

## Data Sheet

# 40,000-Count Dual-Display Handheld LCR Meters Models 878B, 879B, and 880



### Full Featured Handheld LCR Meters

The 878B, 879B, and 880 40,000-count handheld LCR meters measure inductance, capacitance, and resistance quickly and precisely. The 879B and 880 also measure impedance, Theta, and ESR. Additionally, the 880 offers capabilities typically only found in bench LCR meters such as a 4-terminal configuration, basic measurement accuracy up to 0.1%, test frequencies up to 100 kHz, selectable test signal levels and measurement rate.

Fast auto ranging and quick measurement configuration such as measurement parameter and test frequency selection make these meters very simple to operate. The meters also include handy functions such as data hold, Min/Max/Average recording, tolerance sorting, and relative mode.

Measurement data can continuously transfer to a PC via the meter's mini USB interface, using either the provided data logging software or SCPI commands sent from a custom program.

### ESR Measurements

Models 879B and 880 have the ability to measure the ESR (Equivalent Series Resistance) of capacitors. ESR is the sum of in-phase AC resistance of a capacitor and used to rate a capacitor's quality. An ideal capacitor would be lossless and have an ESR of zero. A capacitor could measure the correct capacitance value, yet still be defective, due to the component's excessive in-phase AC resistance. The 879B and 880 would be able to detect this faulty component.

### Features & Benefits

- 40,000 counts resolution on primary and 10,000 counts resolution on secondary display
- L, C, R and Z (879B & 880 only) primary measurements
- Automatic calculation of secondary parameters D, Q,  $\theta$ , ESR ( $\theta$ /ESR for 879B & 880 only), DCR (880 only)
- Accuracy up to 0.1% and selectable test frequencies up to 100 kHz (880 only)
- Fast auto range design for rapid, easy component measurements
- Auto detect mode for automatic component type identification and measurement type selection (880 only)
- Relative mode
- Visible and audible tolerance mode
- Data Hold and Min/Max/Average recording
- USB (Virtual COM) interface
- SCPI compliant commands for remote communication
- Software for datalogging and front panel emulation available as free download
- Configurable power-up-states
- 3 year warranty

### Applications

- Passive component troubleshooting
- Electronic assembly
- Quality control (component sorting)

| Specifications   | 878B             | 879B                             | 880                                               |
|------------------|------------------|----------------------------------|---------------------------------------------------|
| Measurements     | L, C, R, D, Q    | L, C, R, Z, D, Q, $\theta$ , ESR | L, C, R, Z, D, Q, $\theta$ , ESR & DCR            |
| Basic Accuracy   | 0.5%             | 0.5%                             | 0.1%                                              |
| Test Frequency   | 120 Hz, 1 kHz    | 100 Hz, 120 Hz, 1 kHz, 10 kHz    | 100 Hz, 120 Hz, 1 kHz, 10 kHz, 100 kHz            |
| Test Signal      | 0.6 Vrms         | 0.6 Vrms                         | 0.3 Vrms, 0.6 Vrms, 1 Vrms<br>DCR: 1 Vdc          |
| Backlit Display  | -                | √                                | √                                                 |
| Auto Detect Mode | -                | -                                | √                                                 |
| Tolerance Mode   | 1%, 5%, 10%      | 1%, 5%, 10%, 20%                 | 1%, 5%, 10%, 20%                                  |
| Measurement Rate | 1.5 readings/sec | 1.5 readings/sec                 | 4 readings/sec (fast),<br>1.5 readings/sec (slow) |

## Easy Front Panel Operation



## Powerful Features

### Flexible Operation

A tilt stand provides position flexibility for viewing and operating the meter. The over-molding rubber case protects the meter for better durability. A single 9 V battery (16 hours with alkaline battery) or the included 12 V power adapter (with model 879B & 880) can be used to power the meter, giving the user options for portable or bench-top use.

Model 880 includes a rechargeable Ni-MH battery that can provide up to six hours of battery life.

### Four-terminal shielded configuration (880 only)

The 880 provides a 4-terminal socket with separate sensing and current leads plus guard terminal, a configuration typically only found in bench LCR meters. When using the included 4-terminal Kelvin test leads, this configuration can reduce the effect of lead impedances and

contact resistance. This minimizes measurement errors and improves accuracy especially in the lower impedance range.

### Faster Auto Range

The advanced auto range circuit design allows for faster measurements without the need to manually select ranges.

### Dual Display

The dual display allows multiple measurements to be conveniently displayed at once.

### Auto Detect Mode (880 only)

With the push of a single button, the Auto detect function will automatically identify primary parameters L, C or R and related secondary parameters, and set the suitable series/parallel equivalent mode and range.

### Increase Productivity with PC Connectivity

Free downloadable software is available for your handheld LCR meter. View and log measurements and setup and configure the instrument's measurement parameters.



## Accessories

|                                                                                     |                                                                                     |                                                                                      |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|   |  |  |
| AC adapter                                                                          | USB cable                                                                           | Kelvin clip test leads (TL8KCI)                                                      |
|  |  |  |
| Shorting plate                                                                      | Alligator test leads                                                                | SMD tweezer (TL8SM)                                                                  |

| Model | Alligator test leads | USB cable | AC adapter | Shorting plate | Kelvin clip test leads | SMD tweezer |
|-------|----------------------|-----------|------------|----------------|------------------------|-------------|
| 878B  | ●                    | ●         | -          | -              | -                      | -           |
| 879B  | ●                    | ●         | ●          | -              | -                      | -           |
| 880   | ●                    | ●         | ●          | ●              | ●                      | ●           |

“●” Included

## Specifications

### General

| Model                            | 878B                                                                                                     | 879B                              | 880                                                                                                                                                                                                      |
|----------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement Parameters           | L/C/R/D/Q                                                                                                | L/C/R/Z/D/Q/θ/ESR                 | L/C/R/Z/DCR/D/Q/θ/ESR                                                                                                                                                                                    |
| Test Frequency Setting           | 120 Hz, 1 kHz                                                                                            | 100 Hz, 120 Hz, 1 kHz, 10 kHz     | 100 Hz, 120 Hz, 1 kHz, 10 kHz, 100 kHz                                                                                                                                                                   |
| Actual Frequency (±0.02%)        | 120.048 Hz, 1 kHz                                                                                        | 100 Hz, 120.048 Hz, 1 kHz, 10 kHz | 100 Hz, 120.048 Hz, 1 kHz, 10 kHz, 100 kHz                                                                                                                                                               |
| Tolerance Mode                   | 1%, 5%, 10%                                                                                              | 1%, 5%, 10%, 20%                  |                                                                                                                                                                                                          |
| Backlit Display                  | None                                                                                                     | Yes                               |                                                                                                                                                                                                          |
| Test Signal Level (Typical)      | 0.6 Vrms                                                                                                 |                                   | 0.3 Vrms, 0.6 Vrms, 1 Vrms.<br>DCR signal: 1 Vdc                                                                                                                                                         |
| Measuring Circuit Mode           | Series mode / Parallel mode                                                                              |                                   |                                                                                                                                                                                                          |
| Basic Accuracy                   | 0.5%                                                                                                     |                                   | 0.1%                                                                                                                                                                                                     |
| Ranging Mode                     | Auto                                                                                                     |                                   |                                                                                                                                                                                                          |
| Measuring Terminals              | 3 terminals with sockets                                                                                 |                                   | 3-terminal, 5-terminal with sockets                                                                                                                                                                      |
| Measurement Rate                 | 1.5 readings/sec (auto range search not included)                                                        |                                   | LCRZ: 4 readings/sec (Fast), 1.5 readings/sec (Slow)<br>DCR: 3 readings/sec (Fast), 2.5 readings/sec (Slow)                                                                                              |
| Response Time (Typical)          | 680 ms                                                                                                   |                                   |                                                                                                                                                                                                          |
| Auto Power-Off                   | 5, 15, 30, 60 minutes, none                                                                              |                                   |                                                                                                                                                                                                          |
| Operating Temperature            | 32° F to 104° F (0° to 40° C); 0-70% R.H.                                                                |                                   | 32° F to 104° F (0° to 40° C); ≤90% R.H.                                                                                                                                                                 |
| Storage Temperature              | -4° F to 122 °F (-20° to +50° C); 0-80% R.H.                                                             |                                   | -4° F to 104° F (-20° to 50° C); 0-90% R.H.                                                                                                                                                              |
| Low Battery Indication (Typical) | 6.8 V                                                                                                    |                                   |                                                                                                                                                                                                          |
| Battery Life (Typical)           | 16 hours using alkaline battery (at 1 kHz with 100 Ω DUT, backlight off), 6 hours using Ni-MH (880 only) |                                   |                                                                                                                                                                                                          |
| Power Consumption (Typical)      | 28 mA (under full power battery) for operation/ 2 μA (11 μA 880 only) after power-off.                   |                                   |                                                                                                                                                                                                          |
| Power Requirements               | 9V battery or Ext. AC adapter*: DC 12 Vmin –15 Vmax. (load 50 mA Min.)                                   |                                   |                                                                                                                                                                                                          |
| Dimensions (L x W x H)           | 7.5" x 3.5" x 1.6" (190 x 90 x 41) mm                                                                    |                                   |                                                                                                                                                                                                          |
| Weight                           | 0.767 lbs (348 g) without battery                                                                        |                                   |                                                                                                                                                                                                          |
| Safety                           | EN61010-1:2001, EU Low Voltage Directive 2006/95/EC                                                      |                                   |                                                                                                                                                                                                          |
| Electromagnetic Compatibility    | Meets EMC Directive 2004/108/EC, EN61326-1:2006                                                          |                                   |                                                                                                                                                                                                          |
| <b>Three-Year Warranty</b>       |                                                                                                          |                                   |                                                                                                                                                                                                          |
| Standard Accessories             | Banana-to-alligator test leads, 9 V battery, mini USB interface cable, manual, AC adapter* (879B only)   |                                   | Banana-to-alligator test leads, Ni-MH 9 V battery, mini USB interface cable, Quick Start insert, AC adapter* shorting plate, four-terminal shielded Kelvin clip test leads (TL8KCI), SMD tweezer (TL8SM) |

\* The 879B and 880 include a 120 V AC adapter. For a 230 V AC adapter, order model 879B-220 V or 880-220 V. The AC adapters are optional accessories for the 878B.

## Specifications (cont.)

### Accuracy Specifications

Accuracy is expressed as  $\pm$ (% of reading + number of last significant digits) for readings falling within 10% to 100% of full scale of range.

Valid after 30 minutes of warm up time, operation at 23 °C + 5 °C, <75% R.H. and slowest measurement speed.

880 only: When selecting a test signal level of 0.3V, the measurement accuracy is twice the accuracy listed in the table.

|                 | Range                  | Max Display                   | Lx Accuracy (878B & 879B) | Lx Accuracy (880 only) | DF (Dx <0.5) (878B & 879B) | DF (Dx <0.5) (880 only) | Measurement Mode              |
|-----------------|------------------------|-------------------------------|---------------------------|------------------------|----------------------------|-------------------------|-------------------------------|
| 100 Hz* /120 Hz | 1000 H                 | 1000.0 H                      | 1.5% + 3 digits           | 1% + 3 digits          | 1.5% + 50 digits           | 1% + 3 digits           | Parallel                      |
|                 | 400 H                  | 399.99 H                      | 0.7% + 2 digits           | 0.35% + 2 digits       | 0.7% + 50 digits           | 0.35% + 2 digits        | Parallel                      |
|                 | 40 H                   | 39.999 H                      | 0.7% + 2 digits           | 0.1% + 2 digits        | 0.7% + 50 digits           | 0.1% + 2 digits         | Series/ Parallel (Parallel)** |
|                 | 4000 mH<br>4 H**       | 3999.9 mH<br>3.9999 H**       | 0.5% + 1 digits           | 0.1% + 2 digits        | 0.5% + 50 digits           | 0.1% + 2 digits         | Series<br>Series/Parallel**   |
|                 | 400 mH                 | 399.99 mH                     | 0.6% + 2 digits           | 0.1% + 2 digits        | 0.6% + 50 digits           | 0.1% + 2 digits         | Series                        |
|                 | 40 mH                  | 39.999 mH                     | 0.9% + 2 digits           | 0.45% + 2 digits       | 0.9% + 50 digits           | 0.45% + 2 digits        | Series                        |
|                 | 4 mH                   | 3.9999 mH                     | 2.8% + 3 digits           | 1.40% + 5 digits       | 2.8% + 50 digits           | Not Specified           | Series                        |
| 1 kHz           | 100 H                  | 100.00 H                      | 1.5% + 3 digits           | 1% + 3 digits          | 1.5% + 50 digits           | 1% + 3 digits           | Parallel                      |
|                 | 40 H                   | 39.999 H                      | 0.7% + 2 digits           | 0.35% + 2 digits       | 0.7% + 50 digits           | 0.35% + 3 digits        | Parallel                      |
|                 | 4000 mH<br>4 H**       | 3999.9 mH<br>3.9999 H**       | 0.7% + 2 digits           | 0.1% + 2 digits        | 0.7% + 50 digits           | 0.1% + 2 digits         | Series/ Parallel (Parallel)** |
|                 | 400 mH                 | 399.99 mH                     | 0.5% + 1 digits           | 0.1% + 2 digits        | 0.5% + 50 digits           | 0.1% + 2 digits         | Series<br>Series/ Parallel    |
|                 | 40 mH                  | 39.999 mH                     | 0.6% + 2 digits           | 0.1% + 2 digits        | 0.6% + 50 digits           | 0.1% + 2 digits         | Series                        |
|                 | 4000 $\mu$ H<br>4 mH** | 3999.9 $\mu$ H<br>3.9999 mH** | 0.9% + 2 digits           | 0.45% + 2 digits       | 0.9% + 50 digits           | 0.45% + 2 digits        | Series                        |
|                 | 400 $\mu$ H            | 399.99 $\mu$ H                | 2.8% + 3 digits           | 1.4% + 5 digits        | 2.8% + 50 digits           | Not Specified           | Series                        |
| 10 kHz*         | 1000 mH                | 1000.0 mH                     | 1.5% + 3 digits           | 0.8% + 3 digits        | 1.5% + 50 digits           | 0.8% + 3 digits         | Parallel                      |
|                 | 400 mH                 | 399.99 mH                     | 0.7% + 2 digits           | 0.35% + 2 digits       | 0.7% + 50 digits           | 0.35% + 2 digits        | Series/ Parallel (Parallel)** |
|                 | 40 mH                  | 39.999 mH                     | 0.5% + 1 digits           | 0.1% + 2 digits        | 0.5% + 50 digits           | 0.1% + 2 digits         | Series<br>Series/ Parallel**  |
|                 | 4000 $\mu$ H<br>4 mH** | 3999.9 $\mu$ H<br>3.9999 mH** | 0.6% + 2 digits           | 0.3% + 2 digits        | 0.6% + 50 digits           | 0.3% + 2 digits         | Series                        |
|                 | 400 $\mu$ H            | 399.99 $\mu$ H                | 0.9% + 2 digits           | 0.45% + 2 digits       | 0.9% + 50 digits           | 0.45% + 2 digits        | Series                        |
|                 | 40 $\mu$ H             | 39.99 $\mu$ H                 | 2.8% + 3 digits           | 1.4% + 5 digits        | 2.8% + 50 digits           | Not Specified           | Series                        |
| 100 kHz**       | 100 mH                 | 399.99 mH                     | N/A                       | 1.5% + 5 digits        | N/A                        | 1.5% + 5 digits         | Parallel                      |
|                 | 40 mH                  | 39.999 mH                     | N/A                       | 1.5% + 2 digits        | N/A                        | 1.5% + 2 digits         | Parallel                      |
|                 | 4 mH                   | 3.9999 mH                     | N/A                       | 0.5% + 2 digits        | N/A                        | 0.5% + 2 digits         | Series/ Parallel              |
|                 | 400 $\mu$ H            | 399.99 $\mu$ H                | N/A                       | 0.5% + 2 digits        | N/A                        | 0.5% + 2 digits         | Series                        |
|                 | 40 $\mu$ H             | 39.999 $\mu$ H                | N/A                       | 0.8% + 5 digits        | N/A                        | 0.8% + 5 digits         | Series                        |
|                 | 4 $\mu$ H              | 3.999 $\mu$ H                 | N/A                       | 2.5% + 10 digits       | N/A                        | Not Specified           | Series                        |

\* = Models 879B & 880 only, \*\* = Model 880 only



**Specifications (cont.)**

|             |                | Range             | Max Display              | Cx Accuracy (878B & 879B) | Cx Accuracy (880 only) | DF (Dx <0.5) (878B & 879B) | DF (Dx <0.5) (880 only) | Measurement Mode              |
|-------------|----------------|-------------------|--------------------------|---------------------------|------------------------|----------------------------|-------------------------|-------------------------------|
| Capacitance | 100 Hz*/120 Hz | 20 mF             | 20.000 mF                | 8% + 3 digits             | 5% + 5 digits          | 8% + 50 digits             | 5% + 5 digits           | Series                        |
|             |                | 4000 µF (4 mF)**  | 3999.9 µF (3.9999 mF)**  | 2% + 2 digits             | 1% + 3 digits          | 2% + 50 digits             | 1% + 3 digits           | Series                        |
|             |                | 400 µF            | 399.99 µF                | 0.7% + 2 digits           | 0.35% + 2 digits       | 0.7% + 50 digits           | 0.35% + 2 digits        | Series                        |
|             |                | 40 µF             | 39.999 nF                | 0.5% + 1 digits           | 0.1% + 2 digits        | 0.5% + 50 digits           | 0.1% + 2 digits         | Series                        |
|             |                | 4000 nF<br>4 µF** | 3999.9 nF<br>3.9999 µF** | 0.5% + 1 digits           | 0.1% + 2 digits        | 0.5% + 50 digits           | 0.1% + 2 digits         | Series/ Parallel              |
|             |                | 400 nF            | 399.99 nF                | 0.5% + 2 digits           | 0.1% + 2 digits        | 0.5% + 50 digits           | 0.1% + 2 digits         | Series/ Parallel (Parallel)** |
|             |                | 40 nF             | 39.999 nF                | 0.7% + 1 digits           | 0.35% + 3 digits       | 0.7% + 50 digits           | 0.35% + 3 digits        | Parallel                      |
|             |                | 4 nF              | 3.9999 nF                | 2.5% + 2 digits           | 1.25% + 5 digits       | 2.5% + 50 digits           | Not Specified           | Parallel                      |
| Capacitance | 1 kHz          | 1000 µF           | 1000.0 µF                | 3.7% + 3 digits           | 2% + 5 digits          | 3.7% + 50 digits           | 2% + 5 digits           | Series                        |
|             |                | 400 µF            | 399.99 µF                | 2% + 2 digits             | 1% + 3 digits          | 2% + 50 digits             | 1% + 3 digits           | Series                        |
|             |                | 40 µF             | 39.999 µF                | 0.7% + 2 digits           | 0.35% + 2 digits       | 0.7% + 50 digits           | 0.35% + 2 digits        | Series                        |
|             |                | 4000 nF<br>4 µF** | 3999.9 nF<br>3.9999 µF** | 0.5% + 1 digit            | 0.1% + 2 digits        | 0.5% + 50 digit            | 0.1% + 2 digits         | Series                        |
|             |                | 400 nF            | 399.99 nF                | 0.5% + 2 digits           | 0.1% + 2 digits        | 0.5% + 50 digits           | 0.1% + 2 digits         | Series/ Parallel              |
|             |                | 40 nF             | 39.999 nF                | 0.5% + 2 digits           | 0.1% + 2 digits        | 0.5% + 50 digits           | 0.1% + 2 digits         | Series/ Parallel (Parallel)** |
|             |                | 4000 pF<br>4 nF** | 3999.9 pF<br>3.9999 nF** | 0.7% + 2 digits           | 0.35% + 3 digits       | 0.7% + 50 digits           | 0.35% + 3 digits        | Parallel                      |
|             |                | 400 pF            | 399.9 pF                 | 2.5% + 2 digits           | 1.25% + 5 digits       | 2.5% + 50 digits           | Not Specified           | Parallel                      |
| Capacitance | 10 kHz*        | 100 µF            | 100.00 µF                | 3.9% + 5 digits           | 3% + 5 digits          | 3.9% + 50 digits           | 3% + 5 digits           | Series                        |
|             |                | 40 µF             | 39.999 µF                | 3.7% + 3 digits           | 1.5% + 3 digits        | 3.7% + 50 digits           | 1.5% + 3 digits         | Series                        |
|             |                | 4000 nF<br>4 nF** | 3999.9 nF<br>3.9999 nF** | 0.7% + 2 digits           | 0.35% + 2 digits       | 0.7% + 50 digits           | 0.35% + 2 digits        | Series                        |
|             |                | 400 nF            | 399.99 nF                | 0.5% + 2 digits           | 0.1% + 2 digits        | 0.5% + 50 digits           | 0.1% + 2 digits         | Series                        |
|             |                | 40 nF             | 39.999 nF                | 0.5% + 1 digit            | 0.1% + 2 digits        | 0.5% + 50 digit            | 0.1% + 2 digits         | Series/ Parallel              |
|             |                | 4000 pF           | 3999.9 nF                | 0.5% + 2 digits           | 0.1% + 2 digits        | 0.5% + 50 digits           | 0.1% + 2 digits         | Series/ Parallel (Parallel)** |
|             |                | 400 pF            | 399.99 pF                | 0.7% + 2 digits           | 0.35% + 3 digits       | 0.7% + 50 digits           | 0.35% + 3 digits        | Parallel                      |
|             |                | 40 pF             | 39.99 pF                 | 2.5% + 2 digits           | 1.5% + 5 digits        | 2.5% + 50 digits           | Not Specified           | Parallel                      |
| Capacitance | 100 kHz**      | 10 µF             | 10.000 µF                | N/A                       | 6% + 20 digits         | N/A                        | 6% + 20 digits          | Series                        |
|             |                | 4 µF              | 3.9999 µF                | N/A                       | 2.5% + 10 digits       | N/A                        | 2.5% + 10 digits        | Series                        |
|             |                | 400 nF            | 399.99 nF                | N/A                       | 0.8% + 5 digits        | N/A                        | 0.8% + 5 digits         | Series                        |
|             |                | 40 nF             | 39.999 nF                | N/A                       | 0.5% + 2 digits        | N/A                        | 0.5% + 2 digits         | Series/ Parallel              |
|             |                | 4 nF              | 3.9999 nF                | N/A                       | 0.5% + 2 digit         | N/A                        | 0.5% + 2 digit          | Parallel                      |
|             |                | 400 pF            | 399.99 pF                | N/A                       | 0.8% + 2 digits        | N/A                        | 0.8% + 2 digits         | Parallel                      |
|             |                | 40 pF             | 39.999 pF                | N/A                       | 1.2% + 5 digits        | N/A                        | 1.2% + 5 digits         | Parallel                      |
|             |                | 4 pF              | 4.999 pF                 | N/A                       | Not Specified          | N/A                        | Not Specified           | Parallel                      |

## Specifications (cont.)

|                       |                                | Range                            | Max Display                             | R/Zx Accuracy<br>(878B - 879B) | R/Zx Accuracy<br>(880 only) | $\theta$ Accuracy<br>(878B - 879B) | $\theta$ Accuracy<br>(880 only) | Measurement<br>Mode              |
|-----------------------|--------------------------------|----------------------------------|-----------------------------------------|--------------------------------|-----------------------------|------------------------------------|---------------------------------|----------------------------------|
| Resistance/Impedance* | 100 Hz*/120 Hz/ 1 kHz/10 kHz** | 10 M $\Omega$                    | 10.000 M $\Omega$                       | 5.5% + 3 digits                | 3% + 3 digits               | $\pm 3.2^\circ$                    | $\pm 1.75^\circ$                | Parallel                         |
|                       |                                | 4000 k $\Omega$                  | 3999.9 k $\Omega$                       | 2.5% + 2 digits                | 1% + 3 digits               | $\pm 1.5^\circ$                    | $\pm 0.75^\circ$                | Parallel                         |
|                       |                                | 400 k $\Omega$                   | 399.99 k $\Omega$                       | 0.7% + 2 digits                | 0.35% + 2 digits            | $\pm 0.4^\circ$                    | $\pm 0.25^\circ$                | Parallel                         |
|                       |                                | 40 k $\Omega$                    | 39.999 k $\Omega$                       | 0.5% + 2 digits                | 0.1% + 2 digits             | $\pm 0.3^\circ$                    | $\pm 0.1^\circ$                 | Series/ Parallel<br>(Parallel)** |
|                       |                                | 4000 $\Omega$<br>4 k $\Omega$ ** | 3999.9 $\Omega$<br>3.9999 k $\Omega$ ** | 0.5% + 2 digits                | 0.1% + 2 digits             | $\pm 0.3^\circ$                    | $\pm 0.1^\circ$                 | Series/ Parallel                 |
|                       |                                | 400 $\Omega$                     | 399.99 $\Omega$                         | 0.5% + 2 digits                | 0.1% + 2 digits             | $\pm 0.3^\circ$                    | $\pm 0.1^\circ$                 | Series                           |
|                       |                                | 40 $\Omega$                      | 39.999 $\Omega$                         | 0.7% + 2 digits                | 0.35% + 2 digits            | $\pm 0.4^\circ$                    | $\pm 0.25^\circ$                | Series                           |
|                       |                                | 4 $\Omega$                       | 3.9999 $\Omega$                         | 2% + 2 digits                  | 1% + 3 digits               | $\pm 1.2^\circ$                    | $\pm 0.6^\circ$                 | Series                           |
|                       |                                | 0.4 $\Omega$ **                  | 0.3999 $\Omega$ **                      | Not Specified                  | 3% + 5 digits               | Not Specified                      | Not Specified                   | Series                           |
| Impedance**           | 100 kHz**                      | 10 M $\Omega$                    | 10.000 M $\Omega$                       | N/A                            | 8.0% + 20 digits            | N/A                                | $\pm 4.6^\circ$                 | Parallel                         |
|                       |                                | 4 M $\Omega$                     | 3.9999 M $\Omega$                       | N/A                            | 3% + 10 digits              | N/A                                | $\pm 1.75^\circ$                | Parallel                         |
|                       |                                | 400 k $\Omega$                   | 399.99 k $\Omega$                       | N/A                            | 1.2% + 5 digits             | N/A                                | $\pm 0.69^\circ$                | Parallel                         |
|                       |                                | 40 k $\Omega$                    | 39.999 k $\Omega$                       | N/A                            | 0.8% + 2 digits             | N/A                                | $\pm 0.46^\circ$                | Parallel                         |
|                       |                                | 4 k $\Omega$                     | 3.9999 k $\Omega$                       | N/A                            | 0.5% + 2 digits             | N/A                                | $\pm 0.3^\circ$                 | Series/ Parallel                 |
|                       |                                | 400 $\Omega$                     | 399.99 $\Omega$                         | N/A                            | 0.5% + 2 digits             | N/A                                | $\pm 0.3^\circ$                 | Series                           |
|                       |                                | 40 $\Omega$                      | 39.999 $\Omega$                         | N/A                            | 0.8% + 5 digits             | N/A                                | $\pm 0.46^\circ$                | Series                           |
|                       |                                | 4 $\Omega$                       | 3.9999 $\Omega$                         | N/A                            | 2.5% + 10 digits            | N/A                                | $\pm 1.43^\circ$                | Series                           |
|                       |                                | 0.4 $\Omega$                     | 3.9999 $\Omega$                         | N/A                            | 6% + 20 digits              | N/A                                | Not Specified                   | Series                           |

|            |                                 | Range         | Max Display    | ESR Accuracy    | Measurement Mode |
|------------|---------------------------------|---------------|----------------|-----------------|------------------|
| ESR (879B) | 100 Hz/120 Hz/<br>1 kHz/ 10 kHz | 1000 $\Omega$ | 999.9 $\Omega$ | 0.5% + 2 digits | Series           |
|            |                                 | 100 $\Omega$  | 99.99 $\Omega$ | 0.5% + 2 digits | Series           |
|            |                                 | 10 $\Omega$   | 9.999 $\Omega$ | 0.7% + 2 digits | Series           |
|            |                                 | 1 $\Omega$    | .9999 $\Omega$ | 2% + 2 digits   | Series           |

\* = Models 879B & 880 only. \*\* = Model 880 only

## Specifications (cont.)

|           | Range  | Max Display | Accuracy       |
|-----------|--------|-------------|----------------|
| DCR (880) | 20 MΩ  | 20.000 MΩ   | 2 %+20 digits  |
|           | 4 MΩ   | 3.9999 MΩ   | 1%+10 digits   |
|           | 400 kΩ | 399.99 kΩ   | 0.5%+5 digits  |
|           | 40 kΩ  | 39.999 kΩ   | 0.1%+2 digits  |
|           | 4 kΩ   | 3.9999 kΩ   | 0.1%+2 digits  |
|           | 400 Ω  | 399.99 Ω    | 0.1%+2 digits  |
|           | 40 Ω   | 39.999 Ω    | 0.1%+2 digits  |
|           | 4 Ω    | 3.9999 Ω    | 0.5%+10 digits |
|           | 0.4 Ω  | 0.3999 Ω    | 2%+20 digits   |

Notes: Equivalent series resistance (ESR) accuracy for the 880 is calculated according to the following formula:

$$R_{se} = \pm X_x \times \theta_e$$

where  $X_x$  is the measured impedance,  $2\pi fL_x$  or  $\frac{1}{2\pi fC_x}$ , and  $\theta_e$  is the phase angle accuracy,  $\theta_e \times \frac{\pi}{180}$ .