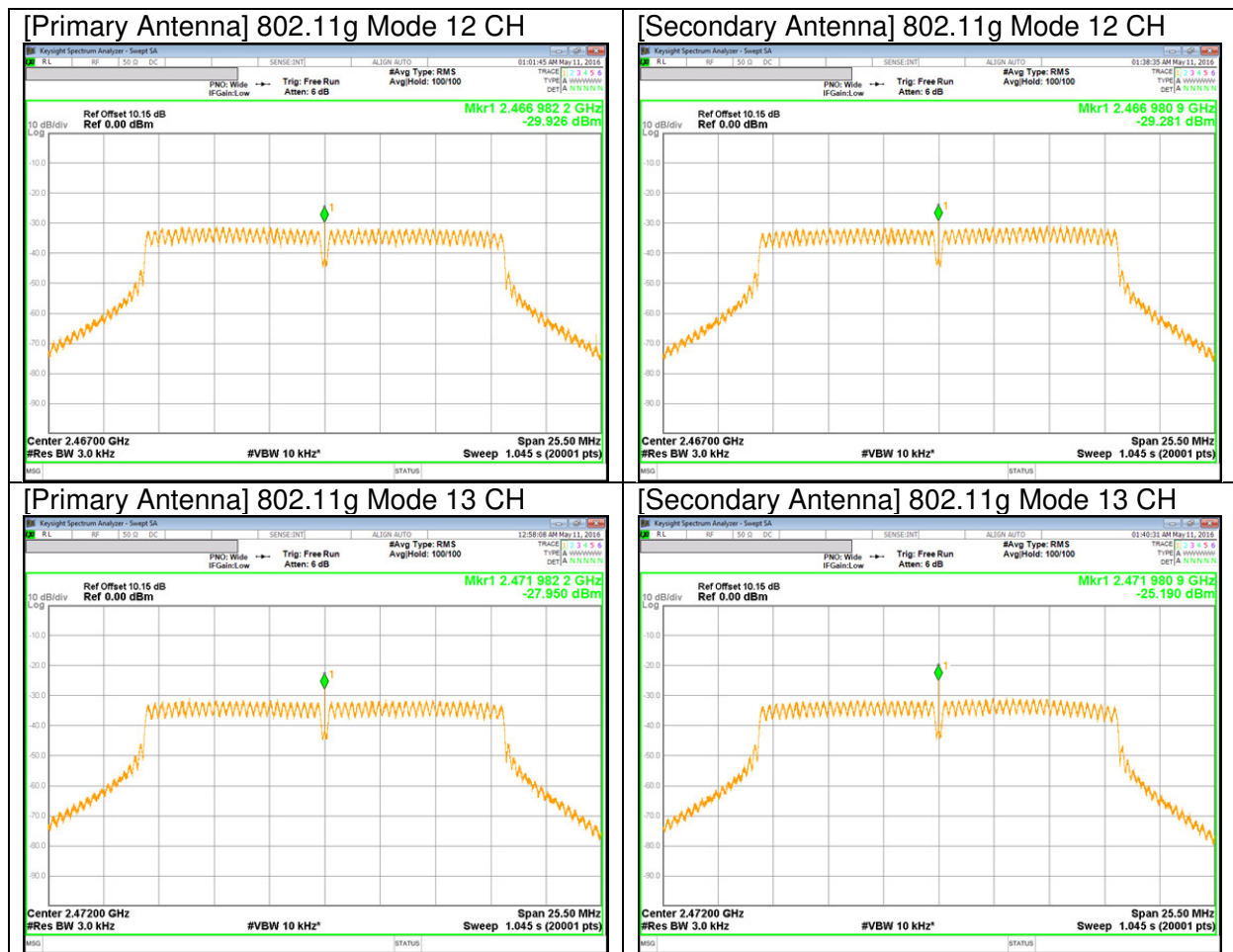
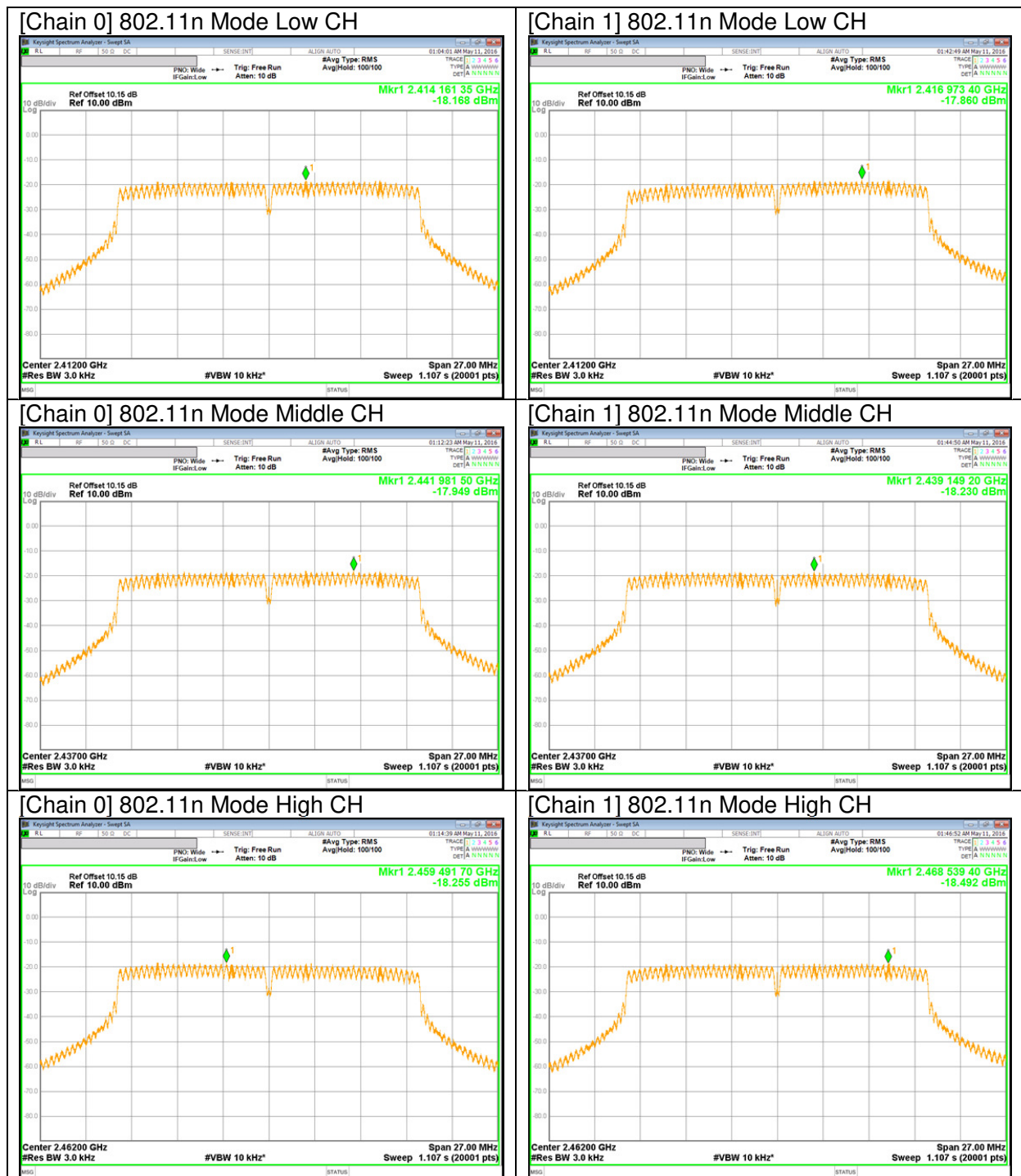
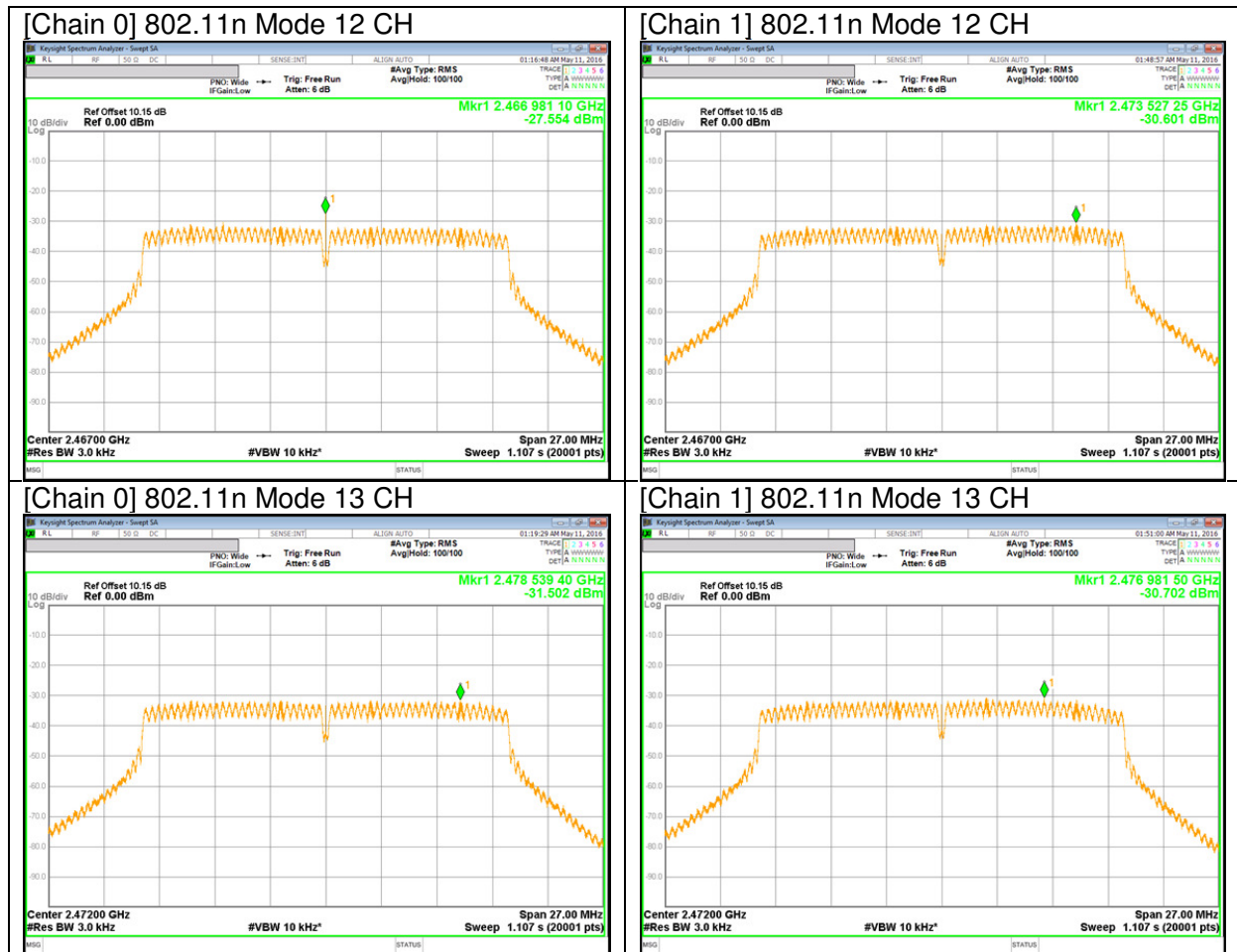








10.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

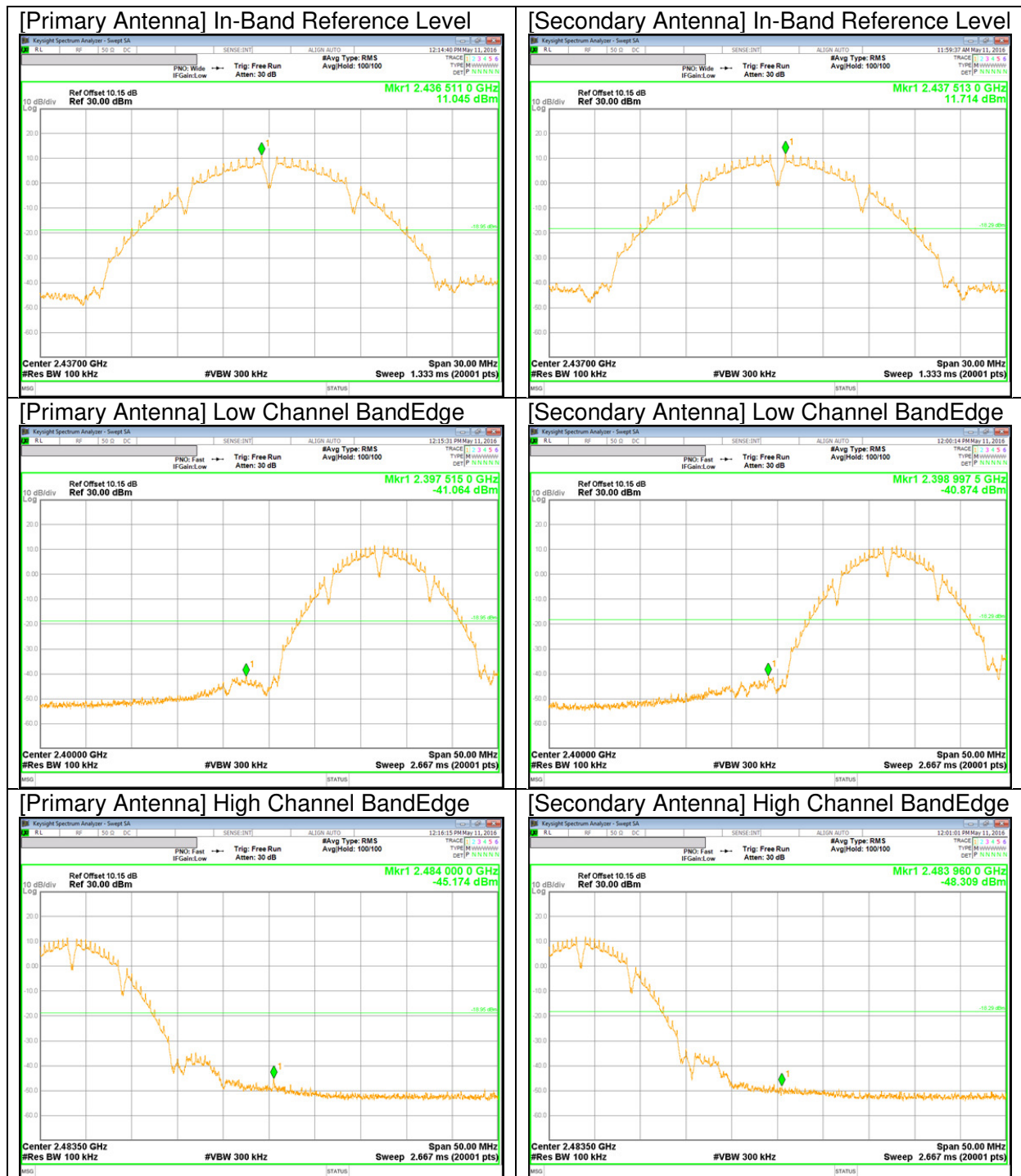
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

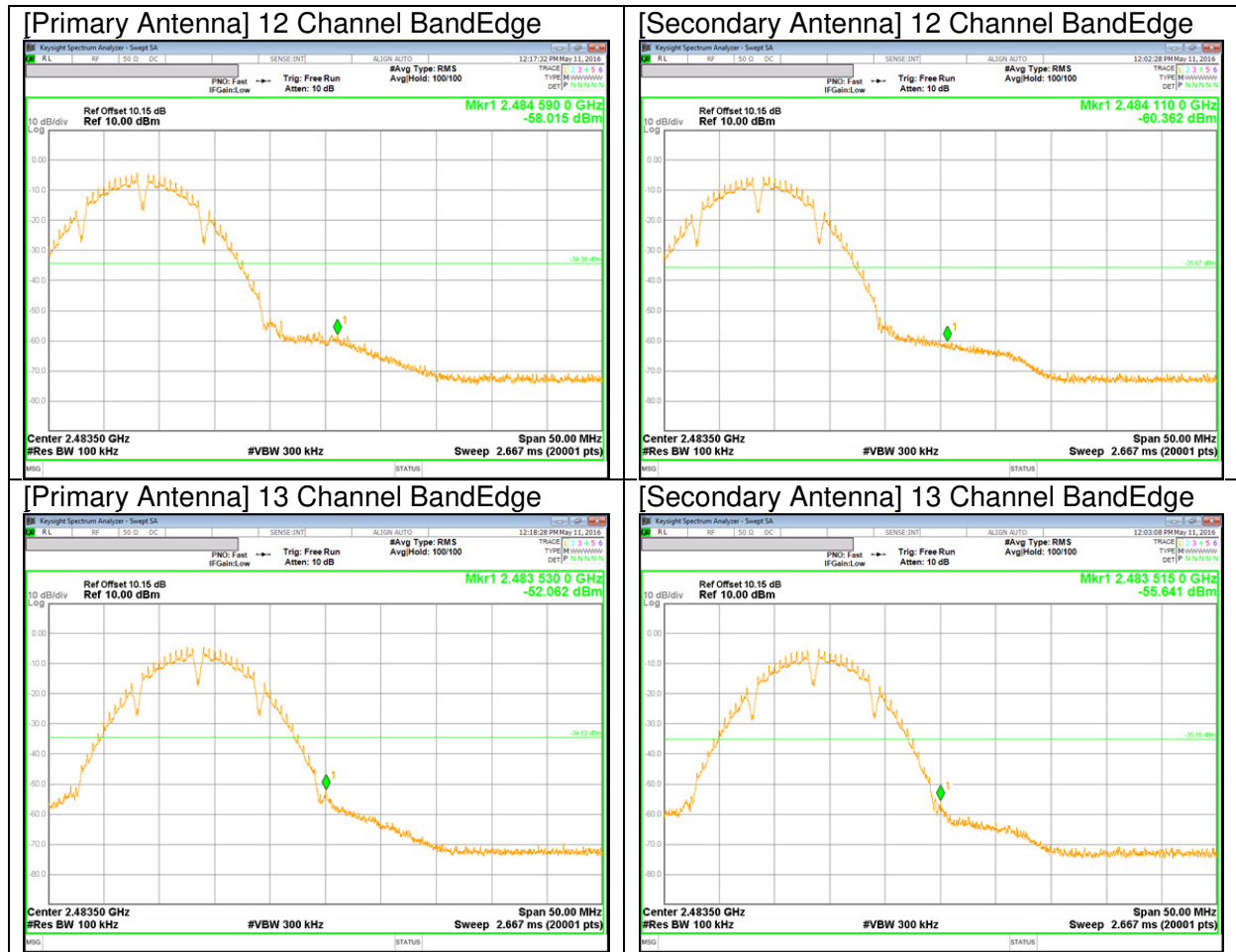
TEST PROCEDURE

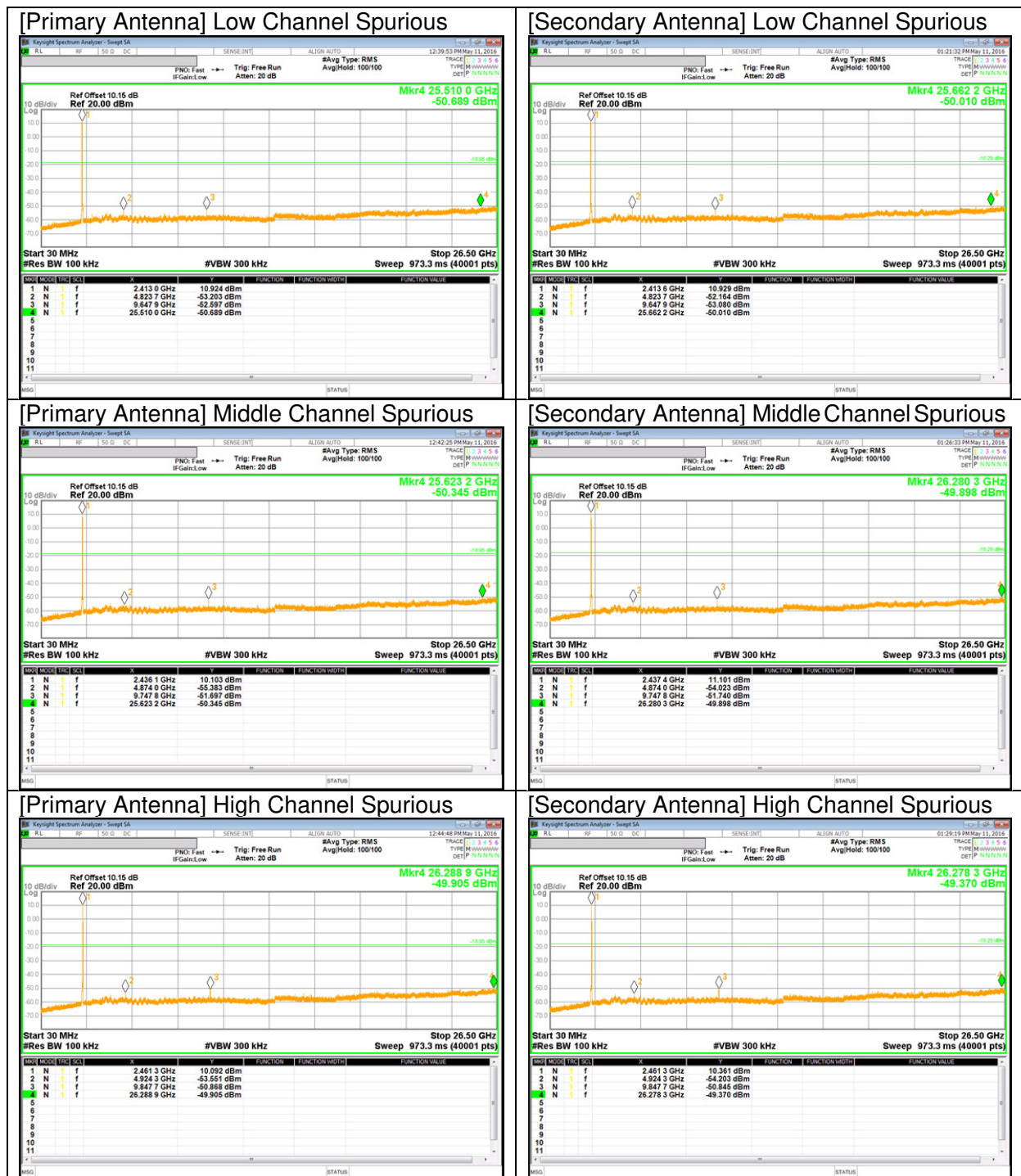
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

10.5.1. 802.11b MODE IN THE 2.4 GHz BAND

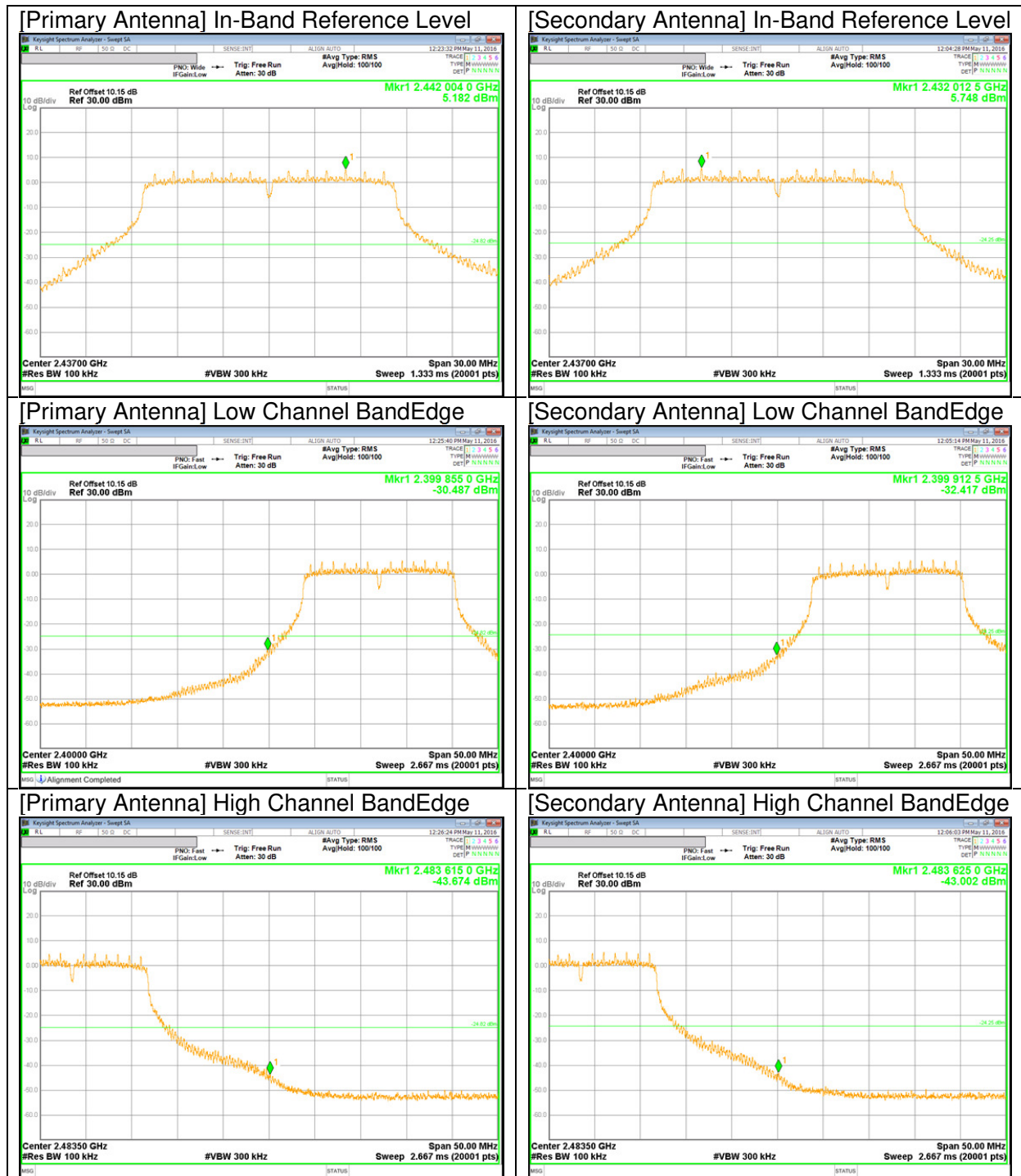


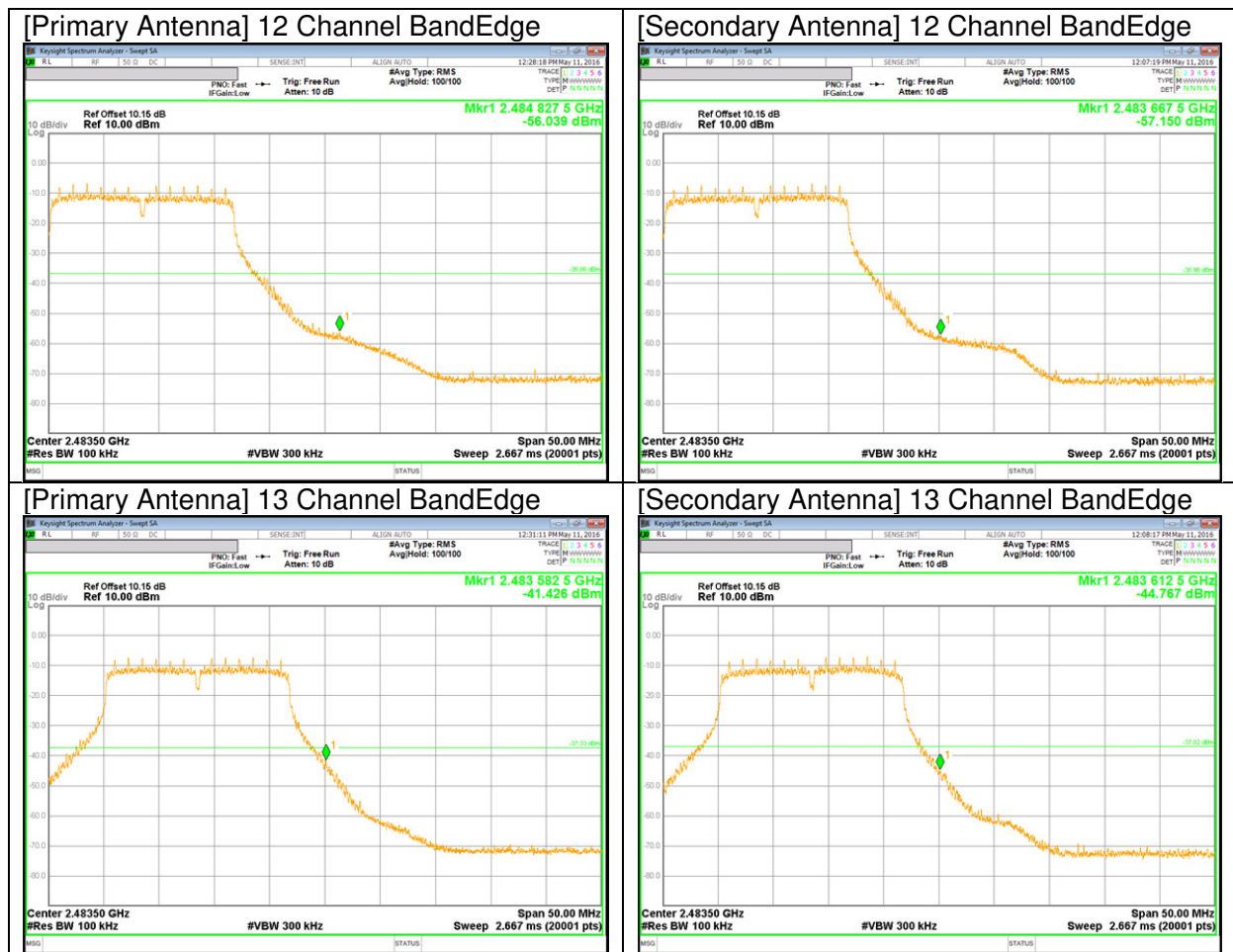


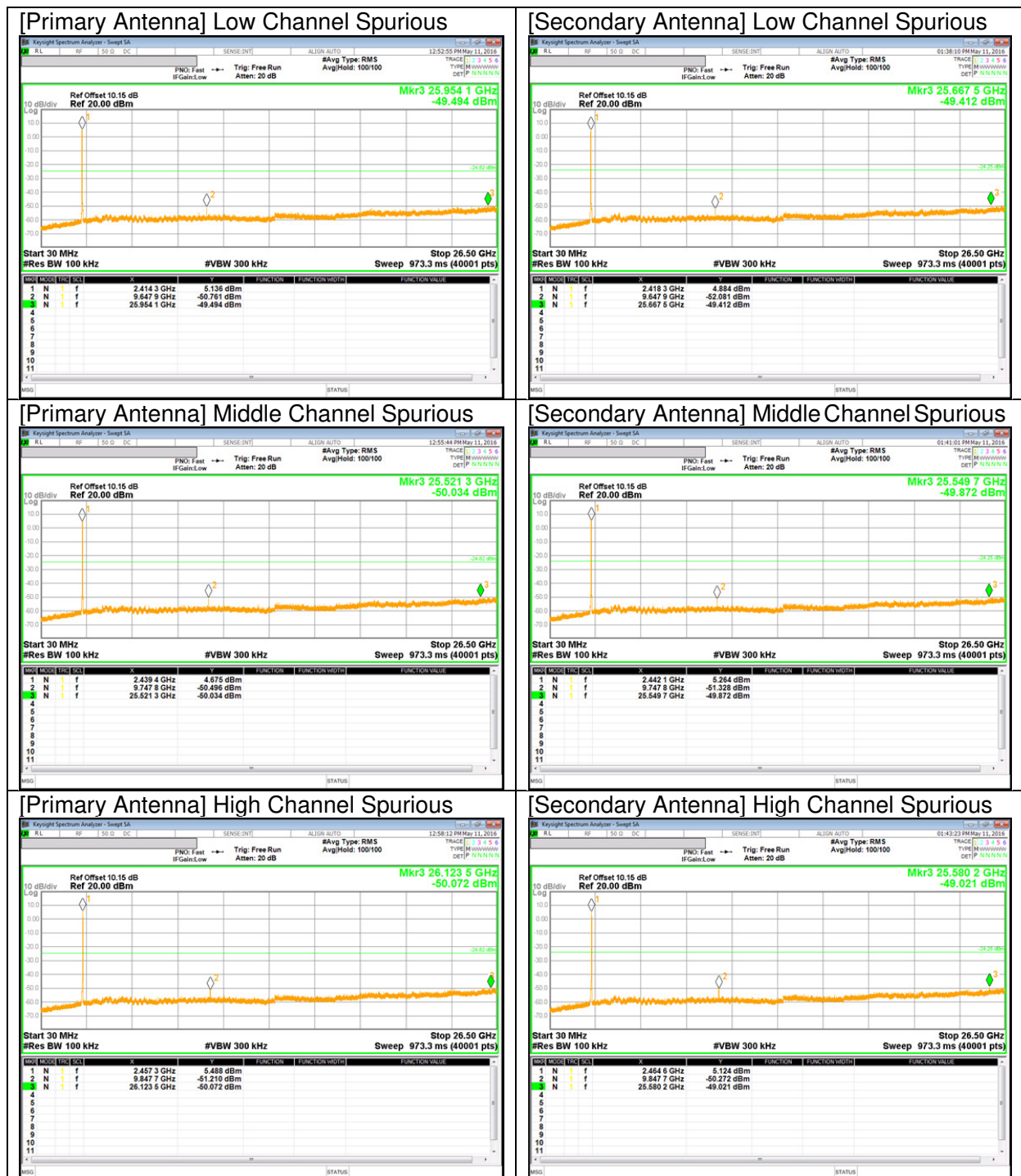


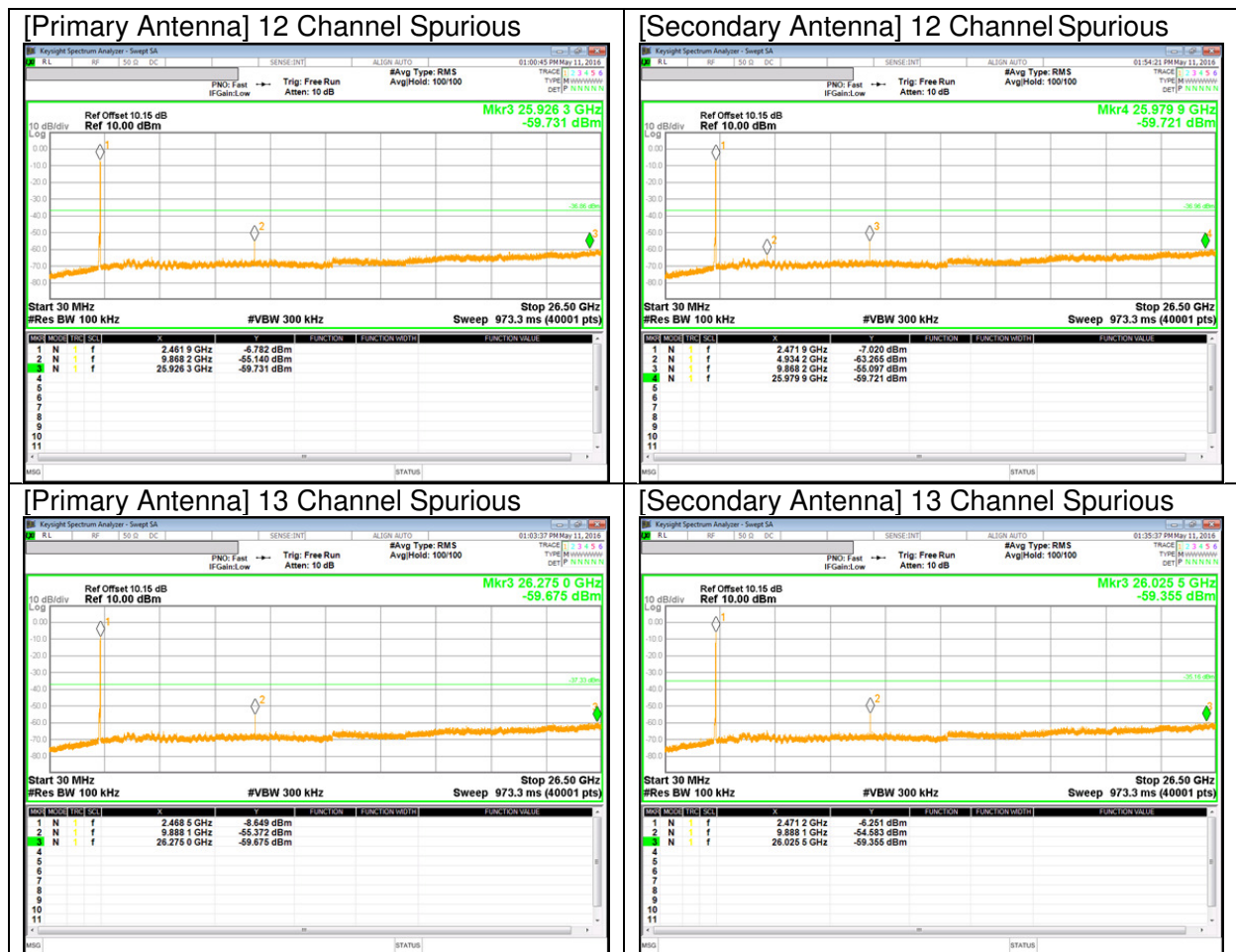


10.5.2. 802.11g MODE IN THE 2.4 GHz BAND

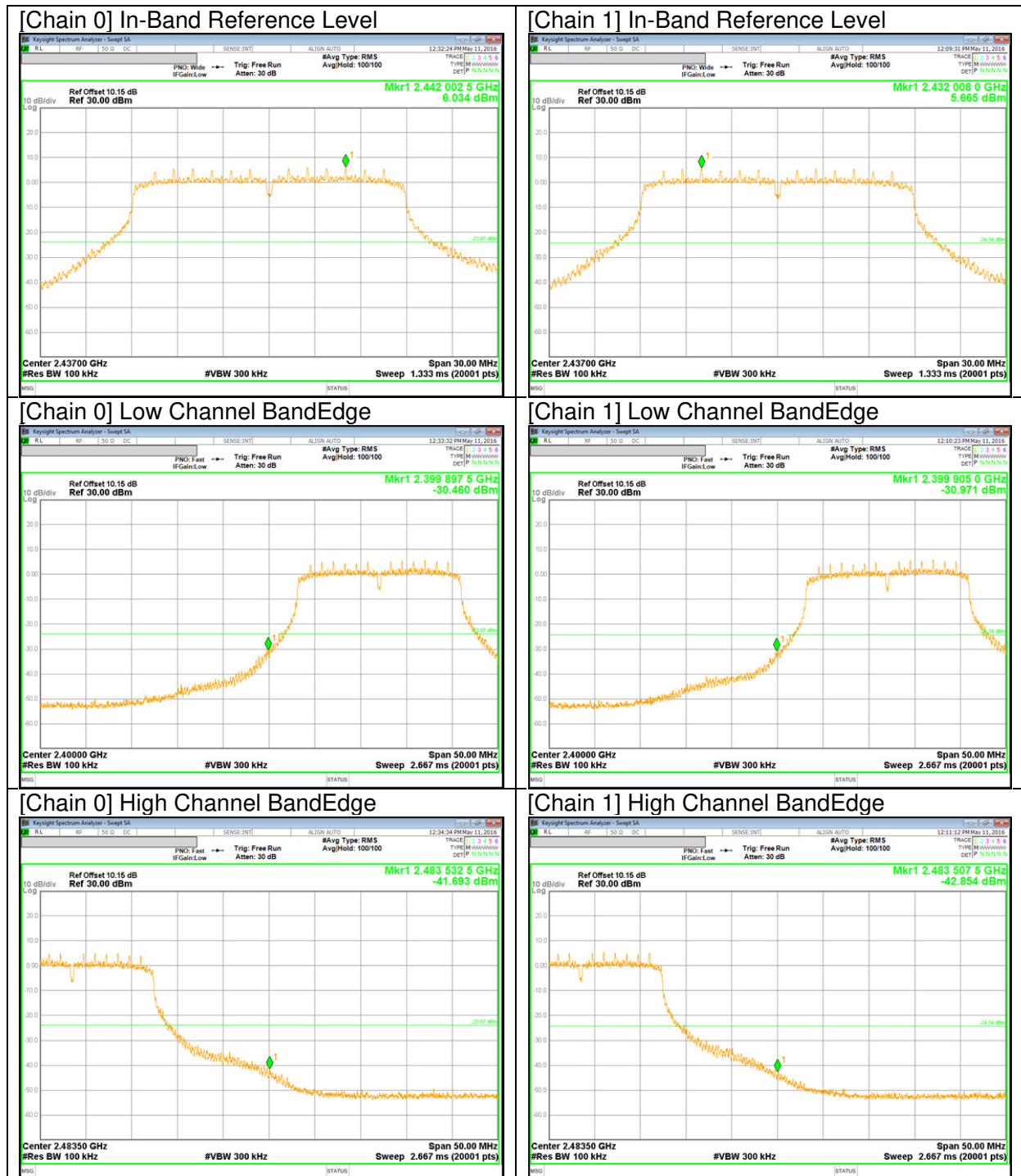


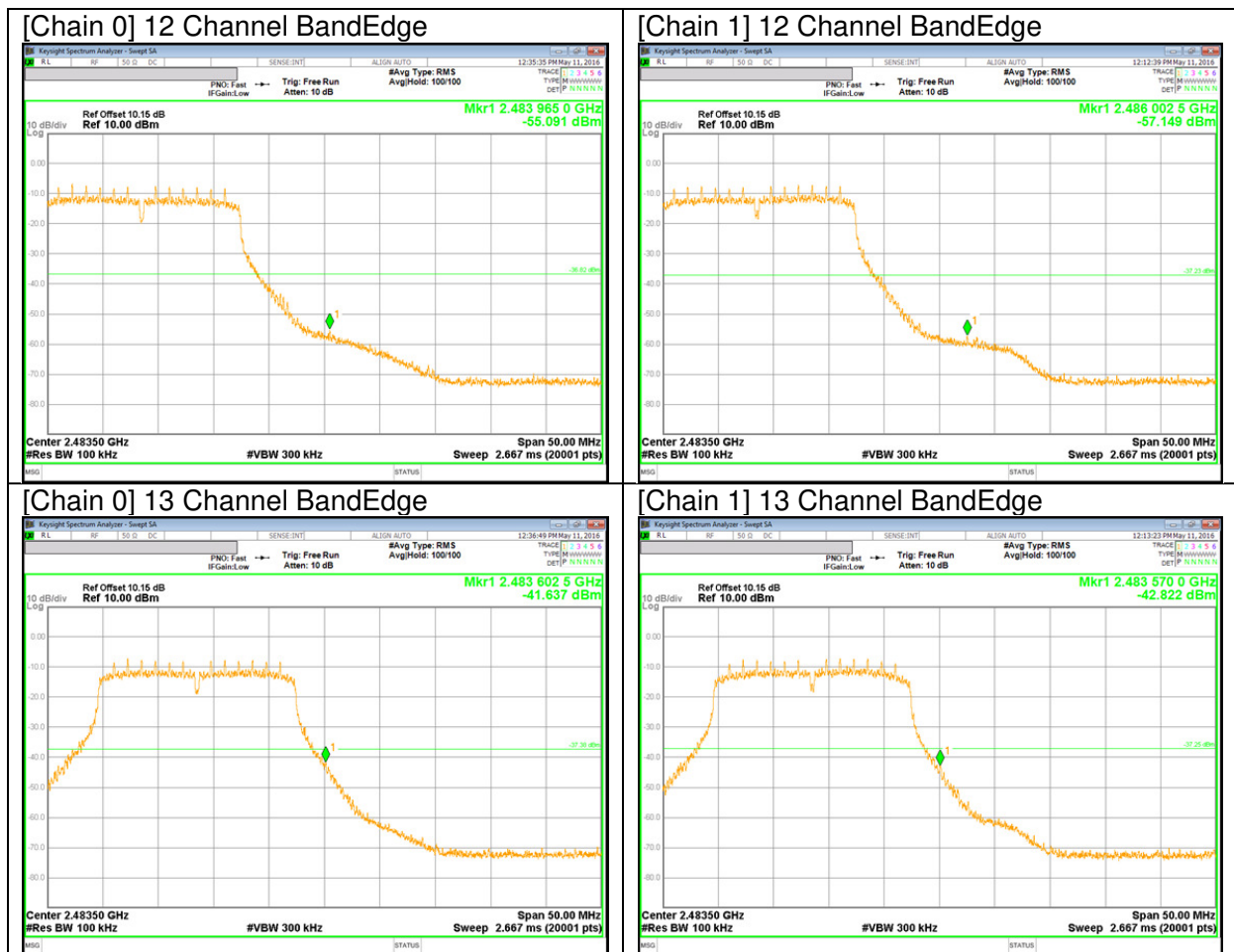


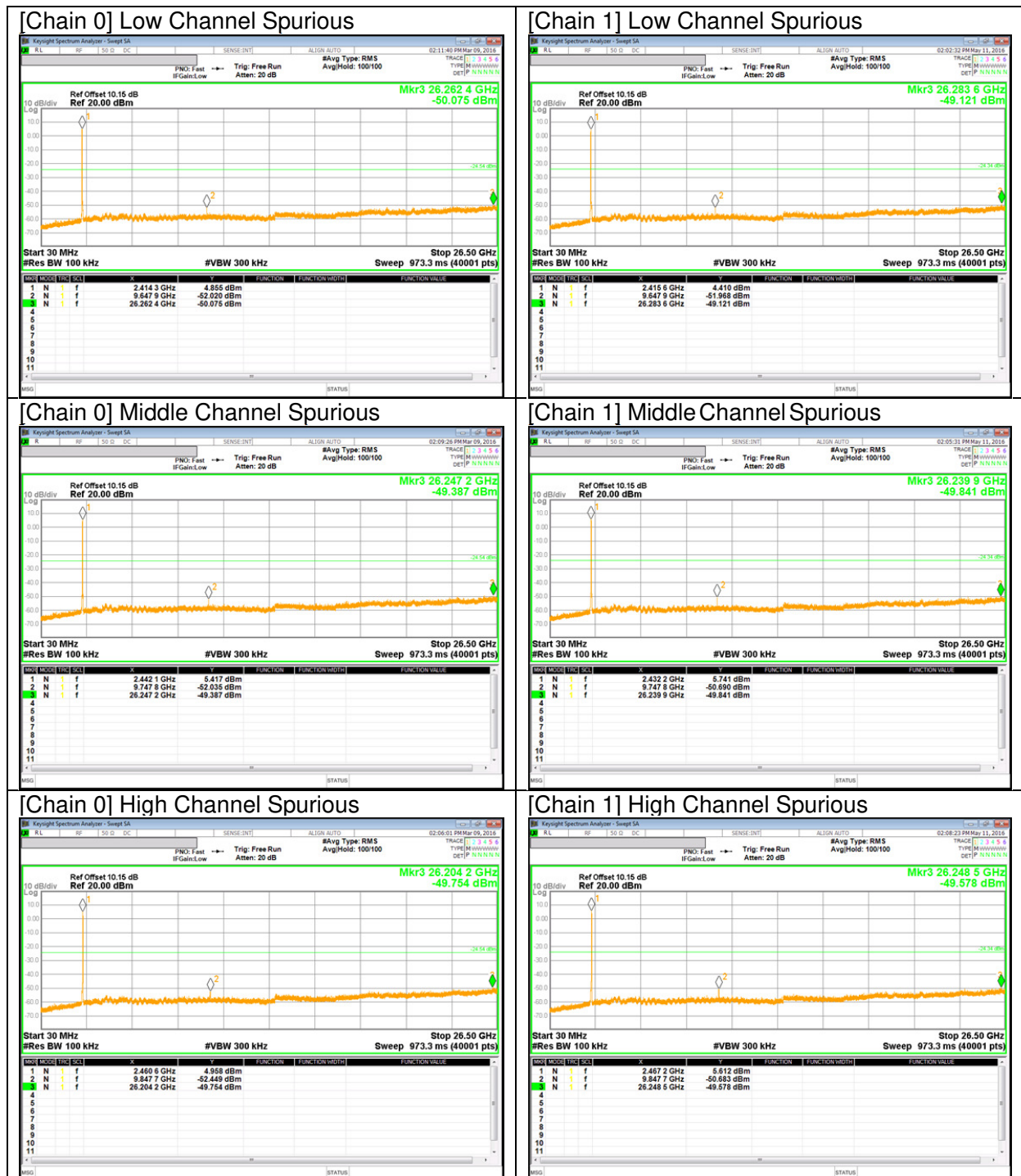


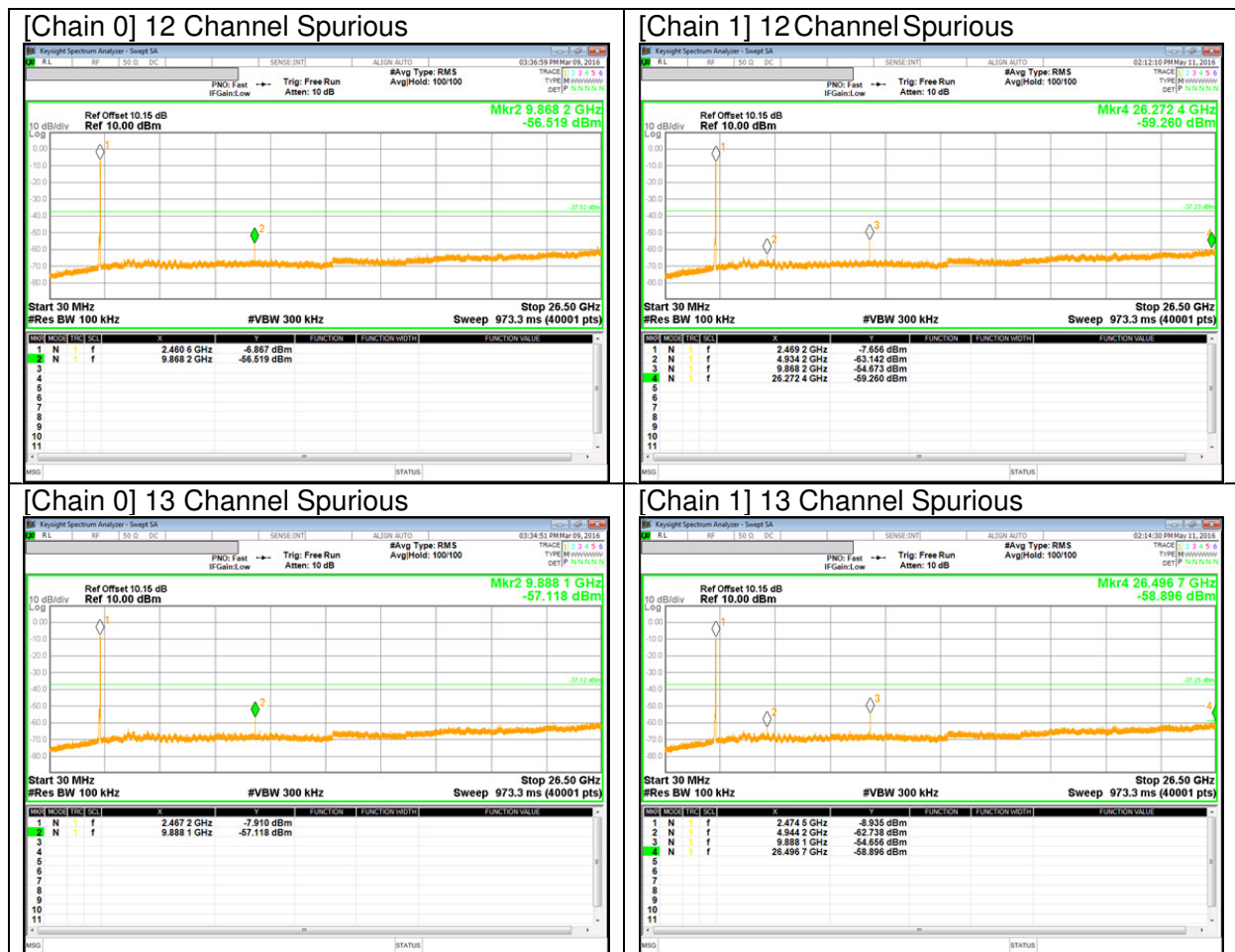


10.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND









11. RADIATED TEST RESULTS

11.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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. The antenna to EUT distance is 3 meters.

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

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor = $10\log(1/x)$ For this sample B mode = 0dB (duty cycle >98%); G mode = 0.31dB; N mode = 0.33dB.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable 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.

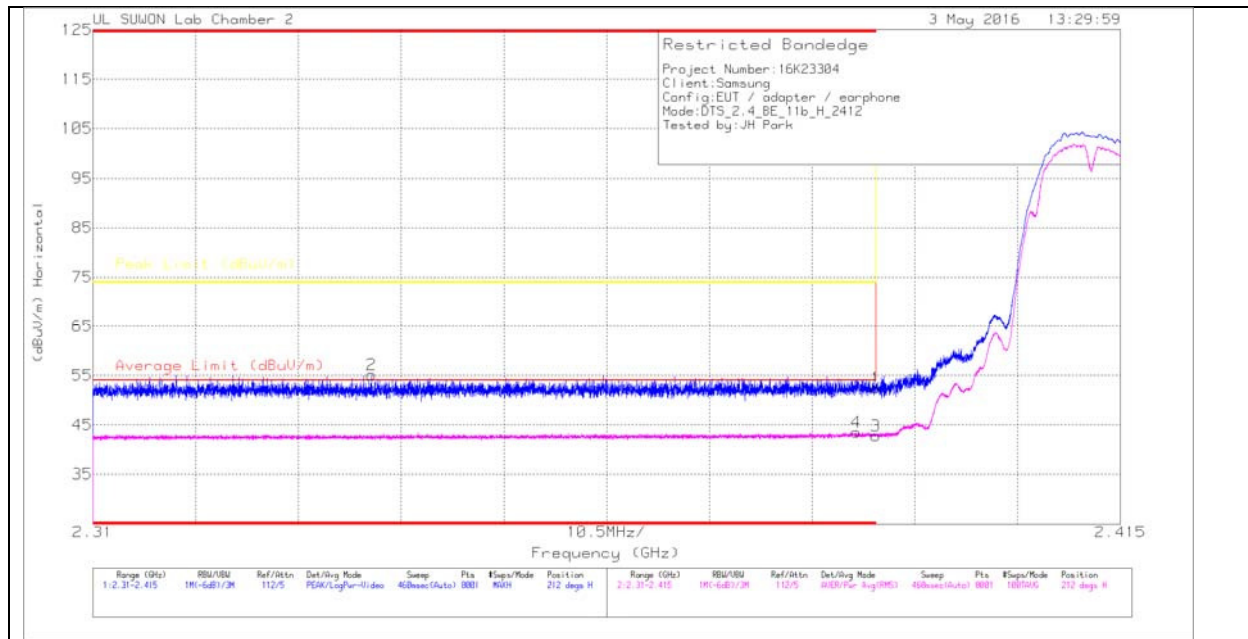
Note : Emission was pre-scanned from 9KHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit. Per FCC part 15.31(o), test results were not reported

11.2. TRANSMITTER ABOVE 1 GHz

11.2.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

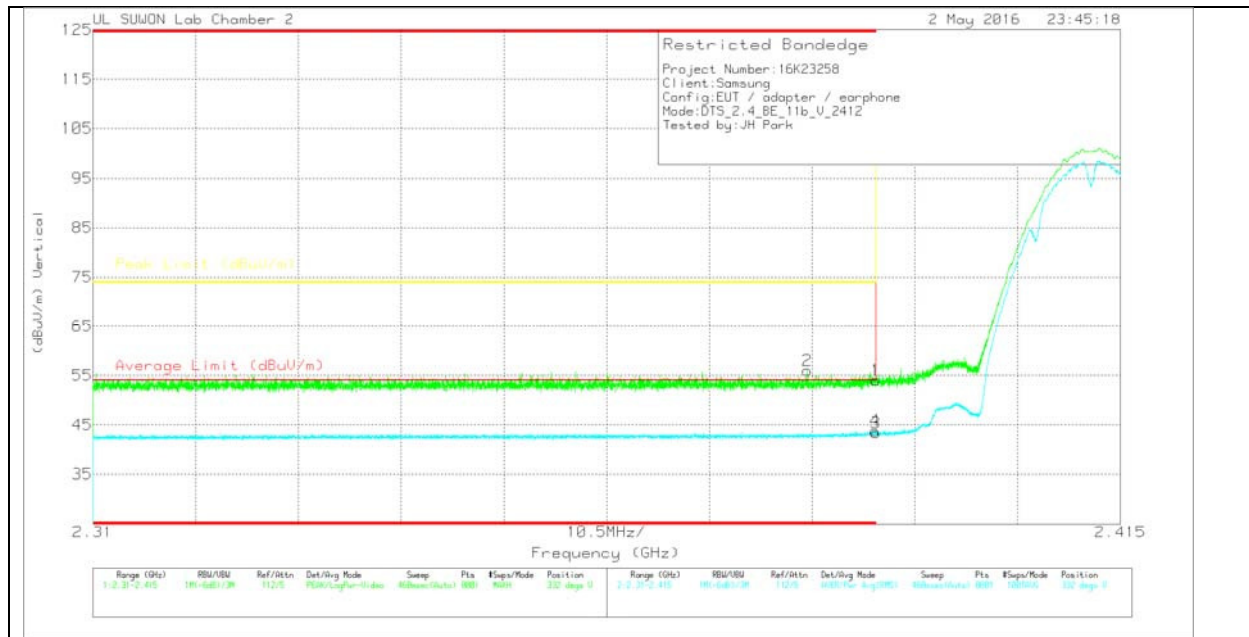
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10d B	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.22	Pk	31.7	-19.5	0	52.42	-	-	74	-21.58	212	107	H
2	* 2.338	43.11	Pk	31.6	-19.6	0	55.11	-	-	74	-18.89	212	107	H
3	* 2.39	30.59	RMS	31.7	-19.5	0	42.79	54	-11.21	-	-	212	107	H
4	* 2.388	31.31	RMS	31.7	-19.5	0	43.51	54	-10.49	-	-	212	107	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24_150619)	Path_2_10d B	DC Corr (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	41.83	Pk	31.7	-19.5	0	54.03	-	-	74	-19.97	332	304	V
2	* 2.383	43.84	Pk	31.7	-19.5	0	56.04	-	-	74	-17.96	332	304	V
3	* 2.39	31.2	RMS	31.7	-19.5	0	43.4	54	-10.6	-	-	332	304	V
4	* 2.39	31.63	RMS	31.7	-19.5	0	43.83	54	-10.17	-	-	332	304	V

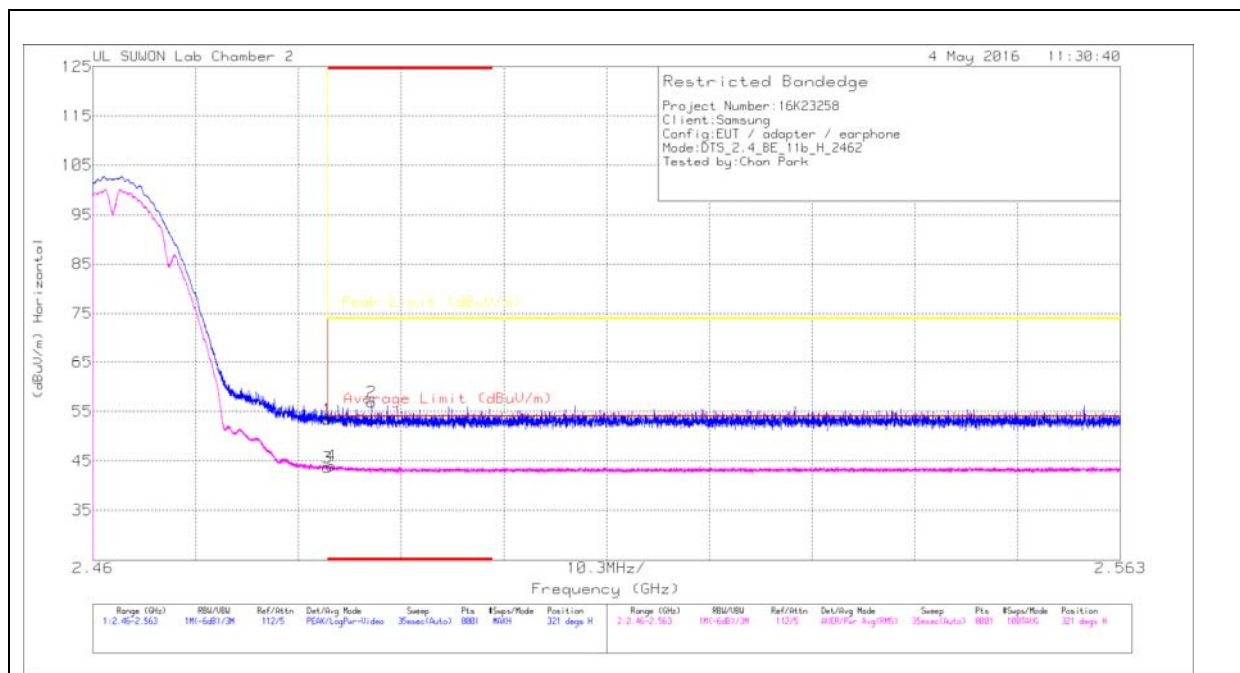
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

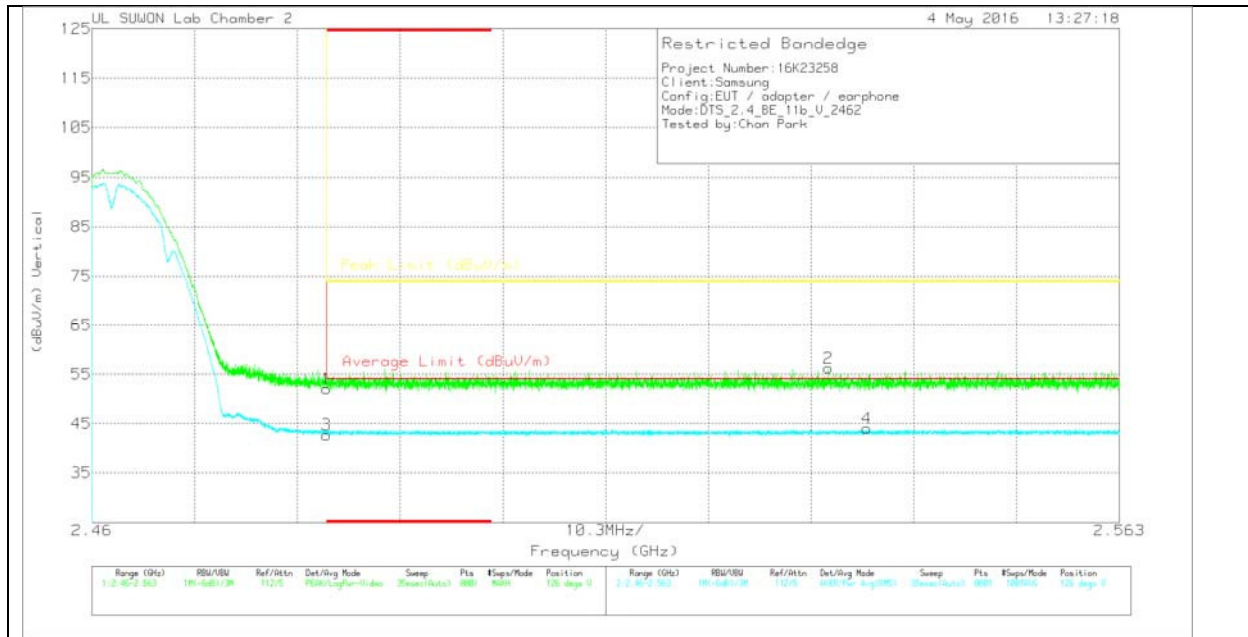
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10d B	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.05	Pk	31.8	-19.4	0	53.45	-	-	74	-20.55	321	288	H
2	* 2.488	44.53	Pk	31.8	-19.4	0	56.93	-	-	74	-17.07	321	288	H
3	* 2.484	31.25	RMS	31.8	-19.4	0	43.65	54	-10.35	-	-	321	288	H
4	* 2.484	31.64	RMS	31.8	-19.4	0	44.04	54	-9.96	-	-	321	288	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24_150619)	Path_Z_10d B	DC Corr (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	39.61	Pk	31.8	-19.4	0	52.01	-	-	74	-21.99	126	290	V
2	2.534	43.66	Pk	31.9	-19.3	0	56.26	-	-	74	-17.74	126	290	V
3	* 2.484	30.32	RMS	31.8	-19.4	0	42.72	54	-11.28	-	-	126	290	V
4	2.538	31.39	RMS	31.9	-19.3	0	43.99	54	-10.01	-	-	126	290	V

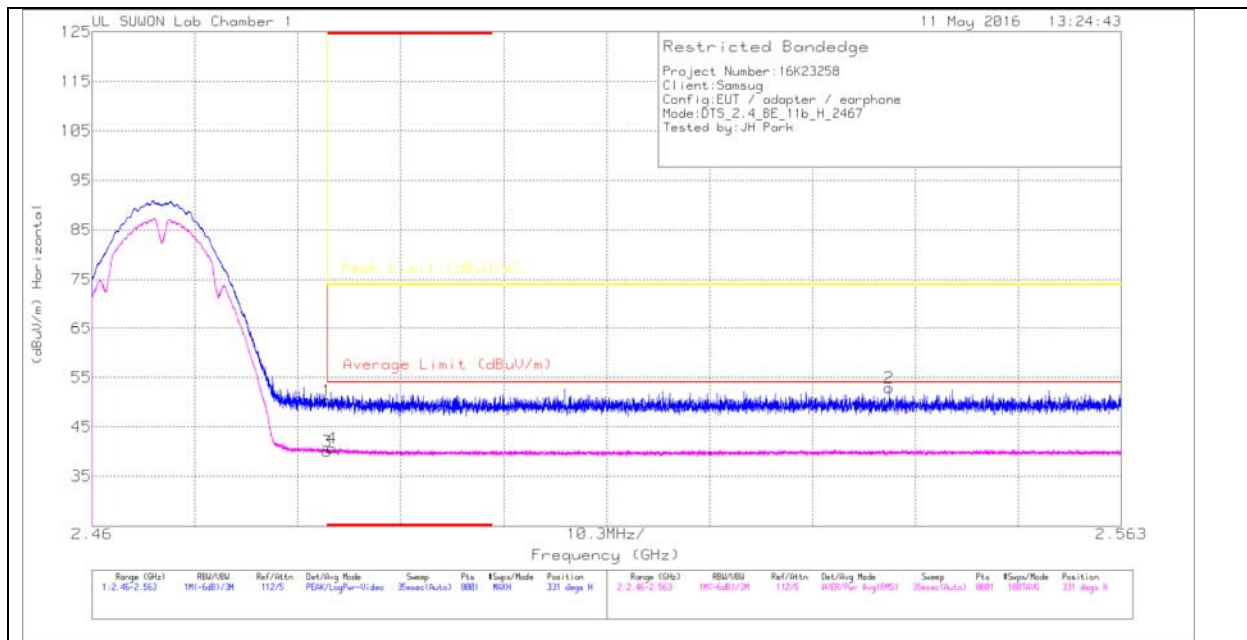
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (12 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

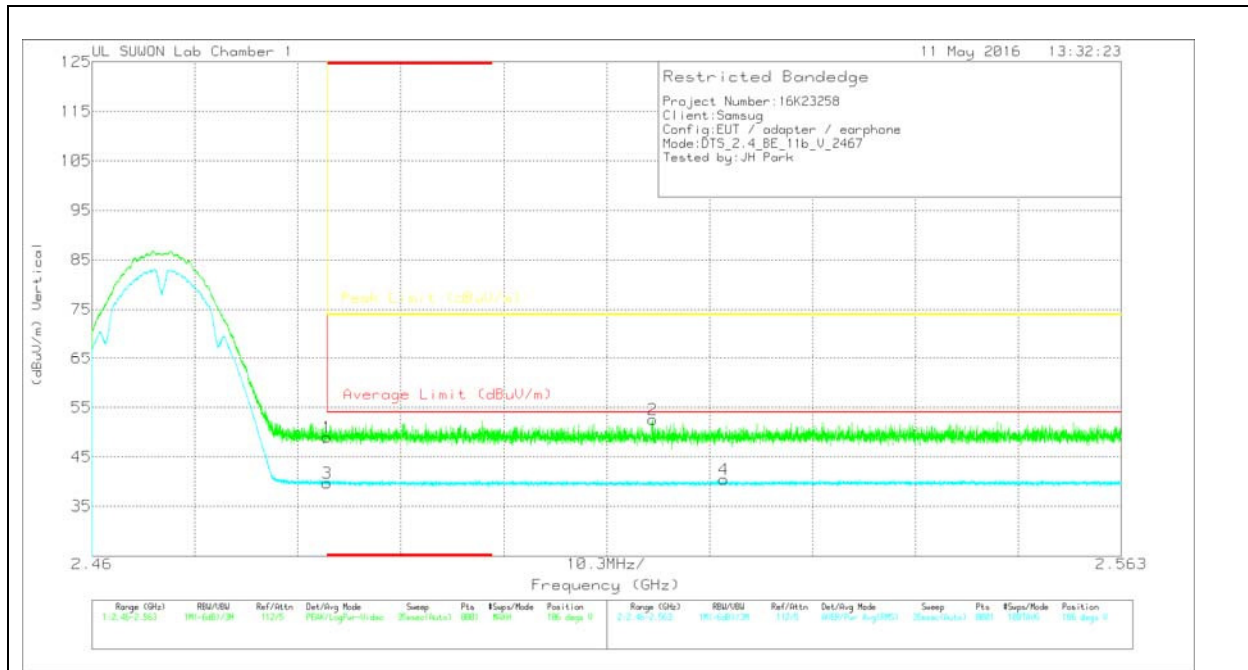
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117/001687 17_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	46.62	Pk	32	-28.3	0	50.32	-	-	74	-23.68	331	109	H
2	2.54	49.28	Pk	32	-28.3	0	52.98	-	-	74	-21.02	331	109	H
3	* 2.484	36.31	RMS	32	-28.3	0	40.01	54	-13.99	-	-	331	109	H
4	* 2.484	36.95	RMS	32	-28.3	0	40.65	54	-13.35	-	-	331	109	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_2	DC Corr (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	45.31	Pk	32	-28.3	0	49.01	-	-	74	-24.99	186	101	V
2	2.516	48.86	Pk	32	-28.3	0	52.56	-	-	74	-21.44	186	101	V
3	* 2.484	35.95	RMS	32	-28.3	0	39.65	54	-14.35	-	-	186	101	V
4	2.523	36.71	RMS	32	-28.3	0	40.41	54	-13.59	-	-	186	101	V

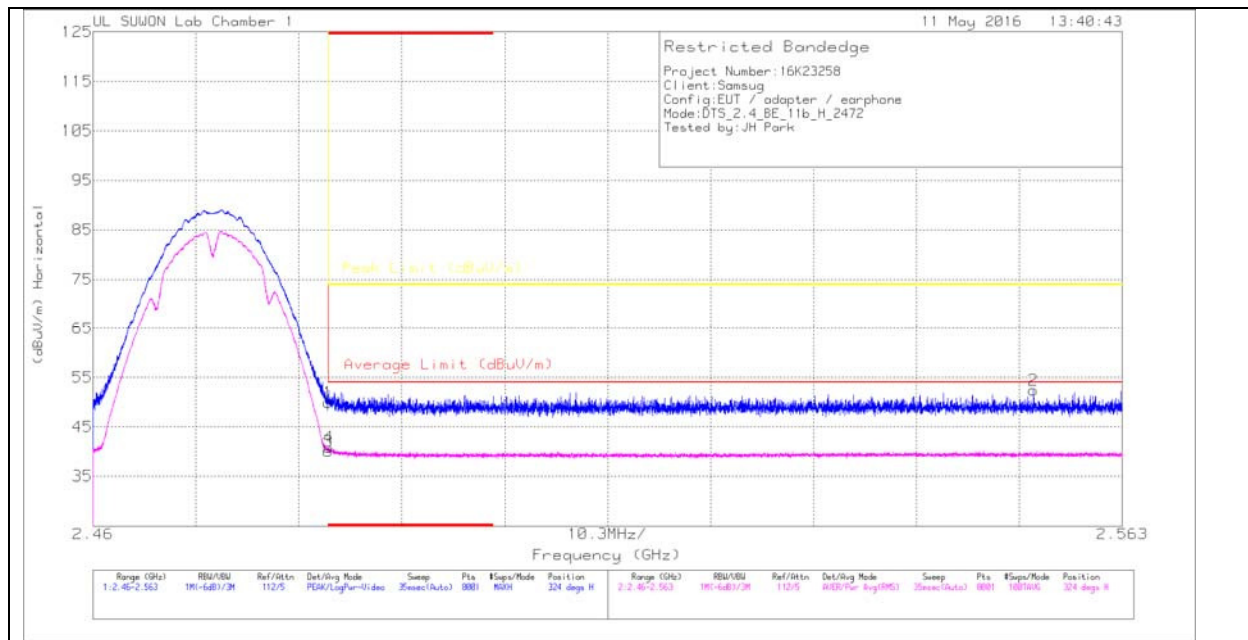
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (13 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

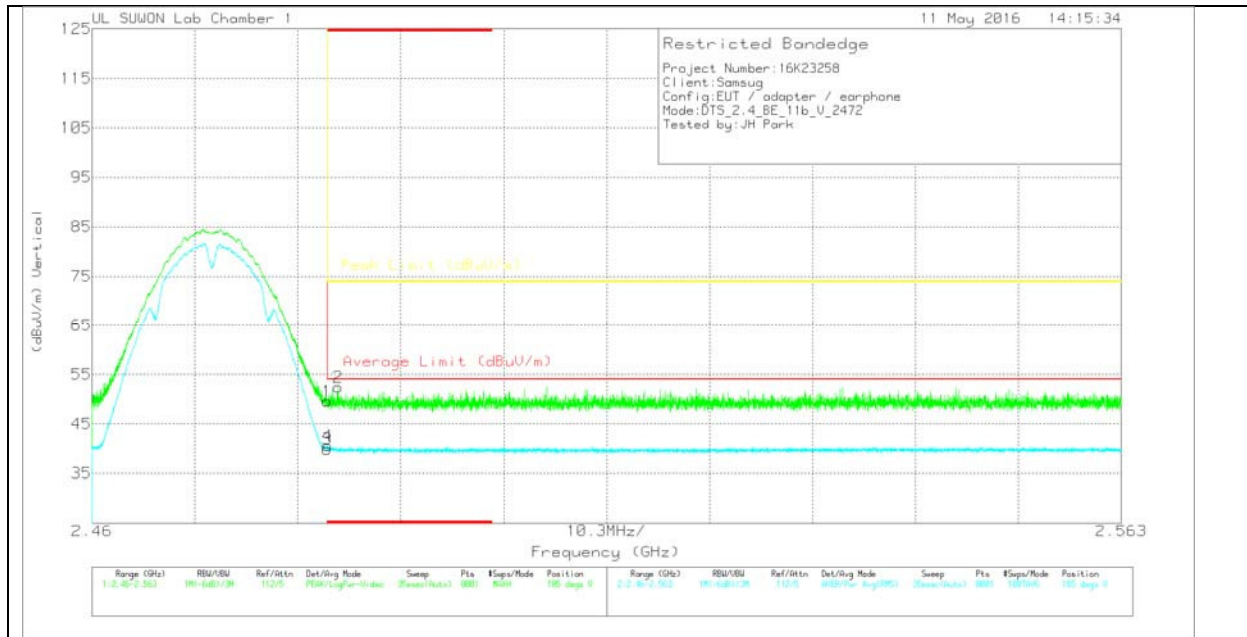
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117/001687 17_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	46.22	Pk	32	-28.3	0	49.92	-	-	74	-24.08	324	102	H
2	2.554	48.68	Pk	32	-28.2	0	52.48	-	-	74	-21.52	324	102	H
3	* 2.484	36.38	RMS	32	-28.3	0	40.08	54	-13.92	-	-	324	102	H
4	* 2.484	37.16	RMS	32	-28.3	0	40.86	54	-13.14	-	-	324	102	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_2	DC Corr (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	45.88	Pk	32	-28.3	0	49.58	-	-	74	-24.42	185	102	V
2	* 2.485	48.73	Pk	32	-28.3	0	52.43	-	-	74	-21.57	185	102	V
3	* 2.484	36.18	RMS	32	-28.3	0	39.88	54	-14.12	-	-	185	102	V
4	* 2.484	36.82	RMS	32	-28.3	0	40.52	54	-13.48	-	-	185	102	V

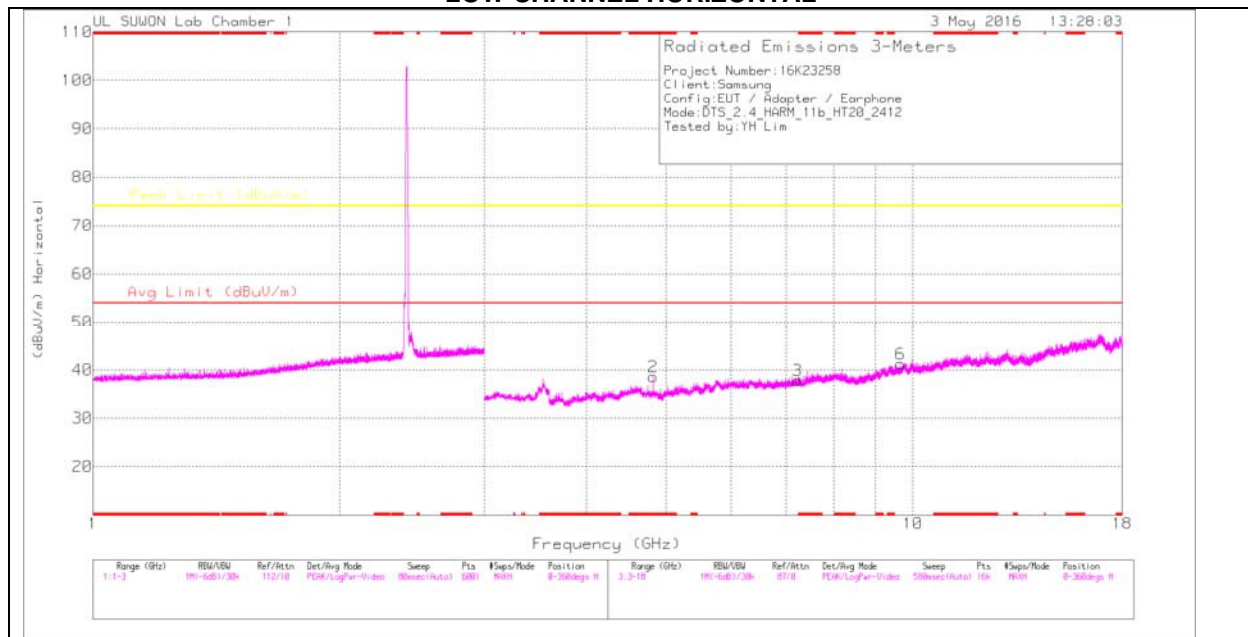
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

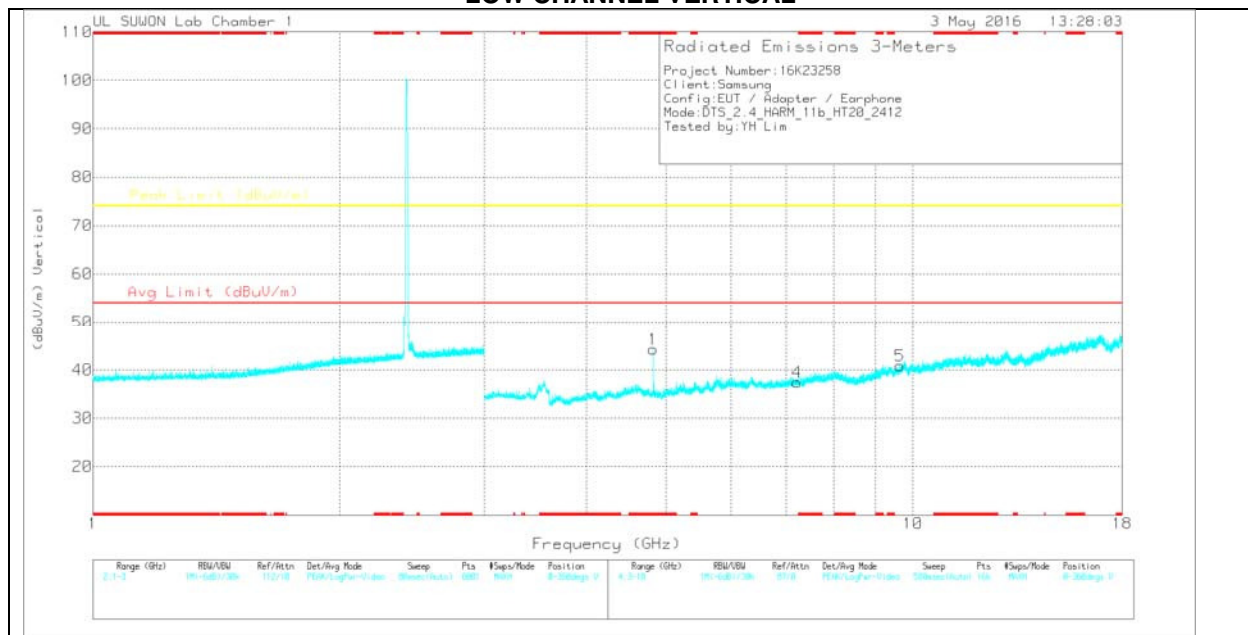
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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	3117(001687 17)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 4.823	38.36	Pk	34	-33.8	0	38.56	-	-	74	-35.44	0-360	100	H
3	7.229	33.08	Pk	35.7	-31	0	37.78	-	-	74	-36.22	0-360	200	H
6	9.649	31.53	Pk	37.1	-27.4	0	41.23	-	-	74	-32.77	0-360	100	H
1	* 4.823	44.13	Pk	34	-33.8	0	44.33	-	-	74	-29.67	0-360	100	V
4	7.227	32.76	Pk	35.7	-31	0	37.46	-	-	74	-36.54	0-360	100	V
5	9.646	31.18	Pk	37.1	-27.4	0	40.88	-	-	74	-33.12	0-360	100	V

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

PK – Peak detector

Radiated Emissions

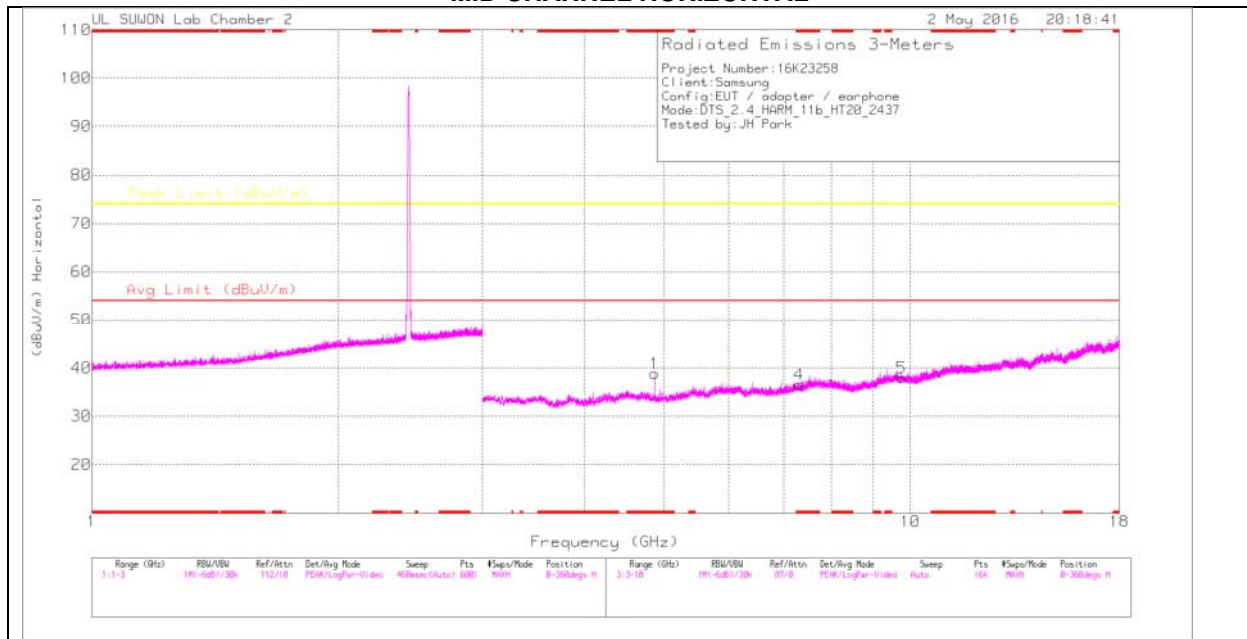
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8717)_150 619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.824	48.86	PK2	34	-33.8	0	49.06	-	-	74	-24.94	239	376	H
* 4.824	40.58	MAv1	34	-33.8	0	40.78	54	-13.22	-	-	239	376	H
* 4.824	49.8	PK2	34	-33.8	0	50	-	-	74	-24	356	382	V
* 4.824	42.44	MAv1	34	-33.8	0	42.64	54	-11.36	-	-	356	382	V

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

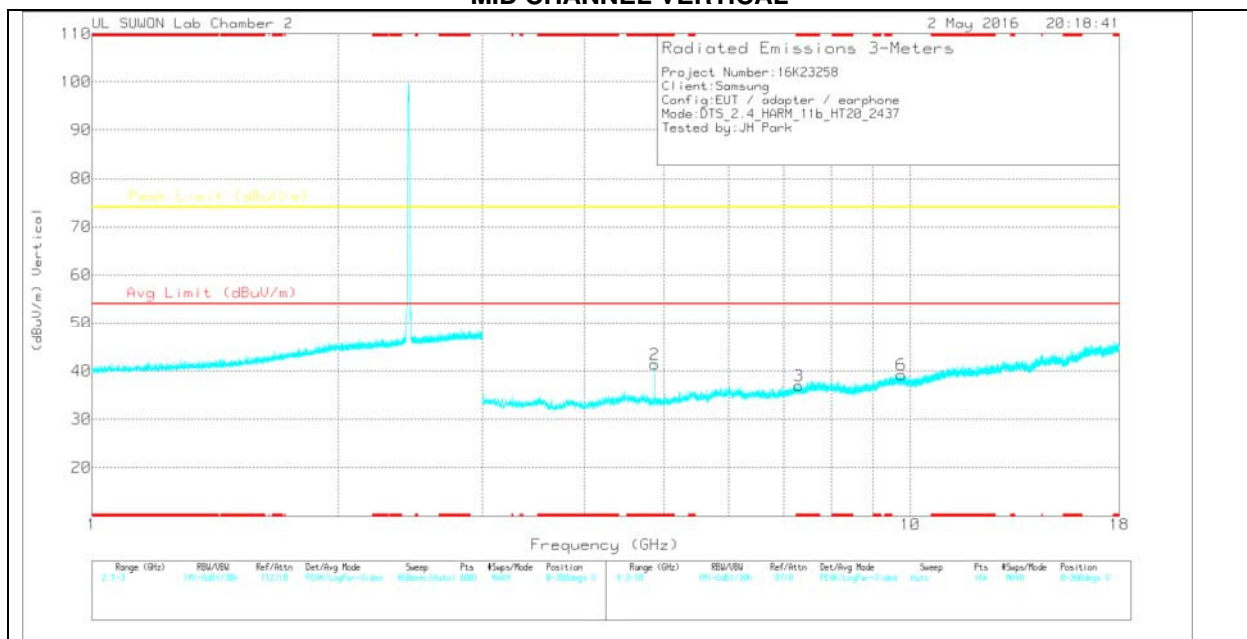
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HORIZONTAL



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	3117(001687 24)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.874	30.11	PK	33.9	-25.2	0	38.81	-	-	74	-35.19	0-360	200	H
4	* 7.308	23.26	PK	35.9	-22.6	0	36.56	-	-	74	-37.44	0-360	100	H
5	9.75	20.28	PK	37	-19.3	0	37.98	-	-	74	-36.02	0-360	100	H
2	* 4.874	32.68	PK	33.9	-25.2	0	41.38	-	-	74	-32.62	0-360	200	V
3	* 7.309	23.66	PK	35.9	-22.6	0	36.96	-	-	74	-37.04	0-360	100	V
6	9.749	21.51	PK	37	-19.3	0	39.21	-	-	74	-34.79	0-360	100	V

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

PK – Peak Detector

Radiated Emissions

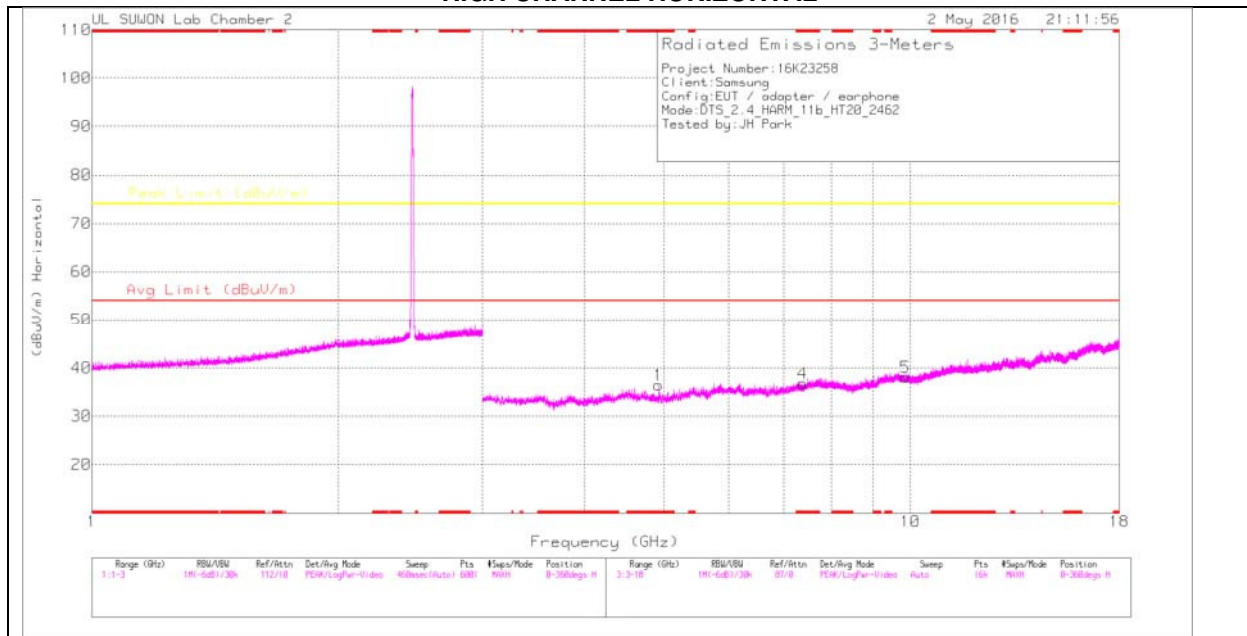
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.874	39.62	PK2	33.9	-25.2	0	48.32	-	-	74	-25.68	221	367	H
* 4.874	30.81	MAv1	33.9	-25.2	0	39.51	54	-14.49	-	-	221	367	H
* 4.874	40.14	PK2	33.9	-25.2	0	48.84	-	-	74	-25.16	15	372	V
* 4.874	32.31	MAv1	33.9	-25.2	0	41.01	54	-12.99	-	-	15	372	V

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

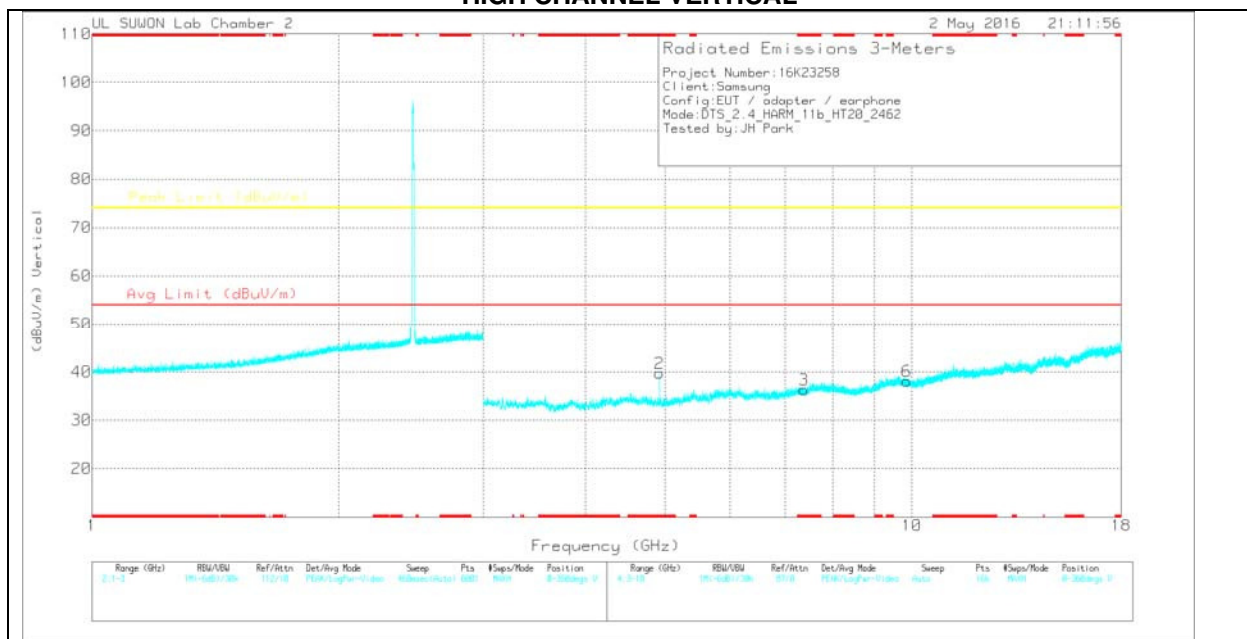
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL



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	3117(001687 24)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.924	27.61	PK	33.9	-25.1	0	36.41	-	-	74	-37.59	0-360	100	H
4	* 7.391	23.09	PK	35.9	-22.2	0	36.79	-	-	74	-37.21	0-360	200	H
5	9.852	20.17	PK	37.1	-19.2	0	38.07	-	-	74	-35.93	0-360	100	H
2	* 4.924	30.89	PK	33.9	-25.1	0	39.69	-	-	74	-34.31	0-360	200	V
3	* 7.384	22.58	PK	35.9	-22.2	0	36.28	-	-	74	-37.72	0-360	100	V
6	9.851	20.14	PK	37.1	-19.2	0	38.04	-	-	74	-35.96	0-360	100	V

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

PK – Peak Detector

Radiated Emissions

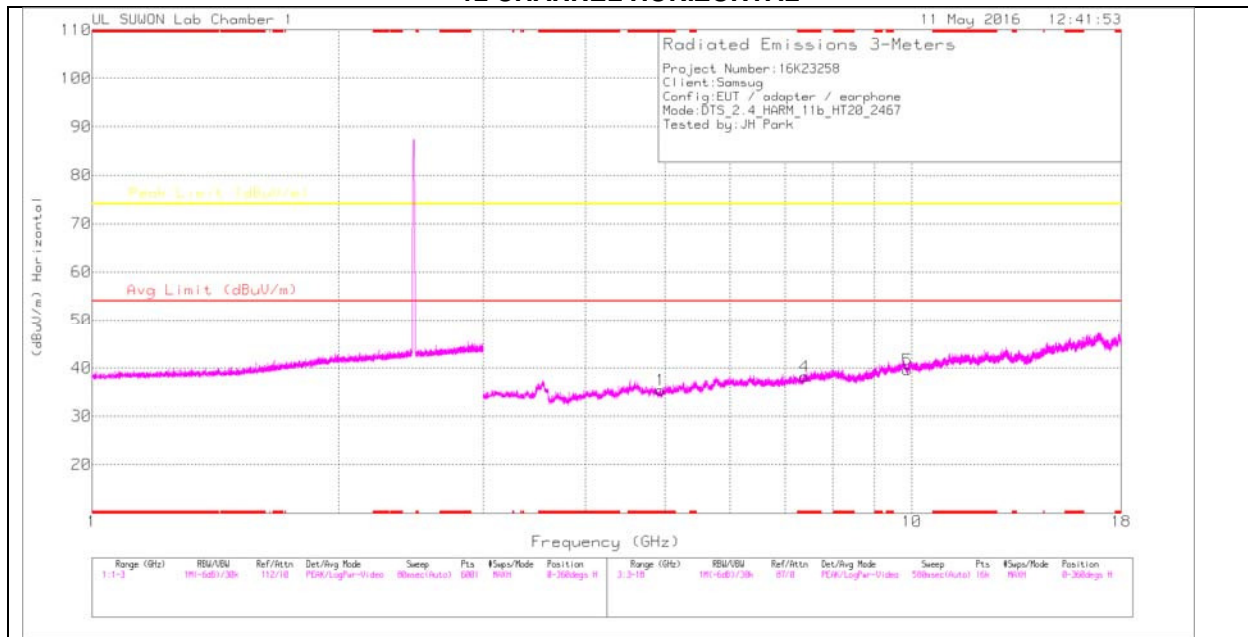
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.924	37.35	PK2	33.9	-25.1	0	46.15	-	-	74	-27.85	187	357	H
* 4.924	26.59	MAv1	33.9	-25.1	0	35.39	54	-18.61	-	-	187	357	H
* 4.924	37.66	PK2	33.9	-25.1	0	46.46	-	-	74	-27.54	4	100	V
* 4.924	28.26	MAv1	33.9	-25.1	0	37.06	54	-16.94	-	-	4	100	V

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

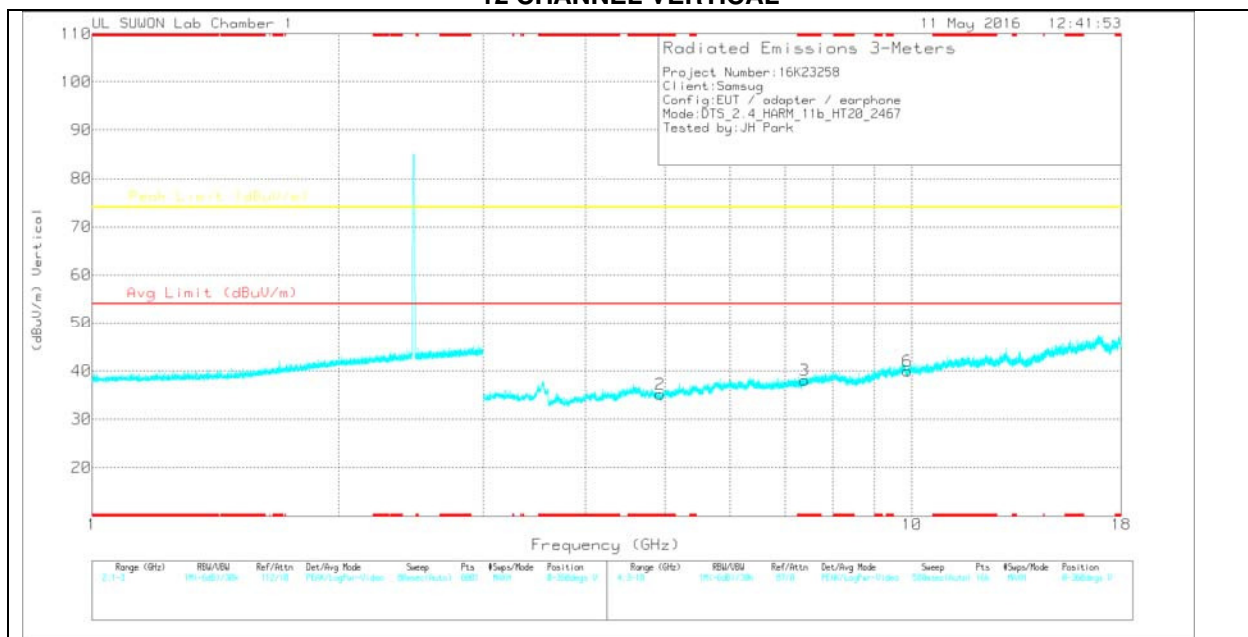
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

12 CHANNEL HORIZONTAL



12 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.

12 CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.937	35.46	PK	34	-34	0	35.46	-	-	74	-38.54	0-360	100	H
4	* 7.402	33	PK	35.8	-30.6	0	38.2	-	-	74	-35.8	0-360	200	H
5	9.87	30.19	PK	37.3	-27.9	0	39.59	-	-	74	-34.41	0-360	200	H
2	* 4.93	35.14	PK	34	-34	0	35.14	-	-	74	-38.86	0-360	100	V
3	* 7.403	32.83	PK	35.8	-30.6	0	38.03	-	-	74	-35.97	0-360	200	V
6	9.87	30.63	PK	37.3	-27.9	0	40.03	-	-	74	-33.97	0-360	200	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).