HF LCR METER
MODEL 11050 SERIES

The Chroma 11050 Series HF LCR Meter is a precision test instrument designed to accurately measure and evaluate passive components at high speeds. Its measurement capabilities cover the primary and secondary parameters required for testing the inductance, capacitance, resistance, quality factor and loss factor of passive components. The HF LCR Meter has a broad testing frequency range 75kHz~30MHz/1kHz~10 MHz/60Hz~5MHz suitable for analyzing component characteristics under different frequencies. Its 0.1% basic measurement accuracy provides stable and highly reliable results. A fast 7ms measurement speed effectively increases productivity when working in an automated environment.

In addition to the excellent measurement features found in other Chroma LCR Meters, the 11050 Series provides additional useful functions. It has 3 output impedance modes to satisfy demands for measuring and working with other instruments. The versatile digital display can be configured to best fit the current testing resolution; furthermore, the test signal monitoring function displays the voltage and current that is actually carried to the DUT. The timing settings of trigger delay, measure delay and average number of times allow the measurements to transfer seamlessly to an automated test environment providing accurate results within a limited testing time.

The detached design adopted by the Chroma 11050 Series provides several advantages. Since test processing and the display use separate CPUs, the testing speed is increased and shorter test leads are needed when integrated into an automated test environment. Shorter test leads improve the accuracy of high frequency measurements.

Chroma's 11050 Series HF LCR Meter has multiple remote interface options. Handler and RS-232C remote interfaces come standard for software or hardware control of test conditions, measurement triggers, judge test results, and collecting measured data. The standard USB port saves device settings and controls the output of an external DC bias current source. Optional GPIB and Ethernet remote interfaces are available as well for software control.

Due to the design of modern portable electronic communication devices with thin form factors and low power consumption, required frequency testing of power inductors is increasing. The equivalent series resistance of components has become a critical indicator to identify if it is good or bad. The buffer capacitor plays an important role for overall circuit reliability and must function properly under various voltage transient conditions; the equivalent series resistance must remain at a very low level when operated at high frequencies. The Chroma 11050 Series is focused on testing passive components at high frequencies and with enhanced key measurement capabilities during R&D so that it simulates the user's actual application as closely as possible. The increased accuracy of low impedance measurements demonstrates the usefulness of Chroma 11050 Series in high frequency testing applications.

The Chroma 11050 Series HF LCR Meter was designed with many enhancements and key features to make it the best choice to meet the demands of modern component characterization analysis and high speed testing for automated production line or incoming/outgoing inspection applications.

MODEL 11050 SERIES

KEY FEATURES

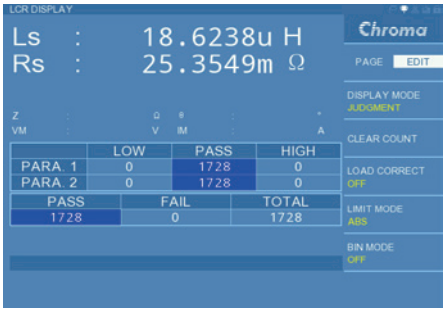
- Test Parameters: L/C/R/Z/Y/DCR/Q/D/ θ
- Test Frequencies:
  75kHz ~ 30MHz (11050-30M)
  1kHz ~ 10MHz (11050)
  60Hz ~ 5MHz (11050-5M)
- Test Level: 10mV ~ 5V
- Basic Accuracy: 0.1%
- 7ms high speed measurement
- 3 output impedance modes
- Test signal monitoring function
- Compare & bin-sorting function
- Open/short zeroing & load correction functions
- Detached measurement & display unit design
- Standard Handler, RS-232C, USB storage & external bias current control interface
- GPIB or LAN interface (Optional)

Chroma

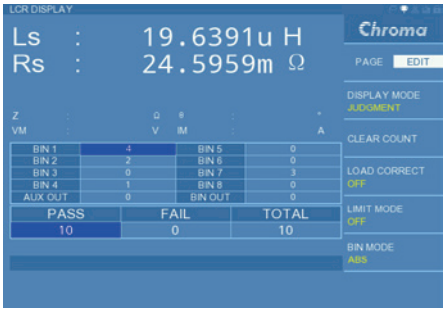
TEST MODES - BASIC

LCR Mode

LCR Mode



LIMIT Mode : low / pass / high

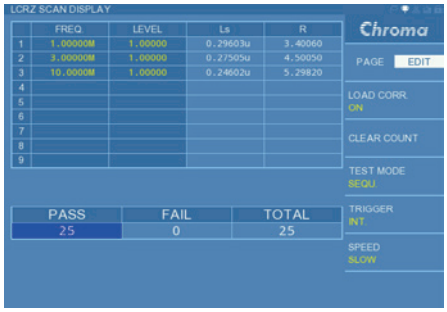


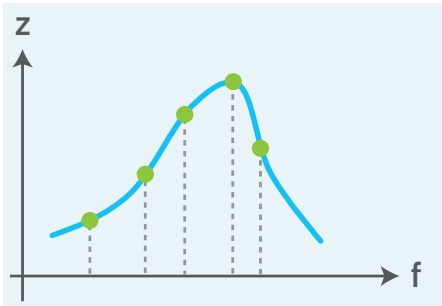
BIN Mode : bin1 ~ bin8 / bin out

TEST MODES - MULTI-POINT

LCRZ Mode

LCRZ mode is designed for testing frequency-dependent and voltage-dependent parameters. Capacitor and inductors impedance and equivalent series resistance tend to be affected by changes of frequency. And because of dielectric characteristics, a ceramic capacitors capacitance is sensitive to test voltage. By LCRZ mode, it is easy to evaluate these characteristics.

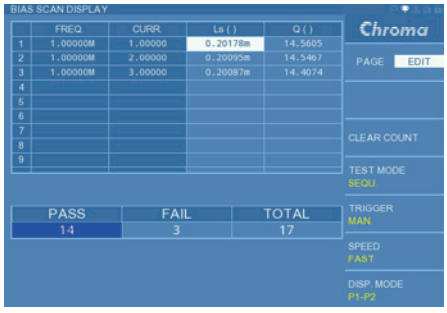


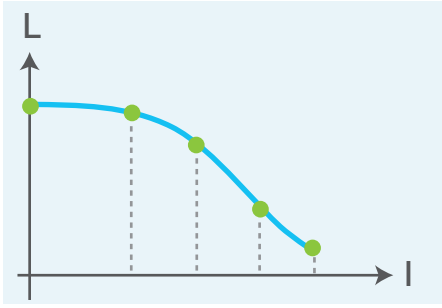


- ☑ Frequency / Level setting: 9 sets
- ☑ Sequence / Step test modes
- ☑ Pass / Fail judgment & count

Bias Scan Mode

Bias scan mode is designed for testing the saturation characteristic of magnetic components. The inductance and impedance of an inductor drops with the increase of bias current. Integrated with Chroma bias current source, the HF LCR meter can control the current setting and output. Bias scan mode is helpful to program the test process.



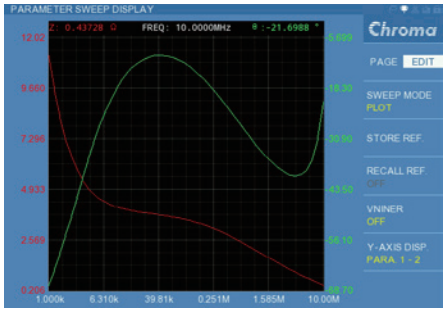


- ☑ Frequency / Bias Current setting: 27 sets
- ☑ Sequence / Step test modes
- ☑ Pass / Fail judgment & count

TEST MODES - ANALYZER

Parameter Sweep Mode

Parameter sweep mode is designed for plotting various characteristic curves. Up to 401 plotted points make the curve smoother. Users can use reference curve store/recall function to easily compare two curves. If there is a need to check the detailed measurements, just turn on the cursor or switch to table mode.



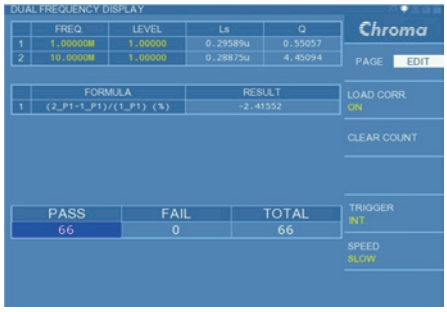
Parameter Sweep Mode

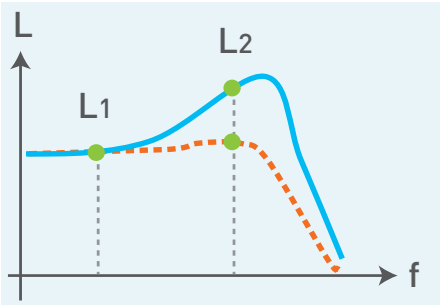
- ☑ Frequency / Level / Bias Current sweep: 401 points max.
- ☑ Plot / Table modes
- ☑ Reference Curve store / recall

TEST MODES - AUTOMATION

Dual Frequency Mode

Dual frequency mode is designed for calculating the percentage variance between measurements at two frequencies. The calculated result can show the characteristics relative to the quality. For example, the percentage variance of inductance can be applied to evaluate the power loss of the core at high frequencies.



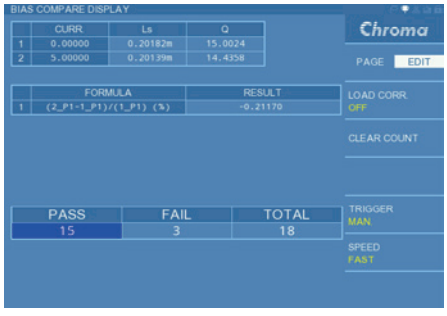


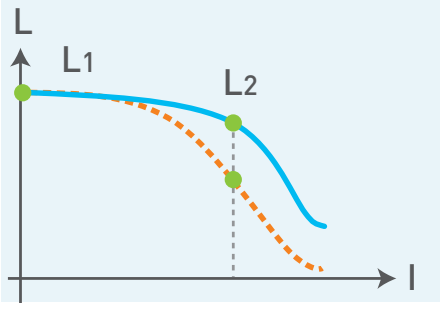
$$\text{Variance \%}\ (L_1, L_2) = \frac{L_2 - L_1}{L_1} \times 100\%$$

☑ Pass / Fail judgment & count

Bias Compare Mode

Bias compare mode is designed for calculating the inductance drop percentage of a magnetic component while bias current flows through it. Compared with the general absolute value judgment method, the drop percentage is more effective to sort out inductors with poor saturation characteristics.





$$\text{Variance \%}\ (L_1, L_2) = \frac{L_2 - L_1}{L_1} \times 100\%$$

☑ Pass / Fail judgment & count

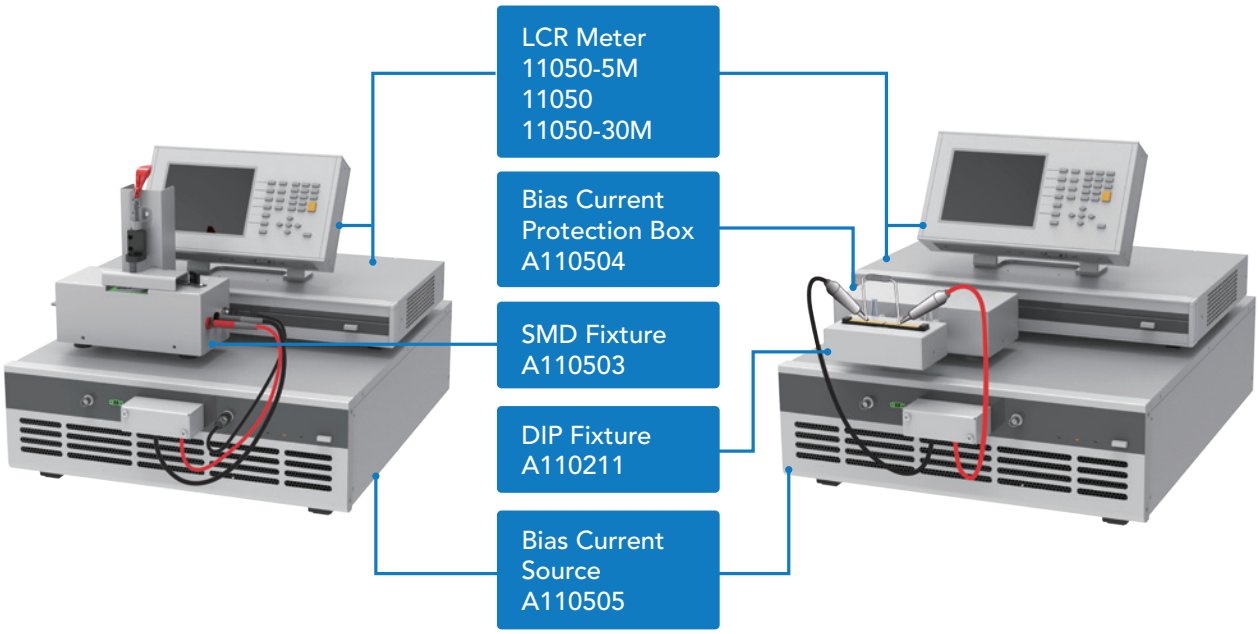
PERIPHERAL DEVICE (OPTIONAL)

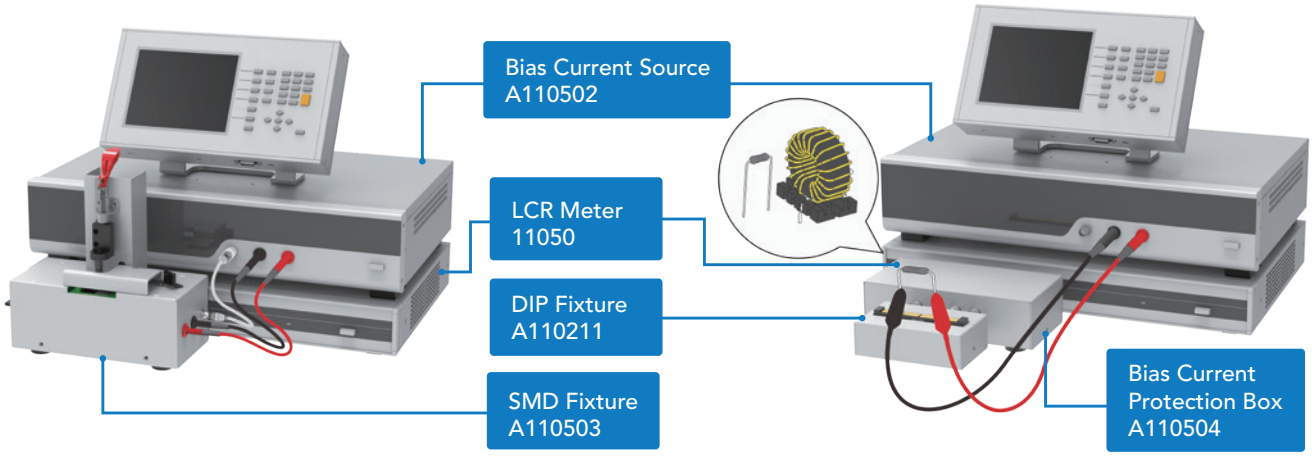
Bias Current Sources A110502 and A110505

The A110502/A110505 bias current source can be controlled by the 11050 series high frequency LCR meter to control the current output. It supports bias current 0A~5A and 0A~20A output at 100kHz~10MHz. If the A110503 bias current test fixture specially designed for A110502/A110505 is matched with A110502/A110505, it can directly put the SMD-type DUT on and start the test, and it can be provided without additional complicated wiring, the shortest measurement path of the SMD type to be measured. In addition, if A110504 bias current protection box is connected to A110211 test fixture and used with A110502/A110505, the DIP-type DUT can be measured. The A110503 bias current test fixture and the A110504 bias current protection box can be regarded as an extension of the 4-wire measurement of the 11050 LCR meter, which improves the accuracy of the measurement.

Model	A110502		A110505	
Bias Current Source				
Output Range	1A	5A	5A	20A
Output Current	0.000 ~ 1.000A	0.000 ~0.0005A	0.00 ~ 5.00A	0.00 ~ 20.00A
Accuracy	0.5% Setting + 0.5% range			
Frequency Response	100K ~ 10MHz			
Application Limitation				
Voltage Across Terminals	< 6.5V			
Interface	LCR Link , Interlock			
General				
Operation Environment	Temperature : 0˚C ~ 40˚C ; Humidity : 10% ~ 90% RH			
Power Reqirement	100 ~ 240V ±10% ; 47Hz ~ 63Hz			

WIRING INSTRUCTIONS - TEST FIXTURE CONNECTION

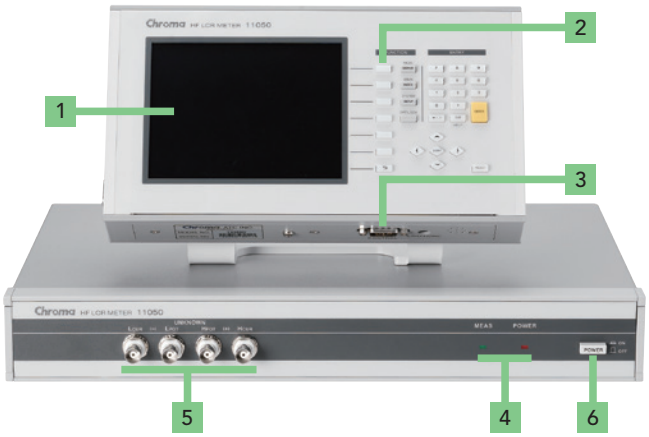


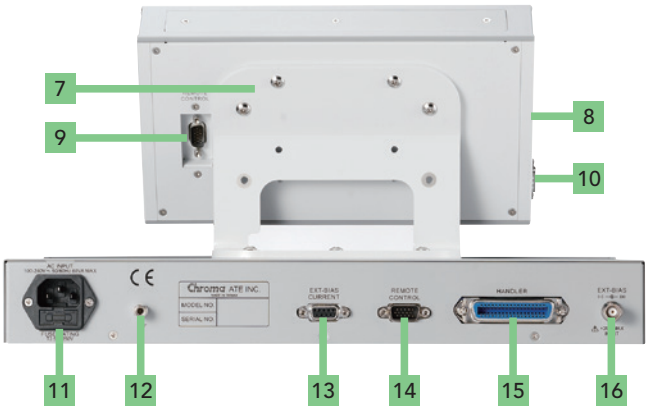


ORDERING INFORMATION

11050 : HF LCR Meter, 1kHz~10MHz
11050-5M : HF LCR Meter, 60Hz~5MHz
11050-30M : HF LCR Meter, 75kHz~30MHz
A110211 : Test fixture (DIP)
A110234 : Test leads (1M)
A110501 : 4-terminal SMD test fixture
A110502 : Bias current source (0~5A)
A110503 : Bias current test fixture (10MHz)
A110504 : Bias current protection box
A110505 : Bias current source (5A~20A)
A133509 : GPIB & Handler interface
A133510 : LAN & USB-H interface
B110500 : Extension test lead for automation (BNC to SMA, 1M)

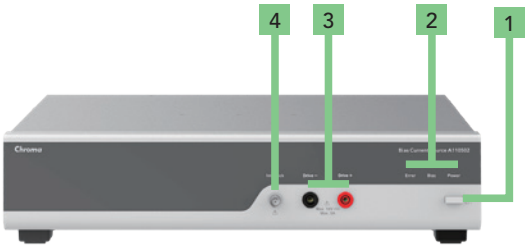
PANEL DESCRIPTIONS





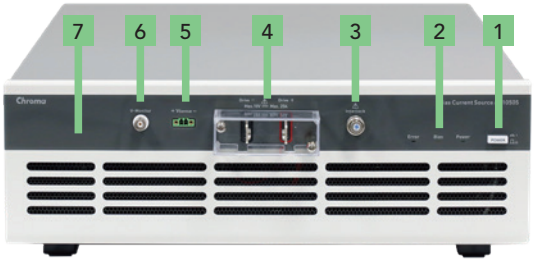
1. LCD Panel
2. Buttons
3. Remote Control Port
4. Power & Test Indicator
5. Measurement Terminals
6. Power Switch
7. Panel Bracket
8. Optional Interface Slot
9. Remote Control Port
10. RS-232C & USB Ports
11. Power Inlet
12. Grounding Terminal
13. Ext. Bias Current Control Port
14. Remote Control Port
15. Handler Interface
16. Ext. Voltage Terminal

Bias current source (0~5A)
A110502



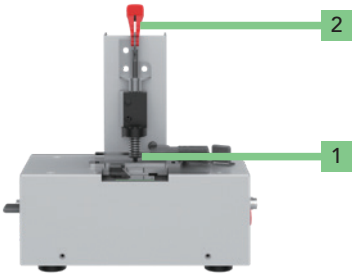
1. Power Switch
2. Indicator: POWER、BIAS and ERROR indicators
3. Current Output End: BIAS Drive+ & Drive- end
4. InterLock: It is mainly used for the fixture with protection device while coordinating with A110503 Bias Current test fixture. It can disable Interloc function via standard accessory InterLock short-circuited component while coordinating with A110504 Bias Current protection box.

Bias Current Source (5A~20A)
A110505



1. Power Switch
2. Indicator: POWER、BIAS and ERROR indicators
3. InterLock: It is for the fixture with a protective device such as the A110503 Bias Current Test Fixture. When the A110504 Bias Current Protection Box is used, the Interlock short circuit fixture on theA110505 will turn off the Interlock function.
4. Current Output Terminal (Drive+ & Drive-)
5. DUT DCV Detect Terminal (+VSense-)
6. DUT Voltage Monitor Terminal (V-Monitor)
7. Air Inlet

Bias Current Test Fixture
A110503



1. Thimble: It is for pressing DUT on the test platform.
2. Clamping: Press the clamp down once the DUT is put then the thimble pressed the DUT.

Bias Current Protection Box
A110504

1. LCR Meter UNKNOWN Connection Terminal: It is for connecting UNKNOWN terminal of 11050 HCUR, HPOT, LPOT and LCUR.
2. DUT UNKNOWN Connection Terminal: It is for connecting UNKNOWN terminal of DUT HCUR, HPOT, LPOT and LCUR.

SPECIFICATIONS

Model	11050-30M	11050	11050-5M
Test Parameter	L, C, R, Z, Y, Q, D, θ	L, C, R, Z, Y, DCR, Q, D, θ	
Test Signal			
Test Frequency	75kHz ~ 30MHz ± (0.1% + 0.01Hz)	1kHz ~ 10MHz ± (0.1% + 0.01Hz)	60Hz ~ 5MHz ± (0.1% + 0.01Hz)
Test Level	10mV ~ 1V ; ± [(10 + fm)% + 10mV] fm: test frequency [MHz]	≦1MHz : 10mV ~ 5V ; ± [(10 + fm)% + 1mV] >1MHz : 10mV ~ 1V ; ± [(10 + fm)% + 1mV] fm: test frequency [MHz]	
Output Impedance	100Ω, 25Ω	100Ω, 25Ω, OFF	
Measurement Display Range			
L	0.00001uH ~ 99.999MH		
C	0.00001pF ~ 999.999F		
R, Z	0.01mΩ ~ 9999.99MΩ		
DCR	--	0.01mΩ ~ 999.99MΩ	
Q, D	0.00001 ~ 99999		
θ	-90.00° ~ 90.00°		
Basic Accuracy			
Z	± 1.5%	± 0.1%	
θ	± 0.3°	± 0.04°	
DCR	--	± 0.1%	
Measurement Speed	Very Fast : 7ms, Fast : 15ms, Medium : 150ms, Slow : 295ms		
Communication Interface	RS-232C, Handler, USB storage, External bias current control, GPIB (option), LAN (option)		
Measurement Functions			
Trigger Mode	Internal, Manual, External, Bus		
Range Switching Mode	Auto, Hold		
Equivalent Circuit Mode	Series, Parallel		
Judgment	Compare, Bin-sorting		
Correction	Open/Short Zeroing, Load Correction		
Others			
Operating Environment	Temperature : 0˚C ~ 40˚C ; Humidity : 10% ~ 90%		
Power Consumption	60VA max.		
Power Requirement	100 ~ 240V ±10% , 47Hz ~ 63Hz		
Dimension (H x W x D)	230 x 428 x 290 mm / 9.06 x 16.85 x 11.42 inch		
Weight	Approx. 8 kg / 17.64 lb		

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