



香 港 標 準 及 檢 定 中 心
Hong Kong Standards and Testing Centre

Date : 2006-02-20
No. : HM155543

TEST REPORT

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Applicant:

River Display Electronics (Songgang) Mfg. Co.
Sha Pu Industrial Zone No.3, Songgang, Bao An
District, Shenzhen, China

Description of Samples:

Model name: Lamp Control Module L206RF
Model no.: L206RF
Brand name: INNCOM
FCC ID: TZJL206RF

Date Samples Received:

2005-11-17

Date Tested:

2005-11-29 to 2006-01-03

Investigation Requested:

FCC Part 15 Subpart C

Conclusions:

The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15 and Part 18. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks:

LEE Kam Chuen, EMD
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

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Appendix A

List of Measurement Equipment

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Appendix B

Photographs

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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate
New Territories, Hong Kong

1.2 Applicant Details
Applicant

River Display Electronics (Songgang) Mfg. Co.
Sha Pu Industrial Zone No.3, Songgang, Bao An District,
Shenzhen, China

Manufacturer

River Display Electronics (Songgang) Mfg. Co.
Sha Pu Industrial Zone No.3, Songgang, Bao An District,
Shenzhen, China

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**1.3 Equipment Under Test [EUT]
Description of Sample**

Product: Lamp Control Module L206RF
Manufacturer: River Display Electronics (Songgang) Mfg. Co.
Brand Name: INNCOM
Model Number: L206RF
Rating: 230Va.c.

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a River Display Electronics (Songgang) Mfg. Co., Lamp Control Module L206RF. The transmitter is a button transmitter. The EUT continues to transmit while button is being pressed, Modulation by IC.

1.4 Date of Order

2005-11-17

1.5 Submitted Sample(s):

1 Sample per model

1.6 Test Duration

2005-11-29 to 2006-01-03

1.7 Country of Origin

China

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2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2005, Part 18 and ANSI C63.4:2003 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.249	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.45MHz to 30MHz	FCC PART 18	ANSI C63.4:2003	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

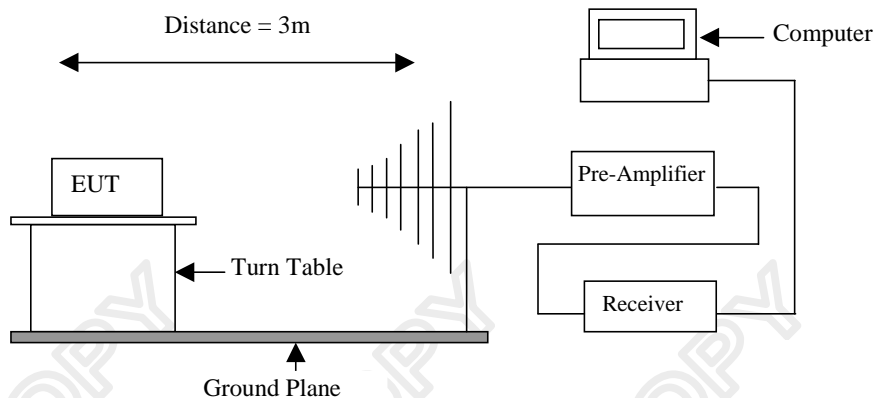
Test Requirement:	FCC 47CFR 15.249
Test Method:	ANSI C63.4:2003
Test Date:	2005-11-29
Mode of Operation:	Tx Mode & Rx Mode

Test Method:

The sample was placed 0.8m above the ground plane on a standard radiated emission test site. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*: On a standard radiated emission test site located at HKSTC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 90657 / 607756.

Test Setup:



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Millivolts/meter]	Field Strength of Fundamental Emission [microvolts/meter]
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-22500	250	2500

Results of Tx Mode: PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
914	62.3	26.7	89.0	28,183.8	50,000	Horizontal
1828	No Emission Detected				5,000	Vertical
2742					5,000	Vertical
3656					5,000	Vertical
4570					5,000	Vertical
5484					5,000	Vertical
6398					5,000	Vertical
7312					5,000	Vertical
8226					5,000	Vertical
9140					5,000	Vertical

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

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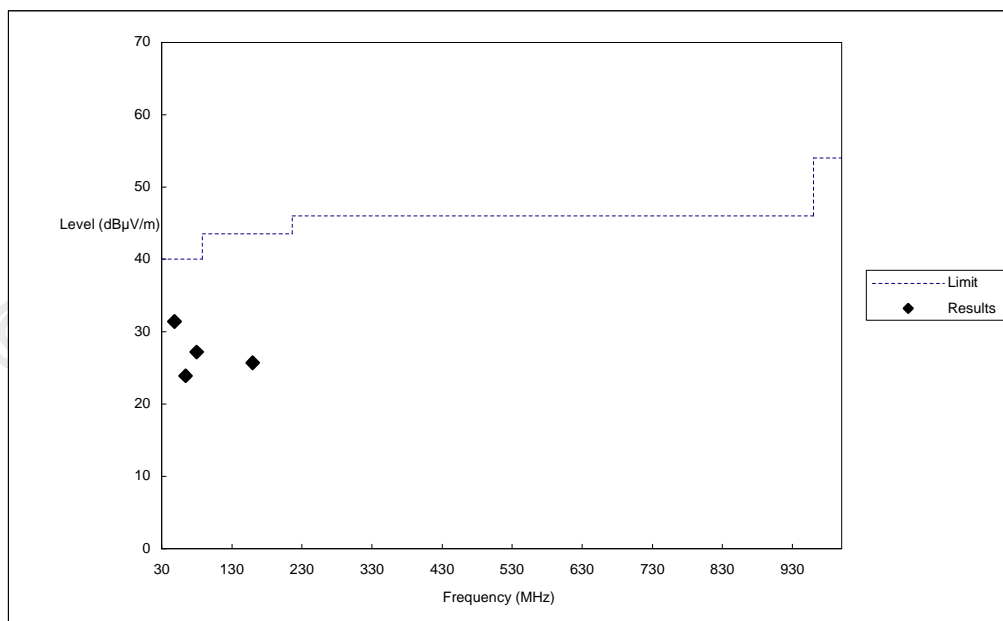
No. : HM155543

Limits for Radiated Emissions [FCC 47 CFR 15.109 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [$\mu\text{V/m}$]
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of Rx Mode: PASS



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Results of Rx Mode: PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dB μ V/m	Limit @3m dB μ V/m	Level @3m @3m μ V/m	Limit @3m μ V/m
48.0	Vertical	31.4	40.0	37.2	100
64.0	Vertical	23.9	40.0	15.7	100
80.0	Vertical	27.2	40.0	22.9	100
160.0	Vertical	25.7	43.5	19.3	150

Remark:

Calculated measurement uncertainty : 30MHz to 1GHz ± 4.1 dB

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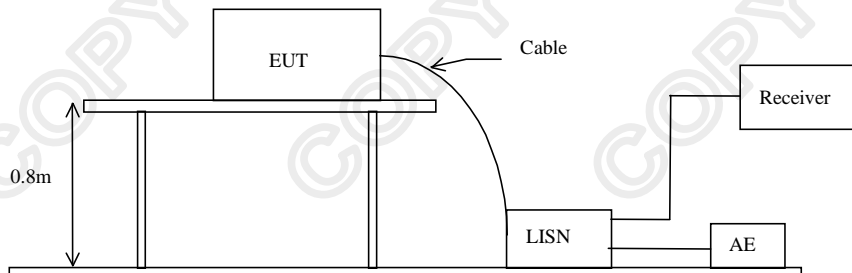
3.1.2 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.4:2003
Test Date:	2004-05-03
Mode of Operation:	Tx Mode & On Mode

Test Method:

The test was performed in accordance with ANSI C63.4:2003, with the following: an initial measurement was performed in peak and average detection mode on the live line. Any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Test Setup:



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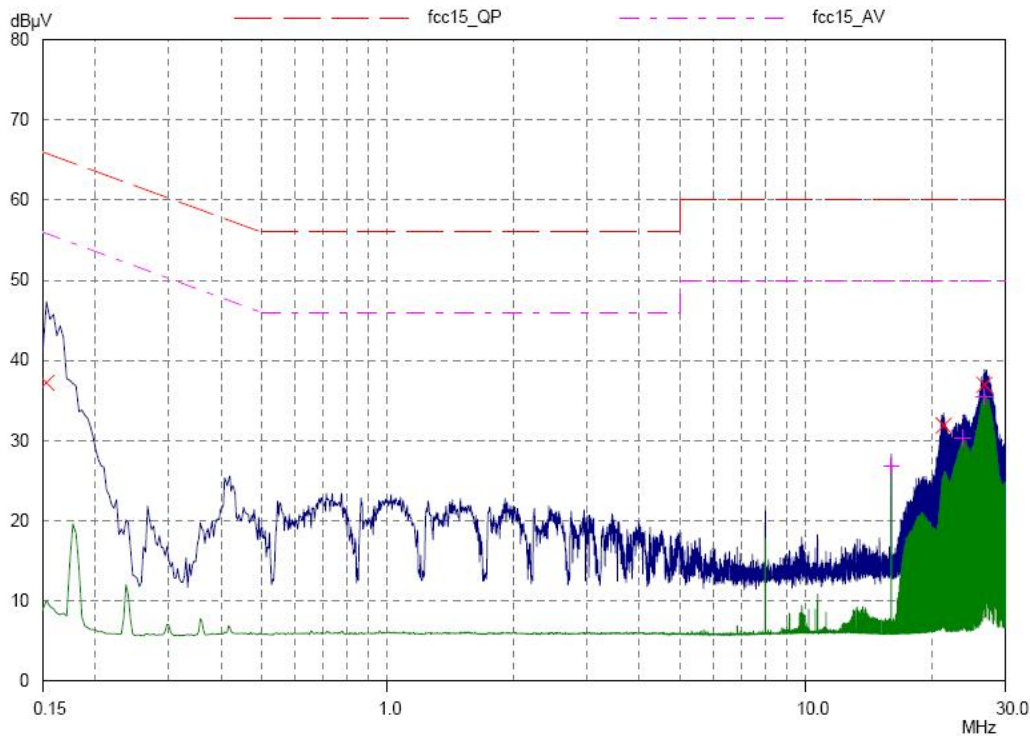
Limits for Conducted Emissions (FCC 47 CFR 15.107):

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram labelled as (QP and AV).

Results of Tx Mode: PASS



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Results of Tx Mode: PASS

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dB μ V/m	Limit dB μ V/m	Level μ V/m	Limit μ V/m
Live	0.153	37.2	65.8	-*-	-*-
Live	16.005	-*-	-*-	26.9	50.0
Live	21.370	31.9	60.0	-*-	-*-
Live	23.770	-*-	-*-	30.3	50.0
Live	26.710	37.0	60.0	35.5	50.0

Remarks:

Calculated measurement uncertainty : ± 2.8 dB

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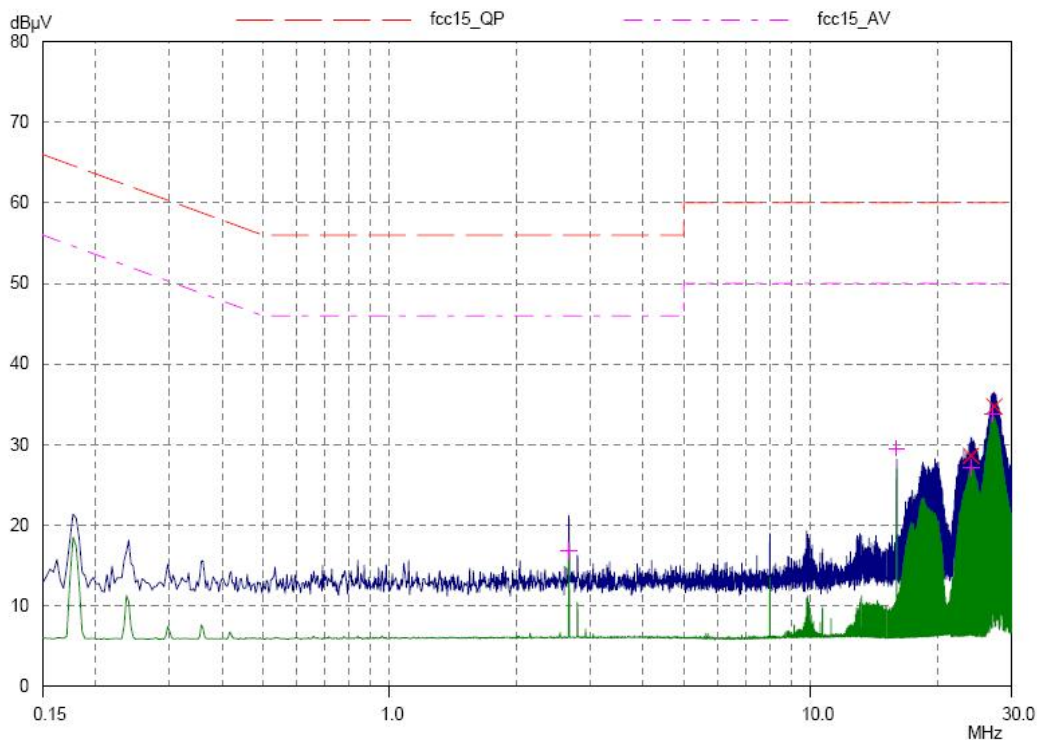
Limits for Conducted Emissions (FCC 47 CFR 15.107):

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram labelled as (QP and AV).

Results of On Mode (High): PASS



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Results of On Mode (High): PASS

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dB μ V/m	Limit dB μ V/m	Level μ V/m	Limit μ V/m
Live	2.665	-*-	-*-	16.8	60.0
Live	24.01	-*-	-*-	27.2	50.0
Live	27.07	-*-	-*-	33.8	50.0
Live	27.310	34.8	60.0	-*-	-*-
Neutral	16.005	-*-	-*-	29.6	50.0
Neutral	24.010	28.6	60.0	-*-	-*-

Remarks:

Calculated measurement uncertainty : ± 2.8 dB

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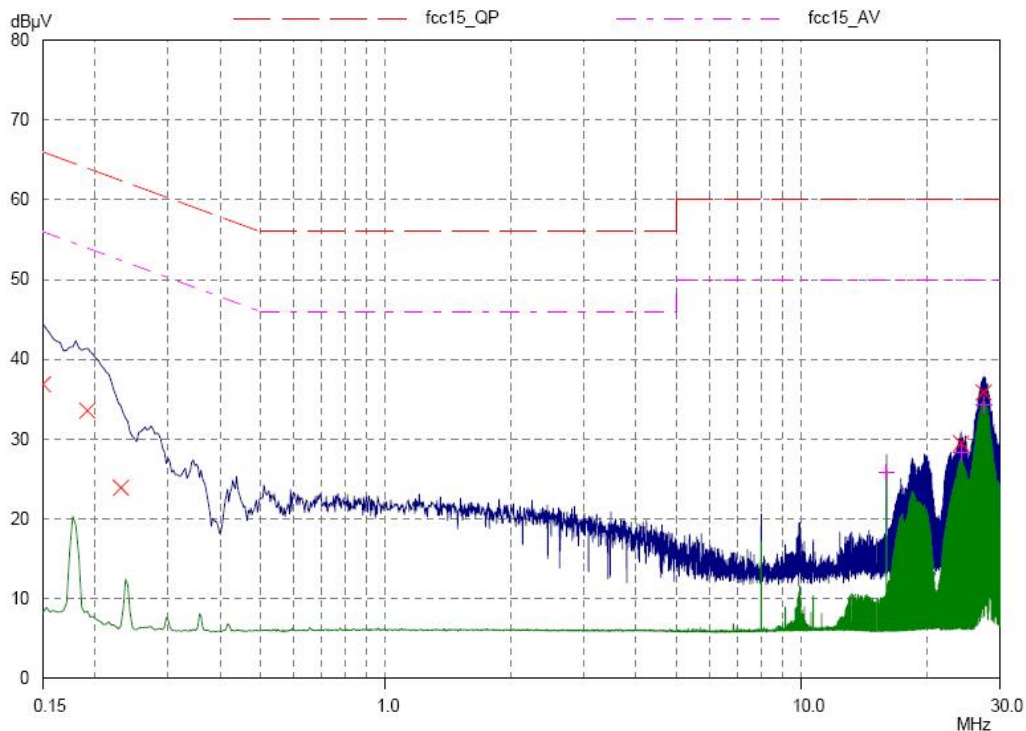
Limits for Conducted Emissions (FCC 47 CFR 15.107):

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram labelled as (QP and AV).

Results of On Mode (Middle): PASS



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Results of On Mode (Middle): PASS

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dB μ V/m	Limit dB μ V/m	Level μ V/m	Limit μ V/m
Live	16.005	-*-	-*-	25.9	50.0
Live	24.250	-*-	-*-	28.3	50.0
Live	27.430	35.9	60.0	-*-	-*-
Live	27.490	-*-	-*-	34.4	50.0
Neutral	0.150	36.9	66.0	-*-	-*-
Neutral	0.192	33.6	64.0	-*-	-*-
Neutral	0.231	23.9	62.4	-*-	-*-
Neutral	24.190	29.5	60.0	-*-	-*-

Remarks:

Calculated measurement uncertainty : ± 2.8 dB

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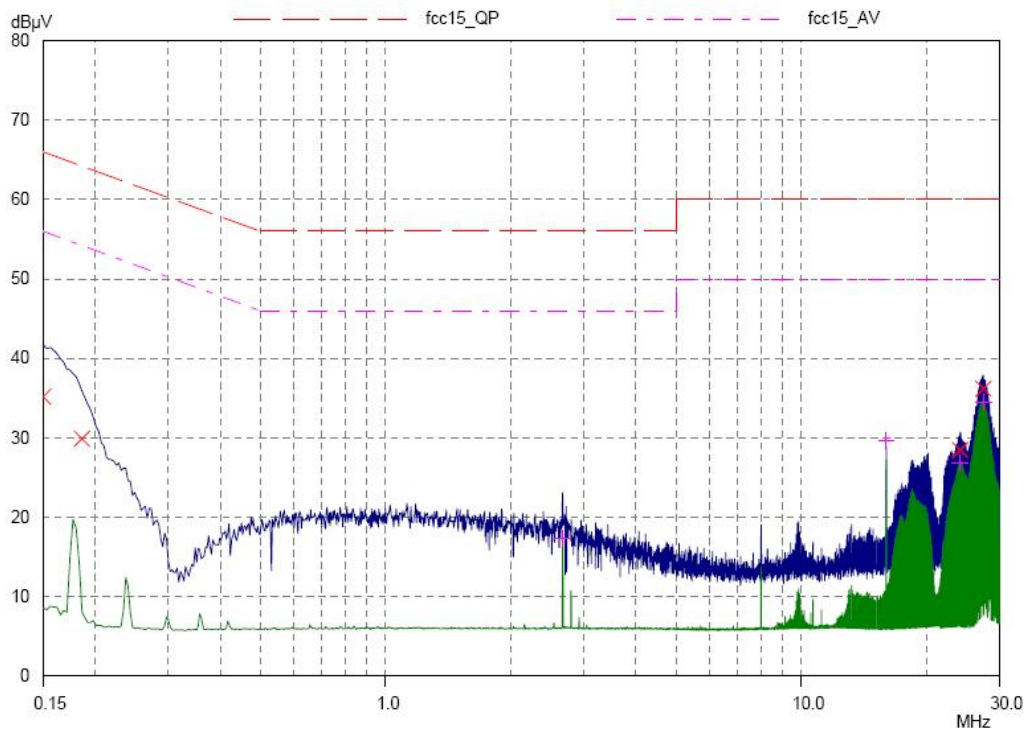
Limits for Conducted Emissions (FCC 47 CFR 15.107):

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram labelled as (QP and AV).

Results of On Mode (Low): PASS



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Results of On Mode (Low): PASS

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dB μ V/m	Limit dB μ V/m	Level μ V/m	Limit μ V/m
Live	2.665	-*-	-*-	17.4	46.0
Live	24.130	28.5	60.0	-*-	-*-
Neutral	0.150	35.2	66.0	-*-	-*-
Neutral	0.186	29.9	64.2	-*-	-*-
Neutral	16.005	-*-	-*-	29.7	50.0
Neutral	24.010	-*-	-*-	26.8	50.0
Neutral	27.430	36.2	60.0	34.5	50.0

Remarks:

Calculated measurement uncertainty : ± 2.8 dB

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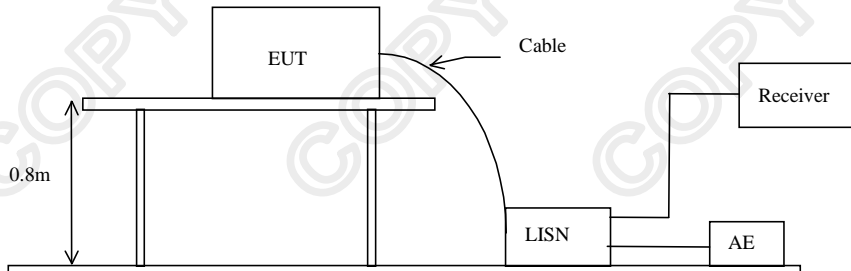
3.1.3 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	PART 18
Test Method:	ANSI C63.4:2003
Test Date:	2006-01-13
Mode of Operation:	Tx Mode & On Mode

Test Method:

The test was performed in accordance with ANSI C63.4:2003, with the following: an initial measurement was performed in peak and average detection mode on the live line. Any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Test Setup:



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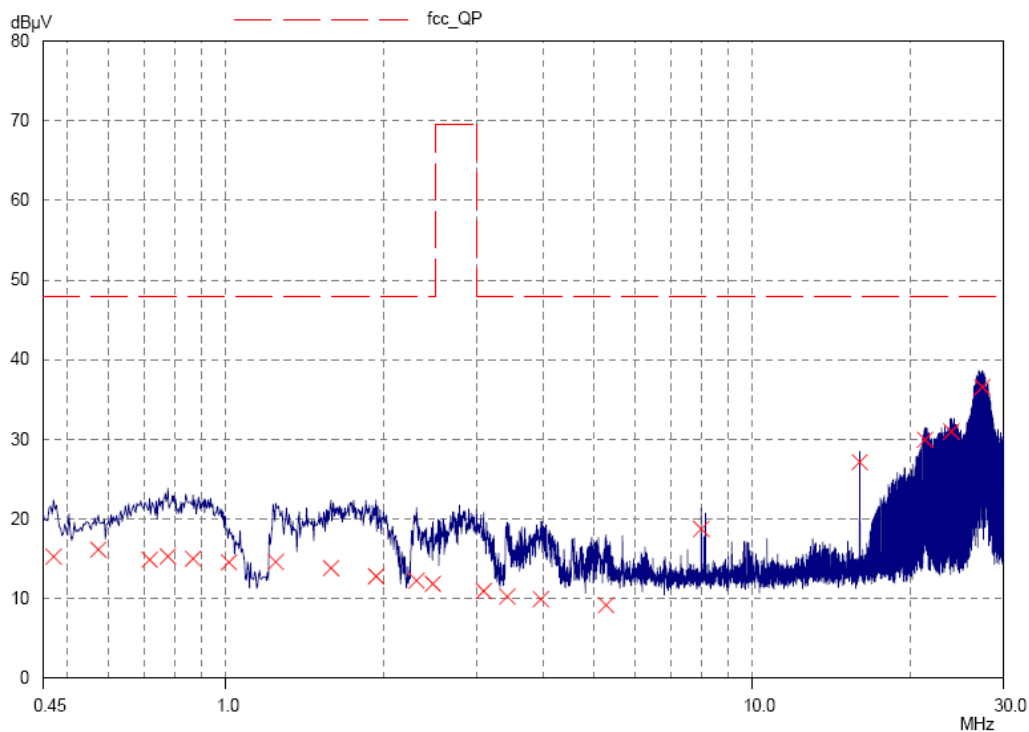
No. : HM155543

Limits for Conducted Emissions

Frequency Range [MHz]	Quasi-Peak Limits [μV]
0.45-2.51	250
2.51-3.00	3,000
3.00-30.00	250

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Results of Tx Mode: PASS



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Results of Tx Mode: PASS

Conductor	Frequency	Quasi-Peak		Average	
		Level dB μ V	Limit dB μ V	Level dB μ V	Limit dB μ V
Live or Neutral	MHz				
Live	0.717	14.9	48.0	-*-	-*-
Live	0.867	15.0	48.0	-*-	-*-
Live	1.245	14.6	48.0	-*-	-*-
Live	2.305	12.3	48.0	-*-	-*-
Live	3.090	11.0	48.0	-*-	-*-
Live	3.970	9.9	48.0	-*-	-*-
Live	8.000	18.8	48.0	-*-	-*-
Live	16.005	27.1	48.0	-*-	-*-
Live	21.310	29.9	48.0	-*-	-*-
Live	23.890	31.0	48.0	-*-	-*-
Live	27.370	36.6	48.0	-*-	-*-
Neutral	0.471	15.3	48.0	-*-	-*-
Neutral	0.573	16.2	48.0	-*-	-*-
Neutral	0.777	15.3	48.0	-*-	-*-
Neutral	1.015	14.6	48.0	-*-	-*-
Neutral	1.585	13.8	48.0	-*-	-*-
Neutral	1.930	12.8	48.0	-*-	-*-
Neutral	2.475	11.9	48.0	-*-	-*-
Neutral	3.425	10.3	48.0	-*-	-*-
Neutral	5.280	9.2	48.0	-*-	-*-

Remarks:

Calculated measurement uncertainty: ± 2.8 dB

-*- Emission(s) that is far below the corresponding limit line.

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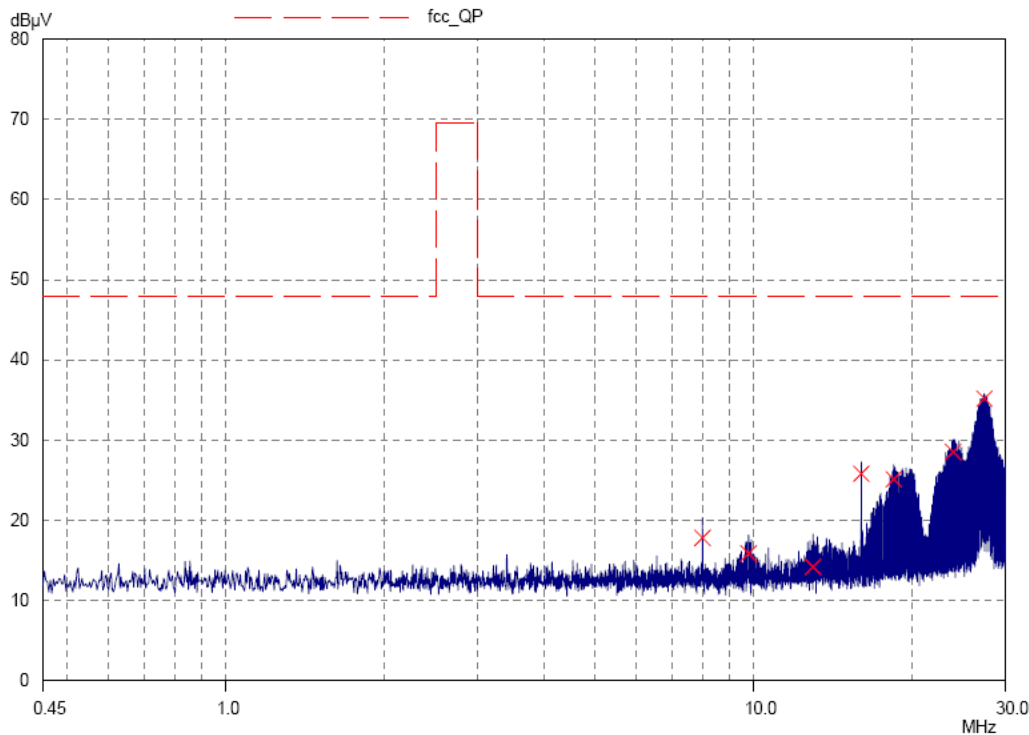
Limits for Conducted Emissions

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram labelled as (QP and AV).

Results of On Mode (High): PASS



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Results of On Mode (High): PASS

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dB μ V/m	Limit dB μ V/m	Level μ V/m	Limit μ V/m
Live	8.00	17.8	48.0	-*-	-*-
Live	16.00	25.8	48.0	-*-	-*-
Live	23.89	28.5	48.0	-*-	-*-
Live	27.37	35.2	48.0	-*-	-*-
Neutral	9.78	15.9	48.0	-*-	-*-
Neutral	12.97	14.2	48.0	-*-	-*-
Neutral	18.43	25.1	48.0	-*-	-*-

Remarks:

Calculated measurement uncertainty : ± 2.8 dB

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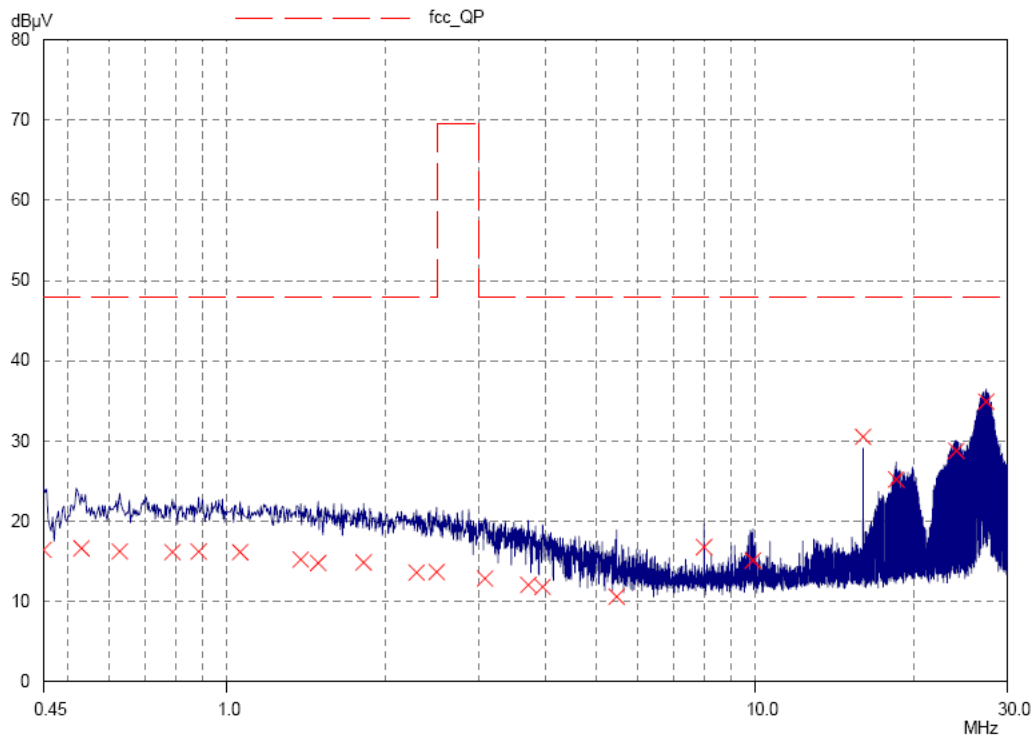
Limits for Conducted Emissions (FCC 47 CFR 15.107):

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram labelled as (QP and AV).

Results of On Mode (Middle): PASS



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Results of On Mode (Middle): PASS

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dB μ V/m	Limit dB μ V/m	Level μ V/m	Limit μ V/m
Live	0.531	16.6	48.0	-*-	-*-
Live	0.627	16.3	48.0	-*-	-*-
Live	0.789	16.2	48.0	-*-	-*-
Live	0.885	16.2	48.0	-*-	-*-
Live	1.060	16.2	48.0	-*-	-*-
Live	1.490	14.8	48.0	-*-	-*-
Live	1.815	14.9	48.0	-*-	-*-
Live	2.495	13.7	48.0	-*-	-*-
Live	3.080	12.9	48.0	-*-	-*-
Live	8.000	16.8	48.0	-*-	-*-
Live	27.370	34.9	48.0	-*-	-*-
Neutral	0.450	16.5	48.0	-*-	-*-
Neutral	1.380	15.2	48.0	-*-	-*-
Neutral	2.285	13.6	48.0	-*-	-*-
Neutral	3.720	12.1	48.0	-*-	-*-
Neutral	3.960	11.8	48.0	-*-	-*-
Neutral	5.465	10.6	48.0	-*-	-*-
Neutral	9.905	15.1	48.0	-*-	-*-
Neutral	16.005	30.5	48.0	-*-	-*-
Neutral	18.485	25.2	48.0	-*-	-*-
Neutral	24.010	28.8	48.0	-*-	-*-

Remarks:

Calculated measurement uncertainty : ± 2.8 dB

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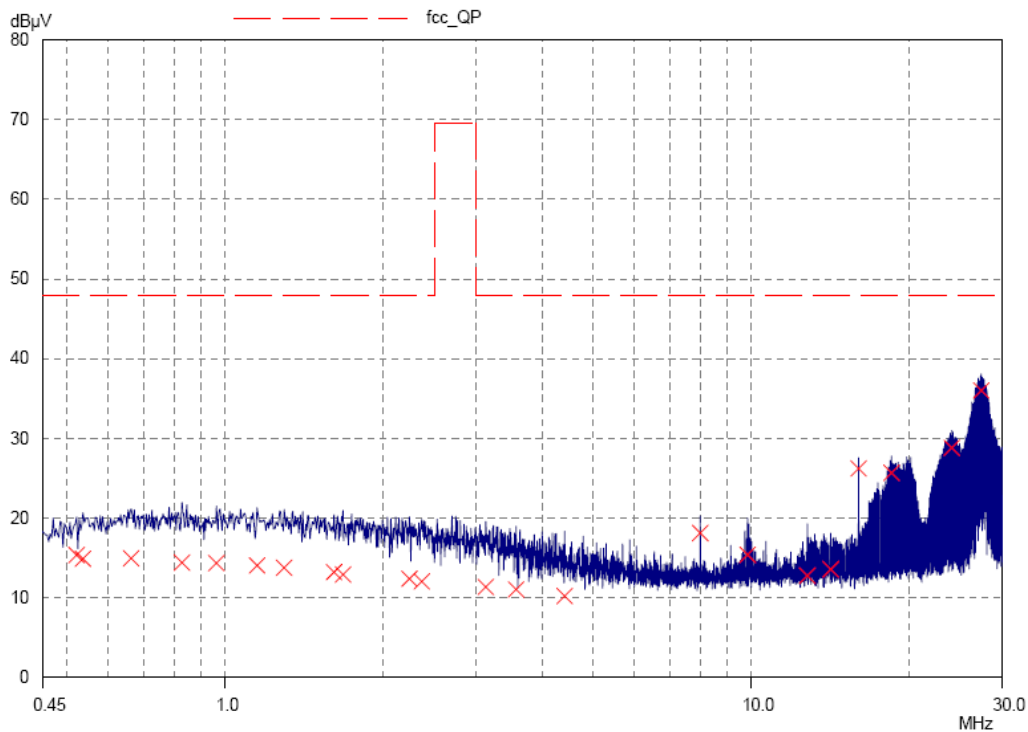
Limits for Conducted Emissions (FCC 47 CFR 15.107):

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram labelled as (QP and AV).

Results of On Mode (Low): PASS



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Results of On Mode (Low): PASS

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dB μ V/m	Limit dB μ V/m	Level μ V/m	Limit μ V/m
Live	0.963	14.4	48.0	-*-	-*-
Live	1.150	14.1	48.0	-*-	-*-
Live	1.295	13.8	48.0	-*-	-*-
Live	1.610	13.2	48.0	-*-	-*-
Live	1.675	12.9	48.0	-*-	-*-
Live	2.240	12.4	48.0	-*-	-*-
Live	2.365	12.1	48.0	-*-	-*-
Live	8.000	18.1	48.0	-*-	-*-
Live	16.005	26.2	48.0	-*-	-*-
Live	18.485	25.7	48.0	-*-	-*-
Live	24.070	28.8	48.0	-*-	-*-
Live	27.370	36.0	48.0	-*-	-*-
Neutral	0.522	15.4	48.0	-*-	-*-
Neutral	0.537	14.9	48.0	-*-	-*-
Neutral	0.663	15.0	48.0	-*-	-*-
Neutral	0.828	14.4	48.0	-*-	-*-
Neutral	3.130	11.4	48.0	-*-	-*-
Neutral	3.575	11.1	48.0	-*-	-*-
Neutral	4.420	10.2	48.0	-*-	-*-
Neutral	9.840	15.4	48.0	-*-	-*-
Neutral	12.785	12.8	48.0	-*-	-*-
Neutral	14.165	13.6	48.0	-*-	-*-

Remarks:

Calculated measurement uncertainty : ± 2.8 dB

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3.2 26dB Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.249
Test Method:	ANSI C63.4:2003 (Section 13.1.7)
Test Date:	2006-01-13
Mode of Operation:	On mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

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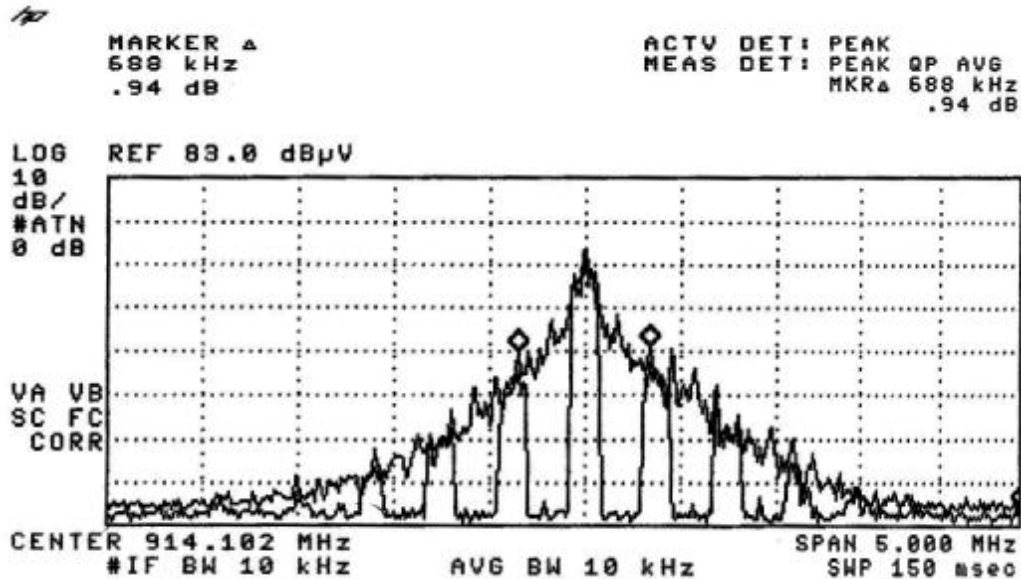
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Limits for Bandwidth of Fundamental Emission:

Frequency Range [MHz]	Bandwidth [KHz]	FCC Limits [MHz]
914.1	688	within 902 - 928

Bandwidth of Fundamental Emission



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Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	15/06/04
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	15/06/04
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	15/06/04
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	15/06/04
EM011	ATTENUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	15/06/04
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	15/06/04
EM020	HORN ANTENNA	ETS-Linggren	3115	4032	30/07/03
EM022	LOOP ANTENNA	ETS-Linggren	6502	1189-2424	19/09/03
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892	N/A
EM083	OPEN AREA TEST SITE	HKSTC	N/A	N/A	08/02/03
EM131	EMC ANALYZER	HEWLETT PACKARD	8595EM	3710A00155	13/01/04
EM145	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS 30	830245/021	04/10/04
EM195	ANTENNA POSITIONING MAST	ETS-Linggren	2075	2368	N/A
EM196	MULTI-DEVICE CONTROLLER	ETS-Linggren	2090	1662	N/A
EM215	MULTIDEVICE CONTROLLER	ETS-Linggren	2090	00024676	N/A
EM216	MINI MAST SYSTEM	ETS-Linggren	2075	00026842	N/A
EM217	ELECTRIC POWERED TURNTABLE	ETS-Linggren	2088	00029144	N/A
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3	--	19/03/04
EM219	BICONOLOG ANTENNA	ETS-Linggren	3142C	00029071	28/10/03
EM218	ETS ANECHOIC CHAMBER	EMCO	Fact-3	N/A	15/03/04
EM215	MULTI-DEVICE CONTROLLER	EMCO	2090	00024676	N/A
EM216	ANTENNA POSITIONING MAST	EMCO	2070	00024727	N/A

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM078	VARIAC	SHANGHAI VOLTAGE	TDGC-3/0.5	N/A	CM
EM081	SMALL SCREENED ROOM	MIKO INST HK	N/A	N/A	27/01/05
EM119	LISN	ROHDE & SCHWARZ	ESH3-Z5	0831.5518.52	14/10/04
EM127	ISOLATION TRANSFORMER 220 TO 300V	WING SUN	N/A	N/A	CM
EM142	PULSE LIMITER	ROHDE & SCHWARZ	ESH3Z2	357.8810.52	04/08/04
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	06/01/04
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057-99A	27/01/05
EM197	LISN	ETS-Linggren	4825/2	1193	05/06/04
EM213	DIGITAL POWER METER	VICNOBL	VIP120	00277	14/09/04

Remarks:-

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined

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Appendix B

Photographs of EUT

Front View of the product



Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



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Photographs of EUT

Measurement of Radiated Emission Test Set Up



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Photographs of EUT

Measurement of Conducted Emission Test Set Up



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