

Agilent U1250 Series Handheld Digital Multimeters

Data Sheet





Introducing the U1250 Series: Handheld Multimeters That Equip You from the Start



Key features

- Superior contrast from organic LED (OLED) display¹
- 50,000-count dual display
- Up to 0.025% basic DCV accuracy
- True-RMS AC and AC+DC² measurements
- K-type and J-type² temperature measurements
- Manual and automated (interval) data logging; internally to DMM and externally to PC
- CAT III 1000 V safety protection
- Built-in 20-MHz frequency counter²
- Built-in programmable square-wave
 generator²

The Agilent U1250 Series handheld digital multimeters (DMMs) exceed your expectations by delivering powerful features and performance that meet your toughest requirements and applications.

Do more with just one instrument

The basic model, U1251A, expands your capabilities beyond typical DMM measurements to include data logging. The U1252A starts with the same foundation, and then adds a 20-MHz frequency counter and programmable square-wave generator — so you'd be able to perform more tests conveniently with one tool. What's more: both models come bundled with a complete set of accessories to equip you right from the start at no extra cost.

Offering the same functionality as the U1252A, the U1253A is the world's first OLED handheld DMM. You won't have to squint to be sure you're reading it right: On the go or on the bench, you'll get crystal-clear viewing indoors, even in dark, off-angle situations.

Find problems quickly

Troubleshooting can be tricky, especially when you're dealing with elusive problems. With the U1250 Series'data logging capability, you can ensure that every reading gets recorded manually or at intervals you specify. Better yet: you can have virtually unlimited data logging saves when you connect any of the U1250 Series DMM to a PC with the optional IR-to-USB cable.

In addition, the U1250 Series lets you achieve greater confidence in your measurements with accurate true-RMS AC measurements, low DCV error rate of up to 0.025% and highresolution display of 50,000 counts.

Uncompromising ruggedness and safety

The U1250 Series DMMs are housed in robust overmold enclosures, rated at CAT III 1000 V and operate over a wide temperature range of -20 °C to +55 °C. Built tough and certified to stringent industrial standards, the U1250 DMM is what you need to face the demands of everyday tasks.



OLED display with approximately 160° viewing angle, and high contrast ratio of 2000:1 for crystal-clear viewing $^{\rm 1}$



Large numerical display that's toggleable to dual display mode, both at 50,000count high resolution



DC SPECIFICATIONS

| FUNCTION | RANGE | RESOLUTION | TEST CURRENT/ | ACCURACY ± (% of reading | + No. of Least Significant Digit) |
|------------------------|--------------------------|------------|----------------|--------------------------|---|
| | | | BURDEN VOLTAGE | U1251A | U1252A/3A |
| | 50.000 mV | 0.001 mV | - | 0.05 + 50 ^[2] | 0.05 + 50 ^[2] |
| | 500.00 mV | 0.01 mV | - | | |
| | 1000.0 mV | 0.1 mV | - | | 0.025 + 5 |
| VOLTAGE ⁽¹⁾ | 5.0000 V | 0.0001 V | - | 0.03 + 5 | 0.025 + 5 |
| | 50.000 V | 0.001 V | - | 0.03 + 5 | |
| | 500.00 V | 0.01 V | - | | 0.03 + 5 |
| | 1000.0 V | 0.1 V | - | | 0.05 + 5 |
| | 500.00 Ω ^[3] | 0.01 Ω | 1.04 mA | 0.08 +10 | 0.05 + 10 |
| | 5.0000 k $\Omega^{[3]}$ | 0.0001 kΩ | 416 µA | | |
| | 50.000 kΩ | 0.001 kΩ | 41.2 μA | 0.08 + 5 | 0.05 + 5 |
| RESISTANCE | 500.00 kΩ | 0.01 kΩ | 4.12 μA | | |
| RESISTANCE | 5.0000 MΩ | 0.0001 MΩ | 375 nA | 0.2 + 5 | 0.15 +5 |
| | 50.000 MΩ ^[4] | 0.001 MΩ | 187 nA | 1 + 10 | 1 + 5 |
| | 500.00 MΩ ^[4] | 0.01 MΩ | 187 nA | N/A | 3+10 < 200 M Ω / 8+10 > 200 M Ω |
| | 500.00 nS ^[5] | 0.01 nS | 187 nA | 1 + 20 | 1 + 10 |
| | 500.00 μA | 0.01 µA | 0.06 V (100 Ω) | 0.1 + 5 ^[6] | 0.05 + 5 ^[6] |
| | 5000.0 μA | 0.1 µA | 0.6 V (100 Ω) | $0.1 + 5^{10}$ | $0.05 + 5^{(0)}$ |
| OUDDENT | 50.000 mA | 0.001 mA | 0.09 V (1 Ω) | | |
| CURRENT | 440.00 mA | 0.01 mA | 0.9 V (1 Ω) | 0.2 + 5 ^[6] | 0.15 + 5 ^[6] |
| | 5.0000 A | 0.0001 A | 0.2 V (0.01 Ω) | 0.0 - 10 | 0.3 + 10 |
| | 10.000 A ^[7] | 0.001 A | 0.4 V (0.01 Ω) | 0.3 + 10 | 0.3 + 5 |
| DIODE TEST | - | 0.1 mV | 1.04 mA | (|).05 + 5 |

U1251A/U1252A TEMPERATURE SPECIFICATIONS

| THERMOCOUPLE | | | RESOLUTION | ACCU | RACY |
|-------------------|----------------|----------------|---------------|-------------|-------------|
| ТҮРЕ | °C | ٩F | | °C | ٥F |
| К | –200 ~ 1372 °C | –328 ~ 2502 °F | 0.1 °C/0.1 °F | 0.3% + 3 °C | 0.3% + 6 °F |
| J (for U1252A) | –210 ~ 1200 °C | –346 ∼ 2192 °F | 0.1 °C/0.1 °F | 0.3% + 3 °C | 0.3% + 6 °F |

U1253A TEMPERATURE SPECIFICATIONS

| THERMOCOUPLE RANGE | | RESOLUTION | ACCU | RACY | |
|--------------------|---------------|---------------|----------------|-----------|-------------|
| ТҮРЕ | °C | ٩F | | ٥c | °F |
| К | _200 ~ _40 °C | −104 ~ −40 °F | 0.1 °C/0.1 °F | 1% + 3 °C | 1% + 5.4 °F |
| ĸ | _40 ∼1372 °C | —40 ~ 2502 °F | 0.1 °C /0.1 °F | 1% + 1 °C | 1% + 1.8 °F |
| | _210 ~ _40 °C | _346 ∼ _40 °F | 0.1 °C /0.1 °F | 1% + 3 °C | 1% + 5.4 °F |
| J | _40 ∼ 1200 °C | —40 ~ 2192 °F | 0.1 °C /0.1 °F | 1% + 1 °C | 1% + 1.8 °F |

[1] Input impedance: >1 G Ω for 50 mV~1000 mV ranges. For U1251A, input impedance is 10 M Ω (nominal) for 5 V~1000 V ranges. For U1252A/3A, input impedance is 10 M Ω (nominal) in parallel with 1.1 M Ω at dual display.

[2] The accuracy could be 0.05% + 10 for U1251A and 0.05% + 5 for U1252A/3A. Always use the NULL function to zero out the thermal effect before measuring the signal.

[3] The accuracy of 500 Ω and 5 k Ω is specified after NULL function, which is used to subtract the test lead resistance and the thermal effect.

[4] For the range of 50 M Ω and 500 M Ω , the R.H. is specified for <60%.

[5] The accuracy is specified for <50 nS and after NULL function with open test lead.

[6] Always use the NULL function to zero out thermal effect with open test lead before measuring the signal. If the NULL function is not used, an additional 20 counts needs to be added to the DC current accuracy. Thermal effect could occur due to the following:

• Wrong operation to measure the high voltage of 50 V ~ 1000 V for resistance, diode, and mV measurements.

· After battery-charging has completed.

• After measuring a current greater than 440 mA, it is suggested that the meter be left to cool down for twice the measuring time used.

[7] Current can be measured up to 10 A continuously. An additional 0.5% needs to be added to the specified accuracy if the signal measured is in the range of 10 A~20 A for 30 seconds maximum. After measuring a current of > 10 A, leave the meter to cool down for twice the measuring time used before application of low current measurement.

U1251A AC SPECIFICATIONS

| | | | ACCURACY \pm (% of reading + No. of Least Significant Digit) | | | | | |
|------------------------|----------------|----------|--|---------------|----------------|-----------------------|--|--|
| FUNCTION | FUNCTION RANGE | | | FREQUENCY | | | | |
| | | | 30 Hz ~ 45 Hz | 45 Hz ~ 1 kHz | 1 kHz ~ 10 kHz | 10 kHz ~ 30 kHz | | |
| | 50.000 mV | 0.001 mV | | 0.6+40 | 1.0+40 | 1.6+60 | | |
| | 500.00 mV | 0.01 mV | | | 1.0+40 | 1.0100 | | |
| | 1000.0 mV | 0.1 mV | | | | | | |
| TRUE RMS AC Voltage | 5.0000 V | 0.0001 V | 1.0+60 | 0.6+25 | 1.0.05 | 1.6+40 | | |
| | 50.000 V | 0.001 V | | | 1.0+25 | | | |
| | 500.00 V | 0.01 V | | | | 1.6+40 ^[1] | | |
| | 1000.0 V | 0.1 V | | 0.6+40 | 1.0+40 | N/A | | |

| | | | ACCURACY \pm (% of reading + No. of Least Significant Digit) | | | | |
|------------|--------------------------|----------|--|---------------|----------------|--|--|
| FUNCTION | FUNCTION RANGE | | FREQUENCY | | | | |
| | | | 30 Hz ~ 45 Hz | 45 Hz ~ 2 kHz | 2 kHz ~ 20 kHz | | |
| | 500.00 µA ^[2] | 0.01 µA | 1.5+50 | | 3.0+80 | | |
| | 5000.0 μA | 0.1 µA | | 0.8+20 | 3.0+60 | | |
| AC CURRENT | 50.000 mA | 0.001 mA | 1.5+40 | | | | |
| AC CONNENT | 440.00 mA | 0.01 mA | | | | | |
| | 5.0000 A | 0.0001 A | 2.0+40 ^[4] | | 3+60, | | |
| | 10.000 A ^[3] | 0.001 A | 2.0740 ⁽¹⁾ | | <3 A/5 kHz | | |

U1252A/U1253A AC SPECIFICATIONS

| | | | | ACCURACY \pm (% of reading + No. of Least Significant Digit) | | | | |
|------------------------|---------------|------------|---------------|--|----------------|-----------------------|-------------------------------|--|
| FUNCTION | RANGE | RESOLUTION | | | FREQUENCY | | | |
| | | | 20 Hz ~ 45 Hz | $45 \text{ Hz} \sim 1 \text{ kHz}$ | 1 kHz ~ 10 kHz | 10 kHz \sim 20 kHz | 20 kHz~100 kHz ^[5] | |
| | 50.000 mV | 0.001 mV | | 0.4+40 | 0.7+40 | | | |
| | 500.00 mV | 0.01 mV | | | | 0.75+40 | 3.5+120 | |
| | 1000.0 mV | 0.1 mV | 1 5.00 | | | | | |
| TRUE RMS AC VOLTAGE | 5.0000 V | 0.0001 V | 1.5+60 | 0.4+25 | 0.4+25 | | | |
| | 50.000 V | 0.001 V | | | | | | |
| | 500.00 V 0.01 | 0.01 V | | | | 1.5+40 | 3.5+120 ^[1] | |
| | 1000.0 V | 0.1 V | | 0.4+40 | 0.4+40 | 1.5+40 ^[1] | N/A | |

| | | | ACCURACY \pm (% of reading + No. of Least Significant Digit) | | | | |
|------------|--------------------------|------------|--|---------------|----------------|-------------------------------|--|
| FUNCTION | RANGE | RESOLUTION | FREQUENCY | | | | |
| | | | 20 Hz ~ 45 Hz | 45 Hz ~ 1 kHz | 1 kHz ~ 20 kHz | 20 kHz~100 kHz ^[5] | |
| | 500.00 µA ^[2] | 0.01 µA | | | | | |
| | 5000.0 μA | 0.1 µA | 1.0+20 | | 0.75+20 | 5.0+80 | |
| AC CURRENT | 50.000 mA | 0.001 mA | 1.0+20 | 0.7+20 | | 5.0+00 | |
| AC CONNENT | 440.00 mA | 0.01 mA | | 0.7+20 | 1.5+20 | | |
| | 5.0000 A | 0.0001 A | 1.5+20 ^[4] | | 3+60, | N/A | |
| | 10.000 A ^[3] | 0.001 A | 1.37200 | | <3 A/5 kHz | IN/A | |

[1] The input signal is lower than 20,000,000 V-Hz (the product of voltage and frequency).

[2] Input current >35 µArms.

[3] Current can be measured from 2.5 A up to 10 A continuously. An additional 0.5% needs to be added to the specified accuracy if the signal measured is in the range of 10 A ~ 20 A for 30 seconds maximum. After measuring a current of >10 A, leave the meter to cool down for twice the measuring time used before application of low current measurement.

[4] Input current < 3 Arms.

[5] The additional error to be added as frequency >20 kHz and signal input<10% of range: 3 counts of LSD per kHz.

U1252A/U1253A AC+DC SPECIFICATIONS

| | | | ACCURACY ± (% of reading + No. of Least Significant Digit) | | | | | | | |
|------------------------|----------------|------------|--|---------------|----------------|-----------------------|-------------------------------|--|--|--|
| FUNCTION | FUNCTION RANGE | RESOLUTION | | FREQUENCY | | | | | | |
| | | | 30 Hz ~ 45 Hz | 45 Hz ~ 1 kHz | 1 kHz ~ 10 kHz | 10 kHz ~ 20 kHz | 20 kHz~100 kHz ^[1] | | | |
| | 50.000 mV | 0.001 mV | 1.5+80 | 0.4+60 | 0.7+60 | 0.8+60 | 3.5+220 | | | |
| | 500.00 mV | 0.01 mV | | | 0.4+30 | 0.8+45 | 3.5+125 | | | |
| | 1000.0 mV | 0.1 mV | | | | | | | | |
| TRUE RMS AC Voltage | 5.0000 V | 0.0001 V | 1.5+65 | 0.4+30 | | | | | | |
| TULIAL | 50.000 V | 0.001 V | 1.0+00 | | | | | | | |
| | 500.00 V | 0.01 V | | | | 1.5+45 | 3.5+125 ^[2] | | | |
| | 1000.00 V | 0.1 V | | 0.4+45 | 0.4+45 | 1.5+45 ^[2] | N/A | | | |

| | FUNCTION RANGE | | ACCURACY \pm (% of reading + No. of Least Significant Digit) | | | | |
|------------|--------------------------|---------------|--|----------------|------------|--|--|
| FUNCTION | | | | FREQUENCY | | | |
| | | 30 Hz ~ 45 Hz | 45 Hz ~ 1 kHz | 1 kHz ~ 20 kHz | | | |
| | 500.00 µA ^[3] | 0.01 µA | 1.1+25 | 0.8+25 | 0.8+25 | | |
| | 5000.0 μA | 0.1 µA | 1.1+23 | 0.0+25 | 0.0+20 | | |
| AC CURRENT | 50.000 mA | 0.001 mA | 1.2+25 | 0.9+25 | 0.0.25 | | |
| AC CORRENT | 440.00 mA | 0.01 mA | 1.2+20 | 0.9+25 | 0.9+25 | | |
| | 5.0000 A | 0.0001 A | 1.8+30 ^[5] | 0.9+30 | 3.3+70, | | |
| | 10.000 A ^[4] | 0.001 A | 1.0+30(8) | 0.9+25 | <3 A/5 kHz | | |

CAPACITANCE SPECIFICATIONS

| RANGE | RESOLUTION | ACCURACY | MEASURING RATE AT FULL SCALE | MAX. DISPLAY |
|-----------|------------|----------|---------------------------------|--------------|
| 10.000 nF | 0.001 nF | 1% + 8 | | |
| 100.00 nF | 0.01 nF | | | |
| 1000.0 nF | 0.1 nF | | 4 times/sec. | 11000 |
| 10.000 µF | 0.001 µF | 1% + 5 | | |
| 100.00 µF | 0.01 µF | 170 + 5 | | 11000 counts |
| 1000.0 µF | 0.1 µF | | 1 time/sec. | |
| 10.000 mF | 0.001 mF | | 0.1 times/sec. | |
| 100.00 mF | 0.01 mF | 3% + 10 | 0.01 times/sec | |

FREQUENCY SPECIFICATIONS^[2]

| RANGE | RESOLUTION | ACCL | IRACY | MIN. INPUT |
|------------|------------|------------------------|------------------------|------------|
| | | U1251A/2A | U1253A | FREQUENCY |
| 99.999 Hz | 0.001 Hz | 0.02%+3 ^[6] | 0.02%+3 ^[6] | |
| 999.99 Hz | 0.01 Hz | | | |
| 9.9999 kHz | 0.0001 kHz | 0.020/ + 2 - <000 kH= | | 1 Hz |
| 99.999 kHz | 0.001 kHz | — 0.02%+3, <600 kHz | 0.02%+3, <600 kHz | |
| 999.99 kHz | 0.01 kHz | | | |

[1] The additional error to be added as frequency >20 kHz and signal input <10% of range: 3 counts of LSD per kHz.

[2] The input signal is lower than 20,000,000 V-Hz (the product of voltage and frequency).

[3] Input current >35 µArms.

[4] Current can be measured from 2.5 A up to 10 A continuously. An additional 0.5% needs to be added to the specified accuracy if the signal measured is in the range of 10 A ~ 20 A for 30 seconds maximum. After measuring a current of >10 A, leave the meter to cool down for twice the measuring time used before application of low current measurement.

[5] Input current < 3 Arms.

[6] For non-square wave signals, add 5 counts.

U1251A FREQUENCY SENSITIVITY DURING VOLTAGE MEASUREMENT

| FREQUENCY SENSITIVITY AND TRIGGER LEVEL | | | | | | | | |
|--|------------------------------------|-------|-------------------------------|--------------------|--|--|--|--|
| INPUT RANGE | MINIMUM S (R.M.S. Si | | TRIGGER LEVEL FOR DC COUPLING | | | | | |
| (Maximum input for specified accuracy = 10 x Range or 1000 V) | 20 Hz - 100 kHz >100 kHz ~ 200 kHz | | < 100 kHz | >100 kHz ~ 200 kHz | | | | |
| 50.000 mV | 10 mV | 15 mV | 10 mV | 15 mV | | | | |
| 500.00 mV | 25 mV | 35 mV | 60 mV | 70 mV | | | | |
| 1000.0 mV | 40 mV | 50 mV | 100 mV | 150 mV | | | | |
| 5.0000 V | 0.25 V | 0.5 V | 0.5 V / 1.25 V (< 100 Hz) | 0.6 V | | | | |
| 50.000 V | 2.5 V | 5 V | 5 V | 6 V | | | | |
| 500.00 V | 25 V | N/A | 50 V | N/A | | | | |
| 1000.0 V | 50 V | N/A | 300 V | N/A | | | | |

U1252A/U1253A FREQUENCY SENSITIVITY DURING VOLTAGE MEASUREMENT

| FREQUENCY SENSITIVITY AND TRIGGER LEVEL | | | | | |
|--|---|--------|-------------------------------|--------------------|--|
| INPUT RANGE | MINIMUM SENSITIVITY (R.M.S. Sine Wave) | | TRIGGER LEVEL FOR DC COUPLING | | |
| (Maximum input for specified accuracy = 10 x Range or 1000 V) | 20 Hz ~ 200 kHz >200 kHz ~ 500 kHz | | < 100 kHz | >100 kHz ~ 500 kHz | |
| 50.000 mV | 10 mV | 25 mV | 10 mV | 25 mV | |
| 500.00 mV | 70 mV | 150 mV | 70 mV | 150 mV | |
| 1000.0 mV | 120 mV | 300 mV | 120 mV | 300 mV | |
| 5.0000 V | 0.3 V | 1.2 V | 0.6 V | 1.5 V | |
| 50.000 V | 3 V | 5 V | 6 V | 15 V | |
| 500.00 V | 30 V < 100 kHz | N/A | 60 V | N/A | |
| 1000.0 V | 50 V < 100 kHz | N/A | 120 V | N/A | |

FREQUENCY SENSITIVITY DURING CURRENT MEASUREMENT

| INPUT RANGE | MINIMUM SENSITIVITY (R.M.S. Sine Wave) 20 Hz ~ 20 kHz |
|-------------|--|
| 500.00 μA | 100 µA |
| 5000.0 μA | 250 μΑ |
| 50.000 mA | 10 mA |
| 440.00 mA | 25 mA |
| 5.0000 A | 1 A |
| 10.000 A | 2.5 A |

PEAK HOLD

| SIGNAL WIDTH | ACCURACY FOR DC mV/VOLTAGE/CURRENT | |
|---------------------|------------------------------------|--|
| Single event > 1 ms | 2% + 400 for all ranges | |
| Repetitive > 250 µs | 2% + 1000 for all ranges | |

DUTY CYCLE AND PULSE WIDTH ^[1]

| FUNCTION | MODE | RANGE | ACCURACY AT FULL SCALE |
|-------------|-------------|----------------|------------------------|
| DUTY CYCLE | DC Coupling | 0.01% ~ 99.99% | 0.3% per kHz + 0.3% |
| PULSE WIDTH | 500 ms | 0.01 ms | 0.2% + 3 |
| | 2000 ms | 0.1 ms | 0.2% + 3 |

[1] The positive or negative pulse width must be greater than 10 µs, and the duty cycle range should be considered. The pulse width range is determined by the frequency of the signal.

U1252A/U1253A FREQUENCY COUNTER SPECIFICATIONS

| DIVISION | RANGE | RESOLUTION | ACCURACY ± (% of reading + No. of Least Significant Digit) | | SENSITIVITY | MIN. INPUT FREQUENCY | |
|-----------------------------|------------|------------|---|--------------------------|---------------------------|-------------------------|--|
| | | | U1252A | U1253A | | | |
| 1 | 99.999 Hz | 0.001 Hz | 0.02% + 3 ^[1] | 0.02% + 3 ^[1] | 100 mV R.M.S. % + 5, < | | |
| (secondary display "-1-") | 999.99 Hz | 0.01 Hz | | | | 0.5 Hz | |
| | 9.9999 kHz | 0.0001 kHz | | | | | |
| | 99.999 kHz | 0.001 kHz | 0.002% + 5, < 2 MHz | 0.002% + 5, < 985 kHz | | | |
| | 999.99 kHz | 0.01 kHz | | 903 KHZ | | | |
| | 9.9999 MHz | 0.0001 MHz | | | 200 mV R.M.S. | | |
| 100 | 9.9999 MHz | 0.0001 MHz | 0.002% + 5, < 20 | 0.002% + 5, < 20 | 400 mV R.M.S. | | |
| (secondary display "-100-") | 99.999 MHz | 0.001 MHz | MHz | MHz 600 mV R.M.S. | 1 MHz | | |

U1252A/U1253A SQUARE WAVE OUTPUT

| OUTPUT ^[2] | RANGE | RESOLUTION | ACCURACY |
|----------------------------|--|------------|-----------------------------------|
| FREQUENCY | 0.5, 1, 2, 5, 6 ⁽⁸⁾ , 10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 100, 120, 150, 200, 240, 300, 400, 480, 600, 800, 1200, 1600, 2400, 48000 Hz | 0.01 Hz | 0.005% + 2 |
| DUTY CYCLE ^[3] | 0.39% ~ 99.60% | 0.390625% | 0.4% of full scale ^[4] |
| PULSE WIDTH ^[4] | 1/Frequency | Range/256 | 0.2 ms + Range/256 |
| AMPLITUDE | Fixed 0 ~ +2.8 V | 0.1 V | 0.2 V |

MEASURING RATE

| FUNCTION | TIMES/SECOND |
|------------------------|--------------|
| ACV | 7 |
| ACV + dB | 7 |
| DCV | 7 |
| AC + DC V | 2 |
| Ω/nS | 14 |
| Diode | 14 |
| Capacitance | 4 (< 100 μF) |
| DCI | 7 |
| ACI | 7 |
| AC + DC I | 2 |
| Temperature | 6 |
| Frequency | 1 (>10 Hz) |
| Duty cycle/Pulse width | 0.5 (>10 Hz) |

MANUAL AND INTERVAL DATA LOGGING

| LOGGING | MAXIMUM DATA POINTS ⁽⁵⁾ U1251A U1252A U1253A | | | |
|----------|---|-----|------|--|
| TYPE | | | | |
| MANUAL | 100 | 100 | 100 | |
| INTERVAL | 200 | 200 | 1000 | |

DECIBEL (dB) CALCULATION

| dB BASE | REFERENCE | DEFAULT REFERENCE |
|---------------------------|-----------|-------------------|
| $1 \text{ m}\Omega$ (dBm) | 1-9999 Ω | 50 Ω |
| 1 V (dBV) | 1 V | 1 V |

[1] All frequency counters are susceptible to errors. Shielding inputs from external noise pickup is critical to minimize measurement errors. For non-square wave signals, add 5 counts.

[2] Output impedance: 3.5 k Ω maximum.

- [3] The positive or negative pulse width must be greater than 50 µs for adjustment of the duty cycle or pulse width under different frequencies. Otherwise, the accuracy and range will be different from the specifications defined.
- [4] For signal frequencies greater than 1 kHz, an addition of 0.1% per kHz is added to the accuracy.
- [5] For data logging to PC, maximum number of data points is dependent on available hard disk space.

[6] For the U1253A model.

GENERAL SPECIFICATIONS

| DISPLAY |
|---|
| Both primary and secondary displays are 5-digit on the LCD display. |
| Both the primary and secondary displays offer a maximum resolution |
| of 50,000 counts. Automatic polarity indication. |
| POWER CONSUMPTION |
| 105 mVA / 420 mVA (with backlight) maximum (U1251A) |
| 165 mVA / 480 mVA (with backlight) maximum (U1252A) |
| 420 mVA maximum (U1253A) |
| BATTERY TYPE |
| 9 V Alkaline battery (ANSI/NEDA 1604A or IEC 6LR61) |
| 9 V Carbon-zinc battery (ANSI/NEDA 1604D or IEC6F22) |
| 7.2 V Ni-MH Rechargeable battery |
| BATTERY LIFE |
| U1251A: 72 hours typical |
| U1252A: 36 hours typical |
| U1253A: 8 hours typical |
| OPERATING ENVIRONMENT |
| + Full accuracy at –20 $^{\rm o}{\rm C}$ to 55 $^{\rm o}{\rm C}$; and to 80% RH for temperatures |
| up to 35 °C, decreasing linearly to 50% RH at 55 °C |
| 0 to 2000 m altitude per IEC 61010-1 2nd Edition CAT III, 1000 V; 2000 to 2000 m altitude new IEC 61010-1 2nd Edition CAT III, 600 V |
| 2000 to 3000 m altitude per IEC 61010-1 2nd Edition CAT III, 600 V |
| STORAGE COMPLIANCE |
| –40 °C to 70 °C |
| SAFETY COMPLIANCE |
| Certified by CSA for IEC/EN/CSA/UL 61010-1 2nd Edition and CAN/CSA 22.2 61010-1 2nd Edition |
| MEASUREMENT CATEGORY |
| CAT III 1000 V Overvoltage Protection up to 2000 m, Pollution degree 2 |
| EMC COMPLIANCE |
| Certified to IEC/EN 61326: 2002, CISPR 11, and equivalents for Group 1, Class A |
| COMMON MODE REJECTION RATIO (CMRR) |
| U1251A/2A: >90 dB at DC, 50/60 Hz \pm 0.1% (1 k Ω unbalanced) |
| U1253A: >100 dB at DC, 50/60 Hz \pm 0.1% (1 k Ω unbalanced) |
| NORMAL MODE REJECTION RATIO (NMRR) |
| U1251A/2A: >60 dB at DC, 50/60 Hz ± 0.1% |
| U1253A: >90 dB at DC, 50/60 Hz ± 0.1% |
| CREST FACTOR |
| < 3.0 |
| TEMPERATURE COEFFICIENT |
| 0.15 * (specified accuracy)/°C (from 20 °C to 18 °C or 28 °C to 55 °C) |
| |
| SHOCK and VIBRATION |
| Tested to IEC/EN 60068-2 |
| DIMENSIONS (HxWxD) |
| 203.5 mm x 94.4 mm x 59.0 mm |
| WEIGHT |
| U1251A: 504±5 g with battery |
| U1252A/3A: 527±5 g with battery (U1252A) |
| CHARGING TIME (only U1252A/3A) |
| < 220 minutes approx. at the environment of 10 °C to 30 °C |
| WARBANTY |
| 3 years |
| 0 youro |

STANDARD SHIPPED ITEMS

| DESCRIPTION | APPLICABLE MODELS | | | |
|---|-------------------|--------|--------|--|
| | U1251A | U1252A | U1253A | |
| Alligator clips | • | • | • | |
| SMT grabbers | • | • | - | |
| Fine-tip test probes | • | • | _ | |
| Test probe leads | • | • | • | |
| Mini grabber | • | • | - | |
| Alkaline 9 V battery | • | _ | _ | |
| Rechargeable Ni-MH battery with power adapter | _ | • | • | |
| GUI data logging software (in Product Reference CD) | • | • | • | |
| Soft carrying case | • | • | _ | |
| Certificate of Calibration | • | • | • | |
| Test Report | • | • | • | |
| Quick Start Guide | • | • | • | |
| User's and Service Guide (in Prod- uct Reference CD) | • | • | • | |

U1253A OPTION

Option 001 Bundled SMT grabbers, fine-tip test probes and soft carrying case

OPTIONAL ACCESSORIES

MEASURING ACCESSORIES (NON-TEMPERATURE)



U1160A Standard test lead kit



U1163A SMT grabbers



U1583A AC current clamp



U1161A Extended test lead kit



U1164A Fine-tip test probes



U1162A Alligator clips



U1165A Test probe leads



34136A High voltage probe

MEASURING ACCESSORIES (TEMPERATURE)



U1180A Thermocouple adapter+lead kit, J and K types



U1181A Immersion temperature probe



U1182A Industrial surface temperature probe



U1183A Air temperature probe



U1184A Temperature probe adapter



U1185A J-type thermocouple and adapter



U1186A K-type thermocouple and adapter





U1173A IR-to-USB cable

CARRYING CASE

AC ADAPTOR



U1172A Transit case (aluminium-clad)



U1174A Soft carrying case

HANGING KIT



U1171A Magnetic hanging kit



U1170A AC adaptor