

Date: 2002-11-05

No.: HM109116

Test Report

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ACCREDITED TESTING LABORATORY

DAR Registration No.: **TTI-P-G150/98-00e**

ACCREDITED BY
Deutsche Akkreditierungsstelle Technik (DATech) e.v.

FCC PART 15 SUBPART B TEST REPORT

TEST REPORT No.: HM109116

Equipment Under Test [EUT]:	“Mousecaster” FM Radio Computer Mouse
Model Number:	NITZAN-12
Applicant:	Smartec Subsidiary Ltd.
FCC ID:	QSJNITZAN-12

Date: 2002-11-05

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CONCLUSION

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

Verify by

Patrick Wong
for Chief Executive

Date: 2002-11-05

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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

Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Applicant Details

Applicant

Smartec Subsidiary Ltd.
P.O. Box 662, Road Town, Tortola, British Virgin Islands

Telephone: 1 310 281 2040
Fax: 1 310 559 7072

HKSTC Code Number for Applicant

PRI013

Manufacturer

Prima Industrial Company
Yu Wu Industrial District, Dong Cheng, Dongguang,
Guangdong, China

Telephone: 0769 2653539
Fax: N/A

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1.3 Equipment Under Test [EUT]

Description of Sample

Product: "Mousecaster" FM Radio Computer Mouse
Manufacturer: Prima Industrial Company
Brand Name: MouseCaster
Model Number: NITZAN-12
Input Voltage: The product was drawing power from the signal port of the console

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Smartec Subsidiary Ltd., "Mousecaster" FM Radio Computer Mouse.

1.4 Date of Order

2002-10-24

1.5 Submitted Sample(s):

1 sample per model

1.6 Test Duration

2002-10-30

1.7 Country of Origin

China

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1.8 Additional Information of EUT

	Submitted	Not Available
User Manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Part List	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Circuit Diagram	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Printed Circuit Board [PCB] Layout	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Block Diagram	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC DOC Label	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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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 and ANSI C63.4: 2000 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Test Result			
			Pass	Failed	N/A	
Radiated Emissions, 30MHz to 1GHz	FCC 47CFR 15.109	ANSI C63.4:2000	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.107	ANSI C63.4:2000	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

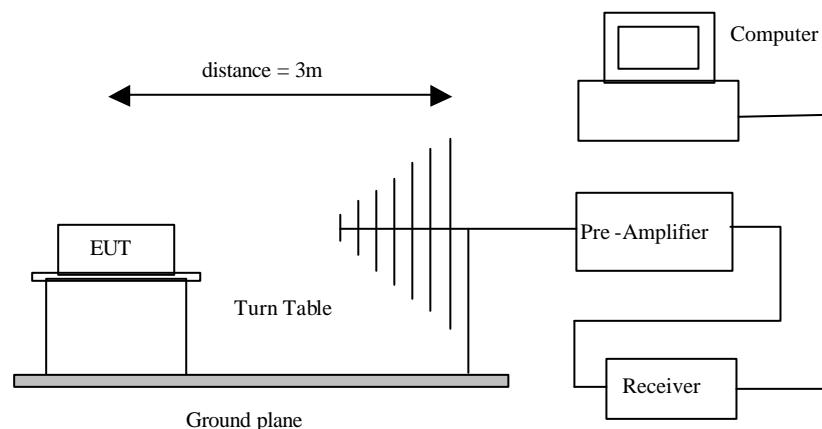
3.0 Test Results**3.1 Emission****3.1.1 Radiated Emissions (30 – 1000MHz)**

Test Requirement:	FCC 47CFR 15.109 Class B
Test Method:	ANSI C63.4:2000
Test Date:	2002-10-30
Mode of Operation:	On mode

Test Method:

The sample was placed 0.8m above the ground plane on the OATS *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigate all operating modes, rotated about all 3 axis (X, Y & Z) 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.

*: OATS [Open Area Test Site] located at HKSTC with a metal ground plane on filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 90657.

Test Setup:

Date: 2002-11-05

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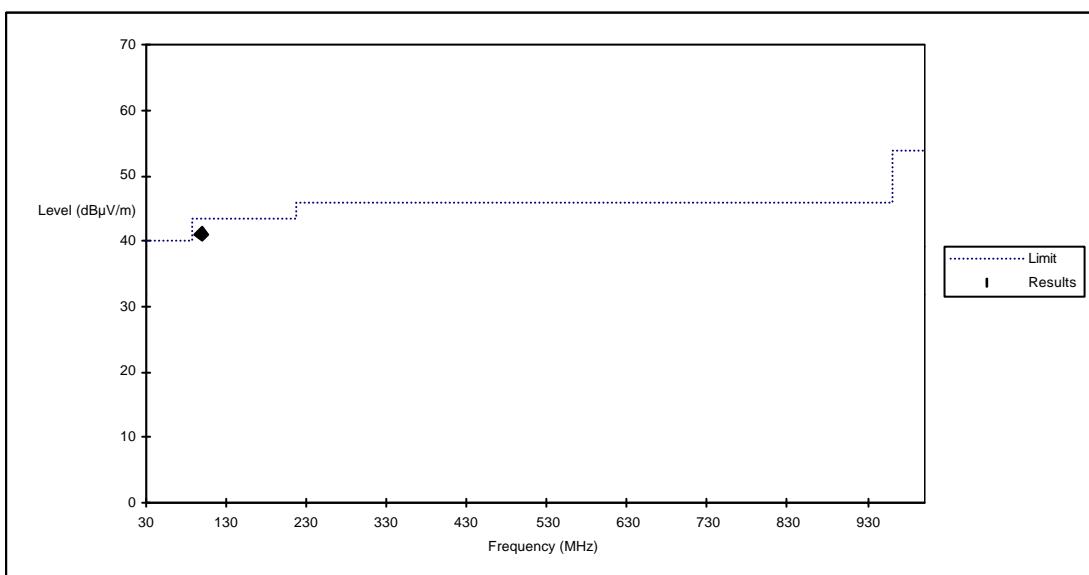
No.: HM109116

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

Frequency Range [MHz]	Quasi-Peak Limits [μ 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: Radio Mode



Radiated Emissions Quasi-Peak

Turned Frequency MHz	Emission Frequency MHz	Measured Level@3m dB μ V/m	Limit .@3m dB μ V/m	Measured Level@3m μ V/m	Limit .@3m μ V/m	Antenna Polarity
88.3	99	41.08	43.5	113.2	150	Horizontal
88.3	99	34.12	43.5	50.8	150	Vertical

Remarks:

IF = 10.70MHz

Calculated measurement uncertainty = 30MHz to 300MHz ± 3.7 dB
300MHz to 1GHz $+3.0$ dB / -2.7 dB

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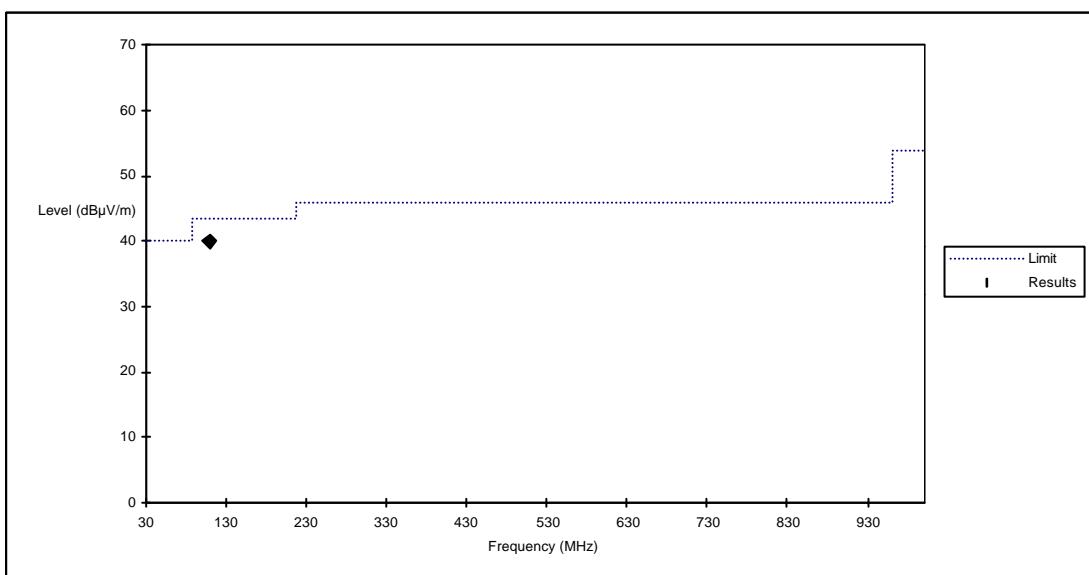
No.: HM109116

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

Frequency Range [MHz]	Quasi-Peak Limits [μ 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: Radio Mode



Radiated Emissions Quasi-Peak						
Turned Frequency MHz	Emission Frequency MHz	Measured Level@3m dB μ V/m	Limit .@3m dB μ V/m	Measured Level@3m μ V/m	Limit .@3m μ V/m	Antenna Polarity
98.3	109	40.08	43.5	100.9	150	Horizontal
98.3	109	35.64	43.5	60.5	150	Vertical

Remarks:

IF = 10.70MHz

Calculated measurement uncertainty = 30MHz to 300MHz ± 3.7 dB
300MHz to 1GHz $+3.0$ dB / -2.7 dB

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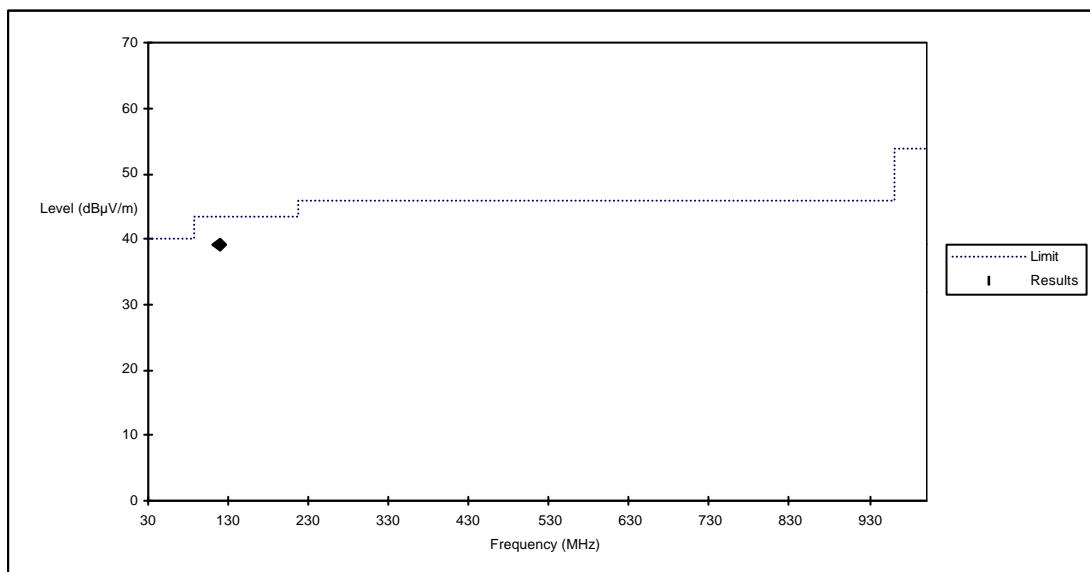
No.: HM109116

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

Frequency Range [MHz]	Quasi-Peak Limits [μ 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: Radio Mode



Radiated Emissions Quasi-Peak						
Turned Frequency MHz	Emission Frequency MHz	Measured Level@3m dB μ V/m	Limit .@3m dB μ V/m	Measured Level@3m μ V/m	Limit .@3m μ V/m	Antenna Polarity
108.3	119	39.18	43.5	91.0	150	Horizontal
108.3	119	25.55	43.5	18.9	150	Vertical

Remarks:

IF = 10.70MHz

Calculated measurement uncertainty = 30MHz to 300MHz ± 3.7 dB
300MHz to 1GHz $+3.0$ dB / -2.7 dB

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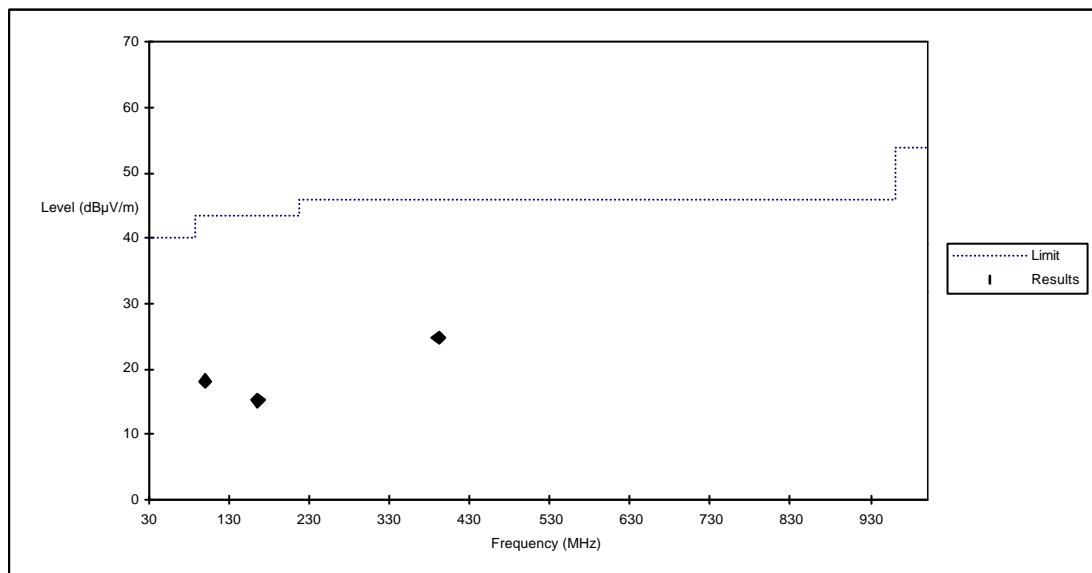
No.: HM109116

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

Frequency Range [MHz]	Quasi-Peak Limits [μ 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: On Mode



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Results: On Mode

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	Antenna Polarity	Level . @ 3m dB μ V/m	Limit . @ 3m dB μ V/m	Level @ 3m . @ 3m μ V/m	Limit . @ 3m μ V/m
99.813	Horizontal	18.20	43.5	8.1	150
165.688	Horizontal	15.20	43.5	5.8	150
391.188	Horizontal	24.80	46.0	17.4	200

Remarks:

Calculated measurement uncertainty = 30MHz to 300MHz ±3.7dB
300MHz to 1GHz +3.0dB / -2.7dB

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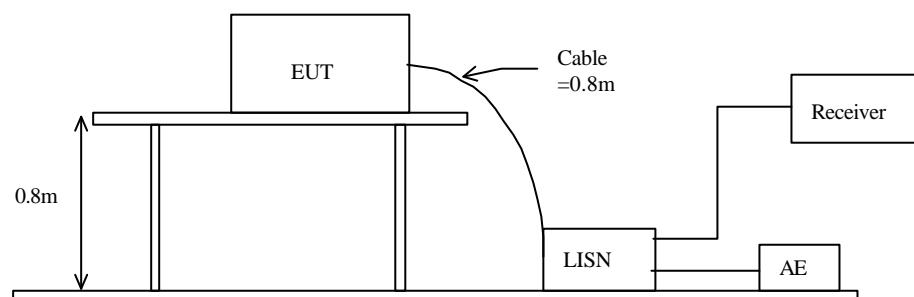
3.1.2 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.107 Class B
Test Method:	ANSI C63.4:2000
Test Date:	2002-10-30
Mode of Operation:	Mouse Mode, FM Mode

Test Method:

The test was performed in accordance with ANSI C63.4: 1992, 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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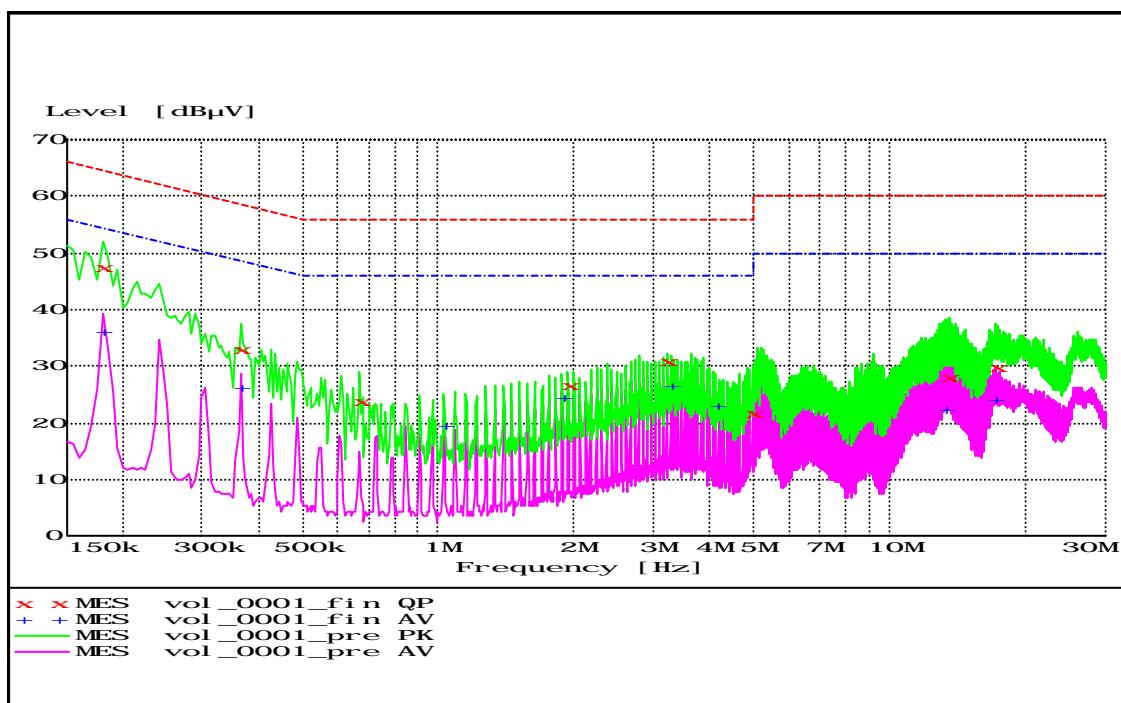
No.: HM109116

Limit for Conducted Emissions (FCC 47 CFR 15.107):

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V/m]	Average Limits [dB μ V/m]
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

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

Results: FM Mode



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Results: FM Mode

Conductor	Frequency	Quasi-Peak		Average	
		Level dB μ V/m	Limit dB μ V/m	Level dB μ V/m	Limit dB μ V/m
Live or Neutral	MHz				
Live	0.180	47.5	65		
Live	0.365	-*-	-*-	26.1	49
Live	1.030	-*-	-*-	19.6	46
Live	1.880	-*-	-*-	24.4	46
Live	1.940	26.6	56	-*-	-*-
Neutral	0.180	-*-	-*-	36.2	55
Neutral	0.365	32.8	59		
Neutral	0.670	23.6	56	-*-	-*-
Neutral	3.215	30.6	56	-*-	-*-
Neutral	3.275	-*-	-*-	26.4	46
Neutral	4.125	-*-	-*-	22.9	46
Neutral	4.970	21.5	56	-*-	-*-
Neutral	13.345	-*-	-*-	22.4	50
Neutral	13.585	28.0	60	-*-	-*-
Neutral	17.105	-*-	-*-	24.0	50
Neutral	17.285	29.8	60	-*-	-*-

Remarks:

Calculated measurement uncertainty = ± 2.3 dB

-*- Emission greater than 30dB below limit line

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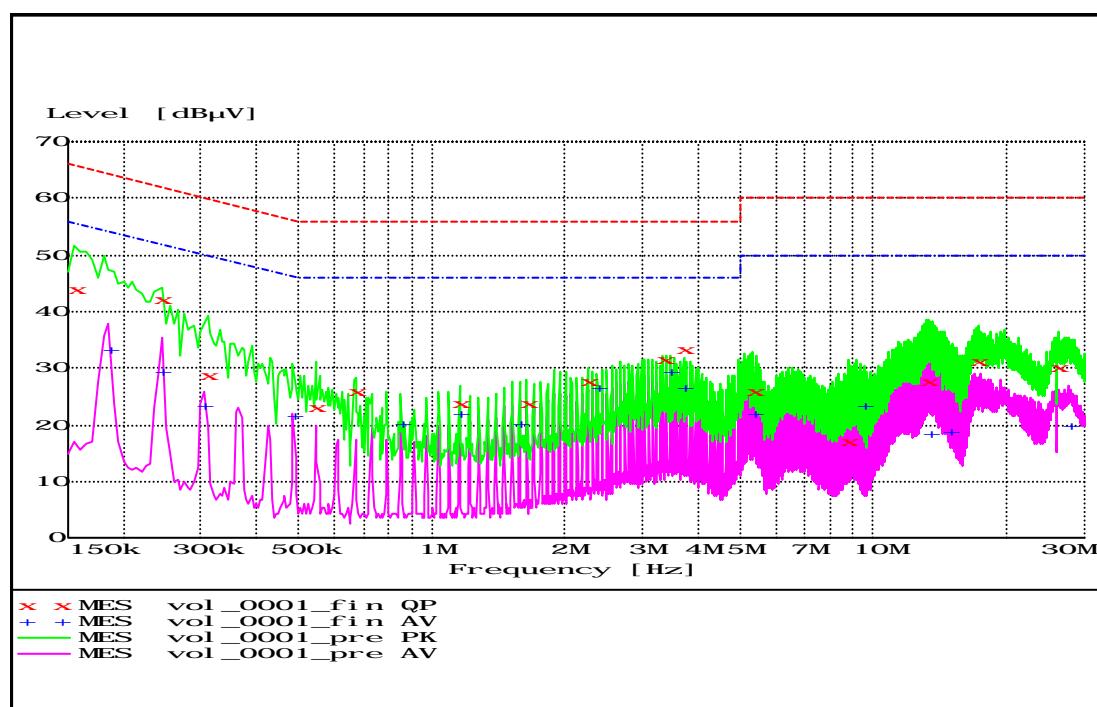
No.: HM109116

Limit for Conducted Emissions (FCC 47 CFR 15.107):

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V/m]	Average Limits [dB μ V/m]
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

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

Results: Mouse Mode



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Results: Mouse Mode

Conductor	Frequency	Quasi-Peak		Average	
		Level dB μ V/m	Limit dB μ V/m	Level dB μ V/m	Limit dB μ V/m
Live or Neutral	MHz				
Live	0.245	42.1	62	-*-	-*-
Live	0.310	28.6	60	-*-	-*-
Live	0.670	25.9	56	-*-	-*-
Live	1.155	-*-	-*-	22.1	46
Live	1.580	-*-	-*-	20.1	46
Live	2.250	27.7	56	-*-	-*-
Live	13.375	-*-	-*-	18.5	50
Live	14.895	-*-	-*-	18.9	50
Live	17.265	31.0	60	-*-	-*-
Live	26.145	30.1	60	-*-	-*-
Neutral	0.155	43.7	66	-*-	-*-
Neutral	0.185	-*-	-*-	33.1	54
Neutral	0.245	-*-	-*-	29.3	52
Neutral	0.305	-*-	-*-	23.3	50
Neutral	0.485	-*-	-*-	21.5	46
Neutral	0.545	23.0	56	-*-	-*-
Neutral	0.850	-*-	-*-	20.1	46
Neutral	1.155	23.8	56	-*-	-*-
Neutral	1.640	23.7	56	-*-	-*-
Neutral	2.370	-*-	-*-	26.7	46
Neutral	3.345	31.5	56	-*-	-*-
Neutral	3.465	-*-	-*-	29.2	46
Neutral	3.710	33.3	56	26.4	46
Neutral	5.350	25.9	60	22.1	50
Neutral	8.755	17.1	60	-*-	-*-
Neutral	9.485	-*-	-*-	23.4	50
Neutral	13.195	27.7	60	-*-	-*-
Neutral	27.790	-*-	-*-	19.8	50

Remarks:

Calculated measurement uncertainty = ± 2.3 dB
 -*- Emission greater than 30dB below limit line

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Appendix A

Test Equipment Audit

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	07/09/01
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	07/09/01
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	07/09/01
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	07/09/01
EM011	ATTENUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	07/09/01
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	07/09/01
EM013	CONTROLLER (COMPUTER), COLOR MONITOR, KEYBOARD & MOUSE FLOPPY DRIVE	HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD	HP9000 HP A1097C HP9133L	6226A60314 3151J39517 2623A02468	CM
EM020	HORN ANTENNA	EMCO	3115	4032	19/07/00
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	04/08/00
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892	N/A
EM083	HKSTC OPEN AREA TEST SITE	HKSTC	N/A	N/A	14/02/02
EM131	PORTABLE SPECTRUM ANALYSER	HEWLETT PACKARD	8595EM	3710A00155	18/12/01
EM145	EMI TEST RECEIVER	R & S	ESCS 30	830245/021	22/07/02
EM194	BICONILOG ANTENNA	EMCO	3142B	1795	14/05/02
EM195	ANTENNA POSITIONING MAST	EMCO	2075	2368	N/A
EM196	MULTI-DEVICE CONTROLLER	EMCO	2090	1662	N/A

Conducted Emission

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	04/10/01
EM119	LISN	R & S	ESH3-Z5	0831.5518.52	31/08/00
EM127	ISOLATION TRANSFORMER 220 TO 300	WING SUN	N/A	N/A	CM
EM142	PULES LIMITER	R & S	ESH3Z2	357.8810.52	04/07/01
EM181	EMI TEST RECEIVER	R & S	ESIB7	100072	28/11/01
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057- 99A	02/01/02
EM197	LISN	EMCO	4825/2	1193	28/03/02

Remarks:

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

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Appendix B

Ancillary Equipment

ITEM NO.	DESCRIPTION	MODEL NO.	FCC ID	REMARK
1	DELL COMPUTER	MMS	E2KTERMIND	N/A
2	AST AVGA MONITOR	CM6P	GDRCM6P	RESOLUTION:720*400(DURING TESTING) 1.0M UNSHIEDDED POWER CORD CONNECTED TO THE COMPUTER 2.8M SHIELDED CABLE CONNECTED TO THE COMPUTER
3	AST KEYBOARD	KB-2923	LIAKWD-200	1.8M SHIELDED COILED CABLE CONNECTED TO THE COMPUTER
4	PARALLEL PRINTER	DMP3000	DE2850CDMP3000	1.8M UNSHIELDED POWER CORD 2.8M SHIELDED CABLE (BYNDLED TO 1M) CONNECTED TO THE COMPUTER

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Appendix C

Photographs of EUT

Front View of the product



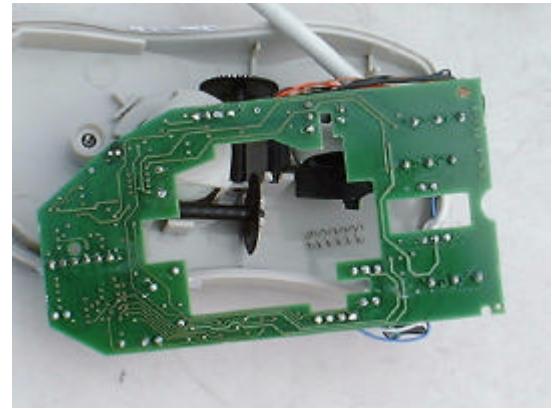
Rear View of the product



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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Measurement of Conducted Emission Test Set Up



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