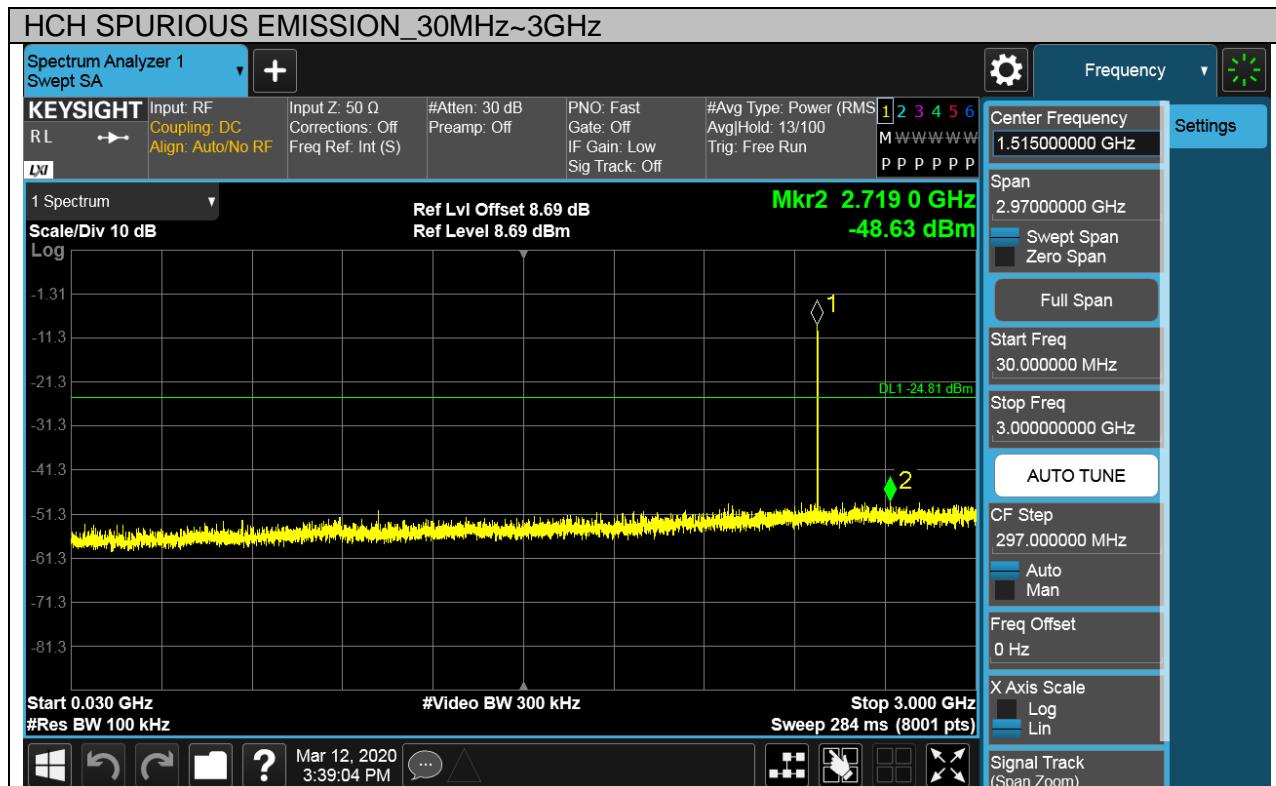
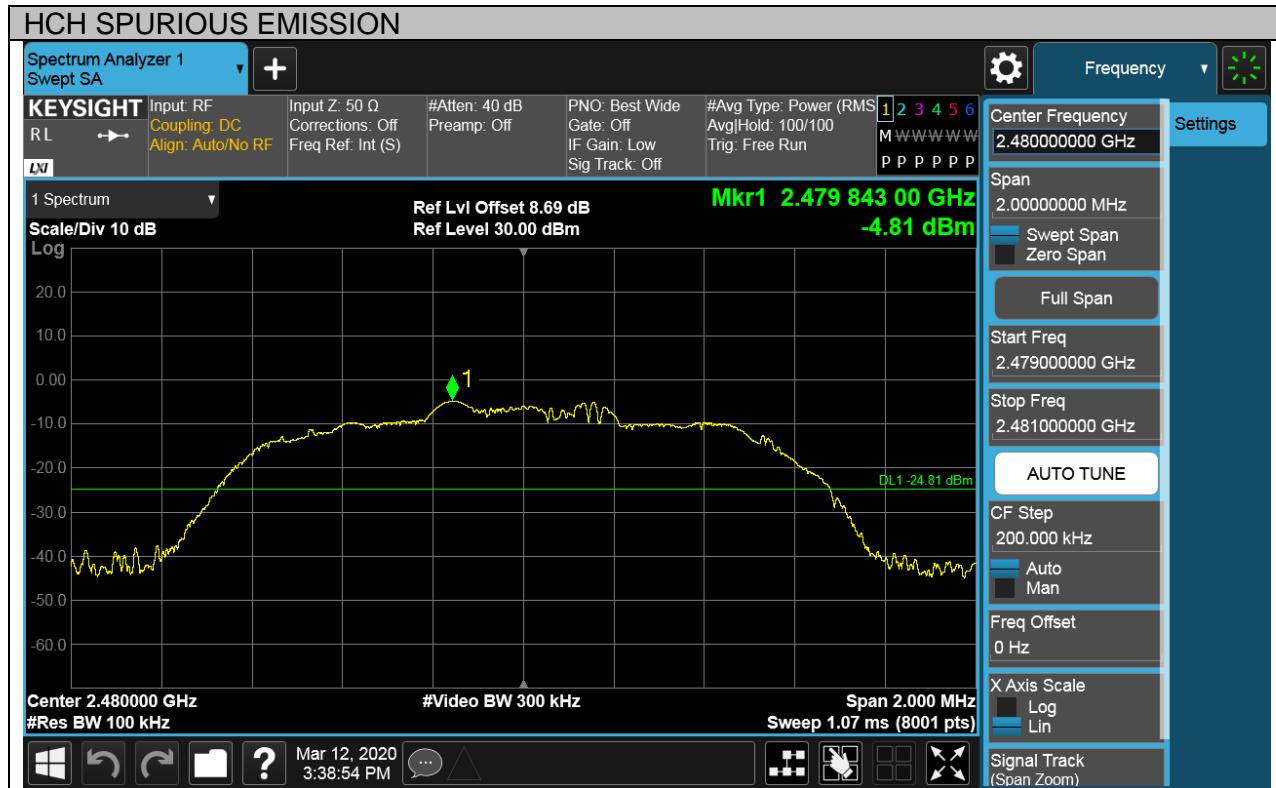
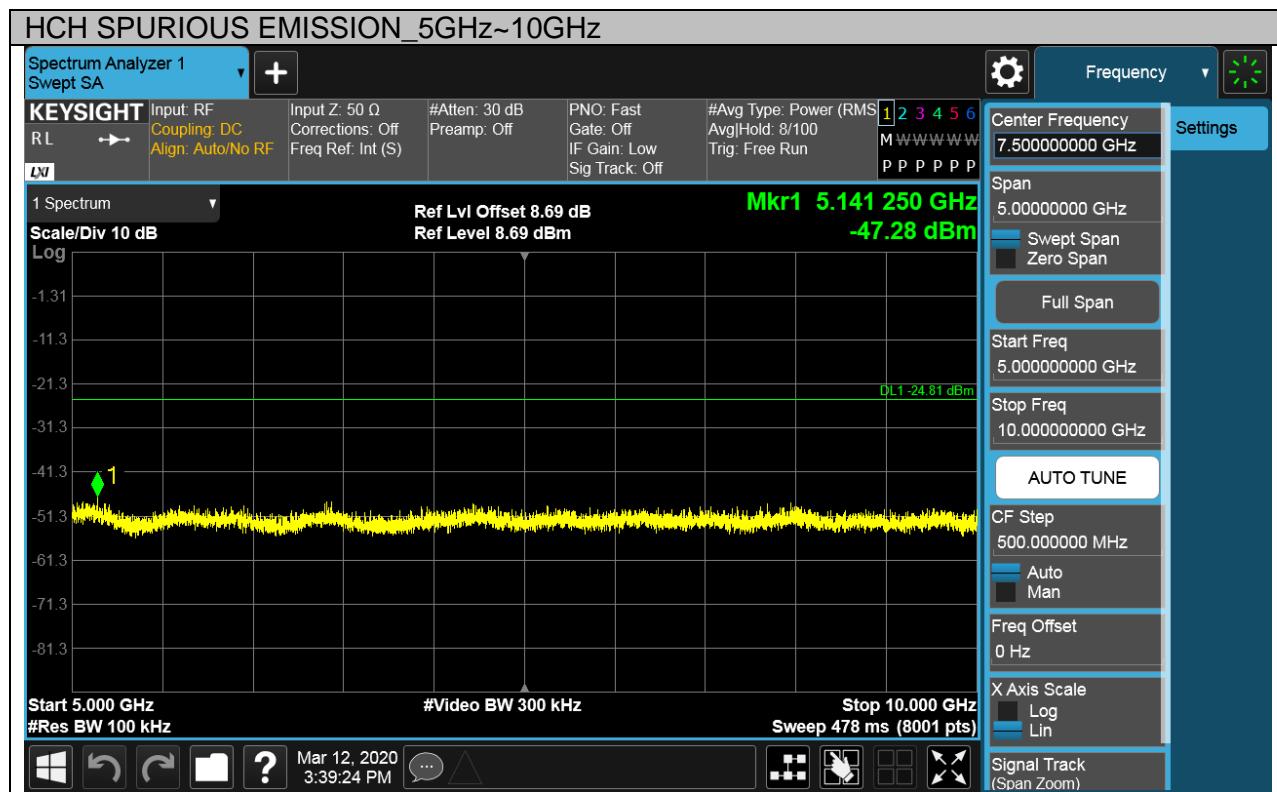
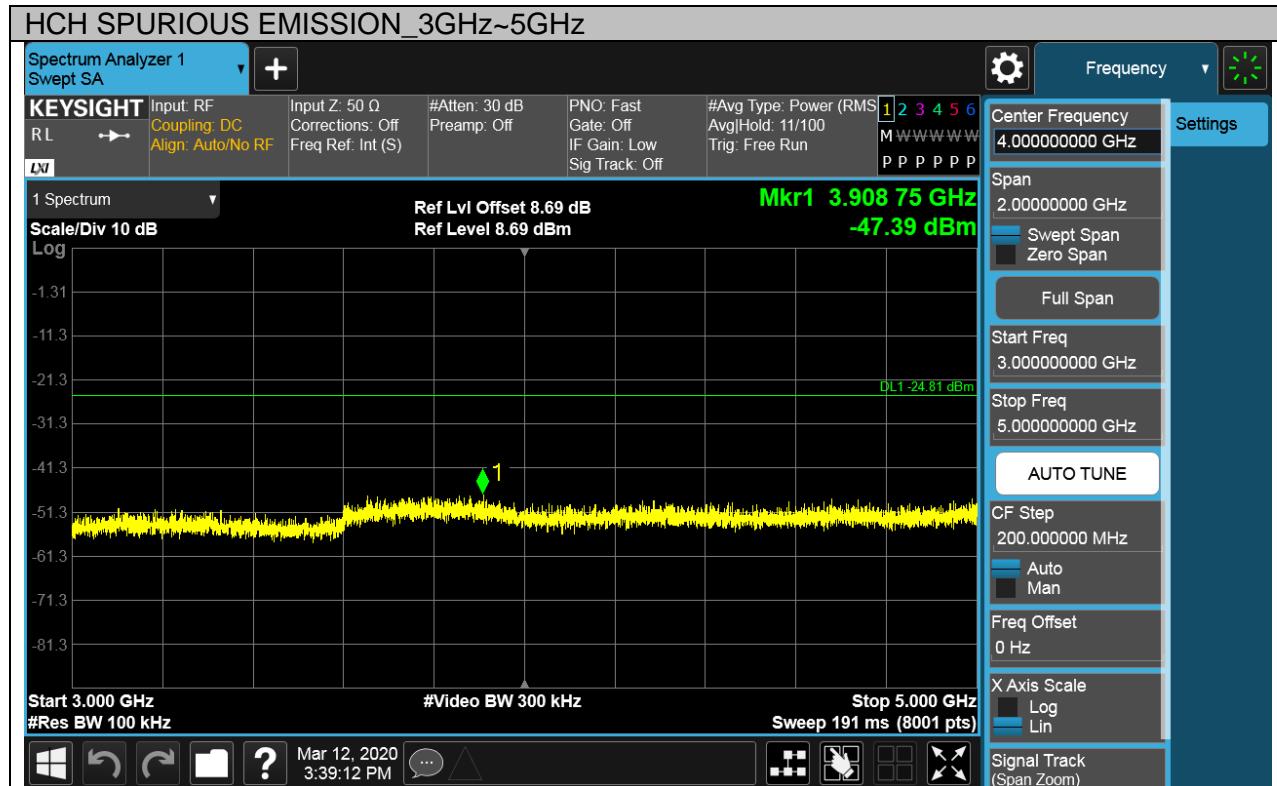
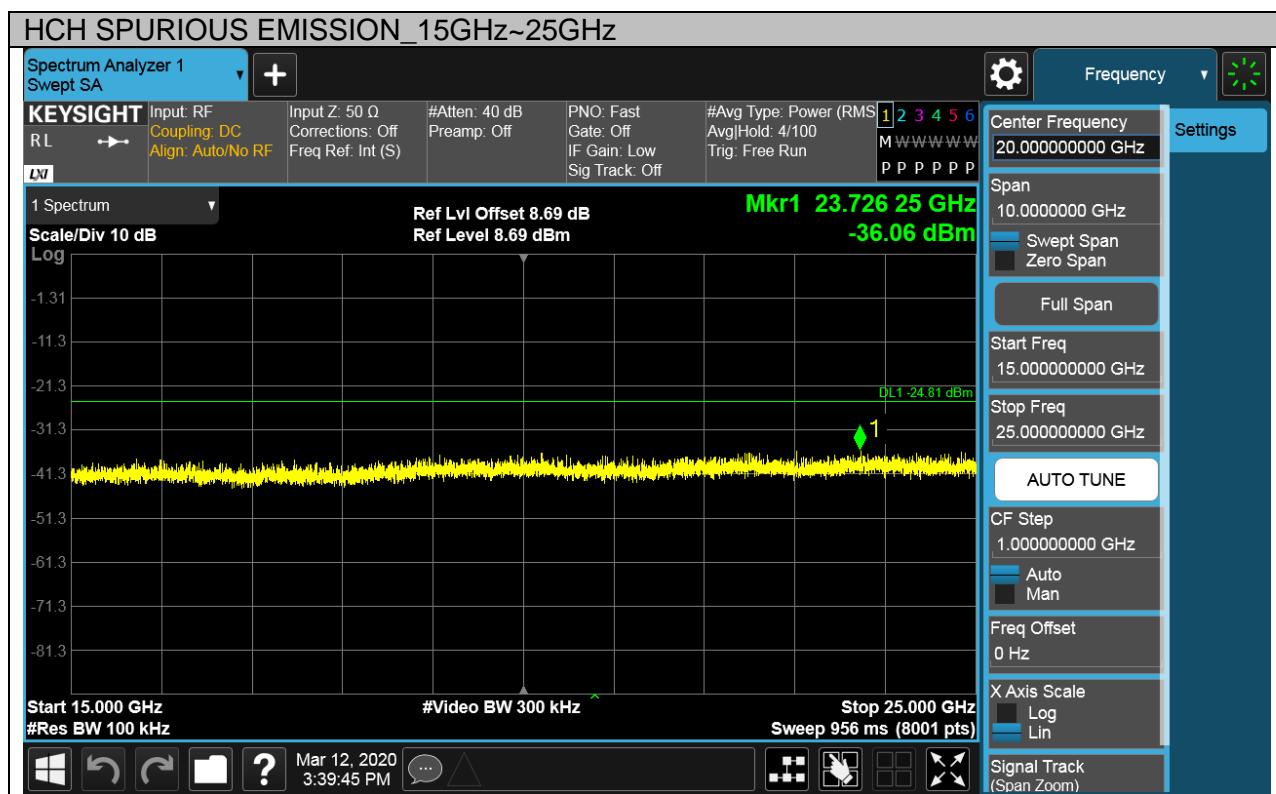
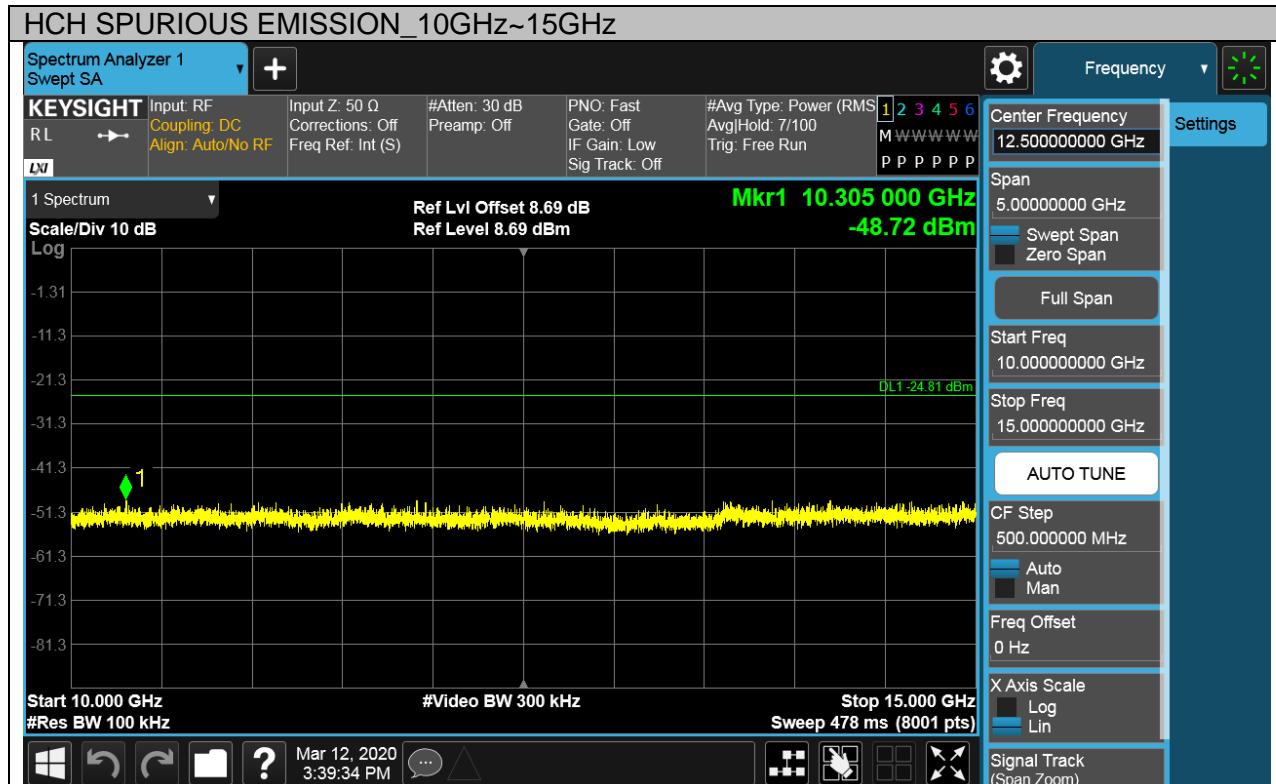


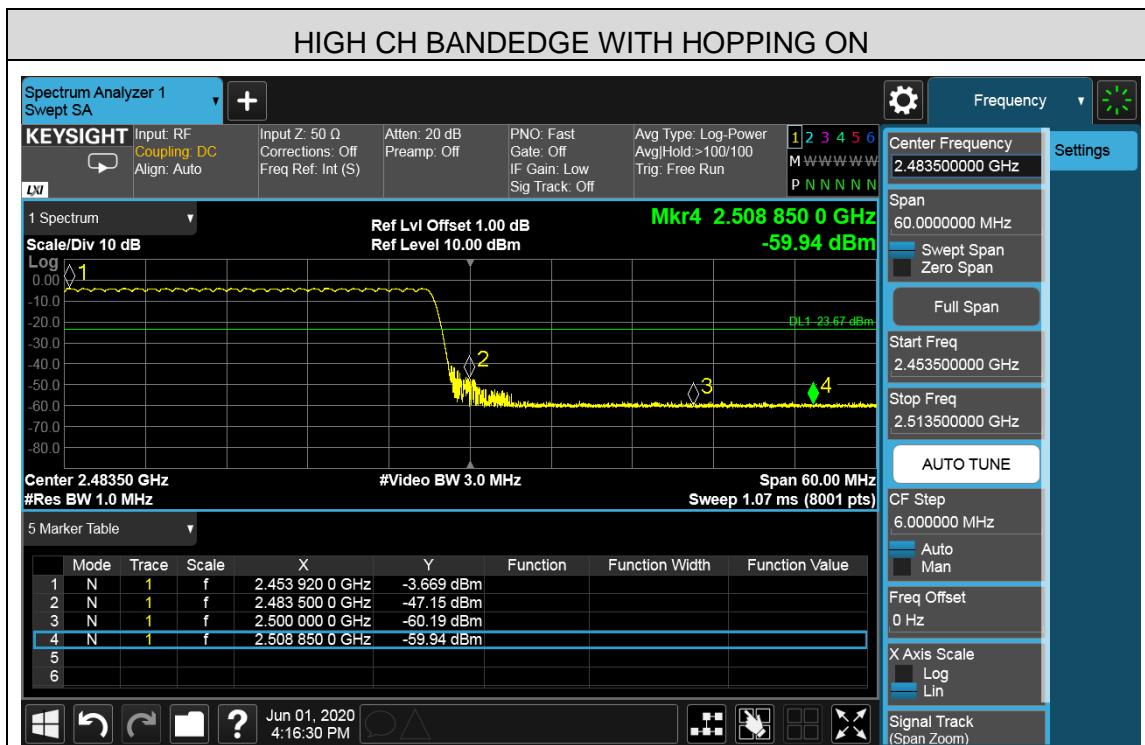
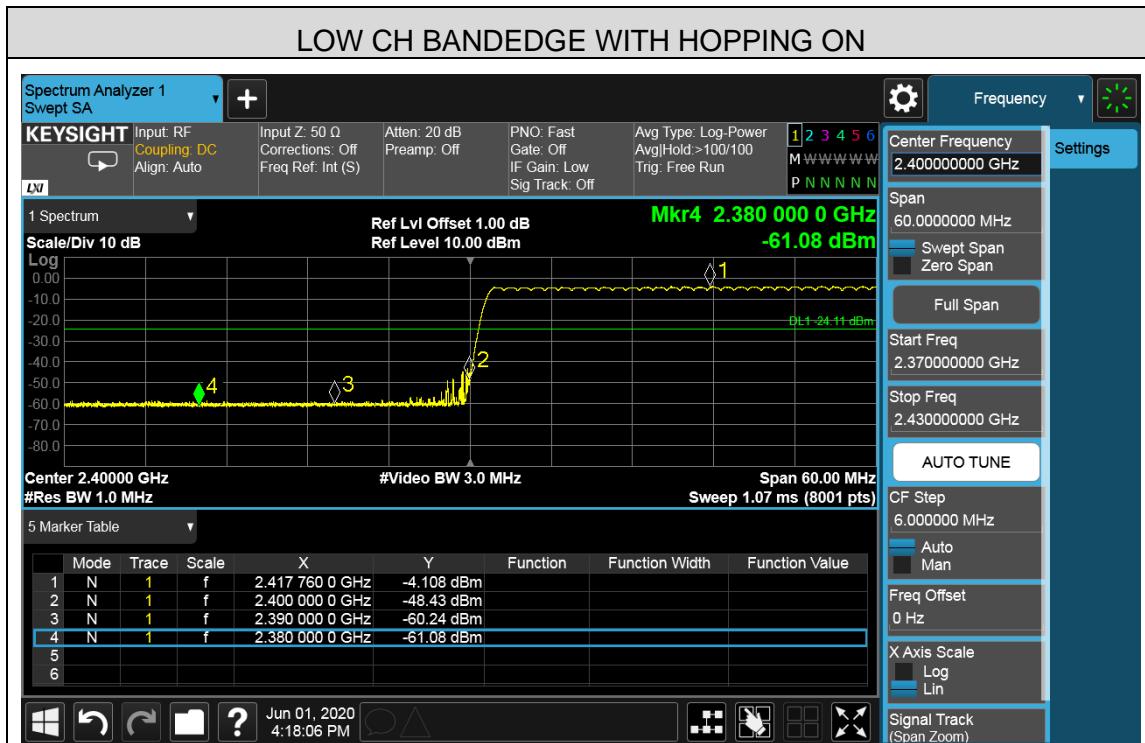
SPURIOUS EMISSIONS, HIGH CHANNEL

Note: The point 1 which exceeds the limit is 2.4G main carrier.





## SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



## 7. RADIATED TEST RESULTS

### 7.1. LIMITS AND PROCEDURE

#### LIMITS

Please refer to FCC §15.205 and §15.209

Please refer to RSS-GEN Clause 8.9 and Clause 8.10

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Limit for below 30MHz based on RSS-GEN table 6:

Table 6 – General field strength limits at frequencies below 30 MHz

Frequency	Magnetic field strength (H-Field) ( $\mu$ A/m)	Measurement distance (m)
9 - 490 kHz <sup>Note 1</sup>	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, 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. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.

#### Radiation Disturbance Test Limit for FCC (Above 1G)

Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

#### Restricted bands of operation

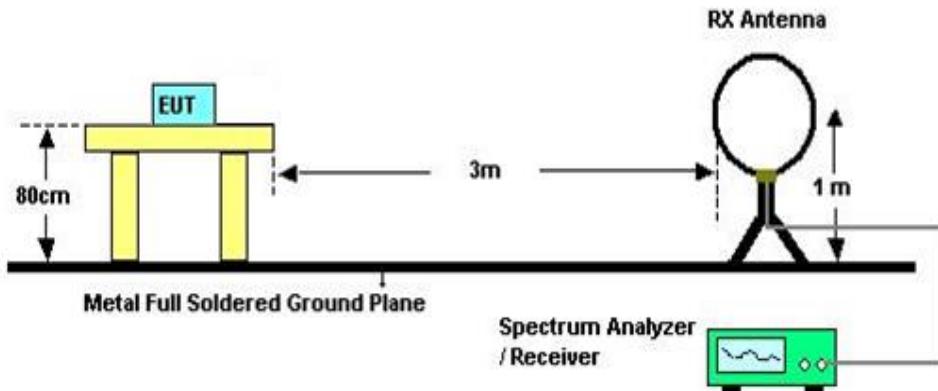
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	( <sup>2</sup> )
13.36-13.41			

Note: <sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup>Above 38.6c

**TEST SETUP AND PROCEDURE**

Below 30MHz

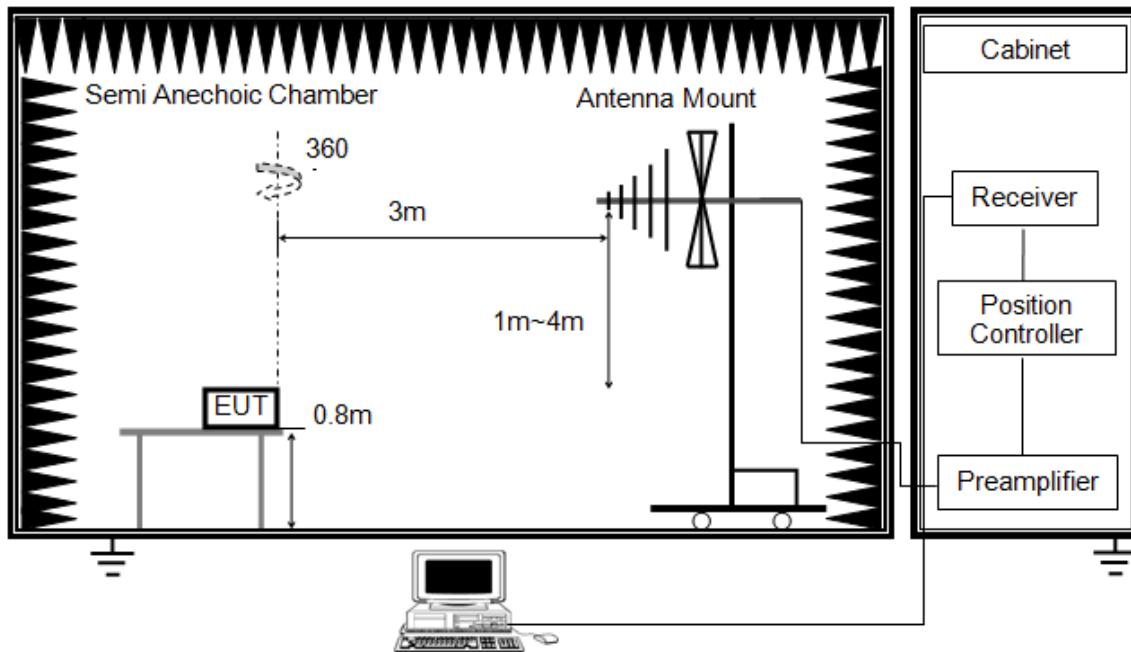


The setting of the spectrum Analyzer

RBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
VBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80cm meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Below 1G and above 30MHz

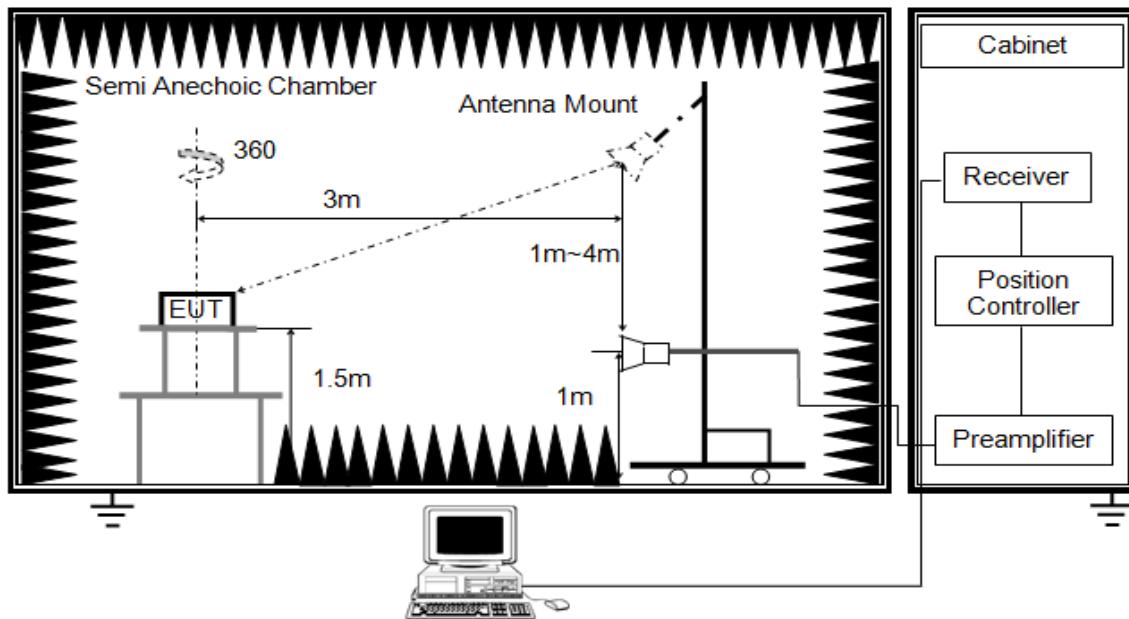


The setting of the spectrum Analyzer

RBW	120K
VBW	300K
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
6. For the actual test configuration, please refer to the related item in this test report.

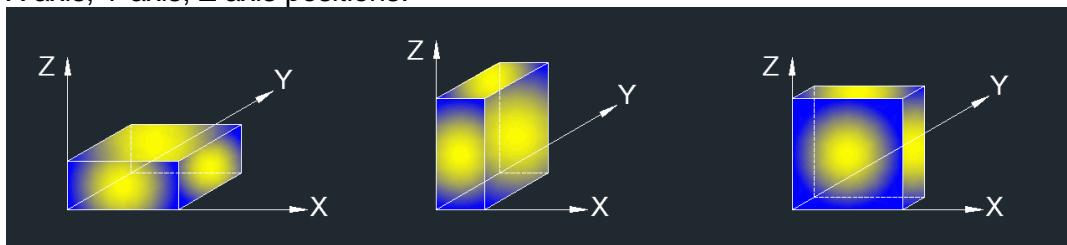
Above 1G



RBW	1M
VBW	PEAK: 3M AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurements 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 video bandwidth with peak detector, max hold to be run for at least 50 x (1/duty cycle) traces for average measurements.
6. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

X axis, Y axis, Z axis positions:

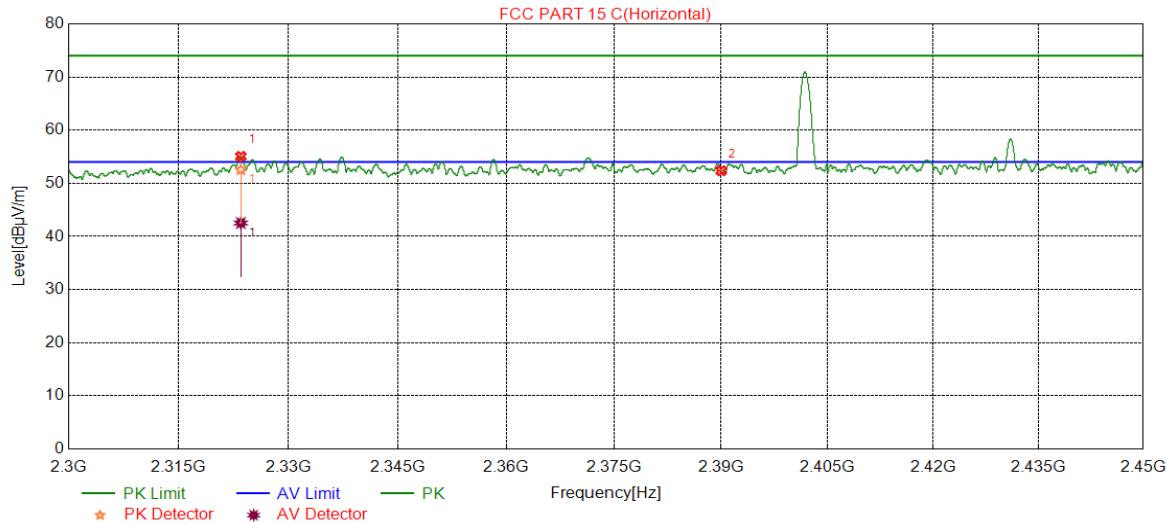


Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (Z axis) data recorded in the report.

## 7.2. RESTRICTED BANDEDGE

### 7.2.1. GFSK MODE

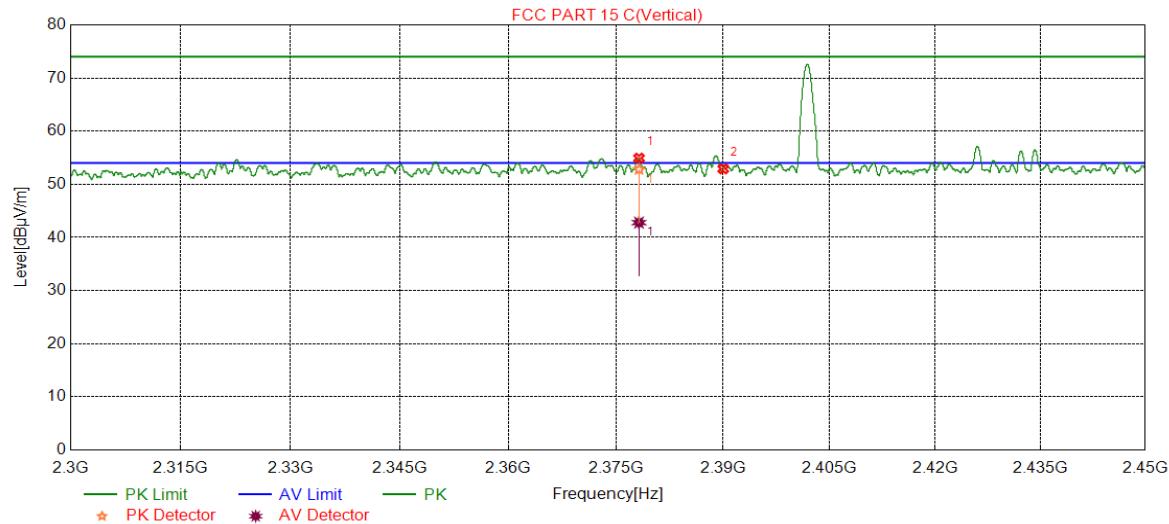
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2323.4592	41.70	13.35	55.05	74.00	-18.95	peak
		39.18	13.35	42.53	54.00	-11.47	average
2	2390.0000	38.27	14.09	52.36	74.00	-21.64	peak

Note:

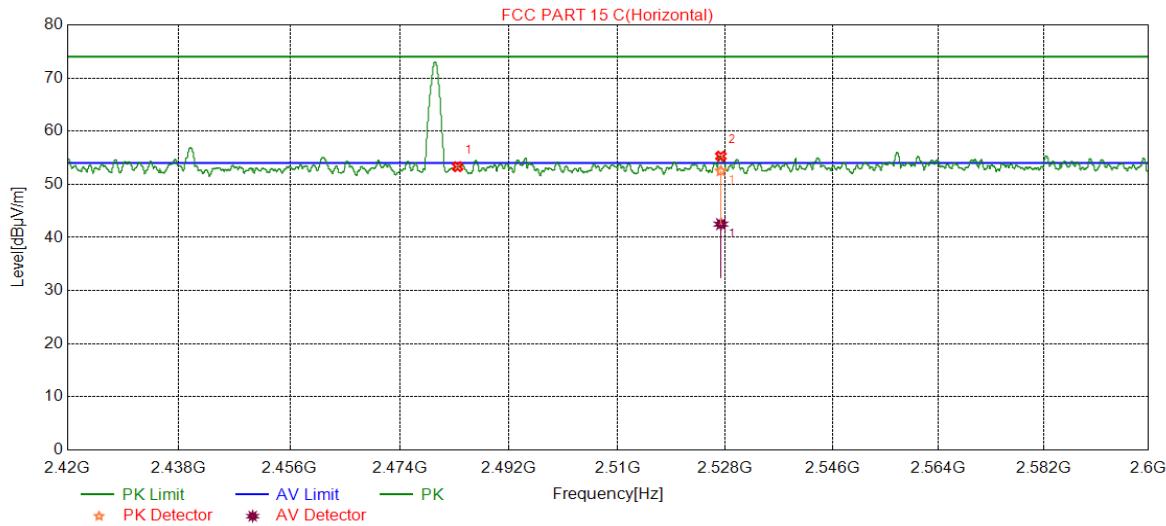
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)


No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dB $\mu$ V/m)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
1	2378.1973	40.95	13.97	54.92	74.00	-19.08	peak
		38.82	13.97	42.79	54.00	-11.21	average
2	2390.0000	38.81	14.09	52.90	74.00	-21.10	peak

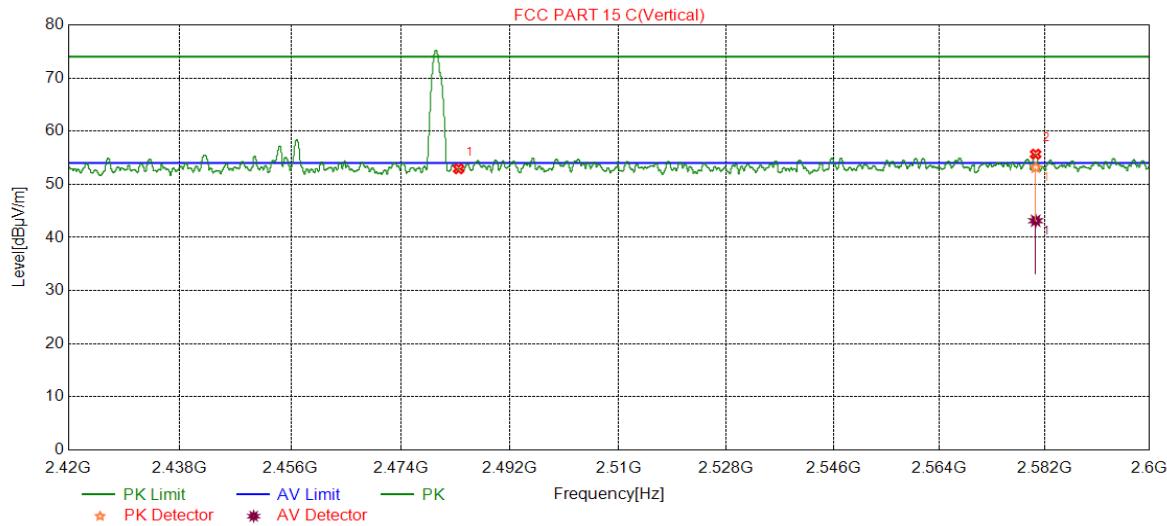
Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.5000	39.43	13.88	53.31	74.00	-20.69	peak
2	2527.2547	41.00	14.29	55.29	74.00	-18.71	peak
		38.21	14.29	42.50	54.00	-11.50	average

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

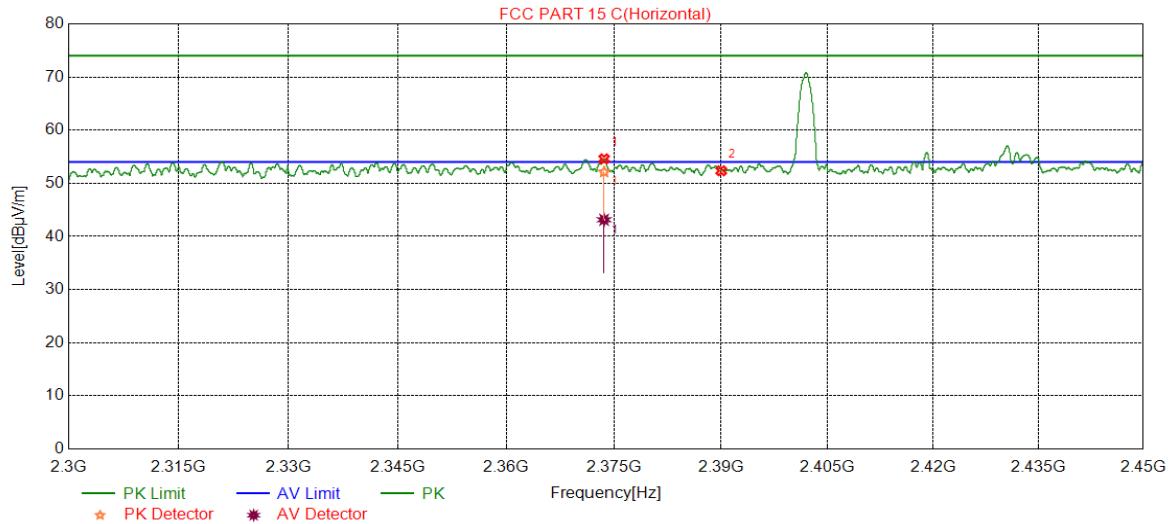
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.5000	39.03	13.88	52.91	74.00	-21.09	peak
2	2580.4140	41.22	14.45	55.67	74.00	-18.33	peak
		38.69	14.45	43.14	54.00	-10.86	average

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

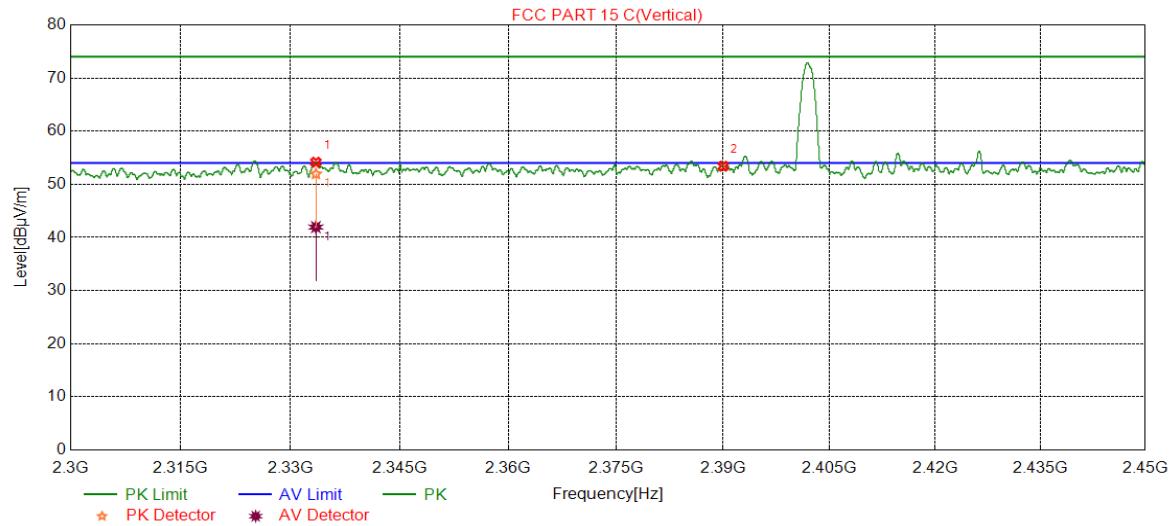
### 7.2.2. 8DPSK MODE

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2373.6030	40.69	13.91	54.60	74.00	-19.40	peak
		38.22	13.91	43.13	54.00	-11.87	average
2	2390.0000	38.26	14.09	52.35	74.00	-21.65	peak

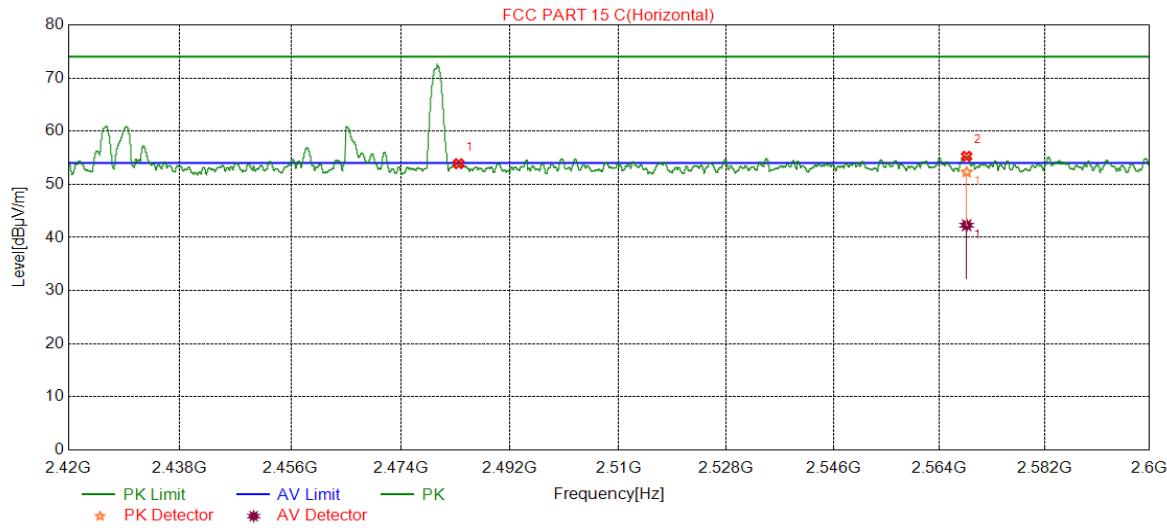
Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)


No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2333.4542	40.63	13.52	54.15	74.00	-19.85	peak
		38.42	13.52	41.94	54.00	-12.06	average
2	2390.0000	39.31	14.09	53.40	74.00	-20.60	peak

Note:

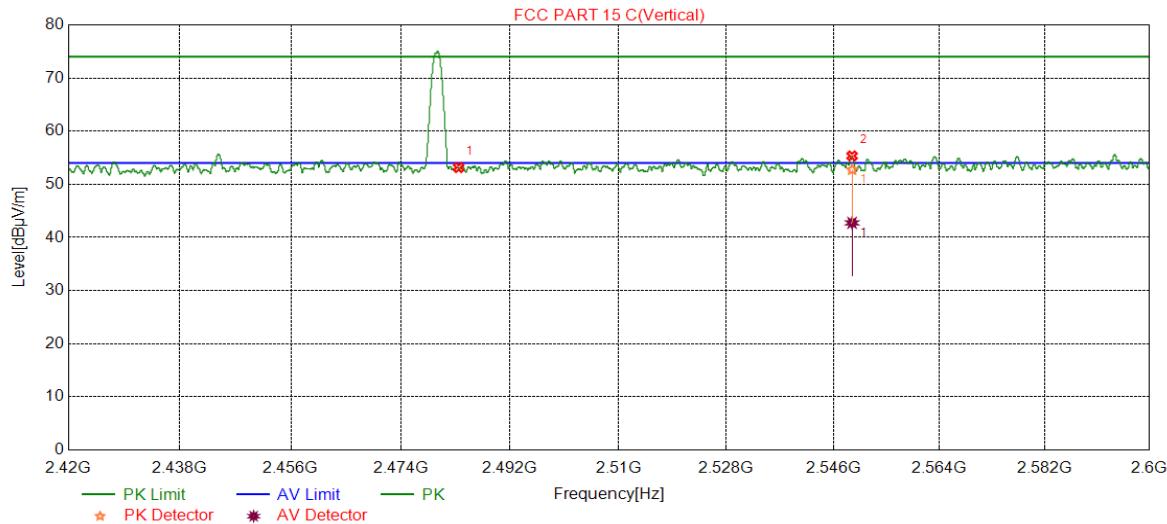
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.5000	39.99	13.88	53.87	74.00	-20.13	peak
2	2568.6229	40.83	14.44	55.27	74.00	-18.73	peak
		37.86	14.44	42.30	54.00	-11.70	average

Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)


No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.5000	39.26	13.88	53.14	74.00	-20.86	peak
2	2549.1809	40.94	14.40	55.34	74.00	-18.66	peak
		38.34	14.40	42.74	54.00	-11.26	average

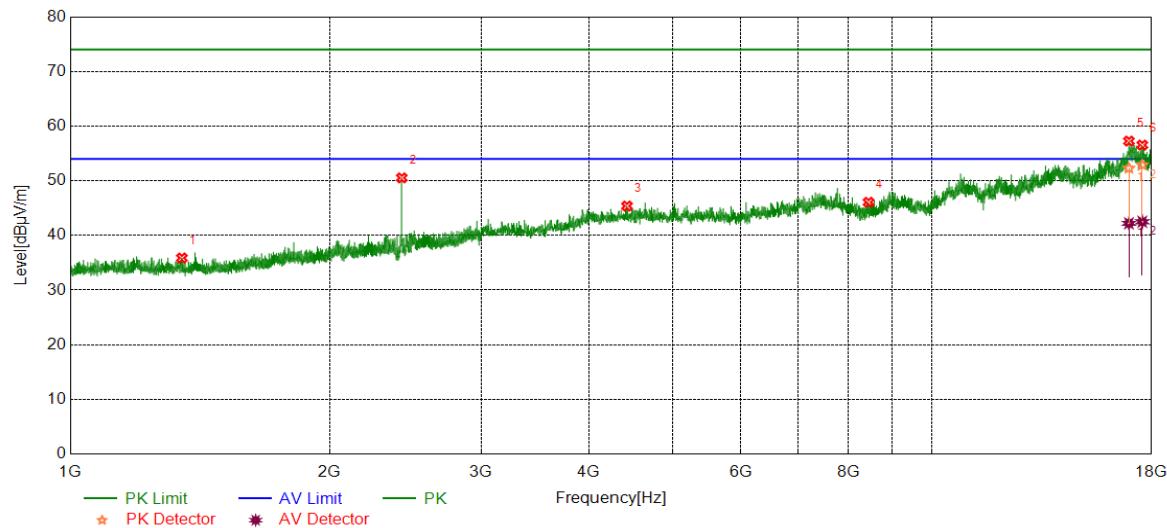
Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

### 7.3. SPURIOUS EMISSIONS (1~18GHz)

#### 7.3.1. GFSK MODE

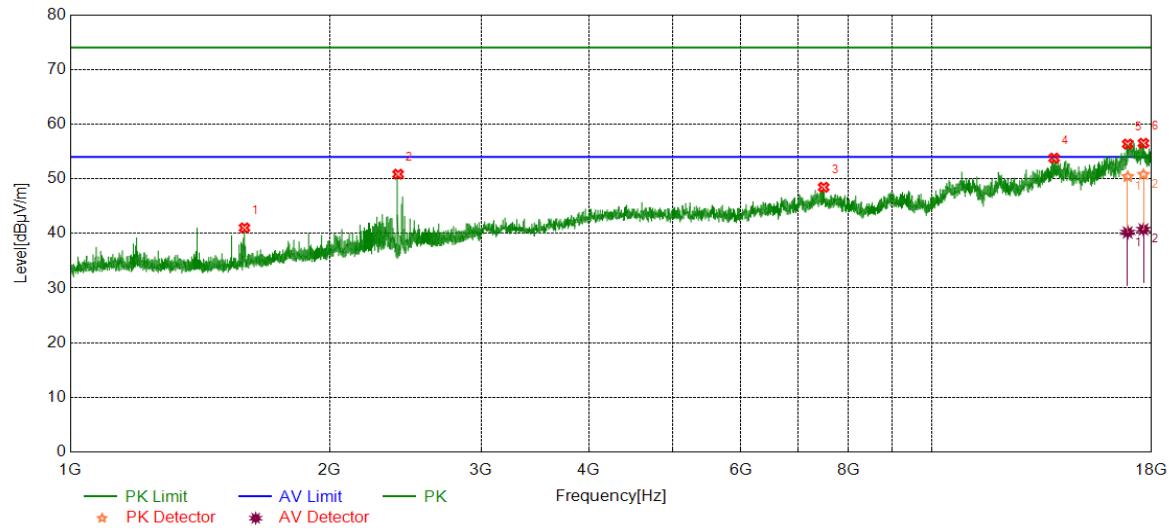
##### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1347.7935	41.53	-5.66	35.87	74.00	-38.13	peak
2	2402.1983	51.68	-1.15	50.53	---	---	Fundamental
3	4428.9286	40.15	5.23	45.38	74.00	-28.62	peak
4	8445.6807	38.91	7.16	46.07	74.00	-27.93	peak
		37.19	20.08	57.27	74.00	-16.73	peak
5	16940.4926	22.13	20.08	42.21	54.00	-11.79	average
		37.31	19.23	56.54	74.00	-17.46	peak
6	17557.4447	23.27	19.23	42.50	54.00	-11.50	average

Note:

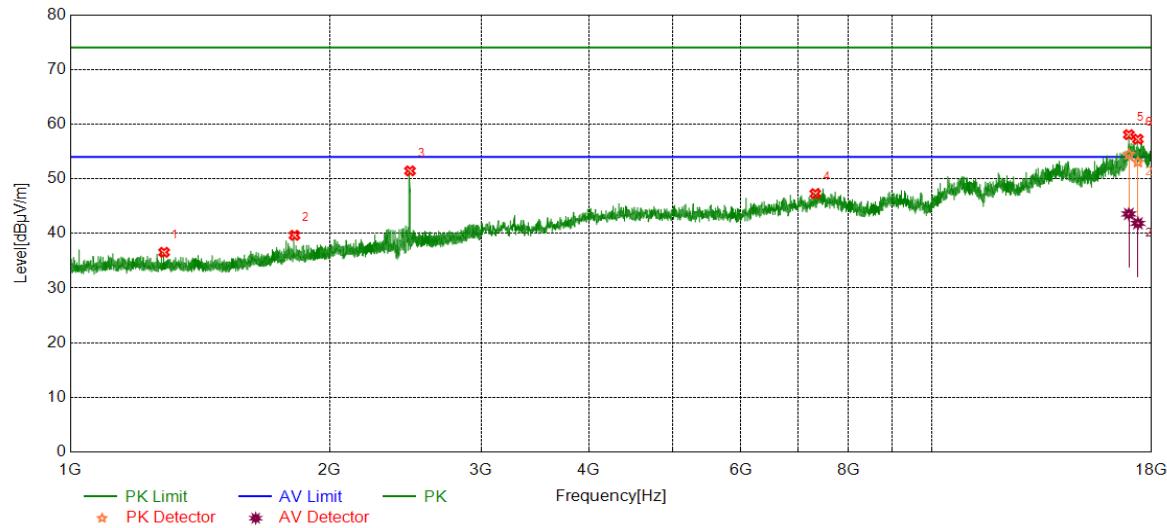
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		Level (MHz)	Level (dBuV/m)				
1	1593.3242	46.37	-5.35	41.02	74.00	-32.98	peak
2	2402.1753	52.18	-1.34	50.84	---	---	Fundamental
3	7491.1864	39.24	9.21	48.45	74.00	-25.55	peak
4	13868.8586	37.76	16.02	53.78	74.00	-20.22	peak
5	16884.2355	38.33	18.02	56.35	74.00	-17.65	peak
		22.16	18.02	40.18	54.00	-13.82	average
6	17611.8265	37.92	18.58	56.50	74.00	-17.50	peak
		22.15	18.58	40.73	54.00	-13.27	average

Note:

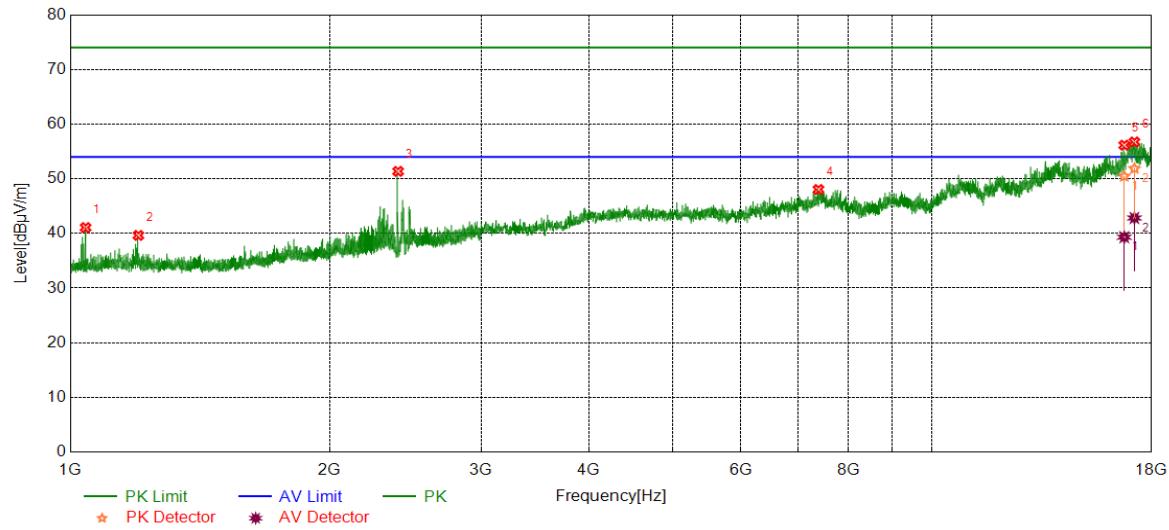
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)


No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
							PK AV
1	1285.2857	42.18	-5.64	36.54	74.00	-37.46	peak
2	1821.1026	43.57	-3.92	39.65	74.00	-34.35	peak
3	2441.6850	52.20	-0.76	51.44	---	---	Fundamental
4	7326.1658	38.39	8.89	47.28	74.00	-26.72	peak
5	16936.7421	38.35	19.72	58.07	74.00	-15.93	peak
		23.84	19.72	43.56	54.00	-10.44	average
6	17351.1689	38.38	18.87	57.25	74.00	-16.75	peak
		22.98	18.87	41.85	54.00	-12.15	average

Note:

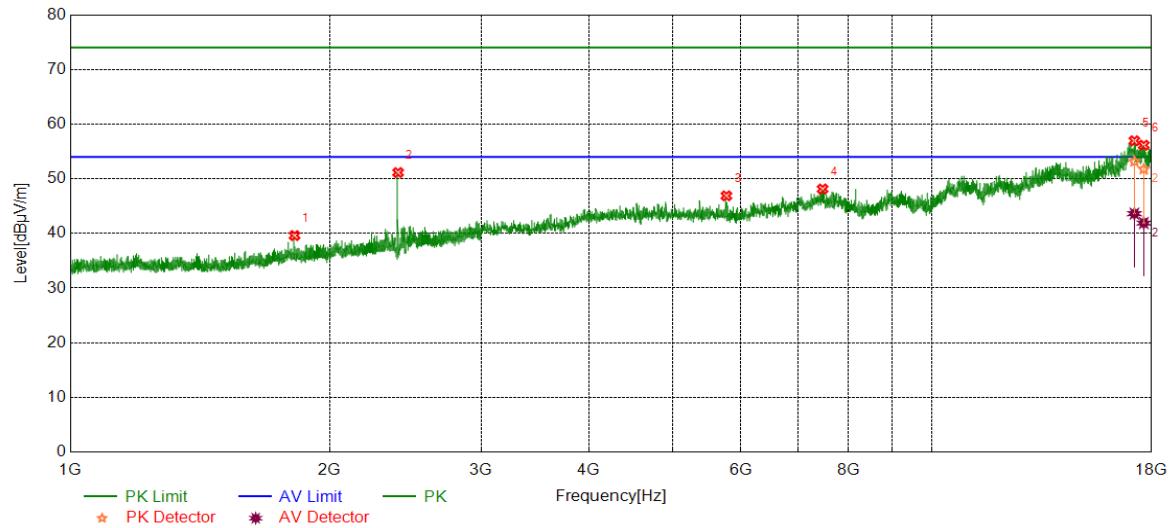
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)


No.	Frequency	Reading	Correct Factor	Result	Limit	Margin	Remark
		Level					
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	1042.0053	46.50	-5.43	41.07	74.00	-32.93	peak
2	1199.7750	45.18	-5.54	39.64	74.00	-34.36	peak
3	2440.1753	52.70	-1.34	51.36	---	---	Fundamental
4	7388.0485	39.00	9.04	48.04	74.00	-25.96	peak
5	16730.4663	38.51	17.64	56.15	74.00	-17.85	peak
		21.67	17.64	39.31	54.00	-14.69	average
6	17189.8987	37.20	19.54	56.74	74.00	-17.26	peak
		23.29	19.54	42.83	54.00	-11.17	average

Note:

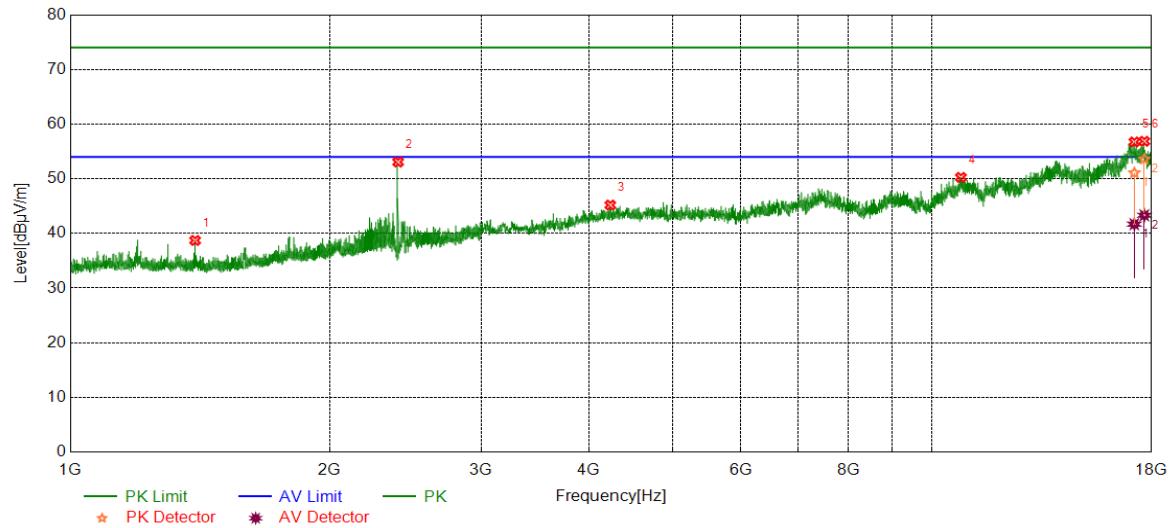
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)


No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
							PK AV
1	1821.3527	43.53	-3.92	39.61	74.00	-34.39	peak
2	2480.1753	52.48	-1.34	51.14	---	---	Fundamental
3	5777.2222	41.43	5.45	46.88	74.00	-27.12	peak
4	7470.5588	38.70	9.43	48.13	74.00	-25.87	peak
5	17189.8987	37.41	19.54	56.95	74.00	-17.05	peak
		24.08	19.54	43.62	54.00	-10.38	average
6	17626.8284	37.06	19.09	56.15	74.00	-17.85	peak
		22.81	19.09	41.90	54.00	-12.10	average

Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)


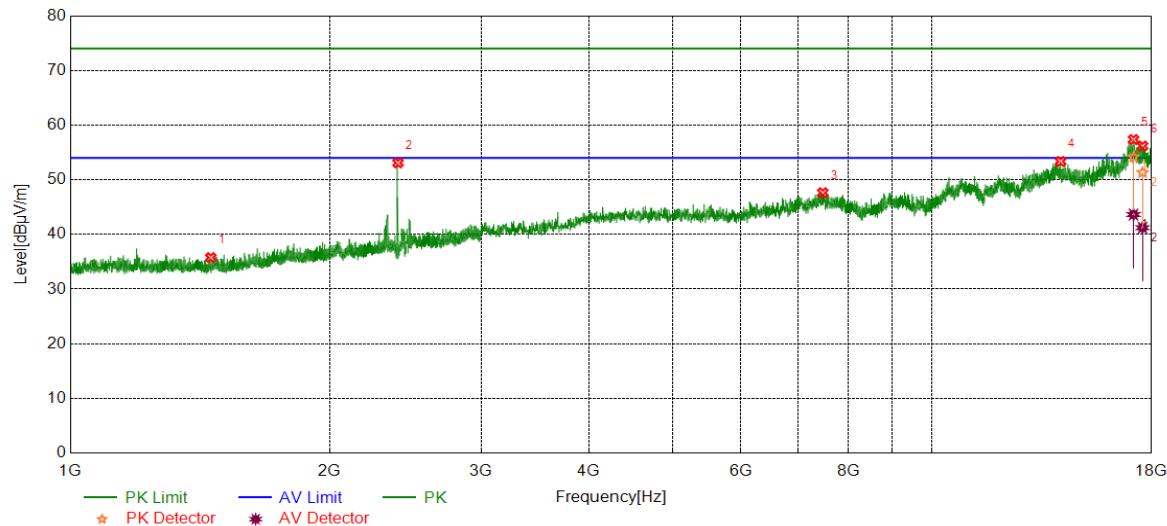
No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
							PK AV
1	1396.2995	44.34	-5.62	38.72	74.00	-35.28	peak
2	2480.1753	54.40	-1.34	53.06	---	---	Fundamental
3	4235.7795	40.47	4.72	45.19	74.00	-28.81	peak
4	10812.2265	37.43	12.82	50.25	74.00	-23.75	peak
5	17186.1483	37.18	19.56	56.74	74.00	-17.26	peak
		22.13	19.56	41.69	54.00	-12.31	average
6	17653.0816	37.72	19.14	56.86	74.00	-17.14	peak
		24.18	19.14	43.32	54.00	-10.68	average

Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

### 7.3.2. 8DPSK MODE

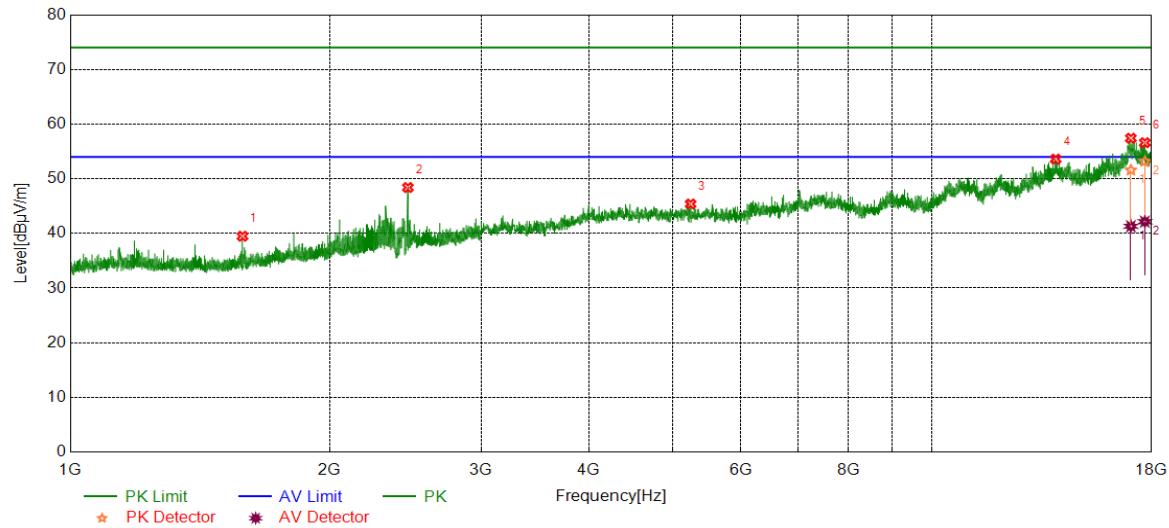
#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1456.3070	41.52	-5.76	35.76	74.00	-38.24	peak
2	2401.6752	54.42	-1.34	53.08	---	---	Fundamental
3	7474.3093	38.28	9.36	47.64	74.00	-26.36	peak
4	14112.6391	37.28	16.07	53.35	74.00	-20.65	peak
5	17148.6436	37.69	19.68	57.37	74.00	-16.63	peak
		23.96	19.68	43.64	54.00	-10.36	average
6	17568.6961	37.09	19.09	56.18	74.00	-17.82	peak
		22.14	19.09	41.23	54.00	-12.77	average

Note:

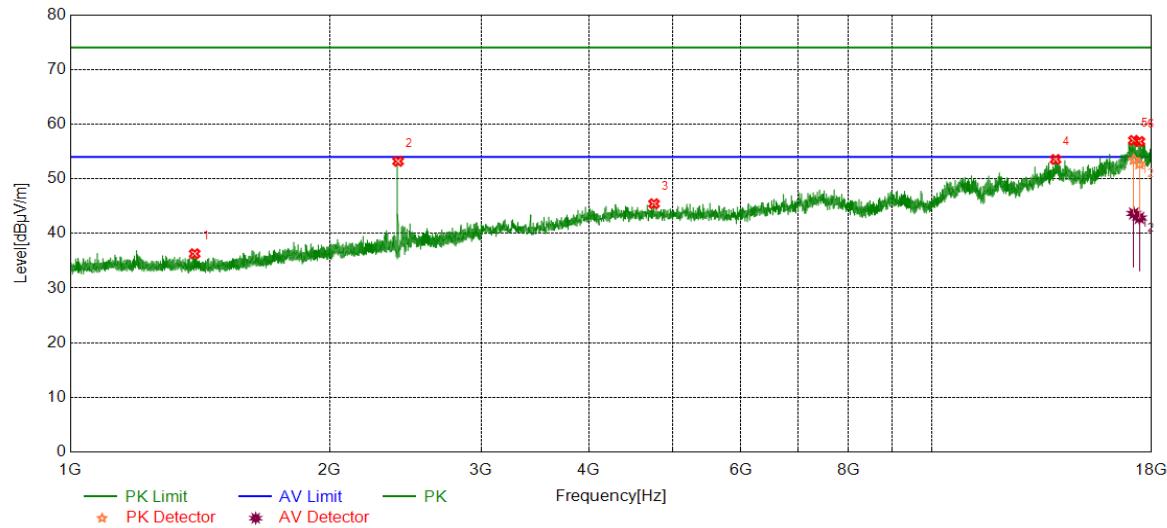
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)


No.	Frequency	Reading	Correct Factor	Result	Limit	Margin	Remark
		Level					
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	1584.8231	44.82	-5.33	39.49	74.00	-34.51	peak
2	2401.9332	49.26	-0.86	48.40	---	---	Fundamental
3	5250.2813	40.24	5.15	45.39	74.00	-28.61	peak
4	13926.9909	37.54	16.06	53.60	74.00	-20.40	peak
5	17028.6286	37.21	20.21	57.42	74.00	-16.58	peak
		21.10	20.21	41.31	54.00	-12.69	average
6	17677.4597	37.56	19.04	56.60	74.00	-17.40	peak
		23.11	19.04	42.15	54.00	-11.85	average

Note:

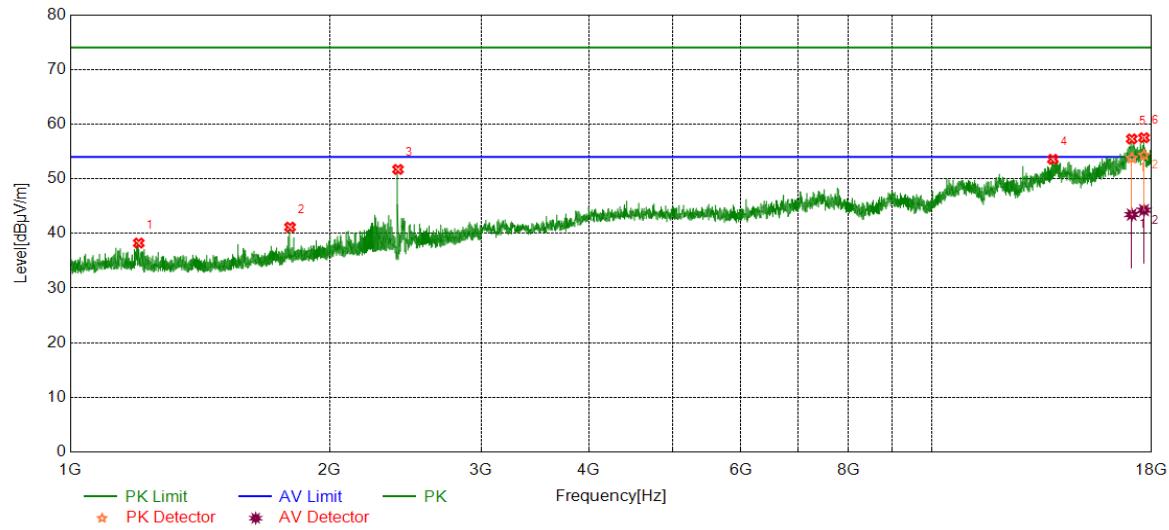
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)


No.	Frequency	Reading Level	Correct Factor	Result		Limit	Margin	Remark
				(MHz)	(dBuV/m)			
1	1394.5493	41.94	-5.66	36.28	74.00	-37.72		peak
2	2441.9252	54.54	-1.34	53.20	---	---		Fundamental
3	4760.8451	40.28	5.15	45.43	74.00	-28.57		peak
4	13925.1156	37.47	16.06	53.53	74.00	-20.47		peak
5	17163.6455	37.39	19.63	57.02	74.00	-16.98		peak
		24.02	19.63	43.65	54.00	-10.35		average
6	17424.3030	37.64	19.18	56.82	74.00	-17.18		peak
		23.65	19.18	42.83	54.00	-11.17		average

Note:

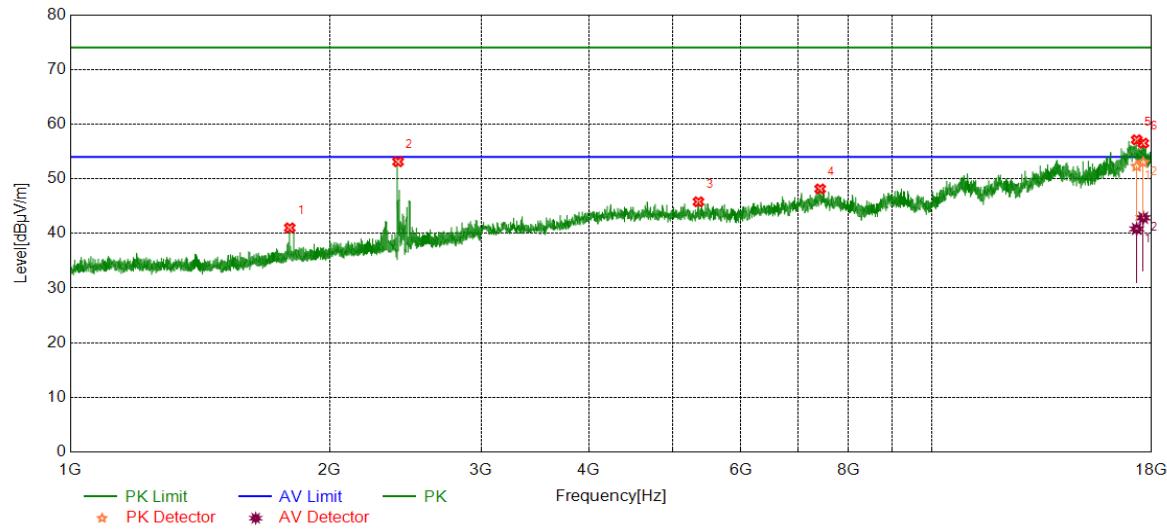
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)


No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
							PK AV
1	1201.0251	43.79	-5.55	38.24	74.00	-35.76	peak
2	1799.6000	45.03	-3.88	41.15	74.00	-32.85	peak
3	2441.6752	53.05	-1.34	51.71	---	---	Fundamental
4	13825.7282	37.92	15.64	53.56	74.00	-20.44	peak
5	17068.0085	36.77	20.52	57.29	74.00	-16.71	peak
		22.93	20.52	43.45	54.00	-10.55	average
6	17636.2045	38.13	19.38	57.51	74.00	-16.49	peak
		24.88	19.38	44.26	54.00	-9.74	average

Note:

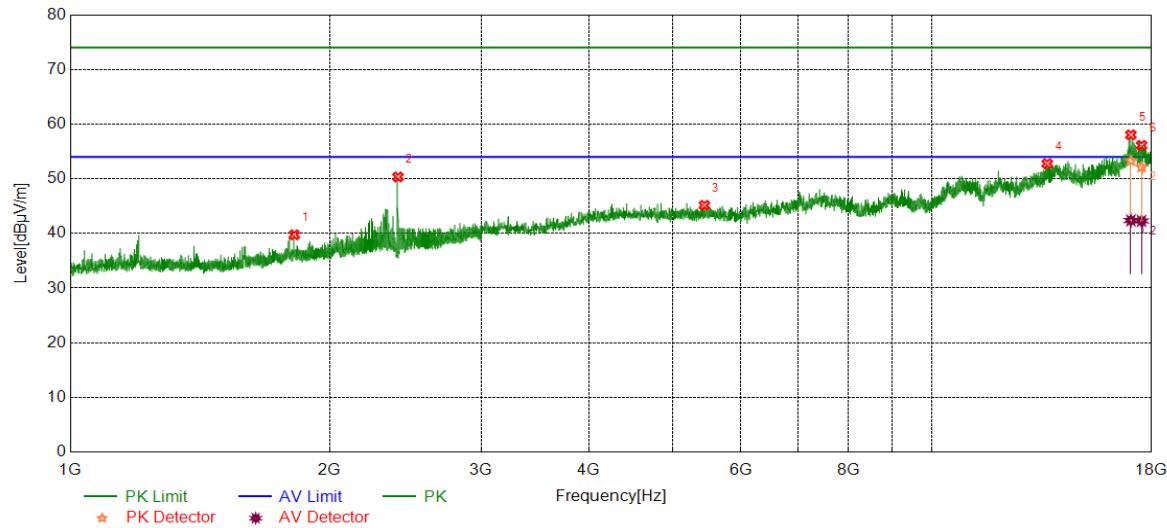
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)


No.	Frequency	Reading	Correct Factor	Result	Limit	Margin	Remark
		Level					
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	1798.3498	44.91	-3.89	41.02	74.00	-32.98	peak
2	2479.9252	54.46	-1.34	53.12	---	---	Fundamental
3	5360.9201	40.46	5.33	45.79	74.00	-28.21	peak
4	7421.8027	38.88	9.26	48.14	74.00	-25.86	peak
5	17294.9119	38.35	18.78	57.13	74.00	-16.87	peak
		22.04	18.78	40.82	54.00	-13.18	average
6	17602.4503	37.25	19.26	56.51	74.00	-17.49	peak
		23.60	19.26	42.86	54.00	-11.14	average

Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)


No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
							PK AV
1	1820.6026	43.67	-3.92	39.75	74.00	-34.25	peak
2	2480.6752	51.67	-1.34	50.33	---	---	Fundamental
3	5447.1809	39.66	5.49	45.15	74.00	-28.85	peak
4	13617.5772	37.92	14.85	52.77	74.00	-21.23	peak
5	17028.6286	37.82	20.21	58.03	74.00	-15.97	peak
		22.16	20.21	42.37	54.00	-11.63	average
6	17523.6905	36.72	19.40	56.12	74.00	-17.88	peak
		22.89	19.40	42.29	54.00	-11.71	average

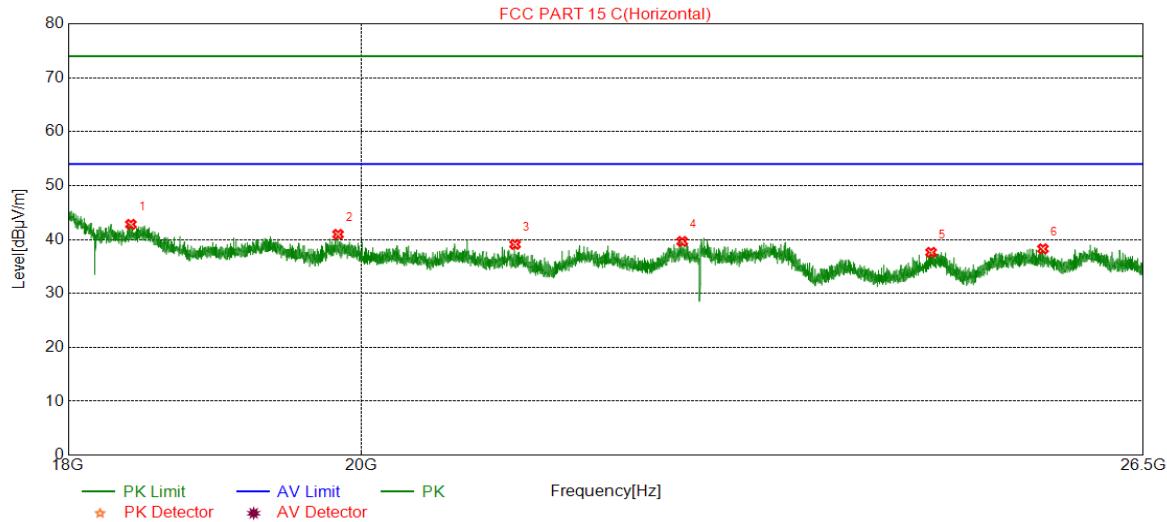
Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

## 7.4. SPURIOUS EMISSIONS 18G ~ 26GHz

### 7.4.1. 8DPSK MODE

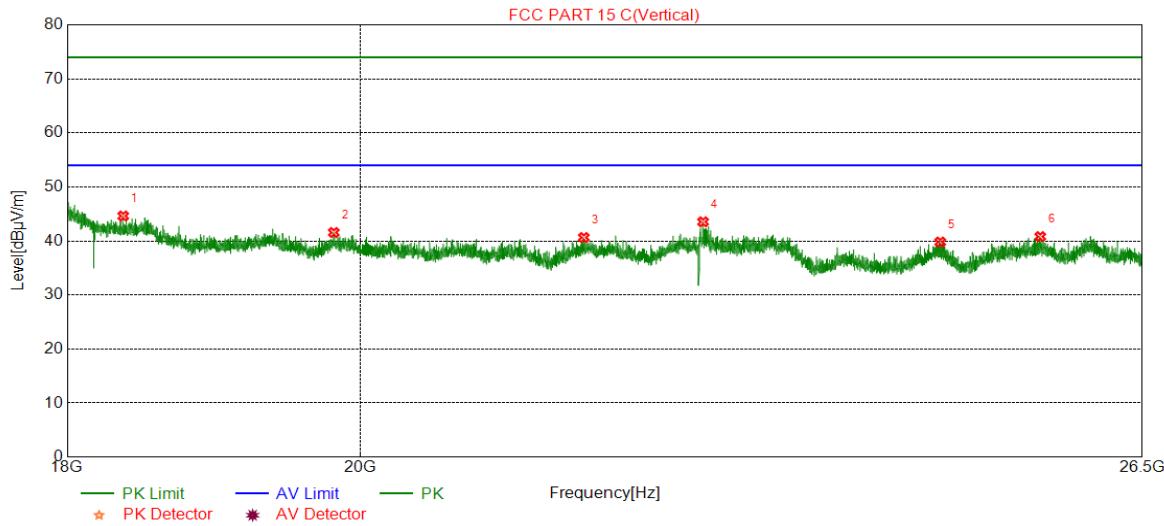
#### SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18410.5911	43.78	-0.97	42.81	74.00	-31.19	peak
2	19835.3335	41.57	-0.61	40.96	74.00	-33.04	peak
3	21140.2140	39.96	-0.87	39.09	74.00	-34.91	peak
4	22450.1950	38.91	0.73	39.64	74.00	-34.36	peak
5	24554.1554	38.13	-0.51	37.62	74.00	-36.38	peak
6	25562.3562	37.32	0.95	38.27	74.00	-35.73	peak

Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)**


No.	Frequency (MHz)	Reading Level (dB $\mu$ V/m)	Correct Factor (dB)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Remark
1	18366.3866	45.61	-0.99	44.62	74.00	-29.38	peak
2	19812.3812	42.18	-0.62	41.56	74.00	-32.44	peak
3	21677.4677	40.90	-0.27	40.63	74.00	-33.37	peak
4	22627.8628	42.60	0.94	43.54	74.00	-30.46	peak
5	24643.4143	40.18	-0.38	39.80	74.00	-34.20	peak
6	25547.0547	39.87	0.93	40.80	74.00	-33.20	peak

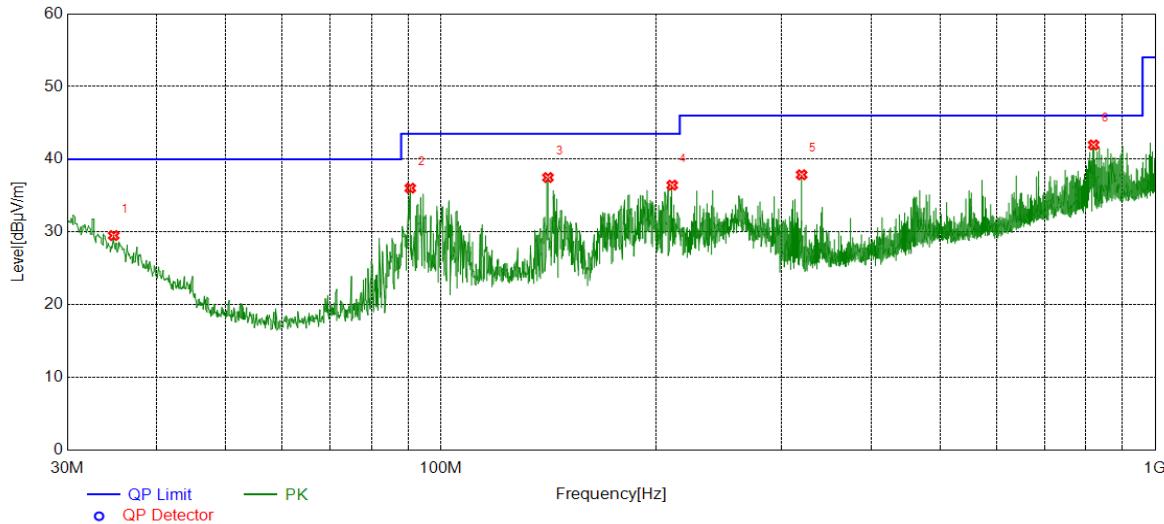
Note: 1. Measurement = Reading Level + Correct Factor.  
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Peak: Peak detector.  
 4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Note: All constructions and test modes have been tested, only the worst data record in the report

## 7.5. SPURIOUS EMISSIONS 30M ~ 1 GHz

### 7.5.1. GFSK MODE

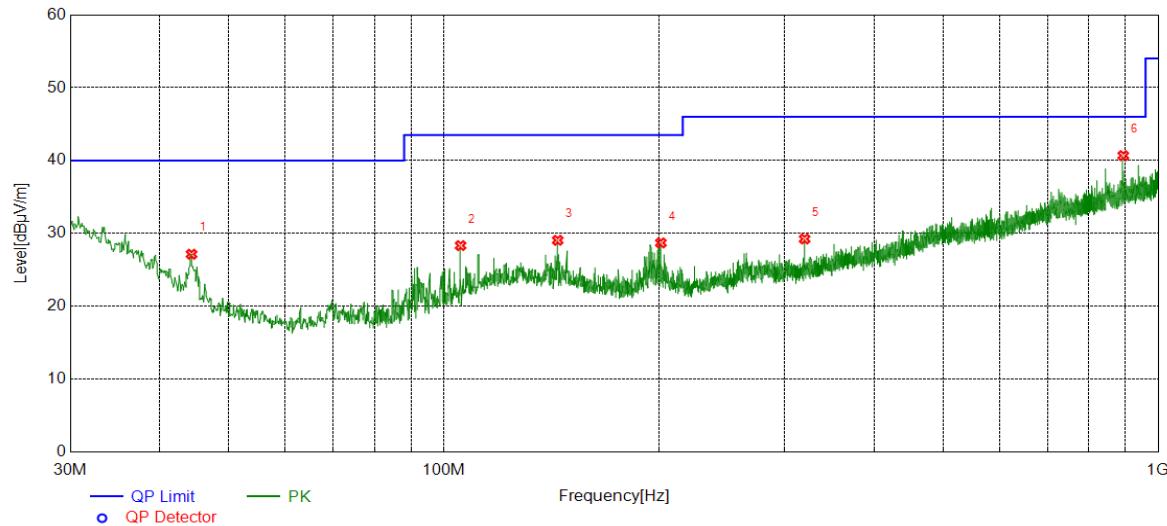
#### SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading Level (dB <sub>uV/m</sub> )	Correct Factor (dB)	Result (dB <sub>uV/m</sub> )	Limit (dB <sub>uV/m</sub> )	Margin (dB)	Remark
1	34.8505	5.45	24.06	29.51	40.00	-10.49	peak
2	90.6311	21.50	14.53	36.03	43.50	-7.47	peak
3	141.2701	17.63	19.86	37.49	43.50	-6.01	peak
4	210.8261	18.14	18.30	36.44	43.50	-7.06	peak
5	319.9620	16.95	20.92	37.87	46.00	-8.13	peak
6	819.8530	11.93	30.05	41.98	46.00	-4.02	peak

Note:

1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)


No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	44.3574	9.09	18.06	27.15	40.00	-12.85	peak
2	105.5706	10.53	17.80	28.33	43.50	-15.17	peak
3	144.3744	9.39	19.67	29.06	43.50	-14.44	peak
4	201.3191	9.68	19.02	28.70	43.50	-14.80	peak
5	319.9620	8.32	20.92	29.24	46.00	-16.76	peak
6	893.5804	9.71	30.97	40.68	46.00	-5.32	peak

Note:

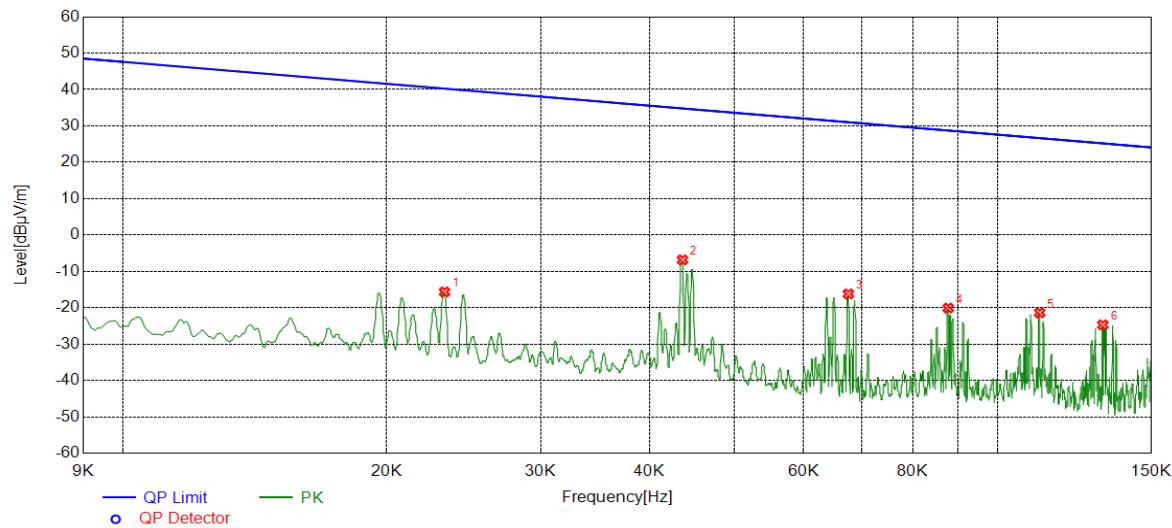
1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

## 7.6. SPURIOUS EMISSIONS BELOW 30M

### 7.6.1. GFSK MODE

#### SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, Face-on)

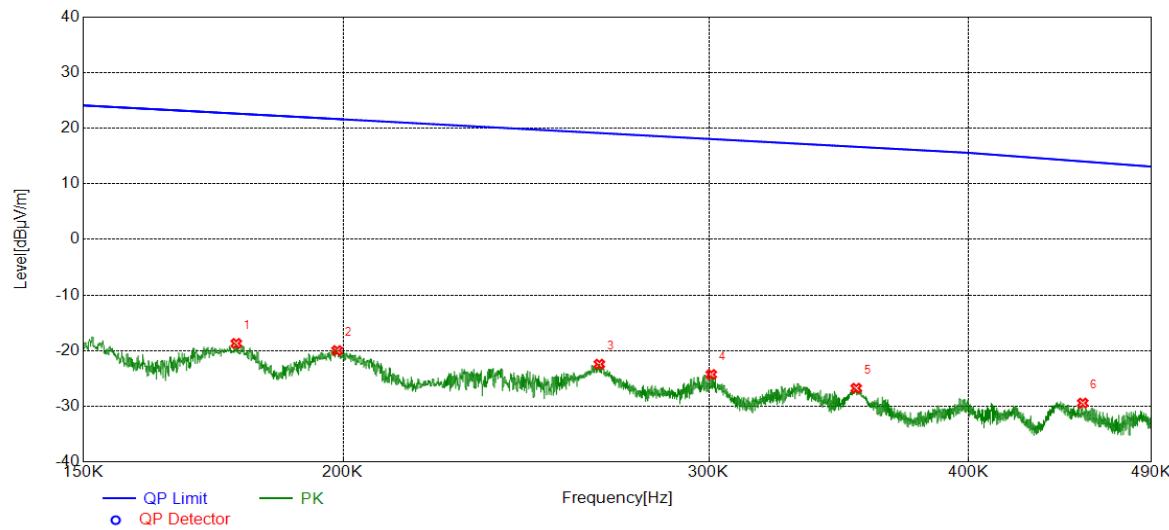
##### 9KHz ~ 150kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	ISED Result (dBuA/m)	ISED Limit (dBuA/m)	Margin (dB)	Remark
1	0.0233	45.33	-60.98	-15.65	40.26	-67.15	-11.24	-55.91	peak
2	0.0436	54.27	-61.11	-6.84	34.82	-58.34	-16.68	-41.66	peak
3	0.0675	45.24	-61.44	-16.20	31.02	-67.70	-20.48	-47.22	peak
4	0.0878	41.11	-61.20	-20.09	28.74	-71.59	-22.76	-48.83	peak
5	0.1117	39.60	-60.99	-21.39	26.65	-72.89	-24.85	-48.04	peak
6	0.1319	36.52	-61.23	-24.71	25.20	-76.21	-26.30	-49.91	peak

Note:

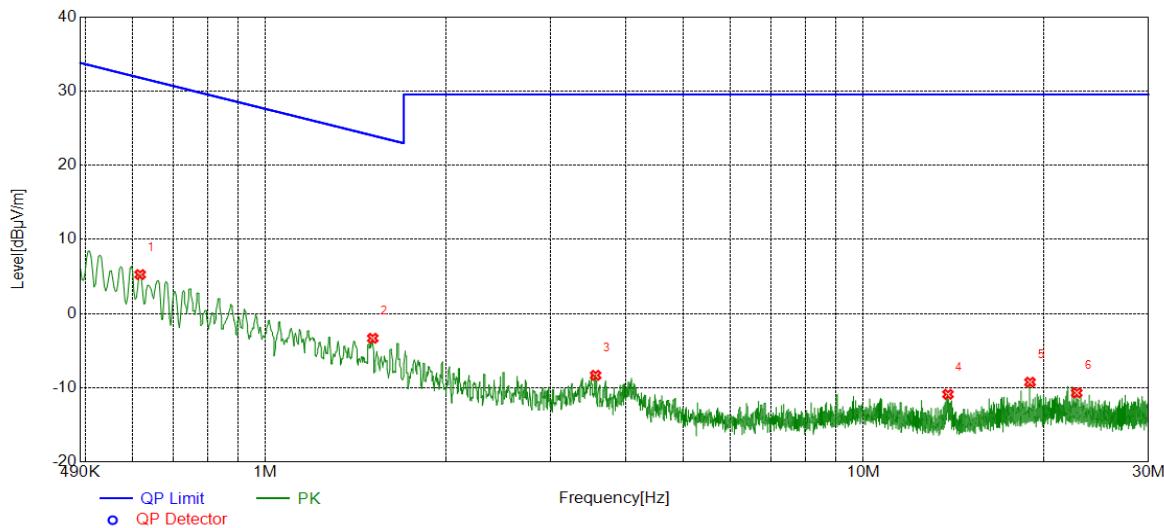
1. Measurement = Reading Level + Correct Factor(dBuA/m= dBuV/m- 20Log10[120π] = dBuV/m- 51.5).
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

150kHz ~ 490kHz


No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.1777	42.61	-61.31	-18.70	22.61	-70.20	-28.89	-41.31	peak
2	0.1987	41.22	-61.20	-19.98	21.64	-71.48	-29.86	-41.62	peak
3	0.2657	38.50	-60.93	-22.43	19.11	-73.93	-32.39	-41.54	peak
4	0.3008	36.62	-60.90	-24.28	18.04	-75.78	-33.46	-42.32	peak
5	0.3532	34.10	-60.85	-26.75	16.64	-78.25	-34.86	-43.39	peak
6	0.4540	31.35	-60.77	-29.42	14.01	-80.92	-37.49	-43.43	peak

Note:

1. Measurement = Reading Level + Correct Factor(dBuA/m= dBuV/m- 20Log10[120π] = dBuV/m- 51.5).
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

490kHz ~ 30MHz


No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dB $\mu$ V)	(dB/m)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB $\mu$ A/m)	(dB $\mu$ A/m)	(dB)	
1	0.6169	26.02	-20.76	5.26	31.80	-46.24	-19.70	-26.54	peak
2	1.5111	17.08	-20.41	-3.33	24.02	-54.83	-27.48	-27.35	peak
3	3.5653	12.03	-20.35	-8.32	29.54	-59.82	-21.96	-37.86	peak
4	13.8505	8.43	-19.31	-10.88	29.54	-62.38	-21.96	-40.42	peak
5	19.0005	8.58	-17.83	-9.25	29.54	-60.75	-21.96	-38.79	peak
6	22.7428	7.14	-17.83	-10.69	29.54	-62.19	-21.96	-40.23	peak

Note:

1. Measurement = Reading Level + Correct Factor(dBuA/m= dBuV/m- 20Log10[120π] = dBuV/m- 51.5).
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

Note: All constructions and test modes have been tested, only the worst data record in the report

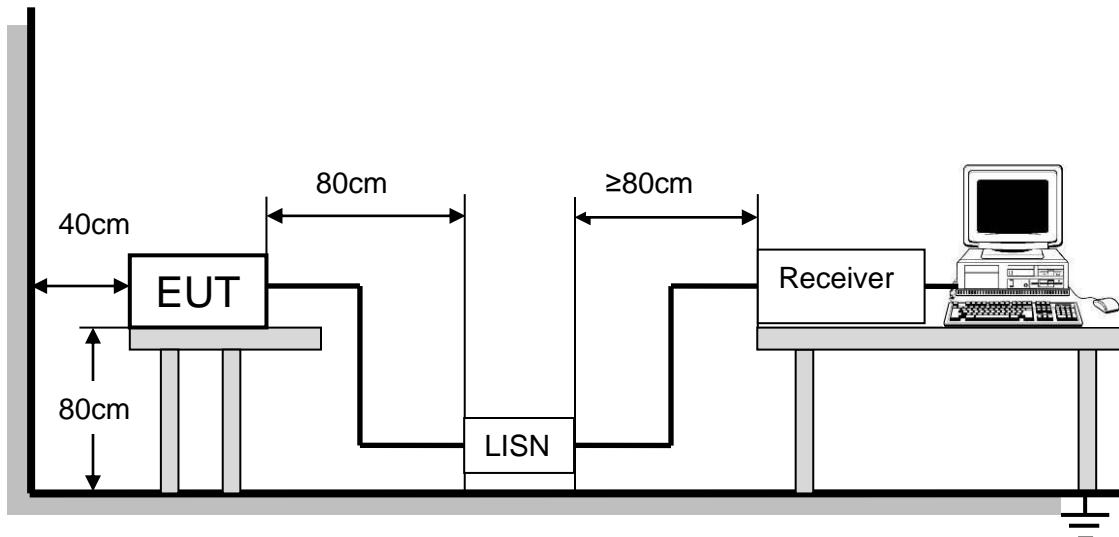
## 7.7. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

Please refer to FCC §15.207 (a) & RSS-GEN Clause 8.8

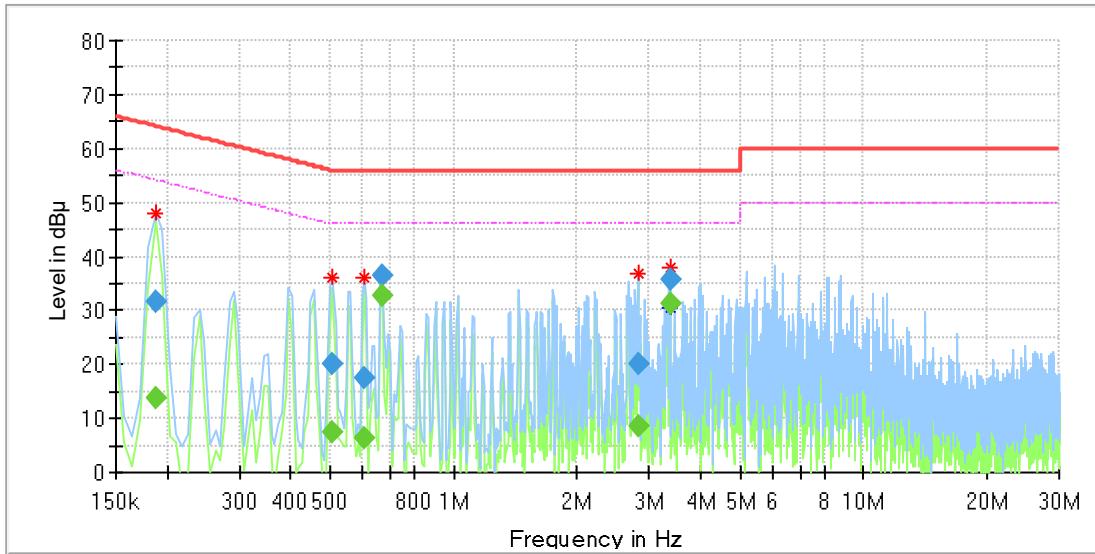
FREQUENCY (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

### TEST SETUP AND PROCEDURE



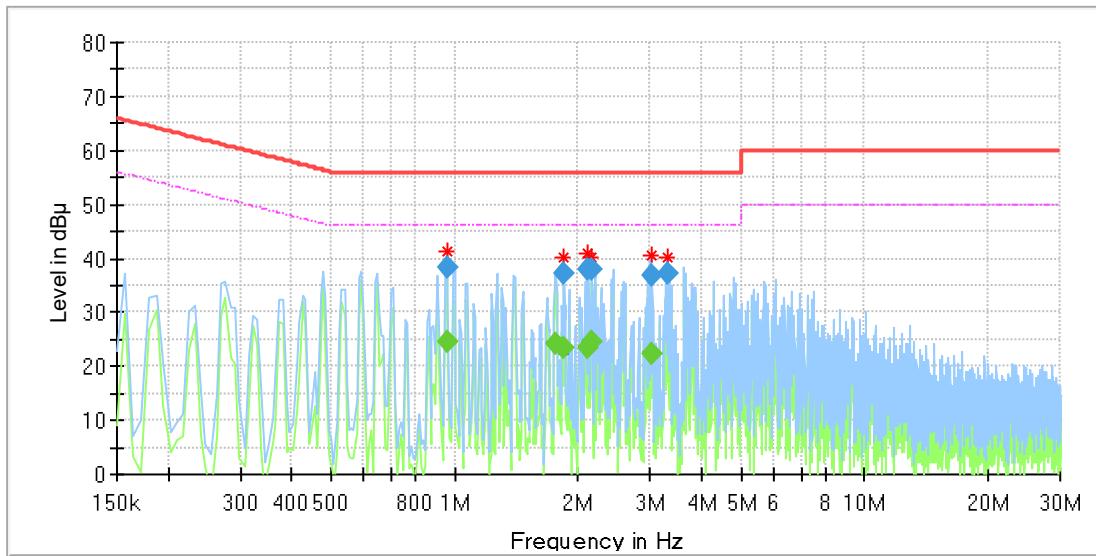
The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

**TEST RESULTS (WORST CASE CONFIGURATION)****For L Line:****Final Result**

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.187313	---	13.94	54.16	40.22	1000.0	9.000	L1	OFF	9.6
0.187313	31.53	---	64.16	32.63	1000.0	9.000	L1	OFF	9.6
0.508200	---	7.56	46.00	38.44	1000.0	9.000	L1	OFF	9.7
0.508200	19.98	---	56.00	36.02	1000.0	9.000	L1	OFF	9.7
0.605213	17.48	---	56.00	38.52	1000.0	9.000	L1	OFF	9.6
0.605213	---	6.47	46.00	39.53	1000.0	9.000	L1	OFF	9.6
0.672375	36.28	---	56.00	19.72	1000.0	9.000	L1	OFF	9.6
0.672375	---	32.62	46.00	13.38	1000.0	9.000	L1	OFF	9.6
2.814113	---	8.61	46.00	37.39	1000.0	9.000	L1	OFF	9.8
2.821575	20.25	---	56.00	35.75	1000.0	9.000	L1	OFF	9.8
3.366338	---	31.09	46.00	14.91	1000.0	9.000	L1	OFF	9.8
3.366338	35.75	---	56.00	20.25	1000.0	9.000	L1	OFF	9.8

Note: 1. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
2. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
3. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.  
4. The extension cord/outlet strip was calibrated with the LISN as required by ANSI C63.10:2013 Clause 6.2.2.  
5. Pre-testing all test modes and channels, and find the MCH of GFSK which is the worst case, so only the worst case is included in this test report.

**For N Line:****Final\_Result**

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.955950	---	24.40	46.00	21.60	1000.0	9.000	N	OFF	9.7
0.955950	38.26	---	56.00	17.74	1000.0	9.000	N	OFF	9.7
1.769363	---	24.27	46.00	21.73	1000.0	9.000	N	OFF	9.6
1.851450	---	23.31	46.00	22.69	1000.0	9.000	N	OFF	9.7
1.851450	37.02	---	56.00	18.98	1000.0	9.000	N	OFF	9.7
2.120100	---	23.26	46.00	22.74	1000.0	9.000	N	OFF	9.7
2.120100	38.08	---	56.00	17.92	1000.0	9.000	N	OFF	9.7
2.157413	38.12	---	56.00	17.88	1000.0	9.000	N	OFF	9.6
2.157413	---	24.56	46.00	21.44	1000.0	9.000	N	OFF	9.6
3.008138	36.86	---	56.00	19.14	1000.0	9.000	N	OFF	9.7
3.008138	---	22.37	46.00	23.63	1000.0	9.000	N	OFF	9.7
3.314100	37.17	---	56.00	18.83	1000.0	9.000	N	OFF	9.7

Note: 1. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
2. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
3. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.  
4. The extension cord/outlet strip was calibrated with the LISN as required by ANSI C63.10:2013 Clause 6.2.2.  
5. Pre-testing all test modes and channels, and find the MCH of GFSK which is the worst case, so only the worst case is included in this test report.

## 8. ANTENNA REQUIREMENTS

### APPLICABLE REQUIREMENTS

Please refer to FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### ANTENNA CONNECTOR

EUT has a EUT with one Meandered printed inverted-F antenna.

### ANTENNA GAIN

The antenna gain of EUT is less than 6 dBi.

**END OF REPORT**