LCR Meter

11021/11021-L

Quick Start Guide

Chroma

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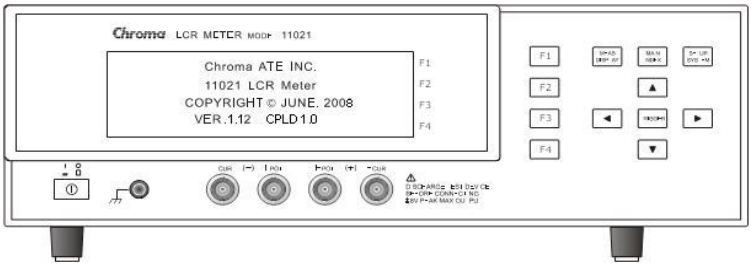

Version 1.0
November 2009
P/N ITM-0102173

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Warranty

All Chroma instruments are warranted against defects in material and workmanship for a period of one year after date of shipment. Chroma agrees to repair or replace any assembly or component found to be defective, under normal use during this period. Chroma's obligation under this warranty is limited solely to repairing any such instrument, which in Chroma's sole opinion proves to be defective within the scope of the warranty when returned to the factory or to an authorized service center. Transportation to the factory or service center is to be prepaid by purchaser. Shipment should not be made without prior authorization by Chroma.

This warranty does not apply to any products repaired or altered by persons not authorized by Chroma, or not in accordance with instructions furnished by Chroma. If the instrument is defective as a result of misuse, improper repair, or abnormal conditions or operations, repairs will be billed at cost.

Chroma assumes no responsibility for its product being used in a hazardous or dangerous manner either alone or in conjunction with other equipment. High voltage used in some instruments may be dangerous if misused. Special disclaimers apply to these instruments. Chroma assumes no liability for secondary charges or consequential damages and in any event, Chroma's liability for breach of warranty under any contract or otherwise, shall not exceed the purchase price of the specific instrument shipped and against which a claim is made.

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Material Contents Declaration

Chroma provides material contents declaration for RoHS compliant products as below:

Part Name	Hazardous Substances					
	Lead	Mercury	Cadmium	Hexavalent Chromium	Polybrominated Biphenyls	Polybromodiphenyl Ethers
	Pb	Hg	Cd	Cr^{6+}	PBB	PBDE
PCBA	O	O	O	O	O	O
CHASSIS	O	O	O	O	O	O
ACCESSORY	O	O	O	O	O	O
PACKAGE	O	O	O	O	O	O

"O" indicates that the level of the specified chemical substance is less than the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

"×" indicates that the level of the specified chemical substance exceeds the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

Disposal

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being. When replacing old appliances with new one, the retailer is legally obligated to take back your old appliances for disposal at least for free of charge.

Storage, Freight, Maintenance & Disposal

Storage
When the device is not in use, please pack it properly and store it under a good environment. (The packing is not needed when the device is under appropriate environment.)

Freight
Please use the original packing material when move the device. If the packing material is missing, please use the equivalent buffer material to pack and mark it fragile as well as keep away from water etc to avoid damaging the device during movement. The device are precise equipment, please use qualified transportation as possible. And avoid heavy hitting etc to damage the device.

Maintenance
There is no maintenance operation for general user (except for the note in the manual.) Please contact Chroma or its local agent when the device is having the user judgment abnormal. Don't maintain by yourself to avoid occurred unnecessary danger and serious damage to the device.

Disposal
When the device in badly condition and can't be used or repaired, please discard it according to your company disposal procedures or local legal procedures. Don't discard arbitrary to avoid polluting environment.

Cleaning
Remove all connected wires and cables on the instrument before cleaning. Use a brush to clean the dust on it. For internal cleaning, use a low-pressure air gun to vacuum the dust inside or send it back to the distributors or agents of Chroma for cleaning.

Table of Contents

1. Preface

1.1 Product Introduction

The 11021/11021-L LCR METER is an automatic instrument used for testing and analyzing components. The device was designed to solve the problems of low labor efficiency and low product quality that have occurred since the electronics industry began to flourish. It is able to increase the work efficiency and enhance the product quality to international standard.

The applicable frequency ranges for 11021 are 100Hz, 120Hz, 1kHz and 10kHz (the actual output is 9.6KHz), and for 11021-L are 1kHz, 10kHz, 40kHz and 50kHz.

The test functions equipped with this device containing: inductance, capacitance, AC resistance, impedance (L, C, R, and Z), and etc., which are perfect functions for the production line and quality control.

Via the internal-controlled auto mode and the programmable mode measurement functions, the instrument is capable of providing fast, highly accurate, convenient and reliable tests at low cost. It has the functions of Hi/Lo-limit comparison, group test, selection control for frequency and voltage test, data storage setting, GPIB interface for remote controlling 11021 and data transfer as well as statistics analysis function from PC. The handler interface is able to trigger the instrument for measurement and then send the test results to an external device for checking the response of the component.

The multi-function test device, ergonomic keyboard design, guided panel operation, extra-large LCD, and password protection make the 11021 instrument very easy to operate. Its protection enables the test result to be shown on the display clearly.

The basic accuracy of 11021 is 0.1%, and to calibrate it an exclusive measurement device (optional) is required with simple measurement parameters. The calibration can be done easily by giving the condition of OPEN and SHORT in the procedure.

If the meter requires external or extended lead tests, please be noted that the connection test of 4 contacts needs to be applied correctly. In cases of high frequency measurement, it is necessary to consider the high frequency response on the test wire.

1.2 Summary of Specification

- **Measurement Parameter:** Primary parameters – L, C, R, ｜Z｜
  Secondary parameters – Q, D, θ, ESR, Xs
- **Basic Accuracy:** Basic 0.2% (1 KHz/1V rms)
- **Measurement Range:** L -- 0.01uH ~ 9.999 KH
  C -- 0.01pF ~ 99.99 mF
  R -- 0.1mΩ ~ 99.99 MΩ
  ｜Z｜-- 0.1mΩ ~ 99.99 MΩ
  Q -- .0001 ~ 9999
  D -- .0001 ~ 9999
  θ -- -180.00° ~ +180.00°
- **Measurement Frequency:** **11021:**
  Standard: 100Hz, 120Hz, 1kHz, 10kHz
  (the actual output is 9.6KHz)
  Optaional: 100Hz, 120Hz, 1kHz
  11021-L:
  1kHz, 10kHz, 40kHz, 50kHz
- **Measurement Voltage:** **Constant voltage:**
  11021: 0.25Vrms, 1V rms
  11021-L: 50mVrms, 1V rms
- **Equivalent Circuit:** Serial, Parallel
- **Zeroing Calibration:** Open, Short
- **Interface:** RS-232 (standard), GPIB & Handler interface (optional)

1.3 Checking Before Use

Upon receipt of the instrument, please check on the following items:

(1) If there are any damages or scratches on the product surface.
(2) The standard and optional accessories came with the instrument as listed in Table 1-1 and Table 1-2.

If any damage is found or any accessory is missing, please contact Chroma, its branches, or agents for prompt service.

Item	Qty	Remarks
Power Cord	1	A 1 meter bend power cord
Adaptor	1	For the power plug from 3P to 2P
Slow Blow Fuse 630mA	2	For power source AC 110V use
Slow Blow Fuse 315mA	2	For power source AC 220V use
User's Manual	1	PDF file in CD
Test Cable	1	For clipping the DUT

Table 1-1 Standard Accessories

Item	Qty	Description
A110211 Components Test Fixture	1	It is a DIP type passive components test fixture.
A110212 Component Remote Test Fixture	1	It is a DIP type passive components remote test fixture (1 meter.)
A110104 SMD Test Cable	1	It is a SMD type passive components test cable.
A110232 4 BNC Test Cable	1	It is a 4 BNC test cable.
A133004 SMD Test Box	1	It is a SMD type passive components test box.
A110235 GPIB & HANDLER Interface Card	1	It is a GPIB & HANDLER interface card.
A110236 19" Rack Mounting Kit	1	It is fixed on the system frame.
A110242 Battery ESR Test Kit	1	It is test box that isolates the DC voltage of DUT.
A165009 4BNC Test Cable with Probe	1	It is a 4BNC test cable with probe.
50 Pin Handler Control Cable	1	It is a control cable (0.5 meter) with 50 Pin Handler connectors (M) at the two ends.
50 Pin Handler Control Cable	1	It is a control cable (1.5 meter) with 50 Pin Handler connectors (M) at the two ends.

Table 1-2 Optional Accessories

2. Installation

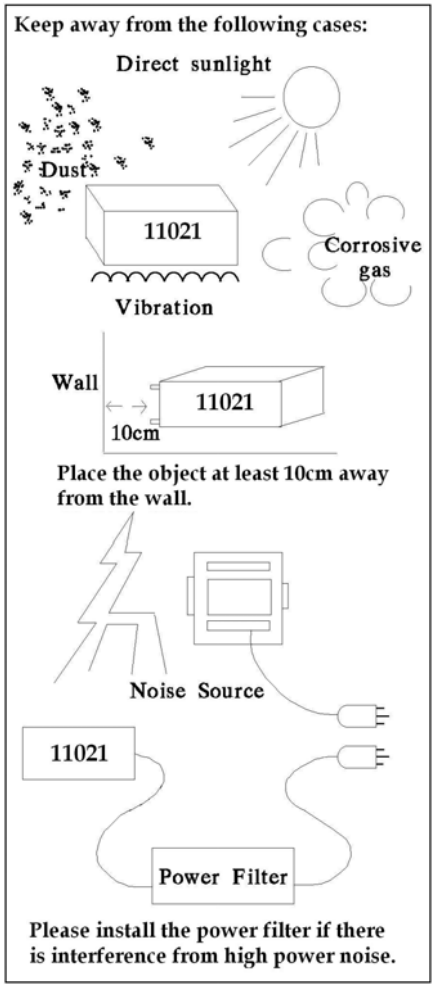
2.1 Ambient Environment

(1) Do not use the meter in a dusty or vibrating location. Do not expose it to sunlight or corrosive gas. Be sure that the ambient temperature is 10 ~ 40°C and that the relative humidity is below 90%.

(2) The rear of the meter is equipped with a cooling fan to keep the internal temperature down, so adequate ventilation should be ensured. The meter should be located at least 10cm from any object or wall behind it. Do not block the left and right ventilation holes to keep the meter in good precision.

(3) The meter has been carefully designed to reduce the noise from the AC power source. However, it should be used in an environment with lowest noise as possible. If noise is inevitable, please install a power filter.

(4) The meter should be stored within the temperature range of 0°C ~ 50°C. If the unit is not going to be used for a long time, please store it in its original box or a similar package and keep it from direct sunlight and humidity.



(5) Common Environment Conditions
1. Indoor use
2. Altitude: 2000 m
3. Transient Overvoltage at Mains Supply: 2500V
4. Pollution Degree: 2

2.2 Power Line Connection

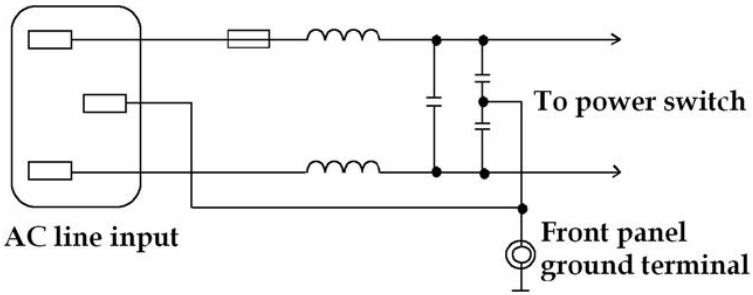
Before plugging in the power cord, make sure the power switch is off and the voltage selector on the rear panel meets the required voltage. Please use the power supply frequency of 50 Hz or 60Hz.

2.3 Fuse

There is one fuse installed in the rear panel. Please be aware of the following when replacing the fuse:

(1) First turn off the power and unplug the power cord before changing the fuse.
(2) The specification of fuse: AC 100V～120V → T630mA 250V
AC 220V～240V → T315mA 250V

For safety and noise reduction, it is necessary to use a 3-pin power cord to connect the power inlet on the rear panel for AC line input and to ground the GROUND terminal on the front panel as shown below.



2.4 Power Regulation

As this instrument is a precision electronic test device, the accuracy might be severely influenced by the undulated input power after tested. There is ±10% changeable power even in the laboratory, so it is suggested to use a regulator between the power sources and test devices. This is the best way to eliminate the variation of measured data caused by the unstable power voltage.

2.5 Connecting the Device Under Test (DUT)

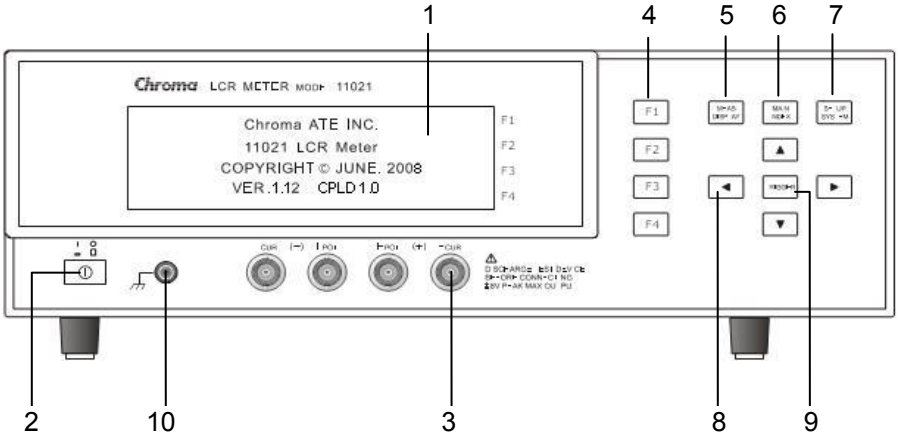
As connecting the 11021/11021-L LCR to a DUT (Device Under Test) can be done via the BNC connectors labeled with HCUR, HPOT, LPOT and LCUR, the external test device is often required.

Notice

Be noted that the LCUR and LPOT connectors should connect to the same terminal on DUT, while the HCUR and HPOT should connect to another.

3. Description of Panel

3.1 Front Panel Description



(1) LCD Display

The display of this test device is a 40 X 4 character mode LCD. All measurements and settings can be clearly displayed.

(2) Power Switch

It switches the power to on or off.

(3) Unknown DUT Connectors

There are 4 unique BNC connectors that can connect an external test device or lead to perform the measurement of an unknown DUT.

HCUR: The current drive terminal with high potential.
HPOT: The potential detector with high potential.
LPOT: The potential detector with low potential.
LCUR: The current drive terminal with low potential.

CAUTION When the DUT is a component containing polarity, the "high potential" should connect to the terminal marked with (+), while "low potential" should connect to the terminal marked with (-) on the front panel during test.

⚠WARNING When measuring the component containing polarity, be sure to discharge first to avoid damaging the instrument.

(4) Function Keys

There are 4 function keys. The major function of them is to show the different conditions of each function or other options which may need to be selected depending on the user's requirements.

(5) MEAS DISPLAY

Upon pressing this key, the instrument is in basic component measurement & analysis mode. In this screen, each test parameter can be changed directly and the value read such as test frequency, test voltage, measurement parameter, measurement speed, test loops (series or parallel)…etc.

(6) MAIN INDEX

Pressing this key allows entry to the main index screen. In this screen you may select the test function you wish to use, for instance the DUT test result sorting function, open test, short test, comparing function…etc.

(7) SYSTEM SETUP

Pressing this key gives access to the main system parameters setup screen, which allows each system parameter to be changed directly, e.g., the calibration of this instrument, memory management, selection and setting parameters of each system and measurement parameters. (The functions of calibration and memory-management require a password for entry).

(8) Cursor

There are [▲], [▼], [◄], and [►] four arrow keys. These keys are for display in different conditions and control cursor, which can be useful when inputting each parameter. They can also be used as selection keys; for instance use [◄], [►] to change the range, also use [▲], [▼] to set the frequency or voltage.

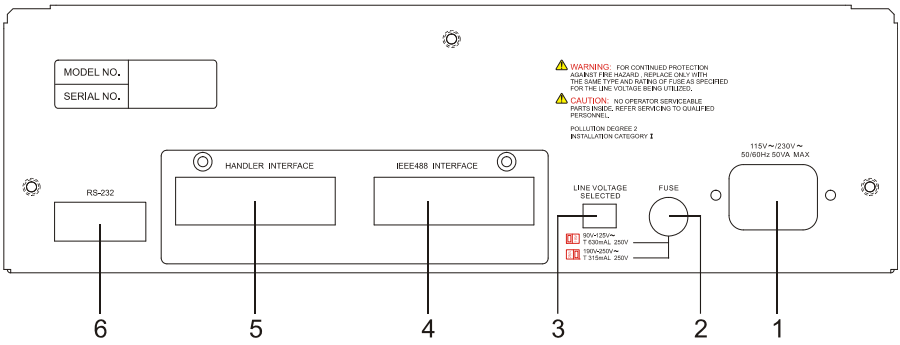
(9) Trigger

This is the key to trigger the measurement for start. When the measurement is in manual state, press this key can do the measurement once.

(10) Isolation Terminal

This terminal connects to the case of the instrument. Connect this terminal to the isolation area of DUT to avoid the test value from interfering by external signal that may affect its accuracy.

3.2 Rear Panel Description



(1) AC Line

It meets the International Electromechnical Commission 320 standard for 3-wire socket. Please use the power cord of Beeline SPH-386 or similar (the accessory W12 010130).

(2) Fuse

A 630mA or 315mA slow blow fuse is used to prevent the over current from occurring when the instrument power is in 90 ~ 125V or 190 ~ 250V.

(3) Power Voltage Switch

Be sure to power off the instrument before switching the voltage. Use a small flat screwdriver to switch the power voltage to the proper position.

(4) IEEE488 Interface Connector

The input/output connecting cable follows the IEEE488-1978 standard. The functions include: total remote control, selected result output, with or without controller, and IEEE-488 interface connection acceptance.

(5) HANDLER Interface Connector

It is the element handler. The output is GO/NG and status etc., while the input is “Start” signal. It accepts Amphonol “Microribbon” plug or P/N 57-30240 or equivalent products.

(6) RS232 Interface Connector

The input/output connecting cable follows the RS232 standard. The functions include: total remote control, selected result output, with or without controller, and RS232 interface connection acceptance.

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