

6.4 Powerline Conducted Emissions [Section 15.207 & 15.407 (b)(5)]

6.4.1 EUT Configuration

The EUT was set up on the non-conductive table that is 1.0 by 1.5 meter, 80cm above ground. The wall of the shielded room was located 40cm to the rear of the EUT.

Power to the EUT was provided through the LISN. The impedance vs. frequency characteristic of the LISN is complied with the limit shown on the figure 1 of ANSI C63.4-2001.

Both lines (neutral and hot) were connected to the LISN in series at testing. A coaxial-type connector which provides one 50 ohms terminating impedance was provided for connecting the test instrument. The excess length of the power cord was folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

If the EUT is a Personal Computer or a peripheral of personal computer, and the personal computer has an auxiliary AC outlet which can be used for providing power to an external monitor, then all measurements will be made with the monitor power from first the computer-mounted AC outlet and then a floor-mounted AC outlet.

6.4.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. The main power line conducted EMI tests were run on the hot and neutral conductors of the power cord and the results were recorded. The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.

At the frequencies where the peak values of the emissions were higher than 6dB below the applicable limits, the emissions were also measured with the quasi-peak detectors. At the frequencies where the quasi-peak values of the emissions were higher than 6dB below the applicable average limits, the emissions were also measured with the average detectors.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

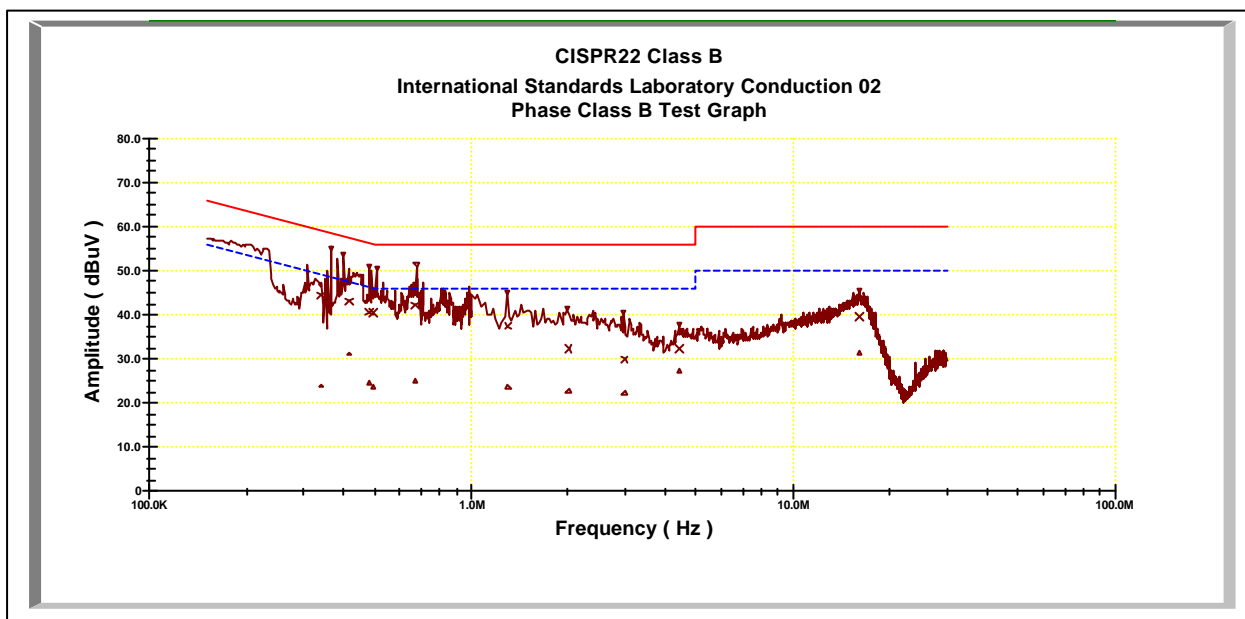
6.4.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150 KHz--30MHz
Detector Function:	Quasi-Peak/Average
Bandwidth (RBW):	9KHz

6.4.4 Test Data:

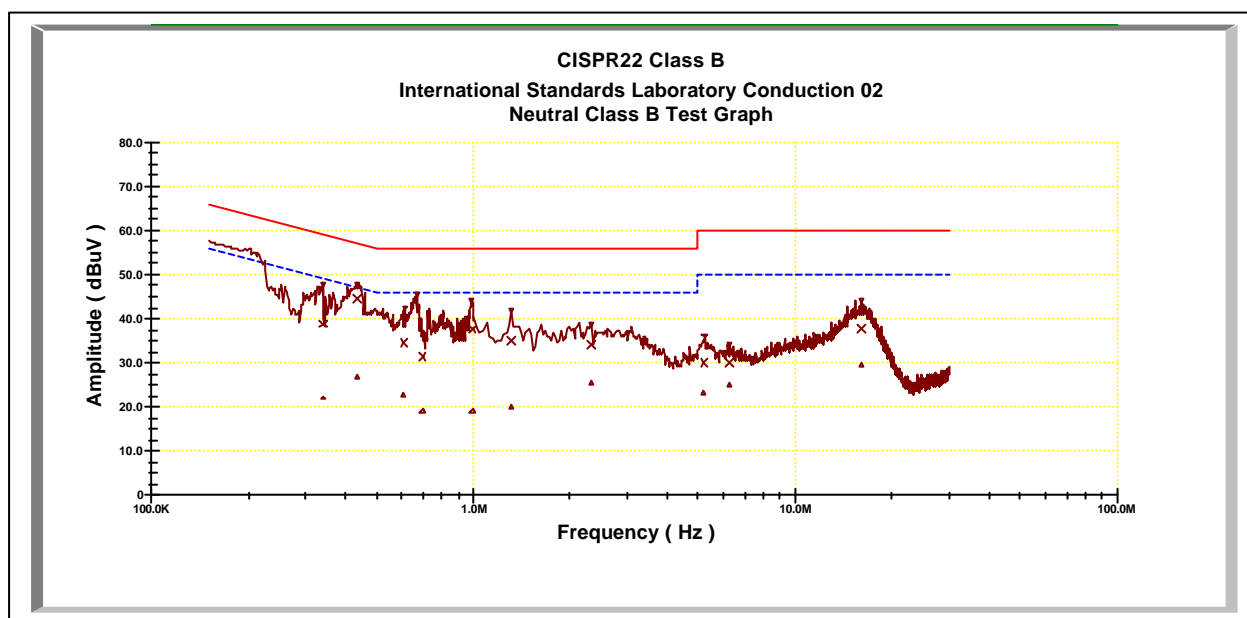
Power Line Conducted Emissions (Hot)

Frequency (MHz)	Corrective Factor		Quasi-Peak			Average		
	LISN Loss (dB)	Cable Loss (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)
0.33968	0.10	0.02	44.35	60.58	-16.23	23.80	50.58	-26.78
0.41718	0.10	0.03	42.99	58.37	-15.38	31.08	48.37	-17.28
0.48263	0.11	0.03	40.60	56.50	-15.89	24.50	46.50	-21.99
0.49673	0.12	0.03	40.60	56.09	-15.50	23.78	46.09	-22.32
0.66888	0.14	0.04	42.04	56.00	-13.96	24.75	46.00	-21.25
1.30088	0.41	0.08	37.44	56.00	-18.56	23.53	46.00	-22.47
2.00268	0.20	0.10	32.14	56.00	-23.86	22.75	46.00	-23.25
2.99232	0.25	0.11	29.83	56.00	-26.17	22.32	46.00	-23.68
4.44697	0.32	0.12	32.41	56.00	-23.59	27.38	46.00	-18.62
16.0402	0.74	0.29	39.64	60.00	-20.36	31.16	50.00	-18.84



Power Line Conducted Emissions (Neutral)

Frequency (MHz)	Corrective Factor		Quasi-Peak			Average		
	LISN Loss (dB)	Cable Loss (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)
0.3411	0.10	0.02	38.85	60.54	-21.69	21.99	50.54	-28.55
0.43746	0.11	0.03	44.45	57.79	-13.33	26.83	47.79	-20.95
0.60821	0.13	0.04	34.70	56.00	-21.30	22.84	46.00	-23.16
0.69373	0.15	0.05	31.48	56.00	-24.52	18.86	46.00	-27.14
0.99191	0.20	0.07	37.52	56.00	-18.48	19.13	46.00	-26.87
1.31702	0.27	0.08	35.10	56.00	-20.90	20.05	46.00	-25.95
2.32265	0.20	0.10	34.00	56.00	-22.00	25.47	46.00	-20.53
5.21177	0.22	0.13	30.14	60.00	-29.86	23.14	50.00	-26.86
6.26249	0.24	0.14	30.09	60.00	-29.91	24.89	50.00	-25.11
16.0904	0.42	0.29	37.65	60.00	-22.35	29.34	50.00	-20.66



* NOTE: During the test, the EMI receiver was set to Max. Hold then switch the EUT between Main antenna , Aux antenna Channel 1 , 4, 5, 8, 9, 12 of Normal Mode and Channel 1, 2, 3, 4, 5 of Turbo Mode to get the maximum reading of all these channels.
 Margin = Amplitude + Insertion Loss- Limit
 A margin of -8dB means that the emission is 8dB below the limit

6.5 Radiated Emission Measurement [Section 15.209 & 15.407(b)(5)]

6.5.1 EUT Configuration

The equipment under test was set up on the 10 meter chamber with measurement distance of 3 meters. The EUT was placed on a non-conductive table 80cm above ground.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

6.5.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. We found the maximum readings by varying the height of antenna and then rotating the turntable. Both polarization of antenna, horizontal and vertical, are measured.

30M to 1GHz: The highest emissions between 30 MHz to 1000 MHz were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission.

1GHz – 40GHz: The highest emissions were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in peak mode to determine the precise amplitude of the emission. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission. During test the EMI receiver and spectrum was setup according to para. 6.5.3.

For the test of 2nd to 10th harmonics frequencies , the equipment setup was also refer to para.6.5.3. The frequencies were tested using Peak mode first, if the test data is higher than the emissions limit, an additional measurement using Average mode will be performed and the average reading will be compared to the limit and record in test report.

6.5.3 EMI Receiver/Spectrum Analyzer Configuration

Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz
Frequency Range Tested:	1GHz – 40 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	1MHz
Frequency Range Tested:	30MHz – 40 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	10 Hz

6.5.4 Test Data (30MHz – 1GHz) .

30M – 1GHz Open Field Radiated Emissions (Horizontal)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin* (dB)	Height (cm)	Position (°)
83.35	14.92	7.34	2.45	0.00	24.70	40.00	-15.30	100.00	107.00
95.96	16.59	9.59	2.61	0.00	28.79	43.50	-14.71	150.00	162.00
165.8	11.80	8.68	3.44	0.00	23.92	43.50	-19.58	200.00	245.00
228.85	13.30	9.46	4.05	0.00	26.81	46.00	-19.19	200.00	25.00
232.73	13.50	9.87	4.09	0.00	27.46	46.00	-18.54	100.00	245.00
265.71	9.60	12.44	4.32	0.00	26.36	46.00	-19.64	100.00	175.00
287.05	10.53	12.34	4.46	0.00	27.33	46.00	-18.67	150.00	272.00
431.58	11.38	15.85	5.39	0.00	32.62	46.00	-13.38	100.00	98.00
463.59	9.02	16.30	5.57	0.00	30.88	46.00	-15.12	100.00	327.00
480.08	5.69	16.66	5.66	0.00	28.01	46.00	-17.99	150.00	42.00

30M – 1GHz Open Field Radiated Emissions (Vertical)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin* (dB)	Height (cm)	Position (°)
32.91	7.01	16.43	1.55	0.00	24.99	40.00	-15.01	150.00	272.00
42.61	16.72	11.04	1.76	0.00	29.52	40.00	-10.48	100.00	135.00
63.95	15.75	5.40	2.13	0.00	23.28	40.00	-16.72	150.00	27.00
106.63	13.97	11.20	2.74	0.00	27.90	43.50	-15.60	200.00	355.00
165.8	13.44	8.68	3.44	0.00	25.56	43.50	-17.94	100.00	355.00
499.48	5.73	17.09	5.79	0.00	28.61	46.00	-17.39	100.00	217.00
530.52	5.24	17.83	5.96	0.00	29.04	46.00	-16.96	250.00	264.00
563.5	5.45	18.30	6.13	0.00	29.88	46.00	-16.12	150.00	355.00
632.37	6.42	18.56	6.47	0.00	31.45	46.00	-14.55	250.00	157.00
644.98	1.87	18.66	6.53	0.00	27.05	46.00	-18.95	150.00	355.00

* NOTE:

During the Pre-test, the EUT has been tested for Channel 1, 4, 5, 8, 9, 12 of Normal Mode and Channel 1, 2, 3, 4, 5 of Turbo mode and transmit from Main and Aux antenna respectively to get all the critical emission frequencies. In the final test all the critical emission frequencies has been tested and the test data are listed above.

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 30MHz to 1GHz have been tested

6.5.5 Test Data (1GHz – 40 GHz, Transmitting) .

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 1 : 5180 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7164.83	41.78	39.80	2.35	46.24	37.70	54.00	-16.30	103	315
10340.7	40.20	39.34	2.87	40.93	41.48	54.00	-12.52	100	25
11410.6	24.77	42.06	3.01	41.40	28.44	54.00	-25.56	104	82
13261.7	25.96	41.57	3.26	41.90	28.89	54.00	-25.11	102	120
14688.3	30.56	44.22	3.43	42.34	35.88	54.00	-18.12	100	110
15299.7	26.49	43.12	3.50	43.26	29.85	54.00	-24.15	100	154

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 1: 5180 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7130.87	42.16	39.84	2.34	46.25	38.10	54.00	-15.90	108	156
7589.41	33.26	39.72	2.43	45.67	29.73	54.00	-24.27	102	25
10340.7	39.96	39.34	2.87	40.93	41.24	54.00	-12.76	106	82
11410.6	24.98	42.06	3.01	41.40	28.66	54.00	-25.34	103	135
14688.3	28.72	44.22	3.43	42.34	34.04	54.00	-19.96	101	118
15265.7	25.78	43.17	3.49	43.34	29.11	54.00	-24.89	100	110

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 4: 5240 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7130.87	42.02	39.84	2.34	46.25	37.96	54.00	-16.04	100	235
10459.5	41.68	39.38	2.89	40.85	43.10	54.00	-10.90	106	24
14688.3	30.02	44.22	3.43	42.34	35.33	54.00	-18.67	107	71
15282.7	25.94	43.15	3.49	43.30	29.28	54.00	-24.72	109	125
15690.3	26.56	43.41	3.54	42.16	31.35	54.00	-22.65	102	108
16013.0	24.76	44.41	3.57	41.16	31.58	54.00	-22.42	100	190

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 4: 5240 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7147.85	42.43	39.82	2.35	46.24	38.35	54.00	-15.65	103	267
7470.53	35.29	39.44	2.40	46.10	31.03	54.00	-22.97	100	142
10459.5	42.16	39.38	2.89	40.85	43.57	54.00	-10.43	100	71
13584.4	25.41	42.07	3.31	41.92	28.86	54.00	-25.14	102	125
14688.3	29.18	44.22	3.43	42.34	34.50	54.00	-19.50	105	108
15282.7	25.47	43.15	3.49	43.30	28.81	54.00	-25.19	100	136

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 5 : 5260 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7572.43	34.49	39.66	2.42	45.75	30.82	54.00	-23.18	100	327
10510.5	41.25	39.42	2.89	40.82	42.75	54.00	-11.25	105	230
14399.6	27.48	44.26	3.40	41.67	33.47	54.00	-20.53	100	175
14688.3	29.93	44.22	3.43	42.34	35.25	54.00	-18.75	109	140
15673.3	26.31	43.35	3.54	42.21	30.99	54.00	-23.01	102	130
15996.0	24.92	44.39	3.57	41.14	31.74	54.00	-22.26	100	192

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 5 : 5260 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7181.82	41.63	39.78	2.35	46.23	37.53	54.00	-16.47	100	310
7623.38	32.98	39.84	2.43	45.51	29.75	54.00	-24.25	102	30
10510.5	41.42	39.42	2.89	40.82	42.92	54.00	-11.08	100	75
13635.4	26.05	42.17	3.31	42.04	29.49	54.00	-24.51	106	140
14688.3	28.86	44.22	3.43	42.34	34.18	54.00	-19.82	100	218
15707.3	26.14	43.46	3.54	42.10	31.04	54.00	-22.96	105	130

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 8: 5320 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7130.87	41.96	39.84	2.34	46.25	37.89	54.00	-16.11	100	93
10629.4	39.82	39.68	2.91	40.74	41.67	54.00	-12.33	100	203
11189.8	25.62	41.22	2.98	40.92	28.90	54.00	-25.10	106	70
11342.7	25.20	41.80	3.00	41.25	28.75	54.00	-25.25	103	262
14688.3	28.87	44.22	3.43	42.34	34.18	54.00	-19.82	107	124
15707.3	25.73	43.46	3.54	42.10	30.63	54.00	-23.37	101	113

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 8: 5320 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7130.87	41.40	39.84	2.34	46.25	37.33	54.00	-16.67	106	223
10612.4	39.78	39.65	2.91	40.75	41.58	54.00	-12.42	100	173
11444.6	25.22	42.19	3.02	41.47	28.96	54.00	-25.04	100	270
14688.3	29.34	44.22	3.43	42.34	34.66	54.00	-19.34	100	324
15333.7	25.57	43.07	3.50	43.18	28.95	54.00	-25.05	109	124
15673.3	26.59	43.35	3.54	42.21	31.27	54.00	-22.73	102	113

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 9: 5745 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7130.87	41.80	39.84	2.34	46.25	37.73	54.00	-16.27	100	146
11478.5	39.61	42.32	3.02	41.54	43.41	54.00	-10.59	100	93
14688.3	29.30	44.22	3.43	42.34	34.61	54.00	-19.39	100	189
15282.7	26.02	43.15	3.49	43.30	29.36	54.00	-24.64	101	342
15690.3	25.87	43.41	3.54	42.16	30.66	54.00	-23.34	102	210
16013.0	24.75	44.41	3.57	41.16	31.57	54.00	-22.43	101	195

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 9: 5745 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7130.87	42.39	39.84	2.34	46.25	38.32	54.00	-15.68	101	279
7538.46	34.11	39.54	2.42	45.91	30.15	54.00	-23.85	100	173
11478.5	40.11	42.32	3.02	41.54	43.91	54.00	-10.09	100	270
14688.3	30.19	44.22	3.43	42.34	35.51	54.00	-18.49	100	324
15282.7	25.59	43.15	3.49	43.30	28.93	54.00	-25.07	104	124
15690.3	26.42	43.41	3.54	42.16	31.21	54.00	-22.79	100	113

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 12 : 5805 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7164.83	42.17	39.80	2.35	46.24	38.09	54.00	-15.91	100	313
7521.48	34.39	39.48	2.41	45.99	30.29	54.00	-23.71	100	239
11580.4	35.36	42.35	3.04	41.77	38.97	54.00	-15.03	100	175
14688.3	30.52	44.22	3.43	42.34	35.84	54.00	-18.16	104	140
15656.3	26.23	43.30	3.53	42.27	30.79	54.00	-23.21	100	130
15979.0	25.39	44.33	3.57	41.20	32.09	54.00	-21.91	100	192

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 12 : 5805 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7130.87	41.08	39.84	2.34	46.25	37.01	54.00	-16.99	100	121
7521.48	34.16	39.48	2.41	45.99	30.07	54.00	-23.93	102	326
11597.4	34.81	42.34	3.04	41.81	38.38	54.00	-15.62	100	275
13652.3	25.52	42.20	3.32	42.09	28.95	54.00	-25.05	106	140
14688.3	29.39	44.22	3.43	42.34	34.71	54.00	-19.29	100	218
15690.3	26.94	43.41	3.54	42.16	31.73	54.00	-22.27	105	130

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Turbo Mode, Channel 1: 5210 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7198.80	40.99	39.76	2.36	46.22	36.89	54.00	-17.11	100	15
7640.36	32.33	39.91	2.43	45.43	29.23	54.00	-24.77	100	189
10391.6	38.30	39.36	2.88	40.89	39.64	54.00	-14.36	103	72
11410.6	25.56	42.06	3.01	41.40	29.24	54.00	-24.76	100	259
14688.3	29.14	44.22	3.43	42.34	34.46	54.00	-19.54	109	121
15265.7	26.81	43.17	3.49	43.34	30.14	54.00	-23.86	101	115

1GHz~ 40 GHz (Vertical), Turbo Mode, Channel 1: 5210 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
5211.79	38.34	35.80	2.00	47.18	28.96	54.00	-25.04	107	234
7181.82	42.27	39.78	2.35	46.23	38.18	54.00	-15.82	100	211
10408.6	40.55	39.36	2.88	40.88	41.91	54.00	-12.09	106	72
11461.5	25.20	42.25	3.02	41.51	28.96	54.00	-25.04	109	121
14688.3	29.09	44.22	3.43	42.34	34.40	54.00	-19.60	100	102
15265.7	25.65	43.17	3.49	43.34	28.97	54.00	-25.03	102	115

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal) , Turbo Mode, Channel 2 : 5250 MHZ

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turtable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7147.85	40.76	39.82	2.35	46.24	36.68	54.00	-17.32	108	140
10476.5	40.02	39.39	2.89	40.84	41.46	54.00	-12.54	108	190
11495.5	24.84	42.38	3.02	41.58	28.67	54.00	-25.33	106	65
14688.3	28.07	44.22	3.43	42.34	33.39	54.00	-20.61	103	115
15265.7	25.87	43.17	3.49	43.34	29.19	54.00	-24.81	105	110
15656.3	26.17	43.30	3.53	42.27	30.74	54.00	-23.26	100	192

1GHz~ 40 GHz (Vertical), Turbo Mode, Channel 2: 5250 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turtable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7147.85	42.13	39.82	2.35	46.24	38.05	54.00	-15.95	101	195
10476.5	41.12	39.39	2.89	40.84	42.56	54.00	-11.44	100	10
14399.6	26.73	44.26	3.40	41.67	32.72	54.00	-21.28	103	65
14688.3	29.16	44.22	3.43	42.34	34.47	54.00	-19.53	106	115
15673.3	26.80	43.35	3.54	42.21	31.47	54.00	-22.53	100	123
16030.0	25.59	44.41	3.57	41.19	32.38	54.00	-21.62	101	110

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Turbo Mode, Channel 3 : 5290 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7147.85	41.38	39.82	2.35	46.24	37.31	54.00	-16.69	109	25
10561.4	42.11	39.54	2.90	40.79	43.76	54.00	-10.24	100	70
11461.5	25.44	42.25	3.02	41.51	29.20	54.00	-24.80	103	130
14688.3	29.06	44.22	3.43	42.34	34.38	54.00	-19.62	100	166
15316.7	26.73	43.09	3.50	43.22	30.10	54.00	-23.90	100	90
15690.3	26.72	43.41	3.54	42.16	31.51	54.00	-22.49	108	85

1GHz~ 40 GHz (Vertical), Turbo Mode, Channel 3: 5290 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7130.87	42.23	39.84	2.34	46.25	38.17	54.00	-15.83	103	273
7674.33	31.39	40.03	2.44	45.27	28.58	54.00	-25.42	100	231
10561.4	40.23	39.54	2.90	40.79	41.87	54.00	-12.13	106	23
14688.3	29.26	44.22	3.43	42.34	34.58	54.00	-19.42	100	199
14841.2	26.31	43.92	3.45	43.14	30.54	54.00	-23.46	105	221
15299.7	25.63	43.12	3.50	43.26	28.99	54.00	-25.01	103	218

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Turbo Mode, Channel 4 : 5760 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7147.85	40.93	39.82	2.35	46.24	36.85	54.00	-17.15	100	254
7572.43	32.22	39.66	2.42	45.75	28.55	54.00	-25.45	100	194
11427.6	25.98	42.12	3.02	41.43	29.68	54.00	-24.32	103	130
11495.5	36.23	42.38	3.02	41.58	40.06	54.00	-13.94	100	166
14688.3	28.84	44.22	3.43	42.34	34.15	54.00	-19.85	100	122
15299.7	25.38	43.12	3.50	43.26	28.73	54.00	-25.27	100	175

1GHz~ 40 GHz (Vertical), Turbo Mode, Channel 4: 5760 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7181.82	41.70	39.78	2.35	46.23	37.60	54.00	-16.40	100	264
11495.5	38.41	42.38	3.02	41.58	42.23	54.00	-11.77	100	231
13992.0	26.61	42.88	3.36	42.90	29.95	54.00	-24.05	101	245
14688.3	28.68	44.22	3.43	42.34	34.00	54.00	-20.00	100	162
15299.7	26.21	43.12	3.50	43.26	29.57	54.00	-24.43	100	221
15690.3	26.02	43.41	3.54	42.16	30.81	54.00	-23.19	100	111

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal) , Turbo Mode, Channel 5 : 5800 MHZ

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turtable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7130.87	40.88	39.84	2.34	46.25	36.82	54.00	-17.18	100	110
7912.09	27.94	40.88	2.48	44.16	27.14	54.00	-26.86	108	190
8404.59	26.47	41.04	2.57	42.71	27.36	54.00	-26.64	106	65
11580.4	34.63	42.35	3.04	41.77	38.24	54.00	-15.76	103	115
14688.3	28.84	44.22	3.43	42.34	34.16	54.00	-19.84	105	110
15282.7	26.11	43.15	3.49	43.30	29.45	54.00	-24.55	100	172

1GHz~ 40 GHz (Vertical), Turbo Mode, Channel 5: 5800 MHz

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turtable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Position (°)
7164.83	42.21	39.80	2.35	46.24	38.12	54.00	-15.88	101	195
11580.4	37.02	42.35	3.04	41.77	40.64	54.00	-13.36	100	210
14688.3	29.01	44.22	3.43	42.34	34.33	54.00	-19.67	103	65
15282.7	25.46	43.15	3.49	43.30	28.80	54.00	-25.20	100	115
15673.3	26.01	43.35	3.54	42.21	30.68	54.00	-23.32	100	123
15979.0	25.19	44.33	3.57	41.20	31.89	54.00	-22.11	101	110

Note: “ * ” : Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

The Spectrum noise level + Correction Factor < Limit - 6 dB

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

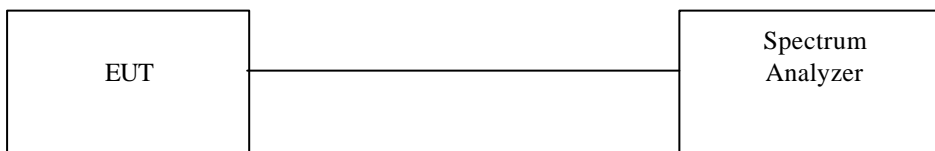
All frequencies from 1GHz to 40 GHz have been tested.

6.6 Band Edge Measurement (Section 15.407 (b) (1) (2))

6.6.1 Test Procedure (Conducted)

1. The Transmitter output of EUT was connected to the spectrum analyzer.
 Equipment mode: Spectrum analyzer
 Detector function: Peak mode
 SPAN: 100MHz
 RBW: 1 MHz
 VBW: 1 MHz
 Sweep time= 200 sec.
2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed.
3. Find the next peak frequency outside the operation frequency band.

6.6.2 Test Setup (Conducted)



6.6.3 Test Data (conducted):

Band Edge measurement (Conducted)

Outside Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Corrected Factor (dB)	Corrected Emissions (dBuV ERP)	Limit: (dBuV ERP)	Pass or Fail
1 (Normal)	5148.7	66.16	6.1	72.26	80	Pass
8 (Normal)	5351.0	66.91	6.1	73.01	80	Pass
1 (Turbo)	5148.8	61.10	6.1	67.2	80	Pass
3 (Turbo)	5352.4	59.47	6.1	65.57	80	Pass

Note: Corrected Emissions = Spectrum + Corrected Factor
 Corrected Factor = Cable Loss + Antenna Peak Gain (dBi)

Band Edge Conducted measurement (Normal Mode Channel 1)



Band Edge Conducted Measurement (Normal Mode Channel 8)



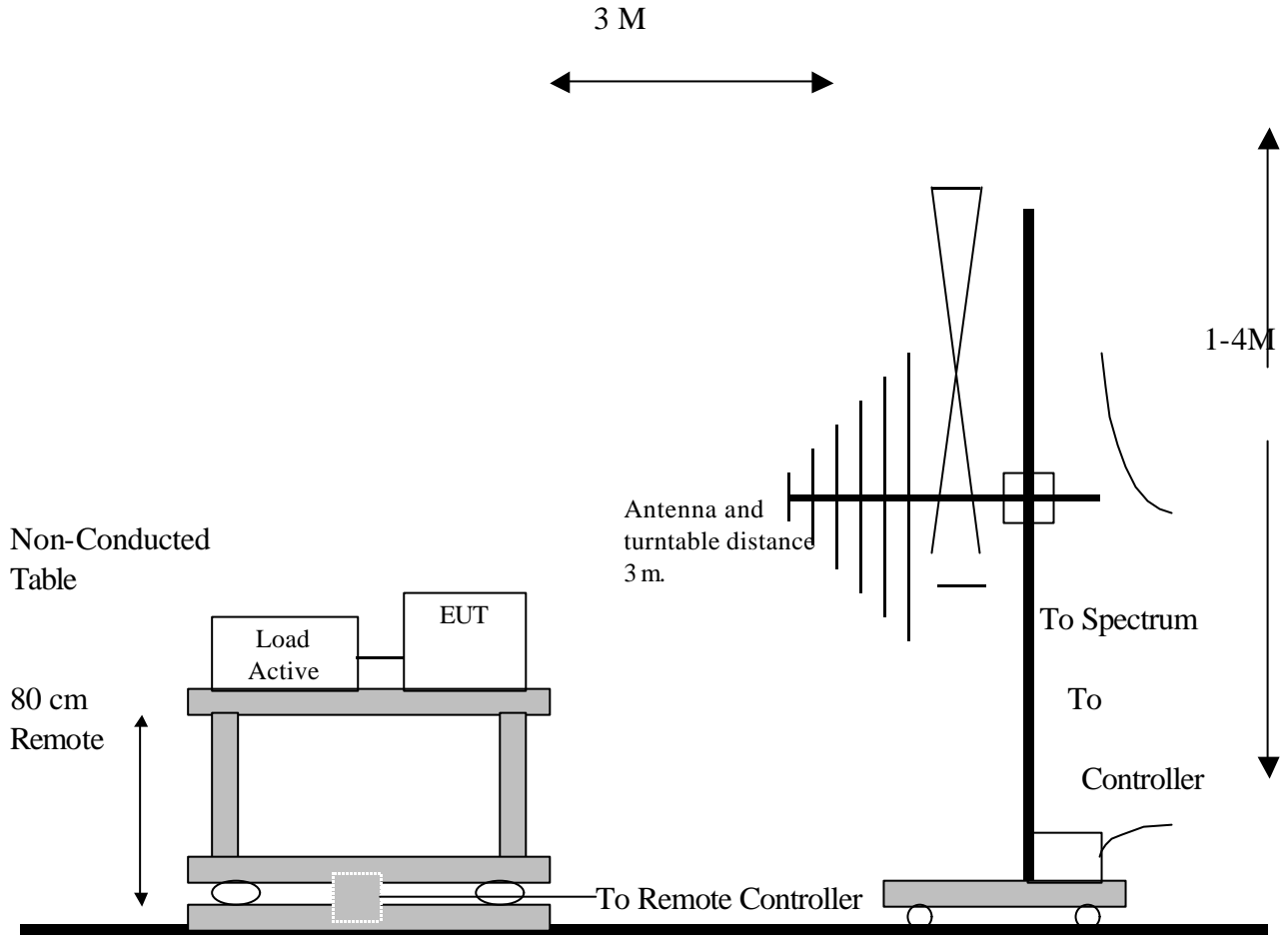
Band Edge Conducted measurement (Turbo Mode Channel 1)



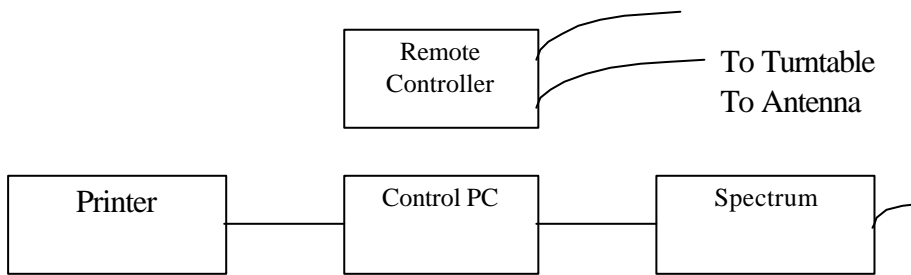
Band Edge Conducted Measurement (Turbo Mode Channel 3)



6.6.5 Test Setup (Radiated)



Metal Full Soldered Ground Plane



6.6.6 Test Data (Radiated):

Band Edge measurement (Radiated)

Outside Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Pass/Fail
1 (Normal)	5144.4	20.3.0 (pk)	38.1	58.40	74	Pass
1 (Normal)	5150.0	7.05 (av)	38.1	45.15	54	Pass
8 (Normal)	5387.2	20.59(pk)	38.1	58.69	74	Pass
8 (Normal)	5376.1	7.38(av)	38.1	45.48	54	Pass
1 (Turbo)	5149.0	20.17(pk)	38.1	58.27	74	Pass
1 (Turbo)	5148.9	6.93 (av)	38.1	45.03	54	Pass
3 (Turbo)	5369.5	20.73 (pk)	38.1	58.83	74	Pass
3 (Turbo)	5350.7	6.91 (av)	38.1	45.01	54	Pass

Note: “pk”: peak reading

“av”: average reading

Emission Level = Spectrum Reading + Correction Factor

Correction Factor = Antenna Factor + cable loss

Both Horizontal and Vertical polarization have been tested and the worst data is listed above.

Band Edge measurement for radiated emission in Restricted Band(Radiated)

Normal Mode (Channel 1) Peak data



Normal Mode (Channel 1) Average Data



Band Edge measurement for radiated emission in Restricted Band(Radiated)

Normal Mode (Channel 8) Peak data



Normal Mode (Channel 8) , Average data

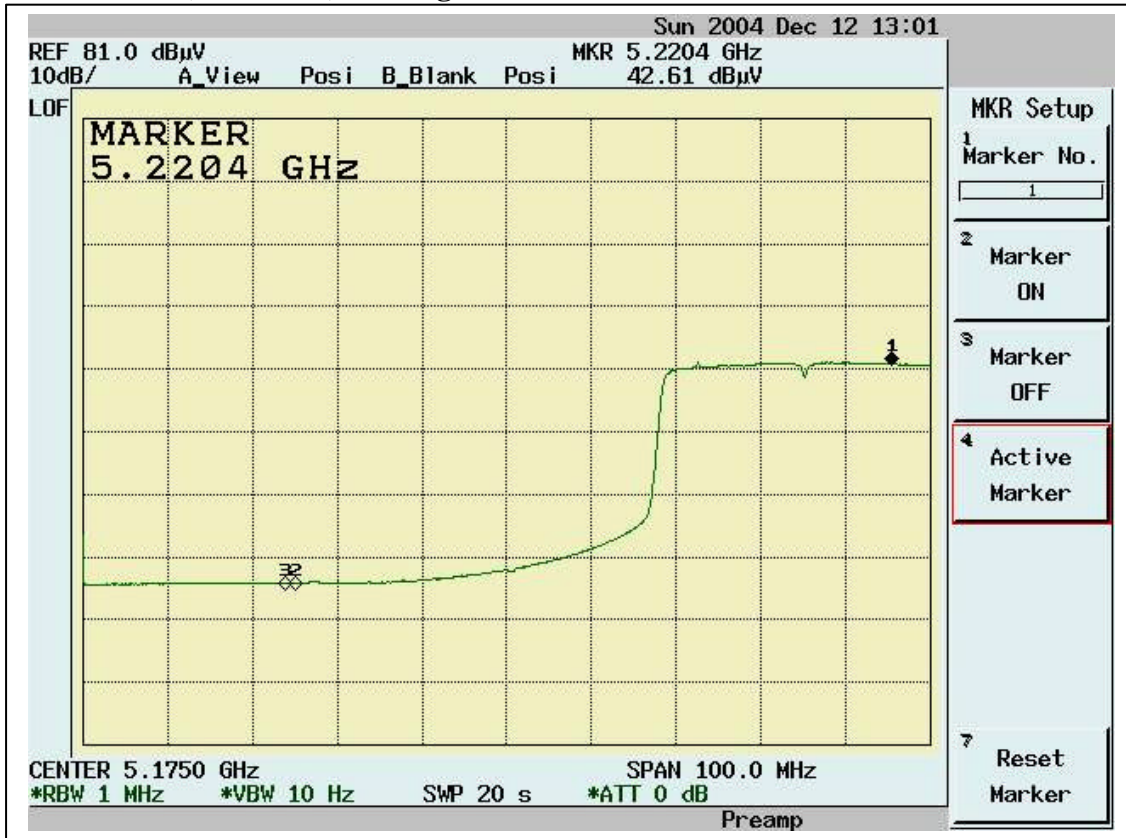


Band Edge measurement for radiated emission in Restricted Band(Radiated)

Turbo Mode (Channel 1) Peak data



Turbo Mode (Channel 1) Average Data



Band Edge measurement for radiated emission in Restricted Band(Radiated)

Turbo Mode (Channel 3) Peak data



Turbo Mode (Channel 3) , Average data



6.7 RF Exposure Measurement [Section 15.407(f)(4) & 1.1307(b)]

Refer to SAR Test Report

6.8 Frequency Stability [Section 15.407(g)]

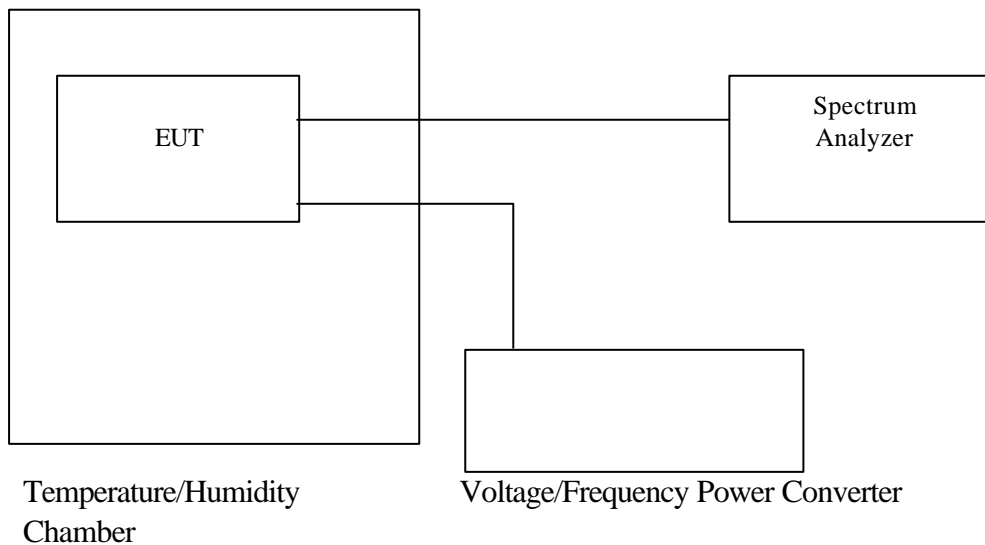
6.8.1 Limits of Frequency Stability Measurement

The frequency tolerance of the carrier signal shall be maintained within +/- 0.02% of the operating frequency over the operation temperature range of EUT (0°C - 35°C), and variation in the primary supply voltage from 85% to 115% of the rated supply voltage (115V AC) at 20°C.

6.8.2 Test Procedure

1. The EUT was placed in the Temperature/Humidity Chamber and powered by a Voltage/Frequency Power converter.
2. Connect the RF output of EUT to Spectrum. Turn on the EUT.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the chamber temperature to stabilize. Turn the EUT on and measure the operating frequency after 2, 5, 10 minutes.
5. Set the Voltage/Frequency Power Converter to 85% and 115% of supply voltage, then repeat step 2, 3, 4 respectively.
6. Repeat step 2, 3, 4, 5 with the temperature of chamber set to the lowest temperature.
7. Repeat step 2, 3, 4, 5 with the temperature of chamber set to 20°C

6.8.3 Test Setup



6.8.4 Test Data

Operating Frequency: 5180MHz		Limit: +/- 0.02%					
Temp. (°C)	Power Supply (V AC)	2 minutes		5 minutes		10 minutes	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
35	132	5179.9832	-0.000324	5179.9802	-0.000382	5179.9869	-0.000253
	115	5179.9870	-0.000251	5179.9889	-0.000214	5179.9890	-0.000212
	97	5179.9830	-0.000328	5179.9832	-0.000324	5179.9910	-0.000174
0	132	5179.9893	-0.000207	5179.9888	-0.000216	5179.9904	-0.000185
	115	5179.9870	-0.000251	5179.9911	-0.000172	5179.9920	-0.000154
	97	5179.9843	-0.000303	5179.9934	-0.000127	5179.9900	-0.000193
20	132	5179.9835	-0.000319	5179.9812	-0.000363	5179.9799	-0.000388
	115	5179.9814	-0.000359	5179.9801	-0.000384	5179.9835	-0.000319
	97	5179.9801	-0.000384	5179.9826	-0.000336	5179.9842	-0.000305

Operating Frequency: 5805 MHz		Limit: +/- 0.02%					
Temp. (°C)	Power Supply (V AC)	2 minutes		5 minutes		10 minutes	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
35	132	5804.9849	-0.000260	5804.9832	-0.000289	5804.9911	-0.000153
	115	5804.9798	-0.000348	5804.9864	-0.000234	5804.9935	-0.000112
	97	5804.9810	-0.000327	5804.9833	-0.000288	5804.9911	-0.000153
0	132	5804.9902	-0.000169	5804.9835	-0.000284	5804.9886	-0.000196
	115	5804.9877	-0.000212	5804.9832	-0.000289	5804.9942	-0.000100
	97	5804.9941	-0.000102	5804.9908	-0.000158	5804.9890	-0.000189
20	132	5804.9844	-0.000269	5804.9769	-0.000398	5804.9770	-0.000396
	115	5804.9781	-0.000377	5804.9792	-0.000358	5804.9782	-0.000376
	97	5804.9791	-0.000360	5804.9833	-0.000288	5804.9805	-0.000336

7. Appendix

7.1 Appendix A: Measurement Procedure for Power line Conducted Emissions

The EUT is set up in accordance with the suggested configuration given in ANSI C63.4-2001, CFR 47 Part 15 Subpart B; or EN55022:1994/ A1:1995/A2:1997; CISPR 22:1993/A1:1995/A2:1996. The measurements are performed in a 3.5m x 3.4m x 2.5m shielded room, which referred as Conduction 01 test site, or a 3m x 3m x 2.3m test site, which referred as Conduction 02 test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the Figure 1 of the ANSI C63.4-2001 or CISPR16. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

If the EUT is supplied with a flexible power cord, the power cord length in excess of the distance separating the EUT from the LISN shall be folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length. If the EUT is provided with a permanently coiled power cord, bundling of the cord is not required. If the EUT is supplied without a power cord, the EUT shall be connected to the LISN by a power cord of the type specified by the manufacturer which shall not be longer than 1 meter. The excess power cord shall be bundled as described above. If a non-flexible power cord is provided with the EUT, it shall be cut to the length necessary to attach the EUT to the LISN and shall not be bundled.

The interconnecting cables were arranged and moved to get the maximum according to ANSI C63.4-2001, CFR 47 Part 15 Subpart B; or EN55022:1994/ A1:1995/A2:1997; CISPR 22:1993/A1:1995/A2:1996. Both the line of power cord, hot and neutral, were measured.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

7.2 Appendix B: Test Procedure for Radiated Emissions

Preliminary Measurements in the Anechoic Chamber

The radiated emissions are initially measured in the anechoic chamber at a measurement distance of 3 meters. Desktop EUT are placed on a wooden stand 0.8 meter in height. The measurement antenna is 3 meters from the EUT. The test setup in anechoic chamber is the same as open site. The turntable rotated 360°. The antenna height is varied from 1-2.5m. The primary objective of the radiated measurements in the anechoic chamber is to identify the frequency spectrum in the absence of the electromagnetic environment existing on the open test site. The frequencies can then be pre-selected on the open test site to obtain the corresponding amplitude. The initial scan is made with the spectrum analyzer in automatic sweep mode. The spectrum peaks are then measured manually to determine the exact frequencies.

Measurements on the Open Site or 10m EMC Chamber

The radiated emissions test will then be repeated on the open site or 10m EMC chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of one of the 3 or 10 meter open field sites. Desktop EUT are set up on a wooden stand 0.8 meter above the ground.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. Both reading are recorded with the quasi-peak detector with 120KHz bandwidth. For frequency between 30 MHz and 1000MHz, the reading is recorded with peak detector or quasi-peak detector. For frequency above 1 GHz, the reading is recorded with peak detector or average detector with 1 MHz bandwidth.

At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum according to ANSI C63.4-2001, CFR 47 Part 15 Subpart B; or EN55022:1994/ A1:1995/A2:1997; CISPR 22:1993/A1:1995/A2:1996. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings.

7.3 Appendix C: Test Equipment

7.3.1 Test Equipment List

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction	Digital Hygro-Thermometer Conduct	MicroLife	HT-2126G	ISL-Conducti on02	12/04/2003	12/04/2004
Conduction	50 Ohms Load Conduction 02	EMCO	N/A	ISL-50ohms conduction 02	11/21/2003	11/21/2004
Conduction	Coaxial Cable 1F-C2	Harbourindustries	RG400	1F-C2	06/03/2003	06/03/2004
Conduction	EMI Receiver 02	HP	85460A	3448A00183	08/21/2003	08/21/2004
Conduction	ISN T4	Schaffner	ISN T400	16593	08/20/2002	08/20/2004
Conduction	ISN T4 02	FCC	F-CMISN-C AT5	02003	12/17/2003	12/17/2004
Conduction	CISPR22 Voltage Probe	FCC	F-CVP-1	68	12/18/2003	12/18/2004
Conduction	Current Probe	Schaffner	SMZ 11	18030	01/09/2003	01/09/2004
Conduction	LISN 01	R&S	ESH2-Z5	890485/013	05/07/2003	05/07/2004
Conduction	LISN 04	EMCO	3810/2	9604-1429	12/17/2003	12/16/2004
Radiation	Digital Hygro-Thermometer Chmb 02	MicroLife	HT-2126G	Chmb 02	12/04/2003	12/04/2004
Radiation	Spectrum Analyzer 06	Advantest	R3162	91700295	09/25/2003	09/24/2004
Radiation	EMI Receiver 04	AFJ	ER 55CR	55390143233	10/28/2003	10/27/2004
Radiation	BILOG Antenna 08	Schaffner	CBL6112B	2756	06/04/2003	06/04/2004
Radiation	Coaxial Cable Chmb 02-10M	Belden	RG-8/U	Chmb 02-10M	10/03/2003	10/03/2004
Radiation	Microwave Cable Chmb 02 3M	HUBER+SUHNER AG.	Sucoflex 103	42731/3 & 42729/3	03/21/2003	03/21/2004
Radiation	Temperature/ Humidity Chamber	K. Son Ins. Tech.	THS-B4H ⁺ - 100	2287	03/01/2003	03/01/2004
Radiation	Voltage/Frequency Power converter	EXTECH Electronics	CFC-105W	780274	08/25/2003	08/25/2004
Rad. Above 1Ghz	Spectrum Analyzer 07	Advantest	R3182	110600649	10/17/2003	10/17/2004
Rad. Above 1Ghz	Horn Antenna 02	Com-Power	AH-118	10088	02/06/2003	02/05/2004
Rad. Above 1Ghz	Horn Antenna 04	Com-Power	AH-826	081-001	12/10/2003	12/09/2004
Rad. above 1Ghz	Horn Antenna 05	Com-Power	AH-640	100A	09/13/2003	09/13/2004
Rad. above 1Ghz	Microwave Cable Chmb 05	HUBER+SUHNER AG.	Sucoflex 103	42726/3 & 42727/3	09/11/2003	09/11/2004

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Rad. Above 1Ghz	Preamplifier 02	MITEQ	AFS44-00102 650-40-10P-4 4	728229	05/07/2003	05/07/2004
Rad. Above 1Ghz	Preamplifier 09	MITEQ	AFS44-00102 650-40-10P-4 4	858687	02/28/2003	02/28/2004
Rad. Above 1Ghz	Preamplifier 10	MITEQ	JS-26004000- 27-5A	818471	02/28/2003	02/28/2004
Rad. Above 1Ghz	Signal Generator 03	Anritsu	MG3642A	6200162550	02/10/2003	02/09/2004
Rad. Above 1Ghz	Signal Generator 04	Anritsu	MG3692A	020311	02/06/2003	02/06/2004
Rad. Above 1Ghz	Peak Power Analyzer	HP	8990A	3621A01269	12/09/2003	12/09/2004
Rad. Above 1Ghz	Power Sensor Radar	HP	84815A	3318A01828	11/12/2003	11/12/2004

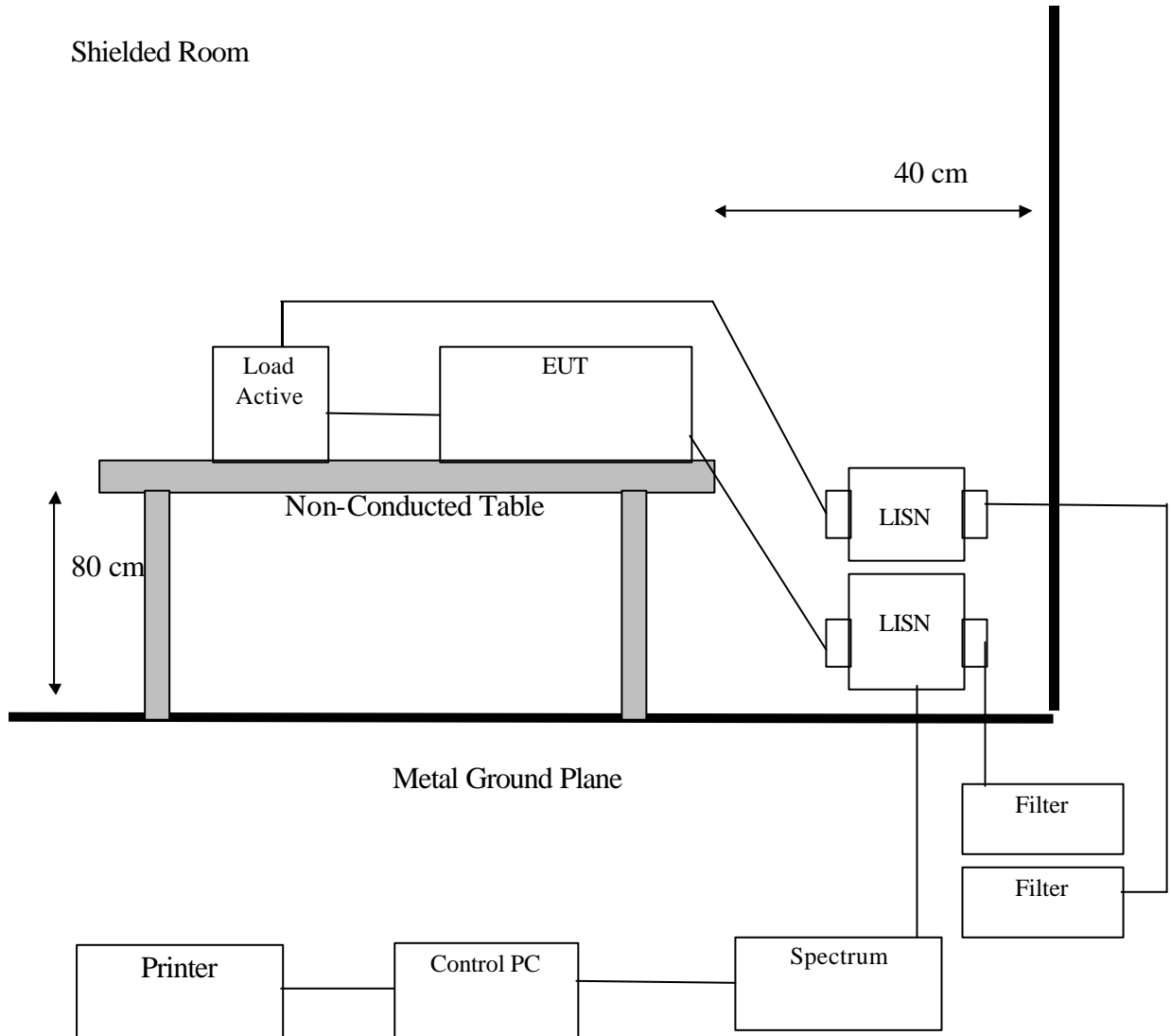
Note: Calibration traceable to NIST or national or international standards.

7.3.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

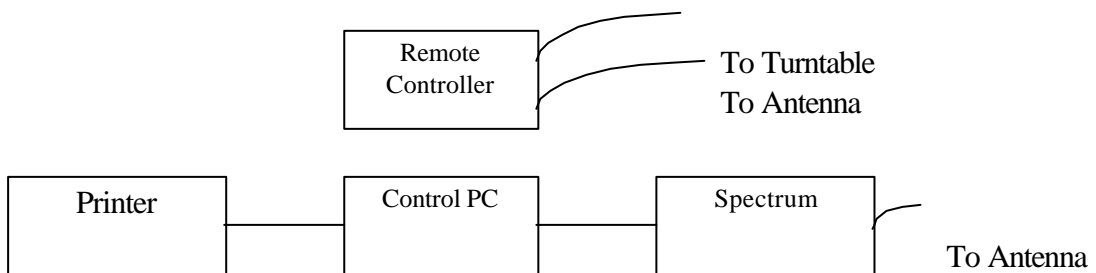
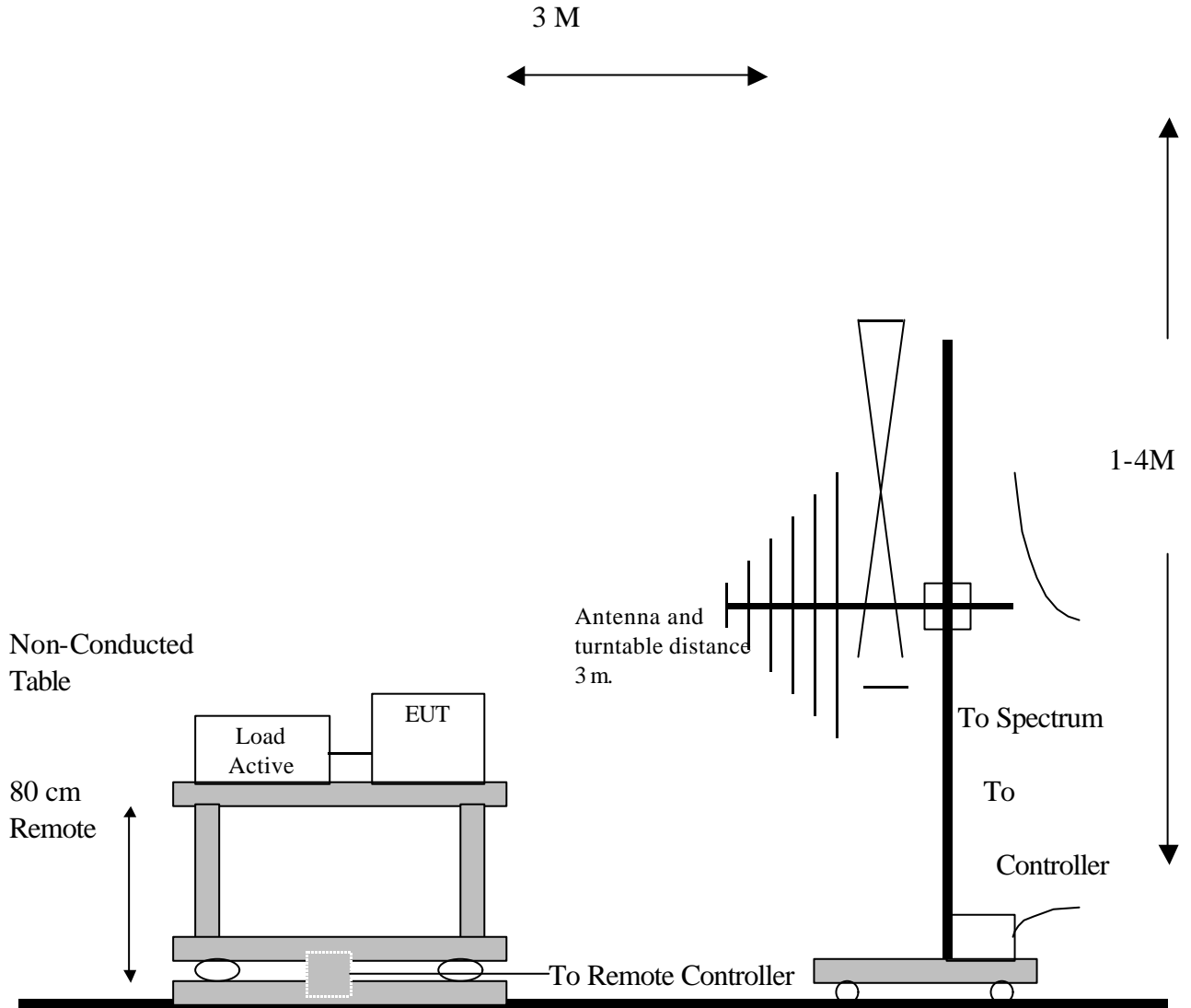
Radiation/Conduction	Filename	Version	Issued Date
Conduction	Tile.exe	1.12E	7/7/2000
Radiation	Tile.exe	1.12C	6/16/2000

7.4 Appendix D: Layout of EUT and Support Equipment

7.4.1 General Conducted Test Configuration



7.4.2 General Radiation Test Configuration



7.5 Appendix E: Description of Support Equipment

7.5.1 Description of Support Equipment

Support Unit 1.

Description:	Acer USB Keyboard
Model Number:	6511-UV
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A (comply with FCC DOC)

Support Unit 2.

Description:	Acer Monitor
Model:	G781
Serial Number:	999007101214400445T7AA31T
Power Cord:	Non-shielded, Detachable
FCC ID:	(Comply with FCC Standards)

7.5.2 Software for Controlling Support Unit

Test programs exercising various part of EUT were used. The programs were executed as follows:

- A. Read and write to the disk drives.
- B. Send H pattern to the video port device (Monitor).
- C. Repeat the above steps.

	Filename	Issued Date
Monitor	HH.bat	8/20/1991

7.5.3 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cord	110V (~240V) to AC Power Cord Inlet (3-pin)	1.8M	Nonshielded, Detachable	Plastic Head
Monitor Data Cable	Monitor to PC VGA port	1.6M	Shielded, Un-detachable	Metal Head
USB Mouse Data Cable	USB Mouse to PC USB port	1.8M	Shielded, Un-detachable	Metal Head

7.6 Appendix F: Accuracy of Measurement

Test Site: Conduction 02

Item	Source of Uncertainty	Probability Distribution	Total Uncertainties (dB)		Standard Uncertainty (dB)	
			k	Value	k	Value
1	Systematic Effects: (Assessment from 20 repeat observation; 1 reading on EUT)	Normal	k=2	0.104	k=1	0.052
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=2	0.330	k=1	0.165
3	Receiver Calibration	Rectangular	k=1.73	1.000	k=1	0.577
4	LISN Factor Calibration	Normal	k=2	1.200	k=1	0.600
5	Cable Loss Calibration	Normal	k=2	1.000	k=1	0.500
6	Combined Standard Uncertainty Uc(y)	Normal			k=1	0.850
7	Total Uncertainty @95% mim. Confidence Level	Normal	k=2	1.701		

Measurement Uncertainty Calculations:

$$U_c(y) = \text{square root} (u_1(y)^2 + u_2(y)^2 + \dots + u_n(y)^2)$$

$$U = 2 * U_c(y)$$

Note: The measurement Uncertainties mentioned above also refer to NIS 81-1994 of NAMAS :
The treatment of Uncertainty in EMC Measurement.

Test Site: Chamber 02-3M

Item	Source of Uncertainty	Probability Distribution	Total Uncertainties (dB)		Standard Uncertainty (dB)	
1	Systematic Effects: (Assessment from 20 repeat observation; 1 reading on EUT)	Normal	k=2	0.067	k=1	0.034
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=2	0.103	k=1	0.052
3	Receiver Calibration	Rectangular	k=1.73	1.000	k=1	0.577
4	Antenna Factor Calibration	Normal	k=2	1.700	k=1	0.850
5	Cable Loss Calibration	Normal	k=2	1.000	k=1	0.500
6	Combined Standard Uncertainty Uc(y)	Normal			k=1	1.029
7	Total Uncertainty @95% mim. Confidence Level	Normal	k=2	2.059		

Measurement Uncertainty Calculations:

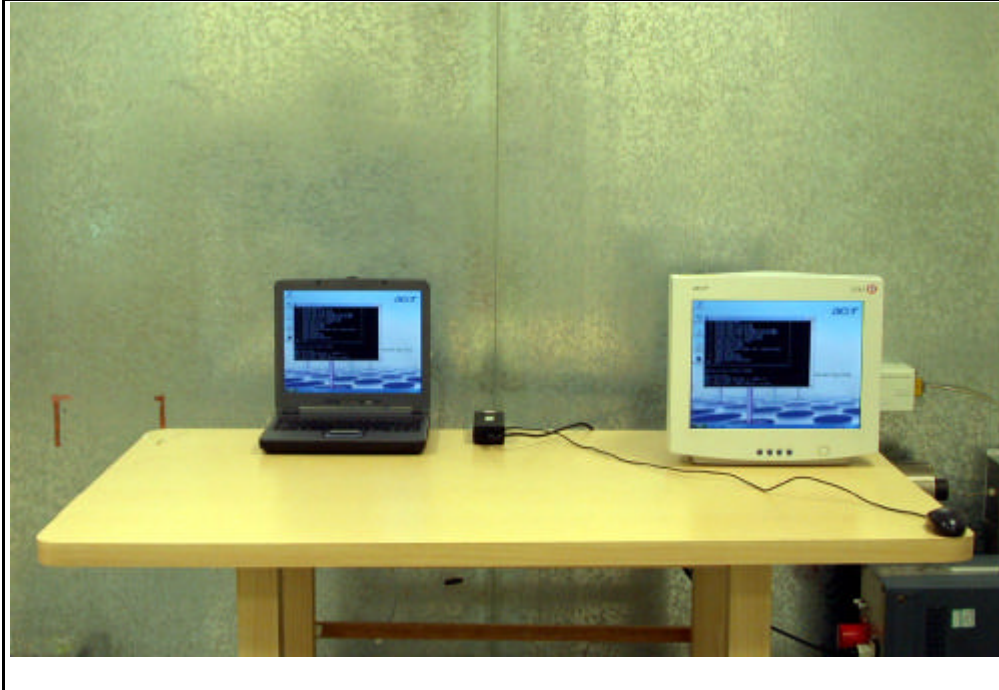
$$Uc(y) = \text{square root} (u_1(y)^2 + u_2(y)^2 + \dots + u_n(y)^2)$$

$$U = 2 * Uc(y)$$

Note: The measurement Uncertainties mentioned above also refer to NIS 81-1994 of NAMAS :
The treatment of Uncertainty in EMC Measurement.

7.7 Appendix G: Photographs of EUT Configuration Test Set Up

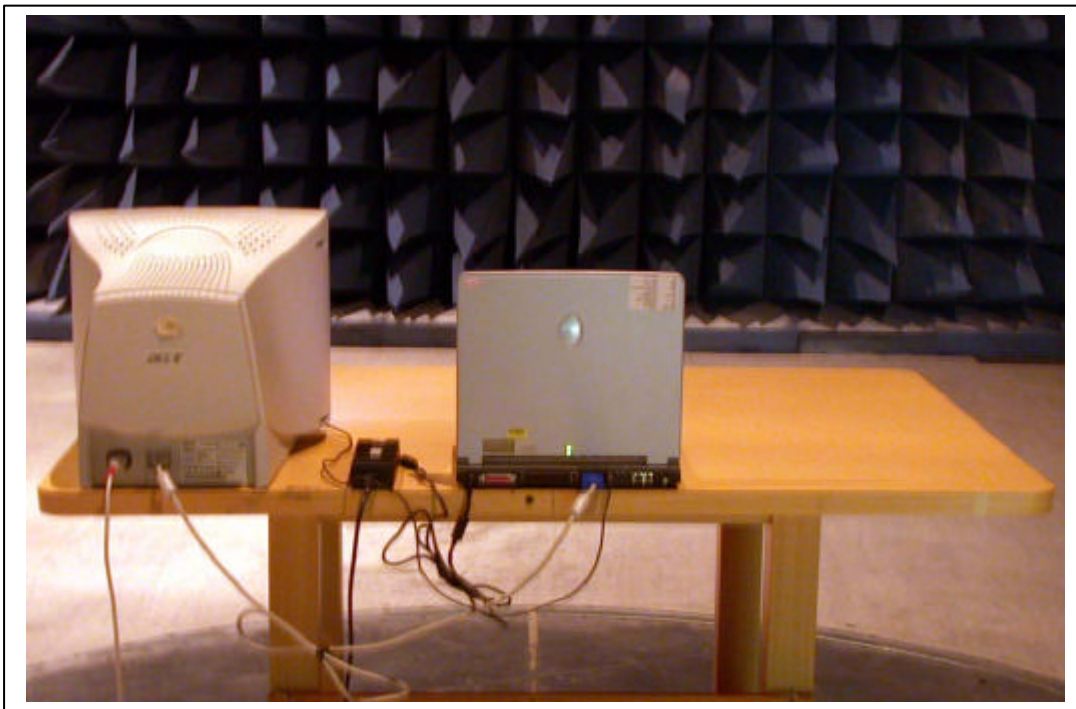
The Front View of Highest Conducted Set-up For EUT



The Front View of Highest Radiated Set-up For EUT



The Back View of Highest Radiated Set-up For EUT



7.8 Appendix H: Antenna Spec.

Please refer to the attached file.