HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD.

Product Compliance Division, Product Compliance Team
SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA
TEL : +82 31 639 8518 FAX : +82 31 639 8525

CERTIFICATION

Manufacture;
NexComm Systems, INC.
Suite#Admin-201. Bundang Techno-Park,151
Yatap-Dong, Bundang-Ku, Sungnam-City, kyunggi-Do,
463-816. Korea

FRN : 0007-7968-99

Dates of Tests: OCT 11, 2002

Test Report No.: HCT-F02-1007

Test Site: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD.
FRN : 0005-8664-21

FCC ID : **QO5NR304GH**
MODEL/TYPE : **NR304GH**

FCC Rule Part(s):	**Part 15 & 2; ET Docket 95-19**
Classification:	**FCC Class B Peripheral Device (JBP)**
Standard(s):	**FCC Class B: 2001**
Equipment(EUT) Type:	**SHDSL ROUTER / NR304GH**
Brand Name:	**NexComm Systems, INC.**
Port/ Connector(s)	**DSL port(1), LAN port(4), Console port(1)**

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.(See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HYUNDAI C-Tech. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse of 1988,21 U.S.C.853(a).

Ki Soo Kim

Report prepared by : Ki-Soo Kim
Manager of Product Compliance Team

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1. GENERAL INFORMATION

1.1 Product Description

The NR304GH router with SHDSL is a full-featured, stand-alone , router for Connecting diverse local area networks(LANs) to the Internet and other remote Networks. You will have a fast SHDSL(Symmetric High-speed Digital Subscriber Line) connection between your LAN and ISP'S network of high-speed digital facilities. SHDSL is a technology based on the G.SHDSL(G.991.2) standard. NR304GH support A packet-based network technology that allows high-speed transmission over twisted-Pair copper wire between an Internet service provider central office and a customer Site or on local loops created within a building.

CHASSIS TYPE	**METAL**
LIST OF EACH OSC. OR XTAL. FREQ. (FREQ.≥ 1MHz)	**25 MHz, 34.56 MHz, 4 MHz**
Data Rate	**WAN : 72 kbps ~ 2368 kbps** **LAN : 10/100 Mbps auto**
Memory	**DRAM : 4Mbyte up to 16Mbyte** **Flash Memory : 512Kbyte up to 2 Mbyte**
Number of Layers	**MAIN BOARD 6 LAYER**
POWER REQUIREMENT	**INPUT : AC 100~240V 50/60Hz 0.3A** **OUTPUT : DC +5V 0.2A**

1.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

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1.3 Tested System Details

The Model names for all equipment, plus descriptions used in the tested system (including inserted cards) are:

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
VDSL MODEM(EUT)	NexComm Systems, INC..	NR304GH	Q05NR304GH	HOST
MONITOR	IMAGEQUEST CO.,LTD	L550A	PJIL150C061	HOST
PC(HOST)	H/P	HP PAVILION700	DOC	N/A
KEY BOARD	H/P	BF12502086	DOC	HOST
MOUSE	H/P	M-S48a	DOC	HOST
PRINTER	H/P	HP895C	DOC	HOST

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at an antenna to EUT distance of 10 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1,MAEKOK-RI,HOBUP-MYUN,ICHON-SI,KYOUNGKI-DO, 467-701,KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 24,2000(Confirmation Number : EA90661)

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2.SYSTEM TEST CONFIGURATION

2.1 Justification

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components and I/O cards inside the E.U.T were used.

DEVICE TYPE	MANUFACTURE	MODEL/PART NUMBER
MAIN BOARD	NexComm Systems, INC.	NR304GH/R304A750

2.2 EUT exercise Software

The EUT was tested on a playing LINK and SYNC mode during the radiated and conducted emission testing

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2.3 Cable Description

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

		Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
SHDSL ROUTER (EUT)	Power	N	N/A	1.5(P)
	LAN	N/A	N	3.0(D)
	CONSOLE	N/A	N	1.2(D)
	LINE	N/A	N	3.0(D)
MONITOR		N	Y	1.8(P), 1.5(D)
PC(HOST)		N	N/A	1.8(P)
KEY BOARD		N/A	Y	2.0(D)
MOUSE		N/A	Y	1.8(D)
PRINTER		N	Y	2.0(P), 1.8(D)

2.4 Noise Suppression Parts on Cable.

		Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
SHDSL ROUTER (EUT)	Power	Y	EUT END	Y	EUT END
	LAN	N	N/A	N	N/A
	CONSOLE	N	N/A	Y	PC END
	LINE	Y	EUT END	N	N/A
MONITOR		Y	BOTH END	Y	BOTH END
PRINTER		Y	PC END	Y	BOTH END
KEY BOARD		N	N/A	Y	PC END
MOUSE		N	N/A	Y	PC END

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2.5 Equipment Modifications

N/A

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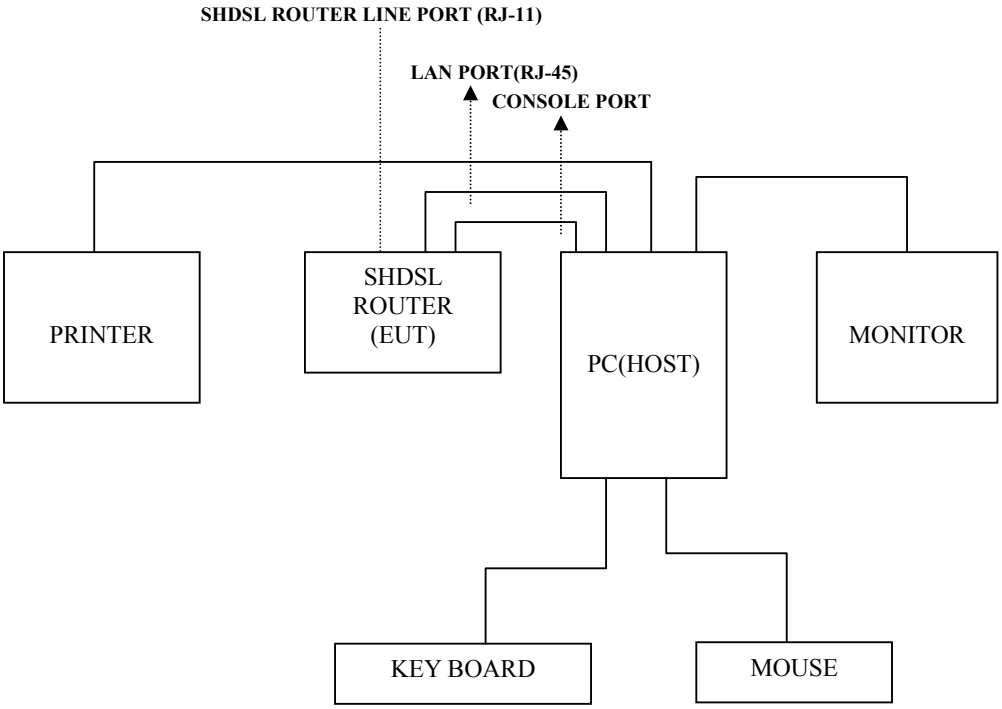
2.6 Configuration of Test system

Line Conducted Test : EUT was connected to LISN, all other supporting equipment were connected to another LISN.
Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary Radiated Emissions tests were conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating condition. Final Radiated Emission tests were conducted at 10 meter open area test site.

[Configuration of Tested System]



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3. PRELIMINARY TESTS

3.1 AC Power line Conducted Emission Tests

During Preliminary Tests, a playing LINK and SYNC mode were investigated.

4.2 Radiated Emission Tests

During Preliminary Tests, a playing LINK and SYNC mode were investigated.

Tested by Jin Pyo Hong **Date : OCT 10, 2002**

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4. FINAL CONDUCETD AND RADIATED EMISSION TESTS SUMMARY

4.1 Conducted Emissions Tests

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Humidity Level : 37% Temperature : 24□
Limit apply to : CISPR 22
Type of Tests : CLASS B
Date : OCT 10, 2002
Result : PASSED BY –3.1 dB Margin

==========

EUT : NR304GH
Operating Condition : NORMAL CONDITION
Detector : CISPR Quasi-Peak (6 dB Bandwidth : 9 KHz)
CISPR Average(6 dB Bandwidth : 9KHz)

Line Conducted Emissions Tabulated Data

Power Line Conducted Emissions			CISPR 22 Class B		
Frequency (MHz)	Amplitude (dBuV)	Conductor	Limit (dBuv)	Margin (dB)	Detector Mode
0.33	46.3	NEUTRAL	49.4	-3.1	Average
1.635	51.2	NEUTRAL	56	-4.8	Quasi-Peak
1.720	51.5	NEUTRAL	56	-4.5	Quasi-Peak

Measured by : Jin Pyo Hong / Engineer

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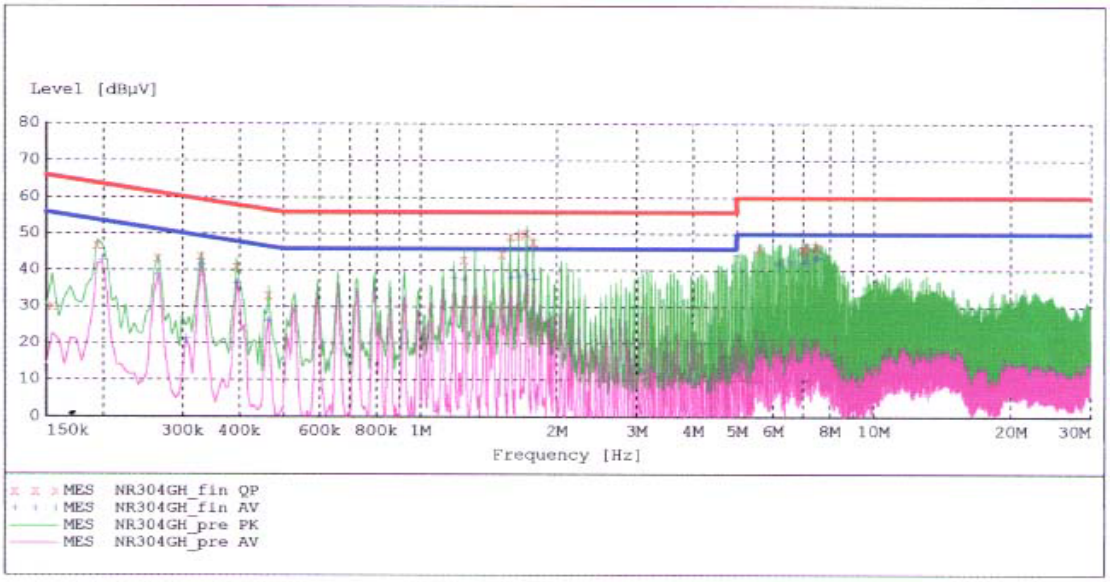
EMC Testing Laboratory

EUT:	NR304GH
Manufacturer:	NEXCOMM
Operating Condition:	NORMAL
Test Site:	SHIELD ROOM
Operator:	JP-HONG
Test Specification:	EN55022 CLASS B
Comment:	H
Start of Test:	10/10/02 / 8:38:49PM

SCAN TABLE: "EN 55022 Voltage"

Short Description: EN 55022 Voltage

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	5.0 kHz	MaxPeak Average	10.0 ms	9 kHz	CABLE LOSS (NEW)
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak Average	10.0 ms	9 kHz	CABLE LOSS (NEW)



MEASUREMENT RESULT: "NR304GH_fin QP"

10/10/02 8:43PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.155000	30.30	10.5	66	35.4	1	---
0.195000	46.90	10.5	64	17.0	1	---
0.265000	43.30	10.5	61	18.0	1	---
0.330000	44.00	10.5	60	15.4	1	---
0.395000	*41.00*	*10.5*	*58*	*16.9*	*1*	---
0.465000	33.20	10.5	57	23.4	1	---
1.255000	43.00	10.5	56	13.0	1	---
1.520000	44.50	10.5	56	11.5	1	---
1.585000	49.20	10.5	56	6.8	1	---
1.655000	49.70	10.5	56	6.3	1	---
1.720000	50.30	10.5	56	5.7	1	---
1.785000	47.90	10.6	56	8.1	1	---
5.620000	46.10	11.0	60	13.9	1	---
7.005000	46.00	11.1	60	14.0	1	---

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MEASUREMENT RESULT: "NR304GH_fin QP"
(continued)

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
7.070000	45.60	11.1	60	14.4	1	---
7.140000	46.90	11.1	60	13.1	1	---
7.470000	46.90	11.1	60	13.1	1	---
7.535000	46.50	11.1	60	13.5	1	---

MEASUREMENT RESULT: "NR304GH_fin AV"
10/10/02 8:43PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.200000	42.90	10.5	54	10.7	1	---
0.265000	39.10	10.5	51	12.2	1	---
0.305000	21.40	10.5	50	28.7	1	---
0.330000	41.70	10.5	50	7.8	1	---
0.395000	36.60	10.5	48	11.3	1	---
0.465000	26.50	10.5	47	20.1	1	---
1.190000	37.90	10.5	46	8.1	1	---
1.255000	37.70	10.5	46	8.3	1	---
1.585000	38.20	10.5	46	7.8	1	---
1.655000	38.40	10.5	46	7.6	1	---
1.720000	39.10	10.5	46	6.9	1	---
1.785000	37.70	10.6	46	8.3	1	---
6.215000	42.00	11.0	50	8.0	1	---
6.610000	42.50	11.1	50	7.5	1	---
7.075000	42.20	11.1	50	7.8	1	---
7.140000	43.30	11.1	50	6.7	1	---
7.470000	43.30	11.1	50	6.7	1	---
7.535000	43.60	11.1	50	6.4	1	---

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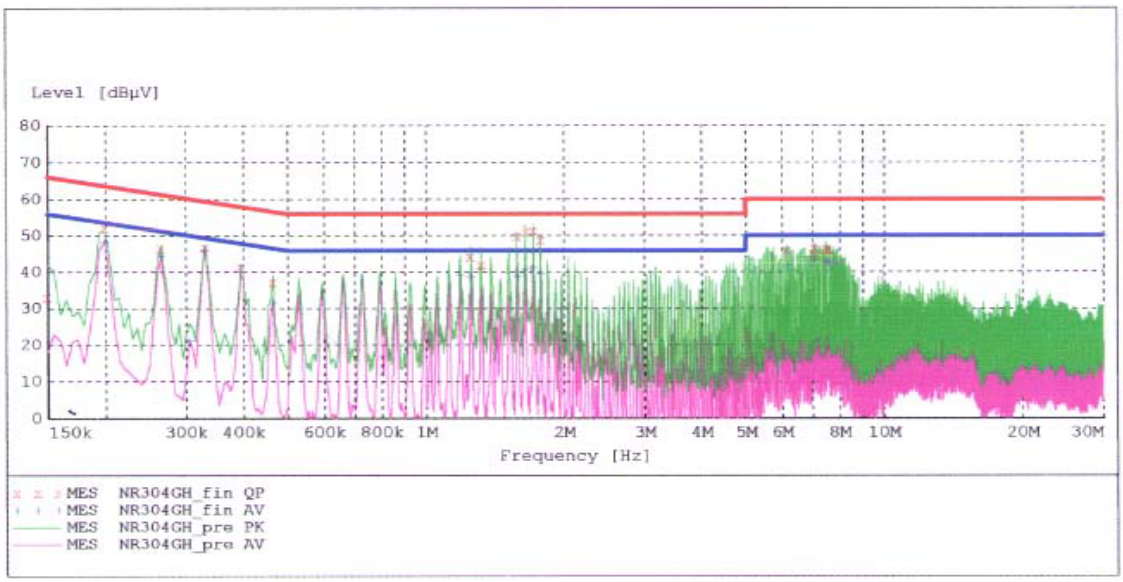
HYUNDAI C TECH
EMC Testing Laboratory

EUT:	NR304GH
Manufacturer:	NEXCOMM
Operating Condition:	NORMAL
Test Site:	SHIELD ROOM
Operator:	JP-HONG
Test Specification:	EN55022 CLASS B
Comment:	N
Start of Test:	10/10/02 / 8:27:01PM

SCAN TABLE: "EN 55022 Voltage"

Short Description: EN 55022 Voltage

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	5.0 kHz	MaxPeak Average	10.0 ms	9 kHz	CABLE LOSS (NEW)
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak Average	10.0 ms	9 kHz	CABLE LOSS (NEW)



MEASUREMENT RESULT: "NR304GH_fin QP"

10/10/02 8:31PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150000	33.20	10.5	66	32.8	1	---
0.200000	52.10	10.5	64	11.5	1	---
0.265000	46.70	10.5	61	14.6	1	---
0.330000	46.90	10.5	60	12.6	1	---
0.395000	41.50	10.5	58	16.5	1	---
0.465000	37.20	10.5	57	19.4	1	---
1.255000	44.20	10.5	56	11.8	1	---
1.325000	42.00	10.5	56	14.0	1	---
1.585000	49.80	10.5	56	6.2	1	---
1.655000	51.20	10.5	56	4.8	1	---
1.720000	51.50	10.5	56	4.5	1	---
1.785000	48.70	10.6	56	7.3	1	---
6.150000	46.00	11.0	60	14.0	1	---
7.010000	45.30	11.1	60	14.7	1	---

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MEASUREMENT RESULT: "NR304GH_fin QP"
(continued)

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
7.075000	46.50	11.1	60	13.5	1	---
7.470000	46.30	11.1	60	13.7	1	---
7.540000	45.90	11.1	60	14.1	1	---
7.605000	46.30	11.1	60	13.7	1	---

MEASUREMENT RESULT: "NR304GH_fin AV"
10/10/02 8:31PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.200000	48.40	10.5	54	5.2	1	---
0.265000	44.50	10.5	51	6.8	1	---
0.305000	21.30	10.5	50	28.8	1	---
0.330000	46.30	10.5	50	3.1	1	---
0.395000	40.10	10.5	48	7.8	1	---
0.465000	31.80	10.5	47	14.8	1	---
1.190000	39.30	10.5	46	6.7	1	---
1.255000	38.80	10.5	46	7.2	1	---
1.585000	39.00	10.5	46	7.0	1	---
1.655000	40.80	10.5	46	5.2	1	---
1.720000	41.50	10.5	46	4.5	1	---
1.785000	39.70	10.6	46	6.3	1	---
6.215000	41.80	11.0	50	8.2	1	---
7.075000	43.40	11.1	50	6.6	1	---
7.540000	42.60	11.1	50	7.4	1	---
7.605000	43.10	11.1	50	6.9	1	---
7.670000	42.40	11.1	50	7.6	1	---
7.935000	42.50	11.2	50	7.5	1	---

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4.2 Radiated Emissions Tests

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

Humidity Level : 38 % Temperature : 21□
Limit apply to : CISPR 22
Type of Tests : CLASS B
Date : OCT 11, 2002
Result : PASSED BY –2.0 dB Margin

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EUT : NR304GH
Operating Condition : NORMAL CONDITION
Detector : CISPR Quasi-Peak (6 dB Bandwidth : 120 KHz)

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dBuV/m
35.4	7.15	17.77	1.0	V	25.9	30	-4.1
111.2	13.39	12.26	2.3	V	28.0	30	-2.0
222.3	6.15	17.05	3.3	V	26.5	30	-3.5
472.5	8.72	18.00	4.8	V	31.5	37	-5.5
639.2	5.39	21.46	5.9	H	32.8	37	-4.2
697.8	3.21	22.36	6.2	H	31.8	37	-5.2
720.0	3.46	22.54	6.2	V	32.2	37	-4.8

Measured by : Jin Pyo Hong0 / Engineer

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5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.
The basic equation with a sample calculation is as follows:

FS = RA + AF + CF

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBuV is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The 30 dBuV/m value was mathematically converted to its corresponding level in uV/m.

FS = 21.5 + 7.4 + 1.1 = 30 dBuV/m

Level in uV/m = Common Antilogarithm [(30 dBuV/m)/20] = 31.6 uV/m

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6. LIST OF TEST EQUIPMENT

TYPE	MANUFACTURE	MODEL	CAL. DATE
EMI Test Receiver	Rohde & Schwarz	ESH3	2002.7.16
EMI Test Receiver	Rohde & Schwarz	ESVP	2002.7.16
EMI Test Receiver	Rohde & Schwarz	ESI40	2001.11.5
EMI Test Receiver	Rohde & Schwarz	ESVS30	2002.7.16
Spectrum Monitor	Rohde & Schwarz	EZM	N.A
Graphic Plotter	Rohde & Schwarz	DOP2	N.A
Printer	Rohde & Schwarz	PDN	N.A
Spectrum Analyzer	H.P	8591EM	2002.9.1
LISN	EMCO	3825/2	2002.2.7
LISN	Rohde & Schwarz	ESH2-Z5	2002.8.12
Amplifier	Hewlett-Packard	8447E	2002.9.
Dipole Antennas	Rohde & Schwarz	VHAP	2002.7.16
Dipole Antennas	Rohde & Schwarz	UHAP	2002.7.16
Biconical Antenna	Rohde & Schwarz	BBA-9106	2002.7.12
Log-Periodic Antenna	Rohde & Schwarz	UHALP-9107	2002.7.12
Antenna Position Tower	EMCO	1051-12	N.A
Turn Table	EMCO	1060-06	N.A
Line Filter	KEENE	ULW 2X30-60	N.A
Power Analyzer	Voltech	PM 3300	2002.2.20
Reference Network Impedance	Voltech	IEC 555	N.A
AC Power Source	PACIFIC	Magnetic Module	N.A
AC Power Source	PACIFIC	360AMX	N.A

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