SANMINA-SCI

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Radiated Emissions Part 22 Test Report
Lab Project Number- 02NOR010

MPAM-CR (Wide-Range HCPA/MPEM)

Revision: 01

Date: May 22, 2002

Prepared for: Nortel Networks Inc.

Author: Shankara Malwes
EMC Test Technologist

Approved by:	Glen Moore EMC Manager	Matthew P. Buxton PI Laboratory Manager

Summary

Sanmina-SCI Canada

Product Integrity Laboratory
5151-47th Street, N.E. Calgary Alberta T3J 3R2
Accreditation Numbers: FCC 101386
IC 46405-3978
Standards Council of Canada Accredited Laboratory No. 440

Performed For: Thomas Wong
Nortel Networks Inc.
5111-47th Street, N.E.
Calgary Alberta T3J 3R2
Phone (403) 769-2425

EUT Description: MPAM-CR (Wide-Range HCPA/MPEM)
Model: Wide-Range MPEM and HPCA, CRPA
Serial Number: Refer Table 2 of the project test plan in Appendix D

Appendix	Core Standard	Reference Standard	Sanmina Test Case	Description & Range	Deviation From Standard	Deviation From Test Plan	Pass / Fail
B	FCC Part22	ANSI C63.4: 2001	RE02-10M-2002-019	Spurious Radiated Emissions 30MHz-1GHz	No	No	Pass
C	FCC Part22	ANSI C63.4: 2001	RE03-10M-2002-005	Spurious Radiated Emissions 1GHz – 10 GHz	No	Yes	Pass

Note: Test Plan deviations are listed in Appendix A.

Test Result: The product presented for testing complied with test requirements shown above.

Tested By: Shankara Malwes
EMC Technologist

Checked By: Glen Moore
EMC Manager

Signature Valid
Digitally signed by Glen Moore
DN: cn=Glen Moore, o=Sanmina-SCI, ou=Product Integrity, c=CA
Date: 2002.06.10 08:56:52 -07'00'

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REGISTER OF REVISIONS

Issue	Date	Description of Revisions
Rev.1	22 May 2002	Initial Release

1. INTRODUCTION

1.1 PURPOSE

The purpose of this report is to describe testing and results for Radiated Emissions on Nortel's MPAM-CR (Wide-Range MPEM and HPCA, CRPA) as performed in reference to FCC Part 22 Subpart H limits.

1.2 ABBREVIATIONS AND DEFINITIONS

None

1.3 REFERENCES

ANSI C63.4-2001
FCC CFR 47 Part 22
Sanmina-SCI Radiated Emissions 30MHz-1GHz (Automated) Test Method E001R6
Sanmina-SCI Radiated Emissions 1GHz – 18GHz (Manual) EMC Test Method E006R3
Sanmina-SCI Radiated Emissions 30MHz – 20GHz Signal Substitution Method Revision:01

2. TEST LOG

Appendix	Test Case	Start	End
Date Received: 28th Apr 2002			
B	Radiated Emissions 30MHz – 1GHz FCC Part 22	06 May 02	07 May 02
C	Radiated Emissions 30MHz – 10GHz FCC Part 22 Signal Substitution	16 May 02	17 May 02
Date Shipped: Not shipped			

3. EUT

3.1 CONFIGURATION

The EUT was placed on the wooden palette located in the center of the turntable in the 10M chamber. Cabling was routed through a cable rack in an attempt to maximize the emissions. The EUT was configured with 3x800MFRMs named MFRM#1, 2 and 3. All the MFRM Antenna ports connected to bulkhead in the center of the turntable and terminated with a 50-ohm attenuator load in the support room under the 10M chamber.

For more detailed EUT configuration and setup refer to Appendix F of the Project test plan in Section 3.4.1.2 and section 4.2 of the Project test plan draft document number xxxxxx, Stream 00, Issue 01, dated 21 Apr 2002.

Table 1 –Description of EUT

Name	MPAM-CR
Model Number	Wide-Range MPEM and HPCA, CRPA
Revision Number	Not provided
Serial Number	Refer to the Table 2
Physical Description	The MPAM-CR consists of three subassemblies mounted in an open, floor-standing frame, all gray in color. Each MFRM has green lights on the front panel and four ports on the back(Ant, Div Ant, RF In, & RF Out).The rack was placed on a 10cm high wooden pallet in the center of the 10M chamber turntable.
Classification	Floor standing
Size	Not provided
Weight	Not provided
Power	+24V DC, 71 Amps in total. The 3MFRM powers were connected to the B-Hubble connector. For more details Refer Appendix F Table 11,of the Project test plan in Section 2.2
Functional Description	The cost reduced MPAM was tested as part of a Metrocell Multi carrier BTS.The cellular and PCS communication uses CDMA Technology and operates at 800MHz. The basic system provides a complete, one carrier cell site that may be configured for indoor or outdoor applications. For more detailed description please Refer to the section 1.3 of the Project test plan draft document Number: xxxxxx, stream 00, issue 01 dated 21 Apr 2002.

Table 2 – EUT Description List

The following equipment was provided by the customer and was verified by Sanmina-SCI.

Module	Module Description	PEC	Serial Number (Unique Identifier)	Verified
DPM	800 DPM #1	NTGS89DB	NNTM74000003	☒
	800 DPM #2	NTGS89DB	NNTM74000006	☒
	800 DPM #3	NTGS89DB	NNTM74000004	☒
MTRM	800 MTRM#1	NTGY10DA 79	NNTM535TGNW5	☒
	800 MTRM#2	NTGY10DA 79	NNTM535TGRER	☒
	800 MTRM#3	NTGY10DA 79	NNTM535TGNLV	☒
MPAM #1	MPAM#1	NPGY80AZ P1	NNTM537YT126	☒
	MCPA	NTGY71AB N1	NNTM74PC4FT2	☒
	MPEM	ACTT MPEM	ACTT00000043	☒
	HPCA	ASTEC HPCA	ADPL0800000G	☒
MPAM #2	MPAM #2	NPGY80AZ P1	NNTM537YT148	☒
	MCPA	NTGY71AB N1	NNTM74PC4FT6	☒
	MPEM	ACTT MPEM	ACTT00000017	☒
	HPCA	ASTEC HPCA	ADPL0800000Q	☒
MPAM #3	MPAM #3	NPGY80AZ P1	NNTM537YT137	☒
	MCPA	NTGY71AB N1	NNTM74PC4FT9	☒
	MPEM	ACTT MPEM	ACTT00000044	☒
	HPCA	ASC0M HPCA	ASENAE000042	☒

Module	Module Description	PEC	Serial Number (Unique Identifier)	Verified
FRAME	FRAME	NTGS65AA 06	DEVP01010848	☒
FAN	FAN#1	NTGY60AE 01	NNTM532VW89F	☒
	FAN#2	NTGY60AE 01	NNTM532VW87D	☒
	FAN#3	NTGY60AE 01	NNTM532VW84A	☒

Note: Special considerations for each test case are noted in the appropriate appendices.

3.1.1 CONFIGURATION DEVIATIONS

None

3.2 Power

B – Hubble: 71 Amps in total
Line 1 +24V DC through LISN B1
Line 2 –24V DC through LISN B2
Line 3 +24V DC through LISN B3
Line 4 –24V DC through LISN B4

3.2.1 POWER DEVIATIONS

None

3.3 CABLES

Table 3 – Cable List

The customer provided the following list of cables and they were verified by Sanmina-SCI.

No	Description	Routing From	Routing to	Length (m)	Connector Type	Shield Type	Back shell Material	Verified
1	50Ω RF Cable # 1	800MFRM# 1 Main Ant D6 port through #1 bulkhead connector	30dB, 150 watts, attenuator and to 50Ω term	~22	N-Type	Braid /Foil	Metal	☒
2	50Ω RF Cable # 2	800MFRM# 2 Main Ant D6 port through #2 bulkhead connector	150 watts, attenuator load term	~22	N Type	Braid /Foil	Metal	☒
3	50Ω RF Cable # 4	800MFRM# 3 Main Ant D6 port through #4 bulkhead connector	40dB, 500 watt, attenuator and to 50Ω term	~22	N-Type	Braid /Foil	Metal	☒
4	50Ω RF Cable # 5	800MFRM# 1 Div Ant port through #5 bulkhead connector	150 watts, attenuator load term	~22	N-Type	Braid /Foil	Metal	☒

No	Description	Routing From	Routing to	Length (m)	Connector Type	Shield Type	Back shell Material	Verified
5	50Ω RF Cable # 7	800MFRM# 2 Div Ant port through #7 bulkhead connector	150 watts, attenuator and to 50Ω term	~22	N-Type	Braid /Foil	Metal	☒
6	50Ω RF Cable # 8	800MFRM# 3 Div Ant port through #8 bulk head connector	150 watts, attenuator load term	~22	N-Type	Braid /Foil	Metal	☒
7	2 Shielded Power Cable	Line 1 and Line 2 of B-Hubble connector	800 MFRM# 1,2 Power I/P	~8.0	N-Type	Braid /Foil	Metal	☒
8	1 Shielded Power Cable	Line 3 and Line 4 of B-Hubble connector	800 MFRM# 3 Power I/P	~8.0	N-Type	Braid /Foil	Metal	☒

3.3.1 CABLE LIST DEVIATIONS

None

3.4 EUT FREQUENCIES

For a detailed list of frequencies refer to the Appendix. D, Table 2 and 3 of the project test plan draft document number: xxxxxx, Stream 00, Issue 01, dated 21 Apr 02. Also Refer to the section 7.2.1 in the test plan.

3.4.1 FREQUENCY LIST DEVIATIONS

Frequencies of the EUT were not verified by Sanmina-SCI.

3.5 MODE OF OPERATION

Refer to the Appendix. D in section 4.4 of the Project test plan draft document number xxxxxx, Stream 00, Issue 01, dated 21 Apr 2002.

3.5.1 MODE OF OPERATION DEVIATION

The customer operated the EUT and reported no operation deviations reported by the client.

3.6 PASS / FAIL CRITERIA

The pass/fail criteria are defined as the limits specified in FCC CFR Part 22 Subpart H. The standard limits are described in each appendix of this report.

4. SUPPORT EQUIPMENT

The following modules were used as support equipment and verified by Sanmina-SCI. The equipment was isolated from the EUT in the shielded enclosure below the test site and was used to excite the EUT and monitor the alarm status of the EUT.

Table 4 – Support Equipment

Module	Module Description	PEC	Serial Number (Unique Identifier)	Verified
Upper Shelf	CEM in Slot 1	NTGS60BA 80	NNTM5357YCHB	☒
	CEM in Slot 2	NTGS60BA 78	NNTM5357H4BF	☒
	CEM in Slot 3	NTGS60BA 73	NNTM533M1365	☒
	CEM in Slot 7	NTGS60BA 76	NNTM53406QTY	☒
	CEM in Slot 8	NTGS60BA 77	NNTM5340832L	☒
	CEM in Slot 9	NTGS60BA 73	NNTM533MUMDQ	☒
Bottom Shelf				☒
	GPSTM slot2	NTBW50AA P4	NNTM74TW0010	☒
	CM Slto4	NTGS40AA 97	NNTM5357CGFT	☒
	CM slot5	NTGS40AA 34	NNTM533MPBB8	☒
	CORE slot6	NTGS30AA 37	NNTM533MNG78	☒
	CORE slot7	NTGS30AA 40	NNTM533MUF16	☒
SHELF		NTGS20AA 09	SNMN53002T2K	☒
FRAME		NTGS45BA 12	SNMN53002UGJ	☒
BRAKER PANEL		NTGS47AB 05	SNMN53002PE8	☒

APPENDICES

APPENDIX A: TEST DEVIATION LOG

Deviation Number	Time & Date	Reference	Deviation from Standard (Y/N)	Description and Justification of Deviation	Core Standard Affected	Approval

Sanmina-SCI Product Integrity Laboratory, 5151-47th Street N.E. Tel: 403-295-5134, Fax: 403-295-4091

APPENDIX B: MTRM 800MHZ RADIATED EMISSIONS 30MHZ – 1GHZ RESULTS

B.1. Test Basis

FCC CFR 47 Part 22
ANSI C63.4

B.2. Test Specifications

FCC Part 22 Subpart H		
Frequency	**ERP Limit**	**Peak Limit @ 10 meters***
MHz	**dBm**	**dBμV/m**
30MHz – 1 GHz	-13	73.90

* Theoretical field strength based on a dipole

B.3. Test Procedure

Sanmina-SCI Radiated Emissions 30MHz-1GHz (Automated) Test Method E001R6
Radiated Emissions Signal Substitution Method 30MHz-20GHz Revision 1.0.
The EUT was scanned for emissions, field strength measurements were made on the EUT, and for any signals detected signal substitution was performed.

B.4. Measurement Uncertainty

The estimated uncertainty for the Radiated Emissions Signal substitution test from 30MHz – 1GHz is +2.15/-2.19 dB. The corresponding expanded uncertainty is +4.29/- 4.37 dB.

B.5. Deviations

From Standard

None.

From Method

Substitutions were referenced to automated compliance peak data.

B.6. Test Results

FCC Part 22

Peak Scan 30MHz – 1GHz (Horizontal Polarization)

Project Name: CR-MPAM **Tester:** Shankara Malwes
Model: MFRM 800MHz **Test ID:** RE02-10M-2002-019
Comments: Horizontal Scan Compliance Data

Standard	FCC Part 22	Measurement Distance	10	meters

Antenna	Start Frequency	Stop Frequency	Frequency	AF	CL	Detector	Pk Measured Value	Corrected Value	Theoretical Limit	Theoretical Margin
	MHz	MHz	MHz	dB/m	dB		dBuV	dBuV/m	dBuV/m	dB
2261 RX BiCon Hpol	30	1000	157.25	10.39	-24.18	Peak	**50.14**	36.35	73.90	37.55
2261 RX BiCon Hpol	30	1000	471.91	17.16	-24.33	Peak	**45.39**	38.23	73.90	35.67

Corrected Value: Measured Value + AF + CL AF: Antenna Factors & CL: Cable Loss

Notes:
Positive Margin indicates a pass

Peak Scan 30MHz – 1GHz (Vertical Polarization)

Project Name: CR-MPAM **Tester:** Shankara Malwes
Model: MFRM 800MHz **Test ID:** RE02-10M-2002-019
Comments: Vertical Scan Compliance Data

Standard	FCC Part 22	Measurement Distance	10	meters

Antenna	Start Frequency	Stop Frequency	Frequency	AF	CL	Detector	Pk Measured Value	Corrected Value	Theoretical Limit	Theoretical Margin
	MHz	MHz	MHz	dB/m	dB		dBuV	dBuV/m	dBuV/m	dB
2261 RX BiCon Vpol	30	1000	157.29	10.60	-24.18	Peak	**45.85**	32.27	73.90	41.63
2261 RX BiCon Vpol	30	1000	471.88	17.74	-24.33	Peak	**42.90**	36.31	73.90	37.59

Corrected Value: Measured Value + AF + CL AF: Antenna Factors & CL: Cable Loss

Notes:
Positive Margin indicates a pass

Substitution Data 30MHz – 1GHz

Sanmina Product Integrity Laboratory V2.5

Project Name: MPAM-CR **Tester:** Shankara Malwes
Model: MFRMs 800MHz **Test ID:** RE02-10M-2002-019
Comments: Substitution Data at 10M distance

Frequency (MHz)	Polarization (V/H)	Uncorrected Peak level	Uncorrected Substitution measure level	Signal Generator level (source) dBuV	Cable factor	Antenna Gain	Effective Radiated Power (E.R.P.)	E.R.P Limit	Margin
		dBuV/m	dBuV/m	dBm	dB	dB	dBm	dBm	dB
157.25	H	50.14	50.17	-53.80	-1.53	1.73	**-53.61**	-13	40.61
471.91	H	45.39	45.17	-34.30	-2.67	3.08	**-33.89**	-13	20.89
157.29	V	45.85	45.93	-29.70	-1.53	1.32	**-29.92**	-13	16.92
471.88	V	42.90	42.93	-28.60	-2.67	2.25	**-29.02**	-13	16.02

Effective Radiate Power (E.R.P) = Signal Generator + Cable Factor + Antenna Gain

Note: Positive Margin indicates a Pass.

B.7. Measurement Equipment

Radiated Emissions 30MHz – 1GHz

Description	Type/Model	Manufacturer	Serial #	Cal Due	Cal Date
10m ANECHOIC CHAMBER					
Bilog Antenna	CBL 6111B	Chase	40500566	12 Mar 03	12 Mar 02
Mast Controller	2090	EMCO	40500188	N/A	N/A
Multi Device Controller TT1 (Turntable)	2090	EMCO	40500197	N/A	N/A
RF Cable west range	Ferrite bead loaded cable	Suhner Succoflex	40500650	17 Apr 03	17 Apr 02
RF Cable from Bulkhead to LNA	Succoflex 103	Suhner Succoflex	35200/3	17 Apr 03	17 Apr 02
Adjustable Dipole Antenna Set	3121C	EMCO	9611-1233	04 Mar 2003	04 Mar 2002
CONTROL ROOM					
ESMI	1032.5510.23	Rohde & Schwarz	40500153/154	11 Jan 03	11 Jan 02
Amplifier	HP-8447F OPT H64	Hewlett Packard	40500228	17 Apr 03	17 Apr 02
Switch Matrix Controller	SMC-002	TDL	40500189	N/A	N/A
VERIFICATION EQUIPMENT					
RefRad	4630B	EMCO	40500257	25 Apr 03	25 Apr 02
RefRad (Kit)	Balun A	NA	NA	N/A	N/A
RefRad (Kit)	40cm Dipole	NA	NA	N/A	N/A
RefRad Fixture	NA	Sanmina	RefRad Fixture #1	N/A	N/A
Signal Generator 10MHz – 40GHz	SMP04	Rohde & Schwarz	40500125	27 Mar 03	27 Mar 02
Cable from RX antenna to 3M center bulk head in 10M Chamber	104	Succoflex	116558/4	18 Apr 03	18 Apr 02
Cable from 3M center bulk head to Control room	104	Succoflex	40500627	18 Apr 03	18 Apr 02
Cable from Control room bulk head TO	104	Succoflex	40500626	18 Apr 03	18 Apr 02

room bulk head TO Signal Generator					

B.8. Deviations from Normal Operating Mode

Client operated the EUT during the test and reported no deviations in its normal operating mode.

B.9. Test Setup Special Considerations

Refer to Appendix D, section 3.4.1.2 and 4.4 of the project test plan draft copy document number xxxxxx, issue 01 dated 21 Apr 02 for more detailed description of the setup configuration and details.

B.10. Sample Calculation

Emission Level = Measured Level + Correction Factors
Margin = Limit – Emission Level

ERP Limit = P_{dBm} – (43 + 10Log(P))
Example
P=20w
ERP Limit
= 43dBm – (43 + 10Log(20)) = -13dBm

Peak Limit = 120 + 20Log(SQRT (49.2 * P_w) / D)
Example
P= -13dBm = 0.00005w
D= 10m
Peak Limit
= 120 + 20Log(SQRT (49.2 * 0.00005) / 10)
= 73.9 dBuV/m

B.11. Test Data and Pictures

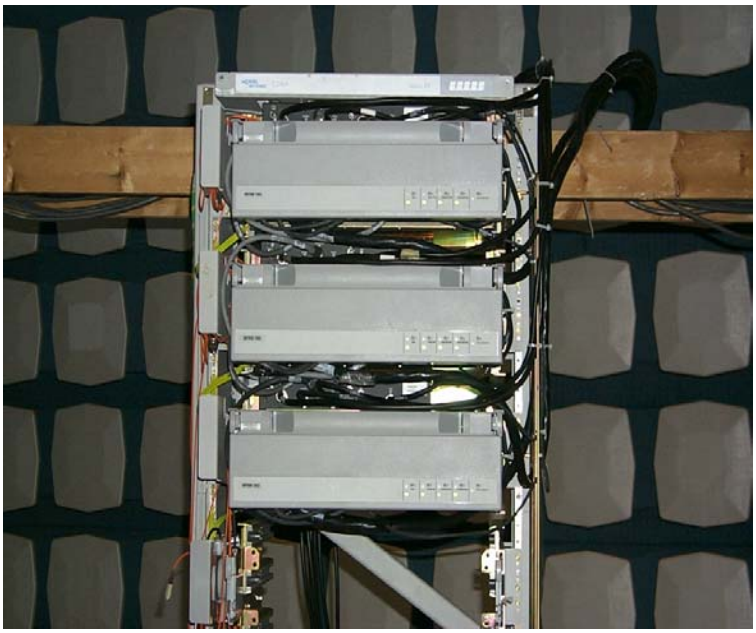
Test data and pictures for Radiated Emissions appear following this page.

B.12. Test Results

The EUT is in compliance with the limits as specified in the standard FCC Part 22 Subpart H.

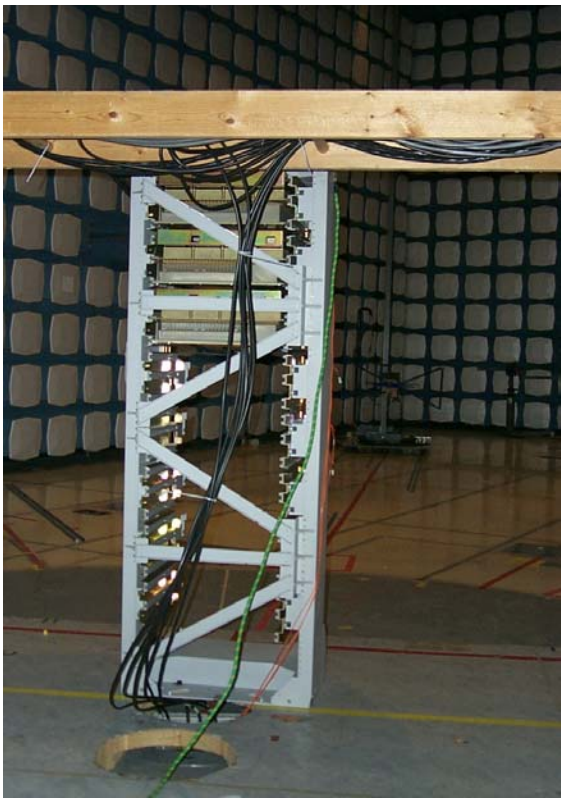
B.13. Signature

Signature/Date: 10/June/02
Name: Shankara Malwes
Function: EMC Technologist

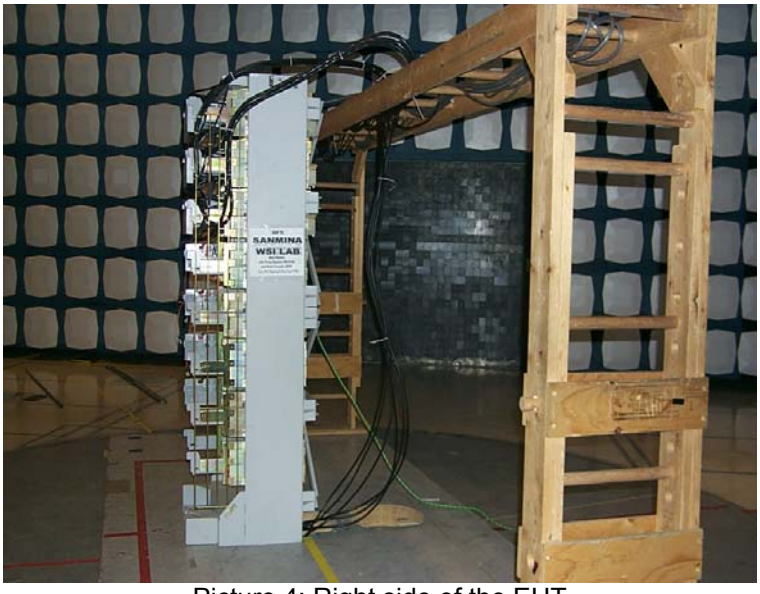


Picture 1: Front view of the EUT towards the Antenna

Picture 2: Left side of the EUT



Picture 3: Back view of the EUT



Picture 4: Right side of the EUT

APPENDIX C: MTRM 800MHZ RADIATED EMISSIONS 1 – 10GHZ TEST RESULTS

C.1. Test Basis

Standards

Core Standard: FCC CFR 47 Part 22, Subpart H.

Reference Standard: ANSI C63.4

C.2. Test Specifications

Applicable Limits:

FCC Part 22 Subpart H Radiated Electric Field @ 3m West Site

FCC Part 22		
Frequency	**ERP Limit**	**Peak Limit @ 3 meters***
MHz	**dBm**	**dBμV/m**
1GHz – 10GHz	-13	84.3

* Theoretical field strength based on a dipole

C.3. Test Procedure

The EUT was scanned for emissions, field strength measurements were made on the EUT, and for any signals detected signal substitution was performed.
Sanmina-SCI Radiated Emissions 1GHz – 18GHz (Manual) Test Method E006R3.
Radiated Emissions Signal Substitution Method 30MHz-20GHz.

C.4. Measurement Uncertainty

The estimated uncertainty for the Radiated Emissions Signal substitution test from 1GHz – 10GHz is +/-2.74 dB. The corresponding expanded uncertainty is +/- 5.49 dB.

C.5. Deviations

From Standard
None

From Test Plan
None

C.6. Test Results

FCC Part 22

Peak Scan 1GHz - 10GHz (Horizontal Polarization)

Project Name: MPAM-CR
Model: MFRM 800MHz and new DPM
Comments: Horizontal Scan Compliance Data
Tester: Shankara Malwes
Test ID: RE03-10M-2002-005

Standard	FCC Part 22	3	meters

Antenna	Start Frequency	Stop Frequency	Frequency	AF	CL + LNA	Detector	Pk Measured Value	Corrected Value	Theoretical Limit	Theoretical Margin
	MHz	MHz	MHz	dB/m	dB		dBuV	dBuV/m	dBuV/m	dB
3115 Hpol	1000	2700	2570.61	30.76	-60.72	Peak	85.05	55.09	84.35	29.26
3115 Hpol	2700	5950	2631.78	30.89	-60.60	Peak	84.41	54.70	84.35	29.65
3115 Hpol	2700	5950	5270.94	35.73	-56.32	Peak	72.91	52.33	84.35	32.02
3115 Hpol	2700	5950	5866.16	36.61	-54.73	Peak	72.69	54.57	84.35	29.78
3160-06	5950	8200	7906.41	30.00	-51.18	Peak	70.61	49.43	84.35	34.92
3160-07	8200	12500	8772.60	33.40	-50.19	Peak	70.41	53.62	84.35	30.73
3160-07	8200	12500	9625.57	33.45	-48.96	Peak	69.85	54.34	84.35	30.01

Corrected Value: Measured Value + AF + CL + LNA. AF: Antenna Factors & CL: Cable Loss & LNA: Amplifier

Notes:
(1) Positive Margin indicates a pass
(2) Corrected Value was measured by FSEK Virtual Instrument with all factors loaded

Peak Scan 1GHz – 10GHz (Vertical Polarization)

Project Name: MPAM-CR
Model: MFRM 800MHz and new DPM
Comments: Vertical Scan Compliance Data
Tester: Shankara Malwes
Test ID: RE03-10M-2002-005

Standard	FCC Part 22	3	meters

Antenna	Start Frequency	Stop Frequency	Frequency	AF	CL + LNA	Detector	Pk Measured Value	Corrected Value	Theoretical Limit	Theoretical Margin
	MHz	MHz	MHz	dB/m	dB		dBuV	dBuV/m	dBuV/m	dB
3115 Vpol	1000	2700	2546.82	30.50	-60.89	Peak	85.71	55.33	84.35	29.02
3115 Vpol	2700	5950	2635.47	30.70	-60.50	Peak	83.83	54.03	84.35	30.32
3115 Vpol	2700	5950	5263.56	35.52	-56.25	Peak	72.38	51.65	84.35	32.70
3115 Vpol	2700	5950	5270.99	36.21	-55.08	Peak	71.35	52.48	84.35	31.87
3160-06	5950	8200	7895.34	30.00	-51.17	Peak	70.50	49.33	84.35	35.02
3160-07	8200	10000	8438.08	33.40	-50.55	Peak	71.50	54.35	84.35	30.00

Corrected Value: Measured Value + AF + CL + LNA. AF: Antenna Factors & CL: Cable Loss & LNA: Amplifier

Notes:
(1) Positive Margin indicates a pass
(2) Corrected Value was measured by FSEK Virtual Instrument with all factors loaded

Substitution Data 1GHz – 10GHz

Project Name: MPAM-CR
Model: MFRM 800MHz and new DPM
Comments: Substitution Data at 3M distance
Tester: Shankara Malwes
Test ID: RE03-10M-2002-005

Frequency (MHz)	Polarization (V/H)	Emission level	Corrected Substitution measure level	Signal Generator level (source) dBuV	Cable factor	Antenna Gain	Effective Radiated Power (E.R.P.)	E.R.P Limit	Margin
		dBuV/m	dBuV/m	dBm	dB	dB	dBm	dBm	dB
2570.61	H	55.09	55.17	-44.40	-6.49	7.68	**-43.21**	-13	30.21
2631.78	H	54.70	54.71	-44.50	-6.56	7.76	**-43.30**	-13	30.30
5270.94	H	52.33	52.22	-45.70	-9.51	8.90	**-46.31**	-13	33.31
5866.16	H	54.57	54.50	-45.50	-10.09	9.12	**-46.47**	-13	33.47
7906.41	H	49.43	49.65	-57.00	-11.86	10.25	**-58.61**	-13	45.61
8772.60	H	53.62	53.79	-49.50	-12.59	9.53	**-52.57**	-13	39.57
9625.57	H	54.34	54.30	-51.00	-13.36	10.48	**-53.89**	-13	40.89
2546.82	V	55.33	55.46	-44.10	-6.44	7.84	**-42.70**	-13	29.70
2635.47	V	54.03	53.95	-46.10	-6.57	7.91	**-44.76**	-13	31.76
5263.56	V	51.65	52.12	-46.80	-9.52	8.90	**-47.42**	-13	34.42
5270.99	V	52.48	52.64	-47.90	-9.51	8.90	**-48.51**	-13	35.51
7895.34	V	49.33	49.44	-56.10	-11.85	10.35	**-57.60**	-13	44.60
8438.08	V	54.35	53.79	-49.50	-12.29	10.25	**-51.54**	-13	38.54

Effective Radiate Power (E.R.P) = Signal Generator + Cable Factor + Antenna Gain

C.7. Measurement Equipment

Description	Type/Model	Manufacturer	Serial #	Cal Due	Cal Date
10m ANECHOIC CHAMBER					
Standard Gain Horn Antenna 1GHz-2.7GHz (TX)	3115	EMCO	40500087	19 N0v 2002	19 N0v 2001
Standard Gain Horn 2.7GHz-5.95GHz	3115	EMCO	40500087	19 N0v 2002	19 N0v 2001
Standard Gain Horn 5.95GHz-8.2GHz	3160-06	EMCO	40500176	N/A	N/A
Standard Gain Horn 8.2GHz-10GHz	3160-07	EMCO	40500177	N/A	N/A
Spectrum Analyzer 9KHz –40GHz	FSEK	Rohde & Schwarz	40500210	12 Mar 03	12 Mar 02
Step Attenuator/Switch	HP11713A	HP	40500014/ 40500276	N/A	N/A
DC Power Supply for LNA	LXO 30-2	Xantrex	40500211	N/A	N/A
Miteq LNA	JSD000121	Miteq	830620 in box	24 Apr 03	24 Apr 02
HPIB Extender	HP37204	HP	40500195	N/A	N/A
Cable from Antenna to LNA	101PEA	Succoflex	1713/1PEA	18 Apr 03	18 Apr 02
High pass filter	11SH10-3860	K&L	1	N/A	N/A
CONTROL ROOM					
Win 2000 PC with FSEK Manual control software loaded	N/A	N/A	N/A	N/A	N/A
Signal Generator 10MHz – 40GHz	SMP04	Rohde & Schwarz	40500125	27 Mar 03	27 Mar 02
HPIB Extender	HP37204	HP	40500193	N/A	N/A
Mast Controller	2090	EMCO	40500184	N/A	N/A
Multi Device Controller TT1 (Turntable)	2090	EMCO	40500197	N/A	N/A

VERIFICATION EQUIPMENT					
Standard Gain Horn Antenna (TX)	3115	EMCO	40500090	19 N0v 2002	19 N0v 2001
Signal Generator 10MHz – 40GHz	SMP04	Rohde & Schwarz	40500125	27 Mar 03	27 Mar 02
Cable from RX antenna to 3M center bulk head in 10M Chamber	104	Succoflex	116558/4	18 Apr 03	18 Apr 02
Cable from 3M center bulk head to Control room	104	Succoflex	40500627	18 Apr 03	18 Apr 02
Cable from Control room bulk head TO Signal Generator	104	Succoflex	40500626	18 Apr 03	18 Apr 02

C.8. Deviations from Normal Operating Mode

The Customer operated the EUT during the test and reported no deviations in its normal operating mode.

C.9. Test Setup Special Considerations

Test was conducted at 3m-distance west range and System was operational as per customer instructions

C.10. Sample Calculation

Emission Level = Measured Level + Correction Factors
Margin = Limit – Emission Level
Effective Radiated Power (ERP) = signal generator + cable factor + Antenna Gain

C.11. Test Data and Pictures

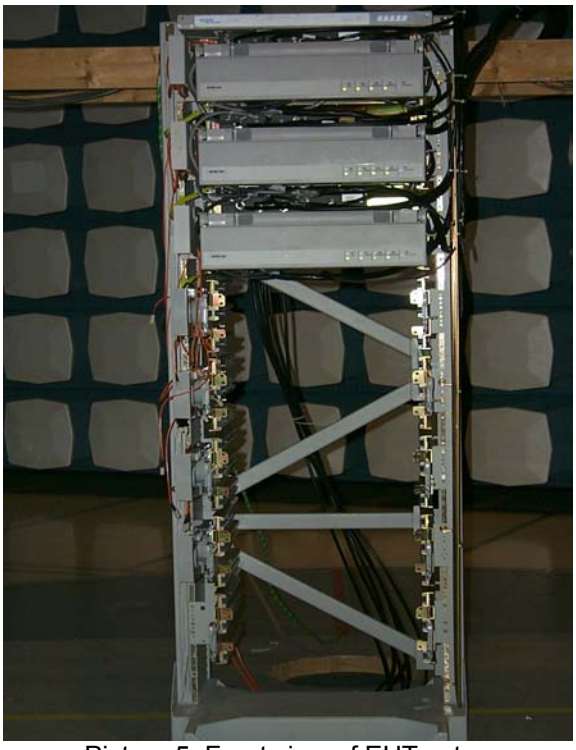
Test data and pictures for Radiated Emission appear following this page.

C.12. Test Results

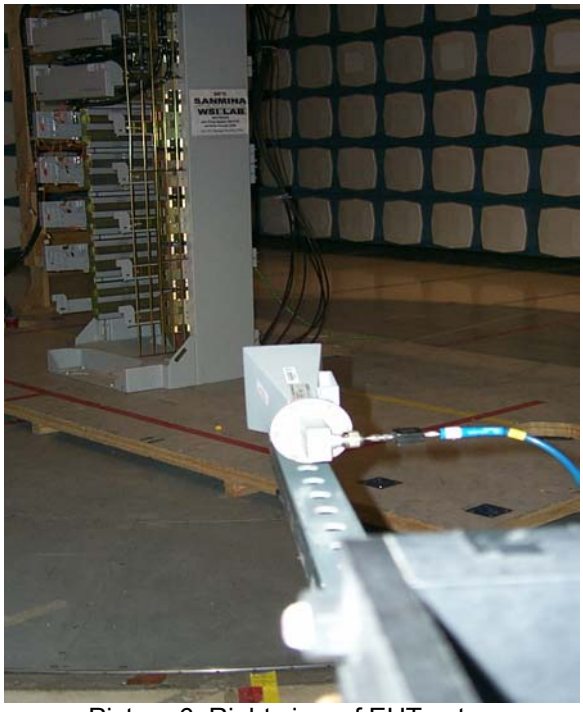
The EUT is in compliance with the limits as specified in the standard FCC Part 22 Subpart H.

C.13. Signature

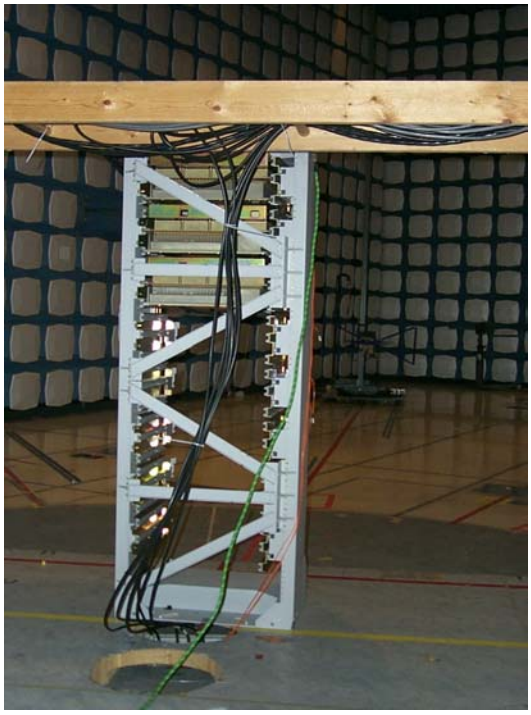
Signature/Date: 10 June/02
Name: Shankara Malwes
Function: EMC Technologist



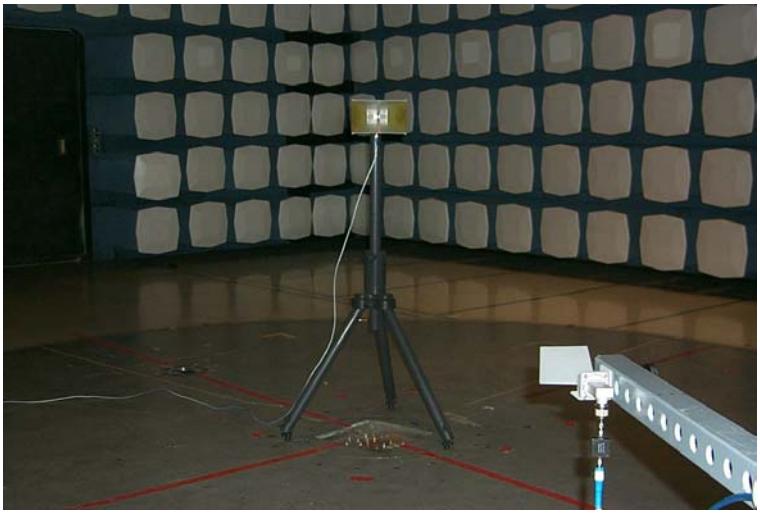
Picture 5: Front view of EUT setup



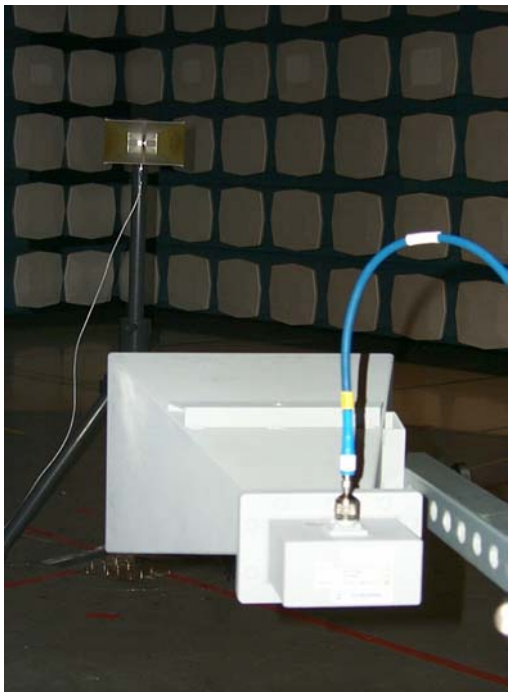
Picture 6: Right view of EUT setup



Picture 7: Back view of EUT



Picture 8: Signal Substitution measurement setup at 3M



Picture 9: Signal Substitution measurement setup at 3M

END OF DOCUMENT

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