

LCR METER

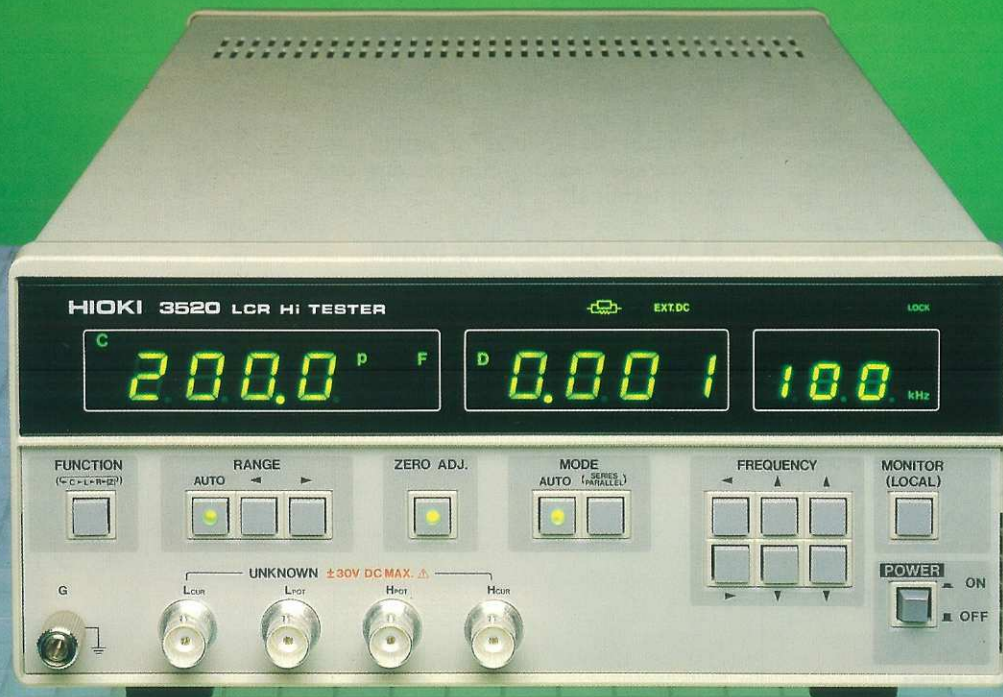
HIOKI

LCR HI TESTER

3520

Tests at frequencies from 40 Hz to 100 kHz with signal levels up to 1 V_{rms}.

Allows characterization of parts and materials under real operating conditions.



Wide Range of Test Frequencies

To evaluate the reliability of electronic components and materials such as capacitors, coils, resistors, and insulators, signals used for testing must closely resemble the conditions under which the components will be used. The 3520 LCR meter makes this possible by providing a wide range of test frequencies and signal levels.

Test frequency can be varied from 40 Hz to 100 kHz, and 11 different signal levels can be selected ranging up to 1 V_{rms}. A wide range of useful functions is also provided, including a protection circuit against residual capacitor charges and a lock function to guard against incorrect test readings. Ease of use, high-reliability design, and features such as a GP-IB interface for automatic measurement assure that this LCR meter will meet every need.

■ Wide range of test frequencies

Test frequency can be varied over a wide range, from 40 Hz to 100 kHz. This makes it possible to test all parameters under conditions that closely resemble those encountered in actual use.

■ Selectable signal levels (with monitor)

Test signal level can be selected in 11 steps up to 1 VAC_{rms} (max 100 mA). A level monitor keeps you posted on the current level.

■ Selectable test modes

Two types of measurement circuits are provided: series equivalent and parallel equivalent. The circuit used can be selected either automatically or manually as suits the device being tested.

■ GP-IB interface (with the 3520-01 type) for automatic measurement systems

The GP-IB interface supports automatic measurement of all parameters. Frequency and signal level settings can be made through the GP-IB interface with a greater degree of precision than is possible from the front panel.

Frequency: 40 Hz to 9.99 Hz
(10 Hz steps)
10 kHz to 100 kHz
(100 Hz steps)
Signal level: 50 mV_{rms} to 1 V_{rms}
(5 mV steps)

■ Residual charge protection circuit for capacitors

A residual charge protection circuit protects the LCR meter from damage by residual capacitor charges (up to 550 VDC).

■ C-D, L-Q, and |Z|·θ display

Measured values of C and D (loss factor), L and Q (1/D), or |Z| and θ can be displayed simultaneously. 3 1/2-digit displays are used for L, C, R, and Z, with a maximum reading of 2020.

■ 4-terminal measurement system

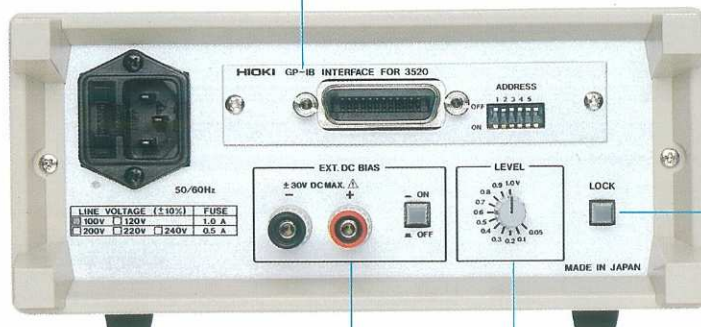
Five terminals are used for testing (two for voltage, two for current, and one guard terminal).

■ Allows DC biasing (when measuring capacitances only)

External DC voltages (up to 30 V) can be applied through the tester to devices being tested.

■ Function lock switch

Function lock assures that settings made will remain unchanged when power is turned off or the front panel switches are pressed. This guards against incorrect readings due to accidental setting changes.

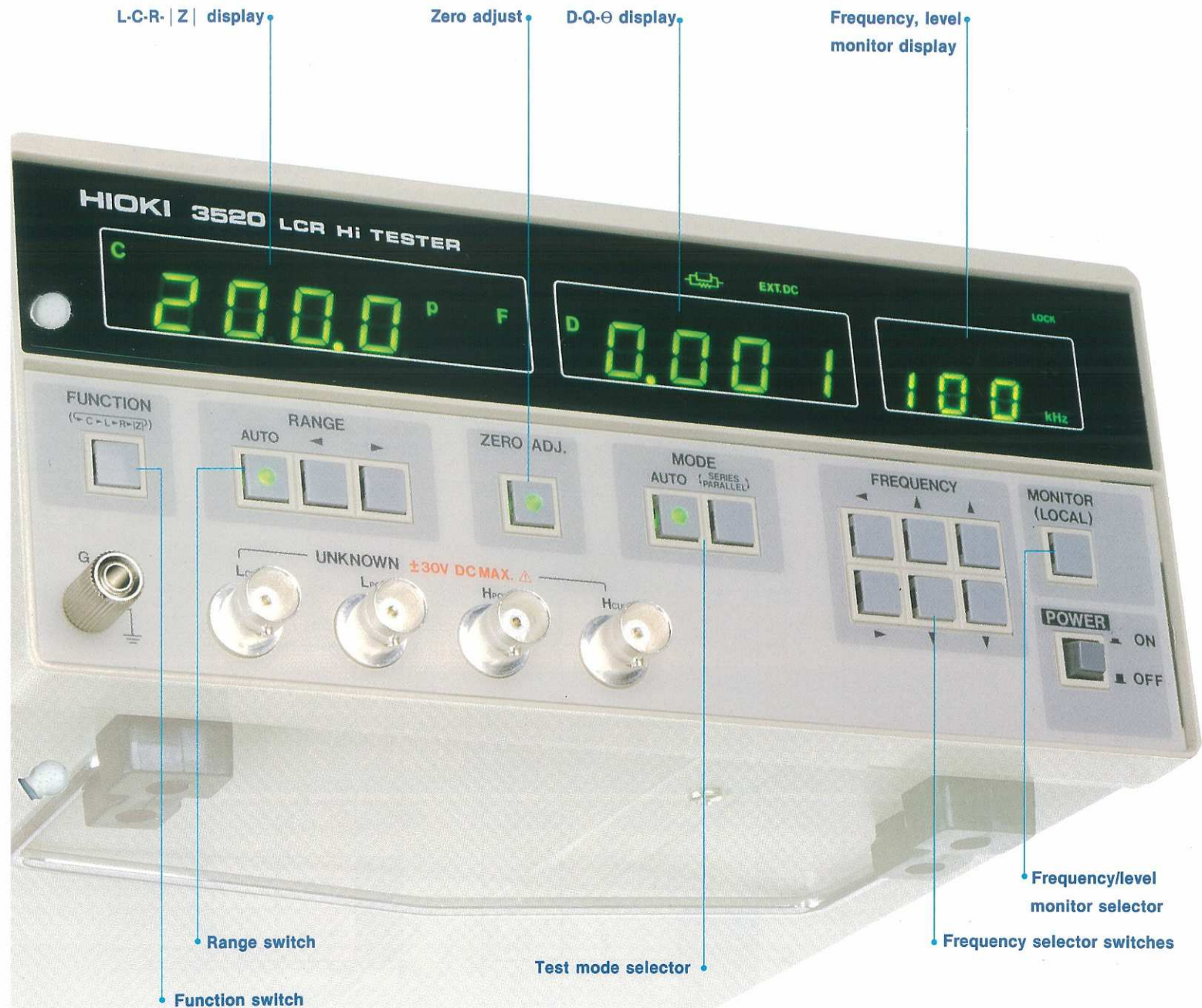


DC bias input

Signal level

GP-IB interface (with 3520-01)

For Automation of Device Testing Systems



Fits Every Need

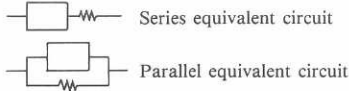
- Research and development**
 For evaluating equivalent circuit characteristics of electronic devices
- Manufacturing**
 For testing/inspecting electronic components and materials
- Receiving inspection**
 For checking characteristics of devices against order specifications
- Quality assurance**
 For evaluating quality of electronic components
 Using low frequencies, can also measure characteristics of power supply transformers.

Specifications

Settings

- (1) C (capacitance), D (loss factor)
- (2) L (inductance), Q (1/D)
- (3) R (resistance)
- (4) |Z| (impedance), θ (phase angle)

Measurement circuit modes: Automatic or manual



Measurement frequencies:

- 40 Hz to 990 Hz (in 10-Hz steps)
- 1.00 kHz to 9.90 kHz (in 0.1 kHz steps)
- 10 kHz to 100 kHz (in 1 kHz steps)

Measurement signal levels:

- 0.05 V to 1.0 V_{rms} (11 ranges)
- Max 50 mA_{rms}, through series-connected 20-ohm current limiting resistance.

Measurement range, accuracy*1:

C	D	Q
0.1pF~2020μF 8 ranges ±(0.3%rdg.+2dgt.+α) typ	0.001~2.020 ±(1%rdg.+0.005α+5dgt.)typ	0.5~999 calculated from 1/D
L	R, Z	θ
0.1μH~202.0H 7 ranges ±(0.3%rdg.+2dgt.+α)typ	0.001Ω~2.020MΩ 7 ranges ±(0.3%rdg.+2dgt.+α)typ	-90.0° ~ +90.0° ±[(1+α/10)*β+5dgt.]typ

* 1--- Measurement range and accuracy vary according to Measurement frequency and signal level. See "Measurement Range Accuracy" for details.

α and β indicate accuracy of calculation. Temperature range for which rated accuracy is assured: 23°C±5°C

Measurement time:

- 40Hz~990 Hz approx. 960ms
- 1kHz~100kHz approx. 360ms
- Not including time required for calculation and automatic range switching.

Signal level monitoring:

Measurement voltage across terminals of device being measured can be monitored. Resolution is 10 mV.

Range selection:

Automatic or manual
Display: 3 1/2 digits; displays up to 2020 (θ, test frequency, and signal level displayed with 3 digits).

Input terminals: 5-terminal configuration, including voltage, current (BNC connector), and guard terminal. (Uses 9140 4-terminal probe).

Residual charge protection:

50 VDC max
DC bias: Up to 30 V external bias when measuring capacitance.

ZERO ADJ function: Automatically corrects for residual test probe components.

- C - 10 pF or less; L - 10 μH or less;
- R - 0.1 Ω or less

Lock function: Allows settings of all control switches to be locked and stored in memory.

Temperature coefficient: 200ppm/°C

Operating temperature/humidity: 0°C~40°C, max 80% RH (with no condensation).

Storage temperature: -10°C~50°C

Power supply: 100, 120, 220, or 240 VAC±10%, 240V+4% -10%, max 250V (specify at order) 50/60 Hz

Dimensions: 96H × 218W × 429D mm

Weight: Approx 3.8 kg

Accessories: Power cord (1), 9140 4-terminal probe (1), spare fuse (1)

Ordering Information

3520

3520-01 with GP-IB Interface

- 1) All settings can be made with front panel switches.
- 2) Frequency setting
40 Hz to 9.99 kHz in 10 Hz steps
10 kHz to 100 kHz in 100 Hz steps
- 3) Measurement signal level
50 mV_{rms} to 1 V_{rms} in 5 mV steps

3520-02 with Printer Interface (Available soon)

9200 Digital printer is option

When connected to the 9200 digital printer, allow R, |Z|, -θ, C-D, L-Q, and frequencies to be printed out for reference and comparison.

Note: GP-IB and printer interfaces cannot be used together.

Optional Accessories

- 9140 4-terminal probe
- 9200 digital printer

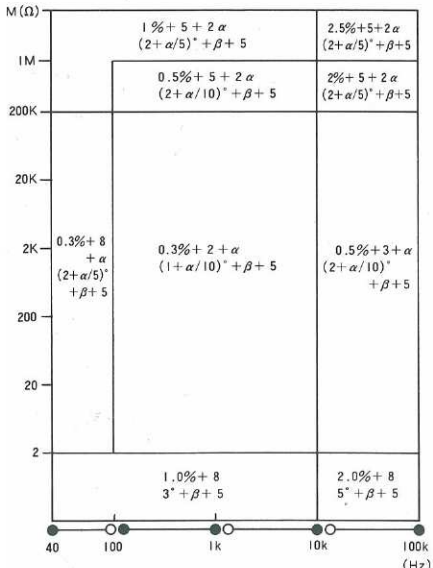
Standard packing

Sets	N.W.(kg)	G.W.(kg)	M ³
1	6.2	8.2	0.13

Measurement Range Accuracy (with 1 V measurement signal level, automatic measurement mode, ZERO ADJ function ON, and 9140 4-terminal probe)

[R, |Z| - θ accuracy table]

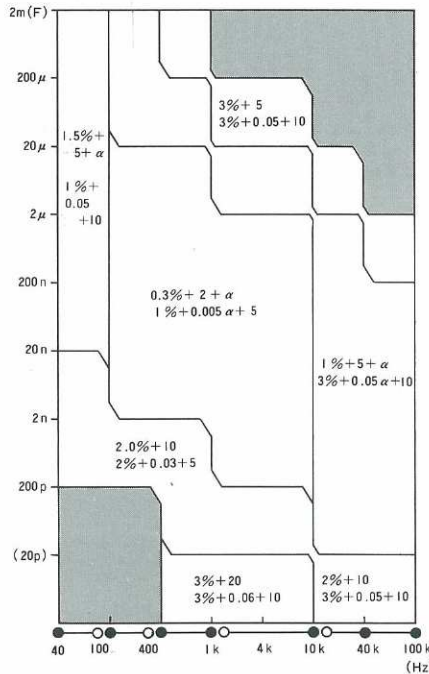
(Signal level: 1 V_{rms} when ZERO ADJ is operating and standard probe is used)
Allowable phase angle for the R range: 0° ± 6°



Top—Accuracy of R and |Z|: %rdg+count+calculation error
Bottom—Accuracy of θ: absolute value (including calculation error)+count

[C-D accuracy table]

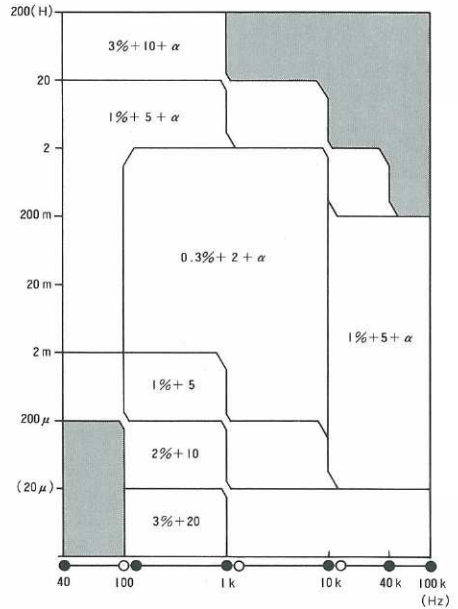
Shaded areas cannot be measured.
Allowable phase angle for the C range: 84° or greater (D ≤ 10)



Top—Accuracy of C: %rdg+count+calculation error
Bottom—Accuracy of D: %rdg+absolute value+count

[L-Q accuracy table] (Q is calculated as 1/D)

Shaded areas cannot be measured.
Allowable phase angle for the L range: 84° or greater (Q ≥ 10)



Accuracy of L: %rdg+count+calculation error

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