ESTECH Co., Ltd.
Rm 1015, World Venture Center II,
426-5 Gasan-dong, Guncheon-gu,
Seoul, 158-803, Korea

Electromagnetic Interference Test Report

Test Report for FCC

Report Number		ESTF150702-003		
Applicant	Company name	Suprema Inc.		
	Address	16F Parkview Office Tower, Jeongja-dong, Bundang-gu,Seongnam, Gyeonggi, 463-863 Korea		
	Telephone	82-31-783-4505		
Product	Product name	FINGERPRINT SYSTEM		
	Model No.	BioStation(BSR-TC)	Manufacturer	Suprema Inc.
	Serial No.	NONE	Country of origin	Korea
Test date	17-Jan-07 ~ 25-Jan-07		Date of issue	1-Feb-07
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea			
Standard	FCC Part 15 Subpart B , 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	Manager Engineer 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	: FINGERPRINT SYSTEM
Model Number	: BioStation(BSR-TC)
Serial Number	: NONE
Manufacturer	: Suprema Inc.
Country of origin	: Korea
Rating	: AC input100 ~250 VAC,0.8A, 50/60Hz , DC output 12V---2.5A
Receipt Date	: 15-Jan-07
X-tal lists	: 6MHz,12MHz,20MHz

2.2 General descriptions of EUT

Specifications

- **CPU : Dual CPU (32 bit RISC + 400MHz DSP)**
- **Memory : 72MB flash + 34MB RAM**
- **Display : 2.5 inch QVGA 16 million color LCD**
- **Identify 3,000 fingerprints in 1 sec.**
- **Fingerprint capacity : 50,000 fingerprint templates**
- **Log capacity : 500,000 events**
- **Host interface : Wireless LAN (optional), 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**
- **Convinent menu navigation key.**
- **4 function keys for user defined functions**
- **Operation mode : Fingerprint Only, PIN Only, Fingerprint + PIN**
- **Product size : 135 x 128 x 50 mm (width x length x depth)**

3. Test Standards

Test Standard : FCC PART 15 (2006)

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)

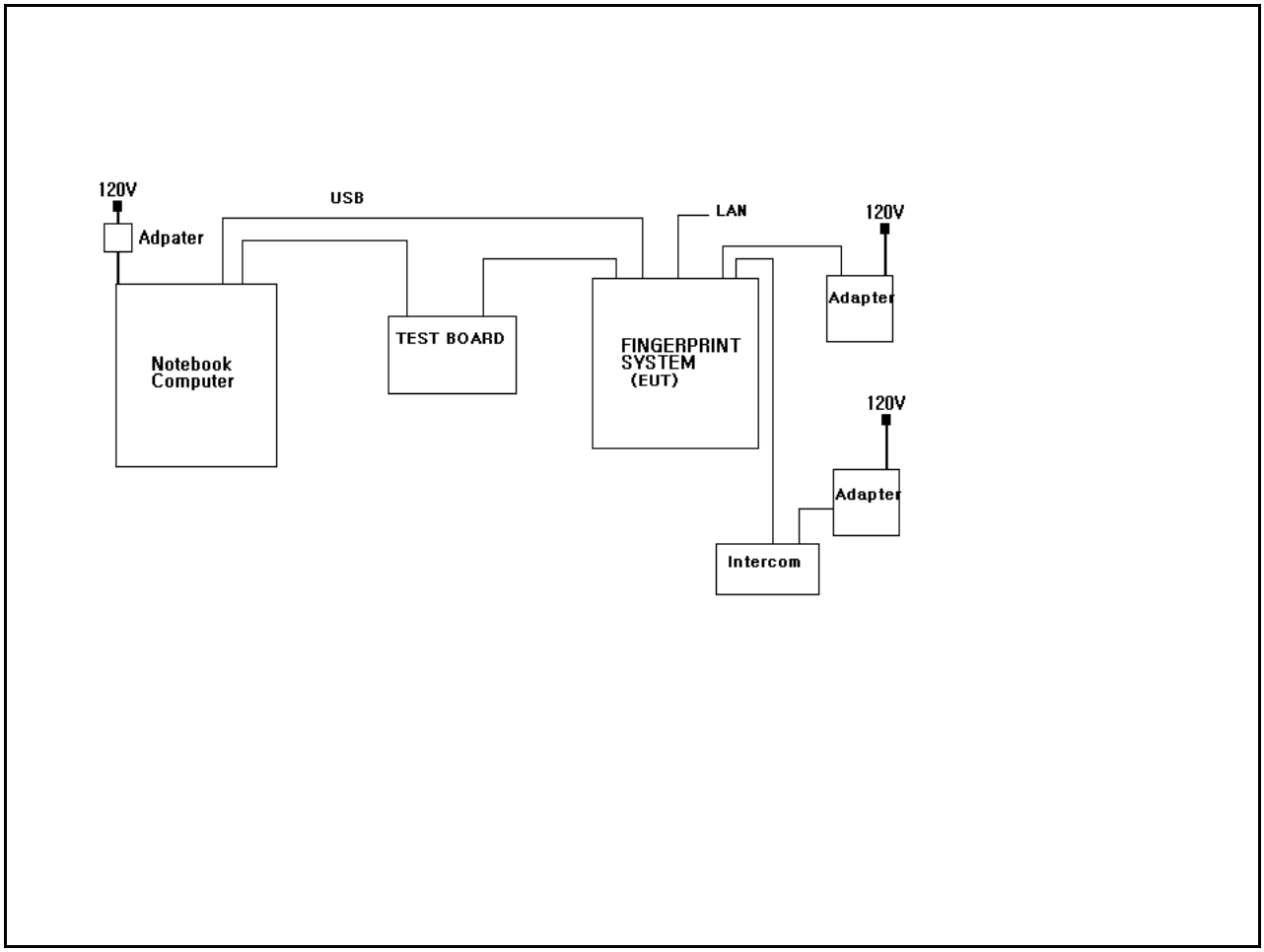
This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and 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

4. Measurement Condition

4.1 EUT Operation.

1. Check to normal mode operation
2. The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission.
3. Connect fingerprint system to Note PC,Local Lan and relay board.
4. Put hand to pingerprint system and check action availability from Note PC.
5. Check fingerprint system under continuous sending and receiving packet data between external network.

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
FINGERPRINT SYSTEM	BioStation(BSR-TC)	NONE	Suprema Inc.	EUT
Adapter	PW127	NONE	AULT Korea Corp.	
Intercom	TP-nAC	S05052150739	COMMAX	
Adapter	SP1805A	SB0510001348	SEUNG BO ELECOM CO., LTD.	
Test Board	NONE	-	Suprema Inc.	
Notebook Computer	D400	40CT	Dell Asia Pacific Sdn.	
Adapter	PA-1650-05D	016B	Dell Asia Pacific Sdn.	

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
FINGERPRINT SYSTEM	Phone	Intercom	-	3	No	
FINGERPRINT SYSTEM	USB	Notebook Computer	USB	1.5	Yes	
FINGERPRINT SYSTEM	Line	Test Board	Line	3	No	
FINGERPRINT SYSTEM	Lan	External Network	Lan	20	No	
Test Board	Serial	Notebook Computer	Serial	2	No	
FINGERPRINT SYSTEM	Power	Adapter	-	2	No	
Intercom	Power	Adapter	-	2	No	
Notebook Computer	Power	Adapter	-	2	No	

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2006). The test setup was made according to ANSI C 63.4 (2003) on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test setup.

5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESVS10	Rohde & Schwarz	838562/002	2008. 1. 23
Spectrum Analyzer	R3261C	ADVANTEST	61720116	2007. 4. 19
LogBicon Antenna	VULB 9160	S/B	3142	2007. 5. 03
Amplifier	8447F	HP	2805A02972	2007. 6. 26
Spectrum Analyzer	8563E	HP	3623A05297	2007. 3. 06
Horn Antenna	BBHA 9120 D	SCHWARZBECK	469	2007. 3. 31
PREAMPLIFIER	8449B	HP	3008A00581	2007. 3. 09
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-01	EMCO	9702-203	-
ANT Mast Controller	2090	EMCO	1535	-
Turn Table Controller	2090	EMCO	1535	-

5.2 Environmental Condition

Test Place : Open site(3m)
Temperature (°C) : 9 ℃
Humidity (%) : 42 %

5.3 Test data

Test Date : 25-Jan-07 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
39.61	9.40	V	1.0	12.43	1.1	40.0	22.89	-17.11
81.00	16.20	V	1.0	8.82	1.4	40.0	26.45	-13.55
112.86	17.30	V	1.0	11.18	1.7	43.5	30.13	-13.37
127.16	15.50	V	1.0	12.22	1.7	43.5	29.46	-14.04
168.84	11.40	H	1.4	13.39	2.0	43.5	26.79	-16.71
200.00	16.40	H	1.2	10.38	2.2	43.5	28.93	-14.57
215.13	10.80	H	1.1	10.67	2.3	43.5	23.75	-19.75
226.00	15.80	H	1.0	11.05	2.4	43.5	29.23	-14.27
250.00	17.10	H	1.0	11.92	2.6	46.0	31.58	-14.42
337.76	9.40	H	1.0	14.04	3.1	46.0	26.52	-19.48
401.96	8.90	H	1.0	15.36	3.4	46.0	27.64	-18.36
598.89	8.70	H	1.0	19.13	4.4	46.0	32.18	-13.82
750.00	6.70	V	1.0	21.20	5.0	46.0	32.86	-13.14
800.01	5.30	V	1.0	21.76	5.2	46.0	32.22	-13.78
1014.17	43.17	H	1.3	23.94	-33.8	54.0	33.31	-20.69
1201.64	45.13	H	1.4	24.38	-33.8	54.0	35.71	-18.29
1470.20	50.01	H	1.6	24.97	-33.70	54.0	41.28	-12.72
1601.00	44.63	V	1.2	24.85	-33.70	54.0	35.78	-18.22
1707.80	41.83	V	1.4	24.71	-33.60	54.0	32.94	-21.06

Remark	H : Horizontal, V : Vertical *CL = Cable Loss-Amplifier Gain(In case of above1000Mhz) *CL = Cable Loss(In case of below1000Mhz) *Below 1000Mhz was applied QPeak Detector and above 1000Mhz was applied Average Detector.

6.3 Test data

Test Date : 17-Jan-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	N	63.57	63.57	46.39	53.57	32.44	32.57
0.27	0.10	0.1	N	61.12	61.12	41.63	51.12	30.57	30.75
0.34	0.10	0.1	H	59.33	59.33	43.51	49.33	35.55	35.77
0.34	0.10	0.1	N	59.30	59.30	45.55	49.30	36.17	36.39
0.40	0.10	0.2	N	57.79	57.79	45.23	47.79	36.01	36.26
0.47	0.10	0.2	N	56.51	56.51	42.86	46.51	33.79	34.08
0.74	0.10	0.2	N	56.00	56.00	38.41	46.00	39.00	39.30
0.83	0.10	0.2	H	56.00	56.00	39.71	46.00	38.42	38.72
2.46	0.12	0.3	N	56.00	56.00	44.45	46.00	40.97	41.39
3.27	0.14	0.3	N	56.00	56.00	44.62	46.00	38.71	39.15
4.08	0.17	0.3	N	56.00	56.00	48.65	46.00	42.50	42.97
4.13	0.17	0.3	H	56.00	56.00	47.35	46.00	37.86	38.33
4.89	0.20	0.3	N	56.00	56.00	42.89	46.00		
6.52	0.24	0.4	N	60.00	60.00	36.36	50.00	25.90	26.51
9.15	0.29	0.5	H	60.00	60.00	30.26	50.00	25.42	26.25
9.62	0.29	0.6	N	60.00	60.00	30.08	50.00	24.41	25.28
11.16	0.32	0.6	H	60.00	60.00	30.43	50.00	25.42	26.39
12.10	0.34	0.7	N	60.00	60.00	29.62	50.00	28.85	29.88
15.60	0.44	0.8	H	60.00	60.00	27.58	50.00		
Remark	H : Hot Line, N : Neutral Line								

6. 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 (2006). 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.

6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESH3-Z5	Rohde & Schwarz	838979/010	2007. 2. 27
LISN	NNLA8120A	Schwarzbeck	8120161	2007. 2. 27
TEST Receiver	ESPI7	Rohde & Schwarz	100185	2007. 8. 24
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2007. 6. 15

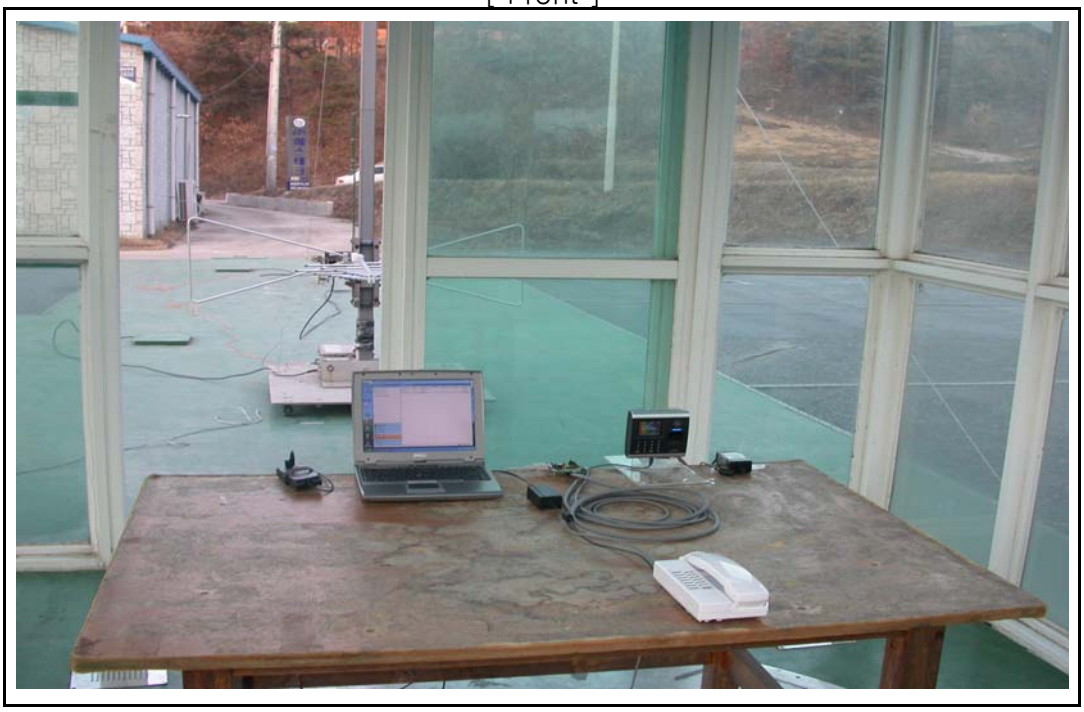
6.2 Environmental Condition

Test Place : Shield Room
Temperature (°C) : 20 ℃
Humidity (%) : 39 %

7. Photographs of test setup

7.1 Setup for Radiated Test : 30 ~ 2000 MHz

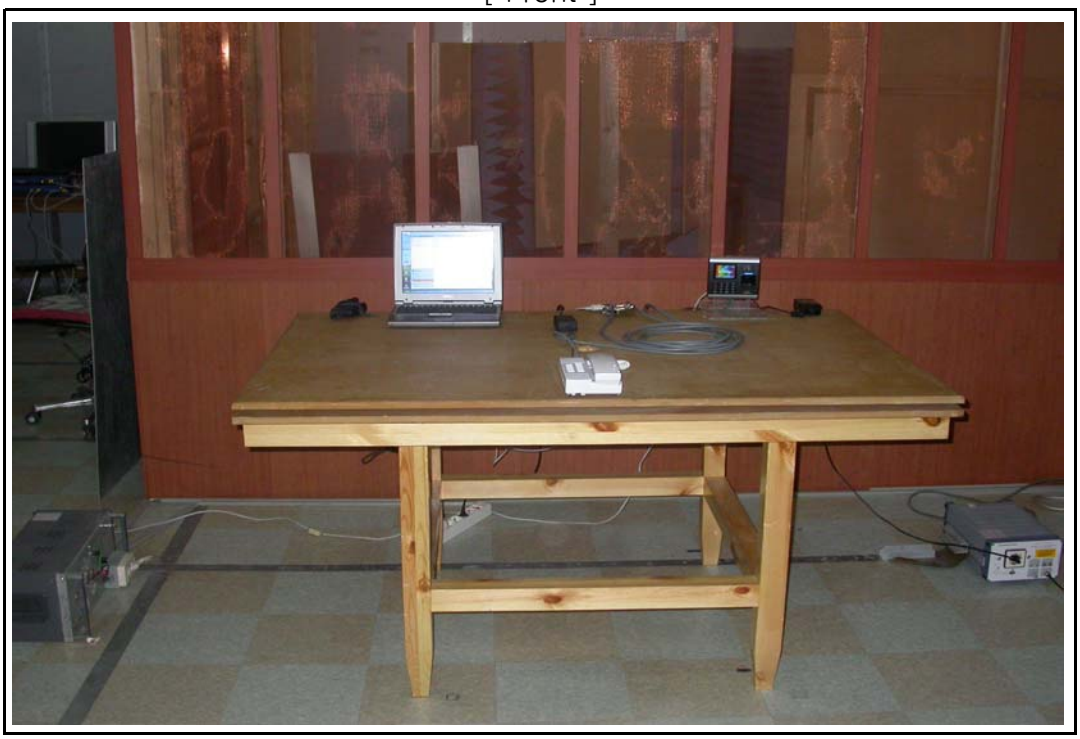
[Front]



[Rear]

7.2 Setup for Conducted Test : 0.15 ~ 30 MHz

[Front]



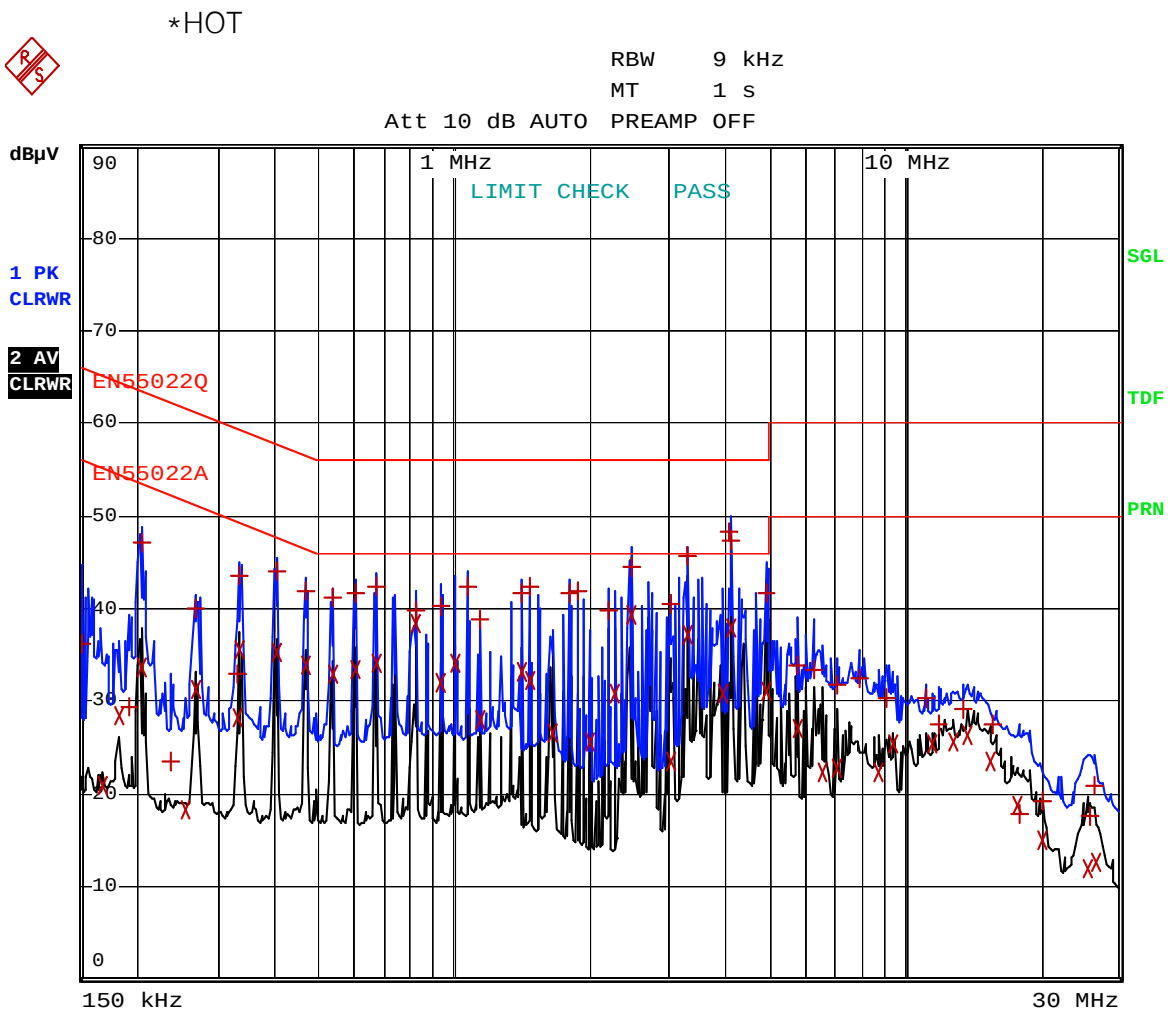
[Rear]

8. Photographs of EUT

[Front]

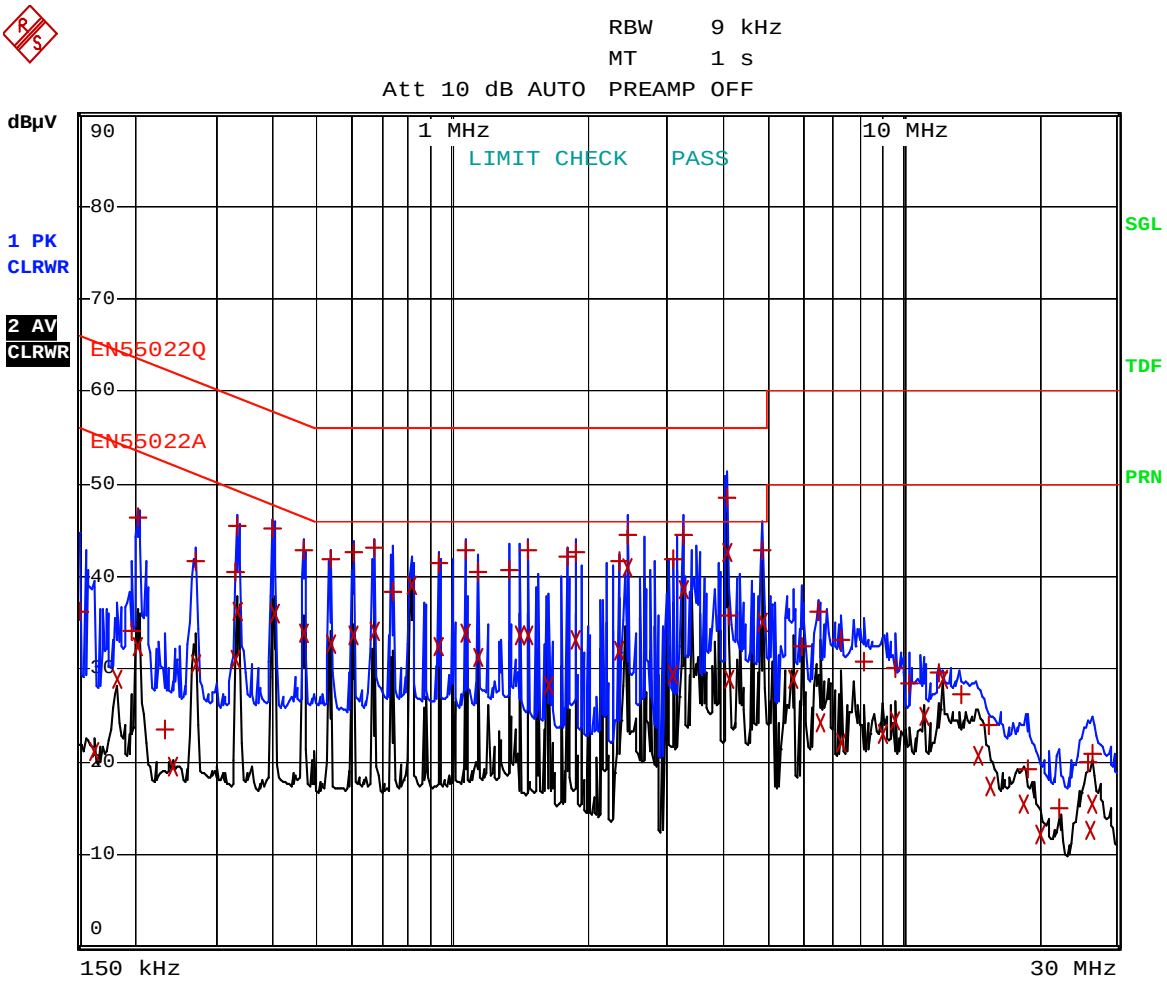
[Rear]

Appendix 1. Spectral diagram



Comment: BioStation(BSR-TC) HOT
Date: 17.JAN.2007 21:12:08

*NEUTRAL



Comment: BioStation(BSR-TC) NEUTRAL
Date: 17.JAN.2007 21:22:40