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SAMMI

Dates of Tests: June 28 ~ July 07, 2006
Test Report S/N: LR500110607D
Test Site : LTA CO., LTD.

CERTIFICATIO OF COMPLIANCE

FCC ID. **RQKSMARTCOMPACT**

APPLICANT **SAMMI Information Systems Co., Ltd.**

FCC Classification	:	**Digital Transmission System (DTS)**
		FCC Part 15 Spread Spectrum Transceiver (DSS)
Manufacturing Description	:	**Industrial PDA**
Manufacturer	:	**SAMMI Information Systems Co., Ltd.**
Model name	:	**SmartCompact**
Test Device Serial No.:	:	**SM00250909**
Rule Part(s)	:	**FCC Part 15.247 Subpart C; ANSI C-63.4-2003**
Frequency Range	:	**2412MHz ~ 2462MHz (DSSS/OFDM)**
		2402 ~ 2480MHz (Bluetooth)
Max. Output Power	:	**14.6dBm Peak Conducted (802.11b)**
		13.3dBm Peak Conducted (802.11g)
		1.52dBm Peak Conducted (bluetooth)
Data of issue	:	**July 10, 2006**

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

NVLAP LAB Code.: 200723-0

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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
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E-mail : 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	2006-09-30	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

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2. Information's about test item

2-1 Client

Company name	:	SAMMI Information Systems Co., Ltd.
Address	:	496,wonchun-dong, yeongtong-ku, suwon, kyung ki-do, Korea
Tel / Fax	:	+82-31-217-8252 / +82-31-217-8254

2-2 Manufacturer

Company name	:	Universal Scientific Industrial Co., Ltd.
Address	:	141, Lane 351, Taiping Road, Sec. 1, Tsao-Tuen, Taiwan,

2-3 Equipment Under Test (EUT)

Trade name	:	Industrial PDA
FCC ID	:	RQKSMARTCOMPACT
Model name	:	SmartCompact
Serial number	:	8601-600160-30
Combo RF Module	:	FCC ID: RQKWMBGMR01
Date of receipt	:	June 12, 2006
EUT condition	:	Production, not damaged
Antenna type	:	PIFA Antenna with 3.31dBi gain for 802.11B/G PIFA Antenna with 2.81dBi gain for Bluetooth
Frequency Range	:	2412MHz ~ 2462MHz (DSSS/OFDM) 2402 ~ 2480MHz (Bluetooth)
RF output power Range	:	14.6 dBm Peak Conducted (802.11b) 13.3 dBm Peak Conducted (802.11g) 1.52 dBm Peak Conducted (Bluetooth)
Number of channels	:	11(DSSS/OFDM), 79(Bluetooth)
Type of Modulation	:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM GFSK for Bluetooth
Transfer Rate	:	11/5.5/2/1Mbps for 802.11b 54/48/36/24/18/12/9/6Mbps for 802.11g
Duty cycle TX power	:	78.4% (Bluetooth)
Power Source (Adaptor)	:	Input: 100-240Vac, 50/60Hz, 0.6A Output: 5V, 3A, 15Wmax

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2-4 Tested frequency

	LOW	MID	HIGH
Frequency (MHz) for Bluetooth	2402	2441	2480
Frequency (MHz) for 802.11b	2412	2437	2462
Frequency (MHz) for 802.11g	2412	2437	2462

2-5 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
PC	Dimension TM 3000	8D2SF1S	DELL
Monitor	1704FPT	568	DELL
Keyboard	SK-8110	1030	DELL
Mouse	MO56UO	510022473	DELL
Speaker	MS-760	N/A	SHENEHEN SHI
Print	Deskjet 600K	SG7631B1XX	HP
earphone	N/A	N/A	N/A

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3. Test Report

3.1 Summary of tests

	Parameter	Limit	Test Condition	Status (note 1)
I. FCC Part Section(s)				
Combo (WLAN &Bluetooth) Module is certified by FCC(FCC ID: RQKWMBGMR01).				
II. Additional items				
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

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3.2 Technical Characteristics Test

3.2.1 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

Trace = max hold Sweep = auto

Measurement Data: Complies

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.

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1. **Measurement Data: Bluetooth mode**

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**
-	-	-	-	-	-
No emissions were detected at a level greater than 10dB below limit.					
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

2. **Measurement Data: 802.11b mode**

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**
-	-	-	-	-	-
No emissions were detected at a level greater than 10dB below limit.					
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

3. **Measurement Data: 802.11g mode**

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**
-	-	-	-	-	-
No emissions were detected at a level greater than 10dB below limit.					
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

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4. Measurement Data: other spurious

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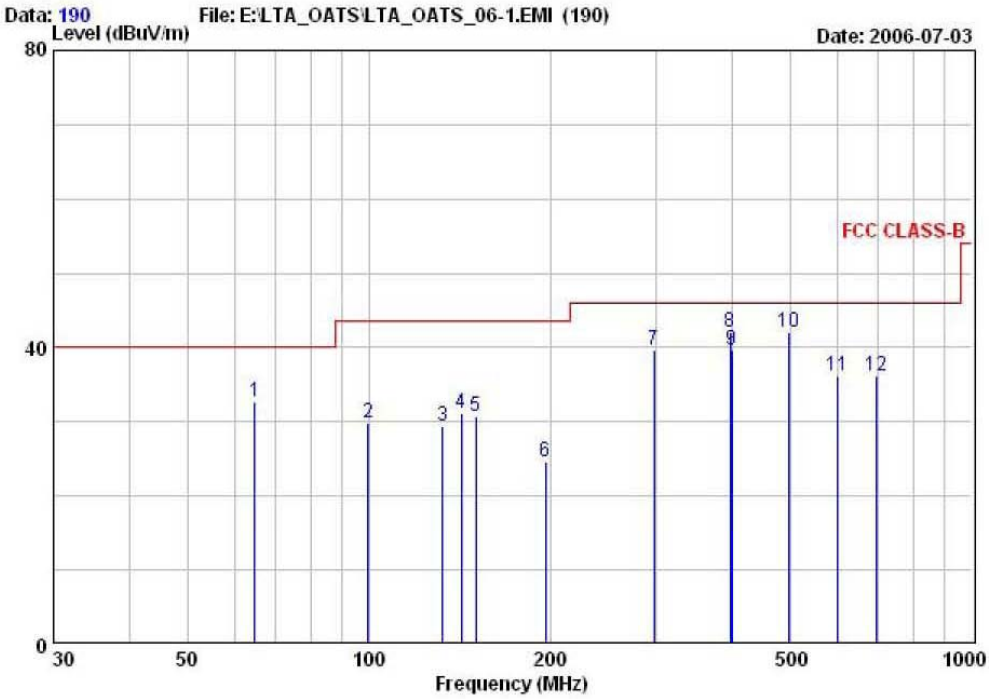
EUT/Model No.: SMART COMPACT Temp/Humi: 23 / 59

Test Mode : USB mode Tested by: K. T. LEE



	Freq MHz	Reading(QP) dBuV	C.F dB	Result(QP) dBuV/m	Limit dBuV/m	Margin dB	Height cm	Angle deg	Polarity
1	64.66	51.69	-18.89	32.80	40.00	7.20	169	25	VERTICAL
2	99.64	45.05	-15.30	29.75	43.50	13.75	200	340	VERTICAL
3	132.51	40.66	-11.20	29.46	43.50	14.04	145	230	VERTICAL
4	142.25	41.69	-10.47	31.22	43.50	12.28	369	30	HORIZONTAL
5	150.30	40.67	-9.95	30.72	43.50	12.78	166	245	VERTICAL
6	196.59	32.48	-7.94	24.54	43.50	18.96	100	200	VERTICAL
7	297.33	43.19	-3.47	39.72	46.00	6.28	400	159	HORIZONTAL
8	397.43	50.98	-8.99	41.99	46.00	4.01	350	278	HORIZONTAL
9	399.25	48.64	-8.95	39.69	46.00	6.31	400	152	HORIZONTAL
10	497.42	49.15	-7.05	42.10	46.00	3.90	289	266	HORIZONTAL
11	597.32	42.15	-6.06	36.09	46.00	9.91	324	10	HORIZONTAL
12	695.30	39.87	-3.64	36.23	46.00	9.77	400	288	HORIZONTAL

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

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3.2.2 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

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AC Conducted Emissions –Line : 802.11b + Bluetooth mode

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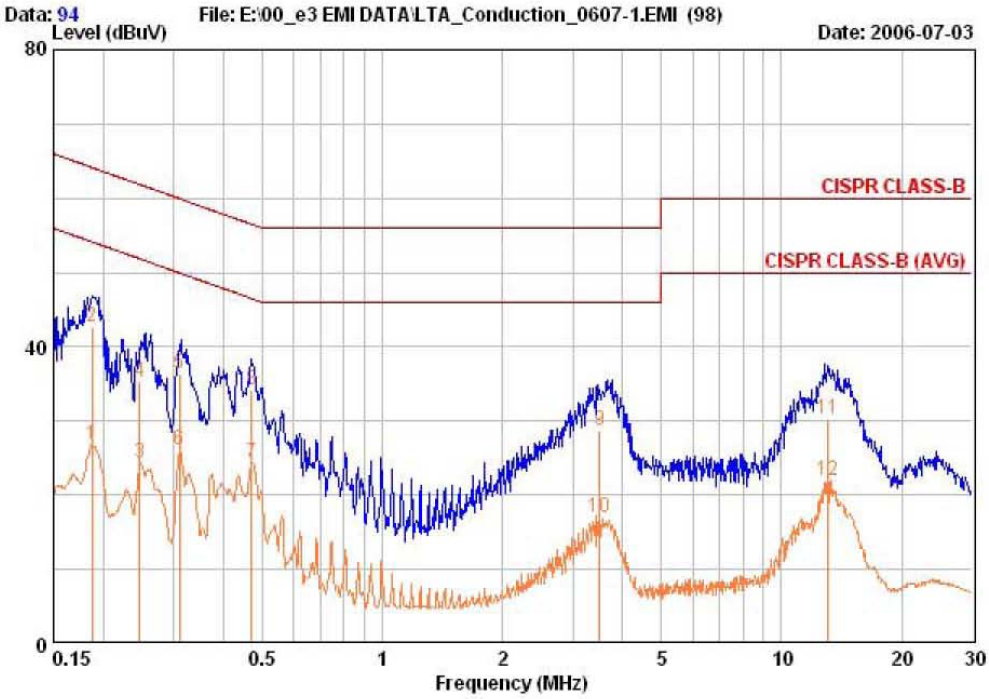
EUT / Model No.	: SmartCompact	Phase	: LINE
Test Mode	: 802.11b	Test Power	: 120 / 60
Temp./Humi.	: 24 / 77	Test Engineer	: K.T. LEE



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
0.19	42.50	26.62	0.28	42.78	26.90	64.15	54.15	21.37	27.25
0.25	35.00	24.08	0.23	35.23	24.31	61.86	51.86	26.63	27.55
0.31	36.20	25.86	0.29	36.49	26.15	59.97	49.97	23.48	23.82
0.47	33.90	24.11	0.32	34.22	24.43	56.49	46.49	22.28	22.07
3.51	28.30	16.55	0.54	28.84	17.09	56.00	46.00	27.16	28.91
13.06	29.30	20.90	1.07	30.37	21.97	60.00	50.00	29.63	28.03

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

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AC Conducted Emissions –Neutral: 802.11b + Bluetooth mode

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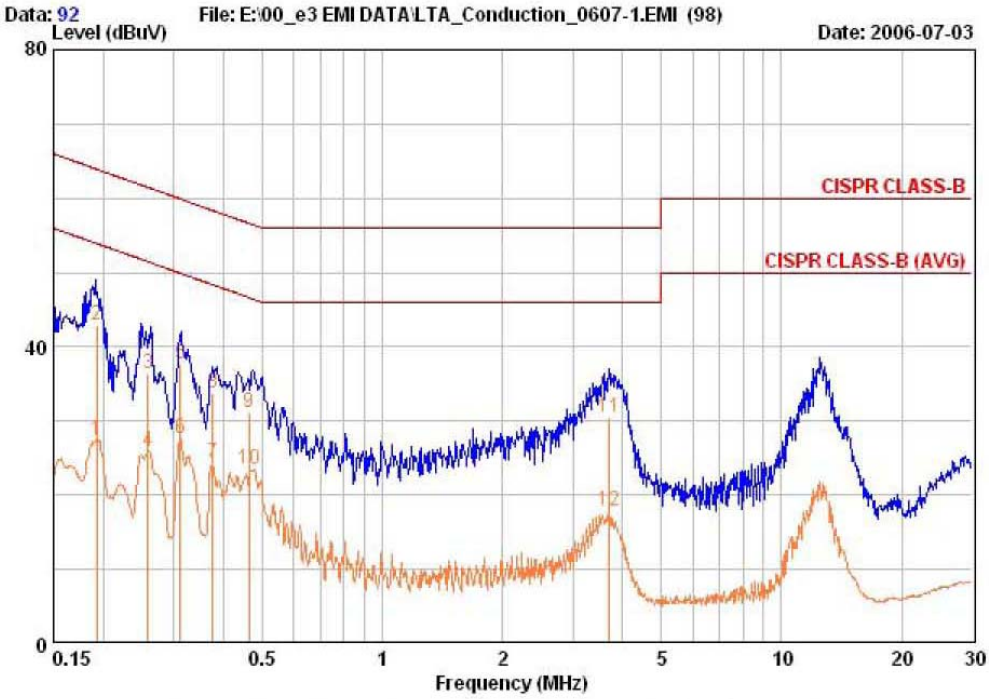
EUT / Model No.	: SmartCompact	Phase	: NEUTRAL
Test Mode	: 802.11b	Test Power	: 120 / 60
Temp./Humi.	: 24 / 77	Test Engineer	: K.T. LEE



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
0.19	42.70	27.20	0.24	42.94	27.44	63.93	53.93	20.99	26.49
0.26	36.10	25.81	0.24	36.34	26.05	61.47	51.47	25.13	25.42
0.31	37.40	27.46	0.29	37.69	27.75	59.93	49.93	22.24	22.18
0.38	33.40	23.97	0.36	33.76	24.33	58.39	48.39	24.63	24.06
0.46	30.90	23.25	0.32	31.22	23.57	56.63	46.63	25.41	23.06
3.70	30.10	17.34	0.45	30.55	17.79	56.00	46.00	25.45	28.21

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

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AC Conducted Emissions –Line : 802.11g + Bluetooth mode

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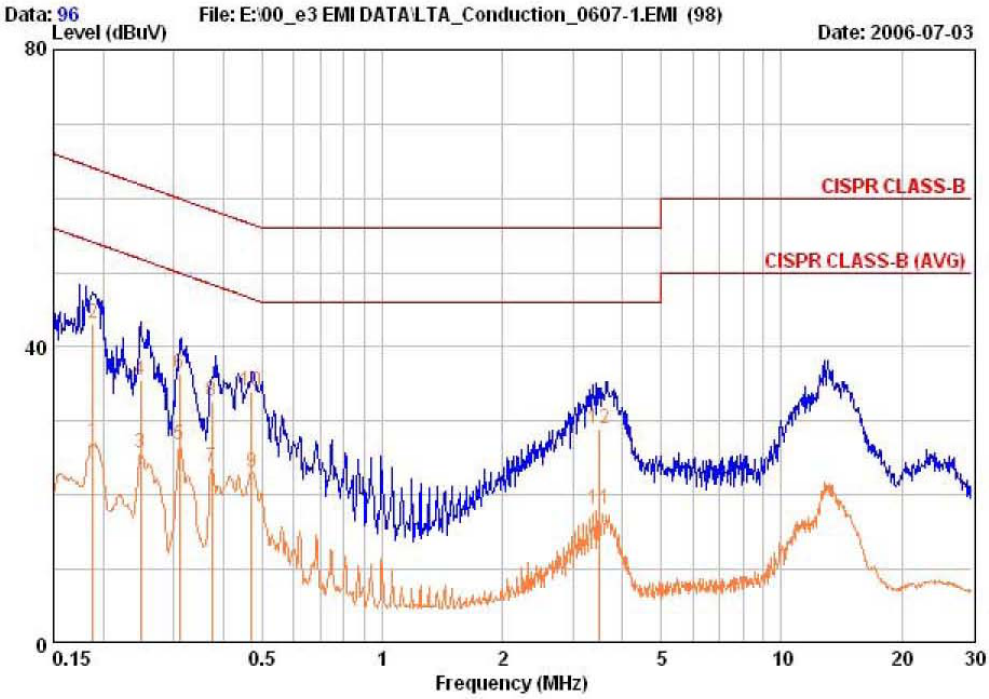
EUT / Model No.	: SmartCompact	Phase	: LINE
Test Mode	: 802.11g	Test Power	: 120 / 60
Temp./Humi.	: 24 / 77	Test Engineer	: K.T. LEE



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
0.19	42.80	26.95	0.27	43.07	27.22	64.11	54.11	21.03	26.88
0.25	35.30	25.47	0.23	35.53	25.70	61.82	51.82	26.29	26.12
0.31	36.20	26.45	0.29	36.49	26.74	59.97	49.97	23.48	23.23
0.37	32.30	23.49	0.36	32.66	23.85	58.43	48.43	25.77	24.58
0.47	33.60	22.74	0.32	33.92	23.06	56.49	46.49	22.58	23.44
3.51	28.40	17.53	0.54	28.94	18.07	56.00	46.00	27.06	27.93

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

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AC Conducted Emissions –Neutral: 802.11g + Bluetooth mode

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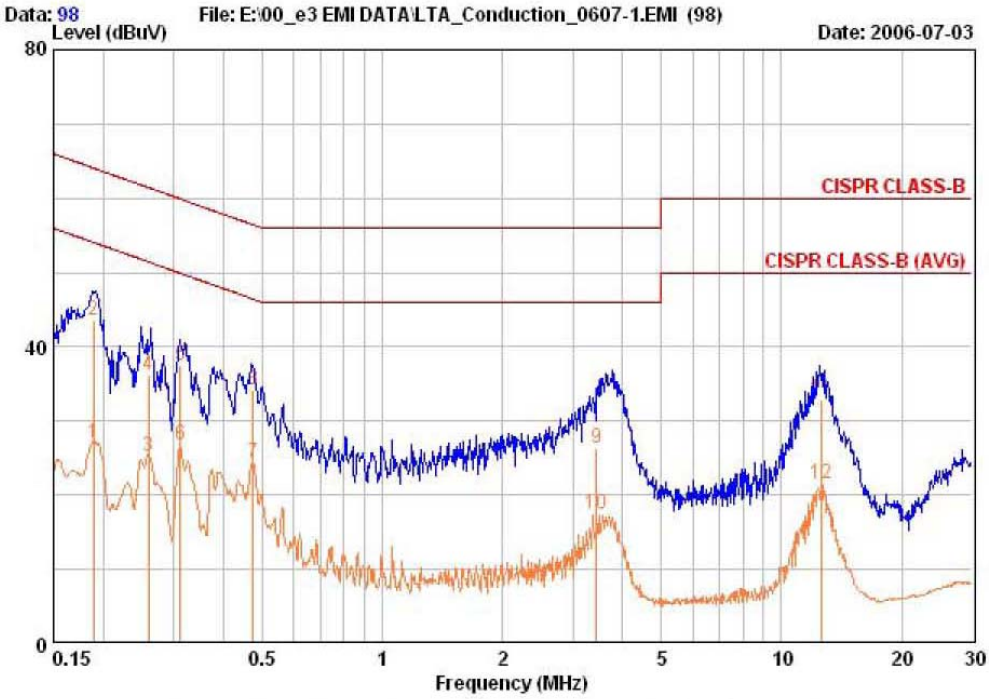
EUT / Model No.	: SmartCompact	Phase	: NEUTRAL
Test Mode	: 802.11g	Test Power	: 120 / 60
Temp./Humi.	: 24 / 77	Test Engineer	: K.T. LEE



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
0.19	43.30	26.87	0.26	43.56	27.13	64.06	54.06	20.50	26.93
0.26	36.00	25.12	0.24	36.24	25.36	61.42	51.42	25.18	26.06
0.31	37.20	26.54	0.29	37.49	26.83	59.93	49.93	22.44	23.10
0.47	34.00	24.05	0.31	34.31	24.36	56.45	46.45	22.14	22.09
3.44	25.90	16.95	0.52	26.42	17.47	56.00	46.00	29.58	28.53
12.58	32.00	20.50	0.99	32.99	21.49	60.00	50.00	27.01	28.51

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

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AC Conducted Emissions –Line : PC link mode

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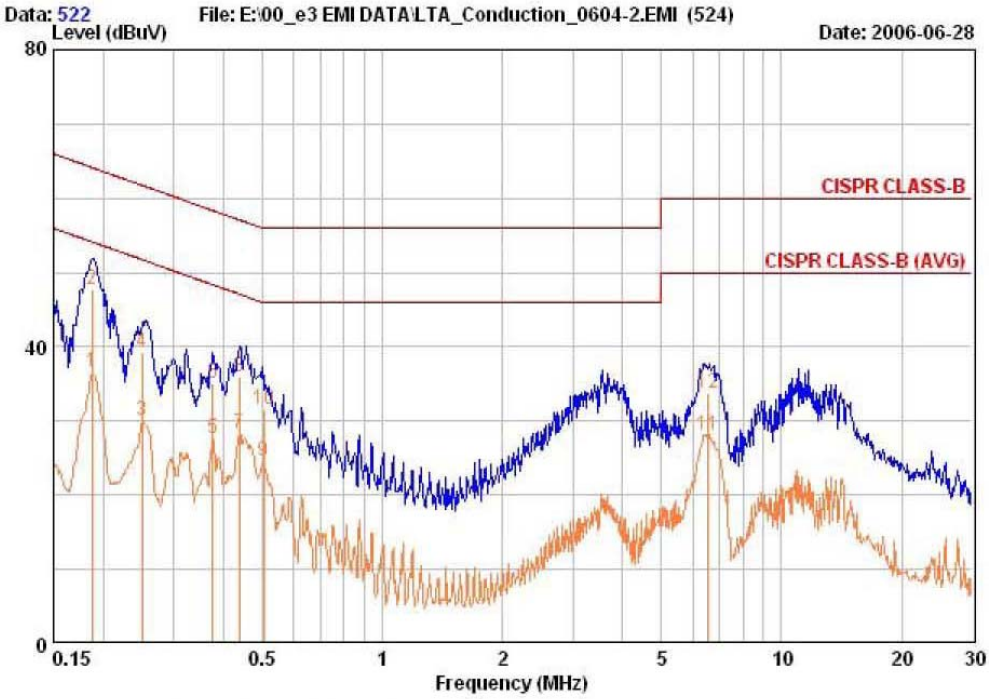
EUT / Model No.	: 삼미 PDA	Phase	: LINE
Test Mode	: File up/down Mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 39	Test Engineer	: K.T. LEE



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
0.19	47.50	36.27	0.28	47.78	36.55	64.15	54.15	16.37	17.60
0.25	39.10	29.82	0.23	39.33	30.05	61.73	51.73	22.40	21.68
0.38	34.80	27.36	0.36	35.16	27.72	58.39	48.39	23.23	20.67
0.44	35.70	28.04	0.35	36.05	28.39	57.11	47.11	21.06	18.72
0.50	31.40	24.32	0.29	31.69	24.61	56.00	46.00	24.31	21.39
6.52	33.20	27.59	0.56	33.76	28.15	60.00	50.00	26.24	21.85

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

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AC Conducted Emissions –Neutral: PC link mode

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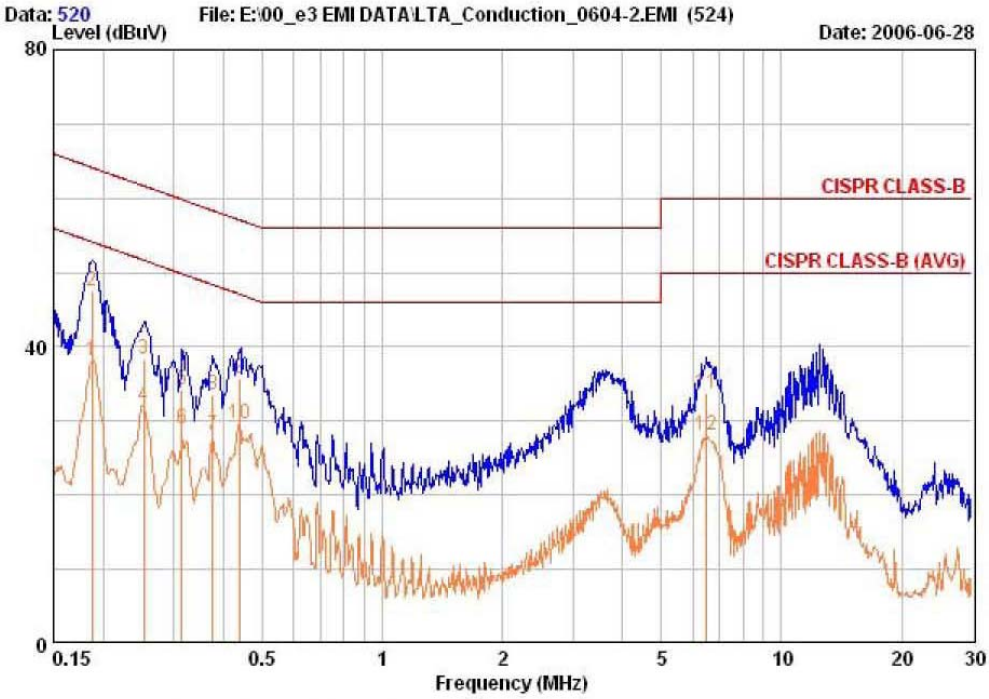
EUT / Model No.	: 삼미 PDA	Phase	: NEUTRAL
Test Mode	: File up/down Mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 39	Test Engineer	: K.T. LEE



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
0.19	47.20	37.93	0.28	47.48	38.21	64.15	54.15	16.67	15.94
0.25	38.10	31.87	0.23	38.33	32.10	61.69	51.69	23.36	19.59
0.31	33.90	28.77	0.29	34.19	29.06	59.84	49.84	25.64	20.77
0.38	33.30	27.66	0.36	33.66	28.02	58.39	48.39	24.73	20.37
0.44	35.40	29.23	0.34	35.74	29.57	57.11	47.11	21.37	17.54
6.45	33.30	27.65	0.53	33.83	28.18	60.00	50.00	26.17	21.82

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

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APPENDIX

TEST EQUIPMENT USED FOR TESTS

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	Description	Model No.	Serial No.	Manufacturer	Next Cal. Date
1	Spectrum Analyzer	8594E	3649A03649	HP	Dec-06
2	Signal Generator	8657A	3430U02049	HP	Dec-06
3	Attenuator (3dB)	8491A	37822	HP	Dec-06
4	Attenuator (3dB)	8491A	28881	HP	Dec-06
5	EMI Test Receiver	ESVD	843748/001	R&S	Dec-06
6	Spectrum Analyzer	8591E	3649A05888	HP	Jan-07
7	Spectrum Analyzer	8563E	3425A02505	HP	Jan-07
8	RF Amplifier	8447D	2949A02670	HP	Jan-07
9	RF Amplifier	8447D	2439A09058	HP	Jan-07
10	RF Amplifier	8449B	3008A02126	HP	Jun-07
11	TRILOG Antenna	VULB 9160	9160-3172	SCHWARZBECK	Feb-07
12	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	Feb-07
13	Biconical Antenna	BBA 9106	VHA 9103-2315	SCHWARZBECK	Feb-07
14	Horn Antenna	3115	00055005	ETS LINDGREN	Jun-07
15	Horn Antenna	BBHA 9120D	0499	Schwarzbeck	Jun-07
16	Hygro-Thermograph	THB-36	0041557-01	ISUZU	Feb-07
17	Splitter (BNC)	ZFM-150	15542	Mini-Circuits	-
18	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-
19	Power Divider	11636A	6243	HP	Apr-07
20	DC Power Supply	6622A	3448A03079	HP	Apr-07
21	Attenuator (30dB)	8498A	1801A06689	HP	Apr-07
22	Attenuator (10dB)	8491A	63196	HP	Apr-07
23	Power Meter	EPM-441A	GB32481702	HP	Apr-07
24	Power Sensor	8481A	2702A64048	HP	Apr-07
25	Audio Analyzer	8903B	3729A18901	HP	May-07
26	Modulation Analyzer	8901B	3749A05878	HP	May-07
27	Dipole Antenna	VHA9103	2116	Schwarzbeck	Oct-06
28	Dipole Antenna	VHA9103	2117	Schwarzbeck	Oct-06
29	Dipole Antenna	UHA9105	2261	Schwarzbeck	Oct-06
30	Dipole Antenna	UHA9105	2262	Schwarzbeck	Oct-06
31	Digital Multimeter	34401A	US36062141	HP	Apr-07
32	LISN	KNW-407	8-1430-1	Kyoritsu	Jan-07
33	Two-Line V-Network	ESH3-Z5	893045/017	R&S	Jan-07
34	Test Receiver	ESHS10	828404009	R&S	Jan-07
35	TEMP & HUMIDITY Chamber	YJ-500	L05022	JinYoung Tech	-

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