EMC TEST REPORT
for
FINGERTEC WORLDWIDE SDN BHD

FINGERTEC

Model No.: AC 900 Series

F

Prepared for	:	FINGERTEC WORLDWIDE SDN BHD
Address	:	NO.6, 8 & 10, JALAN BK 3/2, BANDAR KINRARA, 47100 PUCHONG, SELANGOR MALAYSIA
Prepared by	:	Shenzhen EMTEK Co., Ltd
Address	:	Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Tel: (0755) 26954280 Fax: (0755) 26954282

Report Number	:	E0612001E
Date of Test	:	August 01, 2008 to September 04, 2008
Date of Report	:	September 04, 2008

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TEST REPORT DESCRIPTION

Applicant	:	FINGERTEC WORLDWIDE SND BHD
Manufacturer	:	FINGERTEC WORLDWIDE LIMITED
EUT	:	FINGERTEC
Model No.	:	AC 900 Series
Power Supply	:	DC 12V/1.5A with external AC/DC Adaptor

Measurement Procedure Used:

EN55022: 2006
EN61000-3-2: 2006, EN 61000-3-3: 1995+ A1: 2001+A2: 2005
EN55024: 1998+A1: 2001+A2: 2003
(EN61000-4-2: 2001, EN61000-4-3: 2006, EN61000-4-4: 2004, EN61000-4-5: 2006, EN61000-4-6: 2007, EN61000-4-8: 2001,EN61000-4-11: 2004)

The device described above is tested by SHENZHEN EMTEK CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and SHENZHEN EMTEK CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN55022, EN61000-3-2, EN61000-3-3 and EN55024 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN EMTEK CO., LTD.

Date of Test: August 01, 2008 to September 04, 2008

Prepared by: _____
(Engineer)

Reviewer: _____
(Quality Manager)

Approved & Authorized Signer: _____
(Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	FINGERTEC
Model Number	:	AC 900 Series
AC Adaptor	:	Model: KSAFC1200150W1UV INPUT: AC100-240V~50/60Hz OUTPUT: 12V⎓1.5A
Test Voltage	:	Ac 230V/50Hz
Applicant	:	FINGERTEC WORLDWIDE SDN BHD
Address	:	NO.6, 8&10, JALAN BK 3/2, BANDAR KINRARA, 47100 PUCHONG, SELANGOR, MALAYSIA.
Manufacturer	:	FINGERTEC WORLDWIDE LIMITED
Address	:	Peking University Founder Shiyan Science Park, Bao'an, Shenzhen, China. 518108
Date of receiver	:	August 01, 2008
Date of Test	:	August 01, 2008 to September 04, 2008

1.2. Description of Test Facility

Site Description

EMC Lab. : Accredited by CNAS, 2005.11.02
The certificate is valid until 2010.11
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01: 2006 (identical to ISO/IEC17025: 2005)
The Certificate Registration Number is L2291

Accredited by TUV Rheinland Shenzhen, 2008.3
The Laboratory has been assessed according to the requirements ISO/IEC 17025

Accredited by FCC, March 18, 2008
The Certificate Registration Number is 709623.

Accredited by Industry Canada, May 24, 2008
The Certificate Registration Number is 46405-4480

Name of Firm : SHENZHEN EMTEK CO., LTD.

Address : Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

1.3. Measurement Uncertainty

Conducted Emission Uncertainty : ± 1.2656dB

Radiated Emission Uncertainty : ± 1.4118dB

2. MEASURING DEVICE AND TEST EQUIPMENT

2.1. For Power Line Conducted Emission

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 29, 2008	1 Year
2	L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	May 29, 2008	1 Year
3	50ΩCoaxial Switch	Anritsu	MP59B	M20531	N/A	N/A
4	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 29, 2008	1 Year
5	Voltage Probe	Rohde & Schwarz	TK9416	N/A	May 29, 2008	1 Year

2.2. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	ANRITSU	MS2661C	6200140915	May 29, 2008	1 Year
2	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 29, 2008	1 Year
3	Bilog Antenna	Schwarzbeck	VULB9163	142	May 29, 2008	1 Year
4	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	May 29, 2008	1 Year
5	EMI Power Line Filter	DUOJI EME	FNF 201 B16	N/A	May 29, 2008	1 Year
6	EMI Power Line Filter	JIANLI	DL-40C	N/A	May 29, 2008	1 Year
7	Cable	Schwarzbeck	AK9513	ACRX1	May 29, 2008	1 Year
8	Cable	Rosenberger	N/A	FP2RX2	May 29, 2008	1 Year
9	Cable	Schwarzbeck	AK9513	CRPX1	May 29, 2008	1 Year
10	Cable	Schwarzbeck	AK9513	CRRX2	May 29, 2008	1 Year
11	Signal Generator	HP	8648A	3625U00573	May 29, 2008	1 Year

2.3. For Harmonic Current / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency Test System	HAEFELY	PHF555	080419-03	May 29, 2008	1 Year
2.	PC	N/A	P2L97	N/A	May 29, 2008	N/A

2.4. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PESD1600	H708159	May 29, 2008	1 Year

2.5. For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 29, 2008	1 Year
2.	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 29, 2008	1 Year
3.	Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120 L3F	332	May 29, 2008	1 Year
4.	Power Amplifier	PRANA		N/A	May 29, 2008	1 Year
5.	Power Amplifier	MILMEGA	AS0102-55	N/A	May 29, 2008	1 Year
6.	Signal Generator	AEROFLEX	20238	N/A	May 29, 2008	1 Year
7.	Field Stength Meter	HOLADAY	HI-6005	N/A	May 29, 2008	1 Year
8.	RS232 Fiber Optic Modem	HOLADAY	HI-4413P	N/A	May 29, 2008	1 Year
9.	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	N/A	May 29, 2008	1 Year

2.6. For Electrical Fast Transient /Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	HAEFELY	PEFT4010	080981-16	May 29, 2008	1Year
2.	Coupling Clamp	HAEFELY	IP-4A	147147	May 29, 2008	1Year

2.7. For Surge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Tester	HAEFELY	PSURGE4.1	080107-04	May 29, 2008	1Year

2.8. For Injected Current Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Simulator	EMTEST	CWS500C	0900-12	May 29, 2008	1Year
2.	CDN	EMTEST	CDN-M2	5100100100	May 29, 2008	1Year
3.	CDN	EMTEST	CDN-M3	0900-11	May 29, 2008	1Year
4.	Injection Clamp	EMTEST	F-2031-23 MM	368	May 29, 2008	1Year
5.	Attenuator	EMTEST	ATT6	0010222A	May 29, 2008	1Year

2.9. For Magnetic Field Immunity Test

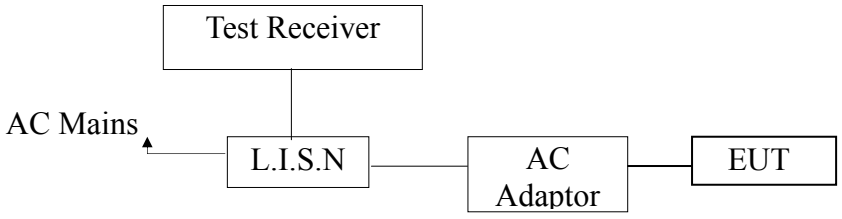
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic Field Tester	HAEFELY	MAG100	250040.1	May 29, 2008	1Year

2.10. For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Dips Tester	HAEFELY	Pline1610	083732-12	May 29, 2008	1Year

3. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1. Block Diagram of Test Setup



(EUT: FINGERTEC)

3.2. Measuring Standard

EN 55022:2006
Power Line Conducted Emission Limits (Class B)

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0
NOTE1-The lower limit shall apply at the transition frequencies. NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

3.3. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN 55022 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

FINGERTEC (EUT)
Model Number AC 900 Series
Serial Number : N/A

3.4. Operating Condition of EUT

3.4.1. Setup the EUT as shown on Section 3.1.

3.4.2. Turn on the power of all equipments.

3.4.3. Let the EUT work in measuring mode (ON) and measure it.

3.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided 50ohm-coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN 55022 regulations during conducted emission measurement.
The bandwidth of the field strength meter (R&S Test Receiver ESCS30) is set at 9KHz in 150KHz~30MHz and 200Hz in 9KHz~150KHz.
The frequency range from 150kHz to 30MHz is investigated
All the scanning waveform is put in Appendix I.

3.6 Measuring Results

PASS.

Please reference to the following page

Date of Test	:	August 15, 2008	Temperature	:	22℃
EUT	:	FINGERTEC	Humidity	:	50%
M/N	:	AC 900 Series	Test Mode	:	ON

Test Line	Frequency MHz	Emission Level QP dB(μV)	Emission Level AV dB(μV)	Limits QP dB(μV)	Limits AV dB(μV)	Margin QP dB(μV)	Margin AV dB(μV)
Neutral	0.160	43.80	40.10	65.46	55.46	21.66	15.36
	0.200	41.50	31.20	63.61	53.61	22.11	22.41
	0.475	34.75	27.80	56.43	46.43	21.68	18.63
Line	0.170	41.70	35.80	64.96	54.96	23.26	19.16
	0.210	38.20	31.50	63.21	53.21	25.01	21.71
	0.470	33.50	27.10	56.51	46.51	23.01	19.41

Remark: .The worst emission is detected at 0.160 MHz with corrected AV signal level of 40.10 dB(μV) (limit is 55.46dB(μV)), When the Neutral of the EUT is connected to LISN.

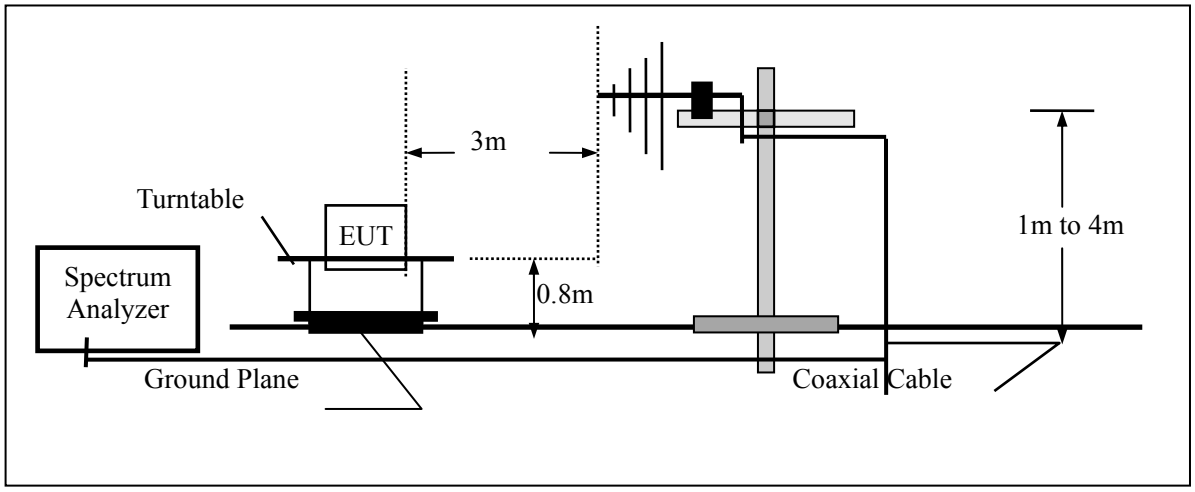
4. RADIATED EMISSION MEASUREMENT

4.1.Block Diagram of Test

4.1.1.Block diagram of connection between the EUT and simulators

(EUT: FINGERTEC)

4.1.2.Block diagram of test setup (In chamber)



(EUT: FINGERTEC)

4.2.Measuring Standard

EN55022: 2006

4.3.Radiated Emission Limits

All emanations from a class B device 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 LIMIT (dBμV/m)
30 ~ 230	10	30
230 ~ 1000	10	37

Note**:** (1) The smaller limit shall apply at the combination point 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 regulations test method must be used to find the maximum emission during radiated emission measurement.

4.5. Operating Condition of EUT

4.5.1. Turn on the power.

4.5.2. After that, let the EUT work in test mode (ON) and measure it.

4.6. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable 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 be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the Receiver (ESCS30) is set at 120kHz.
All the scanning curves are attached in Appendix II.

4.7. Measuring Results

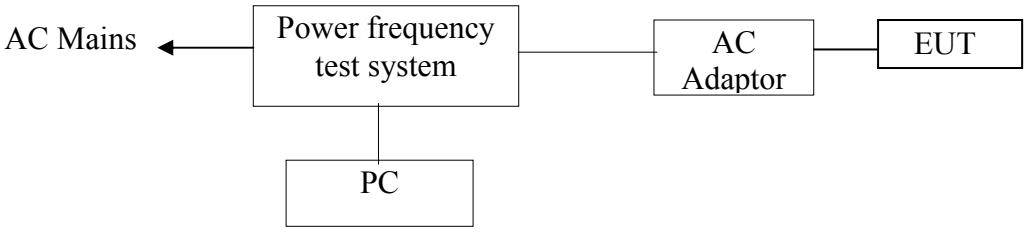
PASS.

The frequency range from 30MHz to 1000MHz is investigated.

Please reference to the following page

5. HARMONIC CURRENT EMISSION MEASUREMENT

5.1 Block Diagram of Test Setup



(EUT: FINGERTEC)

5.2 Measuring Standard

EN61000-3-2: 2006 CLASS A

5.3 Operation Condition of EUT

Same as Section 3.4, except the test setup replaced as Section 5.1.

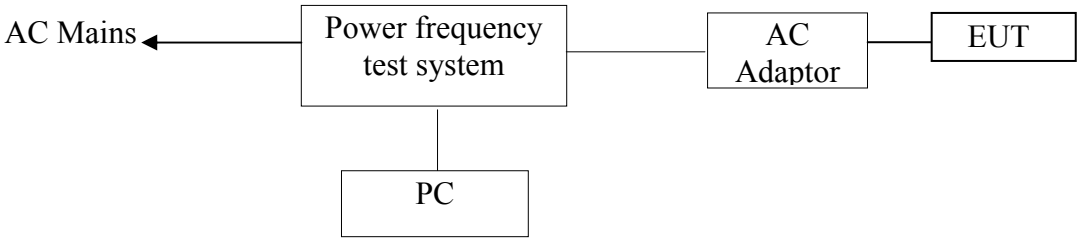
5.4 Measuring Results

PASS.

Because power of EUT less than 75W, According standard EN61000-3-2, Harmonic current unnecessary to test.

6. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

6.1 Block Diagram of Test Setup



(EUT: FINGERTEC)

6.2 Measuring Standard

EN 61000-3-3: 1995+ A1: 2001+A2: 2005

6.3 Operation Condition of EUT

Same as Section 3.4, except the test setup replaced as Section 6.1.

6.4 Measuring Results

PASS.

Please see the attached pages.

IEC 1000-3-3 TEST REPORT

Unit: Fingertec M/N:AC900 Series

TEST MODE: ON/OFF

Applicant: Fingertec

Operator: Shiny

TEST SETUP

Test Freq. :	50.00 Hz.	Test Voltage:	230.0 vac
Waveform :	SINE		
Test Time:	10.0 min.	Tshort:	10.0 min.
Prog. Zo Enabled:	YES	Prog. Zo:	0.000

Voltage Change less than once per Hour: NO
Impedance selected: IEC-725 STD. REF.

Synthetic R+L Enabled: NO
Resistance: 0.380 Ohms Inductance: 460.000 uH

TEST DATA

Result: PASS

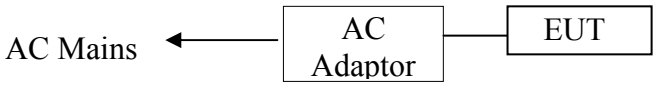
	EUT Data	Limit	Result	Test Enabled
Pst max	0.117	1.00	PASS	true
Plt max	0.117	0.65	PASS	true
dc %	0.03	3.00	PASS	true
dmax %	0.54	4.00	PASS	true
d(t) sec.	0.00	0.20	PASS	true
Power Source Data				
Source Pst max	0.022	0.400	PASS	true
% THD	0.03	3.00	PASS	true

END OF REPORT

7. ELECTROSTATIC DISCHARGE IMMUNITY TEST

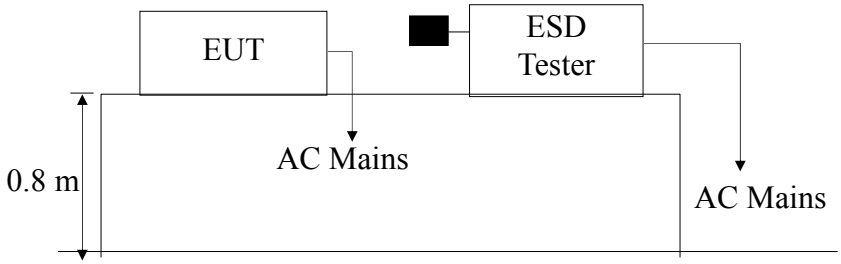
7.1 Block Diagram of Test Setup

7.1.1 Block diagram of connection between the EUT and simulators



(EUT: FINGERTEC)

7.1.2 Block diagram of ESD test setup



(EUT: FINGERTEC)

7.2 Test Standard

EN55024: 1998+A1: 2001+A2: 2003(EN61000-4-2: 2001
Severity Level: 3 / Air Discharge: ±8KV Level: 2 / Contact Discharge: ±4KV)

7.3 Severity Levels and Performance Criterion

7.3.1 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

7.3.2 Performance criterion: **B**

7.4 EUT Configuration

The configuration of EUT is listed in Section 3.3.

7.5 Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section3.4. Except the test set up replaced by Section 7.1.

7.6 Test Procedure

7.6.1 Air Discharge**:**

This test is done on a non-conductive surface. 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.

7.6.2 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.

7.6.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

7.6.4 Indirect discharge for vertical coupling plane

At least 10 single discharges (in the most sensitive polarity) 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.

7.7 Test Results

PASS

Please refer to the following pages

Electrostatic Discharge Test Result

SHENZHEN EMTEK CO., LTD

Applicant :	FINGERTEC WORLDWIDE SDN BHD	Test Date :	August 20, 2008
EUT :	FINGERTEC	Temperature :	22℃
M/N :	AC 900 Series	Humidity :	50%
Power Supply :	AC 230V/50Hz	Test Mode :	ON
Air discharge :	±8.0KV	Criterion :	B
Contact discharge:	±4.0KV	Test Engineer :	Andy

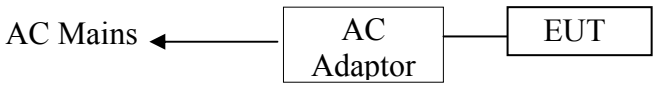
Location		**Kind** A-Air Discharge C-Contact Discharge	**Result**
Slot of the EUT	10 points	A	PASS
LCD	4 points	A	PASS
LED	3 points	A	PASS
Button	3 points	A	PASS
Port	3 points	C	PASS
Screws	3 points	C	PASS
HCP		C	PASS
VCP of front		C	PASS
VCP of rear		C	PASS
VCP of left		C	PASS
VCP of right		C	PASS

Test Equipment: ESD Simulator (HAEFELY, PESD1600)

8. RF FIELD STRENGTH SUSCEPTIBILITY TEST

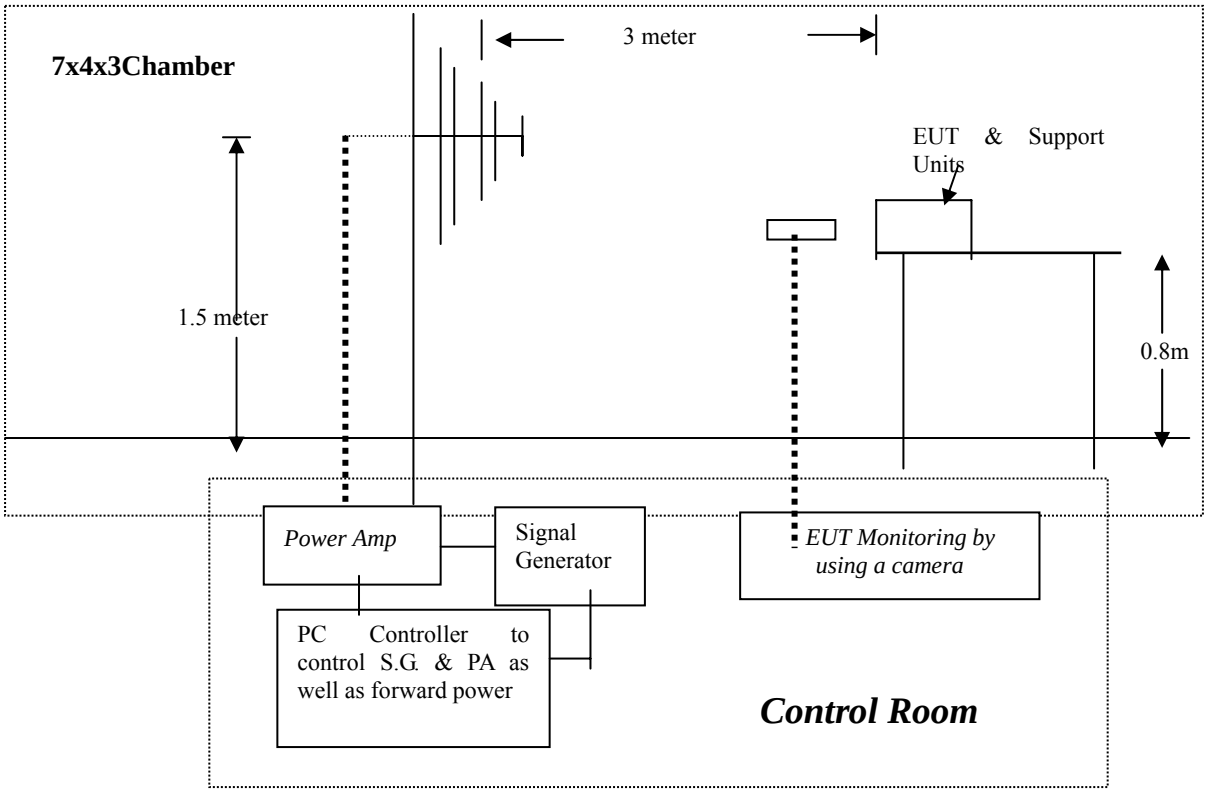
8.1 Block Diagram of Test

8.1.1 Block diagram of connection between the EUT and Load



(EUT: FINGERTEC)

8.1.2 Block diagram of RS test setup



(EUT: FINGERTEC)

8.2 Test Standard

EN55024: 1998+A1: 2001+A2: 2003(EN61000-4-3: 2006 (Severity Level: 2, 3V / m))

8.3 Severity Levels and Performance Criterion

8.3.1 Severity Levels

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

8.3.2 Performance Criterion: **A**

8.4 EUT Configuration on Test

The configuration of the EUT is same as Section 3.3.

8.5 Operating Condition of EUT

Same as radiated emission measurement, which is listed in Section 3.4, except the test setup replaced as Section 8.1.

8.6 Test Procedure

The EUT are placed on a table, which is 0.8 meter high 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 is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.
In order to judge the EUT performance, a CCD camera is used to monitor its screen. All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	3V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80-1000MHz
4. Sweep 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 EMTEK CO., LTD.

Applicant :	FINGERTEC WORLDWIDE SDN BHD	Test Date	August 20, 2008
EUT :	FINGERTEC	Temperature	22℃
M/N :	AC 900 Series	Humidity	50 %
Field Strength :	3V/m	Criterion	A
Power Supply :	AC 230V/50Hz	Test Mode :	ON
Test Engineer:	Andy	Frequency Range	80 MHz to 1000 MHz

Modulation: ☐None ☐ Pulse ☒AM 1KHz 80%

	Frequency Rang 1: 80~ 1000MHz		Frequency Rang 2:	
Steps	# / %		# / %	
	Horizontal	Vertical	Horizontal	Vertical
Front	PASS	PASS		
Right	PASS	PASS		
Rear	PASS	PASS		
Left	PASS	PASS		

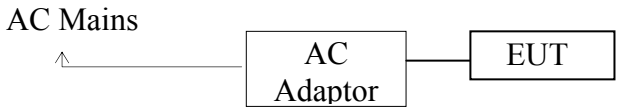
Test Equipment :
1. Signal Generator : 2023B (AEROFLEX)
2. Power Amplifier : AS0102-55(MILMEGA)&AP32MT215(PRANA)
3. Log.-Per.Antenna: VULP9118E(SCHWARZBECK)
4. Broad-Band Horn Antenna: BBHA 9120L3F(SCHWARZBECK)
5. RF Power Meter. Dual Channel: 4232A(BOONTON)
6. Field Strength Meter: HI-6005(HOLADAY)

Note:

9. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

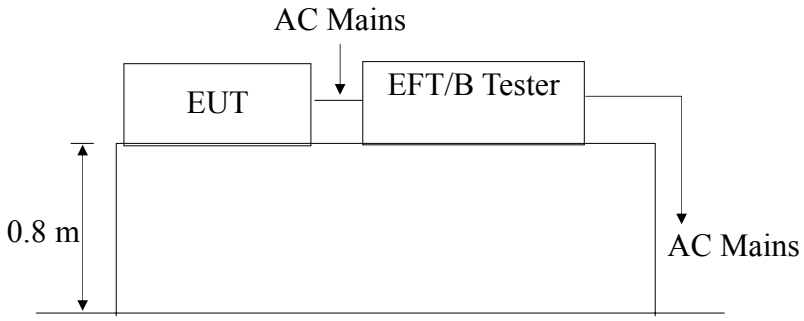
9.1 Block Diagram of Test Setup

9.1.1. Block Diagram of the EUT



(EUT: FINGERTEC)

9.1.2. EFT Test Setup



9.2 Test Standard

EN55024: 1998+A1: 2001+A2: 2003(EN61000-4-4: 2004, Severity Level, Level 2**:** 1KV)

9.3 Severity Levels and Performance Criterion

9.3.1 Severity level

Open Circuit Output Test Voltage ±10%		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 KV	0.25 KV
2.	1 KV	0.5 KV
3.	2 KV	1 KV
4.	4 KV	2 KV
X	Special	Special

9.3.2 Performance criterion: **B**

9.4 EUT Configuration

The configuration of EUT is listed in Section 3.3.

9.5 Operating Condition of EUT

9.5.1 Setup the EUT as shown in Section 9.1.

9.5.2 Turn on the power of all equipments.

9.5.3 Let the EUT work in test mode (ON) and measure it.

9.6 Test Procedure

The EUT is put on the table, which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

9.6.1 For input and output AC power ports**:**

The EUT is connected to the power mains by using a coupling device, which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

9.6.2 For signal lines and control lines ports**:**

No I/O ports. It's unnecessary to test.

9.6.3 For DC output line ports**:**

It's unnecessary to test.

9.7 Test Result

PASS.

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

SHENZHEN EMTEK CO., LTD.

Standard	☐ IEC 61000-4-4 ☒ EN 61000-4-4	Result: ☒ PASS / ☐ FAIL

Applicant : FINGERTEC WORLDWIDE SDN BHD

EUT : FINGERTEC M/N : AC 900 Series

Input Voltage: AC 230 V 50 HZ

Criterion : B

Ambient Condition : 22 ℃ 50% RH

Operation Mode: ON

Line : ☒ AC Mains	Line : ☐ Signal ☐ I/O Cable
Coupling : ☒ Direct	Coupling : ☐ Capacitive
Test Time : 120s	

Line	Test Voltage	Result (+)	Result (-)
L	1KV	PASS	PASS
N	1KV	PASS	PASS
PE			
L、N	1KV	PASS	PASS
L、PE			
N、PE			
L、N、PE			
Signal Line			
DC Line			

Note:

Test Equipment	Burst Tester Model: PEFT 4010

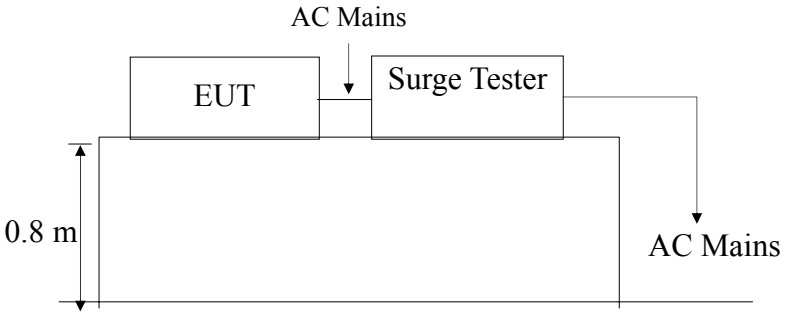
10. SURGE IMMUNITY TEST

10.1 Block Diagram of Test Setup

10.1.1 Block Diagram of the EUT

(EUT: FINGERTEC)

10.1.2. Surge Test Setup



10.2 Test Standard

EN55024: 1998+A1: 2001+A2: 2003(EN61000-4-5: 2006)
Severity Level**:** Line to Line: Level 2, 1.0KV

10.3 Severity Levels and Performance Criterion

10.3.1. Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

10.3.2 Performance criterion: **B**

10.4 EUT Configuration

The configuration of EUT is listed in Section 3.3.

10.5 Operating Condition of EUT

10.5.1 Setup the EUT as shown in Section 10.1.

10.5.2. Turn on the power of all equipments.

10.5.3.Let the EUT work in test mode (ON) and measure it.

10.6 Test Procedure

1) Set up the EUT and test generator as shown on Section 10.1.2.
2) For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
4) Different phase angles are done individually.
5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

10.7 Test Result

PASS.

Please refer to the following page.

Surge Immunity Test Result

SHENZHEN EMTEK CO., LTD.

Applicant: FINGERTEC WORLDWIDE SDN BHD

EUT : FINGERTEC

M/N: AC 900 Series

Power Supply: AC230V/50Hz

Test Mode : On

Test Date**:** August 20, 2008

Temperature : 22℃

Humidity : 50%

Criterion : B

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Result
L-N	+	0°	5	1.0	PASS
	+	90°	5	1.0	PASS
	+	180°	5	1.0	PASS
	+	270°	5	1.0	PASS
	-	0°	5	1.0	PASS
	-	90°	5	1.0	PASS
	-	180°	5	1.0	PASS
	-	270°	5	1.0	PASS
L-PE					
N-PE					

Remark:

Test Equipment :
Surge Tester Psurge4.1

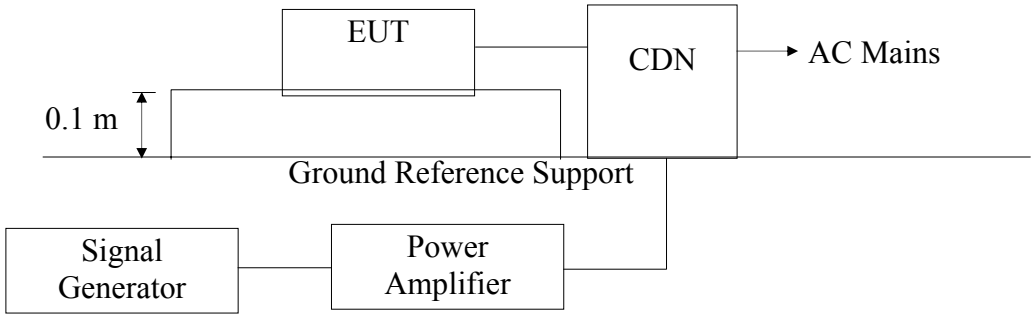
11. INJECTED CURRENTS SUSCEPTIBILITY TEST

11.1 Block Diagram of Test Setup

11.1.1 Block Diagram of the EUT

(EUT: FINGERTEC)

11.1.2 Block Diagram of Test Setup



11.2 Test Standard

EN55024: 1998+A1: 2001+A2: 2003 (EN61000-4-6: 2007, Severity Level: Level 2, 3V (rms), (0.15MHz ~ 80MHz)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

Level	Field Strength V
1	1
2	3
3	10
X	Special

11.3.2 Performance criterion**: A**

11.4 EUT Configuration

The configuration of EUT is listed in Section 3.3.

11.5 Operating Condition of EUT

11.5.1 Setup the EUT as shown in Section 11.1.

11.5.2 Turn on the power of all equipments.

11.5.3 Let the EUT work in test mode (ON) and measure it.

11.6 Test Procedure

1) Set up the EUT, CDN and test generators as shown on Section 11.1.2.
2) Let the EUT work in test mode and measure it.
3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
4) The disturbance signal described below is injected to EUT through CDN.
5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
6) The frequency range is swept from 150KHz to80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
7) The rate of sweep shall not exceed $1.5*10^{-3}$decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

11.7Test Results

PASS.

Please refer to the following page.

Injected Currents Susceptibility Test Results

SHENZHEN EMTEK CO., LTD.

Applicant : FINGERTEC WORLDWIDE SDN BHD EUT : FINGERTEC M/N : AC 900 Series Power Supply : AC 230V / 50Hz Test Engineer : Andy	Test Date: August 20, 2008 Temperature : 22℃ Humidity : 58%

Test Mode : ON

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 80	AC Mains	3V	A	PASS

Test Mode :

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result

Remark : 1. Modulation Signal:1KHz 80% AM Measurement Equipment : Simulator: CWS 500 (SWITZERLAND EMTEST) CDN : ☒CDN-M2 (SWITZERLAND EMTEST) ☐CDN-M3 (SWITZERLAND EMTEST)	Note:

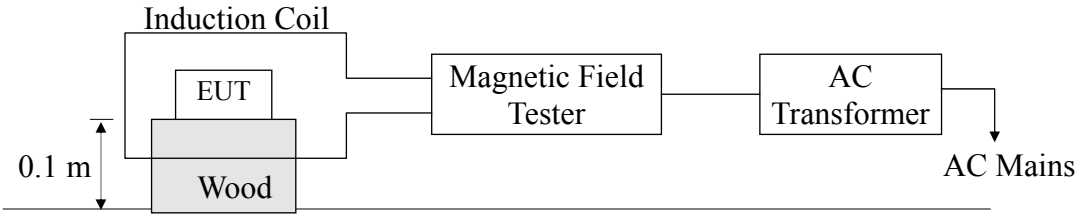
12. MAGNETIC FIELD SUSCEPTIBILITY TEST

12.1 Block Diagram of Test

12.1.1 Block diagram of test setup

(EUT: FINGERTEC)

12.1.2 Magnetic field test setup



(EUT: FINGERTEC)

12.2 Test Standard

EN55024: 1998+A1: 2001+A2: 2003 (EN61000-4-8: 2001, Severity Level: Level 1, 1A / m)

12.3 Severity Levels and Performance Criterion

12.3.1 Severity Levels

Level	Field Strength A/m
1	1
2	3
3	10
4	30
5	100
X	Special

12.3.2 Performance Criterion: **A**

12.4 EUT Configuration on Test

The configuration of the EUT is same as Section 3.3.

12.5 Test Procedure

The EUT is placed in the middle of a induction coil (1*1m), under which is a 1*1*0.1m (high) table, this small table is also placed on a larger table, 0.8 m above the ground. X, Y and Z polarization of the induction coil is set on test, so that each side of the EUT is affected by the magnetic field. Also can reach the same aim by change the position of the EUT.

12.6Test Results

PASS.

Please refer to the following page.

Magnetic Field Immunity Test Result

SHENZHEN EMTEK CO., LTD.

Standard	☐ IEC 61000-4-8 ☒ EN 61000-4-8	Result: ☒ Pass / ☐ Fail

Applicant : FINGERTEC WORLDWIDE SDN BHD

EUT : FINGERTEC M/N: AC 900 Series

Input Voltage : 230V 50Hz

Date of Test : August 20, 2008 Test Engineer: Andy

Ambient Condition : Temp : 22℃ Humid: 58%

Criterion : A

Operation Mode : ON

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
1	5 mins	X	A	PASS
1	5 mins	Y	A	PASS
1	5 mins	Z	A	PASS

Operation Mode :

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result

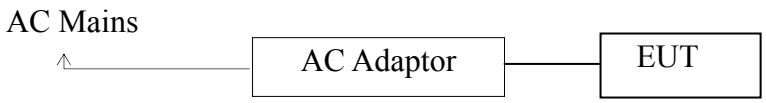
Test Equipment	Magnetic Field Test : HEAFELY MAG 100.1

Note:

13. VOLTAGE DIPS AND INTERRUPTIONS TEST

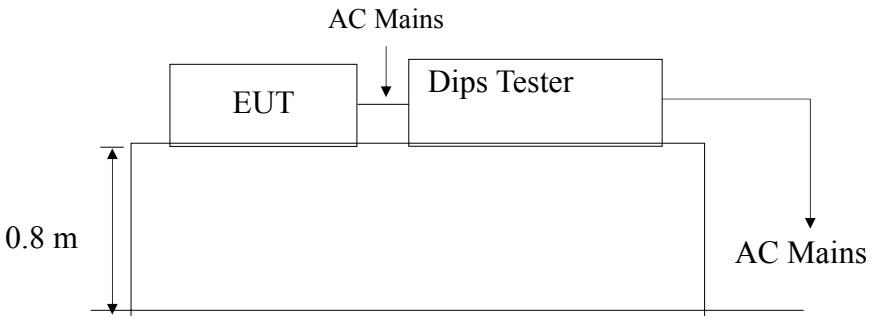
13.1 Block Diagram of Test Setup

13.1.1 Block Diagram of the EUT



(EUT: FINGERTEC)

13.1.2 Dips Test Setup



13.2 Test Standard

EN55024: 1998+A1: 2001+A2: 2003(EN61000-4-11: 2004)

13.3 Severity Levels and Performance Criterion

13.3.1 Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5 1 5 10 25 50 *
40	60	
70	30	

13.3.2 Performance criterion: **B&C**

13.4 EUT Configuration

The configuration of EUT is listed in Section 3.3.

13.5 Operating Condition of EUT

13.5.1 Setup the EUT as shown in Section 13.1.

13.5.2 Turn on the power of all equipments.

13.5.3 Let the EUT work in test mode (ON) and measure it.

13.6 Test Procedure

1) Set up the EUT and test generator as shown on Section 13.1.2.
2) The interruption is introduced at selected phase angles with specified duration.
3) Record any degradation of performance.

13.7 Test Result

PASS.

Please refer to the following page.

Voltage Dips And Interruptions Test Results

SHENZHEN EMTEK CO., LTD.

Applicant: FINGERTEC WORLDWIDE SDN BHD	Test Date : August 20, 2008
EUT : FINGERTEC	Temperature : 22℃
M/N : AC 900 Series	Humidity : 50%
Power Supply : 230V / 50Hz	Test Engineer : Andy

Test Mode: ON

Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in periods)	Criterion ☐ A ☒B ☒ C ☐D	Result P=PASS F=Fail
0	100	250P	C	P
70	30	25P	C	P
0	100	0.5P	B	P

Test Mode :

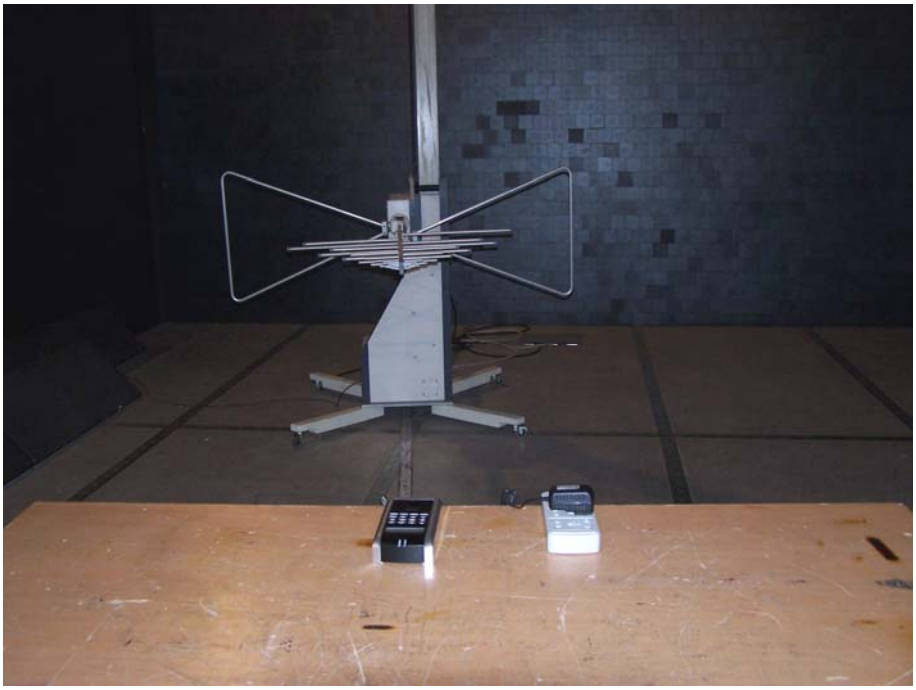
Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in periods)	Criterion ☐ A ☐ B ☐ C ☐ D	Result P=PASS F=FAIL

Note:

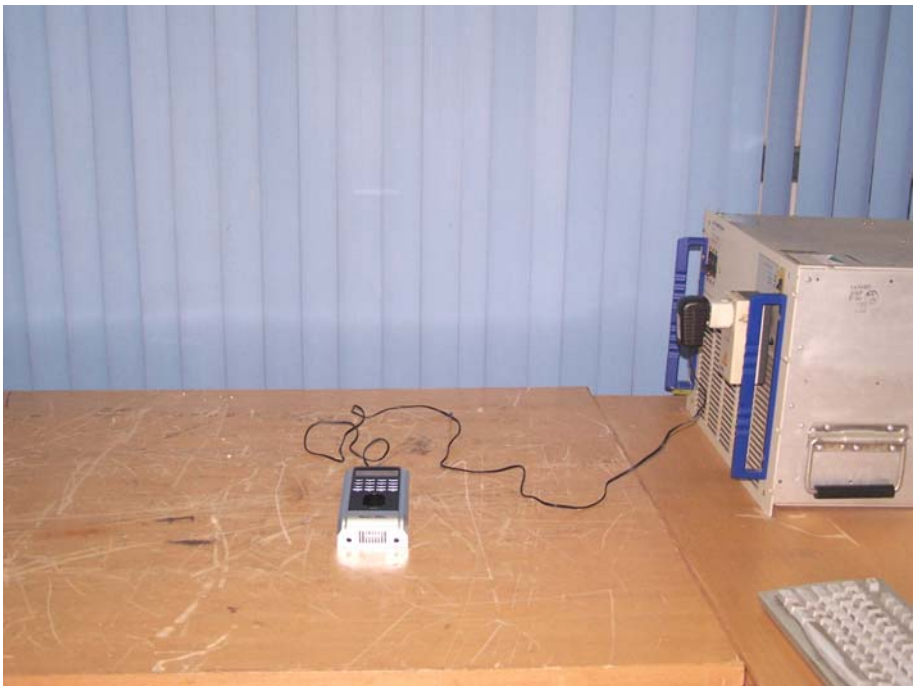
14. PHOTOGRAPH

14.1 Photo of Conducted Emission Measurement

14.2 Photo of Radiation Emission Measurement



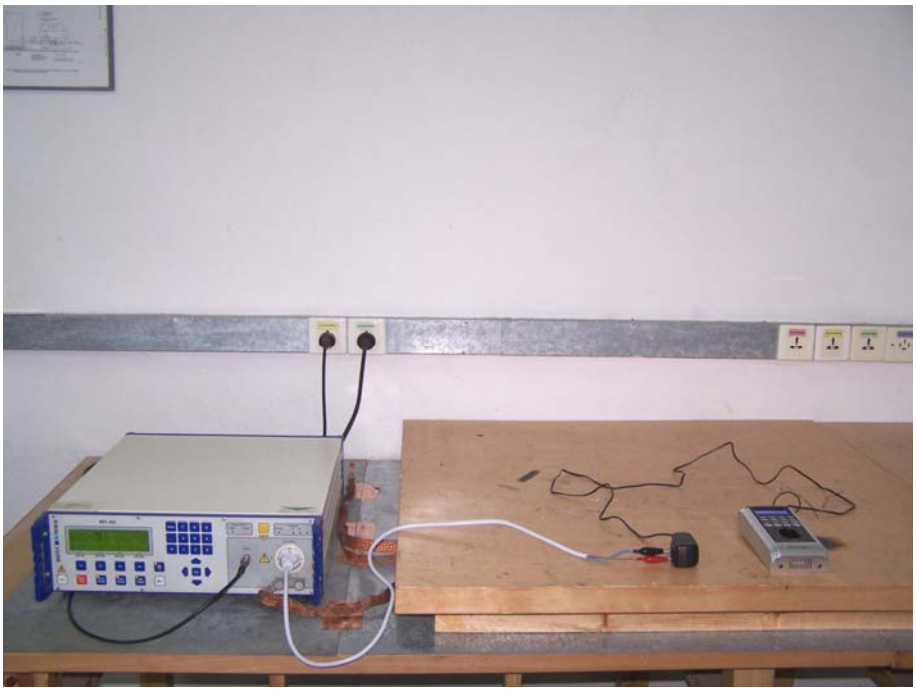
14.3 Photos of Harmonic / Flicker Measurement



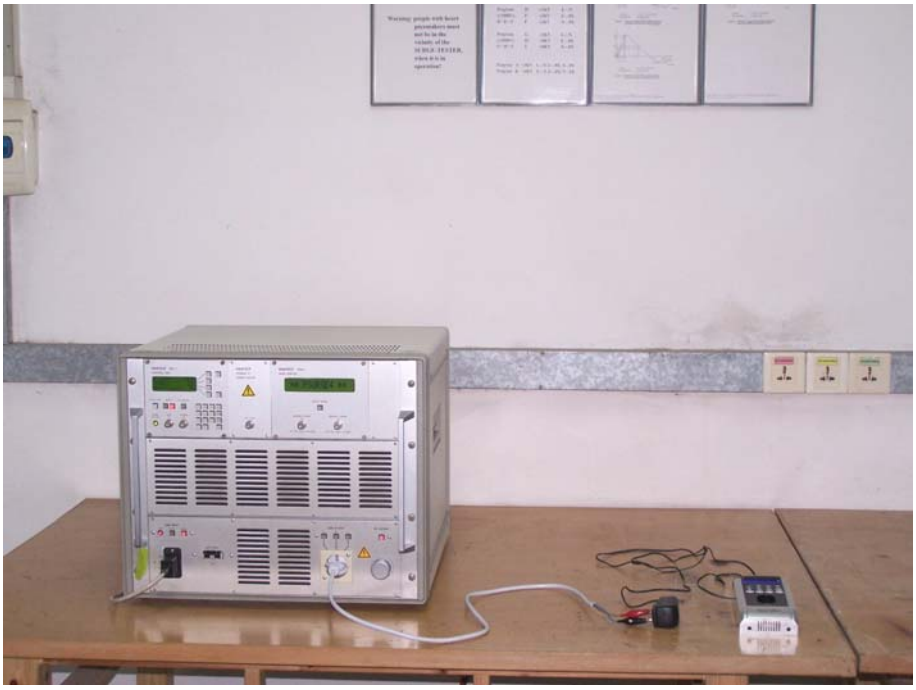
14.4 Photos of Electrostatic Discharge Test

14.5 Photos of RF Field Strength susceptibility Test

14.6 Photo of Electrical Fast Transient /Burst Test

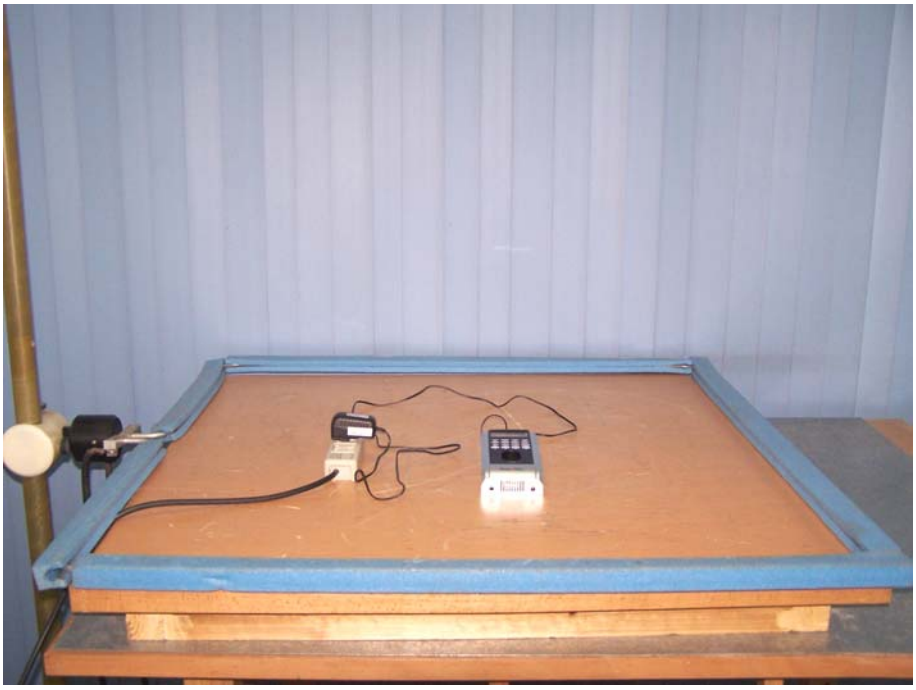


14.7 Photo of Surge Test

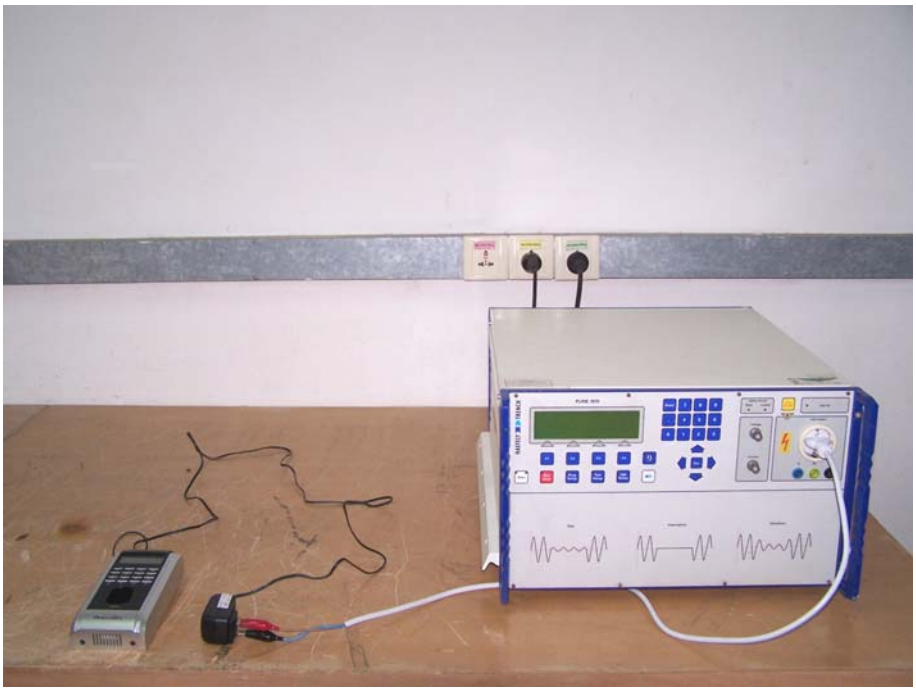


14.8 Photo of Injected Currents Susceptibility Test

14.9 Photo of Magnetic Field Immunity Test



14.10 Photo of Voltage Dips and Interruption Immunity Test



APPENDIX I

CONDUCTION EMISSION STANDARD EN55022B

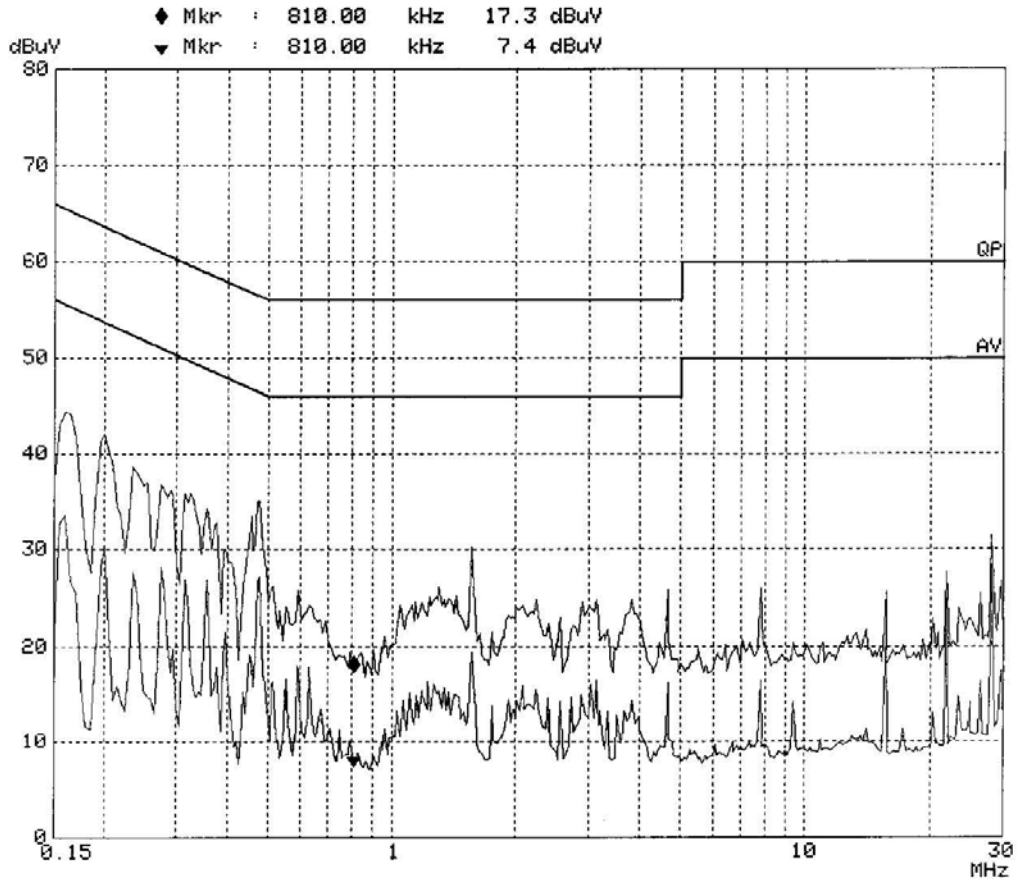
EUT: Fingertec M/N:AC900 Series
Manuf: Fingertec
Op Cond: ON
Operator: CHENTAO
Test Spec: N 230V/50Hz
Comment: Tem22c Humi50%

Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	2M	5k	9k	PK+AV	20ms	AUTO LN	OFF
2M	10M	10k	9k	PK+AV	10ms	AUTO LN	OFF
10M	30M	25k	9k	PK+AV	10ms	AUTO LN	OFF

Transducer No.	Start	Stop	Name
1	9k	30M	CONFAC1

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



CONDUCTION EMISSION STANDARD EN55022B

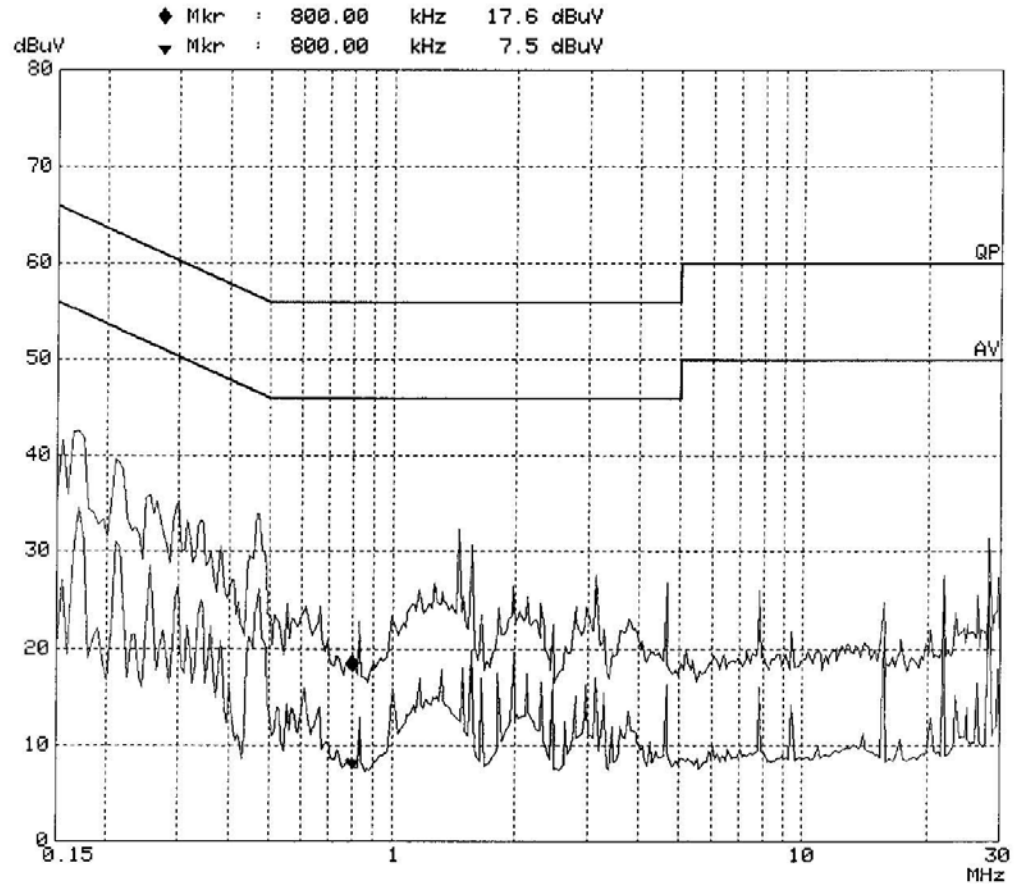
EUT: Fingertec M/N:AC900 Series
Manuf: Fingertec
Op Cond: ON
Operator: CHENTAO
Test Spec: L 230V/50Hz
Comment: Tem22c Humi50%

Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	2M	5k	9k	PK+AV	20ms	AUTO LN	OFF
2M	10M	10k	9k	PK+AV	10ms	AUTO LN	OFF
10M	30M	25k	9k	PK+AV	10ms	AUTO LN	OFF

Transducer No.	Start	Stop	Name
1	9k	30M	CONFAC1

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



APPENDIX II

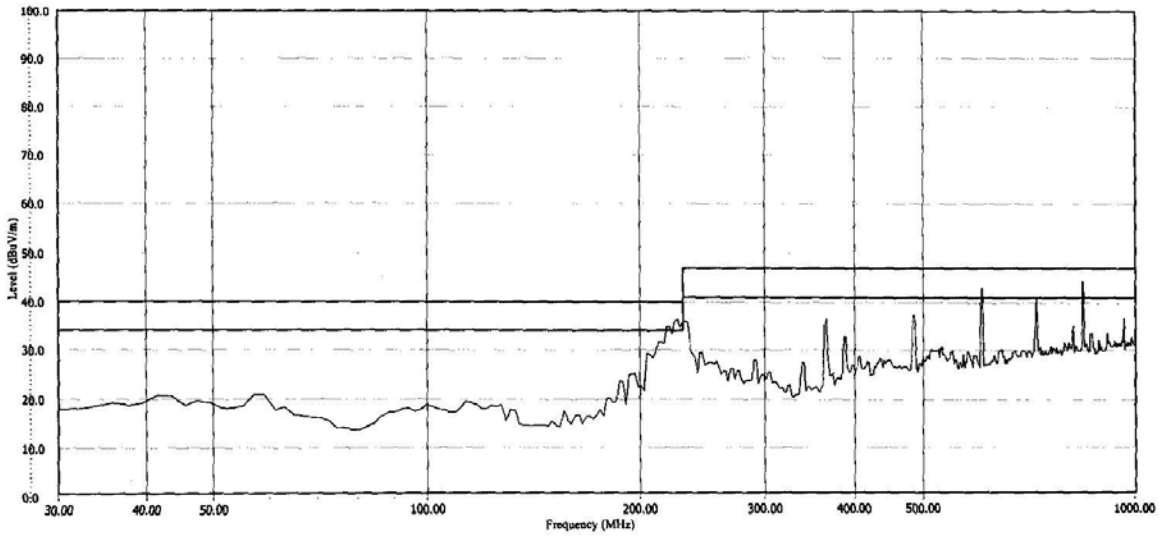
EMTEK®

Shenzhen EMTEK Co., Ltd.

Bldg 69, Majialong,Taipinyang Industry Zone,Nanshan District,Shenzhen Guangdong,China
Tel: (0755)26954280 Fax:(0755)26954282

File# : FINGERTEC
Site : 3M CHAMBER
Limit : CISPR 22 CLASS_B
EUT : Fingertec M/N:AC900 Series
Power : AC 230V/50Hz
Note : ON

Probe : VULB9163 - HORIZONTAL
Margin : 6
Std : 30
Trace :



	Flag	Mark	Freq (MHz)	Measure Level (dB)	Reading Level (dBuV)	Over Limit (dBuV/m)	Limit (dBuV/m)	Probe Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Type

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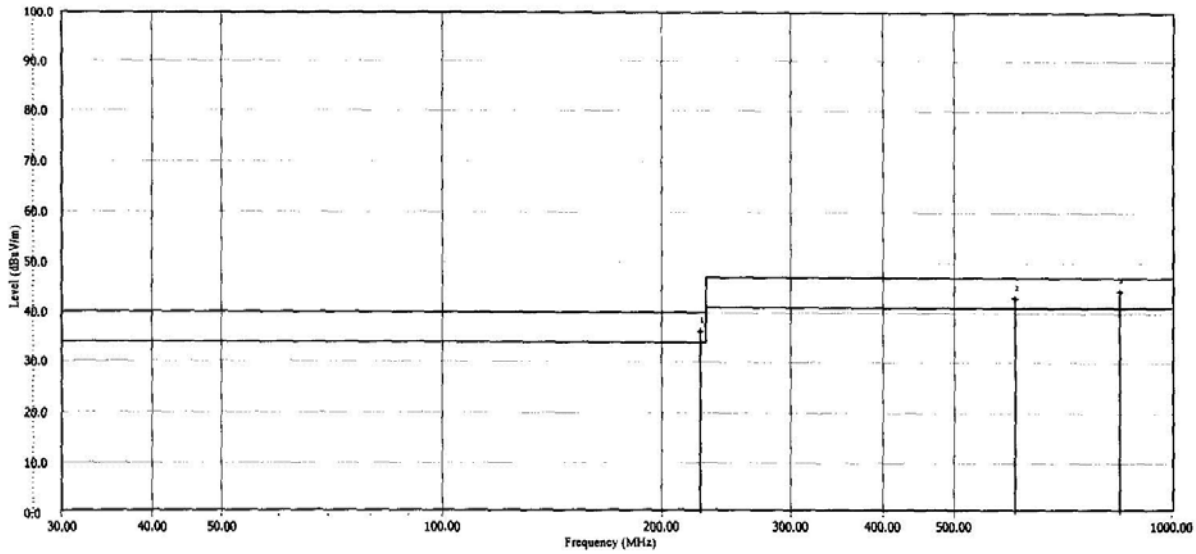
Site : 3M CHAMBER
Limit : CISPR 22 CLASS_B
EUT : Fingertec M/N:AC900 Series
Power : AC 230V/50Hz
Note : ON

Probe : VULB9163 - HORIZONTAL
Margin : 6
Std : 30
Trace :



	Flag	Mark	Freq (MHz)	Measure Level (dB)	Reading Level (dBuV)	Over Limit (dBuV/m)	Limit (dBuV/m)	Probe Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	!		225.940	36.200	23.820	-3.800	40.000	11.580	0.800	0.000	0.000	0.000	
2	!		608.120	42.940	23.050	-4.060	47.000	18.690	1.200	0.000	0.000	0.000	
3	!	*	848.680	44.370	20.470	-2.630	47.000	22.500	1.400	0.000	0.000	0.000	

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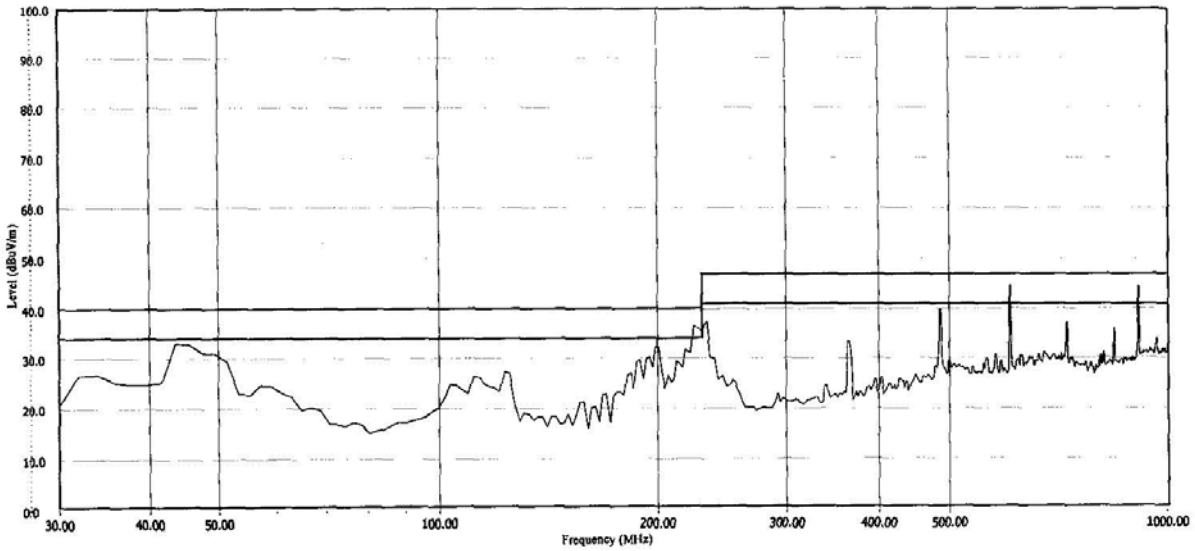
Tel: (0755)26954280 Fax:(0755)26954282

File# : FINGERTEC
Site : 3M CHAMBER
Limit : CISPR 22 CLASS_B
EUT : Fingertec M/N:AC900 Series
Power : AC 230V/50Hz
Note : ON

Probe : VULB9163 - VERTICAL
Margin : 6
Std : 30
Trace :



	Flag	Mark	Freq (MHz)	Measure Level (dB)	Reading Level (dBuV)	Over Limit (dBuV/m)	Limit (dBuV/m)	Probe Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Type

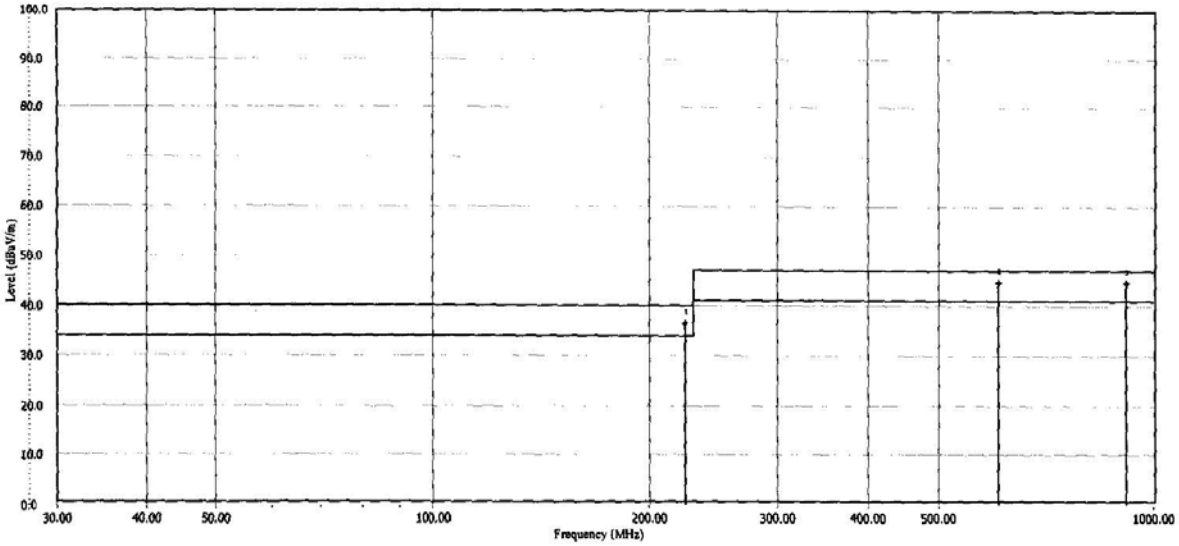
EMTEK®

Shenzhen EMTEK Co., Ltd.

Bldg 69, Majialong,Taipinyang Industry Zone,Nanshan District,Shenzhen Guangdong,China
Tel: (0755)26954280 Fax:(0755)26954282

File# : FINGERTEC
Site : 3M CHAMBER
Limit : CISPR 22 CLASS_B
EUT : Fingertec M/N:AC900 Series
Power : AC 230V/50Hz
Note : ON

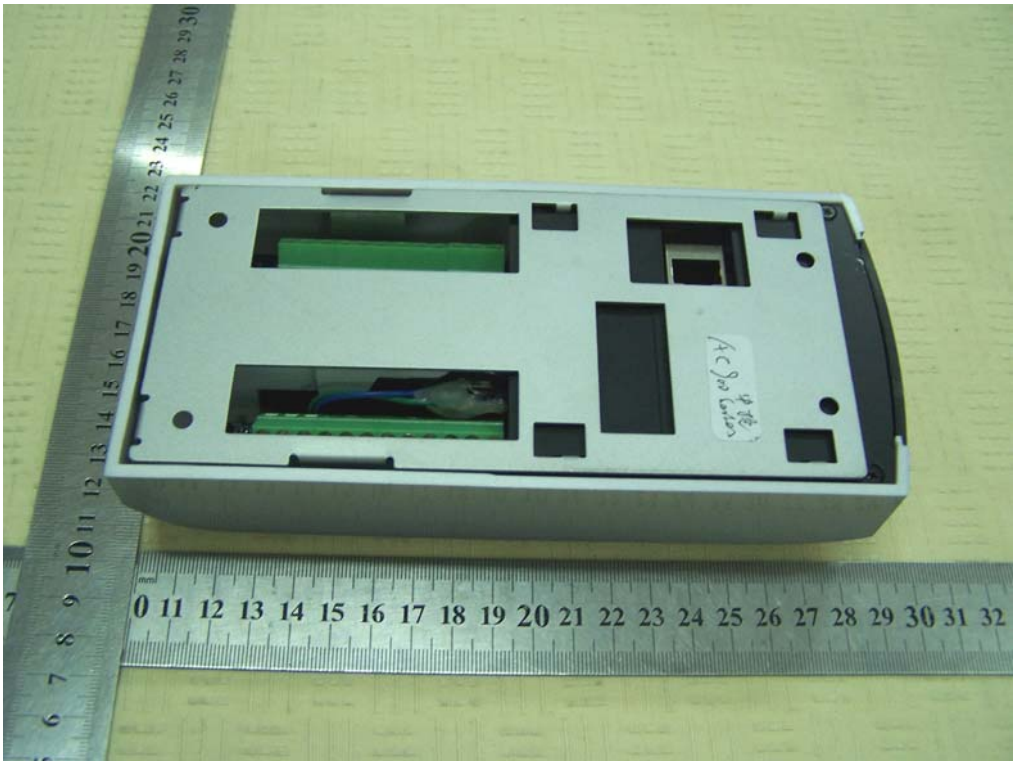
Probe : VULB9163 - VERTICAL
Margin : 6
Std : 30
Trace :

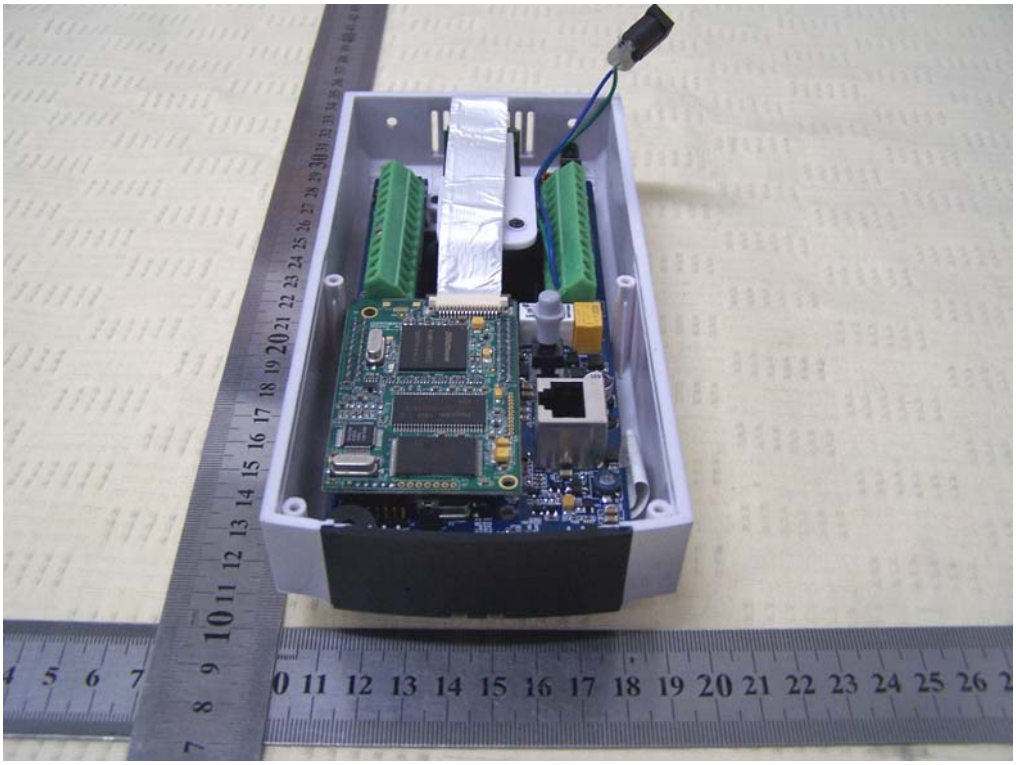


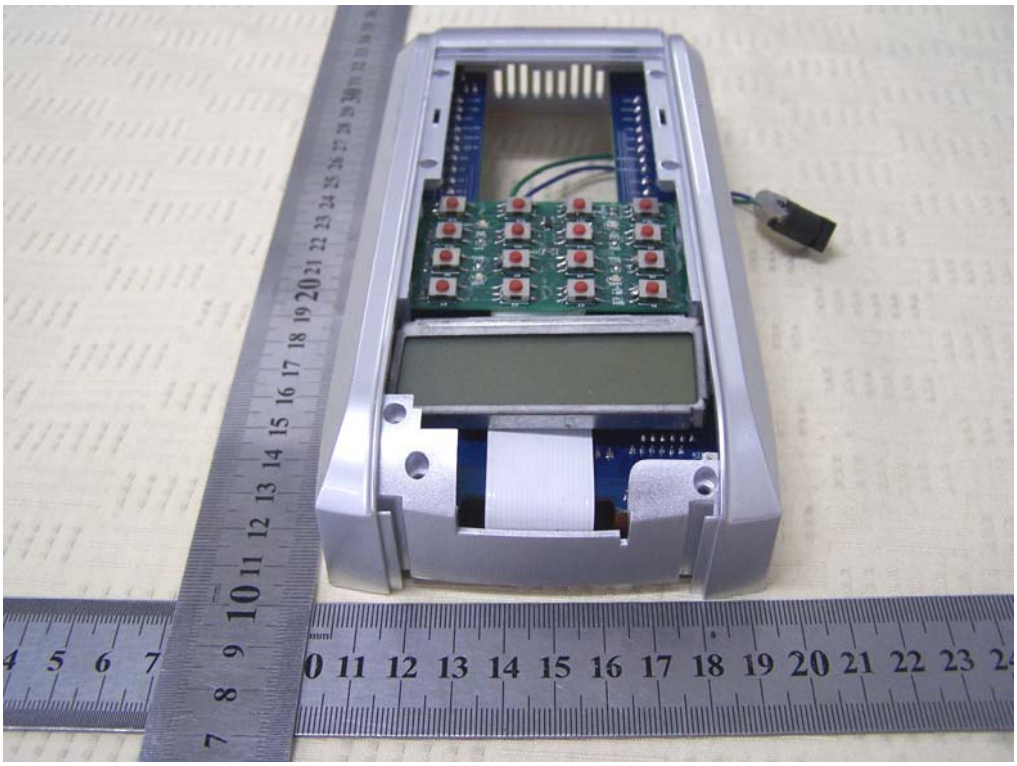
	Flag	Mark	Freq (MHz)	Measure Level (dB)	Reading Level (dBuV)	Over Limit (dBuV/m)	Limit (dBuV/m)	Probe Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	1		224.000	36.510	23.130	-3.490	40.000	12.580	0.800	0.000	0.000	0.000	
2	1	*	606.180	44.630	23.930	-2.370	47.000	19.500	1.200	0.000	0.000	0.000	
3	1		916.580	44.530	20.380	-2.470	47.000	22.750	1.400	0.000	0.000	0.000	

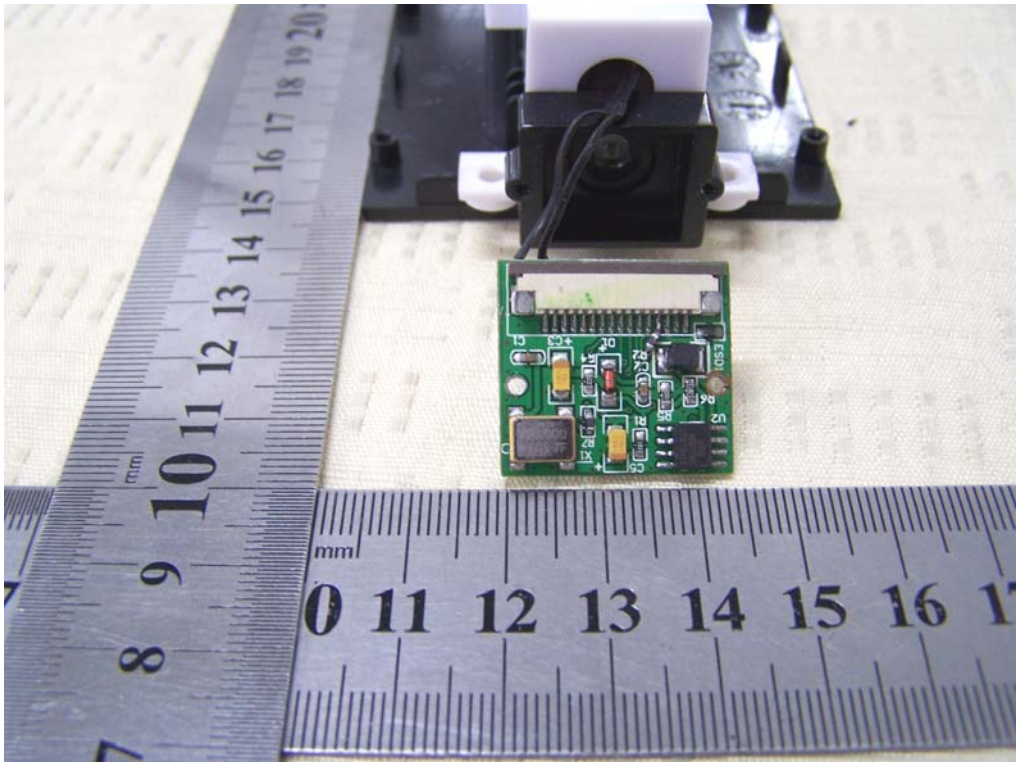
APPENDIX III
(PHOTOS OF EUT)

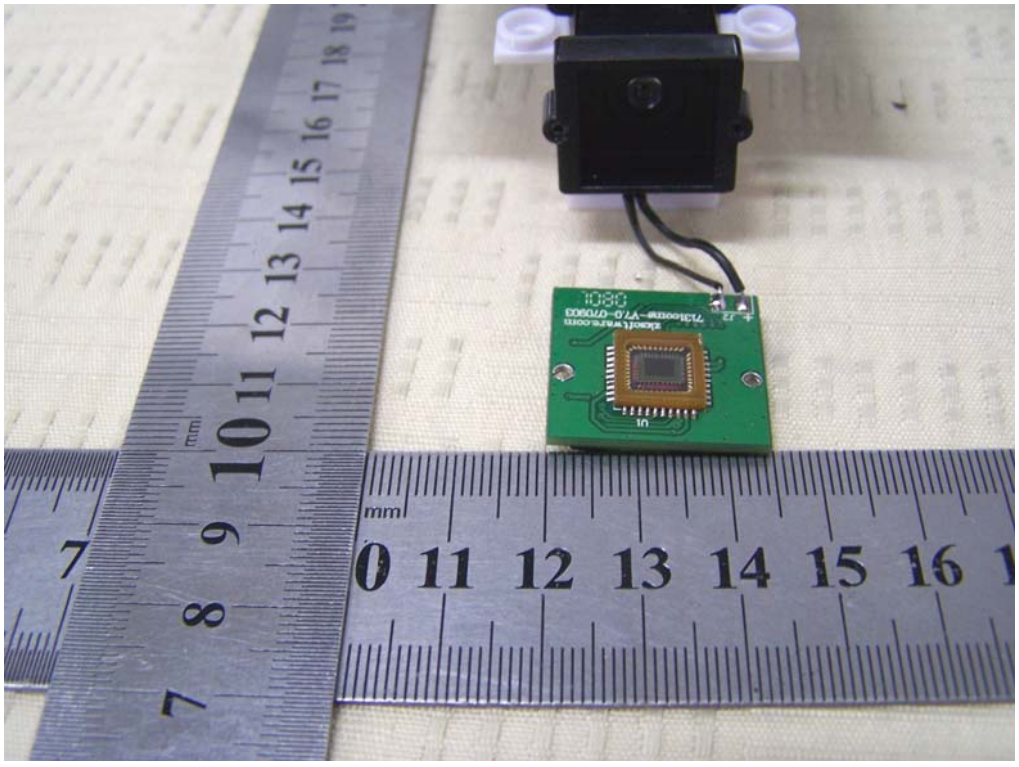
FIGURE 1
GENERAL APPEARANCE OF EUT

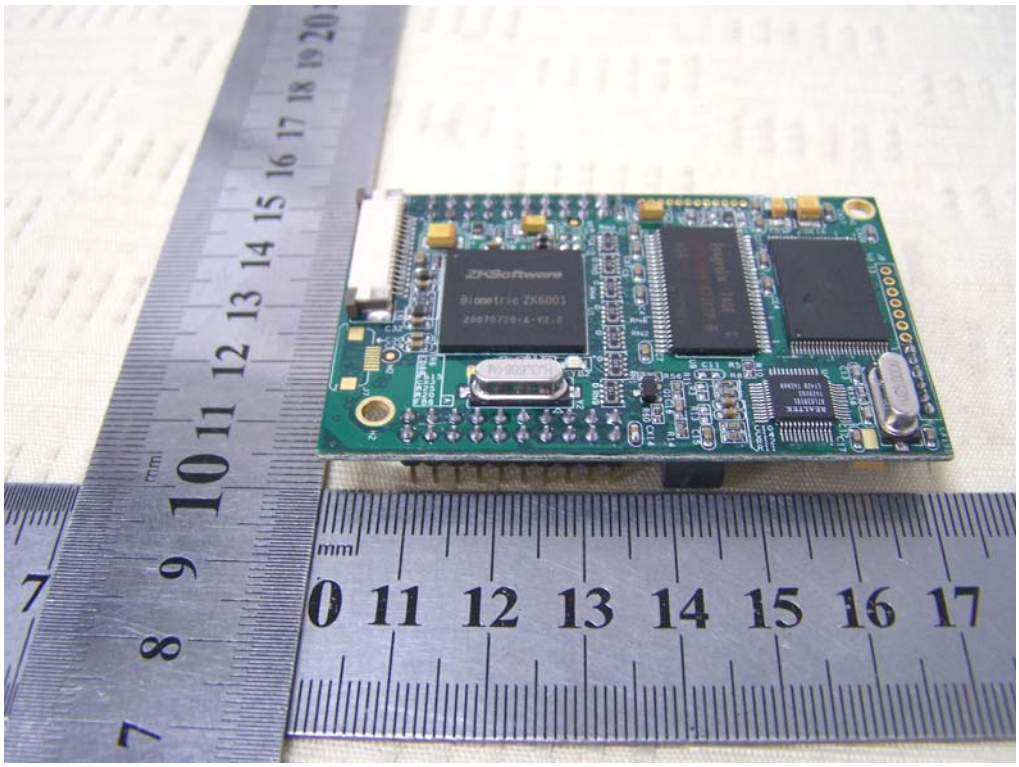








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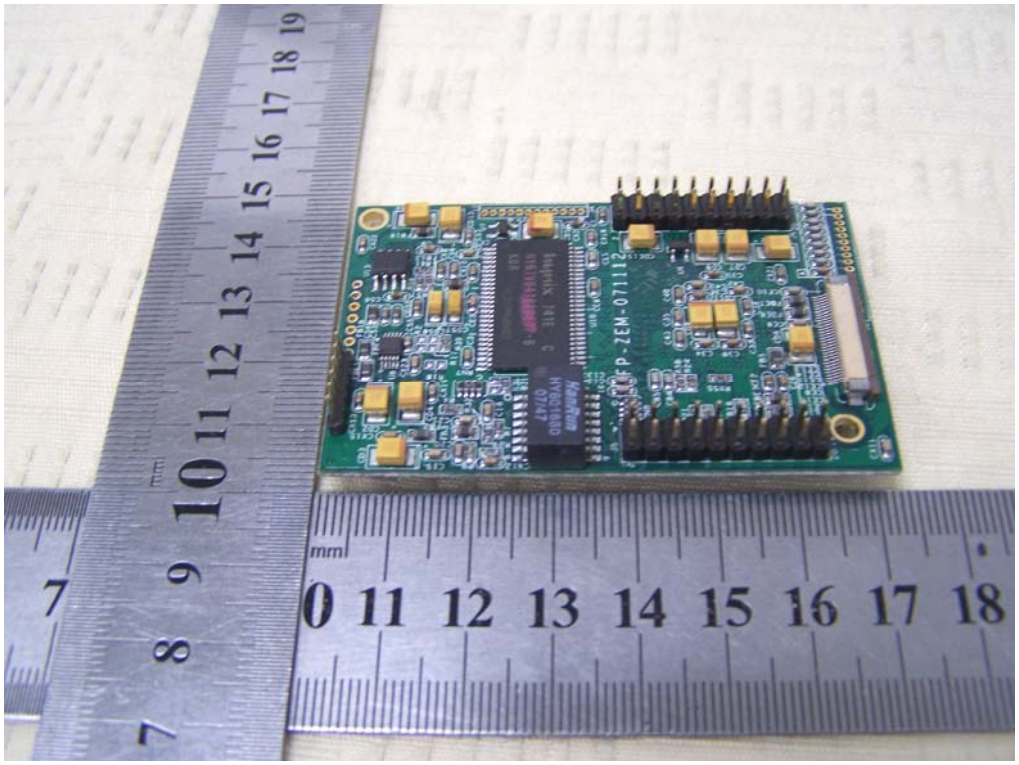
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