

# HIOKI



Three sets of parameters—measurement frequency, signal level, parameters, and thresholds—can be set.

## LCR Meter with Internal Comparator for Line Use LCR Hi-Tester 3521

LCR HI TESTER

# 3521



LCR Meter

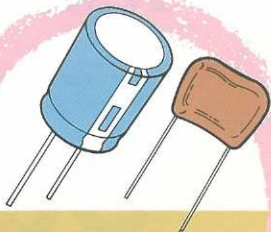
Frequency range of 40Hz to 100kHz, signal level variable from 0.05 to 2.55Vrms

# Allows Testing under Highly Realistic Conditions



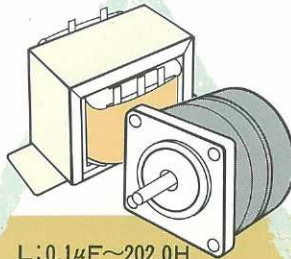
## 3521 LCR Hi TESTER

The 3521 LCR Hi Tester provides measurement close to real operating conditions. Measurement is possible over a wide range from 40Hz to 100kHz, with a measurement signal level of 0.05 to 2.55Vrms, settable in fine steps. Three sets of measurement conditions can be set, and a comparator function is provided for component evaluation. And because measurement is speeded up, this is the LCR meter optimum for line use, components evaluation and testing.

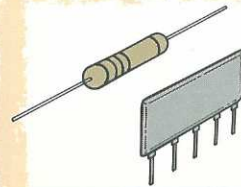


40Hz~  
100kHz

C: 0.1pF~2020μF  
D: 0.001~2.020



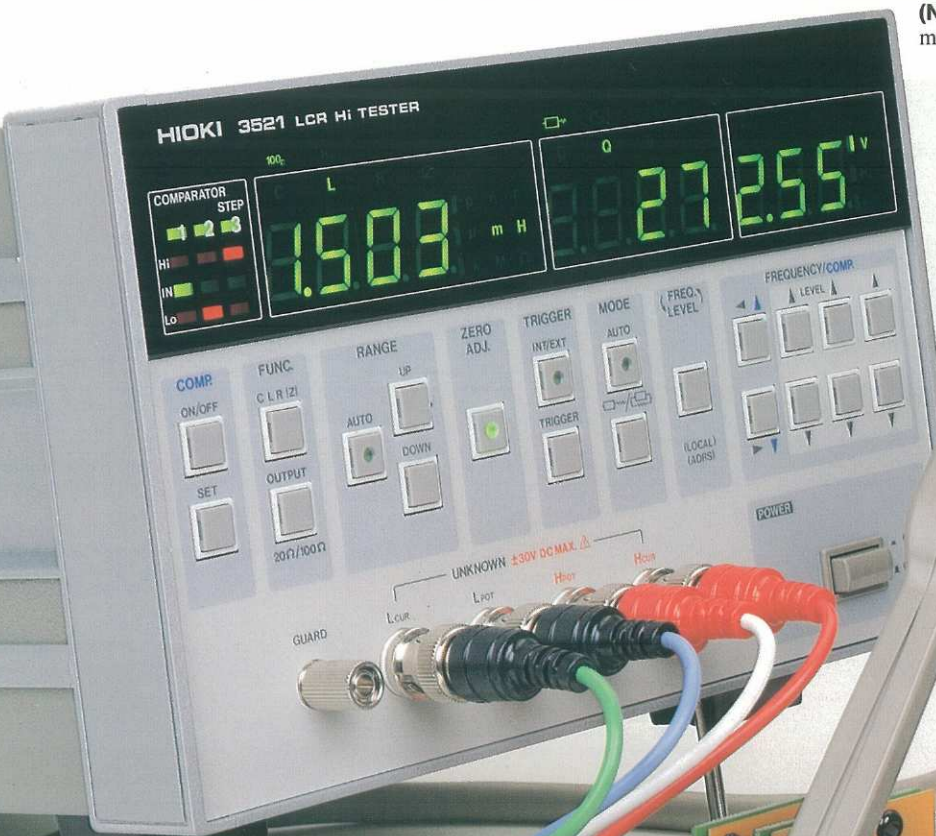
L: 0.1μF~202.0H  
Q: 0.5~999.9



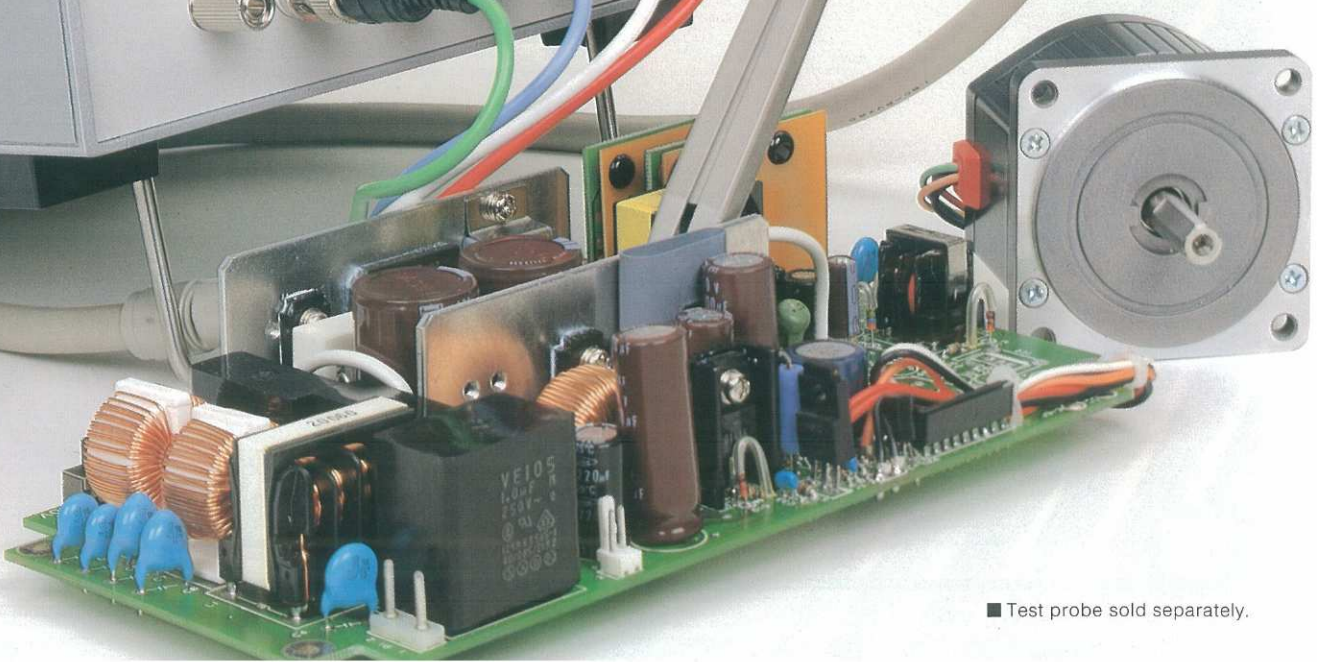
R, |Z|: 0.001Ω~2.020MΩ  
θ: -90.0°~90.0°

0.05~  
2.55Vrms

**(Note)** Measurement range will vary with measurement frequency and signal level.



- Measurement frequency: 40 Hz to 100 kHz
- Measurement signal level: 0.05 to 2.55 Vrms
- Built-in multi-function comparator suitable for line-use
- Comparison result relay output
- Measurement time: 120 ms (typ.)
- Voltage can be monitored across pins of sample being tested
- Selectable output impedance (20Ω/100Ω)
- Built-in GP-IB interface



■ Test probe sold separately.

# Measurement frequency, signal level, parameters, and upper and lower thresholds can be set. Simple Setting for Measurement Conditions and Comparator

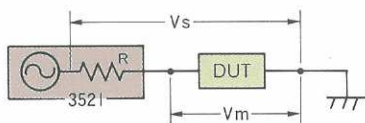
**Wide range of measurement signals widens range of applications**

## Measurement signal level 2.55Vrms max.

Measurement signal level 2.55Vrms max. Most motor coils have low impedance, and measurement with a fixed terminal voltage usually requires raising the signal level. The 3521 is perfect for impedance measurement of stepping motors in particular, because of its 2.55Vrms output.

## Voltage monitor function

Allows monitoring of terminal voltage between workpieces, for confirmation during measurement



Vs: Measurement signal level (0.05 to 2.55Vrms)  
Vm: Monitor voltage  
R: Output impedance (20/100Ω selectable)

**LCR meter for use on production lines**

The 3521 LCR Hi Tester is equipped with an internal comparator function. Additionally, comparison results can be externally output, making the 3521 LCR Hi Tester very suitable for production line use, evaluation, testing, and so forth.

## Comparator for measurement parameters

C-D, L-Q and  $|Z|-\theta$  parameters can be compared with AND conditions.

## Memory of Up to Three Measurement Conditions

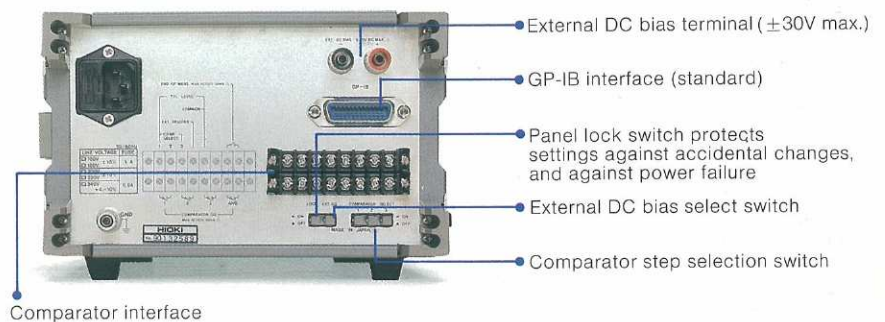
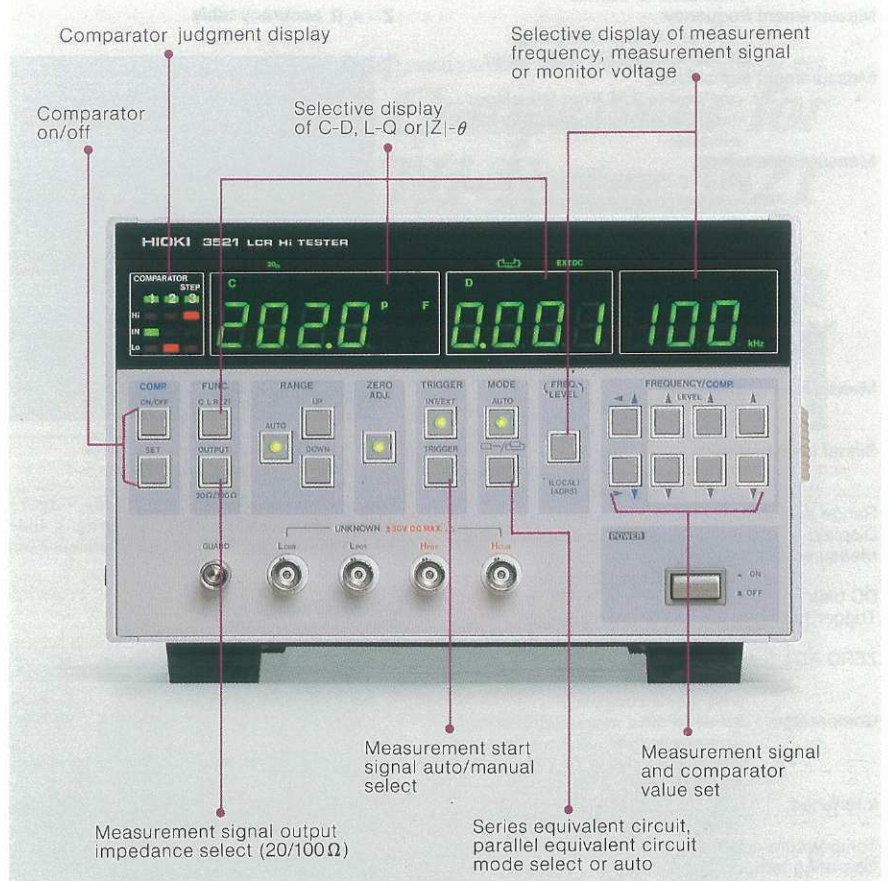
Since measurement function, measurement signal and other data can be independently set and registered for each step, the unit turns into three completely different LCR meters with comparator.

## Up to Three Evaluation Points for Each Sample

For samples that give different values according to measurement frequency, voltage level, etc., measurement conditions can be changed in up to three steps for evaluation.

## Measurement time about 120ms

Measurement time about 120ms. The 3521 is about three times faster than the 3520 it replaces, making it perfect for line use and high-speed applications.



External comparator step selection and measurement start can be set by TTL level negative logic. Both the result of comparison at the selected step and the general evaluation are output.

COMPARATOR...Sets which step comparator SELECT 1 to 3 is used in

EXT. TRIGGER...External trigger input terminal

END OF MEAS...Measurement end signal output terminal

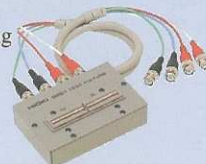
COMPARATOR...Comparator judgment result output terminal

GO 1 to 3...Make contact output for IN judgment

AND...Steps AND is set for are output at IN judgment (Max. 250V AC/50mA)

## Options (sold separately)

●9261 Test Fixture  
4-terminal test fixture for general parts. Cables are 1m long for handling flexibility.



## ●9140 four terminal probe

Four terminal probe with 1-meter cable length



## ●9143 Pincher Probe

Test fixture suitable for measurement of chip parts, etc.



## Specification

Set items: C (capacitance), D (dissipation factor), L (inductance), Q ( $=1/D$ )  
R (resistance)

|Z| (impedance),  $\theta$  (phase angle)

Measurement circuit mode:  
Serial equivalent circuit  
Parallel equivalent circuit  
Automatic or manual

Measurement frequency:  
40Hz to 9.99kHz (10Hz step)  
10.0kHz to 100kHz (100Hz step)

Measurement signal level:  
0.05Vrms to 2.55 Vrms (10 mVrms step), Output impedance 20  $\Omega$ /100 $\Omega$  selectable

Measurement range:  
(1) C: 0.1 pF to 2020  $\mu$ F (8 ranges)  
D: 0.001 to 2.020  
(2) L: 0.1  $\mu$ H to 202.0 H (7 ranges)  
Q: 0.5 to 999.9  
(3) R, |Z|: 0.001  $\Omega$  to 2.020 M $\Omega$  (7 ranges)  
 $\theta$ :  $-90.0^\circ$  to  $90.0^\circ$

Note: The measurement range varies according to measurement frequency, measurement signal level, fixtures used, etc.

Measurement speed:  
40 Hz to 990 Hz Approx. 160 ms  
1 kHz to 100 kHz Approx. 120 ms

Signal level monitor:  
Voltage between terminals of the DUT can be monitored

Range selection: Automatic or manual  
Display: 3 1/2 digits, 2020 indications (max.)

Measurement pins:  
5 pins: Voltage, current and guard pin

DC bias: External DC bias  $\pm 30$ V (max.)  
Trigger function: Internal or external trigger, manual.

ZERO ADJ. function:  
Compensates for measurement pin residual component  
Comparator: Set up to three stages. Result of each stage can be individually output AND output. Make by GO contact AC 250V/50mA (max.)

Interfaces: GP-IB standard, External interface for comparator  
Temperature coefficient: 500ppm/ $^\circ$ C  
Operating temperature/humidity:  $0^\circ$ C to  $40^\circ$ C, 80% RH max. (with no condensation).

Dimensions, weight: 133H $\times$ 215W $\times$ 435Dmm approx. 6.8kg

Power supply: 100, 120, 200, 220V AC  $\pm 10\%$ , 240V AC  $+4\% - 10\%$ , 50/60Hz (Specify at order)

Consumed power: Approx. 35VA

Accessories: Power cord (1), Spare fuse (0.5A-250V) (1)

### Note

The 3521 is not provided with a test fixture. Please purchase an optional test fixture.

## Options

9261 Test Fixture  
9140 Four-Terminal Probe  
9143 Pincher Probe

### Note

Measurement range are limited when using the 9143 Pincher Probe.

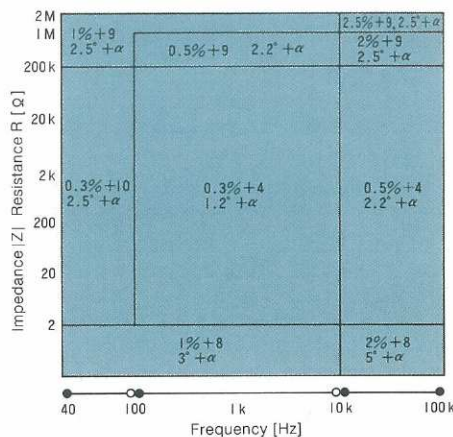
## Optional Accessories

9151-01 GP-IB Connector cable (1m)  
9151-02 GP-IB Connector cable (2m)  
9151-04 GP-IB Connector cable (4m)

## Measurement Range and Accuracy

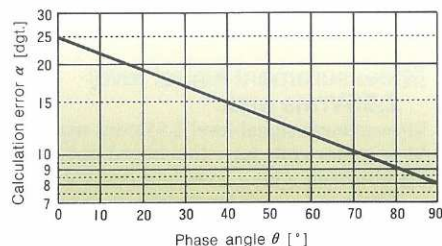
Temperature and humidity  $23^\circ$ C  $\pm 5^\circ$ C, 80% RH max. (no condensation) Time after power on 30 min. or over, Measurement signal level 1 Vrms, Output impedance 20  $\Omega$ , Test fixture 9261  
Permissible phase angle: R measurement;  $-6^\circ \leq \theta \leq 6^\circ$ , L measurement;  $84^\circ \leq \theta \leq 90^\circ$  ( $Q \geq 10$ ), C measurement;  $-84^\circ \geq \theta \geq -90^\circ$  ( $D \leq 0.1$ )  
Common specifications of accuracy table: For measurement frequency, ● means included and ○ means not included. Accuracy table vertical axis indicates measurement range. Values in ( ) are not included.

|Z| -  $\theta$ , R accuracy table

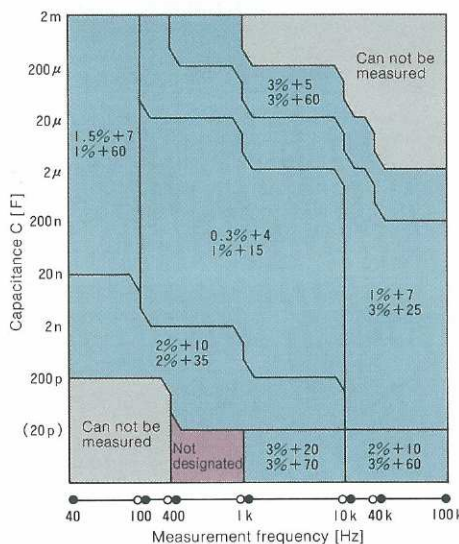


Top row: Accuracy of |Z|, R  $\pm$  (% rdg. + dgt.)  
Bottom row: Accuracy of  $\theta \pm$  ( $^\circ$  +  $\alpha$  dgt.), added to displayed  $\alpha$  calculation error value  
Accuracy given for 0.1  $\Omega$  or less is reference only

Phase angle measurement calculation error ( $\alpha$ ) table

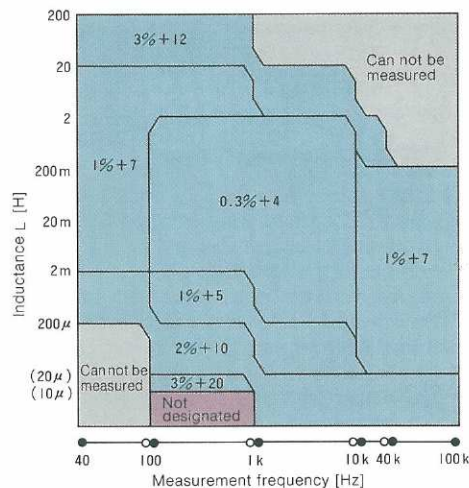


C-D accuracy table



Top row: Accuracy of C  $\pm$  (% rdg. + dgt.)  
Bottom row: Accuracy of D  $\pm$  (% rdg. + dgt.)

L-Q accuracy table



This is also the L accuracy table.  
Q accuracy can be determined from the C-D table as  $1/Q = D \pm$  (% rdg. + dgt.)

**HIOKI E.E. CORPORATION**

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