



## LCR METER MODEL 11021/11021-L

The Chroma 11021 and 11021-L are highly cost-effective digital LCR meters. The 11021 provides test frequencies of 100Hz, 120Hz, 1kHz, and 10kHz, while the 11021-L offers 1kHz, 10kHz, 40kHz, and 50kHz for high-frequency testing. Equipped with a standard RS-232 interface and optional GPIB and Handler interfaces, these instruments offer fast, stable measurements ideal for both production line component evaluation and fundamental impedance testing on the bench.

### 8-Bin Sorting Function

The 11021/11021-L features an 8-bin sorting function complete with bin count statistics, making it ideal for sorting components like magnetic cores and capacitors. The statistical data can be used for analyzing test result distribution and assessing production quality.

### HI/GO/LO Comparator

A built-in comparator function evaluates measurement results against HI, GO, and LO for capacitance, as well as GO/NG judgments for dissipation (D) factor. An audible alarm provides immediate feedback for overall GO/NG results.

### Trigger Delay Time

For large capacitance measurements in automatic production, an RC (meter output resistance and unknown capacitance) delay time for test signal transient is necessary. The 11021/11021-L includes a trigger delay function for this reason, which is convenient for adjustment of automated equipment timing.

### Input Protection

Undischarged devices under test (typically capacitors) are a common cause of damage to LCR meters. The 11021/11021-L incorporates a robust input protection circuit to safeguard the instrument from such damage.

### Open/Short Zeroing

Conventional LCR meters only provide zero offset to substrate stray capacitance, residual resistance, or residual inductance for C, R, and L measurement. This makes it impossible to accurately measure Q (quality) factor and D factor. To address this, the 11021/11021-L provides full open/short circuit zeroing.

## MODEL 11021/11021-L

### KEY FEATURES

- Test frequencies:
  - 11021: 100H/120Hz/1kHz/10kHz (9.6kHz)
  - 11021-L: 1kHz/10kHz/40kHz/50kHz
- Basic accuracy: 0.1% (11021), 0.2% (11021-L)
- 0.1m $\Omega$  to 99.99 M $\Omega$  measurement range, 4½ digits resolution
- Lower harmonic-distortion affection
- Fast measurement speed (75ms)
- Standard RS-232 interface
- Optional GPIB & Handler interface
- Programmable trigger delay time is convenient for measurement timing adjustment in automatic production
- Bin-sorting function
- Comparator and pass/fail alarm beeper function
- Text mode 40x4 matrixes LCD display
- User-friendly interface
- Open/short zeroing
- Online firmware updates (via RS-232)
- Input protection (1 Joule)



**Chroma**  
Advancing Excellence

## Lower Harmonic-distortion Phase-detection Technology

The 11021/11021-L uses low harmonic-distortion phase detection technology to minimize measurement errors caused by hysteresis distortion - commonly encountered when testing magnetic components or capacitors with high dielectric coefficients. This offers a marked improvement over conventional LCR meters that rely on a half-period integration method for phase detection.

The 11021-L is therefore an ideal choice for high-frequency coils, cores, chokes, and other passive components in incoming/outgoing quality inspection or automated production. As shown in Figures 1 and 2, the frequency spectrum of a half-period square wave includes significant 3rd and 5th order harmonics. When testing non-linear components, odd-order harmonics (3rd, 5th, 7th, etc.) may appear in the measured voltage or current signals. If the same low-order harmonics are present in both the unknown signal and the phase detection signal, the result is a noticeable accuracy error.

To address this, the 11021/11021-L uses an eight-step sine-wave multiplier as the phase detector. This reduces the impact of low-order harmonics to a negligible level, safeguarding measurement accuracy.

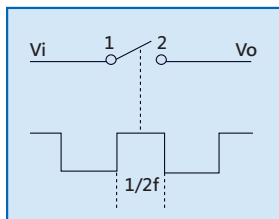


Figure 1: Frequency spectrum of half-period square wave (general low-end LCR meters)

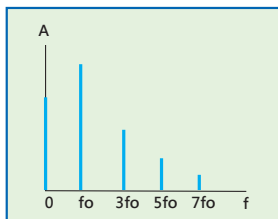
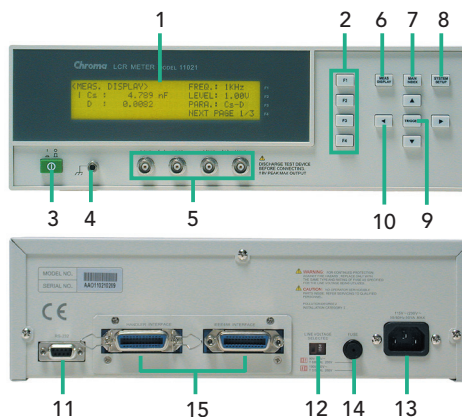


Figure 2: Non-ignorable 3<sup>rd</sup>, 5<sup>th</sup> order harmonics (11021 uses eight-step sine-wave multiplier)

## PANEL DESCRIPTION



1. LCD Display
2. Function Keys
3. Power Switch
4. Ground Terminal
5. Measurement Terminals
6. Measurement Display Key
7. Main Index Key
8. System Setup Key
9. Trigger Key
10. Cursor Keys
11. RS232 Interface
12. Power Voltage Selector
13. AC Line Input
14. Fuse
15. GPIB and Handler Interface

## SPECIFICATIONS

Model	11021	11021-L
Measurement Parameter		
Primary Display	L, C, R,  Z	
Secondary Display	Q, D, ESR, Xs, $\theta$	
Test Signals Information		
Test Level	0.25V / 1V, $\pm(10\% + 3 \text{ mV})$	50mV/ 1V, $\pm 10\%+3\text{mV}$
Test Frequency	100Hz, 120Hz, 1kHz, 10kHz (9.6kHz)	1kHz, 10kHz, 40kHz, 50kHz
Frequency Accuracy	$\pm 0.25\%$	$\pm 0.02\%$
Output Impedance (Typical)	Varies as range resistors 25, 100, 1k, 10k, 100k	
Measurement Display Range		
Primary Parameter	L: 0.01 $\mu\text{H}$ -9.999kH, C: 0.01pF-99.99mF, R, Z : 0.1m.-99.99M $\Omega$	
Secondary Parameter	Q: 0.1-9999.9, D: 0.0001-9999.9, $\theta$ : -180.00° to +180.00°	
Basic Accuracy *1	$\pm 0.1\%$	$\pm 0.2\%$
Measurement Time (1kHz) *2		
Fast	Freq = 1k/10kHz: 75ms Freq = 100/120Hz: 85ms	Freq = 1kHz/10kHz: 75ms Freq = 40kHz: 105ms Freq = 50kHz: 90ms
Medium	145ms	*3
Slow	325ms	*4
Trigger	Internal, Manual, External, BUS	
Display	L, C, R,  Z , Q, D, R, $\theta$	
	40 x 4 (Character Module) LCD Display	
Function		
Correction	Open/Short zeroing	
Equivalent Circuit Mode	Series, Parallel	
Interface & Input/Output		
Interface	RS-232 (Standard), Handler & GPIB (Optional)	
Output Signal	Bin-sorting & HI/GO/LOW judge	
Comparator	Upper/Lower limits in value	
Bin Sorting	8 bin limits in %	
Trigger Delay	0-9999mS	
General		
Operation Environment	Temperature: 10°C-40°C, Humidity: < 90 % R.H.	
Power Consumption	50VA max.	
Power Requirement	90-132Vac or 180-264Vac, 47-63Hz	
Dimensions (H x W x D)	100 x 320 x 206.4 mm / 3.94 x 12.6 x 8.13 inch	
Weight	4 kg / 8.81 lbs	

Note\*1: 23 $\pm$ 5°C after OPEN and SHORT correction, slow measurement speed.

Refer to operation manual for detail measurement accuracy descriptions.

Note\*2: Measurement time includes sampling, calculation and judge test parameter measurement.

Note\*3: Freq.=1kHz/10kHz 145ms Freq.=40kHz 185ms Freq.=50kHz 150ms

Note\*4: Freq.=1kHz/10kHz 325ms Freq.=40kHz 415ms Freq.=50kHz 400ms

\* All specifications are subject to change without notice.

## ORDERING INFORMATION

11021: LCR Meter 1kHz

11021: LCR Meter 10kHz

11021-L: LCR Meter

A110104: SMD Test Cable #17

A110211: Component Test Fixture

A110212: Component Remote Test Fixture

A110232: 4 BNC Test Cable with Clip#18

A110234: High Frequency Test Cable

A110235: GPIB & Handler Interface

A110236: 19" Rack Mounting Kit

A110242: Battery ESR Test Kit

A133004: SMD Test Box

A165009: 4 BNC Test Cable with Probe

HEADQUARTERS  
CHROMA ATE INC.  
88 Wenmao Rd.,  
Guishan Dist.,  
Taoyuan City  
333001, Taiwan  
T +886-3-327-9999  
F +886-3-327-8898  
www.chromaate.com  
info@chromaate.com

U.S.A.  
CHROMA SYSTEMS  
SOLUTIONS, INC.  
19772 Pauling,  
Foothill Ranch,  
CA 92610, USA  
T +1-949-600-6400  
F +1-949-600-6401  
www.chromausa.com  
sales@chromausa.com

EUROPE  
CHROMA ATE EUROPE B.V.  
Morsestraat 32, 6716 AH  
Ede, The Netherlands  
T +31-318-648282  
F +31-318-648288  
www.chroma.eu.com  
salesnl@chroma.eu.com

CHROMA GERMANY GMBH  
Südtiroler Str. 9, 86165,  
Augsburg, Germany  
T +49-821-790967-0  
F +49-821-790967-600  
www.chroma.eu.com  
salesde@chroma.eu.com

JAPAN  
CHROMA JAPAN  
CORP.  
888 Nippa-cho,  
Kouhoku-ku,  
Yokohama-shi,  
Kanagawa,  
223-0057 Japan  
T +81-45-542-1118  
F +81-45-542-1080  
www.chroma.co.jp  
info@chroma.co.jp

KOREA  
CHROMA ATE  
KOREA BRANCH  
312, Gold Tower,  
14-2, Pangyoyeok-ro  
192, Bundang-gu,  
Seongnam-si,  
Gyeonggi-do,  
13524, Korea  
T +82-31-781-1025  
F +82-31-8017-6614  
www.chromaate.co.kr  
info@chromaate.com

CHINA  
CHROMA ELECTRONICS  
(SHENZHEN) CO., LTD.  
8F, No.4, Nanyou Tian  
An Industrial Estate,  
Shenzhen, China  
T +86-755-2664-4598  
www.chroma.com.cn  
info@chromaate.com

SOUTHEAST ASIA  
QUANTEL PTE LTD.  
(A company of Chroma Group)  
25 Kallang Avenue #05-02  
Singapore 339416  
T +65-6745-3200  
F +65-6745-9764  
www.quantel-global.com  
sales@quantel-global.com