

5.5 RADIATED SPURIOUS EMISSIONS

5.5.1.1 30 MHz - 1 GHz Band Procedure

With the EUT first in transmit mode, then in receive mode a prescan of the emissions in the 30 MHz – 1 GHz range was performed. Then suspicious peaks were closely measured while the antenna, table azimuth and EUT cabling were maximized for worst case emissions. The analyzer/receiver was programmed to compensate for all loss and gain factors (such as cables, antennas, preamplifiers etc.). The peak and quasi-peak readings were recorded. The limit used was FCC Part 15 class B radiated emissions limit.

5.5.1.2 30 MHz - 1 GHz Band Results

All emissions measured were below the limit. The following table shows the measured values, system loss/gain factors for those emissions and the position of the EUT and the measurement antenna.

Frequency (MHz)	Reading Peak (dBuV/m)	Reading QP (dBuV/m)	Antenna Factor (dB)	System Loss (dB)	Limit (dBuV/m)	Azimuth Angle (°)	Antenna Height (m)	Polariz.	Margin (dB)
131.20	36.14	31.91	12.41	11.88	43.50	75.00	1m	Horizontal	11.59
145.90	40.34	33.74	12.06	11.49	43.50	290.00	1.5m	Horizontal	9.76
178.74	36.09	29.10	9.82	10.61	43.50	195.00	1m	Horizontal	14.40
189.32	35.43	35.04	9.63	10.40	43.50	225.00	1m	Horizontal	8.46
149.50	41.83	33.25	11.81	11.38	43.50	315.00	1m	Vertical	10.25
161.20	40.68	32.97	11.10	10.98	43.50	5.00	1m	Vertical	10.53
170.50	35.33	30.71	10.42	10.77	43.50	170.00	1m	Vertical	12.79
299.90	40.08	31.77	13.48	21.40	46.00	335.00	1m	Vertical	14.23
278.20	46.48	37.79	13.18	21.67	46.00	315.00	1m	Vertical	8.21

5.5.2.1 1 GHz - 10 GHz Band Procedure

With the transmitter in continuous transmit mode, a pre-scan of the EUT was performed at 1m by rotating the EUT 360° and changing the antenna height between 1m and 4m. All suspicious peaks were noted. Then with the average-peak detector at 1 MHz RBW all suspicious peaks were scanned in the maximized EUT direction and antenna height. Same measurements were made for both polarizations of the antenna. The analyzer / receiver was programmed to compensate for all loss and gain factors (such as cables, antennas, preamplifiers etc.). A 10 dB correction factor was added to the readings for the reduction of measurements distance. The peak and average readings were recorded. The limits used were the limits specified in paragraphs 205 (restricted bands), 209 (spurious emissions), 247 (c) (harmonic emissions) of Part 15.

5.5.2.2 1 GHz - 10 GHz Band Results

The tables on following pages show the measured values, system loss/gain factors for those emissions and the position of the EUT and the antenna. As can be seen all harmonics were within required limits. No detectable emissions were found in receive mode.

Frequency (GHz)	Peak (*) (dBμV/m)	Avg. (*) (dBμV/m)	Gain/Loss (dB)	Polar.	Ant. Ht. (m)	Limit (dBμV/m)	Margin (dB)
Low Channel							
1.8052	48.4	44.2	26.1	V	1	107	62.8
2.7078	52.8	50.9	28.4	V	1	54	3.1
3.6104	49.3	46.2	30.4	V	1	54	7.8
4.5130	46.7	43.4	31.2	V	1	54	10.6
5.4156	43.2	40.1	31.5	V	1	54	13.9
Medium Channel							
1.8292	47.3	42.8	26.1	V	1	107	64.2
2.7438	51.8	49.3	28.4	V	1	54	4.7
3.6584	48.1	45.4	30.4	V	1	54	8.6
4.5730	45.9	43.0	31.2	V	1	54	11
High Channel							
1.8548	48.6	44.5	26.1	V	1	107	62.5
2.7822	53.1	50.8	28.4	V	1	54	3.2
3.7096	48.5	45.8	30.4	V	1	54	8.2
4.6378	46.9	44.1	31.2	V	1	54	9.9

(*) corrected measurements (all factors included)

5.6 CONDUCTED POWERLINE EMISSIONS

5.6.1 Measurement Procedure

The power line conducted emissions were measured at 110 V. In each case the EUT was put into a hopping mode. The source of the emissions (digital circuitry or transmitter) was confirmed by turning the transmitter off. The emissions were measured in the hot and neutral sides of the power line.

5.6.2 Measurement Results

All emissions were caused by the digital circuitry and all were below the limit. CISPR 22 Class B limits were used. The plots are in the following page. The emissions found are listed below.

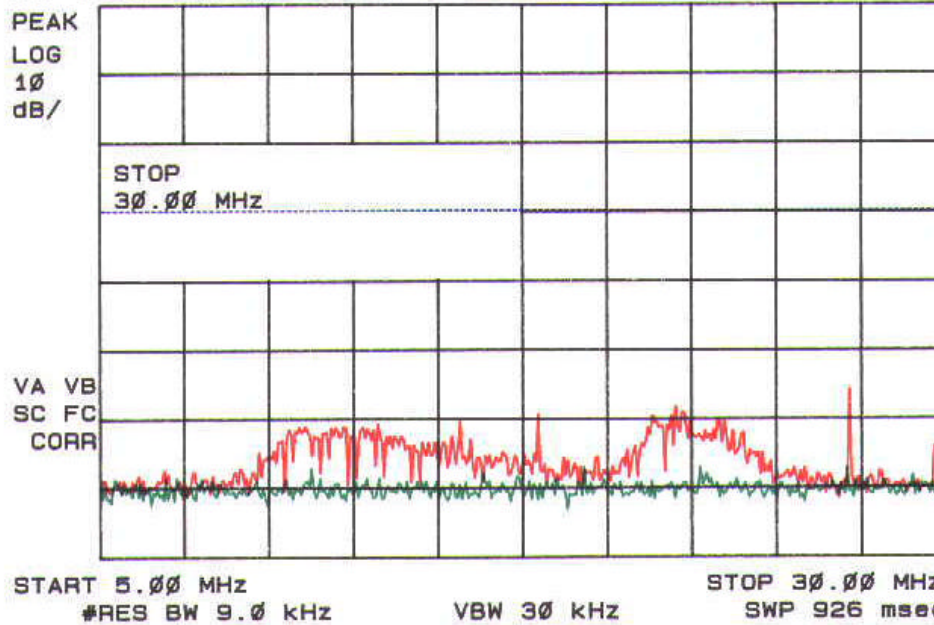
Line	Frequency (MHz)	Peak Level (dBmV)	QP -Level (dBmV)	Avg. Level (dBmV)	Limit (*) (dBmV)	Margin (dB)
Neutral	.155	52.4	38.5	32.4	56	23.6
Neutral	.180	47.6	33.1	28.8	55	26.2
Neutral	.648	32.5	24.8	23.2	46	22.8
Neutral	9.3	31.2	26.1	24.0	60	36
Neutral	11.1	29.1	25.3	25.1	60	34.9
Neutral	22.3	30.4	26.4	23.8	60	36.2
Neutral	23.7	30.6	24.3	22.7	60	37.3
Hot	.155	52.3	38.1	31.7	56	24.3
Hot	.180	46.2	32.9	28.9	55	26.1
Hot	.640	33.1	23.7	22.7	46	23.3
Hot	11.1	29.4	25.8	24.6	60	35.4
Hot	18.7	30.9	23.9	22.4	60	37.6
Hot	22.3	31.1	26.1	22.7	60	37.3
Hot	27.1	33.9	28.4	26.2	60	33.8

(*) Limits for average measurement

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REF 90.0 dB μ V #ATTEN 10 dB PG -10.0 dB

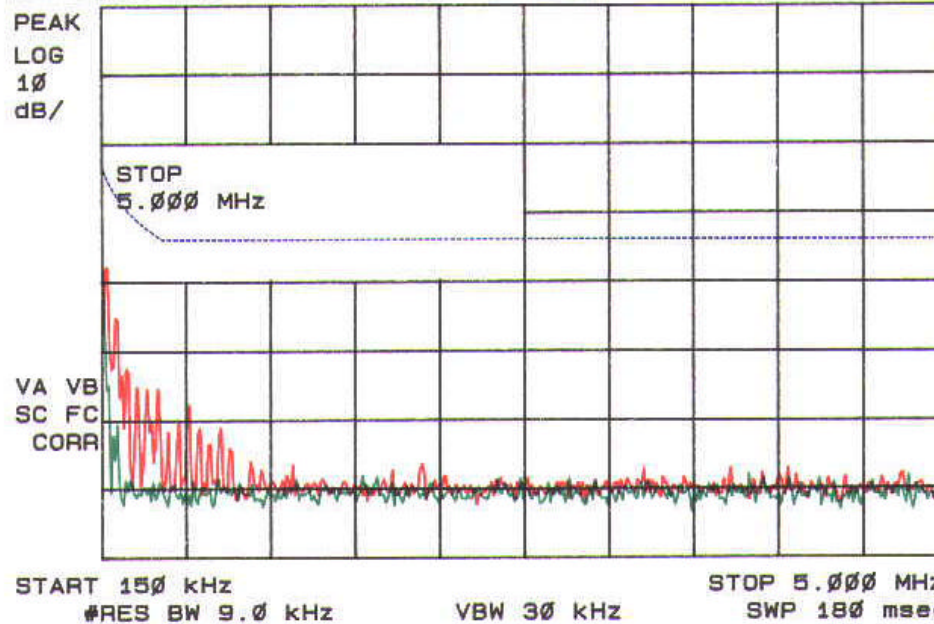


Powerline
Conducted
Emissions
Measurement

Hot
Line

15:54:18 05 OCT 1999

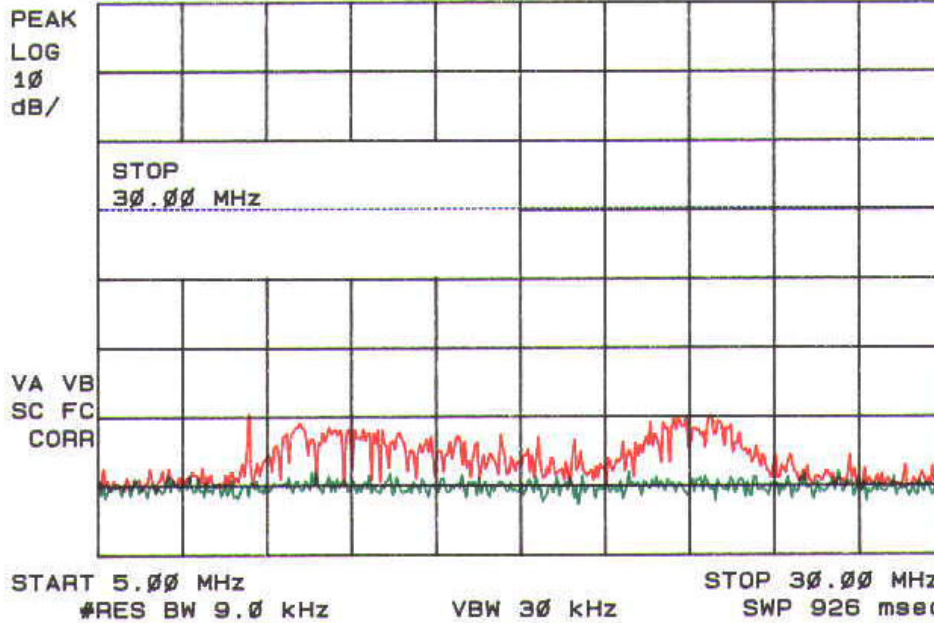
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REF 90.0 dB μ V #ATTEN 10 dB PG -10.0 dB



Powerline
Conducted
Emissions
Measurement

Neutral
Line

15:48:43 05 OCT 1999
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REF 90.0 dB μ V #ATTEN 10 dB PG -10.0 dB

