# Test Report for FCC

**FCC ID:TKWBLSOC**

| | | | | |
|---|---|---|---|---|
| Report Number | | ESTF150806-006 | | |
| 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 Terminal | | |
| | Model No. | BioLite Solo(BLS-OC) | Manufacturer | Suprema Inc. |
| | Serial No. | NONE | Country of origin | KOREA |
| Test date | 2008-06-10 | | Date of issue | 18-Jun-08 |
| Testing location | ESTECH. Co., Ltd.<br>97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea | | | |
| Standard | FCC PART 15 2007 , 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 | Senior 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, Kor
(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 Name : Fingerprint Terminal
Model Number : BioLite Solo(BLS-OC)
Serial Number : NONE
Manufacturer : Suprema Inc.
Country of origin : KOREA
Rating : AC input 100-240V,1.0A, 50-60Hz,DC output 12V----2.5A
Receipt Date : 4-Jun-08
X-tal lists : 25MHz, 27.12MHz, 32.768MHz

## 2.2 General descriptions of EUT

### Specifications

| | |
|---|---|
| Fingerprint sensor | 500dpi optical sensor |
| User capacity | 200 users (400 fingerprint templates) |
| Fingerprint identification speed | less than 1 second |
| Operation modes | Fingerprint, PIN, Fingerprint + PIN |
| Internal relay | deadbolt, EM lock, door strike, automatic door |
| LCD | 128 × 64 pixel black & white |
| Keypad | 3x4 keypad, 3 navigation key |
| User interface | multi-color LED and multi-tone buzzer |
| Log storage for audit trail | 5,000 events |
| Operating voltage | 12VDC |
| Size | 60cm × 185cm × 40cm (W × H × D) |

# 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)**

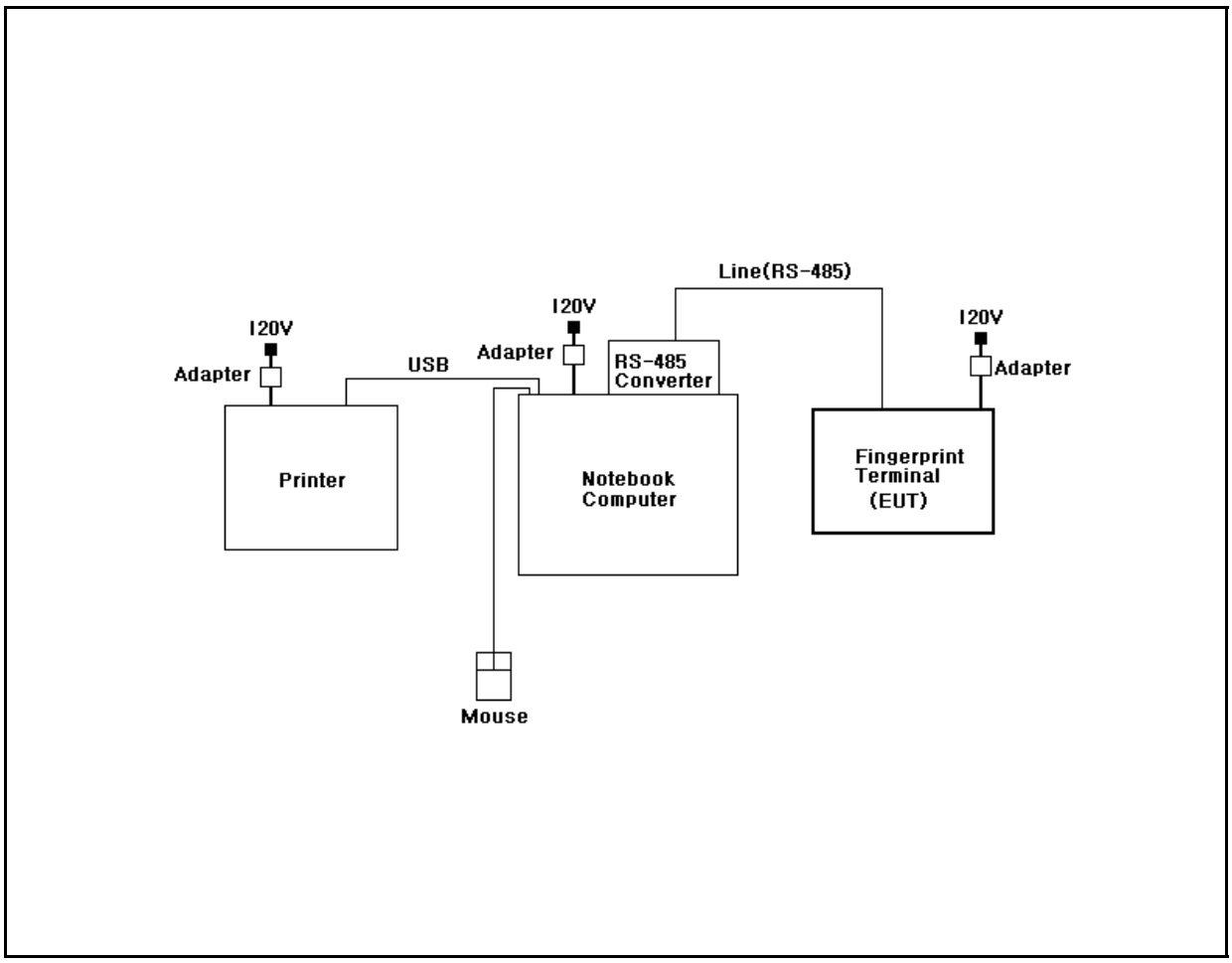
This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and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

# 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
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 Terminal | BioLite Solo(BLS-OC) | NONE | Suprema Inc. | EUT |
| Adapter | JPW128 | NONE | AULT Korea Corp. | |
| Notebook Computer | PPT(Latitude D400) | TW-04U917-70161-326-30BH | Dell Asia Pacific Sdn. | |
| Adapter | PA-1650-05D | NONE | Dell Asia Pacific Sdn. | |
| Printer | CB634A | TH9C6326RY | Hewlett-Packard Company | |
| Adapter | 0957-2231 | 07J0856872 | Bestec DongGuan Electronics Co.,Ltd. | |
| RS-485 Converter | TC-80 | azwNH0400488 | Moxa Technologies Co.,Ltd. | |
| Mouse | M-UAG96B | NONE | Logitech | |

## 4.4 Cable Connecting

| Start Equipment | | End Equipment | | Cable Standard | | Remark |
|---|---|---|---|---|---|---|
| Name | I/O port | Name | I/O port | Length | Shielded | |
| Fingerprint Terminal | LINE(RS-485) | RS-485 Converter | Line(RS-485) | 3 | No | |
| RS-485 Converter | RS-232 | Notebook Computer | RS-232 | - | Yes | |
| Fingerprint Terminal | P0WER | Adapter | - | 2 | No | |
| Notebook Computer | USB | PRINTER | USB | 2 | Yes | |
| Notebook Computer | USB | Mouse | USB | 2 | Yes | |
| Printer | P0WER | Adapter | - | 2 | No | |
| Notebook Computer | P0WER | Adapter | - | 2 | No | |
| | | | | | | |

# 5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2007) & ANSI C 63.4 (2003). The test setup was made according to FCC Part 15 (2007) & 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 Receive | ESVS10 | Rohde & Schwarz | 838562/002 | 2009. 1. 24 |
| Spectrum Analyzer | R3261C | ADVANTEST | 61720116 | 2009. 4. 22 |
| LogBicon Antenna | VULB 9160 | Schwarzbeck | 3142 | 2009. 5. 15 |
| Amplifier | 8447F | HP | 2805A02972 | 2008. 6. 26 |
| 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) : 25 °C
Humidity (%) : 56 %

## 5.3 Test data

Test Date : 10-Jun-08 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) |
| 31.00 | 18.20 | V | 1.0 | 11.11 | 0.2 | 40.0 | 29.53 | -10.47 |
| 76.79 | 13.50 | V | 1.0 | 8.58 | 0.8 | 40.0 | 22.92 | -17.08 |
| 112.86 | 15.40 | V | 1.0 | 10.52 | 1.3 | 43.5 | 27.25 | -16.25 |
| 142.72 | 14.70 | V | 1.0 | 12.75 | 1.6 | 43.5 | 29.01 | -14.49 |
| 178.35 | 13.40 | V | 1.0 | 11.40 | 1.9 | 43.5 | 26.69 | -16.81 |
| 195.40 | 11.90 | V | 1.0 | 9.99 | 2.1 | 43.5 | 24.00 | -19.50 |
| 214.82 | 9.50 | V | 1.0 | 10.18 | 2.2 | 43.5 | 21.92 | -21.58 |
| 388.15 | 11.20 | V | 1.0 | 15.05 | 3.6 | 46.0 | 29.89 | -16.11 |
| 432.33 | 7.10 | V | 1.0 | 16.20 | 3.9 | 46.0 | 27.22 | -18.78 |
| 499.89 | 6.70 | V | 1.0 | 17.18 | 4.4 | 46.0 | 28.28 | -17.72 |
| 562.83 | 5.90 | V | 1.0 | 18.63 | 4.8 | 46.0 | 29.35 | -16.65 |
| 622.77 | 6.70 | V | 1.0 | 19.90 | 5.2 | 46.0 | 31.84 | -14.16 |
| 752.24 | 6.20 | H | 1.0 | 21.90 | 5.9 | 46.0 | 33.96 | -12.04 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| Remark | H : Horizontal, V : Vertical<br>*There is no detected Radiated Emission above 1GHz<br>*CL = Cable Loss - Amplifier Gain(In case of above1000Mhz)<br>*CL = Cable Loss(In case of below1000Mhz)<br>*The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120KHz for Quasi-peak detection at frequency below 1GHz.<br>*The resolution bandwidth and video bandwidth of spectrum analyzer is 1MHz and 10Hz 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 (2007) & ANSI C 63.4 (2003) The test setup was made according to FCC Part 15 (2007) & ANSI C 63.4 (2003) in a shielded Room. 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 | Schwarzbeck | 838979/010 | 2009. 2. 28 |
| LISN | NNLA8120A | Schwarzbeck | 8120161 | 2009. 2. 28 |
| TEST Receiver | ESPI7 | Rohde & Schwarz | 100185 | 2008. 8. 27 |
| Pulse Limiter | ESH3Z2 | Rohde & Schwarz | NONE | - |

## 6.2 Environmental Condition

Test Place : Shielded Room
Temperature (°C) : 20 °C
Humidity (%) : 36 %

## 6.3 Test data

Test Date : 10-Jun-08

| 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 | 0.17 | 0.8 | N | 63.69 | 42.42 | 43.38 | 53.69 | 28.94 | 29.90 |
| 0.26 | 0.20 | 0.8 | N | 61.34 | 37.17 | 38.21 | 51.34 | 24.45 | 25.49 |
| 0.33 | 0.21 | 0.9 | H | 59.55 | 33.58 | 34.66 | 49.55 | 26.95 | 28.03 |
| 0.40 | 0.21 | 0.8 | N | 57.94 | 31.64 | 32.68 | 47.94 | 22.64 | 23.68 |
| 0.46 | 0.20 | 0.8 | N | 56.66 | 31.59 | 32.59 | 46.66 | 23.56 | 24.56 |
| 0.59 | 0.20 | 0.8 | H | 56.00 | 33.50 | 34.49 | 46.00 | 29.22 | 30.21 |
| 0.66 | 0.20 | 0.8 | N | 56.00 | 33.25 | 34.25 | 46.00 | 26.76 | 27.76 |
| 0.86 | 0.19 | 0.8 | N | 56.00 | 29.93 | 30.94 | 46.00 | 23.63 | 24.64 |
| 1.38 | 0.20 | 0.8 | N | 56.00 | 30.27 | 31.28 | 46.00 | 23.59 | 24.60 |
| 3.42 | 0.28 | 0.9 | N | 56.00 | 30.20 | 31.37 | 46.00 | 21.66 | 22.83 |
| 4.01 | 0.30 | 0.9 | N | 56.00 | 31.26 | 32.48 | 46.00 | 24.06 | 25.28 |
| 6.57 | 0.45 | 1.1 | N | 60.00 | 37.73 | 39.24 | 50.00 | 30.34 | 31.85 |
| 6.71 | 0.46 | 1.1 | H | 60.00 | 36.20 | 37.73 | 50.00 | 29.50 | 31.03 |
| 7.10 | 0.48 | 1.1 | N | 60.00 | 38.93 | 40.51 | 50.00 | 31.13 | 32.71 |
| 7.63 | 0.48 | 1.2 | H | 60.00 | 37.97 | 39.60 | 50.00 | 30.28 | 31.91 |
| 8.15 | 0.49 | 1.2 | N | 60.00 | 38.20 | 39.89 | 50.00 | 29.96 | 31.65 |
| 8.22 | 0.49 | 1.2 | H | 60.00 | 36.90 | 38.60 | 50.00 | 29.36 | 31.06 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Remark | H : Hot Line, N : Neutral Line | | | | | | | | |

# 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 ]

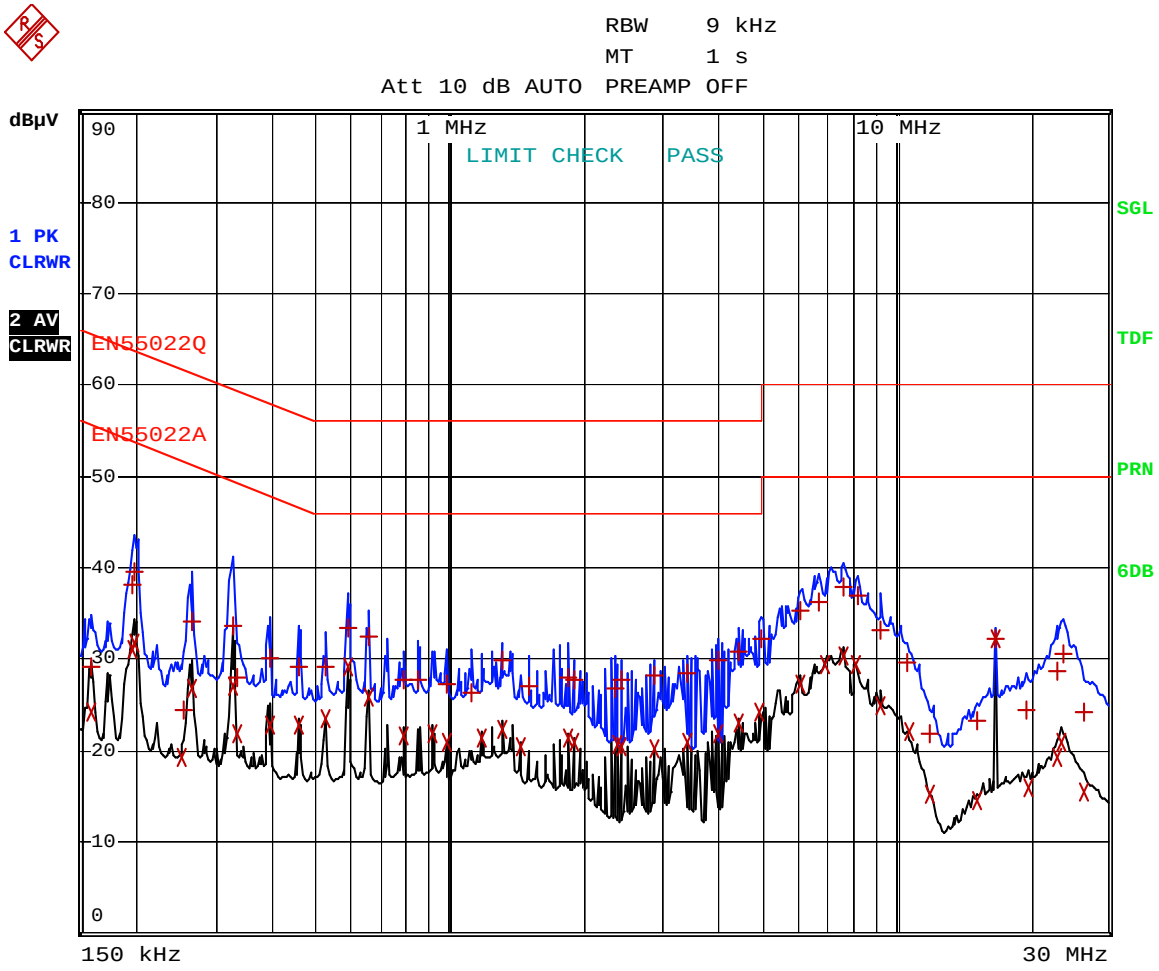
## 8.1 Photographs of EUT

[ Front ]

[ Rear ]

# Appendix 1. Spectral diagram

*HOT

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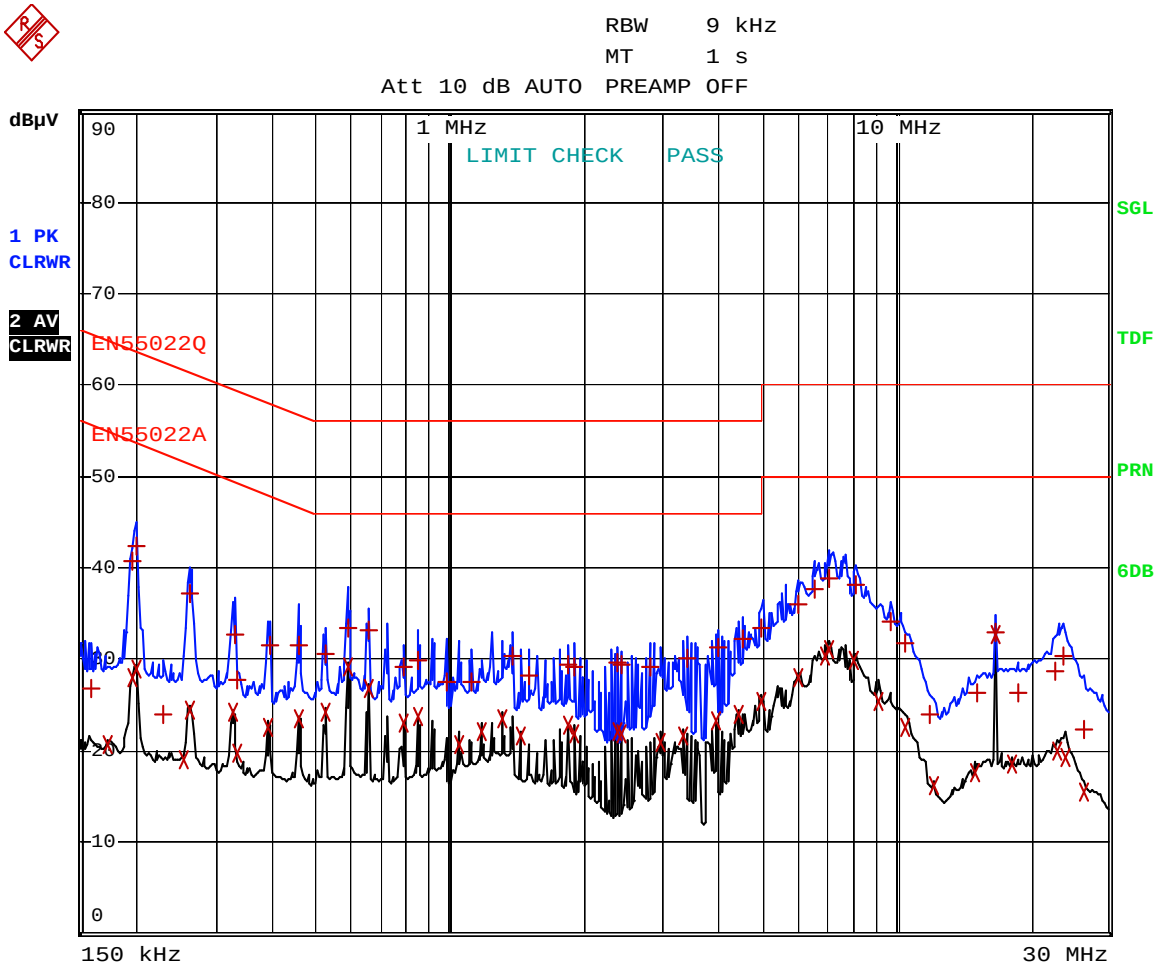


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# Appendix 2. Phorographs of EUT in side PCB