

# LCR-Reader-MPA



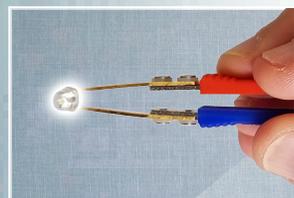
## Multipurpose LCR- and ESR-meter



Oscilloscope mode



Diode mode



Testing LED

## Ultimate PCB Debugging and Simplified Component Testing

LCR-Reader-MPA is the latest version of a popular LCR-Reader LCR/ESR-meter. In addition to the highly accurate 0.1 % LCR measurements it offers an unrivalled number of features as well as a record wide measurement ranges. With the addition of 100 kHz test frequency the device is offering a unique capability to measure 0.1 pF capacitances and a nH range inductances with a resolution as fine as 0.001 pF and 0.1 nH respectively.

It is an easy to use, portable solution to accurate testing and sorting of Surface Mount Devices with just a touch. The lightweight multimeter automatically identifies components and measures them with high speed and accuracy. It is also an efficient tool for troubleshooting a PCB by using its other functions such as AC/DC voltage/ current measurements, oscilloscope, signal generator and frequency meter.

With electronics becoming more compact, the components inside also become smaller; this makes it difficult to keep track of the components, their types and values. Testing and sorting these components can be an arduous task, especially using traditional multimeters with long cables and bulky test leads.

LCR-Reader-MPA provides a unique and simple solution to these issues. The tweezers with sharp, gold-plated test leads can grasp and hold components to a 0201 size, including those mounted on crowded PCBs.

## Time Efficient Automatic Measurements

MPA eliminates trial and error between measurements and allows users to quickly sort multiple components. The device will automatically determine the best test parameters for the component with virtually no set-up. Set the device to 'Auto' and touch a component; MPA will instantly display all measurement values, including main and secondary impedance (ESR, D, Z) values, component type, test frequency used, and test mode.

When required, the device has extensive menus for customizing measurements for any task. These include various automatic and manual test modes (L-C-R-ESR, Z, D, Diode, and LED testing, automatic and manual frequency settings of 100 Hz to 100 kHz, test signal adjustment for in-circuit measurements, pass/no pass electrolytic cap indication with built-in rejection table, frequency meter, automatic diode polarity and short circuit detection, DC measurements of Capacitance and Resistance up to 640 mF, oscilloscope mode with alternative voltage measurements and more.

## Component Sorting / Tolerance Control / Relative Measurements

In order to facilitate incoming control on a production line Relative Measurement feature was implemented allowing to quickly compare a component value to a reference component. When you store the reference component in the device memory, it will show the percentage of deviation when you touch another component of the same type.

## Oscilloscope Mode and Kelvin Probe Connector

Oscilloscope mode is especially useful when the device is used with the Kelvin Probe Connector compatible with all Smart Tweezers and LCR-Reader devices. The connector is made of shielded two-wire connector with replaceable attachments. The connector has to be attached instead one of the test leads and creates a shielded two-wire extension of the device probe thus making LCR-Reader a probe station that could be used for impedance testing of a complete PCB or as an oscilloscope allowing to analyze voltage waveforms at any PCB node.

## Lightweight and Easy-to-Use

The ergonomic design of LCR-Reader-MPA simplifies testing components without the wire-leads. The device is one-handed-use that is light enough to use for extended periods of time without causing fatigue and leaves the other hand free for taking notes or other tasks. The display automatically rotates depending on the hand used. The 1.35 oz. weight, compact design and long lasting Li-Po battery make LCR-Reader-MPA useful for field work and the backlit LCD screen is easy to read in even low-lighting conditions. The tweezers' probes are stable and provide stable contact when holding a component. The shielded 4-wire connection offers minimum offsets during measurements.

## Resistance, Impedance

Range	Resolution	Level	100 Hz, 120 Hz	1 kHz	10kHz	20kHz-100kHz
10Ω	0.001Ω	1.0 Vrms	0.5 %+20	0.2 %+20	0.5 %+20	1 %+20
100Ω	0.01Ω	1.0 Vrms	0.1 %+3	0.1 %+3	0.1 %+3	0.5 %+3
1kΩ	0.1Ω	1.0 Vrms	0.1 %+2	0.1 %+3	0.1 %+3	0.2 %+3
10kΩ	0.001kΩ	1.0 Vrms	0.1 %+2	0.1 %+3	0.1 %+3	0.2 %+3
100kΩ	0.01kΩ	1.0 Vrms	0.1 %+2	0.1 %+3	0.1 %+3	0.5 %+3
1MΩ	0.1kΩ	1.0 Vrms	0.2 %+3	0.2 %+3	0.2 %+3	1 %+3
10MΩ	0.001MΩ	1.0 Vrms	1 %+5	0.5 %+5	1 %+5	-
20MΩ	0.01MΩ	1.0 Vrms	3 %+5	3 %+5	-	-

Accuracy for the ranges 1 R ~ 100 R is specified after subtract of the offset resistance

## Inductance

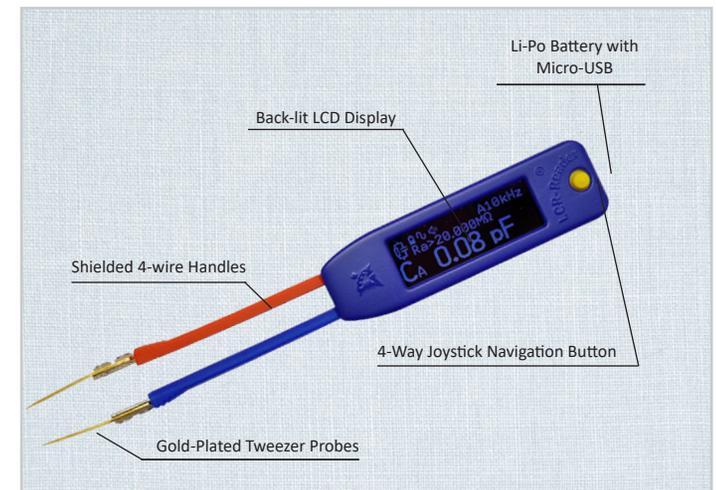
Range	Resolution	Level	100Hz, 120Hz	1kHz	10kHz	20kHz-75kHz	100kHz
100 nH	1 nH	1.0 Vrms	-	-	-	-	3 % + 5
1 μH	10 nH	1.0 Vrms	-	-	-	-	3 % + 2
10 μH	0.001 μH	1.0 Vrms	-	-	0.5 %+30	2 %+30	2 % + 3
100 μH	0.01 μH	1.0 Vrms	-	-	0.3 %+5	0.5 %+5	1 % + 2
1000 μH	0.1 μH	1.0 Vrms	-	1 %+3	0.2 %+3	0.5 %+2	1 % + 2
10 mH	0.001 μH	1.0 Vrms	0.2 %+3	0.2 %+3	0.2 %+3	0.5 %+2	1 % + 2
100 mH	0.01 mH	1.0 Vrms	0.2 %+3	0.2 %+3	0.2 %+3	0.5 %+2	2 % + 3
1000 mH	0.1 mH	1.0 Vrms	0.2 %+3	1 %+3	0.3 %+3	3 %+5	-
10 H	0.001 H	1.0 Vrms	2 %+3	2 %+3	2 %+3	-	-
100 H	0.01 H	1.0 Vrms	5 %+3	5 %+3	-	-	-

## Capacitance

Range	Resolution	Level	100Hz, 120Hz	1kHz	10kHz	20kHz-75kHz	100kHz
10 pF	0.00 1pF	1.0 Vrms	-	-	0.5 %+5*	-	1 %+50*
100 pF	0.01 pF	1.0 Vrms	-	-	0.3 %+5*	3 %+5*	0.3 %+5*
1000 pF	0.1 pF	1.0 Vrms	4 %+5	0.3 %+3	0.2 %+5*	1 %+2*	0.2 %+2*
10 nF	0.001 nF	1.0 Vrms	0.2 %+4	0.2 %+3	0.1 %+3	0.5 %+2	0.5 %+2
100 nF	0.01 nF	1.0 Vrms	0.2 %+2	0.1 %+3	0.1 %+3	0.5 %+2	0.5 %+2
1000 nF	0.1 nF	1.0 Vrms	0.2 %+2	0.1 %+3	0.2 %+3	1 %+3	2 %+3
10 μF	0.001 μF	1.0 Vrms	0.3 %+2	0.2 %+3	0.2 %+3	3 %+5	3 %+5
100 μF	0.01 μF	1.0 Vrms	0.5 %+2	0.2 %+3	3 %+5	-	-
1000 μF	0.1 μF	1.0 Vrms	2 %+5	3 %+5	-	-	-
10 mF	0.01 mF	1.0 Vrms	5 %+5	-	-	-	-
40 mF	0.01 mF	1.0 Vrms	10 %+5	-	-	-	-

Accuracy for the ranges of 10 pF~1000 pF is specified after subtract of the stray capacitances for test leads.

- Automatic and manual L, C, R, Z, D, Q and ESR measurements
- 0.1% Basic accuracy
- LED/Diode test and DC Resistance
- AC/DC Voltage and Current measurements
- Oscilloscope up to 100 kHz
- Frequency Meter
- Component Tolerance/Sorting
- Sine wave Signal Generator up to 100 kHz
- Supercap DC test mode up to 1 F
- Wide range of 11 test frequencies up to 100 kHz
- Test signal of 0.1, 0.5 and 1.0 Vrms
- Automatic signal reduction for in-circuit measurements
- Automatic component identification
- Automatic range selection
- Easy-to-use one-hand operation
- 4-Way joystick navigation
- Backlit LCD display
- Automatic power off
- Li-Po battery with micro-USB charging
- Sound Indicator
- Automatic/Manual Left/Right screen orientation
- Pass/NoPass Electrolytic Cap indication with built-in rejection table
- Easy Short/Open calibration and offset removal



## Technical Specifications

AC Test Mode Test Frequency:

100 Hz, 120 Hz, 1 kHz, 10 kHz, 20 kHz, 30 kHz, 40 kHz, 50 kHz, 60 kHz, 75 kHz, 100 kHz  
0.65, 0.1, +/- 5% Vrms Sine Wave  
Source impedance: ±(0.005%+5) Hz 1kΩ +/- 1%

Test Frequency Accuracy

Source impedance:

## Measurement Ranges

Resistance R:

Capacitance C:

Inductance L:

Quality factor Q:

Dissipation factor D:

10 mΩ to 20 MΩ

0.1 pF to 1 F

10 nH to 100 H

0.001 to 1000

0.001 to 1000

## Physical Specifications

Size:

Weight:

Operating temperature:

Battery Type:

Battery Life (continuous):

166x23x14 mm (6.5 x 0.9 x 0.55 in.)

39 grams(1.3 Oz.)

10°C to 40°C

3.7V LiPo rechargeable 250mAh 80

hours, 2 hours charging cycle

