FCC Test Report

FCC EVALUATION REPORT FOR CERTIFICATION	
Project Reference No.	239671
Product	Tablet PC
Brand Name	HANNspree
Model	HSG1279
Alternate Model	N/A
Tested according to	FCC Rules and Regulations Part 15 Subpart C 2013, 15.247 ANSI C63.4-2009

Tested in period	2013-07-05 to 2013-07-11
Issued date	2013-08-01
Name and address of the Test House	Nemko Nemko Shanghai Ltd. 9A No. 528 Ruiqing Road, PuDong New Area, Shanghai, China P.C. Phone : +86 21 5072 0988 Fax : +86 21 5072 0950
Tested by	 2013-07-31
	Zone Peng ***date***
Verified by	 2013-08-01
	Daria Liu ***date***

Contents of This Report

1. Client Information

1.1 Applicant

Company Name:	**Hannstar Display Corp.**
Company Address:	**4F, No.48, Wuquan Rd, Wugu Dist, New Taipei City 248, Taiwan**

1.2 Manufacturer

Company Name:	**Foxda Technology Industrial (Shenzhen) Co., Ltd.**
Company Address:	**G/F, Block 1 and G/F to 2/F, Block 2, Foxda Industrial Park, Lanzhu Road, Foxda Industrial Zone, Pingshan New District, Shenzhen, CHINA**

1.3 Scope

●Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC part 15.247.

2. Equipment under Test (EUT)

2.1 Identification of EUT

Category:	Bluetooth
Name:	Tablet PC
Model Name:	HSG1279
Alternate model:	N/A
Brand name:	HANNspree

2.2 Detail spec:

Carrier Frequency：2402MHz~2480MHz

Number of Channel：79

Output Power：0.24dBm

Modulation Type：Bluetooth(GFSK, π/4 DQPSK,8DPSK)

Mode of operation (duplex, simplex, half duplex) ：duplex

Antenna Type：Intergral Antenna

Antenna gain：2.06 dBi

Name : Adapter

Manufacturer : Sunny Electronics Corp.

Model: SYS1357-1305

Input: 1.0A, 100-240V~, 50-60Hz, Class II

Output: 5Vdc,2.6A

2.3 Additional Information Related to Testing

CHL : CH 1 2402MHz

CHM : CH 39 2441MHz

CHH : CH 79 2480MHz

3. General Test Conditions

3.1 Location

AUDIX Technology (Shenzhen) Co., Ltd–ELA 135

No.6, Ke Feng Rd.,52 Block ,Shenzhen Science & Industrial Park, Nantou, Shenzhen, Guangdong, China

FCC Registration No.:90454

Industry Canada Registration No.: 5183

Note: all test are witnessed by NEMKO engineer

3.2 Operating Environment

All tests and measurements were performed in a shielded enclosure or a controlled environment suitable for the tests conducted. The climatic conditions in the test area are automatically controlled and recorded continuously.

Parameters	Recording during test	Accepted deviation
Ambient temperature	20-25°C	15 – 35 ºC
Relative humidity	45-55%	30 - 60%
Atmospheric pressure	101.2 kPa -101.3kPa	86-106kPa

3.3 Operating During Test

Test mode:120VAC 60Hz

TM1 : continuance TX MODE

TM2: Hopping on mode

π/4 DQPSK,8DPSK are pretested, 8DPSK is the worse mode ,so GFSK and 8DPSK is the representative mode for full test and record their results in report.

Remark : When measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, have been performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. No findable change appear.
And only choose the worse mode to be the representative test mode

3.4 Test Equipment

The test equipments used in testing are calibrated on a regular basis. For most of the testing equipments accredited calibration is conducted once a year. For certain equipment the calibration interval is longer. Between the calibrations all test equipment are controlled and verified on a regular basis. The test equipments used are defined in each test section of this report.

4. Measurement Uncertainty

The Measurement Uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 with the confidence level of 95 %.

Conducted Emission : 0.15~30MHz 3.45dB

Radiated Emission: 30MHz~1000MHz 4.50dB

1GHz-18GHz 4.70dB

5. Radiated Electromagnetic Disturbances

5.1 Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast.

The EUT were rotated 0 to 360 degree and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. The test result are reported as below.

For below 1GHz

RBW=120 kHz; VBW=300KHz.The frequency range from 30MHz to 1000MHz is checked using QP detector .

For above 1GHz. The frequency range from 1GHz to 25GHz(10^{th} harmonics) is checked.

RBW=1MHz ; VBW=1MHz,PK detector for peak emissions measurement above 1GHz

RBW=1MHz ; VBW=10Hz, PK detector for average emissions measure above 1GHz

5.2 Measurement Equipment

For Radiation Test 30MHz-1000MHz (In 3m Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	3#Chamber	AUDIX	N/A	N/A	Nov.24,12	1 Year
2	EMI Spectrum	Agilent	E4407B	MY41440292	May.08, 13	1 Year
3	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	May.08, 13	1 Year
4	Amplifier	HP	8447D	2648A04738	May.08, 13	1 Year
5	Bilog Antenna	Schaffner	CBL6111C	2598	Dec.26, 12	2.0 Year
6	RF Cable	MIYAZAKI	CFD400-NL	3# Chamber No.1	May.08, 13	1 Year
7	Coaxial Switch	Anritsu	MP59B	M74389	May.08, 13	1 Year

For Radiated Emission Test 1GHz-25GHz (In 3m Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	May.08, 13	1 Year
2	Horn Antenna	EMCO	3115	9510-4580	June.05, 13	1 Year
3	Amplifier	Agilent	8449B	3008A00863	May.08, 13	1 Year
4	RF Cable	Hubersuhner	SUCOFLEX106	77980/6	May.08, 13	1 Year
5	RF Cable	Hubersuhner	SUCOFLEX106	77977/6	May.08, 13	1 Year

5.3 Test Result

Mode	Freq range		Test ANT polarity	Diagram	Test Result
TX	30MHz-1GHz:		H	5-1	Pass
	30MHz-1GHz:		V	5-2	Pass
Mode	**Freq range**	**Channel**	**Test ANT polarity**	**Diagram**	**Test Result**
GFSK	1GHz-18GHz:	CHLOW	H	5-3	Pass
	1GHz-18GHz:	CHLOW	V	5-4	Pass
	1GHz-18GHz:	CHMID	H	5-5	Pass
	1GHz-18GHz:	CHMID	V	5-6	Pass
	1GHz-18GHz:	CH HIGH	H	5-7	Pass
	1GHz-18GHz:	CH HIGH	V	5-8	Pass
Mode	**Freq range**	**Channel**	**Test ANT polarity**	**Diagram**	**Test Result**
8DPSK	1GHz-18GHz:	CHLOW	H	5-9	Pass
	1GHz-18GHz:	CHLOW	V	5-10	Pass
	1GHz-18GHz:	CHMID	H	5-11	Pass
	1GHz-18GHz:	CHMID	V	5-12	Pass
	1GHz-18GHz:	CH HIGH	H	5-13	Pass
	1GHz-18GHz:	CH HIGH	V	5-14	Pass

Remark:

If PK value is lower than AV limit , then Both PK and AV deem to comply their own limit .

1) GFSK ,8DPSK andπ/4 DQPSK of operation were investigated , GFSK and 8DPSK were found as the worst -case emission and are reported.
2) All restriction band have been tested at both CHL,M and H , only reported the worse case as plots shown as below
3) No emission found at 9kHz to 30MHz and 18GHz to 25GHz.

NOTES:

1.All modes were measured and the worst case emission was reported.

2. H =Horizontal V=Vertical

3. Emission = Reading +Antenna Factor + Cable Loss –Amp Factor

4. Emission level dBμV = 20 log Emission level μV/m

5. The lower limit shall apply at the transition frequencies

6. All the emissions appearing within 15.205 Restricted bands shall not exceed the limits shown in 15.209,all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

Remark :

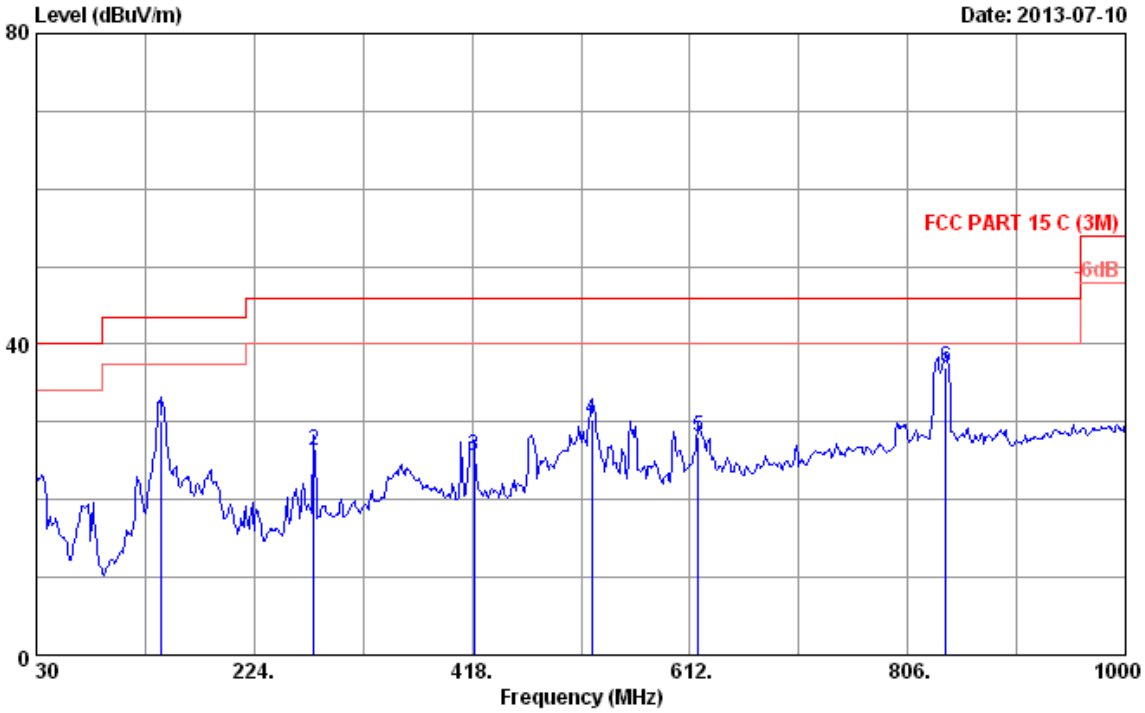
The limit of 15.209(a) of 3 meter distance is

Frequency MHz	Distance m	Field strength		Distance m	Field strength dBμV/m(QP)
		μV/m	dBμV/m(QP)		
30-88	3	100	40.0	10	30.0
88-216	3	150	43.5	10	33.5
216-960	3	200	46.0	10	36.0
960-1000	3	500	54.0	10	44.0
Above 1000	3	74.0 dBμV/m (PK) 54.0 dBμV/m (AV)		/	/

15.205 Restricted bands of operation:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]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	([2])

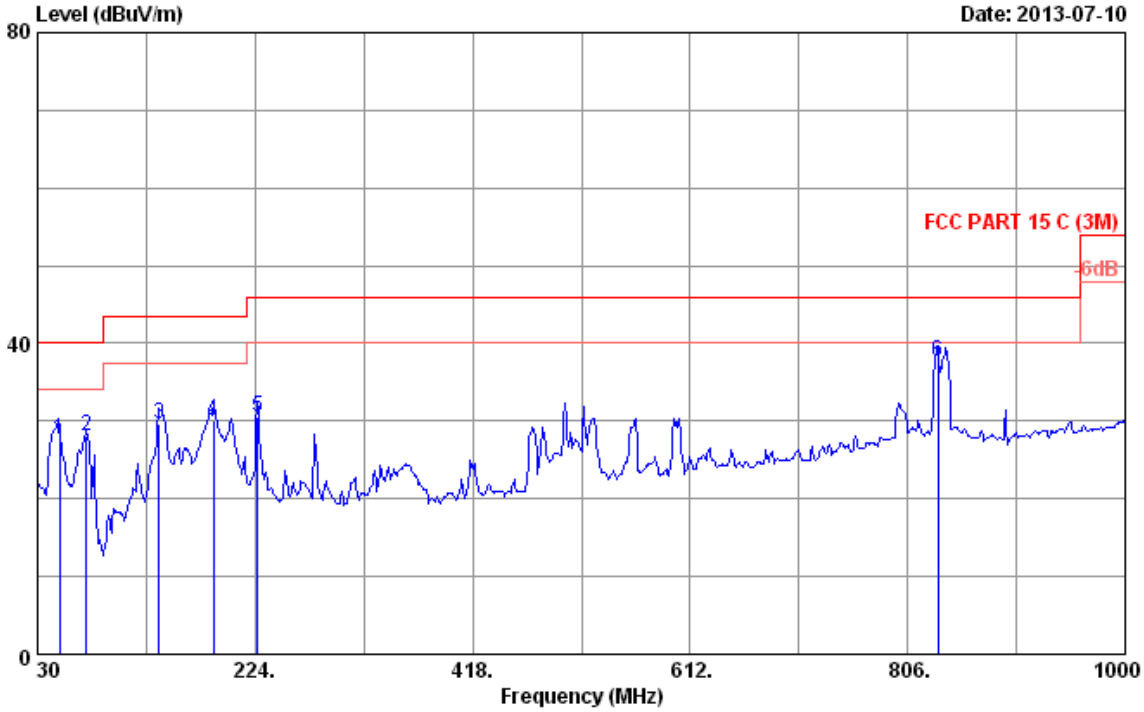
5.3.1 Diagram 5-1



No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	141.550	12.20	1.57	16.41	30.18	43.50	13.32	QP
2	277.350	13.15	2.08	10.99	26.22	46.00	19.78	QP
3	419.940	17.10	2.52	6.04	25.66	46.00	20.34	QP
4	524.700	18.59	2.82	8.96	30.37	46.00	15.63	QP
5	619.760	20.19	3.09	4.75	28.03	46.00	17.97	QP
6	839.950	22.90	3.74	10.34	36.98	46.00	9.02	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

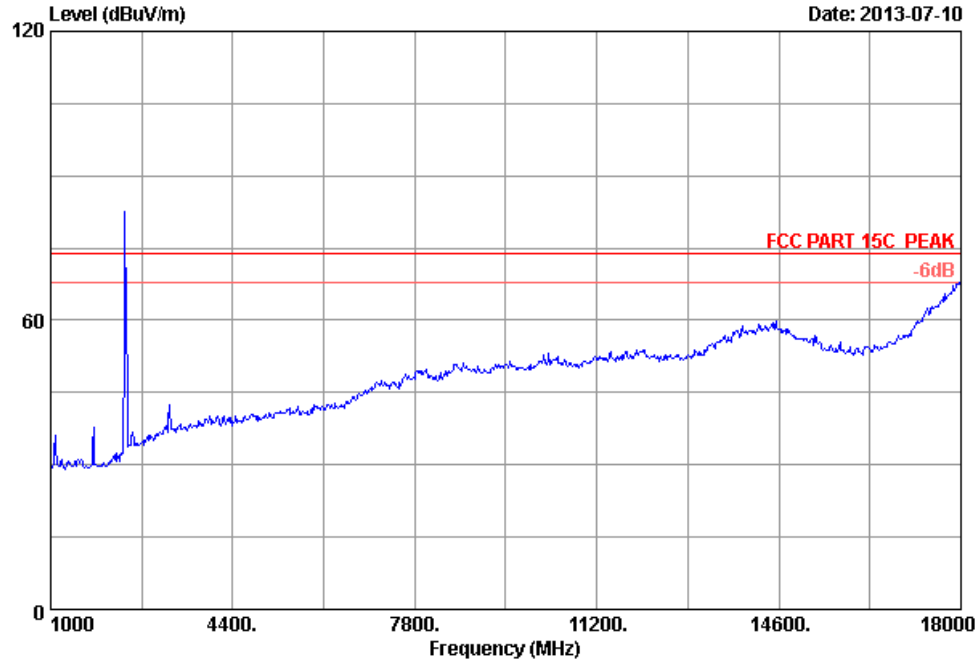
5.3.2 Diagram 5-2

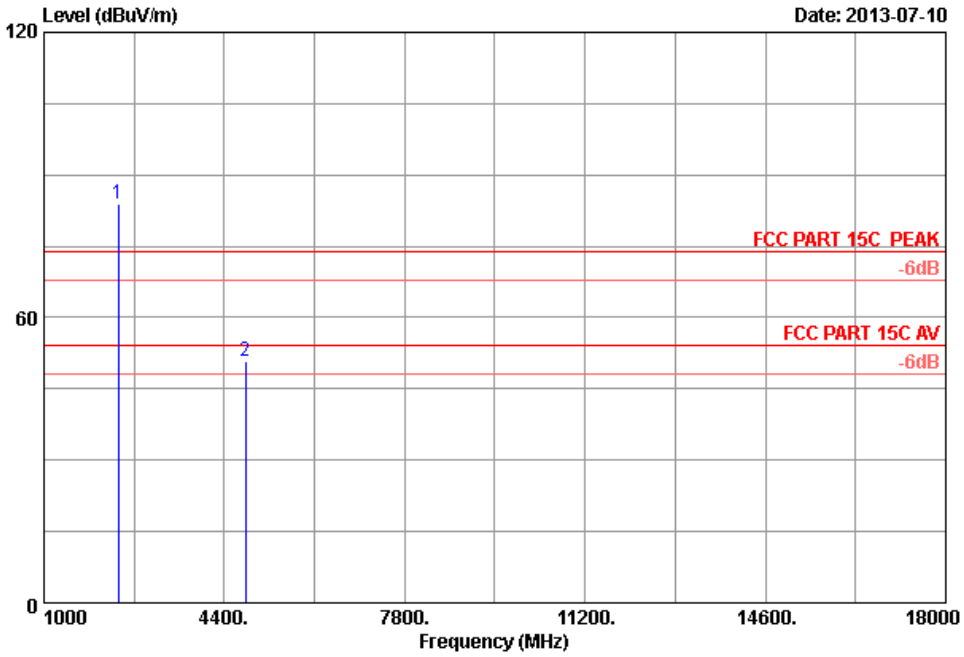


No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	49.400	9.23	1.18	17.23	27.64	40.00	12.36	QP
2	73.650	7.45	1.29	19.34	28.08	40.00	11.92	QP
3	138.640	12.27	1.56	15.81	29.64	43.50	13.86	QP
4	187.140	9.10	1.74	19.21	30.05	43.50	13.45	QP
5	225.940	10.66	1.89	18.00	30.55	46.00	15.45	QP
6	833.160	22.76	3.71	11.30	37.77	46.00	8.23	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

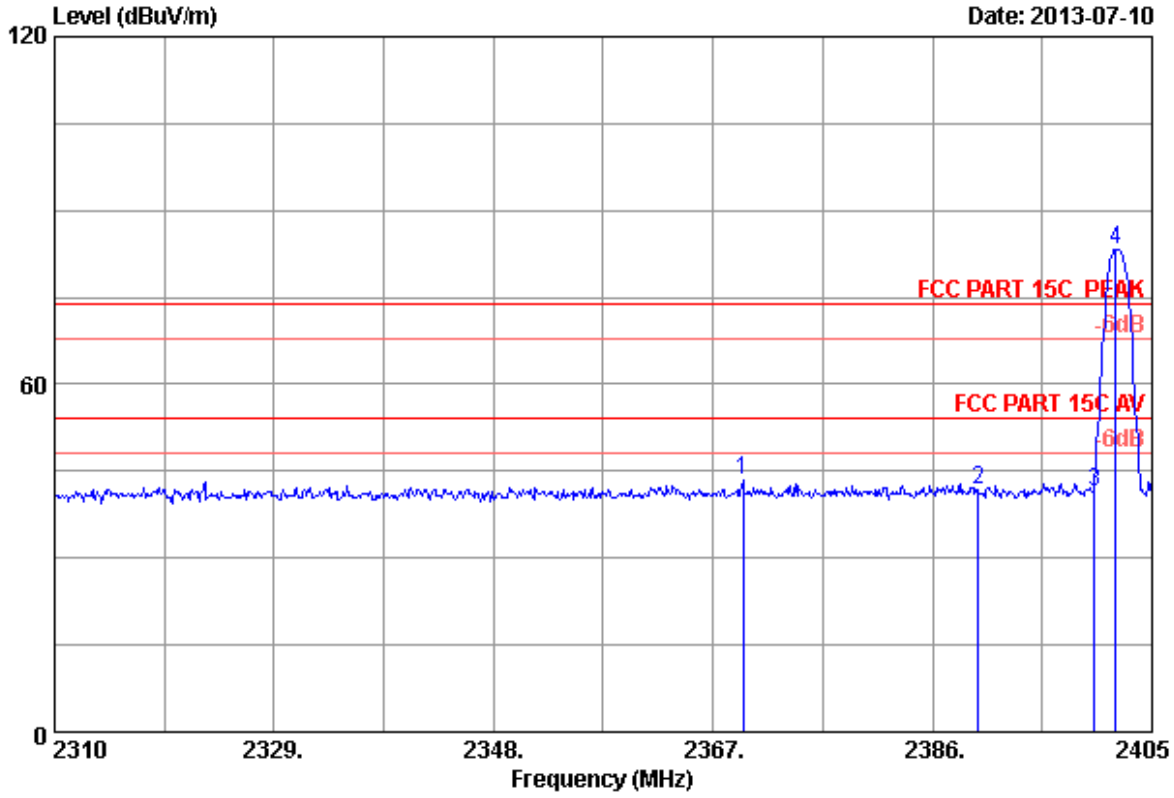
5.3.3 Diagram 5-3





	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	26.77	6.02	35.92	86.94	83.81			Peak
2	4804.000	32.47	8.67	35.72	45.26	50.68	74.00	23.32	Peak

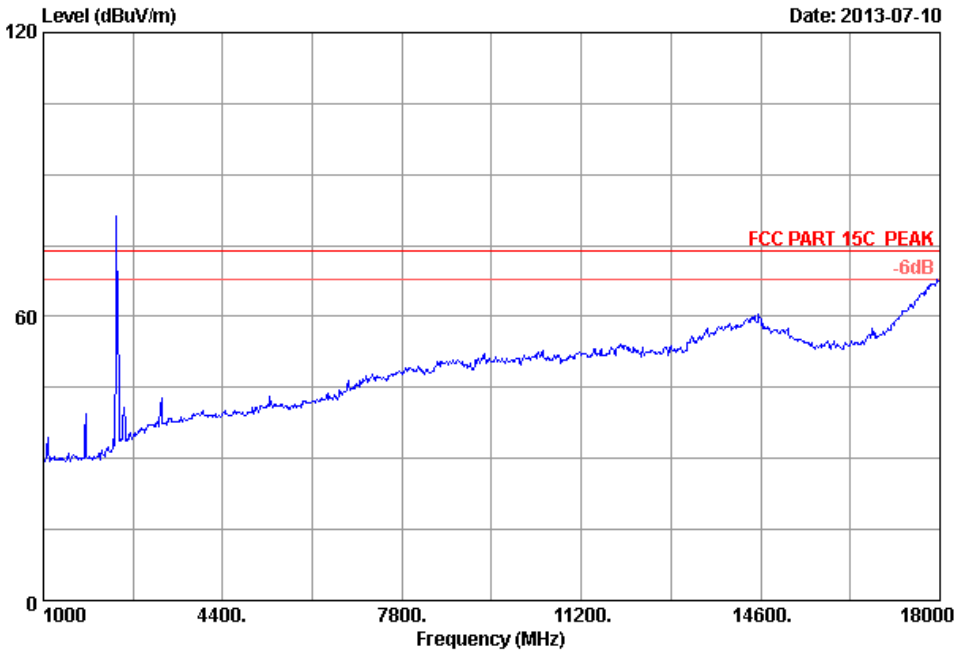
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

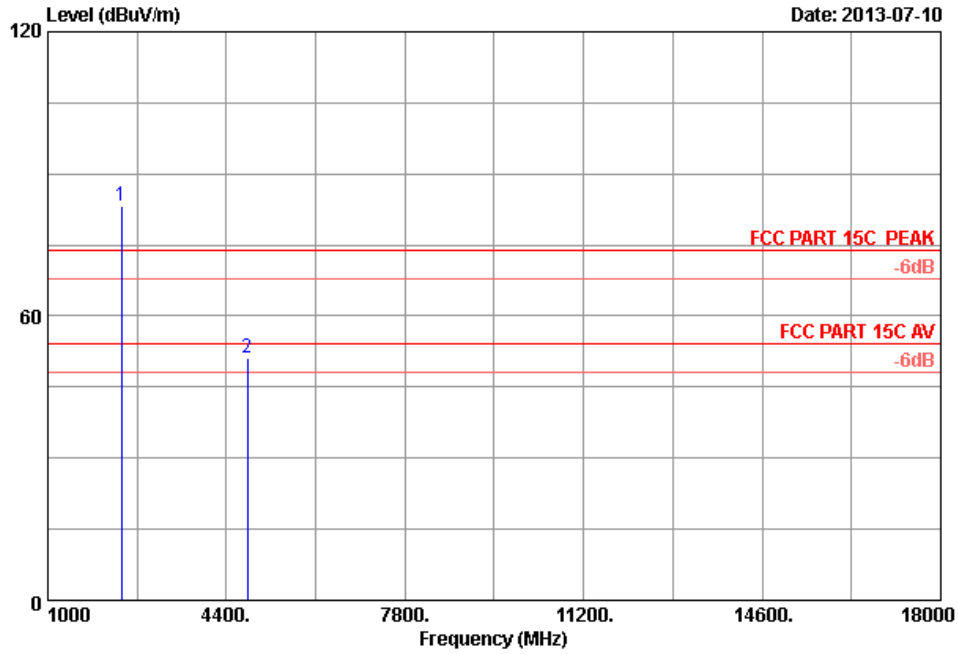


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2369.565	26.57	5.97	35.92	46.94	43.56	74.00	30.44	Peak
2	2390.000	26.70	6.00	35.92	44.99	41.77	74.00	32.23	Peak
3	2400.000	26.76	6.02	35.92	44.62	41.48	74.00	32.52	Peak
4	2401.865	26.77	6.02	35.92	86.45	83.32			Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

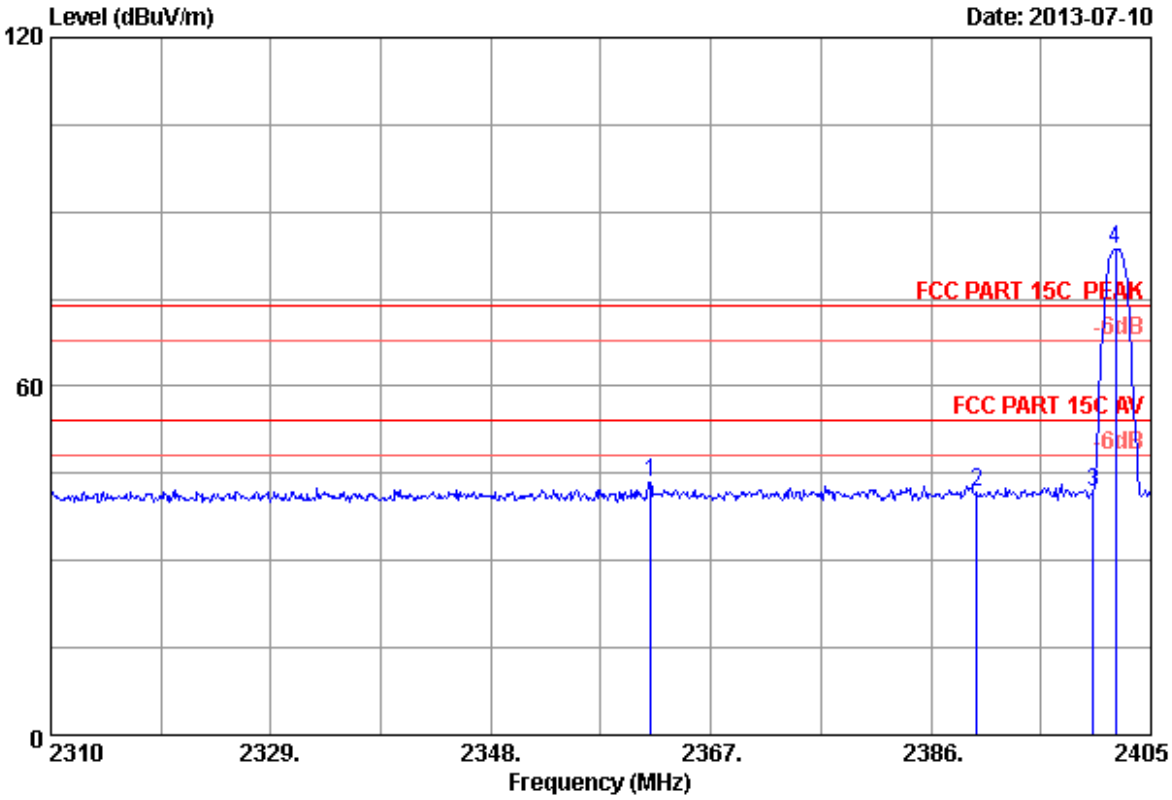
5.3.4 Diagram 5-4





	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	26.77	6.02	35.92	86.23	83.10			Peak
2	4804.000	32.47	8.67	35.72	45.78	51.20	74.00	22.80	Peak

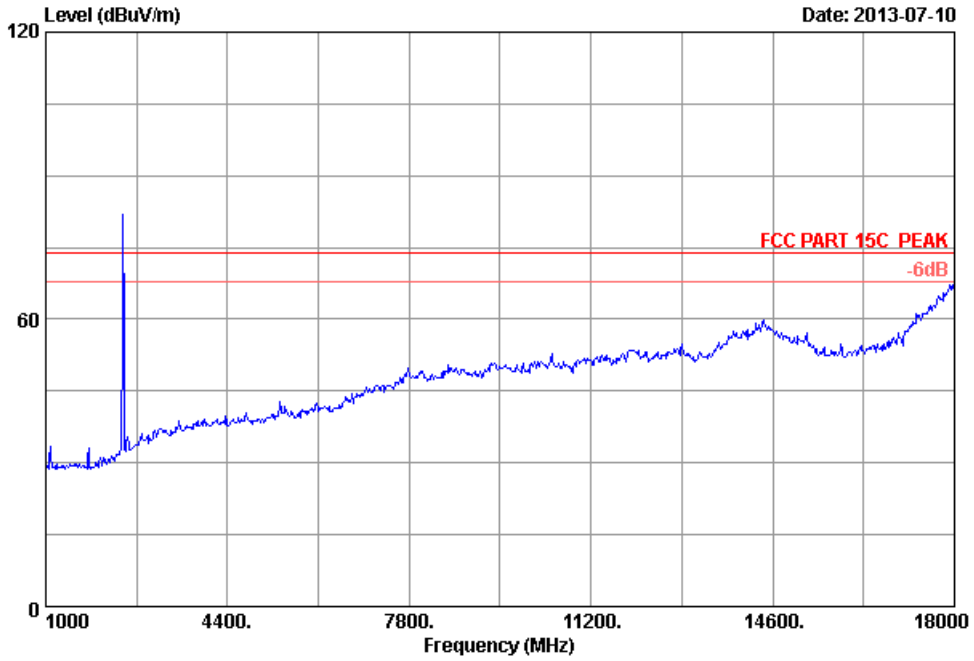
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

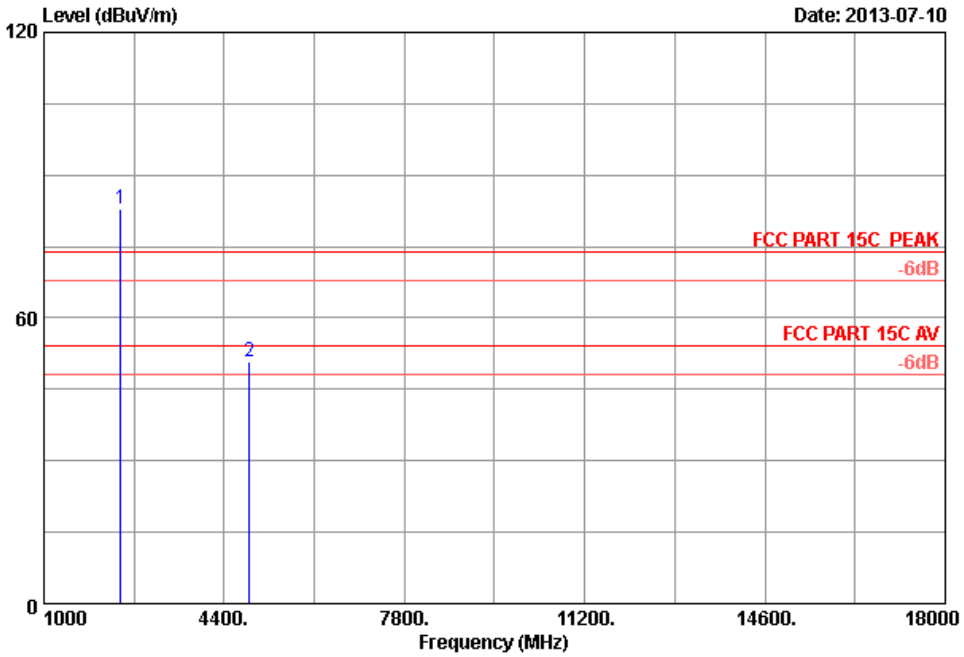


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2361.775	26.52	5.95	35.92	47.00	43.55	74.00	30.45	Peak
2	2390.000	26.70	6.00	35.92	44.85	41.63	74.00	32.37	Peak
3	2400.000	26.76	6.02	35.92	44.83	41.69	74.00	32.31	Peak
4	2401.960	26.77	6.02	35.92	86.76	83.63			Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

5.3.5 Diagram 5-5

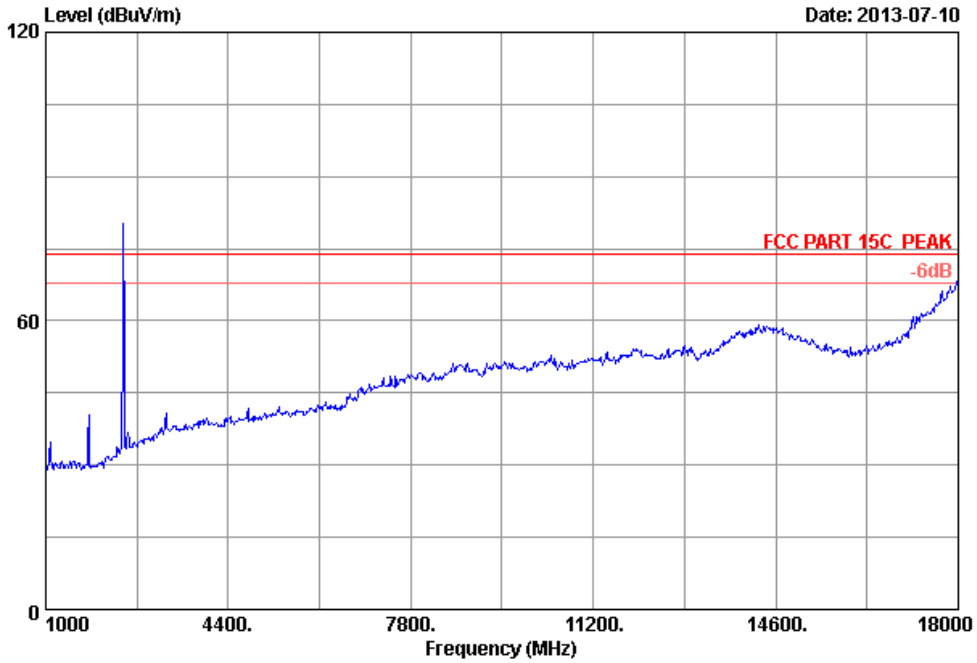


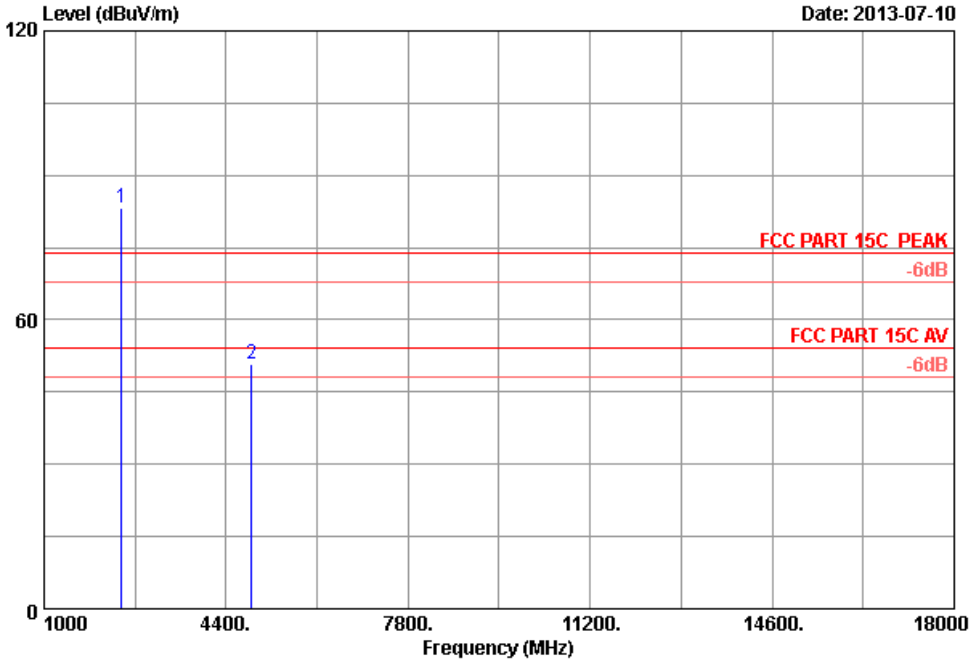


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.000	27.02	6.09	35.92	85.57	82.76			Peak
2	4882.000	32.64	8.74	35.69	45.23	50.92	74.00	23.08	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

5.3.6 Diagram 5-6

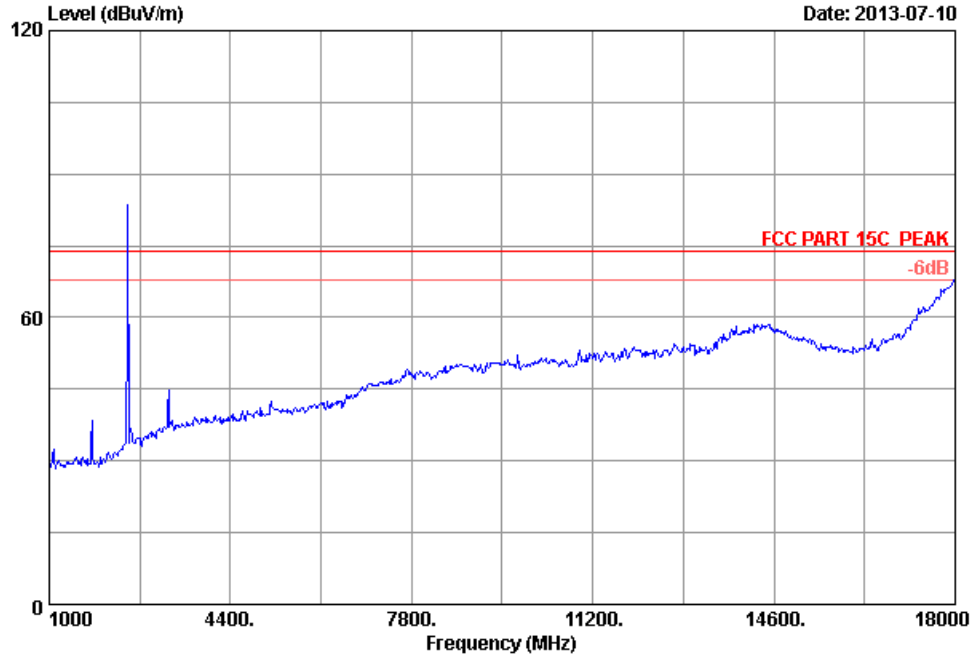


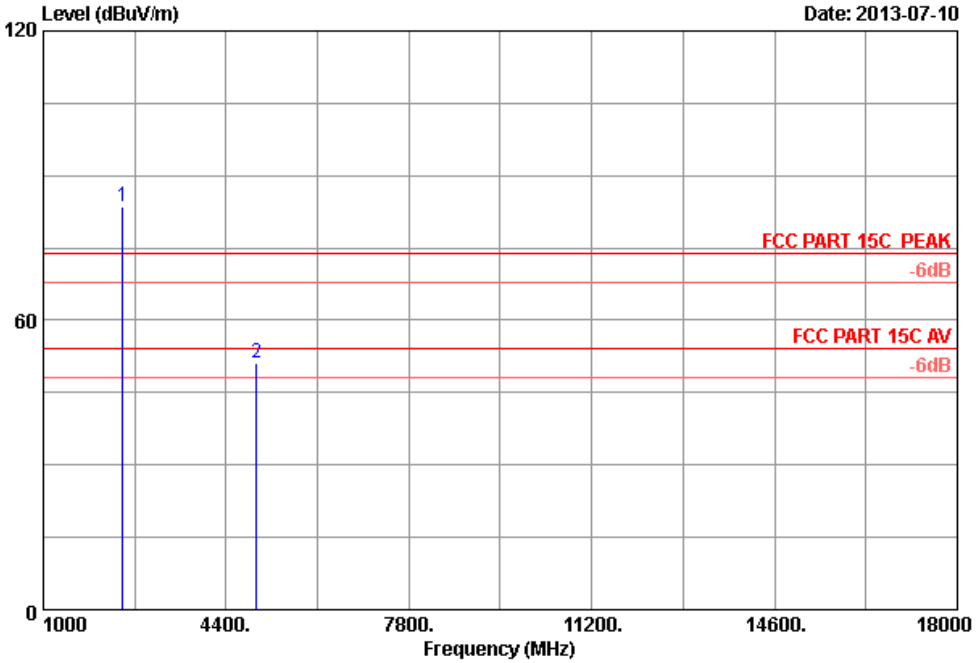


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.000	27.02	6.09	35.92	86.02	83.21			Peak
2	4882.000	32.64	8.74	35.69	45.12	50.81	74.00	23.19	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

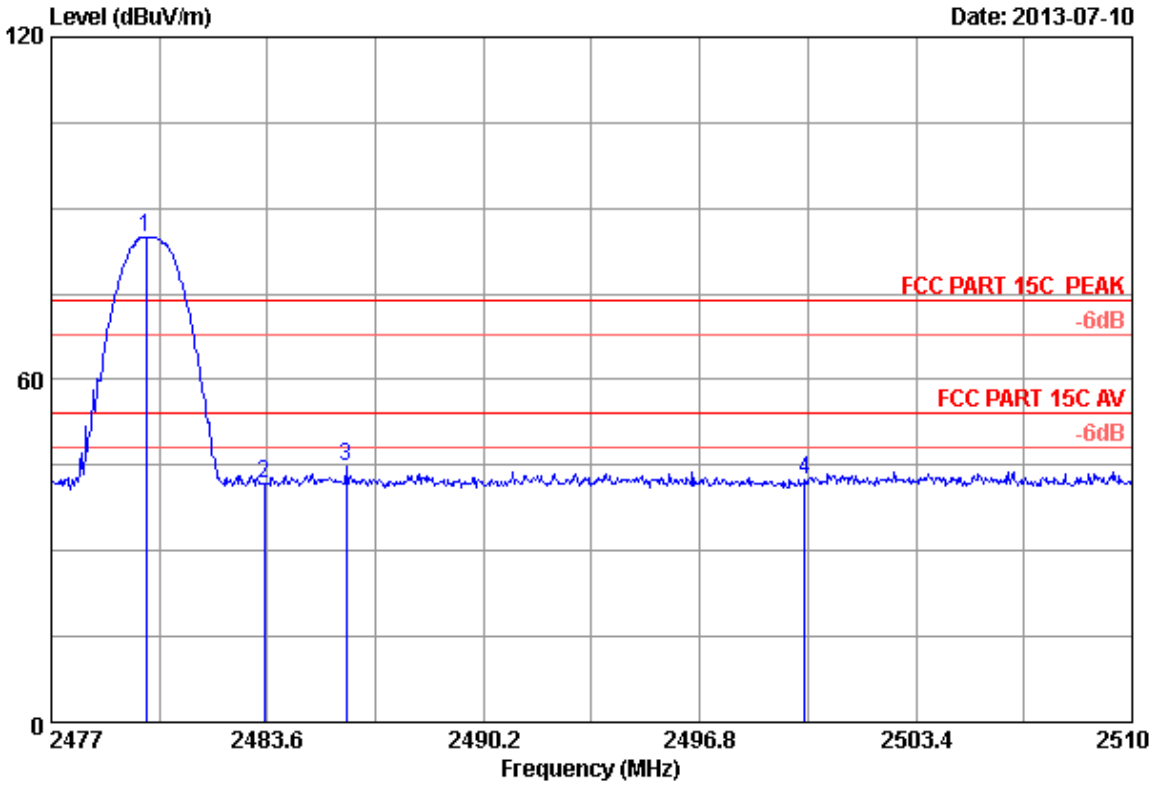
5.3.7 Diagram 5-7





	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.000	27.27	6.15	35.92	86.11	83.61			Peak
2	4960.000	32.81	8.81	35.66	45.22	51.18	74.00	22.82	Peak

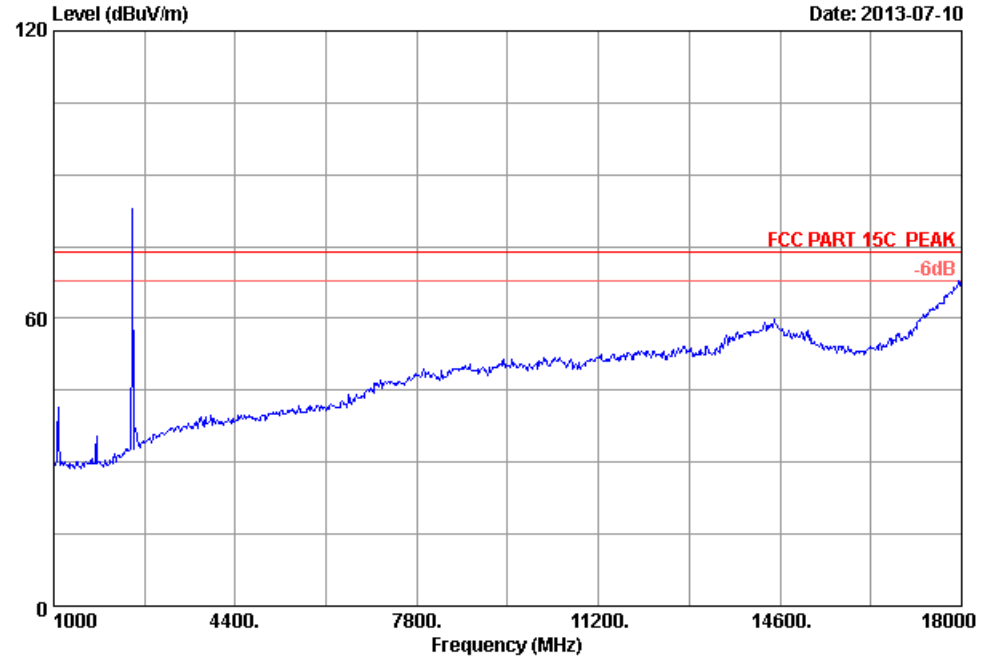
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

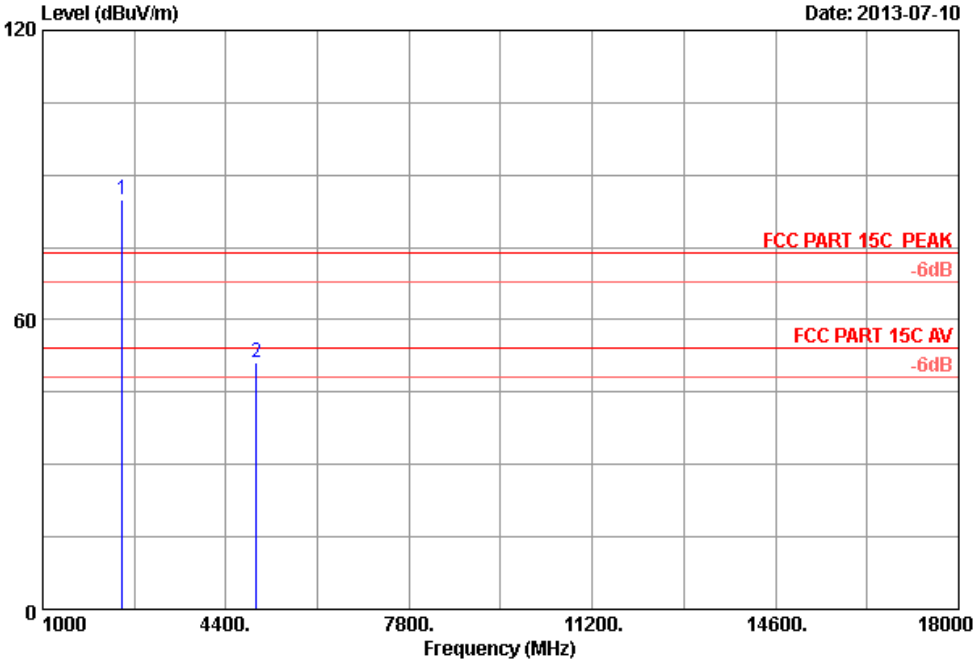


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.904	27.27	6.15	35.92	87.56	85.06			Peak
2	2483.500	27.29	6.16	35.92	44.33	41.86	74.00	32.14	Peak
3	2486.009	27.31	6.16	35.92	47.18	44.73	74.00	29.27	Peak
4	2500.000	27.40	6.19	35.93	44.83	42.49	74.00	31.51	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

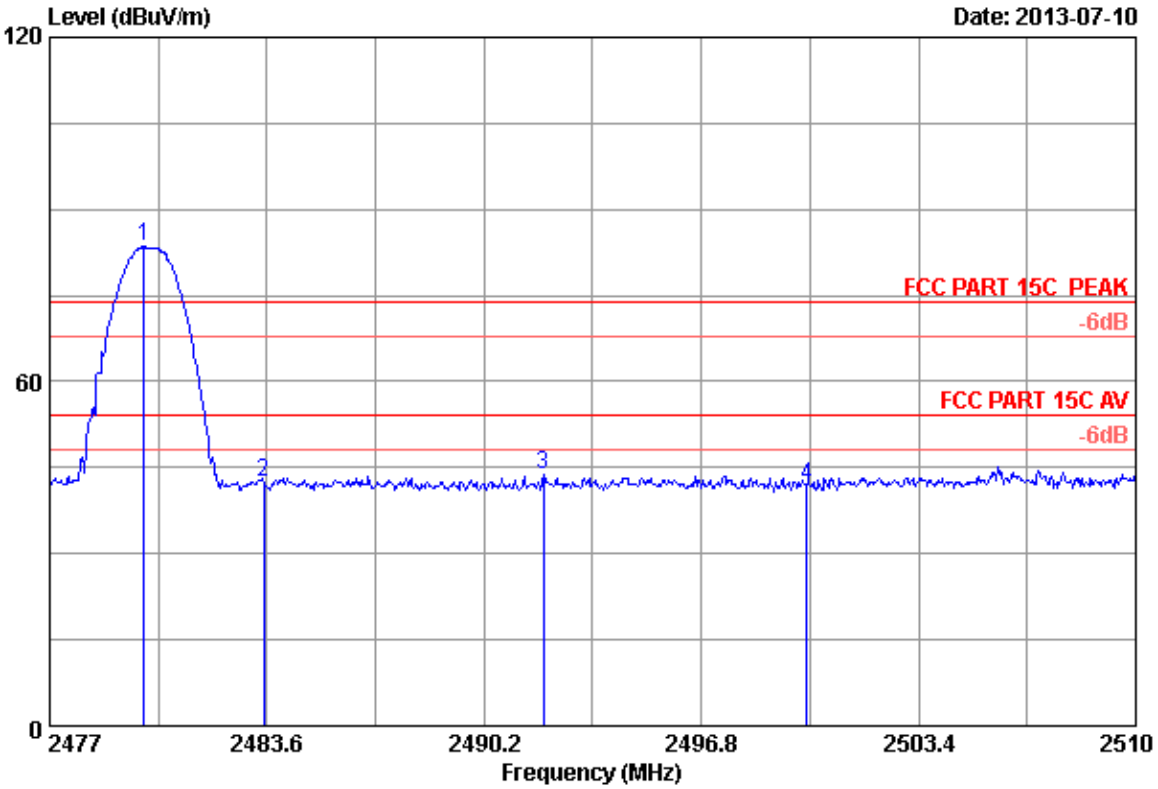
5.3.8 Diagram 5-8





	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.000	27.27	6.15	35.92	87.28	84.78			Peak
2	4960.000	32.81	8.81	35.66	45.09	51.05	74.00	22.95	Peak

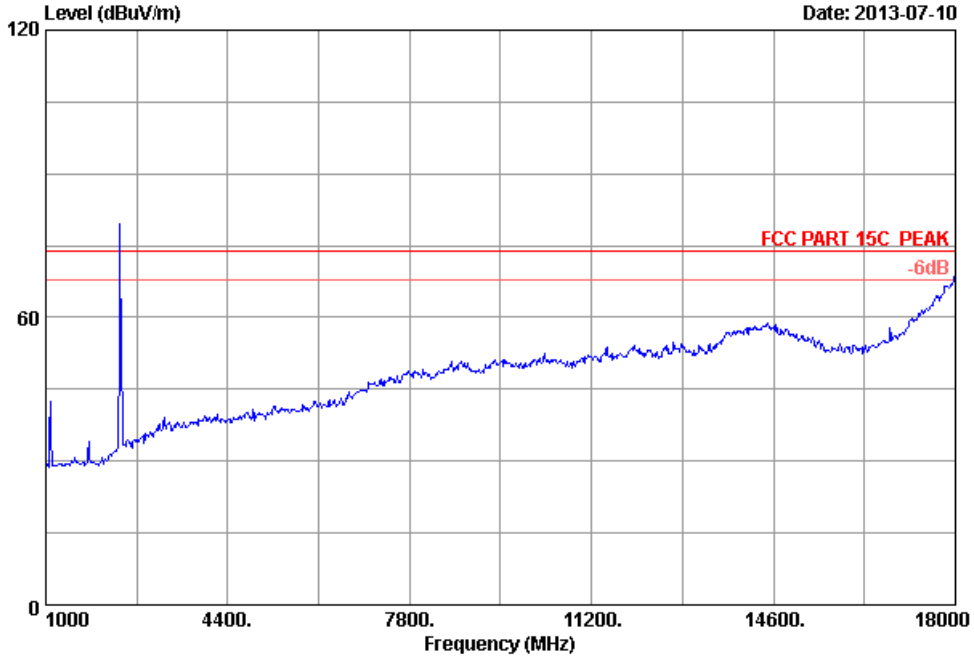
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

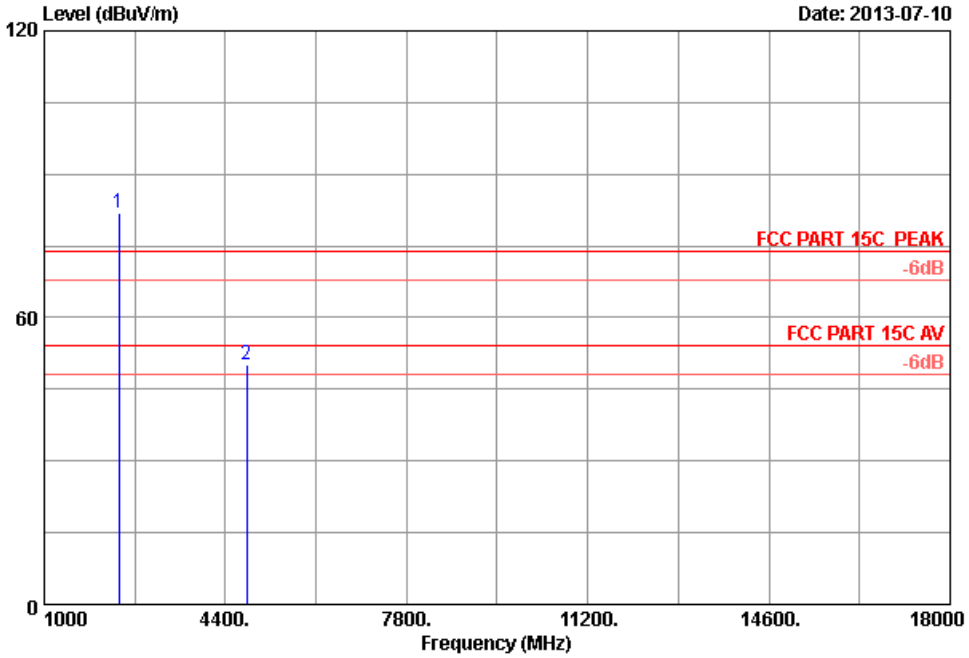


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.871	27.27	6.15	35.92	85.96	83.46			Peak
2	2483.500	27.29	6.16	35.92	45.07	42.60	74.00	31.40	Peak
3	2492.015	27.35	6.17	35.92	46.03	43.63	74.00	30.37	Peak
4	2500.000	27.40	6.19	35.93	44.06	41.72	74.00	32.28	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

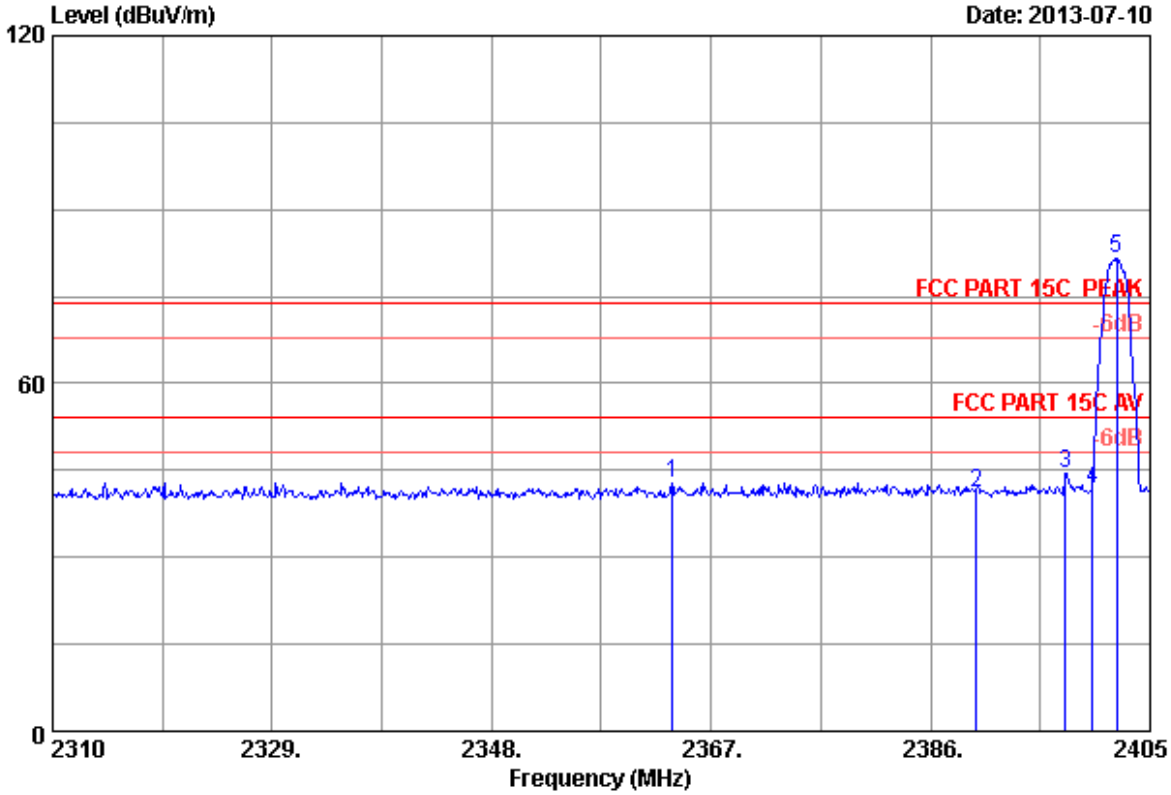
5.3.9 Diagram 5-9





	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	26.77	6.02	35.92	85.07	81.94			Peak
2	4804.000	32.47	8.67	35.72	44.75	50.17	74.00	23.83	Peak

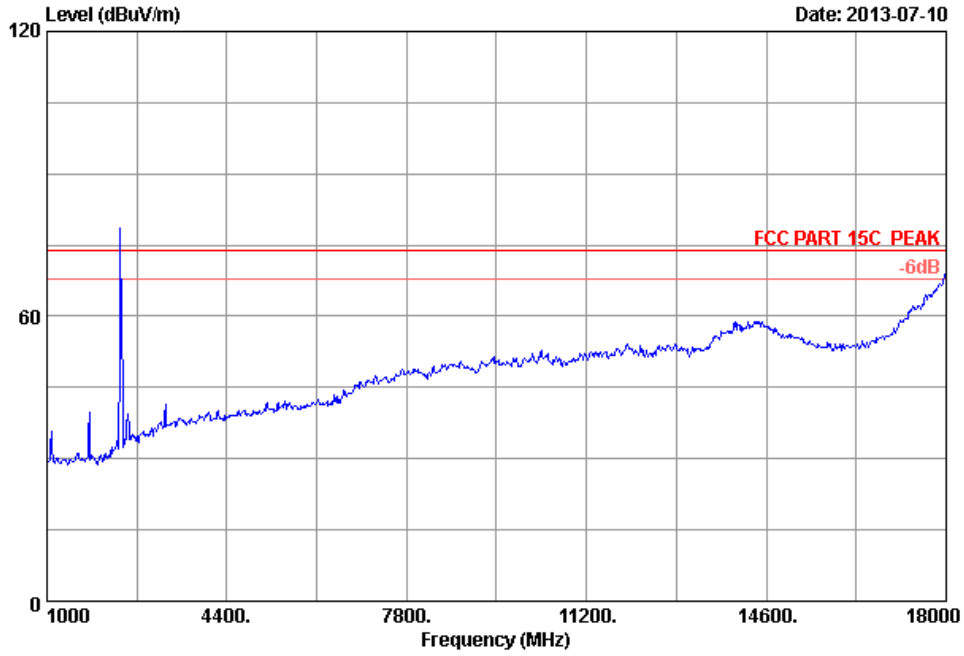
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

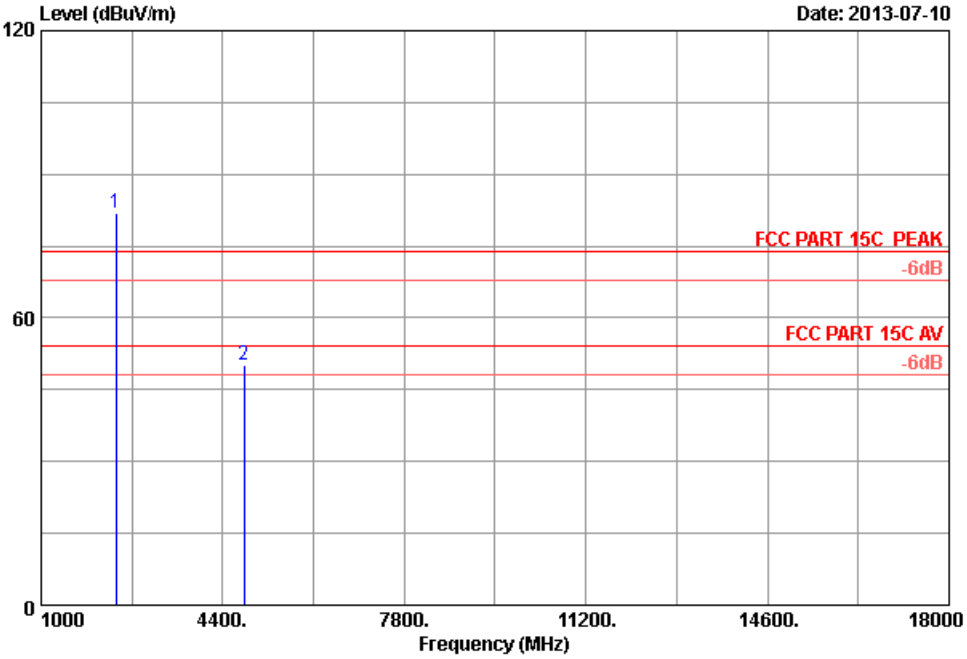


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2363.675	26.53	5.96	35.92	46.31	42.88	74.00	31.12	Peak
2	2390.000	26.70	6.00	35.92	44.41	41.19	74.00	32.81	Peak
3	2397.685	26.75	6.01	35.92	47.73	44.57	74.00	29.43	Peak
4	2400.000	26.76	6.02	35.92	44.87	41.73	74.00	32.27	Peak
5	2402.150	26.77	6.02	35.92	84.56	81.43			Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

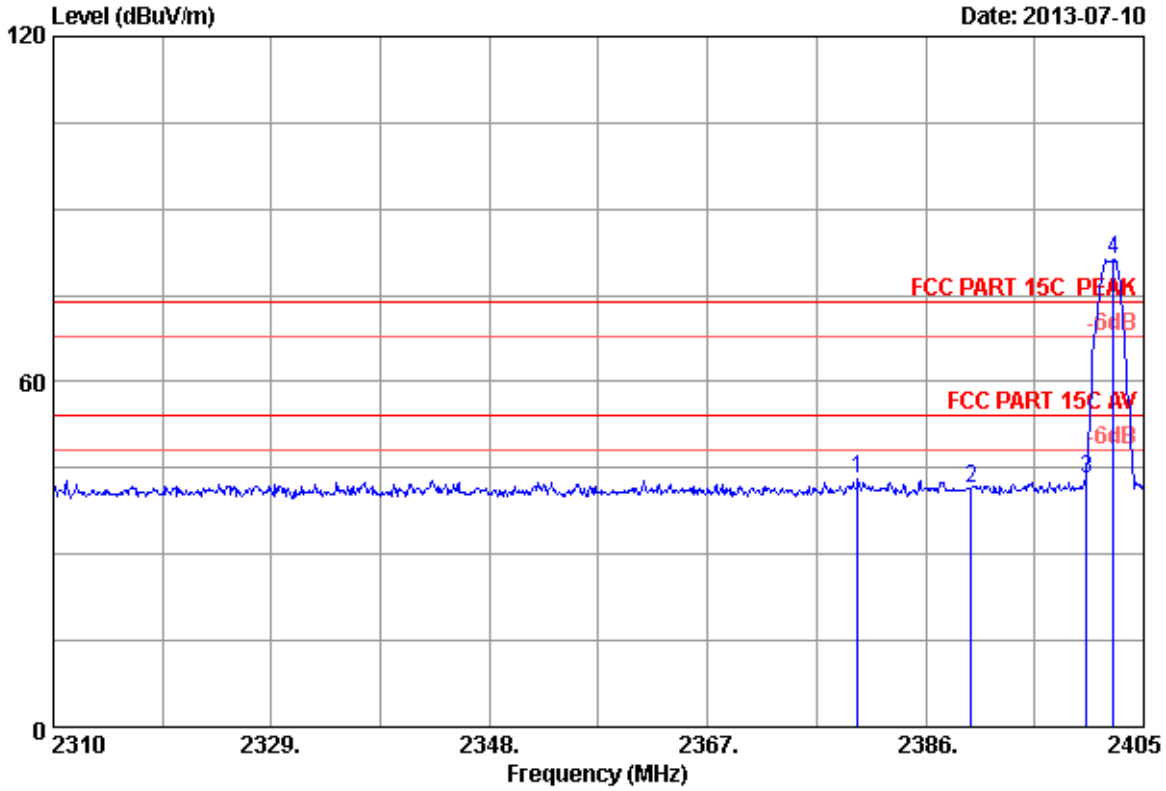
5.3.10 Diagram 5-10





	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	26.77	6.02	35.92	84.99	81.86			Peak
2	4804.000	32.47	8.67	35.72	44.67	50.09	74.00	23.91	Peak

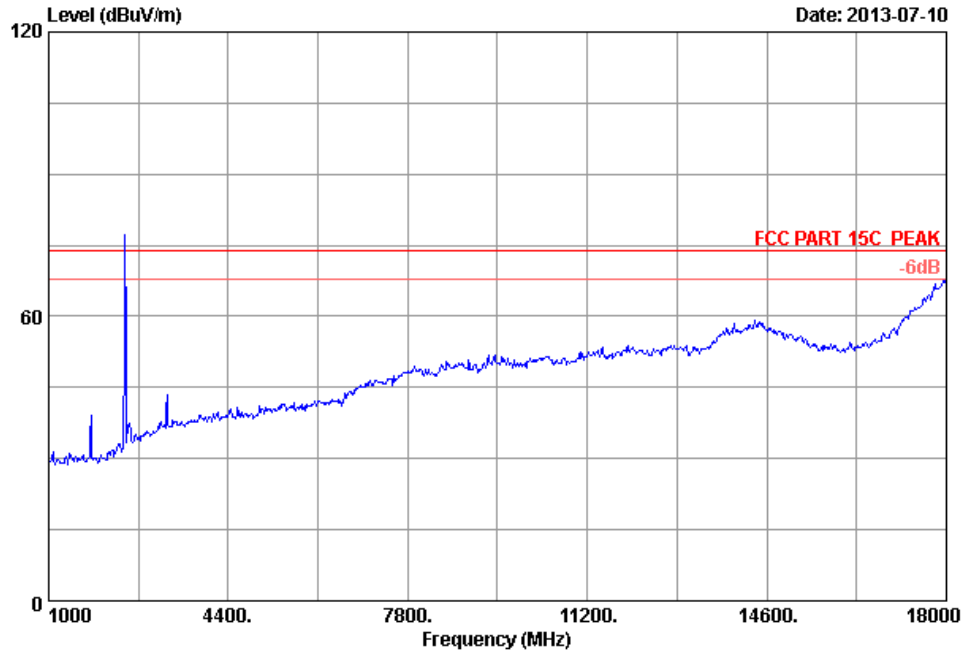
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

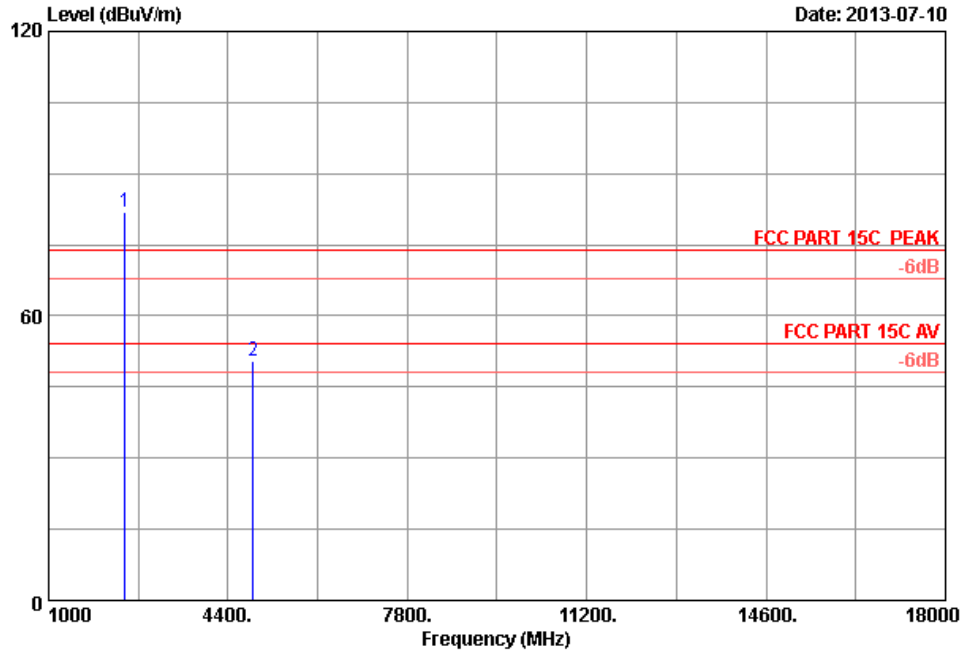


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2380.110	26.63	5.98	35.92	46.36	43.05	74.00	30.95	Peak
2	2390.000	26.70	6.00	35.92	44.82	41.60	74.00	32.40	Peak
3	2400.000	26.76	6.02	35.92	46.34	43.20	74.00	30.80	Peak
4	2402.340	26.77	6.02	35.92	84.51	81.38			Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

5.3.11 Diagram 5-11

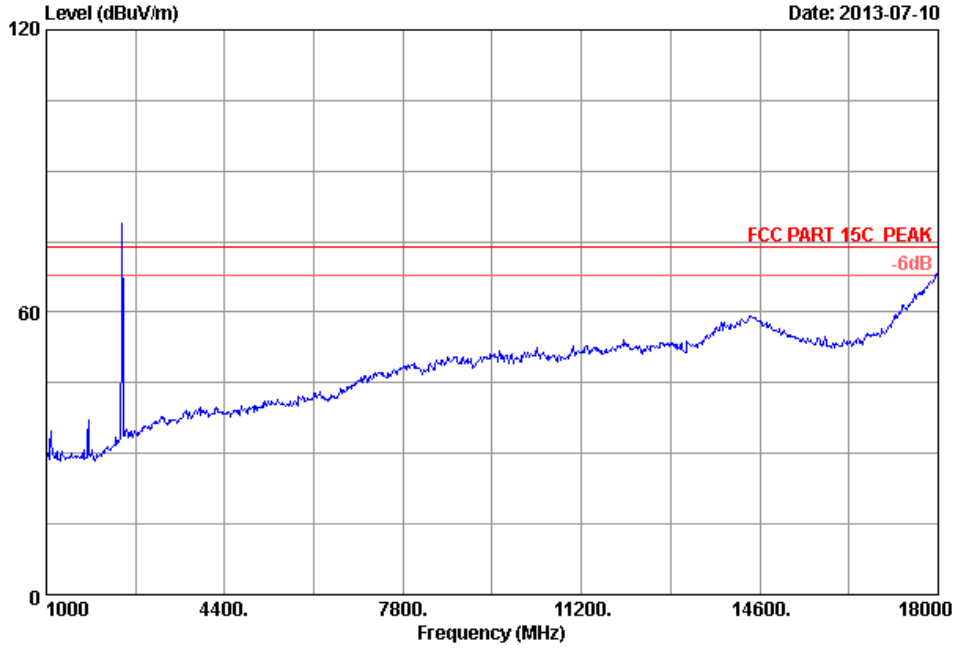


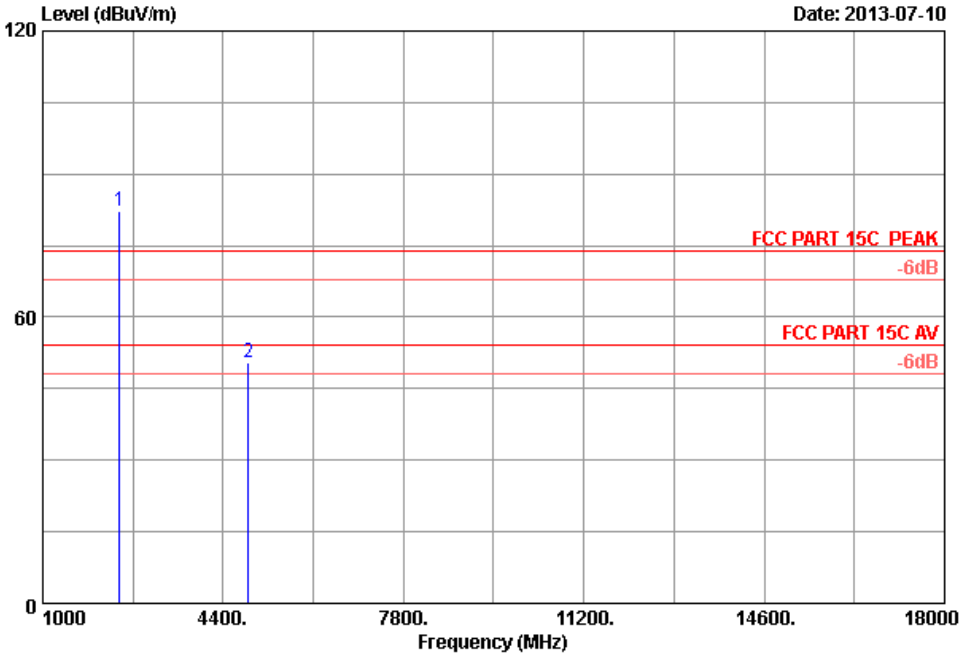


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.000	27.02	6.09	35.92	84.65	81.84			Peak
2	4882.000	32.64	8.74	35.69	44.76	50.45	74.00	23.55	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

5.3.12 Diagram 5-12

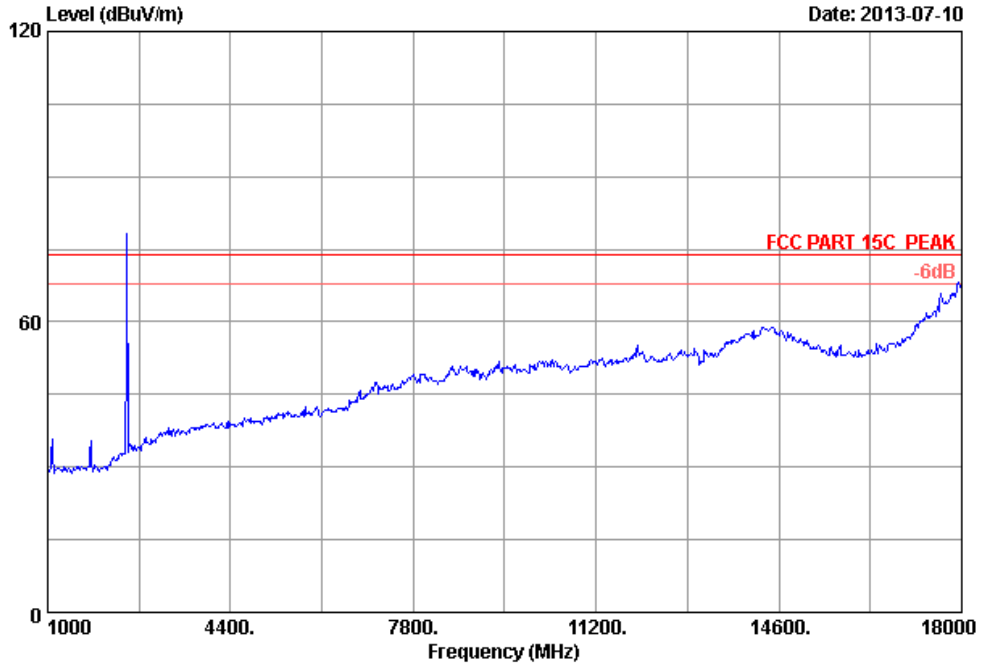


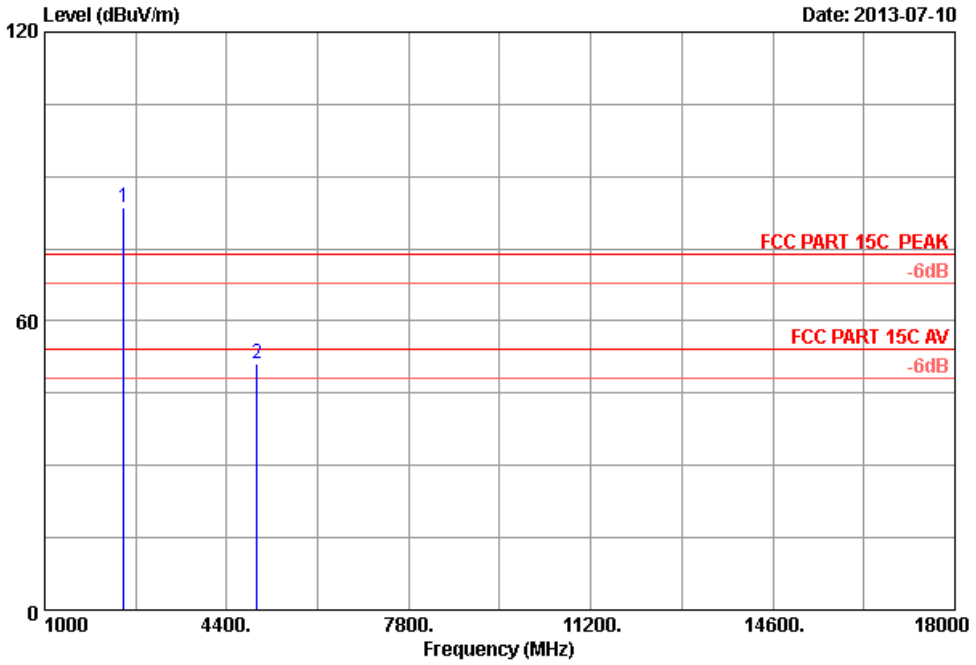


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.000	27.02	6.09	35.92	85.03	82.22			Peak
2	4882.000	32.64	8.74	35.69	44.92	50.61	74.00	23.39	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

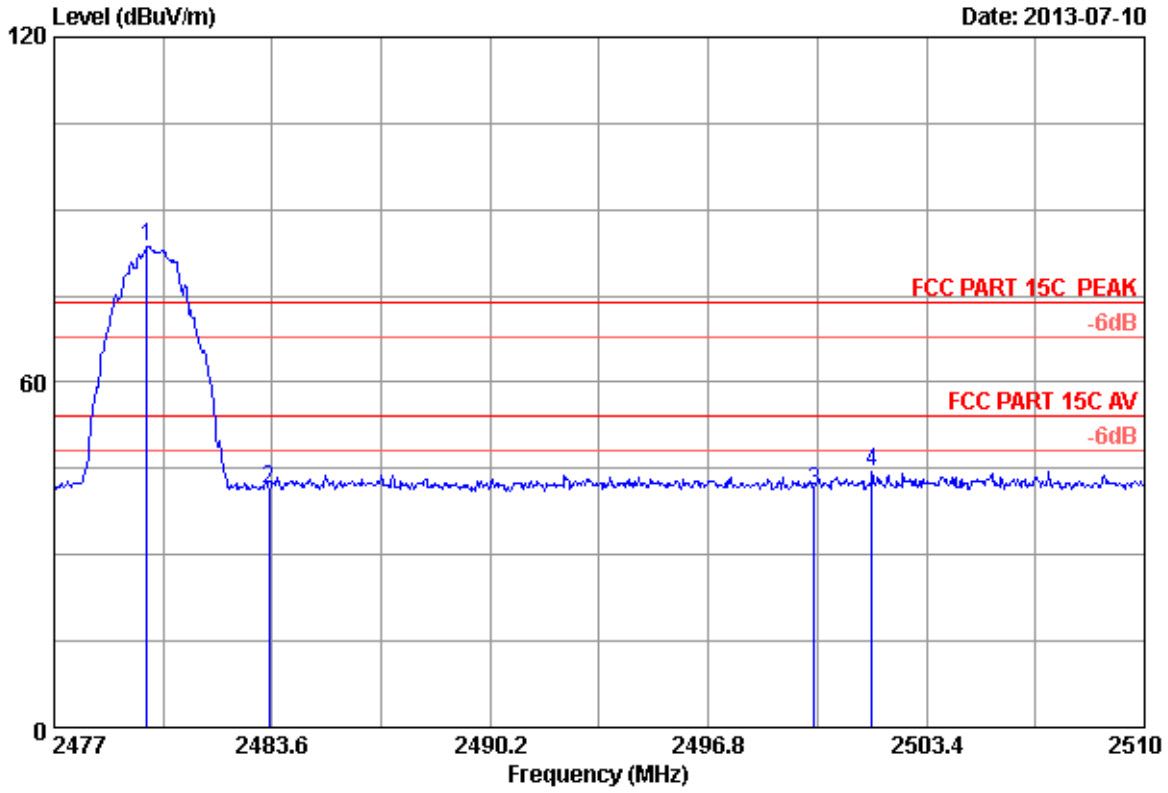
5.3.13 Diagram 5-13





	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.000	27.27	6.15	35.92	86.07	83.57			Peak
2	4960.000	32.81	8.81	35.66	45.03	50.99	74.00	23.01	Peak

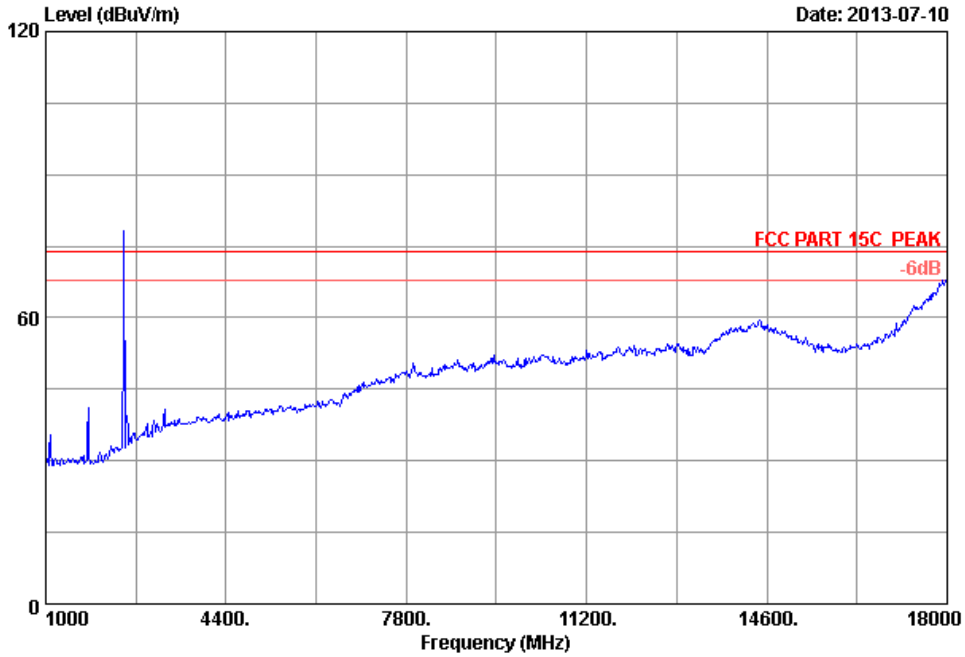
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

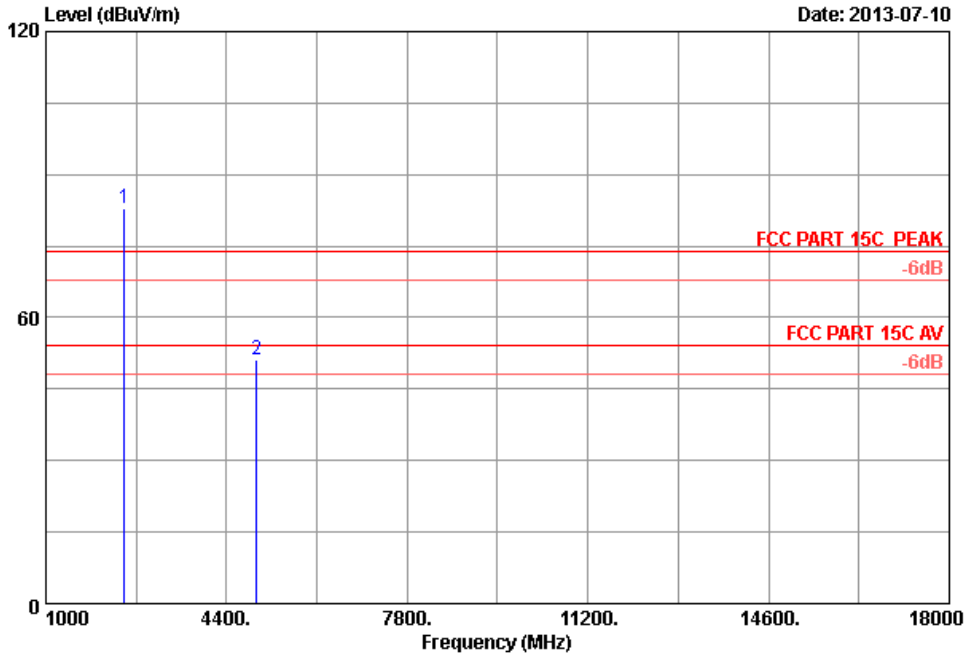


	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.805	27.27	6.15	35.92	86.12	83.62			Peak
2	2483.500	27.29	6.16	35.92	43.82	41.35	74.00	32.65	Peak
3	2500.000	27.40	6.19	35.93	43.48	41.14	74.00	32.86	Peak
4	2501.750	27.41	6.19	35.93	46.70	44.37	74.00	29.63	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

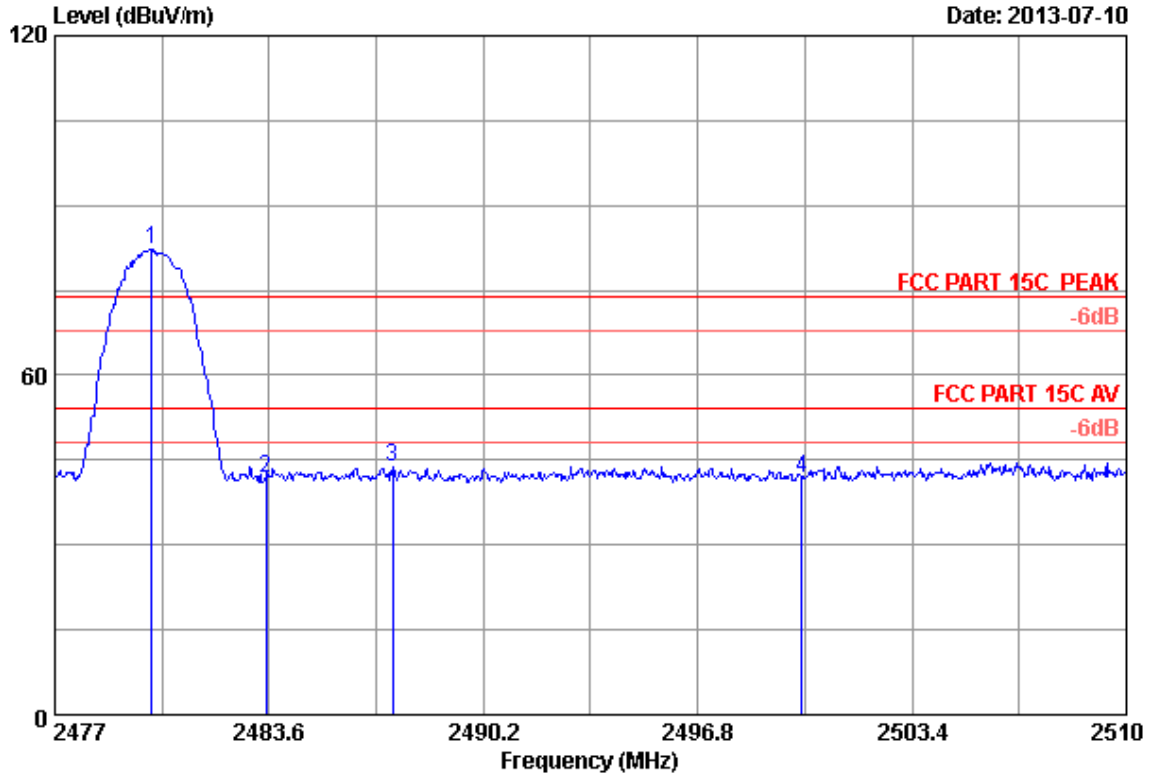
5.3.14 Diagram 5-14





	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.000	27.27	6.15	35.92	85.33	82.83			Peak
2	4960.000	32.81	8.81	35.66	45.19	51.15	74.00	22.85	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.970	27.27	6.15	35.92	84.83	82.33			Peak
2	2483.500	27.29	6.16	35.92	44.40	41.93	74.00	32.07	Peak
3	2487.395	27.32	6.17	35.92	46.22	43.79	74.00	30.21	Peak
4	2500.000	27.40	6.19	35.93	44.29	41.95	74.00	32.05	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

6. 20 dB bandwidth Test

6.1 Test Procedure

Clause 15.215(c) 20dB Bandwidth:

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

6.2 Measurement Equipment

Item	Equipment	Last Calibration	Type	Serial No.	Manufacturer
1	Spectrum	May.08, 13	E4446A	US44300459	Agilent

6.3 Test Result:

Modulation	Channel	20dB bandwidth (kHz)
GFSK	CHL	847.9
	CHM	830.7
	CHH	833.4

GFSK diagrams are as below:


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.441000000 GHz
Center Freq: 2.441000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center Freq
2.441000000 GHz
Center 2.441 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
826.14 kHz
Total Power
11.8 dBm
Transmit Freq Error
-1.581 kHz
OBW Power
99.00 %
x dB Bandwidth
830.7 kHz
x dB
-20.00 dB
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
828.53 kHz
Total Power
11.2 dBm
Transmit Freq Error
-1.009 kHz
OBW Power
99.00 %
x dB Bandwidth
833.4 kHz
x dB
-20.00 dB
Freq Offset
0 Hz
MSG
STATUS

Modulation	Channel	20dB bandwidth(MHz)
8DPSK	CHL	1.206
	CHM	1.207
	CHH	1.205

8DPSK diagrams are as below:


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Clear Write
Average
Max Hold
Min Hold
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
Occupied Bandwidth
1.1446 MHz
Total Power
9.49 dBm
Transmit Freq Error
12.701 kHz
OBW Power
99.00 %
x dB Bandwidth
1.205 MHz
x dB
-20.00 dB
Detector
Peak
Auto
Man
MSG
STATUS

7. Band Edge Compliance Test

7.1 Test Procedure

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

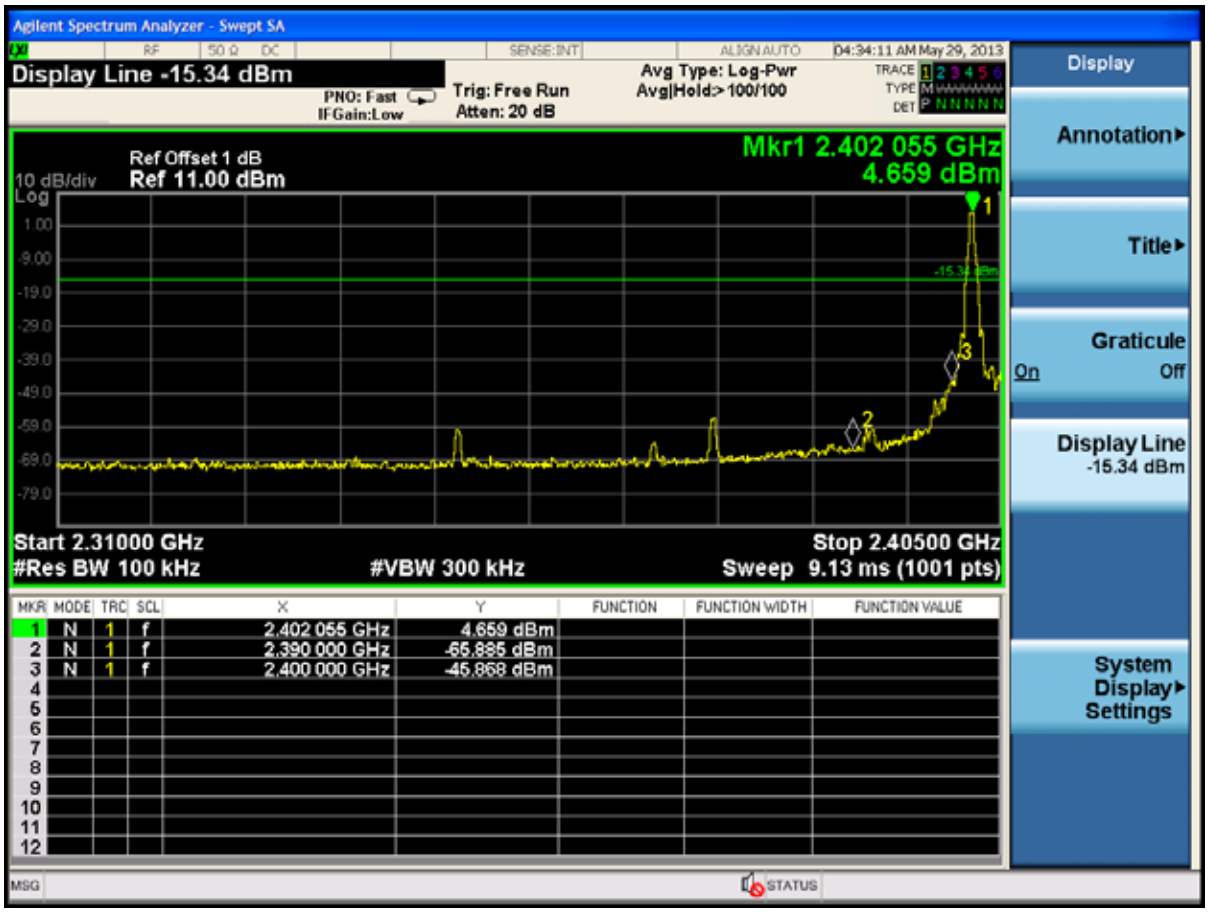
7.2 Measurement Equipment

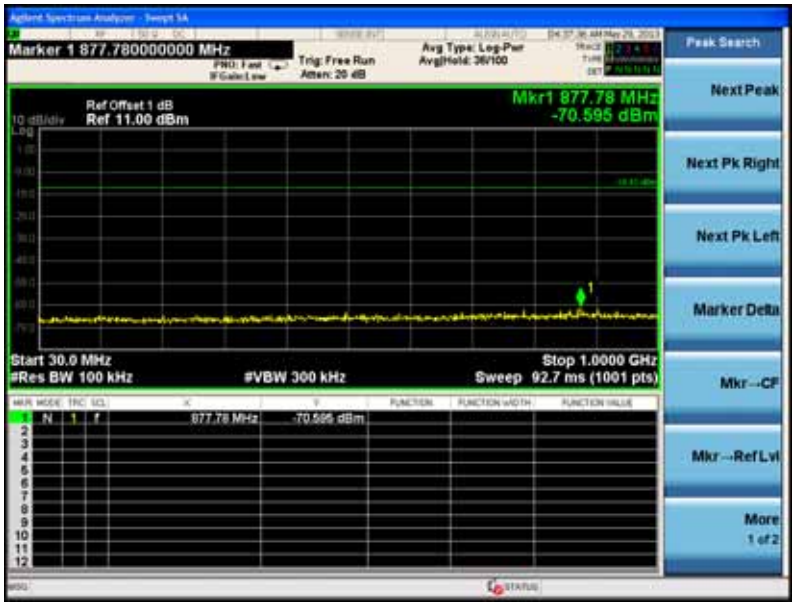
Item	Equipment	Last Calibration	Type	Serial No.	Manufacturer
1	Spectrum	May.08, 13	E4446A	US44300459	Agilent

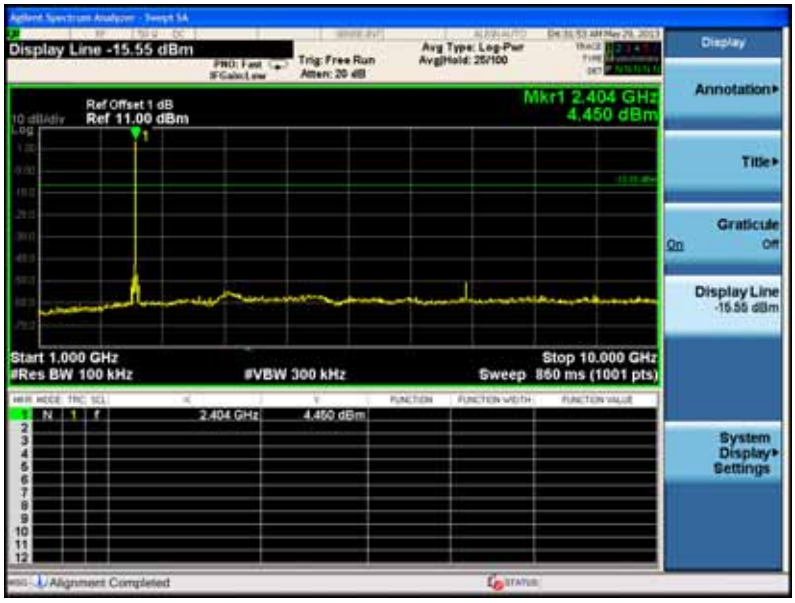
7.3 Test Result

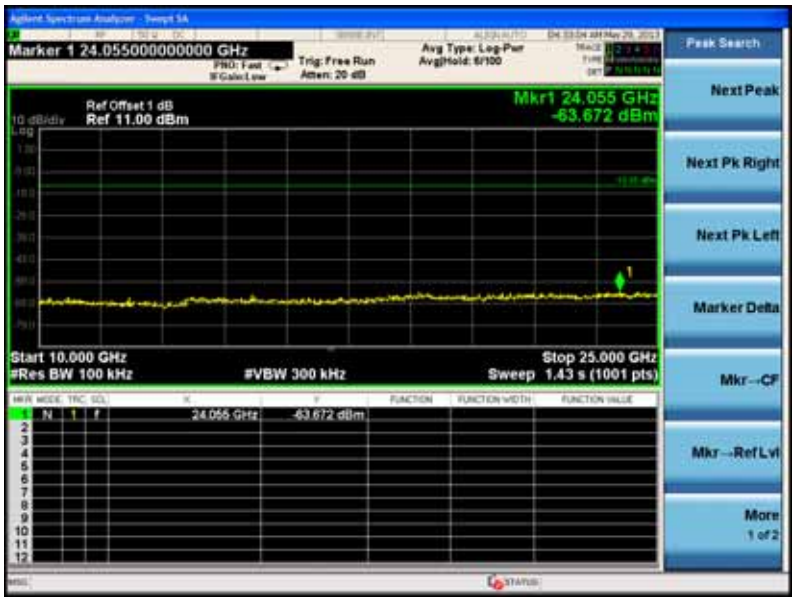
REMARK : Hopping off and Hopping on modes all have been tested, Hopping off mode is the worse case and recorded as below

GFSK Hopping off CHL :

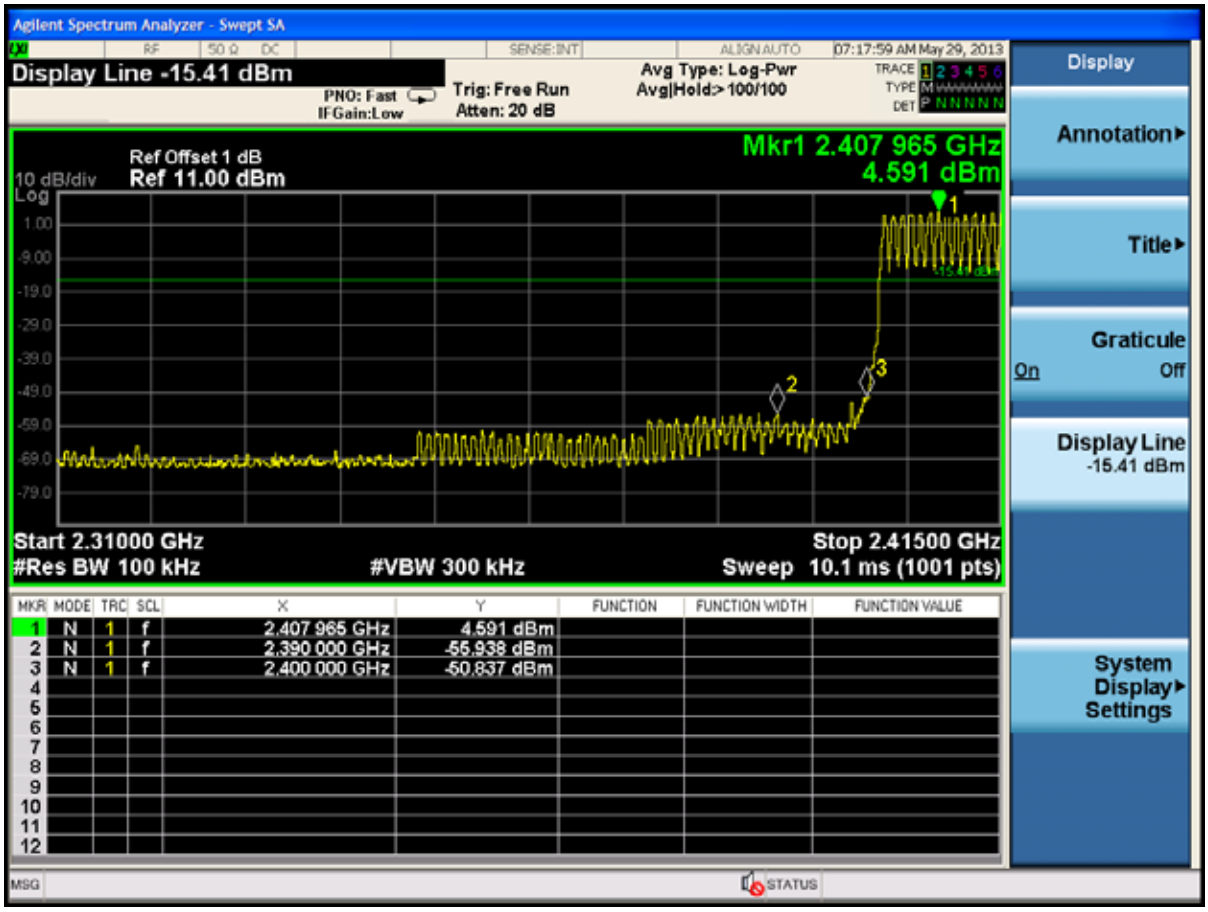



Marker 1 877.780000000 MHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 36/100
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 877.78 MHz
-70.595 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 877.78 MHz -70.595 dBm

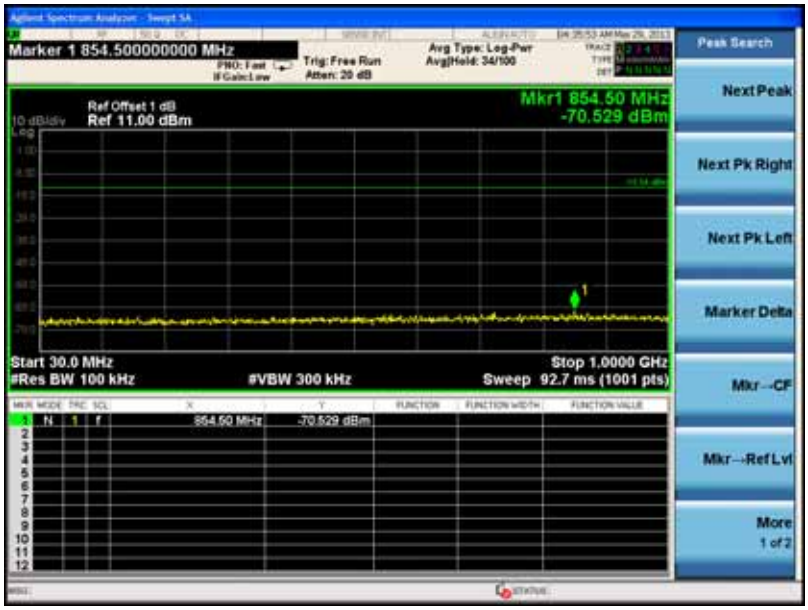

Display Line -15.55 dBm
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 25/100
Display
Annotation
Title
Graticule
On
Off
Display Line
-15.55 dBm
System
Display
Settings
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 2.404 GHz
4.450 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.404 GHz 4.450 dBm
Alignment Completed

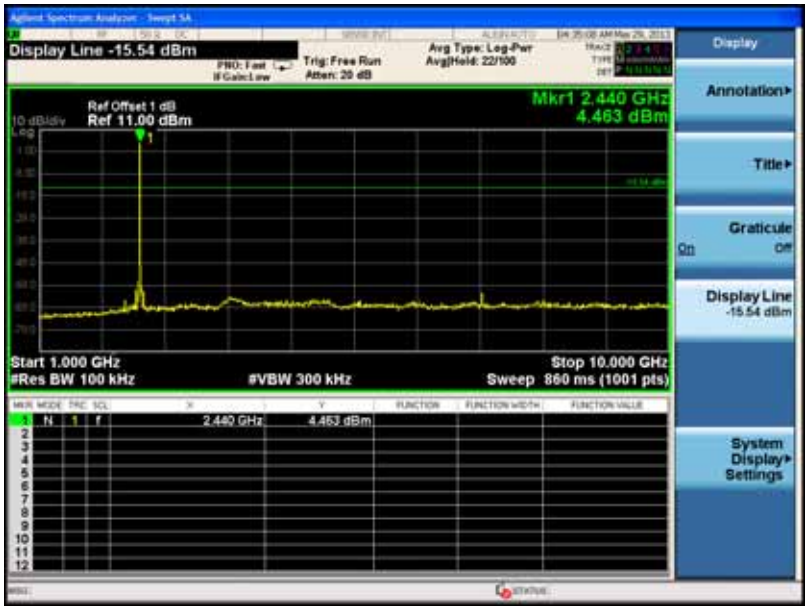

Marker 1 24.055000000000 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 6/100
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 24.055 GHz
-63.672 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.055 GHz -63.672 dBm

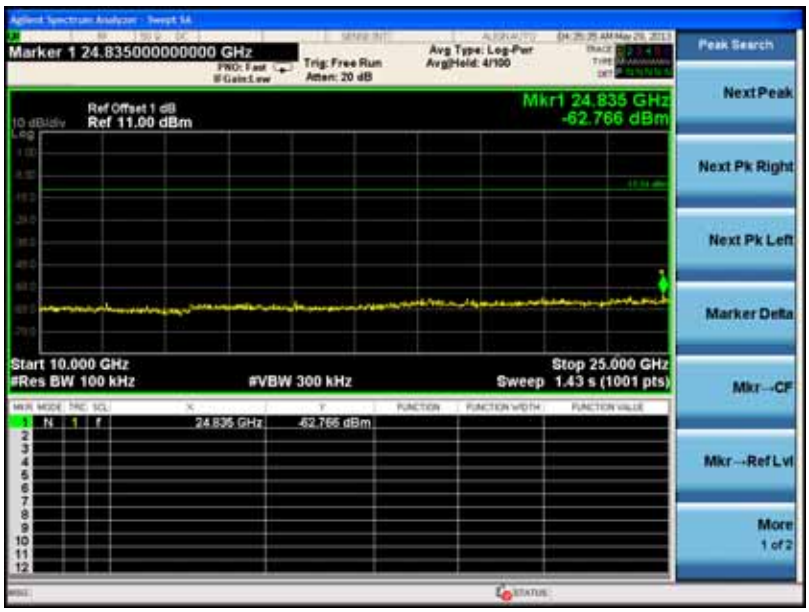
GFSK Hopping on CHL :



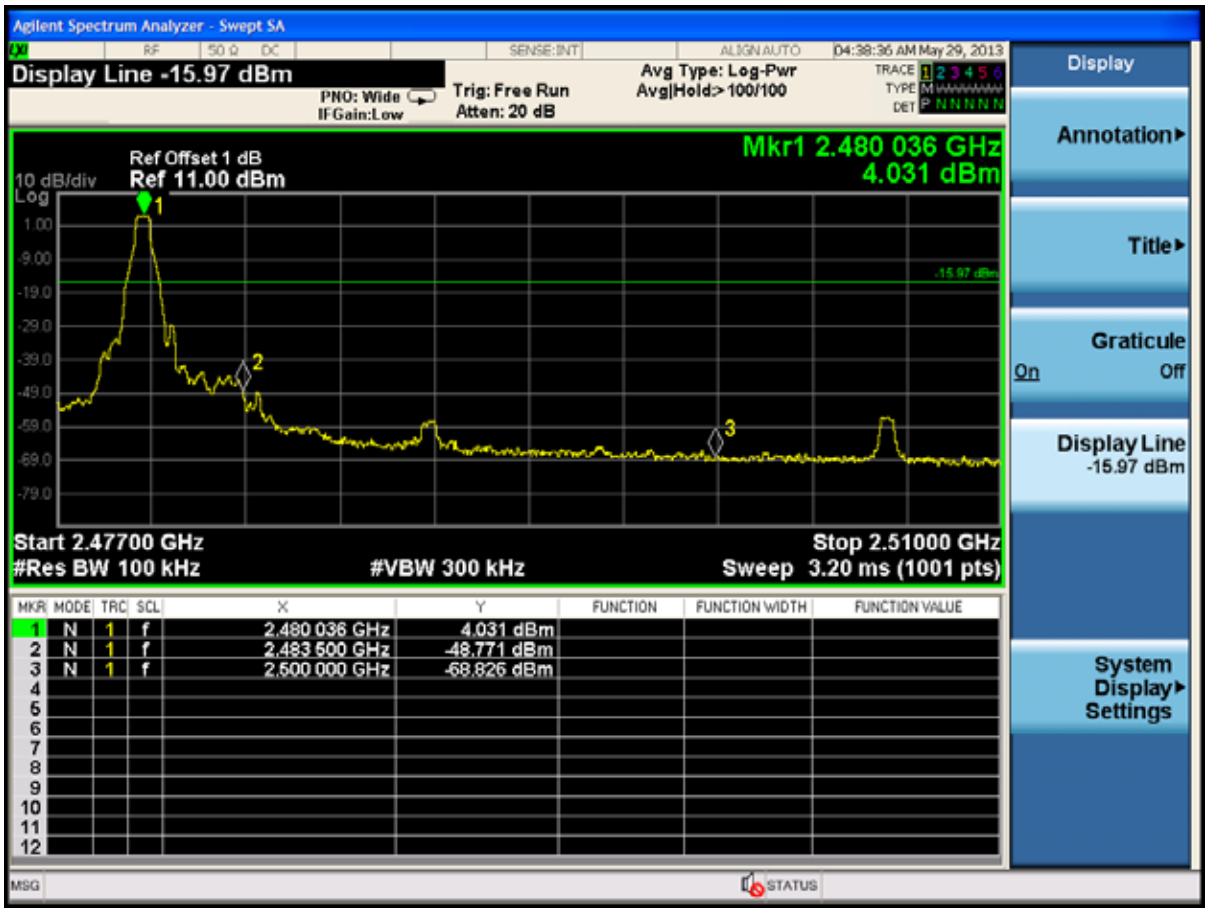
GFSK Hopping off CHM:

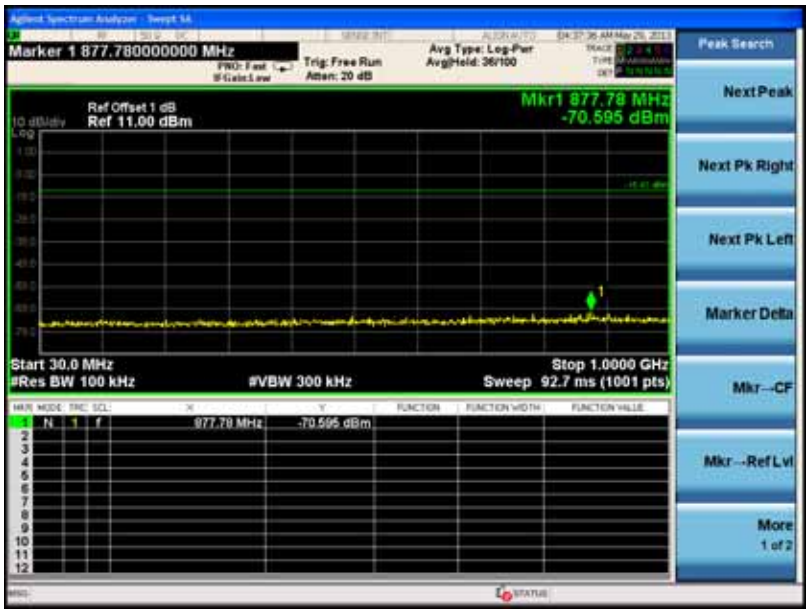


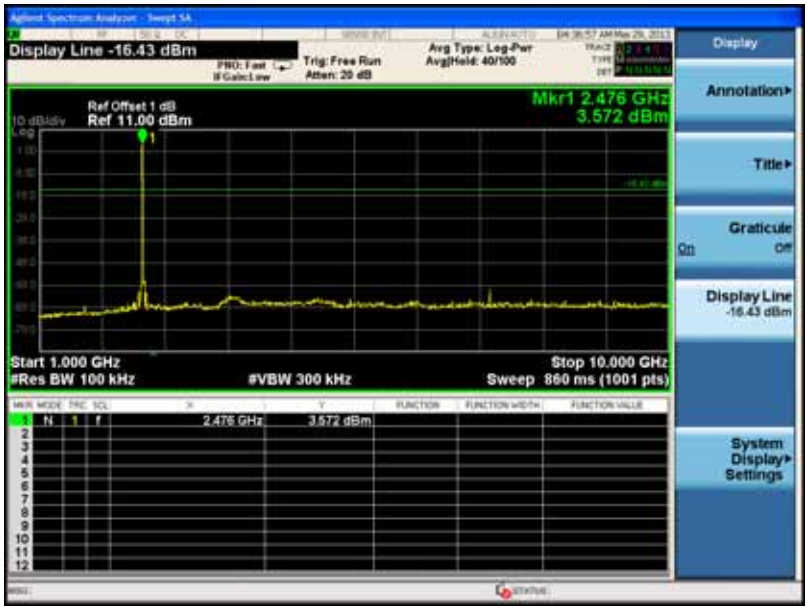

Display Line -15.54 dBm
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 22/100
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 2.440 GHz
4.463 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.440 GHz 4.463 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-15.54 dBm
System
Display
Settings

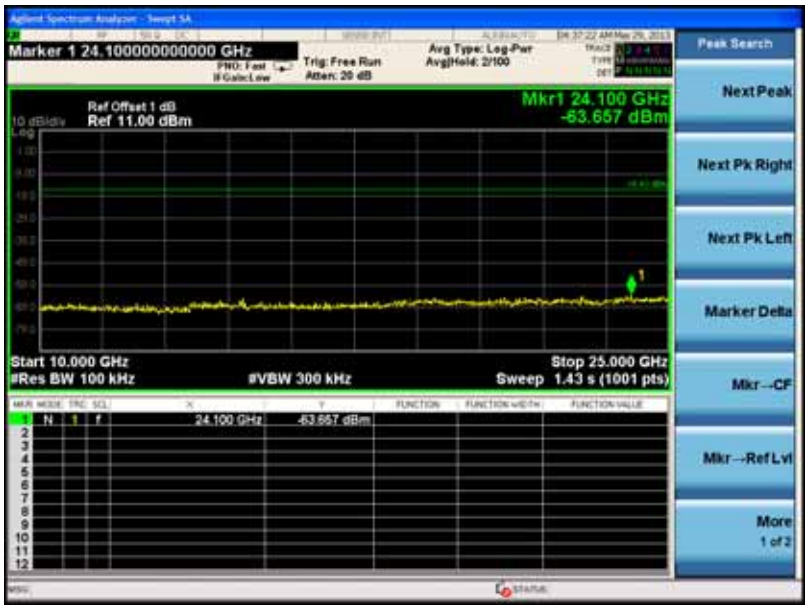

Marker 1 24.835000000000 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 4/100
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 24.835 GHz
-62.766 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.835 GHz -62.766 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

GFSK Hopping off CHH :

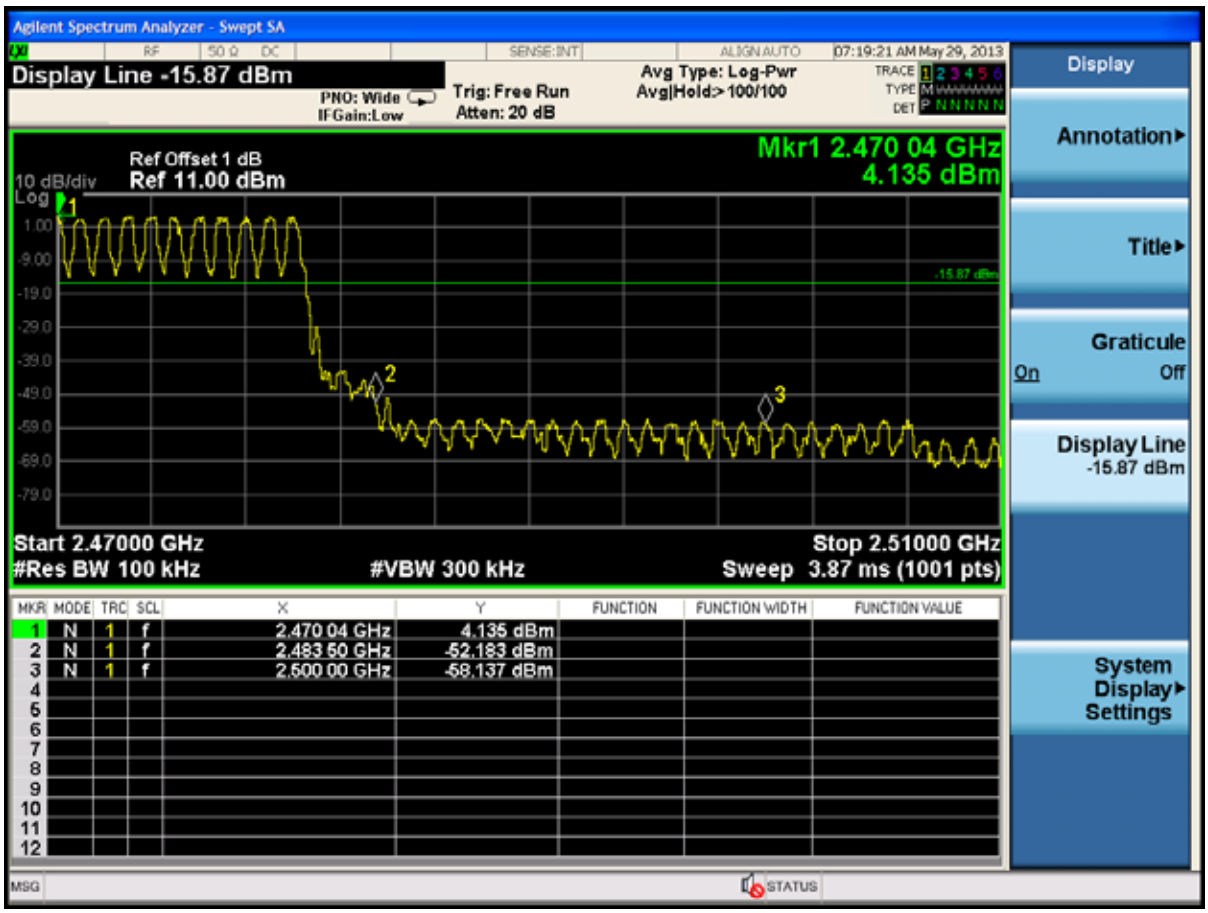




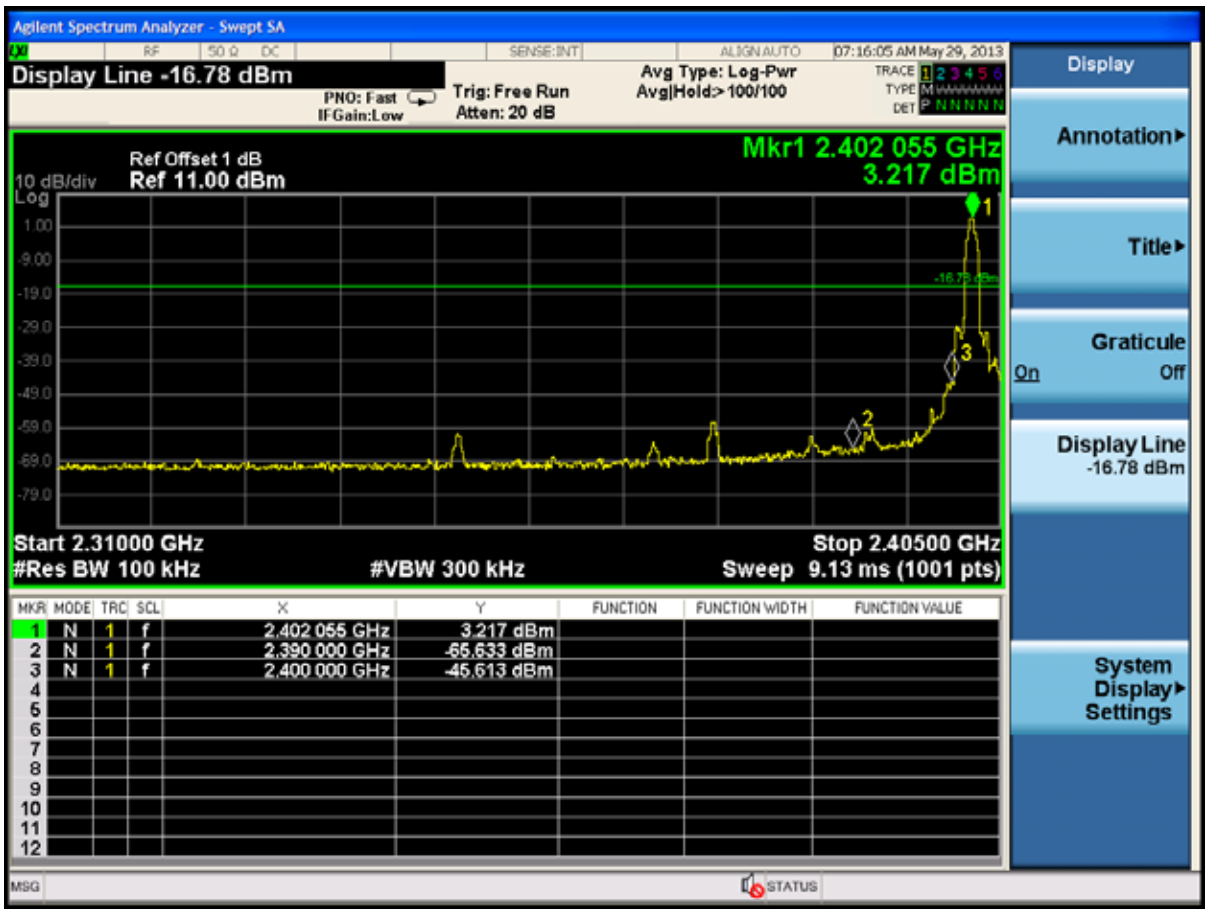

Display Line -16.43 dBm
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 40/100
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 2.476 GHz
3.572 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.476 GHz 3.572 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-16.43 dBm
System
Display
Settings

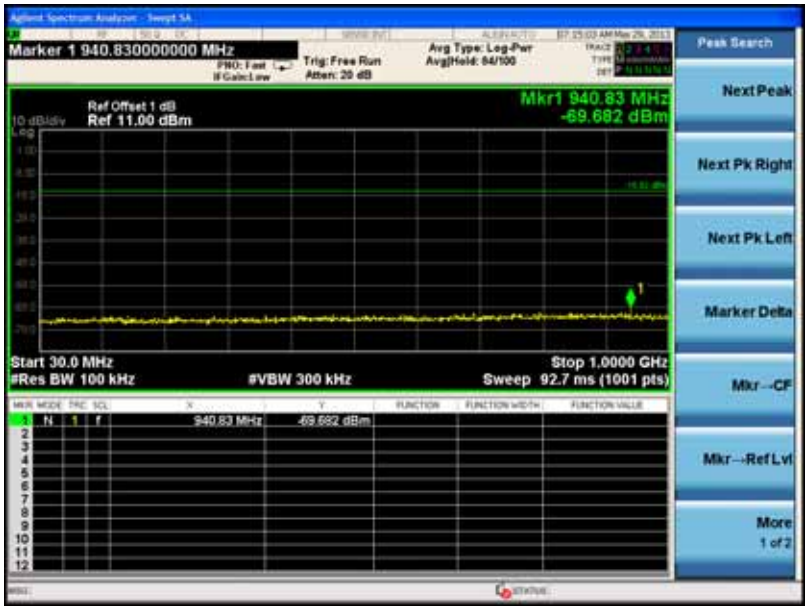

Marker 1 24.100000000000 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 2/100
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 24.100 GHz
-63.657 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.100 GHz -63.657 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

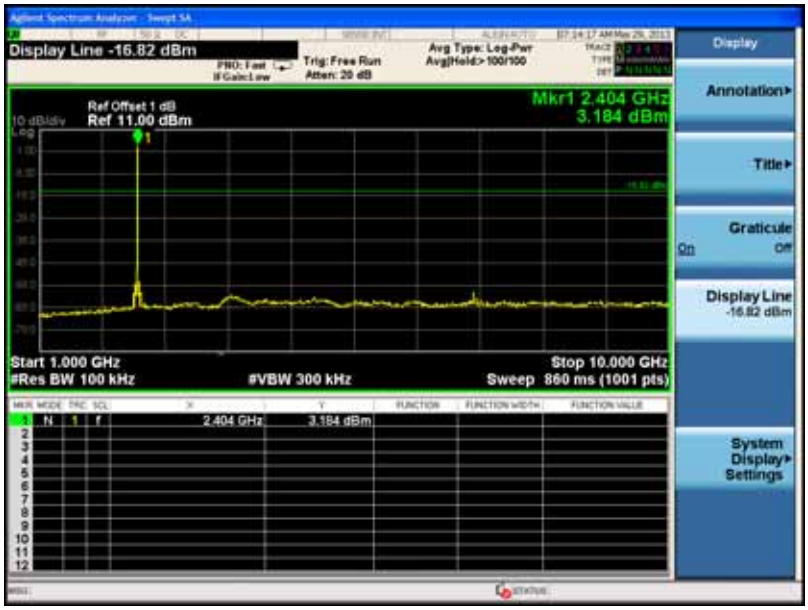
GFSK Hopping on CHH :

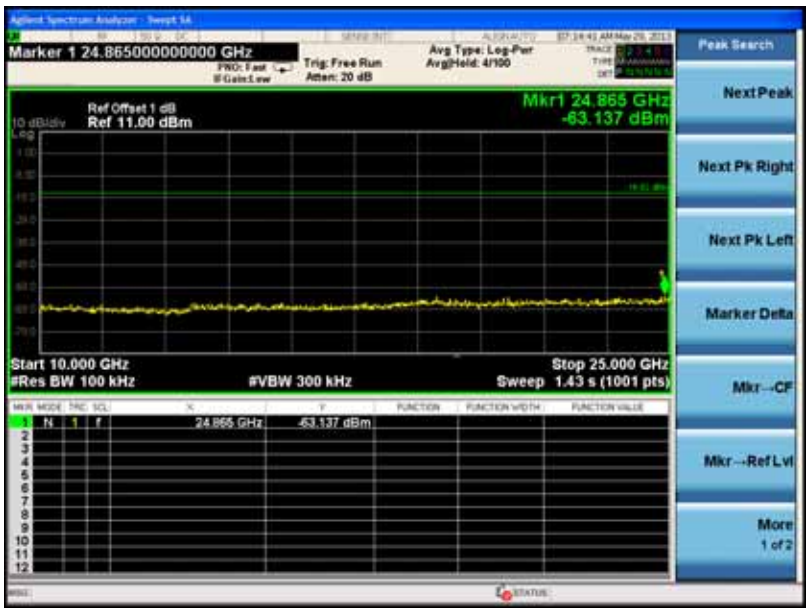


8DPSK Hopping off CHL :

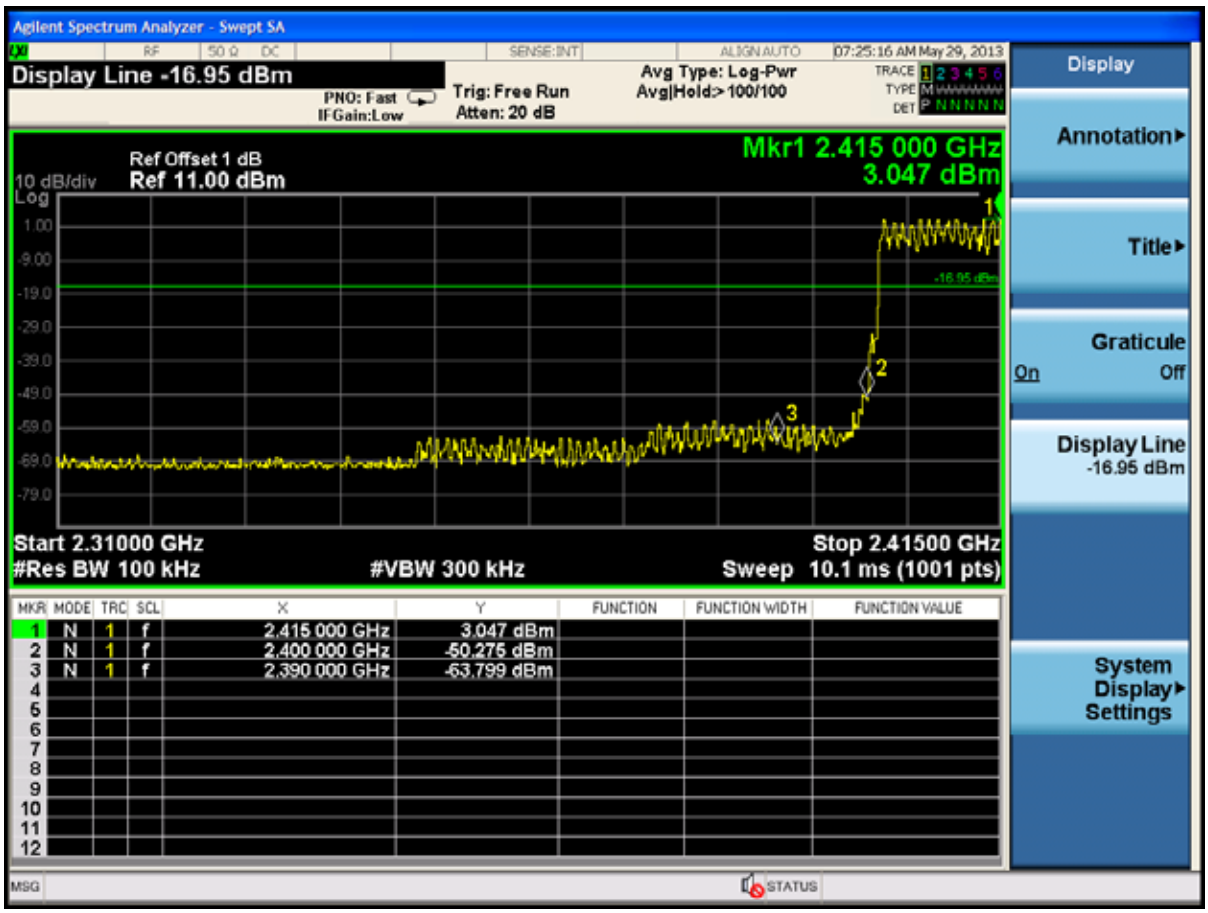




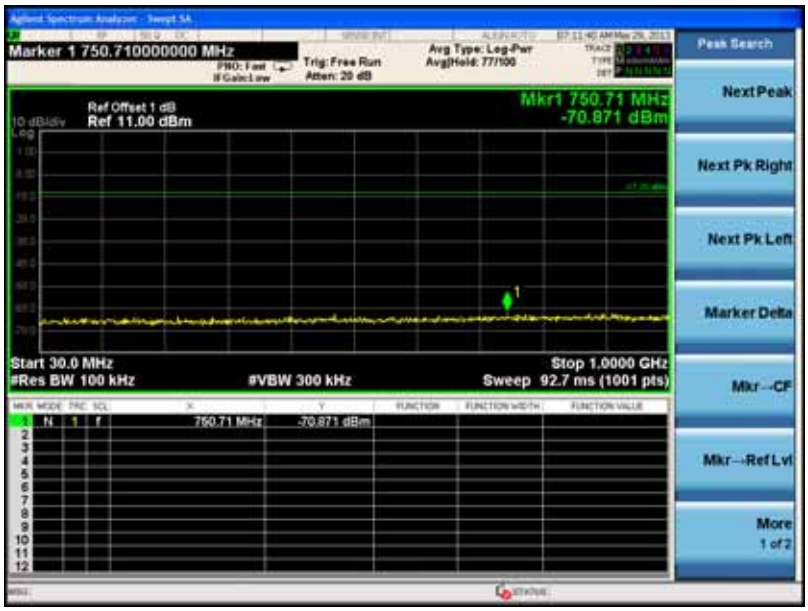

Display Line -16.82 dBm
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 2.404 GHz
3.184 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.404 GHz 3.184 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-16.82 dBm
System
Display
Settings

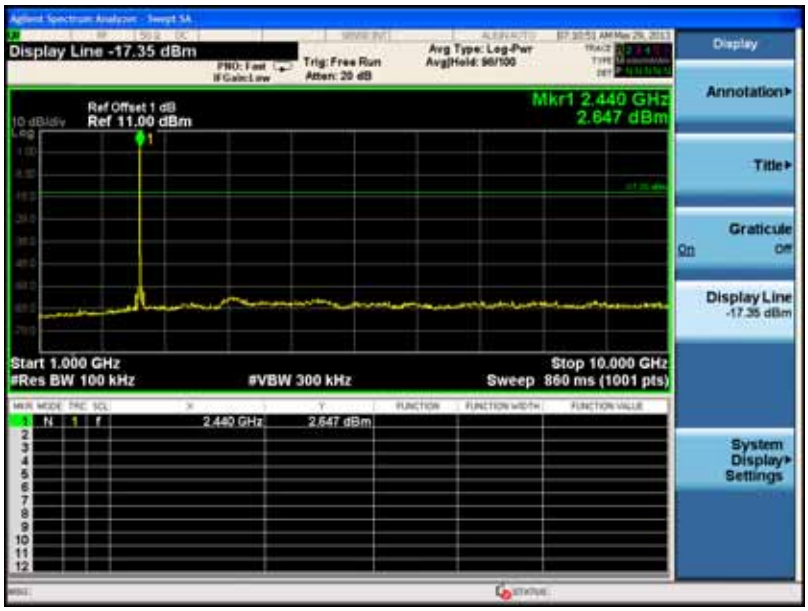

Marker 1 24.865000000000 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 4/100
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 24.865 GHz
-63.137 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.865 GHz -63.137 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

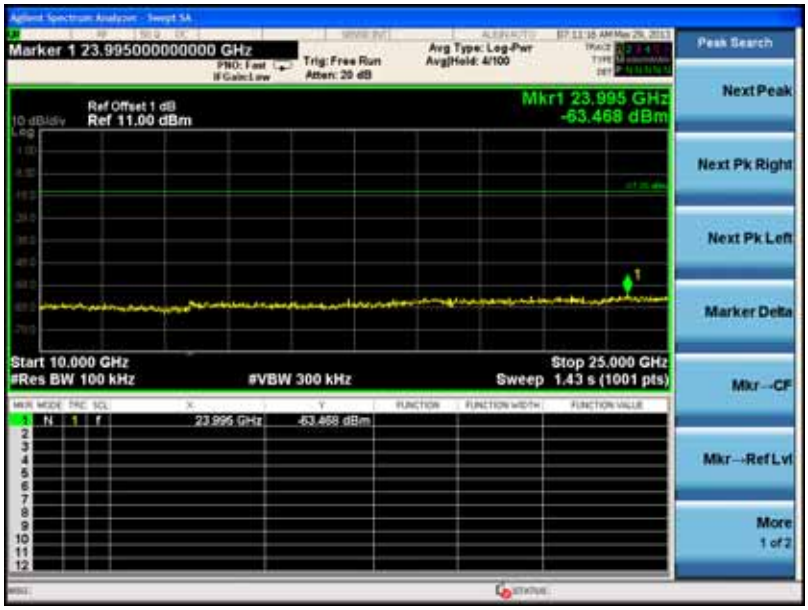
8DPSK Hopping on CHL :



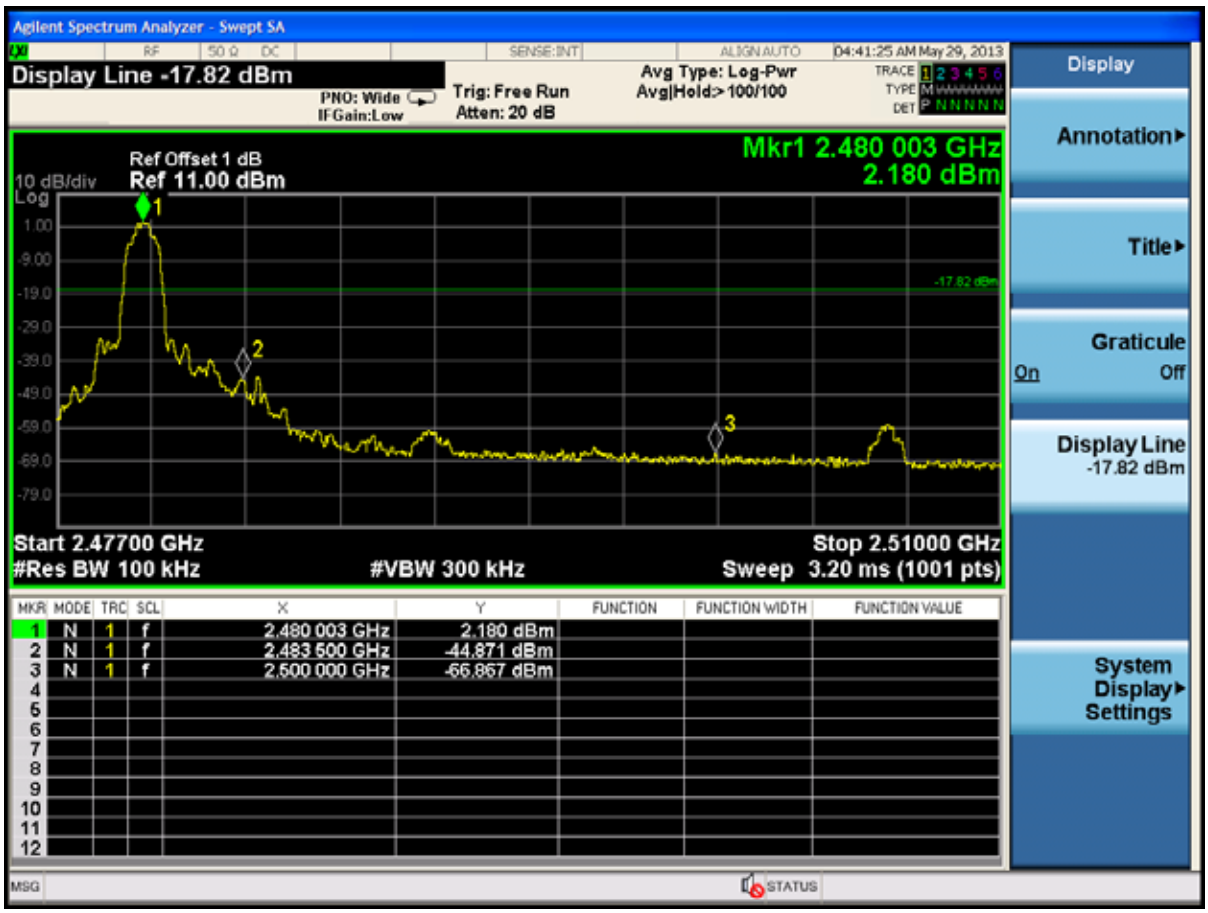
8DPSK Hopping off CHM :

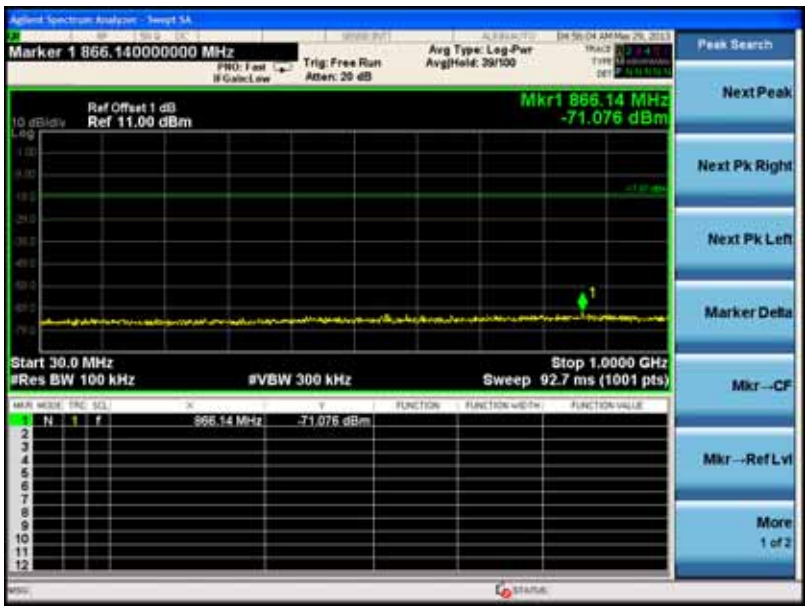


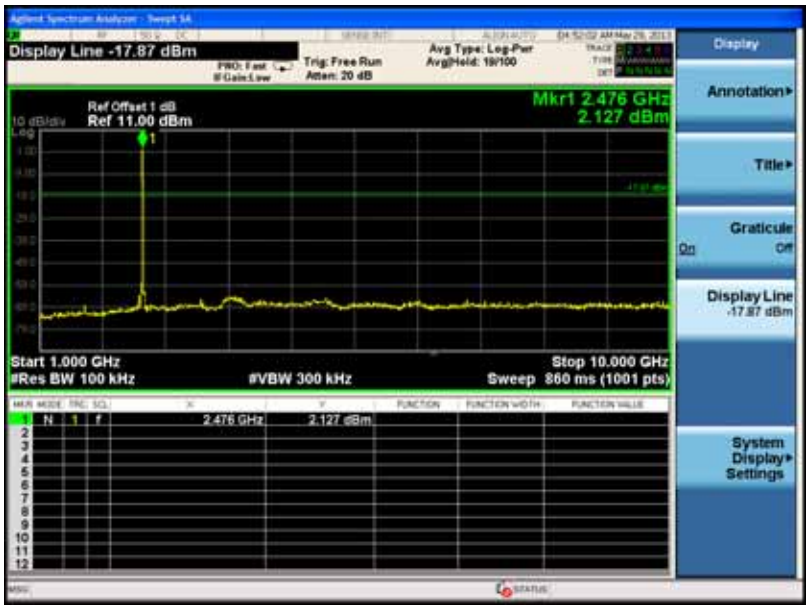


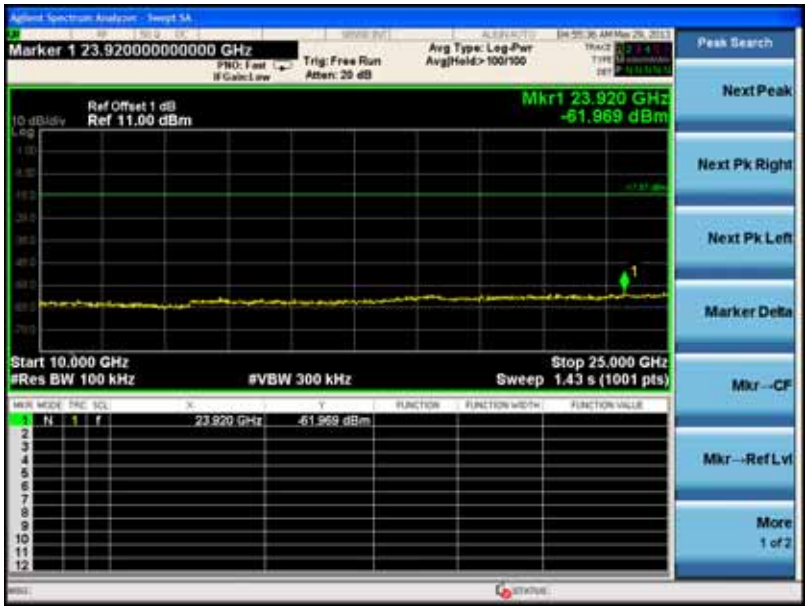

Marker 1 23.995000000000 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 4/100
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 23.995 GHz
-63.469 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 23.995 GHz -63.469 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

8DPSK Hopping off CHH :

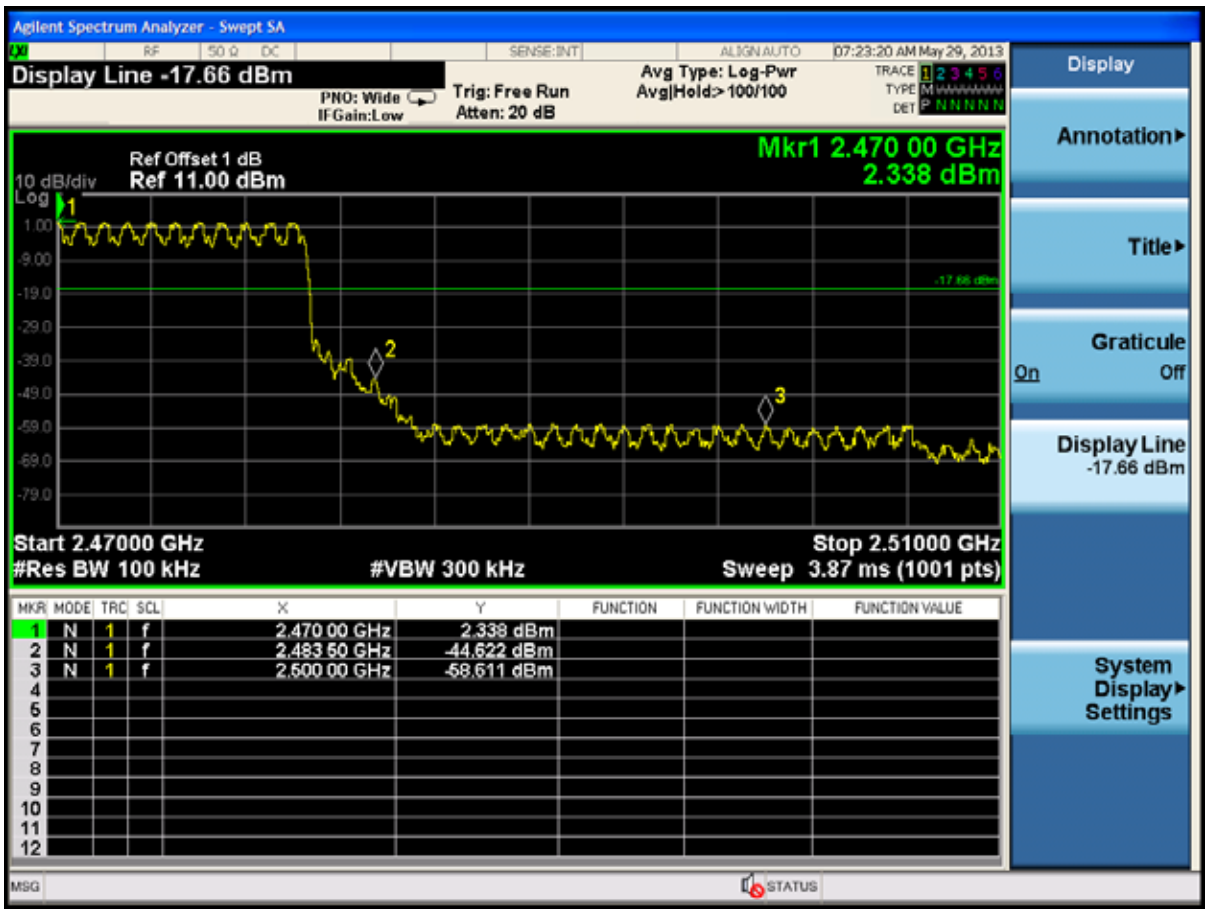





Display Line -17.87 dBm
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 19/100
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 2.476 GHz
2.127 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.476 GHz 2.127 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-17.87 dBm
System
Display
Settings


Marker 1 23.920000000000 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 23.920 GHz
-61.969 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 23.920 GHz -61.969 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

8DPSK Hopping on CHH :



8. Carrier Frequency Separation Test

8.1 Test Procedure

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, freq hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

The peak detector was used with 100 kHz/300 kHz RBW/VBW

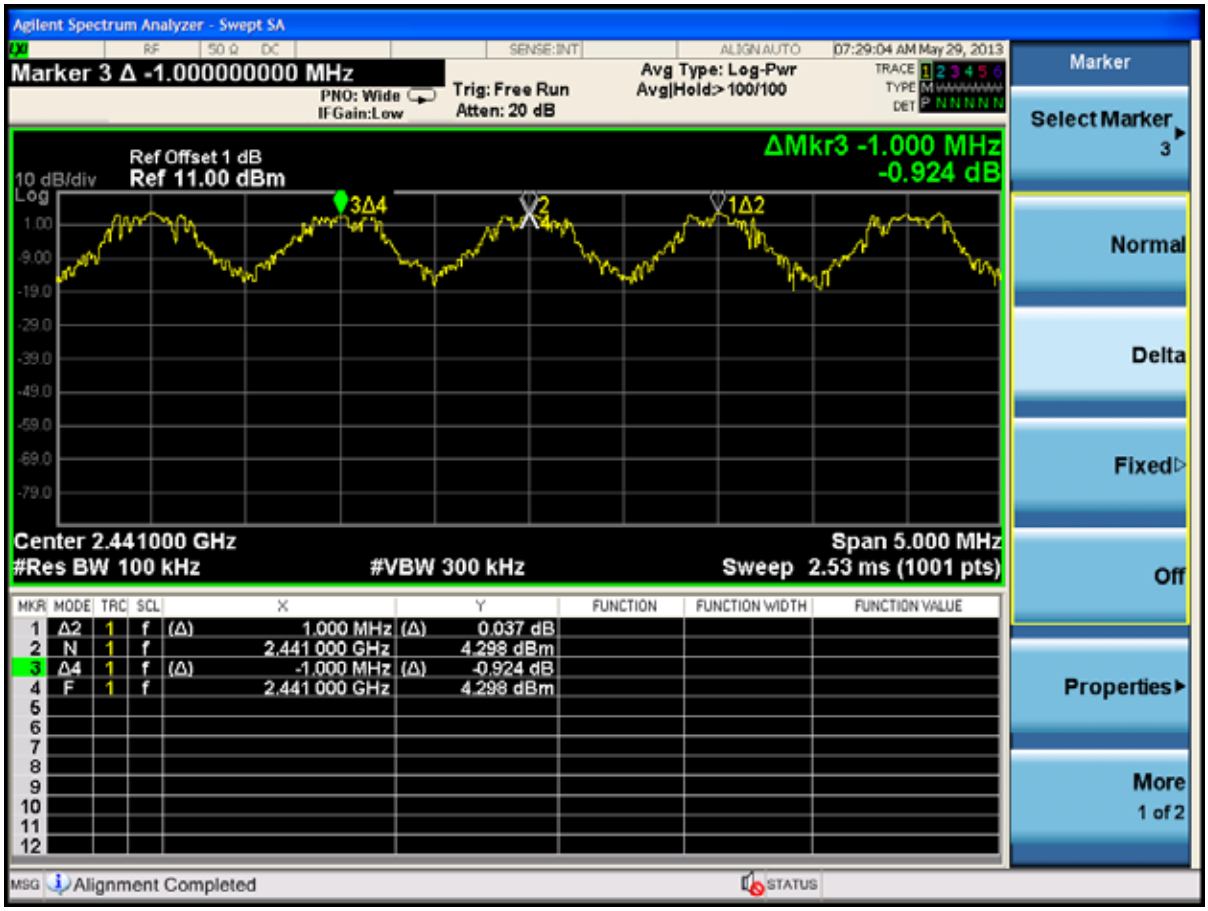
8.2 Measurement Equipment

Item	Equipment	Last Calibration	Type	Serial No.	Manufacturer
1	Spectrum	May.08, 13	E4446A	US44300459	Agilent

8.3 Test Result

Widest channel bandwidth was 1207kHz. So Two-thirds is 805kHz and greater than 25kHz .

Result : Pass. Carrier Frequency Separation=1MHz > 805kHz



9. Output Power Test

9.1 Test Procedure

The maximum peak conducted output power of the intentional radiator shall not exceed the following:
(1) For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 W. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 W.
(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 by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

9.2 Measurement Equipment

Item	Equipment	Last Calibration	Type	Serial No.	Manufacturer
1	Spectrum	May.08, 13	E4446A	US44300459	Agilent

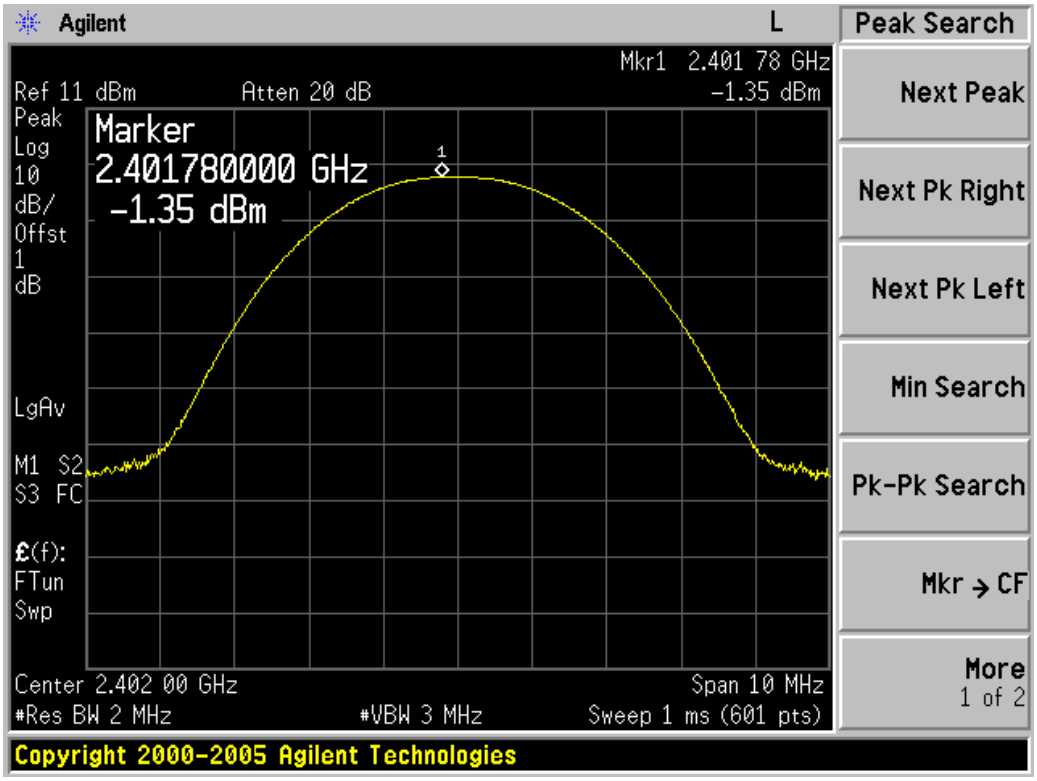
9.3 Test Result

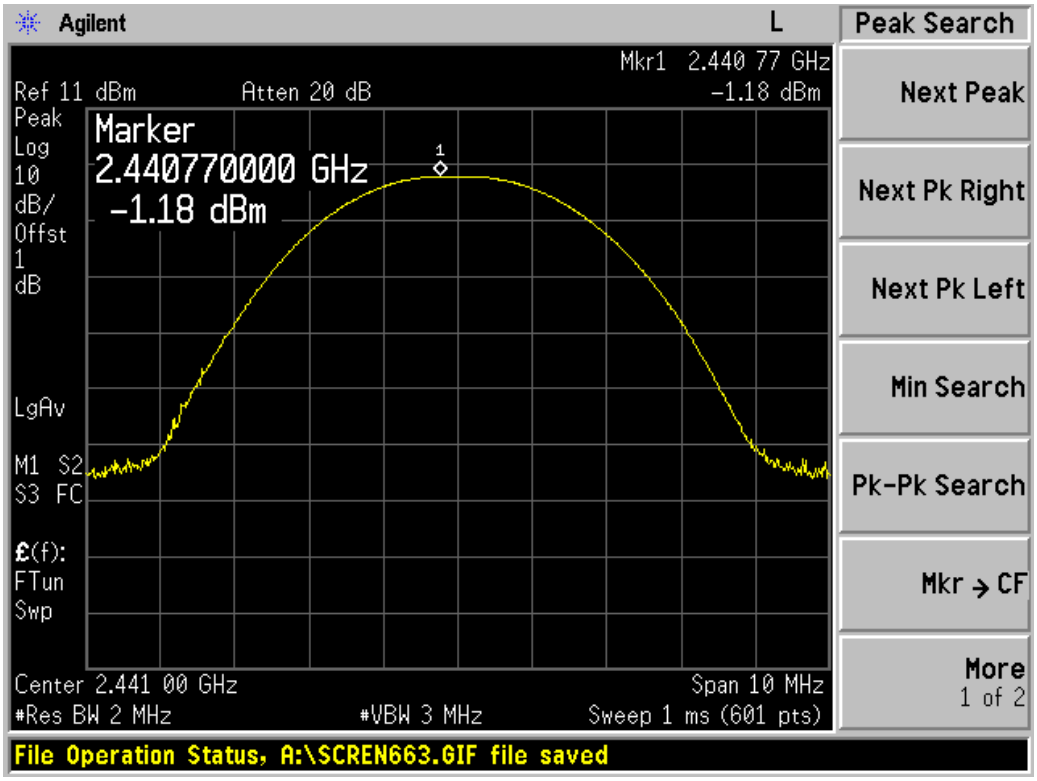
Remark : 1:RBW=2MHz VBW=3MHz PK detector for GFSK
Cable loss is 1dB and it have been set in Spectrum

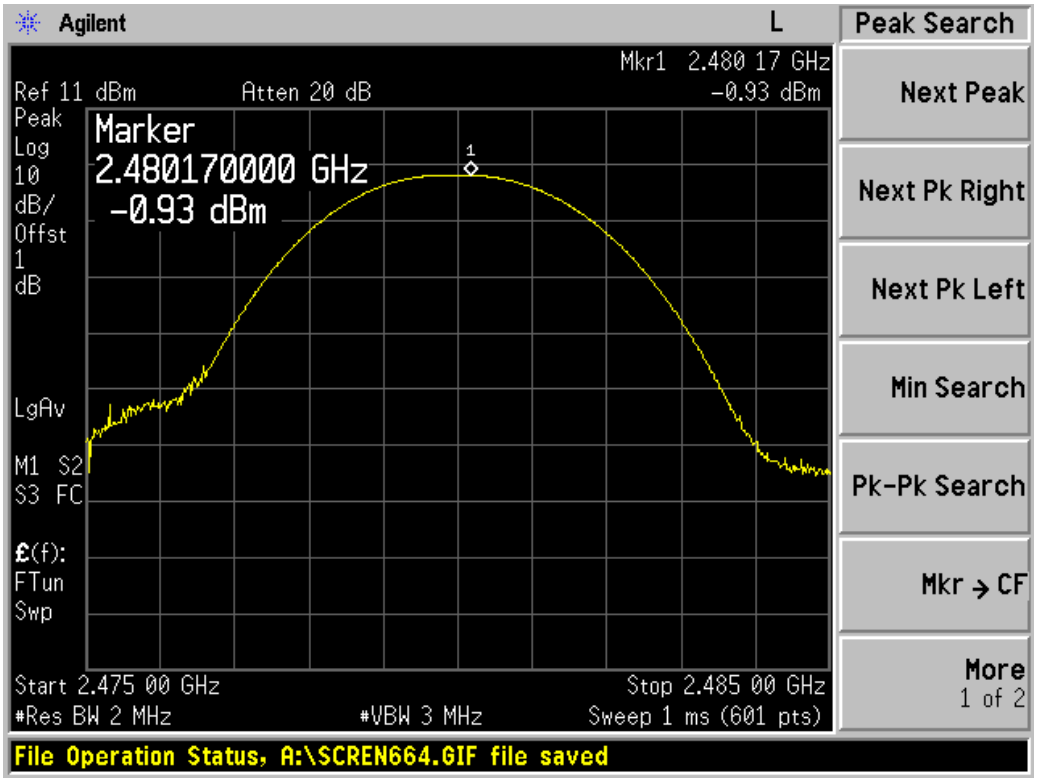
GFSK:

Frequency, MHz	Result Output power, dBm	<Power Limit, dBm
2402	-1.35	30.00
2441	-1.18	30.00
2480	-0.93	30.00

Diagram of GFSK is as below:





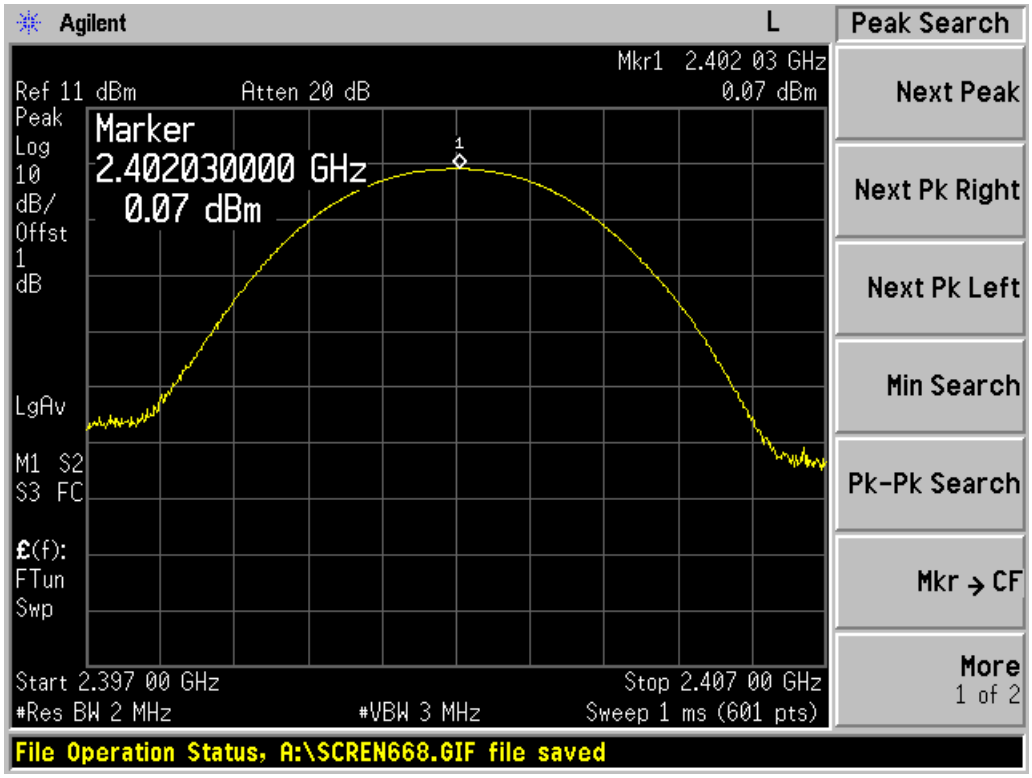

Agilent
L
Peak Search
Mkr1 2.480 17 GHz
Ref 11 dBm
Atten 20 dB
-0.93 dBm
Next Peak
Peak
Log
10
dB/
Offst
1
dB
Marker
2.480170000 GHz
-0.93 dBm
Next Pk Right
Next Pk Left
LgAv
Min Search
M1 S2
S3 FC
Pk-Pk Search
£(f):
FTun
Swp
Mkr → CF
More
1 of 2
Start 2.475 00 GHz
Stop 2.485 00 GHz
#Res BW 2 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
File Operation Status, A:\SCREN664.GIF file saved

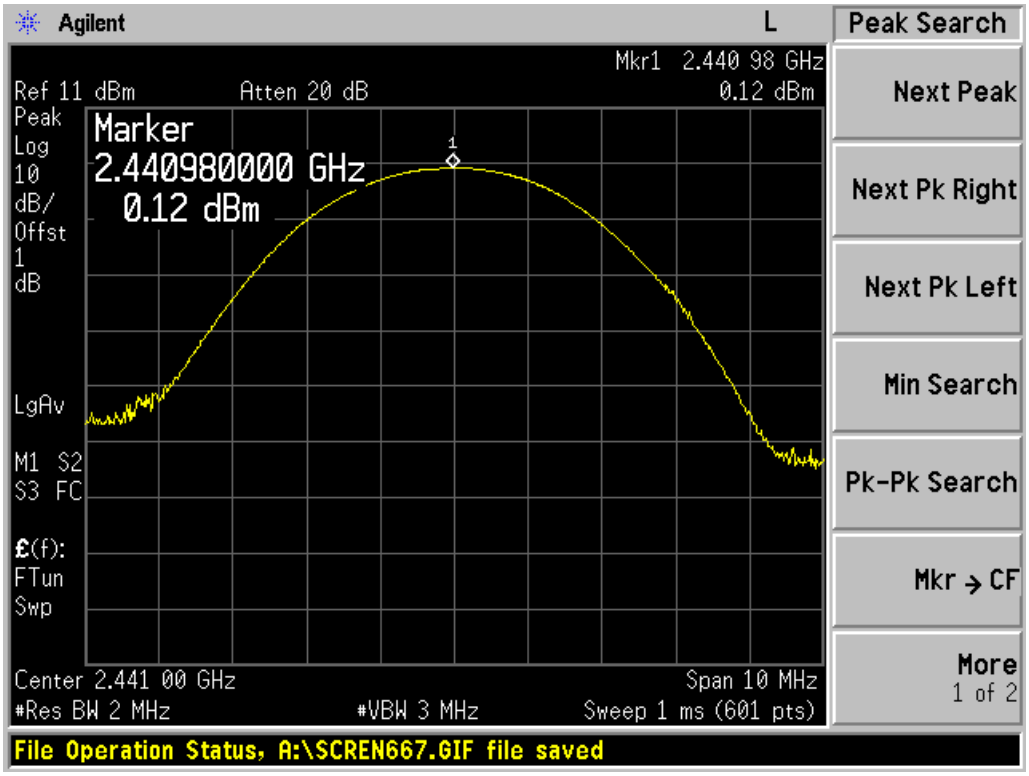
Remark : 1:RBW=2MHz VBW=3MHz PK detector for 8DPSK
Cable loss is 1dB and it have been set in Spectrum

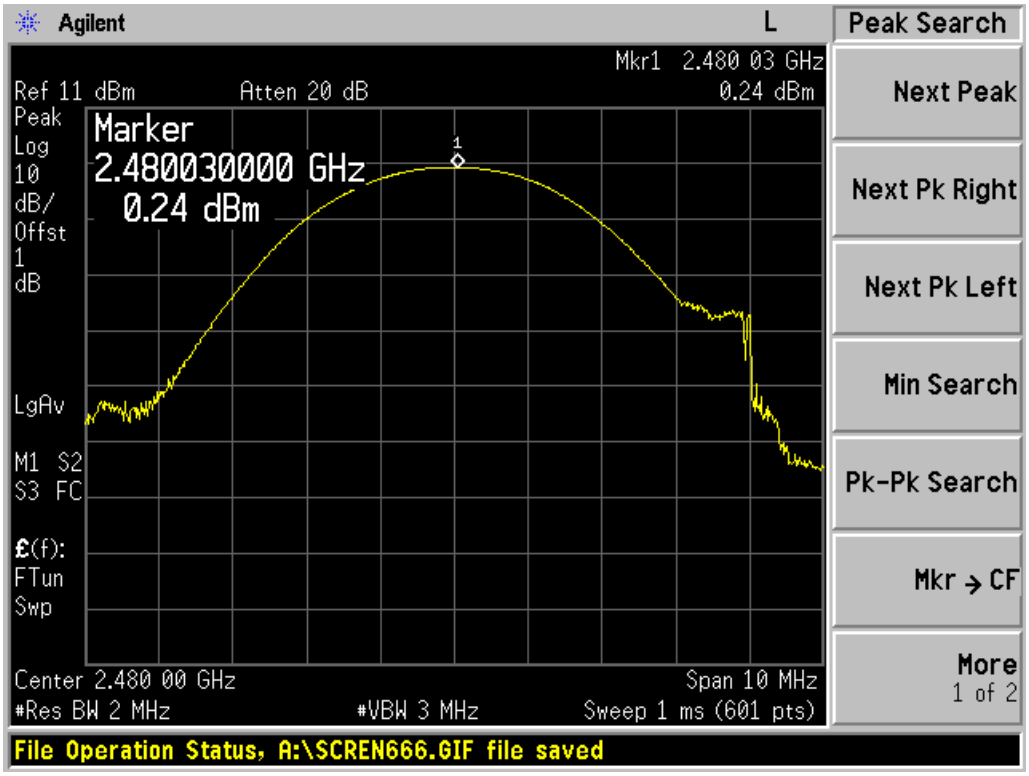
8DPSK:

Frequency, MHz	Result Output power, dBm	<Power Limit, dBm
2402	0.07	30.00
2441	0.12	30.00
2480	0.24	30.00

Diagram of 8DPSK is as below:




Agilent
L
Peak Search
Mkr1 2.440 98 GHz
0.12 dBm
Ref 11 dBm
Atten 20 dB
Peak
Log
10
dB/
Offst
1
dB
Marker
2.440980000 GHz
0.12 dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.441 00 GHz
Span 10 MHz
#Res BW 2 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
File Operation Status, A:\SCREN667.GIF file saved


Agilent
L
Peak Search
Mkr1 2.480 03 GHz
0.24 dBm
Ref 11 dBm
Atten 20 dB
Peak
Log
10
dB/
Offst
1
dB
Marker
2.480030000 GHz
0.24 dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.480 00 GHz
Span 10 MHz
#Res BW 2 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
File Operation Status, A:\SCREN666.GIF file saved

Remark : 1:RBW=2MHz VBW=3MHz PK detector for π/4 DQPSK
Cable loss is 1dB and it have been set in Spectrum

π/4 DQPSK:

Frequency, MHz	Result Output power, dBm	<Power Limit, dBm
2402	-0.389	30.00
2441	-0.509	30.00
2480	-0.012	30.00

Diagram of π/4 DQPSK is as below:


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.440940000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
09:55:03 PM Jul 26, 2013
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 2.440 94 GHz
-0.509 dBm
Center 2.441000 GHz
#Res BW 2.0 MHz
#VBW 3.0 MHz
Span 10.00 MHz
Sweep 1.00 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.479920000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
09:54:30 PM Jul 26, 2013
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 2.479 92 GHz
-0.012 dBm
Center 2.480000 GHz
#Res BW 2.0 MHz
#VBW 3.0 MHz
Span 10.00 MHz
Sweep 1.00 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

10. NUMBER OF HOPPING FREQUENCY TEST

10.1 Test Procedure

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 1 5 channels are used.

10.2 Measurement Equipment

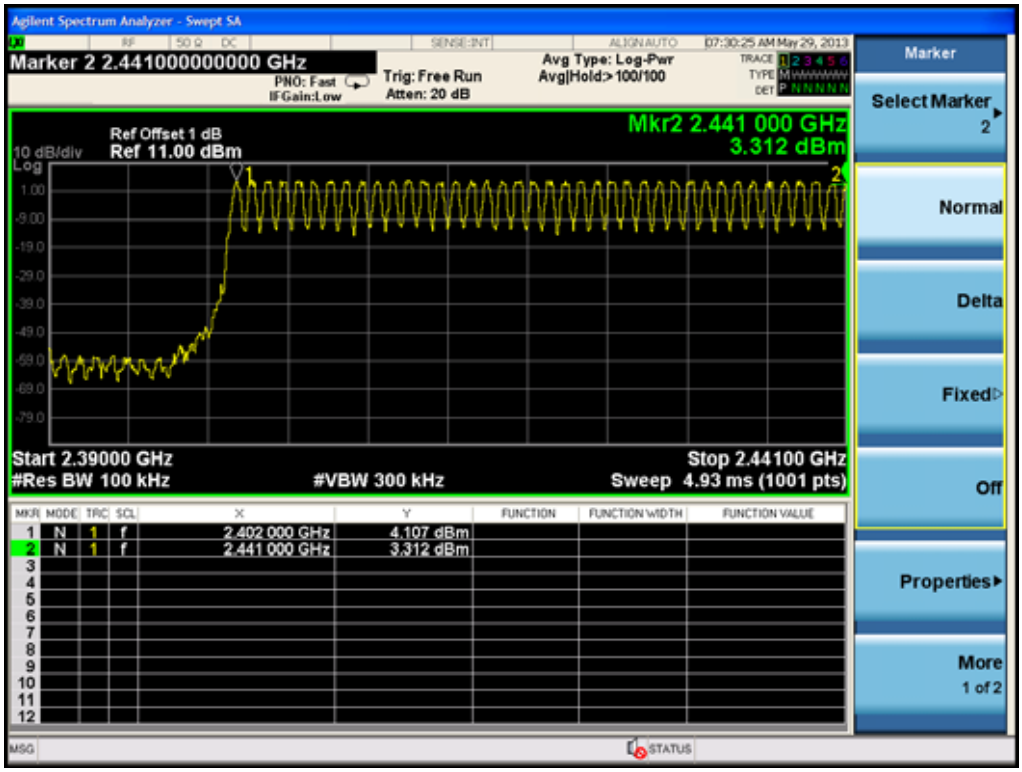
Item	Equipment	Last Calibration	Type	Serial No.	Manufacturer
1	Spectrum	May.08, 13	E4446A	US44300459	Agilent

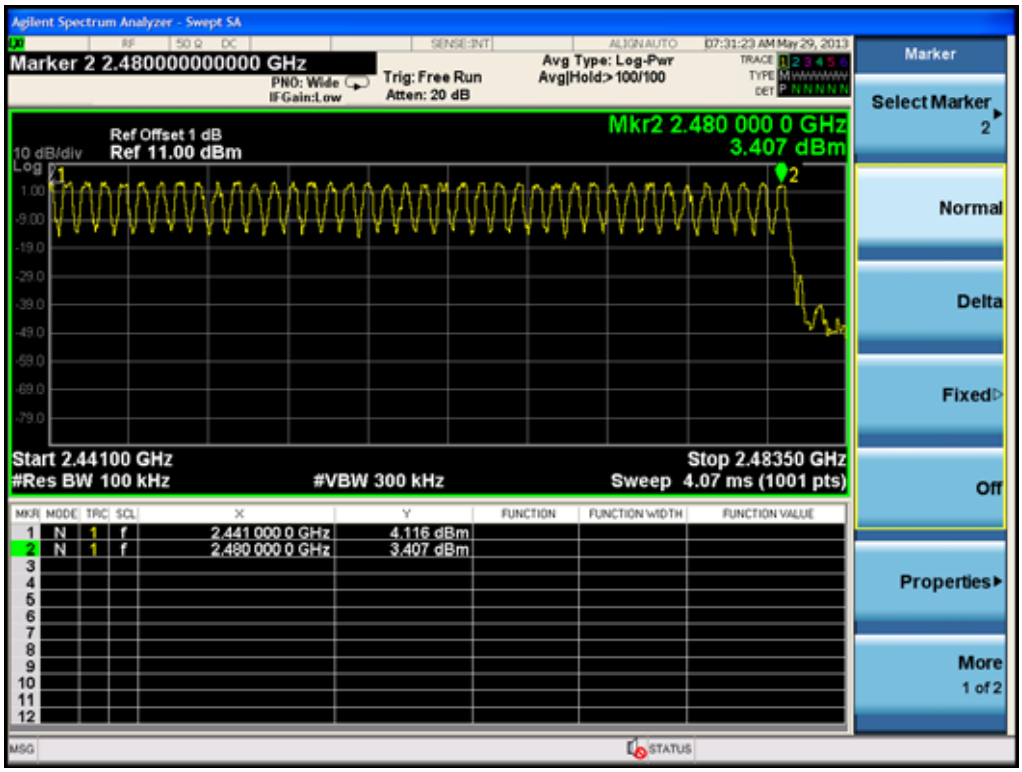
10.3 Test Result

Test mode: Transmitter Hopping on

Number of channels used	Minimum number of channels limit	Margin
79	15	64

10.3.1 Diagram





11. DWELL TIME TEST

11.1 Test Procedure

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

11.2 Measurement Equipment

Item	Equipment	Last Calibration	Type	Serial No.	Manufacturer
1	Spectrum	May.08, 13	E4446A	US44300459	Agilent

11.3 Test Result

Limit:

Total time of occupancy is 0.4 s within a period of time equals number of hopping channels employed multiplied by 0.4 s, which is 0.4 s within the period of time 0.4 × 79 = 31.6 s

Remark :

DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot RX, 1 time slot TX). So, total hops is 10.12 x 31.6 = 320

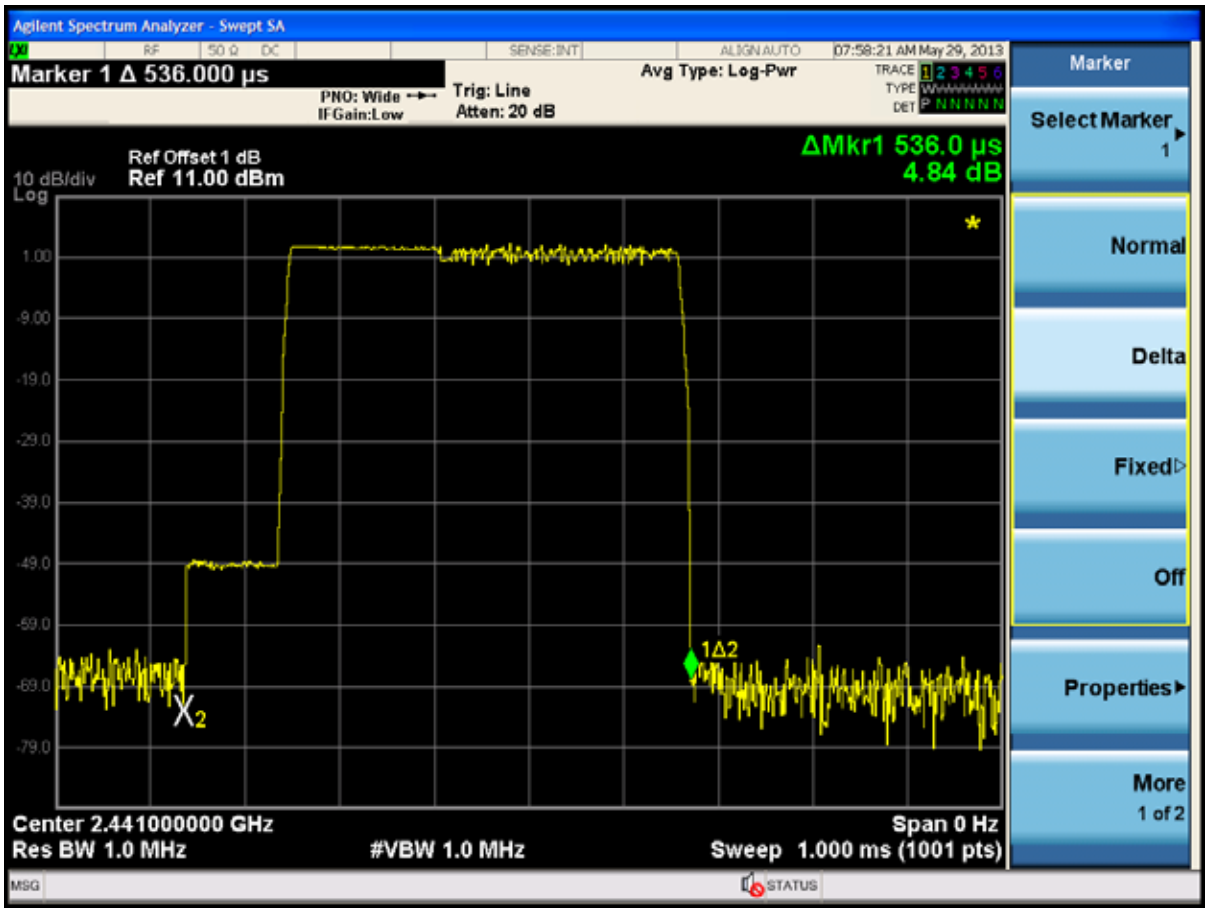
DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots RX, 1 time slot TX). So, total hops is 5.06 x 31.6 = 160

DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So, total hops is 3.37 x 31.6 = 106.6

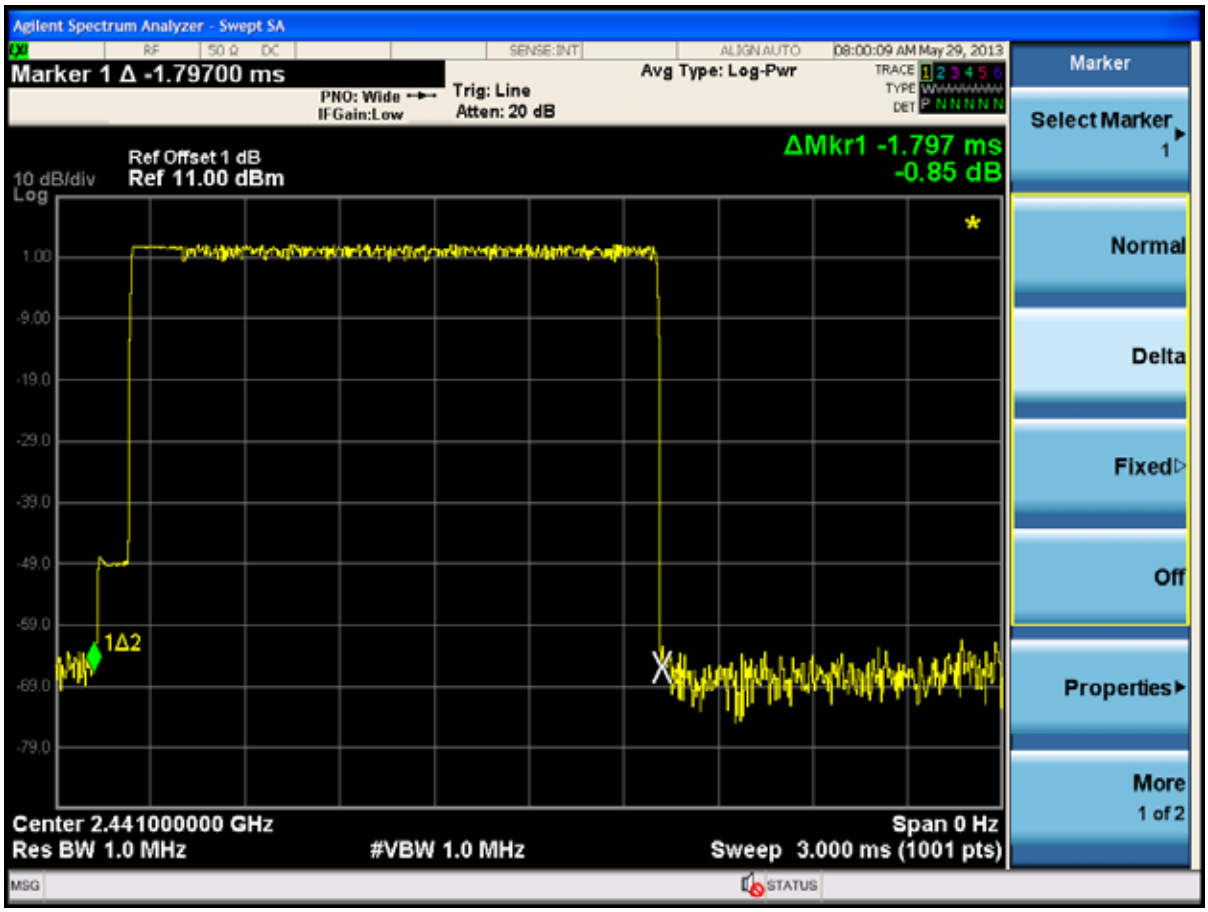
8DPSK

Grouping	Diagram	Time of occupancy ms	Limit ms	Remark
DH1	11-1	171.52	400	320x 0.536
DH3	11-2	287.52	400	160x 1.797
DH5	11-3	327.8	400	106.6x 3.075

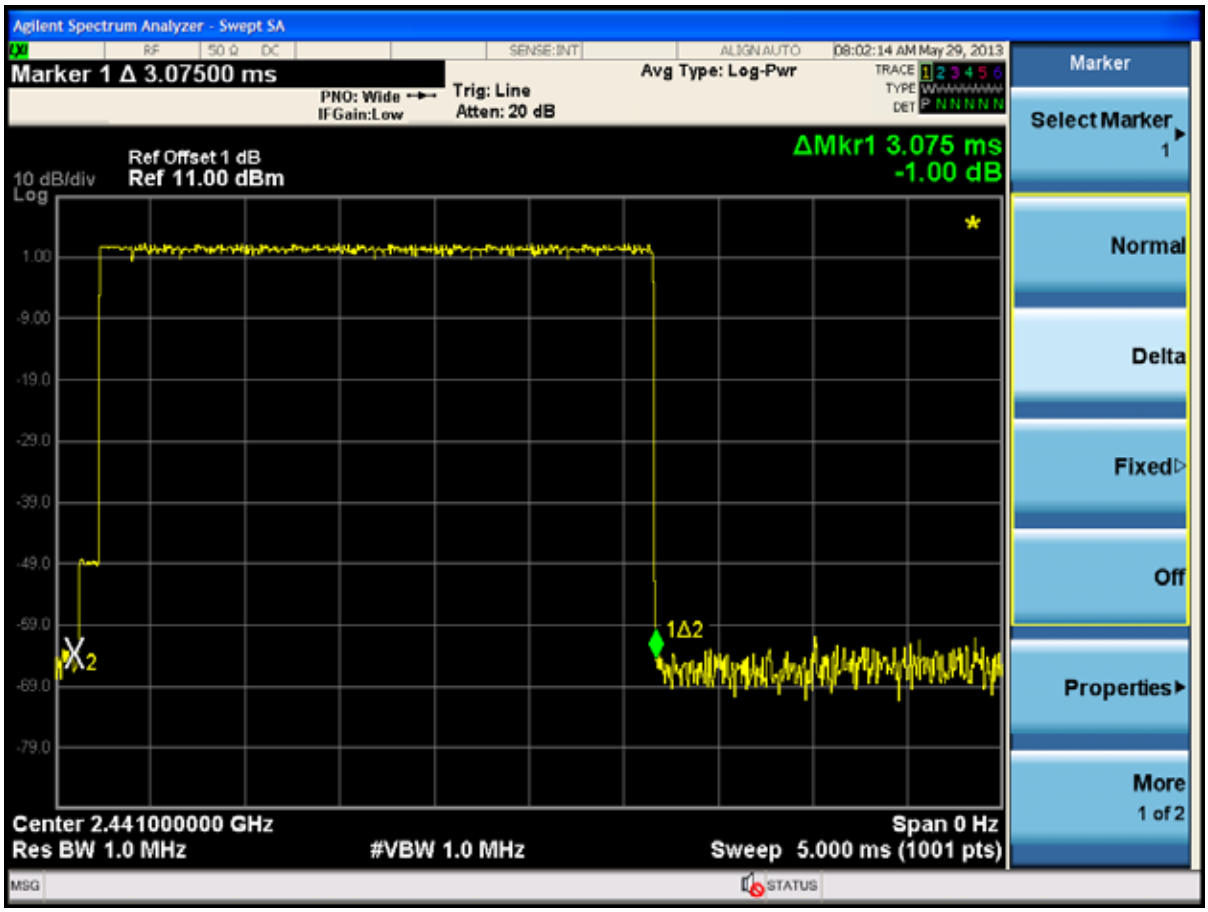
11.3.1 Diagram 11-1



11.3.2 Diagram 11-2



11.3.3 Diagram 11-3

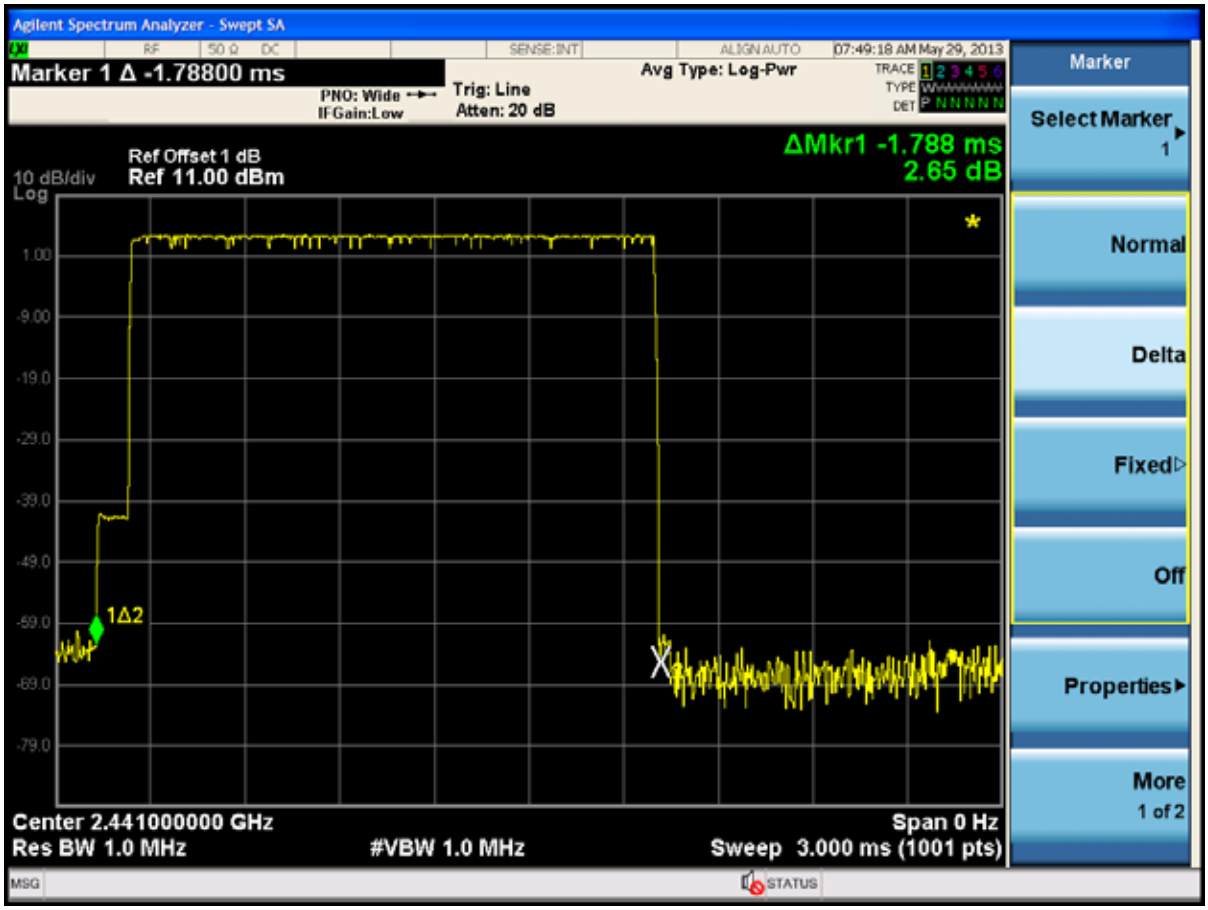


GFSK

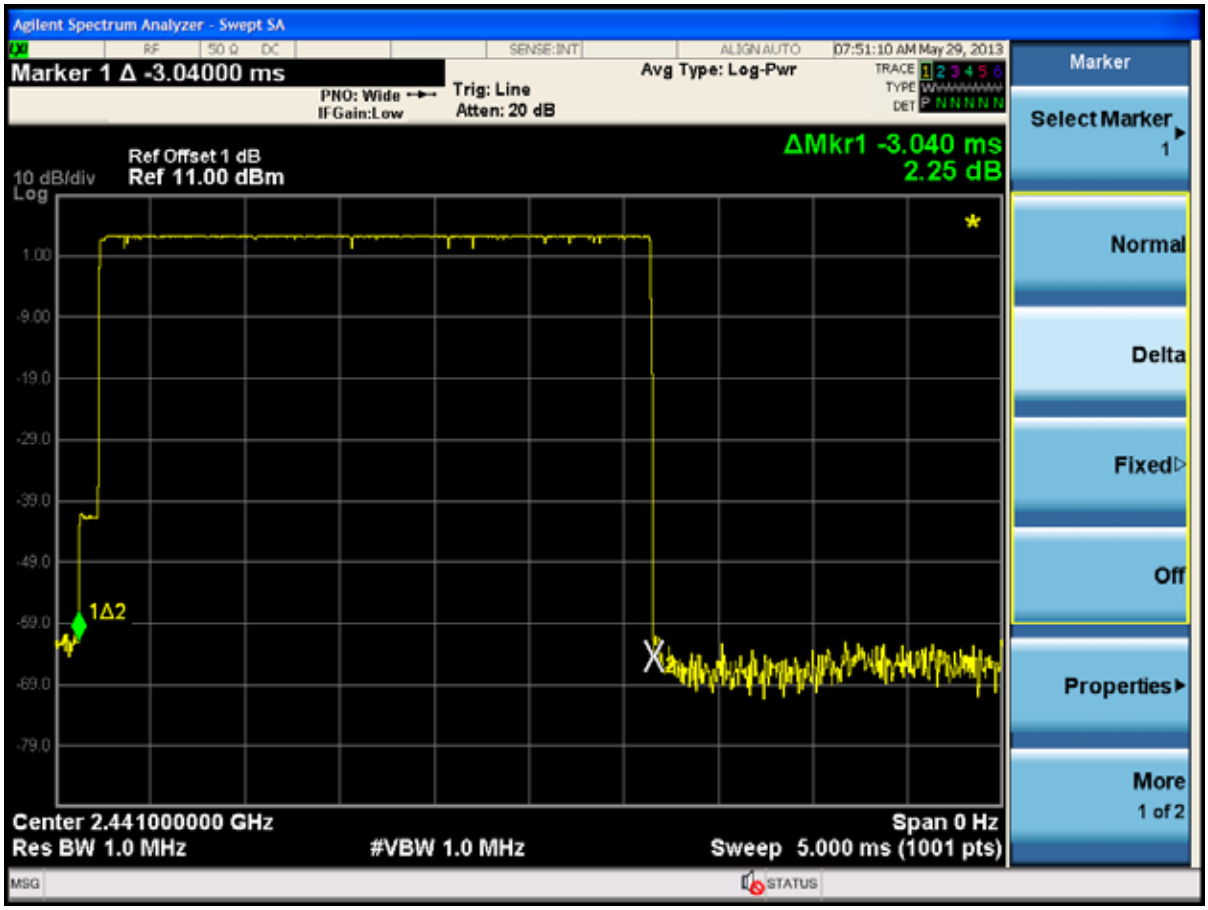
Grouping	Diagram	Time of occupancy ms	Limit ms	Remark
DH1	11-4	168.64	400	320x 0.527
DH3	11-5	286.08	400	160x 1.788
DH5	11-6	324.06	400	106.6x 3.04

11.3.4 Diagram 11-4

11.3.5 Diagram 11-5



11.3.5 Diagram 11-5



12 POWER LINE CONDUCTED EMISSION TEST

12.1 Test Procedure

An intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	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.		

12.2 Measurement Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS10	838693/001	Oct.31, 12	1 Year
2.	L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	Oct.31, 12	1 Year
3.	L.I.S.N.#3	Kyoritsu	KNW-242C	8-1920-1	May.08, 13	1 Year
4.	Terminator	Hubersuhner	50Ω	No. 1	May.08, 13	1 Year
5.	Terminator	Hubersuhner	50Ω	No. 2	May.08, 13	1 Year
6.	RF Cable	Fujikura	3D-2W	No.1	May.08, 13	1Year
7.	Coaxial Switch	Anritsu	MP59B	M50564	May.08, 13	1 Year
8.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100341	May.08, 13	1 Year
9.	Oscilloscope	Tektronix	TDS3052B	B026036	May.20, 13	1 Year

12.3 Test Result

The EUT was placed on a non-metallic table, 80cm above the ground plane. The other peripheral devices power cord connected to the power mains through another line impedance stabilization network.In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4-2003 on conducted Emission test.

Preview measurements:
0.15 MHz to 30 MHz
Receiver settings: PK&AV detector
RBW:9 kHz

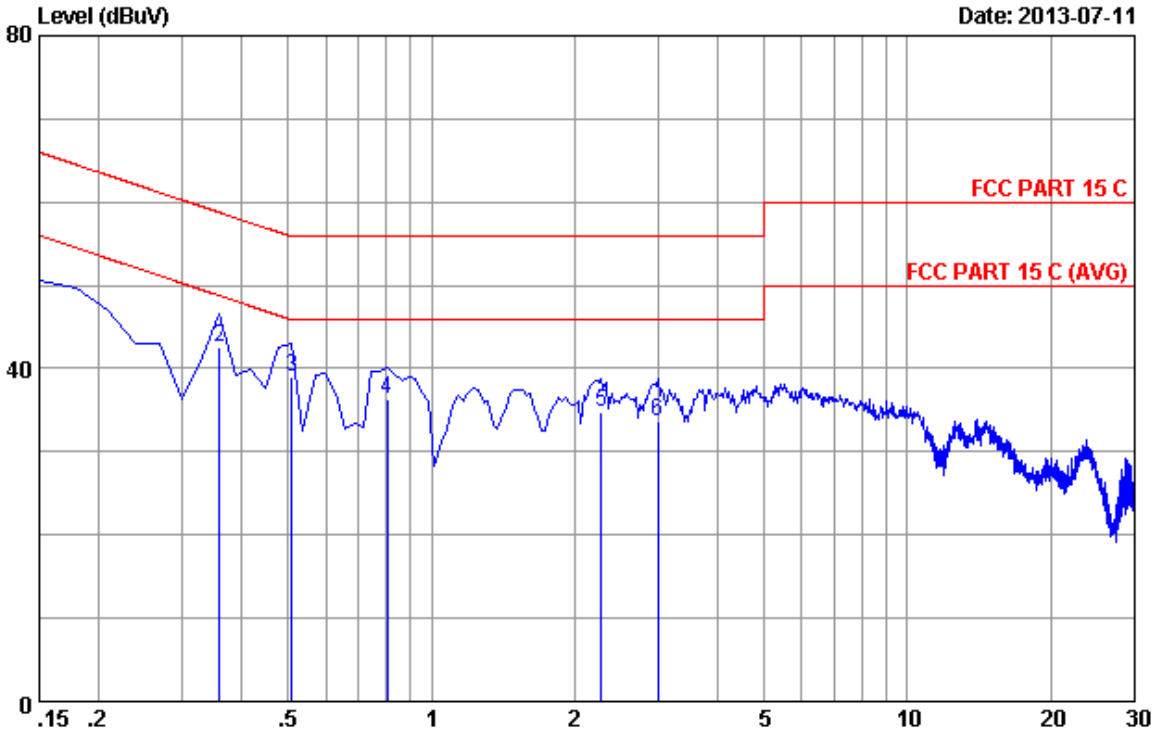
Final measurement:
0.15 MHz to 30 MHz
Receiver settings:QP&AV detector

Test mode	Power Line	Test Data	Test Result
TX MODE	Line	Diagram 12-1	Pass
	Neutral	Diagram 12-2	Pass

NOTES:

1. Measurements using CISPR quasi-peak mode & average mode.
2. All modes of operation were investigated and the worst -case emission are reported.
3: If PK value is lower than AV limit then no reading value listed in report .If QP value is Lower than AV limit ,then AV value don't listed in report.

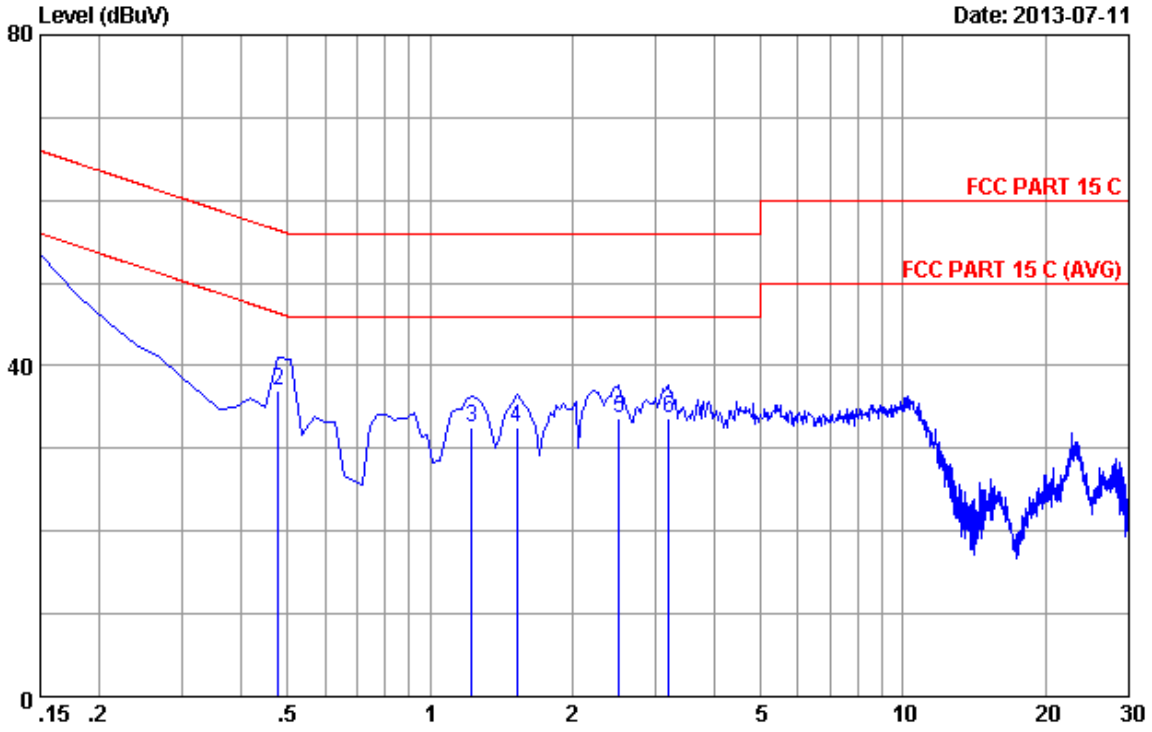
12.3.1 Diagram 12-1



No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15000	0.19	0.01	40.47	40.67	66.00	25.33	QP
2	0.35895	0.19	0.02	42.26	42.47	58.75	16.28	QP
3	0.50820	0.19	0.02	38.71	38.92	56.00	17.08	QP
4	0.80670	0.20	0.03	35.98	36.21	56.00	19.79	QP
5	2.269	0.25	0.04	34.52	34.81	56.00	21.19	QP
6	2.986	0.26	0.05	33.36	33.67	56.00	22.33	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
2.If the average limit is met when useing a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

12.3.2 Diagram 12-2



No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15000	0.21	0.01	46.29	46.51	66.00	19.49	QP
2	0.47835	0.23	0.02	36.72	36.97	56.37	19.40	QP
3	1.225	0.25	0.03	32.15	32.43	56.00	23.57	QP
4	1.523	0.26	0.04	32.22	32.52	56.00	23.48	QP
5	2.508	0.29	0.05	33.21	33.55	56.00	22.45	QP
6	3.195	0.31	0.05	33.22	33.58	56.00	22.42	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
2.If the average limit is met when useing a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

13 Antenna requirement

13.1 Requirement

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

13.2 Result

The antenna used for this product is Internal Patch antenna that no antenna other than that furnished by the responsible party shall be used with the device, The maximum peak gain of this antenna is 2.06dBi.

END OF REPORT