SANMINA-SCI

EXHIBIT 2B

Revised Test Report

(Provided by Sanmina Canada)

Applicant: Northern Telecom Ltd.

For Certification on:

AB6NT1900SFRM

Product Integrity Laboratory

5111-47th Street, N.E.
Calgary, Alberta, T3J-3R2
Tel (403) 295-5117
Fax (403) 295-4091

[redacted]

RADIATED EMISSIONS 30MHz-20GHz REPORT

RE02-10M-2001-028
RE03-10M-2001-010
CDMA Outdoor Metrocell 1900MHz SFRM (20.4 Watts)

Revision: 4.0

Prepared for: Nortel Networks

Keywords: Radiated Emissions 30MHz – 1GHz
Radiated Emissions 1GHz - 20GHz

Abstract: Electromagnetic Compatibility testing report for FCC Part2 Rules for Equipment Authorization

Author: Jacky Wong

Product tested: November 26, 2001 – December 5, 2001

Report Prepared: January 3, 2002

Approved by: Matthew Buxton
Sanmina Product Integrity Laboratory

Customer:	Sanmina Design Solutions 6751-9th Street NE Calgary, Alberta T2E 8R9	For:	Nortel Networks 5111 47th Street NE Calgary, Alberta T3J-3R2

Customer Contact: Troy Williams

Project Number: PI 80053
Laboratory Project Number: 01NOR009

---

1. Table of Contents

Sanmina Canada ULC

Product Integrity Laboratory
5111-47th Street, N.E., Calgary Alberta T3J 3R2

Test Report No: RE02-10m-2001-028
RE03-10m-2001-010

Customer: Sanmina Design Solution
6751 – 9th Street NE.
Calgary, Alberta T2E 8R9
Tel: (403) 295-5100

For: Nortel Networks
5111 47th Street N.E.
Calgary, Alberta T3J-3R2
Tel: (403) 769-2000

EUT description: Metrocell CDMA
Model: Metrocell Base Station Transceiver System (MCBTS) supports CDMA 1900MHz SFRMS
Test Location: Sanmina PI Laboratory, Calgary Alberta

Test Basis	Standard	Test Case	Result
ANSI C63.4	FCC Rules Part 24	Radiated Emissions 30MHz – 1GHz Radiated Emissions 1GHz – 20GHz	PASS PASS

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

Tested by:
Jacky Wong
EMC Tool Developer

Date, Signature

Checked by:
Duane Friesen
Technical Advisor

Date, Signature

Additional information:

Appendix A:	Test Data	06 Pages
Appendix B:	Photographs	02 Pages

2. Release Control Record

Release #	Release authors	Reason for Change	Date of Issue
1.0	Jacky Wong	Original Release	December 12, 2001
2.0	Jacky Wong	Combined RE02-10m-2001-028 and RE03-10m-2001-010	December 17, 2001
3.0	Jacky Wong	Included Correction Factors in Peak Scan Data	December 18, 2001
4.0	Jacky Wong	Corrected equipment list of 1GHz – 20GHz	January 3, 2002

* Please note that Revision (change) bars are not used.

3. Measurement Equipment

Radiated Emissions Test Equipment, 30MHz – 1GHz

Manufacturer	Description	Model Number	Asset or Identification Number	Calibration Due
Rhode & Schwarz	EMI Receiver	ESMI	DE23037	March 09,2002
Chase-Schaffner	Biconilog Antenna	2701	40500566	Oct 11, 2002
EMCO	Mast Controller	2090	40500184	N/A
EMCO	Turntable Controller	2090	40500197	N/A
TDL	Switch Matrix Controller	SMC-002	40500189	N/A
Hewlett Packard	Low Noise Amplifier	8447 OPT H64	40500228	N/A
EMCO	RefRad	4630B	40500135	N/A
Sucoflex	Ferrite bead loaded cable	-	FBL-1	March 04, 2002
Sucoflex	RF Cable	106	9353/6	March 04, 2002
Sucoflex	RF Cable	104	115742	March 04, 2002
Sucoflex	RF Cable	104	116567/4	March 04, 2002
Sucoflex	RF Cable	104	11576/4	March 04, 2002

Radiated Emissions Test Equipment, 1GHz – 20GHz

Manufacturer	Description	Model Number	Asset or Identification Number	Calibration Due
Rhode & Schwarz	Spectrum Analyzer 9KHz – 40GHz	FSEK	40500210	Feb 15, 2002
EMCO	Mast Controller	2090	40500184	N/A
EMCO	Turntable Controller	2090	40500197	N/A
TDL	Switch Matrix Controller	SMC-002	40500189	N/A
MITEQ	Low Noise Amplifier	JSD00121	838621	N/A
Sucoflex	Ferrite bead loaded cable	-	FBL-1	March 04, 2002
Sucoflex	RF Cable	106	9353/6	March 04, 2002
Sucoflex	RF Cable	104	115742	March 04, 2002
Sucoflex	RF Cable	104	116567/4	March 04, 2002
Sucoflex	RF Cable	104	11576/4	March 04, 2002
Rhode & Schwarz	Signal Generator 10MHz-40GHz	SMP	40500125	March 27, 2003
EMC	Quick Box	QBOX-ESD1	N/A	N/A
HP	Attenuation/Switch Driver	11713A	40500014	N/A
Electro-metrics	Antenna	EM6952-314	40500395	June 21, 2002
EMCO	Horn Antenna 1GHz-18GHz	3115	40500087	Nov 19, 2002
Standard Gain Horn	Horn Antenna 13GHz-18GHz	3160-08	N/A	N/A
Standard Gain Horn	Horn Antenna 18GHz-20GHz	3160-09	N/A	N/A

4. Customer Agreements

The Radiated Emissions test was performed according to the test plan "CDMA Metrocell 1900MHz SFRM (20.7 Watts)", Revision 02; November 21, 2001, authored by Sam Jayashankar, under Design Project Number PI 80053 and Lab project number 01NOR009.

The test and measurements were made to detect spurious emissions that might be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. The test was performed under FCC Rules Part 2 section 2.1053 and 2.1057.

The test was performed to enable Nortel's CDMA 1900MHz SFRM system to comply with the FCC Rules and Regulations for Type Certification prior to market deployment.

- The Metrocell Base Station Transceiver System (MCBTS) is an existing Nortel Network's product that supports CDMA 1900MHz SFRM's.
- The EUT, a CDMA Outdoor Metrocell 1900MHz SFRM system Cabinet, consisted of a fully loaded system with 9-1900MHz SFRM's. (3-TRIPLEXERS & 3 DUPLEXERS)
- The EUT power configuration was 208VAC, 2-phase.
- The CDMA Outdoor Metrocell 1900MHz SFRM system Cabinet was positioned on the center of the turntable of the 10m AFC. 10 meters was measured between the tip of the receive antenna and the center of the turntable.
- Power and signal distribution, ground, interconnects cabling, and physical placement simulated the typical application and operation of the unit. The unit was configured, installed and operated in a manner representative of the actual field installation and conditions of intended use.
- The CDMA Outdoor Metrocell 1900MHz SFRM system Cabinet was fully operational and contained all necessary hardware, software and firmware to perform the test.
- In order to maximize the emission levels radiating from the CDMA Outdoor Metrocell 1900MHz SFRM system Cabinet, the height of the receive antenna was varied between 1 and 4 meters and set to different heights in both, horizontal and vertical polarizations. The EUT was also rotated 360 degrees.
- Signal Substitution was used in accordance with the test method for field strength of Radiated Spurious Emissions to verify the final levels for compliance.
- EUT was tested with the all doors open.

5. Equipment Log

EUT Dimensions: 1070mm(W) x 1820mm (H) x 760mm (D)
EUT Weight: 2600 lbs
Voltage: Line 1A 208 VAC / Phase 1/ 60Hz
Line 2A 208 VAC / Phase 2/ 60Hz
Line 4A Neutral

5.1. Equipment serial number and PEC

Modules Description	PEC / Model	Serial Number
DE Enclosure	NTGS01AA 34	SNMN530099U2
Outer and Inner Heat Exchanger	NTGS15AA 02	EBMI0000378R
AUX PDP	NTGS94AA 10	SNMN5300JDT8
MASTER PDP	NTGS25AA 06	SNMN530099GX
CEM	NTGS63AA 05	NNTM535RK4XN
CEM	NTGS63AA 05	NNTM532VK5KC
CEM	NTGS63AA 05	NNTM5373G88D
CEM	NTGS63AA 05	NNTM532VDP7C
CEM	NTGS63AA 09	NNTM535V7W19
CEM	NTGS63AA 09	NNTM535V79K7
CEM	NTGS63AA 05	NNTM535RJCXW
CEM	NTGS63AA 09	NNTM532Y9DNG
CEM	NTGS63AA 09	NNTM532Y9C70
CEM	NTGS63AA 09	NNTM532Y9EFA
CEM	NTGS63AA 09	NNTM532Y9ERL
CEM	NTGS63AA 09	NNTM532Y9CLD

Modules Description	PEC / Model	Serial Number
GPSTM	NTGS50AA 14	NNTM74TM3I1A
CM1	NTGS40AA DL	NNTM532YCFED
CM2	NTGS40AA DL	NNTM532YCFCB
CORE1	NTGS30AA 54	NNTM532Y9H1Y
CORE2	NTGS30AA 54	NNTM537U0Y26
MCBTS Radio Rack	NTGS03AA 15	NNTM536H23JH
DPM 1900-1	NTGS53GA 06	CLWVPP203MB3
TRM-1	NTGS58CA 50	NNTM53714PEL
PAM-1	NTGS56AA 04	EBMI000013TV
Cooling Unit-1	NTGS5651 01	NNTM53741U4E
TRIPLEXER 1900-2	NTGS5302 04	FORM01061072
TRM-2	NTGS58CA 50	NNTM5371487X
PAM-2	NTGS56AA 04	EBMI00000MH0
Cooling Unit-2	NTGS5651 01	NNTM5373WEMD
DPM 1900-3	NTGS53HA 06	CLWVPP203UZ2
TRM-3	NTGS58CA 50	NNTM537RXNUJ
PAM-3	NTGS56AA 04	EBMI00000RVY
Cooling Unit-3	NTGS5651 01	NNTM5374240L
TRIPLEXER 1900-4	NTGS5302 04	FORM01074191
TRM-4	NTGS58CA 65	NNTM537V988Y
PAM-4	NTGS56AA 04	EBMI00001JKD
Cooling Unit-4	NTGS5651 01	NNTM5373WNPP
TRM-5	NTGS58CA 65	NNTM537V97WK

Modules Description	PEC / Model	Serial Number
PAM-5	NTGS56AA 04	EBMI00000MH1
Cooling Unit-5	NTGS5651 01	NNTM5373WEPF
TRIPLEXER 1900-6	NTGS5302 05	FORM01181996
TRM-6	NTGS58CA 65	NNTM536FXY9X
PAM-6	NTGS56AA 04	EBMI000013R9
Cooling Unit-6	NTGS5651 01	NNTM53741UJV
DPM 1900-7	NTGS53IA 05	CLWVPP203HXX
TRM-7	NTGS58CA 50	NNTM53714EPT
PAM-7	NTGS56AA 04	EBMI000013R8
Cooling Unit-7	NTGS5651 01	NNTM53741U2C
DPM 1900-8	NTGS53IA 05	CLWVPP202TRV
TRM-8	NTGS58CA 31	NNTM53712NGK
PAM-8	NTGS56AA 04	EBMI00001J02
Cooling Unit-8	NTGS5651 01	NNTM5373W66N
DPM 1900-9	NTGS53IA 05	CLWVPP203HXY
TRM-9	NTGS58CA 50	NNTM537RXR4X
PAM-9	NTGS56AA 04	EBMI00000TND
Cooling Unit-9	NTGS5651 01	NNTM5373WDJ9

5.2. System Cables and Interconnect

Cable	Description	Length	Manufacture	S/N & Type
Power	3 Conductors, shielded	2.18	N/A	N/A
T1	NTGS0134 (2 Cables X 6 Pairs, 24 AWG) Shielded	15.5	N/A	N/A
RF	Coaxial from GPS antenna through bulkhead to GPS input (DE)	9.0	Times Microwave	LMR-400
RF	Coaxial – SFRM's Antennas to antenna lightning protection brackets through bulkhead to attenuator	9.0	Times Microwave	LMR-400
Ground	From DE chassis to turntable ground	1.92	N/A	N/A
Ground	From shielded power cable (end close to hubble) to turntable ground.	0.74	N/A	N/A

Note: The EUT cabling configuration was under Nortel Network's control. Cable specifications and set-up was the responsibility of Nortel Networks.

6. Radiated Suprious Emissions Test

6.1 Test Basis

FCC Rules Part 2 section 2.1053 and 2.1057

6.2 Test Specifications

FCC Part 24.238

6.3 Test Procedure

Laboratory Test Method No. 2.0 - Radiated Emissions 30MHz-1GHz Test Procedures Rev. 6.0
Laboratory Test Method No. 2.0A - Radiated Emissions 30MHz – 1GHz Test Procedures Rev. 2.0
Laboratory Test Method No. 29 - Radiated Emissions 1GHz- 20GHzTest Procedures Rev. 1.0
Laboratory Test Method No.11 – Substitution Measurement

6.4 Measurement Uncertainty

The estimated uncertainty for the radiated spurious emissions (substitution method) is not defined.

6.5 Deviations from standard

None.

6.6 Test Results

Radiated Emission 30MHz – 1GHz: Peak Scan Data (Refer to pages 13 and 14 for results).
Radiated Emission 30MHz – 1GHz: PASS: Substitution Data (Refer to page 16).
Radiated Emission 1GHz – 20GHz: Peak Scan Data (Refer to pages 17 and 18 for results).
Radiated Emission 1GHz – 20GHz: PASS: Substitution Data (Refer to page 19).

With the exception of emission at 3897.80MHz (horizontal scan) all tabular data presented represents the noise floor measured in each band.

6.7 Signature

This testing was conducted in accordance with ISO 17025: 1999 scope of accreditation, table 1; Quality Manual.

Signature/Date: Jacky. Jan 3, 02
Name: Jacky Wong, EMC Tool Developer

APPENDIX A: TEST DATA

Scan Result 30MHz – 1GHz (Horizontal)

Project Name: Equipment Authorization FCC Part24 **Tester:** Jacky Wong
Model: Metrocell Outdoor CDMA SFRM 1900MHz 20.7 W **Test ID:** RE02-10M-2001-028
Comments: System included 3 -Triplexers & 3 Duplexers - Horizontal Polarization

Standard	FCC Part 24	Measurement Distance	10	meters

Antenna	Frequency	AF	CF	Detector	Measured Value	Corrected Value	Limit	Margin
	MHz	dB/m	dB		dBuV	dBuV/m	dBuV/m	dB
2261 RX BiCon Hpol	314.72	13.20	-22.82	Peak	52.72	43.10	73.90	30.80
2261 RX BiCon Hpol	319.64	13.30	-22.76	Peak	56.43	46.97	73.90	26.93
2261 RX BiCon Hpol	422.96	16.85	-23.12	Peak	51.19	44.91	73.90	28.99
2261 RX BiCon Hpol	550.78	18.75	-23.07	Peak	44.08	39.76	73.90	34.14
2261 RX BiCon Hpol	958.61	24.99	-20.81	Peak	42.13	46.31	73.90	27.59

Corrected Value: Measured Value + AF + CF AF: Antenna Factors & CF: Correction Factors (LNA Gain + Cable Loss)

Notes:
Positive Margin indicates a pass

Scan Result 30MHz – 1GHz (Vertical)

Project Name: Equipment Authorization FCC Part24 **Tester:** Jacky Wong
Model: Metrocell Outdoor CDMA SFRM 1900MHz 20.7 W **Test ID:** RE02-10M-2001-028
Comments: System included 3 -Triplexers & 3 Duplexers - Vertical Polarization

Standard	FCC Part 24	Measurement Distance	10	meters

Antenna	Frequency	AF	CF	Detector	Measured Value	Corrected Value	Limit	Margin
	MHz	dB/m	dB		dBuV	dBuV/m	dBuV/m	dB
2261 RX Bicon Vpol	157.45	10.40	-24.21	Peak	49.82	36.01	73.90	37.89
2261 RX Bicon Vpol	220.23	10.10	-23.47	Peak	52.64	39.27	73.90	34.63
2261 RX Bicon Vpol	319.64	13.88	-22.76	Peak	54.45	45.57	73.90	28.33
2261 RX Bicon Vpol	393.40	16.07	-23.04	Peak	50.69	43.72	73.90	30.18
2261 RX Bicon Vpol	958.73	24.72	-20.81	Peak	39.21	43.12	73.90	30.78

Corrected Value: Measured Value + AF + CF AF: Antenna Factors & CF: Correction Factors (LNA Gain + Cable Loss)

Notes:
Positive Margin indicates a pass

Substitution Data 30MHz – 1GHz

Project Name: Equipment Authorization FCC Part24 **Tester:** Jacky Wong
Model: Metrocell Outdoor CDMA SFRM 1900MHz 20.7 W **Test ID:** RE02-10M-2001-028
Comments: System included 3 -Triplexers & 3 Duplexers

Frequency (MHz)	Polarization (V/H)	Peak Measure level	Signal Generator level (source)	Cable factor	Antenna Gain	Effective Radiated Power (E.R.P.)	E.R.P Limit	margin
		dBuV/m	dBm	dB	dB	dBm	dBm	dB
314.72	H	52.72	-50.00	-0.27	2.10	**-48.17**	-13	35.17
319.64	H	56.43	-46.00	-0.28	2.10	**-44.18**	-13	31.18
422.96	H	51.19	-47.00	-0.32	2.70	**-44.62**	-13	31.62
550.78	H	44.08	-54.00	-0.36	3.00	**-51.36**	-13	38.36
958.61	H	42.13	-51.00	-0.50	2.00	**-49.50**	-13	36.50
157.45	V	49.82	-57.00	-0.19	1.34	**-55.85**	-13	42.85
220.23	V	52.64	-51.00	-0.21	1.20	**-50.01**	-13	37.01
319.64	V	54.45	-54.00	-0.28	1.30	**-52.98**	-13	39.98
393.40	V	50.69	-50.00	-0.30	1.00	**-49.30**	-13	36.30
958.73	V	39.21	-54.00	-0.50	1.10	**-53.40**	-13	40.40

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

Scan Result 1GHz – 20GHz (Horizontal)

Project Name: Equipment Authorization FCC Part24 **Tester:** Jacky Wong
Model: Metrocell Outdoor CDMA SFRM 1900MHz 20.7 W **Test ID:** RE03-10M-2001-010
Comments: System included 3 -Triplexers & 3 Duplexers - Horizontal Polarization

Standard	FCC PART 24	Measurement Distance	10	meters

Antenna	Frequency	AF	CF	Detector	Measured Value	Corrected Value	Limit	Margin
(sheet name)	MHz	dB/m	dB		dBuV	dBuV/m	dBuV/m	dB
EM-6952 Hpol	3897.43	38.41	-59.95	Peak	75.03	53.50	73.90	20.40
EM-6952 Hpol	5846.25	42.79	-57.84	Peak	71.96	56.91	73.90	16.99
EM-6952 Hpol	7794.55	44.27	-55.08	Peak	71.34	60.53	73.90	13.37
EM-6952 Hpol	9743.19	44.95	-52.81	Peak	67.80	59.93	73.90	13.97

Corrected Value: Measured Value + AF + CF AF: Antenna Factors & CF: Correction Factors (LNA Gain + Cable Loss)

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

Peak Scan 1GHz – 20GHz (Vertical)

Project Name: Equipment Authorization FCC Part24 **Tester:** Jacky Wong
Model: Metrocell Outdoor CDMA SFRM 1900MHz 20.7 W **Test ID:** RE03-10M-2001-010
Comments: System included 3 -Triplexers & 3 Duplexers - Vertical Polarization

Standard	FCC PART 24	Measurement Distance	10	meters

Antenna	Frequency	AF	CF	Detector	Measured Value	Corrected Value	Limit	Margin
	MHz	dB/m	dB		dBuV	dBuV/m	dBuV/m	dB
EM-6952 Vpol	3897.43	38.61	-59.95	Peak	75.61	54.28	73.90	19.62
EM-6952 Vpol	5913.43	42.88	-57.84	Peak	72.13	57.16	73.90	16.74
EM-6952 Vpol	7794.60	44.27	-55.08	Peak	70.59	59.78	73.90	14.12
EM-6952 Vpol	9743.19	44.89	-52.81	Peak	69.80	61.88	73.90	12.02

Corrected Value: Measured Value + AF + CF AF: Antenna Factors & CF: Correction Factors (LNA Gain + Cable Loss)

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

Substitution Data 1GHz – 20GHz

Project Name: Equipment Authorization FCC Part24 **Tester:** Jacky Wong
Model: Metrocell Outdoor CDMA SFRM 1900MHz 20.7 W **Test ID:** RE03-10M-2001-010
Comments: System included 3 -Triplexers & 3 Duplexers

Frequency (MHz)	Polarization (V/H)	Peak Measure level	Substitution measure level	Signal Generator	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
3897.52	H	53.37	53.50	-52	-1.10	8.00	**-45.10**	-13	32.10
5846.25	H	55.96	56.91	-52	-1.30	8.95	**-44.35**	-13	31.35
7794.55	H	60.53	60.56	-52	-1.58	10.20	**-43.38**	-13	30.38
9743.19	H	59.93	61.40	-52	-1.75	10.60	**-43.15**	-13	30.15
3897.43	V	54.28	54.57	-47	-1.10	8.10	**-40.00**	-13	27.00
5913.43	V	57.16	57.40	-52	-1.36	9.20	**-44.16**	-13	31.16
7794.60	V	59.78	59.49	-52	-1.58	10.00	**-43.58**	-13	30.58
9743.19	V	61.88	62.27	-48	-1.75	10.70	**-39.05**	-13	26.05

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

APPENDIX B: PHOTOGRAPHS

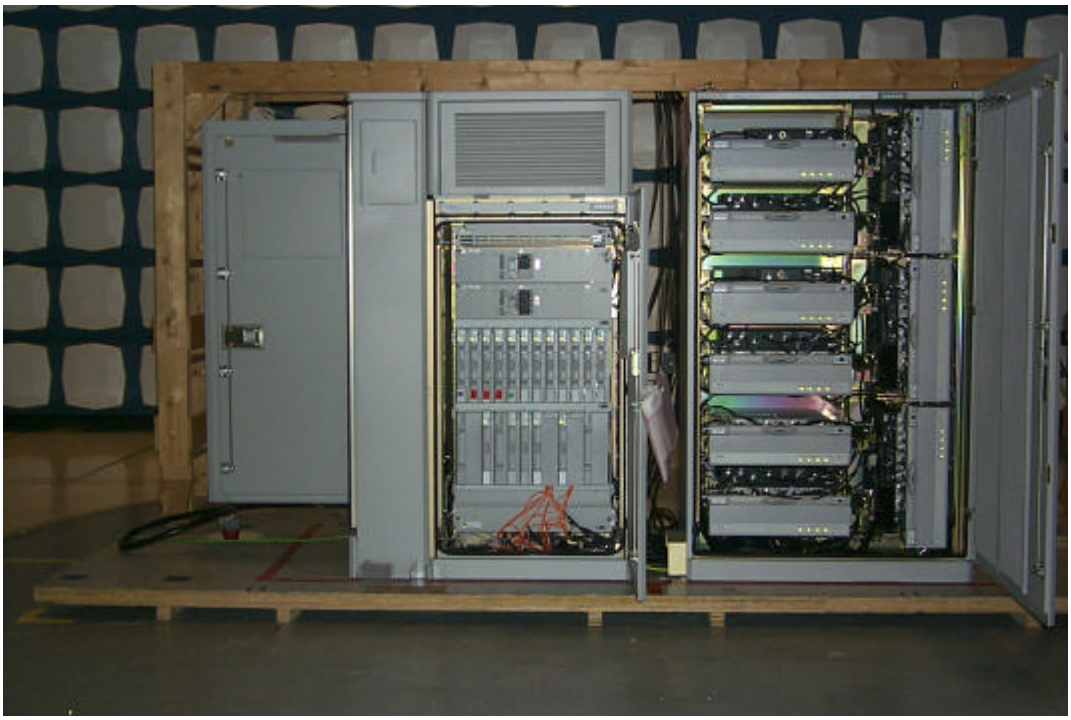

Figure 1. Front Face of EUT towards antenna

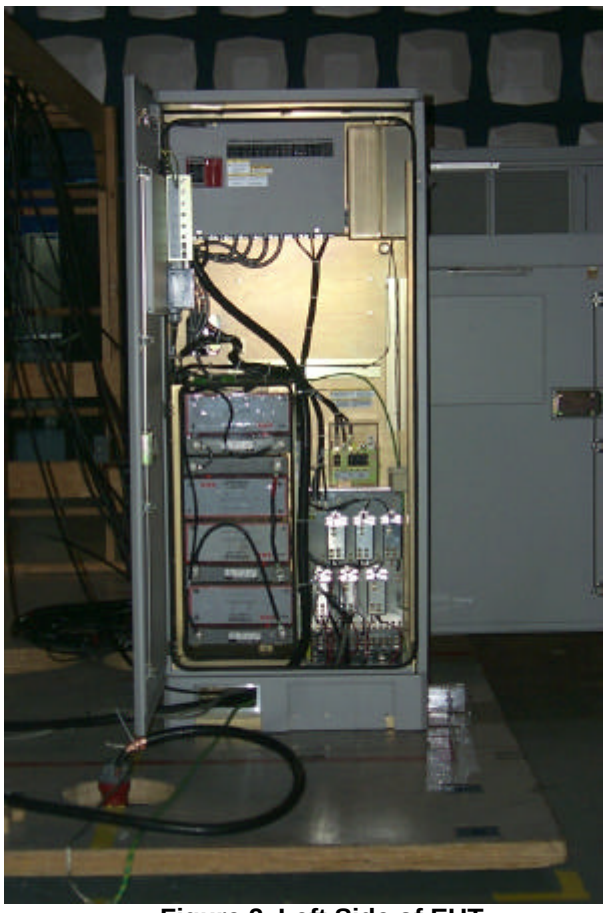

Figure 2. Left Side of EUT