

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

Test Report No. : E123R-075

AGR No. : A122A-152

Applicant : HOSEOTELNET CO., LTD.

Address : 680-3 Deungchon-3dong, Kangseo-gu, Seoul, Korea

Manufacturer : HOSEOTELNET CO., LTD.

Address : 680-3 Deungchon-3dong, Kangseo-gu, Seoul, Korea

Type of Equipment : PAGER

FCC ID : R2SSMC200

Model Name : SMC200

Serial number : N/A

Total page of Report : 21 pages (including this page)

Date of Incoming : March 08, 2012

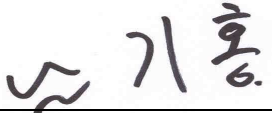
Date of Issuing : March 30, 2012

SUMMARY

The equipment complies with the requirements of **FCC CFR 47 PART 15 SUBPART C, SECTION 15.231**

This test report contains only the result of a single test of the sample supplied for the examination.

It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by: 
Ki-Hong, Nam / Senior Engineer
ONETECH Corp.

Reviewed by: 
Y. K. Kwon / Exe. Managing Director
ONETECH Corp.

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Revision History

Issue Report No.	Issued Date	Revisions	Effect Section
E123R-075	March 30, 2012	Initial Release	All

1. VERIFICATION OF COMPLIANCE

-. APPLICANT : HOSEOTELNET CO., LTD.
 -. ADDRESS : 680-3 Deungchon-3dong, Kangseo-gu, Seoul, Korea
 -. CONTACT PERSON : Mr. Jae-Youn, Shin / Principal Engineer
 -. TELEPHONE NO : +82-2-2659-7345
 -. FCC ID : R2SSMC200
 -. MODEL NO/NAME : SMC200
 -. SERIAL NUMBER : N/A
 -. DATE : March 30, 2012

DEVICE TYPE	DXT – Part 15 Low Power Transceiver, Rx Verified
E.U.T. DESCRIPTION	PAGER - Intentional Radiator
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.4: 2009
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C, Section 15.231
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	None
FINAL TEST WAS CONDUCTED ON	10 m, semi anechoic chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.231 (c)	20dB Bandwidth	Met the Limit / PASS
15.231 (e)	Transmitter Time and Silent Period	Met the Limit / PASS
15.231 (e)	Field strength of the spurious emissions	Met the Limit / PASS
15.209	Radiated emission limits; general requirements.	Met the Limit / PASS
15.207	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met the Requirement / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in section 2.1.

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2009. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The measurement facilities are located on at 301-14, Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862, Korea. The Onetech Corp. has been accredited as a Conformity Assessment Body (CAB) with designation number KR0013.

3. GENERAL INFORMATION

3.1 Product Description

The HOSEOTELNET CO., LTD., Model SMC200 (referred to as the EUT in this report) is a PAGER with transmitter function. The product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Non-Metal
MODULATION	FSK
TRANSMITTING FREQUENCY	464.60 MHz ~ 464.75 MHz
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1 MHz)	14.745 6 MHz
ANTENNA TYPE	Fixed Helical Antenna
RATED SUPPLY VOLTAGE	DC 3.7 V form a rechargeable battery
NUMBER OF PCB LAYERS	4 Layers

3.2 Alternative type(s)/model(s); also covered by this test report

-. None

4. SYSTEM TEST CONFIGURATION

4.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	N/A	SMC200_V03	N/A

4.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested: None

4.3 Mode of operation during the test

-. The EUT was operated with RF transmitting mode continuously during the test and receiving modes were tested also. The operating frequency range is less than 1 MHz, so middle frequency was selected for the compliance testing.

4.4 Equipment Modifications

-. None

4.5 Configuration of Test System

Line Conducted Test: The EUT was connected to charger and the power of charger was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4: 2009 7.3.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2009 8.3.1.1 and 13.4.1 to determine the worse operating conditions. The radiated emissions measurements were performed on the 3 m semi anechoic chamber. The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

4.6 Antenna Requirement

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The transmitter antenna of the EUT is a fixed helical antenna in the EUT, so there is no consideration of replacement by the user.

5. PRELIMINARY TEST

5.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Charging mode	X

5.2 Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
RF transmitting Mode	X

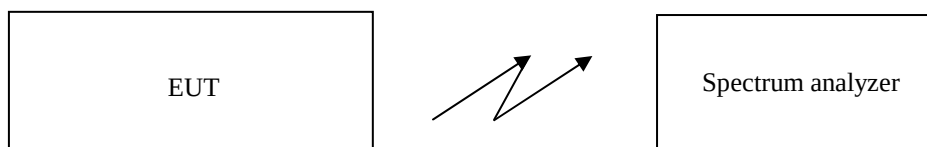
6. 20 dB BANDWIDTH

6.1 Operating environment

Temperature : 27 °C
Relative humidity : 47 % R.H.

6.2 Test set-up

The output signal of EUT was received by the spectrum analyzer. The resolution bandwidth is set to 10 kHz, and peak detection was used. The 20 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 20 dB.



6.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	FSV30	R/S	Spectrum Analyzer	101372	Aug. 29, 2011 (1Y)

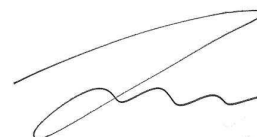
6.4 Test data for Bandwidth

-. Test Date : March 20, 2012
-. Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231 (c)

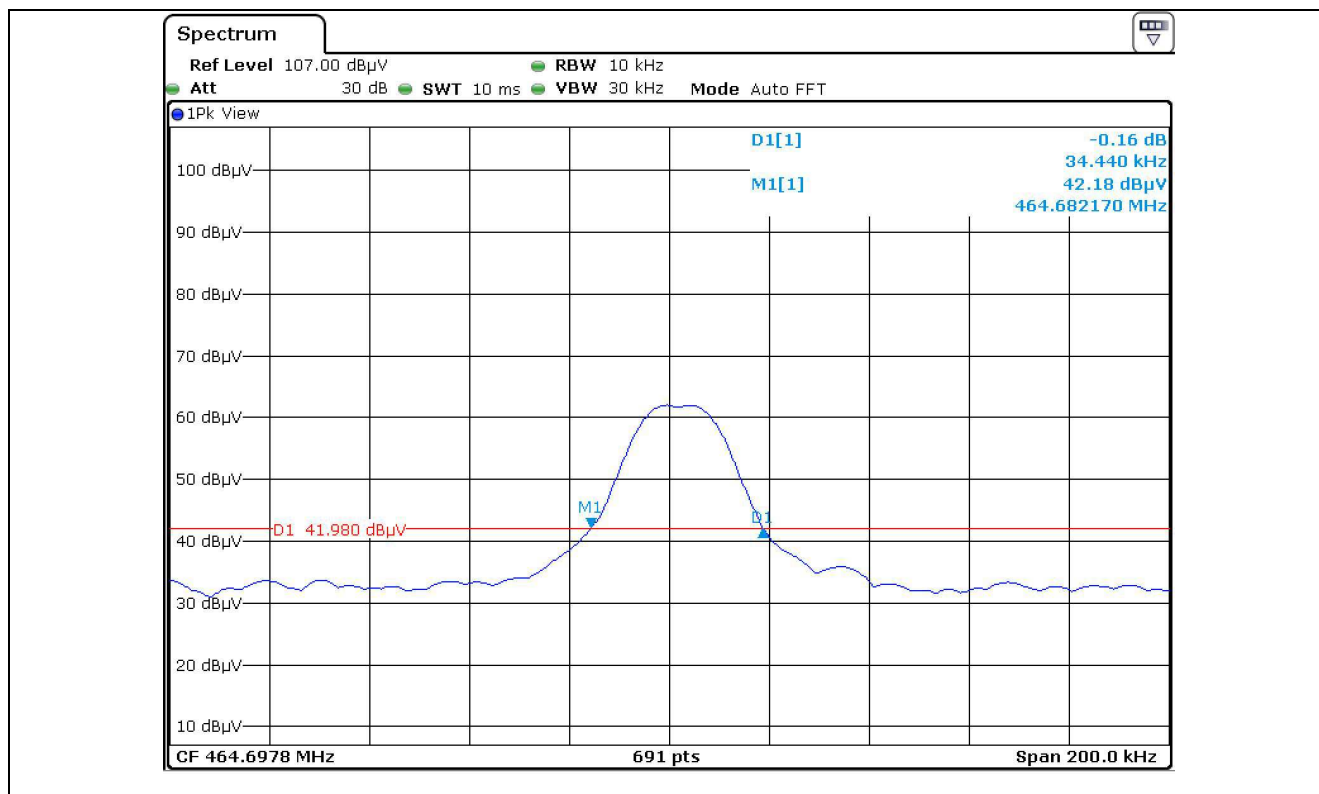
Operating Freq. (MHz)	20 dB Bandwidth (kHz)	Limit (kHz)	Result
464.70	34.440	1 161.75	PASS

Remark: The bandwidth of the emission shall be no wider than 0.25% of the center frequency.

See next page for 20 dB Bandwidth test data



Tested by: Chang-Uk, Jun / Engineer



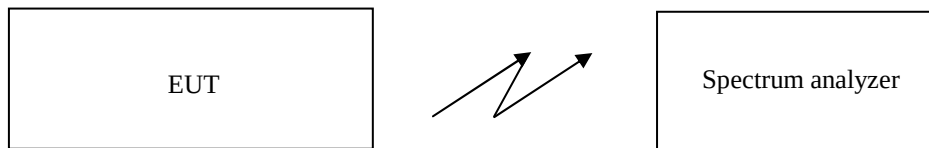
7. TRANSMITTER TIME AND SILENT PERIOD

7.1 Operating environment

Temperature : 27 °C
Relative humidity : 47 % R.H.

7.2 Test set-up

The output signal of EUT was received by the spectrum analyzer. Set the center frequency to 464.70 MHz than set the spectrum analyzer to Zero Span for the release time reading.



7.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	FSV30	R/S	Spectrum Analyzer	101372	Aug. 29, 2011 (1Y)

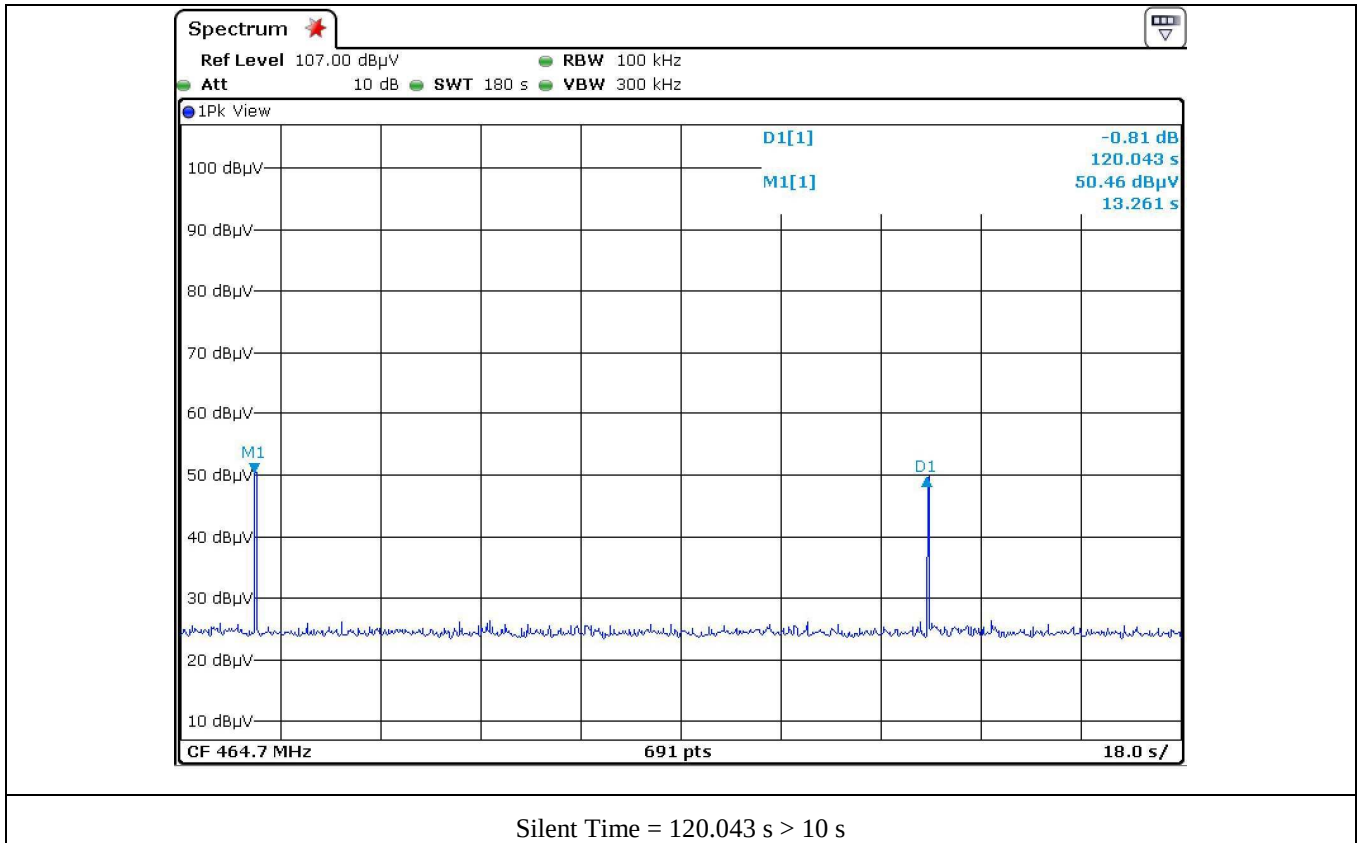
All test equipment used is calibrated on a regular basis.

7.4 Test data

-. Test Date : March 20, 2012



Note. The transmission time of 4.4ms is the same when the EUT transmits within the range of the transmitter as well as out of the range of the transmitter.



Note. The EUT will automatically transmit only every 2 minutes in both modes; i) when the EUT is located out of the range of the transmitter ii) within the range of the transmitter.

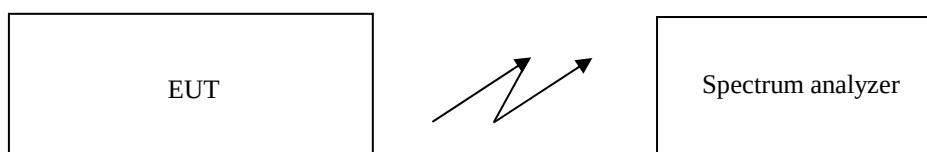
8. SPURIOUS RADIATED EMISSION

8.1 Operating environment

Temperature : 27 °C
Relative humidity : 47 % R.H.

8.2 Test set-up for conducted measurement

The output signal of EUT was received by the spectrum analyzer. The resolution and video bandwidth is set to 100 kHz, and peak detection was used.



8.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	ESCI	R/S	EMI Test Receiver	101013	Oct. 23, 2011 (1Y)
■ -	ESU	R/S	EMI Test Receiver	100261	Sep. 27, 2011(1Y)
■ -	310N	Sonoma Instrument	Amplifier	312544	Oct. 12, 2011(1Y)
■ -	310N	Sonoma Instrument	Amplifier	312545	Oct. 12, 2011(1Y)
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-420	Mar. 23, 2011(1Y)
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-422	Mar. 23, 2011(1Y)
■ -	CO2000	Innco System	Controller	619/27030611/L	N/A
■ -	DT3000	Innco System	Turn Table	930611	N/A
■ -	MA4000-EP	Innco System	Antenna Master	3320611	N/A
■ -	MA4000-EP	Innco System	Antenna Master	3350611	N/A
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Aug. 23, 2011(2Y)
■ -	HFH2-Z2	Rohde & Schwarz	Loop Antenna	889 285 / 26	Nov. 08, 2010(2Y)
■ -	SCU 18	Rohde & Schwarz	Signal Conditioning Unit	10041	Dec. 15, 2011(1Y)

All test equipment used is calibrated on a regular basis.

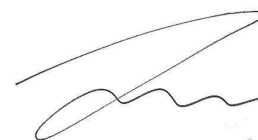
8.4 Test data for Fundamental and Harmonic Frequency

-. Test Date : March 20, 2012
 -. Resolution bandwidth : 120 kHz / 1 MHz
 -. Video bandwidth : 300 kHz / 1 MHz
 -. Frequency range : 30 MHz ~ 5 GHz
 -. Measurement distance : 3 m
 -. Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
464.70	76.25	Peak	H	16.70	4.20	32.90	64.25	93.82	-29.57
	73.25	Average	H				61.25	73.82	-12.57
	76.14	Peak	V				64.14	93.82	-29.68
	73.42	Average	V				61.42	73.82	-12.40
929.40	54.26	Peak	H	22.20	6.20	32.40	50.26	73.82	-23.56
	50.68	Average	H				46.68	53.82	-7.14
	54.16	Peak	V				50.16	73.82	-23.66
	51.42	Average	V				47.42	53.82	-6.40
1 394.10	42.15	Peak	H	26.00	5.10	47.30	25.95	73.82	-47.87
	40.21	Average	H				24.01	53.82	-29.81
	43.74	Peak	V				27.54	73.82	-46.28
	40.16	Average	V				23.96	53.82	-29.86

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical



Tested by: Chang-Uk, Jun / Engineer

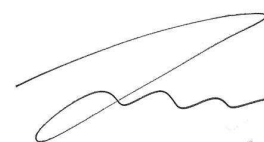
8.5 Test data for other frequency

- Test Date : March 20, 2012
- Resolution bandwidth : 120 kHz
- Frequency range : 30 MHz ~ 5 000 MHz
- Measurement distance : 3 m

Frequency (MHz)	Reading (dBuV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBuV/m)	Limits (dBuV/m)	Margin (dB)
42.68	42.12	H	12.70	1.00	30.42	40.00	-9.58
264.28	41.38	H	11.00	2.70	33.08	43.52	-10.44
336.75	47.26	H	16.20	4.00	35.06	46.02	-10.96
452.12	47.25	H	17.30	4.30	34.25	46.02	-11.77
486.25	51.38	V	21.90	6.10	35.58	46.02	-10.44
942.28	55.28	H	22.40	6.30	39.18	53.97	-14.79
It was not observed any emission from the EUT up to 5 000 MHz.							

Tabulated test data for Radiated Electromagnetic Field

Remark: "H": Horizontal, "V": Vertical

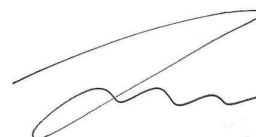


Tested by: Chang-Uk, Jun / Engineer

8.6 Test Data for Below 30 MHz

- Test Date : March 20, 2012
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									



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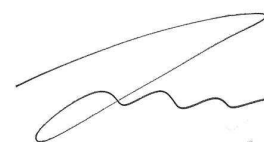
8.7 Test data for receiving mode

- Test Date : March 20, 2012
- Resolution bandwidth : 120 kHz
- Frequency range : 30 MHz ~ 1 000 MHz
- Measurement distance : 3 m

Frequency (MHz)	Reading (dBuV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBuV/m)	Limits (dBuV/m)	Margin (dB)
45.25	32.15	H	13.70	1.30	19.75	40.00	-20.25
56.67	35.51	H	13.10	1.50	23.91	43.52	-19.61
158.36	39.45	H	8.30	2.50	33.65	46.02	-12.37
145.76	40.25	H	8.00	2.40	34.65	46.02	-11.37
345.58	48.26	V	14.40	3.90	37.76	46.02	-8.26
532.74	53.26	H	17.80	5.00	40.46	53.97	-13.51
It was not observed any emission from the EUT up to 1 000 MHz.							

Tabulated test data for Radiated Electromagnetic Field

Remark: "H": Horizontal, "V": Vertical



Tested by: Chang-Uk, Jun / Engineer

9 CONDUCTED EMISSION TEST

9.1 Operating environment

Temperature : 20 °C
Relative humidity : 36 % R.H.

9.2 Test set-up

The EUT was placed on a wooden table, 0.8 m height above the floor. The EUT was connected to charger and power of charger was fed to the EUT through a 50 Ω / 50 μ H + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

9.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
□ -	ESiB26	R&S	Test Receiver	100296	Apr. 11, 2011 (1Y)
■ -	ESHS10	Rohde & Schwarz	Test Receiver	834467/007	Jun. 13, 2011 (1Y)
□ -	NSLK 8126	Schwarzbeck	AMN	8126-404	Jun. 10, 2011 (1Y)
■ -	NSLK 8128	Schwarzbeck	AMN	8128-216	Jun. 10, 2011 (1Y)
□ -	3825/2	EMCO	AMN	9109-1867	Jun. 10, 2011 (1Y)
□ -	3825/2	EMCO	AMN	9109-1869	Jun. 10, 2011 (1Y)
□ -	N/A	KNORR-BREMSE	Artificial Hand	12844	N/A

All test equipment used is calibrated on a regular basis.

9.4 Test data

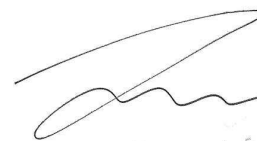
- . Test Date : March 20, 2012
 -. Resolution bandwidth : 9 kHz
 -. Frequency range : 0.15 MHz ~ 30 MHz

Frequency (MHz)	Line	Peak (dB μ V)		Margin (dB)
		Emission level	Q.P Limits	
0.48	N	38.77	56.34	-17.57
0.49	H	43.83	56.08	-12.25
0.69	N	29.66	56.00	-26.34
0.70	H	31.91	56.00	-24.09
0.82	H	30.46	56.00	-25.54
0.96	H	31.51	56.00	-24.49
Frequency (MHz)	Line	Average (dB μ V)		Margin (dB)
		Emission level	Limits	
0.48	N	25.52	46.34	-20.82
0.50	N	29.46	46.00	-16.54
0.69	N	17.94	46.00	-28.06
1.50	N	16.51	46.00	-29.49

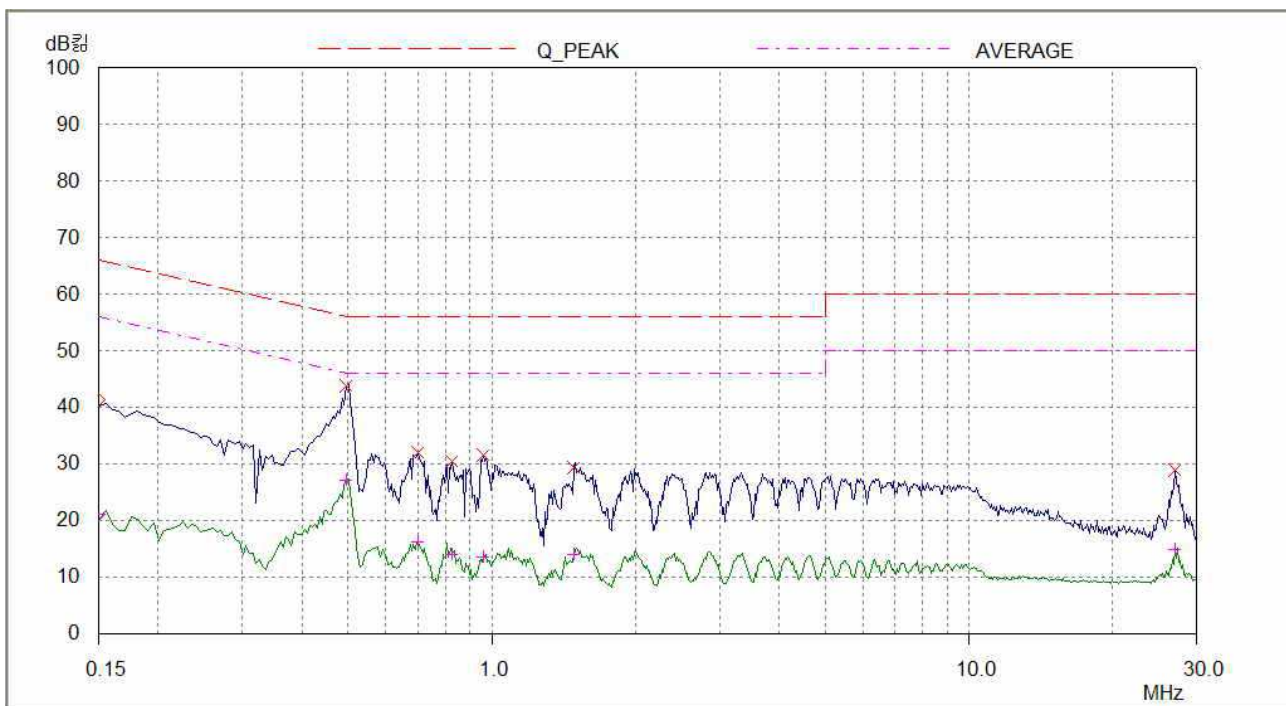
Line Conducted Emissions Tabulated Data

Remark : "H": Hot Line, "N": Neutral Line

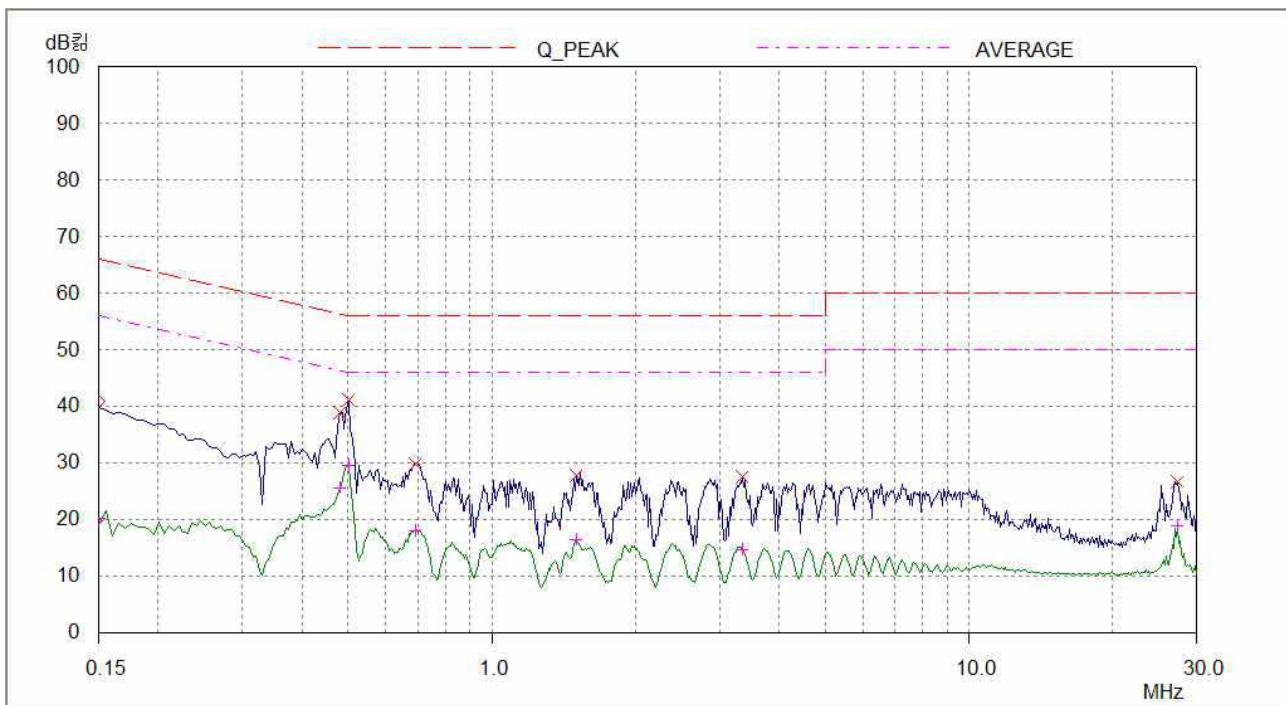
See next page for an overview sweep performed with peak and average detector mode.



Tested by: Chang-Uk, Jun / Engineer



HOT LINE



NEUTRAL LINE