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Dates of Tests: May 2 ~ 10, 2007

Test Report S/N: LR500190705B

Test Site : LTA CO., LTD.

## CERTIFICATION OF COMPLIANCE

FCC ID.

**VASECR300E**

APPLICANT

**eb Corp.**

<b>FCC Classification</b>	:	<b>Part 15 Low Power Communication Device Transmitter</b>
<b>Manufacturing Description</b>	:	<b>Manned Charge System</b>
<b>Manufacturer</b>	:	<b>eb Corp.</b>
<b>Model name</b>	:	<b>ECR-300E</b>
<b>Test Device Serial No.:</b>	:	<b>Identical prototype</b>
<b>Rule Part(s)</b>	:	<b>FCC Part 15.225 Subpart C; ANSI C-63.4-2003</b>
<b>Frequency Range</b>	:	<b>13.56MHz</b>
<b>RF power</b>	:	<b>80.27dBuV/m @ 3m</b>
<b>Data of issue</b>	:	<b>May 10, 2007</b>

This test report is issued under the authority of:

The test was supervised by:

Dong -Min JUNG, Technical Manager

Kyung-Taek LEE, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. This report must not be used by the applicant to claim product endorsement by any agency.



NVLAP LAB Code.: 200723-0

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## 1. General information's

### 1-1 Test Performed

Company name : LTA Co., Ltd.  
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 Web site : <http://www.ltalab.com>  
 E-mail : [chahn@ltalab.com](mailto:chahn@ltalab.com)  
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Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competents of calibration and testing laboratory”.

### 1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2007-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2007-07-13	EMC accredited Lab.
FCC	U.S.A	610755	2008-03-28	FCC filing
VCCI	JAPAN	R2133, C2307	2008-06-22	VCCI registration
IC	CANADA	IC5799	2008-04-23	IC filing

## 2. Information's about test item

### 2-1 Client

Company name : eb Corp.  
 Address : 14th Fl., HIGH-END TOWER, 235-2, Guro-Dong, Guro-Ku, Seoul, Korea  
 Tel / Fax : +82.2.6220.3085 / +82.2.6220.5001

### 2-2 Manufacturer

Company name : eb Corp.  
 Address : 14th Fl., HIGH-END TOWER, 235-2, Guro-Dong, Guro-Ku, Seoul, Korea

### 2-3 Equipment Under Test (EUT)

Trade name : Manned Charge System  
 Model name : ECR-300E  
 Serial number : Identical prototype  
 Date of receipt : April 30, 2007  
 EUT condition : Pre-production, not damaged  
 Antenna type - 1 : PCB Pattern Loop Antenna (Size: 85\*48)  
 Frequency Range : 13.56 MHz  
 RF output power : 80.27dBuV/m @ 3m  
 Temperature range : -20℃ ~ 55℃  
 Power Source : Adaptor: 100-240VAC/1.8A, 12VDC/5A

### 2-4 Tested frequency

	LOW	MID	HIGH
Frequency (MHz)	-	13.56	-

### 2-5 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
-	-	-	-
-	-	-	-

### 3. Test Report

#### 3.1 Summary of tests

FCC Part Section(s)	Parameter	Test Condition	Status (note 1)
15.225(a)	Electric Field Strength - Fundamental Emission	Radiated	C
15.225(b) (c)	Electric Field Strength - Outside the Band		C
15.225(d)	Electric Field Strength - Spurious Emission		C
15.225(c)	20 dB Bandwidth		C
15.225(d)	Frequency Tolerance		C
15.209	Radiated Emission		C
15.207 /15.107	AC Conducted Emissions	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:

FCC Parts 15.225; ANSI C-63.4-2003

## 3.2 Transmitter requirements

### 3.2.1 Electric Field Strength

**Procedure:** About the Fundamental Emission, Outside the Band and Spurious Emission

The Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3m.

→ From 9kHz to 30MHz at distance 3m

The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for each antenna angle 0deg., 45deg. and 90deg.

→ From 30MHz to 1000MHz at distance 3m

The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization.

Bandwidth settings per frequency range;

	From 9kHz to 150kHz	From 150kHz to 30MHz	From 30MHz to 1000MHz
IF Bandwidth	200Hz	9kHz	120kHz

Part 15 Section 15.31 (f)(2) (9kHz ~ 30MHz)

9kHz ~ 490kHz [Limit at 3m] = [Limit at 300m]-40log(3[m]/300[m])

490kHz ~ 30MHz [Limit at 3m] = [Limit at 30m]-40log(3[m]/30[m])

### 3.2.1.1 Electric Field Strength - Fundamental Emission

Test method : Part 15.225(a)  
 Tx Frequency : 13.56 MHz  
 Result : **Complies**

#### Measurement data:

ANT-1

Freq (MHz)	Pol.	Reading (dB $\mu$ V/m)	T.F (dB)	Field Strength @3m (dB $\mu$ V/m)	Limit @3m (dB $\mu$ V/m)	Margin (dB)
13.56	H	82.23	-6.87	75.36	124	48.64
13.56	V	87.14	-6.87	80.27	124	43.73

-- Note 1--

Field strength of 13.553MHz to 13.567MHz Limit@3m = 84dB $\mu$ V/m + 40log30m/3m  
 = 124dB $\mu$ V/m

-- Note 2--

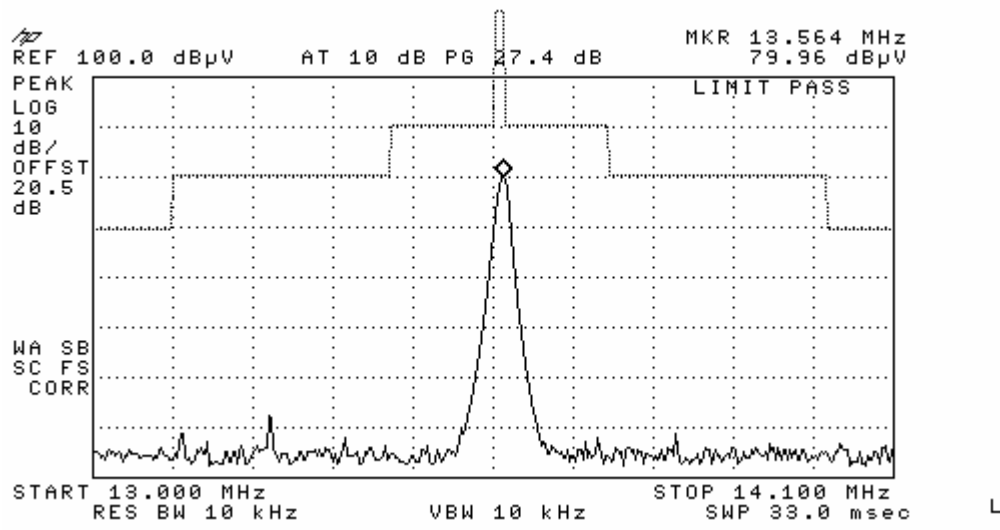
T.F(Total Factor) = Antenna Factor + Cable Loss –Amp Gain

Field Strength @3m = Reading + T.F

3.2.1.2 Electric Field Strength - Outside the Allocated Band

Test method : Part 15.225(b) (c)  
Tx Frequency : 13.56 MHz  
Result : **Complies**

Measurement Data:





### 3.2.1.3 Electric Field Strength – Spurious Emission

Test method : Part 15.225(d)  
 Tx Frequency : 13.56 MHz  
 Result : **Complies**

#### Measurement Data:

Freq (MHz)	Pol.	Reading (dBμV/m)	T.F (dB)	Field Strength @ 3m (dBμV/m)	Limit @3m (dBuV/m)	Margin (dB)
40.69	V	50.59	-13.52	37.1	40.00	2.93
54.25	V	49.37	-13.59	35.8	40.00	4.22
67.81	V	41.33	-14.29	27.0	40.00	12.96
81.37	V	38.56	-17.32	21.2	40.00	18.76

-- Note 1--

T.F(Total Factor) = Antenna Factor + Cable Loss –Amp Gain

Field Strength @3m = Reading + T.F

-- Note 2--

No other emissions were detected at a level greater than 20dB below limit.

#### Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

### 3.2.2 20 dB Bandwidth

#### Procedure:

The measurement was performed in the antenna height to gain the maximum of Electric field strength.

Test method : Part 15.225(c)  
 Tx Frequency : 13.56 MHz  
 Result : **Complies**

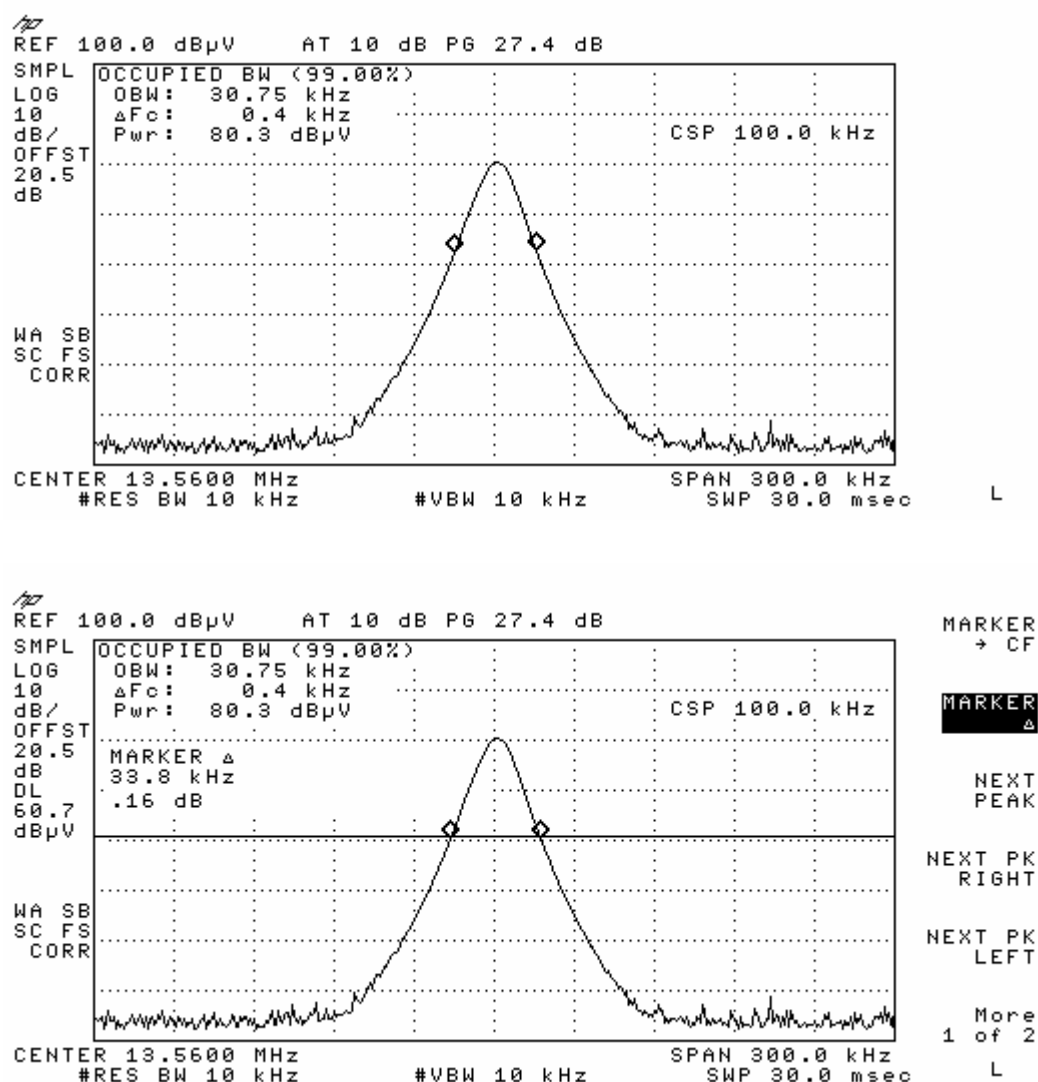
The spectrum analyzer is set to:

Center frequency = 13.56MHz

RBW = 10 kHz

VBW = 10 kHz (VBW  $\geq$  RBW)

#### Measurement Data:



### 3.2.3 Frequency Tolerance

#### Procedure:

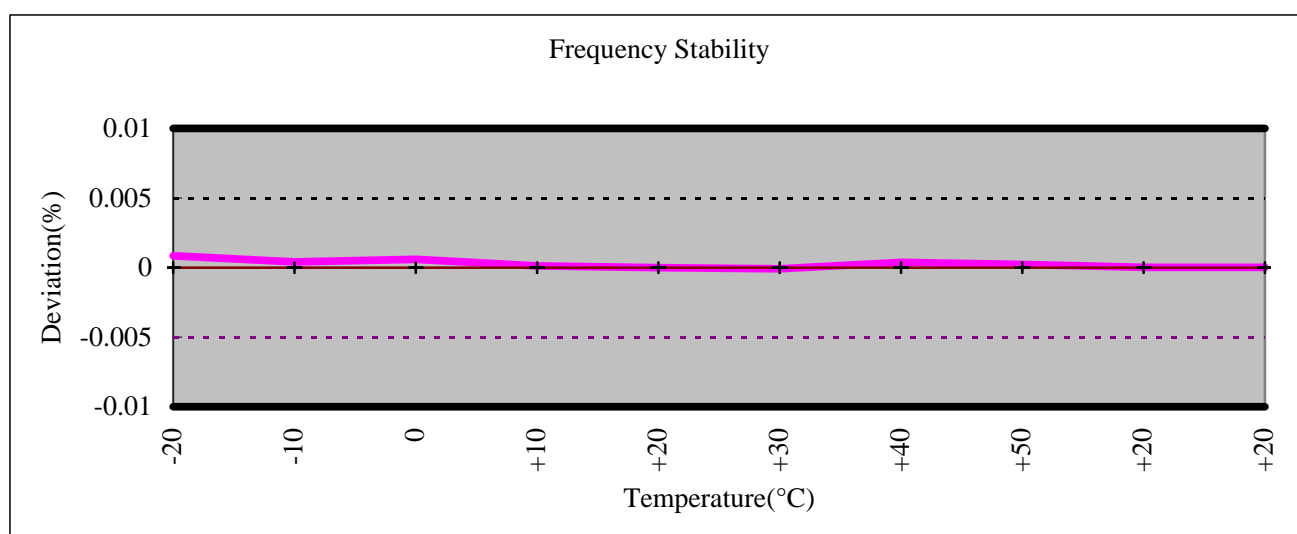
The temperature test was started after the temperature stabilization time of 30 minutes.

Test method : Part 15.225(d)  
 Tx Frequency : 13.56 MHz  
 Result : **Complies**

#### Measurement Data:

OPERATING FREQUENCY: 13,560,221 Hz  
 Freq. Tolerance Limit: ± 0.01% %

VOLTAGE (%)	POWER (V)	TEMP (°C)	FREQ (Hz)	Deviation (%)
100	120	-20	13,560,107	0.000841
100		-10	13,560,165	0.000413
100		0	13,560,141	0.000590
100		10	13,560,205	0.000118
100		20	13,560,221	0.000000
100		30	13,560,233	-0.000088
100		40	13,560,170	0.000376
100		50	13,560,190	0.000229
85	108	20	13,560,219	0.000015
115	132	20	13,560,219	0.000015



### 3.2.4 Radiated Emission

#### Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic.

RBW = 100 kHz ( 30MHz ~ 1 GHz)

VBW ≥ RBW

= 1 MHz (1 GHz ~ 10<sup>th</sup> harmonic )

Trace = max hold

Sweep = auto

#### Measurement Data:

→ Refer to the Next Page

→ No other emissions were detected at a level greater than 10dB below limit.

#### Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

\*\* Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz.

However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

#### Minimum Standard: FCC Part 15.109

Frequency (MHz)	Limit (uV/m) @ 10m
30 ~ 88	90
88 ~ 216	150
216 ~ 960	210
Above 960	300



### 3.2.5 AC Conducted Emissions

#### Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

#### Measurement Data: Complies

- See next pages for actual measured spectrum plots.
- No other emissions were detected at a level greater than 10dB below limit.

#### Minimum Standard: FCC Part 15.207(a)/EN 55022

##### Class B

Frequency Range	quasi-peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

\* Decreases with the logarithm of the frequency

##### Class A

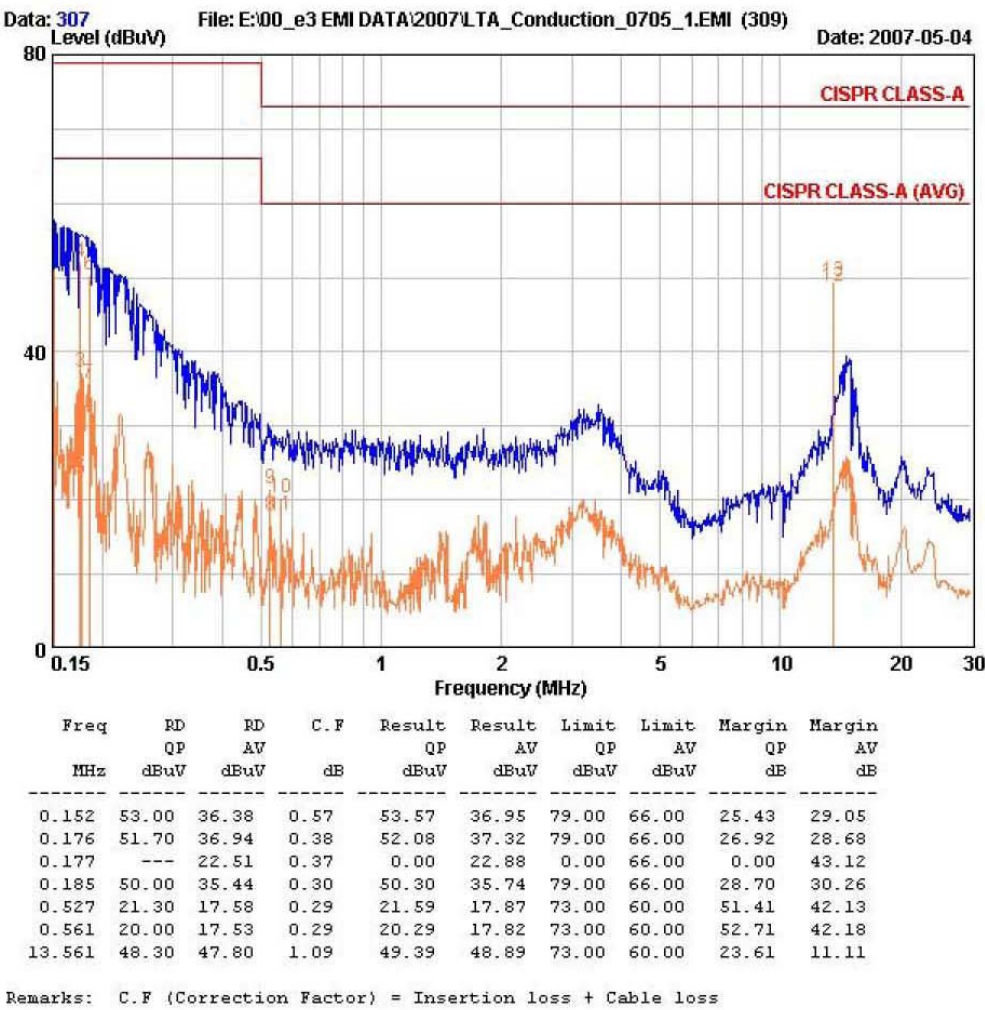
Frequency Range	quasi-peak	Average
0.15 ~ 0.5 MHz	79 dBuV	66 dBuV
0.5 ~ 30 MHz	73 dBuV	60 dBuV

AC Conducted Emissions –Line



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EUT / Model No. : ECR-300E	Phase : LINE
Test Mode :	Test Power : 120 / 60
Temp./Humi. : 21 / 64	Test Engineer : B.S.KIM



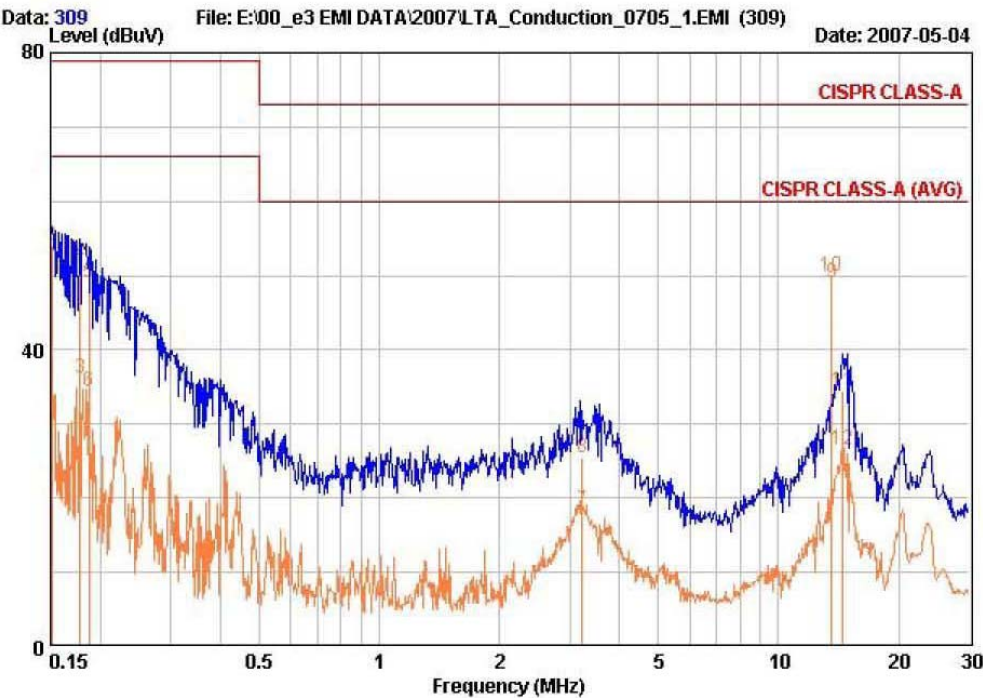
Note: The measurement data of 13.56MHz is retested with a dummy load(50ohm).

AC Conducted Emissions - Neutral



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EUT / Model No. : ECR-300E	Phase : NEUTRAL
Test Mode :	Test Power : 120 / 60
Temp./Humi. : 21 / 64	Test Engineer : B.S.KIM



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV		QP	AV	QP	AV	QP	AV
	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.151	53.40	38.92	0.57	53.97	39.49	79.00	66.00	25.03	26.51
0.178	51.30	35.85	0.36	51.66	36.21	79.00	66.00	27.34	29.79
0.187	48.70	34.12	0.28	48.98	34.40	79.00	66.00	30.02	31.60
3.224	25.00	17.64	0.58	25.58	18.22	73.00	60.00	47.42	41.78
13.560	48.80	48.10	1.04	49.84	49.14	73.00	60.00	23.16	10.86
14.517	33.40	25.59	1.08	34.48	26.67	73.00	60.00	38.52	33.33

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

Note: The measurement data of 13.56MHz is retested with a dummy load(50ohm).



**APPENDIX**

**TEST EQUIPMENT USED FOR TESTS**

	Description	Model No.	Serial No.	Manufacturer	Next Cal. Date
1	Spectrum Analyzer	8594E	3649A03649	HP	Apr-08
2	Signal Generater	8648C	3623A02597	HP	Apr-08
3	Attenuator (3dB)	8491A	37822	HP	Nov-07
4	Attenuator (10dB)	8491A	63196	HP	Nov-07
5	EMI Test Receiver	ESVD	843748/001	R&S	Jan-08
6	LISN	KNW-407	8-1430-1	Kyoritsu	Jan-08
7	Two-Line V-Network	ESH3-Z5	893045/017	R&S	Jan-08
8	RF Amplifier	8447D	2949A02670	HP	Jan-08
9	RF Amplifier	8447D	2439A09058	HP	Jan-08
10	RF Amplifier	8449B	3008A02126	HP	Apr-09
11	Test Receiver	ESHS10	828404009	R&S	Jan-08
12	TRILOG Antenna	VULB 9160	9160-3212	SCHWARZBECK	Jul-07
13	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	Apr-09
14	Biconical Antenna	BBA 9106	VHA 9103-2315	SCHWARZBECK	Apr-09
15	Horn Antenna	3115	00055005	ETS LINDGREN	Mar-09
16	Horn Antenna	BBHA 9120D	0499	Schwarzbeck	Jun-07
17	Dipole Antenna	VHA9103	2116	Schwarzbeck	Nov-07
18	Dipole Antenna	VHA9103	2117	Schwarzbeck	Nov-07
19	Dipole Antenna	UHA9105	2261	Schwarzbeck	Nov-07
20	Dipole Antenna	UHA9105	2262	Schwarzbeck	Nov-07
21	Spectrum Analyzer	8591E	3649A05888	HP	Jan-08
22	Spectrum Analyzer	8563E	3425A02505	HP	Apr-08
23	Hygro-Thermograph	THB-36	0041557-01	ISUZU	Feb-08
24	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	Jun-07
25	RF Switch	MP59B	6200414971	ANRITSU	Jun-07
26	RF Switch	MP59B	6200438565	ANRITSU	Jun-07
27	Power Divider	11636A	6243	HP	Nov-07
28	DC Power Supply	6622A	3448A03079	HP	Oct-07
29	Attenuator (30dB)	11636A	6243	HP	Nov-07
30	Frequency Counter	5342A	2826A12411	HP	Apr-08
31	Power Meter	EPM-441A	GB32481702	HP	Apr-08
32	Power Sensor	8481A	2702A64048	HP	Apr-08
33	Audio Analyzer	8903B	3729A18901	HP	Nov-07
34	Modulation Analyzer	8901B	3749A05878	HP	Nov-07
35	TEMP & HUMIDITY Chamber	YJ-500	L05022	JinYoung Tech	Oct-07
36	LOOP-ANTENNA	FMZB 1516	151602/94	SCHWARZBECK	Mar-09