Preliminary

RIPPLE CURRENT TESTER
MODEL 11800/11801/11810

The Chroma 11800/11801/11810 Ripple Current Tester is a precision tester designed for electrolytic capacitors load life testing. Provides constant ripple current output and constant peak voltage (Vpeak = Vdc + Vac_peak) output digital control function. Let load life testing for electrolytic capacitors becomes easier and more reliable. And, the Chroma 11800/11801/11810 use excellent output amplifier design technology to reduce power consumption and internal temperature rising. For long time testing requirement, it can reduce electricity cost and perform high stability. The Chroma 11800/11801/11810 is a just right test solution for electrolytic quality evaluation.

The Chroma 11800/11801/11810 Ripple Current Tester is the experience and technology accumulation for several years. According to JIS-C-5102 test method to design large LCD display and computer digital programmable precision measurement instrument, which aim at electrolytic capacitor, tantalum capacitor and solid-state capacitor manufacturers to execute life test instead of wasting time and complicated traditional operation method.

To simplify the operation setting procedure and automatic discharge function for ensuring the operational personnel safety, also connect with the computer through RS485 to monitor Ripple Current Tester include test conditions and monitored status.

The precise measurement data andhumanization operation is not only to promote reliability of life test but also assure product quality. It is the best choice in measurement.

Four Terminal Contact Test Jig Design
Four terminal contact test jig design, ensure accurate monitoring of voltage dropped on capacitors under test (Patent pending).

Paired Cooper-foil Wiring Test Cable
The Chroma 11800/11801/11810 provides the test fixture for series and parallel, and it improves the loss effectively as high frequency testing causes by the test cable and fixture. The paired cooper-foil wiring test cable reduces voltage drop on the current driving loop and ensures accurate monitoring of ac level dropped on capacitors under test (Patent pending). Working voltage or rated voltage measurement specification too low will be result in the manufacturer's verification invalid problem.

Large LCD Display
The Chroma 11800/11801/11810 uses large 320x240 dot-matrix display, shows more test information at the same time. Combine with guided operation design, makes the tester easier to operation. Users can operate instrument easily with great view of setting functions and test result.

RS-485

Ripple Current Tester

MODEL 11800/11801/11810

Key Features:

- Digital constant current output and constant peak voltage output control function
- Four terminal contact test jig design (Patent pending)
- Paired cooper-foil wiring test cable (Patent pending)
- 0-500 V DC bias voltage source, 0.3% basic accuracy 0.01-30A, 100Hz/ 120Hz/400Hz/ 1kHz, AC ripple current source, ± (0.5% of reading +0.1% of range) basic accuracy (11800)
- 0.01-10A, 20kHz-100kHz AC ripple current source, ±2% basic accuracy (11801) -10A Max, 20KHz- 1000kHz AC ripple current source, ±2% basic accuracy(11810)
- Lower power consumption and lower electricity cost
- Large LCD display (320 x 240 dot-matrix), with larger screen for reading the test result conveniently
- Alarm for indicating of normal or abnormal test termination. Tested time will be recorded if the test is terminated abnormally. An automatic discharge is always performed after test termination
- When end the test, DUT capacitors are automatic discharged to protect the operational personnel safety Standard RS485 interface is provided for computer monitoring
- Optional 20-fixtures Series or Parallel test jigs
- Digital timer inside

Model 11801

Chroma

APPLICATION FIELD

CAPACITOR QUALITY EVALUATION

Electrolytic capacitor, tantalum capacitors, and solid-state capacitors users (SMPS maker, PC maker, Electronic devices maker etc.) use to compare the quality between different capacitor venders.

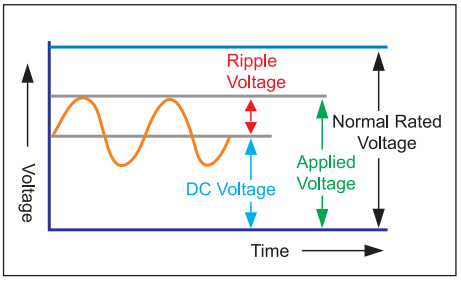
CAPACITOR QUALITY ASSURANCE

Electrolytic capacitor, tantalum capacitors, and solid-state capacitors manufacture uses to perform quality verification as LOAD LIFE TEST.

TEST METHOD

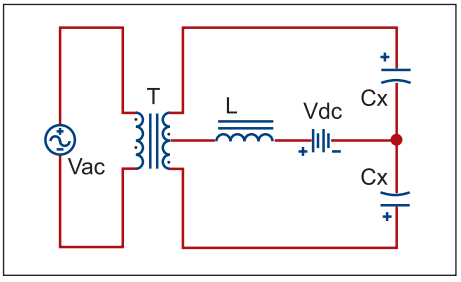
LOAD LIFE TEST

Electrolytic capacitors load life testing assume the capacitors work at severely adverse circumstance. That circumstance include temperature, current and peak voltage. The temperature is the highest ambient temperature for customer using electrolytic capacitors. The current is the maximal ripple current that the capacitors permit. The peak voltage is capacitor applied voltage ,Vdc+ Vac_peak. **(Figure1)**



(Figure 1)

Chroma 11800/11801/11810 follows JISC 5141. The standard recommended test circuit as **Figure 2** for Electrolytic capacitors load life testing. The circuit contains alternating current voltage source (Vac), isolation transformer (T), alternating current segregate Choke (substitute :diode, L), direct current voltage source (Vdc), DUT capacitors (Cx).



(Figure 2)

For more test efficient, the users can use series, parallel , or series-parallel connection with one more pair capacitors to save time, but it is based on without any doubtful situation (JIS C 5101-1 1998 4.23.4).

LOAD LIFE TEST JUDGMENT

Electrolytic capacitors load life testing judgment is depend on the change between the electrolytic capacitors load life testing before and after. The judgment includes the electrical specification and surface. The electrical specification contains leakage current, capacitance, dissipation factor, impedance (Z), and equivalent series resistance (ESR) etc.

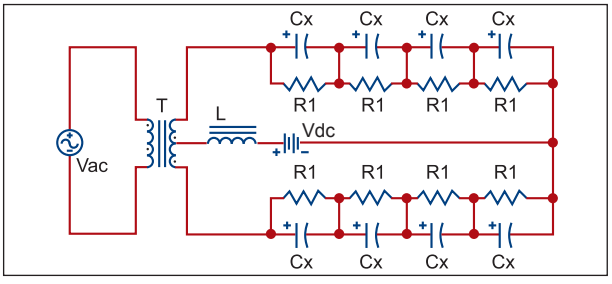
TEST FIXTURE

1 SERIES

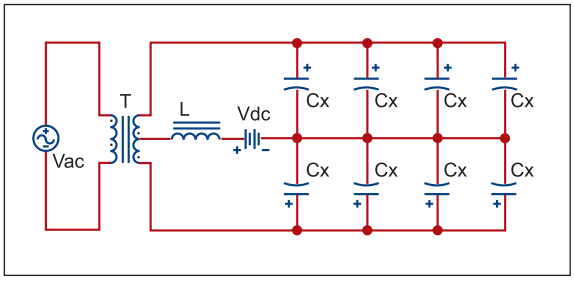
Advantage : Test current are almost equal, lower current capacity required for source.

Disadvantage: Not proper for higher rated WV (>100V) capacitor testing.

Proper for SMPS electrolytic capacitor testing. In General, use Chroma 11801/11810 for testing. **(Figure. 3)**



(Figure 3)



(Figure 4)

2 PARALLEL

Advantage: Same applied voltage on capacitors, and is proper for higher voltage capacitor testing.

Disadvantage: Test current is affected by capacitor impedance, contact resistance between capacitor and jig. Larger current capacity required for source.

Proper for low frequency, higher rated WV capacitor testing. In General, use Chroma 11800 for testing. **(Figure 4)**

KEY FEATURES

DIGITAL OUTPUT CONTROL FUNCTION

Chroma 11800/11801/11810 offer digital output control functions to control constant current output and constant peak voltage output. The controller adjust output voltage and current slowly to fit the setup value, during the output near the setup value. To avoid the over ripple current or negative voltage to injure or plus on the capacitors, that is easy to find at using manual control ACV source for output current. It also avoid the over voltage or less voltage by using manual control DC source to output (Vdc + Vac_peak = Vpeak). Over voltage damages the capacitor under test, and less voltage can not satisfy the test specification.

FEEDBACK SYSTEM

While load life testing on capacitors, the electrical parameters like impedance (include ESR and reactance) and leakage current may change, which will cause test current change if applied AC voltage is fixed. Chroma 11800/11801/11810 are microprocessor controlled, programmed to keep monitoring output current and feedback to adjust applied AC voltage to make output ripple current in constant, and also to adjust DC bias voltage to make peak-voltage on capacitors under test in constant.

SERIES / PARALLEL MODE FUNCTION

Chroma 11800/11801/11810 offer series / parallel mode function. Users can choose the different mode to reach the max benefit. In the series mode, users can get max current output benefit. In the parallel mode, users can get max peak voltage benefit. Sum up the advantages. The series / parallel mode reduces the load life test equipment or the test time by multi DUT in one test equipment to get economic effects.

MULTI DUT DESIGN

Chroma 11800/11801/11810 offer multi DUT design. The function offer the key-in DUT amount and series or parallel mode. Chroma 11800/11801/11810/11810 calculate measurement current and peak voltage of the single DUT and show these on the display. Let users easy to organize the measurement detail situation and avoid the human mistake and inconvenience by calculation.

DIGITAL TIMER INSIDE

Chroma 11800/11801/11810 offer build-in timer. It use for record the load life test time and control the test time. It could avoid the mistake or inaccuracy by artificiality.

FOUR TERMINAL CONTACT TEST JIG DESIGN

Four terminal contact test jig design, ensure accurate monitoring of voltage dropped on capacitors under test

PAIRED COOPER-FOIL WIRING TEST CABLE

The Chroma 11800/11801 provides the test fixture for series and parallel, and it improves the loss effectively as high frequency measurement causes by the test cable and fixture. The paired cooper-foil wiring test cable reduces voltage drop on the current driving loop and ensures accurate monitoring of ac level dropped on capacitors under test (Patent pending). Working voltage or rated voltage measurement specification too low will be result in the manufacturer's verification invalid problem.

DISCHARGE FUNCTION

Chroma 11800/11801/11810 offer discharge function. An automatic discharge is always performed after test termination. The automatic discharge function is for ensuring the operational personnel safety.

BUILD-IN RS485 INTERFACE

Chroma 11800/11801/11810 has build-in RS485 interface. Users connect with the computer through RS485 to monitor test status.

ALARM FUNCTION

Chroma 11800/11801/11810 offer alarm function. Alarm is for indicating of normal or abnormal test termination. Tested time will be recorded if the test is terminated abnormally. An automatic discharge is always performed after test termination.

LARGE LCD DISPLAY (320 X 240 MATRIXES), FRIENDLY USER INTERFACE

The Chroma 11800/11801/11810 uses large 320 x 240 dot-matrix display, shows more test information at the same time. Combine with guided operation design, makes the tester easier to operation. Users can operate instrument easily with great view of setting functions and test conditions.

Model 11800 **Model 11801** **Model 11810**

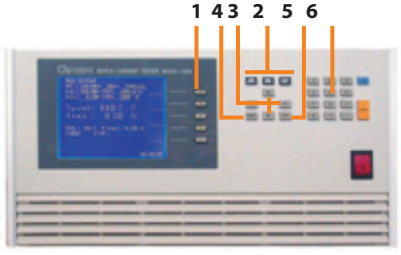
SPECIFICATIONS

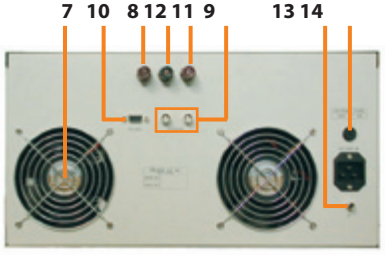
Model		11800	11801	11810
Ripple Current Source				
Current Output Range		0.01~30A	0.01~10A	0.01~10A, *3
Frequency		100Hz/120Hz/400Hz/1kHz ±0.1%	20kHz~100kHz	20kHz~1MHz
Accuracy *1	0.010A~0.199A	± (0.5% of reading + 0.1% of range)	± (3% + 0.005 A)	0.01~0.30A, ±(3% + 0.01 A), *2 0.40~10.0A, ±(2% + 0.05 A), *2
	0.20A~1.99A		± (2.5% + 0.05 A)	
	2.0A~10A		± (2% + 0.2 A)	
	10.0A~30A		--	
Ripple Voltage Output Range		90Vrms / 10Arms, 30Vrms / 30Arms	15Vrms maximum	
DC Bias Voltage Source				
Voltage Output Range		DC 0 ~ 500V, ± (0.3% + 0.05V)		
Charge Current		200mA Max.		200mA, 60W Maximum
Signal Monitor Parameter Accuracy				
Irms (Ripple Current)	0.001A~0.199A	± (0.5% of reading + 0.1% of range)	± (2% + 0.005 A)	0.010A~0.399A: ±(3% +0.01A),*2, *3 0.400A~10.00A: ±(2% +0.05A),*2, *3
	0.20A~1.99A		± (2% + 0.05 A)	
	2.0A~10A		± (2% + 0.2 A)	
	10.0A~30A		--	
Vpeak (Normally, set to capacitor rated voltage)		Vpeak =Vdc + Vac_peak		
Vdc (DC Bias Voltage)		± (0.3% + 0.05V)		
Vrms (Ripple Voltage)		0~1.99V, ± (0.3% of reading + 0.5% of range) 2.00~19.99V, ± (0.3% of reading + 0.1%of range) 20.00V~200.0V, ± (0.3% of reading + 0.1%of range)	± (1% + 0.005V)	± (1% + 0.005V) *2
Control Function				
Timer		1 min~10000 hour, 30min error per year		
Interface		RS-485 (Standard)		
Display		320 x 240 dot-matrix LCD display		
Operation		Start, Stop, Continue		
Protection		OCP, OTP, Over Load		
General				
Operation Environment		Temperature : 10˚C~40˚C, Humidity : < 90 % RH		
Power Consumption		3000 VA max.	700 VA max.	1000VA max.
Power Requirement		220Vac ± 10%;48 Hz ~62 Hz		
Dimension (H x W x D)		221.5 x 440 x 609.8 mm / 8.72 x 17.32 x 24.01 inch	353.6 x 440 x 609.8 mm / 13.92 x 17.32 x 24.01 inch	221.5 x 440 x 609.8 mm / 8.72 x 17.32 x 24.01 inch
Weight		54 kg / 118.94 lbs	60 kg / 132.16 lbs	40 kg / 88 lbs

Note*1 : 23 ± 5˚C
Note*2 : Multiple accuracy for test frequency 20~100kHz (x 1), 101~500kHz (x 2.5), 501kHz~1MHz (x 5)
Note*3 : Frequency > 500kHz : 0.10~10.0A only
Note*4 : Frequency > 500kHz : 0.100~10.00A only

All specifications are subject to change without notice. Please visit our website for the most up to date specifications.

PANEL DESCRIPTION



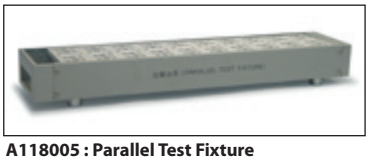


1. **Function keys**
2. **Menu keys**
3. **Cursor keys**
4. **Start key**
5. **Stop key**
6. **Entry keys**
7. **DC dissipation heat fan**
8. **Ripple current output terminal and DC high voltage output terminal (+)**
9. **Ripple voltage (SENSE) measurement terminal of capacitor under test**
10. **RS-485 connection terminal**
11. **Ripple current input terminal and DC high voltage output terminal (+)**
12. **DC high voltage output terminal (-)**
13. **Grounding terminal**
14. **AC 220V power socket**

ORDERING INFORMATION

11800 : Ripple Current Tester
11801 : Ripple Current Tester 100kHz
11810 : Ripple Current Tester 1MHz
A118004 : Series Test Fixture
A118005 : Parallel Test Fixture
A118010 : Monitoring Software for Model 11800/11801
A118028 : Series Test Fixture for Low Voltage
A118029 : SMD Series Test Fixture for Low Voltage
A118030 : PCB for SMD Capacitor

A118004 : Series Test Fixture



A118005 : Parallel Test Fixture

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