3.5 Unwanted Emissions (Radiated)

▣ **Test Requirements and limit,**

§15.247(d), §15.205, §15.209 & RSS-247 [5.5], RSS-Gen [8.9], RSS-Gen [8.10]

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) and (b), then the 15.209(a) limit in the table below has to be followed

▪ **FCC Part 15.209(a) and (b)**

Frequency (MHz)	Limit (uV/m)	Measurement Distance (meter)
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
Above 960	500	3

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 ~ 72 MHz, 76 ~ 88 MHz, 174 ~ 216 MHz or 470 ~ 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

▪ **FCC Part 15.205 (a) :** Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	156.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	156.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	156.7 ~ 156.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900		
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240	3600 ~ 4400		
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

▪ **FCC Part 15.205(b) :** The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

3.5.1 Test Setup

Refer to the APPENDIX I.

3.5.2 Test Procedures

1. The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 1 or 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

Note: Measurement Instrument Setting for Radiated Emission Measurements.

1. Frequency Range: ≤ 1 GHz

RBW = 100 or 120 kHz, VBW = 3 x RBW, Detector = Peak or Quasi Peak

2. Frequency Range: > 1 GHz

Peak Measurement

RBW = 1 MHz, VBW = 3 MHz, Detector = Peak, Sweep time = Auto, Trace mode = Max Hold until the trace stabilizes

Average Measurement

The result of Average measurement was calculated using PK result and duty cycle reduction factor.
(The Peak measurement was performed at 100% duty cycle. But, this device has a low duty cycle when actual operation.)

Note: Refer to appendix II for duty cycle correction factor.

3.5.3 Test Results

Test Mode: TM 1

Frequency Range : 9 kHz ~ 25 GHz

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2388.62	V	Y	PK	50.03	0.77	N/A	N/A	50.80	74.00	23.20
2388.62	V	Y	AV	50.03	0.77	-33.98	N/A	16.82	54.00	37.18
4809.72	H	Y	PK	44.15	7.62	N/A	N/A	51.77	74.00	22.23
4809.72	H	Y	AV	44.15	7.62	-33.98	N/A	17.79	54.00	36.21

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4880.63	H	Y	PK	44.40	7.34	N/A	N/A	51.74	74.00	22.26
4880.63	H	Y	AV	44.40	7.34	-33.98	N/A	17.76	54.00	36.24

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.54	V	Y	PK	58.32	1.10	N/A	N/A	59.42	74.00	14.58
2483.54	V	Y	AV	58.32	1.10	-33.98	N/A	25.44	54.00	28.56
4960.69	H	Y	PK	43.96	7.47	N/A	N/A	51.43	74.00	22.57
4960.69	H	Y	AV	43.96	7.47	-33.98	N/A	17.45	54.00	36.55

▪ **Note.**

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Information of Distance Factor

   For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor(-9.54 dB) is applied to the result.

   - Calculation of distance factor = 20 log(applied distance / required distance) = **20 log(1 m / 3 m)** = **-9.54 dB**

   When distance factor is “N/A”, the distance is 3 m and distance factor is not applied.
3. Sample Calculation.

   Margin = Limit – Result / Result = Reading + T.F + D.C.F / T.F = AF + CL – AG

   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

   DCF = Duty Cycle Correction Factor.

Test Mode: TM 2

Frequency Range : 9 kHz ~ 25 GHz

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.68	H	Z	PK	49.29	0.78	N/A	N/A	50.07	74.00	23.93
2389.68	H	Z	AV	49.29	0.78	-4.98	N/A	45.09	54.00	8.91
4809.24	H	Y	PK	43.88	7.62	N/A	N/A	51.50	74.00	22.50
4809.24	H	Y	AV	43.88	7.62	-4.98	N/A	46.52	54.00	7.48

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4881.80	H	Y	PK	44.85	7.31	N/A	N/A	52.16	74.00	21.84
4881.80	H	Y	AV	44.85	7.31	-4.98	N/A	47.18	54.00	6.82

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.59	H	Z	PK	52.71	1.10	N/A	N/A	53.81	74.00	20.19
2483.59	H	Z	AV	52.71	1.10	-4.98	N/A	48.83	54.00	5.17
4961.14	H	Y	PK	44.46	7.47	N/A	N/A	51.93	74.00	22.07
4961.14	H	Y	AV	44.46	7.47	-4.98	N/A	46.95	54.00	7.05

▪ **Note.**

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Information of Distance Factor

   For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor(-9.54 dB) is applied to the result.

   - Calculation of distance factor = 20 log(applied distance / required distance) = **20 log(1 m / 3 m)** = **-9.54 dB**

   When distance factor is “N/A”, the distance is 3 m and distance factor is not applied.
3. Sample Calculation.

   Margin = Limit – Result / Result = Reading + T.F + D.C.F / T.F = AF + CL – AG

   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

   DCF = Duty Cycle Correction reduction Factor.

Test Mode: TM 3

Frequency Range : 9 kHz ~ 25 GHz

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2386.94	V	Y	PK	50.64	0.77	N/A	N/A	51.41	74.00	22.59
2386.94	V	Y	AV	50.64	0.77	-33.98	N/A	17.43	54.00	36.57
4810.38	H	Y	PK	44.49	7.62	N/A	N/A	52.11	74.00	21.89
4810.38	H	Y	AV	44.49	7.62	-33.98	N/A	18.13	54.00	35.87

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4878.81	H	Y	PK	44.53	7.34	N/A	N/A	51.87	74.00	22.13
4878.81	H	Y	AV	44.53	7.34	-33.98	N/A	17.89	54.00	36.11

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.53	V	Y	PK	58.01	1.10	N/A	N/A	59.11	74.00	14.89
2483.53	V	Y	AV	58.01	1.10	-33.98	N/A	25.13	54.00	28.87
4959.34	H	Y	PK	44.05	7.47	N/A	N/A	51.52	74.00	22.48
4959.34	H	Y	AV	44.05	7.47	-33.98	N/A	17.54	54.00	36.46

▪ **Note.**

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Information of Distance Factor

   For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor(-9.54 dB) is applied to the result.

   - Calculation of distance factor = 20 log(applied distance / required distance) = **20 log(1 m / 3 m)** = **-9.54 dB**

   When distance factor is “N/A”, the distance is 3 m and distance factor is not applied.
3. Sample Calculation.

   Margin = Limit – Result / Result = Reading + T.F + D.C.F / T.F = AF + CL – AG

   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

   DCF = Duty Cycle Correction reduction Factor.

Test Mode: TM 4

Frequency Range : 9 kHz ~ 25 GHz

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2386.94	H	Z	PK	49.07	0.77	N/A	N/A	49.84	74.00	24.16
2386.94	H	Z	AV	49.07	0.77	-4.98	N/A	44.86	54.00	9.14
4810.54	H	Y	PK	44.20	7.62	N/A	N/A	51.82	74.00	22.18
4810.54	H	Y	AV	44.20	7.62	-4.98	N/A	46.84	54.00	7.16

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4879.70	H	Y	PK	44.42	7.34	N/A	N/A	51.76	74.00	22.24
4879.70	H	Y	AV	44.42	7.34	-4.98	N/A	46.78	54.00	7.22

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.50	H	Z	PK	52.83	1.10	N/A	N/A	53.93	74.00	20.07
2483.50	H	Z	AV	52.83	1.10	-4.98	N/A	48.95	54.00	5.05
4959.33	H	Y	PK	44.20	7.47	N/A	N/A	51.67	74.00	22.33
4959.33	H	Y	AV	44.20	7.47	-4.98	N/A	46.69	54.00	7.31

▪ **Note.**

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Information of Distance Factor

   For finding emissions, the test distance might be reduced from 3 m to 1 m. In this case, the distance factor(-9.54 dB) is applied to the result.

   - Calculation of distance factor = 20 log(applied distance / required distance) = **20 log(1 m / 3 m)** = **-9.54 dB**

   When distance factor is “N/A”, the distance is 3 m and distance factor is not applied.
3. Sample Calculation.

   Margin = Limit – Result / Result = Reading + T.F + D.C.F / T.F = AF + CL – AG

   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

   DCF = Duty Cycle Correction reduction Factor.

3.6 Power line Conducted Emissions

▣ **Test Requirements and limit, §15.207 & RSS-Gen [8.8]**

For 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 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dBuV)	
	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

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

3.6.1 Test Setup

See test photographs for the actual connections between EUT and support equipment.

3.6.2 Test Procedures

Conducted emissions from the EUT were measured according to the ANSI C63.10.

1. The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

Note: The worst data TM 3 was reported. Refer to the next page.

3.6.3 Test Results

AC Line Conducted Emissions (Graph) = TM 3 & Test Channel : Middle

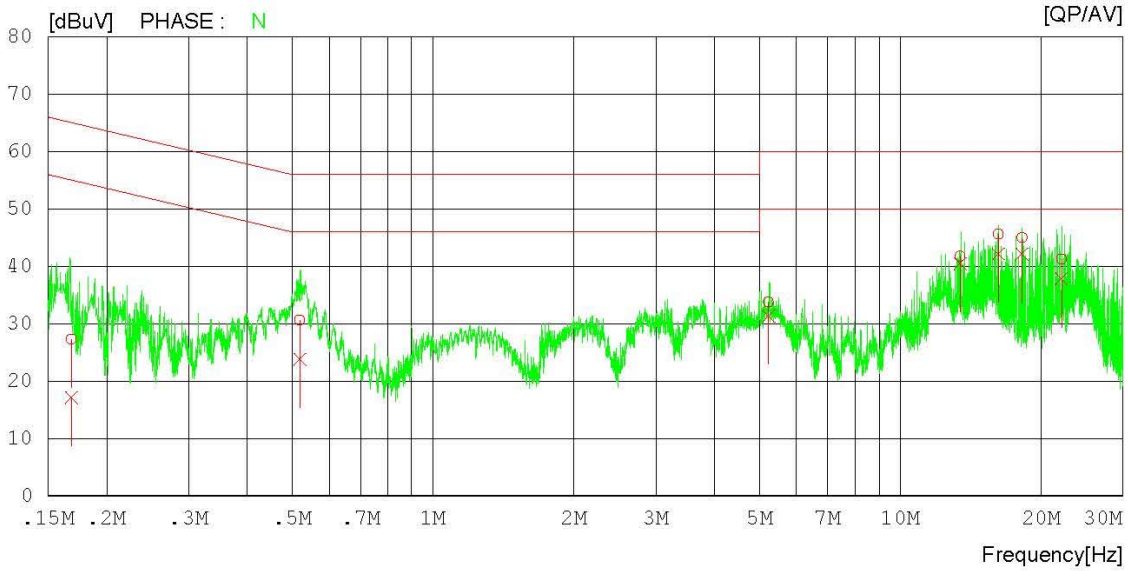
Results of Conducted Emission

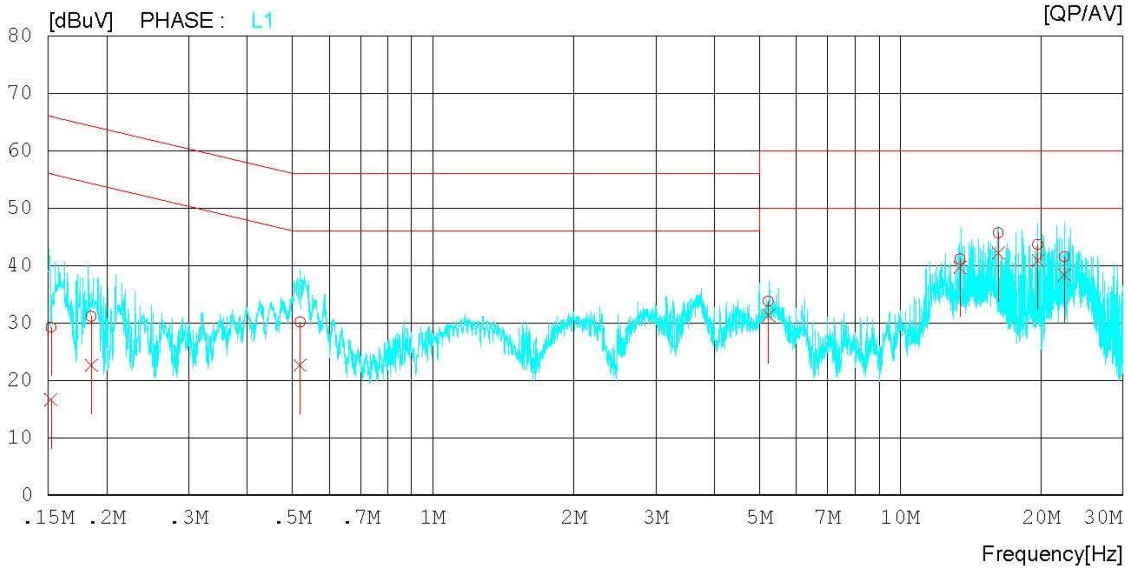
DTNC

Date : 2017-08-02

Order No.	:		Referrence No.	:	
Model No.	:	SLG-CP101	Power Supply	:	
Serial No.	:		Temp/Humi.	:	25 / 43
Test Condition	:	Ant1	Operator	:	J.H.BANG
Memo	:				

LIMIT : FCC P15.207 QP
FCC P15.207 AV





AC Line Conducted Emissions (List) = TM 3 & POE & Test Channel : Middle

Results of Conducted Emission

DTNC

Date : 2017-08-02

Order No.	:		Referrence No.	:	
Model No.	:	SLG-CP101	Power Supply	:	
Serial No.	:		Temp/Humi.	:	25 / 43
Test Condition	:	POE	Operator	:	J.H.BANG

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.16822	17.2	7.0	10.1	27.3	17.1	65.0	55.0	37.7	37.9	N
2	0.51837	20.5	13.7	10.1	30.6	23.8	56.0	46.0	25.4	22.2	N
3	5.22800	23.3	20.9	10.4	33.7	31.3	60.0	50.0	26.3	18.7	N
4	13.44500	30.9	29.5	10.9	41.8	40.4	60.0	50.0	18.2	9.6	N
5	16.22740	34.5	31.0	11.1	45.6	42.1	60.0	50.0	14.4	7.9	N
6	18.24320	33.7	30.8	11.3	45.0	42.1	60.0	50.0	15.0	7.9	N
7	22.15320	29.6	26.2	11.6	41.2	37.8	60.0	50.0	18.8	12.2	N
8	0.15197	19.2	6.6	10.0	29.2	16.6	65.9	55.9	36.7	39.3	L1
9	0.18550	21.1	12.6	10.0	31.1	22.6	64.2	54.2	33.1	31.6	L1
10	0.51950	20.0	12.5	10.1	30.1	22.6	56.0	46.0	25.9	23.4	L1
11	5.22640	23.2	20.8	10.5	33.7	31.3	60.0	50.0	26.3	18.7	L1
12	13.43720	30.1	28.6	11.0	41.1	39.6	60.0	50.0	18.9	10.4	L1
13	16.22720	34.4	30.9	11.2	45.6	42.1	60.0	50.0	14.4	7.9	L1
14	19.70880	32.1	29.3	11.5	43.6	40.8	60.0	50.0	16.4	9.2	L1
15	22.45520	29.7	26.5	11.8	41.5	38.3	60.0	50.0	18.5	11.7	L1

3.7 Occupied Bandwidth

▣ **Test Requirements, RSS-Gen [6.6]**

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99 % emission bandwidth, as calculated or measured.

3.7.1 Test Setup

Refer to the APPENDIX I.

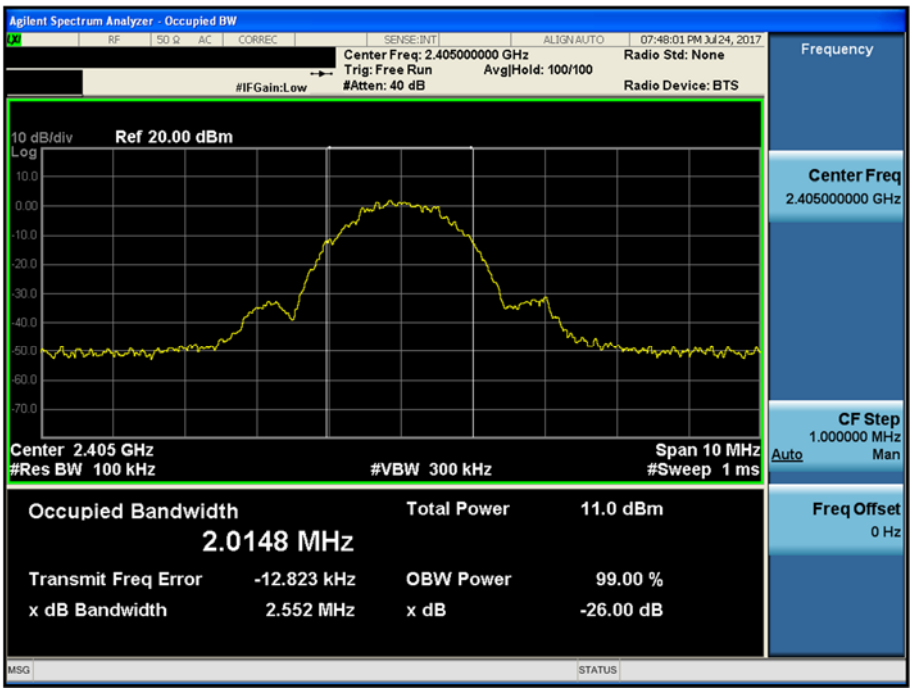
3.7.2 Test Procedures

The 99 % power bandwidth was measured with a calibrated spectrum analyzer.
The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3 × RBW.
Spectrum analyzer plots are included on the following pages.

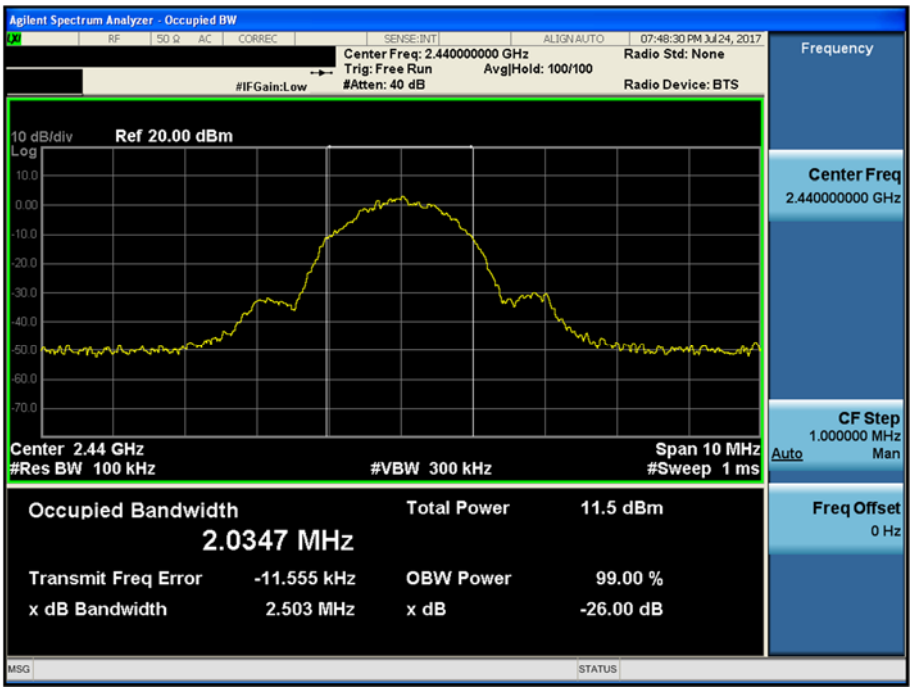
3.7.3 Test Results

Test Mode	Tested Channel	Test Results (MHz)
TM 1	Lowest	2.015
	Middle	**2.035**
	Highest	2.022
TM 2	Lowest	2.002
	Middle	**2.046**
	Highest	2.022

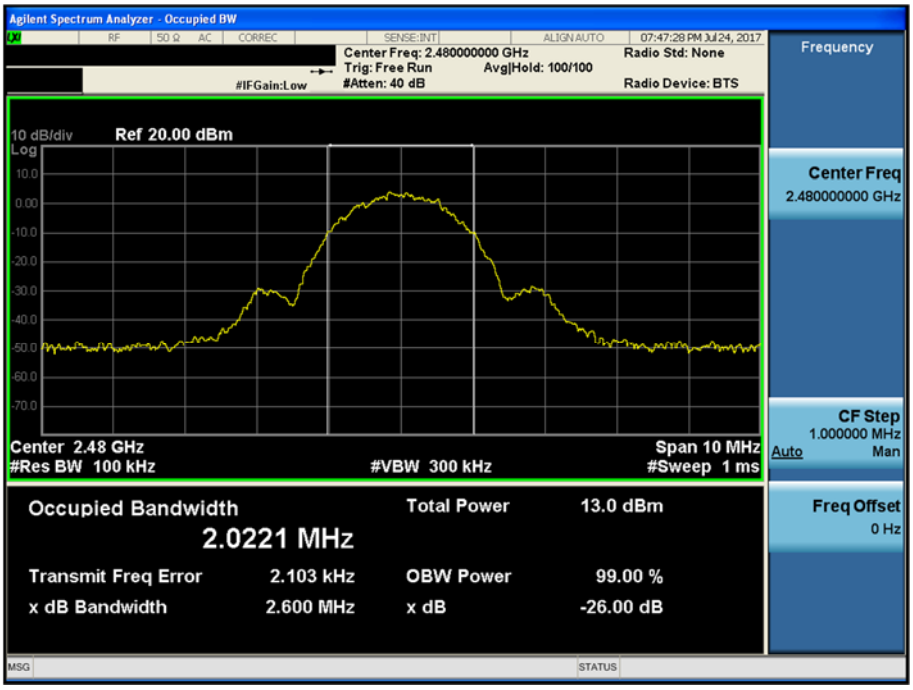
Occupied Bandwidth (99 %) TM 1 & Test Channel : Lowest



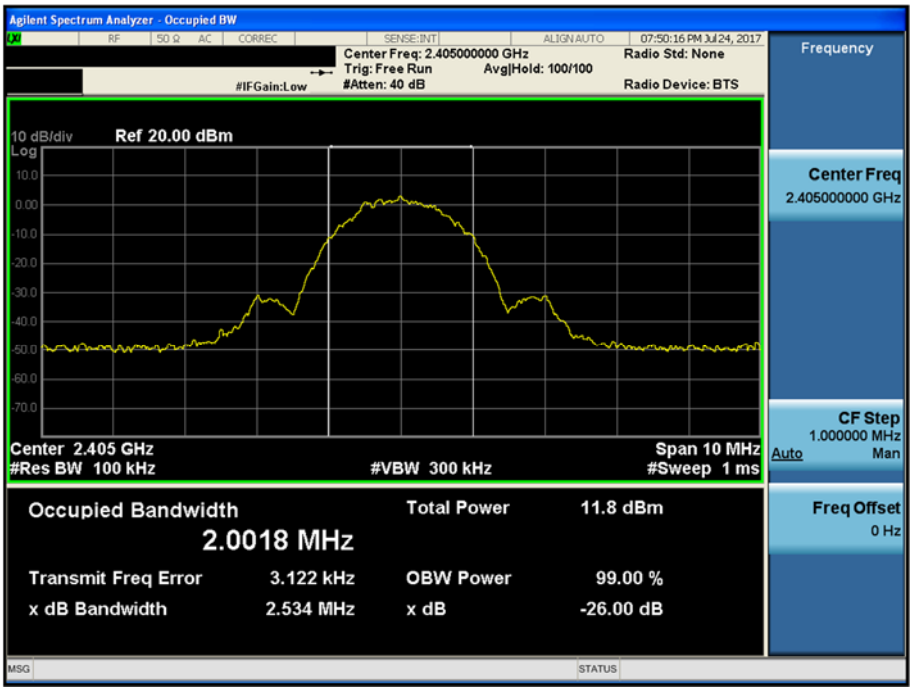
Occupied Bandwidth (99 %) TM 1 & Test Channel : Middle



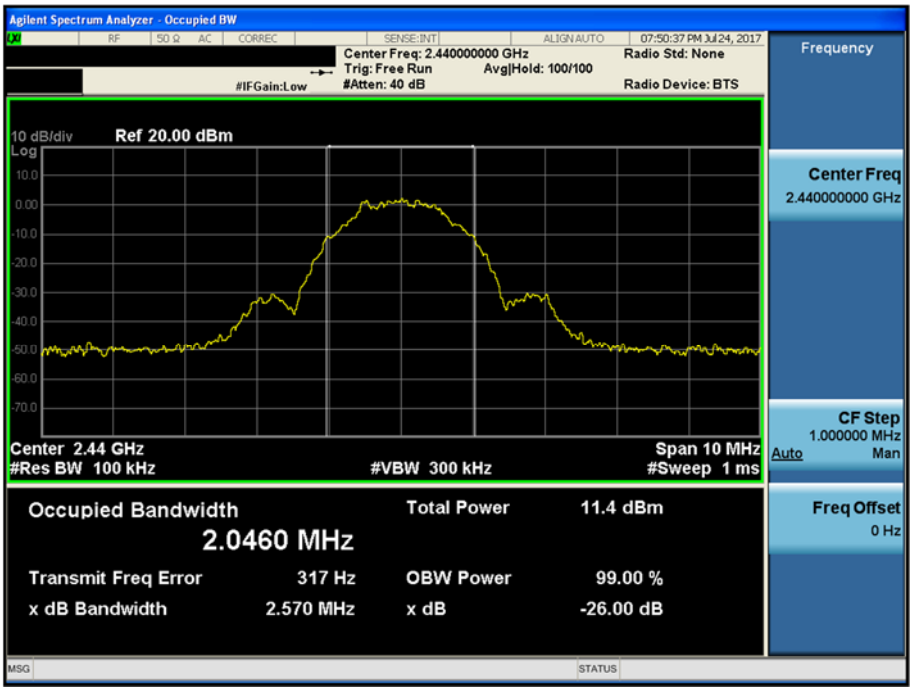
Occupied Bandwidth (99 %) TM 1 & Test Channel : Highest



Occupied Bandwidth (99 %) TM 2 & Test Channel : Lowest



Occupied Bandwidth (99 %) TM 2 & Test Channel : Middle



Occupied Bandwidth (99 %) TM 2 & Test Channel : Highest

4. ANTENNA REQUIREMENTS

▣ **According to FCC 47 CFR §15.203 & RSS-Gen [8.3]**

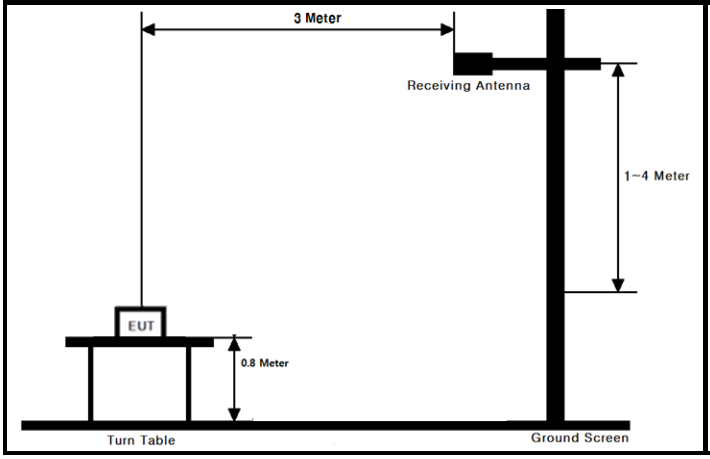
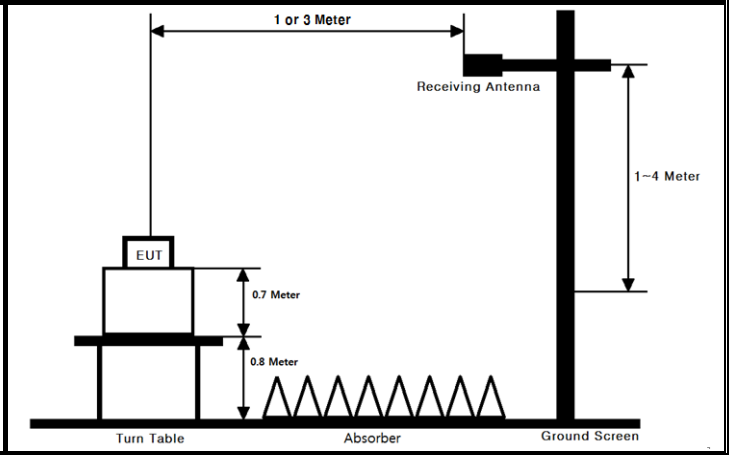
"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

The internal antenna employs a unique antenna connector.
Therefore this E.U.T Complies with the requirement of §15.203

APPENDIX I

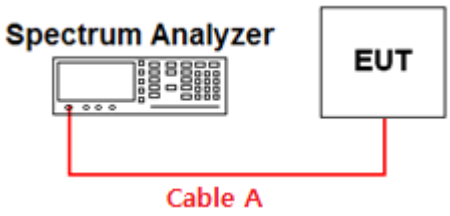
Test set up diagrams

- **Radiated Measurement**

Below 1GHz	Above 1GHz
	

For measurement below 30MHz, the proper calibration between the chamber and OATS has been done per KDB 937606.

- **Conducted Measurement**



Path loss information

Frequency (GHz)	Path Loss (dB)	Frequency (GHz)	Path Loss (dB)
0.03	0.28	15	4.73
1	1.30	20	5.22
2.405 & 2.440 & 2.480	1.86	25	5.81
5	2.96	-	-
10	3.41	-	-

Note 1: The path loss from EUT to Spectrum analyzer was measured and used for test.
Path loss (S/A's correction factor) = Cable A (Attenuator, Applied only when it was used externally)

APPENDIX II

Duty cycle

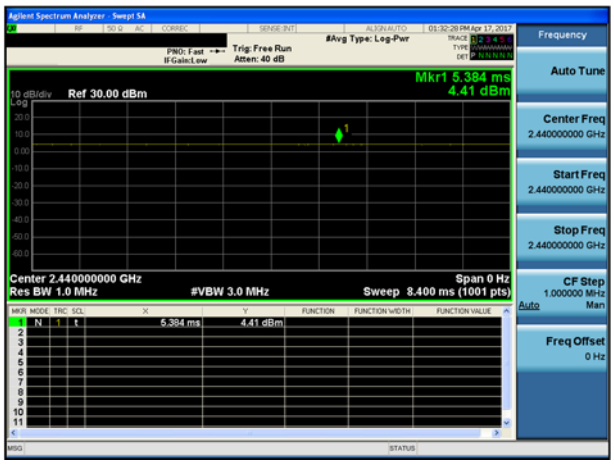
- **Test Procedure**

Duty Cycle was measured using **section 6.0 b) of KDB558074 :**

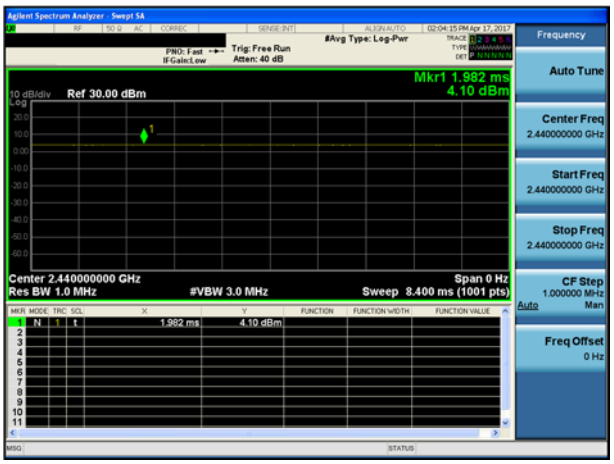
The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

TM 1 & Test Channel : Middle



TM 2 & Test Channel : Middle



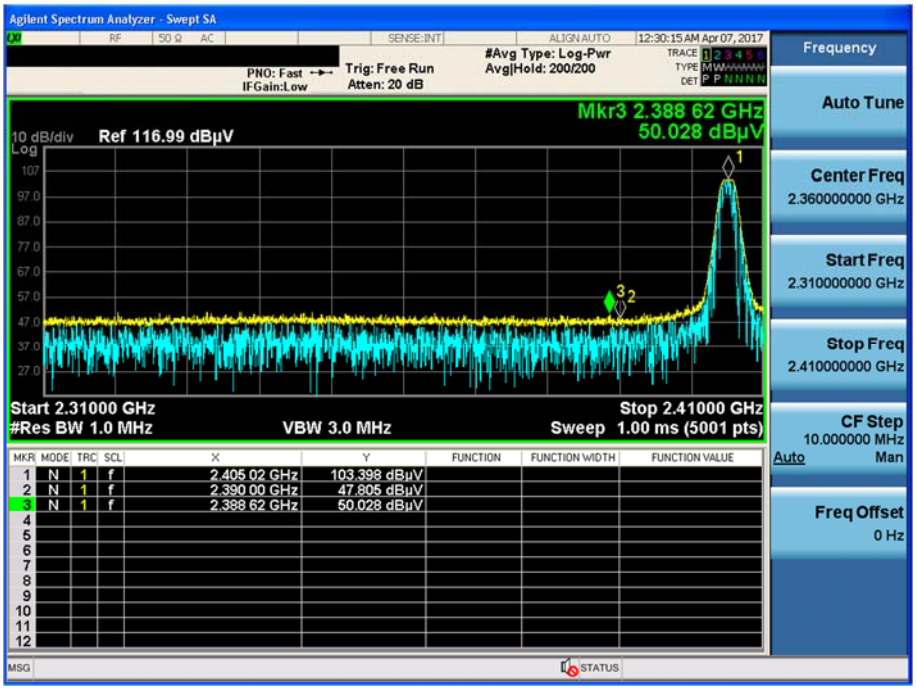
TM 1(Modem #2)	Measured duty cycle under testing condition	100%
	Declared the max duty cycle under normal operating condition (Transmit on time / period)	2.0% (1ms / 50 ms)
	Duty cycle reduction factor	20 x log (1ms/50ms) = -33.98 dB
TM 2(Modem #4)	Measured duty cycle under testing condition	100%
	Declared the max duty cycle under normal operating condition (Transmit on time / period)	56.3 % (4ms / 7.1ms)
	Duty cycle reduction factor	20 x log (4ms/7.1ms) = -4.98 dB

Note: The worst case duty cycle has heen provided by the manufacturer's technical documentation.

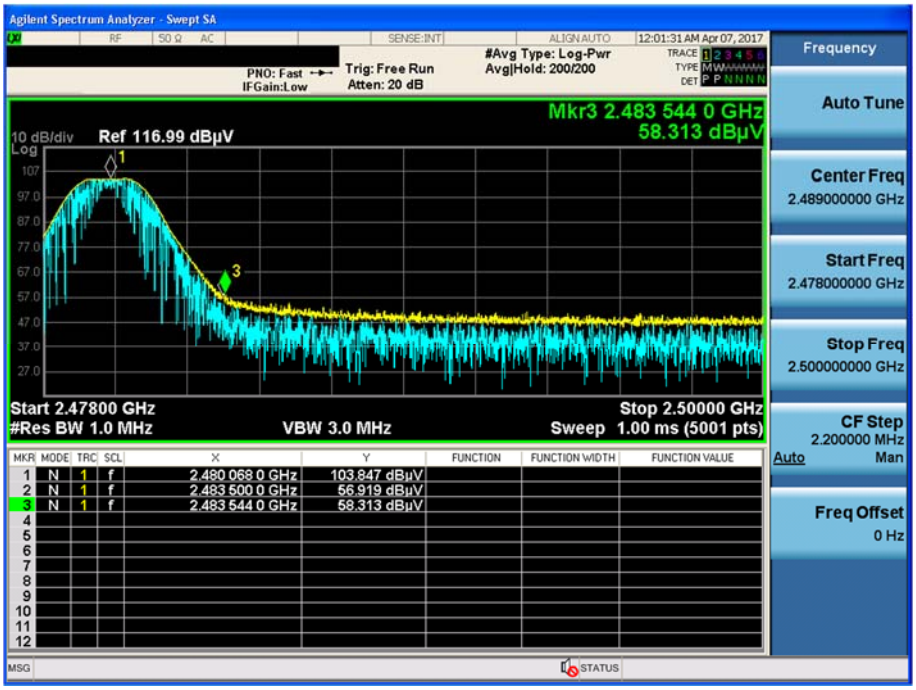
APPENDIX III

Unwanted Emissions (Radiated) Test Plot

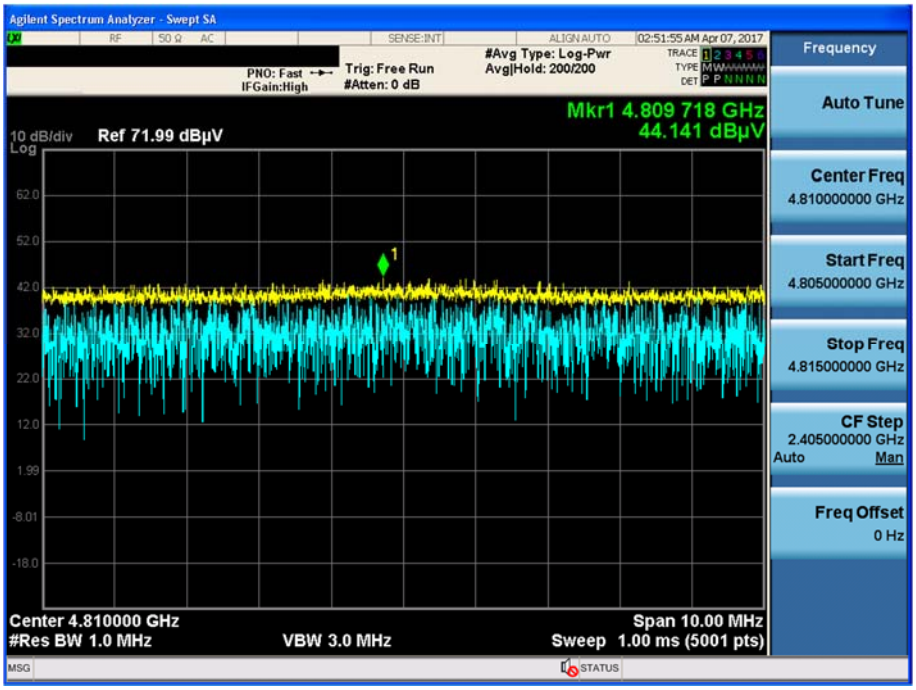
TM 1 & Lowest & Y& Ver **Detector Mode : PK**



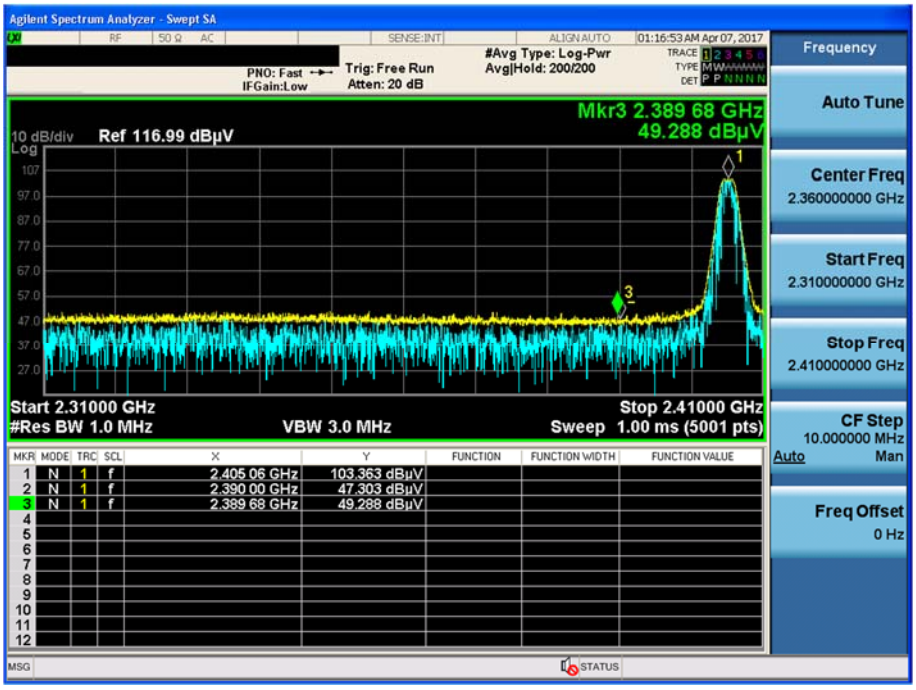
TM 1 & Highest & Y & Ver **Detector Mode : PK**



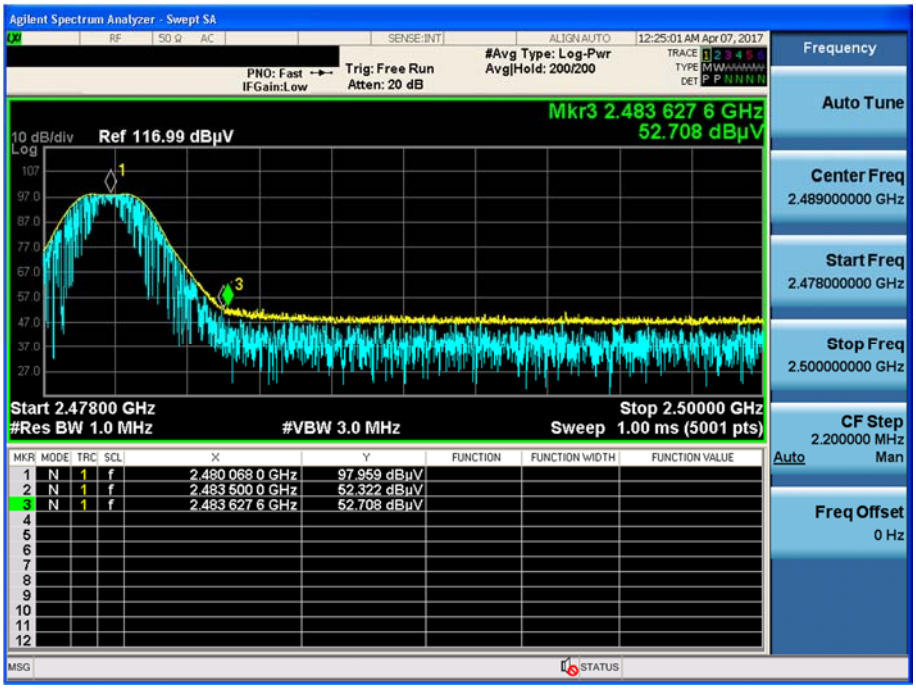
TM 1 & Lowest & Y & Hor **Detector Mode : PK**



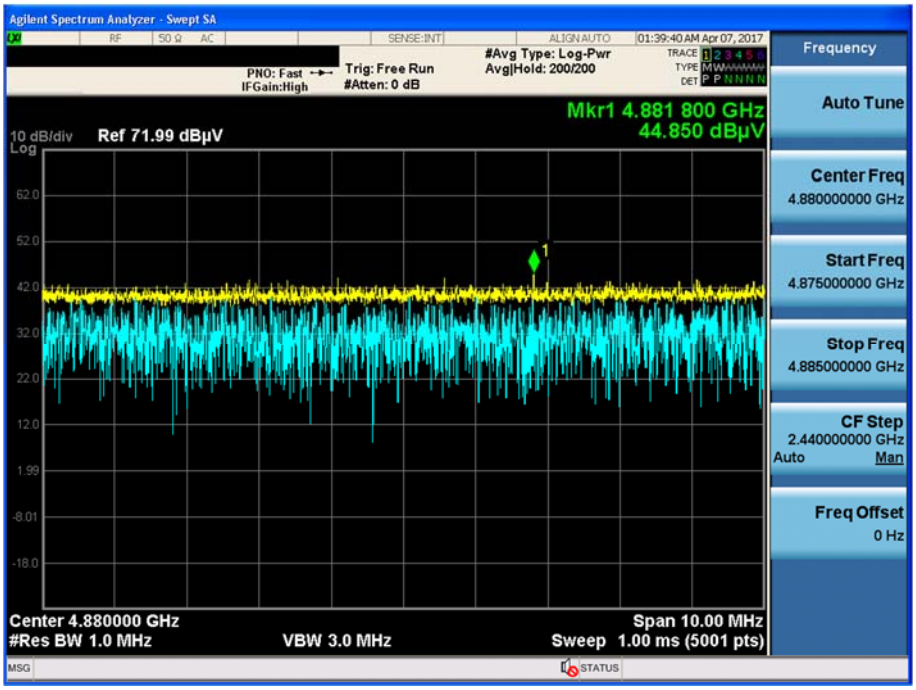
TM 2 & Lowest & Z & Hor **Detector Mode : PK**



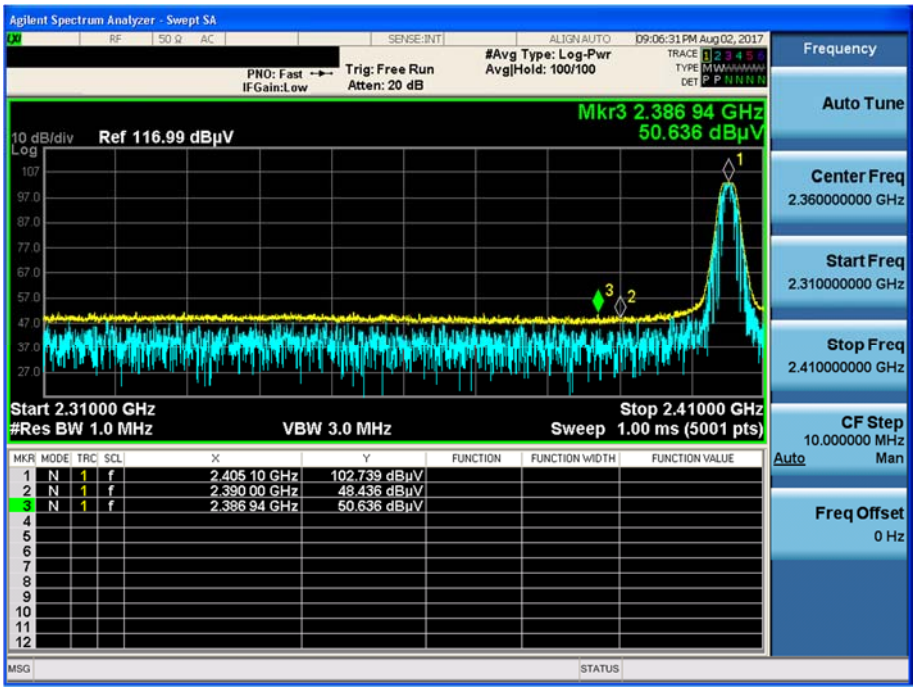
TM 2 & Highest & Z & Hor **Detector Mode : PK**



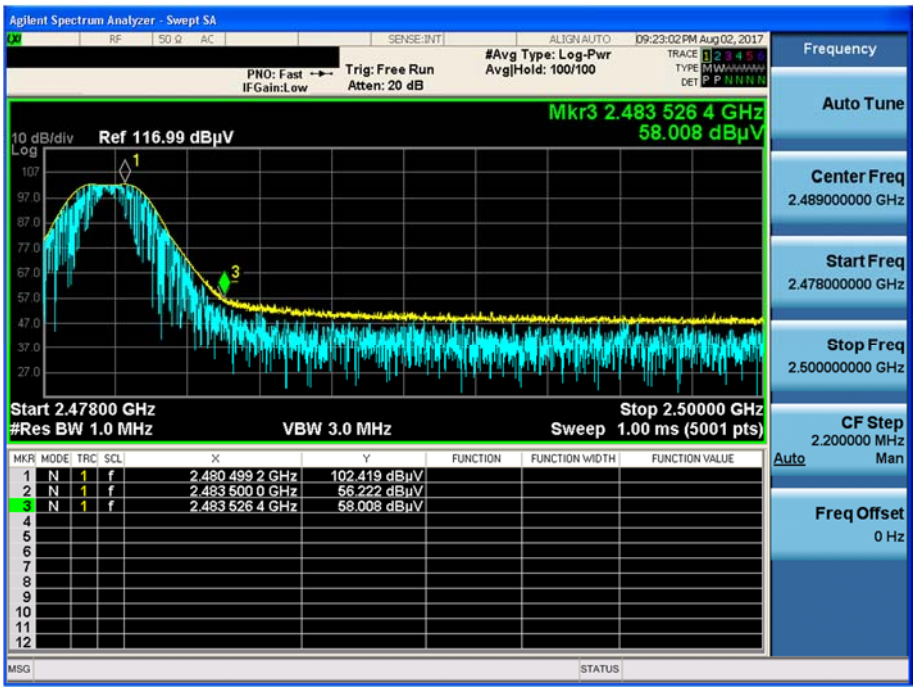
TM 2 & Middle & Y & Hor **Detector Mode : PK**



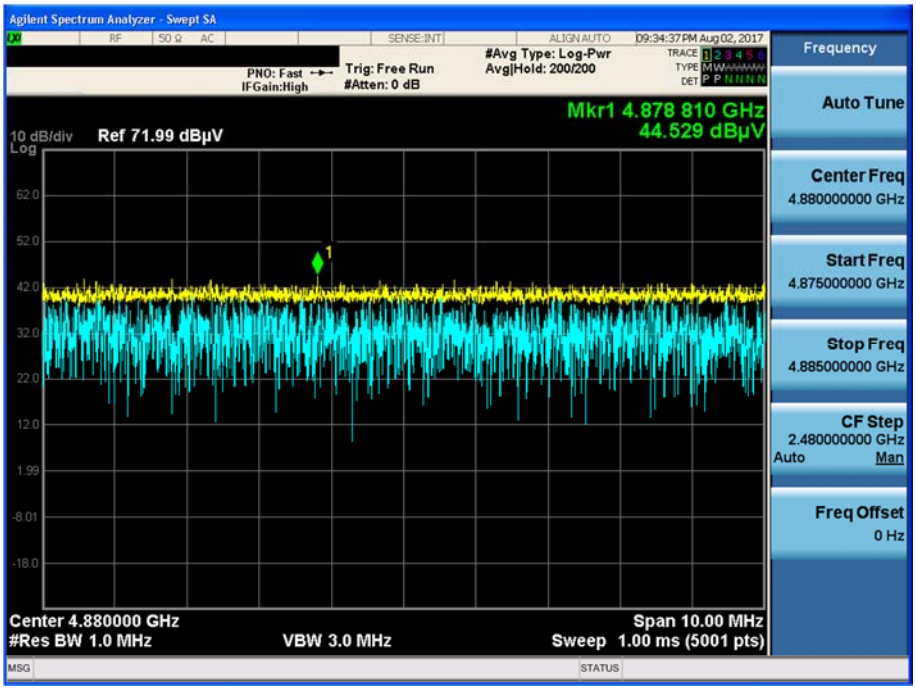
TM 3 & Lowest & Y & Ver **Detector Mode : PK**



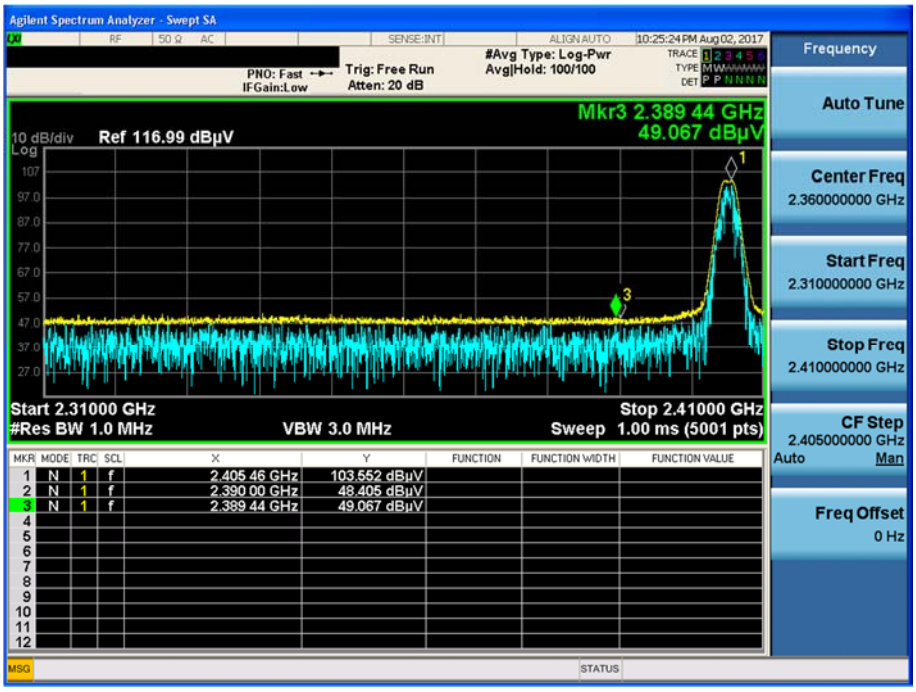
TM 3 & Highest & Y & Ver **Detector Mode : PK**



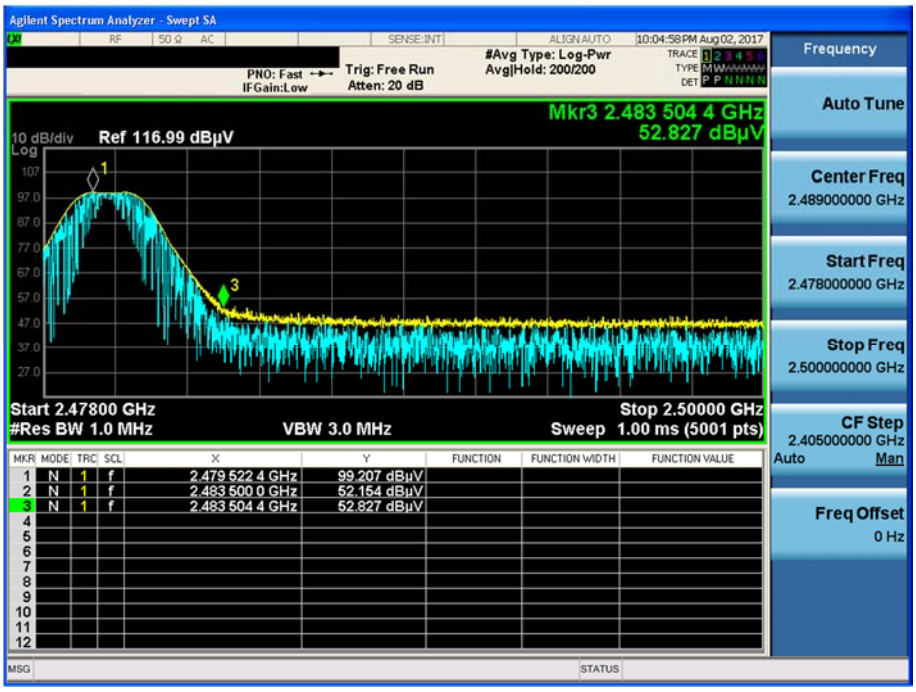
TM 3 & Middle & Y & Hor **Detector Mode : PK**



TM 4 & Lowest & Z & Hor **Detector Mode : PK**



TM 4 & Highest & Z & Hor **Detector Mode : PK**



TM 4 & Highest & Y & Hor **Detector Mode : PK**