

Test Site Services. Inc.

DRAFT

Sample Test Report

Your Company Name

Your Product

Model X-100

Radiated and Conducted Emissions

FCC, Part 15B

Canada, ICES-003

AS/NZS 3548

VCCI (Japan)

BCIQ, CNS 13438

EMC Directive, 89/336/EEC

Test # B00999

Test Site Services, Inc.
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EMI Test Report
for
Your Company Name

Test Number : B00999
Product Name : Your Product
Regulation : FCC, Part 15B (U.S.)
: ICES-003 (Canada)
: AS/NZS 3548
: VCCI (Japan)
: BCIQ / CNS 13438
: EMC Directive, 89/336/EEC
Date : 1/22/00



**Report Reviewed
& Accepted by:**

Your Company Name
2000 Maple Street
Springville, NN 99999-3333
Phone: (123) 456-7890
Fax : (123) 456-7899

Report Issued By:

Richard L. Wiedeman, Laboratory Director

Tested By:

John Doe, Test Engineer

This test report is not valid without the signatures of Test Site Services, Inc. personnel.

Administrative Data

Regulation : FCC, Part 15B (U.S.)
 : ICES-003 (Canada)
 : AS/NZS 3548 (Australia, New Zealand)
 : VCCI (Japan)

Level : BCIQ (Taiwan)
 : EMC Directive 89/336/EEC (E.U.)
 : Class A

Test Method : ANSI C63.4-1992
 : CSA C108.8-M1983
 : VCCI, V3/97.04
 : CNS 13438
 : EN55022(1994)/CISPR22(1993)

Test Type : Qualification

Manufacturer : Your Company Name

EUT Type/Model # : Widget / X-100

Date(s) of Test : 1/22/00

Customer Personnel : John Adams Engineer

TSS Personnel : R. Wiedeman EMC Engineer
 : John Doe Test Engineer

Test Location : Open Area Test Site
 Test Site Services, Inc.
 30 Birch St.
 Milford, MA 01757 U.S.A.

NOTICE : FCC Rule 2.955 requires that a Verification Report for a Class A Computing Device must be signed by "an Official of the Company responsible for the device". A signature block has been provided on the first page for this purpose.

EUT Description

The EUT (Your Product) is a Widget that is faster than a speeding bullet, more powerful than a locomotive, and leaps tall buildings in a single bound.

A complete description of the EUT may be found on block identifier page one.

The tests were run in a typical configuration including the following support equipment;

- 1) Personal Computer
- 2) Ethernet Hub
- 3) Switching Hub
- 4) Switching Hub
- 5) Switching Hub
- 6) Modem

REASON FOR TEST

Qualification of new product for all international specifications for radiated and conducted emissions.

CHANGES MADE DURING TEST

None

DEVIATIONS FROM STANDARD TEST METHOD

None

Test Summary

The Your Product complied with the FCC Part 15 Subpart B and Canadian ICES-003 Limits for equipment when tested in the system configuration defined herein.

The following table indicates the margins (i.e. difference between measurement point and limit) of the six (6) worst case data points:

| TEST CLASS | MARGIN TO SPEC (db) | FREQUENCY (Mhz) |
|-----------------------------------|---------------------|-----------------|
| <i>Radiated Emissions E Field</i> | -4.4 | 299.12 |
| <i>(230 VAC / 50 Hz.)</i> | -4.6 | 80.00 |
| | -4.9 | 277.06 |
| | -5.4 | 432.06 |
| | -6.3 | 332.36 |
| | -7.3 | 125.92 |
| <i>Conducted Emissions</i> | -12.1 | .4905 |
| <i>(208 VAC / 60 Hz.)</i> | -15.6 | 9.304 |
| | -17.6 | 8.816 |
| | -18.7 | .8000 |
| | -20.6 | 15.67 |
| | -24.6 | 1.157 |

Test Summary

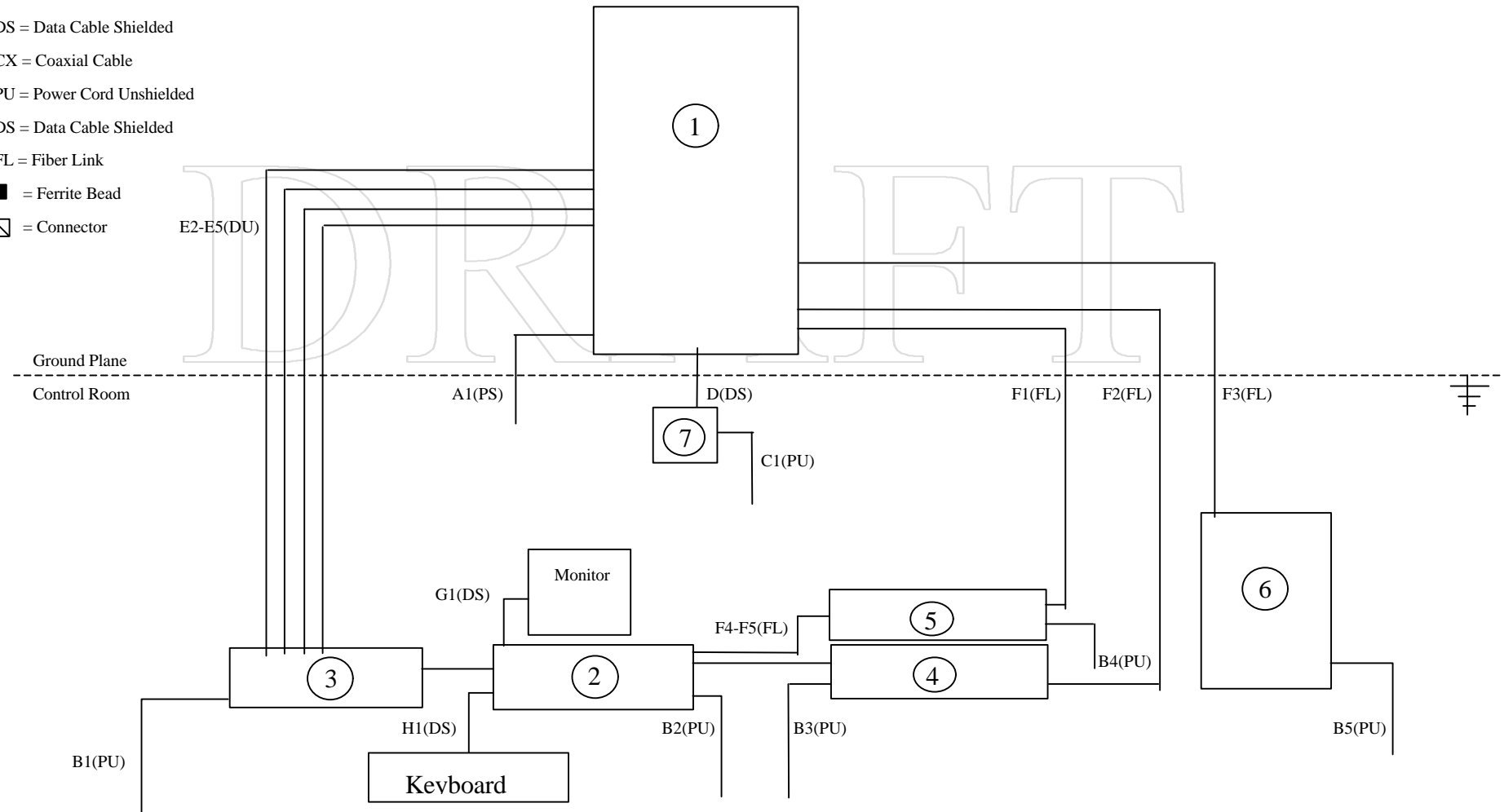
The Your Product complied with the EN55022/CISPR22,VCCI, AS/NZS and BCIQ Limit when tested in the system configuration defined herein.

The following table indicates the margins (i.e. difference between measurement point and limit) of the six (6) worst case data points:

| TEST CLASS | MARGIN TO SPEC (db) | FREQUENCY (Mhz) |
|-----------------------------------|---------------------|-----------------|
| <i>Radiated Emissions E Field</i> | -3.8 | 125.92 |
| <i>(230 VAC / 50 Hz.)</i> | -4.6 | 150.00 |
| | -5.0 | 299.12 |
| | -5.1 | 125.00 |
| | -5.4 | 160.00 |
| | -5.5 | 80.00 |
| <i>Conducted Emissions</i> | -6.3 | 1.002 |
| <i>(230 VAC / 50 Hz.)</i> | -8.7 | 13.63 |
| | -11.6 | 17.76 |
| | -11.7 | 9.356 |
| | -16.1 | 27.400 |
| | -17.3 | 21.31 |

Block Diagram for Your Product

- PS = Power Cord Shielded
- DS = Data Cable Shielded
- CX = Coaxial Cable
- PU = Power Cord Unshielded
- DS = Data Cable Shielded
- FL = Fiber Link
- = Ferrite Bead
- ☐ = Connector



EUT Technical Data – Block Identifier 1

Description : New Widget

Manuf/Model : Your Company, Inc. **Model No.:** :X-100

Part#/Rev : 000-111-222 / Rev. 1.1

Serial # : 000 000 001

FCC/FTZ Ident. : N/A

Power (Rated) : 90 – 240 VAC 50 / 60 Hz. **Current** : 10 / 5 Amps

Power (Tested) : 230 VAC 50 Hz. **Current** : 5 Amps

Internal Options:

| | | | | | | |
|--------------------|-----|-----|-----|---------|------|-----|
| Plug in widget # 1 | M/N | 001 | S/N | 000 001 | Rev. | 1.1 |
| Plug in widget # 2 | M/N | 002 | S/N | 000 002 | Rev. | 2.2 |
| Plug in widget # 3 | M/N | 003 | S/N | 000 003 | Rev. | 3.3 |

External Options:

None

Frequencies Generated:

10.00 MHz. 20.00 MHz. 25.00 MHz. 33.00 MHz. 100.00 MHz. 600.00 MHz.
1.20 GHz.

Comments:

Support Equipment Data – Block Identifier 2

Description : Personal Computer

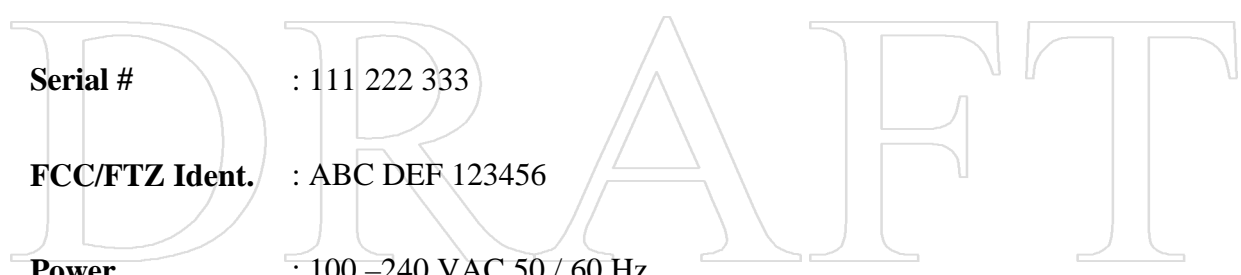
Manuf/Model : Company **Model No.:** FPS

Part #/Rev : 001 / Rev. 5.5

Serial # : 111 222 333

FCC/FTZ Ident. : ABC DEF 123456

Power : 100 –240 VAC 50 / 60 Hz.



Internal Options:

| | | | | | | |
|------------------|-----|-------|-----|--------|------|---|
| Ethernet Adapter | M/N | 12345 | S/N | 123456 | Rev. | A |
| SCSI Adapter | M/N | 67890 | S/N | 789012 | Rev. | B |

External Options:

| | | | | | | |
|----------|-----|-----|-----|-----|------|---|
| Keyboard | M/N | 001 | S/N | 001 | Rev. | A |
|----------|-----|-----|-----|-----|------|---|

Frequencies Generated:

233.00 MHz. 10.00 MHz. 25.00 MHz.

Comments:

Support Equipment Data – Block Identifier 3

Description : Ethernet Hub

Manuf/Model : Company

Model No.: 222

Part #/Rev : 000123 / Rev. 6.6

Serial # : 999 999

FCC/FTZ Ident. : N/A

Power : 120 VAC 60 Hz. to 12 VDC

Internal Options:

None

External Options:

AC/DC Power Adapter M/N 123 S/N 555 555

Frequencies Generated:

10.00 MHz.

Comments:

Support Equipment Data – Block Identifier 4

Description : Switching Hub

Manuf/Model : Company

Model No.: 1000

Part #/Rev : 1000-000 Rev. 1.1

Serial # : 001

FCC/FTZ Ident. : :N/A

Power : 120 VAC 60 Hz.

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Internal Options:

None

External Options:

None

Frequencies Generated:

10.00 MHz. 100.00 MHz.

Comments:

Support Equipment Data – Block Identifier 5

Description : Switching Hub

Manuf/Model : Company

Model No.: 456

Part #/Rev : 789 Rev. 9.9

Serial # : 000-999

FCC/FTZ Ident. : N/A

Power : 120 VAC 60 Hz.

DRAFT

Internal Options:

None

External Options:

None

Frequencies Generated:

10.00 MHz. 100.00 MHz.

Comments:

Support Equipment Data – Block Identifier 6

Description : Switching Hub

Manuf/Model : Company

Model No.: 333

Part #/Rev : 111-222 Rev. 3.33

Serial # : 123456

FCC/FTZ Ident. : N/A

Power : 230 VAC 50 Hz.

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Internal Options:

None

External Options:

None

Frequencies Generated:

10.00 MHz. 100.00 MHz.

Comments:

Support Equipment Data – Block Identifier 7

Description : Modem

Manuf/Model : Company

Model No.: 111

Part #/Rev : 222 / Rev 33.3

Serial # : 444-555

FCC/FTZ Ident. : N/A

Power : 120 VAC to 14 VDC

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Internal Options:

None

External Options:

AC / DC Power Adapter M/N ABC-123 S/N 000-123 Rev. 1.00

Frequencies Generated:

N/A

Comments:

Cable Descriptions

(A1) **Function** : AC Power
Qty = 1 **Type** : Shielded
Length : 2.0 Meters
of Conductors : 3
Connector Shell : Unshielded
Part Number : 000-123
Miscellaneous : E.U.T.

(B1-B5) **Function** : AC Power
Qty = 5 **Type** : Unshielded
Length : 1.8 Meters
of Conductors : 3
Connector Shell : Unshielded
Part Number :
Miscellaneous :

(C-1) **Function** : DC Power
Qty = 1 **Type** : Unshielded
Length : 1.5 Meters
of Conductors : 2
Connector Shell : Unshielded
Part Number :
Miscellaneous : Class 2 Plug-in Transformer 14VDC

(D-1) **Function** : Modem
Qty = 1 **Type** : Shielded
Length : 1.5 Meters
of Conductors : 9
Connector Shell : Shielded
Part Number :
Miscellaneous : RS 232

Cable Descriptions

(E1-E5) **Function** : Data
 Qty = 5 **Type** : Unshielded
Length : 6.0 Meters
of Conductors : 8
Connector Shell : Unshielded
Part Number : 123456
Miscellaneous : 10 base T Cat. 5

(F1-F5) **Function** : Data
 Qty = 5 **Type** : Unshielded
Length : 10 Meters
of Conductors : 0
Connector Shell : Unshielded
Part Number : 038-001-488
Miscellaneous : Fiber Link

(G) **Function** : Monitor Cable
 Qty = 1 **Type** : Shielded
Length : 1.5 Meters
of Conductors : 13
Connector Shell : Shielded
Part Number :
Miscellaneous :

(H) **Function** : Keyboard Cable
 Qty = 1 **Type** : Shielded
Length : 2.0 Meters
of Conductors : 8
Connector Shell : Shielded
Part Number :
Miscellaneous :

Test Software Description

TITLE : Your Application

PART #/REV. : 2.3

FUNCTION : To manage all functions and sweep up afterwards

REPEAT TIME : continuous

LAN INFORMATION

SPEED (MBITS/SEC.): 1,000,000

DATA PATTERN : H

PACKET LENGTH : 6 inches

DELAY (μ S) : 200 μ S

BITS/SECOND : 10,000,000 / 10,000

% of UTILIZATION : 100 %

RUN INSTRUCTIONS _____ :

Power up all widgets and then press go.

OPERATIONAL MODE(s) DURING TEST

OPERATIONAL MODES AVAILABLE:

Simplex, Duplex, Triplex

MODE TESTED: ALL

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| | |
|-----------|---|
| FUNCTION | : To Exercise EUT as in a customer application. |
| RATIONALE | : ALL Modes running has been determined to be worst case RF emissions in pre-testing. |

EUT I/O Ports – Cable Configuration

All testing was performed with the following cables/terminators connected to the EUT I/O ports:

| EUT I/O Ports (All available by type) | Cable Attached (Yes/No) |
|--|----------------------------|
| SCSI 1-16 | Yes |
| SCSI 17-40 | No |
| 100 Base T 1-11 | Yes |
| 100 Base T 12-69 | No |
| ATM 1-3 | Yes |
| FDDI 1-8 | Yes |
| FDDI 8-15 | No |
| 1000 Base (Gigabit) 1-3 | Yes |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

NOTE: FCC Tests : ONE of each TYPE of PORT must be cabled.
 CISPR Tests : ONE of each TYPE of PORT must be cabled.

Test Equipment List

| # | Equipment Type | Manufacturer | Model # | Serial # | Cal Date | Cal Due | Used |
|----|----------------------|-----------------|------------|------------|----------|----------|------|
| 1 | Spectrum Analyzer | Hewlett-Packard | 8568B | 2207A01917 | 8/9/99 | 8/9/00 | X |
| 2 | Quasi-Peak Adapter | Hewlett-Packard | 85650A | 2043A00249 | 8/9/99 | 8/9/00 | X |
| 3 | RF Pre-Selector | Hewlett-Packard | 85685A | 2648A00500 | 8/9/99 | 8/9/00 | X |
| 4 | Spectrum Analyzer | Hewlett-Packard | 8566B | 2532A02250 | 5/8/99 | 5/8/00 | X |
| 5 | Quasi-Peak Adapter | Hewlett-Packard | 85650A | 2521A00665 | 5/8/99 | 5/8/00 | X |
| 6 | RF Pre-Selector | Hewlett-Packard | 85685A | 2510A00186 | 5/8/99 | 5/8/00 | X |
| 7 | EMI Receiver | Rhode & Schwarz | ESV33 | 8726315 | 11/11/99 | 11/11/00 | |
| 8 | Comb Generator | Com Power | CG-520 | 20129 | 5/18/99 | 5/18/00 | |
| 9 | RF Probe | Fischer | F-33-1 | 367 | 1/14/99 | 1/14/00 | |
| 10 | RF Pre-Amplifier | Hewlett Packard | 8447D | 1937A02850 | 5/24/99 | 5/24/00 | X |
| 11 | Pre-Amplifier | Hewlett-Packard | 8449B | 3008A00952 | 5/27/99 | 5/27/00 | X |
| 12 | Biconical Antenna | Schwarzbeck | BBA9106 | 0101 | 5/11/99 | 5/11/00 | X |
| 13 | Biconical Antenna | Schwarzbeck | BBA9106 | 0102 | 5/11/99 | 5/11/00 | |
| 14 | Log Periodic Antenna | Schwarzbeck | UHALP9107 | 9107718 | 6/1/99 | 6/1/00 | X |
| 15 | Log Periodic Antenna | Schwarzbeck | UHALP9107 | 0103 | 6/1/99 | 6/1/00 | |
| 16 | Mag Loop Antenna | EMCO | 6502 | 9307-2841 | 6/1/99 | 6/1/00 | X |
| 17 | Horn Antenna | EMCO | 3115 | 9308-4132 | 10/17/99 | 10/17/00 | X |
| 18 | Active Monopole Ant. | EMCO | 3301B | 9510-3625 | 5/29/99 | 5/29/00 | X |
| 19 | Tuned Dipole Antenna | Comp Design | A100 | 445 | 1/18/99 | 1/18/00 | |
| 20 | Tuned Dipole Antenna | Comp Design | A100 | 494 | 8/25/99 | 8/25/00 | X |
| 21 | LISN 3x24 A | Solar | 8012-50-24 | 0103 | 9/15/98 | 9/15/99 | |
| 22 | LISN 4 x 25 A | Schwarzbeck | NNLA8120 | 8120458A | 8/21/99 | 8/21/99 | X |
| 23 | LISN 4 x 100 A | Schwarzbeck | NNLA8121 | 8121237 | 1/21/99 | 1/21/00 | X |
| 24 | LISN 3 x 25 A | EMCO | 3825/2 | 8904-1483 | 7/9/99 | 7/9/00 | |
| 25 | Antenna Mast | EMCO | | | Daily | Daily | X |
| 26 | Mast Controller | EMCO | 1050 | 1267 | Daily | Daily | X |
| 27 | Turntable | Macton | | | Daily | Daily | X |
| 27 | Turntable Controller | EMCO | 101762 | 8908-1290 | Daily | Daily | X |

Appendix A

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TEST DATA

Appendix B

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TEST PHOTOGRAPHS

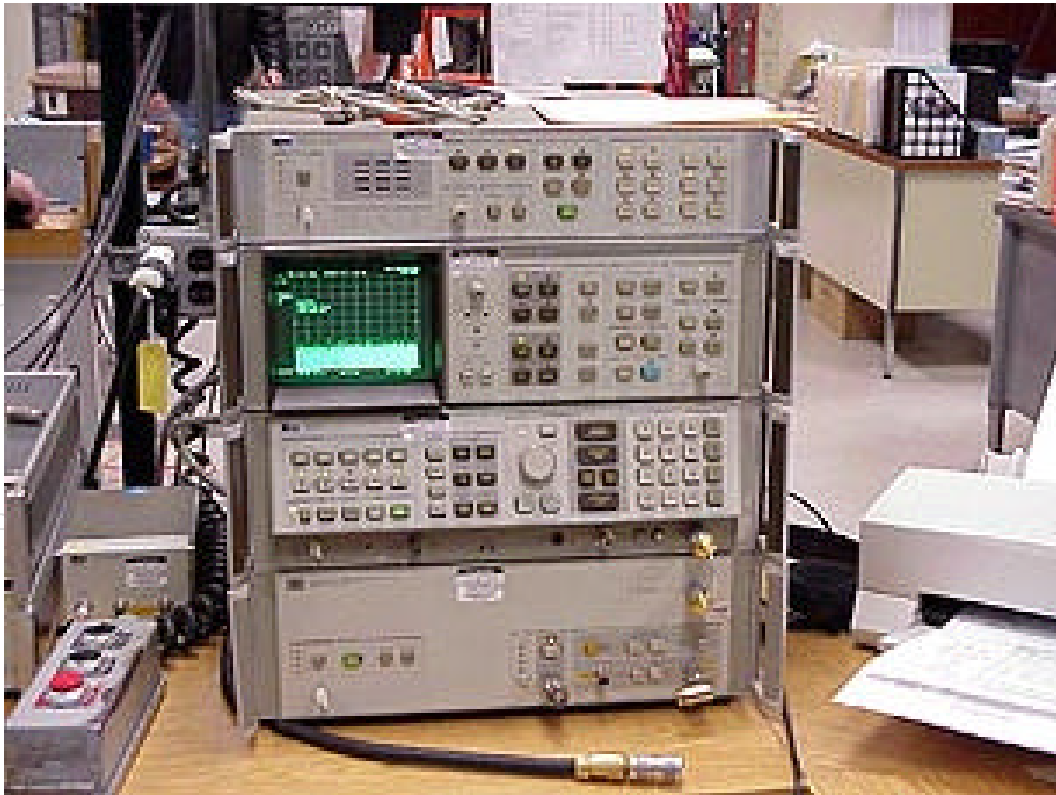
RADIATED EMISSIONS PHOTOGRAPHS



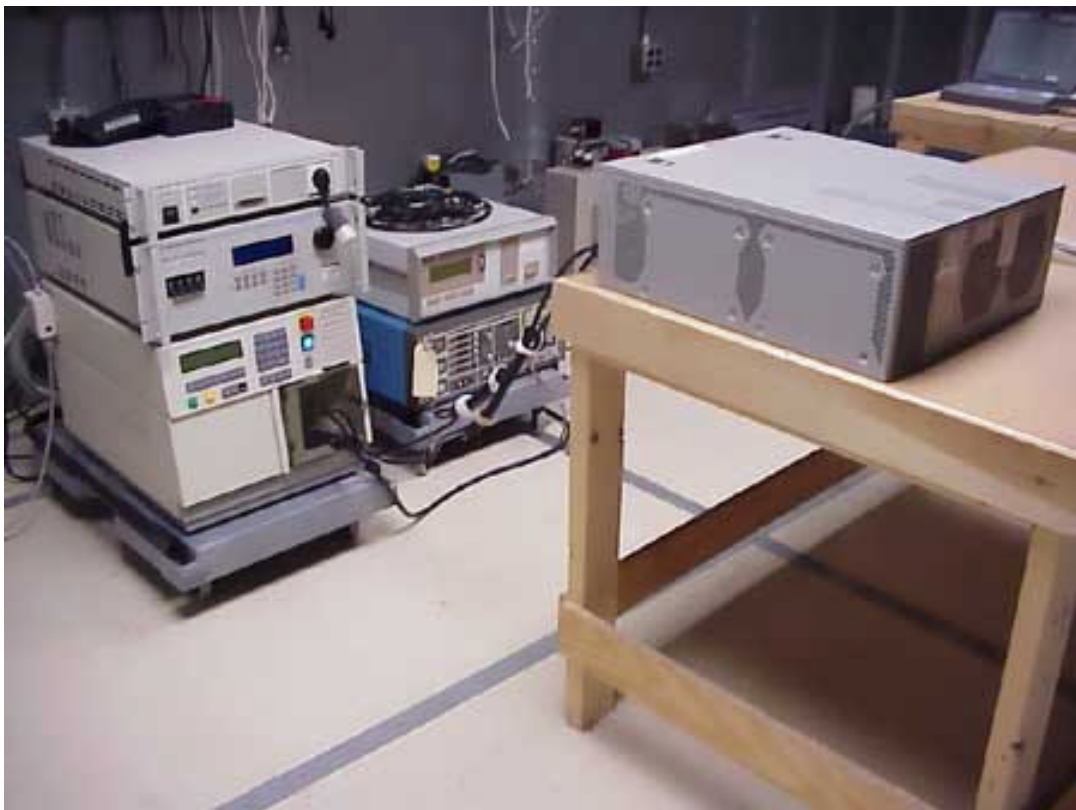
RADIATED EMISSIONS PHOTOGRAPHS



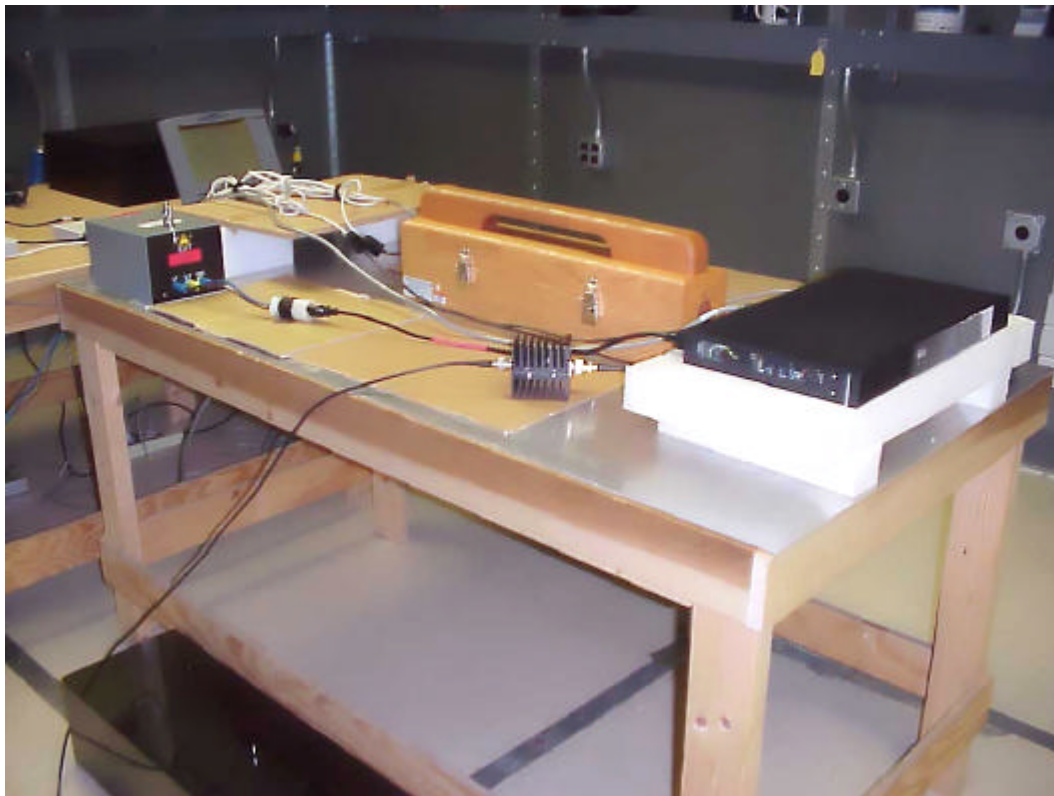
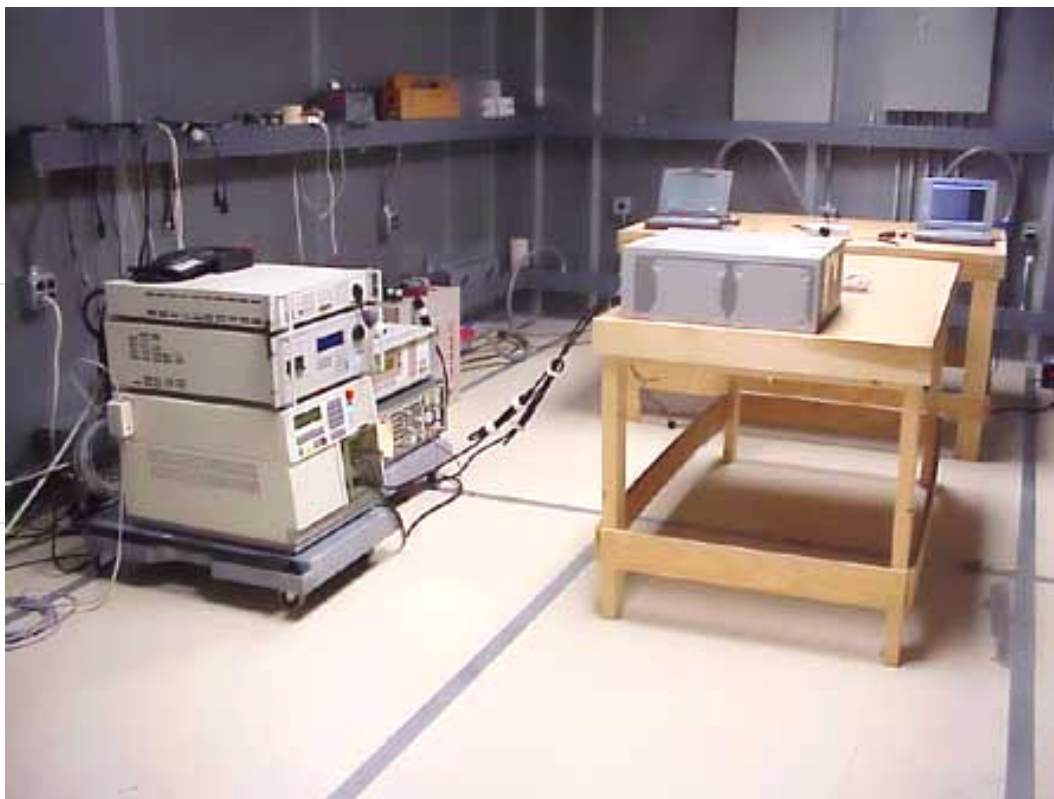
SUPPORT EQUIPMENT PHOTOGRAPHS



CONDUCTED EMISSIONS PHOTOGRAPHS



CONDUCTED EMISSIONS PHOTOGRAPHS



Appendix C

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TEST PROCEDURES

Test Procedures - EMI Operational Description

GENERAL

For each emission signal, maximum level is achieved for both horizontal and vertical polarizations as well as (0-360) degrees turntable rotation.

Antenna Test Distances are selected at either 3, 10 or 30 meters separation from the EUT in accordance with applicable specification requirements.

Antenna Scan Heights are varied from 1-4 meters at Antenna Test Distances of 3, 10 and 30 meters.

FCC RADIATED EMISSIONS (E-FIELD)

EMI test procedures are performed in accordance with the requirements of ANSI C63.4 (1992). Measurements are initially obtained using broad band antennas and PEAK detection. In addition, cables are manipulated to maximize emissions within constraints of a typical system configuration. All measured data within 3 db of the Radiated Limits are retaken using Tuned Dipole Antennas (Roberts Type) and QUASI-PEAK (CISPR) Detection. Each EUT is powered from a 60Hz AC source.

FCC CONDUCTED EMISSIONS

EMI test procedures are performed in accordance with the requirements ANSI C63.4 (1992). Measurements are initially obtained with PEAK Detection. In addition, cables are manipulated to maximize emissions within constraints of a typical system configuration. All measured data within 3 db of the Conducted Limits are retaken using QUASI-PEAK (CISPR) Detection. Each EUT is powered from a 60Hz AC source.

CISPR22/EN55022 RADIATED EMISSIONS (E FIELD)

EMI test procedures are operated in accordance with the requirements of the CISPR22 (1993) and EN55022 (1987) Documents. Measurements are initially obtained with PEAK Detection. In addition, cables are manipulated to maximize emissions within constraints of a typical system configuration. All measured data within 3 db of the Radiated Limits are retaken using QUASI-PEAK (CISPR) detection. Each EUT is powered from a 50Hz AC source.

CISPR22/EN55022 CONDUCTED EMISSIONS

EMI test procedures are operated in accordance with the requirements of the CISPR22 (1993) and EN55022 (1987) Documents. Measurements are initially obtained with PEAK Detection. In addition, cables are arranged per the specification within constraints of a typical system configuration. All measured data exceeding 3 db below the Conducted QP Limit are retaken using QUASI-PEAK (CISPR) Detection. All measured data exceeding 2 db below the Conducted AVERAGE Limit are retaken using AVERAGE (CISPR) Detection. Each EUT is powered from a 50Hz AC source.

Appendix D

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MEASUREMENT FACILITIES INFORMATION

DESCRIPTION of MEASUREMENT FACILITIES

The Open Area Test Site (OATS) is composed of a building and associated ground screen with a control room underneath.

The building is a TUFF-SPAN enclosure constructed of fiberglass reinforced plastic materials which provide above-ground weather protection. These materials are non conductive, non magnetic and RF transparent. They do not impact the surrounding electromagnetic environment and are corrosion resistant. The enclosure size permits Ten Meter Radiated Measurements within its confines and utilizes a remote controlled Macton Turntable Assembly. The conductive turntable is 16 feet in diameter and capable of moving a 10,000 pound load a full 360 degrees of rotation. It is flush-mounted to the ground screen and edge bonded circumferentially to the ground screen with beryllium copper "fingers". The ground screen is constructed of welded wire mesh lying directly on top of a concrete-over-steel foundation. The screen is extended beyond the building itself to provide 30 meter measurement capability when needed. There are no reflecting objects within the required obstruction free oval area.

The control room is located beneath the ground screen level with stairwell access to the ground plane area. An elevator is located beyond the ground screen and provides access to the control room, shipping dock and ground screen areas for large sized EUT's. Primary power cabling to the EUT is fed through a hole in the center of the table along with necessary EUT/Support Equipment interface cabling. A remote controlled EMCO Antenna Mast Assembly is located on the ground screen. It provides the operator with adjustable antenna height over the 1 meter through 4 meter range as well as allowing both horizontal and vertical polarizations at any height.

A conducted emissions measurement area is located in a shielded room and consists of a conductive (galvanized sheet metal) wall 20' wide x 8' high with a metal floor bonded to the wall. AC Power is supplied through receptacles located on the vertical wall. Each receptacle is adequately filtered using Shielded Room EMI Power Line Filters (Rayproof 1B42 Units) which provide 100 db attenuation over the 14KHz to 10GHz frequency range. The shielded room itself is bonded directly to earth ground.

Additionally, both the control room/shielded rooms and ground plane area have heating, air conditioning and relative humidity controlled environments.

Capability

Test Site Service's open area Test Sites have been evaluated in accordance with ANSI C63.4 procedures and found to be in compliance with ANSI C63.4-(1992) Site Attenuation and LISN requirements.

In addition, Test Site Services is Assessed and Approved annually by a European Competent Body to assure competence in testing products for CE Mark Compliance (Emissions and Immunity).

All of Test Site Service's measurement facilities meet the technical requirements for qualification testing of products to FCC, CISPR, IEC, VCCI, BSMI and other International Standards.

Accreditation / Approval

- FCC Registered
- VCCI Registered
- BSMI Accreditation
- NVLAP Accredited
- AUSTEL Listed
- New Zealand Approved (Ministry of Commerce)
- Competent Body Assessment / Approval (Technology International, UK)
- Sub-Accredited by Hewlett Packard (Mass. Medical Environmental Test Lab.)
- NARTE certified EMC Engineers

