9.6.2 RADIATED SPURIOUS EMISSIONS

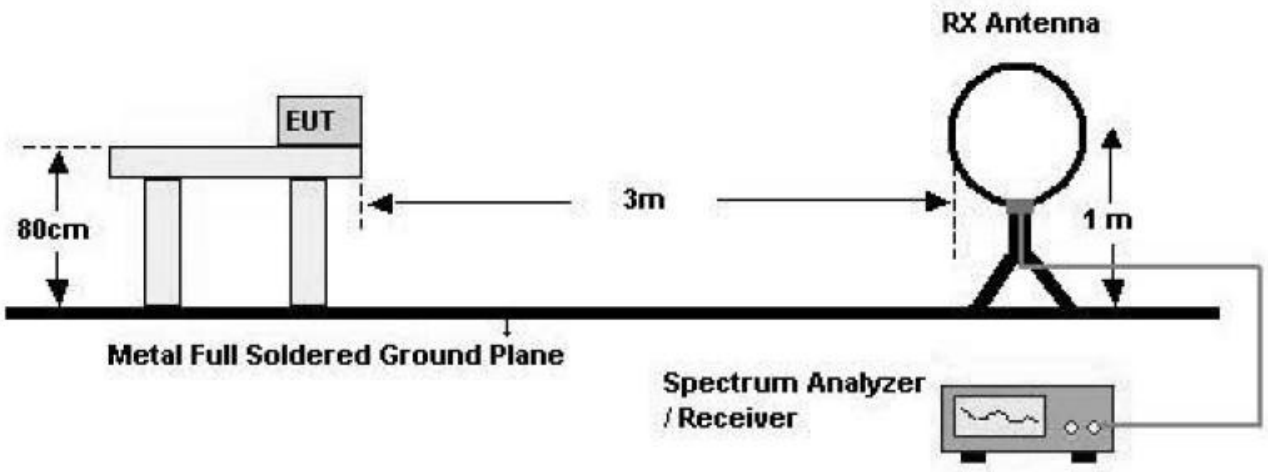
LIMIT : §15.247(d), §15.205, §15.209

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.

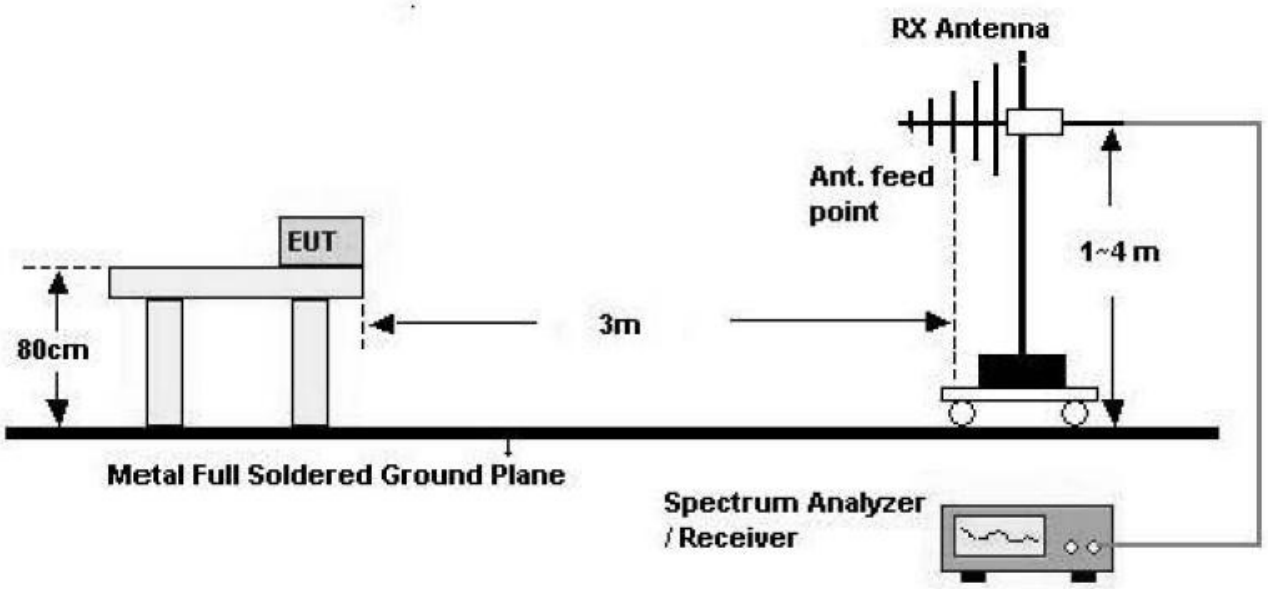
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

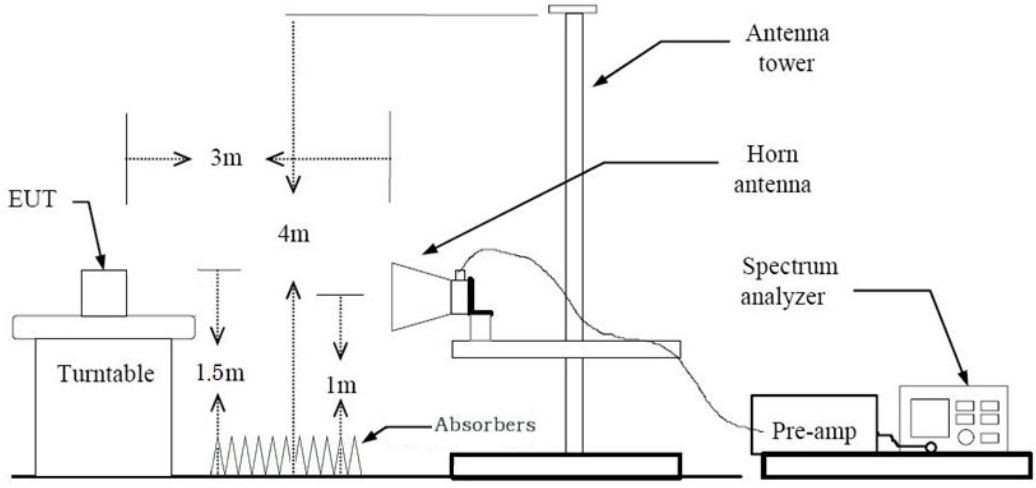
Below 30 MHz



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 ≥3*RBW
   b. Average: 1 GHz – 25 GHz, RBW = 1 MHz, VBW ≥ 1/τ Hz, where τ = 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_{on} (ms)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
GFSK	2.880	347	1000
π/4DQPSK	2.880	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	48.74	-2.96	V	45.78	73.98	28.20	PK
4804	35.58	-2.96	V	32.62	53.98	21.36	AV
7206	45.24	6.88	V	52.12	73.98	21.86	PK
7206	31.69	6.88	V	38.57	53.98	15.41	AV
4804	49.98	-2.96	H	47.02	73.98	26.96	PK
4804	35.73	-2.96	H	32.77	53.98	21.21	AV
7206	45.55	6.88	H	52.43	73.98	21.55	PK
7206	31.85	6.88	H	38.73	53.98	15.25	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	48.40	-2.96	V	45.44	73.98	28.54	PK
4804	35.23	-2.96	V	32.27	53.98	21.71	AV
7206	45.39	6.88	V	52.27	73.98	21.71	PK
7206	31.72	6.88	V	38.6	53.98	15.38	AV
4804	49.28	-2.96	H	46.32	73.98	27.66	PK
4804	35.49	-2.96	H	32.53	53.98	21.45	AV
7206	45.46	6.88	H	52.34	73.98	21.64	PK
7206	31.77	6.88	H	38.65	53.98	15.33	AV

Operation Mode: CH Low(π/4DQPSK)

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	49.15	-2.96	V	46.19	73.98	27.79	PK
4804	35.30	-2.96	V	32.34	53.98	21.64	AV
7206	45.71	6.88	V	52.59	73.98	21.39	PK
7206	31.82	6.88	V	38.7	53.98	15.28	AV
4804	49.80	-2.96	H	46.84	73.98	27.14	PK
4804	35.45	-2.96	H	32.49	53.98	21.49	AV
7206	45.67	6.88	H	52.55	73.98	21.43	PK
7206	31.80	6.88	H	38.68	53.98	15.30	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 ≥ 1/τ Hz, where τ = 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= Δ t= τ [ms] x 79 channels = 229.100 ms, where τ = pulse width
   b. 100 ms/ Δt [ms] = *H* → Round up to next highest integer, *H ' =1*
   c. Worst Case Dwell Time = τ [ms] x *H '* = 2.900 ms
   d. Duty Cycle Correction = 20log (Worst Case Dwell Time/ 100ms) dB = -30.752 dB
7. Duty Cycle Correction Factor(AFH mode – minimum channel number case - 20 channels)
   a. Time to cycle through all channels= Δ t= τ [ms] x 20 channels = 58.00 ms, where τ = pulse width
   b. 100 ms/ Δt [ms] = *H* → Round up to next highest integer, *H ' = 2*
   c. Worst Case Dwell Time = τ [ms] x *H '* = 5.800 ms
   d. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) 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.

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	50.49	-2.60	V	47.89	73.98	26.09	PK
4882	37.33	-2.60	V	34.73	53.98	19.25	AV
7323	46.17	6.11	V	52.28	73.98	21.70	PK
7323	32.33	6.11	V	38.44	53.98	15.54	AV
4882	50.78	-2.60	H	48.18	73.98	25.80	PK
4882	37.47	-2.60	H	34.87	53.98	19.11	AV
7323	46.42	6.11	H	52.53	73.98	21.45	PK
7323	32.41	6.11	H	38.52	53.98	15.46	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	49.85	-2.60	V	47.25	73.98	26.73	PK
4882	36.17	-2.60	V	33.57	53.98	20.41	AV
7323	46.19	6.11	V	52.30	73.98	21.68	PK
7323	32.28	6.11	V	38.39	53.98	15.59	AV
4882	50.58	-2.60	H	47.98	73.98	26.00	PK
4882	36.24	-2.60	H	33.64	53.98	20.34	AV
7323	46.54	6.11	H	52.65	73.98	21.33	PK
7323	32.41	6.11	H	38.52	53.98	15.46	AV

Operation Mode: CH Mid(π/4DQPSK)

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	50.27	-2.60	V	47.67	73.98	26.31	PK
4882	36.14	-2.60	V	33.54	53.98	20.44	AV
7323	46.28	6.11	V	52.39	73.98	21.59	PK
7323	32.33	6.11	V	38.44	53.98	15.54	AV
4882	50.49	-2.60	H	47.89	73.98	26.09	PK
4882	36.21	-2.60	H	33.61	53.98	20.37	AV
7323	46.37	6.11	H	52.48	73.98	21.50	PK
7323	32.35	6.11	H	38.46	53.98	15.52	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 ≥ 1/τ Hz, where τ = 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= Δ t= τ [ms] x 79 channels = 229.100 ms, where τ = pulse width
   b. 100 ms/ Δt [ms] = *H* → Round up to next highest integer, *H ' =1*
   c. Worst Case Dwell Time = τ [ms] x *H '* = 2.900 ms
   d. Duty Cycle Correction = 20log (Worst Case Dwell Time/ 100ms) dB = -30.752 dB
7. Duty Cycle Correction Factor(AFH mode – minimum channel number case - 20 channels)
   a. Time to cycle through all channels= Δ t= τ [ms] x 20 channels = 58.00 ms, where τ = pulse width
   b. 100 ms/ Δt [ms] = *H* → Round up to next highest integer, *H ' = 2*
   c. Worst Case Dwell Time = τ [ms] x *H '* = 5.800 ms
   d. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) 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.

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	50.52	-2.53	V	47.99	73.98	25.99	PK
4960	39.29	-2.53	V	36.76	53.98	17.22	AV
7440	46.22	5.73	V	51.95	73.98	22.03	PK
7440	32.15	5.73	V	37.88	53.98	16.10	AV
4960	51.12	-2.53	H	48.59	73.98	25.39	PK
4960	39.65	-2.53	H	37.12	53.98	16.86	AV
7440	46.18	5.73	H	51.91	73.98	22.07	PK
7440	32.19	5.73	H	37.92	53.98	16.06	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	49.64	-2.53	V	47.11	73.98	26.87	PK
4960	36.32	-2.53	V	33.79	53.98	20.19	AV
7440	46.11	5.73	V	51.84	73.98	22.14	PK
7440	32.18	5.73	V	37.91	53.98	16.07	AV
4960	50.66	-2.53	H	48.13	73.98	25.85	PK
4960	36.51	-2.53	H	33.98	53.98	20.00	AV
7440	43.38	5.73	H	49.11	73.98	24.87	PK
7440	32.25	5.73	H	37.98	53.98	16.00	AV

Operation Mode: CH High (π/4DQPSK)

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	49.68	-2.53	V	47.15	73.98	26.83	PK
4960	36.52	-2.53	V	33.99	53.98	19.99	AV
7440	46.09	5.73	V	51.82	73.98	22.16	PK
7440	32.17	5.73	V	37.90	53.98	16.08	AV
4960	50.65	-2.53	H	48.12	73.98	25.86	PK
4960	36.61	-2.53	H	34.08	53.98	19.90	AV
7440	46.31	5.73	H	52.04	73.98	21.94	PK
7440	32.22	5.73	H	37.95	53.98	16.03	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 ≥ 1/τ Hz, where τ = 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= Δ t= τ [ms] x 79 channels = 229.100 ms, where τ = pulse width
   b. 100 ms/ Δt [ms] = *H* → Round up to next highest integer, *H ' =1*
   c. Worst Case Dwell Time = τ [ms] x *H '* = 2.900 ms
   d. Duty Cycle Correction = 20log (Worst Case Dwell Time/ 100ms) dB = -30.752 dB
7. Duty Cycle Correction Factor(AFH mode – minimum channel number case - 20 channels)
   a. Time to cycle through all channels= Δ t= τ [ms] x 20 channels = 58.00 ms, where τ = pulse width
   b. 100 ms/ Δt [ms] = *H* → Round up to next highest integer, *H ' = 2*
   c. Worst Case Dwell Time = τ [ms] x *H '* = 5.800 ms
   d. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) dB = -24.7314 dB

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

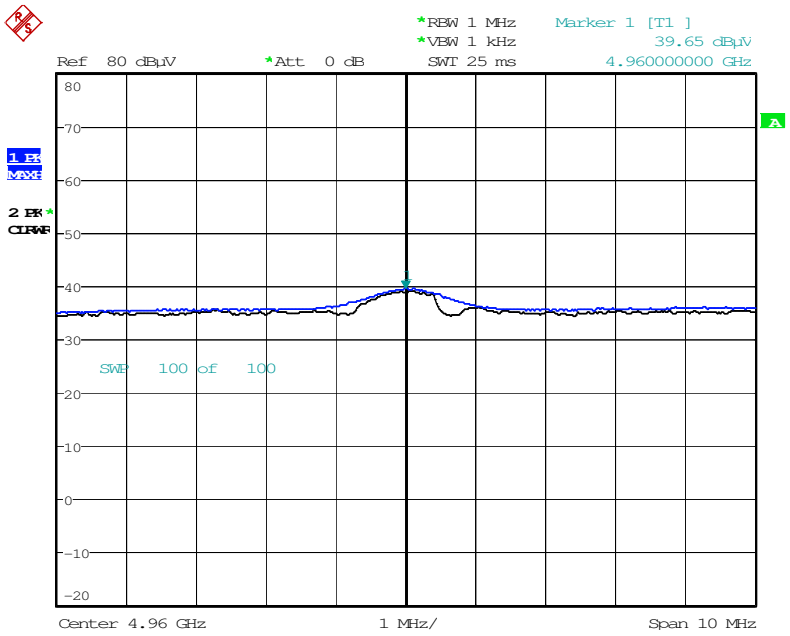
8. We have done Normal Mode and EDR Mode test.

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.

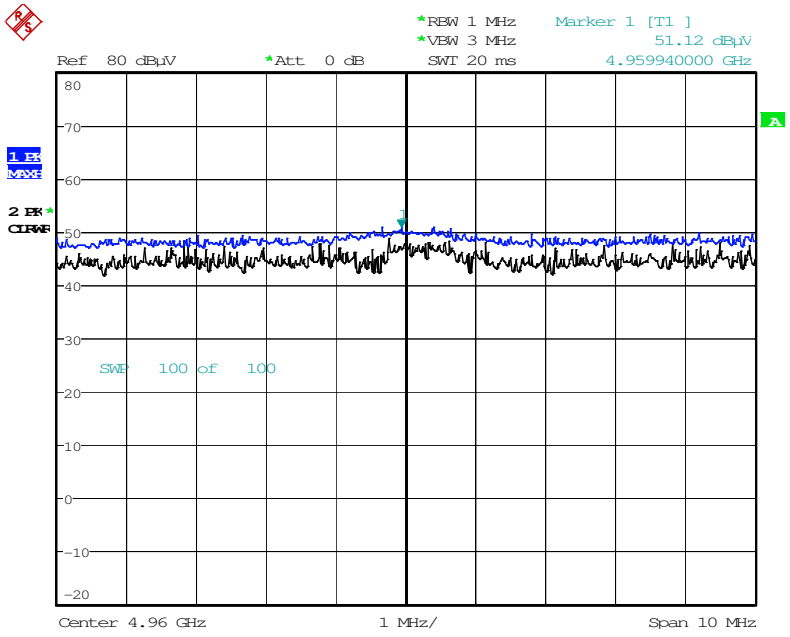
▣ RESULT PLOTS (Worst case : z-H)

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



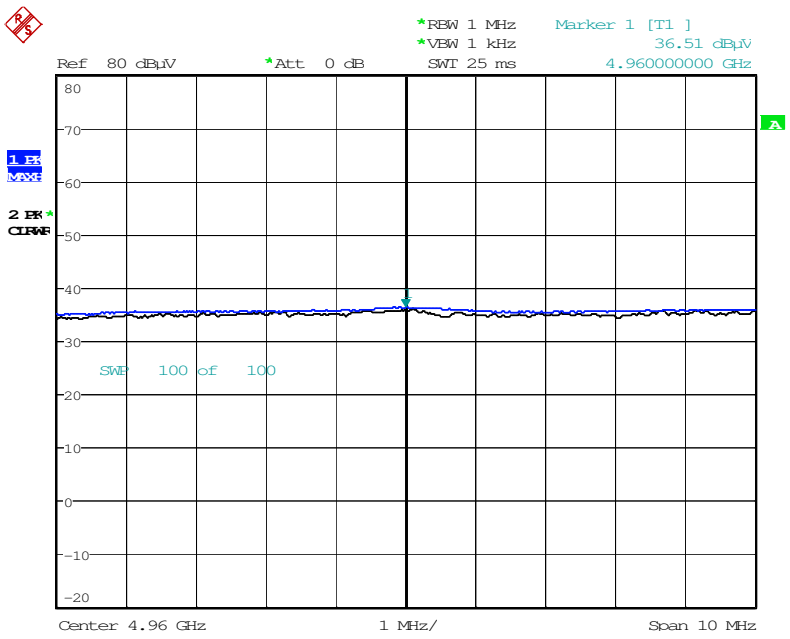
Date: 4.MAY.2016 14:24:31

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



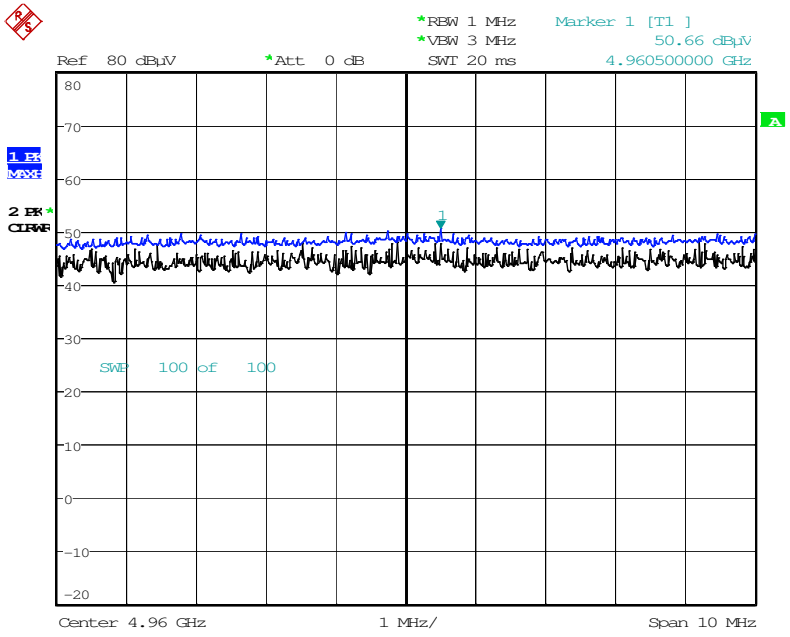
Date: 4.MAY.2016 14:25:05

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



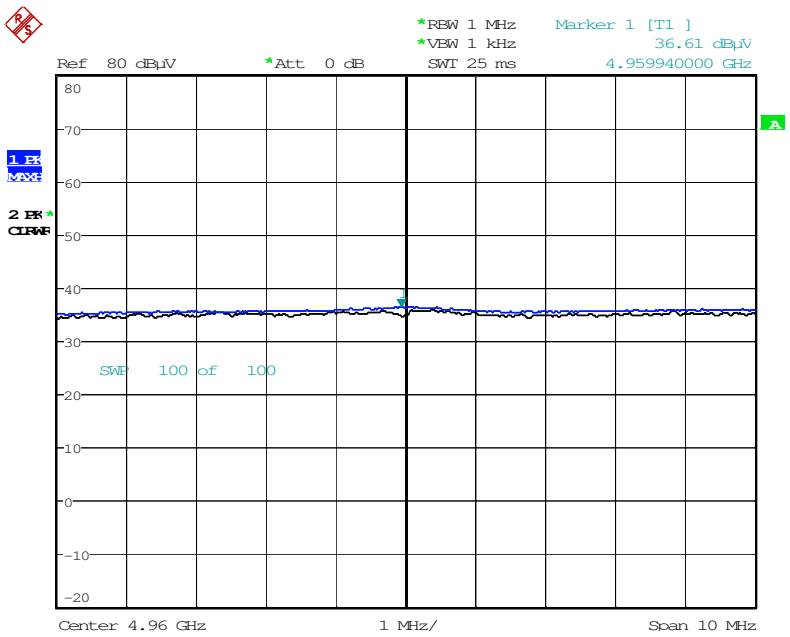
Date: 4.MAY.2016 14:26:44

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



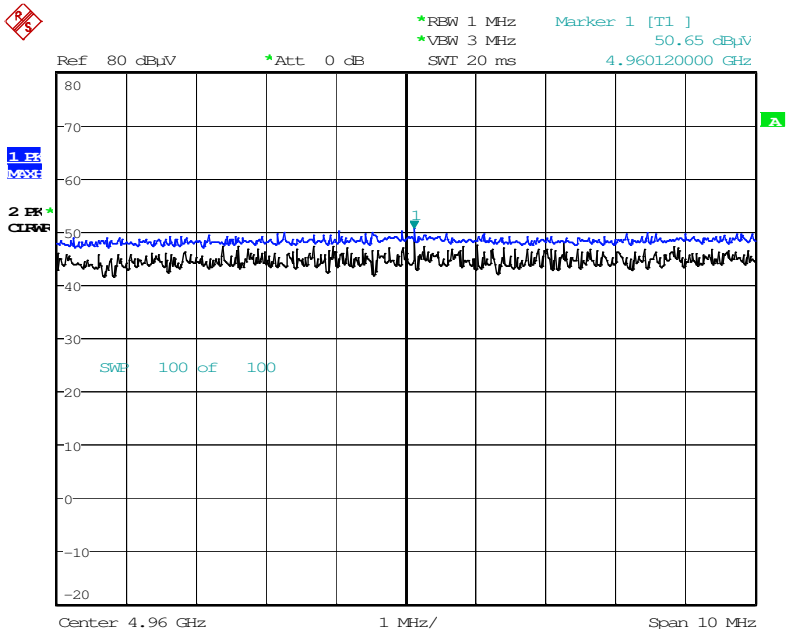
Date: 4.MAY.2016 14:26:15

Radiated Spurious Emissions plot – Average Reading (π/4DQPSK, Ch.78 3rd Harmonic)



Date: 4.MAY.2016 14:27:09

Radiated Spurious Emissions plot – Peak Reading (π/4DQPSK, Ch.78 3rd Harmonic)



Date: 4.MAY.2016 14:25:48

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	26.11	31.31	H	0	57.42	73.98	16.56	PK
2390.0	12.11	31.31	H	-24.73	18.69	53.98	35.29	AV
2390.0	26.17	31.31	V	0	57.48	73.98	16.50	PK
2390.0	12.17	31.31	V	-24.73	18.75	53.98	35.23	AV
2483.5	30.85	31.37	H	0	62.22	73.98	11.76	PK
2483.5	27.38	31.37	H	-24.73	34.02	53.98	19.96	AV
2483.5	30.24	31.37	V	0	61.61	73.98	12.37	PK
2483.5	26.12	31.37	V	-24.73	32.76	53.98	21.22	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	25.93	31.31	H	0	57.24	73.98	16.74	PK
2390.0	12.09	31.31	H	-24.73	18.67	53.98	35.31	AV
2390.0	26.05	31.31	V	0	57.36	73.98	16.62	PK
2390.0	12.10	31.31	V	-24.73	18.68	53.98	35.30	AV
2483.5	30.37	31.37	H	0	61.74	73.98	12.24	PK
2483.5	25.18	31.37	H	-24.73	31.82	53.98	22.16	AV
2483.5	30.08	31.37	V	0	61.45	73.98	12.53	PK
2483.5	24.79	31.37	V	-24.73	31.43	53.98	22.55	AV

Operation Mode	EDR(π/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	25.80	31.31	H	0	57.11	73.98	16.87	PK
2390.0	12.15	31.31	H	-24.73	18.73	53.98	35.25	AV
2390.0	25.89	31.31	V	0	57.20	73.98	16.78	PK
2390.0	12.07	31.31	V	-24.73	18.65	53.98	35.33	AV
2483.5	30.50	31.37	H	0	61.87	73.98	12.11	PK
2483.5	25.10	31.37	H	-24.73	31.74	53.98	22.24	AV
2483.5	30.12	31.37	V	0	61.49	73.98	12.49	PK
2483.5	24.87	31.37	V	-24.73	31.51	53.98	22.47	AV

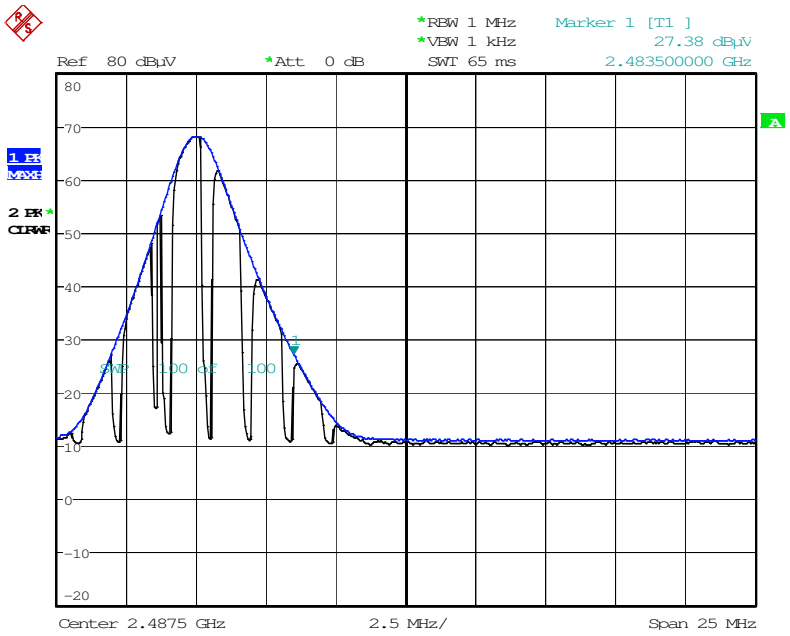
※ A·F: ANTENNA FACTOR
C·L: CABLE LOSS
AMP GAIN: AMPLIFIER GAIN

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 ≥ 1/τ Hz, where τ = 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= Δ t= τ [ms] x 79 channels = 229.100 ms, where τ = pulse width
   b. 100 ms/ Δt [ms] = *H* → Round up to next highest integer, *H ' =1*
   c. Worst Case Dwell Time = τ [ms] x *H '* = 2.900 ms
   d. Duty Cycle Correction = 20log (Worst Case Dwell Time/ 100ms) dB = -30.752 dB
5. Duty Cycle Correction Factor(AFH mode – minimum channel number case - 20 channels)
   a. Time to cycle through all channels= Δ t= τ [ms] x 20 channels = 58.00 ms, where τ = pulse width
   b. 100 ms/ Δt [ms] = *H* → Round up to next highest integer, *H ' = 2*
   c. Worst Case Dwell Time = τ [ms] x *H '* = 5.800 ms
   d. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) 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.

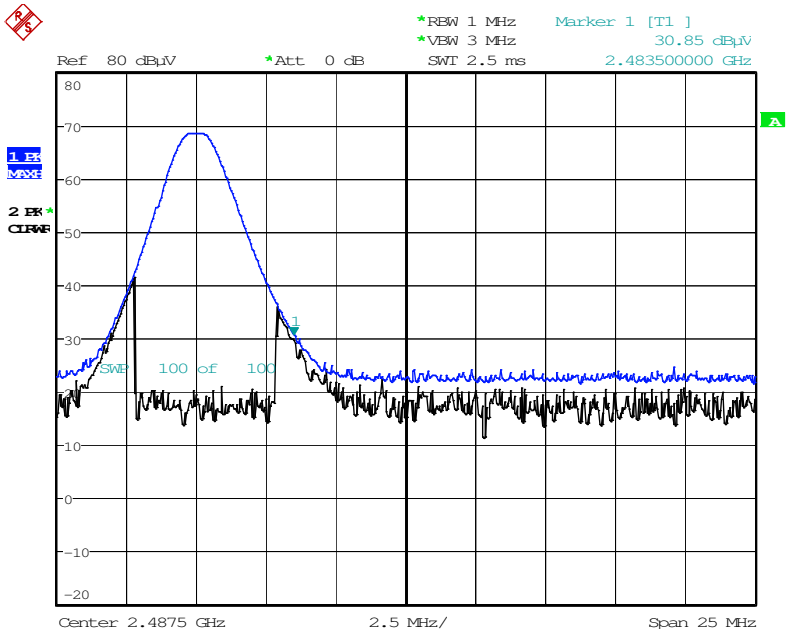
▣ RESULT PLOTS (Worst case : x-H)

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



Date: 4.MAY.2016 11:57:42

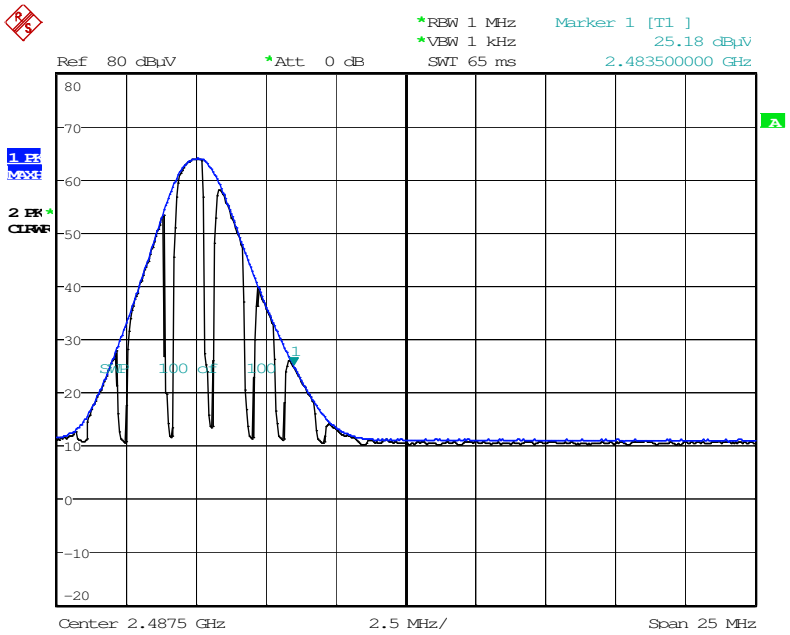
Radiated Restricted Band Edges plot – Peak Reading (GFSK, Ch.78)



Date: 4.MAY.2016 11:55:16

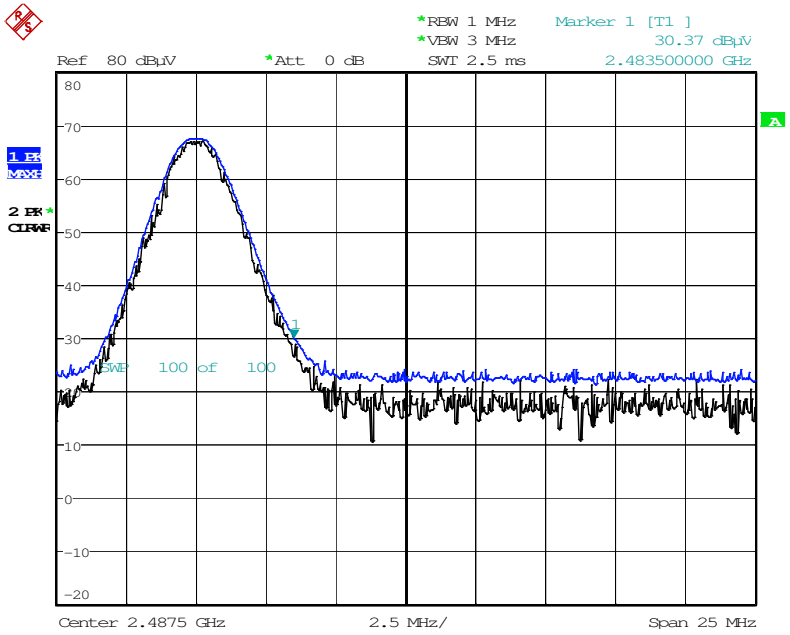
Note : Only the worst case plots for Radiated Restricted Band Edges.

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



Date: 4.MAY.2016 11:56:48

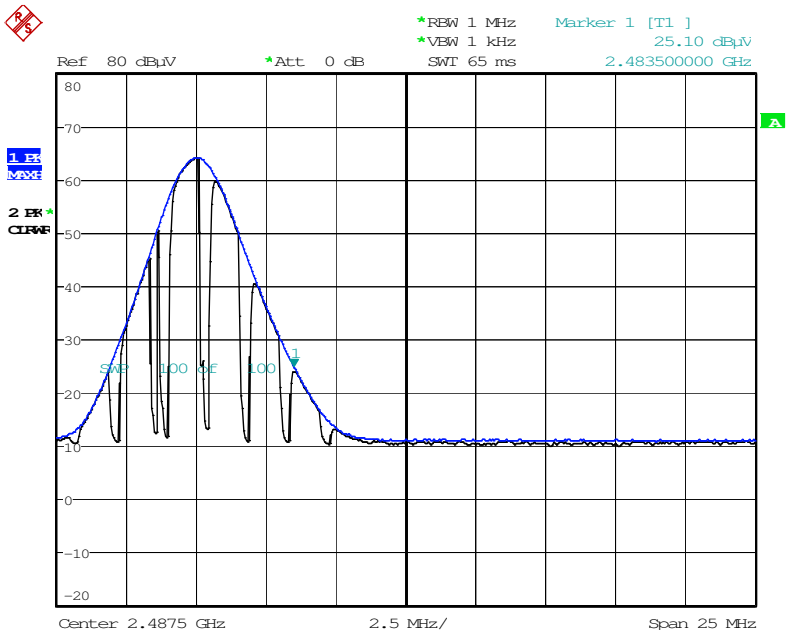
Radiated Restricted Band Edges plot – Peak Reading (8DPSK, Ch.78)



Date: 4.MAY.2016 11:56:24

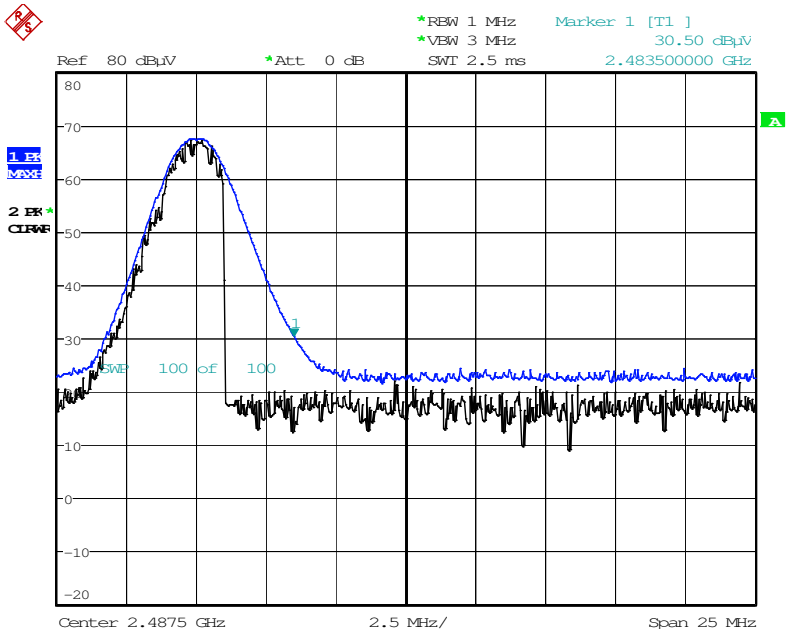
Note : Only the worst case plots for Radiated Restricted Band Edges.

Radiated Restricted Band Edges plot – Average Reading (π/4DQPSK, Ch.78)



Date: 4.MAY.2016 11:57:09

Radiated Restricted Band Edges plot – Peak Reading (π/4DQPSK, Ch.78)



Date: 4.MAY.2016 11:56:04

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

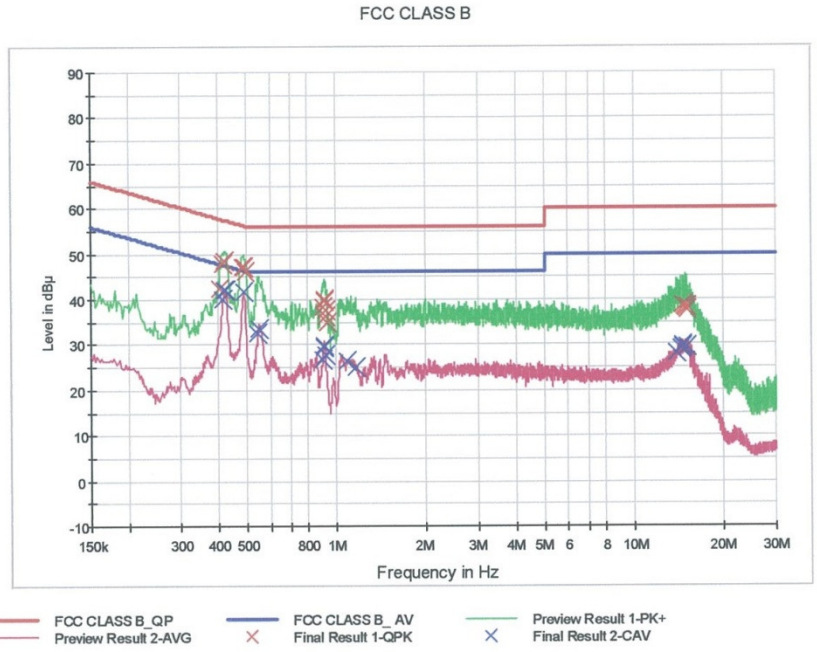
Conducted Emissions (Line 1)

Test 1 / 2

HCT TEST Report

Common Information

EUT:	LG-K220H
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	BT MODE



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.406000	42.5	9.000	Off	N	9.6	15.2	57.7
0.416000	47.9	9.000	Off	N	9.6	9.6	57.5
0.422000	48.6	9.000	Off	N	9.6	8.8	57.4
0.482000	47.3	9.000	Off	N	9.6	9.0	56.3
0.488000	47.2	9.000	Off	N	9.6	9.0	56.2
0.492000	46.3	9.000	Off	N	9.6	9.9	56.1
0.896000	38.4	9.000	Off	N	9.7	17.6	56.0
0.904000	40.1	9.000	Off	N	9.7	15.9	56.0
0.912000	39.6	9.000	Off	N	9.7	16.4	56.0
0.918000	37.6	9.000	Off	N	9.7	18.4	56.0
0.922000	36.2	9.000	Off	N	9.7	19.8	56.0
0.926000	34.8	9.000	Off	N	9.7	21.2	56.0
14.566000	38.8	9.000	Off	N	10.1	21.2	60.0
14.702000	38.4	9.000	Off	N	10.1	21.6	60.0
14.858000	38.1	9.000	Off	N	10.1	21.9	60.0
14.872000	38.1	9.000	Off	N	10.1	21.9	60.0
14.992000	38.2	9.000	Off	N	10.1	21.8	60.0
15.002000	37.8	9.000	Off	N	10.1	22.2	60.0

Final Result 2

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Test 2 / 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.416000	40.0	9.000	Off	N	9.6	7.5	47.5
0.420000	42.2	9.000	Off	N	9.6	5.2	47.4
0.424000	42.0	9.000	Off	N	9.6	5.4	47.4
0.488000	41.8	9.000	Off	N	9.6	4.4	46.2
0.544000	32.4	9.000	Off	N	9.6	13.6	46.0
0.548000	33.6	9.000	Off	N	9.6	12.4	46.0
0.896000	26.8	9.000	Off	N	9.7	19.2	46.0
0.904000	29.3	9.000	Off	N	9.7	16.7	46.0
0.912000	29.7	9.000	Off	N	9.7	16.3	46.0
0.918000	27.9	9.000	Off	N	9.7	18.1	46.0
1.080000	26.5	9.000	Off	N	9.7	19.5	46.0
1.166000	25.2	9.000	Off	N	9.7	20.8	46.0
13.912000	28.1	9.000	Off	N	10.1	21.9	50.0
14.414000	29.1	9.000	Off	N	10.1	20.9	50.0
14.502000	29.5	9.000	Off	N	10.1	20.5	50.0
14.510000	29.5	9.000	Off	N	10.1	20.5	50.0
14.566000	29.8	9.000	Off	N	10.1	20.2	50.0
15.002000	29.5	9.000	Off	N	10.1	20.5	50.0

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Conducted Emissions (Line 2)

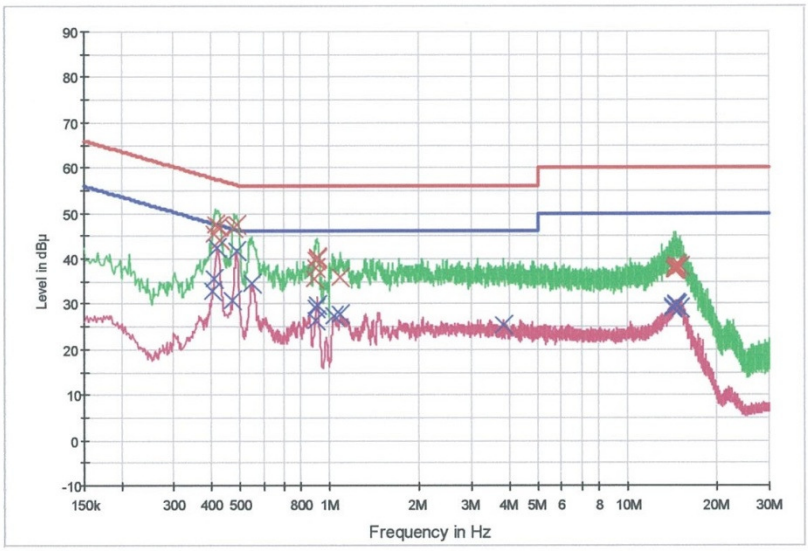
Test 1 / 2

HCT TEST Report

Common Information

EUT:	LG-K220H
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	BT MODE

FCC CLASS B



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.410000	45.6	9.000	Off	L1	9.7	12.1	57.6
0.414000	47.6	9.000	Off	L1	9.7	10.0	57.6
0.426000	47.2	9.000	Off	L1	9.7	10.1	57.3
0.432000	44.1	9.000	Off	L1	9.7	13.1	57.2
0.480000	46.7	9.000	Off	L1	9.7	9.6	56.3
0.486000	47.4	9.000	Off	L1	9.7	8.8	56.2
0.886000	35.6	9.000	Off	L1	9.7	20.4	56.0
0.894000	38.1	9.000	Off	L1	9.7	17.9	56.0
0.900000	39.6	9.000	Off	L1	9.7	16.4	56.0
0.904000	40.3	9.000	Off	L1	9.7	15.7	56.0
0.910000	40.0	9.000	Off	L1	9.7	16.0	56.0
1.088000	35.9	9.000	Off	L1	9.7	20.1	56.0
14.312000	37.6	9.000	Off	L1	10.1	22.4	60.0
14.458000	37.9	9.000	Off	L1	10.1	22.1	60.0
14.462000	37.8	9.000	Off	L1	10.1	22.2	60.0
14.506000	38.3	9.000	Off	L1	10.1	21.7	60.0
14.546000	38.6	9.000	Off	L1	10.1	21.4	60.0
14.996000	38.3	9.000	Off	L1	10.1	21.7	60.0

Final Result 2

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Test 2 / 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.406000	32.8	9.000	Off	L1	9.7	14.9	47.7
0.410000	35.7	9.000	Off	L1	9.7	12.0	47.6
0.422000	42.2	9.000	Off	L1	9.7	5.2	47.4
0.472000	30.9	9.000	Off	L1	9.7	15.6	46.5
0.488000	41.8	9.000	Off	L1	9.7	4.4	46.2
0.550000	34.6	9.000	Off	L1	9.7	11.4	46.0
0.894000	26.6	9.000	Off	L1	9.7	19.4	46.0
0.902000	29.2	9.000	Off	L1	9.7	16.8	46.0
0.910000	29.8	9.000	Off	L1	9.7	16.2	46.0
1.028000	27.2	9.000	Off	L1	9.7	18.8	46.0
1.088000	27.7	9.000	Off	L1	9.7	18.3	46.0
3.828000	25.2	9.000	Off	L1	9.8	20.8	46.0
14.214000	29.3	9.000	Off	L1	10.1	20.7	50.0
14.218000	29.2	9.000	Off	L1	10.1	20.8	50.0
14.514000	29.8	9.000	Off	L1	10.1	20.2	50.0
14.552000	30.1	9.000	Off	L1	10.1	19.9	50.0
14.630000	30.0	9.000	Off	L1	10.1	20.0	50.0
14.996000	29.1	9.000	Off	L1	10.1	20.9	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	AM4000 / Antenna Position Tower	N/A	N/A	N/A
Audix	Turn Table	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
CERNEX	CBL18265035 / POWER AMP	07/27/2015	Annual	22966
Schwarzbeck	BBHA 9120D/ Horn Antenna	05/07/2015	Biennial	937
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 Instrument	WHF3.0/18G-10EF / High Pass Filter	06/29/2015	Annual	8
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
Rohde & Schwarz	CBT / BLUETOOTH TESTER	03/10/2016	Annual	100808
TESCOM	TC-3000C / Bluetooth Tester	04/01/2016	Annual	3000C000276