# UT8806E Benchtop Digital Multimeter

## Datasheet

REV 1.3

2025.4

# 1. Characteristics

- 4.3” TFT-LCD, display resolution 480×272
- 6½ digital reading
- Measuring speed up to10,000 rdgs/s
- TRMS AC voltage and current measurement
- Total capacity of 32Gb Nand Flash for saving a large number of setting and data files of the instrument.
- Built-in thermocouple cold-end compensator
- Supports SCPI remote control command, upper computer software and compatible with the latest mainstream multimeter command set.
- Supports dual display, simplified Chinese and English display, and built-in help system for accessing information easily.
- Configuration interface has USB Host,USB Device, LAN, RS-232C and GPIB(optional)
- Measured data and settings can be imported or exported by VXI-11, USBTMC and USB, so that users can easily modify, view and backup.
- Backup is support SCPI remote control command.

# 2. Product Introduction

The UT8806E 6½-digit dual-display digital multimeter with its outstanding reading rate and accuracy, which is designed to meet customers' requirements of high-precision and automatic measurement.

**Basic Measurement Function**

DC voltage measurement: 200mV, 2V, 20V, 200V, 1000V

DC current measurement: 2μA, 20μA, 200μA, 2mA, 20mA, 200mA, 2A, 10A

AC voltage measurement (RMS): 200mV, 2V, 20V, 200V, 750V

AC current measurement (RMS): 200μA, 2mA, 20mA, 200mA, 2A, 10A

Resistance measurement (2-wire, 4-wire): 20Ω, 200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 10MΩ, 100MΩ, 1GΩ

Capacitance measurement: 2nF, 20nF, 200nF, 2μF, 20μF, 200μF, 2mF, 20mF, 100mF

Connectivity test: Max. 2KΩ, continuously adjustable

Diode test: 0V to 4V

Frequency test: 3Hz to 1MHz

Period measurement: 1μs to 0.333s

Temperature measurement: supports thermocouple and thermal resistance sensor

**Mathematical Operation**

Maximum, minimum, average, standard deviation, relative measurement, bar chart, histogram, tendency chart, dB/dBm,Pass/Fail

**Humanized Design**

Graphical user interface, simple and convenient operation; more help system for accessing information easily; supports simplified Chinese and English menus; dual-window display function; supports USB and local storage for file management.

**Application Fields**

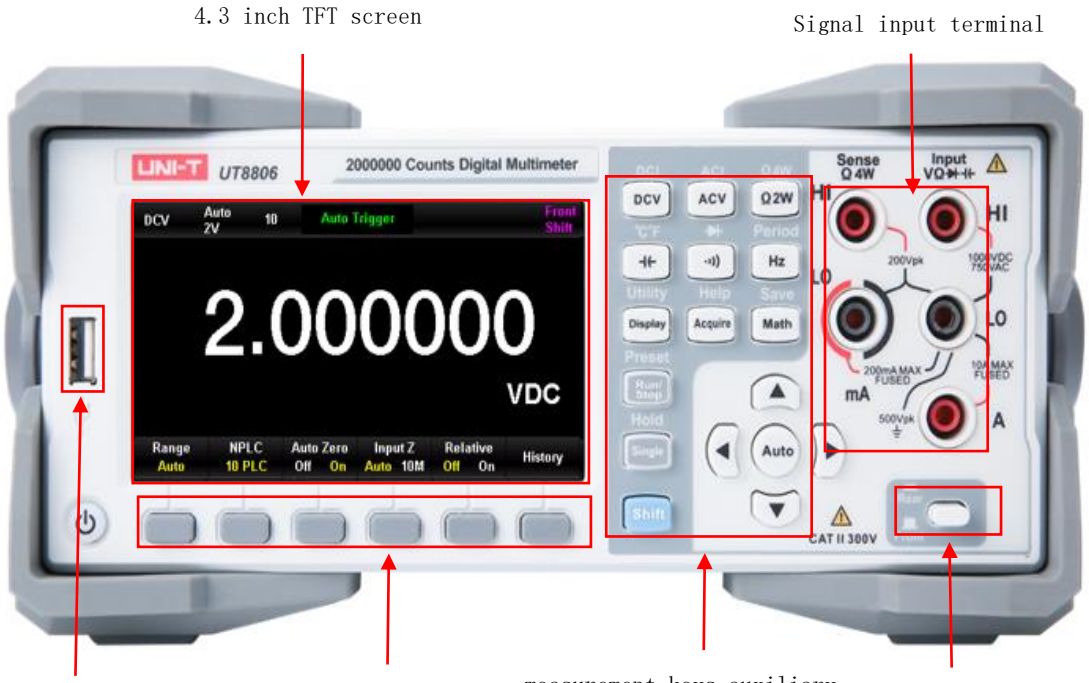
Scientific research and education

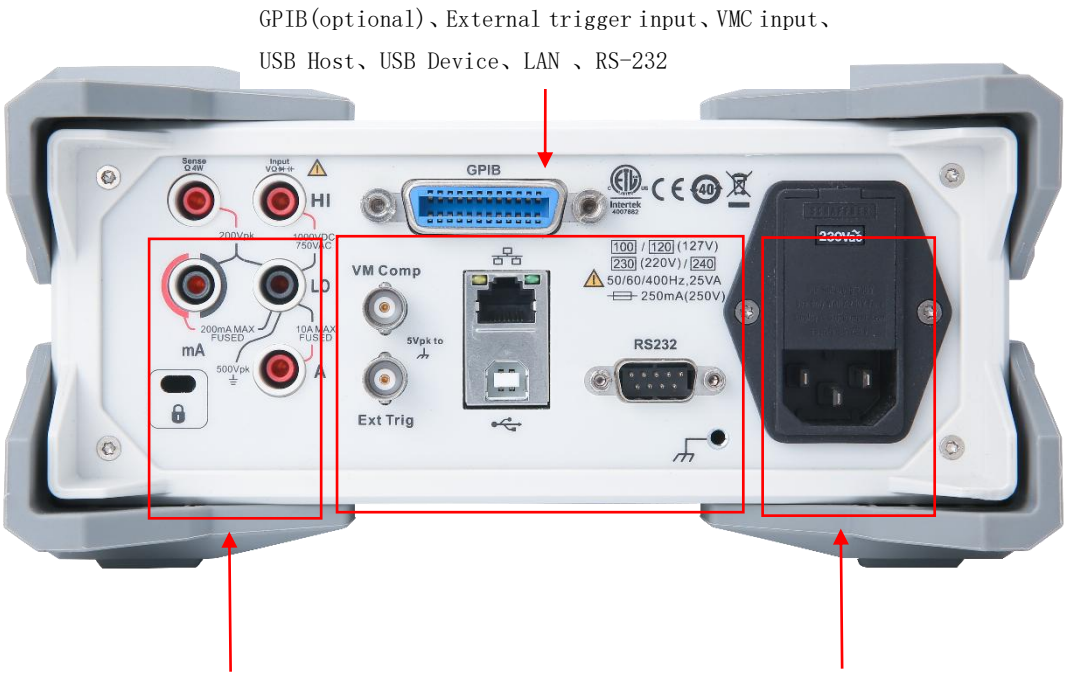
Research and development

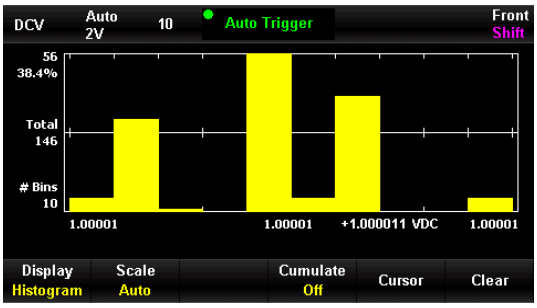
Inspection and maintenance

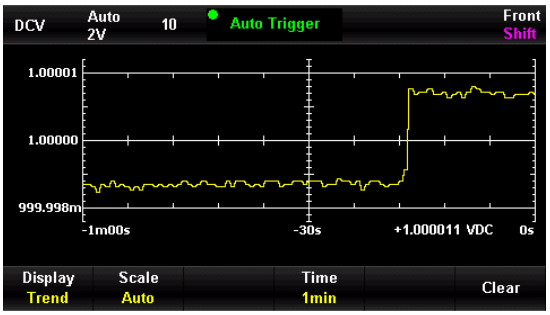
# 3. Design Highlights

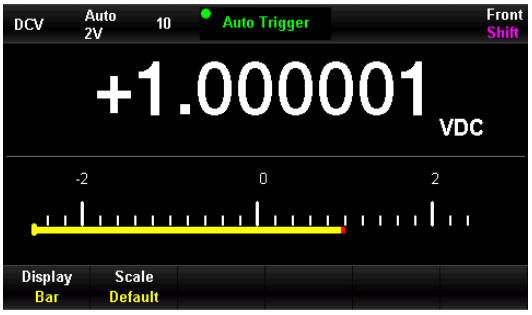
Clear and simple key front, 4.3 inch TFT-LCD, graphical user interface, simple and convenient operation; more help system for accessing information easily; supports simplified Chinese and English menus; dual-window display function; supports USB and local storage for file management.




DCV
Auto
2V
10
Auto Trigger
Front
Shift
56
38.4%
Total
146
# Bins
10
1.00001
1.00001
+1.000011 VDC
1.00001
Display
Histogram
Scale
Auto
Cumulate
Off
Cursor
Clear


DCV
Auto
2V
10
Auto Trigger
Front
Shift
1.00001
1.00000
999.998m
-1m00s
-30s
+1.000011 VDC
0s
Display
Trend
Scale
Auto
Time
1min
Clear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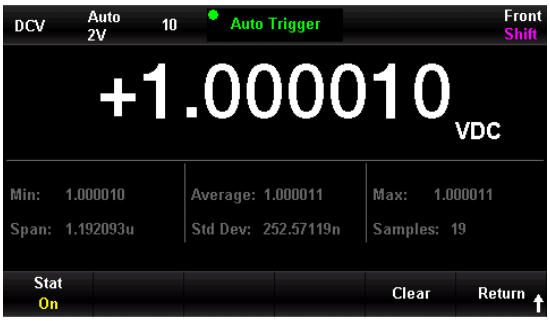
Auto
2V
10
Auto Trigger
Front
Shift
+1.000001
VDC
-2
0
2
Display
Bar
Scale
Default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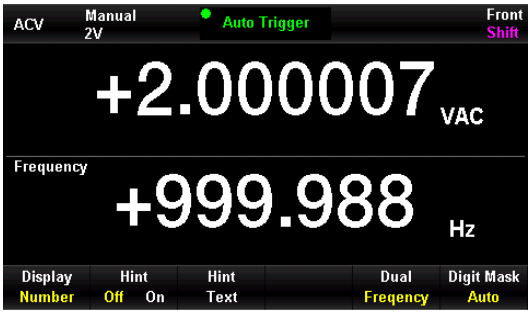
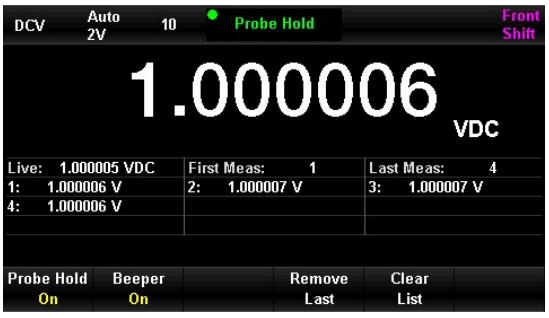
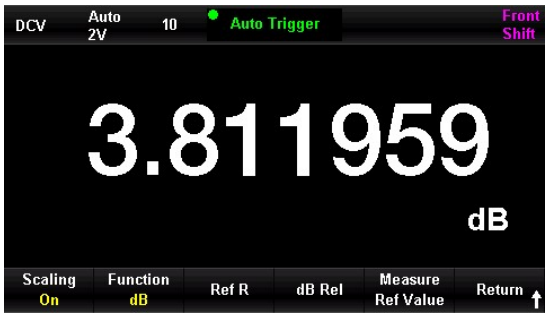
Auto
2V
10
Auto Trigger
Front
Shift
+1.000010
VDC
Min: 1.000010
Average: 1.000011
Max: 1.000011
Span: 1.192093u
Std Dev: 252.57119n
Samples: 19
Stat
On
Clear
Return


ACV
Manual
2V
Auto Trigger
Front
Shift
+2.000007
VAC
Frequency
+999.988
Hz
Display
Number
Hint
Off
On
Hint
Text
Dual
Freqency
Digit Mask
Auto


DCV
Auto
2V
10
Probe Hold
Front
Shift
1.000006
VDC
Live: 1.000005 VDC
First Meas: 1
Last Meas: 4
1: 1.000006 V
2: 1.000007 V
3: 1.000007 V
4: 1.000006 V
Probe Hold
On
Beeper
On
Remove
Last
Clear
List


DCV
Auto
2V
10
Auto Trigger
Front
Shift
3.811959
dB
Scaling
On
Function
dB
Ref R
dB Rel
Measure
Ref Value
Return

# 4. Technical Index

## UT8806E Accuracy Index ±(% Reading+% Range)[1]

| Range[2]/frequency | | 24Hours[3] | 90Days | 1Year | Temperature Coefficient /℃[4] |
|---|---|---|---|---|---|
| | | TCAL±1℃ | TCAL±5℃ | TCAL±5℃ | |
| DC Voltage | Input Resistance | | | | |
| 200mV | 10MΩ or＞10GΩ | 0.0020+0.0015 | 0.0030+0.0020 | 0.0040+0.0023 | 0.0005+0.0003 |
| 2V | 10MΩ or＞10GΩ | 0.0015+0.0004 | 0.0020+0.0004 | 0.0035+0.0006 | 0.0005+0.0001 |
| 20V | 10MΩ or＞10GΩ | 0.0020+0.0003 | 0.0030+0.0004 | 0.0040+0.0004 | 0.0005+0.0001 |
| 200V | 10MΩ | 0.0020+0.0005 | 0.0040+0.0004 | 0.0050+0.0005 | 0.0005+0.0001 |
| 1000V | 10MΩ | 0.0020+0.0005 | 0.0040+0.0008 | 0.0055+0.0008 | 0.0005+0.0001 |
| TRMS AC Voltage[2,5,6] | | | | | |
| 200mV、2V、20V、200Vand 750V range | | | | | |
| 3Hz - 5Hz | | 1.00+0.02 | 1.00+0.03 | 1.00+0.03 | 0.10+0.003 |
| 5Hz - 10Hz | | 0.35+0.02 | 0.35+0.03 | 0.35+0.03 | 0.035+0.005 |
| 10Hz - 20kHz | | 0.04+0.02 | 0.05+0.03 | 0.06+0.03 | 0.005+0.003 |
| 20kHz - 50kHz | | 0.10+0.04 | 0.11+0.05 | 0.12+0.05 | 0.011+0.005 |
| 50kHz - 100kHz | | 0.55+0.08 | 0.60+0.08 | 0.60+0.08 | 0.060+0.008 |
| 100kHz - 300kHz | | 4.00+0.50 | 4.00+0.50 | 4.00+0.50 | 0.20+0.02 |
| Resistance[7] | Testing Current | | | | |
| 20Ω | About 10 mA | 0.008+0.006 | 0.010+0.006 | 0.015+0.005 | 0.0006+0.0008 |
| 200Ω | About 10mA | 0.0030+0.0031 | 0.008+0.005 | 0.010+0.004 | 0.0006+0.0006 |
| 2kΩ | About 1 mA | 0.0020+0.0005 | 0.008+0.001 | 0.010+0.001 | 0.0006+0.0002 |
| 20kΩ | About 100μA | 0.0020+0.0005 | 0.008+0.001 | 0.010+0.001 | 0.0006+0.0001 |
| 200kΩ | About 10μA | 0.0020+0.0005 | 0.008+0.001 | 0.010+0.001 | 0.0010+0.0002 |
| 2MΩ | About 1μA | 0.002+0.001 | 0.010+0.001 | 0.012+0.001 | 0.0010+0.0002 |
| 10MΩ | About 1μA | 0.015+0.001 | 0.030+0.001 | 0.040+0.001 | 0.0030+0.0005 |
| 100MΩ | 1μA\|\|10MΩ | 0.1+0.001 | 0.2+0.001 | 0.3+0.001 | 0.1+0.0001 |
| 1000MΩ | 1μA\|\|10MΩ | 2+0.001 | 2+0.001 | 3+0.001 | 1+0.0001 |
| DC Current | Burden Voltage | | | | |
| 2μA | ＜ 5mV | 0.009+0.010 | 0.040+0.007 | 0.050+0.007 | 0.0025+0.0030 |
| 20μA | ＜ 5mV | 0.009+0.002 | 0.040+0.005 | 0.050+0.005 | 0.0025+0.0005 |
| 200μA | ＜ 30mV | 0.009+0.010 | 0.040+0.005 | 0.050+0.005 | 0.0020+0.0026 |
| 2mA | ＜ 0.3V | 0.007+0.001 | 0.030+0.001 | 0.050+0.002 | 0.0020+0.0001 |
| 20mA | ＜ 30mV | 0.006+0.008 | 0.030+0.005 | 0.050+0.005 | 0.0020+0.0015 |
| 200mA | ＜ 0.3V | 0.009+0.001 | 0.030+0.001 | 0.050+0.002 | 0.0020+0.0001 |
| 2A | ＜ 0.1V | 0.045+0.015 | 0.080+0.005 | 0.100+0.012 | 0.0050+0.0008 |

| | | | | | |
|---|---|---|---|---|---|
| 10A[8] | < 0.3V | 0.090+0.002 | 0.120+0.005 | 0.150+0.005 | 0.0050+0.0018 |

| Capacitance[15] | | | | |
|---|---|---|---|---|
| 2.000 nF | 1.8+2.4 | 1.8+2.4 | 2+2.4 | 0.05+0.06 |
| 20.00 nF | 0.9+0.1 | 0.9+0.1 | 1+0.1 | 0.05+0.01 |
| 200.0 nF | 0.9+0.1 | 0.9+0.1 | 1+0.1 | 0.01+0.01 |
| 2..000 μF | 0.9+0.1 | 0.9+0.1 | 1+0.1 | 0.01+0.01 |
| 20..00 μF | 0.9+0.1 | 0.9+0.1 | 1+0.1 | 0.01+0.01 |
| 200.0 μF | 0.9+0.1 | 0.9+0.1 | 1+0.1 | 0.01+0.01 |
| 2.000 mF | 0.9+0.1 | 0.9+0.1 | 1+0.1 | 0.01+0.01 |
| 20.00 mF | 0.9+0.2 | 0.9+0.2 | 1+0.2 | 0.01+0.01 |
| 100.0 mF | 2.8+0.1 | 2.8+0.1 | 3+0.1 | 0.05+0.02 |

| Range[2]/Frequency | | 24Hours[3] | 90Days | 1 Year | Temperature Coefficient /℃[4] |
|---|---|---|---|---|---|
| | | TCAL±1℃ | TCAL±5℃ | TCAL±5℃ | |
| TRMS AC Current [2,6,9] | Burden Voltage | | | | |
| 200μA、2mA | < 30mV, < 0.3V | | | | |
| 20mAand 200mA range | < 30mV, < 0.3V | | | | |
| 3Hz-10Hz | | 1.0+0.04 | 1.0+0.04 | 1.0+0.04 | 0.02+0.006 |
| 10Hz-10kHz | | 0.1+0.04 | 0.1+0.04 | 0.1+0.04 | 0.03+0.006 |
| 2A、10A[8]Range | < 0.1V、< 0.3V | | | | |
| 3Hz-10Hz | | 1.0+0.04 | 1.0+0.04 | 1.0+0.04 | 0.02+0.006 |
| 10Hz-10kHz | | 0.15+0.04 | 0.15+0.04 | 0.15+0.04 | 0.03+0.006 |

| Connectivity | | | | | |
|---|---|---|---|---|---|
| | Testing Current | | | | |
| 2kΩ | About 1mA | 0.002+0.010 | 0.008+0.020 | 0.010+0.020 | 0.0010+0.0020 |

| Diode Test[10] | | | | | |
|---|---|---|---|---|---|
| | Testing Current | | | | |
| 4V | About 1mA | 0.002+0.010 | 0.008+0.020 | 0.010+0.020 | 0.0010+0.0020 |

| Temperature[11] | |
|---|---|
| RTD(R0 span 49Ω ~ 2.1kΩ) | Probe accuracy +0.05℃ |
| Thermocouple（E、J、K、N、R、T） | Probe accuracy +0.5℃ |
| Thermocouple（S） | Probe accuracy +0.6℃ |
| Thermocouple（B） | Probe accuracy +0.76℃ |
| 5KΩ Thermistor | Probe accuracy +0.1℃ |

| Frequency(±%Reading)[12, 13] 200mV、2V、20V、200Vand 720Vrange[14] | | | | |
|---|---|---|---|---|
| 3 Hz-5 Hz | 0.07 | 0.07 | 0.07 | 0.005 |
| 5 Hz-10 Hz | 0.04 | 0.04 | 0.04 | 0.005 |
| 10 Hz-40 Hz | 0.02 | 0.02 | 0.02 | 0.001 |
| 40 Hz-300 kHz | 0.005 | 0.006 | 0.007 | 0.001 |
| 300 kHz-1 MHz | 0.005 | 0.006 | 0.007 | 0.001 |
| square wave[15] | 0.004 | 0.005 | 0.006 | 0.001 |

| Additional low frequency error (% Reading)[13] Gate Time (Resolution/range) | 1s (0.1ppm) | 0.1s (1ppm) | 0.01s (10ppm) | 0.001s (100ppm) |
|---|---|---|---|---|
| 3 Hz-5 Hz | 0 | 0.12 | 0.12 | 0.12 |
| 5 Hz-10 Hz | 0 | 0.17 | 0.17 | 0.17 |
| 10 Hz-40 Hz | 0 | 0.2 | 0.2 | 0.2 |
| 40 Hz-100 Hz | 0 | 0.06 | 0.21 | 0.21 |
| 100 Hz-300 kHz | 0 | 0.03 | 0.21 | 0.21 |
| 300 kHz-1 MHz | 0 | 0.01 | 0.07 | 0.07 |

1. For DC： The specifications are valid after 60 minutes of warm-up, with the integration time set to 10 or 100 NPLC and auto-zeroing is enabled.

For AC: The specifications are valid after a 60-minute warm-up period, with slow AC filtering and sine wave.

2. All scales have 20% overrange except 1,000V DCV, 750V ACV, 10 A DC, 10 A AC, and diode tests.

3. Relative to calibration standards.

4. . Increase by a factor for every 1 degree (°C) when exceed the TCAL ±5°C range.

5. Technical indicators under sinusoidal signals with amplitude > 5% range; When the input is within 1%~5% range and the frequency is less than 50 kHz, an additional error of 0.1% range is added. If the frequency is in the range of 50kHz to 100kHz, the additional error of 0.13% range will be increased. 750V ACV range is limited to 8 x 107 V-Hz; When the input exceeds 300V rms, 0.7mV error is added for every 1V excess.

6. Low Frequency Performance: Three filter settings are available: 3 Hz, 20 Hz, and 200 Hz. The frequency in excess of the filter setting is specified so that no additional error occurs.

7. The specifications is apply to resistance measurements with 4-wire or 2-wire measurements (operation bias to zeroed). When 2-wire resistance measurements without "relative" operation, it adds ±0.2 Ω of additional error.

8. For continuous currents > DV 7A or ACrms 7A, it requires 30 seconds of on-time and 30 seconds of off-time.

9. The specifications is valid when sine wave inputs >1% of range and >10μA AC.

10. The specifications is apply to voltage measured at the input port. The measurement current of 1 mA is typical value. The voltage drop across the diode junction will change with the change of current source.

11. The selected probe limits the actual measurement range and detection error. The probe accuracy includes all measurement and ITS-90 temperature conversion errors. PT100 Ro can be set to 100Ω ±5Ω to eliminate raw probe error.

12. Unless otherwise noted, specifications are valid after a 60-minute warm-up period and with a sine wave input. The specification is apply to a select time of 1s (7 bits).

13. For sine and square wave inputs ≥ 100 mV. For 10 mV to 100 mV inputs, multiply % reading error by 10.

14. Amplitude range is 10% to 120% below 750 ACV.

15. Square wave inputs are specified from 3 Hz - 1 MHz.

| Measurement and Other Features | |
|---|---|
| **DC voltage** | |
| Input Resistance | 200 mV , 2Vand 20 V scale，10MΩ or > 10GΩ |
| | 200 V and 1000 V scale，10MΩ ±2% |
| Input Bias Current | Testing < 30 pA，25℃ |
| Input Protection | DC 1000V or AC 750V，full scale |
| Common-mode Rejection Ratio | 120dB (For the 1 kΩ unbalanced resistance of the LO lead, the maximum is ±500 VDC.) |
| **Resistance** | |
| Measurement Mode | 4-wire resistance or 2-wire resistance |
| Open-circuit Voltage | The maximum about 10V |
| The maximum Lead Resistance (4-wire) | 200Ω, 2kΩ scale of each leadis 10% scale, and all other ranges are 1kΩ per lead. |
| Input Protection | DC 1000V or AC 750V，full scale |
| **DC current** | |
| Current Divider | 2 μA, 20 μA is adopted transresistancetest |
| | 200 μA, 2 mAscale sampling the resistance 100 Ω |
| | 20 mA , 200 mA scale sampling the resistance 1 Ω |
| | 2 A, 10 A scale sampling the resistance 8 mΩ |
| Input Protection | Internal 250m A, 250Vfast-acting fuse and10A，250Vfast-acting fuse |
| **Continuity/DiodeTest** | |
| Measurement Mode | Use the constant current of 1 mA±5% to measure the resistance or voltage |
| Response Time | 300 sampling/second |
| Beeper | √ |
| Continuity Threshold | Adjustable |
| Input Protection | DC 1000V or AC 750V |
| **TRMS AC Voltage** | |
| Measurement Mode | ACcoupling TRMS measurement，the maximum DC bias is 400 V in arbitrary ranges |
| Crest Factor | Full scale, crest factor ≤5 |
| Input Resistance | 1MΩ±2% in parallel < 150 pF in full scale |
| Input Protection | Full scale 700Vrms |
| AC Filter Bandwidth | 3Hz~300 kHz; 20Hz~300 kHz; 200Hz~300 kHz |
| Common-mode Rejection Ratio | 70 dB (For the 1 kΩ unbalanced resistance and < 60 Hz of the LO lead, the maximum is ±500 VDC.) |
| **TRMS AC Current** | |
| Measurement Mode | DC coupling tothe resistance divider，AC coupling toTRMS measurement (AC component of measurement input) |
| Crest Factor | Full scale, crest factor ≤3 |
| Maximum Input | Including RMS current of DC component < 10 A |
| Resistance Divider | 0.008 Ω in 2 A and 10 A scale，1Ω in 20 mA and 200 mA scale, 100Ω in 200 μA and 2 mA scale |
| Input Protection | Internal 250m A，250Vfast-acting fuse and10A，250V fast-acting fuse |
| | |

| | | |
|---|---|---|
| **Frequency and Period** | | |
| Measurement Mode | Testing the frequency when timing the low frequency, counting the high frequency at the high frequency, AC coupling input, use AC voltage or AC current function | |
| Notes | All frequency counter introduces the error at low voltage and low frequency signal | |
| **Capacitance Measurement** | | |
| Measurement Mode | Use the fixed current to charge the capacitance and measure the average rate of voltage rising | |
| Connecting Mode | 2-wire | |
| Input Protection | Full scale, DC 1000V or AC 750V | |
| **Arbitrary Sensor Measurement** | | |
| Measurement Mode | Thermocouple, DCV, DCI, Ω(2-wire/4-wire), frequencyoutput type sensor，built-in thermocouple cold-end compensation | |
| Output Polarity | Positive/Negative | |
| Other | Preset ITS-90 transformer of B, E, J, K, N, R, S, T thermocouple and Pt100, Pt385 resistance temperature sensor convertor | |
| **FrequencyResponse** | | |
| TRMS Measurement | AC voltage measurement，300kHz | |
| **Sampling and Trigger** | | |
| Maximum Testing Rate | 10,000 rdgs/s | |
| Trigger Delay | Can set to 6 ms~10000 ms | |
| External Trigger Input | Input Level | TTL compatibility |
| | Trigger Condition | Rising edge/falling edge |
| | Input Resistance | ＞20kΩ // 400pF (DC coupling) |
| | Minimum Pulse Width | 50μs |
| VMC Output | Level | TTL compatibility (input ≥1kΩload) |
| | Output Polarity | Positive/Negative |
| | Output Resistance | 200Ω (typical) |
| | Pulse Width | About 1μ |
| **Record Function** | | |
| Volatile Memory | History data record of 10k reading | |
| Nonvolatile memory | Total capacity of 32Gb Nand Flash for saving a large number of setting and data files of the instrument | |
| | Preset setting of 6 groups | |
| | Supports USB | |
| **Mathematical Function** | | |
| Mathematical Function | Pass/Fail, relative, minimum/maximum/average, standard deviation, dBm, dB, Hold, histogram, tendency chart and bar chart | |
| **Interface** | | |
| Interface type | USB Host, USB Device, LAN, RS-232C, GPIB (option) | |

# 5. General Features

**Power**

AC 90V～110V, 45～440Hz
AC 110V～132V, 45～440Hz
AC 200V～240V, 45～66Hz
AC 216V～264V, 45～66Hz
Power consumption: MAX 25W

**Machine Features**

Size: 225mm*113.2mm*378.24mm (width x height x depth)
Weight: 3.39kg
Color: grey-white and grey

**Other Features**

Full precision working environment: 0℃~28℃<90%; 28℃~40℃<75%; 40℃~55℃<50% (non-condensation)

Storage temperature: -20℃~70℃, <95%; Continuously powered on for at least 7 days before use when save the instrument in high humidity environment
Altitude: ≤2000meters
Shock and shake: MIL-T-28800E, CAT III, 5class (only for sine wave)
Electromagnetic compatibility: Low voltage directive 2004/108/EC, EN61326-1:2013
Security: Low voltage directive 2006/95/EC, EN61010－1:2010
Remote interface: 10/100Mbit LAN, USB Device, USB Host, RS-232C, GPIB (option)
Programming language: SCPI and the latest mainstream multimeter command set
Pre-heat time: 30minutes

# 6. Accessories

| Article | Quantity | Remarks |
|---|---|---|
| UT8806E | 1 piece | |
| Three-core power cable | 1 piece | |
| Probe | 1 pair | |
| USBconnecting line | 1 piece | |
| RS232 connecting line | 1 piece | |
| Upper computer software | 1 set | |

# 7. Contact Us

UNI-T Technical Support Hotline: 400-876-7822

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