TEST REPORT

1. Applicant

Name : A1Tech Inc.
Address : 254-2 Oryu2-Dong, Guro-Gu, Seoul, Korea

2. Products

Name : Security/Remote Control transceiver(Car Alarm System)
Model/Type : PROSTAR-Gold
Manufacturer : A1Tech Inc.

3. Test Standard : FCC CFR 47 Part 15, Subpart C section 15.231(a)

4. Test Method : ANSI C63.4-2003

5. Test Result : Positive

6. Date of Application : August 07, 2007

7. Date of Issue : August 29, 2007

Tested by

Bum-Jong Kim
Telecommunication Team
Engineer

Approved by

S. J. Kim

Seok-Jin Kim
Telecommunication Team
Manager

Korea Testing Laboratory

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Ⅰ. GENERAL INFORMATIONS

1.1 Applicant (Client)

Name	A1Tech Inc.
Address	254-2 Oryu2-Dong, Guro-Gu, Seoul, Korea
Contact Person	Zintea KIM
Telephone No.	+82-2-838-3006
Facsimile No.	+82-2-838-3055
E-mail address	trade@topalam.com

1.2 Equipment (EUT)

Type of equipment	Security/Remote Control transceiver(Two-way Car Alarm System)
Model Name	PROSTAR-Gold
FCC ID	QQ5A1GR
Operating Frequency	433.92 MHz
Type of Signal	Pulse Code Signal
Power Source	DC 12V (Battery)
Manufacturer Name	A1Tech Inc.
Manufacturer Address	254-2 Oryu2-Dong, Guro-Gu, Seoul, Korea

1.3 Testing Laboratory

Testing Place	Korea Testing Labortory (KTL) 222-13 Guro-dong, Guro-Gu, Seoul 152-848 Korea
Test Engineer	Bum-Jong KIM
Telephone number	+82 2 860 1464
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E-mail address	temple@ktl.re.kr
Other Comments	-

Ⅱ. SUMMARY OF TEST RESULTS

The QQ5A1GR has been found to conform as detailed below.

FCC	Test Requirements	Result
15.231(a)	Provisionss of FCC 15.231	Pass
15.231(b)	Transmitter Radiated Emissions – Fundamental, Harmonic and Spurious	Pass
15.231(c)	20 dB Bandwidth	Pass
15.109(a)	Receiver Radiated Emissions	Pass
15.107(a)	Conducted Emissions	Pass

Ⅲ. TEST RESULTS

3.1. Transmitter Spurious Emissions (FCC Part 15.231(a))

3.1.1 Test procedure

3.1.1.1 Preliminary Testing for Reference

Preliminary testing was performed in a KTL absorber-lined room to determine the emission characteristics of the EUT. The EUT was placed on the wooden table which has dimensions of 0.8 meters in height, 1 meter in length and 1.5 meters in width. Receiving antenna (Biconi-Log antenna : 30 to 1000 MHz or Horn Antenna : 1 to 18 GHz) was placed at the distance of 1 meter from the EUT.

An attempt was made to maximize the emission level with the various configurations of the EUT while rotating the table and varying antenna height.

Emissions level from the EUT with various configurations were examined on a Spectrum Analyzer connected with an RF amplifier and graphed by a plotter.

3.1.1.2 Final Radiated Emission Test at an Absorber-Lined Room

The final measurement of radiated field strength was carried out in a KTL Absorber-Lined Room that was listed up at FCC according to the "Radiated Emissions Testing" procedure specified by ANSI C63.4.

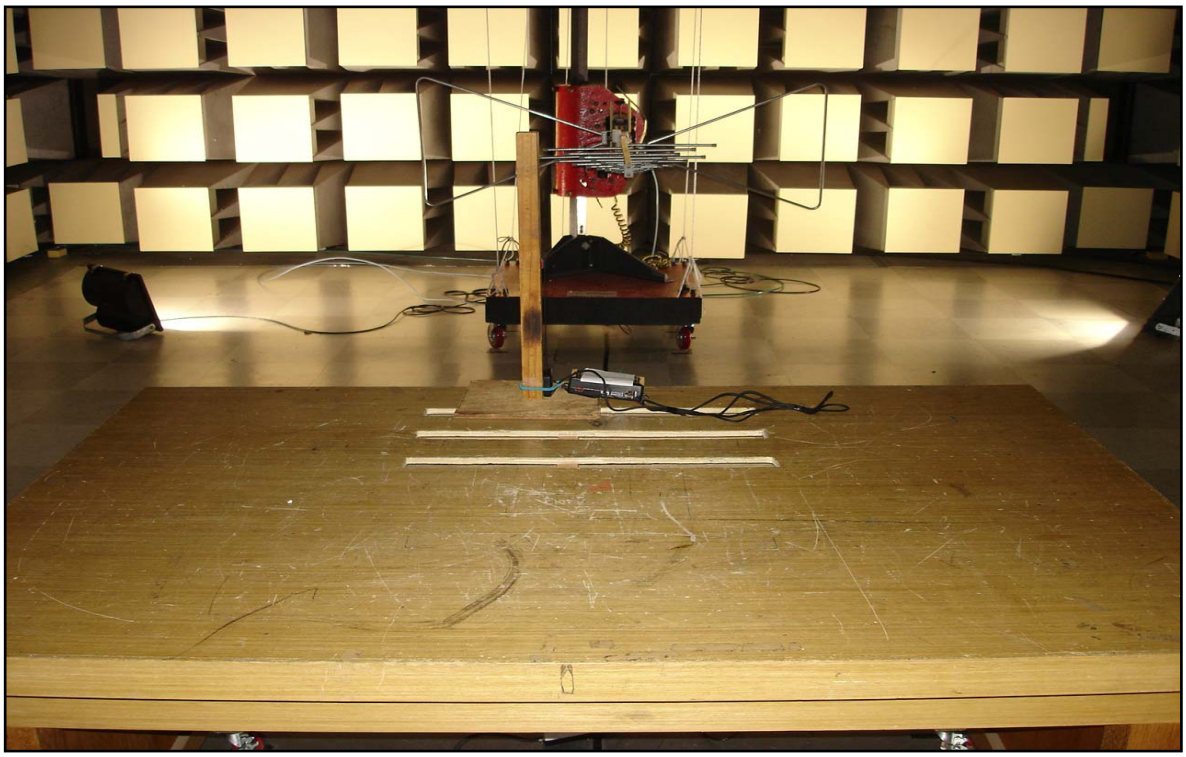
Based on the test results in preliminary test, measurement was made in same test set up and configuration which produced maximum emission level. Receiving antenna was installed at 3-meter distance from the EUT, and was connected to an EMI receiver. Receiving antenna polarization was changed vertical and horizontal. The worst value was recorded.

Turntable was rotated through 360 degrees and receiving antenna height was varied from 1 to 4 meters above the ground plane to read maximum emission level.

If necessary, the radiated emission measurements could be performed at a closer distance than specified distance to ensure higher accuracy and their results were extrapolated to the specified distance using an inverse linear distance extrapolation factor (20 dB/decade) as per Section 15.31(f).

The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

3.1.2. Photograph for the test configuration



3.1.3 Limit

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emission (microvolts/meter)
40.66–40.70	1,000	100
70-130	500	50
130-174	500 to 1,500**	50 to 150**
174-260	1,500	150
260-470	1,500 to 5,000**	150 to 500**
Above 470	5,000	500

** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows : for the band 130-174 MHz, Uv/m at 3 meters = 22.72727(F)-2454.545; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) – 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

Example) 433.92 MHz Field Strength of Fundamental (microvolts/meter)
41.6667 * 433.92 – 7083.3333 = 10996.68116 uV/m = 80.8 dBuV/m

3.1.3. Sample Calculation

The emission level measured in decibels above one microvolt (dB μN) was converted into microvolt per meter (μN/m) as shown in following sample calculation.

For example :

	Measured Value at 433.9 MHz	56.3 dB μN
+	Antenna Factor & Cable Loss	18.6 dB/m
−	Preamplifier	0.0 dB
−	Distance Correction Factor *	0.0 dB
=	Radiated Emission	74.9 dB μN/m (= 5559.0 μN/m)

3.1.4. Measurement Data

- Resolution Bandwidth : __x__ CISPR Quasi-Peak
  ____ Peak
- Measurement Distance : 3 Meter
- Measurement Frequency: 30 MHz ~ 5000 MHz
- The worst case is Z axes

Frequency (MHz)	* D.M.	* A.P.	Measured Value (dBμV)	* A.F. + C.L (dB/m)	* A.G. (dB)	* D.C.F. (dB)	Emission Level		Limit (dBμV/m)	** Margin (dB)
							(dBμV/m)	(μV/m)		
433.9	Q	V	56.3	18.6	0.0	0.0	74.9	5559.0	80.8	-5.9
867.8	Q	V	26.2	26.5	0.0	0.0	52.7	431.5	60.8	-8.1
1864.0	Q	H	22.8	33.1	0.0	0.0	55.9	623.7	60.8	-4.9
-	-	-	-	-	-	-	-	-	-	-

Note

The observed EMI receiver(ESVS30) noise floor level was 2.0 dBμV. And all other emissions not reported on data were more than 25 dB below the permitted level.

* D.M. : Detect Mode (P : Peak, Q : Quasi-Peak, A : Average)
A.P. : Antenna Polarization (H : Horizontal, V : Vertical)
A.F. : Antenna Factor
C.L. : Cable Loss
A.G. : Amplifier Gain
D.C.F. : Distance Correction Factor
< : Less than

** Margin (dB) = Emission Level (dB) - Limit (dB)

Note ;

(1) Fundamental emissions from the intentional radiators were not located within any of frequency bands described in section 15.205(a) listed below ;

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.1775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	
13.36-13.41			

The field strength of emissions appearing within above frequency bands did not exceed the limits shown in section 15.209. At frequency equal to or less than 1000MHz, compliance with the limits section 15.209 was demonstrated using measurement employing a CISPR quasi-peak detector. Above 1000MHz, demonstrated based on the average value of the measured emissions.

(2) If the intentional radiator was operated under the radiated emission limits of the general requirements of section 15.209, it's fundamental emissions were not located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-860MHz.

(3) The level of any unwanted emissions from an intentional radiator did not exceed the level of the fundamental emission.

(4) Radiated and spurious emissions were checked from 30MHz to 3GHz. And all other emissions not reported on data were more than 20 dB below the permitted level.

3.2 Bandwidth of Momentary Signals (FCC Part 15.231(c))

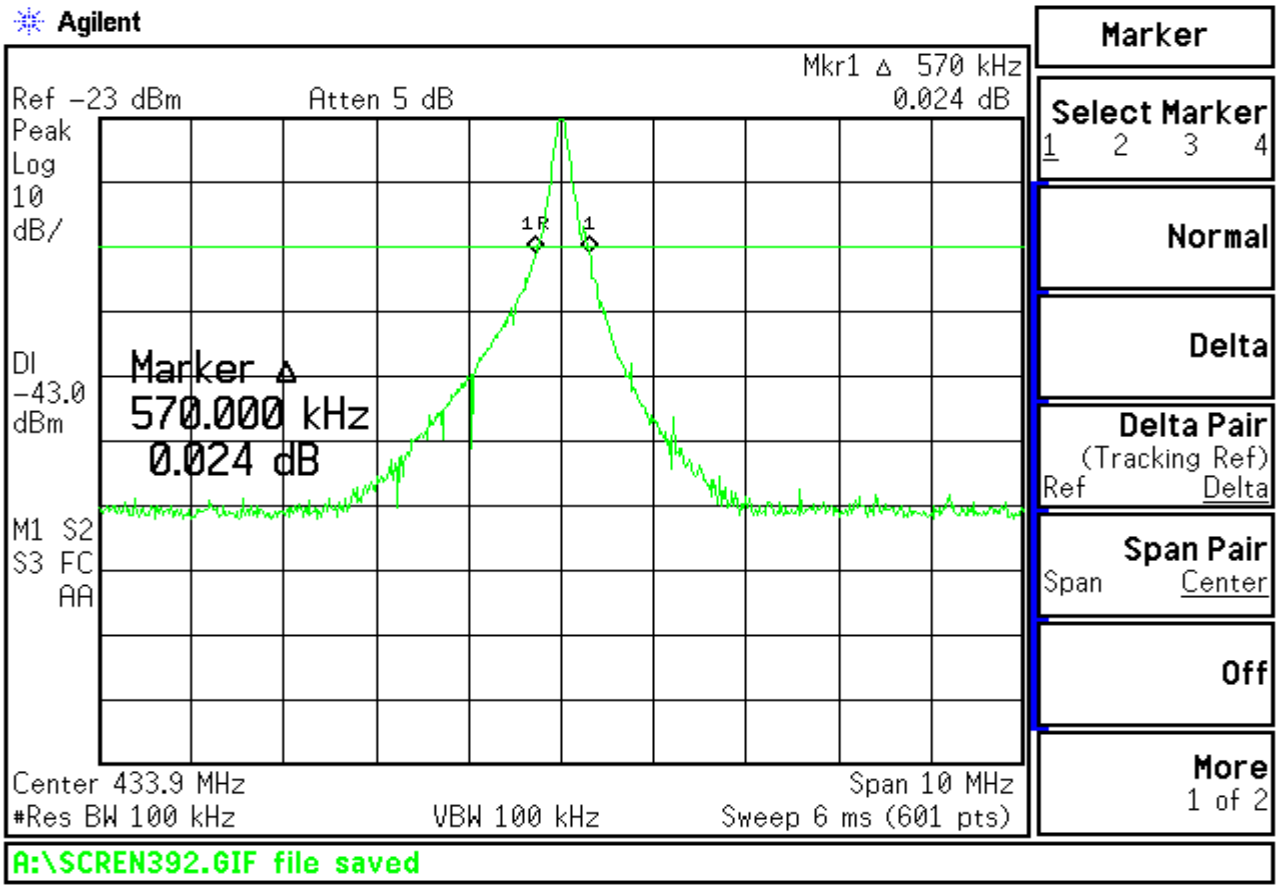
3.2.1 Limit

The bandwidth shall be no wider than 0.25% of the centre frequency for devices operating between 70~900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the centre frequency.

3.2.2 Test result (FCC Part 15.231(c))

Frequency (MHz)	Result (kHz)	Limit (MHz)	Verdict
433.92	570.0	1.0848	Pass

1. Carrier Frequency = 433.92 MHz
2. The bandwidth of emission shall be no wider than 0.25 % of center frequency.
3. Limit : less than 1.0848 MHz (433.92 x 0.025)



– 20 dB Occupied Bandwidth –

3.3 Receiver Spurious Emissions (FCC Part15.109)

3.3.1 Test Procedure

3.2.1.1 Preliminary Testing for Reference

Preliminary testing was performed in a KTL absorber-lined room to determine the emission characteristics of the EUT. The EUT was placed on the wooden table which has dimensions of 0.8 meters in height, 1 meter in length and 1.5 meters in width. Receiving antenna (Biconi-Log antenna : 30 to 1000 MHz or Horn Antenna : 1 to 18 GHz) was placed at the distance of 1 meter from the EUT.

An attempt was made to maximize the emission level with the various configurations of the EUT. Emission levels from the EUT with various configurations were examined on a spectrum analyzer connected with a RF amplifier and graphed by a plotter.

3.2.1.2 Final Radiated Emission Test at an Absorber-Lined Room

The final measurement of radiated field strength was carried out in a KTL Absorber-Lined Room that was listed up at FCC according to the "Radiated Emissions Testing" procedure specified by ANSI C63.4.

Based on the test results in preliminary test, measurement was made in same test set up and configuration which produced maximum emission level. Receiving antenna was installed at 3-meter distance from the EUT, and was connected to an EMI receiver.

Turntable was rotated through 360 degrees and receiving antenna height was varied from 1 to 4 meters above the ground plane to read maximum emission level. Receiving antenna polarization was changed vertical and horizontal. The worst value was recorded.

If necessary, the radiated emission measurements could be performed at a closer distance than specified distance to ensure higher accuracy and their results were extrapolated to the specified distance using an inverse linear distance extrapolation factor (20 dB/decade) as per Section 15.31(f).

The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

3.3.3. Sample Calculation

The emission level measured in decibels above one microvolt (dB μV) was converted into microvolt per meter (μV/m) as shown in following sample calculation.

For example :

Measured Value at	83.4 MHz	17.6 dB μV
+	Antenna Factor & Cable loss	9.7 dB
−	Preamplifier	0.0 dB
−	Distance Correction Factor *	0.0 dB
=	Radiated Emission	27.3 dB μV/m (= 23.2 μV/m)

* Extrapolated from the measured distance to the specified distance by an inverse linear distance extrapolation.

3.3.4. Test Results

- Resolution Bandwidth : _x_ CISPR Quasi-Peak (6 dB Bandwidth : 120 kHz)
  ___ Peak (3 dB Bandwidth : 100 kHz)
- Measurement Distance : 3 Meter
- Measurement Frequency : 30 MHz ~ 1 GHz
- The worst case is Z axes

Frequency (MHz)	* D.M.	* A.P.	Measured Value (dBμV)	* A.F. + C.L (dB/m)	* A.G. (dB)	* D.C.F. (dB)	Emission Level		Limit (dBμV/m)	** Margin (dB)
							(dBμV/m)	(μV/m)		
83.4	Q	V	17.6	9.7	0.0	0.0	27.3	23.2	40.0	-12.7
144.6	Q	H	22.0	11.3	0.0	0.0	33.3	46.2	43.5	-10.2
289.2	Q	H	25.7	14.7	0.0	0.0	40.4	104.7	46.0	-5.6

Note

The observed EMI receiver(ESVS30) noise floor level was 2.0 dBμV. And all other emissions not reported on data were more than 25 dB below the permitted level.

* D.M. : Detect Mode (P : Peak, Q : Quasi-Peak, A : Average)
A.P. : Antenna Polarization (H : Horizontal, V : Vertical)
A.F. : Antenna Factor
C.L. : Cable Loss
A.G. : Amplifier Gain
D.C.F. : Distance Correction Factor
< : Less than

** Margin (dB) = Emission Level (dB) - Limit (dB)

3.4 Receiver Spurious Emissions (FCC Part15.109)

3.4.1 Test Procedure

Conducted emission measurements on the EUT were performed by "AC Power Line Conducted Emissions Testing" procedure as per ANSI C63.4. The EUT was set up on a wooden table 0.8 meters height, 1.0 by 1.5 meters in size, placed in the shielded enclosed with a side of wall of which constituted a vertical conducting surface of 2.2 m x 3.1 m in size to maintain 40 cm from the rear of EUT

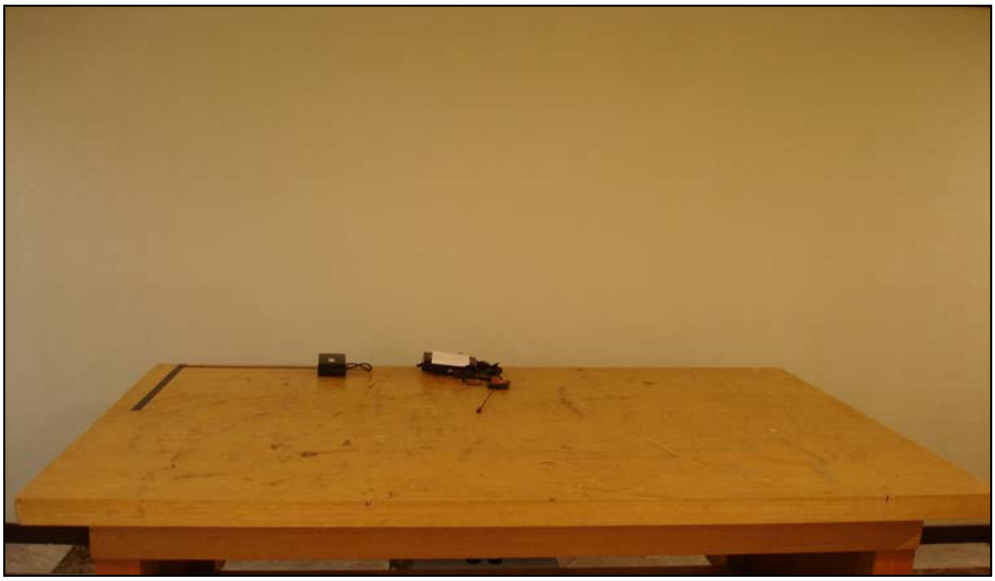
LISN(Line Impedance Stabilization Network, ROHDE & SCHWARZ, ESH3-Z5, 50 ohm / 50 μH) was installed and electrically boned to the conducting ground plane. The EUT was connected to the LISN using a typical power adapter.

One of two 50 ohm output terminals of the LISN was connected to the EMI Receiver (ROHDE & SCHWARZ, ESCI, 9 kHz to 3 GHz) and the other was terminated in 50 ohms. Measurements were again performed after interchanging such a connection oppositely.

The frequency range from 150 kHz to 30 MHz was examined and the remarkable frequencies were measured with Quasi-peak and Average values using the EMI receiver instrument (ROHDE & SCHWARZ, ESI, 9 kHz to 3 GHz ; Detector Function ; CISPR Quasi-Peak & Average). The 6 dB bandwidth of the Receiver was set to 9 kHz

The position of connecting cables of the EUT was changed to find the worst case configuration during measurements. The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

3.4.2 Photograph for the test configuration



3.4.3 Sample calculation

The emission level measured in decibels above one microvolt (dB μV) was converted into microvolt (μV) as shown in following sample calculation.

For example :

Measured Value at	0.15 MHz	30.3 dB μV @ Q-Peak mode
+ Cable Losses *		0.0 dB
= Conducted Emission		30.3 dB μV

* In case of RG214/ RF cable 15 Ft, the loss is about 0.17 dB at the frequency of 30 MHz which is negligible.

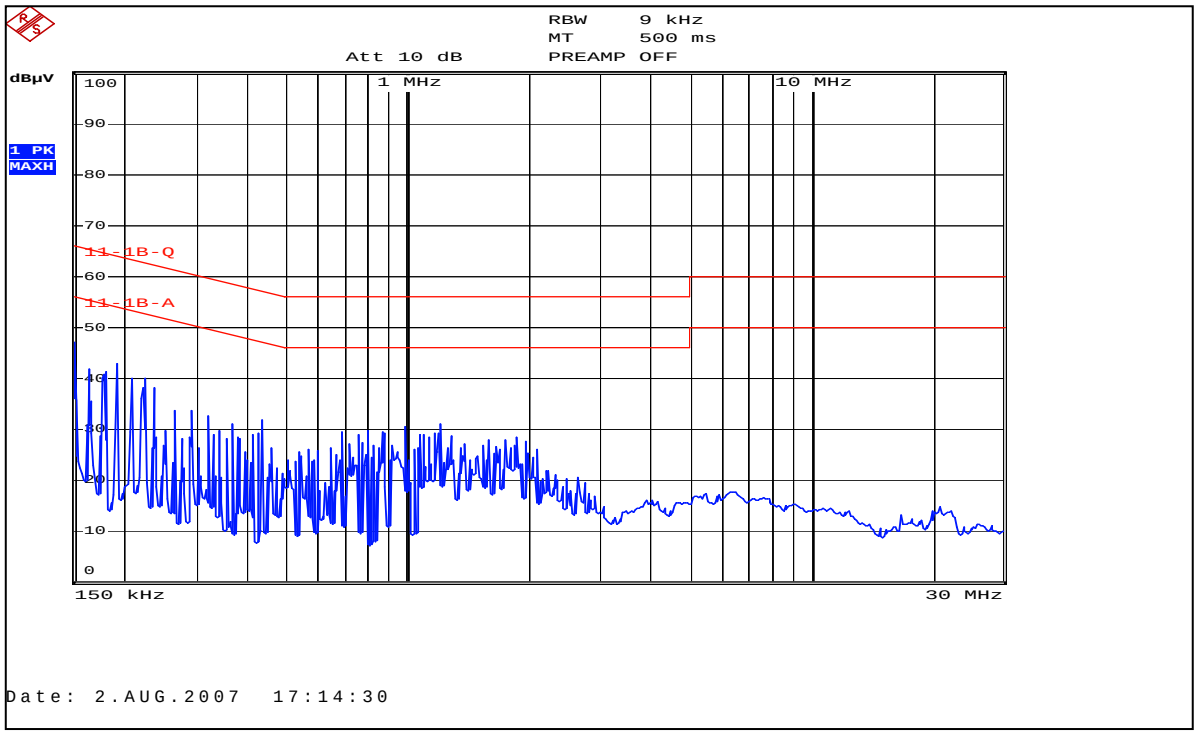
3.4.4 Test Results

- Resolution Bandwidth : x CISPR Quasi-Peak (6dB Bandwidth : 9 kHz)
  x Average (6dB Bandwidth : 9 kHz)

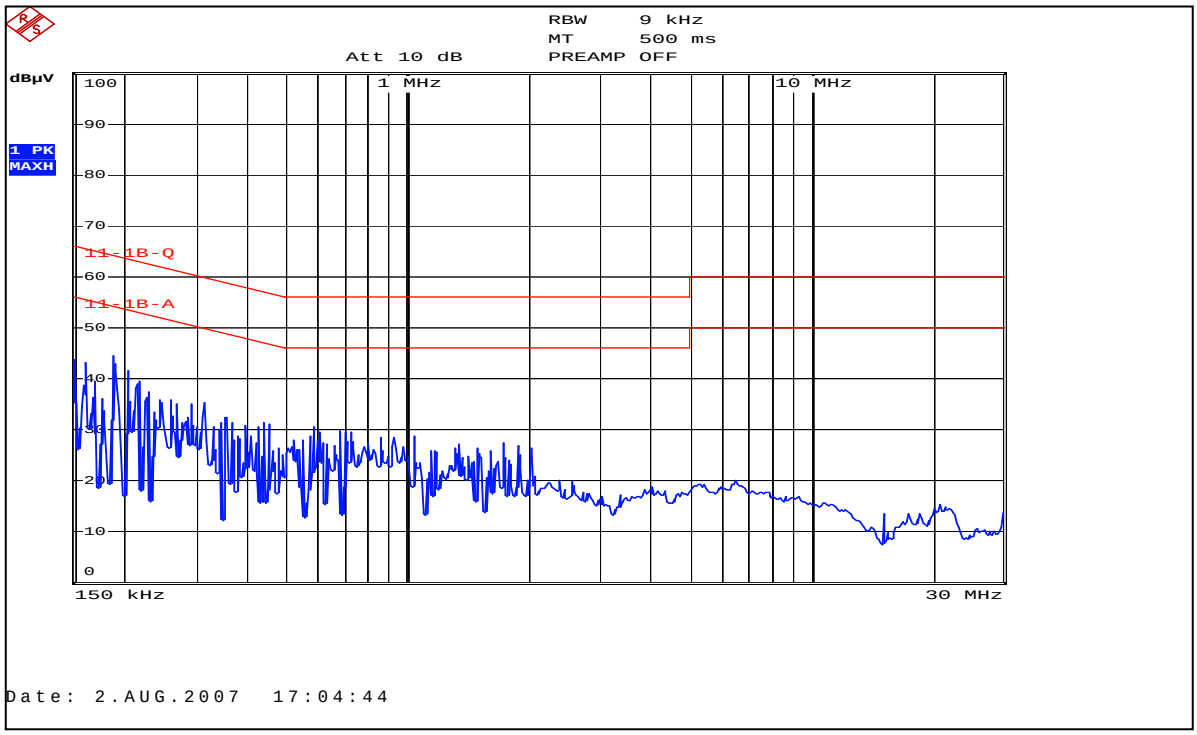
Power Lead Tested	Frequency (MHz)	Emission Level		Limit		(*) Margin	
		Q-Peak (dB μV)	Average (dB μV)	Q-Peak (dB μV)	Average (dB μV)	Q-Peak (dB μV)	Average (dB μV)
Live to Ground	0.15	30.3	16.3	66.0	56.0	-35.7	-39.7
	0.19	32.9	7.5	64.8	54.8	-31.9	-47.3
	0.22	28.5	9.2	64.0	54.0	-35.5	-44.8
	0.42	18.8	4.0	58.4	48.4	-39.6	-44.4
	0.68	17.4	3.9	56.0	46.0	-38.6	-42.1
	1.20	16.3	8.3	56.0	46.0	-39.7	-37.7
	1.86	14.4	6.7	56.0	46.0	-41.6	-39.3
Neutral to Ground	0.15	38.0	22.0	66.0	56.0	-28.0	-34.0
	0.16	35.0	17.5	65.7	55.7	-30.7	-38.2
	0.20	31.1	13.5	64.6	54.6	-33.5	-41.1
	0.22	29.7	10.6	64.0	54.0	-34.3	-43.4
	0.77	19.6	7.5	56.0	46.0	-36.4	-38.5
	1.16	20.3	6.7	56.0	46.0	-35.7	-39.3
	1.88	23.1	9.6	56.0	46.0	-32.9	-36.4

Note : Refer to measured graphs on next page.

* Margin(dB) : Emission Level (dB) - Limit (dB)



(Test side: Live-Ground side)



(Test side: Neutral-Ground side)

Ⅵ. TEST EQUIPMENTS

No.	Equipment	Manufacturer	Model	S/N	Effective Cal.Duration
1	EMI Receiver (20 MHz ~ 1 GHz)	R&S	ESVS30	830516002	03/15/2007 ~ 03/15/2008
2	EMI Receiver (9 kHz ~ 3 GHz)	R&S	ESCI	100076	03/28/2007 ~ 03/28/2008
3	Spectrum Analyzer (100 Hz ~ 26.5 GHz)	Agilent	E4407B	US41443316	12/01/2006 ~ 12/01/2007
4	Spectrum Analyzer (3 Hz ~ 50 GHz)	Agilent	E4448A	MY43360322	02/26/2007 ~ 02/26/2008
5	Test Receicer (9 kHz ~ 30 MHz)	R&S	ESH3	860905001	06/18/2007 ~ 06/18/2008
6	Pre-Amplifier (100 kHz ~ 3 GHz)	H.P.	8347A	2834A00543	05/19/2007 ~ 05/19/2008
7	Pre-Amplifier (1 GHz ~ 26.5 GHz)	H.P.	8449B	3008A00302	06/14/2007 ~ 06/14/2008
8	LISN(50 Ω , 50 μH) (10 kHz ~ 100 MHz)	R&S	ESH3-Z5	826789009	07/05/2007 ~ 07/05/2008
9	Biconi-Log Ant. (30 MHz ~ 1000 MHz)	Schwarzbeck	VULB9168	9168-168	08/16/2007 ~ 08/16/2008
10	Horn Ant. (1 GHz ~ 18 GHz)	EMCO	3115	--	05/09/2007 ~ 05/09/2008
11	Active Loop Ant. (9 kHz ~ 30 MHz)	EMCO	6502	2532	06/08/2007 ~ 06/08/2008
12	Shielded Room (5.0 m x 4.5 m)	SIN-MYUNG	--	--	--
13	Signal Generator (250 kHz ~ 20 GHz)	Agilent	E8257D	MY44320379	01/02/2007 ~ 01/02/2008
14	DC Power Supply	Agilent	E4356A	MY41000296	09/28/2006 ~ 09/28/2007
15	Power Splitter	H.P.	11667A	21063	10/09/2006 ~ 10/09/2007
16	Power Meter	Agilent	E4417A	GB4129075	09/17/2006 ~ 09/17/2007
17	Attenuator	Weinschel	56-20	N8257	01/13/2007 ~ 01/13/2008
18	Oscillator	Kenwood	AG-203D	10040568	10/23/2006 ~ 10/23/2007