

CE / EMC Test Report

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Testing Laboratory name..... : U.K Standard Testing Co., LTD.

Address..... : Floor 2&3, Building E, Nanpu Technology Innovation Center,
Banshi Village, Changping Town, Dongguan City, Guangdong
Province.

Testing location..... : Same as above

Applicant's name..... : ZHANGZHOU WEIHUA ELECTRONIC CO.,LTD.

Address..... : NO. 3 BEIDOU ROAD, BEIDOU IND. PARK, JINFENG IND. ZONE,
ZHANGZHOU, FUJIAN, CHINA

Manufacturer's name..... : ZHANGZHOU WEIHUA ELECTRONIC CO.,LTD.

Address..... : NO. 3 BEIDOU ROAD, BEIDOU IND. PARK, JINFENG IND. ZONE,
ZHANGZHOU, FUJIAN, CHINA

Test Result..... : Pass

Test Object

Description..... : DIGITAL MULTIMETER

Trademark..... : N/A

Model and/or type reference..... : DT830B, DT831, DT832, DT830D, DT838, DT830E

Rating(s)..... : DC 9V

Testing

Date of receipt of test item : 2022-06-05

Date(s) of performance of test..... : 2022-06-06 to 2022-06-08

Remark: This device described above has been tested by U.K Standard Testing Co., LTD, This test report shall not be reproduced except in full without the written approval of the testing laboratory. The test results presented in this report relate only to the item tested and are in compliance with the EMC requirements.

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2 Test Summary

Test	Test Requirement	Test Method	Criterion	Result
Radiated Emissions 30MHz to 1GHz	EN IEC 61326-1:2021, EN IEC 61326-2-2:2021, EN IEC 61000-6-3:2021	EN 55011:2016+A1:2017/ EN 55011:2016+A11:2020/ EN 55011:2016+A2:2021	Limit	PASS
Electrostatic Discharge	EN IEC 61326-1:2021, EN IEC 61326-2-2:2021, EN IEC 61000-6-1:2019	EN 61000-4-2: 2009 IEC 61000-4-2:2008	A,B	PASS
R/S	EN IEC 61326-1:2021, EN IEC 61326-2-2:2021 , EN IEC 61000-6-1:2019	EN IEC 61000-4-3-2020	A	PASS
Power Frequency magnetic Field	EN IEC 61326-1:2021, EN IEC 61326-2-2:2021, EN IEC 61000-6-1:2019	EN 61000-4-8:2010 IEC 61000-4-8:2009	A	PASS
Note:-				

2.1 Measurement Uncertainty

The report uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

No.	Item	Frequency Range	U , Value
1	Power Line Conducted Emission	150KHz~30MHz	1.13 dB
2	Disturbance Power Emission	30MHz~300MHz	2.95 dB
3	Radiated Emission Test	30MHz~1GHz	3.03 dB

3 REMARK**3.1 Deviation from standard**

None

3.2 Abnormalities from standard conditions

None

4 General Information

4.1 General Description of EUT

EUT Name:	DIGITAL MULTIMETER
Model No:	DT830B, DT831, DT832, DT830D, DT838, DT830E (REMARK:All the model are identical except model no.)
Serial Model No:	-
Brand Name:	N/A
Power Supply Range:	Powered by 9.0vdc with 1604E 6F22
Test Power Supply:	Powered by 9.0vdc with 1604E 6F22
Power cable:	N/A
Signal cable:	N/A

4.2 EUT Test Mode

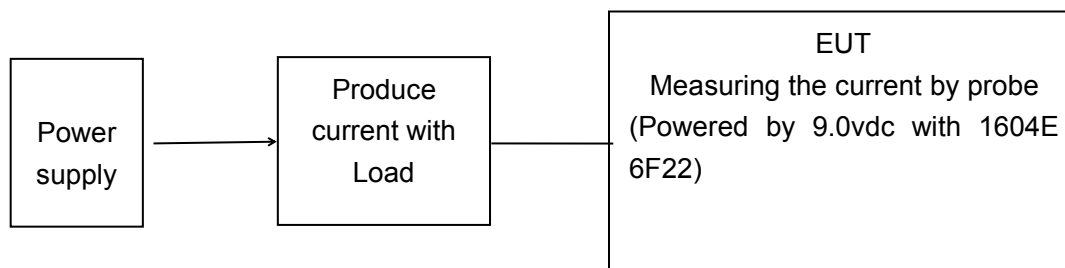
Mode	On mode,keep EUT measuring and LCD displaying
------	---

4.3 Description of Test setup

EUT was tested in normal configuration (Please See following Block diagrams)

1. Block diagram of EUT configuration-EMI

Mode1:



2. Block diagram of EUT configuration-EMS

The same as above.

4.4 Test Peripheral List

No.	Equipment	Manufacturer	EMC Compliance	Model No.	Serial No.	Power cord	signal cable
1	0-200Ω Resistor	Supplied by UK	Comply	RE200A	N/A	N/A	N/A

5 Equipments List for All Test Items

☒ Radiation Test Equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ANRITSU	MS2661C	6200140915	2022-3-20	2023-3-19
2	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	2022-3-20	2023-3-19
3	Bilog Antenna	Schwarzbeck	VULB9163	142	2022-3-20	2023-3-19
4	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	2022-3-20	2023-3-19
5	EMI Power Line Filter	DUOJI EME	FNF 201 B16	N/A	2022-3-20	2023-3-19
6	EMI Power Line Filter	JIANLI	DL-40C	N/A	2022-3-20	2023-3-19
7	Cable	Schwarzbeck	AK9513	ACRX1	2022-3-20	2023-3-19
8	Cable	Rosenberger	N/A	FP2RX2	2022-3-20	2023-3-19
9	Cable	Schwarzbeck	AK9513	CRPX1	2022-3-20	2023-3-19
10	Cable	Schwarzbeck	AK9513	CRRX2	2022-3-20	2023-3-19

☐ Conduction Test equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	2022-3-20	2023-3-19
2	L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	2022-3-20	2023-3-19
3	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	2022-3-20	2023-3-19
4	50 Coaxial Switch	Anritsu	MP59B	M20531	2022-3-20	2023-3-19

☐ H/F Test Equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Power Frequency Test System	HAEFELY	PHF555	080419-03	2022-3-20	2023-3-19

☒ ESD Test Equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	ESD Tester	HAEFELY	PESD1600	H708159	2022-3-20	2023-3-19

☒ R/S Test Equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Signal Generator	HP	8648A	3625U00573	2022-3-20	2023-3-19
2	Amplifier	AR	500A100	17034	2022-3-20	2023-3-19
3	Amplifier	AR	100W/1000M1	17028	2022-3-20	2023-3-19
4	Isotropic Field Monitor	AR	FM2000	16829	2022-3-20	2023-3-19
5	Isotropic Field Probe	AR	FP2000	16755	2022-3-20	2023-3-19
6	Biconic Antenna	EMCO	3108	9507-2534	2022-3-20	2023-3-19
7	Log-periodic Antenna	AR	AT1080	16812	2022-3-20	2023-3-19
8	PC	N/A	486DX2	N/A	2022-3-20	2023-3-19

☐ EFT/B Test equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Burst Tester	HAEFELY	PEFT4010	080981-16	2022-3-20	2023-3-19
2	Coupling Clamp	HAEFELY	IP-4A	147147	2022-3-20	2023-3-19

☐ Surge Test Equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Surge Tester	HAEFELY	PSURGE4.1	080107-04	2022-3-20	2023-3-19

☐ C/S Test Equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Simulator	EMTEST	CWS500C	0900-12	2022-3-20	2023-3-19
2	Attenuator	EMTEST	ATT6	0010222A	2022-3-20	2023-3-19
3	CDN	EMTEST	CDN-M2	5100100100	2022-3-20	2023-3-19
4	CDN	EMTEST	CDN-M3	0900-11	2022-3-20	2023-3-19
5	Power Line CDN	tsj	TSCDN-M3-16A	07032	2022-3-20	2023-3-19

☒ PFMF Test Equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Magnetic field generator	Schaffner	MFO6502	29832	2022-3-20	2023-3-19
2	Magnetic Field Loop Antenna	FCC	F-1000-4-8/9/ 10-L-1M	2078	2022-3-20	2023-3-19

☐ Dips Test Equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Dips Tester	HAEFELY	Pline1610	083732-18	2022-3-20	2023-3-19

Note:

1. ☐ is not applicable in this Test Report. ☒ is applicable in this Test Report.

6 Emission Test Results

6.1 Radiated Emission Measurement

Limits of Radiated Emission Measurement (Below 1GHz)

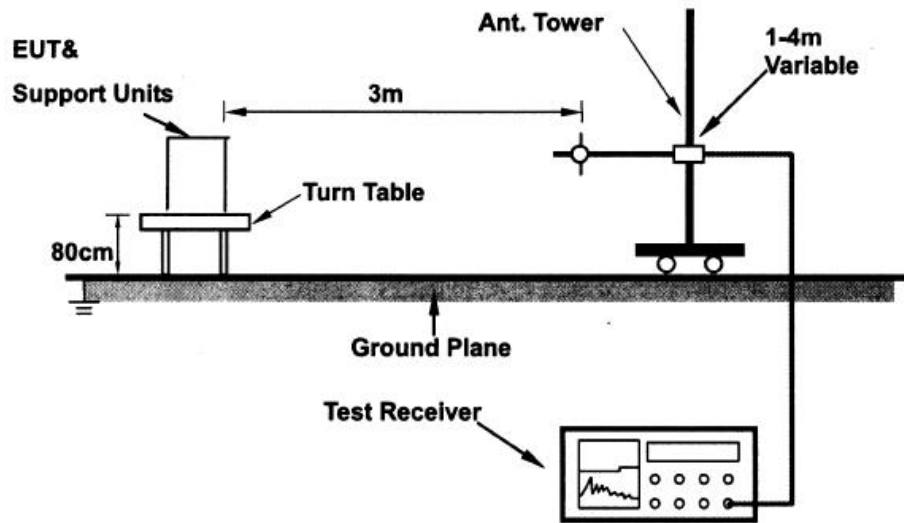
Frequency (MHz)	Quasi-Peak dB(μ V/m)
30 ~ 230	30.0
230 ~ 1000	37.0

Detector:	Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak if maximum peak within 6dB of limit
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6.1.1 E.U.T. Operation

Temperature:	25°C	Humidity:	53% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	On mode,keep EUT measuring and LCD displaying			The Worst Mode:	On mode,keep EUT measuring and LCD displaying	

6.1.2 Test Specification



EUT was placed upon a wooden test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn table and move the antenna from 1m to 4m to find the maximum field-strength reading. All peripherals were placed at a distance of 10cm between each other. Both horizontal and vertical antenna polarities were tested.

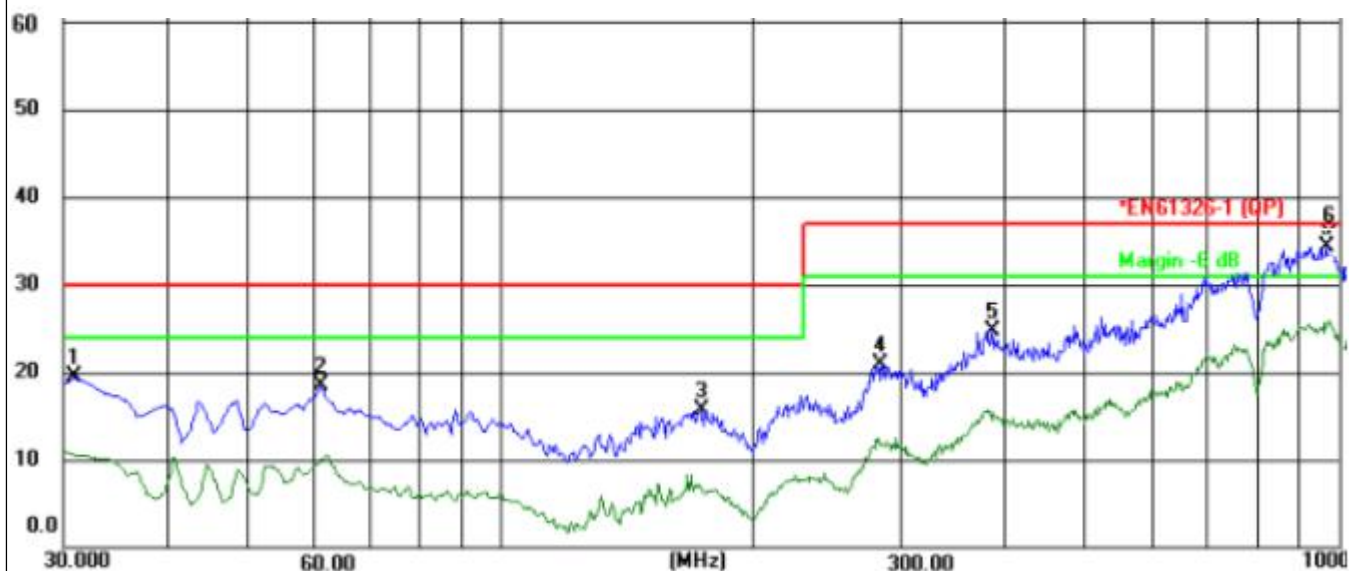
6.1.3 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyzers in peak detection mode. The EUT was measured by Biology antenna with 2 orthogonal polarities and peak emissions from the EUT were detected within 6dB of the class B limit line.

The following quasi-peak measurements were performed on the EUT.

Between 30 MHz - 1000 MHz

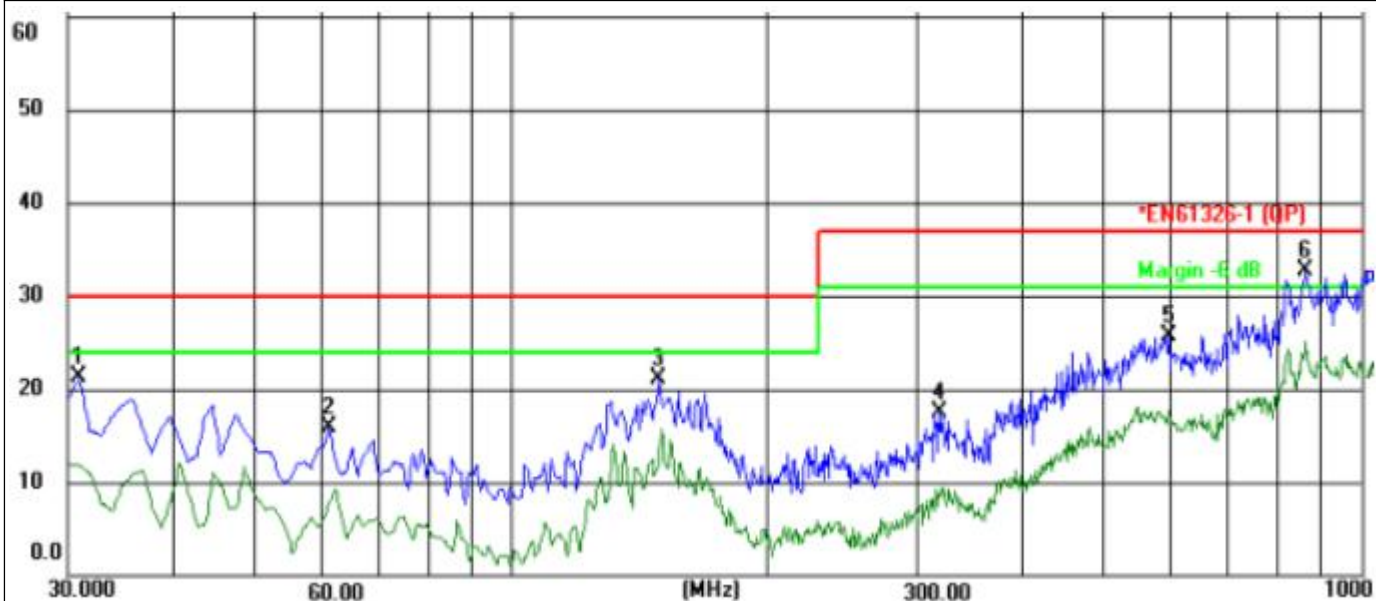
Test Mode:	On mode,keep EUT measuring and LCD displaying	Polarization:	Horizontal
Model:	DT830B	Date:	2022-06-06



Remark: Factor = Gain/Loss Factor + Transducer Loss

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.9700	1.90	17.54	19.44	30.00	-10.56
2	61.0400	3.56	14.87	18.43	30.00	-11.57
3	173.5600	2.50	13.24	15.74	30.00	-14.26
4	285.1099	1.87	19.06	20.93	37.00	-16.07
5	387.9300	2.81	21.99	24.80	37.00	-12.20
6 *	975.7500	4.34	31.43	35.77	37.00	-3.23

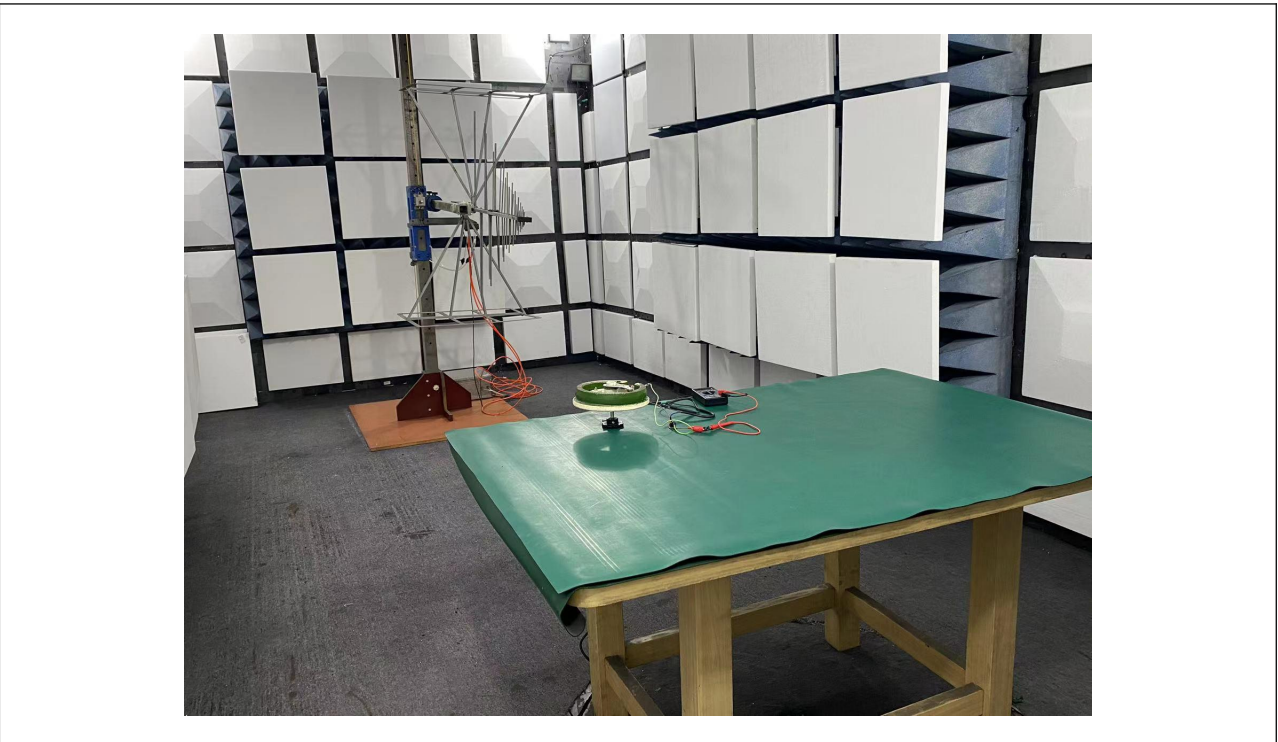
t Mode:	On mode,keep EUT measuring and LCD displaying	Polarization:	Vertical
Model:	DT830B	Date:	2022-06-07



Remark: Factor = Gain/Loss Factor + Transducer Loss

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.9700	3.14	18.15	21.29	30.00	-8.71
2	61.0400	5.26	10.70	15.96	30.00	-14.04
3	149.3100	6.90	14.24	21.14	30.00	-8.86
4	319.0600	0.58	17.00	17.58	37.00	-19.42
5	594.5400	1.01	24.67	25.68	37.00	-11.32
6 *	862.2600	1.19	31.42	32.61	37.00	-4.39

6.1.4 Test Setup Photograph.



U.K Standard Testing Co., Limited.

Building E, Nanpu Technology Innovation Center, Banshi, Changping, Dongguan, Guangdong, China.

7 Immunity Test Results

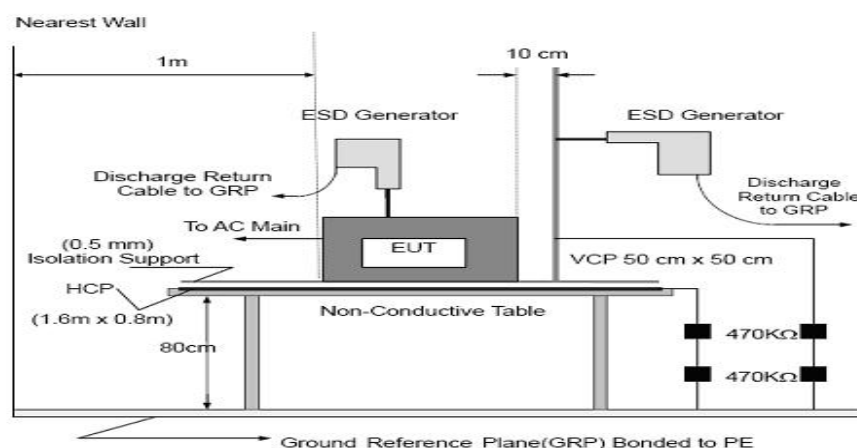
7.1 Electrostatic discharge immunity test

Acceptable Performance Criterion:	A for Contact Discharge, B for Air Discharge
Discharge Impedance:	330 Ω / 150 pF
Discharge Voltage:	Air Discharge: ± 8 kV
	Contact Discharge: ± 4 kV
	VCP, HCP: ± 4 kV
Polarity:	Positive & Negative
Minimum discharge Interval:	1 second

7.1.1 E.U.T. Operation

Temperature:	25°C	Humidity:	54% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	On mode,keep EUT measuring and LCD displaying			The Worst Mode:	On mode,keep EUT measuring and LCD displaying	

7.1.2 Test specification



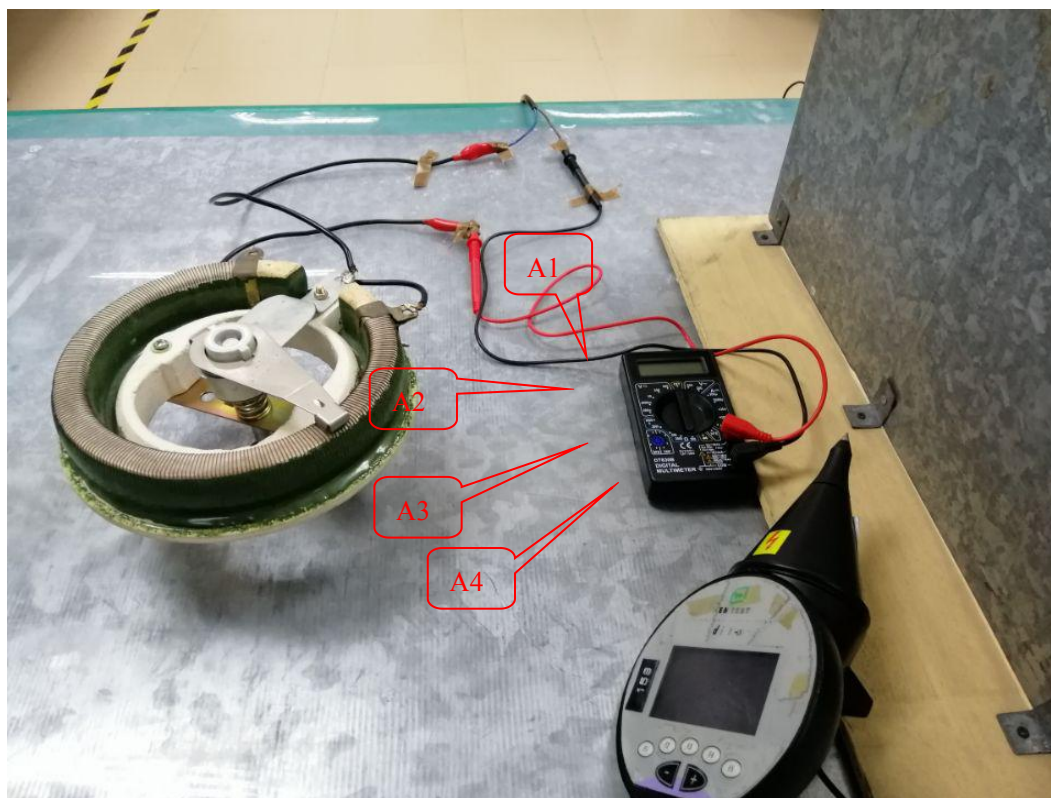
EUT was operated in the mode as mentioned above. Both contact and air discharge was executed. Contact discharge to the conductive surfaces and to coupling planes; air discharge at insulating surfaces. Each test point shall be subjected to 25 discharges at least (For each voltage and polarity).

7.1.3 Measurement Data

Test Record

Electrostatic Discharge Test Results																		
M/N:	DT830B								Test Result: ☒ Pass ☐ Fail									
Test Voltage:	Powered by 9.0Vdc with 1604E 6F22								Test date: 2022-06-07									
Discharge times	Contact discharge: minimum <u>10</u> times (+/-respectively) at each point, Air discharge: minimum <u>10</u> times (+/- respectively) at each point.																	
Discharge Mode	Air Discharge								Contact Discharge								Performance Criterion	Result
Test level (kV)	4		8		10		15		2		4		6		8			
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
VCP									P	P	P	P					A	Pass
HCP									P	P	P	P						Pass
C1									P	P	P	P						Pass
C2									P	P	P	P						Pass
A1	P	P	P	P													B	Pass
A2	P	P	P	P														Pass
A3	P	P	P	P														Pass
A4	P	P	P	P														Pass
A5	P	P	P	P														Pass
Note: “P” means Pass, Horizontal Coupling Plane (HCP) and Vertical Coupling plane (VCP). “Cx” means Contact Point ,x=1～N,“Ax” means Air Point, x=1～N.																		

7.1.4 Test Setup Photograph



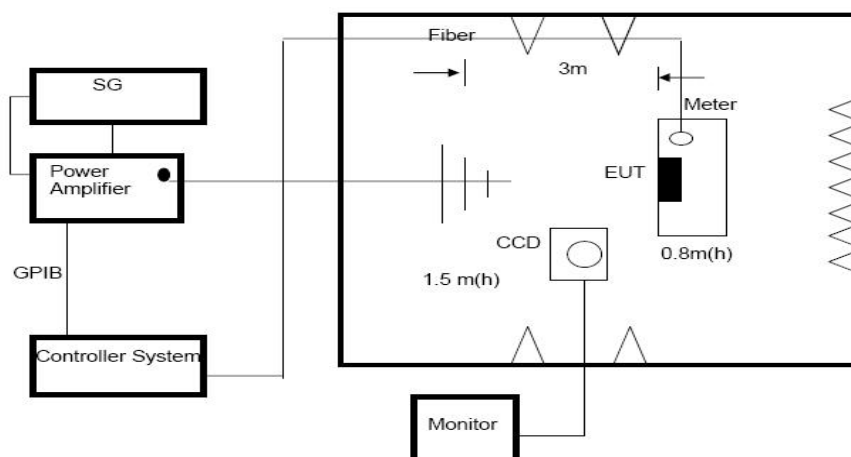
7.2 RF field strength immunity test

Acceptable Performance Criterion:	A
Frequency Range & Test Level	80MHz~1000MHz 3V/m
Test Distance	3 m
Polarity:	Horizontal & Vertical

7.2.1 E.U.T. Operation

Temperature:	25°C	Humidity:	53% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	On mode,keep EUT measuring and LCD displaying			The Worst Mode:	Mode 1	

7.2.2 Test specification



Test was executed in a fully Anechoic chamber. An antenna was used to transmit interference signal. EUT was placed upon a wooden table above the reference ground 0.8m, and was positioned so that the four sides of the EUT shall be exposed to the electromagnetic field in a sequence. In each position the performance of the EUT was investigated. A camera was used to monitor the loss of function or degradation of performance of the EUT.

7.2.3 Measurement Data

Test Record

Radiated Frequency Field Strength Susceptibility Results					
M/N:	DT830B	Test Result: ☒ Pass ☐ Fail			
Test Voltage:	9.0Vdc with 1604E 6F22	Test date: 2022-06-07			
Test Port	Enclosure				
Operating Mode	On mode,keep EUT measuring and LCD displaying				
Test Level	___ 3 ___ V/m(r.m.s) (unmodulated)		Criterion	A	
Frequency Range		Antenna polarity	Modulation	EUT position	Result
80MHz~2.7GHz		Horizontal	1KHz, 80% AM	Front	Pass
				Rear	Pass
				Left	Pass
				Right	Pass
				Top	Pass
				Bottom	Pass
80MHz~2.7GHz		Vertical	1KHz, 80% AM	Front	Pass
				Rear	Pass
				Left	Pass
				Right	Pass
				Top	Pass
				Bottom	Pass

7.2.4 Test Setup Photograph



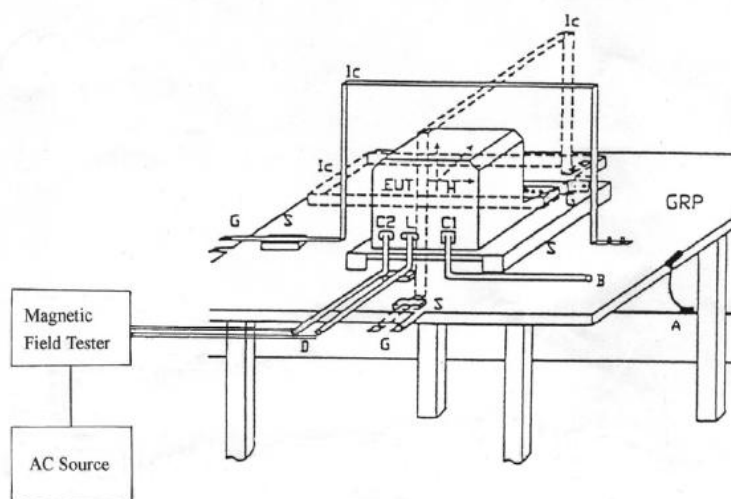
7.3 Power frequency magnetic field immunity test

Acceptable Performance Criterion:	A
Test Level:	3A/m
Coil Orientation:	X & Y & Z
Test Duration:	5 Minutes for each orientation

7.3.1 E.U.T. Operation

Temperature:	25°C	Humidity:	53% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	On mode,keep EUT measuring and LCD displaying			The Worst Mode:	Mode 1	

7.3.2 Test specification



The equipment is configured and connected to satisfy its functional requirements. It was placed on the ground reference plane with the interposition of a 0.1 m thickness wooden support and was placed in the center of the induction coil. All cables (include power cord and signal line) were exposed to the magnetic field for at least 1m of their length.

7.3.3 Measurement Data

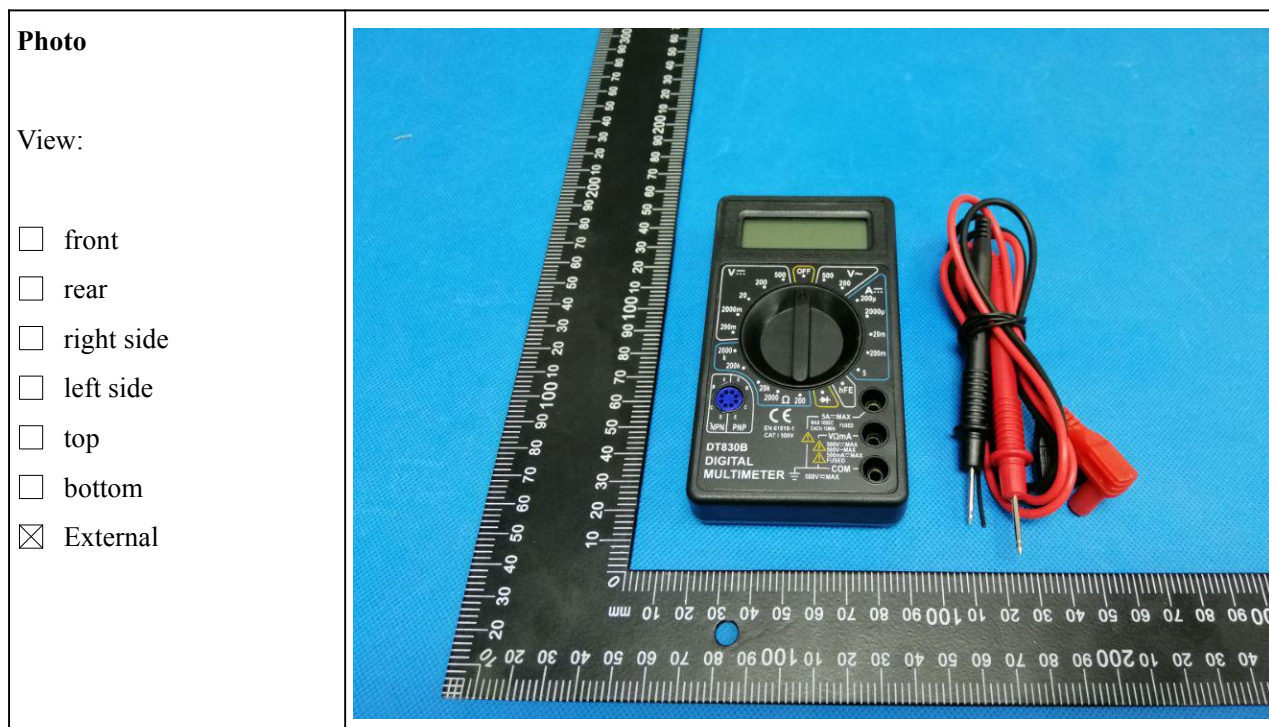
Test Record

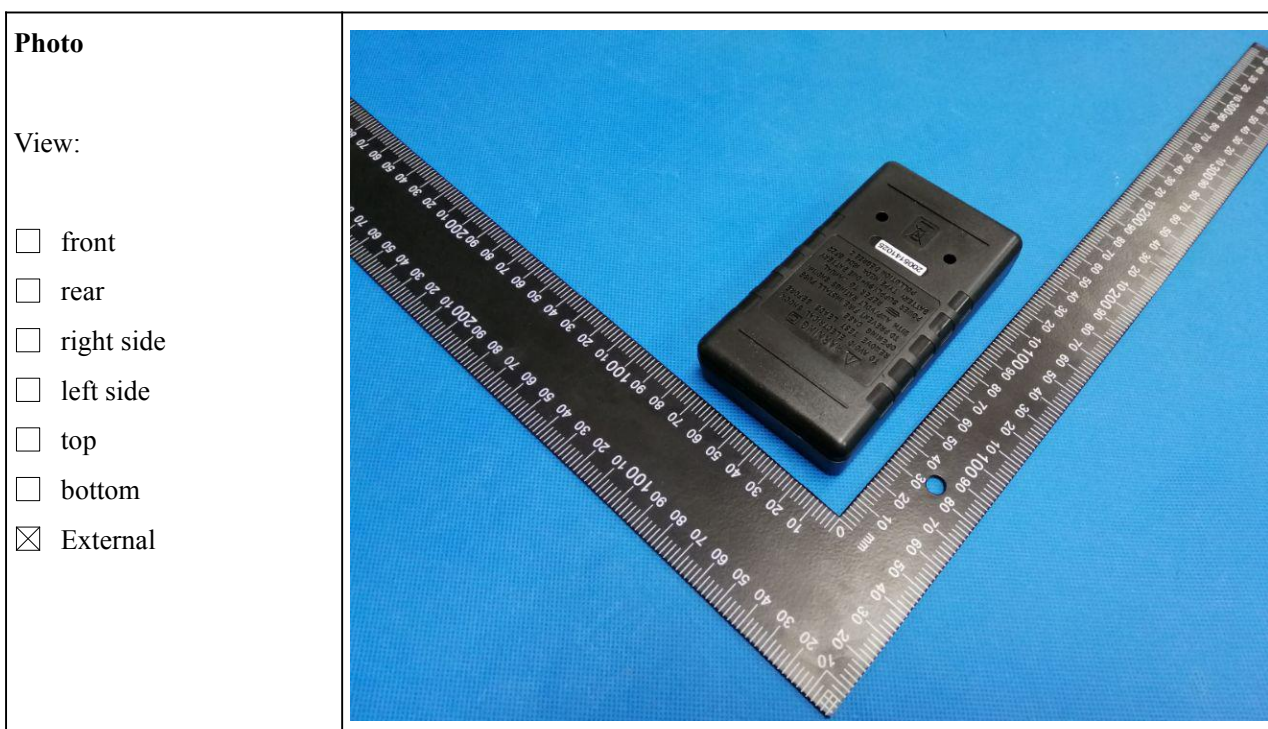
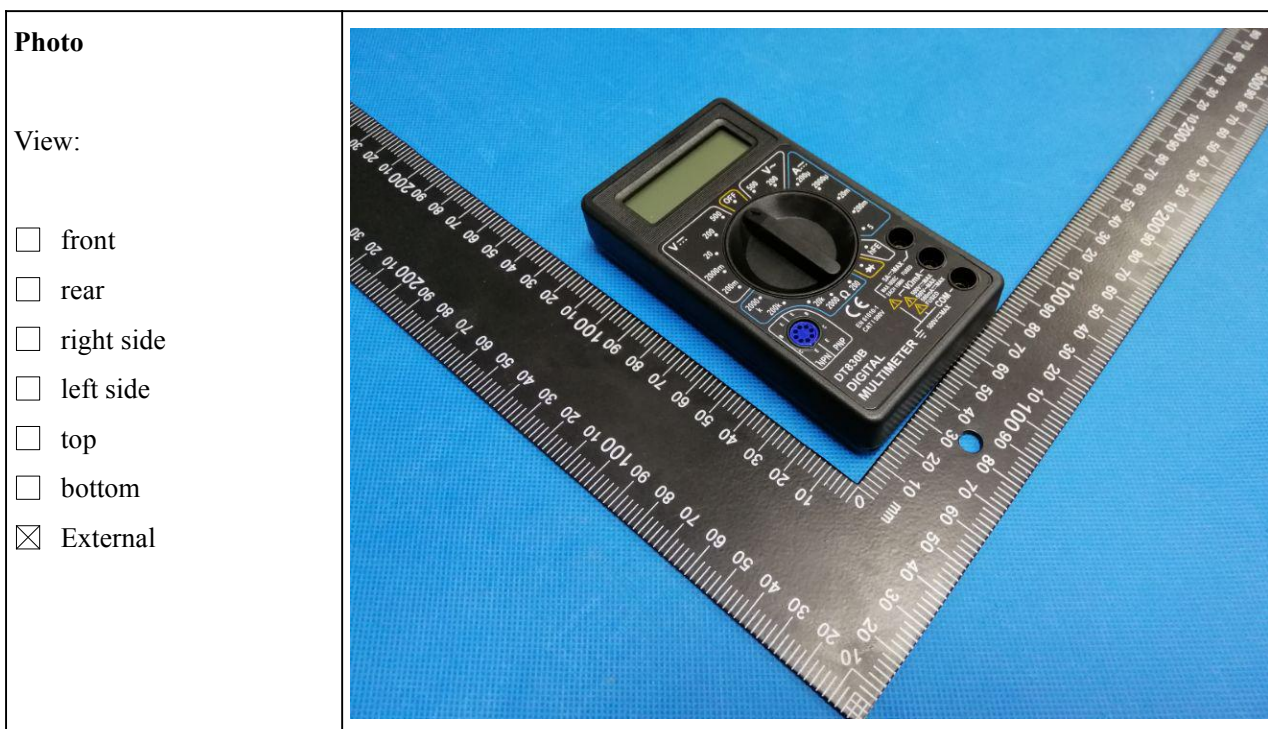
Power Frequency Magnetic Field Immunity Test Results				
M/N:	DT830B		Test Result: ☒ Pass ☐ Fail	
Test Voltage:	9.0Vdc with 1604E 6F22		Test date: 2022-06-08	
Operating Mode	On mode,keep EUT measuring and LCD displaying			
Test Level	Test Duration	Coil Orientation	Criterion	Result
<u>3</u> A/m	<u>5</u> minus	X	A	Pass
<u>3</u> A/m	<u>5</u> minus	Y	A	Pass
<u>3</u> A/m	<u>5</u> minus	Z	A	Pass
Note:				

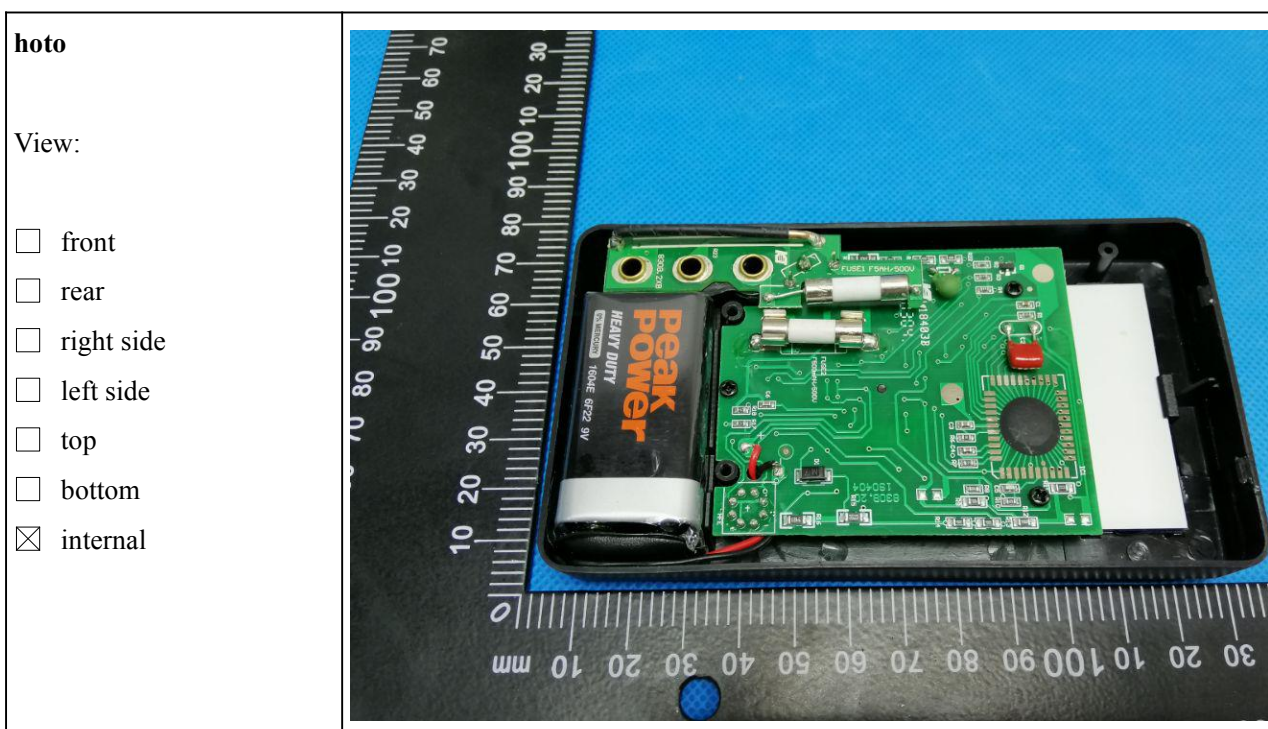
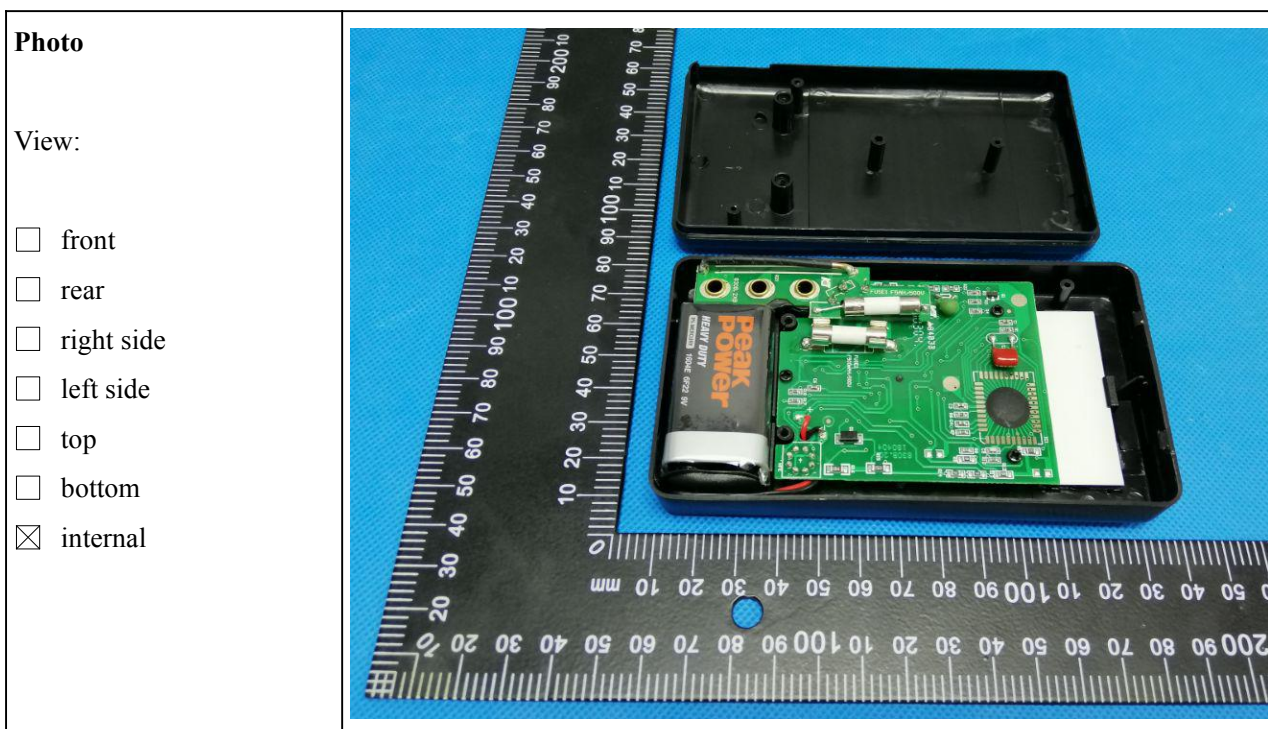
7.3.4 Test Setup Photograph.

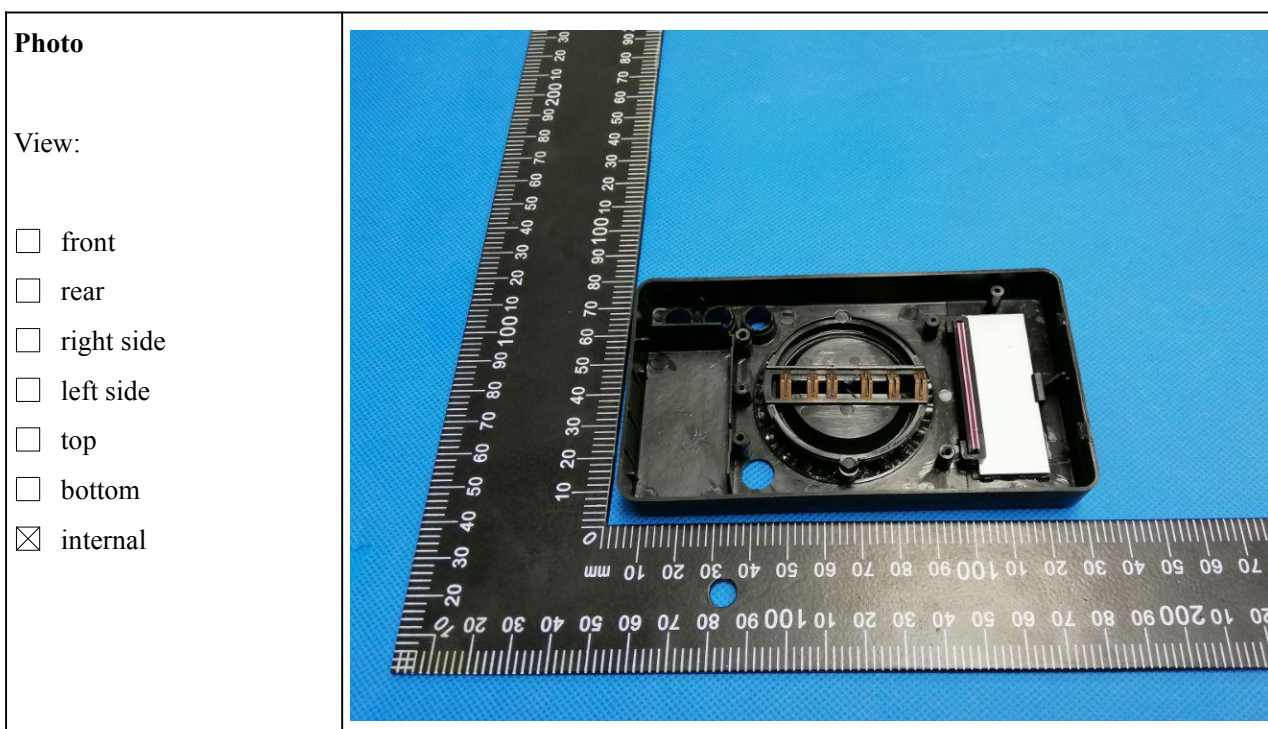
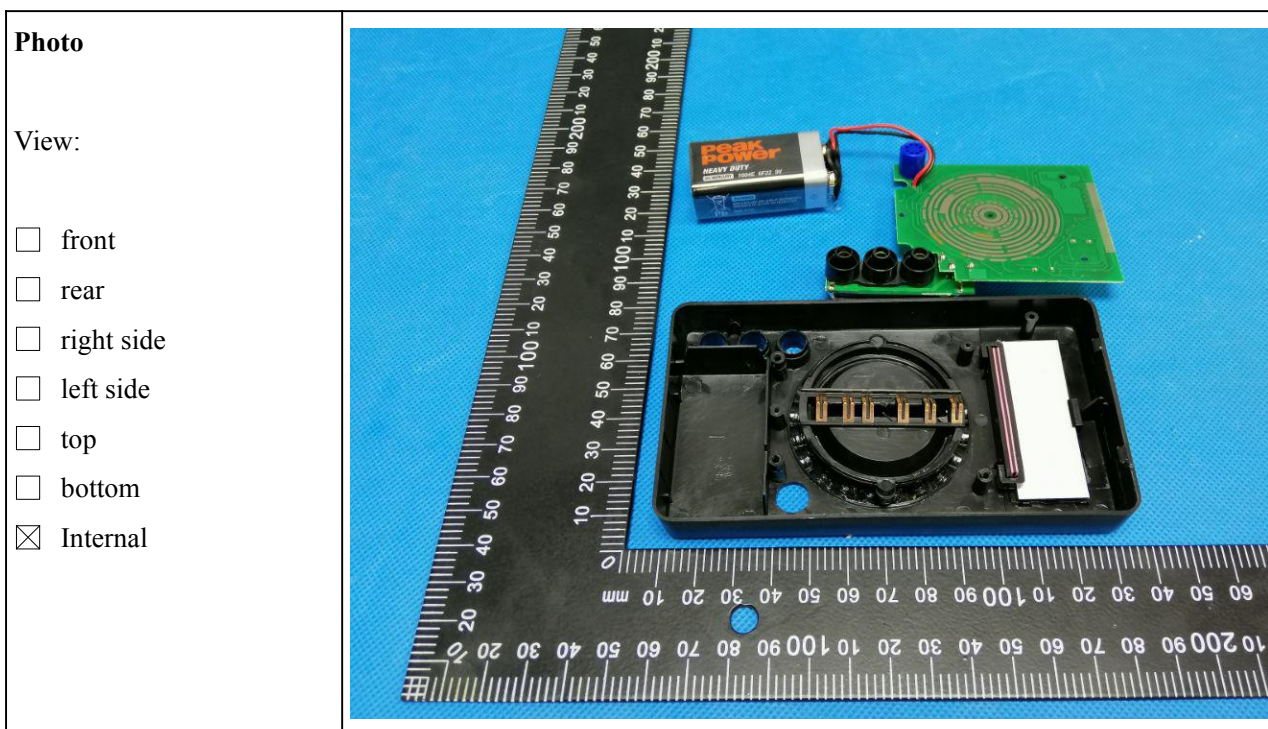


8 Photographs of EUT Constructional Details









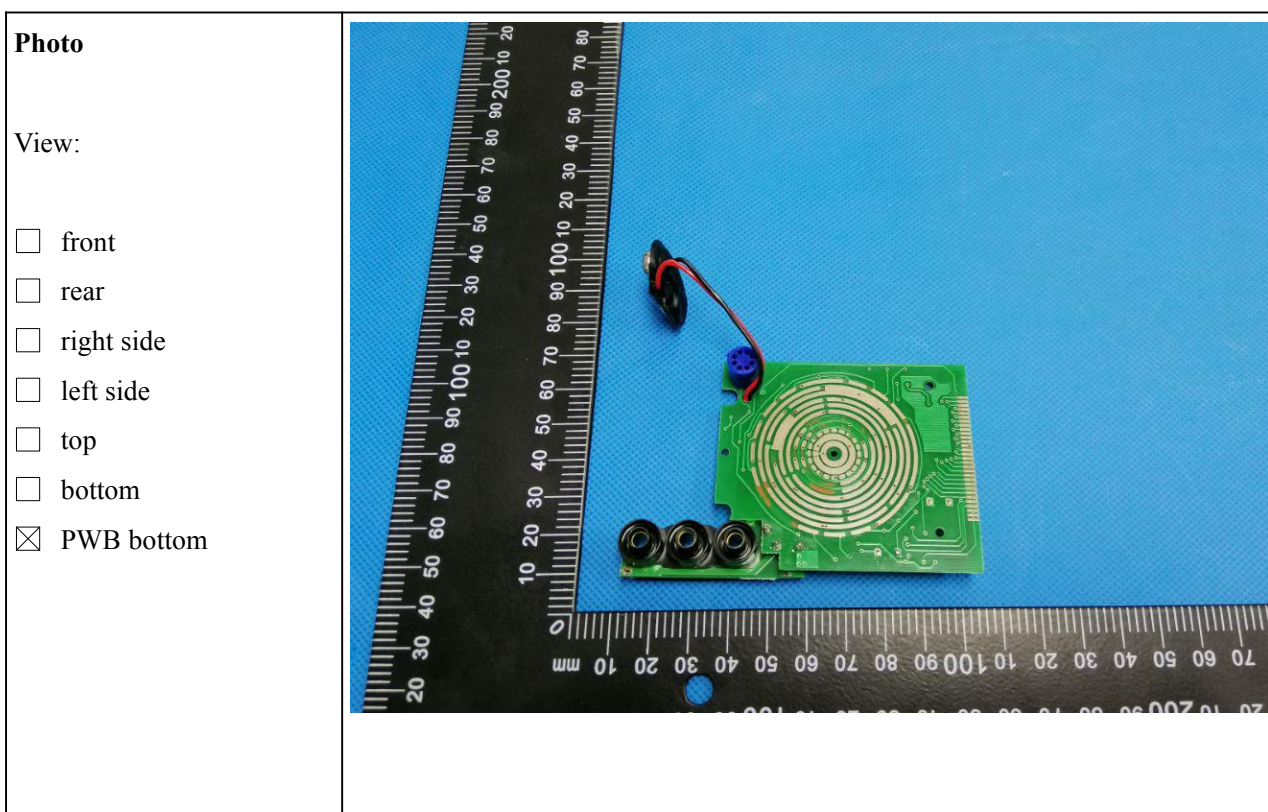
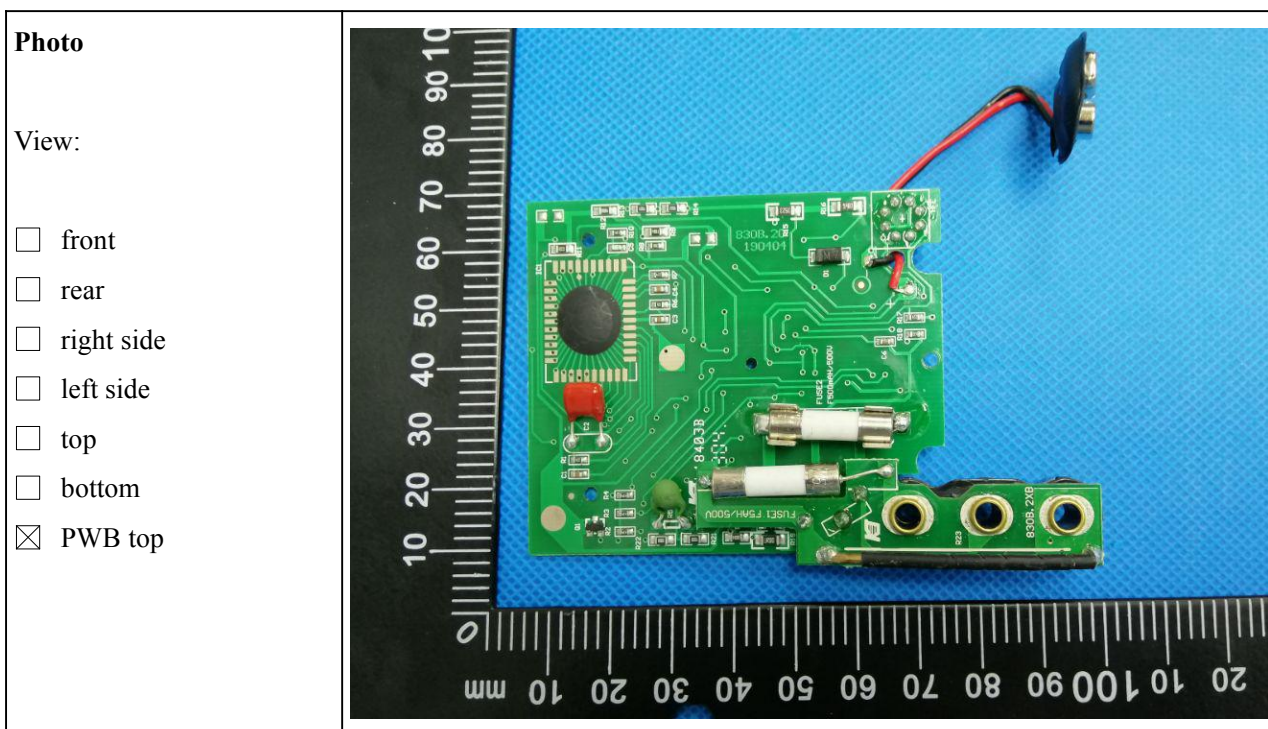


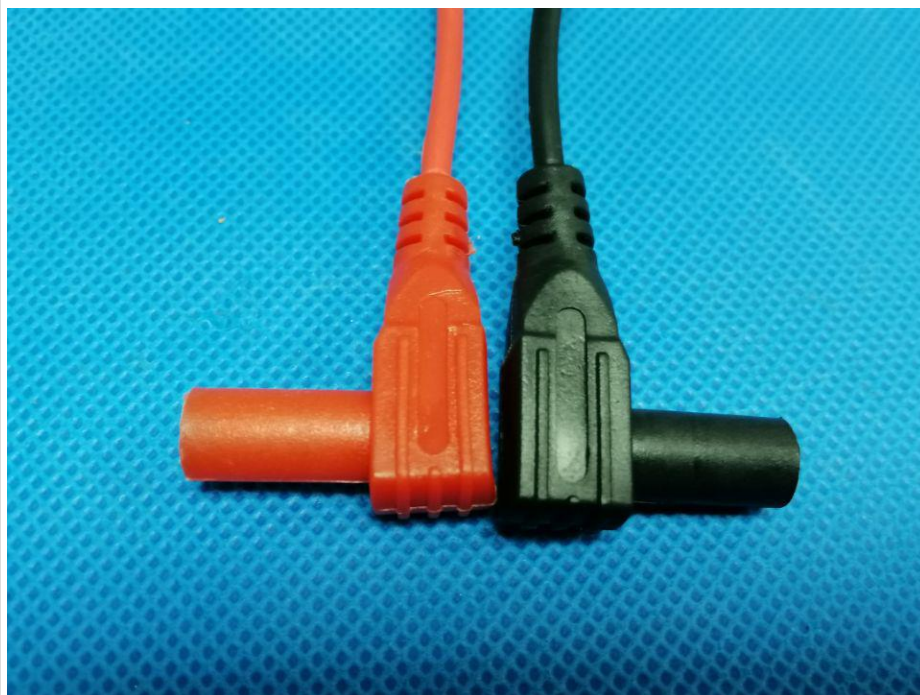
Photo View: ☐ front ☐ rear ☐ right side ☐ left side ☐ top ☐ bottom ☒ probe	
--	--

Photo View: ☐ front ☐ rear ☐ right side ☐ left side ☐ top ☐ bottom ☒ probe	
--	--

Photo

View:

- ☐ front
- ☐ rear
- ☐ right side
- ☐ left side
- ☐ top
- ☐ bottom
- ☒ Probe



***** End of Report *****