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 (11050-30M), 1kHz~10MHz (11050), 60Hz~5MHz (11050-5M) 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.
**TEST MODES - BASIC**

**LCR 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.

**LIMIT Mode**
Frequency / Level setting: 9 sets
Sequence / Step test modes
Pass / Fail judgment & count

**BIN Mode**
Frequency / Bias Current setting: 27 sets
Sequence / Step test modes
Pass / Fail judgment & count

**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.

**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.

**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.

**TEST MODES - MULTIPLE**

**Parameter Sweep Mode**
Frequency / Level / Bias Current sweep: 401 points max.
Plot / Table modes
Reference Curve store / recall

**LIMIT Mode**
Frequency / Level setting: 9 sets
Sequence / Step test modes
Pass / Fail judgment & count

**BIN Mode**
Frequency / Bias Current setting: 27 sets
Sequence / Step test modes
Pass / Fail judgment & count
**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.

\[
\text{Variance % (L}_1, \text{ L}_2) = \frac{\text{L}_2 - \text{L}_1}{\text{L}_2} \times 100\%
\]

☑ 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.

\[
\text{Variance % (L}_1, \text{ L}_2) = \frac{\text{L}_2 - \text{L}_1}{\text{L}_1} \times 100\%
\]

☑ Pass / Fail judgment & count

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**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
### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>11050-30M</th>
<th>11050</th>
<th>11050-5M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Parameter</td>
<td>L, C, R, Z, Y, Q, D, θ</td>
<td>L, C, R, Z, Y, DCR, Q, D, θ</td>
<td></td>
</tr>
<tr>
<td>Test Signal</td>
<td>Test Parameter</td>
<td>Test Parameter</td>
<td>Test Parameter</td>
</tr>
<tr>
<td>Test Frequency</td>
<td>75kHz ~ 30MHz ± (0.1% + 0.01Hz)</td>
<td>1kHz ~ 10MHz ± (0.1% + 0.01Hz)</td>
<td>60Hz ~ 5MHz ± (0.1% + 0.01Hz)</td>
</tr>
<tr>
<td>Test Level</td>
<td>10mV ~ 1V ; ± [(10 + fm)% + 10mV] fm: test frequency [MHz]</td>
<td>1MHz : 10mV ~ 5V ; ± [(10 + fm)% + 1mV] &gt;1MHz : 10mV ~ 1V ; ± [(10 + fm)% + 1mV] fm: test frequency [MHz]</td>
<td></td>
</tr>
<tr>
<td>Output Impedance</td>
<td>100 Q, 25 Ω</td>
<td>100 Q, 25 Ω</td>
<td>100 Q, 25 Ω, OFF</td>
</tr>
<tr>
<td>Measurement Display Range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>0.00001uH ~ 99.999MH</td>
<td>0.00001uH ~ 999.999F</td>
<td>0.01mΩ ~ 9999.99MΩ</td>
</tr>
<tr>
<td>C</td>
<td>0.0001pF ~ 999.999F</td>
<td>0.0001pF ~ 999.999F</td>
<td>0.01mΩ ~ 9999.99MΩ</td>
</tr>
<tr>
<td>R, Z</td>
<td>0.01mΩ ~ 999.999MΩ</td>
<td>0.01mΩ ~ 999.999MΩ</td>
<td></td>
</tr>
<tr>
<td>DCR</td>
<td>--</td>
<td>0.01mΩ ~ 9999.99MΩ</td>
<td></td>
</tr>
<tr>
<td>θ</td>
<td>L, C, R, Z, Y, D, θ</td>
<td>0.00001 ~ 99999</td>
<td>90.00˚ ~ 900.00˚</td>
</tr>
<tr>
<td>Basic Accuracy</td>
<td>± 1.5%</td>
<td>± 0.1%</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>± 0.3˚</td>
<td>± 0.04˚</td>
<td></td>
</tr>
<tr>
<td>DCR</td>
<td>--</td>
<td>± 0.1%</td>
<td></td>
</tr>
<tr>
<td>Measurement Speed</td>
<td>Very Fast : 7ms, Fast : 15ms, Medium : 150ms, Slow : 295ms</td>
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<tr>
<td>Communication Interface</td>
<td>RS-232C, Handler, USB storage, External bias current control, GPIB (option), LAN (option)</td>
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<tr>
<td>Measurement Functions</td>
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<tr>
<td>Trigger Mode</td>
<td>Internal, Manual, External, Bus</td>
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<tr>
<td>Range Switching Mode</td>
<td>Auto, Hold</td>
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<tr>
<td>Equivalent Circuit Mode</td>
<td>Series, Parallel</td>
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<tr>
<td>Judgment</td>
<td>Compare, Bin-sorting</td>
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<tr>
<td>Correction</td>
<td>Open/Short Zeroing, Load Correction</td>
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<td></td>
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<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Environment</td>
<td>Temperature : 0˚C ~ 40˚C ; Humidity : 10% ~ 90%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Consumption</td>
<td>60VA max.</td>
<td></td>
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<tr>
<td>Power Requirement</td>
<td>100 ~ 240V ±10% , 47Hz ~ 63Hz</td>
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<td></td>
</tr>
<tr>
<td>Dimension (H x W x D)</td>
<td>230 x 428 x 290 mm / 9.06 x 16.85 x 11.42 inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 8 kg / 17.64 lb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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  
A133509 : GPIB & Handler interface  
A133510 : LAN & USB-H interface  
B110500 : Extension test lead for automation (BNC to SMA, 1M)