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Project: 10CA64967

File: TC8329

Report: 10CA64967-FCC

Date: December 17, 2010

Model: Ethernet Access Residential Unit 1112
(Order Code : NTC952MBE6)

FCC Certification Report **- Class II Permissive Change**

For

WDM-PON ONT

LG-Ericsson Co., Ltd.

**LG R&D Complex 533 Hogye-1dong, Dongan-gu, Anyang-si, Kyungki-do,
431-749, Korea**


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to public safety and committed to
quality service for over 100 years**

TEST REPORT DETAILS

Test Report No. 10CA64967-FCC
Tests Performed By: UL Korea Ltd.
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Kangnam-ku, Seoul, 135-984, Korea
Test site: LG-Ericsson Co.Ltd.(Test Laboratory)
299, Kongdan-dong, Gumi-si, Kyungsangbuk-do, Korea
Applicant: LG-Ericsson Co.Ltd
LG R&D Complex 533 Hogue-1dong, Dongan-gu, Anyang-si,
Kyungki-do, 431-749, Korea
Applicant Contact: Mr. Young-Ho Son
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E-mail: yhsonb@lgericsson.com
Test Report Date: December 17, 2010
Product Type: WDM-PON ONT
FCC ID: TUIEARU1112
Product standards: FCC Part 15 Subpart B Class B
Equipment Code: JBP
FCC Classification : Class B Computing Device Peripheral
FCC Procedure : Certification(Class II Permissive Change)
Model Number: Ethernet Access Residential Unit 1112 (Order Code : NTC952MBE6)
Additional model Number: None
Trade Name: 
Sample Serial Number: None (Proto type)
Sample Receive Date: December 14, 2010
Testing Start Date: December 14, 2010
Date Testing Complete: December 14, 2010
Overall Results: PASS

UL Korea Ltd. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. UL Korea Ltd. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from UL Korea Ltd. issued reports.

TEST SUMMARY

Test Result

Requirement – Test	Reference standards	Result	Verdict
Conducted Disturbance at the mains ports	FCC Part 15 Subpart B, Class B ANCI C63.4-2009	Pass	Complied
Radiated Disturbance		Pass	Complied

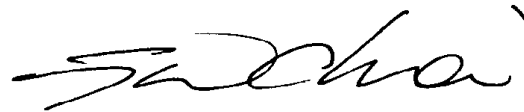
The tests listed in the Summary of Testing section of this report have been performed and the results recorded by UL Korea, Ltd. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

The equipment under test has

- met the technical requirements
- not met the technical requirements



Tested by
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 Conformity Assessment Services - 3014ASEO
 UL Korea Ltd.
 December 17, 2010



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 December 17, 2010

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1. EQUIPMENT UNDER TEST(EUT)

1.1 Equipment Description

The WDM-PON system of LG-Ericsson Co., Ltd. provides dedicated bandwidth to subscribers in FTTH (Fiber to the Home) environment. ONT (EARU 1112) device is installed in subscriber's home and can accommodate various types of service through the Ethernet (100Base-TX) port. It interfaces with RN through SMF 1 Core.

The followings are major specification of the ONT product.

Item	Specification
Transmission speed	125Mbps
Transmission method	WDM (Wavelength Division Multiplex)
Optical Transceiver	C band : Uplink, L band : Downlink
LED indicator	Power, alarms and data
Connector	SC/APC (optical), RJ45 (Ethernet)
Power	12V DC, 1A
Power consumption	6Watts Typ. (Max 8 Watts)
Dimension	203(w) x 150(d) x 35(h)
Temperature	0 °C ~ 50 °C
Humidity	20% ~ 80%

1.2 Equipment Marking Plate



1.3 Equipment Used During Test

Use*	Product Type	Manufacturer	Model	Comments
EUT	WDM-PON ONT	LG-Ericsson Co., Ltd.	Ethernet Access Residential Unit 1112	-
AE	AC/DC Adaptor	Weihai Sunlin Electronics Co., Ltd.	SR693J01	-
SIM	Data Quality Analyzer	Anritsu	MD1230A	-
SIM	RN	LG-Ericsson Co., Ltd.	AWG	-
SIM	OLT Shelf	LG-Ericsson Co., Ltd.	EAST1100 OLT Shelf	MC, SW, PI-
SIM	DC Power Supply	Agilent	6674A	

* Note: **EUT** - Equipment Under Test , **AE** - Auxiliary/Associated Equipment, **SIM** - Simulator (Not Subjected to Test)

1.4 Input/Output Ports

Port #	Name	Type*	Cable Length	Cable Shielded	Comments
1	Mains Power Input	AC	1.5 m	Unshielded	Connected to Main power
2	Optic	N/E	20.0 m	Optical	Connected to RN
3	LAN Port	TP	20.0 m	Unshielded	Connected to Data Quality Analyzer : 4 ports

Note:

*AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
 I/O = Signal Input or Output Port (Not Involved in Process Control)
 TP = Telecommunication Ports

1.5 EUT Internal Operating Frequencies:

Frequency (MHz)	Description	Frequency (MHz)	Description
0.1	IC	25.0	MII CLK
6.25	SMI I/F (MDCCLK)	25.0	Ethernet Switch
22.0	MCU CLK	25.0	PHY
25.0	CPU Clock	50.0	Main Processor

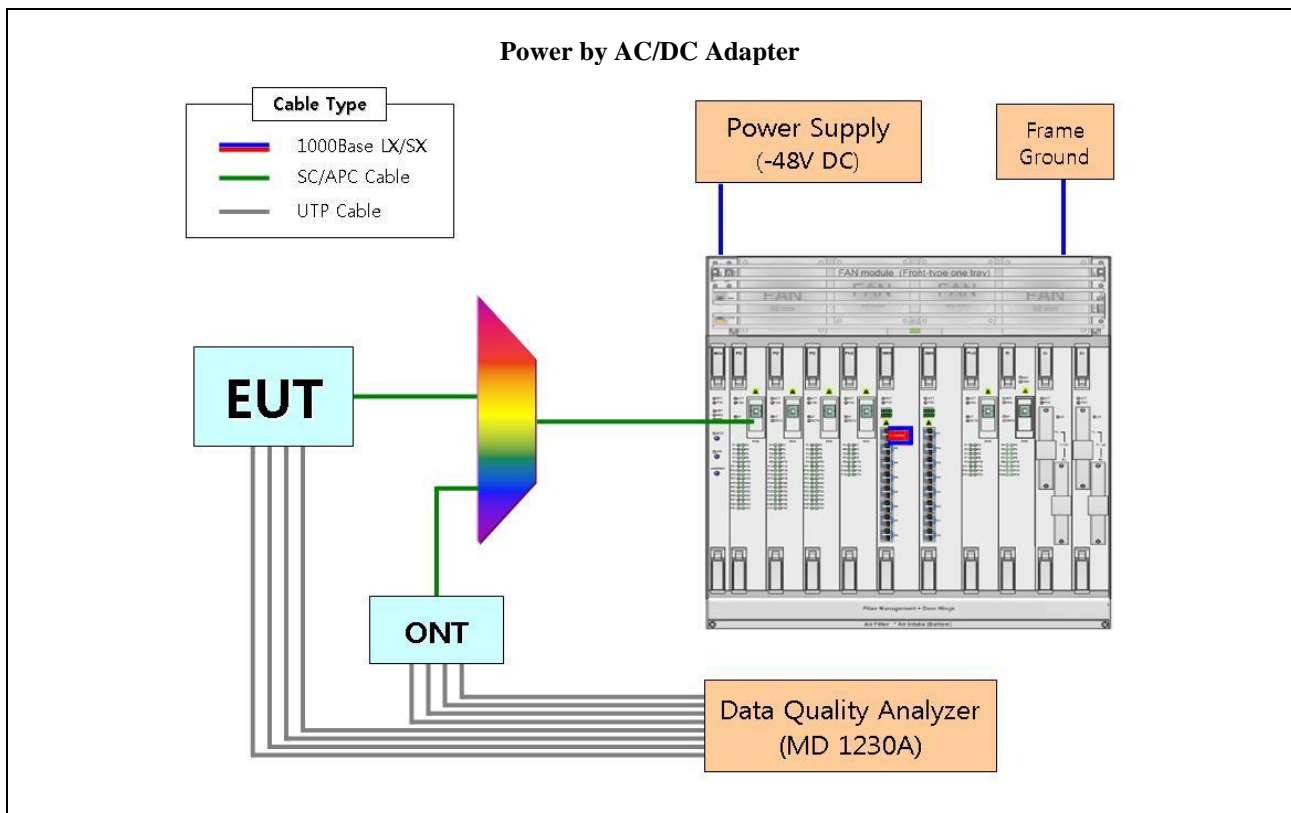
1.6 Power Interface:

Mode #	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
Rated	100-240V	1	-	AC 50/60HZ	Single Phase	Input of AC/DC Adaptor
	+12	1	-	DC	-	Supplied from external ac power adaptor provided with EUT
1	120Vac	-	-	60HZ	Single Phase	Input of AC/DC Adapter

2. EUT Operation Modes:

Mode #	Description
1	Communication link and Data transmission function Emission & Immunity tests have been performed by establishing optic communication links between ONT and OLT PI through RN interface. To simulator and check the optic communication link quality, the Data Quality Analyzer (MD1230A) was used for Ethernet packet data sending / receiving of 100 Mbps LAN port.

3. EUT Configurations:



Note : EUT (WDM-PON ONT) have the operation function that supply the subscriber with fast Ethernet(125Mbps) port. The Ethernet switching function of EUT is performed that service Ethernet traffic from a subscriber is switched to optic signal through the Network device optic port. MD1230A(Anritsu) functions as Data Quality Analyzer, is connected to fast Ethernet port of EUT with the Auto negotiation method which provide the function of the link layer connection of 125M bps speed and analyze the normal operation function through generating the IP packet signal of Ether frame and analyzing the switched packet signal from EUT. Data Quality Analyzer should be configured for the normal operating system and maximum emission condition during the test period.

4. CONDUCTED EMISSION

TEST: Limits of mains terminal disturbance voltage				
Method	Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.			
Test Environment				
Parameters recorded during the test	Laboratory Ambient Temperature		24 °C	
	Relative Humidity		31 %	
	Frequency range on each side of line		Measurement Point	
Fully configured sample scanned over the following frequency range	150kHz to 30MHz		Mains Power Input	
Limits - Class A				
Frequency (MHz)	Limit (dB μ V)			
	Quasi-Peak	Results	Average	Results
0.15 to 0.50	79	N/A	66	N/A
0.50 to 30	73	N/A	60	N/A
Limits - Class B				
Frequency (MHz)	Limit (dB μ V)			
	Quasi-Peak	Results	Average	Results
0.15 to 0.50	66 to 56	Pass	56 to 46	Pass
0.50 to 5	56	Pass	46	Pass
5 to 30	60	Pass	50	Pass
Supplementary information: None				

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Test Receiver	Rohde&Schwarz	ESS	845637/014	2010.08.26	2011.08.26
LISN	EMCO	3825/2	9502-2334	2010.08.12	2011.08. 12
ISN	T800	Teseq GmbH	26085	2010.06.11	2011.06. 11

Table 1. Test data for conducted emission :

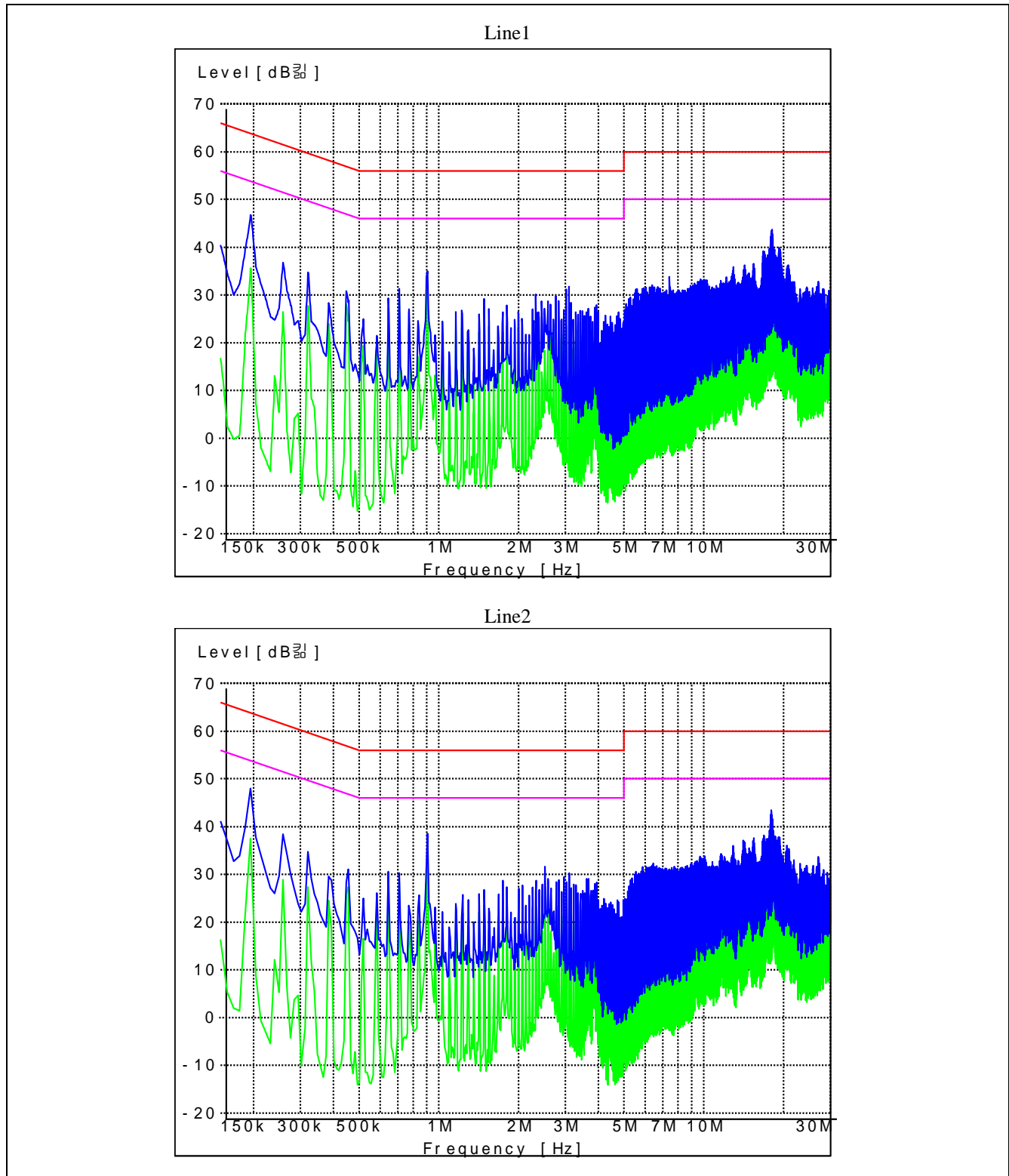
Test Frequency (MHz)	Correction Factor		Reading value (dBuV)		Line	Level (dBuV)		Limit (dBuV)		Margin (dB)	
	Cable	LISN	QP	AV		QP	AV	QP	AV	QP	AV
0.1927	0.03	0.09	46.48	36.48	1	46.6	36.6	54.78	44.78	8.18	8.18
0.2593	0.03	0.07	35.2	27.4	2	35.3	27.5	52.87	42.87	17.57	15.37
0.3223	0.04	0.06	33.9	27.8	1	34	27.9	51.07	41.07	17.07	13.17
0.9026	0.06	0.04	37.9	36.8	2	38	36.9	56	46	18	9.1
3.0263	0.12	0.06	29.82	22.32	1	30	22.5	56	46	26	23.5
17.9896	0.28	0.22	41.1	36.6	2	41.6	37.1	56	46	14.4	8.9
18.0508	0.28	0.22	41.5	37.2	2	42	37.7	56	46	14	8.3

Note:

1. Margin (dB)= Limit (dBuV) - Level (dBuV)
2. If no frequencies are specified in the tables, no measurement for quasi-peak or average was necessary.

Figure 1. Graphical representation of conducted emissions

AR Tech Optic Module



5. RADIATED EMISSION

TEST: Limits for radiated disturbance		
Method	Measurements were made at 10m Anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter and 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at 1, 2, 3 and 4 meter heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
TEST ENVIRONMENT		
Parameters recorded during the test	Laboratory Ambient Temperature	24 °C
	Relative Humidity	31 %
Fully configured sample scanned over the following frequency range	Frequency range	Measurement Point
	30MHz – 2GHz	Product Enclosure
Limits - Class A		
Frequency (MHz)	Limit (dB μ V/m)	
	Quasi-Peak	Results
30 to 230	40	N/A
230 to 1000	47	N/A
1000 to 2000	60/80(AV/Peak, 3m distance)	N/A
Limits - Class B		
Frequency (MHz)	Limit (dB μ V/m)	
	Quasi-Peak(10m distance)	Results
30 to 230	30	Pass
230 to 1000	37	Pass
1000 to 2000	54/74(AV/Peak, 3m distance)	Pass
Supplementary information:		

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test Receiver	Rohde&Schwarz	ESI	834000/002	2010.11. 29	2011.11.29
BiconiLog Antenna	EMCO	3142B	1432	2010.08. 13	2011.08.13
Turn Table	EMCO	1072	N/A	N/A	N/A
Horn Antenna	EMCO	3115	9202-3821	2010.07.14	2011.07.14
Antenna Mast	EMCO	1084	862557/010	N/A	N/A
A/M&T/T Controller	EMCO	1090	N/A	N/A	N/A

Table 3. Radiated emission Test data :

AR Tech Optic Module_30MHz ~ 1GHz_10m distance

Test Frequency (MHz)	Meter Reading (dBuV)	Detector (Pk/QP)	Polarity (V/H)	Azimuth (Deg.)	Antenna Height (m)	Cable Loss (dB)	Antenna Factor (dB/m)	Level dBuV/m	Limit dBuV/m	Margin (dB)
50.04	18.05	QP	V	273	263	0.96	7.91	26.92	30	3.08
108.78	13.24	QP	V	75	109	1.43	6.91	21.58	30	8.42
181.24	12.81	QP	V	201	100	1.84	9.32	23.97	30	6.03
193.72	13.01	QP	V	198	100	1.90	9.09	24	30	6
206.24	14.18	QP	V	244	100	1.96	9.39	25.53	30	4.47
625.02	8.2	QP	H	72	142	3.41	21.18	32.79	37	4.21
725.02	7.18	QP	H	135	123	3.66	22.27	33.11	37	3.89

Supplementary information:

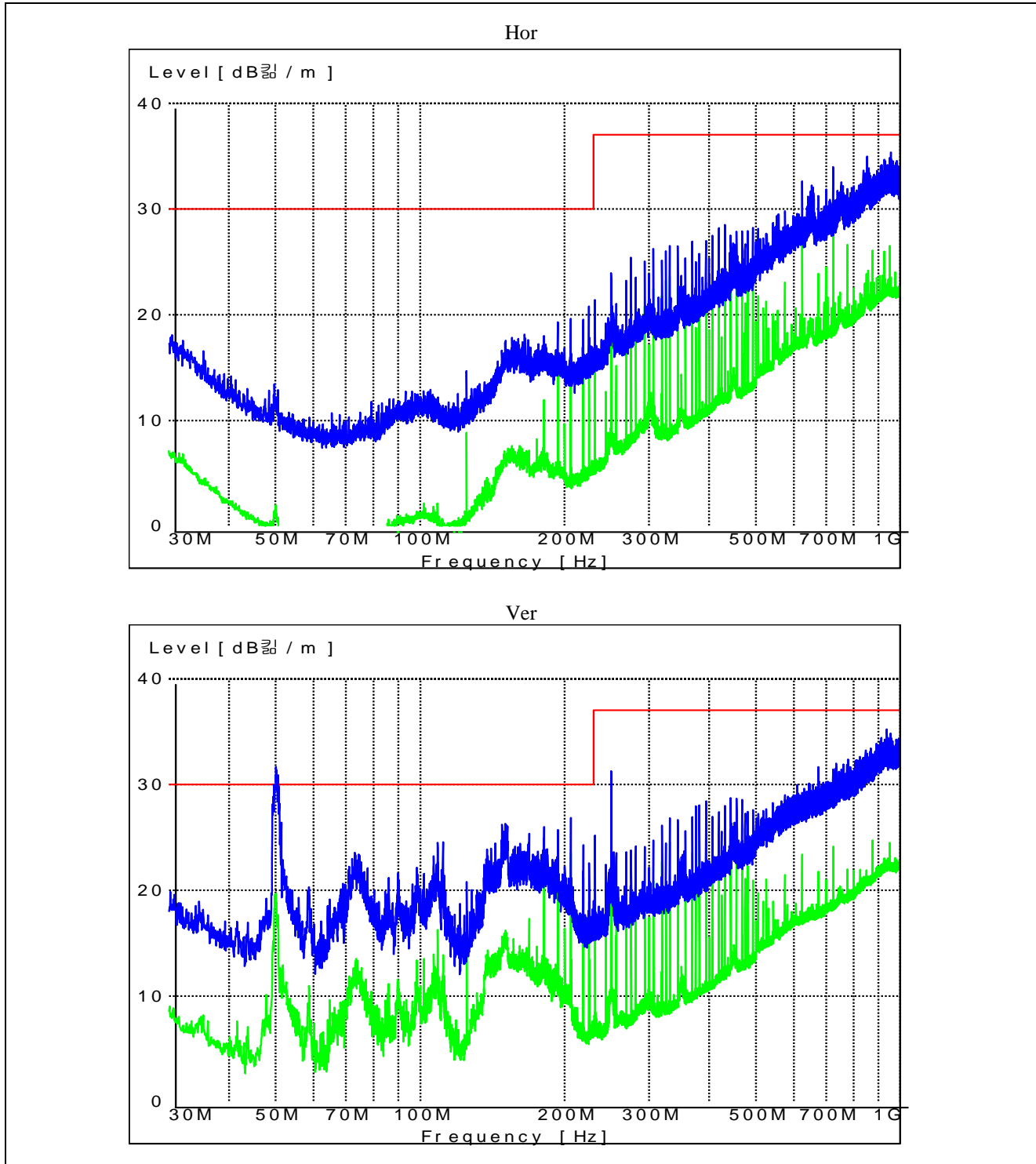
This table is to be use when Gain/Loss and Transducer Factors are provided separately.

AR Tech Optic Module 1GHz ~ 2GHz_3m distance

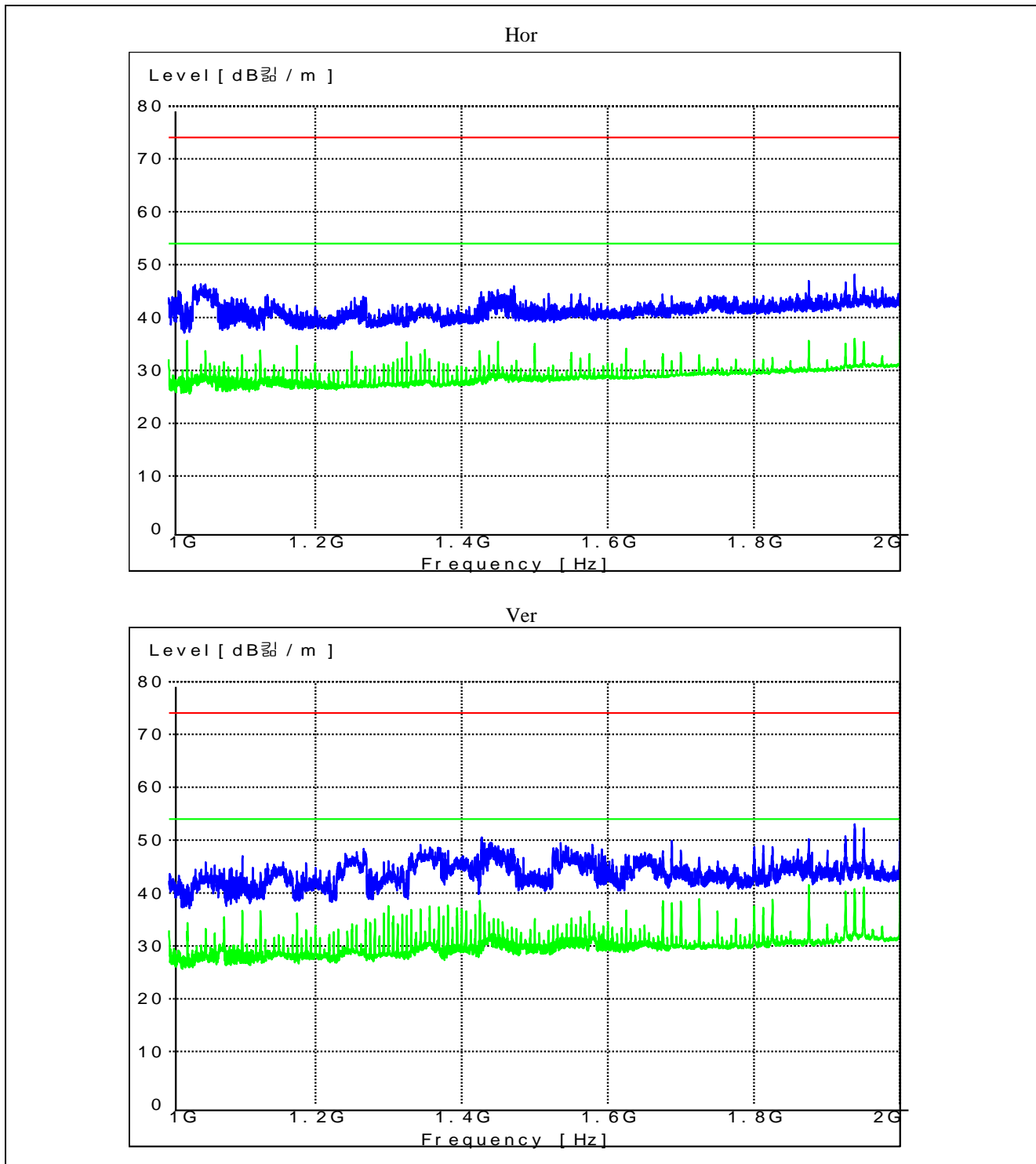
Frequency (MHz)	Reading(AV) (dBuV)		Pol.	Ant. Height (m)	Correction Factor			Limit (dBuV/m)	Level (dBuV/m)	
	Peak	AV			Ant. (dB/m)	Cable (dB)	Amp. (dB)		Peak	AV
1.42516	12.9	3.41	V	166	26.04	5.19	-	54	44.13	34.64
1.68756	18.07	5.49	V	100	26.62	5.69	-	54	50.38	37.8
1.70008	17.3	6.73	V	100	26.62	5.69	-	54	49.61	39.04
1.87516	13.96	3.86	V	100	27.09	6.09	-	54	47.14	37.04
1.93756	18.37	5.29	V	159	27.20	6.19	-	54	51.76	38.68
1.95008	17.88	6.72	V	121	27.20	6.19	-	54	51.27	40.11

Figure 2. Graphical representation of Radiated emission

AR Tech Optic Module_30MHz~1GHz



AR Tech Optic Module_1GHz~2GHz



Appendix A_Accreditations and Authorizations



KCC: Designated as a testing laboratory by Radio Research Agency in accordance with the Regulation on Designation of Testing Laboratory for Information and Communication Equipment. Registration No. : KR020



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland and accepted in a letter dated Aug 17, 2010 (Reg. No. 90762). As a Conformity Assessment Body (CAB), our organization is designated to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Part 15 and 18 of the Commission's Rules in a letter dated Jul 1, 2008 (Reg. No. 614154).

Appendix B_Measurement Uncertainties

Test	Uncertainty
Radiated Emissions	±4.08 dB
Conducted Emissions	±2.0 dB