Keysight Technologies
U1240B Series Handheld Digital Multimeters

Data Sheet

KEYSIGHT TECHNOLOGIES

Key Features

Check more, fix more

- 10,000-count display
- 0.09% basic DCV accuracy
- True RMS AC measurement
- Basic functions – ACV, DCV, ACI, DCI, resistance, frequency, diode, continuity tests
- Advanced functions – Capacitance, temperature, MINMAX recording

Ease of use

- Adjustable backlighting – two intensity levels
- Manual data logging (U1242B only)
- Built-in switch counter, harmonic ratio (U1242B only), dual/differential temperature capabilities (U1242B only)

Built to last

- Overmold body casing
- CAT III 1000 V and CAT IV 600 V safety protection
- Certified to CE and CSA standards
- Operating temperature –10 to 55 °C

Keysight Technologies, Inc. U1240B Series handheld digital multimeters enable you to check more with wider measurement ranges. They feature true RMS readings on their 10,000-count displays. The adjustable backlighting allows you to complete your jobs even in subdued lighting conditions, or to simply prolong battery life. Your maintenance tasks are greatly simplified due to the built-in switch counter, harmonic ratio, dual and differential temperature capabilities, with just a press of the button. The meters have a high safety rating with CAT III 1000 V and CAT IV 600 V protection and are certified to CE and CSA standards. On top of that, the U1240B Series comes with a certificate of calibration and test report – at no extra cost.

The latest multimeters in this series, the U1241B and U1242B, now come in vivid orange cases, offering the capabilities and functions you need.

Functions and ranges at a glance

Electrical Specifications

DC specifications

Function	Range	Resolution	Test current/burden voltage	Accuracy ±(% of reading + counts of least significant digit)	
				U1241B	U1242B
Voltage[1]	1000.0 mV	0.1 mV	–	0.09% + 5	
	10.000 V	0.001 V	–	0.09% + 2	
	100.00 V	0.01 V	–		
	1000.0 V	0.1 V	–	0.15% + 5	
Current	1000.0 µA	0.1 µA	< 0.06 V (50 Ω)	0.1% + 3	
	10000 µA	1 µA	< 0.55 V (50 Ω)	0.1% + 3	
	100.00 mA	0.01 mA	< 0.18 V (0.5 Ω)	0.2% + 3	
	440.0 mA[2]	0.1 mA	< 0.8 V (0.5 Ω)	0.5% + 3	
	10.000 A[3]	0.001 A	< 0.4 V (0.01 Ω)	0.6% + 5	
Resistance[4]	1000.0 Ω[5]	0.1 Ω	0.5 mA	0.3% + 3	
	10.000 kΩ[5]	0.001 kΩ	50 µA		
	100.00 kΩ	0.01 kΩ	4.91 µA		
	1000.0 kΩ	0.1 kΩ	447 nA		
	10.000 MΩ	0.001 MΩ	112 nA	0.8% + 3	
	100.00 MΩ[6]	0.01 MΩ	112 nA	1.5% + 3	
Diode test[7]	1 V	0.001 V	approximately 0.5 mA	0.3% + 2	

1. Input impedance: 10 MΩ (nominal).
2. Current can be measured up to 440 mA continuously. An additional 0.2% needs to be added to the specified accuracy if the signal measured is in the range of 440 mA to 1100 mA for 30 seconds maximum. After measuring a current of > 440 mA, leave the meter to cool down for twice the measuring time used before applying a low current measurement.
3. Current can be measured up to 10 A continuously with a maximum operating temperature of 50 °C. An additional 0.3% needs to be added to the specified accuracy if the signal measured is in the range of 10 A to 19.999 A for 15 seconds maximum. After measuring a current of > 10 A, leave the meter to cool down for 60 seconds before applying a low current measurement.
4. The maximum open voltage is < 2.8 V. For instant continuity, the built-in buzzer sounds when resistance is < 10.0 Ω.
5. The accuracy of 1 kΩ and 10 kΩ is specified after Null function, which is used to substrate the test lead resistance and the thermal effect.
6. For the range of 100 MΩ, the R.H. is specified for < 60%. The temperature coefficient will be 0.15 times of specified accuracy as > 50 MΩ.
7. Overload protection: 1000 V RMS for circuits < 0.3 A short circuit current. The built-in buzzer sounds when reading is approximately below 50 mV and audible single tone for normal forward biased diode or semiconductor junction as 0.3 V ≤ Reading ≤ 0.8 V.

Electrical Specifications

AC specifications

Function	Range	Resolution	Test current/burden voltage	Accuracy ± (% of reading + counts of least significant digit)		
				40 to 500 Hz	500 Hz to 1 kHz	1 to 2 kHz
AC voltage[1, 5] True RMS	1000.0 mV	0.1 mV	–	1% + 5	2% + 5	–
	10.000 V	0.001 V	–		1% + 5	2% + 5
	100.00 V	0.01 V	–			
	1000.0 V	0.1 V	–			–
AC current[2, 5] True RMS	1000.0 µA	0.1 µA	< 0.06 V (50 Ω)	1% + 5	1.5% + 5	–
	10000 µA	1 µA	< 0.55 V (50 Ω)			
	100.00 mA	0.01 mA	< 0.18 V (0.5 Ω)			
	440.0 mA[3]	0.1 mA	< 0.8 V (0.5 Ω)			
	10.000 A[4]	0.001 A	< 0.4 V (0.01 Ω)			

1. Input impedance: 10 MΩ (nominal) in parallel with < 100 pF, with overload protection of 1000 V RMS
2. Crest factor ≤ 3. For non-sinusoidal waveforms with crest factor up to 3, add 2% reading + 2% full scale typical.
3. Current can be measured from 50 mA to 440 mA continuously. An additional 0.2% needs to be added to the specified accuracy if the signal measured is in the range of 440 mA to 1100 mA for 30 seconds maximum. After measuring a current of > 440 mA, leave the meter to cool down for twice the measuring time used before application of low current measurement.
4. Current can be measured from 0.5 A up to 10 A continuously with a maximum operating temperature of 50 °C. An additional 0.3% needs to be added to the specified accuracy if the signal measured is in the range of 10 A to 19.999 A for 15 seconds maximum. After measuring a current of >10 A, leave the meter to cool down for 60 seconds before applying a low current measurement.
5. AC voltage and AC current specifications are AC coupled. True RMS measurement is valid from 5 % of range to 100 % of range.

Temperature specifications

Thermocouple type	Range	Resolution	Accuracy ± (% of reading + offset error)
K (for U1241B and U1242B)	–40 to 1000 °C/–48 to 1832 °F	0.1 °C /0.1 °F	1% + 1 °C/1% + 1.8 °F
J (for U1242B only)	–40 to 1000 °C/–48 to 1832 °F	0.1 °C/0.1 °F	1% + 1 °C/1% + 1.8 °F

Capacitance specifications

Range	Resolution	Accuracy ± (% of reading + counts of least significant digit)
1000.0 nF	0.1 nF	1.2% + 4
10.000 µF	0.001 µF	
100.00 µF	0.01 µF	
1000.0 µF	0.1 µF	2% + 4
10.000 mF	0.001 mF	

Harmonic ratio specifications

Range	Frequency	Voltage
0.0% to 99.9%	40 to 500 Hz	100 mVAC to 1000 VAC

Electrical Specifications

Switch counter definition

Switch condition[1, 2]	Circuit switch	Display[3]	Switch threshold
Low level	Normally close	Lo	< 370 ohms
Intermittent[4]	Close to open	Number of switch count	Low to high transition
High level	Normally open	Hi	> 430 ohms
Intermittent[5]	Open to close	Number of switch count	High to low transition

1. Detects intermittent Opens or Closes lasting for at least 250 µsec.
2. Test current of 0.5 mA with maximum open circuit voltage of 2.8 V is used.
3. Maximum count reading: 199.99 M (display "OL" when achieving 2 x 10^8 and thereafter).
4. Count only low to high transition for initial switch condition of Low.
5. Count only high to low transition for initial switch condition of High.

Frequency specifications

Range	Resolution	Accuracy	Minimum input frequency
100.00 Hz	0.01 Hz	0.03%+3	1 Hz
1000.0 Hz	0.1 Hz		
10.000 kHz	0.001 kHz		
100.00 kHz	0.01 kHz		
1000.0 kHz[1]	0.1 kHz		

1. Effective frequency measurement of up to 200 kHz; refer to frequency sensitivity table below for details.

Frequency sensitivity during voltage measurement

Input range (Maximum input for specified accuracy = 10 x Range or 1000 V)	Minimum sensitivity (RMS sine wave)	
	20 Hz to 50 kHz	50 to 200 kHz
1000.0 mV	0.3 V	0.6 V
10.000 V	0.5 V	1.8 V
100.00 V	5 V	10 V (< 100 kHz)
1000.0 V	50 V	100 V (< 100 kHz)

Frequency sensitivity during current measurement

Input range	Minimum sensitivity (RMS sine wave)
	20 Hz to 20 kHz
1000.0 µA	100 µA
10000 µA	500 µA
100.00 mA	10 mA
440.00 mA	50 mA
10.000 A	1 A

Electrical Specifications

Measuring rate

Function	Times/second
ACV	7
DCV (V or mV)	7
Ω	14
Diode	14
Capacitance	4 (< 100 µF)
DCA (µA, mA, A)	7
ACA (µA, mA, A)	7
Temperature	7 (single)
Frequency	1 (> 10 Hz)

General Specifications

Display	Dual display (secondary display is intended for temperature function display only) consists of 4-digit liquid crystal display (LCD) with maximum reading of 11,000 counts. Automatic polarity indication.
Power consumption	0.22 VA maximum
Battery type and life	Four single standard 1.5 V AAA batteries (Alkaline or Zinc Chloride type); 300 hours typical
Operating environment	Full accuracy at –10 to 55 °C; and to 80% RH for temperatures up to 30 °C, decreasing linearly to 50% RH at 55 °C 0 – 2000 meters per IEC 61010-1 3rd edition CAT III, 1000 V/CAT IV, 600 V IEC 61010-1 3rd edition
Storage compliance	–20 to 70 °C
Safety compliance	IEC 61010-1:2010 / EN 61010-1:2010, IEC 61010-2-033:2012 / EN 61010-2-033:2012 Canada: CAN/CSA-C22.2 No.61010-1-12, CAN/CSA-C22.2 No. 61010-2-033-12 USA: ANSI/UL Std. No. 61010-1 (3rd Edition), ANSI/UL Std. No. 61010-2-033 (1st Edition)
Measurement category	CAT III 1000 V/CAT IV 600 V Overvoltage Protection, Pollution Degree 2
EMC compliance	Commercial limits compliance with EN61326-1 Influence of radiated immunity: In RF electromagnetic fields of 3 V/M DC voltage measurement typical accuracy: 1000 mV to 1000 V range; ± 0.2% of range DC current measurement typical accuracy: 1000 uA & 10000uA range; ± 0.7% of range 100 mA range; ± 0.22% of range 440 mA range; ± 0.5% of range 10 A range; ± 0.11% of range Note: - If used in close proximity to an RF transmitter or when subjected to continuously present electromagnetic phenomena, some recoverable degradation of performance may occur.
Common Mode Rejection Ratio (CMRR)	> 90 dB at DC, 50/60 Hz ± 0.1% (1 kΩ unbalanced)
Normal Mode Rejection Ration (NMRR)	> 60 dB at 50/60 Hz ± 0.1%
Crest factor	< 3.0
Temperature coefficient	0.1 × (specified accuracy)/°C (from –10 to 18 °C or 28 to 55 °C)
Shock and vibration	Tested to IEC/EN 60068-2
Dimensions (H x W x D)	193.8 x 92.2 x 58.0 mm
Weight	450 g with batteries 400 g without batteries
Warranty	Three years for main unit Three months for standard shipped accessories

Ordering Information

U1241B

U1242B

Standard shipped accessories
Four 1.5 V AAA alkaline batteries
Certificate of Calibration (CoC)
Test probe leads (4-mm tips)
Quick Start Guide
Free test data (Option UK6)

Optional accessories

Measuring accessories (non-temperature)

U1161A Extended test lead kit		Includes two test leads (red and black), two test probes, medium-sized alligator clips and 4-mm banana plugs. – Test leads: CAT III 1000 V, CAT IV 600 V, 15 A – Test probes: CAT lll 1000 V, CAT lV 600 V, 15 A – Medium-sized alligator clips: CAT III 1000 V, CAT IV 600 V, 15 A – 4-mm banana plugs: CAT II 600 V, 10 A
U1162A Alligator clips		– One pair of insulated alligator clips (red and black). Recommended for use with Keysight standard test leads. – Rated CAT III 1000 V, CAT IV 600 V, 15 A
U1163A SMT grabbers		– One pair of SMT grabbers (red and black). Recommended for use with Keysight standard test leads. – Rated CAT II 300 V, 3 A
U1164A Fine-tip test probes		– One pair of fine-tip test probes (red and black). Recommended for use with Keysight standard test leads. – Rated CAT II 300 V, 3 A
U1168A Standard test lead kit		Includes two test leads (red and black), 19-mm and 4-mm test probes, alligator clips, fine-tip test probes, SMT grabbers and mini grabber (black). – Test leads: CAT III 1000 V, CAT IV 600 V, 15 A – Test probes (19-mm tip): CAT II 1000 V, 15 A – Test probes (4-mm tip): CAT III 1000 V, CAT IV 600 V, 15 A **(highly recommended for CAT IV environment)** – Alligator clips: CAT III 1000 V, CAT IV 600 V, 15 A – Fine-tip test probes: CAT II 300 V, 3 A – SMT grabber: CAT II 300 V, 3 A – Mini grabber: CAT II 300 V, 3 A
U1169A Test probe leads		Includes two test leads (red and black), and a pair each of 19-mm and 4-mm test probes. – Test leads: CAT III 1000 V, CAT IV 600 V, 15 A – Test probes (19-mm tip): CAT II 1000 V, 15 A – Test probes (4-mm tip): CAT III 1000 V, CAT IV 600 V, 15 A **(highly recommended for CAT IV environment)**
U1583B AC current clamp		– Dual range: 40 A and 400 A – Rated CAT III 600 V – BNC-to-banana-plug adapter provided for use with DMMs

Ordering Information

Optional accessories		
Measuring accessories (temperature)		
U1180A Thermocouple adapter+lead kit, J and K types		Includes thermocouple adapter, thermocouple bead J-type and thermocouple bead K-type. – T/C adapter J/K-type – T/C bead J-type: –20 to 200 °C – T/C bead K-type: –20 to 200 °C
U1181A Immersion temperature probe		– Type-K T/C for use in oil and other liquids – Measurement range: –50 to 700 °C – Includes adapter U1184A for connection to DMM
U1182A Industrial surface temperature probe		– Type-K T/C for use on still surfaces – Measurement range: –50 to 400 °C – Includes adapter U1184A for connection to DMM
U1183A Air temperature probe		– Type-K T/C for use in air and non-caustic gas – Measurement range: –50 to 800 °C – Includes adapter U1184A for connection to DMM
U1184A Temperature probe adapter		– Mini-connector-to-banana-plug adapter for use with DMM
U1185A J-type thermocouple and adapter		– T/C adapter J/K-type – T/C bead J-type: –20 to 200 °C
U1186A K-type thermocouple and adapter		– T/C adapter J/K-type – T/C bead J-type: –20 to 200 °C
Carrying case		
U1172A Transit case (aluminium-clad)		The robust casing to transport your DMM and accessories – Aluminum-clad, black panel construction – Dimension: 18 inches (H) x 13 inches (W) x 6 inches (D) – Weight: 4 kg
U1174A Soft carrying case		The convenient way to carry your DMM and essential accessories – Dimension: 9 inches (H) x 5 inches (W) x 3 inches (D)
Hanging kit		
U1171A Magnetic hanging kit		For fastening the DMM to a steel surface so both hands are free
U1179A IR Connectivity Bracket		Connect with U1177A IR-to-Bluetooth adapter or U1173A IR-USB cable

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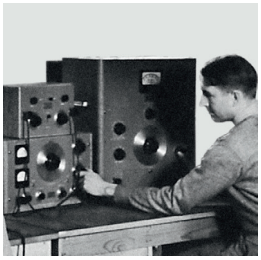
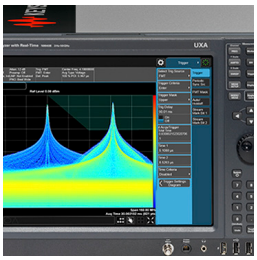

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