HIOKI

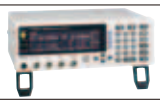
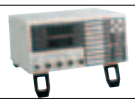
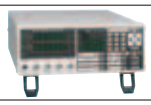
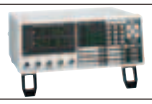
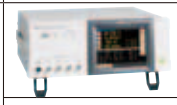
LCR METER Series

A New Series of LCR Meters to Meet Your Applications

From Production Lines to Research and Development

CE

LCR Meter Series Full Product Lineup

Model	Measurement speed (Basic value)	Measurement frequency range / Applications and measurement object
LCR METER IM3536	 1ms	DC ○ 4Hz ●——● 8MHz General-purpose LCR meter up to 8 MHz Measure electronic components such as capacitors and inductors
LCR METER IM3533	 2ms **IM3533** **IM3533-01**	DC ○ 1mHz ●——● 200kHz Capable of special measurements of transformers including turn ratio and mutual inductance IM3533-01: High-end model of the IM3523 and IM3533 with sweep measurement
LCR METER IM3523	 2ms	DC ○ 40Hz ●——● 200kHz Extremely cost-effective model suitable for production lines including integration into automated machinery For C-D and ESR measurement of electrolytic capacitors and L-Q and DCR measurement of inductors
LCR HiTESTER 3511-50	 5ms	120Hz ○ 1kHz ○ Compact LCR meter with single function For production lines of aluminum electrolytic capacitors
C METER 3506-10	 1.5ms	1kHz ○ 1MHz ○ C meter for low-capacity capacitors For production of MLCC and film capacitors
C HiTESTER 3504	 2ms **3504-40** **3504-50** **3504-60**	120Hz ○ 1kHz ○ C meter for large-capacity MLCCs For sorting machines of large-capacity MLCCs (3504-50/60) and taping machines (3504-40)
IMPEDANCE ANALYZER IM7580A	 0.5ms	1MHz ●——● 300MHz High-frequency measurement up to 300 MHz Ideal for production lines of ferrite beads and inductors
IMPEDANCE ANALYZER IM3570	 0.5ms	DC ○ 4Hz ●——● 5MHz LCR meter integrated with impedance analyzer Measure the frequency characteristics of piezo-electric devices, functional polymer capacitors, and power inductors
CHEMICAL IMPEDANCE ANALYZER IM3590	 2ms	DC ○ 1mHz ●——● 200kHz Supports LCR impedance measurements for Cole-Cole plots and equivalent-circuit analyses Measure electrochemical components, materials, batteries, and electric double-layer capacitors (EDLCs)

LCR METER IM3523

Ideal for Production Lines and Automated Testing

- ±0.05% accuracy with wide measurement range (DCR testing, 40Hz to 200kHz, 5mV to 5V, 10uA to 50mA)
- Non-stop testing over mixed measurement conditions such as C-D and ESR at 10 times the speed of previous models
- Built-in comparator and BIN functions
- Rapid 2msec test time

GP-IB OPTION RS-232C OPTION LAN OPTION USB2.0 STANDARD

Model No. (Order Cord) **IM3523**

Note: *This product is not supplied with measurement probes or test fixtures. Please select and purchase the measurement probe or test fixture options appropriate for your application separately. All probes are constructed with a 50Ω coaxial cable. For an RS-232C connection: A crossover cable for interconnection can be used. You can use the RS-232C CABLE 9637 without hardware flow control.*

■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Measurement modes	LCR, Continuous testing
Measurement parameters	Z, Y, θ, Rs (ESR), Rp, Rdc (DC resistance), X, G, B, Cs, Cp, Ls, Lp, D (tanδ), Q
Measurement range	100 mΩ to 100 MΩ, 10 ranges (All parameters defined in terms of Z.)
Displayable range	Z, Y, Rs, Rp, Rdc, X, G, B, Ls, Lp, Cs, Cp : ± (0.00000 [unit] to 9.99999G [unit]) Real value display for Z and Y only θ: ± (0.000° to 180.000°), D: ± (0.00000 to 9.99999) Q: ± (0.00 to 99999.9), Δ%: ± (0.0000% to 999.999%)
Basic accuracy	Z : ±0.05% rdg. θ: ±0.03°
Measurement frequency	40 Hz to 200 kHz (5 digits setting resolution)
Measurement signal level	V mode, CV mode: 5 mV to 5 Vrms, 1 mVrms steps CC mode: 10 µA to 50 mArms, 10 µArms steps
Output impedance	100 Ω
Display	Monochrome LCD
Measurement time	2 ms (1 kHz, FAST, representative value)
Functions	Comparator, BIN measurement (classify function), Panel loading/saving, Memory function
Interfaces	EXT I/O (handler), USB communication (high-speed) Optional: Choose 1 from RS-232C, GP-IB, or LAN
Power supply	100 to 240 V AC, 50/60 Hz, 50 VA max
Dimensions and mass	260 mm (10.24 in) W × 88 mm (3.46 in) H × 203 mm (7.99 in) D, 2.4 kg (84.7 oz)
Accessories	Power cord ×1, Instruction manual ×1, CD-R (Includes PC commands and sample software) ×1

OPTIONS

FOUR-TERMINAL PROBE	9500-10
DC BIAS VOLTAGE UNIT	9268-10
DC BIAS CURRENT UNIT	9269-10
GP-IB INTERFACE	Z3000
RS-232C INTERFACE	Z3001
LAN INTERFACE	Z3002
FOUR-TERMINAL PROBE (DC to 8 MHz)	L2000
FOUR-TERMINAL PROBE (DC to 200 kHz)	9140-10
PINCHER PROBE (cable length 730 mm, DC to 8 MHz)	L2001
TEST FIXTURE (cable length 1m, DC to 8 MHz)	9261-10
TEST FIXTURE (direct connection type, DC to 8 MHz)	9262
SMD TEST FIXTURE (direct connection type, DC to 8 MHz)	9263
SMD TEST FIXTURE (DC to 120 MHz)	9677
SMD TEST FIXTURE (DC to 120 MHz)	9699
SMD TEST FIXTURE (DC to 8 MHz)	IM9100
SMD TEST FIXTURE (DC to 1 MHz)	IM9110
GP-IB CONNECTION CABLE (2 m)	9151-02

LCR METER IM3533 IM3533-01

From R&D Applications to Windings, Coil and Transformer Manufacturing

- ±0.05% accuracy with wide measurement range (DCR testing, 1mHz to 200kHz,, 5mV to 5V, 10uA to 50mA)
- Non-stop testing over mixed measurement conditions such as C-D and ESR at 10 times the speed of previous models
- Built-in low impedance high precision mode effective for testing lowinductance or the ESR of aluminum electrolysis capacitance (10x the measurement speed and dramatic improvements in repeatability and stability over the previous model 3522-50)
- Dedicated modes for measuring transformer winding ratio, mutual inductance and temperature compensated DCR
- Frequency sweep testing (IM3533-01 only)
- 2m/4m cable setting in addition to the standard 0m/1m(IM3533-01 only)
- Built-in comparator and BIN functions
- Rapid 2msec test time

GP-IB OPTION RS-232C OPTION LAN OPTION USB2.0 STANDARD

Model No. (Order Cord) **IM3533**
IM3533-01 (Advanced function model)

Note:*This product is not supplied with measurement probes or test fixtures. Please select and purchase the measurement probe or test fixture options appropriate for your application separately. All probes are constructed with a 50Ω coaxial cable. For an RS-232C connection: A crossover cable for interconnection can be used. You can use the RS-232C CABLE 9637 without hardware flow control*

■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

	IM3533	IM3533-01
Measurement modes	LCR, Transformer testing (N, M, ΔL), Continuous testing (LCR mode)	LCR, Transformer testing (N, M, ΔL), Analyzer (sweep testing), Continuous Testing (LCR/Analyzer mode)
Measurement parameters	Z, Y, θ, Rs (ESR), Rp, Rdc (DC resistance), X, G, B, Cs, Cp, Ls, Lp, D (tanδ), Q, N, M, ΔL, T	
Measurement range	100 mΩ to 100 MΩ, 10 ranges (All parameters defined in terms of Z.)	
Displayable range	Z, Y, Rs, Rp, Rdc, X, G, B, Ls, Lp, Cs, Cp : ± (0.00000 [unit] to 9.99999G [unit]) Real value display for Z and Y only θ: ± (0.000° to 180.000°), D: ± (0.00000 to 9.99999) Q: ± (0.00 to 99999.9), Δ%: ± (0.0000% to 999.999%), T: -10.0°C to 99.9°C	
Basic accuracy	Z : ±0.05% rdg. θ: ±0.03°	
Measurement frequency	1 mHz to 200 kHz (5 digits setting resolution, minimum resolution 1 mHz)	
Measurement signal level	[Normal mode] V mode, CV mode: 5 mV to 5 Vrms, 1 mVrms steps CC mode: 10 µA to 50 mArms, 10 µArms steps [Low impedance high accuracy mode] V mode, CV mode: 5 mV to 2.5 Vrms, 1 mVrms steps CC mode: 10 µA to 100 mArms, 10 µArms steps	
Output impedance	Normal mode: 100 Ω, Low impedance high accuracy mode: 25 Ω	
Display	5.7-inch touch-screen color TFT, display can be set to ON/OFF	
Measurement time	2 ms (1 kHz, FAST, display OFF, representative value)	
Functions	DC bias measurement, DC resistance temperature compensation (converted reference temperature display), Comparator, BIN measurement (classify function), Panel loading/saving, Memory function	
Interfaces	EXT I/O (Handler), USB communication (high-speed), USB memory Optional: Choose 1 from RS-232C, GP-IB, or LAN	
Power supply	100 to 240 V AC, 50/60 Hz, 50 VA max	
Dimensions and mass	330 mm (12.99 in) W × 119 mm (4.69 in) H × 168 mm (6.61 in) D, 3.1 kg (109.3 oz)	
Accessories	Power cord ×1, Instruction manual ×1, CD-R (Includes PC commands and sample software) ×1	

OPTIONS

FOUR-TERMINAL PROBE	9500-10
DC BIAS VOLTAGE UNIT	9268-10
DC BIAS CURRENT UNIT	9269-10
GP-IB INTERFACE	Z3000
RS-232C INTERFACE	Z3001
LAN INTERFACE	Z3002
FOUR-TERMINAL PROBE (DC to 8 MHz)	L2000
FOUR-TERMINAL PROBE (DC to 200 kHz)	9140-10
PINCHER PROBE (cable length 730 mm, DC to 8 MHz)	L2001
TEST FIXTURE (cable length 1m, DC to 8 MHz)	9261-10
TEST FIXTURE (direct connection type, DC to 8 MHz)	9262
SMD TEST FIXTURE (direct connection type, DC to 8 MHz)	9263
SMD TEST FIXTURE (DC to 120 MHz)	9677
SMD TEST FIXTURE (DC to 120 MHz)	9699
SMD TEST FIXTURE (DC to 8 MHz)	IM9100
SMD TEST FIXTURE (DC to 1 MHz)	IM9110
GP-IB CONNECTION CABLE (2 m)	9151-02
TEMPERATURE PROBE (Sheath type, 1m, waterproof)	9478

IMPEDANCE ANALYZER IM3570

Single Device Solution for High Speed Testing and Frequency Sweeping

- LCR measurement, DCR measurement, sweep measurement, continuous measurement and high-speed testing achieved with one instrument
- High-speed testing, achieving maximum speeds of 1.5ms (1 kHz) and 0.5ms (100kHz) in LCR mode
- High-accuracy measurements, basic accuracy of Z parameter: ± 0.08%
- Perform frequency sweeps, level sweeps, and time interval measurements in analyzer mode

CE USB2.0 STANDARD GP-IB STANDARD RS-232C STANDARD LAN STANDARD

Model No. (Order Cord) **IM3570**

Note: *This product is not supplied with measurement probes or test fixtures. Please select and purchase the measurement probe or test fixture options appropriate for your application separately. For an RS-232C connection: A crossover cable for interconnection can be used. You can use the RS-232C cable 9637 without hardware flow control.*

■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Measurement modes	LCR mode, Analyzer mode (Sweeps with measurement frequency and measurement level), Continuous measurement mode
Measurement parameters	Z, Y, θ, Rs (ESR), Rp, Rdc (DC resistance), X, G, B, Cs, Cp, Ls, Lp, D (tanδ), Q
Measurement range	100 mΩ to 100 MΩ, 12 ranges (All parameters are determined according to Z)
Display range	Z, Y, Rs, Rp, Rdc, X, G, B, Ls, Lp, Cs, Cp : ±(0.000000 [unit] to 9.999999G [unit], Absolute value display for Z and Y only θ : ±(0.000° to 180.000°), D : ±(0.000000 to 9.999999) Q : ±(0.00 to 99999.99), Δ % : ±(0.0000% to 999.9999%)
Basic accuracy	Z ±0.08% rdg. θ: ±0.05°
Measurement frequency	4 Hz to 5 MHz (5 digits setting resolution, minimum resolution 10 mHz)
Measurement signal level	Normal mode: V mode/CV mode: 5 mV to 5 Vrms (up to 1 MHz), 10 mV to 1 Vrms (1.0001 MHz to 5 MHz), 1 mVrms steps CC mode: 10 µA to 50 mArms (up to 1 MHz), 10 µA to 10 mArms (1.0001 MHz to 5 MHz), 10 µArms steps Low impedance high accuracy mode: V mode/CV mode: 5 mV to 1 Vrms (up to 100 kHz), 1 mVrms steps CC mode:10 µA to 100 mArms (100 mΩ and 1Ω ranges of up to 100 kHz), 10 µArms steps
Output impedance	Normal mode: 100 Ω, Low impedance high accuracy mode: 10 Ω
Display	5.7-inch color TFT, display can be set to ON/OFF
Measurement time	0.5 ms (100 kHz, FAST, display OFF, representative value)
Functions	DC bias measurement, Comparator, BIN measurement (classification), Panel loading/saving, Memory function
Interfaces	EXT I/O (handler), RS-232C, GP-IB, USB communication, USB memory, LAN
Power supply	90 to 264 V AC, 50/60 Hz, 150 VA max.
Dimensions and mass	330 mm (12.99 in) W × 119 mm (4.69 in) H × 307 mm (12.09 in) D, 5.8 kg (204.6 oz)
Accessories	Power cord ×1, Instruction manual ×1, PC communication instruction manual (CD-R) ×1

OPTIONS

EQUIVALENT CIRCUIT ANALYSIS FIRMWARE	IM9000
FOUR-TERMINAL PROBE (DC to 8 MHz)	L2000
FOUR-TERMINAL PROBE (DC to 200 kHz)	9140-10
PINCHER PROBE (cable length 730 mm, DC to 8 MHz)	L2001
TEST FIXTURE (cable length 1m, DC to 8 MHz)	9261-10
FOUR-TERMINAL PROBE	9500-10
DC BIAS VOLTAGE UNIT	9268-10
DC BIAS CURRENT UNIT	9269-10
TEST FIXTURE (direct connection type, DC to 8 MHz)	9262
SMD TEST FIXTURE (direct connection type, DC to 8 MHz)	9263
SMD TEST FIXTURE (DC to 120 MHz)	9677
SMD TEST FIXTURE (DC to 120 MHz)	9699
SMD TEST FIXTURE (DC to 8 MHz)	IM9100
SMD TEST FIXTURE (DC to 1 MHz)	IM9110
GP-IB CONNECTION CABLE (2 m)	9151-02

LCR METER IM3536

The New Standard for General-Purpose LCR Meters with Measurement Frequency from DC, 4Hz to 8MHz

- DC, 4Hz to 8MHz measurement frequency
- High-speed measurement of 1ms (fastest time)
- High-precision measurement of ±0.05% rdg. (representative value)
- Guaranteed accuracy range from 1 mΩ, low-impedance measurement with unmatched repeatability

CE USB2.0 STANDARD GP-IB STANDARD RS-232C STANDARD LAN STANDARD

Model No. (Order Cord) **IM3536**

Note: *This product is not supplied with measurement probes or test fixtures. Please select and purchase the measurement probe or test fixture options appropriate for your application separately. For an RS-232C connection: A crossover cable for interconnection can be used. You can use the RS-232C cable 9637 without hardware flow control.*

■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Measurement modes	LCR mode, Continuous measurement mode
Measurement parameters	Z, Y, θ, X, G, B, Q, Rdc (DC resistance), Rs (ESR), Rp, Ls, Lp, Cs, Cp, D (tanδ), σ, ε
Measurement range	100 mΩ to 100 MΩ, 10 ranges (All parameters are determined according to Z)
Display range	Z: 0.00 m to 9.99999 GΩ, Y: 0.000 n to 9.99999 GS, θ: ± (0.000° to 180.000°), Q: ± (0.00 to 9999.99), Rdc: ± (0.00 m to 9.99999 GΩ), D: ± (0.00000 to 9.99999), Δ%: ± (0.000 % to 999.999 %), or other
Basic accuracy	Z ±0.05% rdg. θ: ±0.03° (representative value, Measurable range: 1 mΩ to 200 MΩ)
Measurement frequency	4 Hz to 8 MHz (5 digits setting resolution, minimum resolution 10 mHz)
Measurement signal level	[Normal mode: V mode/CV mode] 4 Hz to 1.0000 MHz: 10 mV to 5 V rms(maximum 50 mA), 1.0001 MHz to 8 MHz: 10 mV to 1 V rms(maximum 10mA) [Low impedance high accuracy mode: V mode/CV mode] 4 Hz to 1.0000 MHz: 10 mV to 1 V rms(maximum 100 mA) [Normal mode: CC mode] 4 Hz to 1.0000 MHz: 10 µA to 50 mA rms(maximum 5 V) 1.0001 MHz to 8 MHz: 10 µA to 10 mA rms(maximum 1 V) [Low impedance high accuracy mode: CC mode] 4 Hz to 1.0000 MHz: 10 µA to 100 mA rms(maximum 1 V) [DC resistance measurement] Measurement signal level: Fixed at 1 V
DC bias measurement	Generating range: DC voltage 0 V to 2.50 V (10 mV resolution) In low Z high accuracy mode: 0 V to 1 V (10 mV resolution)
Output impedance	Normal mode: 100 Ω, Low impedance high accuracy mode: 10 Ω
Display	5.7-inch color TFT with touch panel
Functions	Comparator, BIN measurement (10 categories for 2 measurement parameters), Trigger function, Open/short compensation, Contact check, Panel loading/saving, Memory function
Interfaces	EXT. I/O(HANDLER) ,USB, USB flash drive, LAN, GP-IB, RS-232C, BCD
Power supply	100 to 240 V AC, 50/60 Hz, 50 VA max.
Dimensions and mass	330 mm (12.99 in) W × 119 mm (4.69 in) H × 230 mm (9.06 in) D, 4.2 kg (148.1 oz)
Accessories	Power cord ×1, Instruction manual ×1, LCR application disc (Communications user manual) ×1

OPTIONS

FOUR-TERMINAL PROBE (DC to 8 MHz)	L2000
FOUR-TERMINAL PROBE (DC to 200 kHz)	9140-10
PINCHER PROBE (cable length 730 mm, DC to 8 MHz)	L2001
TEST FIXTURE (cable length 1m, DC to 8 MHz)	9261-10
FOUR-TERMINAL PROBE	9500-10
DC BIAS VOLTAGE UNIT	9268-10
DC BIAS CURRENT UNIT	9269-10
TEST FIXTURE (direct connection type, DC to 8 MHz)	9262
SMD TEST FIXTURE (direct connection type, DC to 8 MHz)	9263
SMD TEST FIXTURE (DC to 120 MHz)	9677
SMD TEST FIXTURE (DC to 120 MHz)	9699
SMD TEST FIXTURE (DC to 8 MHz)	IM9100
SMD TEST FIXTURE (DC to 1 MHz)	IM9110
GP-IB CONNECTION CABLE (2 m)	9151-02

LCR HiTESTER 3511-50

Compact & powerful dedicated LCR measurement in 5m second timeframes

- High speed measurement : 5ms (1 kHz) or 13ms (120 Hz)
- Built-in high-speed comparator
- Measurement frequency : 1kHz/ 120Hz selectable

GP-IB OPTION RS-232C STANDARD

Model No. (Order Cord) **3511-50**

Note: *This product is not supplied with measurement probes or test fixtures. Please select and purchase the measurement probe or test fixture options appropriate for your application separately. For an RS-232C connection: You can use the RS-232C cable 9637 without hardware flow control.*

■ Basic specifications (Accuracy guaranteed for 6 months, Post-adjustment accuracy guaranteed for 6 months)

Measurement parameters	|Z|, θ, R, C, L, D (tanδ), Q
Measurement range	|Z|, R: 10 mΩ to 200.00 MΩ θ: -90.00° to +90.00° C (at 120 Hz): 9.40 pF to 999.99 mF, C (at 1 kHz): 0.940 pF to 99.999 mF L (at 120 Hz): 14.00 µH to 200.00 kH, L (at 1 kHz): 1.600 µH to 20.000 kH D: 0.0001 to 1.9900, Q: 0.85 to 999.99
Basic accuracy	|Z| : ±0.08 % rdg. θ: ±0.05°
Measurement frequency	120 Hz or 1 kHz
Measurement signal level	50 mV, 500 mV, 1 V rms
Output impedance	50 Ω
Display	LED (5-digit display, full-scale count depends on range)
Measurement time	Fast: 13 msec, Normal: 90 msec, Slow: 400 msec. (at 120 Hz) Fast: 5 msec, Normal: 60 msec, Slow: 300 msec. (at 1 kHz)
DC bias	DC voltage/DC current can be superimposed on the measurement signal. (Requires optional unit and external constant voltage source/constant current source.)
Functions	Panel save and load function, External input/Output (EXT. I/O), GP-IB (option) or RS-232C interface
Power supply	Selectable 100, 120, 220 or 240V AC ±10%, 50/60Hz, 20VA max.
Dimensions and mass	210 mm (8.27 in)W × 100 mm (3.94 in)H × 168 mm (6.61 in)D, 2.5 kg (88.2 oz)
Accessories	Instruction manual ×1, Power cord ×1, Spare fuse ×1

OPTIONS

FOUR-TERMINAL PROBE (DC to 100 kHz)	9140
PINCHER PROBE (DC to 5 MHz)	9143
TEST FIXTURE (cable connection type, DC to 8 MHz)	9261
TEST FIXTURE (direct connection type, DC to 8 MHz)	9262
SMD TEST FIXTURE (direct connection type, DC to 8 MHz)	9263
SMD TEST FIXTURE (DC to 8 MHz)	IM9100
SMD TEST FIXTURE (DC to 1 MHz)	IM9110
DC BIAS VOLTAGE UNIT (± 40 V DC max.)	9268
DC BIAS CURRENT UNIT (± 2 A DC max.)	9269
CONNECTION CORD (for 9268/9269; BNC to BNC, 1.5 m)	9165
CONNECTION CORD (for 9268/9269; BNC to clip, 1.5 m)	9166
GP-IB CONNECTION CABLE (2 m)	9151-02
GP-IB INTERFACE	9518-01
PRINTER	9442
AC ADAPTER (for the 9442, for 200~240 V power lines)	9443-02
CONNECTION CABLE (for the 3511-50/9442)	9444
RECORDING PAPER (25 m, 10 rolls/ set, for the 9442)	1196

CHEMICAL IMPEDANCE ANALYZER IM3590

Ideal for Measuring Electrochemical Impedance High-precision, Easy-to-use Operation

- 1mHz to 200kHz wide frequency source ideal for measuring ionic behavior and solution resistance
- High-speed LCR and continuous sweep testing with a single unit
- Measure the internal impedance of batteries in no-load state
- Fastest test speed of 2ms enables rapid sweep measurements
- Basic accuracy of ±0.05% ideal for both component inspections and R&D
- Rich functions such as Cole-Cole plot and equivalent circuit analysis meet advanced applications in electrochemical and material impedance (LCR) testing

USB2.0 STANDARD GP-IB OPTION RS-232C OPTION LAN OPTION

Model No. (Order Cord) **IM3590** (For electrochemical components)

Note: *Test fixtures are not supplied with the unit. Select an optional test fixture or probe when ordering. Probes are constructed with a coaxial cable with 50 Ω impedance characteristics. For an RS-232C connection: You can use the RS-232C cable 9637 without hardware flow control.*

■ Basic specifications (Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year)

Measurement modes	LCR mode, Continuous measurement mode (LCR mode / Analyzer mode), Analyzer mode (Sweeps with measurement frequency and measurement level, temperature characteristics, equivalent circuit analysis)
Measurement parameters	Z, Y, θ, Rs (ESR), Rp, Rdc (DC resistance), X, G, B, Cs, Cp, Ls, Lp, D (tanδ), Q, T, σ (conductivity), ε (dielectric constant)
Measurement range	100 mΩ to 100 MΩ, 10 ranges (All parameters are determined according to Z)
Display range	Z, Y, Rs, Rp, Rdc, X, G, B, Ls, Lp, Cs, Cp, σ, ε : ±(0.00000 [unit] to 9.99999G [unit], Absolute value display for Z and Y only θ : ±(0.000° to 180.000°), D : ±(0.00000 to 9.99999) Q : ±(0.00 to 99999.9), Δ % : ±(0.0000% to 999.999%) T : -10.0°C to 99.9°C σ, ε :±(0.00000f [unit] to 999.999G [unit]
Basic accuracy	Z: ±0.05% rdg. θ: ±0.03°
Measurement frequency	1 mHz to 200 kHz (5 digits setting resolution, minimum resolution 1 mHz)
Measurement signal level	Normal mode: V mode/CV mode: 5 mV to 5 Vrms, 1 mVrms steps CC mode: 10 µA to 50 mArms, 10 µArms steps Low impedance high accuracy mode: V mode/CV mode: 5 mV to 2.5 Vrms, 1 mVrms steps CC mode:10 µA to 100 mArms, 10 µArms steps
Output impedance	Normal mode: 100 Ω, Low impedance high accuracy mode: 25 Ω
Display	5.7-inch color TFT, display can be set to ON/OFF
Measurement time	2 ms (1 kHz, FAST, display OFF, representative value)
Functions	DC bias measurement, DC resistance temperature compensation (converted reference temperature is displayed), Temperature measurement, Battery mesurement (Automatic DC biasing system), Comparator, BIN measurement (classification), Panel loading/saving, Memory function
Interfaces	EXT I/O (Handler), USB communication (high-speed), USB memory Optional: Choose 1 from RS-232C, GP-IB, or LAN
Power supply	100 to 240 V AC, 50/60 Hz, 50 VA max.
Dimensions and mass	330 mm (12.99 in) W × 119 mm (4.69 in) H × 168 mm (6.61 in) D, 3.1 kg (109.3 oz)
Accessories	Power cord ×1, Instruction manual ×1, CD-R (Communication instruction manual and sample software [Communications control, accuracy calculation, and screen capture functionality]) ×1

OPTIONS

FOUR-TERMINAL PROBE	9500-10
DC BIAS VOLTAGE UNIT	9268-10
DC BIAS CURRENT UNIT	9269-10
GP-IB INTERFACE	Z3000
RS-232C INTERFACE	Z3001
LAN INTERFACE	Z3002
FOUR-TERMINAL PROBE (DC to 8 MHz)	L2000
FOUR-TERMINAL PROBE (DC to 200 kHz)	9140-10
PINCHER PROBE (cable length 730 mm, DC to 8 MHz)	L2001
TEST FIXTURE (cable length 1m, DC to 8 MHz)	9261-10
TEST FIXTURE (direct connection type, DC to 8 MHz)	9262
SMD TEST FIXTURE (direct connection type, DC to 8 MHz)	9263
SMD TEST FIXTURE (DC to 120 MHz)	9677
SMD TEST FIXTURE (DC to 120 MHz)	9699
SMD TEST FIXTURE (DC to 8 MHz)	IM9100
SMD TEST FIXTURE (DC to 1 MHz)	IM9110
GP-IB CONNECTION CABLE (2 m)	9151-02
TEMPERATURE PROBE (Sheath type, 1m, waterproof)	9478

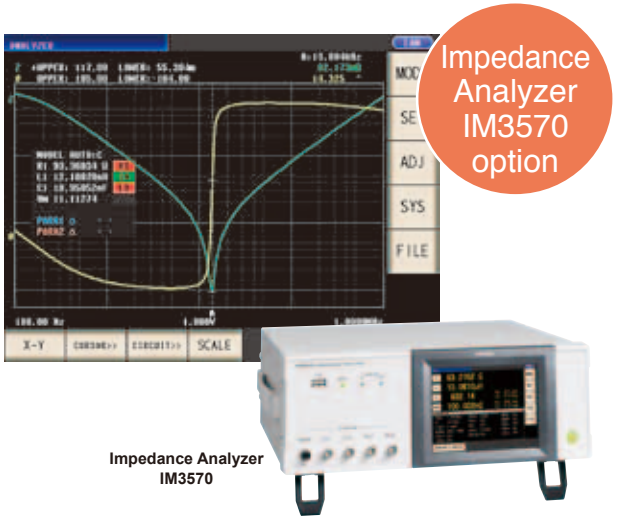
EQUIVALENT CIRCUIT ANALYSIS FIRMWARE IM9000

Enabling Simple Circuit Analysis & Detailed Acceptance/Rejection Decision-Making

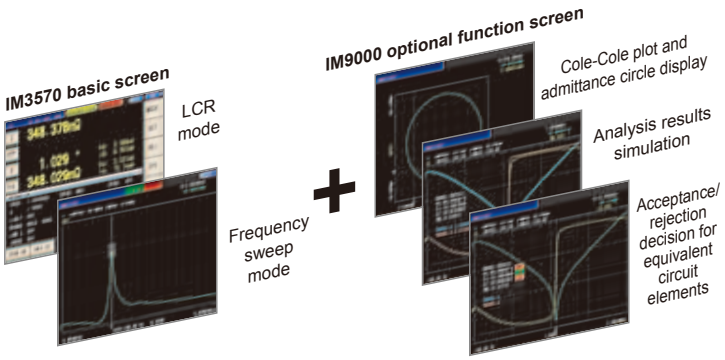
- The IM9000 can automatically select the equivalent circuit model from the five typical models to minimize the differences between the measured values and the ideal frequency characteristics derived from the analysis results.
- An acceptance/rejection decision can be made for the L, C, and R elements comprising a part and the resonance sharpness (mechanical quality coefficient).
- A detailed decision can be made on the elements using the resonance of a piezoelectric element or inductor.

Model No. (Order Cord) **IM9000** (factory option firmware for the IM3570)

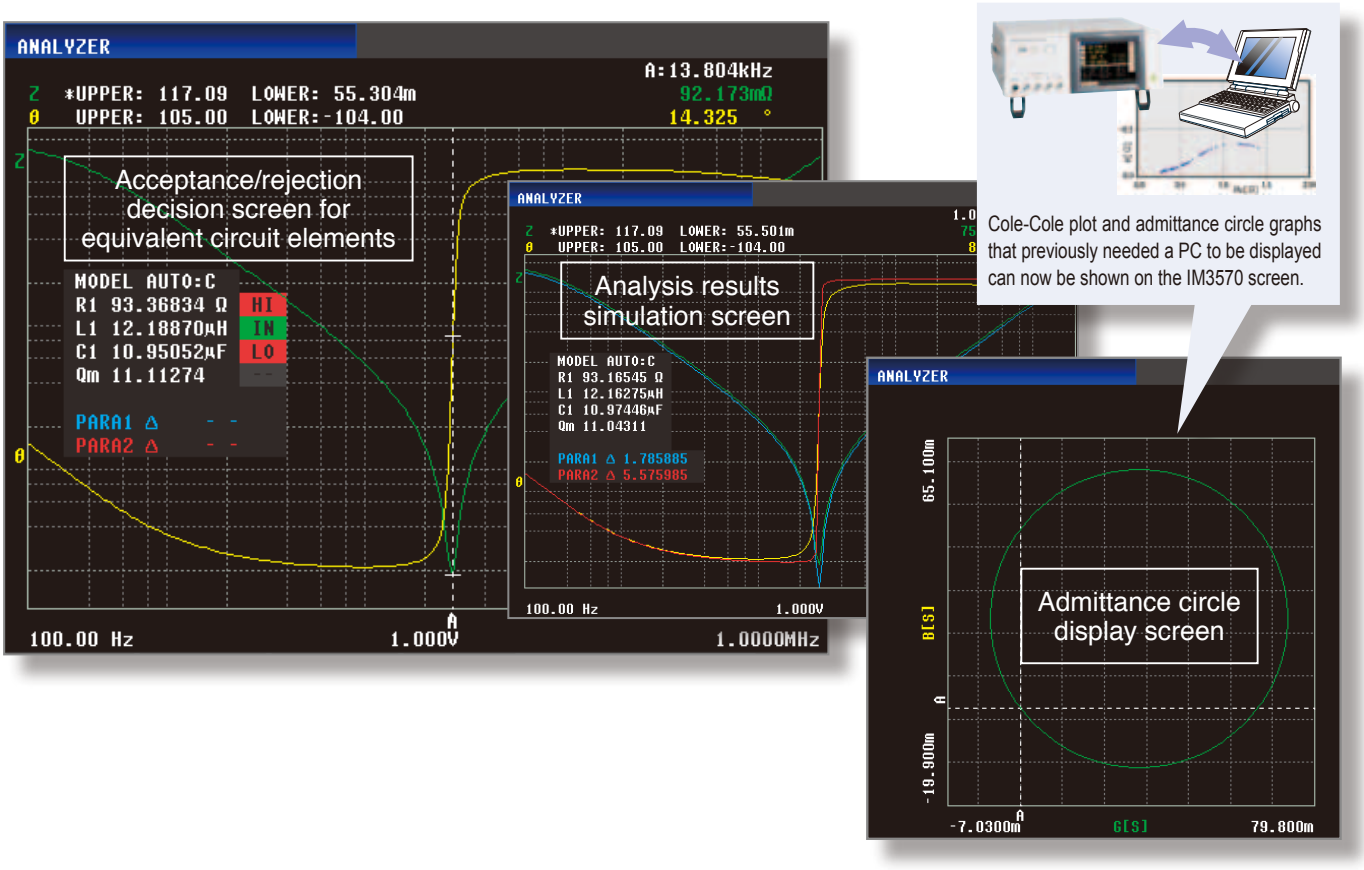
Note: The IM9000 is not included in the standard package. To use the IM9000 function, specify the option upon purchase. Customers who have purchased the Impedance Analyzer IM3570 can add the Equivalent Circuit Analysis Firmware IM9000 function. Please contact your local HIOKI representative.



■ The Equivalent Circuit Analysis Firmware IM9000 Provides an Optional Function to Perform a Variety of Equivalent Circuit Analysis and Display Graphs



- Five equivalent circuit analysis (Auto/Fixed) patterns
- Acceptance/rejection decision for equivalent circuit elements
- Analysis results simulation
- Cole-Cole plot and admittance circle display



■ Features

● Simple:
Automatic Selection of Equivalent Circuit Model

The IM9000 can automatically select the equivalent circuit model from the five typical models to minimize the differences between the measured values and the ideal frequency characteristics derived from the analysis results.

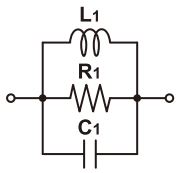
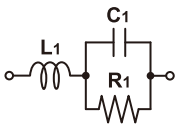
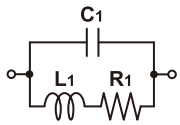
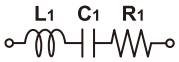
● Detailed:
Acceptance/Rejection Decision for Elements Comprising Part

An acceptance/rejection decision can be made for the L, C, and R elements comprising a part and the resonance sharpness (mechanical quality coefficient). A detailed decision can be made on the elements using the resonance of a piezoelectric element or inductor.

■ Equivalent Circuit Analysis Firmware IM9000 Specifications

● Equivalent Circuit Model and Measurement Items

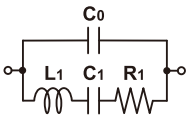
■ Three-element model

A		Coil: Core loss is large while ESR is small	C		Capacitor: Impact of the leakage resistance is large Resistance: Resistance is large and impact of the floating capacitance is large
B		Coil: ESR is relatively large Resistance: Resistance is small and impact of the wire inductance is large	D		Capacitor: General capacitor

■ Measurement items (Three-element model)

L1 (Inductance)
C1 (Capacitance)
R1 (Resistance)
Qm (Resonance sharpness)
fr (Resonance frequency) /
fa (Anti-resonance frequency)

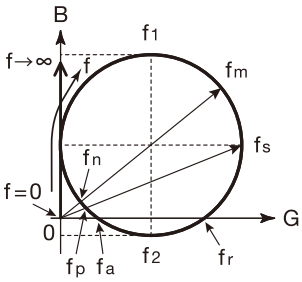
■ Four-element model

E		Pizoelectric element

■ Measurement items (Four-element model)

L1 (Inductance)
C1 (Capacitance)
R1 (Resistance)
C0 (Parallel capacitance)
Qm (Resonance sharpness or mechanical quality coefficient)

fr (Resonance frequency)
fa (Anti-resonance frequency)
fs (Series resonance frequency)
fp (Parallel resonance frequency)
fm (Maximum admittance frequency)
fn (Minimum admittance frequency)
f1 (Maximum susceptance frequency)
f2 (Minimum susceptance frequency)



Parameters of the 4-element model

● Other functions

Circuit model selection	AUTO (automatic selection) / HOLD (fixed)
Estimation execution	AUTO (estimation is executed after frequency sweep ends) / MANUAL (estimation is executed by the user)
Sweep range using estimation	Normal sweep: Analysis is performed in the sweep range from the analysis start frequency to the analysis end frequency Segment sweep: Analysis is performed in the sweep range of the set segment number
Simulation	Enables displaying and comparing the ideal frequency characteristics graph derived from the analysis results or the values specified by the user

Comparator	Runs a comparator on the analysis results and outputs the decision results to LCD, EXT. I/O R1, L1, C1, C0, Qm: HI/IN/LO, absolute value setting
Display position of estimation results	Select the display position from upper, lower, left or right
X-Y display	Cole-Cole plot: Set Rs to the first measurement item, X to the third measurement item, reverse the polarity of the third measurement item, and set correction coefficient A =-1 for scaling correction Admittance circle display: Set G to the first measurement item and B to the third measurement item

OPTIONS

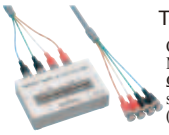
Probes and Test Fixtures for Lead Components

FOUR-TERMINAL PROBE L2000

Cable length 1 m (3.28 ft), DC to 8 MHz, impedance characteristics of 50 Ω, 4-terminal pair configuration, measurable conductor diameter: ø0.3 mm (0.01 in) to 5 mm (0.20 in)

FOUR-TERMINAL PROBE 9140-10

Cable length 1 m (3.28 ft), DC to 200 kHz, impedance characteristics of 50 Ω, 4-terminal pair configuration, measurable conductor diameter: ø0.3 mm (0.01 in) to 5 mm (0.20 in)



TEST FIXTURE 9261-10

Cable length 1 m (3.28 ft), DC to 8 MHz, impedance characteristics of 50 Ω, 4-terminal pair configuration, measurable conductor diameter: ø0.3 mm (0.01 in) to 1.5 mm (0.06 in)

FOUR-TERMINAL PROBE 9140

DC to 100kHz, 1 m (3.28 ft) length

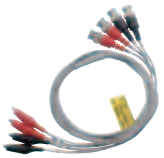
TEST FIXTURE 9261

DC to 5MHz, Cable connecting type, 1m (3.28ft) length

TEST FIXTURE 9262

Direct connection type, DC to 8 MHz, measurable conductor diameter: ø0.3 mm (0.01 in) to 2 mm (0.08 in)

Four-Terminal Probe for Electrochemical Measurement



FOUR-TERMINAL PROBE 9500-10

Cable length 1 m (3.28 ft), DC to 200 kHz, impedance characteristics of 50 Ω, 4-terminal pair configuration, measurable conductor diameter: ø0.3 mm (0.01 in) to 2 mm (0.08 in)

Test Fixtures for SMD

SMD TEST FIXTURE 9263

Direct connection type, DC to 8 MHz, Test sample dimensions: 1 mm (0.04 in) to 10 mm (0.39 in)

SMD TEST FIXTURE 9677

Direct connection type, For measuring SMDs with electrodes on the side; DC to 120MHz, test sample dimensions: 3.5mm ±0.5mm (0.14in ±0.02in)

SMD TEST FIXTURE 9699

Direct connection type, For measuring SMDs with electrodes on the bottom; DC to 120MHz, test sample dimensions: 1.0mm (0.04in) to 4.0mm (0.16in) wide, maximum 1.5mm (0.06in) high

PINCHER PROBE L2001

Cable length 730 mm (2.40 ft), DC to 8 MHz, characteristic impedance of 50 Ω, tip electrodes featuring 2-terminal design (4-terminal pair design between electrode and measurement unit), tip electrode spacing of 0.3 to approx. 6 mm (0.01 to approx. 0.24 in)

CONTACT TIPS IM9901
Compatible chip sizes: 1608 to 5750 (JIS)

CONTACT TIPS IM9902
Compatible chip sizes: 0603 to 5750 (JIS)

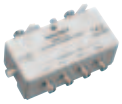
SMD TEST FIXTURE IM9100

Compatible with 0402-, 0603-, and 1005-size SMDs, DC to 8 MHz, 4-terminal electrode design

DC Bias Unit

DC BIAS VOLTAGE UNIT 9268-10

Direct connection type, 40 Hz to 8 MHz, maximum applied voltage of DC ±40 V.



DC BIAS CURRENT UNIT 9269-10

Direct connection type, 40 Hz to 2 MHz, maximum applied current of DC 2 A (maximum applied voltage of DC ±40 V).

DC BIAS VOLTAGE UNIT 9268

42 Hz to 5 MHz, max. allowable voltage ± 40 V DC

DC BIAS CURRENT UNIT 9269

42 Hz to 100 kHz, max. allowable current: ±2A DC

*When using the DC Bias Unit, external constant-voltage and constant-current sources are required.

SMD TEST FIXTURE IM9110

Measurable range: DC to 1 MHz, For SMD with electrodes on side , Measurable sample sizes: 008004 (EIA), 0201 (JIS), Please contact Hioki for information about other sizes, Direct connection type

HIOKI LCR Fixtures and Probes			3506-10	3504S	3511-50	IM3536	IM3523	IM3533	IM3533-01	IM3570	IM3590
			C	C	LCR	LCR	LCR	LCR	LCR	LCR	LCR
			1kHz,1MHz	120Hz,1kHz	120Hz,1kHz	DC, 4Hz to 8MHz	40Hz to 200kHz	1mHz to 200kHz	1mHz to 200kHz	4Hz to 5MHz	1mHz to 200kHz
IM9100	SMD Test Fixture	DC to 8 MHz, 50Ω	✔	✔	✔	✔	✔	✔	✔	✔	✔
IM9110	SMD Test Fixture	DC to 1 MHz, 50Ω	✔	✔	✔	✔	✔	✔	✔	✔	✔
9140	4-Terminal Probe	DC to 100 kHz, 75Ω		✔	✔						
9261-10	Test Fixture	DC to 5MHz, 50Ω	✔			✔	✔	✔	✔	✔	✔
L2001	Pin Type Probe	DC to 8MHz, 50Ω	✔			✔	✔	✔	✔	✔	✔
9140-10	4-Terminal Probe	DC to 200kHz, 50Ω	✔			✔	✔	✔	✔	✔	✔
L2000	4-Terminal Probe	DC to 8MHz, 50Ω	✔			✔	✔	✔	✔	✔	✔
9261	Test Fixture	DC to 5 MHz, 75Ω		✔	✔						
9262	Test Fixture	DC to 8MHz	✔	✔	✔	✔	✔	✔	✔	✔	✔
9263	SMD Test Fixture	DC to 8MHz	✔	✔	✔	✔	✔	✔	✔	✔	✔
9677	SMD Test Fixture	DC to 120MHz	✔	✔	✔	✔	✔	✔	✔	✔	✔
9699	SMD Test Fixture	DC to 120MHz	✔	✔	✔	✔	✔	✔	✔	✔	✔
9268	DC Bias Voltage Unit	42Hz to 5MHz			✔*						
9268-10	DC Bias Voltage Unit	40Hz to 8MHz				✔*	✔*	✔*	✔*	✔*	✔*
9269	DC Bias Current Unit	42Hz to 100kHz			✔*						
9269-10	DC Bias Current Unit	40Hz to 2MHz				✔*	✔*	✔*	✔*	✔*	✔*
9500-10	4-Terminal Probe	DC to 200kHz, 50Ω	✔			✔	✔	✔	✔	✔	✔

*External voltage or current power supply required

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