

THRU Lab & Engineering.

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

Kyunggi-Do, 469-803, Korea

T82-31-883-5092/F82-31-883-5169 email thrukang@paran.com

Test Report

Product Name: Alpha Pager (Receiver)

FCCID: QBT-LT2004A

Model No.: LT2004A

Applicant:

Lee Technology Korea Co., Ltd.

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

Date Receipt : 05/15/2009

Date Tested : 05/22/2009

Date Issued : 05/25/2009

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID #: QBT-LT2004A

REPORT #: TK-FR9012

COVER SHEET

THRU Lab & Engineering.

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

Kyunggi-Do, 469-803, Korea

T82-31-883-5092/F82-31-883-5169 email thrukang@paran.com

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID: QBT-LT2004A

TABLE OF CONTENTS FOR A RECEIVER REPORT

PAGE 1-2..... TEST EQUIPMENT LIST

PAGE 3..... TEST PROCEDURE

PAGE 4-6..... RADIATED EMISSIONS TEST DATA

PAGE 7-9..... POWERLINE CONDUCTED EMISSIONS

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID #: QBT-LT2004A

REPORT #: TK-FR9012

TABLE OF CONTENTS

THRU Lab & Engineering.

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

Kyunggi-Do, 469-803, Korea

T82-31-883-5092/F82-31-883-5169 email thrukang@paran.com

EMC Equipment List

No	Description	Manufacturer	Model No.	Serial No.	Due Cal.	Used
1	Test Receiver	Rohde & Schwarz	ESHS 10	862970/018	2010.05.21	<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	2010.05.15	<input checked="" type="checkbox"/>
4	Preamplifier	Hewlett Packard	8447F	2805A02570	2010.05.15	<input type="checkbox"/>
5	Preamplifier	A.H. Systems	PAM-0118	164	2010.04..17	<input type="checkbox"/>
6	Signal Generator	Hewlett Packard	8673D	2708A00448	2010.05.15	<input type="checkbox"/>
7	Loop Antenna	Rohde & Schwarz	HFH2-Z2.335.4711.52	826532/006	2010.02.12	<input type="checkbox"/>
8	Dipole Antenna	Rohde & Schwarz	VHAP	574	2010.07.07	<input type="checkbox"/>
9	Dipole Antenna	Rohde & Schwarz	VHAP	575	2010.07.17	<input type="checkbox"/>
10	Dipole Antenna	Rohde & Schwarz	UHAP	546	2010.07.07	<input type="checkbox"/>
11	Dipole Antenna	Rohde & Schwarz	UHAP	547	2010.07.07	<input type="checkbox"/>
12	Trilog -Broadband Antenna	SCHWARZBECK	VULB 9168	9168-350	2011.03.27	<input checked="" type="checkbox"/>
13	Biconical Antenna	Eaton Corp.	94455-1	0977	2010.07.03	<input type="checkbox"/>
14	Biconical Antenna	EMCO	3104C	9111-2468	2010.07.03	<input type="checkbox"/>
15	Log Periodic Antenna	EMCO	3146	2051	2010.06.05	<input type="checkbox"/>
16	Log Periodic Antenna	EMCO	3146	8901-2320	2010.07.03	<input type="checkbox"/>
17	Horn Antenna	A.H. Systems	SAS-571	414	2011.03.16	<input type="checkbox"/>
18	LISN	EMCO	3825/2	9111-1912	2010.05.15	<input checked="" type="checkbox"/>
19	LISN	EMCO	3810/2	2228	2010.05.15	<input type="checkbox"/>
20	Dummy Load	Bird Electronics	8201	16521	2010.04.17	<input type="checkbox"/>

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID #: QBT-LT2004A

REPORT #:TK-FR9012

1 of 9

THRU Lab & Engineering.

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

Kyunggi-Do, 469-803, Korea

T82-31-883-5092/F82-31-883-5169 email thrukang@paran.com

TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written approval of Thru lab & 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 Rohde & Schwarz EMI Test Receiver ESVS10. The bandwidth of the test receiver was 120 kHz with an appropriate sweep speed. The test receiver was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 120 kHz. The ambient temperature of the UUT was 25.6°C with a humidity of 59%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the test receiver (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.

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.

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID #: QBT-LT2004A

REPORT #:TK-FR9012

2 of 9

THRU Lab & Engineering.

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

Kyunggi-Do, 469-803, Korea

T82-31-883-5092/F82-31-883-5169 email thrukang@paran.com

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID: QBT-LT2004A

NAME OF TEST: RADIATION INTERFERENCE

RULES PART NUMBER: 15.109, 15.33(b)(3)

REQUIREMENTS: 30 to 88 MHz: 40.0 dBuV/M @ 3 METERS
88 to 216 MHz: 43.5 dBuV/M
216 to 960 MHz: 46.0 dBuV/M
ABOVE 960 MHz: 54.0 dBuV/M

TEST RESULTS: A search was made of the spectrum from 30 to 1000 MHz and the measurements indicate that the unit DOES meet the FCC requirements.

TEST DATA:

* Tuning Frequency : 450.3250MHz

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	47.68	8.3	V	13.7	1.3	23.3	-16.7	40.0
2	86.17	6.1	H	9.4	1.8	17.3	-22.7	40.0
3	200.50	11.2	H	9.9	2.6	23.7	-19.8	43.5
4	286.00	8.3	V	12.5	3.0	23.8	-22.2	46.0
5	316.50	7.3	H	13.1	3.2	23.6	-22.4	46.0
6	354.00	7.4	H	13.9	3.3	24.6	-21.4	46.0
7	434.00	9.5	V	15.5	3.7	28.7	-17.3	46.0
8	495.50	6.3	V	16.5	4.1	26.9	-19.1	46.0
9	573.80	13.0	H	17.8	4.4	35.3	-10.7	46.0
10	786.30	8.0	V	20.6	5.1	33.8	-12.2	46.0
11	907.50	8.0	V	21.7	5.5	35.2	-10.8	46.0

SAMPLE CALCULATION: $FSdBuV/m = MR(dBuV) + ACFdB$.

TEST PROCEDURE: ANSI STANDARD C63.4-2003 using a Rohde & Schwarz EMI Test Receiver ESVS10, and an appropriate antenna – see the test equipment list. The bandwidth of test receiver was 120 kHz with an appropriate sweep speed. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported.

PERFORMED BY: Kyoung Moon Choi

DATE: 05/22/2009

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID #: QBT-LT2004A

REPORT #:TK-FR9012

3 of 9

THRU Lab & Engineering.

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

Kyunggi-Do, 469-803, Korea

T82-31-883-5092/F82-31-883-5169 email thrukang@paran.com

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID: QBT-LT2004A

NAME OF TEST: RADIATION INTERFERENCE

RULES PART NUMBER: 15.109, 15.33(b)(3)

REQUIREMENTS: 30 to 88 MHz: 40.0 dBuV/M @ 3 METERS
88 to 216 MHz: 43.5 dBuV/M
216 to 960 MHz: 46.0 dBuV/M
ABOVE 960 MHz: 54.0 dBuV/M

TEST RESULTS: A search was made of the spectrum from 30 to 1000 MHz and the measurements indicate that the unit DOES meet the FCC requirements.

TEST DATA:

* Tuning Frequency : 457.5750MHz

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	48.55	8.6	V	13.6	1.3	23.6	-16.4	40.0
2	76.73	6.1	H	9.8	1.7	17.6	-22.4	40.0
3	185.00	17.3	V	11.1	2.5	30.8	-12.7	43.5
4	291.50	7.7	V	12.6	3.1	23.4	-22.6	46.0
5	314.00	7.3	V	13.1	3.2	23.5	-22.5	46.0
6	382.30	7.7	H	14.5	3.5	25.7	-20.3	46.0
7	406.30	7.7	V	14.9	3.6	26.2	-19.8	46.0
8	452.80	6.8	V	16.0	3.8	26.6	-19.4	46.0
9	525.00	6.2	H	17.0	4.2	27.3	-18.7	46.0
10	803.70	8.2	H	20.6	5.2	34.0	-12.0	46.0
11	943.70	7.9	H	22.1	5.7	35.6	-10.4	46.0

SAMPLE CALCULATION: $FS_{dBuV/m} = MR_{(dBuV)} + ACF_{dB}$.

TEST PROCEDURE: ANSI STANDARD C63.4-2003 using a Rohde & Schwarz EMI Test Receiver ESVS10, and an appropriate antenna – see the test equipment list. The bandwidth of test receiver was 120 kHz with an appropriate sweep speed. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported.

PERFORMED BY: Kyoung Moon Choi

DATE: 05/22/2009

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID #: QBT-LT2004A

REPORT #:TK-FR9012

4 of 9

THRU Lab & Engineering.

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

Kyunggi-Do, 469-803, Korea

T82-31-883-5092/F82-31-883-5169 email thrukang@paran.com

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID: QBT-LT2004A

NAME OF TEST: RADIATION INTERFERENCE

RULES PART NUMBER: 15.109, 15.33(b)(3)

REQUIREMENTS:

30 to 88 MHz:	40.0 dBuV/M @ 3 METERS
88 to 216 MHz:	43.5 dBuV/M
216 to 960 MHz:	46.0 dBuV/M
ABOVE 960 MHz:	54.0 dBuV/M

TEST RESULTS: A search was made of the spectrum from 30 to 1000 MHz and the measurements indicate that the unit DOES meet the FCC requirements.

TEST DATA:

* Tuning Frequency : 469.0250MHz

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	56.95	8.2	V	13.0	1.4	22.6	-17.4	40.0
2	179.00	5.7	H	11.8	2.4	19.9	-23.6	43.5
3	414.80	7.3	H	15.1	3.6	26.1	-19.9	46.0
4	432.80	7.0	H	15.5	3.7	26.1	-19.9	46.0
5	437.80	6.9	V	15.5	3.7	26.1	-19.9	46.0
6	457.80	6.8	V	16.0	3.8	26.6	-19.4	46.0
7	487.80	6.6	V	16.4	4.2	27.2	-18.8	46.0
8	678.50	8.6	H	19.5	4.8	32.9	-13.1	46.0
9	774.30	8.1	V	20.6	5.1	33.7	-12.3	46.0
10	910.00	7.9	H	21.7	5.6	35.2	-10.9	46.0
11	963.20	8.0	V	22.2	5.8	35.9	-10.1	46.0

SAMPLE CALCULATION: $FSdBuV/m = MR(dBuV) + ACFdB$.

TEST PROCEDURE: ANSI STANDARD C63.4-2003 using a Rohde & Schwarz EMI Test Receiver ESVS10, and an appropriate antenna – see the test equipment list. The bandwidth of test receiver was 120 kHz with an appropriate sweep speed. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported.

PERFORMED BY: Kyoung Moon Choi

DATE: 05/22/2009

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID #: QBT-LT2004A

REPORT #:TK-FR9012

5 of 9

THRU Lab & Engineering.

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

Kyunggi-Do, 469-803, Korea

T82-31-883-5092/F82-31-883-5169 email thrukang@paran.com

APPLICANT: Lee Technology Korea Co., Ltd.

MODEL #: QBT-LT2004A

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.

TEST DATA:

THE HIGHEST EMISSION READ FOR LINE 1 WAS 41.79dBuV @ 0.162MHz (Quasi-peak)

THE HIGHEST EMISSION READ FOR LINE 2 WAS 42.33dBuV @ 0.150MHz (Quasi-peak)

THE GRAPHS ON THE FOLLOWING PAGE REPRESENT THE EMISSIONS TAKEN 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.

PERFORMED BY: Kyoung Moon Choi

DATE: 05/18/2009

APPLICANT: Lee Technology Korea Co., Ltd.

FCCID #: QBT-LT2004A

REPORT #:TK-FR9012

THRU Lab & Engineering.

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

Kyunggi-Do, 469-803, Korea

T82-31-883-5092/F82-31-883-5169 email thrukang@paran.com

Line1 (H)

Conducted Emission

18 May 2009 14:25

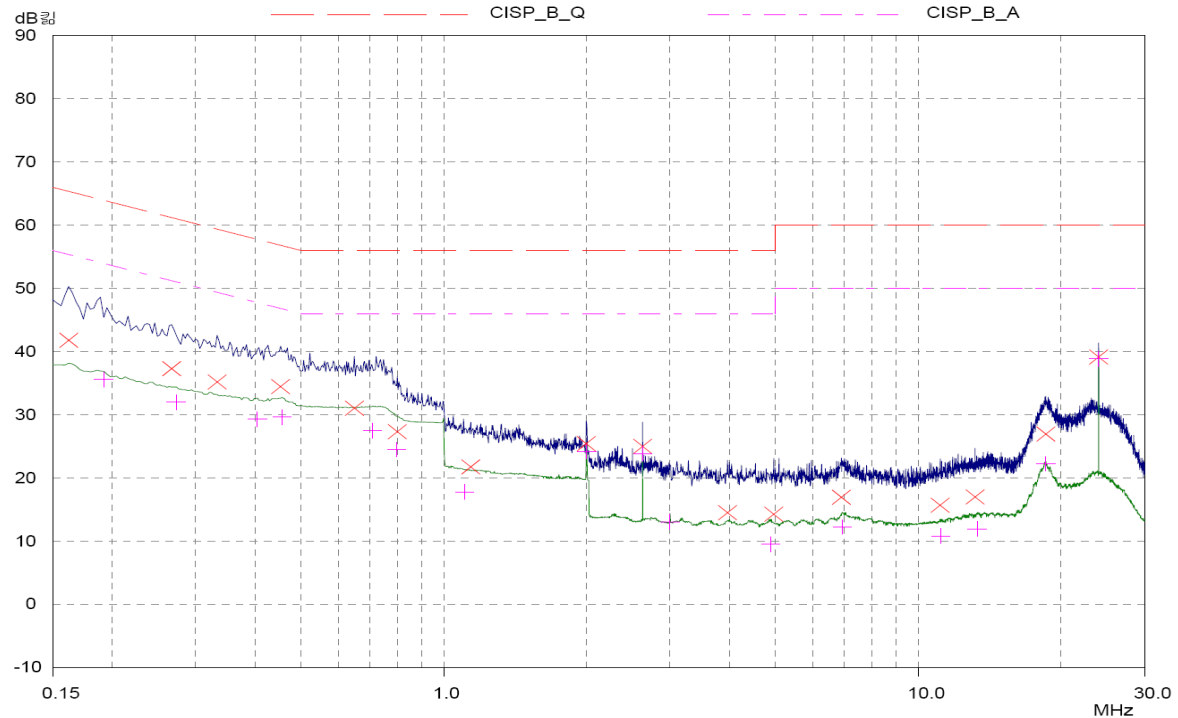
Conducted Test

EUT: LT2004A
Manuf: LEETEK
Op Cond: Line1
Operator: THRU
Test Spec: EN22
Comment:

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	OpRge	
150kHz	3MHz	3kHz	10kHz	PK+AV	100msec	Auto	60dB	
3MHz	30MHz	9kHz	10kHz	PK+AV	20msec	Auto	60dB	

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Subranges: 16
Acc Margin: 50 dB



APPLICANT: Lee Technology Korea Co., Ltd.

FCCID #: QBT-LT2004A

REPORT #:TK-FR9012

7 of 9

THRU Lab & Engineering.

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

Kyunggi-Do, 469-803, Korea

T82-31-883-5092/F82-31-883-5169 email thrukang@paran.com

Line2(N)

Conducted Emission

18 May 2009 14:4

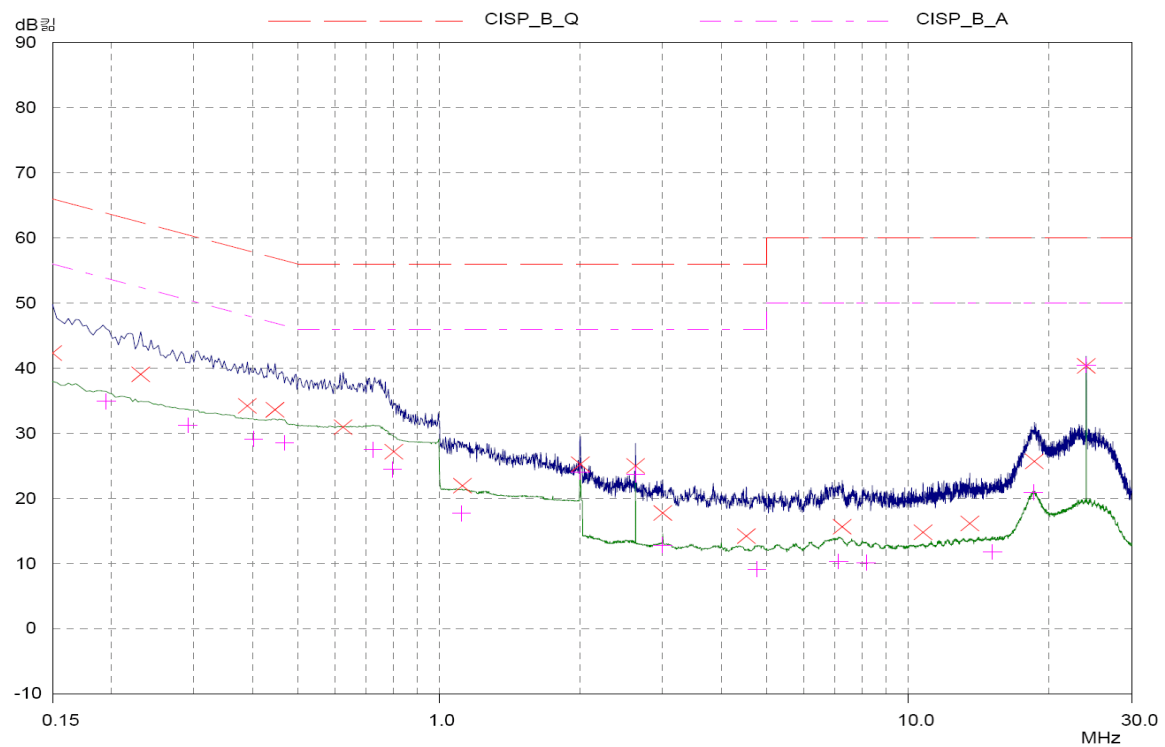
Conducted Test

EUT: LT2004A
Manuf: LEETEK
Op Cond: Line2
Operator: THRU
Test Spec: KN22
Comment:

Scan Settings (2 Ranges)

Frequencies		Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	100msec	Auto	60dB
3MHz	30MHz	9kHz	10kHz	PK+AV	20msec	Auto	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Subranges: 16
Acc Margin: 50 dB



APPLICANT: Lee Technology Korea Co., Ltd.

FCCID #: QBT-LT2004A

REPORT #:TK-FR9012

8 of 9