LTA
Laboratory for Test & Approval Co.,Ltd.

243 Jubug-Ri,Yangji-Myeon, Yongin-Si, Gyeonggi-Do, Korea 449-822
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http://www.ltalab.com

TEST REPORT

Dates of Tests: JAN 14 ~ 25, 2008
Test Report S/N: LR500190803A
Test Site : LTA CO., LTD.

CERTIFICATION OF COMPLIANCE

FCC ID. **U9SFX853CCRADLE**

APPLICANT **i-Sirius Co., Ltd**

FCC Classification	**:**	**Digital Transmission System (DTS)**
Manufacturing Description	**:**	**DESKTOP CHARGER**
Manufacturer	**:**	**Jurong Hi-Tech (Suzhou) Co. Ltd**
Model name	**:**	**FX-853C**
Test Device Serial No.:	**:**	**-**
Rule Part(s)	**:**	**FCC Part 15.247 Subpart C; ANSI C-63.4-2003**
Frequency Range	**:**	**2405MHz ~ 2480MHz**
Max. Output Power	**:**	**-1.73 dBm Peak Conducted**
Data of issue	**:**	**January 31, 2008**

This test report is issued under the authority of:

Dong –Min JUNG, Technical Manager

The test was supervised by:

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

TABLE OF CONTENTS

1. General information's

1-1 Test Performed

Company name	:	LTA Co., Ltd.
Address	:	243, Jubug-ri,Yangji-Myeon,Youngin-Si, Kyunggi-Do, Korea. 449-822
Web site	:	http://www.ltalab.com
E-mail	:	chahn@ltalab.com
Telephone	:	+82-31-323-6008
Facsimile		+82-31-323-6010

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	2008-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2009-06-20	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 / Manufacturer

Company name : i-Sirius Co.,Ltd

Address : 3th FL,Sam Young B/D, 106-2, Banpo-Dong, Seocho-Gu, Seoul, 137-040, Korea

Tel / Fax : +82-2-3480-0970/ +82-2-596-6570

2-2 Manufacturer

Company name : Jurong Hi-Tech (Suzhou) Co. Ltd

Address : 275,Xinglong Street Suzhou Industrial Park, Suzhou 215024,China

2-3 Equipment Under Test (EUT)

Trade name : DESKTOP CHARGER

Model name : FX-853C

Brand name : MOTOROLA

Date of receipt : December 16, 2007

EUT condition : Pre-Production, not damaged

Antenna Gain : Max 1.45dBi

Frequency Range 2405MHz ~ 2480MHz (DSSS)

RF output power Range -1.73 dBm Peak Conducted

Number of channels : 16

Channel spacing : 5MHz

Type of Modulation : O-QPSK

Power Source (Adaptor) : Input: 100-240Vac, 50/60Hz, 0.3A Output: 5Vdc, 0.6A

Power Source (Battery) 3.6Vdc Ni-MH Battery, 500mAh

2-4 Tested frequency

	LOW	MID	HIGH
Frequency (MHz)	2405	2445	2480

2-5 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
GSM Phone	FX-853C	-	i-Sirius

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(b)	Transmitter Output Power	< 1Watt	Conducted	C
15.247(d)	Conducted Spurious emission	> 20 dBc		C
15.247(d)	Band Edge	> 20 dBc		C
15.247(a)	6 dB Bandwidth	> 500kHz		C
15.247(d)	Transmitter Power Spectral Density	< 8dBm @ 3kHz		C
15.209	Field Strength of Harmonics	< 54 dBuV (at 3m)	Radiated	C
15.207	AC Conducted Emissions	EN 55022	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 15.247; ANSI C-63.4-2003

3.2 Technical Characteristics Test

3.2.1 6 dB Bandwidth

Procedure:

The bandwidth at 6dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 5 MHz

VBW = 100 kHz (VBW ≥ RBW)

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data:

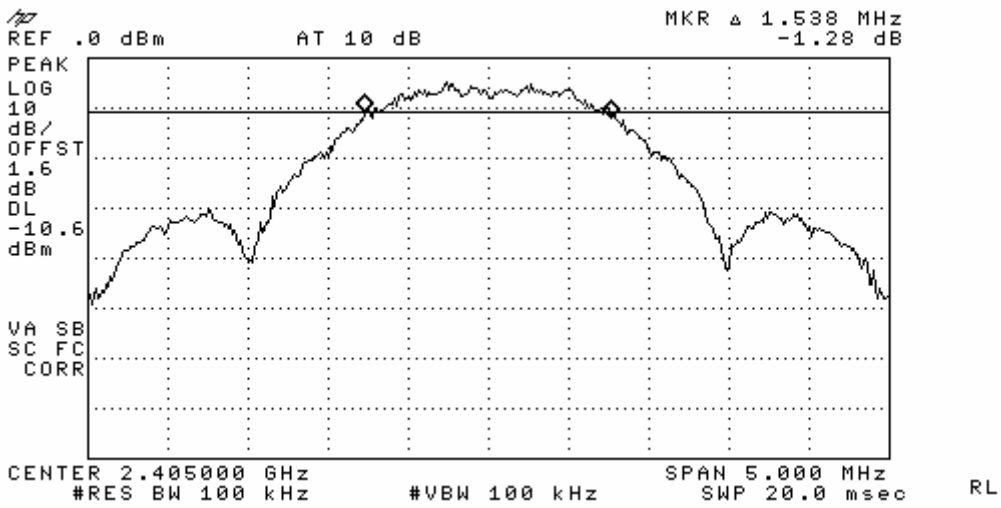
Frequency (MHz)	Cradle Test Results	
	Measured Bandwidth (MHz)	Result
2405	**1.538**	Complies
2445	**1.538**	Complies
2480	**1.400**	Complies

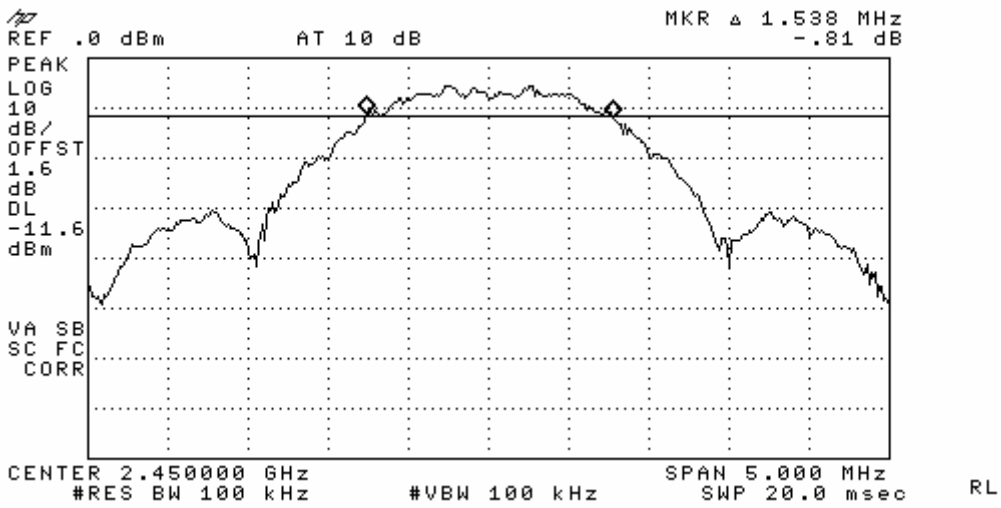
- See next pages for actual measured spectrum plots.

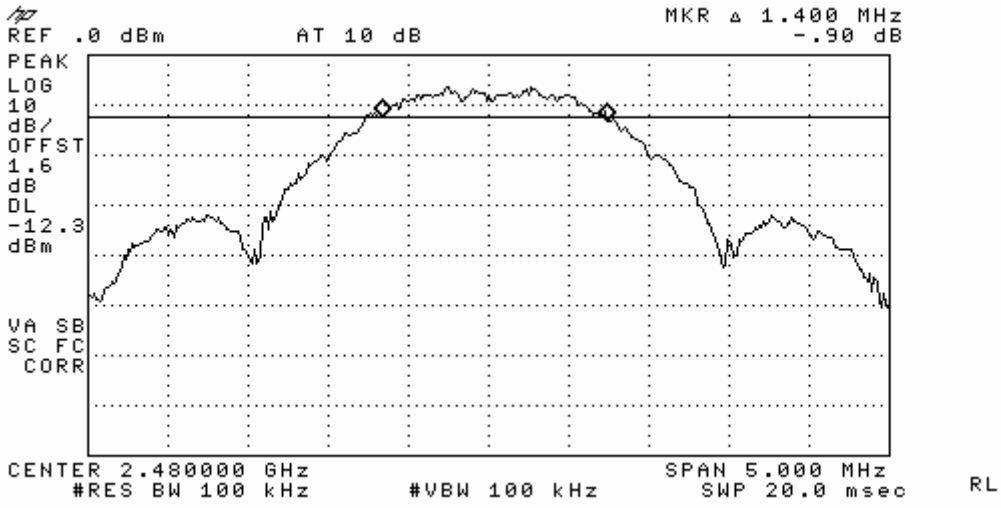
Minimum Standard:

6 dB Bandwidth > 500kHz

Cradle DATA







3.2.2 Output Power Measurement

Procedure:

The peak output power was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels..

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 10 MHz (approximately 5 times of the 20 dB bandwidth)

RBW = 3 MHz (greater than the 20dB bandwidth of the emission being measured)

VBW = 3 MHz (VBW ≥ RBW) Detector function = peak

Trace = max hold Sweep = auto

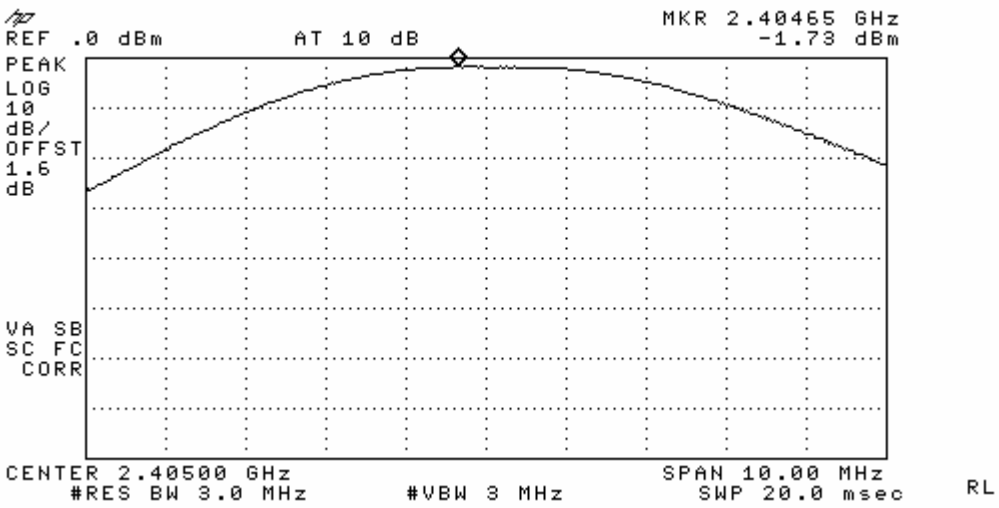
Measurement Data:

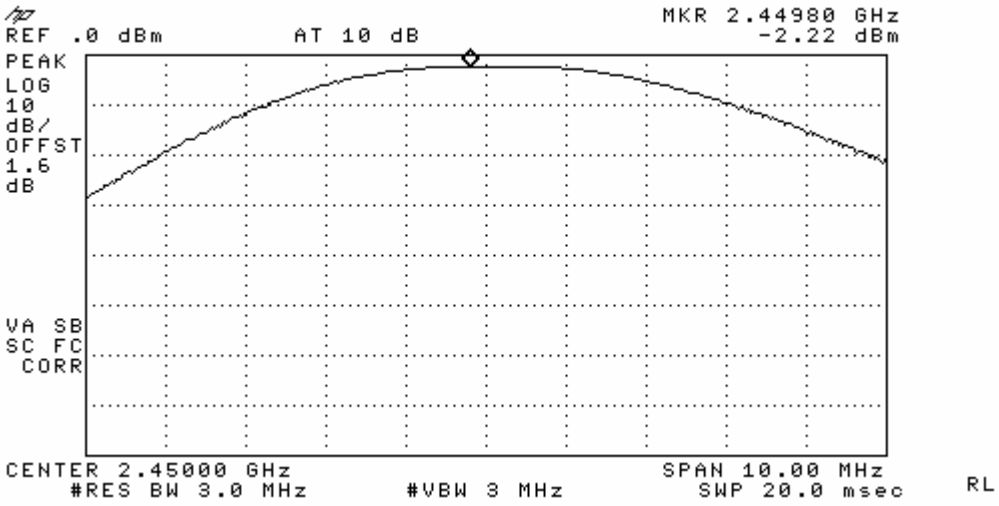
Frequency (MHz)	Cradle Test Results		
	dBm	mW	Result
2405	**-1.73**	**0.6714**	Complies
2445	**-2.22**	**0.5998**	Complies
2480	**-3.02**	**0.4989**	Complies

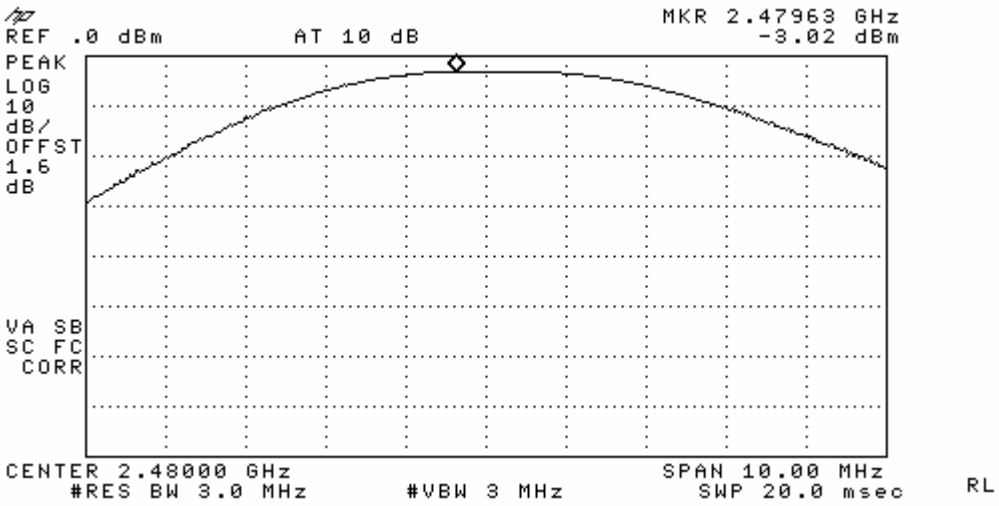
- See next pages for actual measured spectrum plots.

Minimum Standard:	< 1W

Cradle DATA







3.2.3 Power Spectral Density

Procedure:

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = VBW = 3 kHz Span = 100 KHz

Sweep = 1000 sec Trace = max hold

Detector function = peak

Measurement Data:

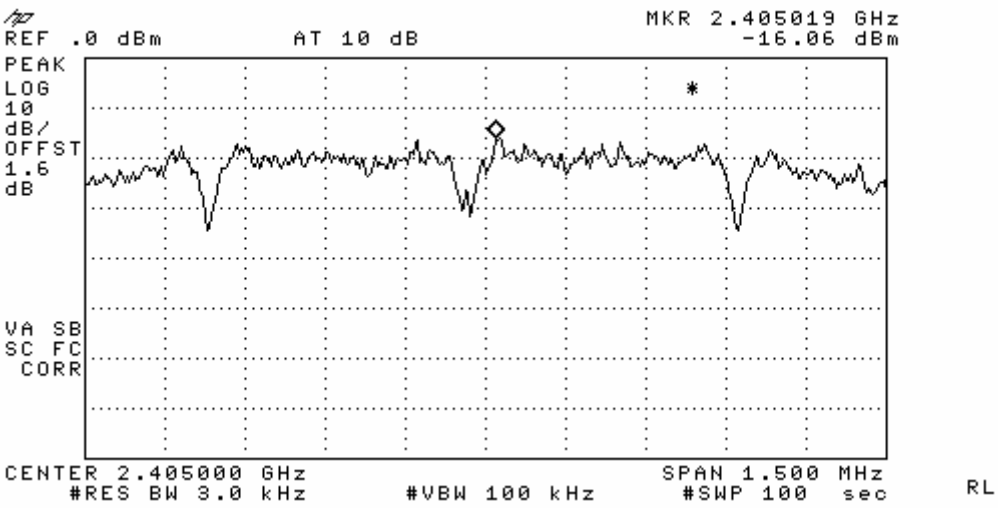
Frequency (MHz)	Cradle Test Results	
	dBm	Result
2405	**-16.06**	Complies
2445	**-16.79**	Complies
2480	**-17.08**	Complies

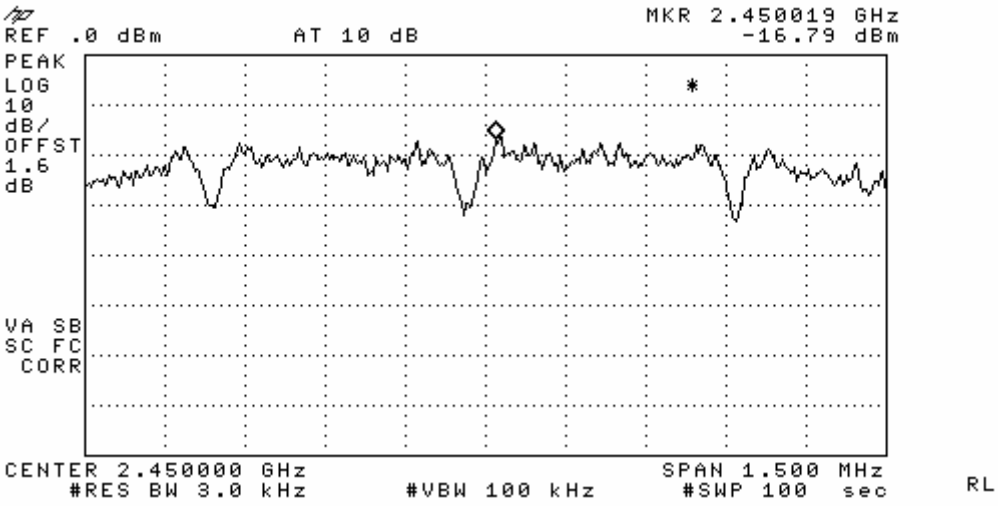
See next pages for actual measured spectrum plots.

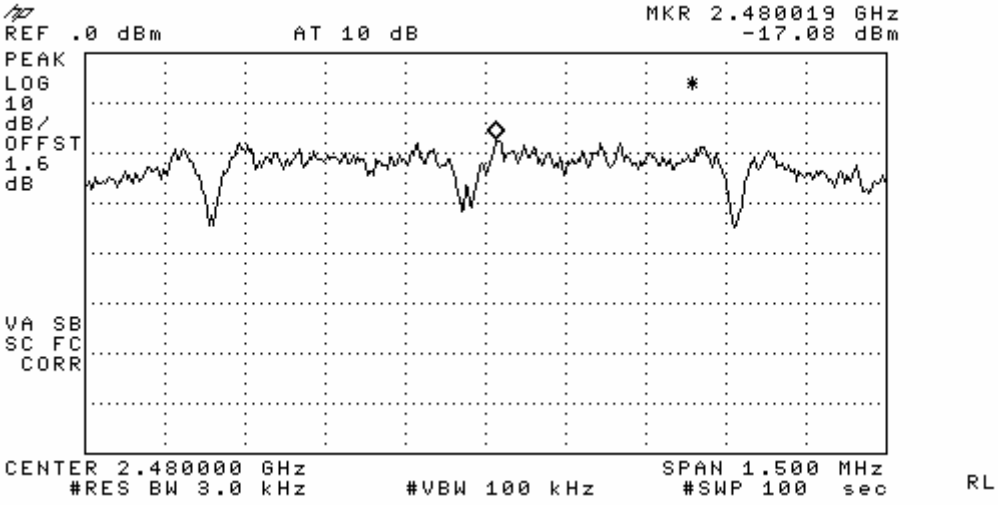
Minimum Standard:

Power Spectral Density	< 8dBm @ 3kHz BW

Cradle DATA







3.2.4 Band - edge

Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz	VBW = 100 kHz
Span = 20 MHz	Detector function = peak
Trace = max hold	Sweep = auto

Measurement Data: Complies

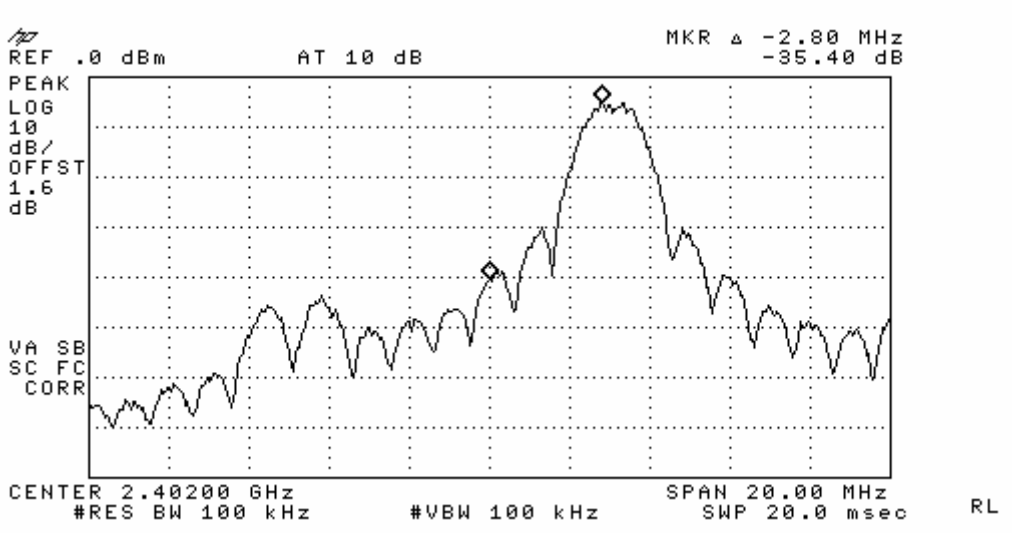
- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

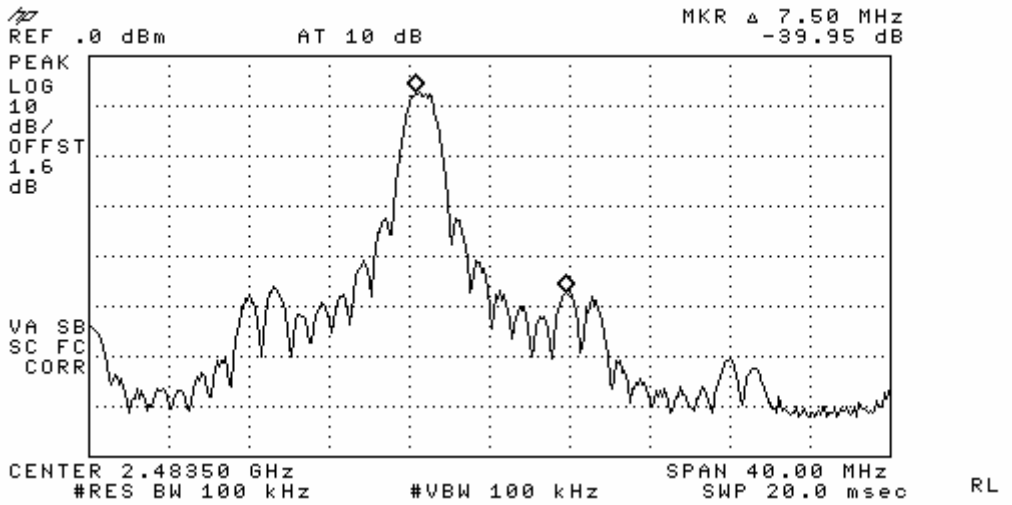
Minimum Standard:	> 20 dBc

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

Cradle Band–edge Measurements





Band-edges in the restricted band 2483.5 ~ 2500 MHz measurement

- **Document DA 00-705 Marker Delta Method**

Frequency (MHz)	Detect mode	Pol.	Reading (dBuV/m)	T.F (dB)	Step 1 Data	delta	Step 3 Data	Limit
2480	PK	V	62.17	34.6	96.77	39.95	56.82	74
	AV	V	52.8	34.6	87.4	39.95	47.45	54

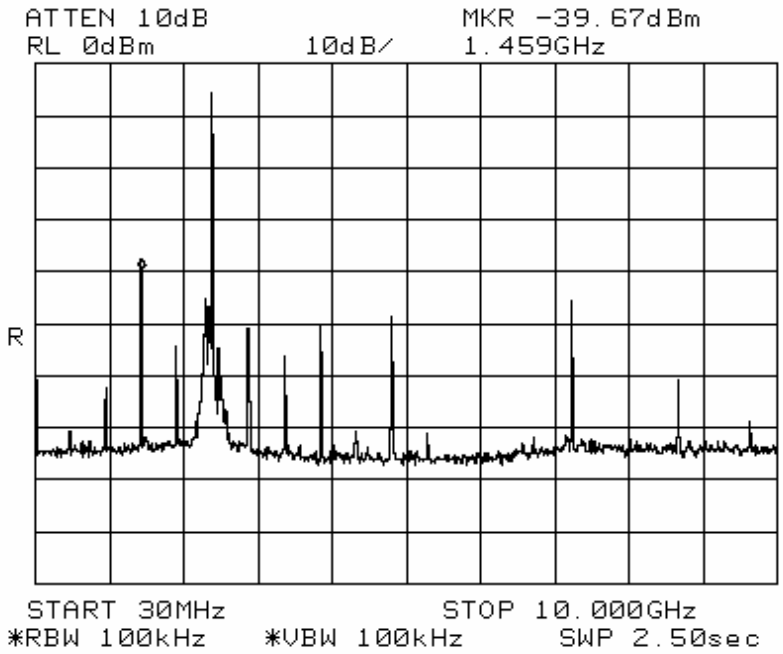
Note) Step 1 = Reading + T.F

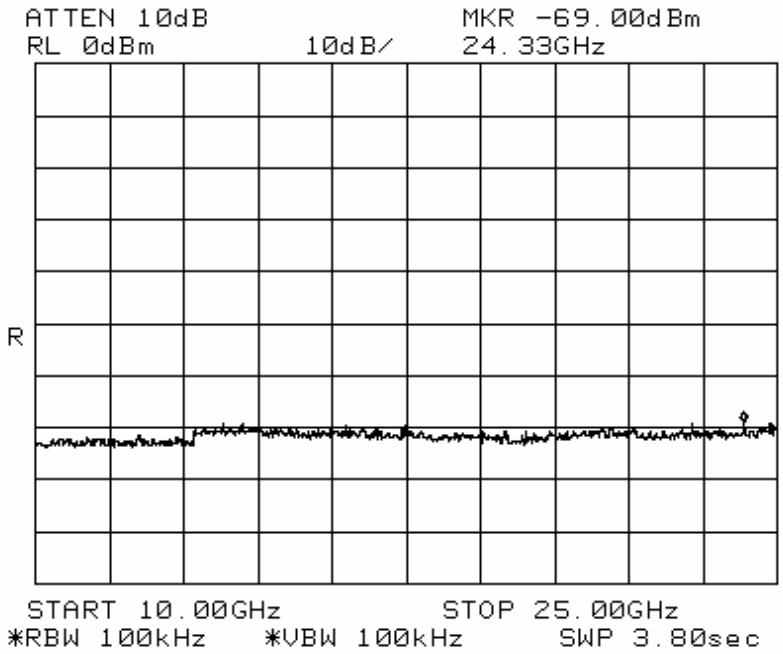
T.F = Ant.F + Cable loss

Step 3 = Step 1 – Delta Value

Cradle data --- **Band - edge (at 20 dB blow) – Low channel**

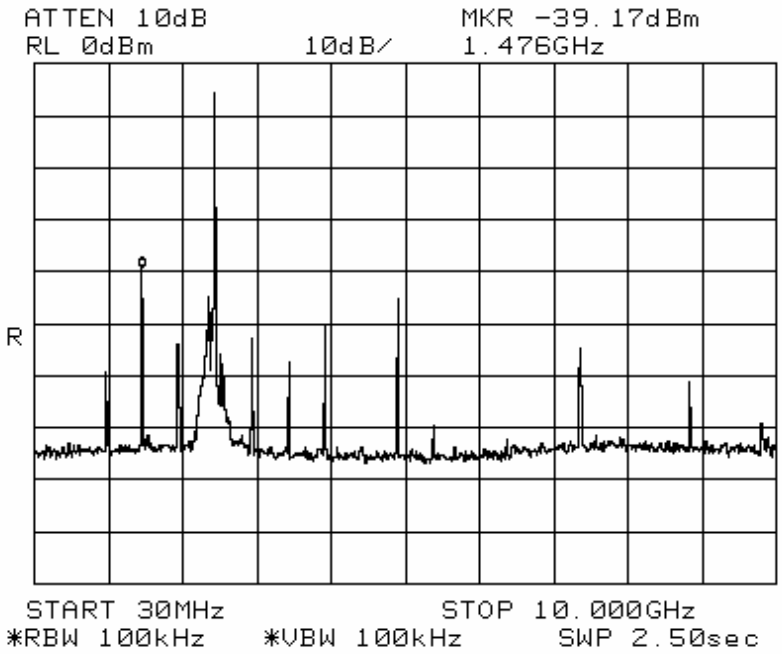
Frequency Range = 30 MHz ~ 10th harmonic.

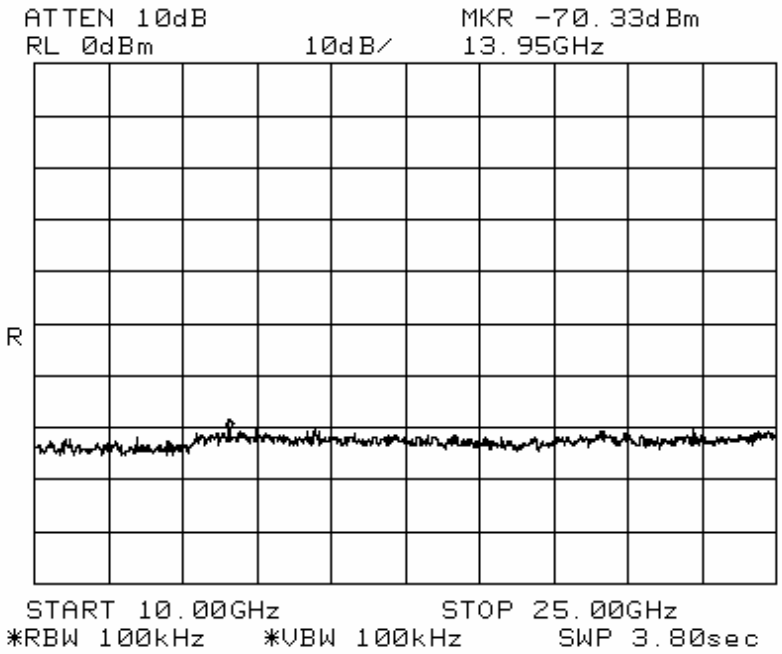




Cradle data --- **Band - edge (at 20 dB blow) – Mid channel**

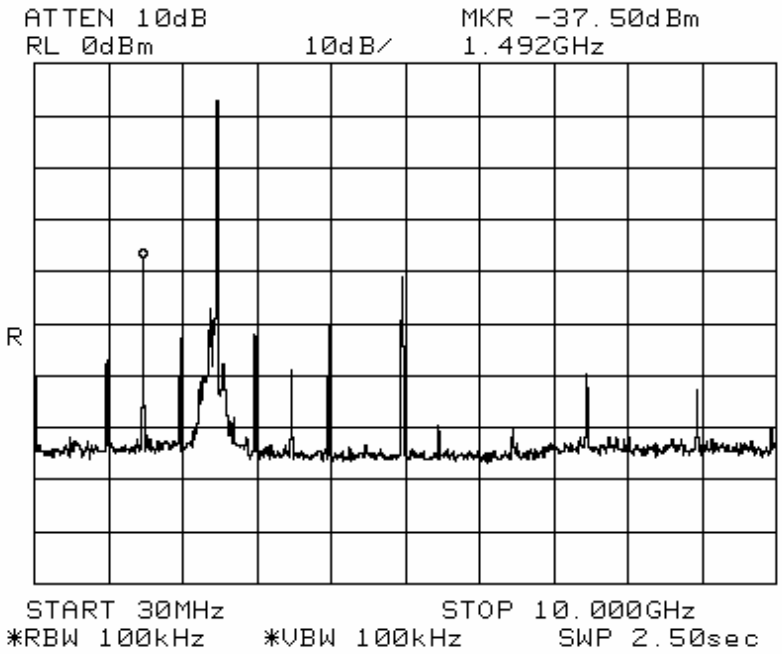
Frequency Range = 30 MHz ~ 10th harmonic.

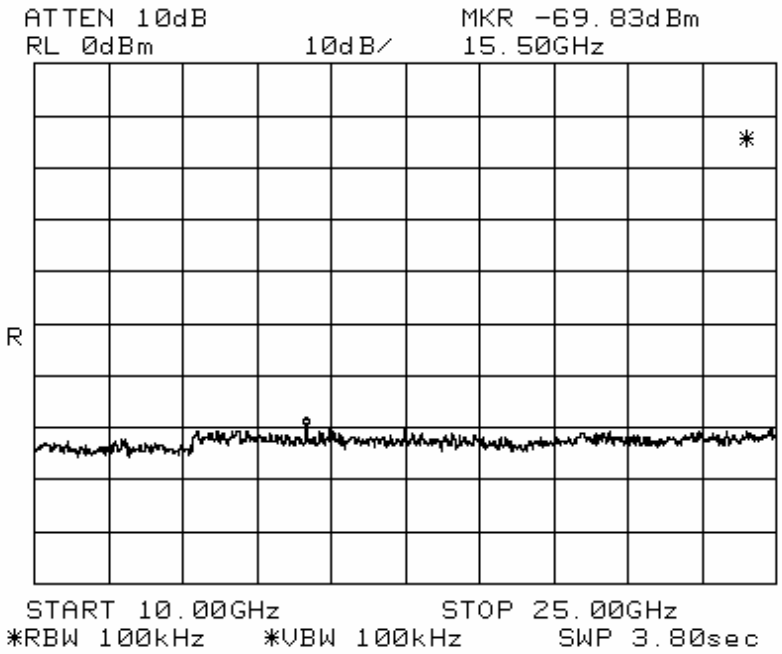




Cradle data --- **Band - edge (at 20 dB blow) – High channel**

Frequency Range = 30 MHz ~ 10th harmonic.





3.2.5 Field Strength of Harmonics

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 ~ 10th harmonic.

RBW = 100 kHz (30MHz ~ 1 GHz) VBW ≥ RBW

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz Detector function = Peak / Average

Trace = max hold Sweep = auto

Measurement Data: Complies

→ Refer to the next page

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.

Measurement Data:

1. PEAK data

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**
1443	48.31	1470	49.13	1488	51.16
2325	51.78	2369	53.27	2400	55.21
2887	44.92	2940	43.15	2975	41.47
3847	52.33	3920	50.01	2560	43.08
4809	56.27	4899	58.33	4961	55.16
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

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

2. AVERAGE data

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**	**Frequency (MHz)**	**Level (dBuV/m)**
1443	46.70	1470	47.54	1488	49.40
2325	52.59	2369	51.06	2400	53.02
2887	43.64	2940	42.88	2975	40.52
3847	49.06	3920	48.20	2560	41.66
4809	45.17	4899	49.19	4961	44.07
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

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

Cradle data

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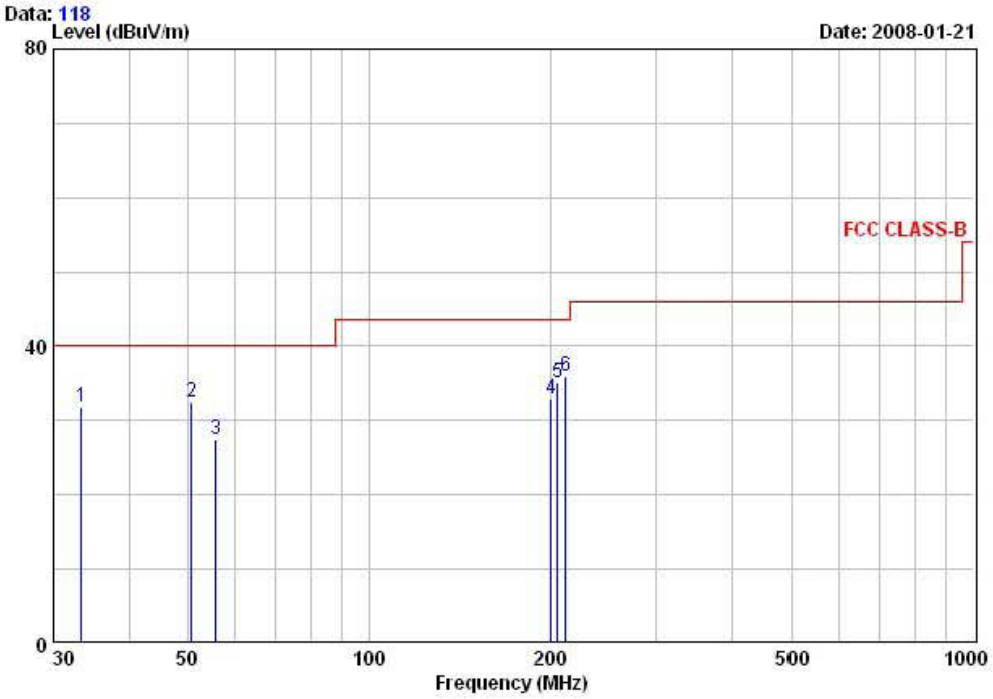
EUT/Model No.: FX-853C (CRADLE) TEST MODE: Zigbee mode

Temp Humi : 12/ 34 Tested by: B.S.KIM



	Freq	Reading	C.F	Result QK	Limit	Margin	Height	Angle	Polarity
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
1	33.38	45.10	-13.26	31.84	40.00	8.16	100	37	VERTICAL
2	50.78	45.30	-12.84	32.46	40.00	7.54	100	307	VERTICAL
3	55.75	40.30	-12.90	27.40	40.00	12.60	100	36	VERTICAL
4	200.31	46.20	-13.21	32.99	43.50	10.51	297	181	HORIZONTAL
5	205.34	48.20	-13.05	35.15	43.50	8.35	100	224	VERTICAL
6	212.36	48.70	-12.83	35.87	43.50	7.63	300	243	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

3.2.6 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 emissions were detected at a level greater than 10dB below limit.

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

Frequency Range (MHz)	Conducted Limit (dBuV)	
	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

AC Conducted Emissions –Line

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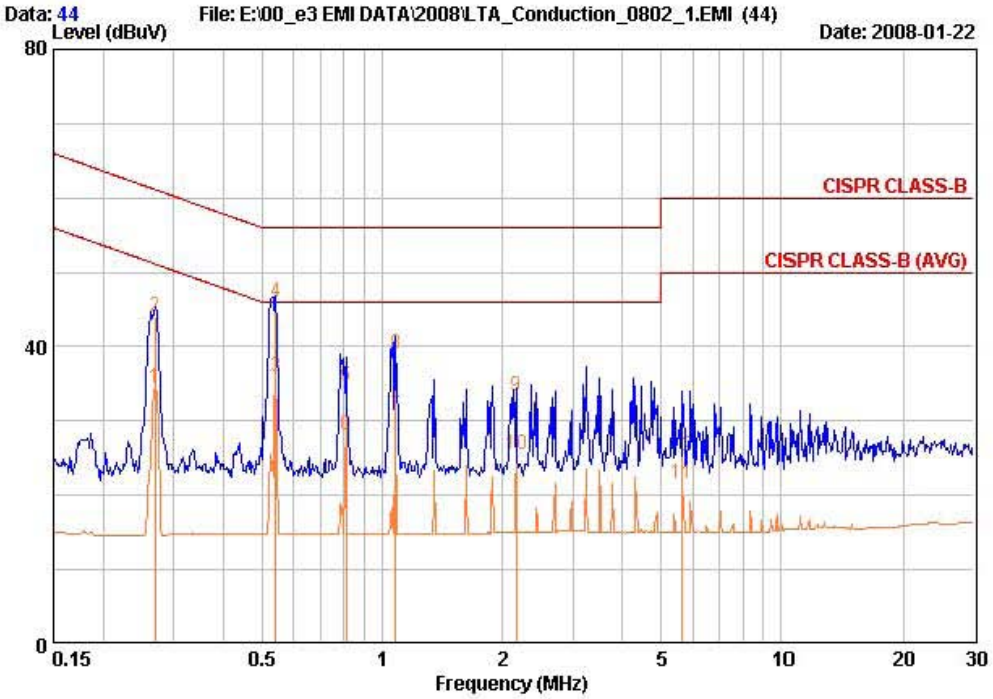
EUT / Model No.	: FX-853C	Phase	: LINE
Test Mode	: Zigbee mode	Test Power	: 120 / 60
Temp./Humi.	: 19 / 22	Test Engineer	: B.S.KIM



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
0.270	43.80	34.27	0.25	44.05	34.52	61.12	51.12	17.06	16.59
0.541	45.60	35.71	0.29	45.89	36.00	56.00	46.00	10.11	10.00
0.813	34.30	27.70	0.40	34.70	28.10	56.00	46.00	21.30	17.90
1.082	38.60	30.45	0.32	38.92	30.77	56.00	46.00	17.08	15.23
2.167	32.80	24.98	0.47	33.27	25.45	56.00	46.00	22.73	20.55
5.653	24.80	21.10	0.58	25.38	21.68	60.00	50.00	34.62	28.32

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

AC Conducted Emissions -Neutral

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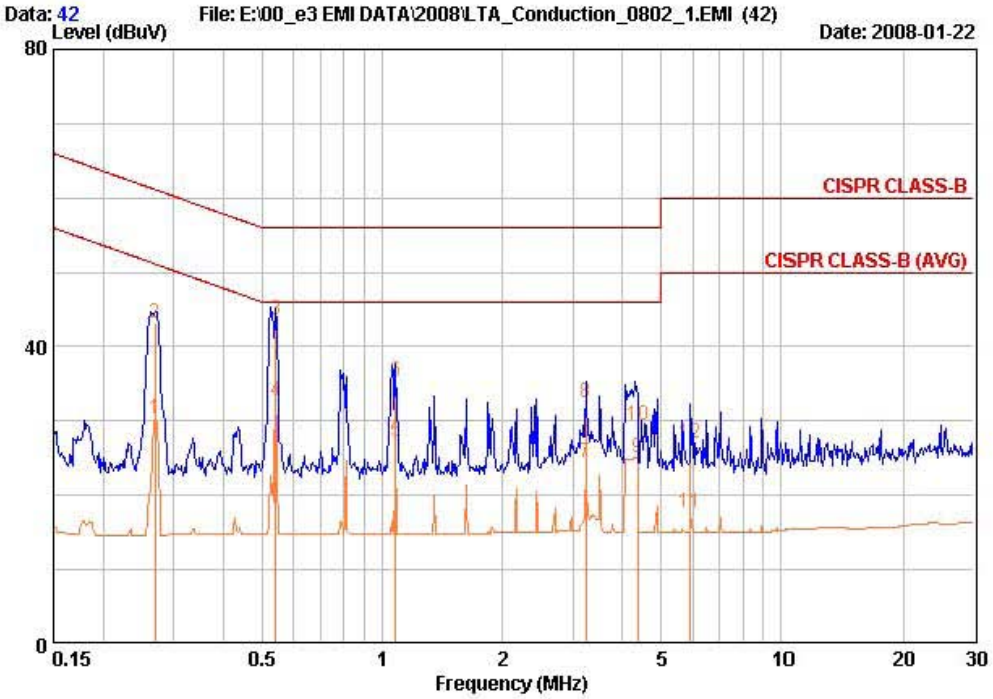
Fax:+82-31-323-6010

EUT / Model No.	: FX-853C	Phase	: NEUTRAL
Test Mode	: Zigbee mode	Test Power	: 120 / 60
Temp./Humi.	: 19 / 22	Test Engineer	: B.S.KIM



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.270	42.80	30.00	0.25	43.05	30.25	61.12	51.12	18.06	20.86
0.541	43.30	32.40	0.29	43.59	32.69	56.00	46.00	12.41	13.31
1.082	35.00	27.02	0.32	35.32	27.34	56.00	46.00	20.68	18.66
3.241	31.90	23.76	0.61	32.51	24.37	56.00	46.00	23.49	21.63
4.361	28.90	24.50	0.46	29.36	24.96	56.00	46.00	26.64	21.04
5.929	26.50	17.00	0.59	27.09	17.59	60.00	50.00	32.91	32.41

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

APPENDIX 1

Maximum Permissible Exposure Calculations

** MPE Calculations **

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

EIRP = P + G	Where, P = Power input to the antenna (mW) G = Power gain of the antenna (dBi)
EIRP = -1.73 dBm + 1.45dBi	
EIRP =-0.28dBm	

Power density at the specific separation:

$S = PG/(4R^2\pi)$ $S = (0.67 * 1.4) / (4 * 20^2 * \pi)$ $S = 0.0002$ mW/cm^2	Where, S = Maximum power density (mW/cm^2) P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The Maximum permissible exposure (MPE) for the general population is 1 mW/cm^2 .
The power density at 20cm does not exceed the 1 mW/cm^2 limit. Therefore, the exposure condition is compliant with FCC rules.

Estimated safe separation:

$R = \sqrt{(PG / 4\pi)}$ $R = \sqrt{(0.67 * 1.4 / 4\pi)}$ R = 0.27Cm	Where, P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The numeric gain(G) of the antenna with a gain specified in dB is determined by:

$G = Log^{-1}$ (dB antenna gain / 10)
$G = Log^{-1}$ (1.45 / 10)
G = 1.4

APPENDIX 2

TEST EQUIPMENT USED FOR TESTS

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