Radiated Restricted Band Measurements

§15.205 / §15.209

Special attention is made for the EUT's harmonic and spurious radiated emission in the restricted bands of operations. The EUT was tested from 9kHz and up to the tenth harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHZ. Above 1 GHz, average measurement was used, using RBW 1MHz – VBW 10Hz and linearly polarized horn antennas. All harmonics/spurs are at least 20dB below the highest emission in the authorized band using RBW = 100kHz. In addition, peak measurements were taken to ensure that the peak levels are not more than 20dB above the average limit. All out of band emissions, other than those created by the spreading sequence, data sequence, and the carrier modulation must not exceed the limits show in Table G-1 per Section 15.209.

Frequency	F/S (µV/m)	Measured Distance (Meters)
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table A-1. Restricted Band Limits

TEST MEASUREMENT EQUIPMENT

Agilent E4448A	PSA Spectrum Analyzer 3 Hz - 50GHz
HP 8566B	Spectrum Analyzer 100Hz – 22GHz
HP 83017A	Microwave Analyzer 40dB Gain (0.5 – 26.5GHz)
HP 3784A	Digital Transmission Analyzer
EMCO 3115	Horn Antenna (1 – 18GHz)
HP 8495A	20dB Attenuator (DC-40GHz) 0 –70dB
HP 8493B	10dB Attenuator
MicroCoax Cables	Low Loss Microwave Cables (1 – 26.5GHz)
CDI Dipoles	Dipole Antennas (30 – 1000MHz)
EMCO 3116	Horn Antenna (18 – 40GHz)

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Radiated Restricted Band Measurements (Cont.)

§15.205 /§15.209 courtesy

Operating Frequency: 2480 MHz

Number of Channels: 79

FREQ (MHz)	Level (dBm)	AFCL (dB/m)	POL (H/V)	F/S (dBV/m)	F/S (uV/M)	Margin (dB)
2483.9	-98.3	33.0	V	41.7	121.6	-12.3
2484.0	-99.6	33.0	V	40.4	104.7	-13.6
2484.9	-101.3	33.1	V	38.8	87.1	-15.2
2485.2	-112.0	33.1	V	28.1	25.4	-25.9
2490.1	-114.0	33.2	V	26.2	20.4	-27.8
2490.8	-109.3	33.2	V	30.9	35.1	-23.1

Table A-2. Radiated Restricted Band Measurements at 3-meters

NOTES:

1. The antenna is manipulated through typical positions, polarity and length during the testing.

2. The EUT is supplied with the minimal AC voltage or/and a new/fully re-charged battery.

3. The spectrum is measured from 9kHz up to the 10th harmonic and the worst-case emissions are reported.

4. The conducted limits are shown on Figure A-14. Above 1 GHz the limit is 500µV/m.

5. < -135 dBm is below the analyzer measurement floor level.

6. The peak emissions above 1 GHz are not more than 20 dB above average limit.

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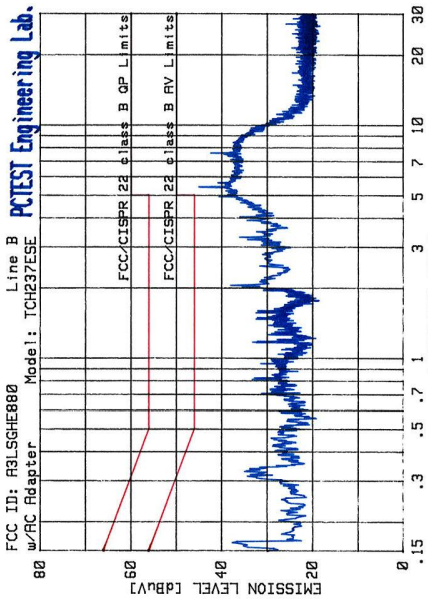
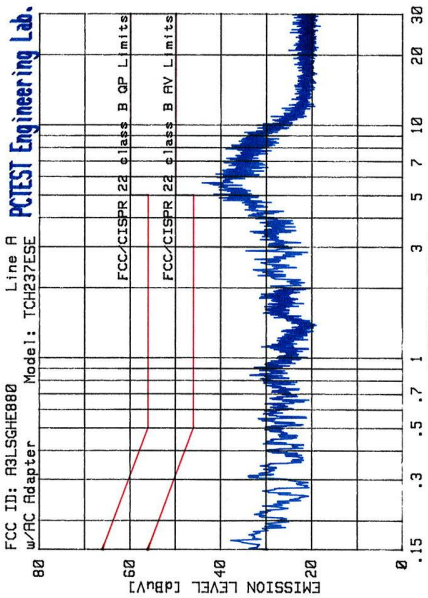
Line-Conducted Test Data

§15.207



No.	Freq. [MHz]	Quasi-Pk [dBuV]	Limit [dBuV]	Margin [dB]	Average [dBuV]	Limit [dBuV]	Margin [dB]
1	4.803	30.68	56.00	-25.32	20.67	46.00	-25.33
2	5.589	33.00	60.00	-27.00	21.87	50.00	-28.13
3	4.972	30.95	56.00	-25.05	21.52	50.00	-28.48
4	6.171	31.58	60.00	-28.42	21.42	50.00	-28.58
5	5.887	31.41	60.00	-28.59	22.03	50.00	-27.97
6	6.418	30.80	60.00	-29.20	21.55	50.00	-28.45
7	6.848	30.50	60.00	-29.50	21.47	50.00	-28.53
8	7.878	31.28	60.00	-28.72	20.73	50.00	-29.27
9	7.121	32.48	60.00	-27.52	20.54	50.00	-29.46
10	2.834	22.09	56.00	-33.91	17.63	46.00	-28.37



No.	Freq. [MHz]	Quasi-Pk [dBuV]	Limit [dBuV]	Margin [dB]	Average [dBuV]	Limit [dBuV]	Margin [dB]
1	5.350	33.23	60.00	-26.77	22.57	50.00	-27.43
2	4.900	30.95	56.00	-25.05	21.39	46.00	-24.61
3	7.547	32.27	60.00	-27.73	21.90	50.00	-28.10
4	1.963	23.89	56.00	-32.11	18.25	46.00	-27.75
5	4.747	29.82	56.00	-26.18	20.19	46.00	-25.81
6	3.223	24.21	56.00	-31.79	18.27	46.00	-27.73
7	3.962	25.01	56.00	-30.99	18.41	46.00	-27.59
8	7.517	31.79	60.00	-28.21	21.72	50.00	-28.28
9	5.143	32.07	60.00	-27.93	22.02	50.00	-27.98
10	3.905	25.43	56.00	-30.57	18.54	46.00	-27.46

Notes:

1. All Modes of operation were investigated and the worst-case emissions are reported.
2. The limit for Class B device(s) from 150kHz to 30MHz are Specified in EN55022.
3. Line A = Phase; Line B = Neutral
4. Deviations to the Specifications: *None.*

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