Uni-Trend Technology (China) Co., Ltd

TEST REPORT

SCOPE OF WORK
EMC TESTING–UT216A, UT216B, UT216C, UT216D

REPORT NUMBER
131227014GZU-001

ISSUE DATE **[REVISED DATE]**

08 June 2014 [08 August 2024]

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Applicant Name & Address	:	Uni-Trend Technology (China) Co., Ltd. No 6, Gong Ye Bei 1st Road, Songshan Lake National High-Tech Industrial Development Zone, Dongguan City, Guangdong Province, P. R. China
Manufacturing Site	:	Same as applicant
Intertek Report No:		131227014GZU-001 Amendment 3

Test standards

EN IEC 61326-1:2021
EN IEC 61326-2-2:2021

Sample Description

Product	:	Clamp Digital Multimeter
Model No.	:	UT216A, UT216B, UT216C, UT216D
Electrical Rating	:	CAT III 600V, CAT II 1000V, Class II; 3 x AAA 1.5V batteries
Serial No.		Not Labeled
Date Received	:	25 January 2024
Date Test Conducted	:	25 January 2024 to 15 March 2024

Prepared and Checked By

Jed Guo

Project Engineer

Approved By:

Sky Zhu

Supervisor

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1. TEST RESULTS SUMMARY

Test Item	Standard	Result
Radiated EM field immunity	**EN IEC 61326-1, EN IEC 61326-2-2 Reference: EN 61000-4-3:2006 +A1:2008+A2:2010**	**Pass**

Remark:
1. When determining the test results, measurement uncertainty of tests has been considered.
2. The EUT belonging to Class B, Group 1 equipment, as requirement by EN 55011.

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2. EMC RESULTS CONCLUSION

Test result:
It is found that the Clamp Digital Multimeter, Models: UT216A, UT216B, UT216C, UT216D met the requirements of EN IEC 61326-1: 2021 and EN IEC 61326-2-2:2021 standard.

Report revision reason:
Amendment 1:
This report is based on the previous version 131227014GZU-001 dated 08 June 2014 and will be used with it together. This report is issued because the standard EN 61326-1 is updated from EN 61326-1:2006 to EN 61326-1:2013, EN61326-2-2 is updated from EN 61326-2-2:2006 to EN 61326-2-2:2013.

Amendment 2:
This report is the revision of the previous test report 131227014GZU with Amendment 1 dated 22 July 2015 and shall be used together with it.
This report was issued because of the following changes:
1.The EMC Directive has been updated: the EMC Directive has been updated from 2004/108/EC to 2014/30/EU.
2.Add the test Power Frequency Magnetic Filed Immunity for the pruducts, please refer to the following page.

Amendment 3:
This report is the revision of the previous test report 131227014GZU-001 Amendment 2 dated 24 July 2017 and shall be used together with it.
This report was issued because of the following change:
(1) Updated the standard from “EN 61326-1: 2013” to “EN IEC 61326-1:2021”;
(2) Updated the standard from “EN 61326-2-2: 2013” to “EN IEC 61326-2-2:2021”;
(3) Added the PCB view of model UT216C and UT216D.
(4) Added C14 270pF for UT216A and C14 47nF and C17 3.3nF for UT216B.

Based on engineering judgement, Radiated EM field immunity was performed to UT216A.

The production units are required to conform to the initial sample as received when the units are placed on the market.

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3. LABORATORY MEASUREMENTS

Configuration Information

Support Equipment: N/A

Rated Voltage and frequency under test: 3 x AAA 1.5V
Condition of Environment: Temperature: 22~28°C
Relative Humidity:35~60%
Atmosphere Pressure:86~106kPa

Notes:
1. The EMI measurements had been made in the operating mode produced the largest emission in the frequency band being investigated consistent with normal applications. An attempt had been made to maximize the emission by varying the configuration of the EUT.

2. The EMS measurements had been made in the frequency bands being investigated, with the EUT in the most susceptible operating mode consistent with normal applications. The configuration of the test sample had been varied to achieve maximum susceptibility.

3. Test Location:
Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
All tests were performed at:
Room102/104, No 203, KeZhu Road, Science City, GETDD Guangzhou, China

4. Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Emission (9 kHz-150 kHz)	2.79 dB
2	Conducted Emission (150 kHz-30 MHz)	2.55 dB
3	Disturbance Power (30 MHz-300 MHz)	3.04 dB
4	Radiated Emission (9 kHz-30 MHz)	4.24 dB
5	Radiated Emission (30 MHz-1 GHz)	4.80 dB
6	Radiated Emission (1 GHz-6 GHz)	4.97 dB
7	Radiated Emission (6 GHz-18 GHz)	4.89 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty is calculated in accordance with CISPR16-4-2:2011+A1:2014 +A2:2018.
The measurement uncertainty is given with a confidence of 95%, k=2.
Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

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4. EQUIPMENT USED DURING TEST

Radiated Susceptibility

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM030-04	3m Semi-Anechoic Chamber	9×6×6 m^3	ETS LINDGREN	1Y
EM031-01	Signal generator	SMB100A	R&S	1Y
EM086-11	Power meter	NRP2	R&S	1Y
EM086-11-01	Power sensor	NRP-Z91	R&S	1Y
EM046-01	Power Amplifier	80RF1000-300	MILMEGA	1Y
EM046-03	Power Amplifier	AS0860-75-45	MILMEGA	1Y
EM061-05	Log. - Per. Broadband Antenna	VULP 9118 E	SCHWARZBECK	2Y
EM061-07	Stacked Log.-Per. Broadband Antenna	STLP 9149	SCHWARZBECK	2Y
EM034-01	Open Switch and Control Platform	OSP120/1505.3009K12	R&S	1Y
EM045-01-01	EMC32 software (RE/RS)	V10.01.00	R&S	1Y
SA047-118	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y

Detail of the equipment calibration due date:

Equipment No.	Cal. Due date (DD-MM-YYYY)
Radiated Susceptibility	
EM030-04	09/04/2025
EM031-01	17/03/2025
EM086-11	12/11/2024
EM086-11-01	12/11/2024
EM046-01	03/03/2025
EM046-03	04/09/2024
EM061-05	09/10/2025
EM061-07	09/10/2025
EM034-01	/
EM045-01-01	/
SA047-118	16/07/2024

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5. EMS TEST

Performance Criteria:

Criterion A: The equipment shall continue to operate as intended during and after the test. No DEGRADATION OF PERFORMANCE or LOSS OF FUNCTION is allowed below a PERFORMANCE LEVEL specified in the user documentation, when the equipment is used as intended. In the case of applying immunity tests with continuous electromagnetic phenomena, the PERFORMANCE LEVEL may be replaced by a permissible LOSS OF PERFORMANCE which shall recover, without user intervention. A permissible LOSS OF PERFORMANCE is allowed within the PERFORMANCE LEVEL only when this information is clearly provided to the end user via documentation, such as the product user manual. No change in the operating state is allowed nor is loss of data.

Criterion B: The equipment shall continue to operate as intended after the test. No DEGRADATION OF PERFORMANCE or LOSS OF FUNCTION is allowed below a PERFORMANCE LEVEL specified in the user documentation, when the equipment is used as intended. During the test, the equipment PERFORMANCE LEVEL may be replaced by a permissible LOSS OF PERFORMANCE if such LOSS OF PERFORMANCE is detailed in the EMC test plan. A permissible LOSS OF PERFORMANCE is allowed within the PERFORMANCE LEVEL only when this information is clearly provided to the end user via documentation, such as the product user manual. An unintended change of the operating state is allowed if self-recoverable. No loss of stored data is allowed.

Criterion C: LOSS OF FUNCTION is allowed, provided the function is self-recoverable or can be restored by the operation of the controls. Recovery procedure shall be included in the user documentation. No permanent damage to the equipment is allowed.

Operation mode of EMS test:

Test Item	Operation mode
Radiated EM field immunity	Voltage/current/ resistance mode

Note: "N/A" means Not Applicable in below text.

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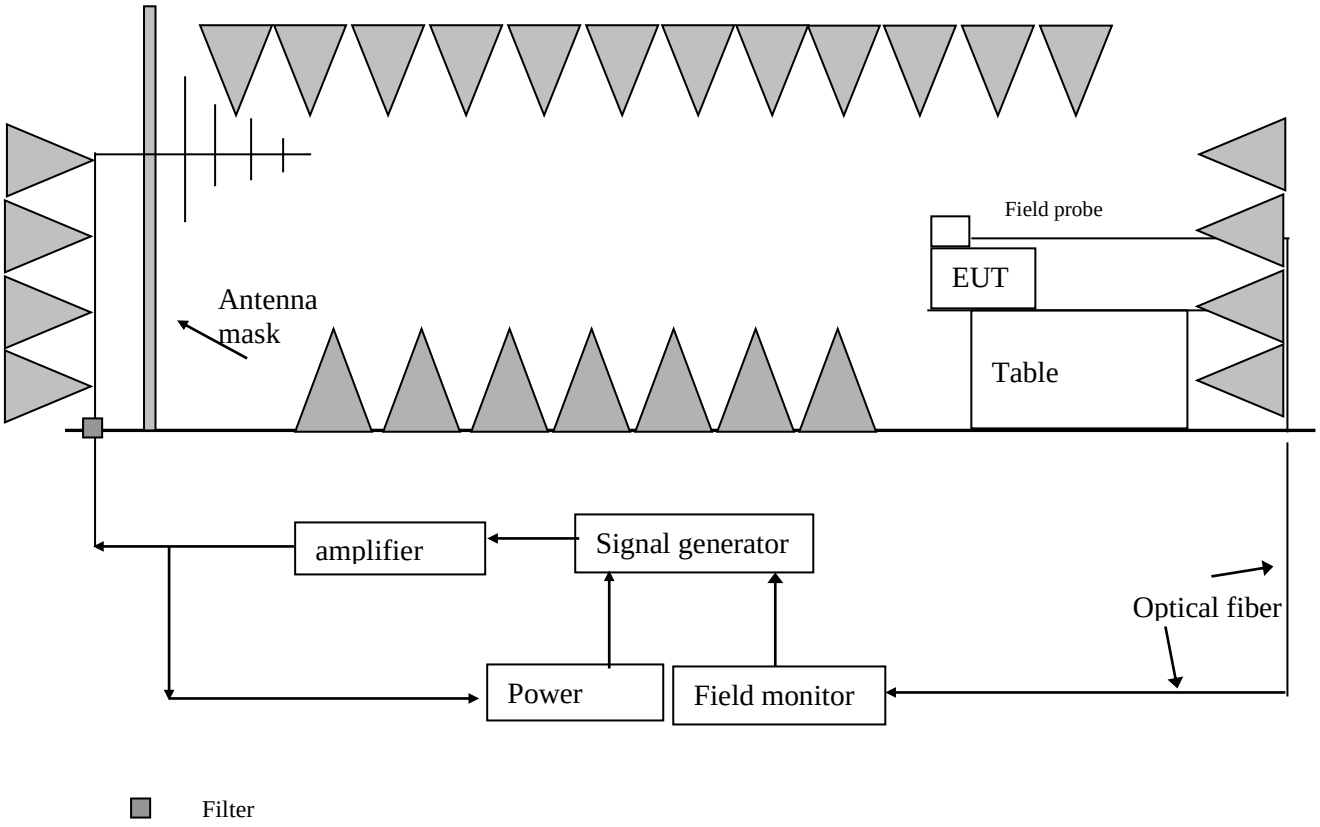
5.1 EN 61000-4-3(Pursuant to EN IEC 61326-1) Radiated Electromagnetic Field Immunity

Performance criterion: A
Test Result: Pass

5.1.1 Block Diagram of Test Setup



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5.1.2 Test Setup and Procedure

The test was conducted in a fully anechoic chamber to maintain a uniform field of sufficient dimensions with respect to the EUT, and also in order to comply with various national and international laws prohibiting interference to radio communications.

The equipment was placed in the test facility on a non-conducting table 0.8m high (for floor standing EUT, is placed on a non-conducting support 0.1m height).

For all ports connected to EUT, manufacturer specified cable type and length was used, for those cables no specification, unshielded cable applied. Wire was left exposed to the electromagnetic field for a distance of 1m from the EUT. The EUT was arranged and connected according to its functional requirements

Before testing, the intensity of the established field strength had been checked by placing the field sensor at a calibration grid point, and with the field generating antenna and cables in the same positions as used for the calibration, the forward power needed to give the calibrated field strength was measured. Spot checks was made at a number of calibration grid points over the frequency range 80MHz to 6000MHz, both polarizations was checked.

After calibration, the EUT was initially placed with one face coincident with the calibration plane.

The frequency range was swept from 80 MHz to 1000 MHz at 3V/m EM field, 1.4 GHz to 2 GHz at 3V/m EM field and 2.0 GHz to 6 GHz at 1V/m EM field, with the signal 80% amplitude modulated with a 1 kHz sine-wave, pausing to adjust the r.f. signal level.

The dwell time at each frequency was 3s so as that the EUT to be exercised and be able to respond.

The step size was 1% of the fundamental with linear interpolation between calibrated points. Test was performed with the generating antenna facing each of the four sides of the EUT.

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5.1.3 Test Result

Frequency (MHz)	Exposed Side	Field Strength (V/m)	Result
80 to 1000, 1400-2000	Front	3V/m (r.m.s.)	Pass
80 to 1000, 1400-2000	Left	3V/m (r.m.s.)	Pass
80 to 1000, 1400-2000	Rear	3V/m (r.m.s.)	Pass
80 to 1000, 1400-2000	Right	3V/m (r.m.s.)	Pass

Frequency (GHz)	Exposed Side	Field Strength (V/m)	Result
2.0 to 6.0	Front	1V/m (r.m.s.)	Pass
2.0 to 6.0	Left	1V/m (r.m.s.)	Pass
2.0 to 6.0	Rear	1V/m (r.m.s.)	Pass
2.0 to 6.0	Right	1V/m (r.m.s.)	Pass

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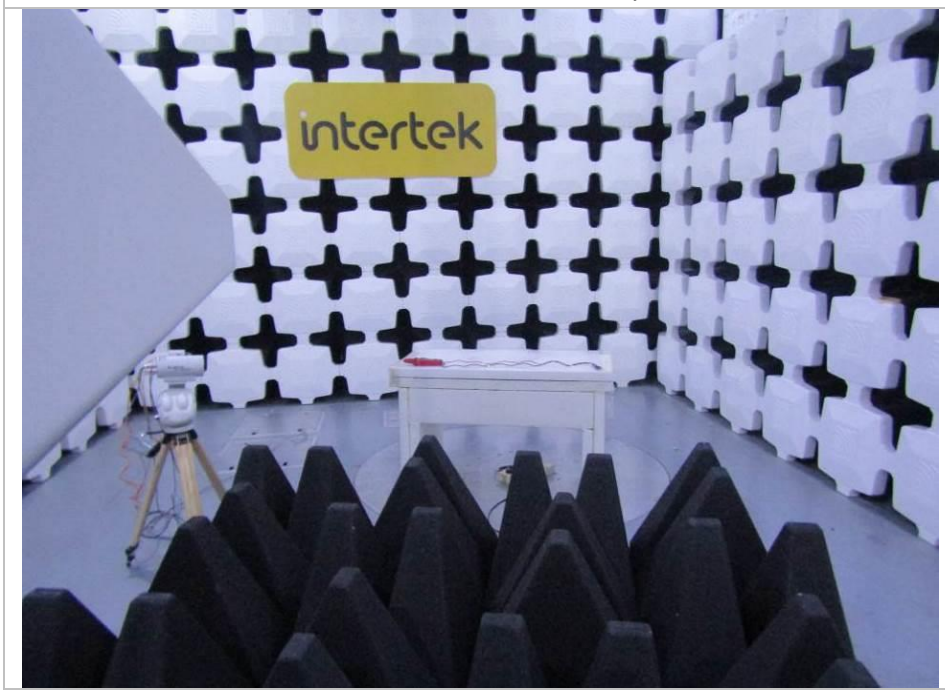
6. APPENDIX I - PHOTOS OF TEST SETUP

Radiated EM field immunity


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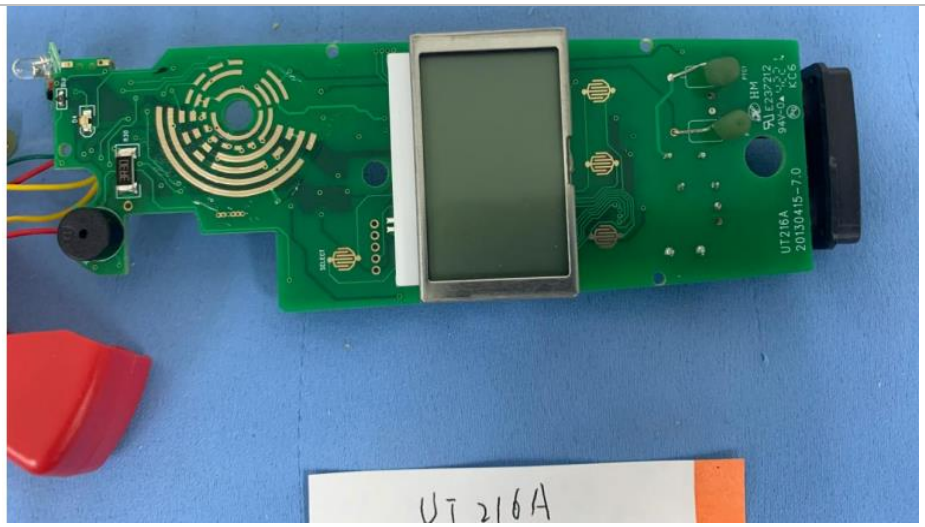
7. APPENDIX II – PHOTOS OF EUT

UT216A

UT216A


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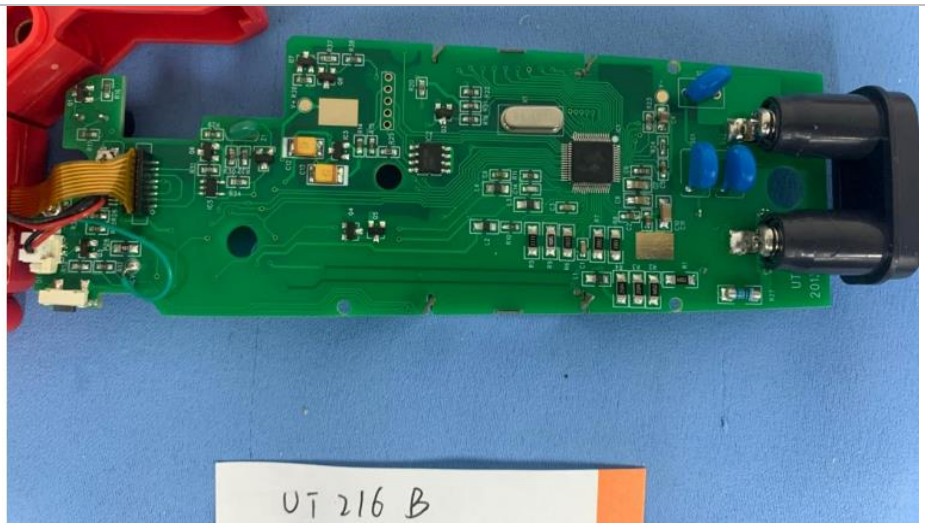
UT216B

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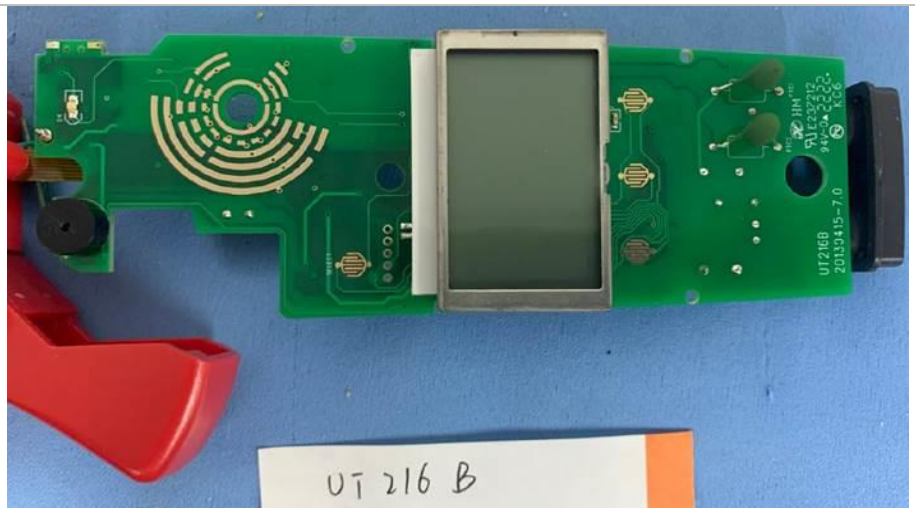

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UT216C

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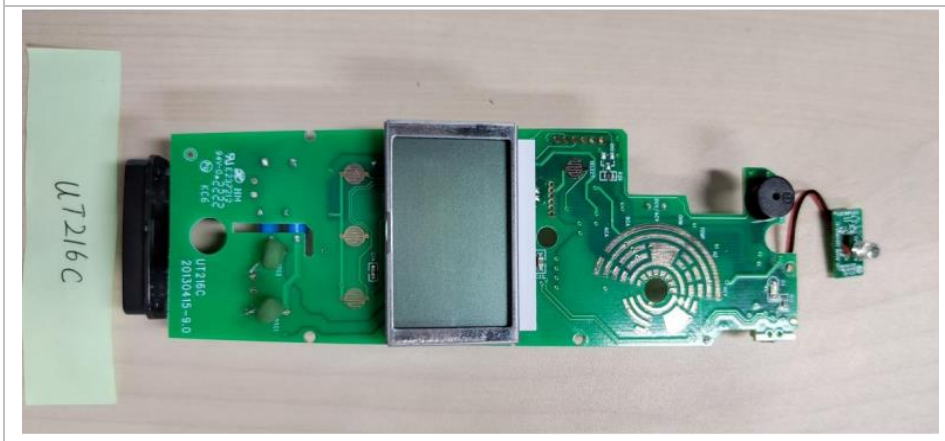

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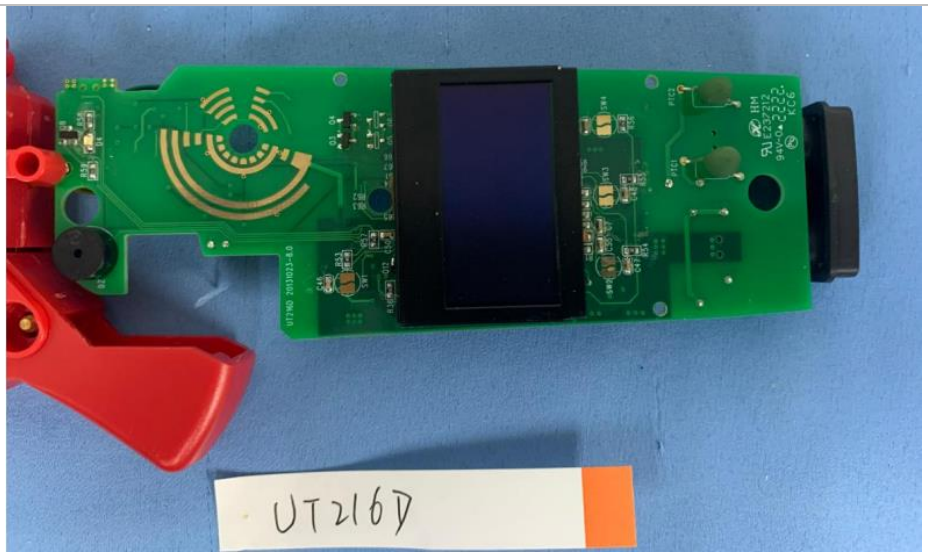
UT216D

UT216D


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