

# **THRU Lab & Engineering.**

**477-6, Hager-Ri, Yoju-Up, Yoju-Gun  
Kyunggi-Do, 469-803, Korea  
T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)**

# **THRU**

## **Test Report**

**Product Name: UHF Alpha Transmitter  
FCC ID: WDC-IQBASE**

**Applicant:  
LEE TECHNOLOGY KOREA CO., LTD.**

**3<sup>rd</sup> FL #499-2, Sang 3-dong, Wonmi-gu,  
Bucheon-city, Kyungki-do,  
KOREA**

**Date Receipt: 08/30/2008**

**Date Tested: 09/09/2008**

**APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.  
FCC ID: WDC-IQBASE  
REPORT #: THRU-702011**

**COVER SHEET**

# THRU Lab & Engineering.

477-6, Hager-Ri, Yoju-Up, Yoju-Gun  
Kyunggi-Do, 469-803, Korea  
T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)

APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.

FCC ID :WDC-IQBASE

## TABLE OF CONTENTS

PAGE 1-2....TEST EQUIPMENT LIST AND TEST PROCEDUR  
PAGE 3.....TEST PROCEDURE  
PAGE 4-5....RADIATED EMISSIONS TEST DATA  
PAGE 6.....POWERLINE CONDUCTED EMISSIONS TEST DATA  
PAGE 7-8....POWERLINE CONDUCTED EMISSIONS TEST PLOT

EXHIBIT 1.....BLOCK DIAGRAM  
EXHIBIT 2.....SCHEMATIC  
EXHIBIT 3.....TEST SETUP PHOTO  
EXHIBIT 4.....Users MANUAL  
EXHIBIT 5.....SAMPLE OF FCC ID LABEL  
EXHIBIT 6.....LOCATION OF FCC ID LABEL  
EXHIBIT 7.....EXTERNAL PHOTO - FRONT SIDE  
EXHIBIT 8.....EXTERNAL PHOTO - BACK SIDE  
EXHIBIT 9.....INTERNAL PHOTO - COMPONENT SIDE  
EXHIBIT 10.....INTERNAL PHOTO - COPPER SIDE

APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.

FCC ID: WDC-IQBASE  
REPORT #: THRU-702011

COVER SHEET

# THRU Lab & Engineering.

477-6, Hager-Ri, Yoju-Up, Yoju-Gun

Kyunggi-Do, 469-803, Korea

T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)

APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.

FCC ID :WDC-IQBASE

## TEST EQUIPMENT LIST

No	Description	Manufacturer	Model No.	Serial No.	Due Cal.	Used
1	Test Receiver	Rohde & Schwarz	ESHS 10	862970/018	2009.05.13	<input checked="" type="checkbox"/>
2	Test Receiver	Rohde & Schwarz	ESVS 10	826008/014	2009.06.20	<input checked="" type="checkbox"/>
3	Spectrum Analyzer	Hewlett Packard	8566B	2311A02394	2009.06.10	<input checked="" type="checkbox"/>
4	Spectrum Analyzer	Advantest Corp.	R3261C	61720208	2009.06.10	<input checked="" type="checkbox"/>
	Spectrum Analyzer	Advantest Corp.	R3273	101003536	2009.09.05	<input checked="" type="checkbox"/>
5	Modulation	Hewlett Packard	8901B	3438A05094	2009.05.29	<input type="checkbox"/>
6	Audio analyzer	Hewlett Packard	8903B	3011A12915	2009.05.29	<input checked="" type="checkbox"/>
7	Preamplifier	Hewlett Packard	8447F	2805A02570	2009.05.26	<input type="checkbox"/>
8	Preamplifier	A.H. Systems	PAM-0118	164	2009.04.27	<input checked="" type="checkbox"/>
9	Signal Generator	Hewlett Packard	8673D	2708A00448	2009.06.10	<input type="checkbox"/>
10	Power Meter	Hewlett Packard	437B	312U24787	2009.04.29	<input type="checkbox"/>
11	Power Sensor	Hewlett Packard	8482B	3318A06943	2009.06.29	<input type="checkbox"/>
12	Loop Antenna	Rohde & Schwarz	HFH2-	826532/006	2009.01.31	<input type="checkbox"/>
13	Dipole Antenna	Rohde & Schwarz	VHAP	574	2010.07.07	<input type="checkbox"/>
14	Dipole Antenna	Rohde & Schwarz	VHAP	575	2010.07.17	<input type="checkbox"/>
15	Dipole Antenna	Rohde & Schwarz	UHAP	546	2010.07.07	<input type="checkbox"/>
16	Dipole Antenna	Rohde & Schwarz	UHAP	547	2010.07.07	<input type="checkbox"/>
17	Biconical Antenna	Eaton Corp.	94455-1	0977	2010.07.03	<input type="checkbox"/>
18	Biconical Antenna	EMCO	3104C	9111-2468	2010.07.03	<input checked="" type="checkbox"/>
19	Log Periodic	EMCO	3146	2051	2010.06.05	<input checked="" type="checkbox"/>
20	Log Periodic	EMCO	3146	8901-2320	2010.07.03	<input type="checkbox"/>
21	Horn Antenna	A.H. Systems	SAS-571	414	2009.03.17	<input checked="" type="checkbox"/>
22	LISN	EMCO	3825/2	9111-1912	2008.12.12	<input type="checkbox"/>

APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.

FCC ID: WDC-IQBASE

REPORT #: TK-FI8002

# THRU Lab & Engineering.

477-6, Hager-Ri, Yoju-Up, Yoju-Gun

Kyunggi-Do,469-803, Korea

T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)

23	LISN	Kyoritsu	KNW-242	8-923-2	2009.05.23	<input checked="" type="checkbox"/>
24	Waveform	Hewlett Packard	33120A	US34001190	2009.05.29	<input type="checkbox"/>
25	Digital Oscilloscope	Tektronix	TDS 340A	B012287	2009.06.10	<input type="checkbox"/>
26	Dummy Load	Bird Electronics	8251	11511	2009.02.02	<input type="checkbox"/>

APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.

FCC ID: WDC-IQBASE

REPORT #: TK-FI8002

# THRU Lab & Engineering.

477-6, Hager-Ri, Yaju-Up, Yaju-Gun

Kyunggi-Do, 469-803, Korea

T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)

## TEST PROCEDURE

**GENERAL:** This report shall NOT be reproduced except in full without the written approval of Thrulab & Engineering. Shielded interface cables were used in all cases except for cables connecting to the telephone line and the power cords. A test program was run which filled the screen with H's and also with the modem dialing out. Peripherals were turned on and operating.

**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 12°C with a humidity of 35%.

**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:**

$$\begin{aligned} \text{Freq (MHz)} & \text{ METER READING + ACF = FS} \\ 33 & \quad 20 \text{ dBuV} + 10.36 \text{ dB} = 30.36 \text{ dBuV/m @ 3m} \end{aligned}$$

**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.

APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.

FCC ID: WDC-IQBASE

REPORT #: TK-FI8002

# THRU Lab & Engineering.

477-6, Hager-Ri, Yoju-Up, Yoju-Gun  
Kyunggi-Do, 469-803, Korea  
T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)

**APPLICANT:** LEE TECHNOLOGY KOREA CO., LTD.

**FCC ID** :WDC-IQBASE

**NAME OF TEST:** RADIATED SPURIOUS EMISSIONS

**RULES PART NO.:** 15.109(a)

<b>REQUIREMENTS:</b>	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:** Samsung Notebook  
Keyboard MODEL: Sens Q760(S760)  
MODEL:5510M US PS/2

APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.  
FCC ID: WDC-IQBASE  
REPORT #: TK-FI8002

# THRU Lab & Engineering.

477-6, Hager-Ri, Yoju-Up, Yoju-Gun

Kyunggi-Do, 469-803, Korea

T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)

## TEST DATA:

No	Emission Frequency (MHz)	Meter Reading dBuV	Ant. Polarity	Correction Factor dB	Cable Loss dB	Field Strength (dBuv/m)	Margin (dBuv)	Limit (dBuv/m)
1	47.98	12.5	H	11.3	1.0	24.7	-15.3	40.0
2	55.80	13.1	V	8.9	1.1	23.1	-16.9	40.0
3	118.12	11.0	H	10.9	1.8	23.7	-19.8	43.5
4	174.30	6.5	V	15.5	2.3	24.3	-19.2	43.5
5	211.40	7.0	V	10.8	2.7	20.5	-25.5	46.0
6	246.20	9.0	H	11.7	3.1	23.7	-22.3	46.0
7	419.60	6.3	H	15.7	4.3	26.3	-19.7	46.0
8	572.50	7.5	V	18.5	5.4	31.4	-14.6	46.0
9	628.00	6.2	V	20.6	5.7	32.6	-13.4	46.0
10	957.00	7.1	H	23.4	7.4	37.8	-8.2	46.0

**TEST PROCEDURE:** ANSI STANDARD C63.4-2003. The spectrum was scanned from 30 to 1000 MHz. The unit was measured at ThruLab & Engineering 477-6, Hager-Ri, Yoju-Up, Yoju-Gun Kyunggi-Do, 469-803, Korea

**TEST RESULTS:** THE UNIT DOES MEET THE FCC REQUIREMENTS.

**PERFORMED BY:** T.H KIM

**DATE:** 02/27/2008

APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.

FCC ID: WDC-IQBASE

REPORT #: TK-FI8002

# THRU Lab & Engineering.

477-6, Hager-Ri, Yoju-Up, Yoju-Gun  
Kyunggi-Do, 469-803, Korea  
T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)

APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.

FCC ID :WDC-IQBASE

NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE

RULES PART NO.: 15.107

REQUIREMENTS:	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 0.168MHz @ 42.2 dBuv/m

The highest emission read for Line 2 was 23.5MHz @ 40 dbuv/m

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.

TEST RESULTS: THE UNIT DOES MEET THE FCC REQUIREMENTS.

PERFORMED BY: T.H KIM

DATE: 02/27/2008

APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.  
FCC ID: WDC-IQBASE  
REPORT #: TK-FI8002

# THRU Lab & Engineering.

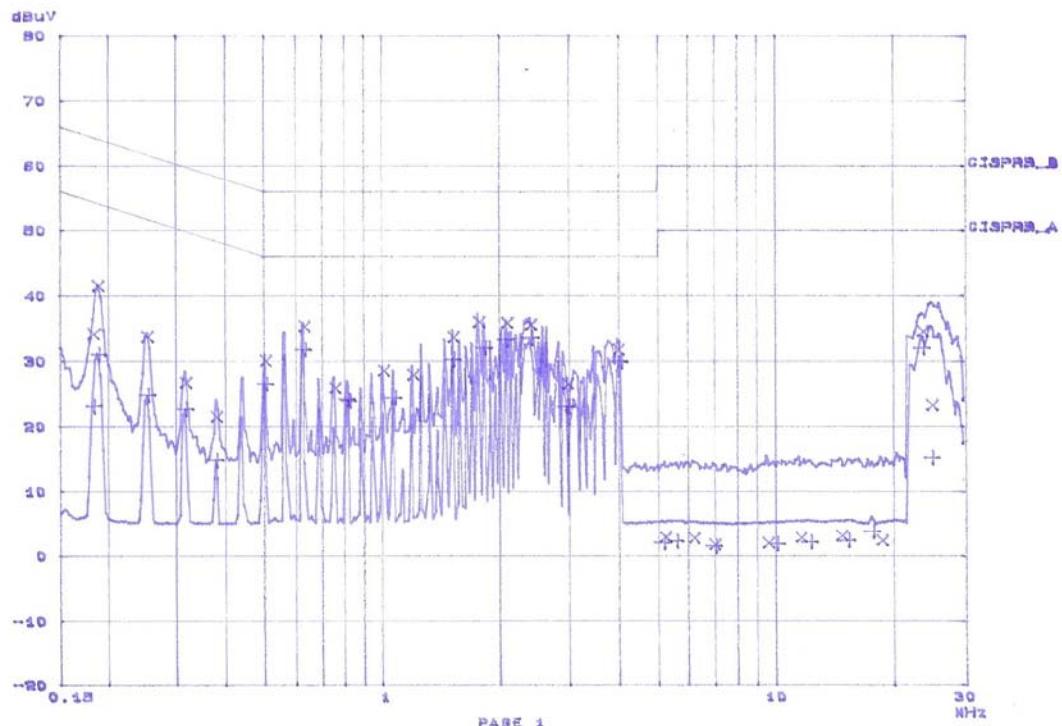
477-6, Hager-Ri, Yoju-Up, Yoju-Gun  
Kyunggi-Do, 469-803, Korea  
T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)

H

## CONDUCTED EMISSION CONDUCTED TEST

EUT: ACTIVE  
Manuf: HNE  
Op Cond: LINE1  
Operator: THRU  
Test Spec: EN324

Scan Settings (2 Ranges)  
Frequencies | Receiver Settings |  
Start Stop Step IF BW Detector H-Time Atten Preamp Operate  
150K 3M 3K 10K PkAV 100ms AUTO LN OFF 60dB  
3M 30M 3K 10K PkAV 20ms AUTO LN OFF 60dB  
Final Measurement: X GP / + AV  
Meas. Time: 1 s  
Subranges: 25  
Acc Margin: 50dB



APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.  
FCC ID: WDC-IQBASE  
REPORT #: TK-FI8002

# THRU Lab & Engineering.

477-6, Hager-Ri, Yoju-Up, Yoju-Gun

Kyunggi-Do, 469-803, Korea

T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)

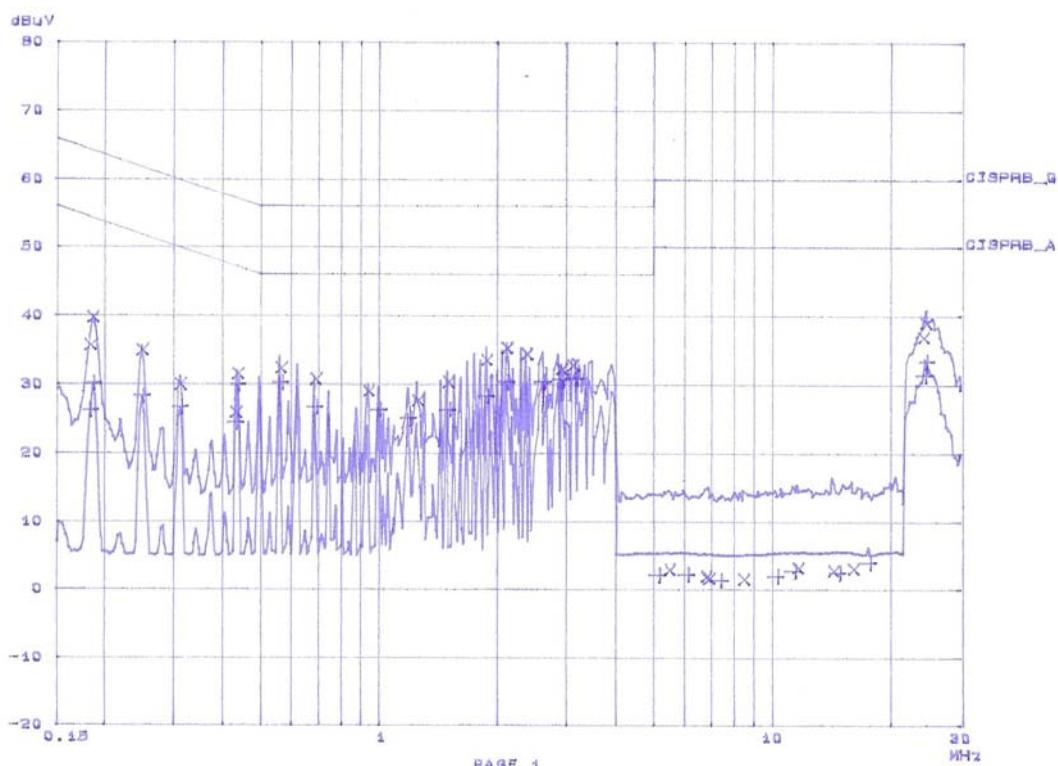
N

## CONDUCTED EMISSION CONDUCTED TEST

EUT: ACTIVE  
Manuf: HME  
Op Cond: LINE2  
Operator: THRU  
Test Spec: EN22

Scan Settings (2 Ranges)  
Frequencies Step Step IF BW Detector M-Time Atten Preamp D-Range  
Start Stop 3M 3K 10K PK+AV 100ms AUTO LN OFF 60dB  
150K 3M 3K 10K PK+AV 20ms AUTO LN OFF 60dB

Final Measurement: X GP / + AV  
Meas Time: 1 s  
Subranges: 25  
Acc Margin: 50dB



APPLICANT: LEE TECHNOLOGY KOREA CO., LTD.

FCC ID: WDC-IQBASE

REPORT #: TK-FI8002