

Date: 2002-11-05

Test Report

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No.: HM109116

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]:
Model Number:
Applicant:
FCC ID:

“Mousecaster” FM Radio Computer Mouse
NITZAN-12
Smartec Subsidiary Ltd.
QSJNITZAN-12

Date: 2002-11-05

No.: HM109116

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List of Measurement Equipment

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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 Distric, 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 | Class / Severity | 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

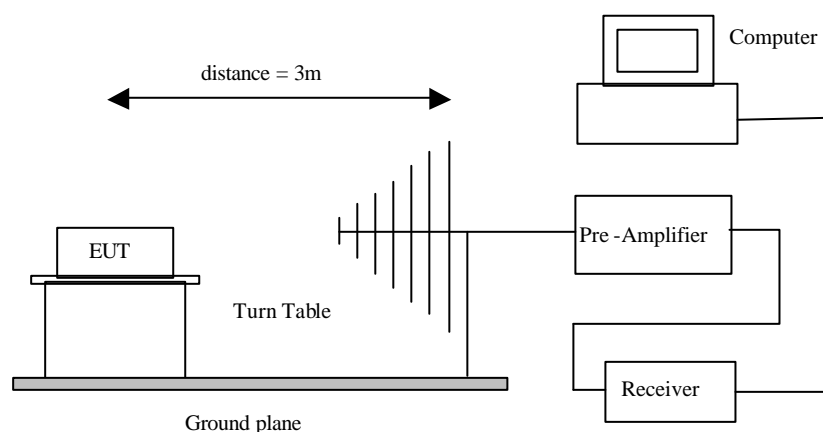
3.0 Test Results**3.1 Emission****3.1.1 Radiated Emissions (30 – 1000MHz)**

| | |
|--------------------|--------------------------|
| 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:

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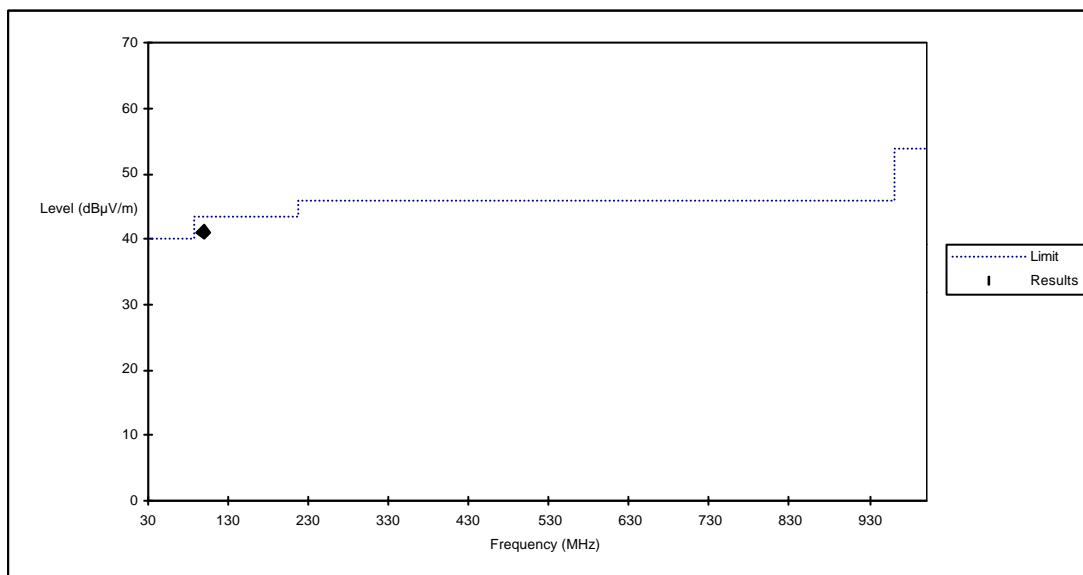
No.: HM109116

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

| Frequency Range [MHz] | Quasi-Peak Limits [$\mu\text{V}/\text{m}$] |
|--------------------------|-------------------------------------------------|
| 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 $\mu\text{V}/\text{m}$ | Limit @3m dB $\mu\text{V}/\text{m}$ | Measured Level@3m $\mu\text{V}/\text{m}$ | Limit @3m $\mu\text{V}/\text{m}$ | 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 $\pm 3.7\text{dB}$
300MHz to 1GHz $+3.0\text{dB} / -2.7\text{dB}$

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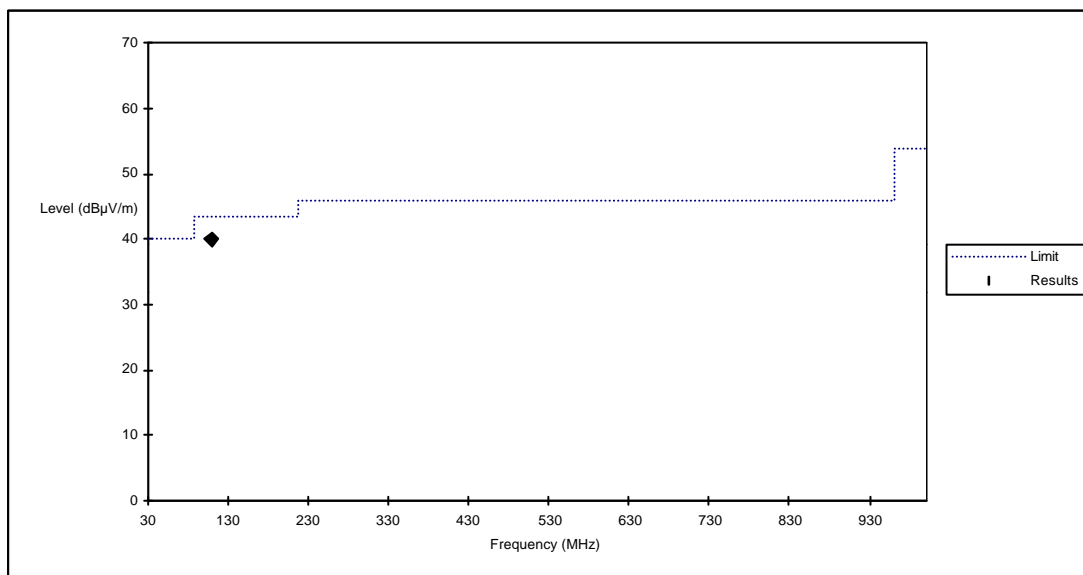
No.: HM109116

Limited 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: Radio Mode



| Radiated Emissions Quasi-Peak | | | | | | |
|----------------------------------|------------------------------|--------------------------------------------|------------------------------------|-----------------------------------------|---------------------------------|---------------------|
| Turned Frequency MHz | Emission Frequency MHz | Measured Level@3m dB $\mu\text{V/m}$ | Limit @3m dB $\mu\text{V/m}$ | Measured Level@3m $\mu\text{V/m}$ | Limit @3m $\mu\text{V/m}$ | 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 $\pm 3.7\text{dB}$
300MHz to 1GHz $+3.0\text{dB} / -2.7\text{dB}$

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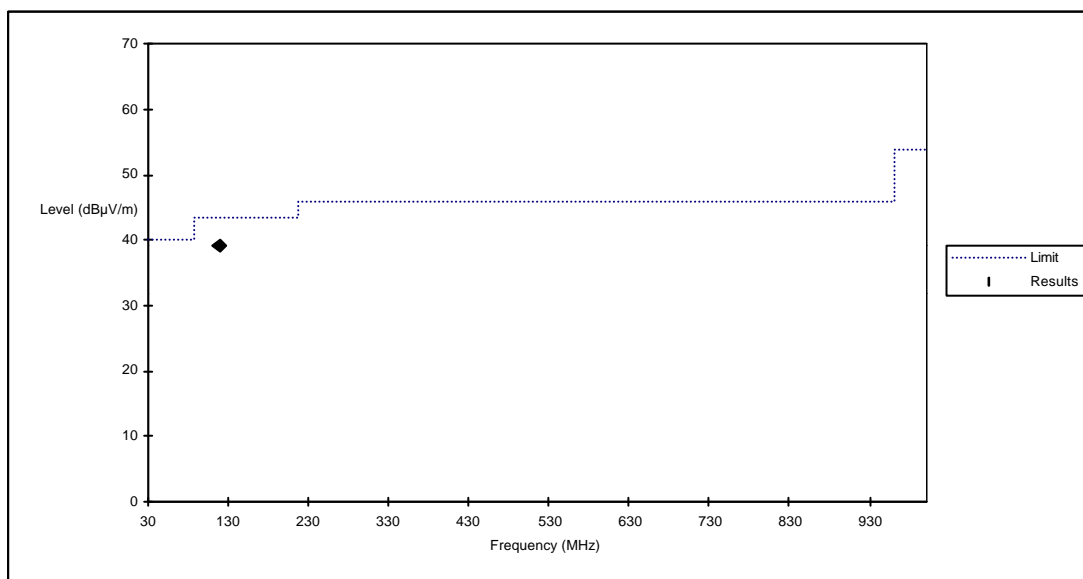
No.: HM109116

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

| Frequency Range [MHz] | Quasi-Peak Limits [μV/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 dBμV/m | Limit @3m dBμV/m | Measured Level@3m μV/m | Limit @3m μV/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 ±3.7dB
300MHz to 1GHz +3.0dB / -2.7dB

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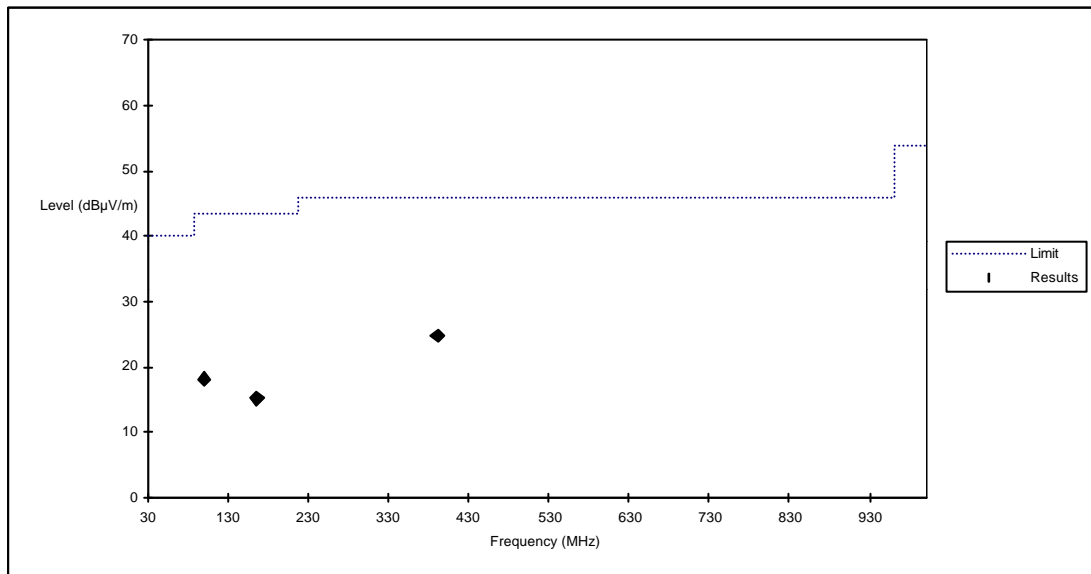
No.: HM109116

Limited 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: 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 ± 3.7 dB
300MHz to 1GHz +3.0dB / -2.7dB

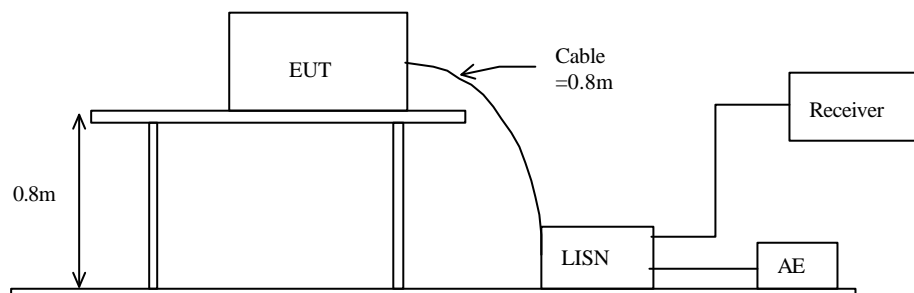
3.1.2 Conducted Emissions (0.15MHz to 30MHz)

| | |
|--------------------|--------------------------|
| 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.

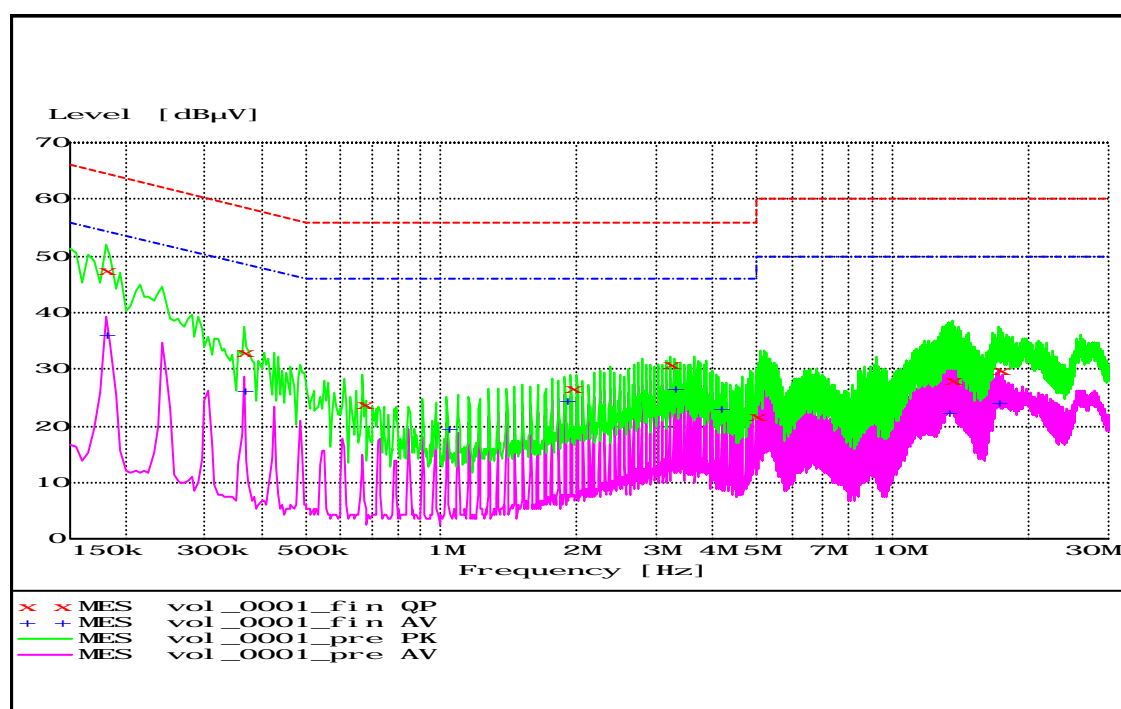
Test Setup:



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 | |
|-----------------|-----------|-----------------------|-----------------------|-----------------------|-----------------------|
| Live or Neutral | MHz | Level dB μ V/m | Limit dB μ V/m | Level dB μ V/m | Limit dB μ V/m |
| 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:

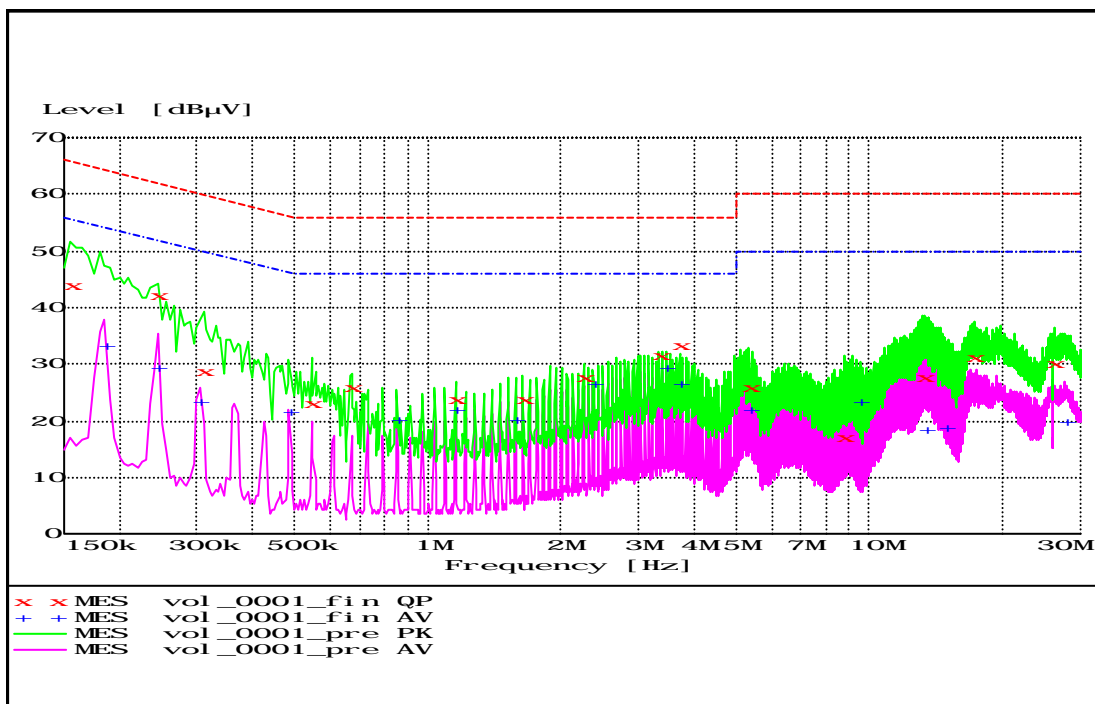
Calculated measurement uncertainty = ± 2.3 dB

-*- Emission greater than 30dB below limit line

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 | |
|-----------------|-----------|-----------------------|-----------------------|-----------------------|-----------------------|
| Live or Neutral | MHz | Level dB μ V/m | Limit dB μ V/m | Level dB μ V/m | Limit dB μ V/m |
| 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 | PULSES 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 UNSHIEDED 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



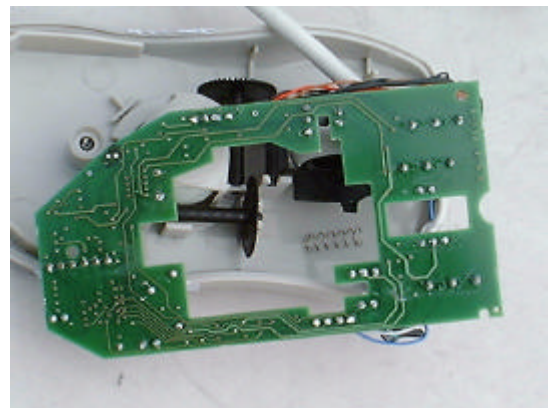
Rear View of the product



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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Photographs of EUT

Measurement of Conducted Emission Test Set Up



End of Document

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