

**9.6.2 RADIATED SPURIOUS EMISSIONS**

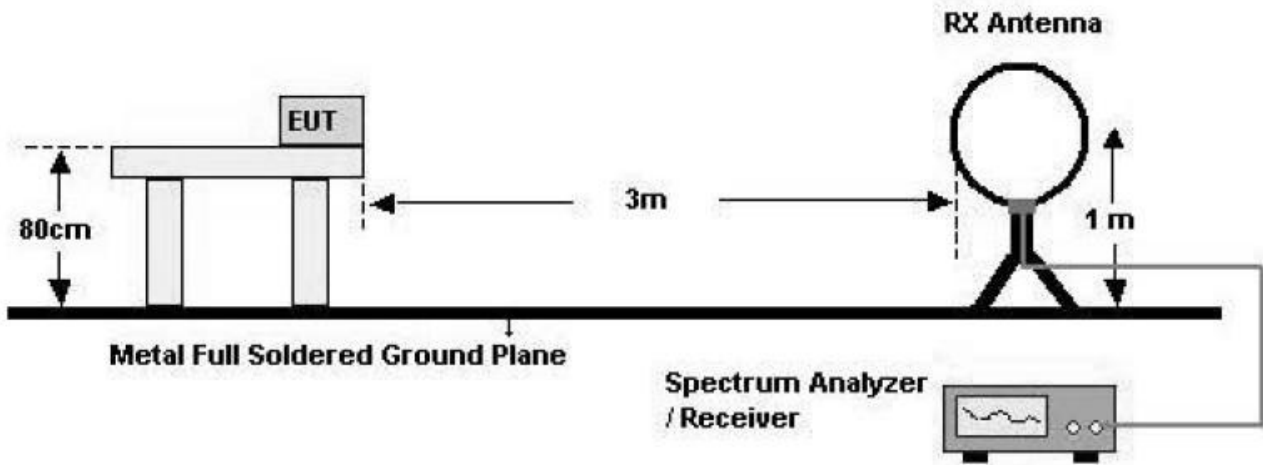
**LIMIT : §15.247(d), §15.205, §15.209**

1. 20dBc in any 100kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

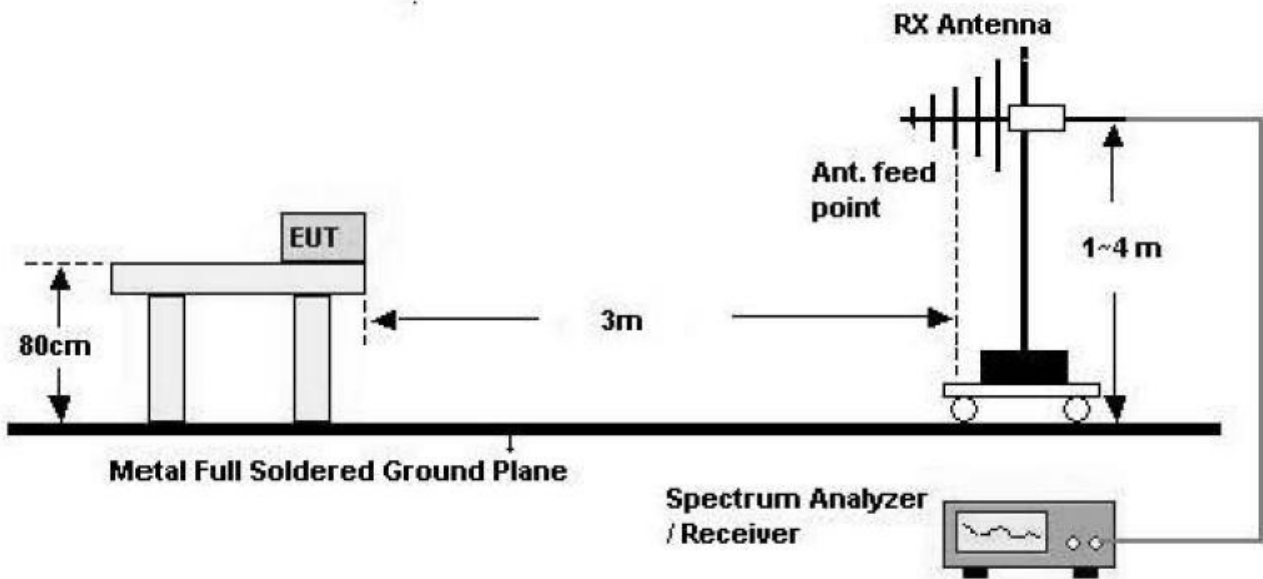
<b>Frequency (MHz)</b>	<b>Field Strength (uV/m)</b>	<b>Measurement Distance (m)</b>
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

### Test Configuration

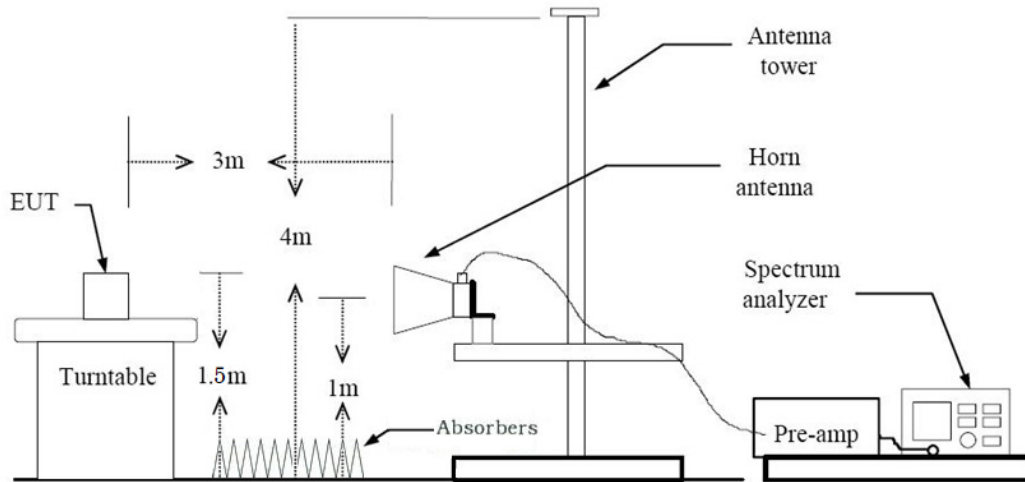
#### Below 30 MHz



#### 30 MHz - 1 GHz



**Above 1 GHz**



**TEST PROCEDURE**

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m 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.
7. Spectrum Setting
  - a. Peak: 1 GHz – 25 GHz, RBW = 1 MHz, VBW  $\geq 3 \times$  RBW
  - b. Average: 1 GHz – 25 GHz, RBW = 1 MHz, VBW  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.

Note :

1. We are performed the RSE and radiated band edge using standard radiated method.
2. The duty cycle factor for BT mode.

BT Mode	T <sub>on</sub> (ms)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
GFSK	2.875	348	1000
$\pi/4$ DQPSK	2.885	347	1000
8DPSK	2.880	347	1000

**TEST RESULTS**

**9 kHz – 30MHz**

**Operation Mode:** Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB
No Critical peaks found							

**Notes:**

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. This test is performed with hopping off.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

**TEST RESULTS****Below 1 GHz****Operation Mode:** Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB
No Critical peaks found							

**Notes:**

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. This test is performed with hopping off.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Above 1 GHz

Operation Mode: CH Low(GFSK)

Frequency [MHz]	Reading [dBuV]	*A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	49.45	0.11	V	49.56	73.98	24.42	4804
4804	35.68	0.11	V	35.79	53.98	18.19	4804
7206	48.81	6.86	V	55.67	73.98	18.31	7206
7206	35.21	6.86	V	42.07	53.98	11.91	7206
4804	49.54	0.11	H	49.65	73.98	24.33	PK
4804	35.76	0.11	H	35.87	53.98	18.11	AV
7206	48.84	6.86	H	55.70	73.98	18.28	PK
7206	35.24	6.86	H	42.10	53.98	11.88	AV

Operation Mode: CH Low(8DPSK)

Frequency [MHz]	Reading [dBuV]	*A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	49.45	0.11	V	49.56	73.98	24.42	PK
4804	35.69	0.11	V	35.80	53.98	18.18	AV
7206	48.86	6.86	V	55.72	73.98	18.26	PK
7206	35.21	6.86	V	42.07	53.98	11.91	AV
4804	49.49	0.11	H	49.60	73.98	24.38	PK
4804	35.70	0.11	H	35.81	53.98	18.17	AV
7206	48.90	6.86	H	55.76	73.98	18.22	PK
7206	35.23	6.86	H	42.09	53.98	11.89	AV

Operation Mode: CH Low( $\pi/4$ DQPSK)

Frequency [MHz]	Reading [dBuV]	※A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	49.43	0.11	V	49.54	73.98	24.44	PK
4804	35.67	0.11	V	35.78	53.98	18.20	AV
7206	48.83	6.86	V	55.69	73.98	18.29	PK
7206	35.20	6.86	V	42.06	53.98	11.92	AV
4804	49.52	0.11	H	49.63	73.98	24.35	PK
4804	35.74	0.11	H	35.85	53.98	18.13	AV
7206	48.85	6.86	H	55.71	73.98	18.27	PK
7206	35.22	6.86	H	42.08	53.98	11.90	AV

※ A·F: ANTENNA FACTOR  
 C·L: CABLE LOSS  
 AMP GAIN: AMPLIFIER GAIN

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
  - a. Peak Setting 1 GHz – 25 GHz, RBW = 1 MHz, VBW = 3 MHz.
  - b. Average Setting 1 GHz – 25 GHz, RBW = 1 MHz, VBW  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.  
 We performed using a reduced video BW method was done with the analyzer in linear mode.
6. FYI : Duty Cycle Correction Factor (79 channel hopping)
  - a. Time to cycle through all channels=  $\Delta t = \tau$  [ms] x 79 channels = 229.100 ms, where  $\tau$  = pulse width
  - b.  $100 \text{ ms} / \Delta t$  [ms] =  $H \rightarrow$  Round up to next highest integer,  $H' = 1$
  - c. Worst Case Dwell Time =  $\tau$  [ms] x  $H' = 2.900$  ms
  - d. Duty Cycle Correction =  $20 \log (\text{Worst Case Dwell Time} / 100\text{ms}) \text{ dB} = -30.752 \text{ dB}$
7. Duty Cycle Correction Factor (AFH mode – minimum channel number case - 20 channels)
  - a. Time to cycle through all channels=  $\Delta t = \tau$  [ms] x 20 channels = 58.00 ms, where  $\tau$  = pulse width
  - b.  $100 \text{ ms} / \Delta t$  [ms] =  $H \rightarrow$  Round up to next highest integer,  $H' = 2$
  - c. Worst Case Dwell Time =  $\tau$  [ms] x  $H' = 5.800$  ms

- d. Duty Cycle Correction(AFH) =  $20\log(\text{Worst Case Dwell Time}/ 100\text{ms}) \text{ dB} = -24.7314 \text{ dB}$
- e. We applied DCCF in the test result which hopping channel number is 20.
- 8. We have done Normal Mode and EDR Mode test.
- 9. This test is performed with hopping off.
- 10. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Operation Mode: CH Mid(GFSK)

Frequency [MHz]	Reading [dBuV]	*A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4882	48.39	0.23	V	48.62	73.98	25.36	PK
4882	34.89	0.23	V	35.12	53.98	18.86	AV
7323	48.41	7.06	V	55.47	73.98	18.51	PK
7323	34.52	7.06	V	41.58	53.98	12.40	AV
4882	48.48	0.23	H	48.71	73.98	25.27	PK
4882	34.92	0.23	H	35.15	53.98	18.83	AV
7323	48.46	7.06	H	55.52	73.98	18.46	PK
7323	34.58	7.06	H	41.64	53.98	12.34	AV

Operation Mode: CH Mid(8DPSK)

Frequency [MHz]	Reading [dBuV]	*A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4882	48.33	0.23	V	48.56	73.98	25.42	PK
4882	34.89	0.23	V	35.12	53.98	18.86	AV
7323	48.38	7.06	V	55.44	73.98	18.54	PK
7323	34.46	7.06	V	41.52	53.98	12.46	AV
4882	48.42	0.23	H	48.65	73.98	25.33	PK
4882	34.93	0.23	H	35.16	53.98	18.82	AV
7323	48.40	7.06	H	55.46	73.98	18.52	PK
7323	34.55	7.06	H	41.61	53.98	12.37	AV

Operation Mode: CH Mid( $\pi/4$ DQPSK)

Frequency [MHz]	Reading [dBuV]	※A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4882	48.35	0.23	V	48.58	73.98	25.40	PK
4882	34.87	0.23	V	35.10	53.98	18.88	AV
7323	48.39	7.06	V	55.45	73.98	18.53	PK
7323	34.48	7.06	V	41.54	53.98	12.44	AV
4882	48.45	0.23	H	48.68	73.98	25.30	PK
4882	34.94	0.23	H	35.17	53.98	18.81	AV
7323	48.43	7.06	H	55.49	73.98	18.49	PK
7323	34.56	7.06	H	41.62	53.98	12.36	AV

※ A·F: ANTENNA FACTOR  
 C·L: CABLE LOSS  
 AMP GAIN: AMPLIFIER GAIN

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
  - a. Peak Setting 1 GHz – 25 GHz, RBW = 1 MHz, VBW = 3 MHz.
  - b. Average Setting 1 GHz – 25 GHz, RBW = 1 MHz, VBW  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.  
 We performed using a reduced video BW method was done with the analyzer in linear mode.
6. FYI : Duty Cycle Correction Factor (79 channel hopping)
  - a. Time to cycle through all channels=  $\Delta t = \tau$  [ms] x 79 channels = 229.100 ms, where  $\tau$  = pulse width
  - b.  $100 \text{ ms} / \Delta t$  [ms] =  $H \rightarrow$  Round up to next highest integer,  $H' = 1$
  - c. Worst Case Dwell Time =  $\tau$  [ms] x  $H' = 2.900$  ms
  - d. Duty Cycle Correction =  $20 \log (\text{Worst Case Dwell Time} / 100\text{ms}) \text{ dB} = -30.752 \text{ dB}$
7. Duty Cycle Correction Factor (AFH mode – minimum channel number case - 20 channels)
  - a. Time to cycle through all channels=  $\Delta t = \tau$  [ms] x 20 channels = 58.00 ms, where  $\tau$  = pulse width
  - b.  $100 \text{ ms} / \Delta t$  [ms] =  $H \rightarrow$  Round up to next highest integer,  $H' = 2$
  - c. Worst Case Dwell Time =  $\tau$  [ms] x  $H' = 5.800$  ms

- d. Duty Cycle Correction(AFH) =  $20\log(\text{Worst Case Dwell Time}/ 100\text{ms}) \text{ dB} = -24.7314 \text{ dB}$
- e. We applied DCCF in the test result which hopping channel number is 20.
- 8. We have done Normal Mode and EDR Mode test.
- 9. This test is performed with hopping off.
- 10. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode: CH High(GFSK)

Frequency [MHz]	Reading [dBuV]	*A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	48.19	0.98	V	49.17	73.98	24.81	PK
4960	34.31	0.98	V	35.29	53.98	18.69	AV
7440	48.88	7.69	V	56.57	73.98	17.41	PK
7440	34.97	7.69	V	42.66	53.98	11.32	AV
4960	48.24	0.98	H	49.22	73.98	24.76	PK
4960	34.36	0.98	H	35.34	53.98	18.64	AV
7440	49.07	7.69	H	56.76	73.98	17.22	PK
7440	35.06	7.69	H	42.75	53.98	11.23	AV

Operation Mode: CH High(8DPSK)

Frequency [MHz]	Reading [dBuV]	*A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	48.15	0.98	V	49.13	73.98	24.85	PK
4960	34.26	0.98	V	35.24	53.98	18.74	AV
7440	48.83	7.69	V	56.52	73.98	17.46	PK
7440	34.92	7.69	V	42.61	53.98	11.37	AV
4960	48.15	0.98	H	49.13	73.98	24.85	PK
4960	34.31	0.98	H	35.29	53.98	18.69	AV
7440	49.17	7.69	H	56.86	73.98	17.12	PK
7440	35.00	7.69	H	42.69	53.98	11.29	AV

Operation Mode: CH High ( $\pi/4$ DQPSK)

Frequency [MHz]	Reading [dBuV]	※A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	48.16	0.98	V	49.14	73.98	24.84	PK
4960	34.27	0.98	V	35.25	53.98	18.73	AV
7440	48.82	7.69	V	56.51	73.98	17.47	PK
7440	34.94	7.69	V	42.63	53.98	11.35	AV
4960	48.17	0.98	H	49.15	73.98	24.83	PK
4960	34.32	0.98	H	35.3	53.98	18.68	AV
7440	49.34	7.69	H	57.03	73.98	16.95	PK
7440	35.07	7.69	H	42.76	53.98	11.22	AV

※ A·F: ANTENNA FACTOR  
 C·L: CABLE LOSS  
 AMP GAIN: AMPLIFIER GAIN

## Notes:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
- Spectrum setting:
  - Peak Setting 1 GHz – 25 GHz, RBW = 1 MHz, VBW = 3 MHz.
  - Average Setting 1 GHz – 25 GHz, RBW = 1 MHz, VBW  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.  
We performed using a reduced video BW method was done with the analyzer in linear mode.
- FYI : Duty Cycle Correction Factor (79 channel hopping)
  - Time to cycle through all channels=  $\Delta t = \tau$  [ms] x 79 channels = 229.100 ms, where  $\tau$  = pulse width
  - $100 \text{ ms} / \Delta t$  [ms] =  $H \rightarrow$  Round up to next highest integer,  $H' = 1$
  - Worst Case Dwell Time =  $\tau$  [ms] x  $H' = 2.900$  ms
  - Duty Cycle Correction =  $20 \log (\text{Worst Case Dwell Time} / 100\text{ms}) \text{ dB} = -30.752 \text{ dB}$
- Duty Cycle Correction Factor (AFH mode – minimum channel number case - 20 channels)
  - Time to cycle through all channels=  $\Delta t = \tau$  [ms] x 20 channels = 58.00 ms, where  $\tau$  = pulse width
  - $100 \text{ ms} / \Delta t$  [ms] =  $H \rightarrow$  Round up to next highest integer,  $H' = 2$
  - Worst Case Dwell Time =  $\tau$  [ms] x  $H' = 5.800$  ms

d. Duty Cycle Correction(AFH) =  $20\log(\text{Worst Case Dwell Time}/ 100\text{ms})$  dB = -24.7314 dB

e. We applied DCCF in the test result which hopping channel number is 20.

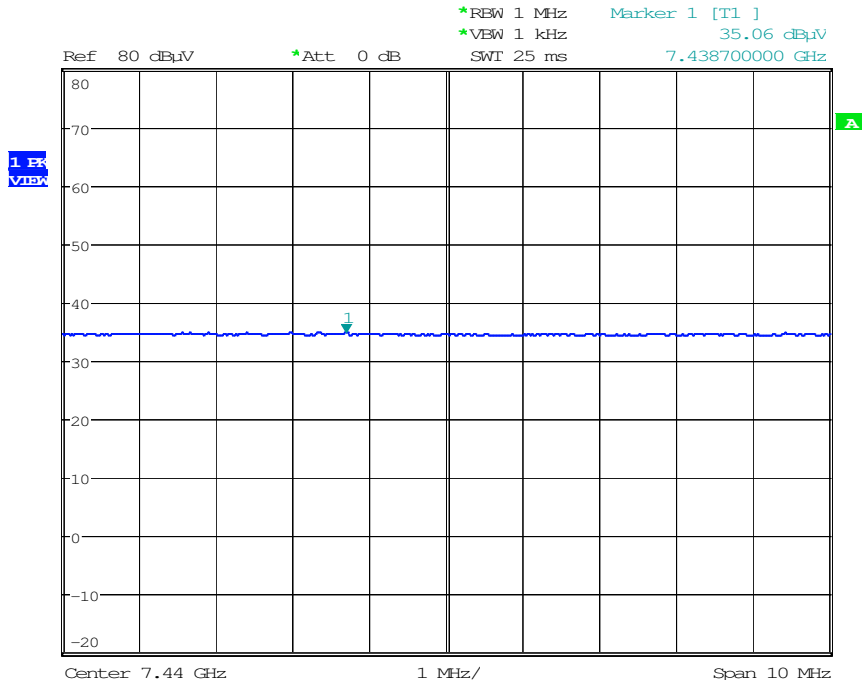
8. We have done Normal Mode and EDR Mode test.

9. This test is performed with hopping off.

10. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

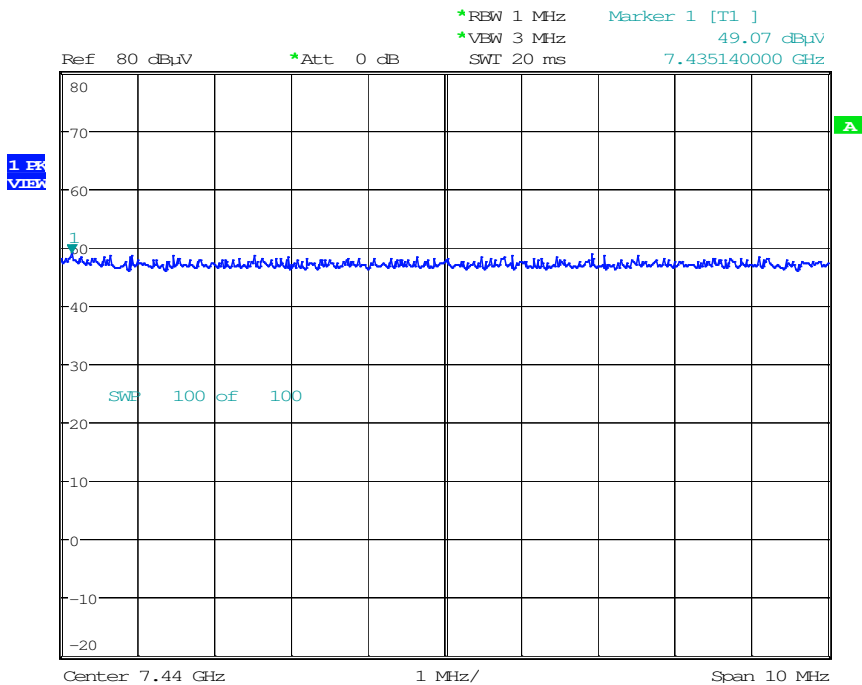
■ **RESULT PLOTS (Worst case : x-H)**

**Radiated Spurious Emissions plot – Average Reading (GFSK, Ch.78 3rd Harmonic)**



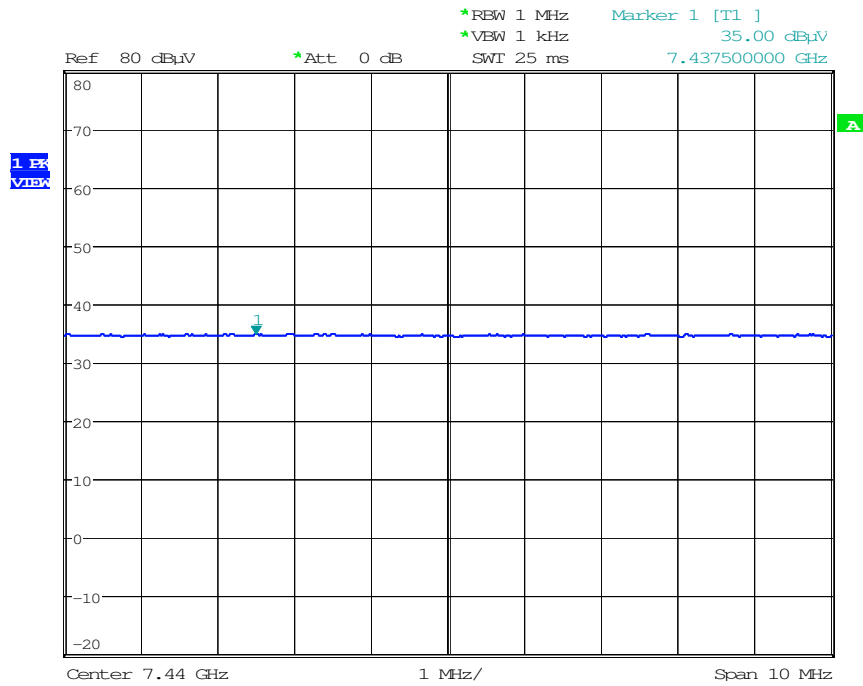
Date: 1.MAY.2016 13:45:09

**Radiated Spurious Emissions plot – Peak Reading (GFSK, Ch.78 3rd Harmonic)**



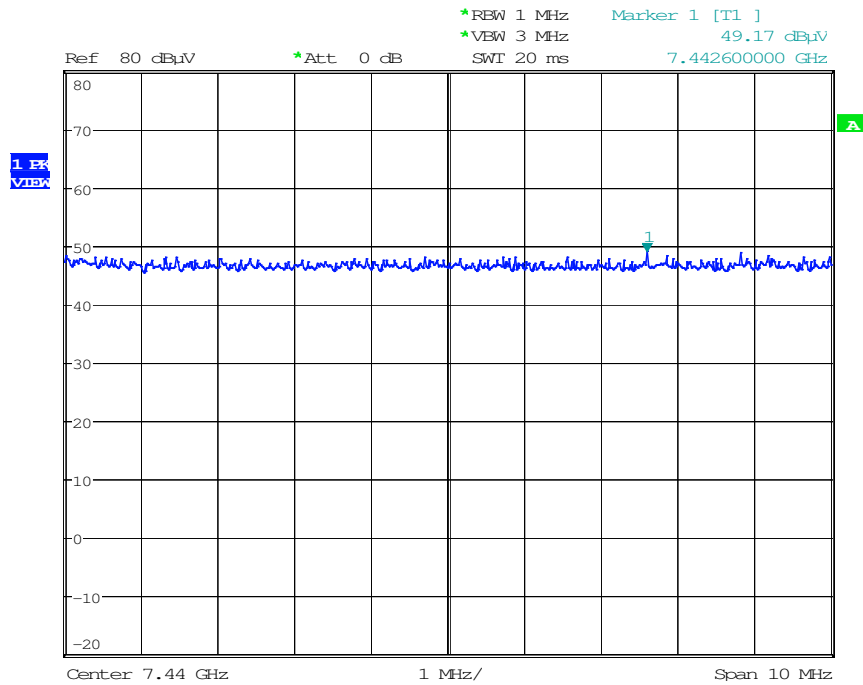
Date: 15.MAY.2016 13:51:43

**Radiated Spurious Emissions plot – Average Reading (8DPSK, Ch.78 3rd Harmonic)**



Date: 1.MAY.2016 13:46:28

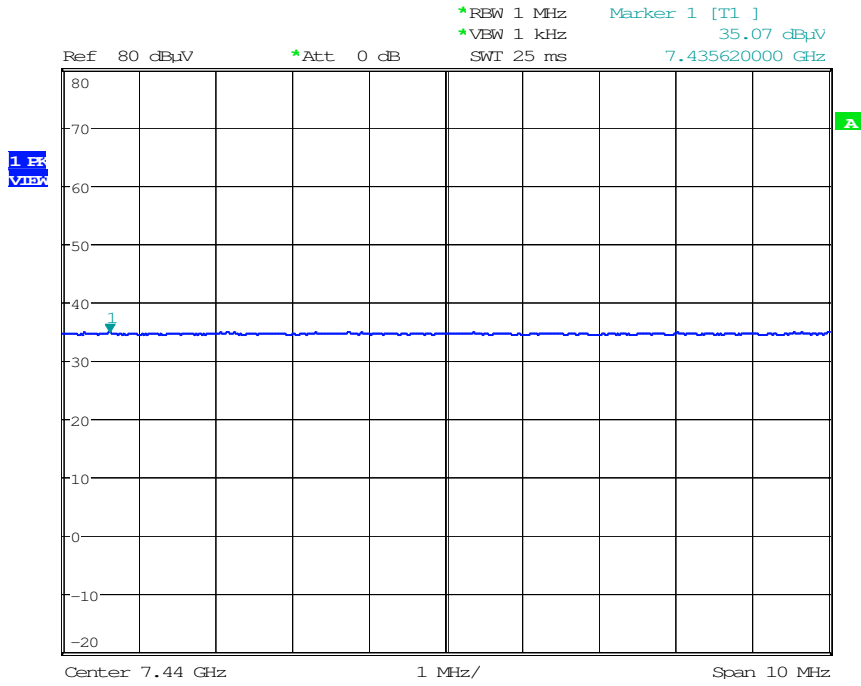
**Radiated Spurious Emissions plot – Peak Reading (8DPSK, Ch.78 3rd Harmonic)**



Date: 1.MAY.2016 13:46:51

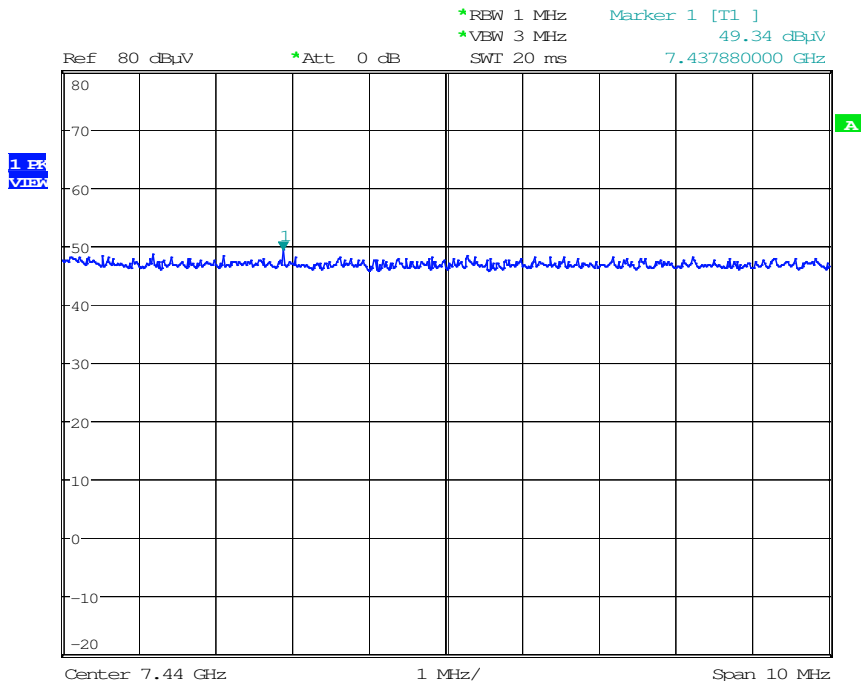


**Radiated Spurious Emissions plot – Average Reading ( $\pi/4$ DQPSK, Ch.78 3rd Harmonic)**



Date: 1.MAY.2016 13:45:55

**Radiated Spurious Emissions plot – Peak Reading ( $\pi/4$ DQPSK, Ch.78 3rd Harmonic)**



Date: 1.MAY.2016 13:47:09

### 9.6.3 RADIATED RESTRICTED BAND EDGES

#### Test Requirements and limit, §15.247(d), §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

Operation Mode	Normal(GFSK)
Operating Frequency	2402 MHz, 2480 MHz
Channel No	CH 0, CH 78

Frequency [MHz]	Reading dBuV	* A.F.+CL [dB]	Ant. Pol. [H/V]	Duty Cycle Correction [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	25.30	32.32	H	0	57.62	73.98	16.36	PK
2390.0	12.33	32.32	H	-24.73	19.92	53.98	34.06	AV
2390.0	25.22	32.32	V	0	57.54	73.98	16.44	PK
2390.0	12.25	32.32	V	-24.73	19.84	53.98	34.14	AV
2483.5	29.99	32.68	H	0	62.67	73.98	11.31	PK
2483.5	25.34	32.68	H	-24.73	33.29	53.98	20.69	AV
2483.5	30.53	32.68	V	0	63.21	73.98	10.77	PK
2483.5	26.96	32.68	V	-24.73	34.91	53.98	19.07	AV

Operation Mode EDR(8DPSK)  
 Operating Frequency 2402 MHz , 2480 MHz  
 Channel No CH 0, CH 78

Frequency [MHz]	Reading dBuV	* A.F.+CL [dB]	Ant. Pol. [H/V]	Duty Cycle Correction [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	25.28	32.32	H	0	57.60	73.98	16.38	PK
2390.0	12.26	32.32	H	-24.73	19.85	53.98	34.13	AV
2390.0	25.18	32.32	V	0	57.50	73.98	16.48	PK
2390.0	12.21	32.32	V	-24.73	19.80	53.98	34.18	AV
2483.5	28.08	32.68	H	0	60.76	73.98	13.22	PK
2483.5	22.57	32.68	H	-24.73	30.52	53.98	23.46	AV
2483.5	30.21	32.68	V	0	62.89	73.98	11.09	PK
2483.5	24.36	32.68	V	-24.73	32.31	53.98	21.67	AV

Operation Mode EDR( $\pi$ /4DQPSK)  
 Operating Frequency 2402 MHz , 2480 MHz  
 Channel No CH 0, CH 78

Frequency [MHz]	Reading dBuV	* A.F.+CL [dB]	Ant. Pol. [H/V]	Duty Cycle Correction [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	25.24	32.32	H	0	57.56	73.98	16.42	PK
2390.0	12.24	32.32	H	-24.73	19.83	53.98	34.15	AV
2390.0	25.20	32.32	V	0	57.52	73.98	16.46	PK
2390.0	12.24	32.32	V	-24.73	19.83	53.98	34.15	AV
2483.5	28.11	32.68	H	0	60.79	73.98	13.19	PK
2483.5	22.45	32.68	H	-24.73	30.40	53.98	23.58	AV
2483.5	30.84	32.68	V	0	63.52	73.98	10.46	PK
2483.5	24.34	32.68	V	-24.73	32.29	53.98	21.69	AV

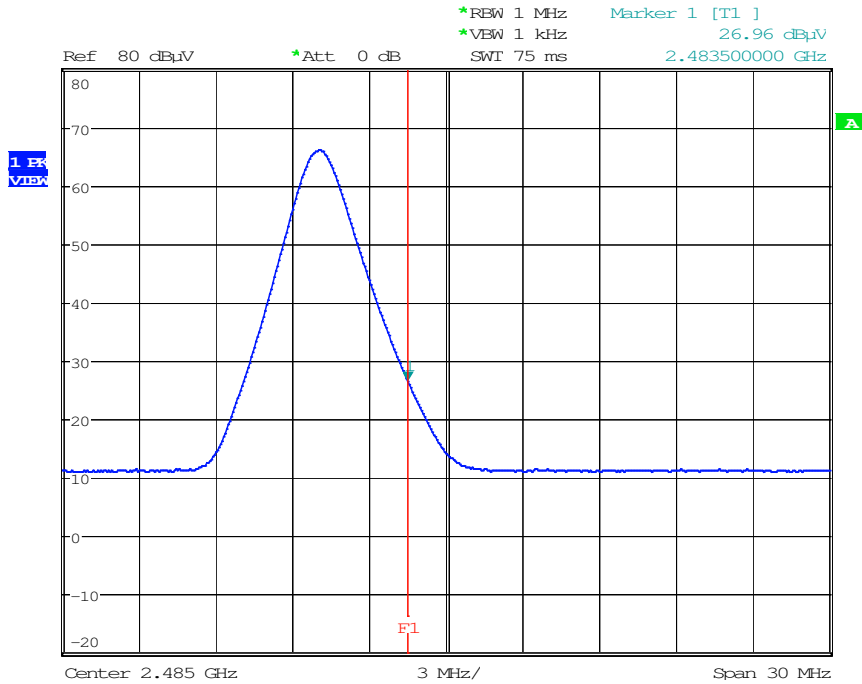
\* A:F: ANTENNA FACTOR  
 C:L: CABLE LOSS  
 AMP GAIN: AMPLIFIER GAIN

**Notes:**

1. Frequency range of measurement = 2483.5 MHz ~ 2500 MHz
2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Correction Factor
3. Spectrum setting:
  - a. Peak Setting 1 GHz – 25 GHz, RBW = 1 MHz, VBW = 3 MHz.
  - b. Average Setting 1 GHz – 25 GHz, RBW = 1 MHz, VBW  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.  
We performed using a reduced video BW method was done with the analyzer in linear mode.
4. FYI : Duty Cycle Correction Factor (79 channel hopping)
  - a. Time to cycle through all channels=  $\Delta t = \tau$  [ms] x 79 channels = 229.100 ms, where  $\tau$  = pulse width
  - b.  $100 \text{ ms} / \Delta t$  [ms] =  $H \rightarrow$  Round up to next highest integer,  $H' = 1$
  - c. Worst Case Dwell Time =  $\tau$  [ms] x  $H' = 2.900$  ms
  - d. Duty Cycle Correction =  $20\log(\text{Worst Case Dwell Time} / 100\text{ms})$  dB = -30.752 dB
5. Duty Cycle Correction Factor(AFH mode – minimum channel number case - 20 channels)
  - a. Time to cycle through all channels=  $\Delta t = \tau$  [ms] x 20 channels = 58.00 ms, where  $\tau$  = pulse width
  - b.  $100 \text{ ms} / \Delta t$  [ms] =  $H \rightarrow$  Round up to next highest integer,  $H' = 2$
  - c. Worst Case Dwell Time =  $\tau$  [ms] x  $H' = 5.800$  ms
  - d. Duty Cycle Correction(AFH) =  $20\log(\text{Worst Case Dwell Time} / 100\text{ms})$  dB = -24.7314 dB
  - e. We applied DCCF in the test result which hopping channel number is 20.
6. We have done Normal Mode, EDR Mode.
7. This test is performed with hopping off.
8. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

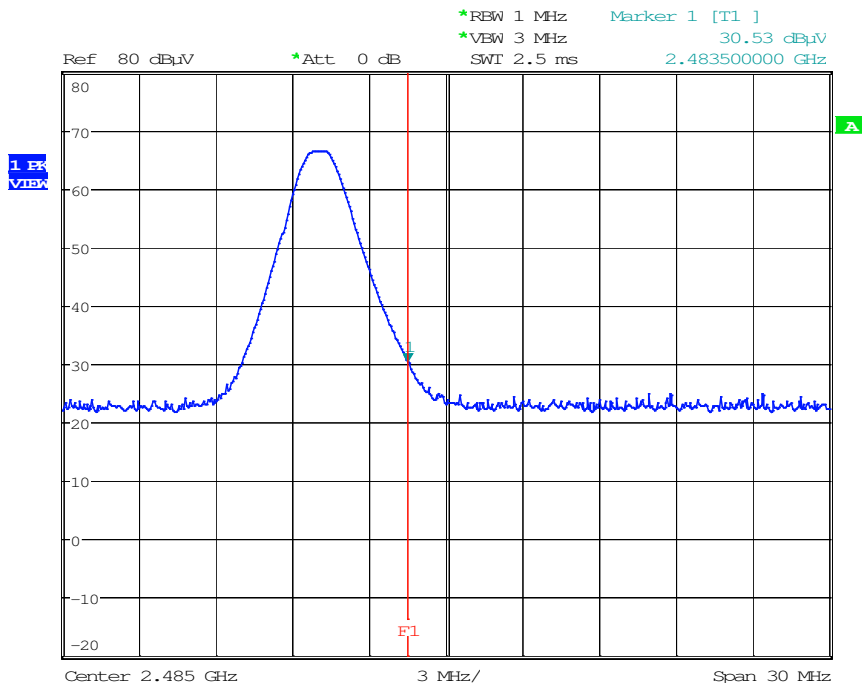
▣ **RESULT PLOTS (Worst case : z-V)**

**Radiated Restricted Band Edges plot – Average Reading (GFSK, Ch.78)**



Date: 1.MAY.2016 09:42:49

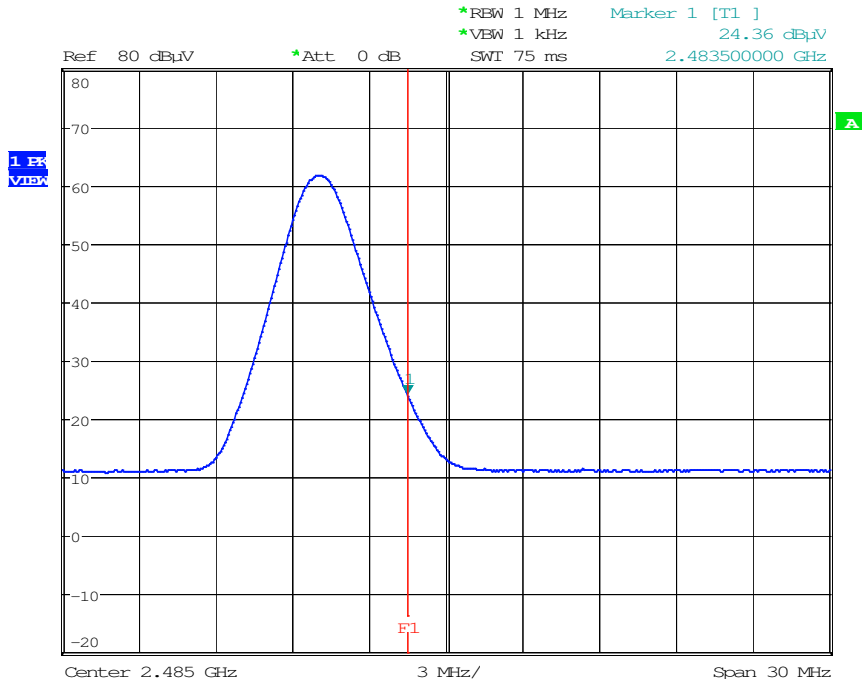
**Radiated Restricted Band Edges plot – Peak Reading (GFSK, Ch.78)**



Date: 1.MAY.2016 09:42:20

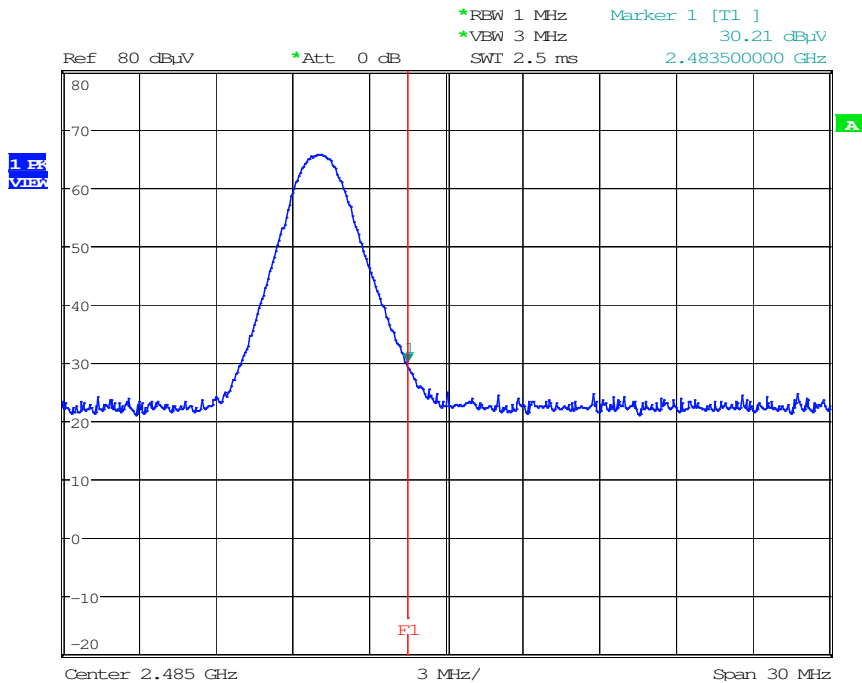
**Note : Only the worst case plots for Radiated Restricted Band Edges.**

**Radiated Restricted Band Edges plot – Average Reading (8DPSK, Ch.78)**



Date: 1.MAY.2016 09:40:41

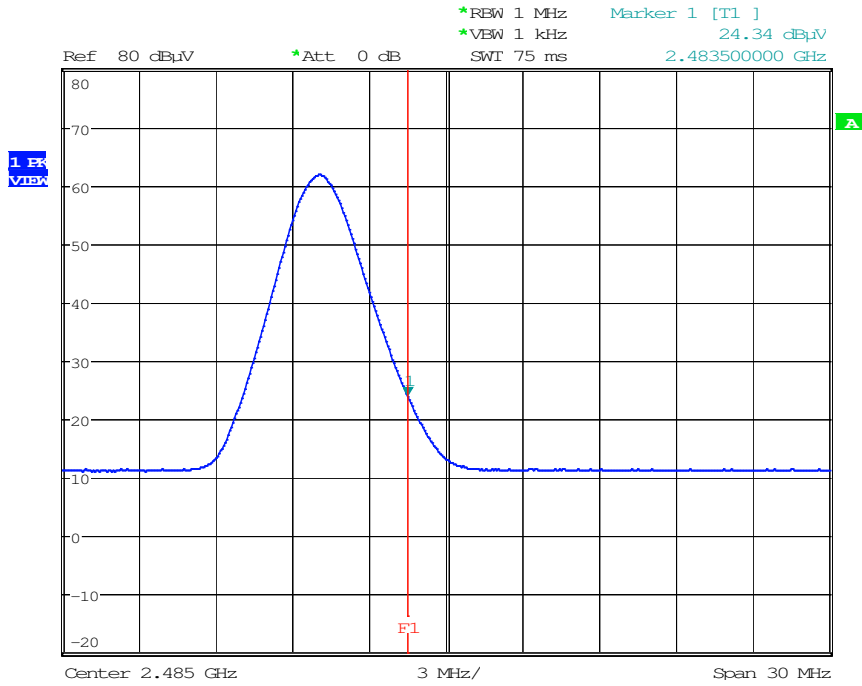
**Radiated Restricted Band Edges plot – Peak Reading (8DPSK, Ch.78)**



Date: 1.MAY.2016 09:41:07

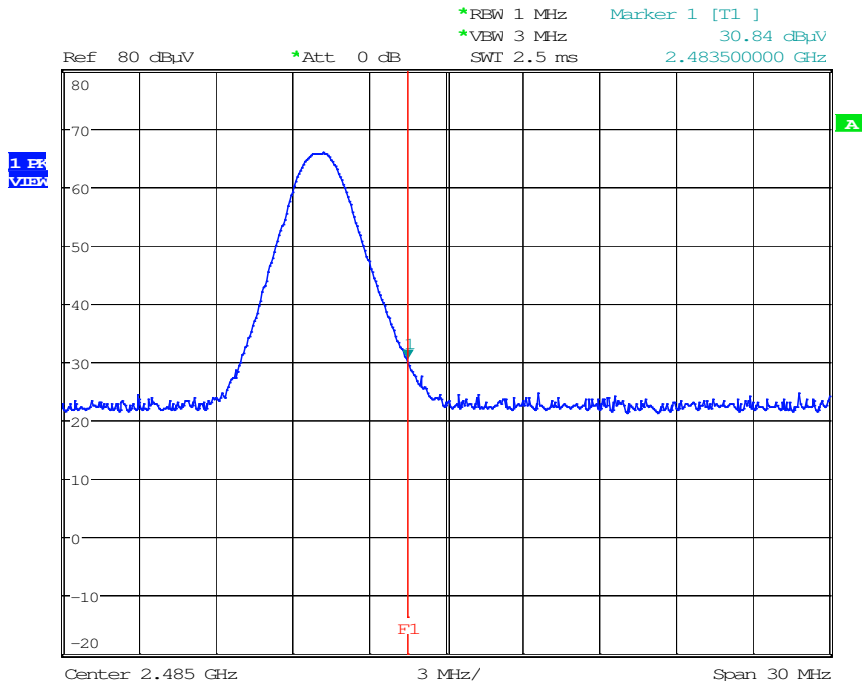
**Note : Only the worst case plots for Radiated Restricted Band Edges.**

**Radiated Restricted Band Edges plot – Average Reading ( $\pi/4$ DQPSK, Ch.78)**



Date: 1.MAY.2016 09:40:17

**Radiated Restricted Band Edges plot – Peak Reading ( $\pi/4$ DQPSK, Ch.78)**



Date: 1.MAY.2016 09:41:39

**Note : Only the worst case plots for Radiated Restricted Band Edges.**

## 9.7 POWERLINE CONDUCTED EMISSIONS

### LIMIT

For an intentional radiator which 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 250 microvolt (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

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.

### Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

### Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor



**RESULT PLOTS**

**Conducted Emissions (Line 1)**

BT MODE N

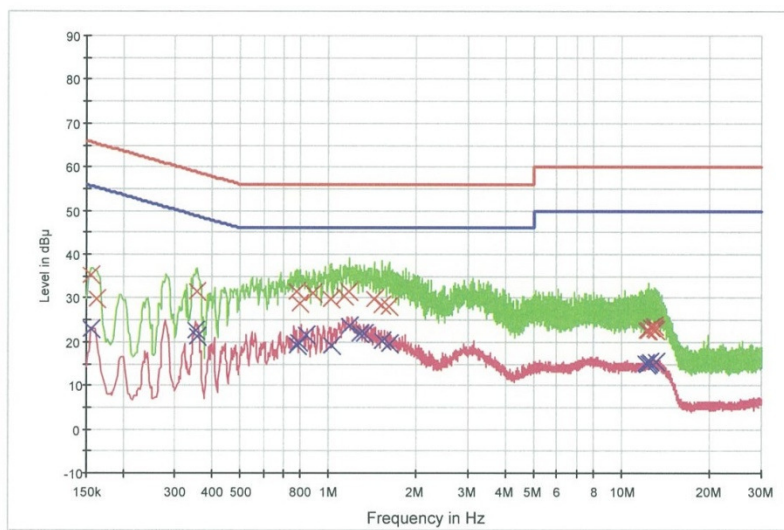
1 / 2

**HCT TEST Report**

**Common Information**

EUT: LG-K240H  
 Manufacturer: LG  
 Test Site: SHIELD ROOM  
 Operating Conditions: BT MODE

FCC CLASS B



— FCC CLASS B\_QP     — FCC CLASS B\_AV     — Preview Result 1-PK+  
— Preview Result 2-AVG     x Final Result 1-QPK     x Final Result 2-CAV

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.156000	35.2	9.000	Off	N	9.6	30.5	65.7
0.162000	30.0	9.000	Off	N	9.6	35.4	65.4
0.356000	31.4	9.000	Off	N	9.6	27.4	58.8
0.782000	31.3	9.000	Off	N	9.7	24.7	56.0
0.796000	28.7	9.000	Off	N	9.7	27.3	56.0
0.892000	31.1	9.000	Off	N	9.7	24.9	56.0
1.016000	29.7	9.000	Off	N	9.7	26.3	56.0
1.136000	30.3	9.000	Off	N	9.7	25.7	56.0
1.172000	31.4	9.000	Off	N	9.7	24.6	56.0
1.426000	29.7	9.000	Off	N	9.7	26.3	56.0
1.524000	28.5	9.000	Off	N	9.7	27.5	56.0
1.604000	28.0	9.000	Off	N	9.7	28.0	56.0
12.166000	22.7	9.000	Off	N	10.1	37.3	60.0
12.392000	22.6	9.000	Off	N	10.1	37.4	60.0
12.672000	23.2	9.000	Off	N	10.1	36.8	60.0
12.850000	23.1	9.000	Off	N	10.1	36.9	60.0
12.854000	23.6	9.000	Off	N	10.1	36.4	60.0
13.060000	22.8	9.000	Off	N	10.1	37.2	60.0

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BT MODE N

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**Final Result 2**

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.156000	23.1	9.000	Off	N	9.6	32.6	55.7
0.354000	22.6	9.000	Off	N	9.6	26.3	48.9
0.358000	21.3	9.000	Off	N	9.6	27.5	48.8
0.782000	19.2	9.000	Off	N	9.7	26.8	46.0
0.794000	19.9	9.000	Off	N	9.7	26.1	46.0
0.842000	21.7	9.000	Off	N	9.7	24.3	46.0
1.016000	19.3	9.000	Off	N	9.7	26.7	46.0
1.172000	23.7	9.000	Off	N	9.7	22.3	46.0
1.282000	22.1	9.000	Off	N	9.7	23.9	46.0
1.326000	22.1	9.000	Off	N	9.7	23.9	46.0
1.524000	20.4	9.000	Off	N	9.7	25.6	46.0
1.604000	19.7	9.000	Off	N	9.7	26.3	46.0
12.092000	15.0	9.000	Off	N	10.1	35.0	50.0
12.164000	15.0	9.000	Off	N	10.1	35.0	50.0
12.296000	15.3	9.000	Off	N	10.1	34.7	50.0
12.466000	15.4	9.000	Off	N	10.1	34.6	50.0
13.016000	15.5	9.000	Off	N	10.1	34.5	50.0
13.060000	15.5	9.000	Off	N	10.1	34.5	50.0

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**Conducted Emissions (Line 2)**

BT MODE L1

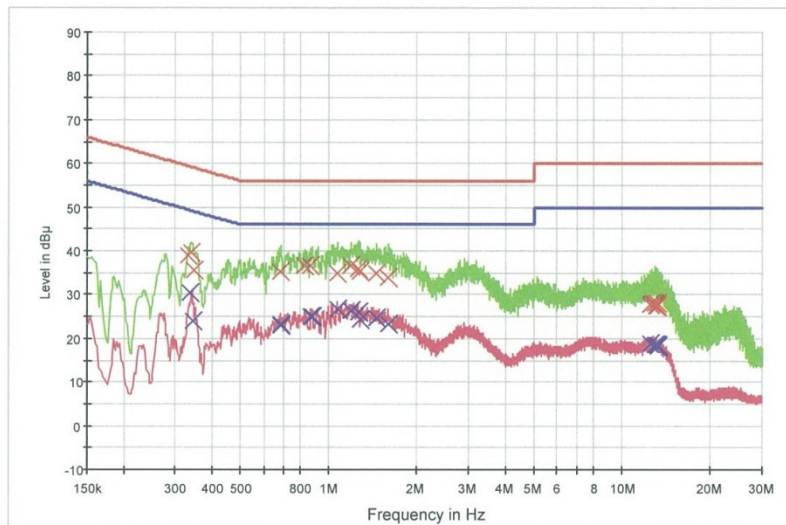
1 / 2

**HCT TEST Report**

**Common Information**

EUT: LG-K240H  
 Manufacturer: LG  
 Test Site: SHIELD ROOM  
 Operating Conditions: BT MODE

FCC CLASS B



— FCC CLASS B\_QP      — FCC CLASS B\_AV      — Preview Result 1-PK+  
 — Preview Result 2-AVG      × Final Result 1-QPK      × Final Result 2-CAV

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.334000	38.9	9.000	Off	L1	9.6	20.5	59.4
0.340000	39.8	9.000	Off	L1	9.6	19.4	59.2
0.348000	35.5	9.000	Off	L1	9.6	23.5	59.0
0.686000	35.2	9.000	Off	L1	9.7	20.8	56.0
0.830000	36.5	9.000	Off	L1	9.7	19.5	56.0
0.870000	36.6	9.000	Off	L1	9.7	19.4	56.0
1.072000	35.0	9.000	Off	L1	9.7	21.0	56.0
1.192000	36.7	9.000	Off	L1	9.7	19.3	56.0
1.260000	35.9	9.000	Off	L1	9.7	20.1	56.0
1.268000	35.3	9.000	Off	L1	9.7	20.7	56.0
1.456000	34.9	9.000	Off	L1	9.7	21.1	56.0
1.600000	33.9	9.000	Off	L1	9.7	22.1	56.0
12.502000	27.9	9.000	Off	L1	10.1	32.1	60.0
12.688000	28.0	9.000	Off	L1	10.1	32.0	60.0
12.912000	27.9	9.000	Off	L1	10.1	32.1	60.0
13.136000	27.6	9.000	Off	L1	10.1	32.4	60.0
13.174000	27.9	9.000	Off	L1	10.1	32.1	60.0
13.190000	27.2	9.000	Off	L1	10.1	32.8	60.0

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BT MODE L1

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**Final Result 2**

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.336000	30.3	9.000	Off	L1	9.6	19.0	49.3
0.344000	24.2	9.000	Off	L1	9.6	24.9	49.1
0.684000	23.2	9.000	Off	L1	9.7	22.8	46.0
0.688000	23.1	9.000	Off	L1	9.7	22.9	46.0
0.872000	25.0	9.000	Off	L1	9.7	21.0	46.0
0.880000	25.1	9.000	Off	L1	9.7	21.0	46.0
1.070000	26.9	9.000	Off	L1	9.7	19.1	46.0
1.192000	26.3	9.000	Off	L1	9.7	19.7	46.0
1.260000	25.9	9.000	Off	L1	9.7	20.1	46.0
1.268000	24.4	9.000	Off	L1	9.7	21.6	46.0
1.450000	24.5	9.000	Off	L1	9.7	21.5	46.0
1.600000	23.2	9.000	Off	L1	9.7	22.8	46.0
12.502000	18.9	9.000	Off	L1	10.1	31.1	50.0
12.912000	18.7	9.000	Off	L1	10.1	31.3	50.0
13.136000	18.5	9.000	Off	L1	10.1	31.5	50.0
13.166000	18.6	9.000	Off	L1	10.1	31.4	50.0
13.174000	18.5	9.000	Off	L1	10.1	31.5	50.0
13.230000	18.3	9.000	Off	L1	10.1	31.7	50.0

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Note : The Worst case of Conducted Emission is standalone mode.

## 10. LIST OF TEST EQUIPMENT

### 10.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216/ LISN	12/28/2015	Annual	100073
Rohde & Schwarz	ESCI / TEST RECEIVER	12/28/2015	Annual	100584
Agilent	E4440A/ Spectrum Analyzer	03/18/2016	Annual	US45303008
Agilent	N9020A / SIGNAL ANALYZER	06/30/2015	Annual	MY51110085
Agilent	N9030A / SIGNAL ANALYZER	11/24/2015	Annual	MY49431210
Agilent	N1911A/Power Meter	07/09/2015	Annual	MY45100523
Agilent	N1921A /Power Sensor	03/11/2016	Annual	MY52260025
Agilent	87300B/Directional Coupler	11/30/2015	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	06/15/2015	Annual	5001
Hewlett Packard	E3632A / DC POWER SUPPLY	03/09/2016	Annual	KR75303962
Agilent	8493C / Attenuator(10 dB)	07/23/2015	Annual	07560
Rohde & Schwarz	CBT / BLUETOOTH TESTER	03/10/2016	Annual	100808

## 10.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/15/2015	Biennial	255
Audix	ACT-A400 / Antenna Master	N/A	N/A	N/A
Audix	ACT-T150 / Turn Table	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	C060518
CERNEX	CBL18265035 / POWER AMP	07/27/2015	Annual	22966
Schwarzbeck	BBHA 9120D / Horn Antenna	07/31/2015	Biennial	1151
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	09/03/2015	Biennial	BBHA9170541
Rohde & Schwarz	FSP / Spectrum Analyzer	01/15/2016	Annual	839117/011
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/23/2015	Annual	101068-SZ
Wainwright Instruments	F6_HPF 3.0 / High Pass Filter	09/11/2015	Annual	F6
Wainwright Instruments	WRCJV2400/2483.5-2370/2520- 60/12SS / Band Reject Filter	07/06/2015	Annual	2
Rohde & Schwarz	LOOP ANTENNA	02/23/2016	Biennial	1513-175
Agilent	8493C-10 / Attenuator(10 dB)	08/20/2015	Annual	76649
CERNEX	CBL06185030 / POWER AMP	07/21/2015	Annual	22965
CERNEX	CBLU1183540 / POWER AMP	07/21/2015	Annual	22964
CERNEX	CBL26405040 / Power Amplifier	07/09/2015	Annual	25956
TESCOM	TC-3000C / Bluetooth Tester	04/01/2016	Annual	3000C000276