Test Report for FCC

FCC ID:VV8-RCGI9CRW

Report Number		ESTF150712-007			
Applicant	Company name	RCG Holdings Limited			
	Address	P.O.Box 957, Offshore Incorporations Centre, Road Town, Tortola British Virgin Islands			
	Telephone	852-3669-6999			
Product	Product name	Access Control System			
	Model No.	i9	Manufacturer	Suprema Inc.	
	Serial No.	NONE	Country of origin	Korea	
Test date	23-Nov-07		Date of issue	6-Dec-07	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC Part 15 Subpart C , ANSI C 63.4 2003				
Test item	■ Conducted Emission	□ Class A ■ Class B	Test result	OK	
	■ Radiated Emission	□ Class A ■ Class B	Test result	OK	
Measurement facility registration number		94696			
Tested by	Engineer J.H.Kim	(Signature)			
Reviewed by	Engineering Manager J.M.Yang	(Signature)			
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable				

* Note

- This test report is not permitted to copy partly without our permission
- This test result is dependent on only equipment to be used
- This test result based on a single evaluation of one sample of the above mentioned

Contents

1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.
ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co. Ltd

Head Office : Rm 1015, World Venture Center II, 426-5, Gasan-dong, Geumcheon-gu, Seoul, Korea
(Safety & Telecom. Test Lab)

EMC Test Lab : 58-1 Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea
97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

1.3 Official Qualification(s)

MIC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication
KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements
FCC : Filed Laboratory at Federal Communications Commission
VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test

Product	: Access Control System
Model Number	: i9
Serial Number	: NONE
Manufacturer	: Suprema Inc.
Country of origin	: Korea
Operating Frequency	: 13.56MHz
Antenna Type	: Loop Coil
Modulation Type	: ASK
Channel Spacing	: 1
Rating	: AC input100 ~240 VAC,1.0A, 50/60Hz, DC output 12V---2.5A
Receipt Date	: 13-Nov-07
X-tail lists	: 12MHz,27.12MHz,20MHz

2.2 General descriptions of EUT

- CPU : Dual CPU (32 bit RISC + 400MHz DSP)
- Memory : 72MB flash + 34MB RAM
- Display : 2.5 inch QVGA 16 million color LCD
- Identification speed : 3,000 fingerprints in 1 second
- Fingerprint capacity : 40,000 fingerprint templates
- Log capacity : 200,000 events
- Host interface : Wireless LAN, TCP/IP, RS485
- PC interface : USB, RS232
- USB memory slot : USB host
- 1 relay for deadbolt, EM lock, door strike, or automatic door
- Wiegand input/output, 4 TTL input/output
- Built-in microphone and speaker supporting door phone
- Convenient menu navigation key
- 4 function keys for user defined functions
- Operation mode : Fingerprint, PIN, PIN+Fingerprint,
- Card only*, Card+Fingerprint*, Card+PIN* (*RF model only)
- RF Card : 13.56MHz Mifare
- RTC with backup battery (CR2032)**
- Product size : 135 x 128 x 50 mm (width x length x depth)

3. Test Standards

Test Standard : FCC PART 15 (2007)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2003)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain decides that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment These method apply to the measurement of individual units or systems comprised of multiple units

Summary of Test Results

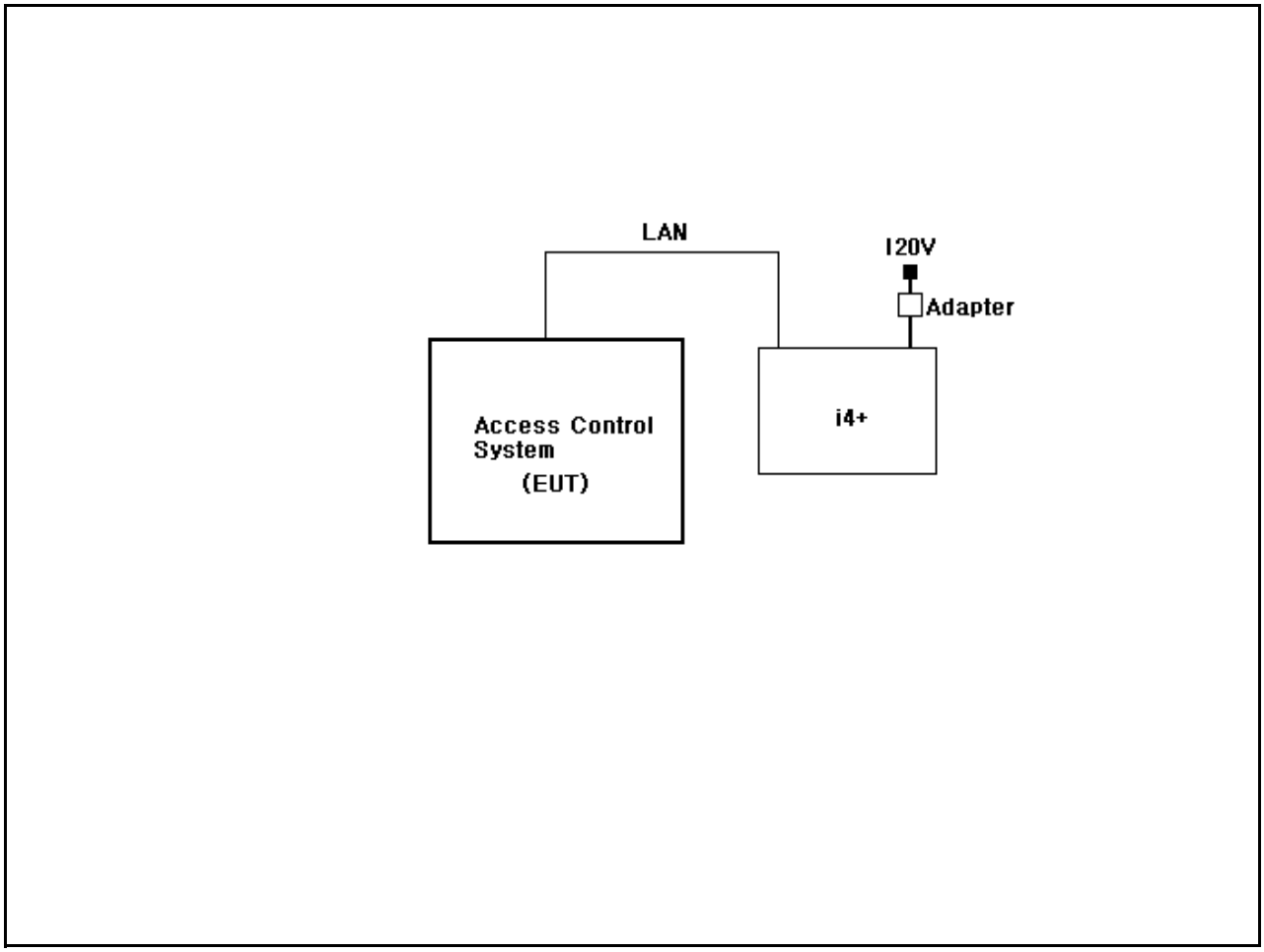
Applied Satandard : 47 CFR Part 15, Subpart C				
Standard	Test Type	Result	Remark	Limit
15.207	AC Power Conducted Emission	Pass	Meet the requirement	
15.225(a)(b)(c)(d)	Radiated Emission (9kHz ~ 30MHz)	Pass	Meet the requirement	
15.225(d) 15.209	Radiated Emission (30MHz ~ 1GHz)	Pass	Meet the requirement	
15.225(e)	Frequency stability	Pass	Meet the requirement	
15.215(c)	20dB Bandwidth	Pass	Meet the requirement	

4. Measurement Condition

4.1 EUT Operation.

The EUT was measured by transmitter mode continuosly.

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
Access Control System	i9	NONE	Suprema Inc.	EUT
Access Control System	i4+ Converter	146000445	Suprema Inc.	
Adapter	JPW128	82-31-299-1234	AULT KOREA CORP.	

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
Access Control System	LAN	i4+ Converter	LAN	2	No	
i4+ Converter	POWER	Adapter	–	2	No	

5. 20 dB Bandwidth

5.1 Procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength

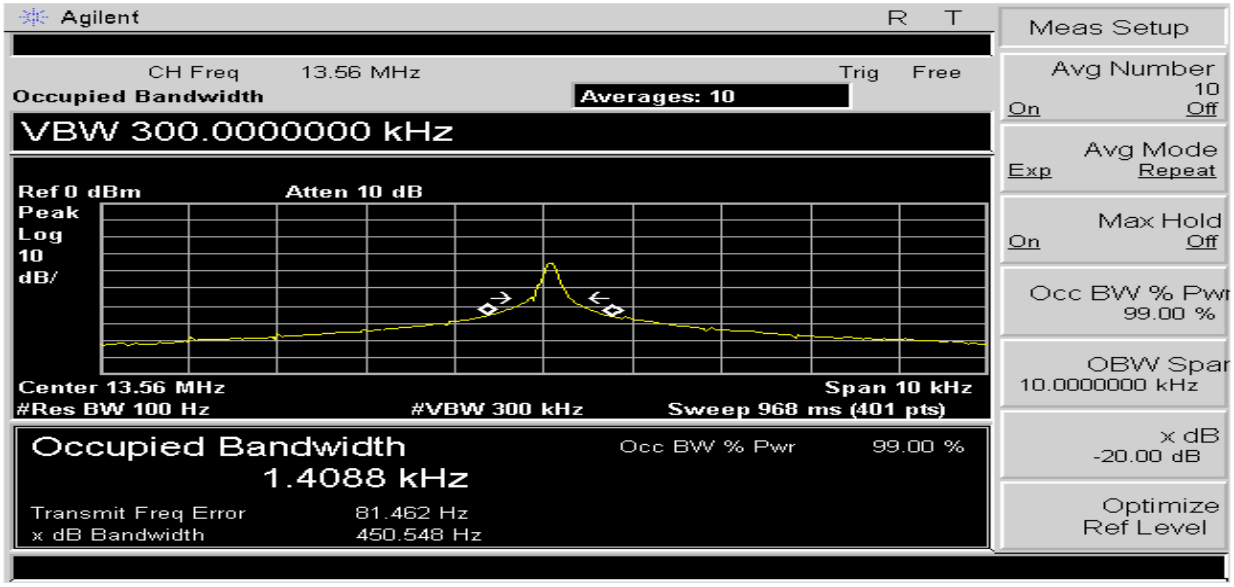
5.2 20dB Bandwidth setup

The spectrum analyzer is set to as following
RBW:10KHz
VBW:300KHz
Span:10KHz
Sweep:suitable duration based on the EUT specification

20dB Bandwidth Test Instruments

Decription	Model	Serial Number	Cal. Due Data
Spectrum Analyzer	E4407B	US42041281	2-Mar-08
Dual Directional Coupler	778D	16502	2-Mar-08

5.3 Measurement Data



6. Frequency Tolerance

6 Procedure

The frequency stability of the transmitter is measured by:

a) Temperature: The temperature is varied from -20℃ to +60℃ using an environmental chamber.

b) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

The frequency tolerance of the carrier shall be maintained within ±0.01% of the operating frequency.

The following test equipments are used during test

Decription	Model	Serial Number	Cal. Due Data
Spectrum Analyzer	E4407B	US42041281	2-Mar-08
DC Power Supply	AK-3010	01000106	2-Mar-08
Temp./Humidity Chamber	SM-150-2	04-TH24	2-Mar-08

6.3 Measurement Data

Operting Frequency :	13,565,000
Reference Voltage :	12.00Vdc
Deviatin Limit :	± 0.01%

Voltage (%)	Power (VDC)	Temperature (℃)	Frequency (Hz)	Deviation
100	12.00	+20℃(Ref)	13,565,000	0.000000
100		-20	13,565,012	-0.000088
100		-10	13,565,015	-0.000111
100		**0**	13,565,020	-0.000147
100		10	13,565,011	-0.000081
100		20	13,565,000	0.000000
100		25	13,565,015	-0.000111
100		30	13,565,019	-0.000140
100		40	13,565,005	-0.000037
100		50	13,565,020	-0.000147
85	10.2	20	13,565,002	-0.000015
115	13.8	20	13,565,004	-0.000029

7. Measurement of radiated disturbance

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter Open test site. The table was rotated 360 degrees to determine the position of the highest radiation.Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

7.1 Radiated emission limits, general requirements

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength @30m (uV/m)	Field strength @30m (dBuV/m)	Field strength @3m (dBuV/m)
Below 13.110	30	29.5	69.5
13.110 ~13.410	106	40.5	80.5
13.410~13.553	334	50.5	90.5
13.553~13.567	15,848	84	124
13.567~13.710	334	50.5	90.5
13.710~14.010	106	40.5	80.5
Above 14.010	30	29.5	69.5

* dBuV/m=20*log(uV/m) * Distance factor=40dB / decade(15.31(f))

7.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Test Receive	ESVS10	Rohde & Schwarz	838562/002	23-Jan-08
Test Receive	ESPI7	Rohde & Schwarz	100005	12-Jan-08
Spectrum Analyzer	R3261C	ADVANTEST	61720116	20-Apr-08
Logbicon Antenna	VULB 9160	SCHWARZBECK	3142	7-May-08
Amplifier	8447F	HP	2805A02972	26-Jun-08
Loop Antenna	HFH2-Z2	Rohde & Schwarz	893103/024	12-Oct-08
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-01	EMCO	9702-203	-
ANT Mast Controller	2090	EMCO	1535	-
Turn Table Controller	2090	EMCO	1535	-

7.3 Environmental Condition

Test Place : Open site(3m)
Temperature (°C) : 15 ℃
Humidity (%) : 49 %

7.4 Test data(9kHz ~ 30MHz)

Test Date : 23-Nov-07 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value(Qeas-Peak)		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
13.56	51.18	V	1.0	18.69	0.6	124.0	70.45	-53.55
27.12	18.00	V	1.0	19.99	0.8	69.5	38.83	-30.71

Remark

*Below 30Mhz was applied Average Detector.
*There was no detected Restricted bands.
*The 30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows;
-3 m Limit(dBuV/m) = 20log(X))+40log(30/3)= 20log(15848)+40log(30/3) = 124dBuV

7.5 Test data(30MHz ~ 1000MHz)

Test Date : 23-Nov-07 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value(Qeas-Peak)		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
40.76	7.40	V	1.0	11.73	1.0	40.0	20.13	-19.87
69.40	20.10	V	1.0	9.96	1.3	40.0	31.36	-8.64
75.20	21.00	V	1.0	8.88	1.3	40.0	31.18	-8.82
193.77	17.10	V	1.0	10.13	2.2	43.5	29.43	-14.07
300.02	20.40	H	1.2	13.11	3.0	46.0	36.51	-9.49
466.69	14.90	V	1.0	16.85	4.0	46.0	35.75	-10.25
500.01	10.20	H	1.0	17.18	4.2	46.0	31.58	-14.42
700.01	4.10	H	1.0	20.57	5.3	46.0	29.97	-16.03
Remark	H : Horizontal, V : Vertical							

8. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 to 30 MHz was measured in accordance to FCC Part 15 (2007). The test setup was made according to ANSI C 63.4 (2003) in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plan. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0m.. The test receiver with Quasi Peak detector complies with CISPR 16.

8.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESH3-Z5	Rohde & Schwarz	838979/010	2008. 2. 28
LISN	NNLA8120A	Schwarzbeck	8120161	2008. 2. 28
TEST Receiver	ESPI7	Rohde & Schwarz	100185	2008. 8. 27
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	-

9.2 Environmental Condition

Test Place : Shield Room
Temperature (°C) : 19 ℃
Humidity (%) : 35 %

8.3 Test data

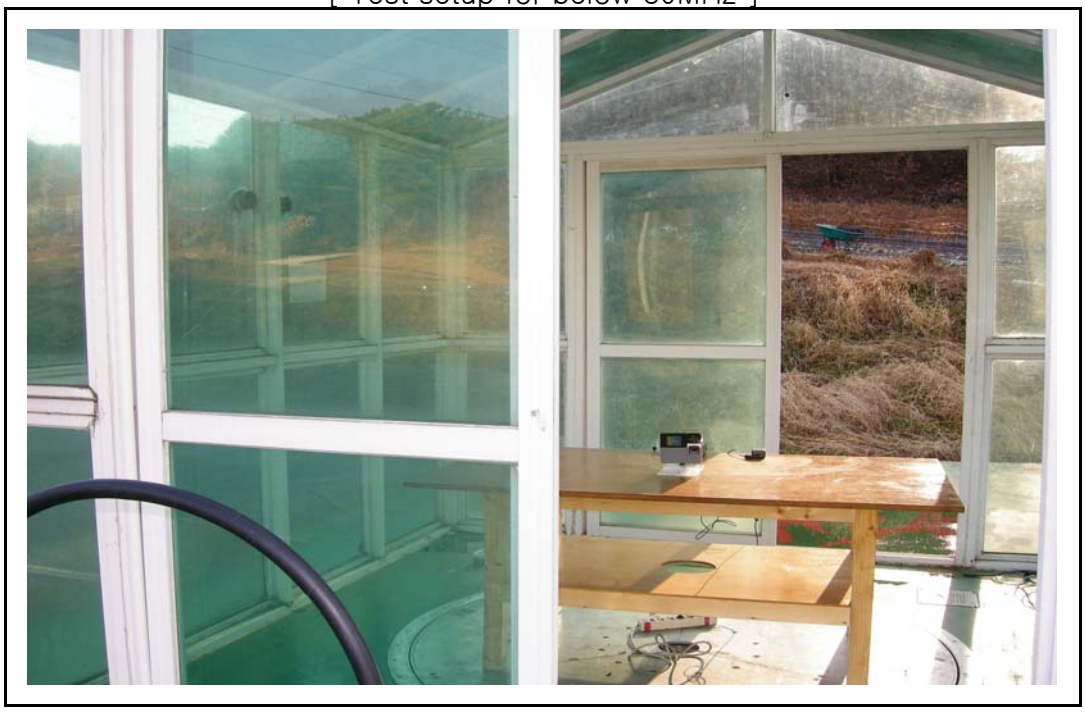
Test Date : 23-Nov-07

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dB)
0.20	0.10	0.0	H	63.57	39.84	39.97	53.57	35.33	35.46
0.27	0.10	0.1	H	61.12	34.98	35.16	51.12	28.56	28.74
0.33	0.10	0.1	N	59.40	24.38	24.60	49.40	19.90	20.12
0.34	0.10	0.1	H	59.25	27.42	27.64	49.25	22.95	23.17
0.40	0.10	0.2	H	57.81	28.64	28.89	47.81	24.12	24.37
0.47	0.10	0.2	H	56.50	27.79	28.08	46.50	25.41	25.70
0.54	0.10	0.2	H	56.00	27.09	27.39	46.00	24.47	24.77
0.60	0.10	0.2	N	56.00	32.14	32.44	46.00	30.94	31.24
0.67	0.10	0.2	H	56.00	30.66	30.96	46.00	28.44	28.74
0.74	0.10	0.2	N	56.00	28.44	28.74	46.00	24.46	24.76
1.28	0.10	0.2	H	56.00	27.48	27.81	46.00	20.00	20.33
4.83	0.19	0.3	N	56.00	27.44	27.93	46.00	21.87	22.36
11.41	0.33	0.7	H	60.00	36.10	37.08	50.00	32.00	32.98
13.43	0.37	0.7	H	60.00	37.50	38.61	50.00	29.23	30.34
15.17	0.41	0.8	N	60.00	38.17	39.38	50.00	27.15	28.36
18.06	0.58	0.8	N	60.00	38.33	39.71	50.00	32.14	33.52
20.20	0.81	0.8	H	60.00	38.62	40.23	50.00	31.92	33.53
20.26	0.71	0.8	N	60.00	37.21	38.73	50.00	29.83	31.35
Remark	H : Hot Line, N : Neutral Line								

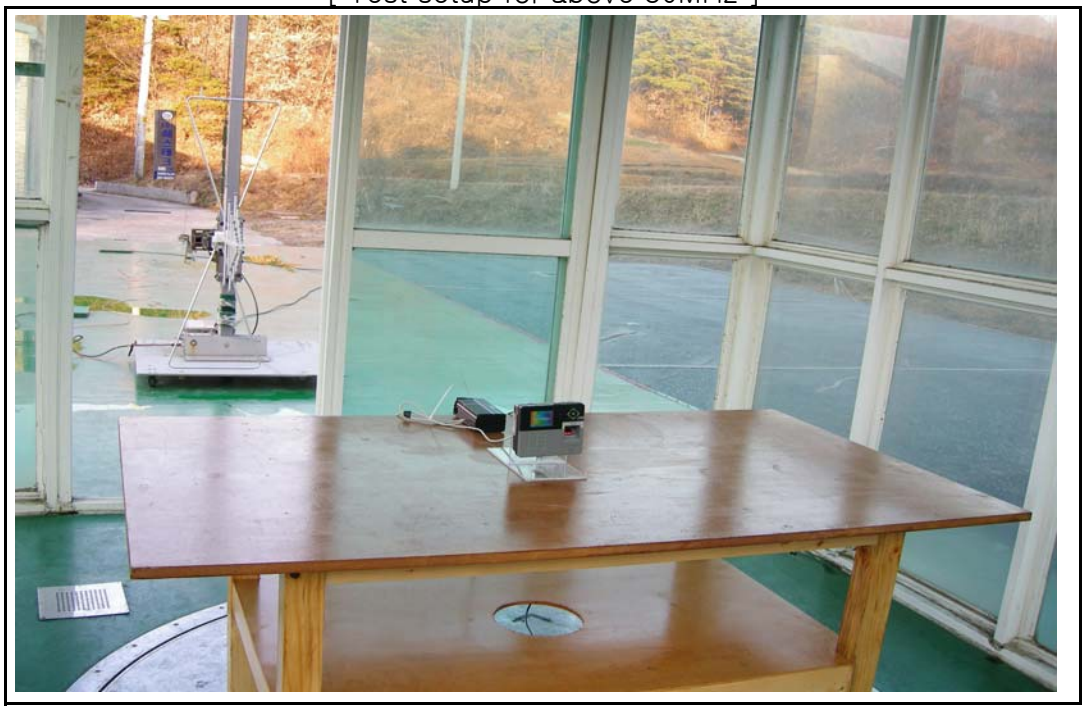
9. Photographs of test setup

9.1 Setup for Radiated Test

[Test setup for below 30MHz]



[Test setup for above 30MHz]



9.2 Setup for Conducted Test : 0.15 ~ 30 MHz

[Front]

[Rear]

10.0 Photographs of EUT

[Front]

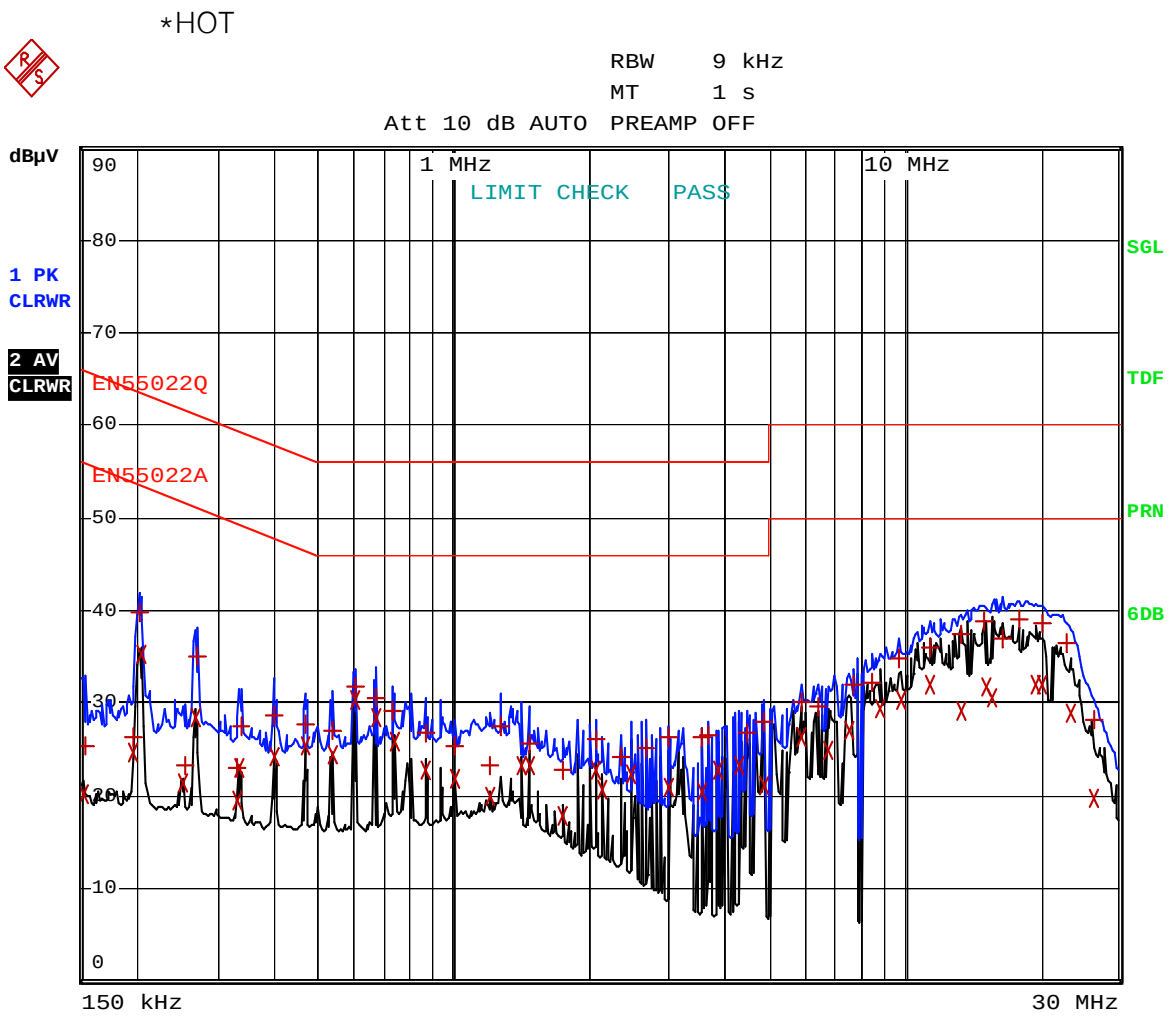
[Rear]

10.1 Photographs of EUT

[Front]

[Rear]

Appendix 1. Spectral diagram



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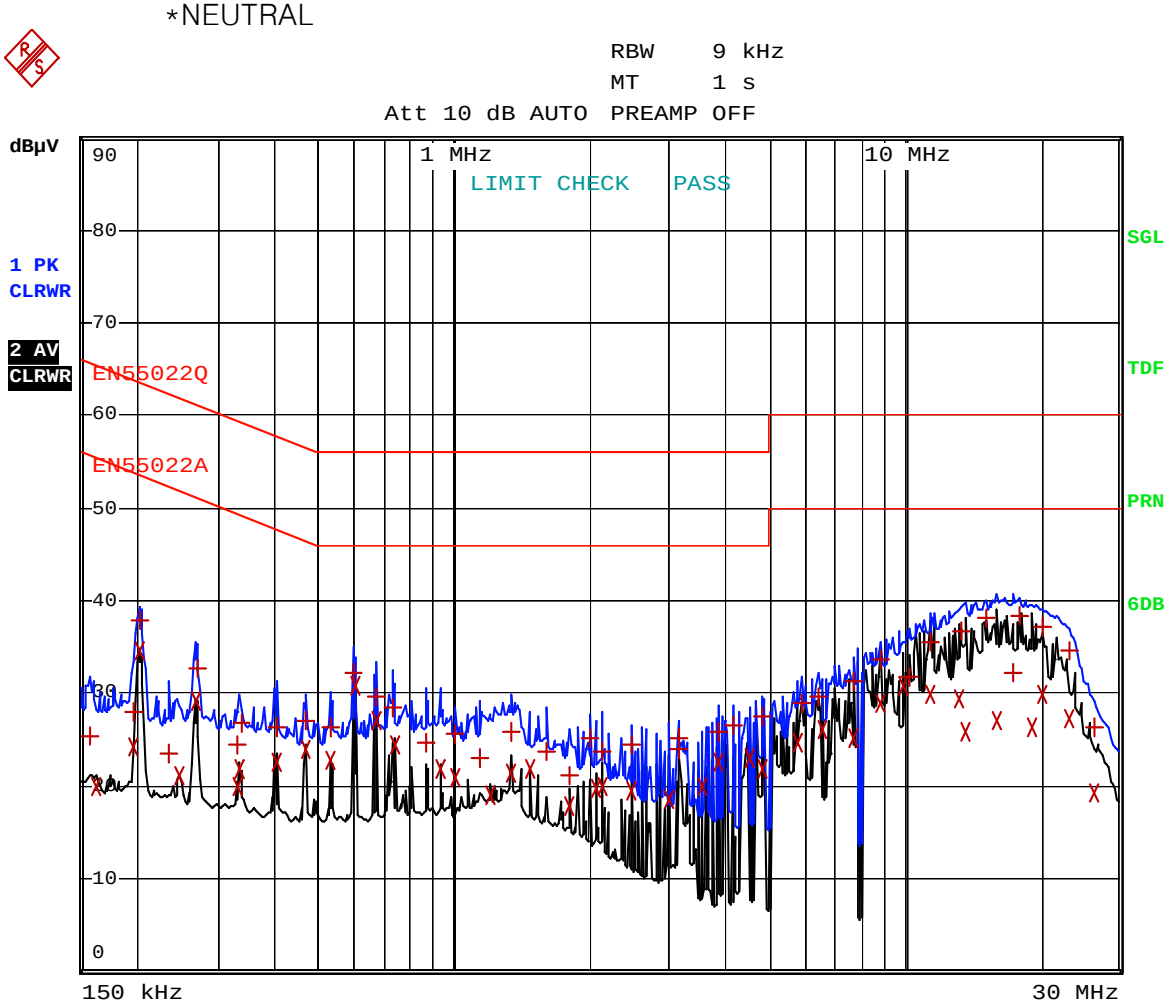

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