

## 5.11. Spurious Emission (radiated)

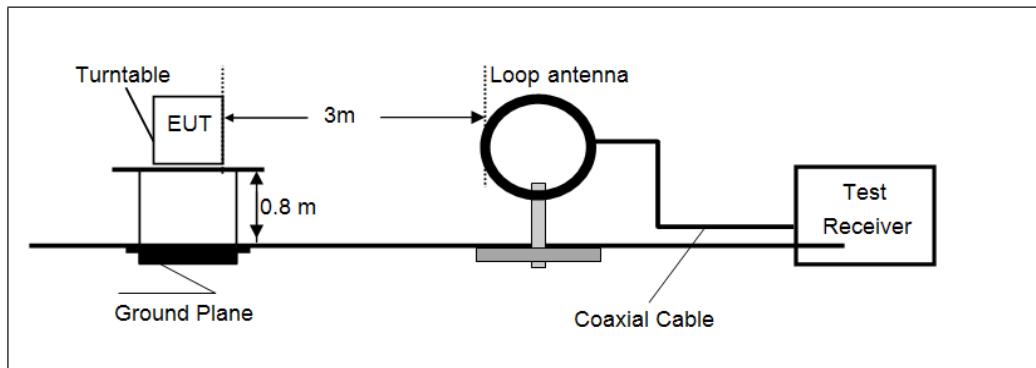
### LIMIT

#### FCC CFR Title 47 Part 15 Subpart C Section 15.209

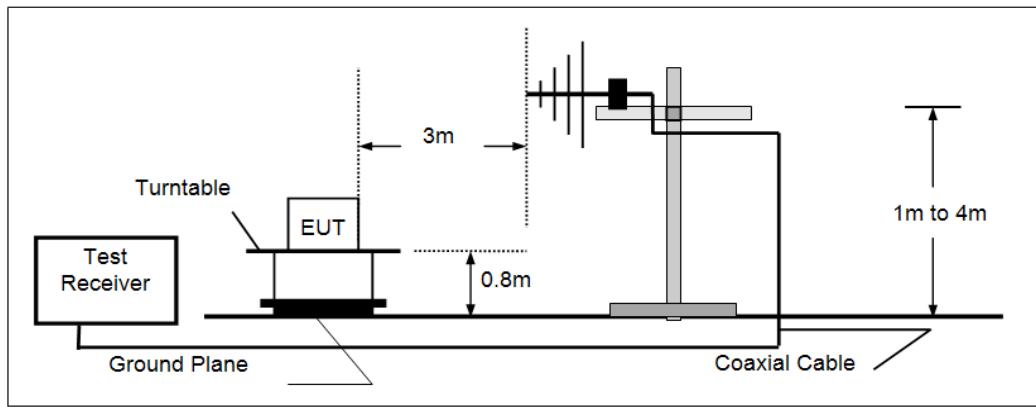
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

### TEST CONFIGURATION

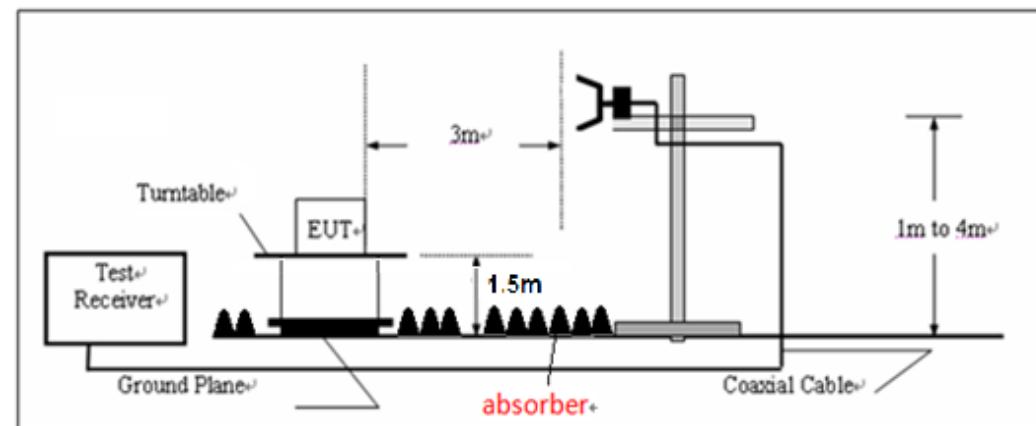
- 9KHz ~30MHz



- 30MHz ~ 1GHz



- Above 1GHz



## TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna.
5. Use the following spectrum analyzer settings
  - (1) Span shall be wide enough to fully capture the emission being measured;
  - (2) Below 1GHz, RBW=120KHz, VBW=300KHz, Sweep=auto, Detector function=QP, Trace=max hold;  
*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.*
  - (3) Above 1GHz, RBW=1MHz, VBW=3MHz Peak detector for Peak value  
RBW=1MHz, VBW=10Hz Peak detector for Average value.

## TEST MODE:

Please refer to the clause 3.3

## TEST RESULTS

Passed       Not Applicable

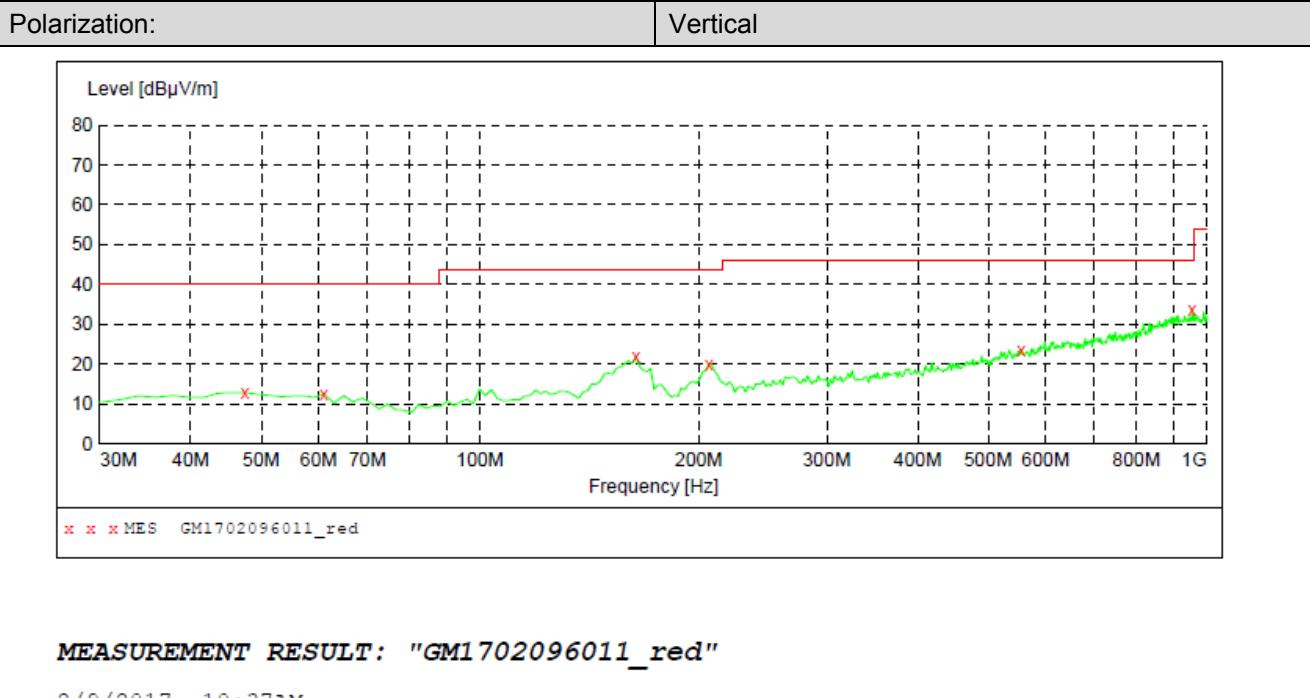
Note:

- 1) Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2) “\*”, means this data is the too weak instrument of signal is unable to test.
- 3) The emission levels of other frequencies are very lower than the limit and not show in test report.
- 4) Have pre-scan all modulation mode, found the GFSK modulation which it was worst case, so only the worst case’s data on the test report.

### ➤ 9kHz ~ 30MHz

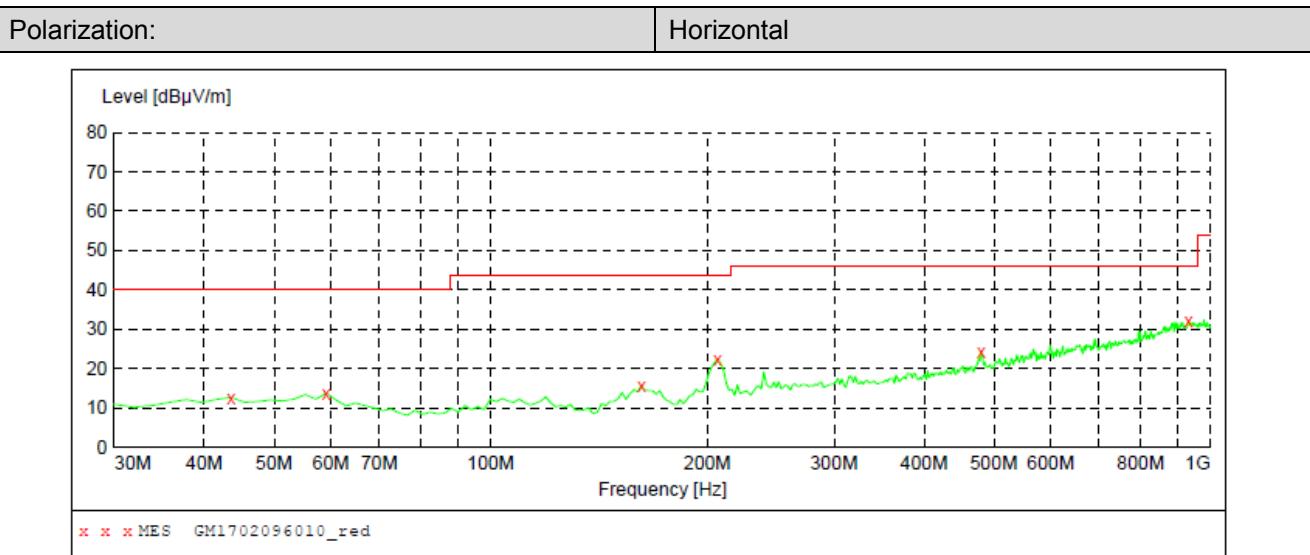
The EUT was pre-scanned the frequency band (9KHz~30MHz), found the radiated level lower than the limit, so don’t show on the report.

## &gt; 30MHz ~ 1GHz

**MEASUREMENT RESULT: "GM1702096011\_red"**

2/9/2017 10:37AM

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	12.80	-16.3	40.0	27.2	QP	100.0	182.00	VERTICAL
61.040000	12.40	-17.4	40.0	27.6	QP	100.0	98.00	VERTICAL
163.860000	21.70	-19.3	43.5	21.8	QP	100.0	330.00	VERTICAL
206.540000	20.10	-15.8	43.5	23.4	QP	100.0	330.00	VERTICAL
555.740000	23.60	-6.0	46.0	22.4	QP	100.0	0.00	VERTICAL
953.440000	33.60	1.6	46.0	12.4	QP	100.0	26.00	VERTICAL

**MEASUREMENT RESULT: "GM1702096010\_red"**

2/9/2017 10:35AM

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
43.580000	12.60	-16.6	40.0	27.4	QP	100.0	195.00	HORIZONTAL
59.100000	13.70	-17.1	40.0	26.3	QP	100.0	98.00	HORIZONTAL
161.920000	15.70	-19.4	43.5	27.8	QP	100.0	303.00	HORIZONTAL
206.540000	22.40	-15.8	43.5	21.1	QP	100.0	98.00	HORIZONTAL
480.080000	24.30	-8.4	46.0	21.7	QP	100.0	76.00	HORIZONTAL
932.100000	32.00	1.4	46.0	14.0	QP	100.0	0.00	HORIZONTAL

➤ **Above 1GHz**

CH00									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1593.34	46.66	24.99	5.55	36.71	40.49	74.00	-33.51	Vertical	Peak
3184.25	42.64	28.58	7.70	38.20	40.72	74.00	-33.28	Vertical	
4354.97	43.43	30.51	9.09	37.58	45.45	74.00	-28.55	Vertical	
7527.83	32.13	36.22	12.49	34.92	45.92	74.00	-28.08	Vertical	
1597.40	53.33	25.01	5.56	36.72	47.18	74.00	-26.82	Horizontal	
3184.25	42.83	28.58	7.70	38.20	40.91	74.00	-33.09	Horizontal	
4354.97	44.93	30.51	9.09	37.58	46.95	74.00	-27.05	Horizontal	
7840.75	32.14	36.54	13.06	34.96	46.78	74.00	-27.22	Horizontal	

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

CH39									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1597.40	46.77	25.01	5.56	36.72	40.62	74.00	-33.38	Vertical	Peak
3184.25	41.11	28.58	7.70	38.20	39.19	74.00	-34.81	Vertical	
4354.97	42.60	30.51	9.09	37.58	44.62	74.00	-29.38	Vertical	
7643.68	31.91	36.36	12.84	35.00	46.11	74.00	-27.89	Vertical	
1597.40	51.55	25.01	5.56	36.72	45.40	74.00	-28.60	Horizontal	
3200.50	43.43	28.58	7.72	38.20	41.53	74.00	-32.47	Horizontal	
4354.97	44.73	30.51	9.09	37.58	46.75	74.00	-27.25	Horizontal	
8002.06	34.30	36.72	12.30	34.53	48.79	74.00	-25.21	Horizontal	

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

CH78									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1198.10	49.29	24.43	4.66	36.57	41.81	74.00	-32.19	Vertical	Peak
1593.34	51.77	24.99	5.55	36.71	45.60	74.00	-28.40	Vertical	
4354.97	44.59	30.51	9.09	37.58	46.61	74.00	-27.39	Vertical	
6886.15	32.73	35.66	11.71	34.90	45.20	74.00	-28.80	Vertical	
1198.10	44.56	24.43	4.66	36.57	37.08	74.00	-36.92	Horizontal	
1597.40	46.84	25.01	5.56	36.72	40.69	74.00	-33.31	Horizontal	
4354.97	43.46	30.51	9.09	37.58	45.48	74.00	-28.52	Horizontal	
6379.86	32.77	34.62	10.99	35.31	43.07	74.00	-30.93	Horizontal	

## Remark:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

## 6. Test Setup Photos of the EUT

Conducted Emission (AC Mains)



Radiated Emission

