

**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		ESTF151002-004			
Applicant	Company name	Suprema Inc.			
	Address	16F Parkview Office Tower, Jeongja-dong, Bundang-gu, Seongnam, Gyeonggi, 463-863 Korea			
	Telephone	82-31-710-2442			
Product	Product name	RealScan-F			
	Model No.	RSF	Manufacturer	Suprema Inc.	
	Serial No.	NONE	Country of origin	KOREA	
Test date	28-Jan-10		Date of issue	2-Feb-10	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC PART 15 2008 , ANSI C 63.4 2003				
Test item	<input checked="" type="checkbox"/> Conducted Emission	<input checked="" type="checkbox"/> Class A	<input type="checkbox"/> Class B	Test result	OK
	<input checked="" type="checkbox"/> Radiated Emission	<input checked="" type="checkbox"/> Class A	<input type="checkbox"/> Class B	Test result	OK
Measurement facility registration number		659627			
Tested by	Senior Engineer H.H.Lee		(Signature)		
Reviewed by	Engineering Manager J.M.Yang		(Signature)		
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable				
<p>* Note</p> <p>- This test report is not permitted to copy partly without our permission</p> <p>- This test result is dependent on only equipment to be used</p> <p>- This test result based on a single evaluation of one sample of the above mentioned</p>					

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## 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 : 97-1, Hoeok-ri, Majang-myun, Ichion-city, Kyonggi-do, South Korea

### 1.3 Official Qualification(s)

KCC : 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

NONE : RealScan-F  
Model Number : RSF  
Serial Number : NONE  
Manufacturer : Suprema Inc.  
Country of origin : KOREA  
Rating : Adapter AC Input : 100-240 V, 50-60 Hz, 1.0 A  
DC Output : +12 V === 2.5 A  
Receipt Date : 28-Jan-10  
X-tal : 30.0 MHz, 18.432 MHz

## 2.2 General descriptions of EUT

- Scans various fingerprint images (1, 2, or 4 flats or 1 roll and palm).
- High-quality image scanning regardless of states of finger.
- Automatically segments when scanning flats, and detects slippage when scanning rolls.
- Prevents external light, halo effect, and ghost images.
- Full compliance with IDENT, US-VISIT, and DHS standards.
- User Interface
  - ① Buttons can be used to make scanning easier.
  - ② Scanning progress can be seen on the display.
  - ③ Emits beeps and voice instruction messages through the built-in speaker.
- Detachable cover protects the fingerprint scanning area.
- USB 2.0 transmits data and supplies power.
- For use only with UL Listed I.T.E computer
- Input Power : 12VDC / 2.5A

### 3. Test Standards

#### Test Standard : FCC PART 15 (2008)

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)

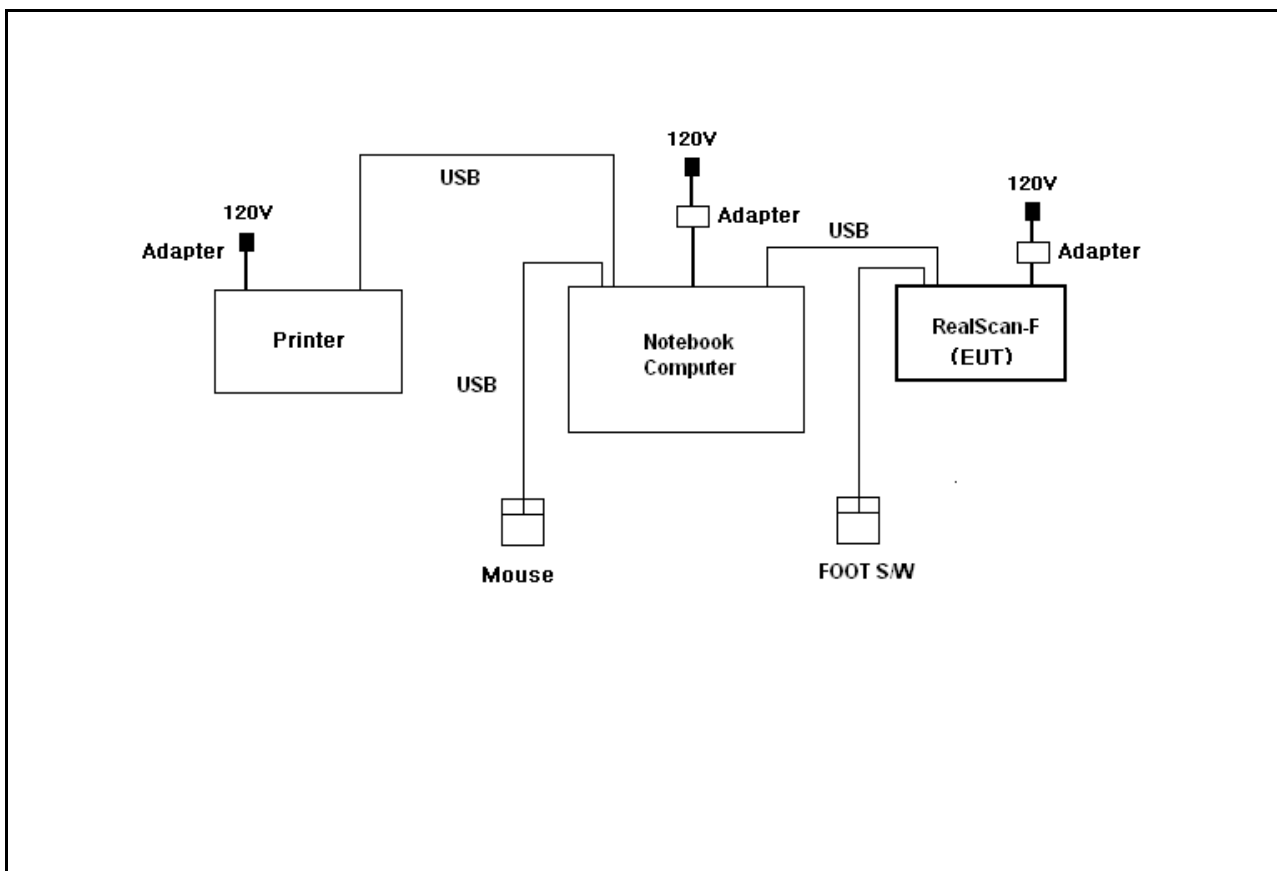
This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain devices 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 methods apply to the measurement of individual units or systems comprised of multiple units.

## 4. Measurement Condition

### 4.1 EUT Operation.

- The EUT was in the following operation mode during all testing
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 the EUT to Notebook computer usb port.
  4. Install scanning program in the Notebook computer.
  5. Put hand to RealScan-F and check action availability from Notebook computer.

### 4.2 Configuration and Peripherals



### 4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
RealScan-F	RSF	NONE	Suprema Inc.	EUT
ADAPTER	JPW128KA1200F03	NONE	BridgePower Corp.	
ADAPTER	Series PPP014L-SA	9215517102	Suzhou Li Shin Electronic Co., Ltd.	
Notebook computer	Pavilion dv5	CNF9100JMW	Hewlett-Packard	
MOUSE	M-BJ58	NONE	Logitech	
PRINTER	K10299	NONE	Canon Inc.	
FOOT S/W	JUNIOR	NONE	LINEMASTER SWITCH CORP.	

### 4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
RealScan-F	USB	Notebook computer	USB	1.83	YES	
RealScan-F	line	FOOT S/W	line	2	YES	
RealScan-F	POWER	ADAPTER	-	1.5	NO	
NOTEBOOK COMPUTER	USB	PRINTER	USB	1.5	YES	
NOTEBOOK COMPUTER	USB	MOUSE	USB	2	YES	
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 (2008) . The test setup was made according to ANSI C 63.4 (2003) on an open test site, which allows a 10 m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8 m. 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	ESPI	Rohde & Schwarz	100005	2011. 1. 15
Spectrum Analyzer	R3273	ADVANTEST	110600592	2010. 6. 04
LogBicon Antenna	VULB 9160	Schwarzbeck	3142	2010. 5. 13
Amplifier	8447F	HP	2805A02972	2010. 6. 24
Horn Antenna	BBHA 9120 D	Schwarzbeck	352	2010. 6. 17
PREAMPLIFIER	8449B	Sonoma Instrument	3008A00581	2010. 3. 06
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(10 m )  
 Temperature (°C) : 5 °C  
 Humidity (%) : 40 %



### 5.3 Test data

Test Date : 28-Jan-10

Measurement Distance : 10 m

Frequency (MHz)	Reading (dB $\mu$ V)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB $\mu$ V/m)	Result (dB $\mu$ V/m)	Margin (dB)
43.95	10.70	V	1.0	11.82	1.0	39.5	23.52	-15.98
76.17	10.00	H	4.0	9.47	1.3	39.5	20.81	-18.69
110.54	13.10	H	4.0	10.37	1.6	43.5	25.08	-18.42
143.98	14.40	V	1.0	12.57	2.0	43.5	29.00	-14.50
196.63	18.80	V	1.0	10.12	2.3	43.5	31.24	-12.26
229.02	10.00	H	4.0	10.75	2.6	43.5	23.35	-20.15
236.94	11.80	H	4.0	11.02	2.7	46.5	25.48	-21.02
276.72	11.60	V	1.0	12.40	3.1	46.5	27.06	-19.44
344.04	10.10	H	3.7	14.07	3.6	46.5	27.79	-18.71
393.21	11.40	H	3.4	15.26	4.0	46.5	30.61	-15.89
416.15	15.70	V	1.0	15.83	4.2	46.5	35.70	-10.80
442.35	8.70	H	2.6	16.48	4.4	46.5	29.61	-16.89
721.78	3.00	H	1.6	21.45	6.6	46.5	31.02	-15.48
904.02	1.00	H	1.0	23.48	7.6	46.5	32.11	-14.39
Remark	H : Horizontal, V : Vertical *CL = Cable Loss-Amplifier Gain(In case of above1000 MHz) *CL = Cable Loss(In case of below1000 MHz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz. *The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection at frequency above 1GHz.							

## 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 (2008) . 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 0.8 m above the ground plan. A grounded vertical reference plane was positioned in a distance of 0.4 m from the EUT. The distance from the EUT to other metal surfaces was at least 0.8 m. 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 1.0 m. 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	2010. 2. 21
LISN	NNLA8120A	Schwarzbeck	8120161	2010. 2. 21
TEST Receiver	ESPI7	Rohde & Schwarz	100185	2010. 8. 25
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2010. 9. 9

### 6.2 Environmental Condition

Test Place : Shield Room  
 Temperature (°C) : 20 °C  
 Humidity (%) : 34 %

## 6.3 Test data

Test Date : 28-Jan-10

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dB $\mu$ V)	Reading (dB $\mu$ V)	Result (dB $\mu$ V)	Limit (dB $\mu$ V)	Reading (dB $\mu$ V)	Result (dB)
0.19	0.09	0.2	H	79.00	52.92	53.24	66.00	41.84	42.16
0.20	0.09	0.2	N	79.00	35.01	35.33	66.00	24.35	24.67
0.26	0.09	0.2	H	79.00	48.18	48.50	66.00	39.84	40.16
0.33	0.09	0.2	H	79.00	40.59	40.93	66.00	34.39	34.73
0.39	0.09	0.3	N	79.00	35.40	35.79	66.00	29.78	30.17
0.46	0.10	0.3	H	79.00	38.75	39.18	66.00	37.19	37.62
0.52	0.10	0.4	H	73.00	43.63	44.09	60.00	43.53	43.99
0.65	0.11	0.4	H	73.00	46.93	47.42	60.00	46.85	47.34
0.98	0.11	0.5	H	73.00	40.57	41.18	60.00	40.31	40.92
2.02	0.14	0.4	H	73.00	40.30	40.86	60.00	40.11	40.67
4.63	0.22	0.6	H	73.00	40.24	41.05	60.00	38.41	39.22
7.96	0.33	0.8	H	73.00	40.12	41.25	60.00	37.73	38.86
Remark	H : Hot Line, N : Neutral Line								

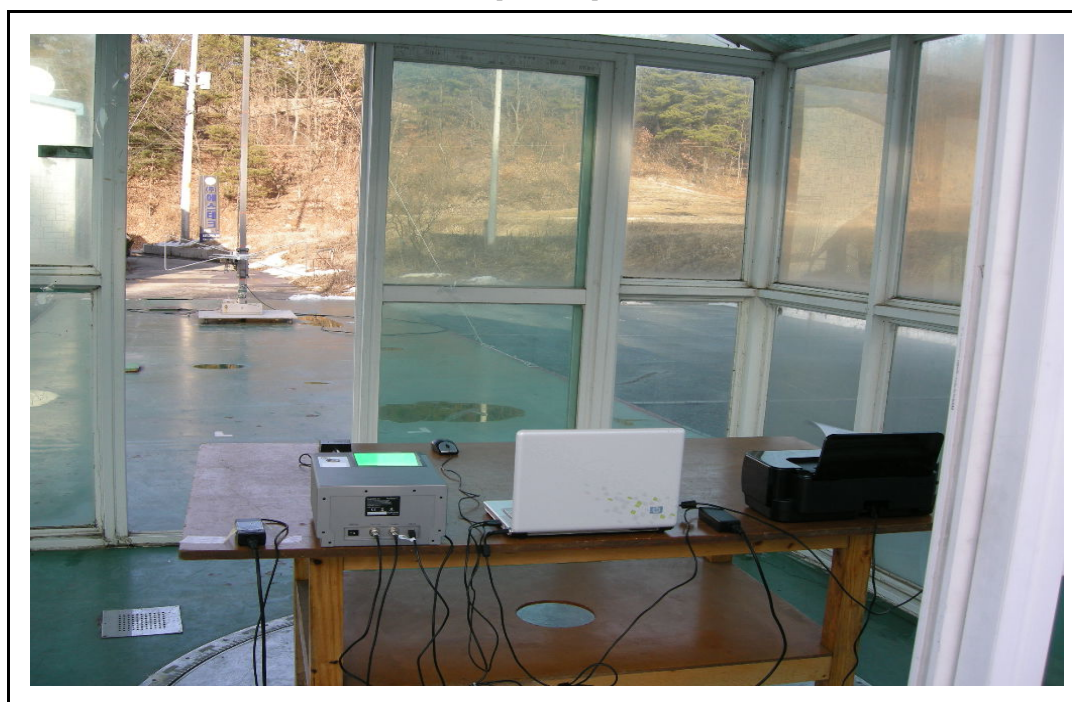
## 7. Photographs of test setup

### 7.1 Setup for Radiated Test : 30 ~ 1000 MHz

[ Front ]



[ Rear ]





### 7.3 Setup for Conducted Test : 0.15 ~ 30 MHz

[ Front ]



[ Rear ]







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## 8. Photographs of EUT

[ Front ]



[ Rear ]



# Appendix 1. Spectral diagram

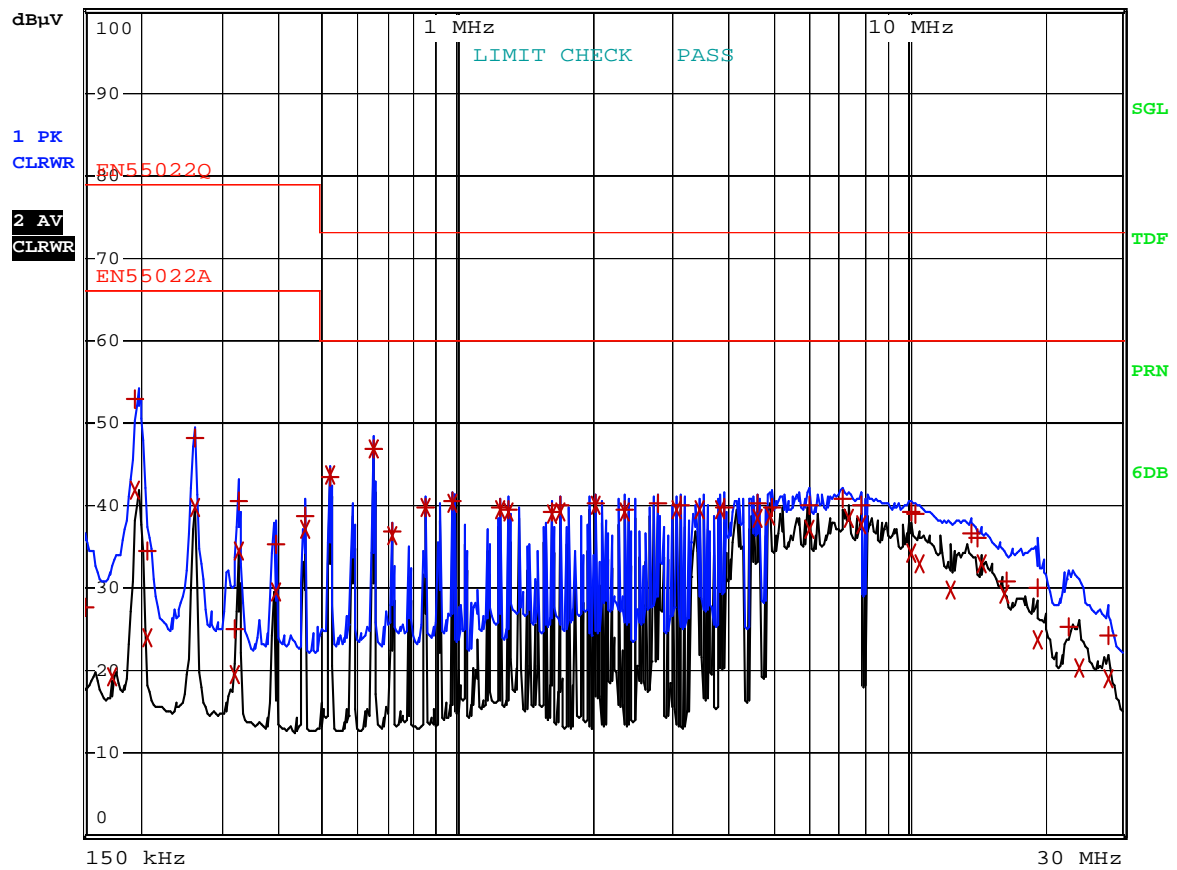
\*HOT



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



Comment: RSF HOT

Date: 28.JAN.2010 15:42:50



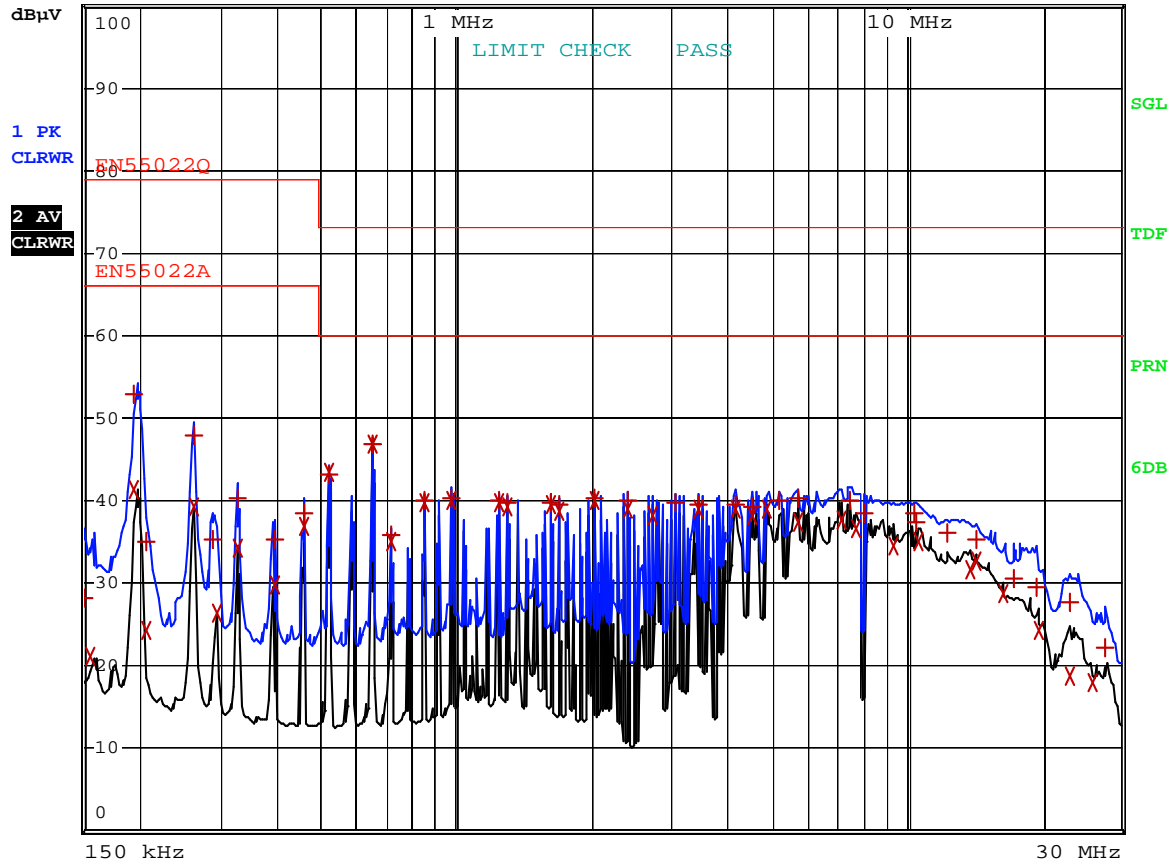
\*NEUTRAL



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



Comment: RSF NEUTRAL

Date: 28.JAN.2010 15:37:22

## Appendix 2. Photographs of EUT in side PCB

