

TEST REPORT For FCC

Test Report No. : TK-FI9010

Date of Issue : 07/27/2009

FCC ID : QBTLTK-2000M

Description of Product : Multicall Charger Paging System

Model No. : LTK-2000MS

Applicant : **Lee Technology Korea Co., Ltd.**
3rd Floor # 499-2 Sang 3-Dong, Wonmi-Gu
Bucheon-City, Kyungki-Do, Korea

Manufacturer : **Lee Technology Korea Co., Ltd.**
3rd Floor # 499-2 Sang 3-Dong, Wonmi-Gu
Bucheon-City, Kyungki-Do, Korea


Standards : FCC Part15

Test Date : 07/15/2009 – 07/26/2009

Test Results : ☒ PASS ☐ FAIL

The test results relate only to the items tested.

Tested by:


Kyoung-Moon Choi
Test Engineer
Date: 07/27/2009

Reviewed by:



K. T. Kang
Technical Manager
Date: 07/27/2009

TABLE OF CONTENTS

1.0	General Product Description	3
1.1	Device Modifications	3
1.2	Peripheral Devices	3
1.3	Calibration Details of Equipment Used for Measurement	4
1.4	Test Facility.....	4
1.5	Laboratory Accreditations and Listings	4
2.0	Summary of tests	5
2.1	Technical Characteristic Test.....	6
2.1.0	Test Procedure	6
2.1.1	Radiated Spurious Emissions	8
2.1.2	Power Line Conducted Interference	9
APPENDIX A – Test Equipment Used For Tests		12
Test Setup Photo and Configurationb-(Part 15B)		13

1.0 General Product Description

EUT Type	:	Paging Transmitter with Charging cradle
FCC Rule Part(s)	:	§2; §15; §90
Model name	:	LTK-2000MS
Serial number	:	Identical prototype
Tx Freq. Range	:	450.0250 ~ 469.9975 MHz
Channel Space Bandwidth		12.5kHz
Type of Modulation	:	10K2F1D
Frequency Tolerance:	:	± 0.00025 % (2.5ppm)
Maximum Output Power	:	Conducted: 1.743W
Power Source	:	12 Vdc
Antenna type	:	Helical antenna Gain: -2dBi

Note: EUT is equipped with a USB port for serial communication with Hyper terminal of Notebook.

1.1 Device Modifications

The following modifications were necessary for compliance:
Not applicable

1.2 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
EUT	Lee Technology Korea Co., Ltd.	LTK-2000MI	-
AC Adaptor	HJC Hua Jung Comp. Co., Ltd.	HASU11FB42	662401200738 4
Notebook	ASUSTek Computer Inc.	EeePC901	860AAQ326043
AD/DC Adaptor	Enertronix. INC.	EXA0801XA	




1.3 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to RRA & HCT, therefore, all test data recorded in this report is traceable to RRA & HCT.

1.4 Test Facility

The measurement facility is located at 477-6, Hager-Ri, Yoju-Up, Yoju-Gun Kyunggi-Do, 469-803, Korea. Tel: +82-31-883-5092/Fax: +82-31-883-5169. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.5 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	 343818
KOREA	KCC	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site)	 KR100
Canada	IC	3 & 10 meter Open Area Test Sites and one conducted site	 4769B-1

2.0 Summary of tests

FCC Part Section(s)	Parameter	Test Condition	Status (note 1)
15.109(a)	Radiated	Radiated	C
15.107	Power Line	Conducted	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:

2.1 Technical Characteristic Test

2.1.0 Test Procedure

GENERAL: USB port of EUT is used for communication with Hyper terminal of Notebook. The serial program signal from notebook registers/corrects the register informations in CPU's(18F4620 and PIC18F8722) of EUT via CP2102 chip(serial to USB)<Baud rate : 9600> EUT USB port connects to PC USB Port and then Hyper Terminal of PC access to work between EUT' CPU and PC Program(Hyper terminal) with data.

The data is that EUT's CPU register reads or writes data with PC program(Hyper terminal). So we tested When These was interaction.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-2003 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz. The ambient temperature of the UUT was 28°C with a humidity of 56%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz)	METER READING + ACF = FS
33	20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES: The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The UUT was placed in a manner that was representative of the way the EUT would be used. If the EUT had any peripherals, they were attached and placed in a similar manner. The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. In addition, in the event of the test being for a computer set up, the modem and printer positions were swapped and cables were manipulated as much as possible. The monitor was not moved, as that would not represent a typical situation configuration.

The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSIC63.4-2003 with the EUT 40 cm from the vertical ground wall.

2.1.1 Radiated Spurious Emissions

15.109(a) :

30-88 MHz	40.0 dBuV/m measured at 3 meters
88-216 MHz	43.5 dbuV/m
216-960 MHz	46.0 dbuV/m
ABOVE 960 MHz	54.0 dbuV/m

TEST

CONFIGURATION: Asus Notebook **MODEL:** Eee PC 901

Test Results:

No	Emission Frequency (MHz)	Meter Reading dBuV/m	Ant. Polaritry	Correction Factor dB	Cable Loss dB	Field Strength (dBuV/m)	Margin (dBuV)	Limit (dBuV/m)
1	83.41	11.5	V	8.9	1.4	21.8	-18.2	40.0
2	125.74	9.3	V	11.9	1.9	23.1	-20.4	43.5
3	127.42	9.2	H	12.2	1.9	23.3	-20.2	43.5
4	134.30	10.8	H	13.7	2.0	26.5	-17.0	43.5
5	143.42	7.6	V	15.6	2.1	25.3	-18.2	43.5
6	153.00	15.2	V	16.9	2.1	34.2	-9.3	43.5
7	172.84	7.5	V	15.7	2.3	25.5	-18.0	43.5
8	300.50	8.9	V	16.2	3.4	28.5	-17.5	46.0

TEST PROCEDURE: ANSI STANDARD C63.4-2003. The spectrum was scanned from 30 to 1000 MHz. The unit was measured at THRU-KES 477-6, Hager-Ri, Yoju-Up, Yoju-GunKyunggi-Do, 469-803, Korea

2.1.2 Power Line Conducted Interference

15.107 :

	QUASI-PEAK	AVERAGE
.15 - 0.5 MHz	66-56 dBuV	56-46 dBuV
0.5 - 5.0	56	46
5.0 - 30.	60	50

TEST PROCEDURE: ANSI STANDARD C63.4-2003. The spectrum was scanned from .15 to 30 MHz.

THE HIGHEST EMISSION READ FOR LINE 1 WAS 39.51 dBuV @ 21.306 MHz.

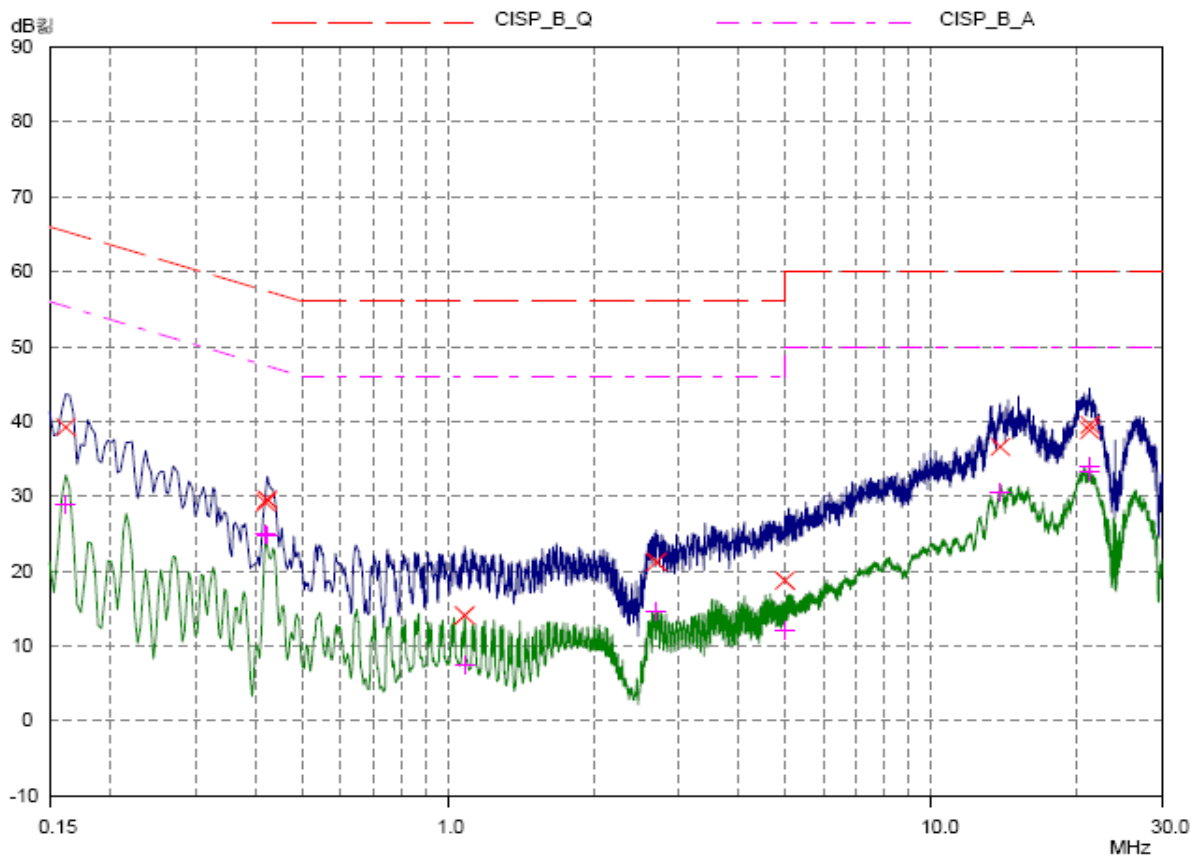
THE HIGHEST EMISSION READ FOR LINE 2 WAS 39.69 dBuV @ 20.739 MHz.

THE ATTACHED GRAPHS REPRESENT THE EMISSIONS READ FOR POWERLINE CONDUCTED FOR THIS DEVICE.

TEST RESULTS: Both lines were observed. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

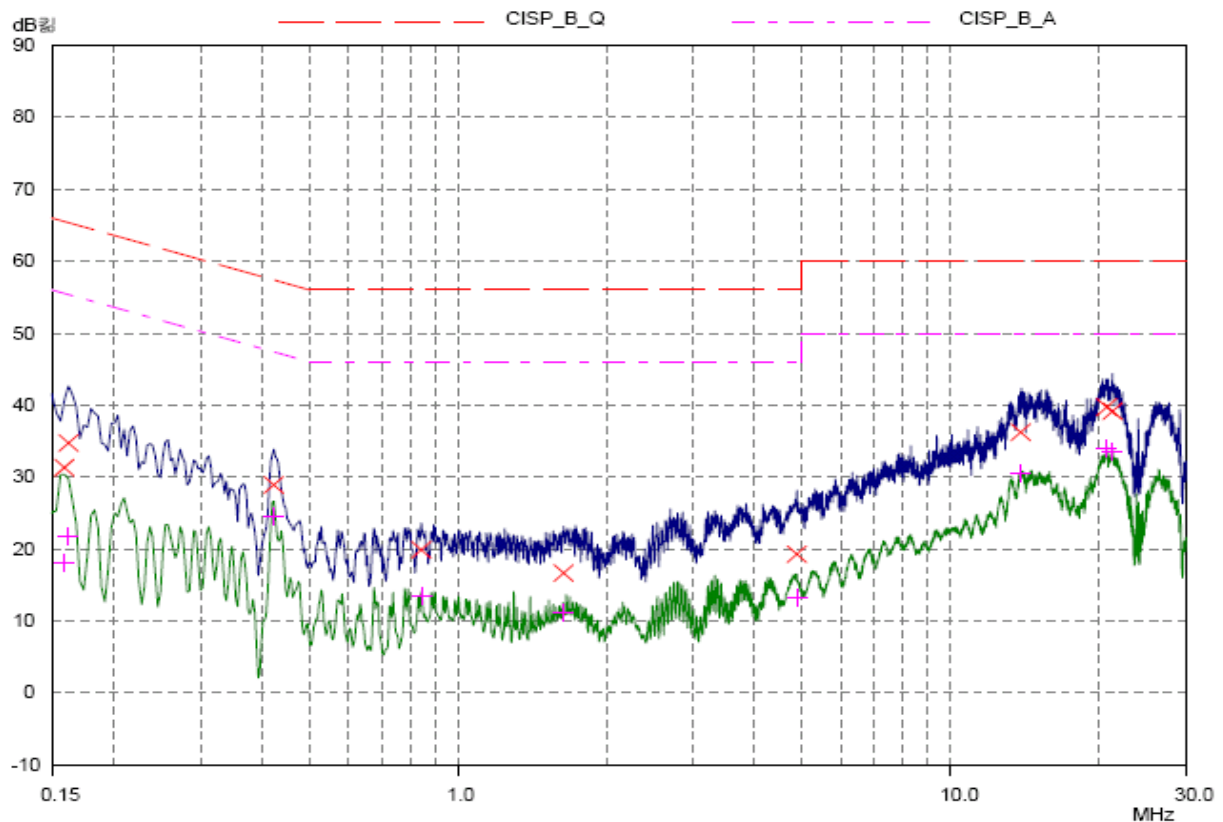
H

Final Measurement:	Detectors:	X QP / + AV
	Meas Time:	1sec
	Subranges:	8
	Acc Margin:	50 dB



N

Final Measurement:	Detectors:	X QP / + AV
	Meas Time:	1sec
	Subranges:	8
	Acc Margin:	50 dB



APPENDIX A – Test Equipment Used For Tests

No	Description	Manufacturer	Model No.	Serial No.	Due Cal.
1	Test Receiver	Rohde & Schwarz	ESHS 10	862970/018	2010.06.11
2	Test Receiver	Rohde & Schwarz	ESVS 10	826008/014	2010.05.20
3	Spectrum Analyzer	Hewlett Packard	8566B	2311A02394	2010.05.15
4	Spectrum Analyzer	Rohde & Schwarz	FSP13	100130	2010.05.15
5	Modulation Analyzer	Hewlett Packard	8901B	3438A05094	2010.05.15
6	Audio analyzer	Hewlett Packard	8903B	3011A12915	2010.05.15
7	Preamplifier	Hewlett Packard	8447F	2805A02570	2010.05.15
8	Preamplifier	A.H. Systems	PAM-0118	164	2010.04.17
9	Signal Generator	Hewlett Packard	8673D	2708A00448	2010.05.15
10	Power Meter	Hewlett Packard	437B	312U24787	2010.04.21
11	Power Sensor	Hewlett Packard	8482B	3318A06943	2010.05.15
12	Digital Multi Meter	Tektronix	DMM916	138401	2010.05.15
13	Loop Antenna	Rohde & Schwarz	HFH2-Z2.335.4711.52	826532/006	2011.02.06
14	Dipole Antenna	Rohde & Schwarz	VHAP	574	2010.07.07
15	Dipole Antenna	Rohde & Schwarz	VHAP	575	2010.07.17
16	Dipole Antenna	Rohde & Schwarz	UHAP	545	2010.07.17
17	Dipole Antenna	Rohde & Schwarz	UHAP	546	2010.07.07
18	Biconical Antenna	Eaton Corp.	94455-1	0977	2010.07.03
19	Biconical Antenna	EMCO	3104C	9111-2468	2010.07.03
20	Log Periodic Antenna	EMCO	3146	2051	2010.06.05
21	Log Periodic Antenna	EMCO	3146	8901-2320	2010.07.03
22	Horn Antenna	A.H. Systems	SAS-571	414	2011.03.16
23	Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-350	2011.03.27
24	LISN	EMCO	3810/2	2228	2010.05.15
25	Waveform Generator	Hewlett Packard	33120A	US34001190	2010.05.15
26	Digital Oscilloscope	Tektronix	TDS 340A	B012287	2010.05.15
27	Dummy Load	Bird Electronics	8251	11511	2010.04.17