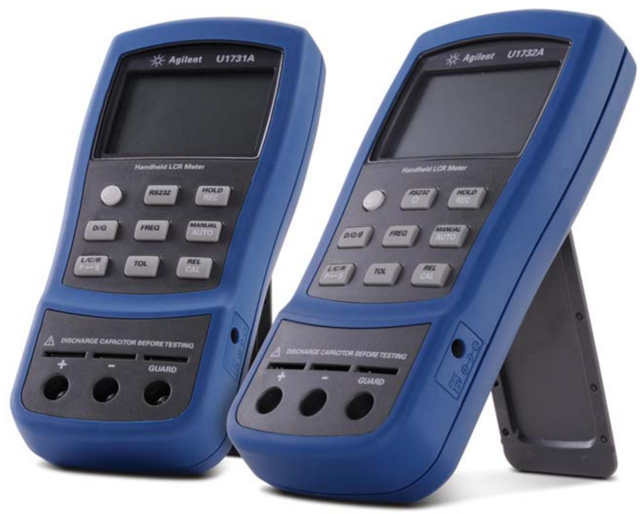
Agilent U1731A/32A Handheld LCR Meters

Data Sheet

LCR testing without the wait



Agilent U1731A/32A handheld LCR meters expand Agilent's portfolio of handheld tools into electronics assembly and passive components troubleshooting. Better yet, these handheld models extends the tradition of Agilent's industry-leading benchtop units to more affordable and portable forms.

Features

- 20,000 counts resolution
- Dual display with backlight (for U1732A)
- Wide LCR ranges with 2 to 4 selectable test frequencies
- Auto-calculation of phase angle (for U1732A), dissipation factor and quality factor
- Tolerance mode: 1%, 5% and 10% (20% with U1732A)
- Relative mode
- Hold and Min/Max/Average recordings
- Data logging to PC with optional IR-to-USB cable

No waiting for quick, basic LCR tests

Sharing a bench LCR meter is practical, but isn't always convenient. With Agilent's new line of handheld LCR meters, you can perform quick, basic LCR measurements at your convenience. Now that they're available at a lower price point compared to traditional benchtop units, everyone on your team can be equipped for passive-component testing—on the bench or on the go—without the wait.

Figure 1: Automate the recording of continuous readings when you hook the U1731A/32A to a PC

Uncompromised quality and reliability

The U1731A/32A are housed in robust overmold and tested to stringent industrial standards. Each U1731A/32A is also sealed with a three-year warranty and the assurance that you can test your components with confidence.

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Take a closer look

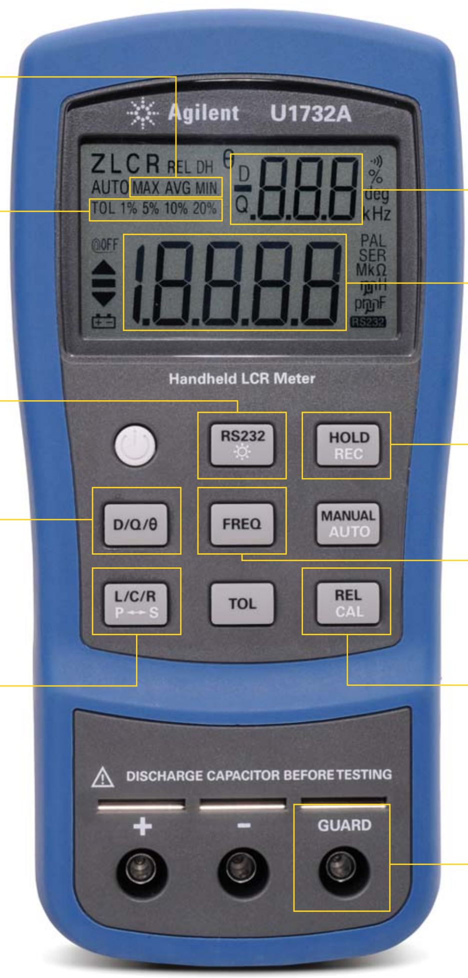
Maximum, Minimum and Average values recording

Visible and audible tolerance mode for capacitor sorting

Backlight function to ease viewing in subdued lighting (U1732A only)

Auto-calculation of Phase Angle (U1732A only), Dissipation Factor and Quality Factor

One-touch access to inductance, capacitance and resistance measurements



Secondary display

20,000 counts resolution

Data Hold function to freeze measured values

Selection of test frequencies
U1731A: 120 Hz/1 kHz
U1732A: 100 Hz/120 Hz/1 kHz/10 kHz

Calibration function for greater measurement accuracy

Guard terminal to be used with SMD tweezer for better noise immunity

Figure 2: U1732A front view

U1731A Electrical Specifications

Accuracy is expressed as ± (% of reading + number of least significant digits) at 23 °C ±5 °C and <75% R.H.

Resistance (Parallel Mode), Test Frequency = 120 Hz/1 kHz

Range	Maximum Display	Accuracy		Note
		@ 120 Hz	@ 1 kHz	
10 MΩ	9.999 MΩ	2.0% + 8	2.0% + 8	After open cal.
2000 kΩ	1999.9 kΩ	0.5% + 5	0.5% + 5	After open cal.
200 kΩ	199.99 kΩ	0.5% + 3	0.5% + 3	-
20 kΩ	19.999 kΩ	0.5% + 3	0.5% + 3	-
2000 Ω	1999.9 Ω	0.5% + 3	0.5% + 3	-
200 Ω	199.99 Ω	0.8% + 5	0.8% + 5	After short cal.
20 Ω	19.999 Ω	1.2% + 40	1.2% + 40	After short cal.

[1] Specifications are based on measurements performed at the test sockets and on battery operation.
[2] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

Capacitance (Parallel Mode), Test Frequency = 120 Hz

Range	Maximum Display	Accuracy		Note
		Capacitance	DF	
10 mF	19.99 mF [1]	3.0% + 5 (DF<0.1)	10% + 100/Cx + 5 (DF<0.1)	After short cal.
1000 μF	1999.9 μF [2]	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After short cal.
200 μF	199.99 μF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
20 μF	19.999 μF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
2000 nF	1999.9 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
200 nF	199.99 nF	0.7% + 5 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	After open cal.
20 nF	19.999 nF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After open cal.

Capacitance (Parallel Mode), Test Frequency = 1 kHz

Range	Maximum Display	Accuracy		Note
		Capacitance	DF	
1 mF	1.999 mF [1]	3.0% + 5 (DF<0.1)	10% + 100/Cx + 5 (DF<0.1)	After short cal.
200 μF	199.99 μF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After short cal.
20 μF	19.999 μF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
2000 nF	1999.9 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
200 nF	199.99 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
20 nF	19.999 nF	0.7% + 5 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	After open cal.
2000 pF	1999.9 pF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After open cal.

[1] This reading can be extended up to 1999 MAX display with accuracy that is not specified.
[2] This reading can be extended up to 19999 MAX display with accuracy that is not specified.
[3] Q value is the reciprocal of DF.
[4] Cx = Counts of displayed C value. E.g., If C = 88.88 μF then Cx = 8888.
[5] Specifications are based on measurements performed at the test sockets and on battery operation.
[6] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

Inductance (Series Mode), Test Frequency = 120 Hz

Range	Maximum Display	Accuracy		Note
		Inductance	DF	
1000 H	999.9 H	1.0% + (Lx/10000)% + 5	2.0% + 100/Lx + 5	After open cal.
200 H	199.99 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
20 H	19.999 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
2000 mH	1999.9 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
200 mH	199.99 mH	1.0% + (Lx/10000)% + 5	3.0% + 100/Lx + 5	After short cal.
20 mH	19.999 mH	2.0% + (Lx/10000)% + 5	10.0% + 100/Lx + 5	After short cal.

Inductance (Series Mode), Test Frequency = 1 kHz

Range	Maximum Display	Accuracy		Note
		Inductance	DF	
100 H	99.99 H	1.0% + (Lx/10000)% + 5	2.0% + 100/Lx + 5	After open cal.
20 H	19.999 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
2000 mH	1999.9 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
200 mH	199.99 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
20 mH	19.999 mH	1.0% + (Lx/10000)% + 5	3.0% + 100/Lx + 5	After short cal.
2000 µH	1999.9 µH	2.0% + (Lx/10000)% + 5	10.0% + 100/Lx + 5	After short cal.

[1] Q value is the reciprocal of DF.
[2] Lx = Counts of displayed L value. E.g., If L = 88.88 H then Lx = 8888.
[3] Specifications are based on measurements performed at the test sockets and on battery operation.
[4] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

U1732A Electrical Specifications

Accuracy is expressed as ± (% of reading + number of least significant digits) at 23 °C ± 5 °C and <75% R.H.

Resistance (Parallel Mode), Test Frequency = 100 Hz/120 Hz

Range	Maximum Display	Accuracy		Note
		@ 100 Hz	@ 120 Hz	
10 MΩ	9.999 MΩ	2.0% + 8	2.0% + 8	After open cal.
2000 kΩ	1999.9 kΩ	0.5% + 5	0.5% + 5	After open cal.
200 kΩ	199.99 kΩ	0.5% + 3	0.5% + 3	-
20 kΩ	19.999 kΩ	0.5% + 3	0.5% + 3	-
2000 Ω	1999.9 Ω	0.5% + 3	0.5% + 3	-
200 Ω	199.99 Ω	0.8% + 5	0.8% + 5	After short cal.
20 Ω	19.999 Ω	1.2% + 40	1.2% + 40	After short cal.

Resistance (Parallel Mode), Test Frequency = 1 kHz/10 kHz

Range	Maximum Display	Accuracy		Note
		@ 1 kHz	@ 10 kHz	
10 MΩ	9.999 MΩ	2.0% + 8	3.5% + 10	After open cal.
2000 kΩ	1999.9 kΩ	0.5% + 5	2.0% + 10	After open cal.
200 kΩ	199.99 kΩ	0.5% + 3	1.5% + 5	-
20 kΩ	19.999 kΩ	0.5% + 3	1.5% + 5	-
2000 Ω	1999.9 Ω	0.5% + 3	1.5% + 5	-
200 Ω	199.99 Ω	0.8% + 5	2.0% + 10	After short cal.
20 Ω	19.999 Ω	1.2% + 40	2.5% + 200	After short cal.

[1] Specifications are based on measurements performed at the test sockets and on battery operation.
[2] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

Capacitance (Parallel Mode), Test Frequency = 100 Hz/120 Hz

Range	Maximum Display	Accuracy		Note
		Capacitance	DF	
10 mF	19.99 mF [1]	3.0% + 5 (DF<0.1)	10% + 100/Cx + 5 (DF<0.1)	After short cal.
1000 µF	1999.9 µF [2]	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After short cal.
200 µF	199.99 µF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
20 µF	19.999 µF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
2000 nF	1999.9 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
200 nF	199.99 nF	0.7% + 5 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	After open cal.
20 nF	19.999 nF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After open cal.

Capacitance (Parallel Mode), Test Frequency = 1 kHz

Range	Maximum Display	Accuracy		Note
		Capacitance	DF	
1 mF	1.999 mF [1]	3.0% + 5 (DF<0.1)	10% + 100/Cx + 5 (DF<0.1)	After short cal.
200 µF	199.99 µF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After short cal.
20 µF	19.999 µF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
2000 nF	1999.9 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
200 nF	199.99 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
20 nF	19.999 nF	0.7% + 5 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	After open cal.
2000 pF	1999.9 pF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After open cal.

Capacitance (Parallel Mode), Test Frequency = 10 kHz

Range	Maximum Display	Accuracy		Note
		Capacitance	DF	
50 µF	50.0 µF	3.0% + 8 (DF<0.1)	12.0% + 100/Cx + 10 (DF<0.1)	After short cal.
20 µF	19.999 µF	3.0% + 6 (DF<0.2)	5.0% + 100/Cx + 8 (DF<0.2)	After short cal.
2000 nF	1999.9 nF	1.5% + 5 (DF<0.5)	1.5% + 100/Cx + 6 (DF<0.5)	-
200 nF	199.99 nF	1.5% + 5 (DF<0.5)	1.5% + 100/Cx + 6 (DF<0.5)	-
20 nF	19.999 nF	1.5% + 5 (DF<0.5)	1.5% + 100/Cx + 6 (DF<0.5)	-
2000 pF	1999.9 pF	2.0% + 6 (DF<0.5)	3.0% + 100/Cx + 6 (DF<0.1)	After open cal.
200pF	199.99 pF	3.0% + 8 (DF<0.1)	5.0% + 100/Cx + 8 (DF<0.1)	After open cal.

[1] This reading can be extended up to 1999 MAX display with accuracy that is not specified.
[2] This reading can be extended up to 19999 MAX display with accuracy that is not specified.
[3] Q value is the reciprocal of DF.
[4] Cx = Counts of displayed C value. E.g., If C = 88.88 µF then Cx = 8888.
[5] Specifications are based on measurements performed at the test sockets and on battery operation.
[6] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

Inductance (Series Mode), Test Frequency = 100 Hz/120 Hz

Range	Maximum Display	Accuracy		Note
		Inductance	DF	
1000 H	999.9 H	1.0% + (Lx/10000)% + 5	2.0% + 100/Lx + 5	After open cal.
200 H	199.99 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
20 H	19.999 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
2000 mH	1999.9 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
200 mH	199.99 mH	1.0% + (Lx/10000)% + 5	3.0% + 100/Lx + 5	After short cal.
20 mH	19.999 mH	2.0% + (Lx/10000)% + 5	10.0% + 100/Lx + 5	After short cal.

Inductance (Series Mode), Test Frequency = 1 kHz

Range	Maximum Display	Accuracy		Note
		Inductance	DF	
100 H	99.99 H	1.0% + (Lx/10000)% + 5	2.0% + 100/Lx + 5	After open cal.
20 H	19.999 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
2000 mH	1999.9 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
200 mH	199.99 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
20 mH	19.999 mH	1.0% + (Lx/10000)% + 5	3.0% + 100/Lx + 5	After short cal.
2000 µH	1999.9 µH	2.0% + (Lx/10000)% + 5	10.0% + 100/Lx + 5	After short cal.

Inductance (Series Mode), Test Frequency = 10 kHz

Range	Maximum Display	Accuracy		Note
		Inductance	DF	
1000 mH	999.9 mH	2.0% + (Lx/10000)% + 8	2.0% + 100/Lx + 10	-
200 mH	199.99 mH	1.5% + (Lx/10000)% + 8	2.0% + 100/Lx + 10	-
20 mH	19.999 mH	1.5% + (Lx/10000)% + 10	3.0% + 100/Lx + 15	-
2000 µH	1999.9 µH	2.0% + (Lx/10000)% + 10	8.0% + 100/Lx + 20	After short cal.

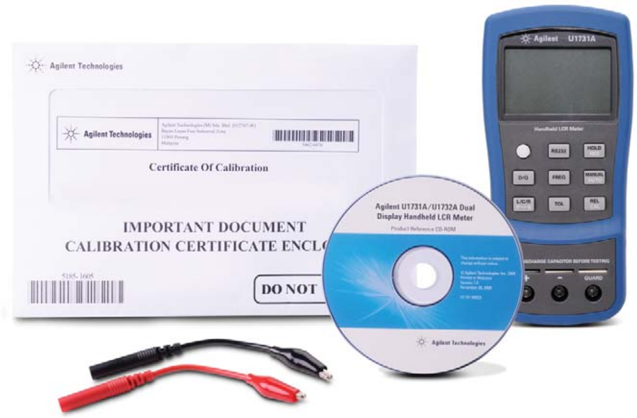
[1] Q value is the reciprocal of DF.
[2] Lx = counts of displayed L value. E.g., If L = 88.88 H, then Lx = 8888.
[3] Specifications are based on measurements performed at the test sockets and on battery operation.
[4] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

General Specifications

Parameter	U1731A		U1732A	
Measurements	L/C/R/D/Q		L/C/R/D/Q/θ	
Tolerance mode	1%, 5%, 10%		1%, 5%, 10%, 20%	
Test frequency (Accuracy = ±0.1% of actual test frequency)	**Test frequency setting**	**Actual test frequency**	**Test frequency setting**	**Actual test frequency**
	120 Hz	120 Hz	100 Hz	100 Hz
	1 kHz	1010 Hz	120 Hz	120 Hz
			1 kHz	1010 Hz
			10 kHz	9.6 kHz
Measuring circuit mode	Inductance (L): Defaults to series mode Capacitance/Resistance (C/R): Defaults to parallel mode			
Display	L/C/R : Maximum display 19999 D/Q: Maximum display 999 (Auto range)			
Backlight	Available for model U1732A			
Ranging mode	Auto and Manual			
Test signal level	~0.6 V_{RMS}			
Measurement rate	1 reading/s, nominal			
Response time	~1 s/DUT (manual range)			
Auto power-off	~5 mins without operation			
Power supply	• 9 V Alkaline battery (ANSI/NEDA 1604A or IEC 6LR61) • AC power adapter and cord available as options			
Power consumption	• ~40 mA (on battery operation) • 0.08 mA after auto power-off			
Input protection fuse	0.1 A/250 V			
Battery life	7 hours (typical) without backlight and based on new alkaline			
Low battery indicator	+ − will appear when the voltage drops below ~ 6.8 V			
Operating environment	0 °C to 40 °C; 0 to 70% relative humidity (R.H.)			
Storage environment	–20 °C to 50 °C; 0 to 80% R.H. non-condensing			
Temperature coefficient	0.15 x (specified accuracy)/°C (0 °C to 18 °C or 28 °C to 40 °C)			
Weight	330 g			
Dimensions (H x W x D)	184 mm x 87 mm x 41 mm			
Safety and EMC compliance	IEC 61010-1:2001/EN 61010-1:2001 (2nd Edition) Pollution Degree 2, IEC 61326-2-1:2005/ EN 61326-2-1:2006, ICES-001:2004, AS/NZS CISPR11:2004			
Calibration	One-year calibration cycle recommended			
Warranty	3 years			

Ordering Information

Standard shipped items

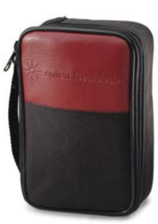


Standard U1731A and U1732A ordering includes:

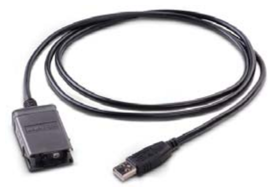
- Quick Start Guide
- User's and Service Guide (included in Product Reference CD)
- Certificate of Calibration (CoC)
- Alligator clip leads
- Data logging software (included in Product Reference CD)
- 9 V Alkaline battery

Option U1731A-SMD and U1732A-SMD ordering includes:
SMD tweezer and soft carrying case in addition to the standard shipped items

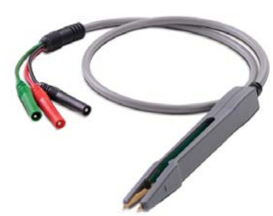
Optional accessories



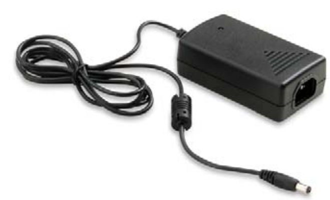
U1174A Soft carrying case



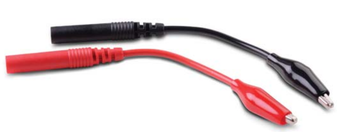
U5481A IR-to-USB cable



U1782A SMD tweezer



U1780A Power adapter and cord (according to country)



U1781A Alligator clip leads

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