

# 100KHz Handheld LCR Meter

The First One On the Market

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MT 4080A



MT4080A  
100Hz to 100KHz



MT4080D  
100Hz to 10KHz

# The Most Advanced

## Dual Display:

60(2.36")x40(1.57")mm LCD.  
displays measurement values  
and instrument states

## Frequency:

Select the desired test frequency

## Measurement Parameter:

Select the desired test parameter  
and circuit mode

## Remote Binning:

Sort the components easily

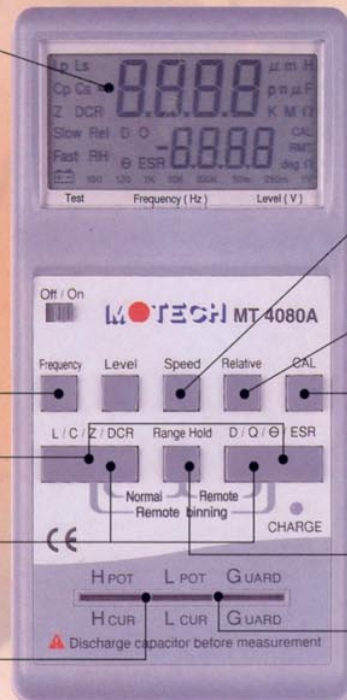
## Five Terminals:

Reduces errors due to cable  
extension



## IrDA:

Allow communication with  
a personal computer



## Speed:

Select variable measurement speed

## Relative:

Offset from a previous  
measurement value

## Calibration:

Open and short correction  
(compensation)

## Range Hold:

Select the autorange or  
manual mode

## Built-in Direct Test Fixture:

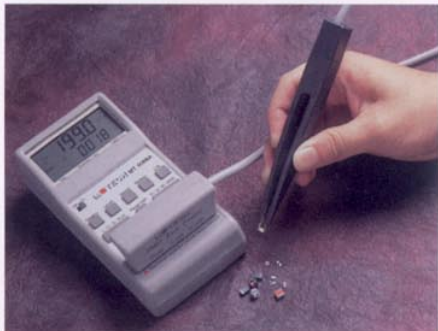
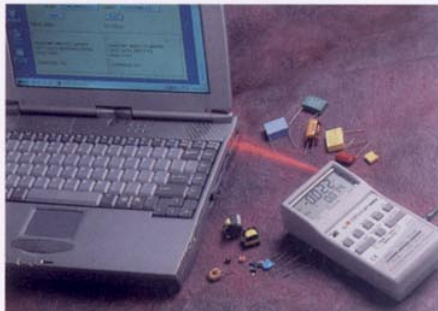
Test the lead components easily

The MT4080A/ MT4080D LCR Meter is the first handheld meter of this type on the market, with a wide range of test frequencies up to 10KHz ( MT4080D ) or 100KHz (MT4080A), and many measurement parameters including Z, L, C, DCR, ESR, D, Q, and  $\theta$  as well. The MT4080A/ MT4080D is designed for both component evaluation on the production line and fundamental impedance testing for bench-top applications. With a built-in direct test fixture you can test the lead components very easily. The 4-wire test clip can give a convenient connection to larger components and assemblies with the accuracy of 4-wire testing. The LCR meter offers fast, reliable, and versatile testing at low cost. Furthermore, the infrared interface (RS232C) is an attractive, cost-effective solution for quality assurance and incoming inspection operations, making the MT4080A/ 4080D is the most advanced handheld LCR meter available on the market today.

- Measurement parameters : Z, L, C,DCR,ESR, D,Q, and $\theta$
- Test conditions: 100Hz, 120Hz,1KHz, 10KHz, 100 KHz (MT4080A only) 1Vrms, 0.25Vrms, 0.05Vrms
- 0.2% basic accuracy
- Dual LCD display
- Remote binning capability
- Very quick response
- Fully auto/manual selection
- DC resistance measurement
- Rechargeable battery/ AC powered
- User friendly
- Infrared interface(RS232C)

# Handheld LCR Meter

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### ESR measurement

In today's switching mode power supply design, higher frequency is reached everyday to take advantage of the size and output power barrier. To ensure the performance of the circuit, the Equivalent Serial Resistance (ESR) in a capacitor is the key element determining efficiency and performance. With MT4080A/ MT4080D the user can quickly check the ESR of a capacitor up to 100KHz or 10KHz without hesitation.

### Built-in infrared Port

MT4080A/ MT4080D comes with a built-in infrared port to allow communication with a personal computer. With the fully Remote Control Command (RCC) support, both units are able to act as an automatic LCR testing system - this is especially applicable in automatic Q.A and I.Q.C testing. The user is able to control the measurements and get the measured values through the infrared port. Remote-Binning feature, easily sorting the components, is combined with remote-binning software and infrared port.

### SMD test probe (options)

Surfacemount components are usually tiny and have no wire leads, making it more difficult to test surfacemount devices than conventional components. The TL08A SMD test probe gives users an easy way to conduct SMD component testing. The uniquely designed SMD test probe can also be used to test conventional components if the wire leads are too short to insert into the test terminals.

### Open and short calibration

In the world of LCR meters, open and short calibrations are important procedures before making any measurements, especially when user changes the testing frequency and level. Therefore, very fast open and short calibrations are the key factors to the user. Within just 10 seconds, the user can perform open or short calibrations at any frequency and level that s/he desires.

### Transformer measurement

To qualify xDSL transformers, you can measure the primary inductance or coupling capacitance at 10KHz, and leakage inductance at 100KHz with lower test voltage. You can also measure the DC-resistance of primary and secondary with the standard DCR function.

## Specifications

### Measurement Functions

Measurement parameters:

- Z : Absolute value of impedance
- L : Inductance
- C : Capacitance
- DCR : Direct current resistance
- ESR : Equivalent series resistance
- D : Dissipation factor
- Q : Quality factor
- $\theta$  : Phase angle

Combinations

DCR	Z	Ls,Cs	Lp,Cp
	$\theta$	D,Q,ESR	D,Q

- Ranging : Auto-Range and Range-Hold
- Relative : Relative mode
- Cal : Open / Short calibration
- RS232C :
- Connector Type : IrDA
- Transmission Signal : Tx and Rx
- Flow Control : XON / XOFF

### Test Signal

Frequency : 100Hz, 120Hz, 1KHz,  
10KHz, 100KHz  
(MT4080A only)

Accuracy :  $\pm 0.2\%$  (MT4080D)  
:  $\pm 0.4\%$  (MT4080A)

Level: 1Vrms, 250mVrms, 50mVrms  
1Vdc (for DCR)

Output Impedance :  $100\Omega \pm 5\%$   
Display Range

Parameter	Range
Z	0.001 $\Omega$ to 9999M $\Omega$
L	0.000 $\mu$ H to 9999H
C	0.000PF to 9999F
DCR	0.000 $\Omega$ to 9999M $\Omega$
ESR	0.000 $\Omega$ to 9999 $\Omega$
D	0.000 to 9999
Q	0.000 to 9999
$\theta$	-180.0° to 180.0°

### |Z|, L, C, and ESR Accuracy (Ae):

Z  Freq.	20M ~10M $\Omega$	10M ~1M $\Omega$	1M ~100K $\Omega$	100K ~10 $\Omega$	10 ~ 1 $\Omega$	1 ~ 0.1 $\Omega$
DCR	2% $\pm 1$	1% $\pm 1$	0.5% $\pm 1$	0.2% $\pm 1$	0.5% $\pm 1$	1% $\pm 1$
100Hz	①					①
120Hz						
1KHz						
10KHz	5% $\pm 1$	2% $\pm 1$				
	①					
100KHz (4080A)	NA	5% $\pm 1$	2% $\pm 1$	0.4% $\pm 1$	2% $\pm 1$	5% $\pm 1$
		①				①

- Note :** 1. The accuracy applies when the test level is set to 1Vrms  
2. Ae multiplies 1.25 when the test level is set to 250mVrms.  
3. Ae multiplies 1.50 when the test level is set to 50mVrms.  
4. When measuring L and C, multiply Ae by  $\sqrt{1+Dx^2}$  if the Dx > 0.1.

① : Ae is not specified if the test level is set to 50mV.

### D Accuracy :

D accuracy De is given as

$$De = \pm \frac{Ae}{100}$$

Accuracy applies when Dx (measured D value)  $\leq 0.1$

When Dx > 0.1, multiply De by (1+Dx)

### Q Accuracy :

Q accuracy Qe is given as

$$Qe = \pm \frac{Qx^2 \cdot De}{1 \mp Qx \cdot De}$$

Where, Qx is the measure Q value,  
De is the relative D accuracy.

Accuracy applies when  $Qx \cdot De < 1$

$\theta$  Accuracy:

$\theta$  accuracy  $\theta_e$  is given as

$$\theta_e = \frac{180}{\pi} \cdot \frac{Ae}{100} \text{ [deg]}$$

### Measuring Speed :

Fast : 4.5 meas. / sec.

Slow : 2.5 meas. / sec.

### General:

Temperature : 0 °C to 40 °C (Operating),  
-20 °C to 70 °C (storage)

Relative Humidity : Up to 85%

Battery Type : Ni-Mh or Alkaline (2xAA size)

Battery Charge : Constant current 150 mA  
approximately

Battery Operating Time : 2.5 Hours typical

AC Operation : 110V/220V AC, 60/50Hz with  
proper Adapter

Low Power Warning : under 2.2V

Dimensions : 6.9" x 3.4" x 1.9" (LxWxH)  
(174mm x 86mm x 48mm)

Weight : 470g

### Order Information

#### MT4080A

100Hz to 100KHz Handheld LCR Meter

#### MT4080D

100Hz to 10KHz Handheld LCR Meter

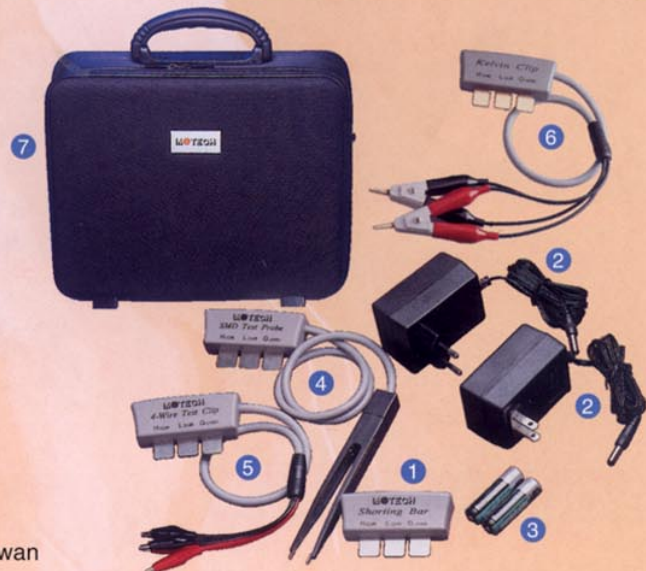
## Standard/Optional Test Fixtures/Accessories, Part No., and Pictures

### Standard Accessories

- ① Shorting bar
- ② DC 6V power adapter
- ③ AA-size Ni-Mh rechargeable battery

### Optional Test Fixtures/Accessories :

- ④ TL08A SMD test probe
- ⑤ TL08B 4-wire test clips
- ⑥ TL08C 4-Wire Kelvin Clips
- ⑦ Carry case



# MOTECH

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\*\*Specifications subject to change without notice

# MOTTECH

## MT 4080 A / MT 4080 D LCR Handmeßgeräte

- LCD Dual - Anzeige
- DC-Widerstandsmessungen
- Prüffrequenzen: 100 Hz / 120 Hz / 1 kHz / 10 kHz / 100 kHz (MT 4080 A)
- Prüfspannungen: 1 V<sub>rms</sub> / 0,25 V<sub>rms</sub> / 50 mV<sub>rms</sub>
- Akku/Netzbetrieb
- RS-232 Infrarotschnittstelle (IrDA)
- automatische / manuelle Bereichswahl
- Meßfrequenz 2,5 / sec. oder 4,5 / sec.
- Abmessungen (BxHxT) 86 x 174 x 48 mm
- Lieferumfang: 2 x 1,2 V Ni-Mh-Akkus, Bedienungsanleitung, 6V AC/DC- Adapter, **Kurzschluß-Schiene und Tragetasche**
- Sonderzubehör: TL08A: SMD-Tastkopf, TL08B: 4-Draht-Testklemmen, TL08C: 4-Draht Kelvin-Klemmen, RS-232 Infrarot-Schnittstelle für den PC



### Messfunktionen

- Z absoluter Impedanzwert
- L<sub>S/P</sub> Induktivität Seriell/Parallel
- C<sub>S/P</sub> Kapazität Seriell/Parallel
- DCR DC-Widerstand
- ESR äquivalenter Reihenwiderstand
- D Verlustleistung
- Q Qualitätsfaktor
- θ Phasenwinkel

### Anzeige-Kombinationen

- Seriell Z-θ, C<sub>S</sub>-D, C<sub>S</sub>-Q, C<sub>S</sub>-ESR, L<sub>S</sub>-D, L<sub>S</sub>-Q, L<sub>S</sub>-ESR
- Parallel C<sub>P</sub>-D, C<sub>P</sub>-Q, L<sub>P</sub>-D, L<sub>P</sub>-Q

### Technische Daten MT 4080 A / MT 4080 D

#### Messfrequenz / Messbereich

100 Hz	79,57 pF – 159,1 pF 2% ± 1	159,1 pF – 1,591 nF 1% ± 1	1,591 nF – 15,91 nF 0,5% ± 1	15,91 nF – 159,1 μF 0,2% ± 1	159,1 μF – 1591 μF 0,5% ± 1	1591 μF – 15,91 mF 1% ± 1
120 Hz	66,31 pF – 132,6 pF 2% ± 1	132,6 nF – 1,326 nF 1% ± 1	1,326 nF – 13,26 nF 0,5% ± 1	13,26 nF – 132,6 μF 0,2% ± 1	132,6 μF – 1326 μF 0,5% ± 1	1326 μF – 13,26 mF 1% ± 1
1 kHz	7,957 pF – 15,91 pF 2% ± 1	15,91 pF – 159,1 pF 1% ± 1	159,1 pF – 1,591 nF 0,5% ± 1	1,591 nF – 15,91 μF 0,2% ± 1	15,91 μF – 159,1 μF 0,5% ± 1	159,1 μF – 1,591 mF 1% ± 1
10 kHz	0,795 pF – 1,591 pF 5% ± 1	1,591 pF – 15,91 pF 2% ± 1	15,91 pF – 159,1 pF 0,5% ± 1	159,1 pF – 1,591 μF 0,2% ± 1	1,591 μF – 15,91 μF 0,5% ± 1	15,91 μF – 159,1 μF 1% ± 1
100 kHz (MT 4080 A) –	– –	0,159 pF – 1,591 pF 5% ± 1	1,591 pF – 15,91 pF 2% ± 1	15,91 pF – 159,1 nF 0,4% ± 1	159,1 nF – 1,591 μF 2% ± 1	1,591 μF – 15,91 μF 5% ± 1

100 Hz	31,83 kH – 15,91 kH 2% ± 1	15,91 kH – 1591 H 1% ± 1	1591 H – 159,1 H 0,5% ± 1	159,1 H – 15,91 H 0,2% ± 1	15,91 mH – 1,591 mH 0,5% ± 1	1,591 mH – 159,1 μH 1% ± 1
120 Hz	26,52 kH – 13,26 kH 2% ± 1	13,26 kH – 1326 H 1% ± 1	1326 H – 132,6 H 0,5% ± 1	132,6 H – 13,26 mH 0,2% ± 1	13,26 mH – 1,326 mH 0,5% ± 1	1,326 mH – 132,6 μH 1% ± 1
1 kHz	3,183 kH – 1,591 kH 2% ± 1	1,591 kH – 159,1 H 1% ± 1	159,1 H – 15,91 H 0,5% ± 1	15,91 H – 1,591 mH 0,2% ± 1	1,591 mH – 159,1 μH 0,5% ± 1	159,1 μH – 15,91 μH 1% ± 1
10 kHz	318,3 H – 159,1 H 5% ± 1	159,1 H – 15,91 H 2% ± 1	15,91 H – 1,591 H 0,5% ± 1	1,591 H – 159,1 μH 0,2% ± 1	1,591 μH – 15,91 μH 0,5% ± 1	15,91 μH – 1,591 μH 1% ± 1
100 kHz (MT 4080 A) –	31,83 H – 15,91 H –	15,91 H – 1,591 H 5% ± 1	1,591 H – 159,1 H 2% ± 1	159,1 mH – 15,91 μH 0,4% ± 1	15,91 μH – 1,591 μH 2% ± 1	1,591 μH – 0,159 μH 5% ± 1

	20 MΩ – 10 MΩ	10 MΩ – 1 MΩ	1 MΩ – 100 kΩ	100 kΩ – 10 Ω	10 Ω – 1 Ω	1 Ω – 0,1 Ω
DCR	2% ± 1	1% ± 1	0,5% ± 1	0,2% ± 1	0,5% ± 1	1% ± 1
100 Hz	2% ± 1	1% ± 1	0,5% ± 1	0,2% ± 1	0,5% ± 1	1% ± 1
120 Hz	2% ± 1	1% ± 1	0,5% ± 1	0,2% ± 1	0,5% ± 1	1% ± 1
1 kHz	2% ± 1	1% ± 1	0,5% ± 1	0,2% ± 1	0,5% ± 1	1% ± 1
10 kHz	5% ± 1	2% ± 1	0,5% ± 1	0,2% ± 1	0,5% ± 1	1% ± 1
100 kHz (MT 4080 A) –	–	5% ± 1	2% ± 1	0,4% ± 1	2% ± 1	5% ± 1