3	-24.8	36.65	54	-17.35	-	-	252	235	H
4	* 2.484	29.54	VA1T	32.3	-24.8	37.04	54	-16.96	-	-	252	235	H

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

Pk - Peak detector

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

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Ampl/Cbl/Filt /Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	43.99	Pk	32.3	-24.8	51.49	-	-	74	-22.51	341	146	V
2	* 2.484	45.3	Pk	32.3	-24.8	52.8	-	-	74	-21.2	341	146	V
3	* 2.484	31.01	VA1T	32.3	-24.8	38.51	54	-15.49	-	-	341	146	V
4	* 2.484	30.86	VA1T	32.3	-24.8	38.36	54	-15.64	-	-	341	146	V

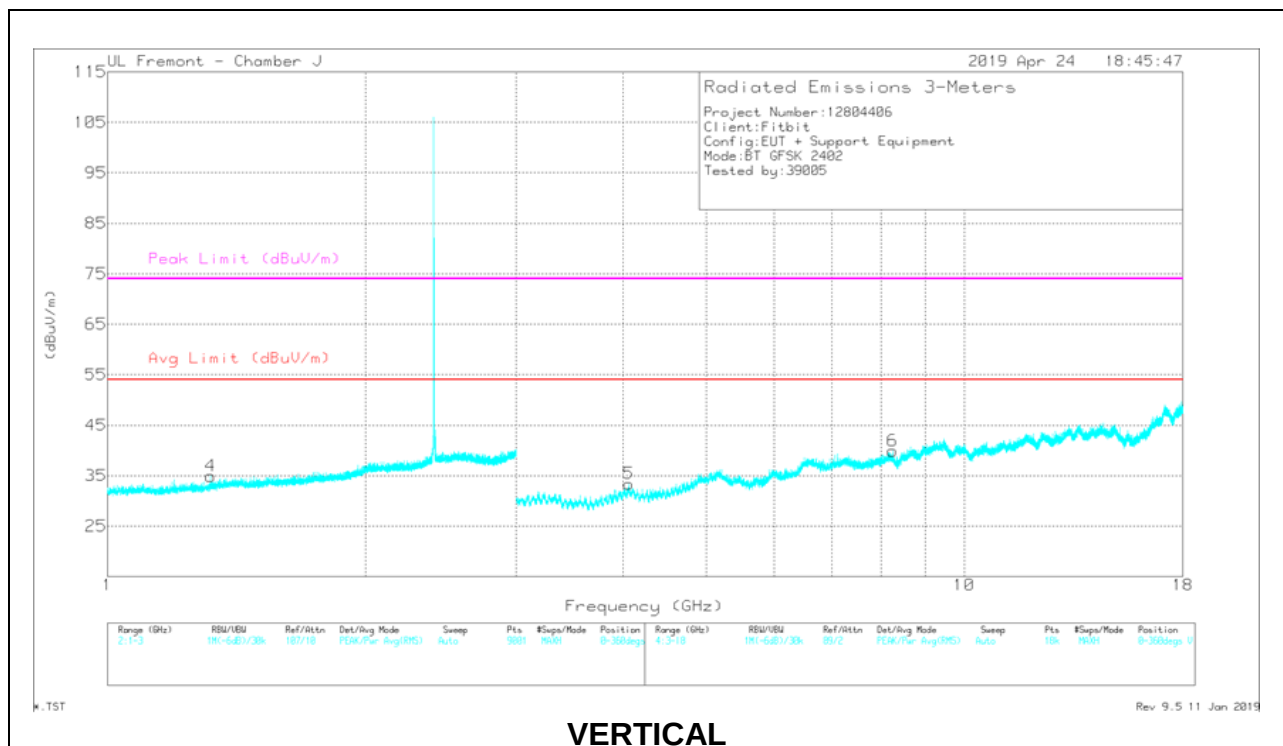
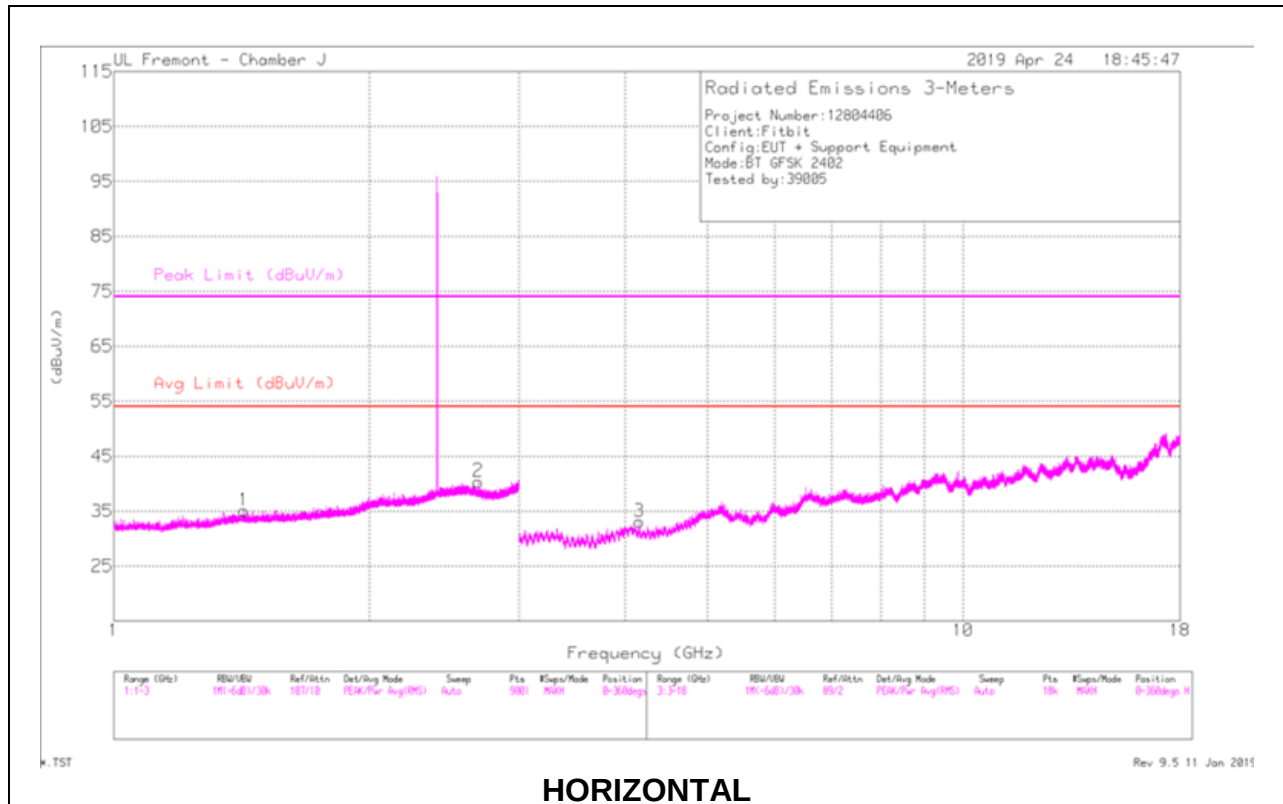
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

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

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



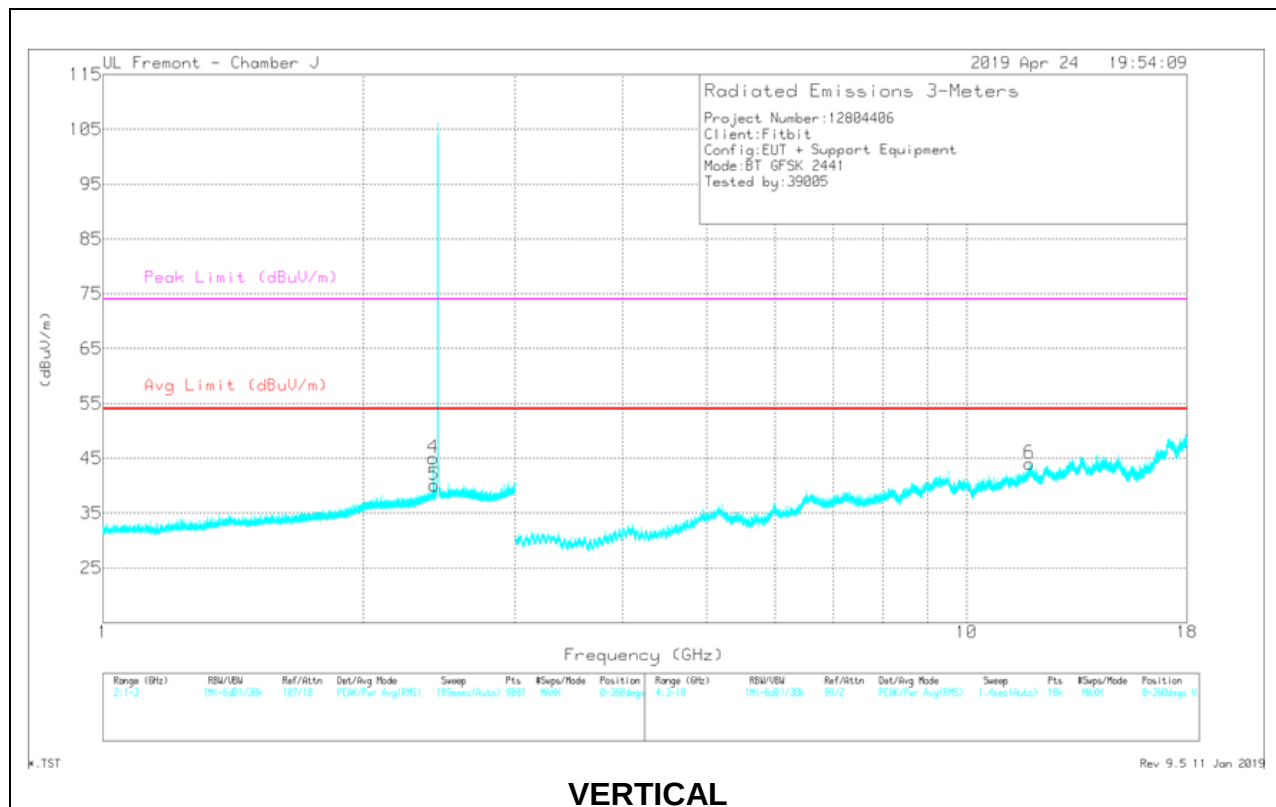
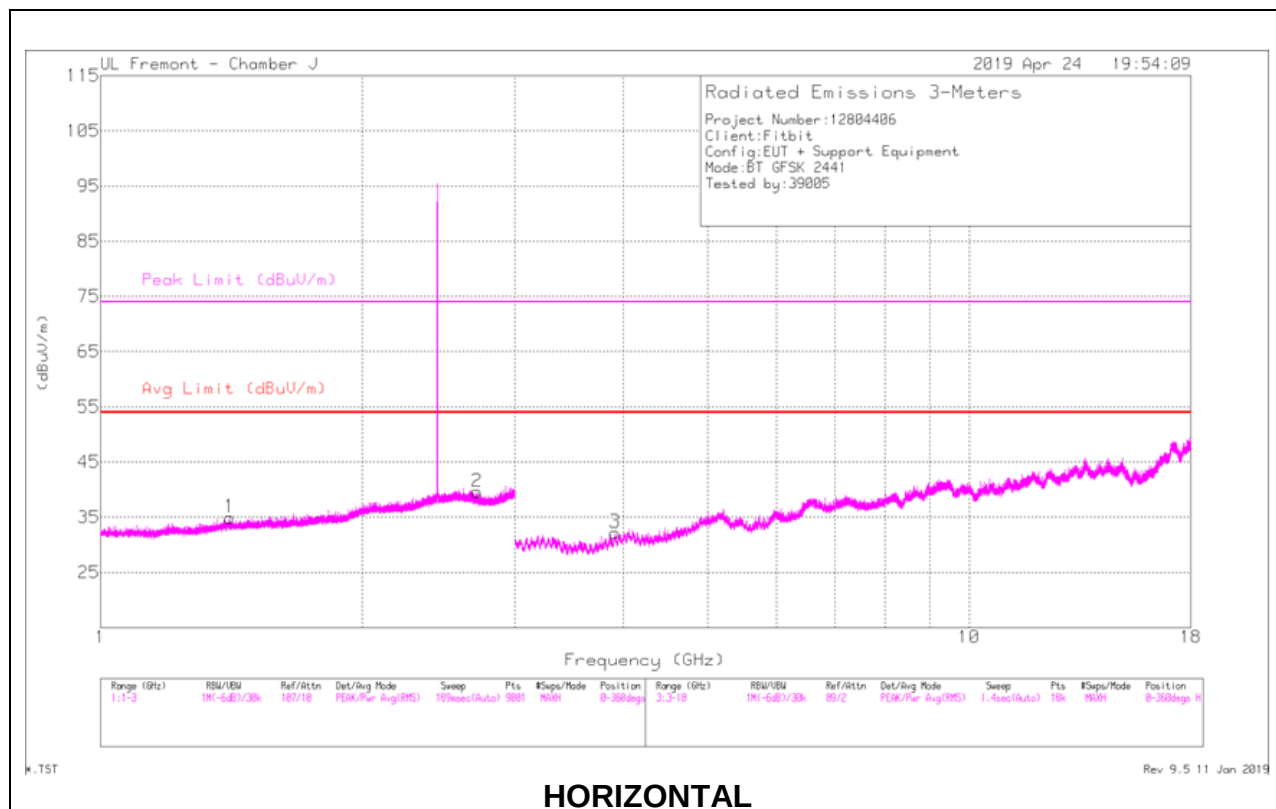
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE018905 5 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.424	42.61	PKFH	25.1	-26.1	41.61	-	-	74	-32.39	30	168	H
* 1.424	30.56	VA1T	25.1	-26.1	29.56	54	-24.44	-	-	30	168	H
* 2.686	42.34	PKFH	29.7	-25.5	46.54	-	-	74	-27.46	331	136	H
* 2.685	29.89	VA1T	29.7	-25.5	34.09	54	-19.91	-	-	331	136	H
* 1.318	43.29	PKFH	24.6	-26.1	41.79	-	-	74	-32.21	286	168	V
* 1.319	30.29	VA1T	24.6	-26.1	28.79	54	-25.21	-	-	286	168	V
* 4.164	39.7	PKFH	32.1	-31.9	39.9	-	-	74	-34.1	323	200	H
* 4.16	26.77	VA1T	32.1	-31.8	27.07	54	-26.93	-	-	323	200	H
* 4.061	40.17	PKFH	32.3	-32	40.47	-	-	74	-33.53	85	309	V
* 4.058	27.43	VA1T	32.3	-32	27.73	54	-26.27	-	-	85	309	V
* 8.249	35.07	PKFH	38.4	-26.5	46.97	-	-	74	-27.03	169	326	V
* 8.252	22.38	VA1T	38.4	-26.5	34.28	54	-19.72	-	-	169	326	V

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

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

MID CHANNEL RESULTS



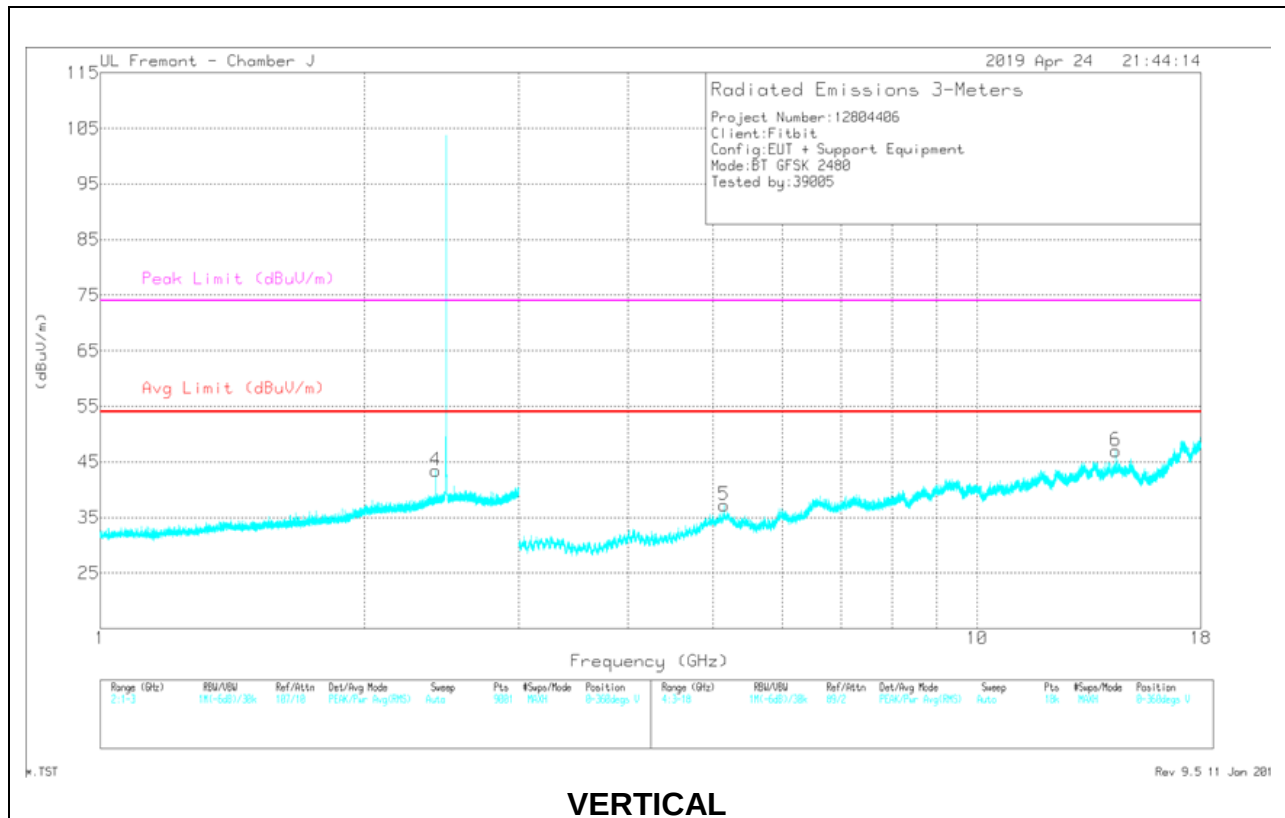
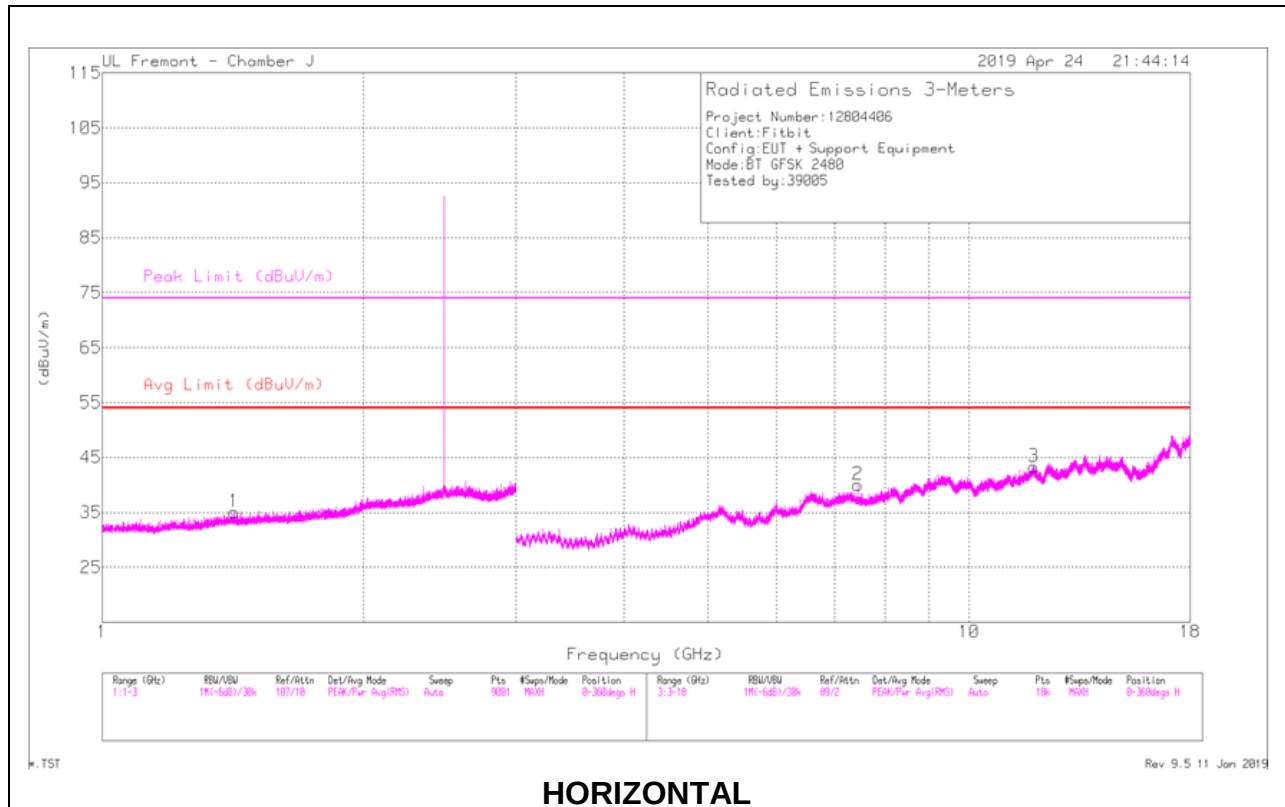
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE018905 5 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.407	43.25	PKFH	25.2	-26.1	42.35	-	-	74	-31.65	142	272	H
* 1.41	30.25	VA1T	25.2	-26.1	29.35	54	-24.65	-	-	142	272	H
* 2.712	42.38	PKFH	29.6	-25.5	46.48	-	-	74	-27.52	303	354	H
* 2.714	29.74	VA1T	29.6	-25.5	33.84	54	-20.16	-	-	303	354	H
2.411	47.03	PKFH	29.7	-25.8	50.93	-	-	-	-	304	354	V
2.411	30.16	VA1T	29.7	-25.8	34.06	-	-	-	-	304	354	V
2.417	42.25	PKFH	29.7	-25.8	46.15	-	-	-	-	310	386	V
2.417	30.49	VA1T	29.7	-25.8	34.39	-	-	-	-	310	386	V
* 3.914	39.45	PKFH	32.1	-32.5	39.05	-	-	74	-34.95	100	291	H
* 3.912	27.67	VA1T	32.1	-32.5	27.27	54	-26.73	-	-	100	291	H
* 11.825	31.37	PKFH	40	-22.2	49.17	-	-	74	-24.83	205	384	V
* 11.826	19.66	VA1T	40	-22.2	37.46	54	-16.54	-	-	205	384	V

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

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

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE018905 5 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.421	42.75	PKFH	25.1	-26.1	41.75	-	-	74	-32.25	5	342	H
* 1.421	30.28	VA1T	25.2	-26.1	29.38	54	-24.62	-	-	5	342	H
2.411	43.67	PKFH	29.7	-25.8	47.57	-	-	-	-	198	157	V
2.411	30.06	VA1T	29.7	-25.8	33.96	-	-	-	-	198	157	V
* 7.44	37.93	PKFH	37.6	-27.6	47.93	-	-	74	-26.07	308	151	H
* 7.44	25.03	VA1T	37.6	-27.6	35.03	54	-18.97	-	-	308	151	H
* 11.883	31.72	PKFH	39.9	-22.4	49.22	-	-	74	-24.78	159	345	H
* 11.885	19.74	VA1T	39.9	-22.4	37.24	54	-16.76	-	-	159	345	H
* 5.145	39.7	PKFH	35.7	-31.1	44.3	-	-	74	-29.7	166	279	V
* 5.145	26.64	VA1T	35.7	-31.1	31.24	54	-22.76	-	-	166	279	V
14.387	31.9	PKFH	41.2	-20.6	52.5	-	-	-	-	75	254	V
14.387	19.12	VA1T	41.2	-20.6	39.72	-	-	-	-	75	254	V

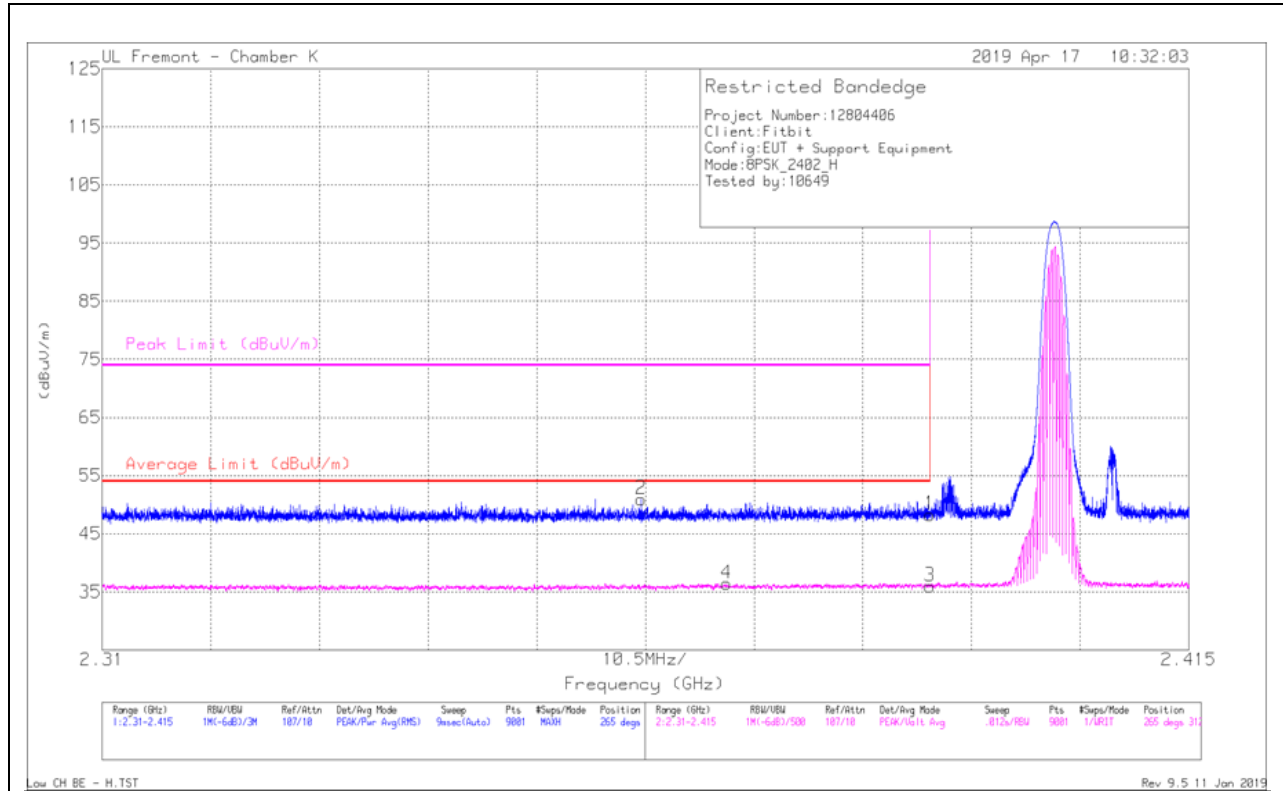
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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

9.1.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



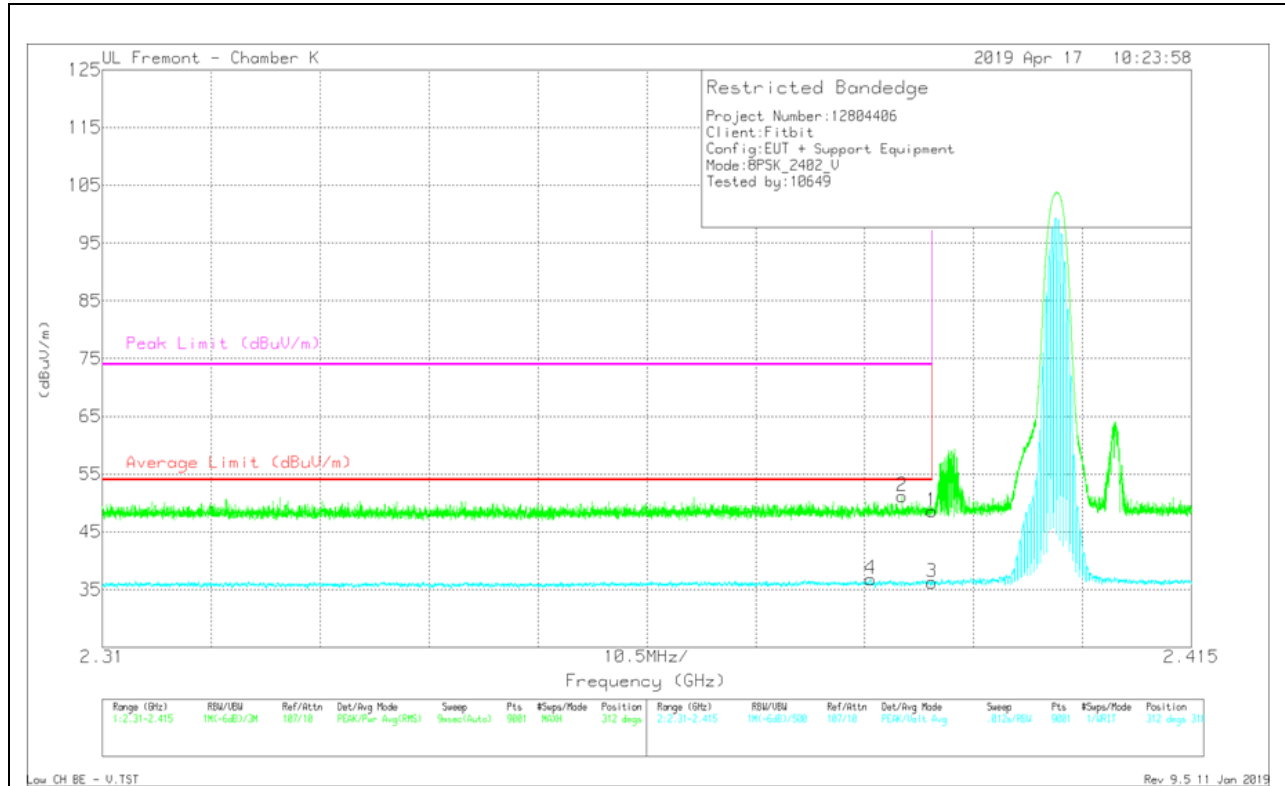
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Ampl/Cbl/Ftr /Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.07	Pk	31.9	-24.7	48.27	-	-	74	-25.73	265	312	H
2	* 2.362	43.75	Pk	31.8	-24.6	50.95	-	-	74	-23.05	265	312	H
3	* 2.39	28.76	VA1T	31.9	-24.7	35.96	54	-18.04	-	-	265	312	H
4	* 2.37	29.22	VA1T	31.8	-24.6	36.42	54	-17.58	-	-	265	312	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

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Ampl/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	* 2.39	41.41	Pk	31.9	-24.7	48.61	-	-	74	-25.39	312	318	V
2	* 2.387	43.88	Pk	31.9	-24.6	51.18	-	-	74	-22.82	312	318	V
3	* 2.39	29.06	VA1T	31.9	-24.7	36.26	54	-17.74	-	-	312	318	V
4	* 2.384	29.53	VA1T	31.9	-24.6	36.83	54	-17.17	-	-	312	318	V

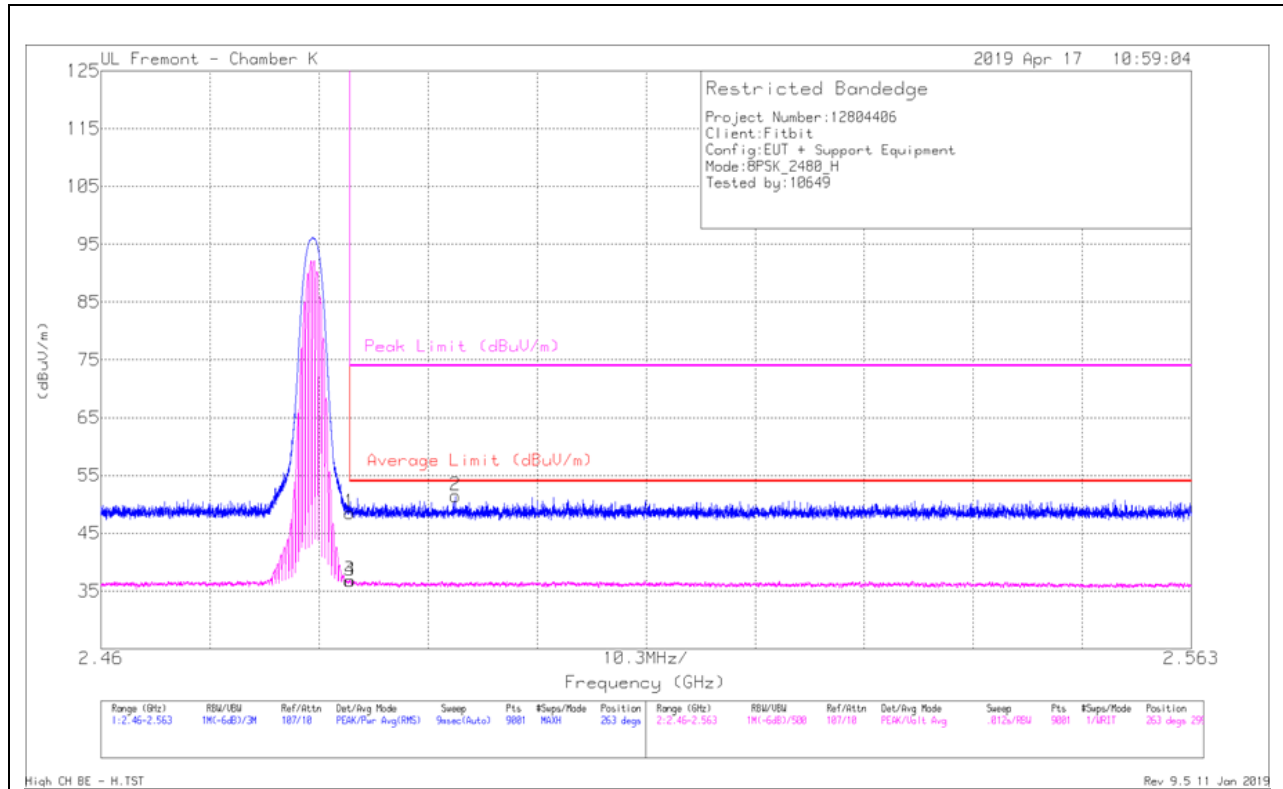
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

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

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



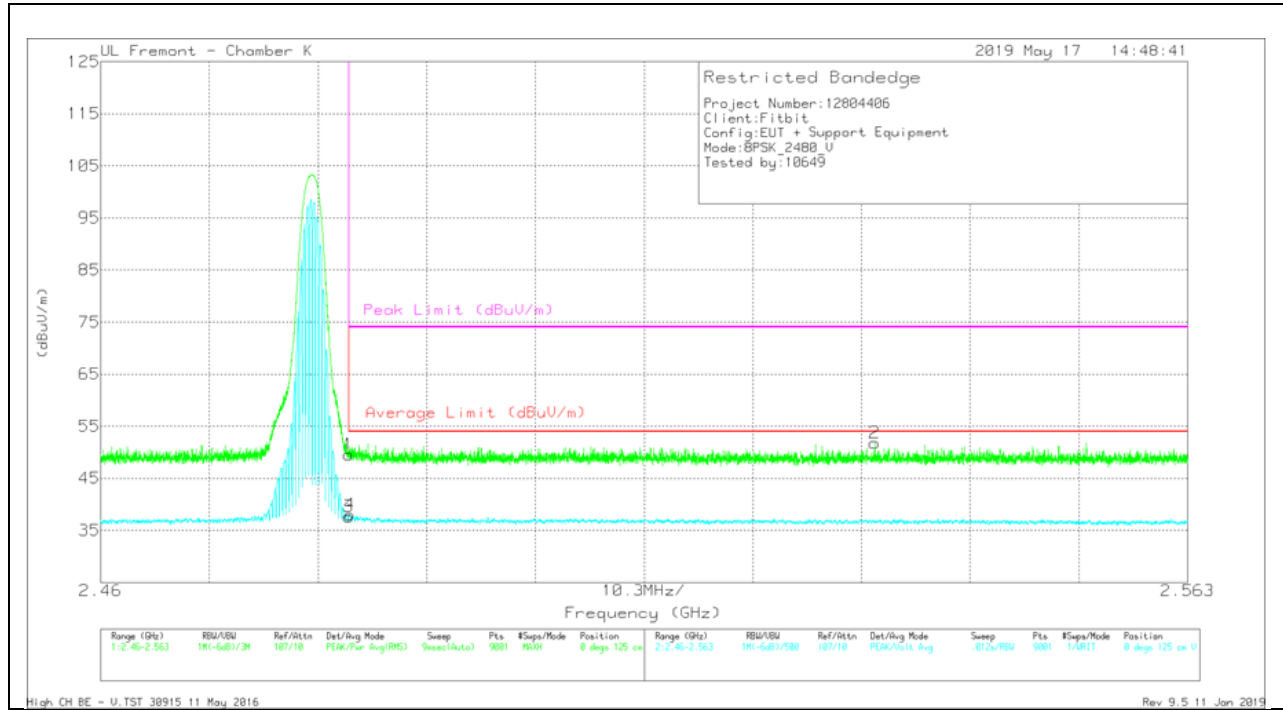
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Ampl/Cbl/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.05	Pk	32.3	-24.8	48.55	-	-	74	-25.45	263	299	H
2	* 2.493	43.98	Pk	32.3	-24.8	51.48	-	-	74	-22.52	263	299	H
3	* 2.484	29.34	VA1T	32.3	-24.8	36.84	54	-17.16	-	-	263	299	H
4	* 2.484	29.3	VA1T	32.3	-24.8	36.8	54	-17.2	-	-	263	299	H

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

Pk - Peak detector

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

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dBm)	Ampl/Cbl/Filt /Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.7	Pk	32.6	-24.8	49.5	-	-	74	-24.5	0	125	V
2	2.533	43.79	Pk	32.7	-24.7	51.79	-	-	74	-22.21	0	125	V
3	* 2.484	29.79	VA1T	32.6	-24.8	37.59	54	-16.41	-	-	0	125	V
4	* 2.484	30.21	VA1T	32.6	-24.8	38.01	54	-15.99	-	-	0	125	V

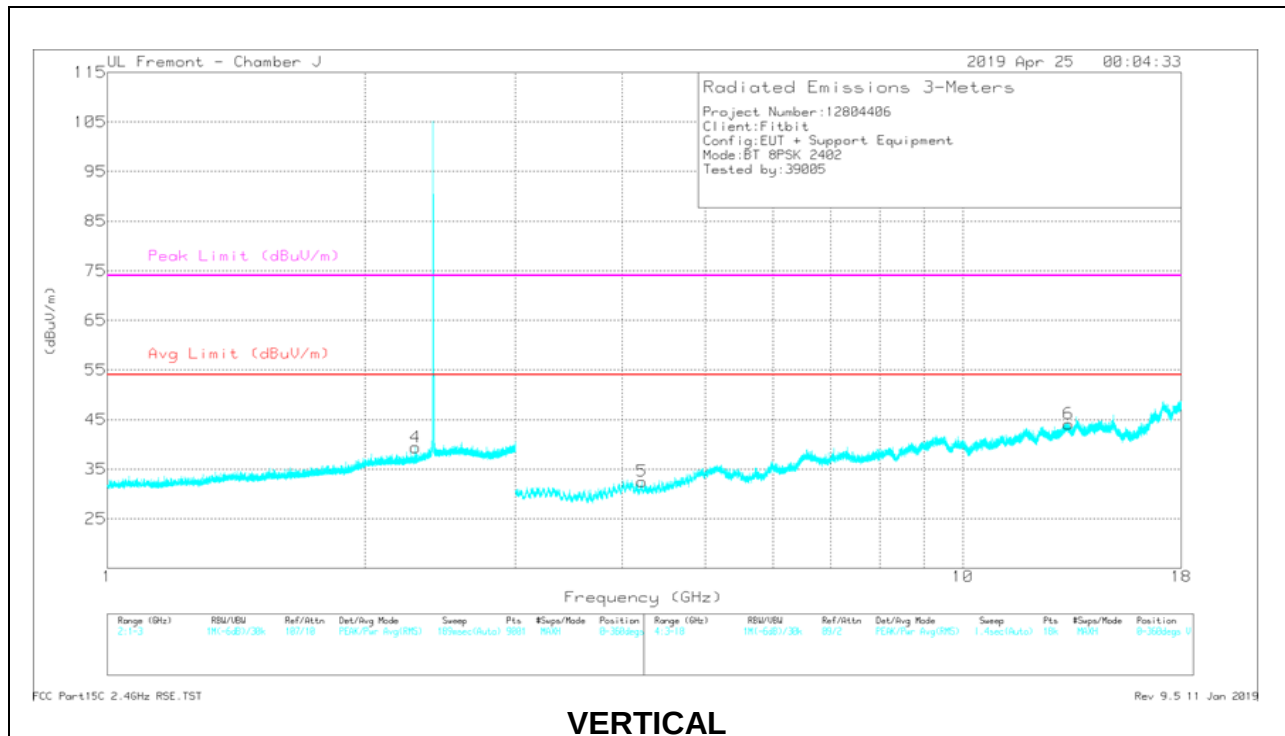
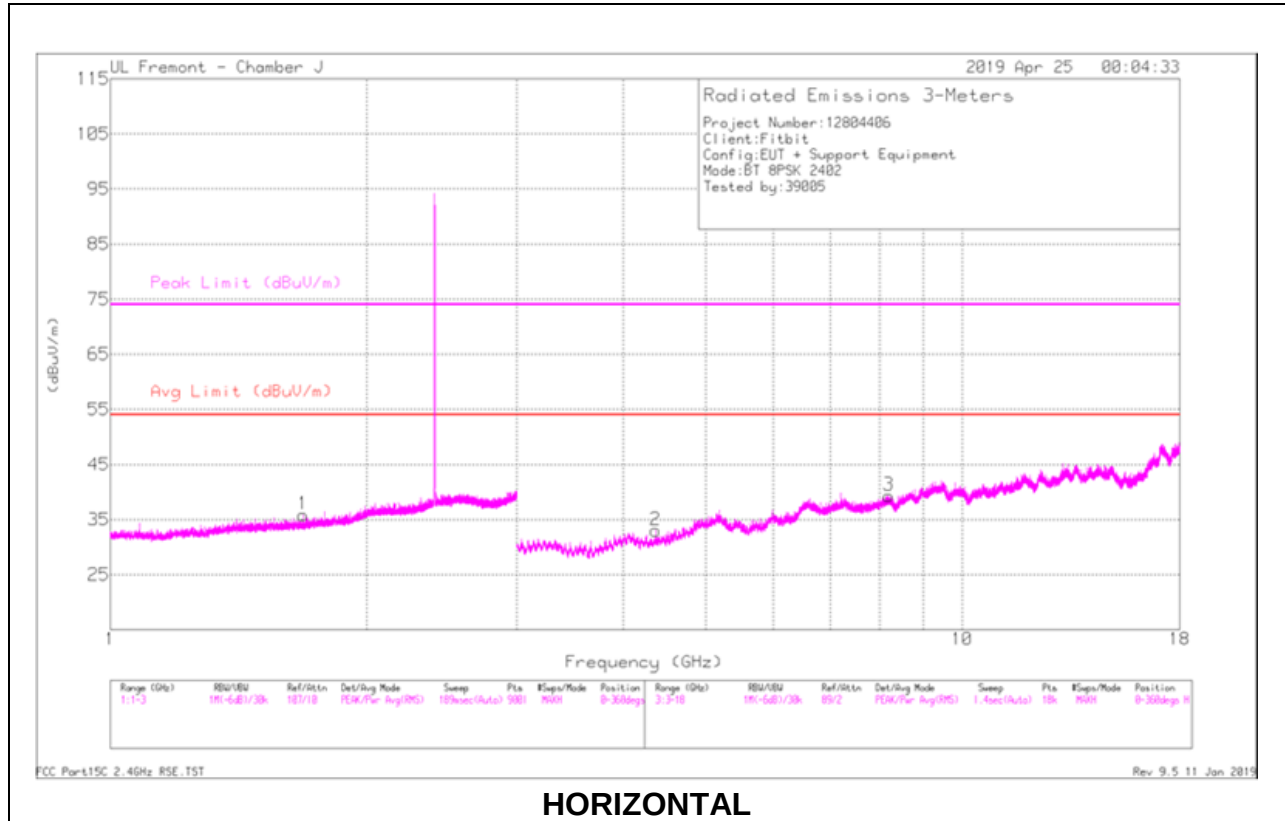
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

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

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



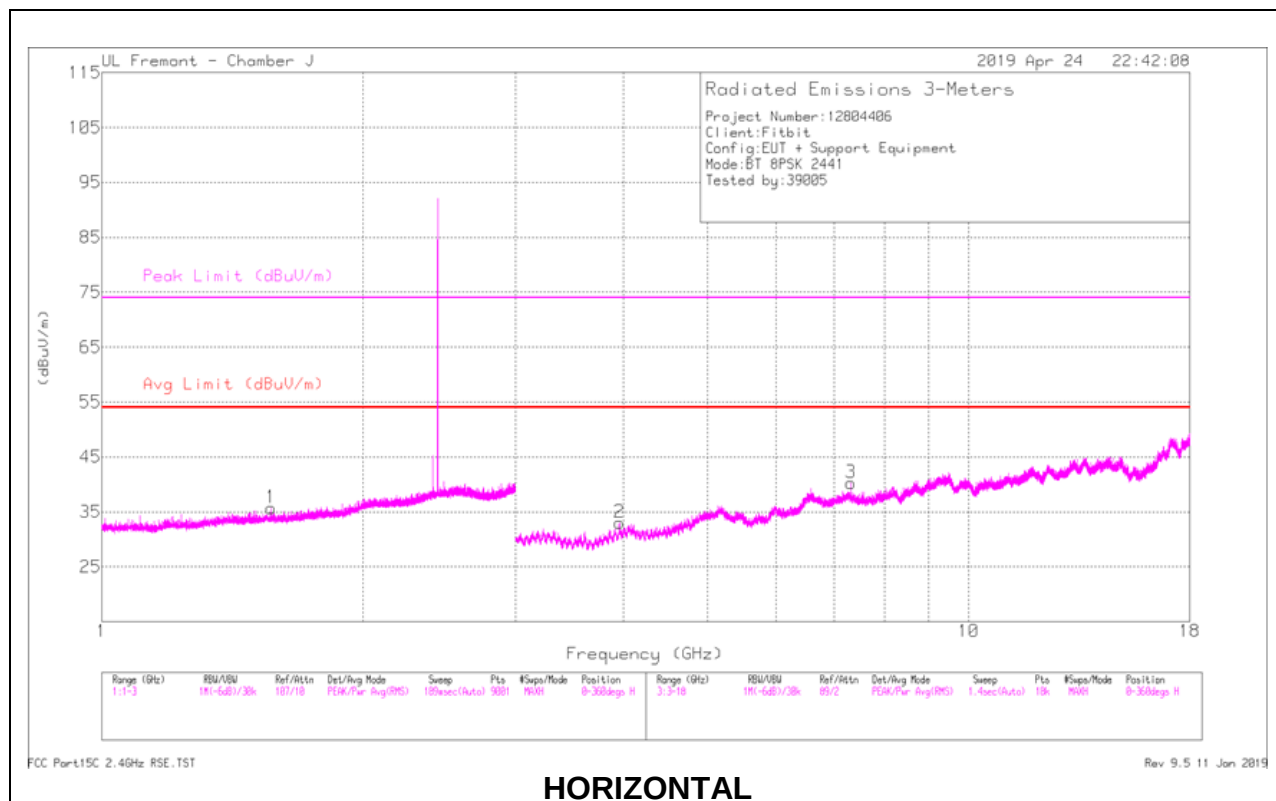
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE018905 5 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.685	42.41	PKFH	25.8	-26.1	42.11	-	-	74	-31.89	278	313	H
* 1.684	29.91	VA1T	25.8	-26.1	29.61	54	-24.39	-	-	278	313	H
* 2.294	42.27	PKFH	28.5	-25.8	44.97	-	-	74	-29.03	309	335	V
* 2.292	29.99	VA1T	28.5	-25.8	32.69	54	-21.31	-	-	309	335	V
* 4.364	38.91	PKFH	32	-31.6	39.31	-	-	74	-34.69	164	306	H
* 4.362	26.48	VA1T	32	-31.6	26.88	54	-27.12	-	-	164	306	H
* 8.2	34.28	PKFH	38.4	-26.6	46.08	-	-	74	-27.92	58	264	H
* 8.202	22.5	VA1T	38.4	-26.6	34.3	54	-19.7	-	-	58	264	H
* 4.215	39.37	PKFH	32	-32	39.37	-	-	74	-34.63	82	205	V
* 4.214	26.57	VA1T	32	-32	26.57	54	-27.43	-	-	82	205	V
* 13.298	31.6	PKFH	41.4	-21.8	51.2	-	-	74	-22.8	340	357	V
* 13.299	19.02	VA1T	41.4	-21.8	38.62	54	-15.38	-	-	340	357	V

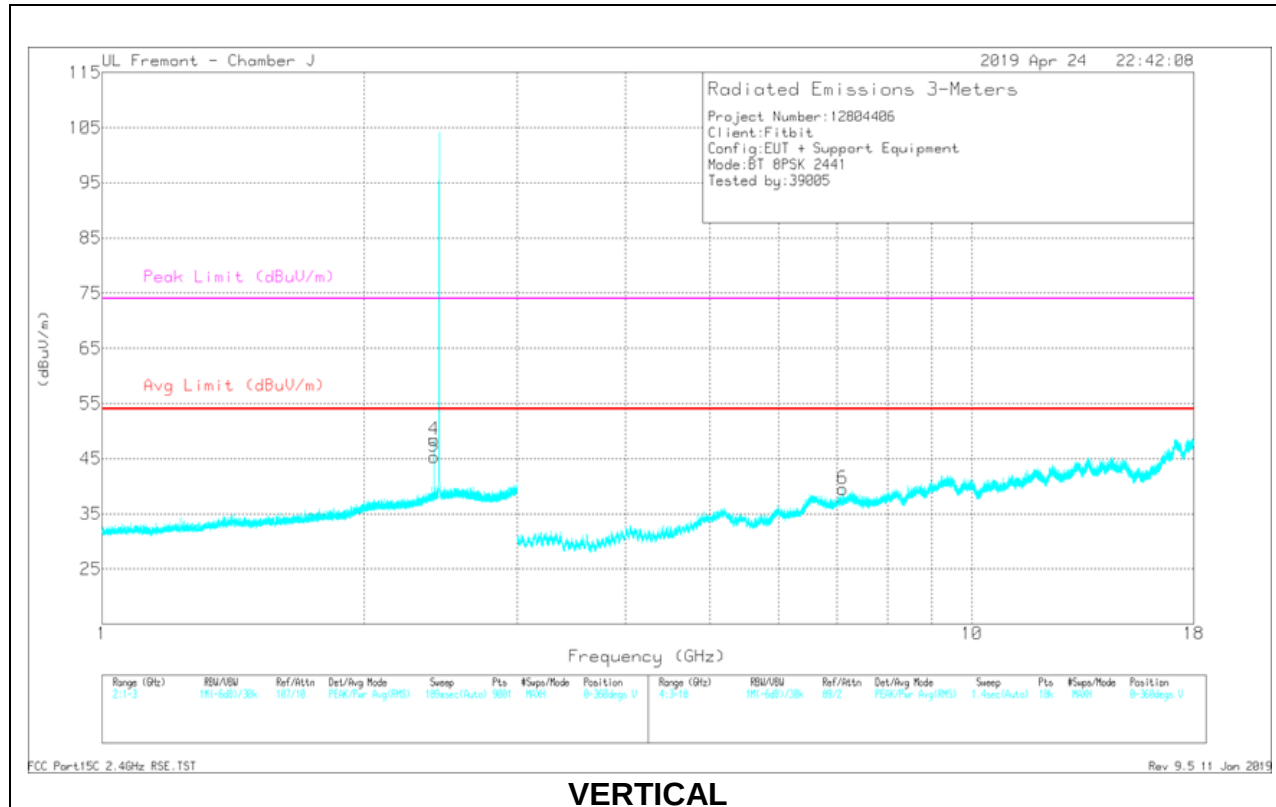
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

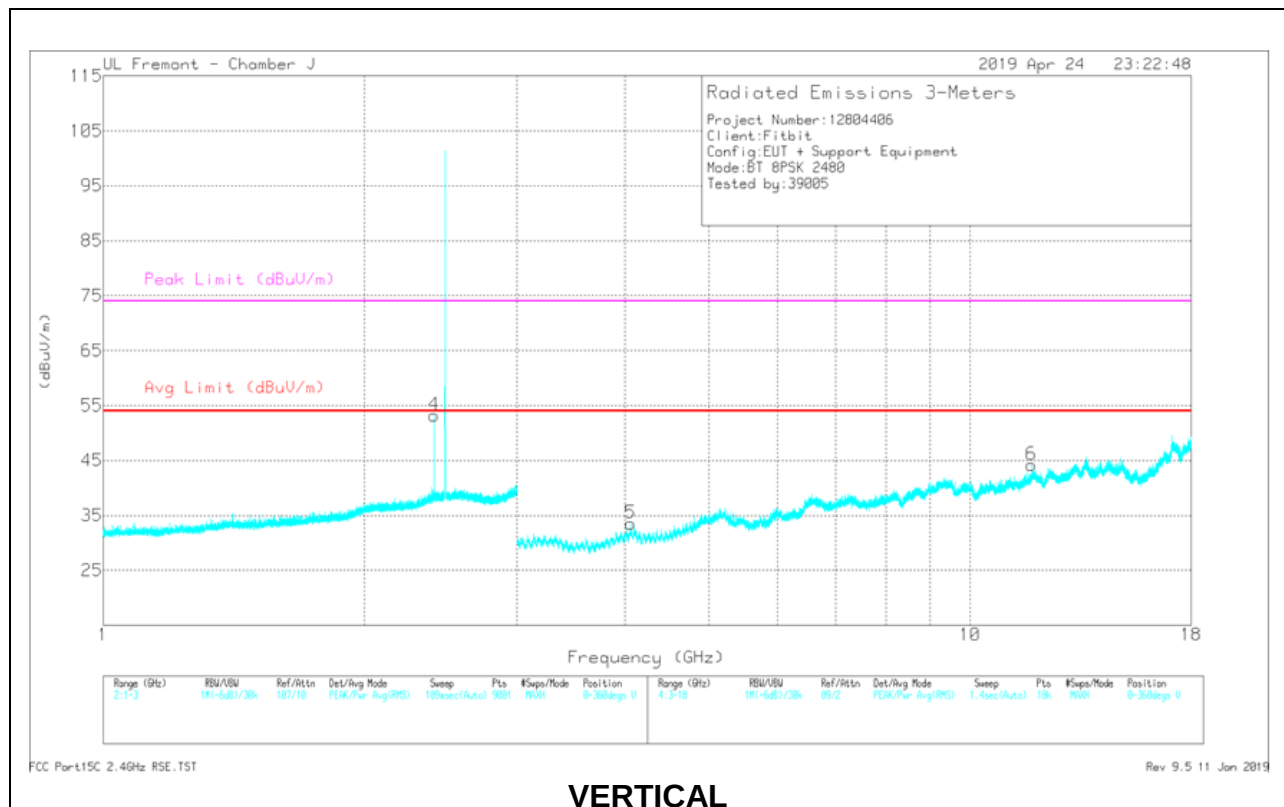
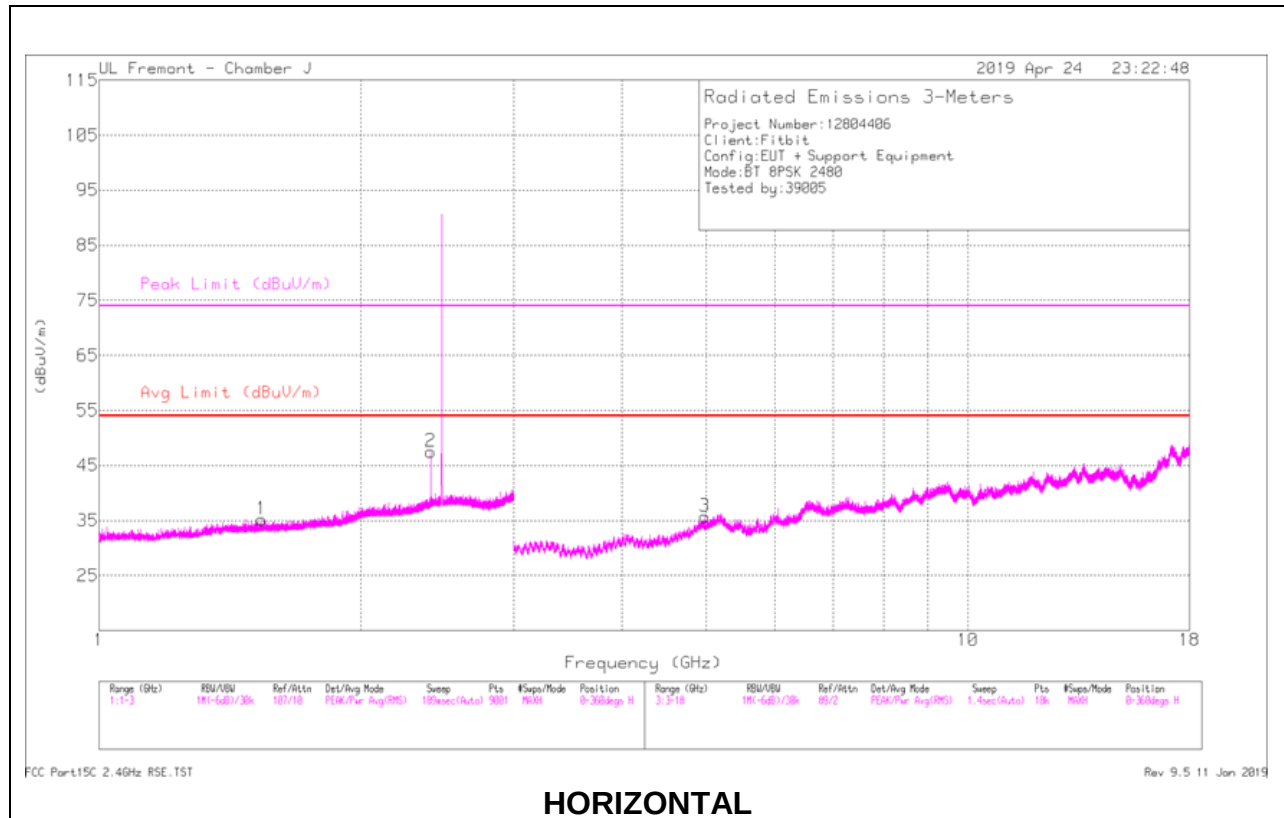
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE018905 5 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degr)	Height (cm)	Polarity
* 1.569	43.12	PKFH	25.5	-26.1	42.52	-	-	74	-31.48	38	191	H
* 1.569	30.17	VA1T	25.5	-26.1	29.57	54	-24.43	-	-	38	191	H
2.41	47.61	PKFH	29.7	-25.8	51.51	-	-	-	-	55	396	V
2.409	30.12	VA1T	29.7	-25.8	34.02	-	-	-	-	55	396	V
2.409	43.52	PKFH	29.7	-25.8	47.42	-	-	-	-	62	311	V
2.411	30.04	VA1T	29.7	-25.8	33.94	-	-	-	-	62	311	V
* 3.957	40.59	PKFH	32.3	-32.5	40.39	-	-	74	-33.61	71	360	H
* 3.958	27.4	VA1T	32.3	-32.5	27.2	54	-26.8	-	-	71	360	H
* 7.323	36.15	PKFH	38	-27.5	46.65	-	-	74	-27.35	230	168	H
* 7.323	24.43	VA1T	38	-27.5	34.93	54	-19.07	-	-	230	168	H
7.113	34.95	PKFH	37.8	-27.6	45.15	-	-	-	-	224	183	V
7.113	22.9	VA1T	37.8	-27.6	33.1	-	-	-	-	224	183	V

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

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

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

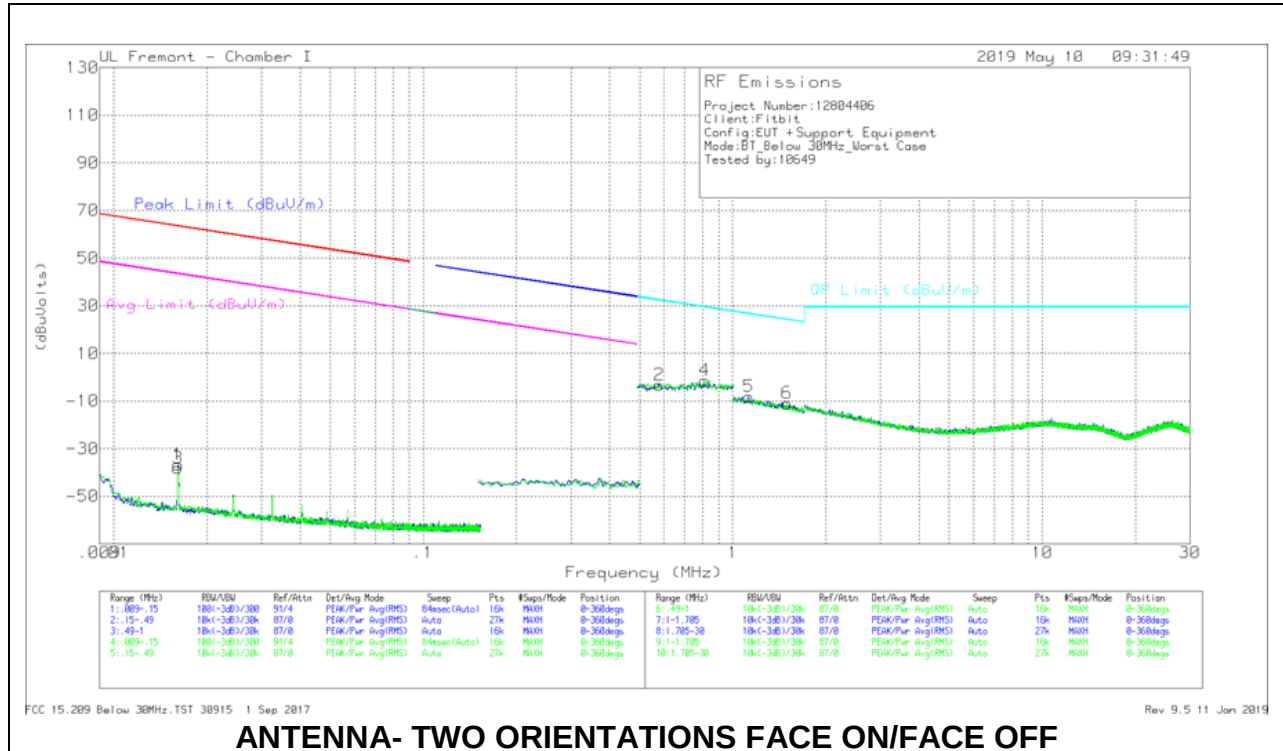
Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE018905 5 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.539	43.41	PKFH	25.4	-26.1	42.71	-	-	74	-31.29	5	141	H
* 1.537	30.91	VA1T	25.3	-26.1	30.11	54	-23.89	-	-	5	141	H
2.409	53.27	PKFH	29.7	-25.8	57.17	-	-	-	-	220	369	H
2.409	30.12	VA1T	29.7	-25.8	34.02	-	-	-	-	220	369	H
2.409	58.66	PKFH	29.7	-25.8	62.56	-	-	-	-	310	334	V
2.408	30.32	VA1T	29.7	-25.8	34.22	-	-	-	-	310	334	V
* 4.978	38.98	PKFH	34.9	-30.5	43.38	-	-	74	-30.62	283	112	H
* 4.978	25.39	VA1T	34.9	-30.6	29.69	54	-24.31	-	-	283	112	H
* 4.058	40.67	PKFH	32.3	-32	40.97	-	-	74	-33.03	267	355	V
* 4.059	27.79	VA1T	32.3	-32	28.09	54	-25.91	-	-	267	355	V
* 11.782	32.28	PKFH	40	-22.4	49.88	-	-	74	-24.12	274	293	V
* 11.783	19.65	VA1T	40	-22.4	37.25	54	-16.75	-	-	274	293	V

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

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

9.2. TRANSMITTER WORST CASE BELOW 30MHZ

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



ANTENNA- TWO ORIENTATIONS FACE ON/FACE OFF

Below 30MHz Data

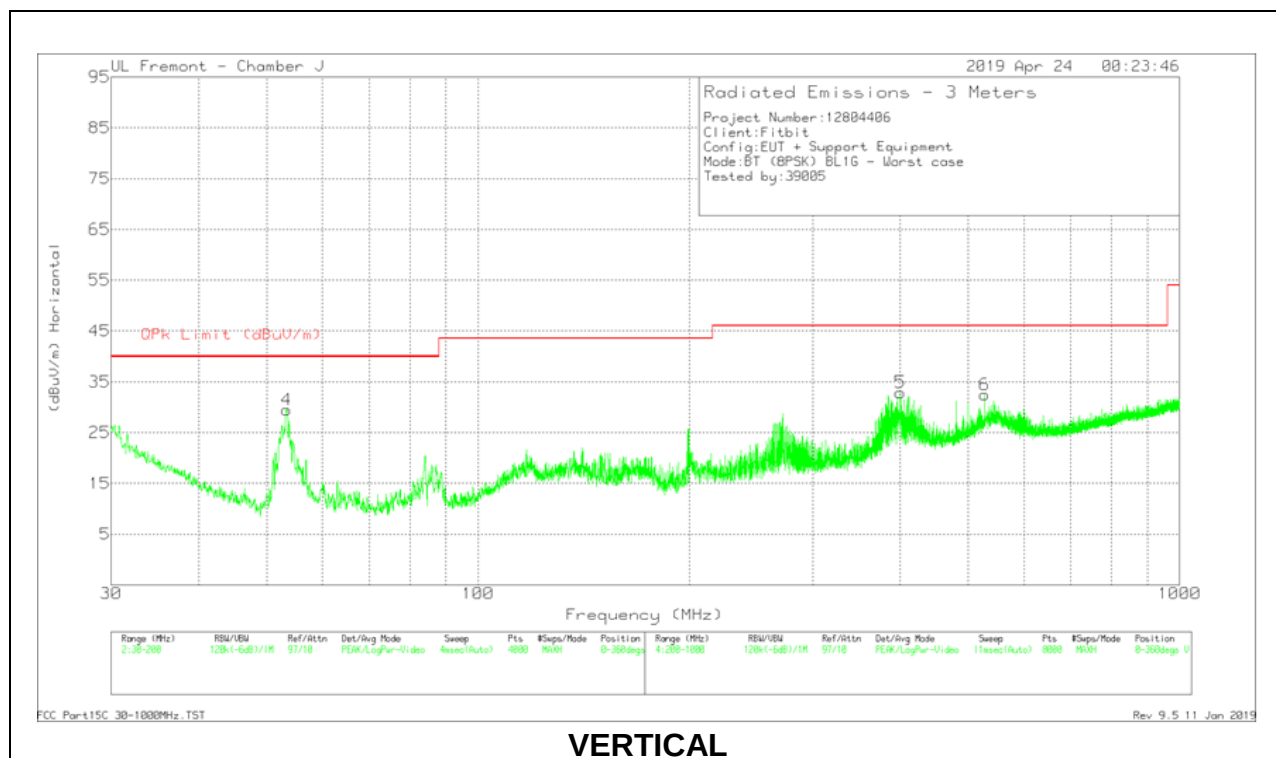
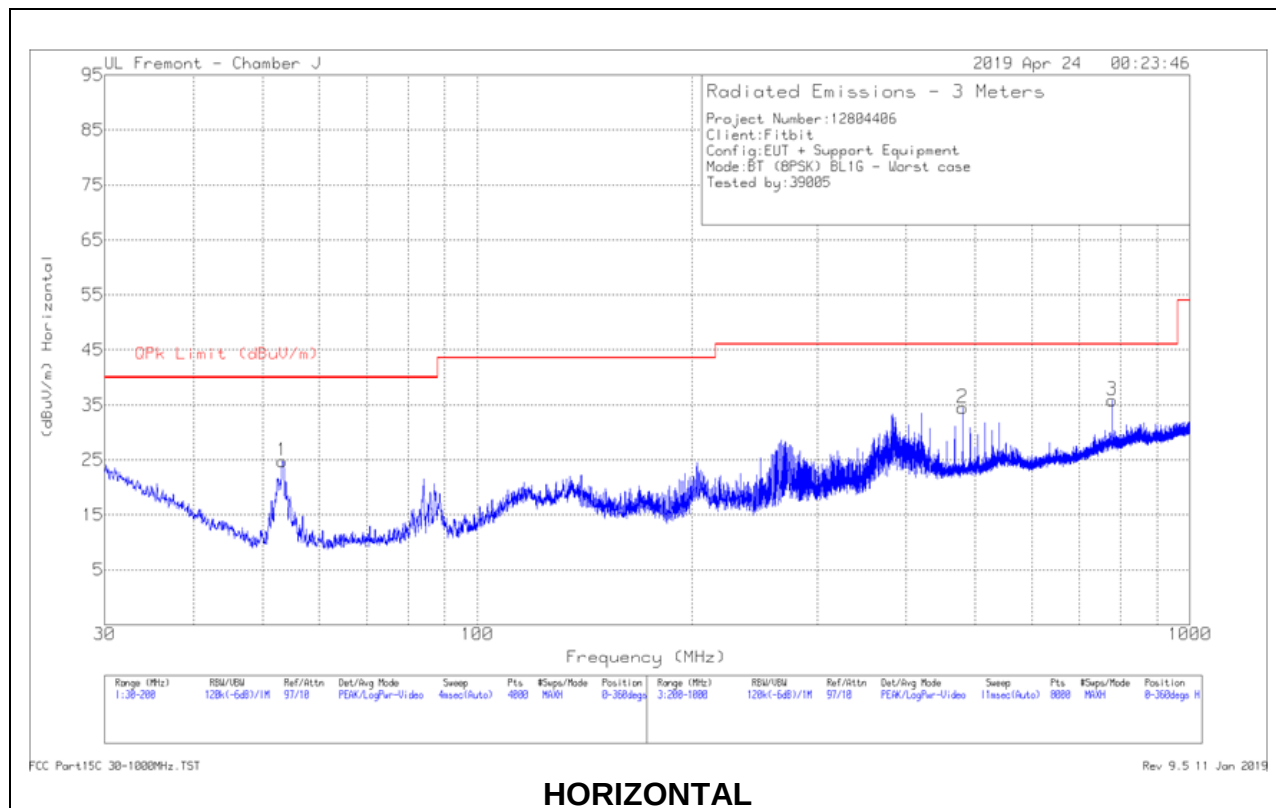
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0180175 (dB)	Dist Corr 300m	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.01616	16.03	Pk	59.5	-32.4	-80	-36.87	63.42	-100.29	43.42	-80.29	0-360
3	.01615	14.72	Pk	59.5	-32.4	-80	-38.18	63.42	-101.6	43.42	-81.6	0-360

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0180175 (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
2	.57976	12.21	Pk	56.3	-31.8	-40	-3.29	32.34	-35.63	0-360
4	.8112	14.21	Pk	56.3	-31.8	-40	-1.29	29.43	-30.72	0-360
5	1.12617	18.01	Pk	45.7	-31.8	-40	-8.09	26.59	-34.68	0-360
6	1.49458	16.98	Pk	43.8	-31.8	-40	-11.02	24.14	-35.16	0-360

Pk - Peak detector

9.3. TRANSMITTER WORST CASE BELOW 1 GHZ

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



Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181575 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	53.2535	42.91	Pk	13.2	-31.3	24.81	40	-15.19	0-360	398	H
4	53.3385	47.58	Pk	13.2	-31.3	29.48	40	-10.52	0-360	101	V
	53.257	46.12	Qp	13.2	-31.3	28.02	40	-11.98	176	105	V
2	479.9364	40.28	Pk	23.6	-29.4	34.48	46.02	-11.54	0-360	198	H
3	777.7751	37.08	Pk	27	-28.2	35.88	46.02	-10.14	0-360	101	H
5	* 400.126	41.09	Pk	21.5	-29.7	32.89	46.02	-13.13	0-360	101	V
6	528.0426	38.06	Pk	23.8	-29.4	32.46	46.02	-13.56	0-360	199	V

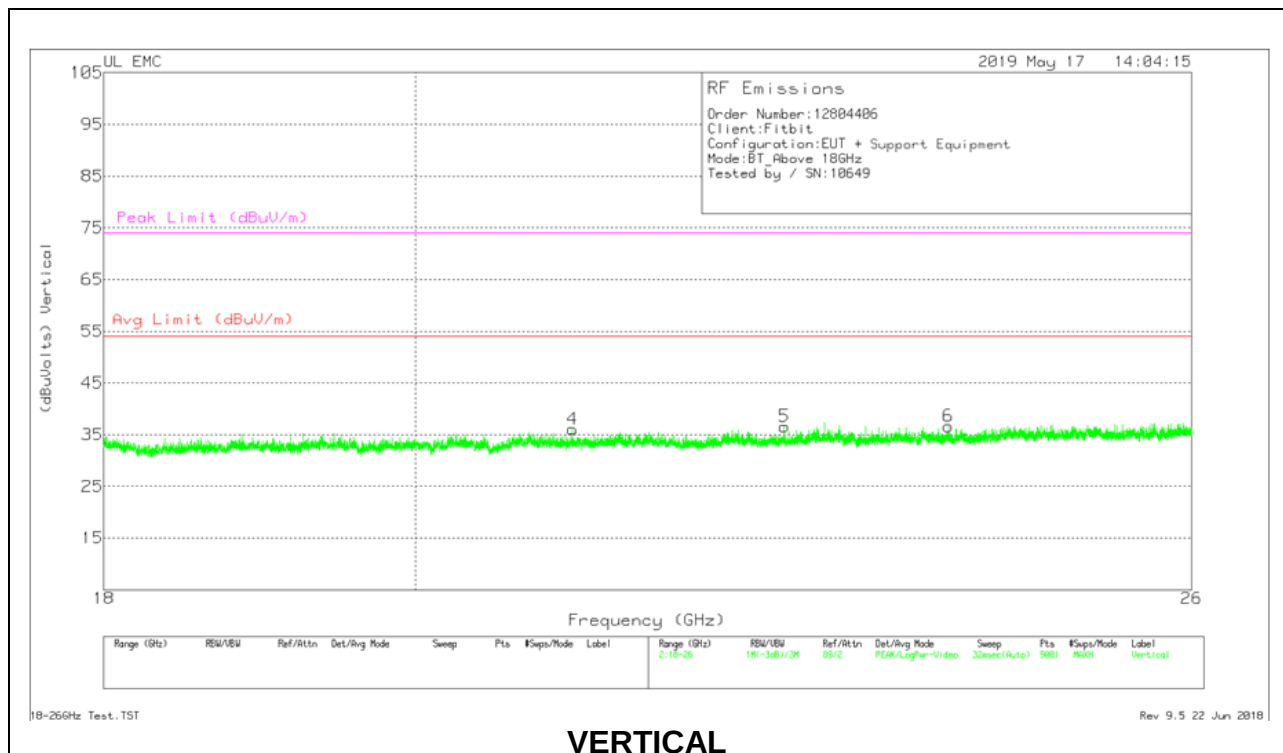
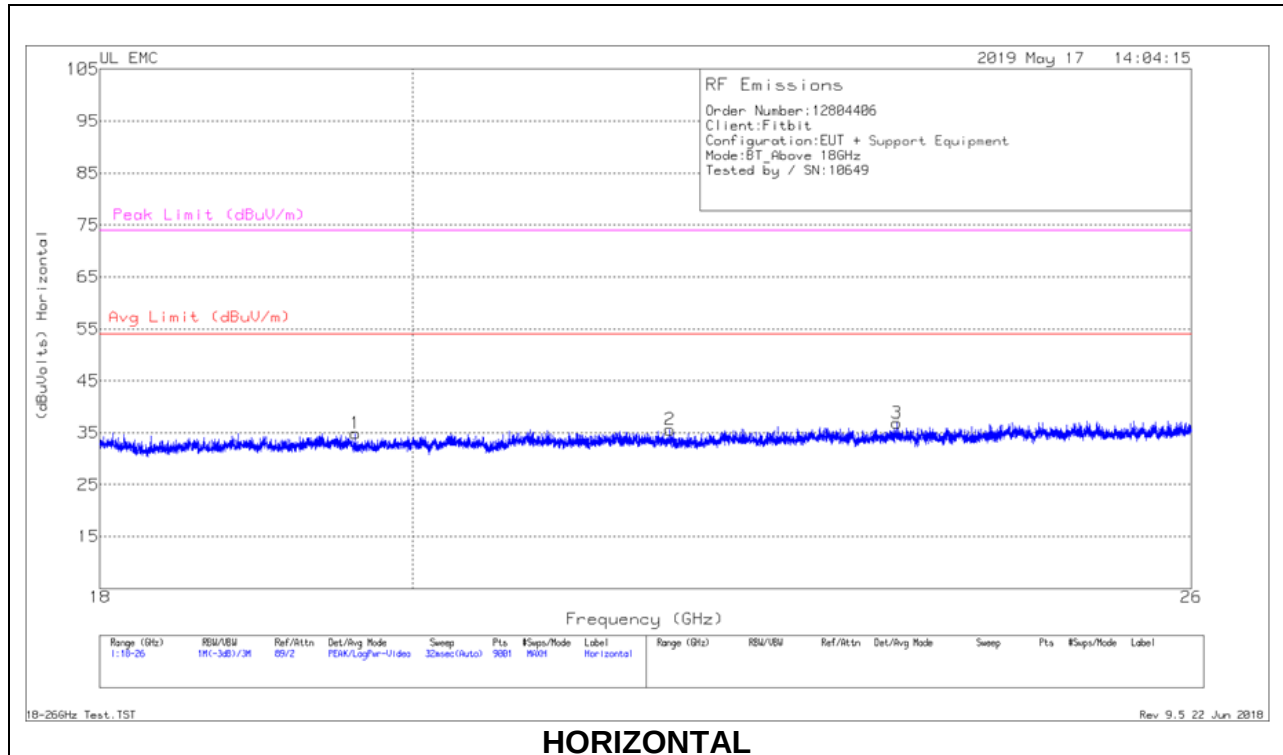
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

Qp - Quasi-Peak detector

9.4. TRANSMITTER WORST CASE 18-26 GHZ

SPURIOUS EMISSIONS 18-26 GHZ (WORST-CASE CONFIGURATION)



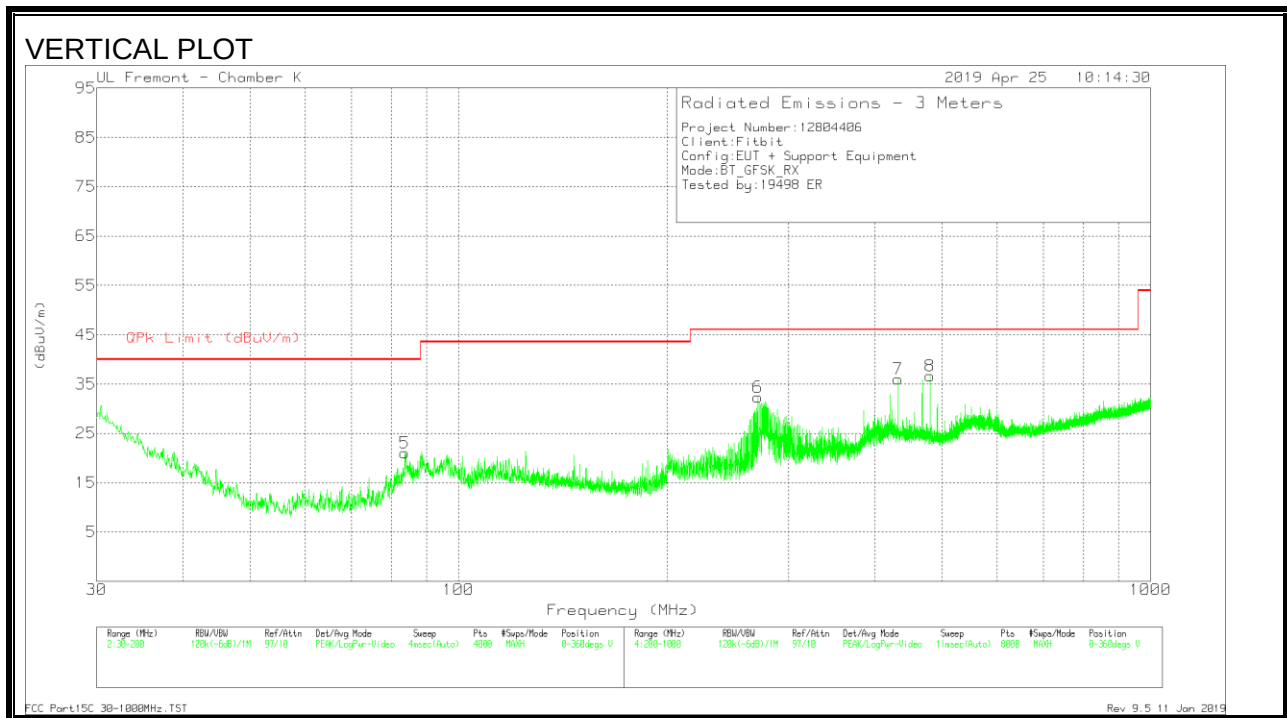
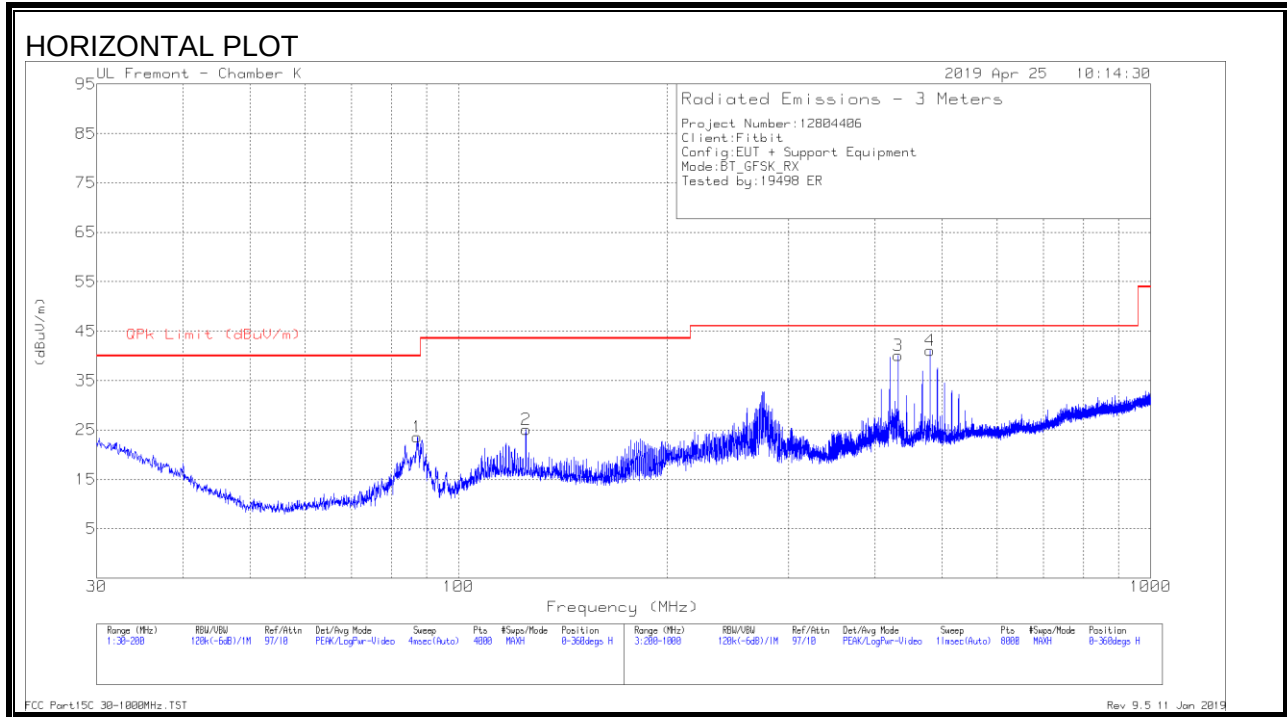
18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0182188 (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	19.618	68.16	Pk	33.1	-56.9	-9.5	34.86	54	-19.14	74	-39.14
2	21.81	68.48	Pk	33.9	-57.3	-9.5	35.58	54	-18.42	74	-38.42
3	23.545	68.76	Pk	34.5	-56.9	-9.5	36.86	54	-17.14	74	-37.14
4	21.09	68.96	Pk	33.6	-57	-9.5	36.06	54	-17.94	74	-37.94
5	22.656	69.78	Pk	34.1	-57.8	-9.5	36.58	54	-17.42	74	-37.42
6	23.947	68.3	Pk	34.6	-56.8	-9.5	36.6	54	-17.4	74	-37.4

Pk - Peak detector

9.5. RECEIVER WORST-CASE BELOW 1GHz

3 m RADIATED EMISSIONS 30 TO 1000 MHz



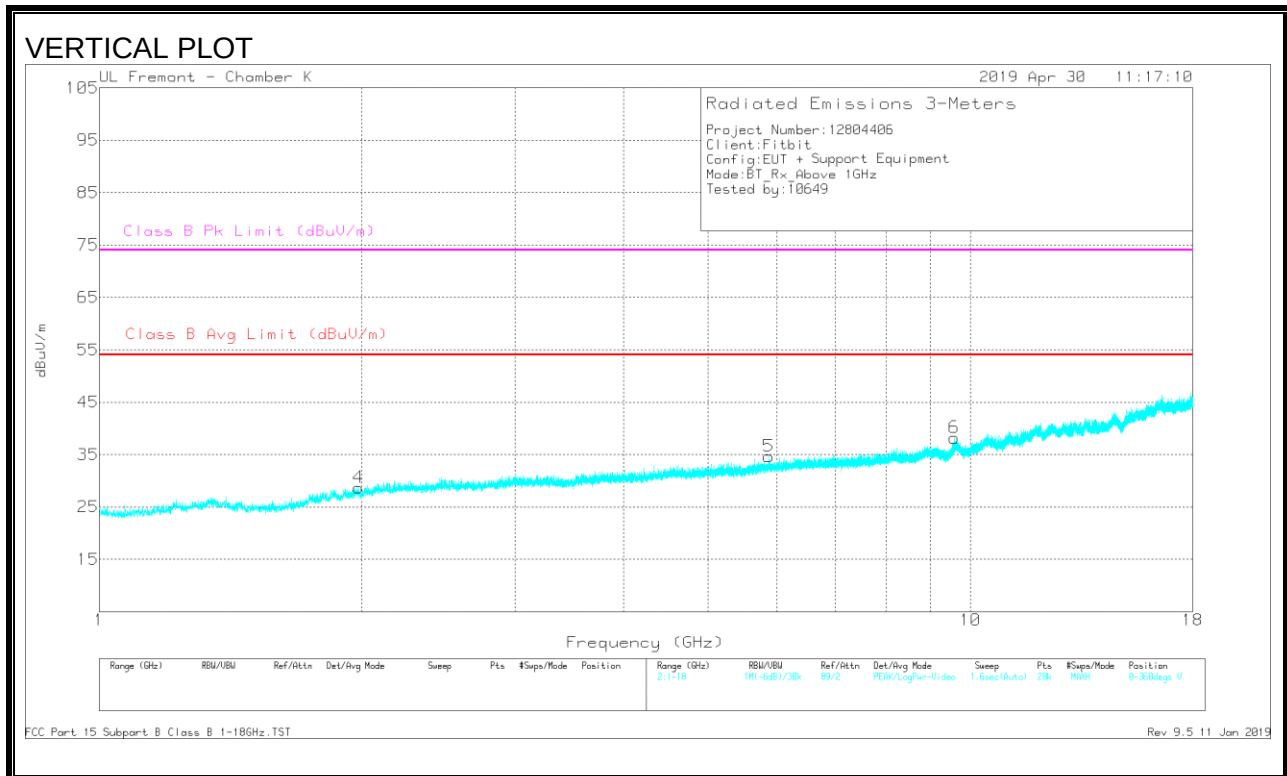
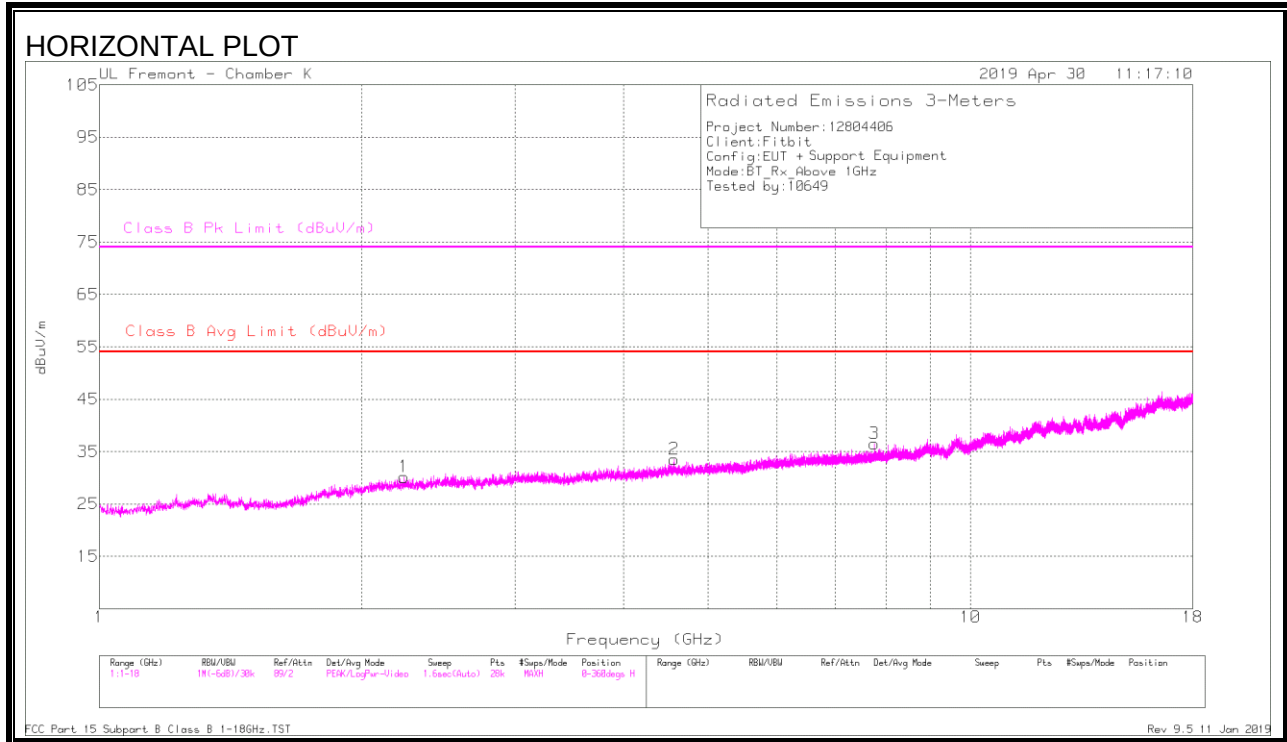
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184052 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	87.1773	41.23	Pk	13.3	-31	23.53	40	-16.47	0-360	299	H
2	* 125.1396	36.04	Pk	19.7	-30.7	25.04	43.52	-18.48	0-360	199	H
5	83.6489	38.88	Pk	13.3	-31.1	21.08	40	-18.92	0-360	100	V
3	431.9301	46.97	Pk	22.5	-29.4	40.07	46.02	-5.95	0-360	199	H
	431.9555	42.62	Qp	22.5	-29.4	35.72	46.02	-10.3	23	207	H
4	479.9364	46.74	Pk	23.5	-29.1	41.14	46.02	-4.88	0-360	199	H
	480.0007	46.65	Qp	23.5	-29.1	41.05	46.02	-4.97	349	174	H
6	* 270.7092	43.02	Pk	19.2	-29.9	32.32	46.02	-13.7	0-360	199	V
7	431.9301	42.92	Pk	22.5	-29.4	36.02	46.02	-10	0-360	100	V
8	479.9364	42.21	Pk	23.5	-29.1	36.61	46.02	-9.41	0-360	100	V

Pk - Peak detector

9.6. RECEIVER WORST-CASE ABOVE 1GHz

3 m RADIATED EMISSIONS 1000 TO 18,000 MHz



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degr)	Height (cm)	Polarity
1	2.239	32.48	Pk	31.9	-35.4	28.98	-	-	74	-45.02	182	141	H
	2.239	19.99	Av	31.9	-35.4	16.49	54	-37.51	-	-	182	141	H
2	4.568	29.25	Pk	34.1	-31.2	32.15	-	-	74	-41.85	42	295	H
	4.568	16.4	Av	34.1	-31.2	19.3	54	-34.7	-	-	42	295	H
3	7.762	25.27	Pk	35.7	-26.3	34.67	-	-	74	-39.33	273	183	H
	7.762	12.19	Av	35.7	-26.3	21.59	54	-32.41	-	-	273	183	H
4	1.985	42.61	Pk	31	-35.4	38.21	-	-	74	-35.79	141	204	V
	1.985	28.96	Av	31	-35.4	24.56	54	-29.44	-	-	141	204	V
5	5.869	36.51	Pk	35	-28.8	42.71	-	-	74	-31.29	240	288	V
	5.869	23.25	Av	35	-28.8	29.45	54	-24.55	-	-	240	288	V
6	9.582	33.92	Pk	36.8	-24.2	46.52	-	-	74	-27.48	181	253	V
	9.582	20.67	Av	36.8	-24.2	33.27	54	-20.73	-	-	181	253	V

Pk - Peak detector

Av - Average detection

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

NCC LP0002 §2.3

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

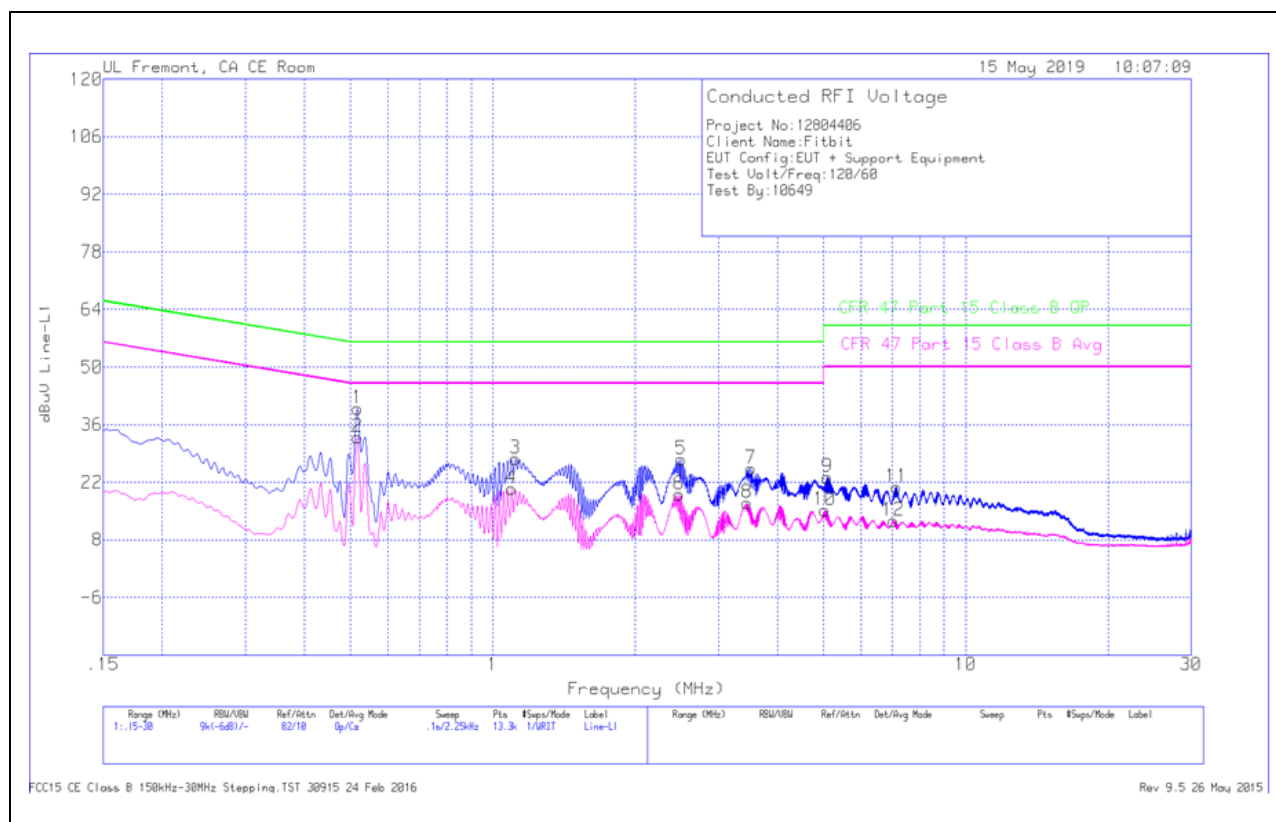
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

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

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

RESULTS

LINE 1 RESULTS

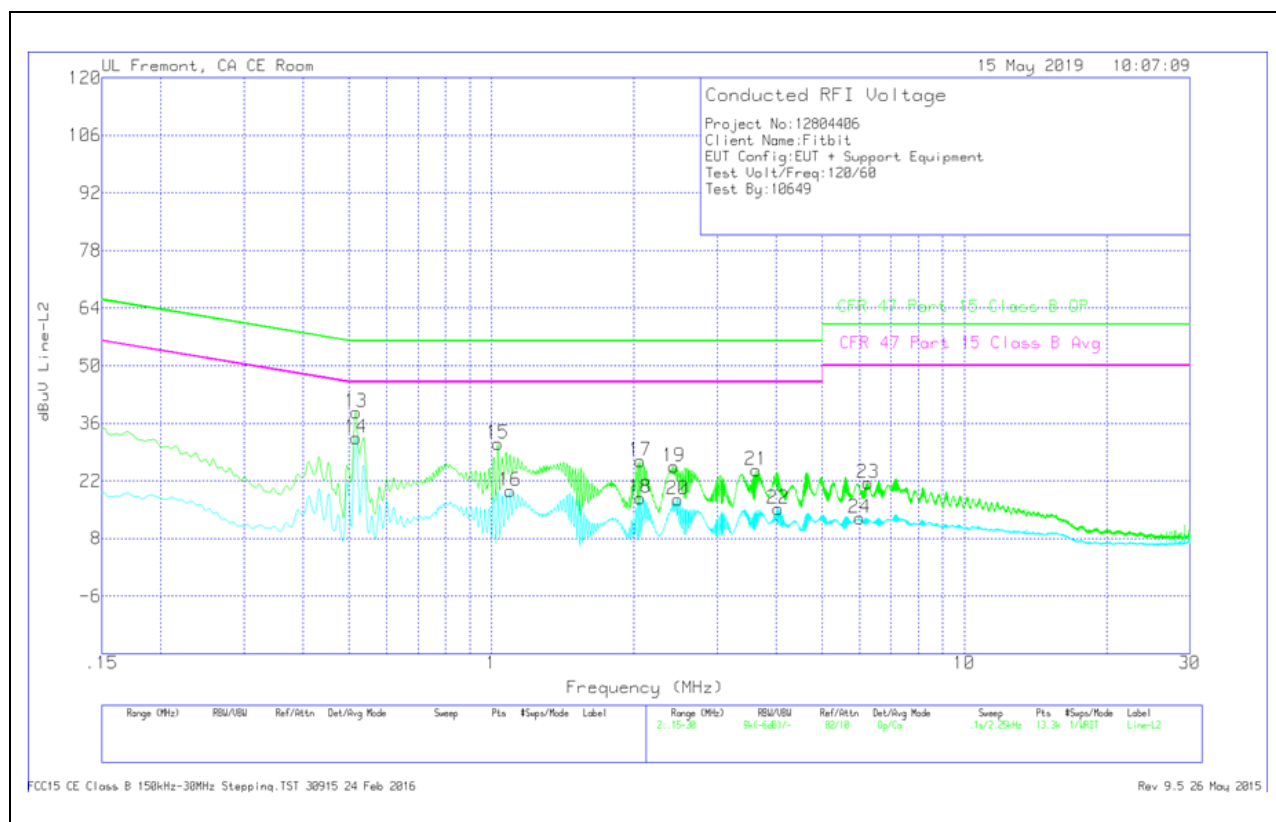


Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.51675	29.74	Qp	0	0	10.1	39.84	56	-16.16	-	-
2	.51675	22.92	Ca	0	0	10.1	33.02	-	-	46	-12.98
3	1.1175	17.5	Qp	0	.1	10.1	27.7	56	-28.3	-	-
4	1.095	10.26	Ca	0	.1	10.1	20.46	-	-	46	-25.54
5	2.50125	17.31	Qp	0	.1	10.1	27.51	56	-28.49	-	-
6	2.47875	8.92	Ca	0	.1	10.1	19.12	-	-	46	-26.88
7	3.51375	15.16	Qp	0	.1	10.1	25.36	56	-30.64	-	-
8	3.4485	6.8	Ca	0	.1	10.1	17	-	-	46	-29
9	5.10675	13.07	Qp	0	.1	10.1	23.27	60	-36.73	-	-
10	5.03925	5.01	Ca	0	.1	10.1	15.21	-	-	50	-34.79
11	7.152	10.44	Qp	0	.2	10.2	20.84	60	-39.16	-	-
12	7.044	2.26	Ca	0	.2	10.2	12.66	-	-	50	-37.34

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 RESULTS



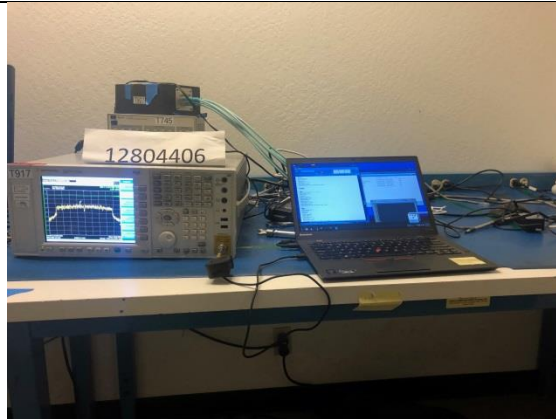
Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables C2&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.51675	28.58	Qp	0	0	10.1	38.68	56	-17.32	-	-
14	.51675	22.35	Ca	0	0	10.1	32.45	-	-	46	-13.55
15	1.032	20.91	Qp	0	.1	10.1	31.11	56	-24.89	-	-
16	1.095	9.41	Ca	0	.1	10.1	19.61	-	-	46	-26.39
17	2.0625	16.62	Qp	0	.1	10.1	26.82	56	-29.18	-	-
18	2.06475	7.72	Ca	0	.1	10.1	17.92	-	-	46	-28.08
19	2.4315	15.36	Qp	0	.1	10.1	25.56	56	-30.44	-	-
20	2.47538	7.23	Ca	0	.1	10.1	17.43	-	-	46	-28.57
21	3.63075	14.37	Qp	0	.1	10.1	24.57	56	-31.43	-	-
22	4.0425	5.06	Ca	0	.1	10.1	15.26	-	-	46	-30.74
23	6.252	11.05	Qp	0	.2	10.2	21.45	60	-38.55	-	-
24	6.00225	2.55	Ca	0	.2	10.2	12.95	-	-	50	-37.05

Qp - Quasi-Peak detector

Ca - CISPR average detection

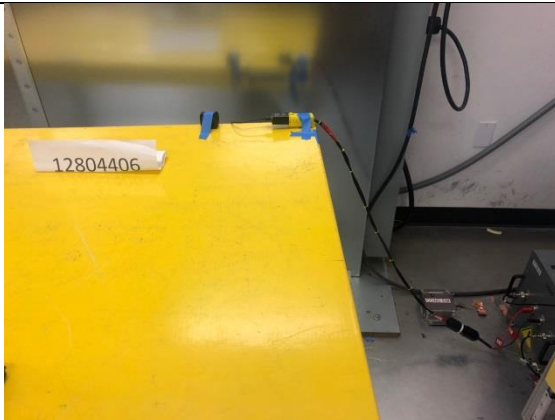
11. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

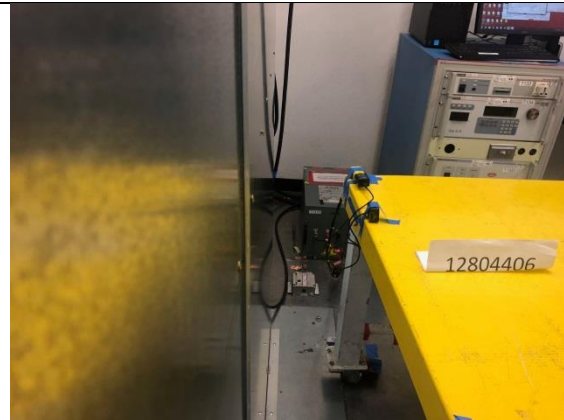


FRONT PHOTO

AC MAINS LINE CONDUCTED EMISSIONS

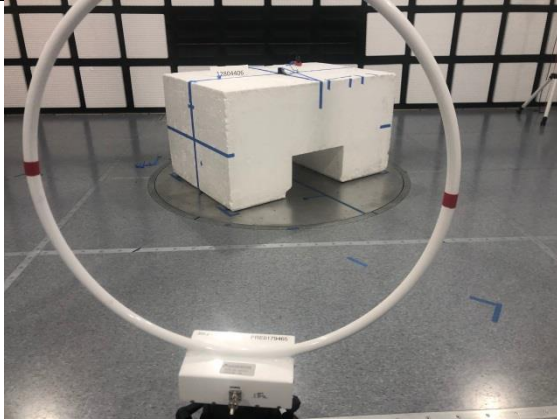


FRONT PHOTO (AC/DC ADAPTER)



BACK PHOTO (AC/DC ADAPTER)

3 METER RADIATED SPURIOUS EMISSIONS BELOW 30MHz



FRONT PHOTO

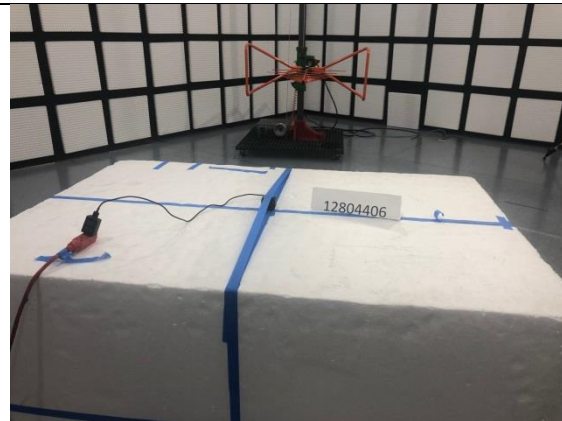


BACK PHOTO

3 METER RADIATED SPURIOUS EMISSIONS 30MHz TO 1GHz

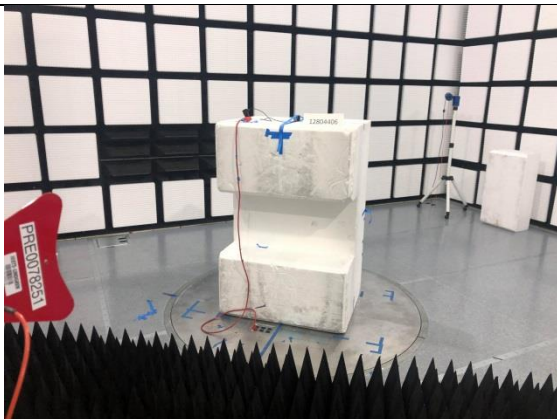


FRONT PHOTO



BACK PHOTO

3 METER RADIATED SPURIOUS EMISSIONS 1GHz TO 18GHz

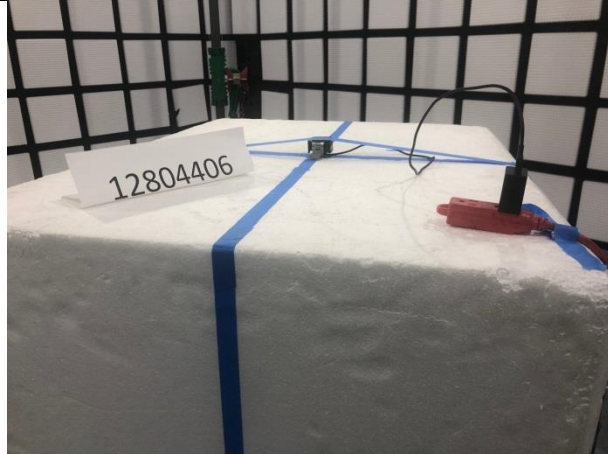


FRONT PHOTO



BACK PHOTO

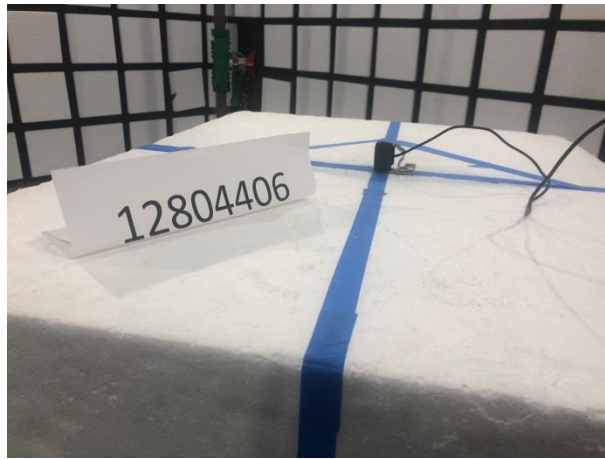
RADIATED RF MEASUREMENT FOR PORTABLE CONFIGURATION



X-AXIS FRONT PHOTO



Y-AXIS FRONT PHOTO



Z-AXIS FRONT PHOTO

END OF REPORT