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Dates of Tests: August 11 ~ September 10, 2009
 Test Report S/N: LR500190909F
 Test Site : LTA CO., LTD.

CERTIFICATIO OF COMPLIANCE

FCC ID.

STSFLEX7000

APPLICANT

Bitel Co., Ltd.

FCC Classification	:	Licensed Portable Transmitter Worn on body (PCT)
Manufacturing Description	:	Industrial PDA POS
Manufacturer	:	Bitel Co.,Ltd.
Manufacturer (RF Module)	:	Wavecom S.A
Model name	:	Flex7000
Brand name	:	Bitel
Test Device Serial No.:	:	Identical prototype
Rule Part(s)	:	§24(E), §22(H), §2
TX Frequency Range	:	824.2 ~ 848.8 MHz (GSM850)/1850.2 ~ 1909.8 MHz (PCS1900)
RX Frequency Range	:	869.2 ~ 893.8 MHz (GSM850)/1930.2 ~ 1989.8 MHz (PCS1900)
RF Output Power	:	GSM850 (33dBm: Level 5) / PCS1900 (30dBm: Level 0)
Max. SAR Measurement	:	0.201W/kg GSM850 Body SAR 0.132W/kg PCS1900 Body SAR

This test report is issued under the authority of:

The test was supervised by:

Dong -Min J UNG, 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.
 Address : 243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822
 Web site : <http://www.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	2010-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2011-06-20	EMC accredited Lab.
FCC U.S.A		610755	2011-04-22	FCC filing
VCCI	JAPAN	R2133, C2307	2011-06-21	VCCI registration
IC CANADA		IC5799	2010-05-03	IC filing

2. Information's about test item

2-1 Client & Manufacturer

Company name : Bitel Co., Ltd.
 Address : 11F Yohyun B/D 242-29 Nonhyun-dong Gangnam-gu Seoul, 135-830, KOREA
 Tel / Fax : +82 2 545 2630/ +82 2 545 0190

2-2 Equipment Under Test (EUT)

Trade name : Industrial PDA POS
 Model name : Flex7000
 Serial number : Identical prototype
 Date of receipt : August 11, 2009
 EUT condition : Pre-production, not damaged
 GSM Module : Wavecom S.A (Q24 Plus)
 Identification mark: 0682
 Antenna type : DIPOLE ANTENNA / Gain: -2dBi
 RF output power : 1.27 W ERP GSM850 (31.02dBm)
 1.03 W EIRP PCS1900 (30.12dBm)
 Modulation : GMSK, 8PSK
 Temperature range : -30℃ ~ +60℃
 Power Source : Adaptor(ITS-006X): 100-240VAC/0.8A, 1 2VDC/3A
 Battery: Rechargeable Lithium Ion Battery 7.4VDC 1100mA

2-3 Tested frequency

Frequency	Ch.	GSM 850	Ch	PCS
Low frequency (MHz)	128	824.2 51	2	1850.2
Middle frequency (MHz)	190	836.6 66	1	1880.0
High frequency (MHz)	251	848.8 81	0	1909.8

2.4 Test conditions

Temperature	: + 15~35 ℃	Humidity	: 30~65 %RH
Pressure	: 860~1030 mbar	Operating mode	: Air link mode
GSM850	A communication link is established between the mobile station and the test simulator. The transmitter is operated at its maximum rated output power: 33 dBm (power class 4 = power control level 5)		
PCS1900	A communication link is established between the mobile station and the test simulator. The transmitter is operated at its maximum rated output power: 30 dBm (power class 1 = power control level 0)		

3. Test Report

3.1 Summary of tests

Parameter	Test Condition	Status (note 1)
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I. FCC Part Section(s)

GSM 850/1900 Terminal equipment (**Q24 Plus**) is certified by FCC(FCC ID: O9EQ24PL001).

Refer to the test report of FCC ID:O9EQ24PL003.

II. Additional items

Output Power	Radiated C	
Field Strength of Harmonics	Radiated C	
AC Conducted Emissions	Line Conducted	C

Note 1: C=Complies NC=No t 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:

ANSI C-63.4-2003

3.2 Technical Characteristics Test

3.2.1 Effective Radiated Power Output

Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turn table rotation was adjusted for the highest reading on the receive spectrum analyzer. For GSM signals, an average detector is used, with RBW=VBW=3MHz, SPAN=10MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

3.2.2 Radiation Spurious and Harmonic Emissions

Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

Radiation and harmonic emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. The Spectrum was investigated from 30MHz to the 10th Harmonic of the fundamental. A peak detector is used. With RBW=VBW=1MHz. The value that we could measure was only reported. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

Effective Radiated Power Output (GSM850)

Measurement Data:

GSM850

Channel	Frequency (MHz)	TEST CONDITIONS Power Step: 5				
		Ref. level (dBm)	Pol. (H/V)	ERP (dBm)	ERP (W)	Battery
128 82	4.2	-9.45 V		30.78	1.20	Li-ion 7.4V
190 83	6.6	-9.05 V		31.02	1.27	Li-ion 7.4V
251 84	8.8	-9.93 V		30.11	1.03	Li-ion 7.4V

Note 1: Radiated measurements at 3 meters by Substitution Method.

Equivalent Isotropic Radiated Power (PCS1900)

Measurement Data:

PCS1900

Channel	Frequency (MHz)	TEST CONDITIONS Power Step: 0				
		Ref. level (dBm)	Pol. (H/V)	EIRP (dBm)	EIRP (W)	Battery
512 18	50.2	-11.90 V		29.53	0.90	Li-ion 7.4V
661 18	80.0	-11.01 V		30.12	1.03	Li-ion 7.4V
810 19	09.8	-11.41 V		29.02	0.80	Li-ion 7.4V

Note 2: Radiated measurements at 3 meters by Substitution Method.

3.2.2 Field Strength

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 = Quasi-peak

Trace = max hold

Sweep = auto

Measurement Data: Complies

→ No other emissions were detected are 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

** 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

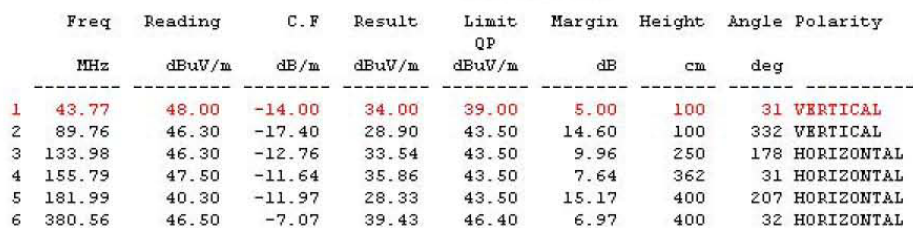


TEST MODE: 850 mode

Tested by: PARK.H.W

Level (dBuV/m)

Date: 2009-08-28

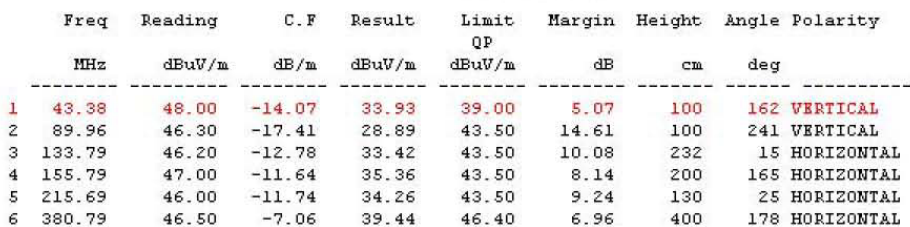


Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



TEST MODE: 1900 mode

Tested by: PARK.H.W

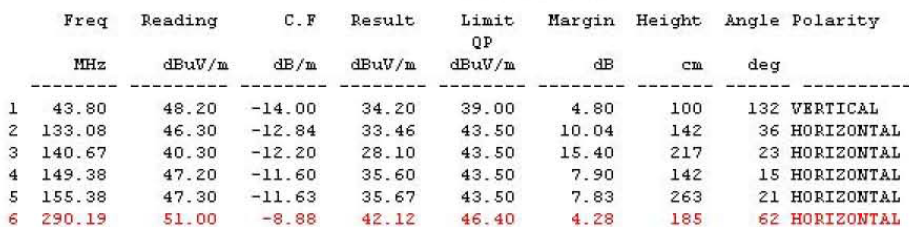


Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



TEST MODE: ACTIVE SYNC mode

Tested by: PARK.H.W

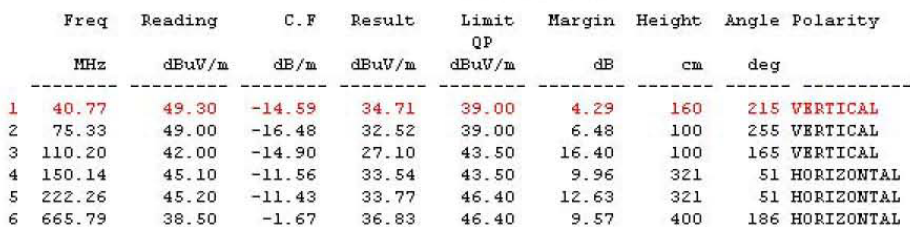


Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



TEST MODE: PRINT mode

Tested by: PARK.H.W



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

3.2.3 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

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

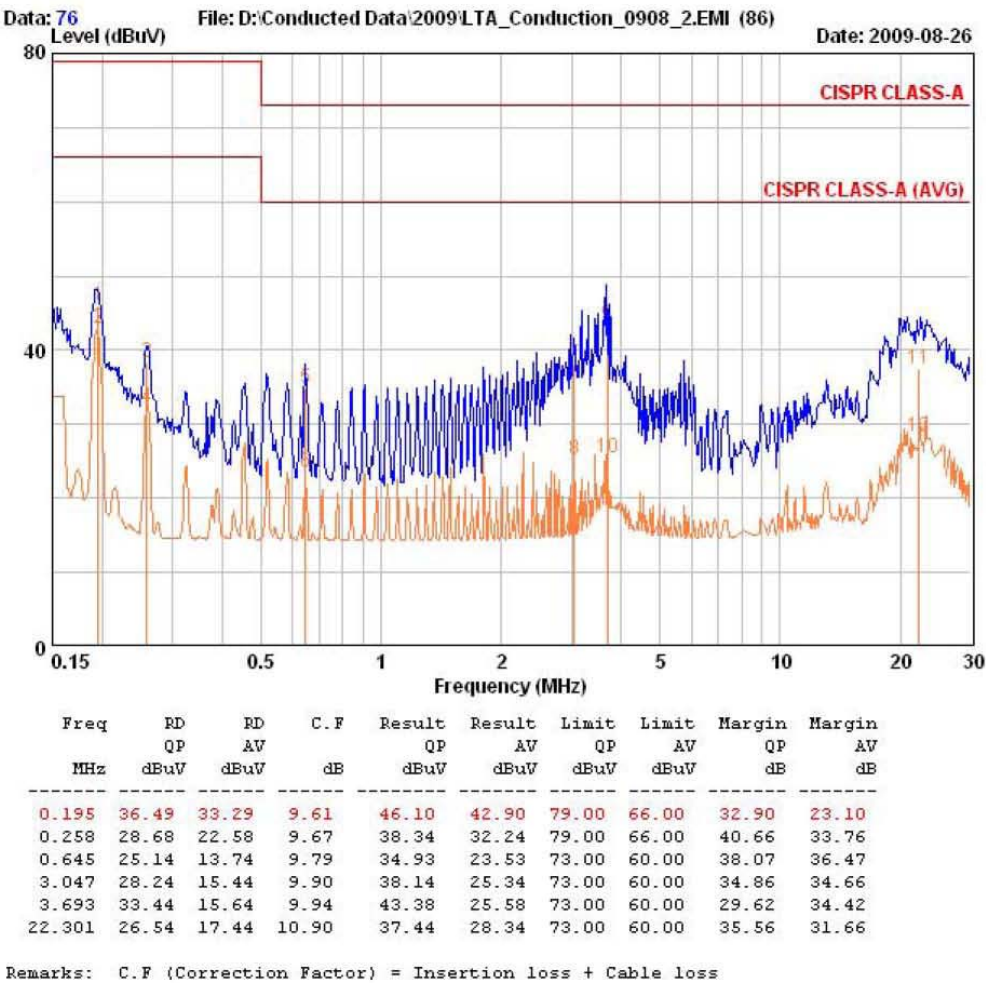
Frequency Range	quasi-peak	Average
0.15 ~ 0.5 MHz	79 dBuV	66 dBuV
0.5 ~ 30 MHz	73 dBuV	60 dBuV

AC Conducted Emissions –GSM850 mode



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EUT / Model No. :	FLEX 7000	Phase	: LINE
Test Mode	: 850 mode	Test Power	: 120 / 60
Temp./Humi.	: 25 / 55	Test Engineer	: B.S.KIM

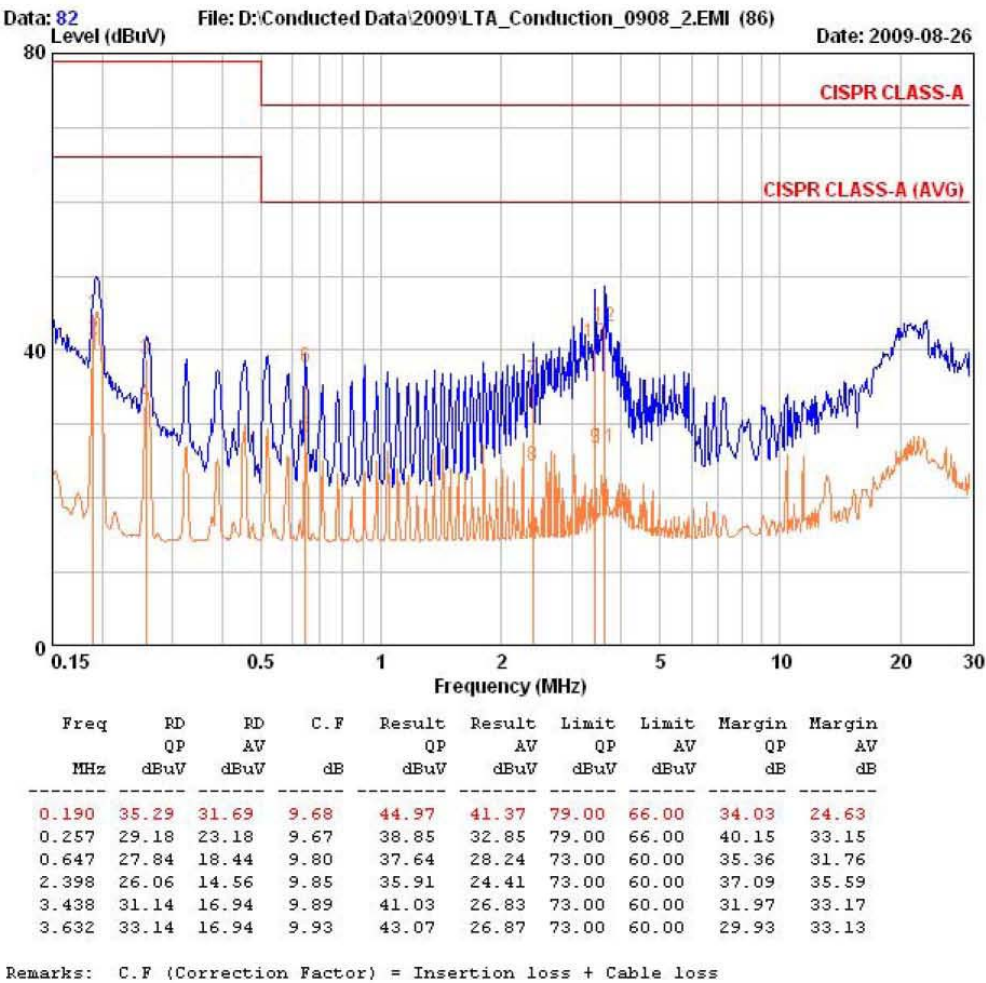


AC Conducted Emissions –GSM850 mode



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EUT / Model No. : FLEX 7000	Phase : NEUTRAL
Test Mode : 850 mode	Test Power : 120 / 60
Temp./Humi. : 25 / 55	Test Engineer : B.S.KIM

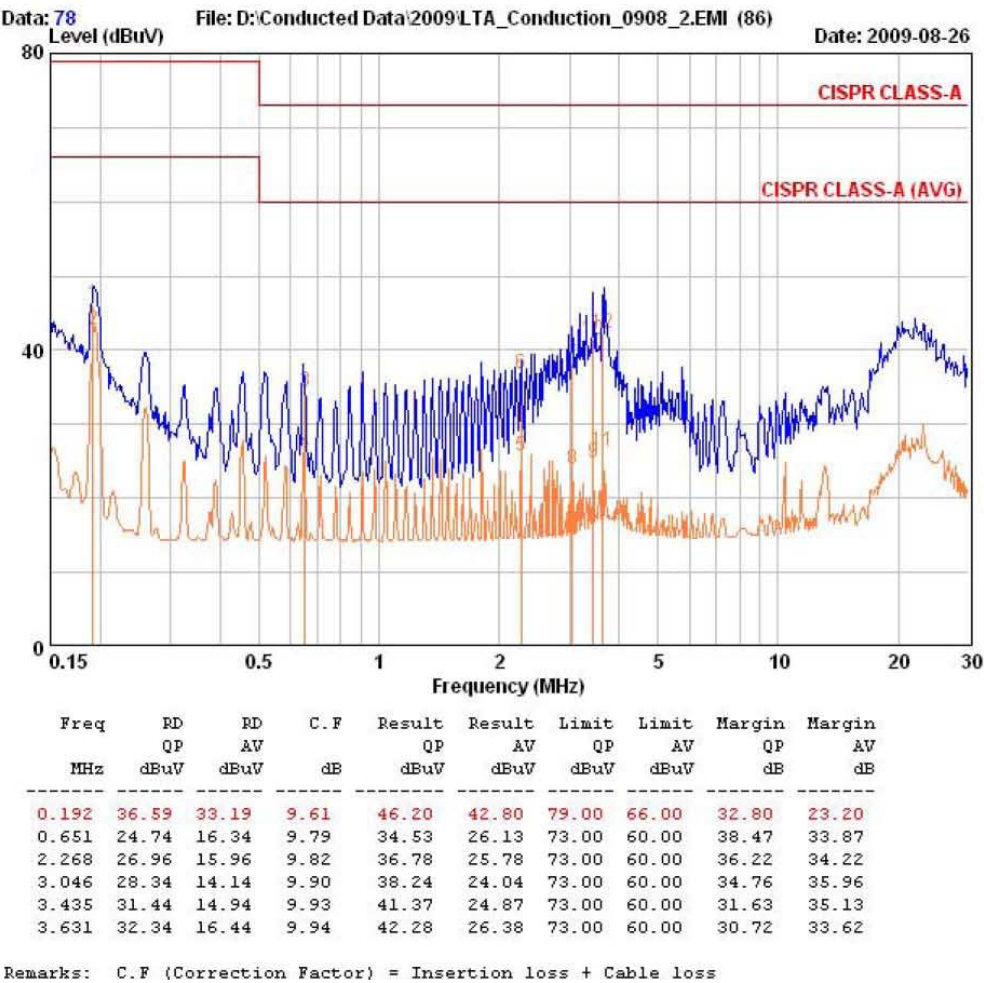


AC Conducted Emissions –Line : PCS1900 mode



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EUT / Model No. : FLEX 7000	Phase : LINE
Test Mode : 1900 mode	Test Power : 120 / 60
Temp./Humi. : 25 / 55	Test Engineer : B.S.KIM

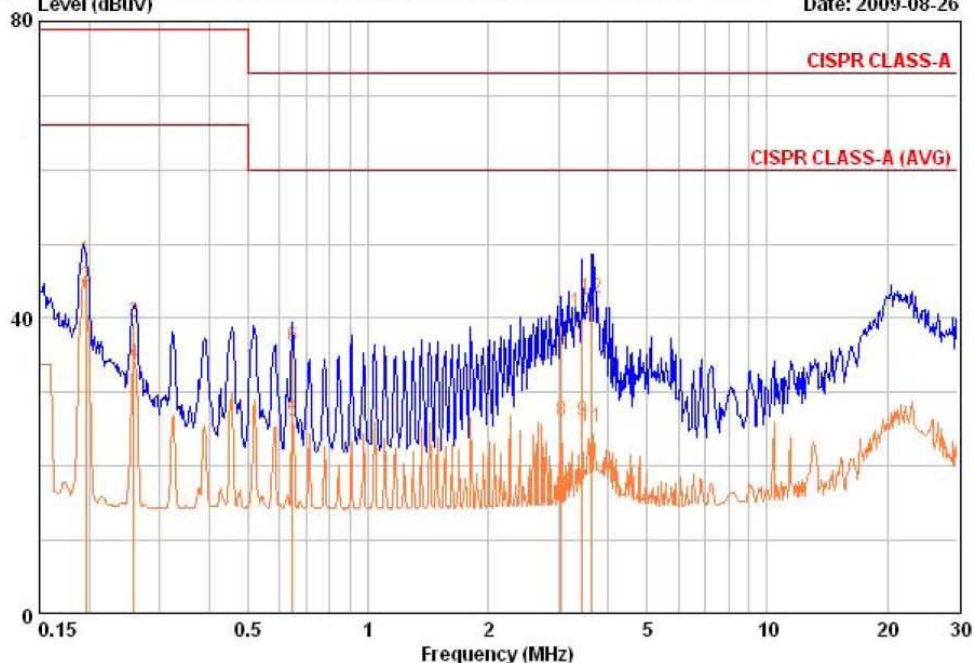


AC Conducted Emissions –Neutral: PCS1900 mode

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EUT / Model No. : FLEX 7000	Phase : NEUTRAL
Test Mode : 1900 mode	Test Power : 120 / 60
Temp./Humi. : 25 / 55	Test Engineer : B.S.KIM

Data: 80 Level (dBuV) File: D:\Conducted Data\2009\LTA_Conduction_0908_2.EMI (86) Date: 2009-08-26



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV	dB	QP	AV	QP	AV	QP	AV
	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dB	dB
0.196	37.99	34.69	9.67	47.66	44.36	79.00	66.00	31.34	21.64
0.258	29.88	24.18	9.67	39.55	33.85	79.00	66.00	39.45	32.15
0.645	26.34	16.34	9.79	36.14	26.14	73.00	60.00	36.86	33.86
3.050	28.04	16.34	9.85	37.89	26.19	73.00	60.00	35.11	33.81
3.438	30.84	16.34	9.89	40.73	26.23	73.00	60.00	32.27	33.77
3.629	32.84	15.34	9.93	42.77	25.27	73.00	60.00	30.23	34.73

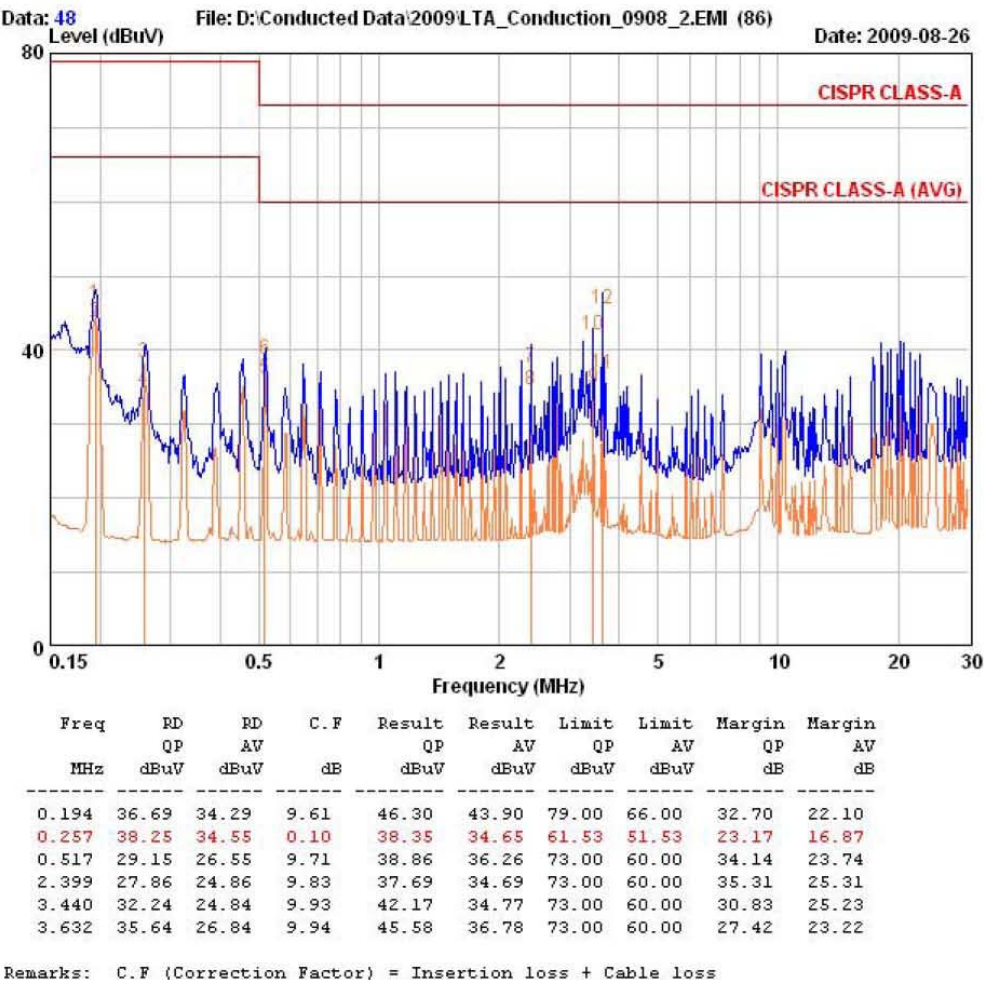
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions –Active SYNC mode



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EUT / Model No. :	FLEX 7000	Phase	: LINE
Test Mode	: ACTIVE SYNC mode	Test Power	: 120 / 60
Temp./Humi.	: 25 / 55	Test Engineer	: B.S.KIM

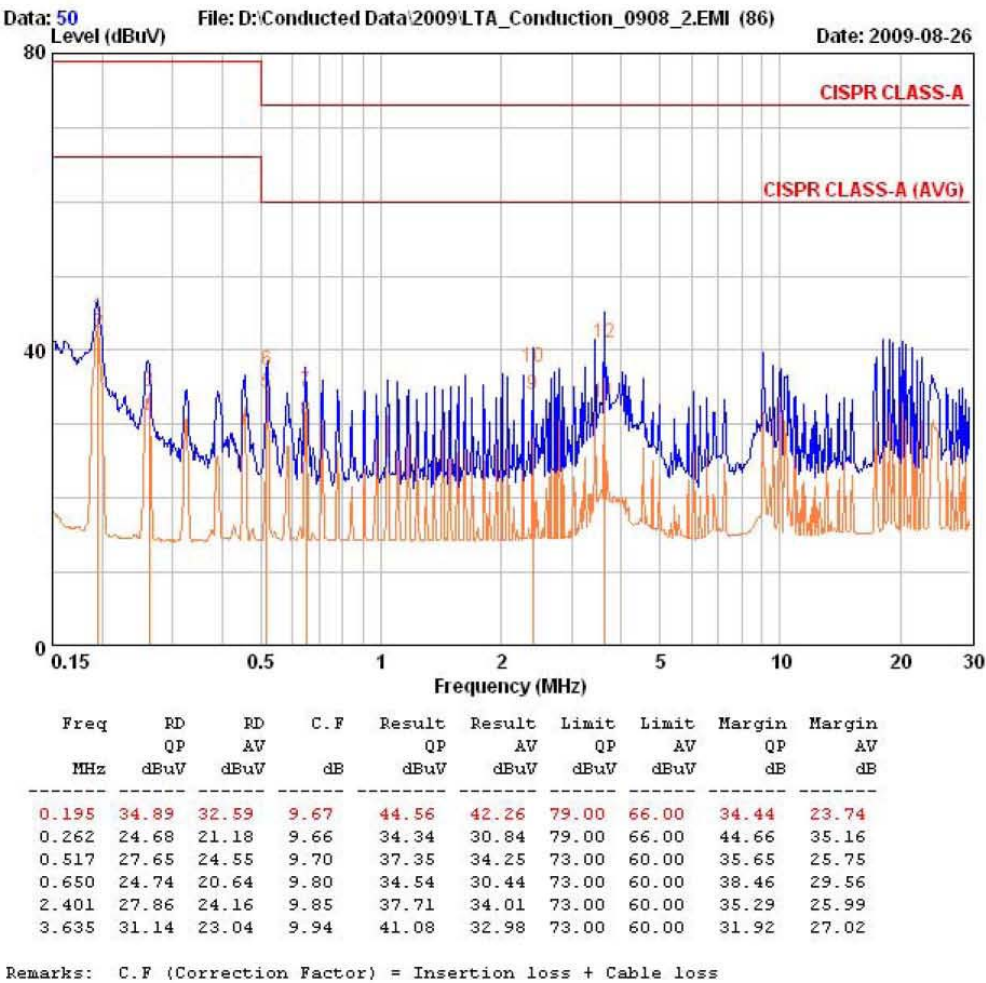


AC Conducted Emissions – Active SYNC mode



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EUT / Model No. : FLEX 7000	Phase : NEUTRAL
Test Mode : ACTIVE SYNC mode	Test Power : 120 / 60
Temp./Humi. : 25 / 55	Test Engineer : B.S.KIM

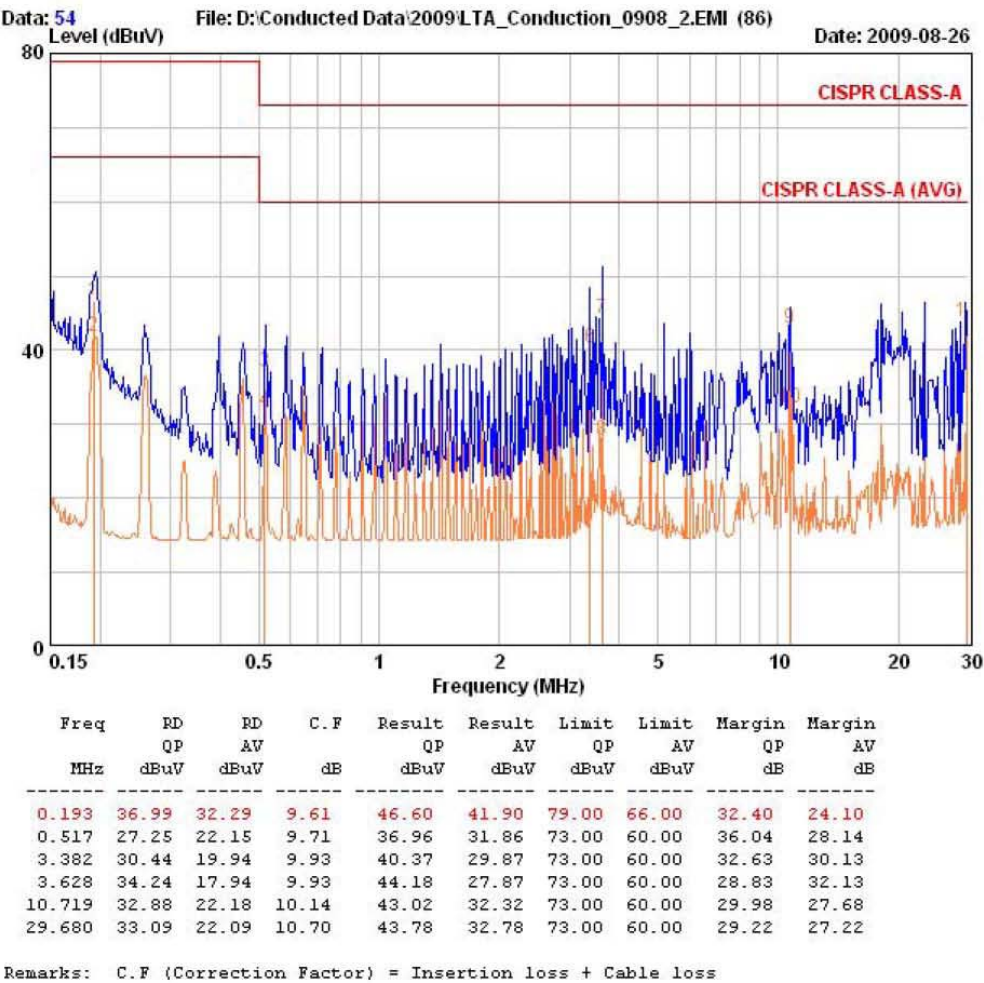


AC Conducted Emissions –Line : Print mode



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EUT / Model No. : FLEX 7000	Phase : LINE
Test Mode : PRINT mode	Test Power : 120 / 60
Temp./Humi. : 25 / 55	Test Engineer : B.S.KIM

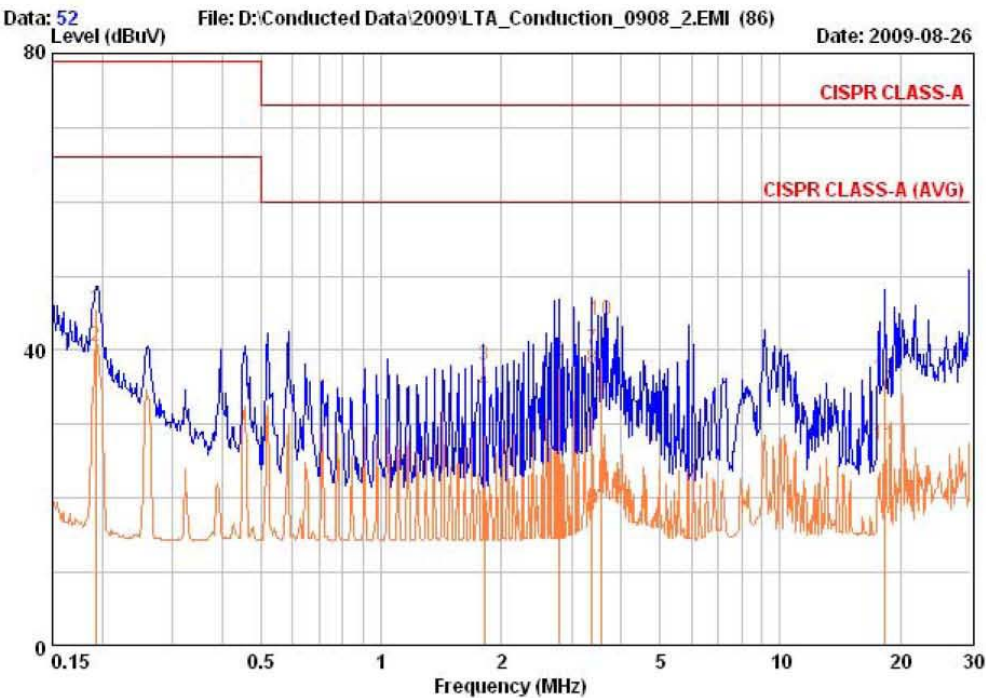


AC Conducted Emissions –Neutral: Print mode



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EUT / Model No. : FLEX 7000	Phase : NEUTRAL
Test Mode : PRINT mode	Test Power : 120 / 60
Temp./Humi. : 25 / 55	Test Engineer : B.S.KIM



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV	dB	QP	AV	QP	AV	QP	AV
	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dB	dB
0.193	35.99	30.89	9.68	45.67	40.57	79.00	66.00	33.33	25.43
1.816	28.05	24.65	9.79	37.84	34.44	73.00	60.00	35.16	25.56
2.796	28.65	19.95	9.89	38.54	29.84	73.00	60.00	34.46	30.16
3.376	30.14	27.64	9.88	40.02	37.52	73.00	60.00	32.98	22.48
3.571	34.04	24.04	9.92	43.96	33.96	73.00	60.00	29.04	26.04
18.314	25.82	16.72	10.44	36.25	27.15	73.00	60.00	36.75	32.85

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

APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Next Cal. Date
1	Spectrum Analyzer	FSV-30 1	00757	R&S Feb-10	
2	Spectrum Analyzer	8563E	3425A02505	HP	Apr-10
3	Spectrum Analyzer	8594E	3710A04074	HP	Oct-10
4	Signal Generator	8648C	3623A02597	HP	Apr-10
5	Signal Generator	83711B	US34490456	HP	Apr-10
6	Attenuator (3dB)	8491A	37822	HP	Oct-10
7	Attenuator (10dB)	8491A	63196	HP	Oct-10
8	Attenuator (30dB)	8498A 1	801A06689	HP	Oct-10
9	EMI Test Receiver	ESVD	843748/001	R&S	Apr-10
10	Horn Antenna(18 ~ 40GHz)	SAS-574	154	Schwarzbeck	Nov-10
11	Horn Antenna(18 ~ 40GHz)	SAS-574	155	Schwarzbeck	Nov-10
12	RF Amplifier	8447D	2949A02670	HP	Oct-10
13	RF Amplifier	8449B	3008A02126	HP	Apr-10
14	Test Receiver	ESHS10	828404/009 R&S		Apr-10
15	TR ILOG Antenna	VULB 9160	9160-3212	SCHWARZBECK	Apr-11
16	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	Apr-11
17	Biconical Antenna	BBA 9106	VHA 9103-2315	SCHWARZBECK	Apr-11
18	Horn Antenna	3115	00055005	ETS LINDGREN	Mar-11
19	Horn Antenna	BBHA 9120D	9120D122	SCHWARZBECK	Dec-11
20	Dipole Antenna	VHA9103	2116	SCHWARZBECK	Nov-09
21	Dipole Antenna	VHA9103	2117	SCHWARZBECK	Nov-09
22	Dipole Antenna	VHA9105	2261	SCHWARZBECK	Nov-09
23	Dipole Antenna	VHA9105	2262	SCHWARZBECK	Nov-09
24	Hygro-Thermograph	THB-36	0041557-01	ISUZU	Apr-10
25	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-
26	RF Switch	MP59B	6200414971	ANRITSU	-
27	Power Divider	11636A	6243	HP	Oct-10
28	DC Power Supply	6622A	3448A03079	HP	Oct-10
29	Frequency Counter	5342A	2826A12411	HP	Apr-10
30	Power Meter	EPM-441A	GB32481702	HP	Apr-10
31	Power Sensor	8481A	2702A64048	HP	Apr-10
32	Audio Analyzer	8903B	3729A18901	HP	Oct-10
33	Modulation Analyzer	8901B	3749A05878	HP	Oct-10
34	TEMP & HUMIDITY Chamber	YJ-500 L	TAS06041	JinYoung Tech	Oct-10
35	LOOP-ANTENNA	FMZB 1516	151602/94	SCHWARZBECK	Mar-11
36	Stop Watch	HS-3	601Q09R	CASIO	Apr-10
37	LIS N	ENV216	100408	R&S	Oct-10