EMC TEST REPORT

For

FINGERTEC WORLDWIDE SDN BHD

FINGERPRINT

Model: R2/M2

Prepared For : FINGERTEC WORLDWIDE SDN BHD
NO.6, 8 & 10, JALAN BK 3/2, BANDAR KINRARA,
47100 PUCHONG, SELANGOR

Prepared By : Shenzhen BST Technology Co., Ltd.
3F,Weames Technology Building,No. 10 Kefa Road,
Science Park,Nanshan District,Shenzhen,Guangdong,China

Date of Test : Apr.07-08,2008
Date of Report : Apr.09,2008
Report Number: BTRE0804071110

TABLE OF CONTENT

TEST REPORT DECLARATION

Applicant	:	FINGERTEC WORLDWIDE SDN BHD
Manufacturer	:	FINGERTEC WORLDWIDE LIMITED
EUT Description	:	FINGERPRINT

(A) MODEL NO. : R2/M2

(B) Remark : N/A

Test Procedure Used:
EN55022:1998+A1:2000+A2:2003
EN55024:1998+A1:2001+A2:2003
(EN61000-4-2:1995+A1:1998+A2:2001, EN61000-4-3:2002,EN61000-4-4:1995+A1:2001
EN61000-4-5: 1995+A1:2001,EN61000-4-6: 1996+A1:2001
EN61000-4-8: 1996+A1:2001)

The device described above is tested by US to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and EUT's performance criterion. The test results are contained in this test report. Shenzhen BST Technology Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests. Also, this report shows that the EUT is technically compliant with
the EN55022, EN55024 standards.

Date of Test : Apr.07-08,2008

Prepared by : Jack Li / Assistant

Reviewer : Mary Du / Supervisor

Approved & Authorized Signer : Christina / Manager

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description : FINGERPRINT

Model Number : R2/M2

Applicant : FINGERTEC WORLDWIDE SDN BHD
NO.6, 8 & 10, JALAN BK 3/2, BANDAR KINRARA, 47100 PUCHONG, SELANGOR

Manufacturer : FINGERTEC WORLDWIDE LIMITED
Peking University Founder Shiyan Science Park, Bao ' an, Shezhen, China. 518108

Date of Test : Apr.07-08,2008

1.2. Test Facility

Site Description

EMC Lab. : Certificated by TUV,TIMCO

Name of Firm : Shenzhen BST Technology Co., Ltd.

Site Location : 3F,Weames Technology Building,
No. 10 Kefa Road,Science Park,
Nanshan District,Shenzhen,Guangdong,China

1.3. Test Uncertainty

Conducted Emission Uncertainty = ±2.66dB

Radiated Emission Uncertainty = ±4.26dB

2. TEST INSTRUMENT USED

2.1. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PSD 1600	H911'292	Jun. 02, 07	1 Year

2.2. For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	HP	8648A	3633A02081	Jun. 03, 07	1 Year
2.	Amplifier	A&R	500A100	17034	NCR	NCR
3.	Amplifier	A&R	100W/1000M1	17028	NCR	NCR
4.	Isotropic Field Monitor	A&R	FM2000	16829	NCR	NCR
5.	Isotropic Field Probe	A&R	FP2000	16755	Jun. 03, 07	1 Year
6.	Biconic Antenna	EMCO	3108	9507-2534	NCR	NCR
7.	Log-periodic Antenna	A&R	AT1080	16812	NCR	NCR
8.	PC	N/A	486DX2	N/A	N/A	N/A

2.3. For Radiated Emission Measurement

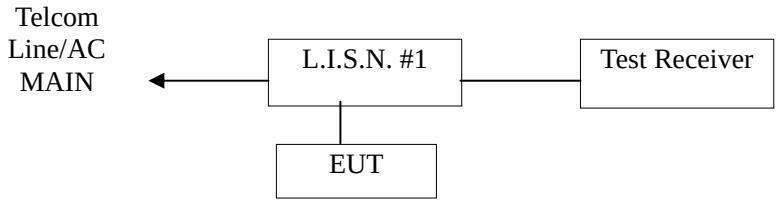
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	ANRITSU	MS2661C	6200140915	Jun 01,07	1 Year
2.	Test Receiver	Rohde&Schwarz	ESC830	828982/018	Jun 01,07	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	Jun 01,07	1 Year
4.	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	Jun 01,07	1 Year
5.	Cable	Schwarzbeck	AK9513	ACRX1	Jun 01,07	1 Year
6.	Cable	Rosenberger	N/A	FR2RX2	Jun 01,07	1 Year
7.	Cable	Schwarzbeck	AK9513	CRRX2	Jun 01,07	1 Year
8.	Cable	Schwarzbeck	AK9513	CRRX2	Jun 01,07	1 Year
9.	Signal Generator	HP	864A	3625U00573	Jun 01,07	1 Year

2.4. For Conducted Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS30	828985/018	Jun. 01, 07	1 Year
2.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	Jun. 01, 07	1 Year
3.	L.I.S.N.	Rohde & Schwarz	ESH2-Z5	834549/005	Jun. 01, 07	1 Year
4.	Conical	Emtek	N/A	N/A	N/A	N/A
5.	Voltage Probe	Schwarzbeck	TK9416	N/A	Jun. 01.07	1 Year
6.	Coaxial Switch	Anritsu	MP59B	6100214550	Jun. 01, 07	1 Year

3. POWER LINE CONDUCTED EMISSION TEST

3.1. Block Diagram of Test Setup



(EUT: FINGERPRINT)

3.2. Test Standard

EN 55022: 2006

3.3. Power Line Conducted Emission Limit

Frequency	Power Port limits (dBμV)		Telecommunication Port Limits (dBμA)		Telecommunication Port Limits (dBμV)	
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.15MHz ~ 0.5MHz	79	66	53~43*	40~30*	97~87*	84~74*
0.5MHz ~ 30MHz	73	60	43	30	87	74

* Decreasing linearly with logarithm of the frequency

3.4. EUT Configuration on Test

The following equipments are installed on conducted emission test to meet EN55013 requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

3.4.1. EUT

Model Number :R2/M2
Serial Number :N/A
Manufacturer : FINGERTEC WORLDWIDE SDN BHD.

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulators as shown in Section 3.1.

3.5.2. Turn on the power of all equipments.

3.5.3. Let the EUT work in test modes (EUT Working) and test it.

3.6. Test Procedure

The EUT is put on the ground and connected to the AC mains through a Artificial Mains Network (AMN). This provided 50ohm-coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission levels according to the EN55022 regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESHS30) is set at 10KHz.

The frequency range from 150 KHz to 30 MHz is investigated.

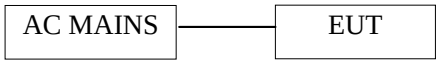
3.7. Power Line Conducted Emission Test Results

PASS.

The frequency range 150KHz to 30MHz is investigated. All the emission levels not reported below are too low against the prescribed limit.

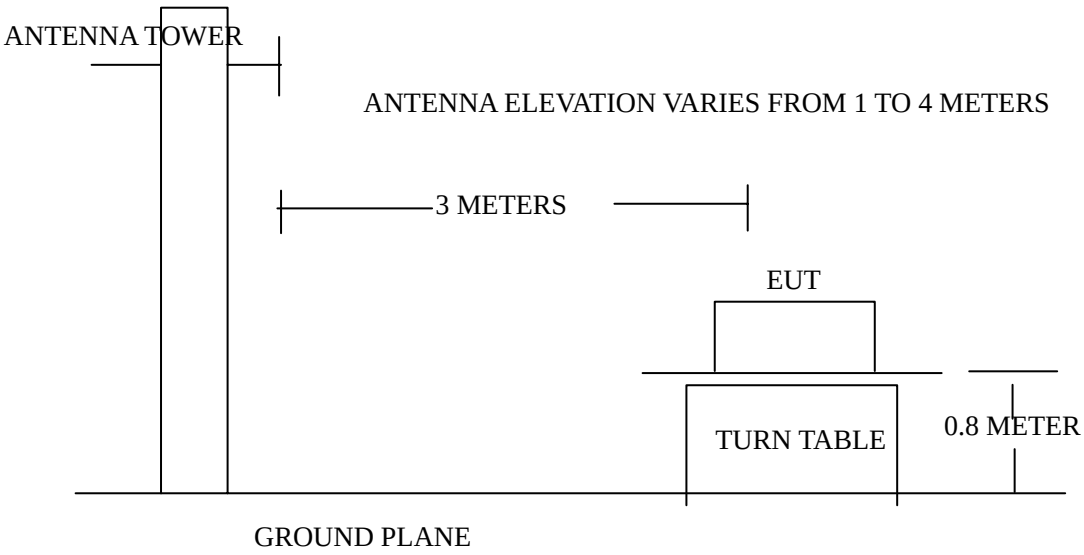
4. RADIATED EMISSION TEST

4.1.1. Block Diagram of Test Setup



(EUT: FINGERPRINT)

4.1.2. Open Site Setup Diagram



4.2. Test Standard

EN 55022:2006

4.3. Radiated Emission Limit

All emanations from a Class B computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dBμV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note**:**(1) The tighter limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

4.4. EUT Configuration on Test

The EN55022 Class B regulations test method must be used to find the maximum emission during radiated emission test.

4.5. Operating Condition of EUT

4.5.1. Setup the EUT as shown on Section 3.1.

4.5.2. Turn on the power of all equipments.

4.5.3. Let the EUT work in test mode and measure it.

4.6. Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth setting on the test receiver (R&S TEST RECEIVER ESCS20) is 120 KHz. The EUT is tested in Anechoic Chamber. All the test results are listed in Section 4.7. and all the scanning waveform are attached within **Appendix I.**

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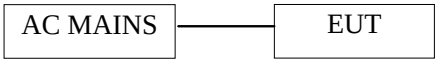
4.7. Radiated Emission Test Results

PASS.

The frequency range from 30MHz to 1000MHz is investigated. Please see the following pages.

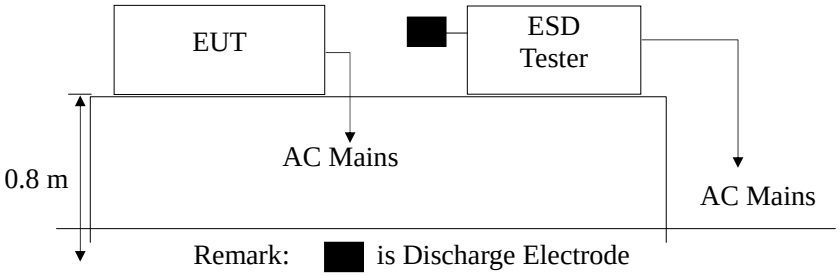
5. ELECTROSTATIC DISCHARGE TEST

5.1.1. Block Diagram of Test Setup



(EUT: FINGERPRINT)

5.1.2. Block Diagram of ESD Test Setup



5.2. Test Standard

EN 55024:1998+A1:2001+A2: 2003 (EN61000-4-2:1995+A1:1998+A2:2001)
Severity Level 3 for Air Discharge at 8KV
Severity Level 2 for Contact Discharge at 4KV

5.3. Severity Levels and Performance Criterion

5.3.1. Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

5.3.2. Performance criterion**: B**

5.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.4..

5.5. Operating Condition of EUT

5.5.1. Setup the EUT as shown in Section 5.1..

5.5.2. Turn on the power of all equipments.

5.5.3. Let the EUT work in test mode (off hook) and test it.

5.6. Test Procedure

5.6.1. Air Discharge**:**

This test is done on a non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

5.6.2. Contact Discharge**:**

All the procedure shall be same as Section 7.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

5.6.3. Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

5.6.4. Indirect discharge for vertical coupling plane

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

5.7. Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

Shenzhen BST Technology Co., Ltd.

04/08/2008

Applicant	*: FINGERTEC WORLDWIDE SDN BHD*	*Test Date*	*: Apr.08,2008*
EUT	*: FINGERPRINT*	*Temperature*	*: 22℃*
M/N	*: R2/M2*	*Humidity*	*: 50％*
Power Supply	*:*	*Test Mode*	*: Off Hook*
Test Engineer	*: Deng Yong*		

Air Discharge: ±8KV *For each point positive 10 times and negative 10 times discharge.*

Contact Discharge: ±4KV

Location		***Kind*** *A-Air Discharge* *C-Contact Discharge*	***Result***
Slots	*10 points*	*A*	*PASS*
Button	*20 points*	*A*	*PASS*
LED	*2 points*	*A*	*PASS*
Enclosure	*20 points*	*A*	*PASS*
Screw	*3 points*	*C*	*PASS*
Ports	*2 points*	*C*	*PASS*
HCP	*5 points*	*C*	*PASS*
VCP	*5 points*	*C*	*PASS*

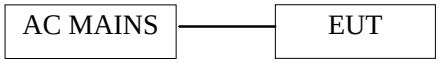
Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

Reviewer**:** _____

6. RF FIELD STRENGTH SUSCEPTIBILITY TEST

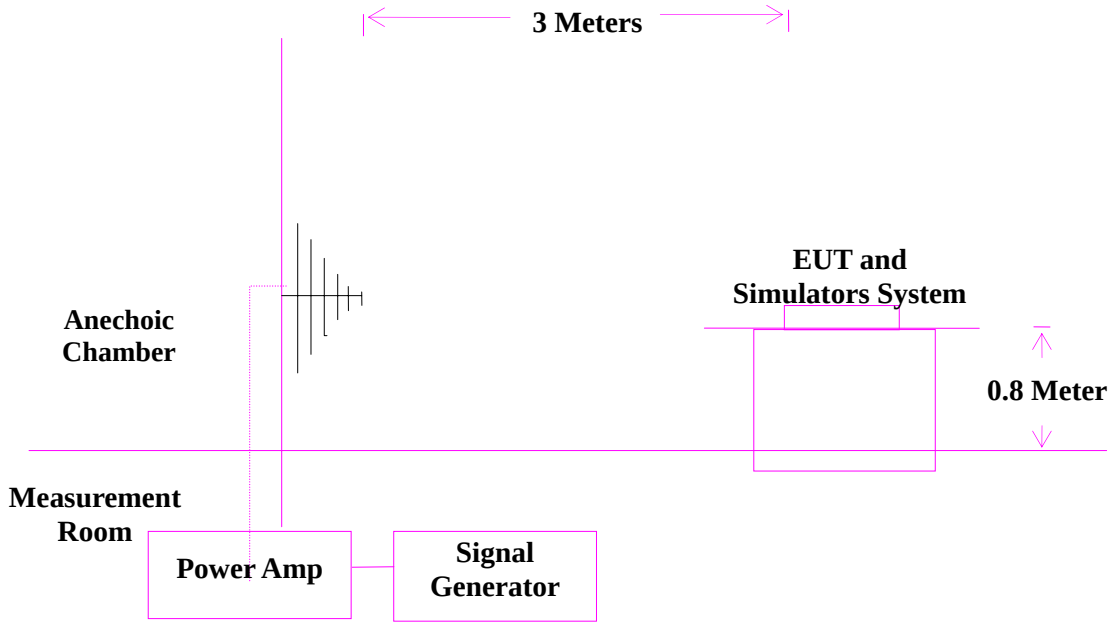
6.1. Block Diagram of Test Setup

6.1.1. Block Diagram of the EUT and the simulators



(EUT: FINGERPRINT)

6.1.2. R/S Test Setup



6.2. Test Standard

EN 55024:1998+A1:2001+A2: 2003 (EN61000-4-3:2002)
Severity Level 2 at 3V / m

6.3. Severity Levels and Performance Criterion

6.3.1. Severity level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

6.3.2. Performance criterion **: A**

6.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.4..

6.5. Operating Condition of EUT

Setup the EUT as shown in Section 6.1.. The operating condition of EUT are listed in section 3.5.

8.6. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.
In order to judge the EUT performance, a CCD camera is used to monitor the EUT.
All the scanning conditions are as follows **:**

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80 - 1000 MHz
4. Sweeping time of radiated	0.0015 decade/s
5. Dwell Time	1 Sec.

8.7. Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

Shenzhen BST Technology Co., Ltd.

Date :04/08/2008

Applicant	*: FINGERTEC WORLDWIDE SDN BHD*	*Test Date*	*: Apr.08,2008*
EUT	*: FINGERPRINT*	*Temperature*	*: 22℃*
M/N	*: R2/M2*	*Humidity*	*: 50％*
Power Supply	*:*	*Test Mode*	*: Off Hook*
Test Engineer	*: Deng Yong*	*Frequency Range :*	*80 MHz to 1000 MHz*

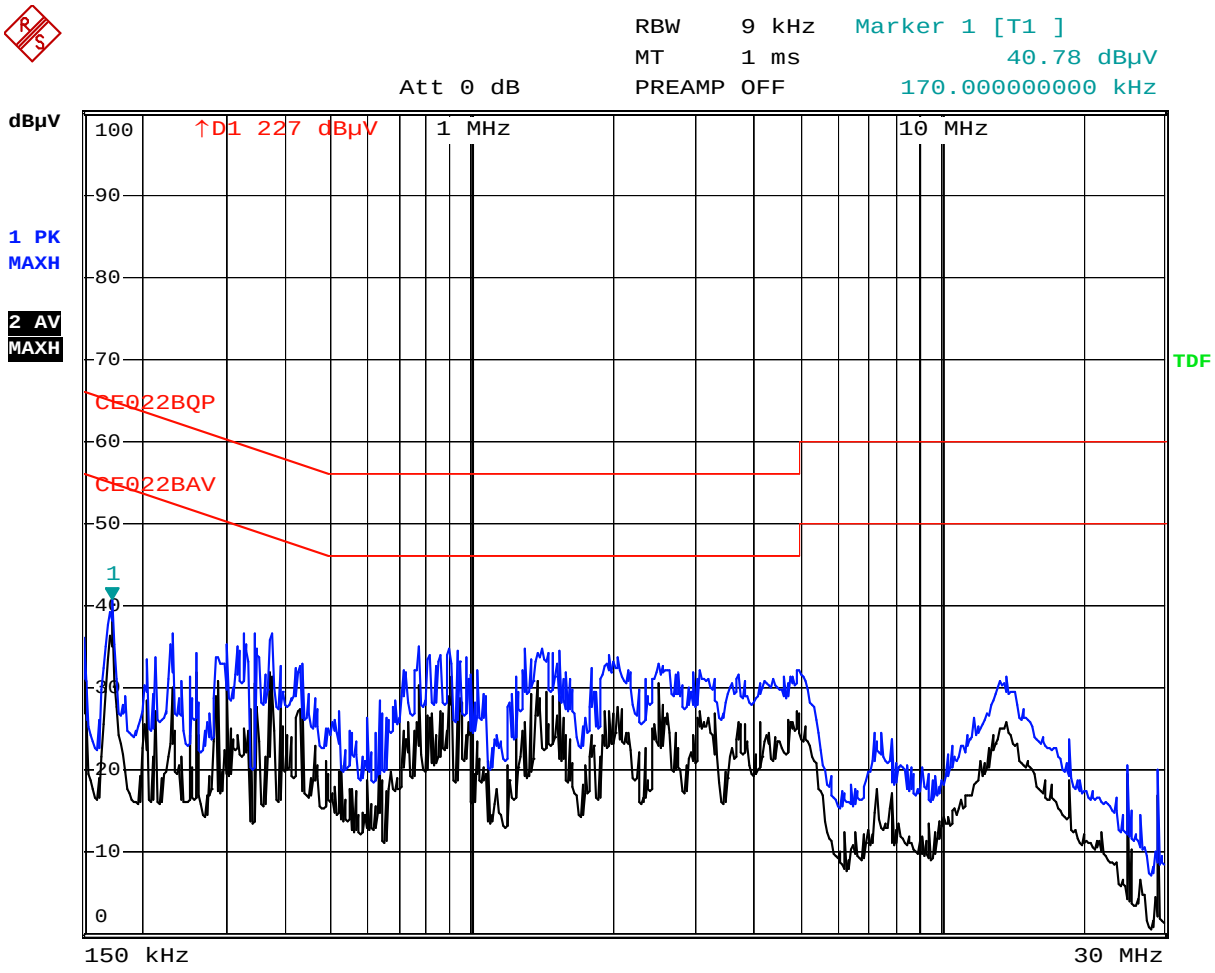
Modulation: ☑*AM* ☐*Pulse* ☐*none 1 KHz 80%*

Criterion : A

	Frequency Rang : 80-1000	
Steps	*1%*	*1%*
	Horizontal	*Vertical*
Front	*Pass*	*Pass*
Right	*Pass*	*Pass*
Rear	*Pass*	*Pass*
Left	*Pass*	*Pass*

Reviewer : _____

APPENDIX I



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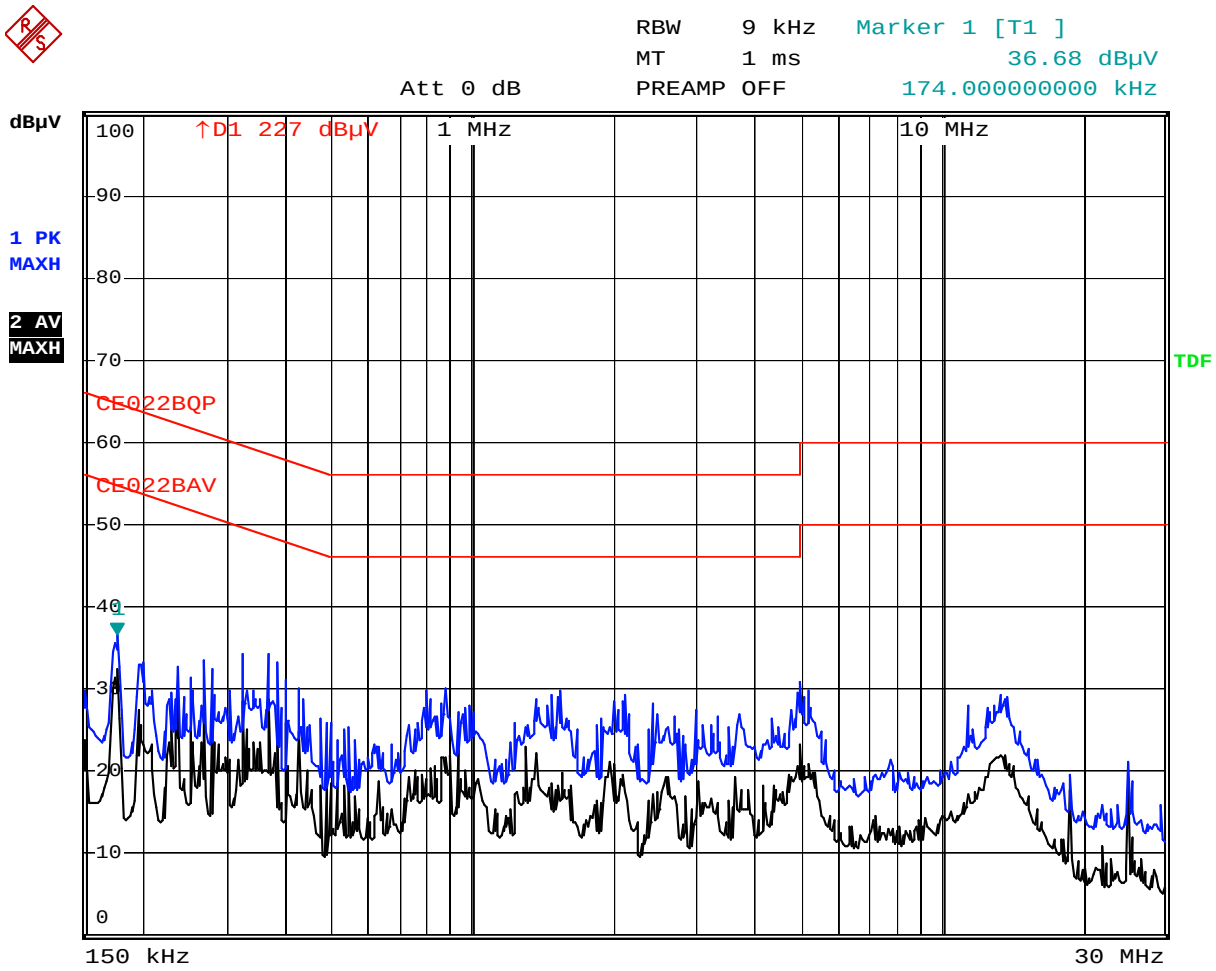

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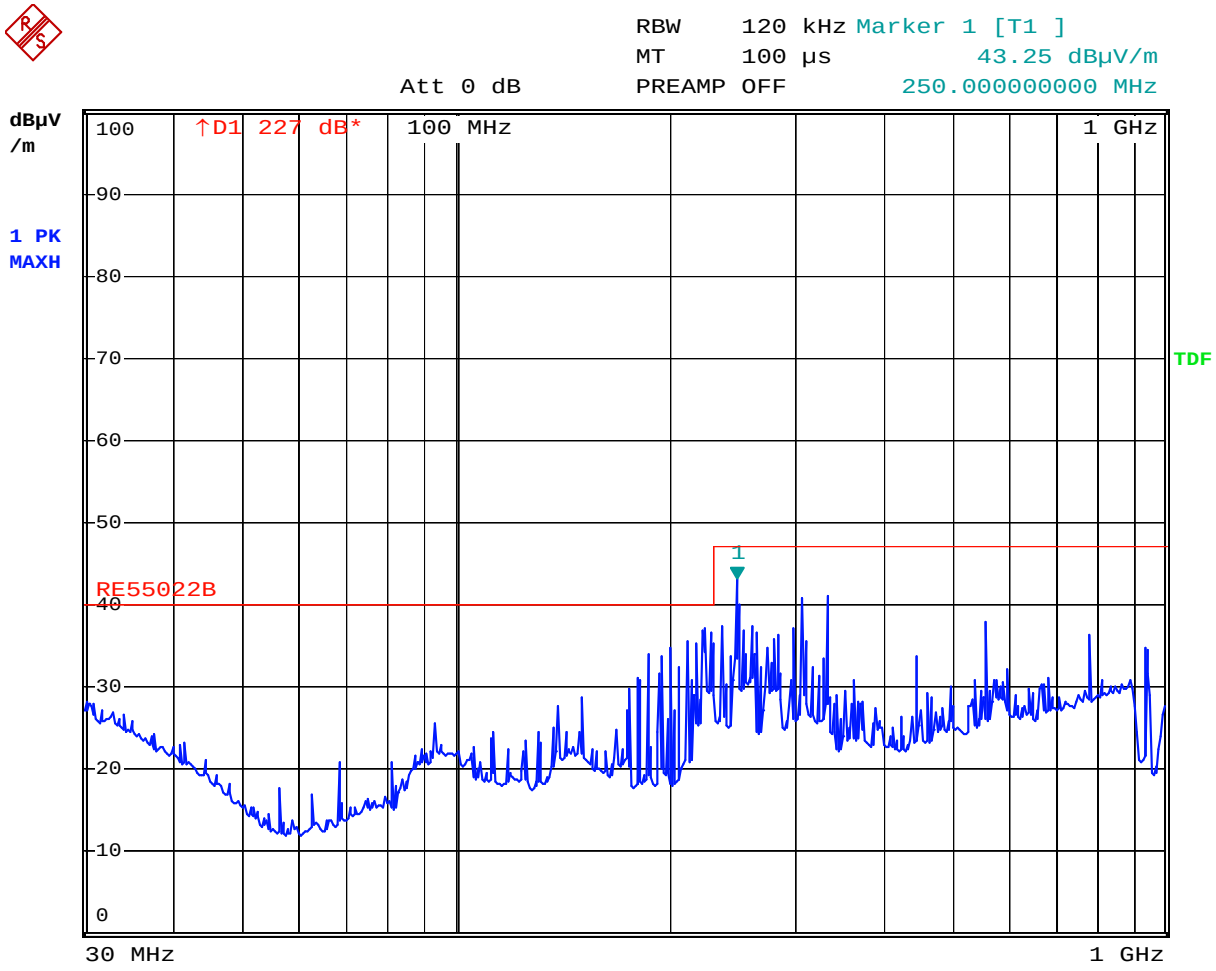
APPENDIX II



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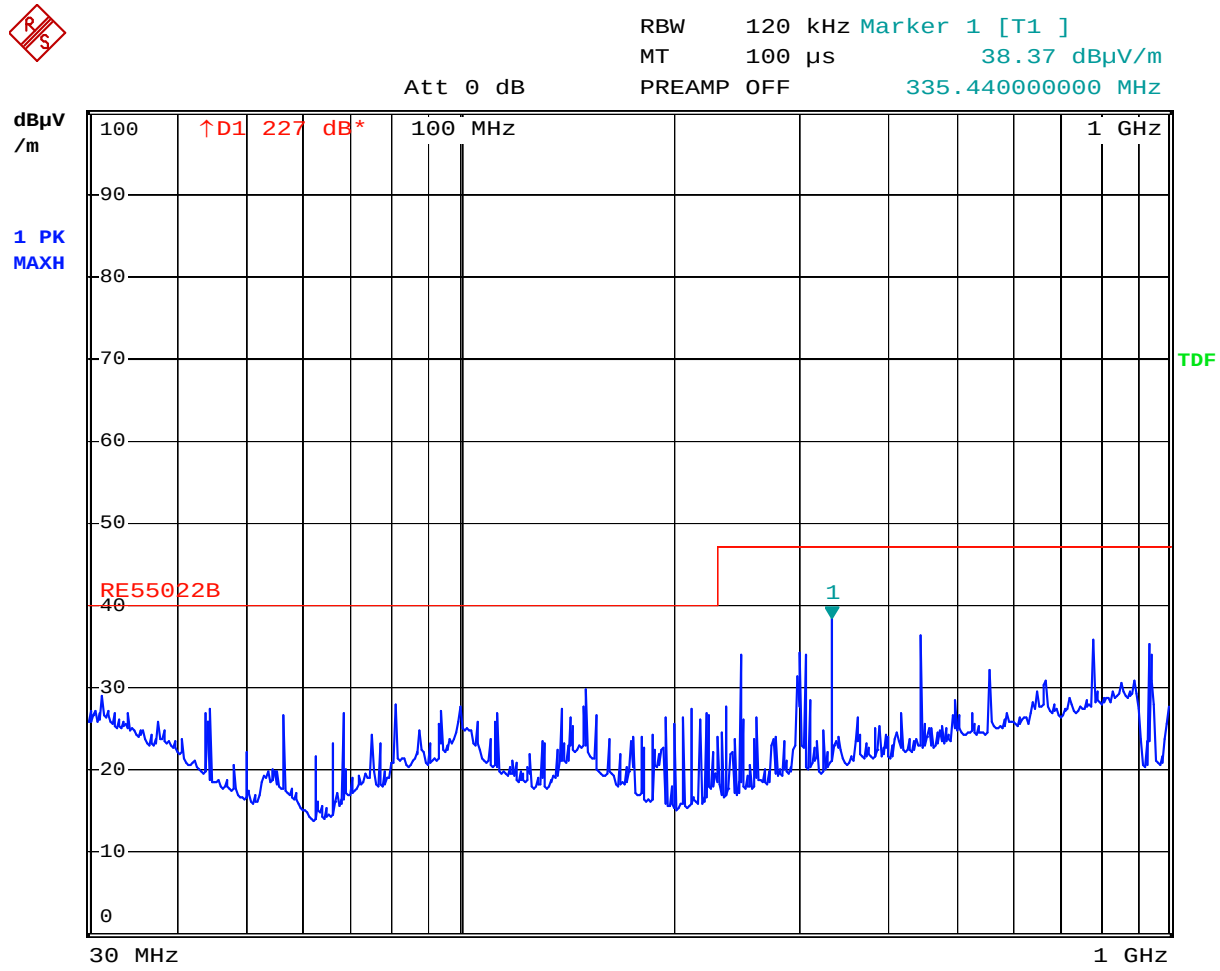

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APPENDIX III
(Photos of the EUT)

Figure 1
General Appearance of EUT

Figure 2
General Appearance of EUT

Figure 3
Inside of EUT

Figure 4
Inside of EUT

Figure 5
Test scene

Figure 6
Test scene