INDUCTOR LAYER SHORT ATS MODEL 1871

The Chroma 1871 is an automatic test system specifically designed for chip inductors in testing layer short for mass production applications. This system inherits all judgment functions from the Chroma 19301A impulse winding tester including Area, Laplacian, and two new test functions -ΔPeak Ratio and ΔResonant Area.

As miniature inductors are widely used in the electronic products today, mass production of power inductors is necessary. The production capacity of Chroma 1871 is up to 1,500ppm, which can satisfy the quantity demanded. It uses 5 layer short test stations to conduct the testing at one time for fast production. Alternatively, it can select 2 layer short test stations for R&D or QA unit use to run in a cost-effective way.

The Chroma 1871 uses a circular vibrating plate that carries thin products at high speed for feeding. The circular vibrating plate uses a guide rail design, fiber detection and blow hole to determine the feed direction. This is fast and space saving when compared to traditional linear reciprocating mechanical feeders.

When moving inductors for testing, the traditional reciprocating or turret-type mechanical structure uses a nozzle to attract the inductor for movement, and the product often drops due to inertial effects or inaccurate positioning making it unable to test. The Chroma 1871 uses an index disc design for testing, so that the equipment is within a closed architecture that can eliminate dropped inductors during high-speed movement. It is faster and more stable when compared to the traditional mechanical structure.

Chroma ATE Inc. not only specializes in electronic testing technology but also masters in fixture design for automated test equipment. The test socket used by the Chroma 1871 is a four-wire measurement design that is more accurate and stable than common automatic test equipment. The chip design applied to the connection of the test socket and inductor is easier to contact and has longer product life compared to a probe in use.

The Chroma 1871 has exclusive software for monitoring test status during production in real time, and saving the collected test data for each inductor. Real-time monitoring functions can benefit the production unit by reducing the production risk during manufacturing and cut down unnecessary working hours. The data collection function is favorable to R&D and QA units for product analysis and quality control. The software can perform data analysis to improve the product quality and increase profit.

MODEL 1871

KEY FEATURES

- Applicable size 3.2mm x 2.5mm to 1.6mm x 0.8mm
- Test and packing speeds from 600ppm to 1500ppm
- Layer short judgment functions:
  - Area
  - Laplacian
  - -ΔPeak Ratio
  - -ΔResonant Area
- Equipped with contact check function to extend the fixture lifespan.
- Provides from 2 to 5 test stations for ATS selections based on testing requirements.
- Index disc design eliminates dropped inductors
- Four-wire measurement test socket design.
- Each test station has an independent NG (No Good) product collection box.
- Exclusive data collection software designed for monitoring product quality in real time
- Switchable Chinese/English/Japanese operating interface
- Equipment is fast, stable and safe

Chroma

APPLICATIONS

Two layer short test stations for RD and QA batch verification

The R&D and QA units can use layer short testing to inspect the defect status of all products. Thus, data collection is required during testing to analyze the product data and quality.

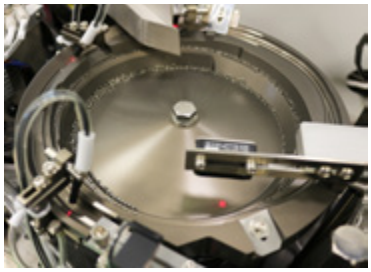
Five layer short test stations for high-speed production line

For production line, 5 layer short test stations can be selected to test 5 inductors at the same time reducing the testing time for fast production. The test status and data can also be monitored and collected during testing.

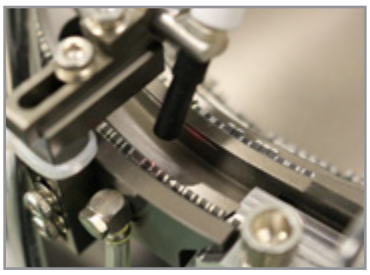
DEVICE FEATURES

Circular vibrating plate for feeding

The parts feeder is the first post that can affect the overall equipment production efficiency. The circular vibrating plate feeder is fast and stable. As there used to be orientation problems when testing inductors, a linear design was applied for feeding with additional detection and turnover mechanism in the path. The space required for feeding was increased relatively with speed limited. The circular vibrating plate changes the linear feeding path to spiral, and is able to overturn the DUT correctly with a fiber detector and simple blowing machine. It can fix the feed direction without complex turnover mechanism, and only occupies a small space. This new way of feeding is fast, stable and in the same direction.



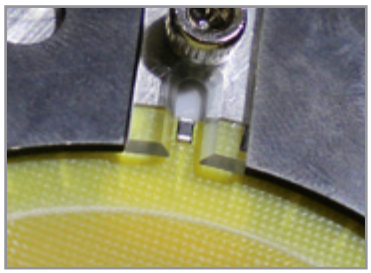
Circular vibrating plate for feeding



Fiber detection in loading

Movement of index disc

When moving inductors for testing, the traditional reciprocating or turret-type mechanical structure uses nozzle to attract the inductor for movement, and the product often drops or is offset due to inertial force or centrifugal force generated when transferring linearly or circularly.



Closed space design for index disc

Five layer short test stations

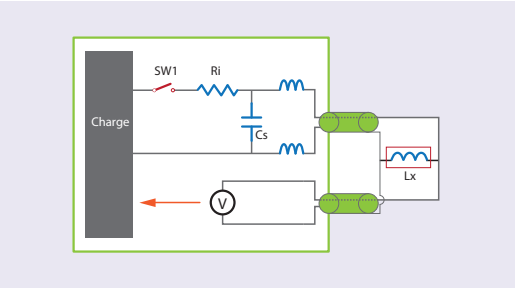
- ☑ Closed space design for index disc without dropping any inductors
- ☑ Fixed space easy for contact
- ☑ Stable high-speed transfer

Five layer short test stations for parallel testing

The layer short test requires longer time compared to the inductance nominal test; therefore, the Chroma 1871 supports parallel testing on 5 layer short test stations to reduce the testing time. Furthermore, the special designed circular guide rail for placement is able to test 5 different DUTs simultaneously.

Four-wire measurement design of test socket

When the specification range of a chip inductor is small, it is easy to be affected by wiring and fixtures when conducting layer short tests. The common test socket is a two-wire design that can be easily influenced by wiring when measuring smaller inductance and causes the voltage applied on chip inductor lower than the set voltage. The four-wire design is less affected by wiring as it uses separate circuits for output signal transmission and measurement signal capture. When working with the voltage output compensation function of Chroma 19301A, it can make sure the set voltage and applied voltage are the same.



1871 Four-wire measurement architecture

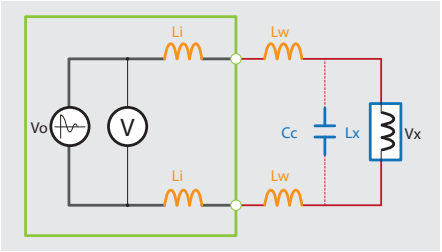
Impulse Winding Tester Model 19301A

The Chroma 19301A is a layer withstand voltage test instrument specifically designed for testing the low inductance power inductors. It provides the 4-wire detection for testing the low inductance, and the contact check function (patent) to avoid the damage to the fixture due to the high voltage and the flashover caused by loose contact, poor contact or open circuit. It also has the voltage compensation function for differential inductance (patent) to reduce the testing voltage difference caused by the differential inductance. The high speed test can be applied with automatic test systems in production line environments.

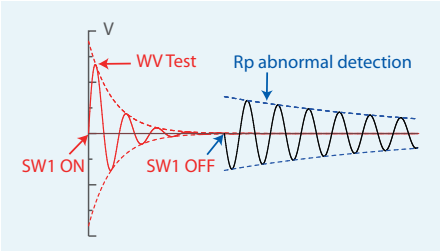
The △ Peak Ratio judgment function, which can detect the abnormalities or the deterioration of the resistance (Rp) to improve the overall product quality, is a characteristic testing technology from Chroma.

Features

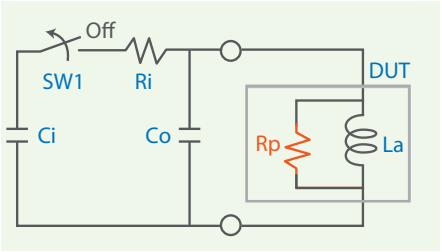
- ☑ Test application 0.1 μH~100 μH
- ☑ Impulse voltage 10V~1000V
- ☑ <18ms high speed test
- ☑ Impulse testing sampling rate (200MHz), 10 bits
- ☑ Inductance contact check function
- ☑ Voltage compensation function for differential inductance
- ☑ Breakdown Voltage Analysis (BDV)
- ☑ USB waveform storage and screen capture function



Equivalent Circuit Diagram



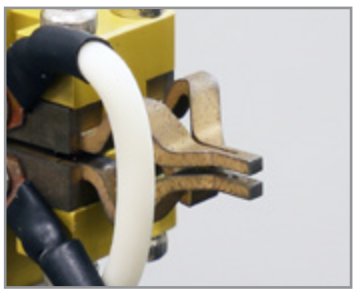
IWT Waveform & Peak Ratio Waveform



△Peak Ratio Test Circuit Diagram

Stable and long life span for specific test piece

A probe is usually used for contact between the test fixture and inductor; however, the spring inside the probe may fail, easily causing testing errors. The Chroma 1871 test fixture uses a test piece to directly connect the test wire without using a spring. The contact area of the test piece and inductor is larger than a probe with better connection. The life span of test pieces is also longer and easy to maintain.



Specific test piece

NG (No Good) product collection boxes

Independent NG (No Good) product collection box for each station

The Chroma 1871 equipped with 5 sets of 19301A have different testing purposes. To facilitate analysis, the NG products are collected separately by different test criteria with clear classification. It can improve production quality by analyzing the various defect statuses.

User friendly operating interface

The touch panel has a user interface selection for Chinese, English and Japanese languages. It has a production count function for production line use. The error messages are directly shown on the user interface to facilitate troubleshooting.

User interface – failure position light panel and count screen

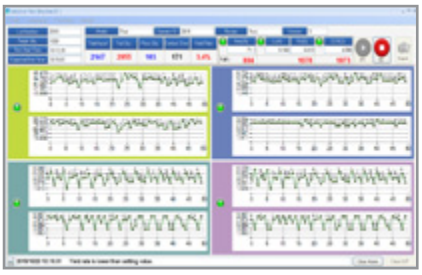
SOFTWARE INTERFACE – TESTING, MONITORING AND DATA COLLECTION

The A187100 is an optional data collection software program for the Chroma 1871 that is specifically designed for factory use. Other than basic information collection, it provides real-time X-bar and R-chart control, and test parameters setup functions that fulfill requirements for R&D, Production, and QA units.

Software features

- ☑ Test parameter setting, save and recall
- ☑ Real-time test monitoring
- ☑ Test data collection
- ☑ Production report query
- ☑ Statistical analysis
- ☑ System level and authority management
- ☑ Support barcode scan

A187100 Data collection software


Test monitoring window

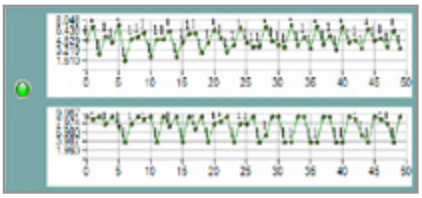
Test parameter settings, save and recall

The Chroma 1871 uses the A187100 software platform to set the parameters and condition limits on all configured instruments instead of operating them individually. Moreover, the test parameters can be saved to a PC and recalled later to test different products.


Parameter setting window

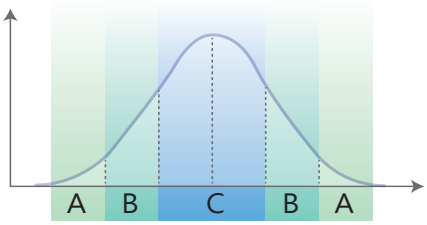
Real-time test monitoring

The A187100 data collection software has a real-time monitoring function that includes the number of inputs, the good products count, the defect products count, the production yield and good/no good statistics for each station. X-bar and R-charts real-time monitoring function is added for the production unit to control the product quality as well as to monitor for any abnormalities that have occurred.


X-bar and R-charts

Control chart pattern recognition

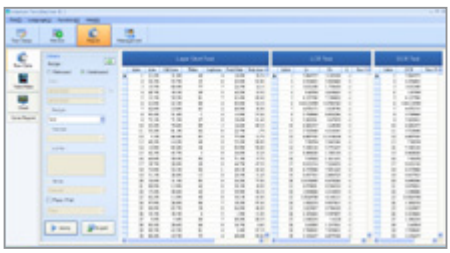
- ☑ 1 dot exceeds control limits (out of 3 Sigma)
- ☑ 2 dots out of 3 consecutive dots in zone A or over zone A (applicable for X-bar chart only)
- ☑ 4 dots out of 5 consecutive dots in zone B or over zone 5 (applicable for X-bar chart only)
- ☑ 6 consecutive dots rise and fall
- ☑ 8 consecutive dots not in zone C (applicable for X-bar chart only)
- ☑ 9 consecutive dots are on the same side of center line
- ☑ 14 consecutive dots alternately rise and fall
- ☑ 15 consecutive dots in zone C (applicable for X-bar chart only)



Normal distribution

Production report query and statistical analysis

The software is able to query the test data for basic information, production yield, and control charts. It can also analyze the test data from the queried control charts, and automatically calculate, as well as set, the control limits in test conditions.

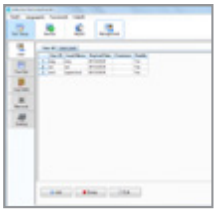

Basic information query widow


Control chart query window

Control limits calculated by tested data

System level and authority management

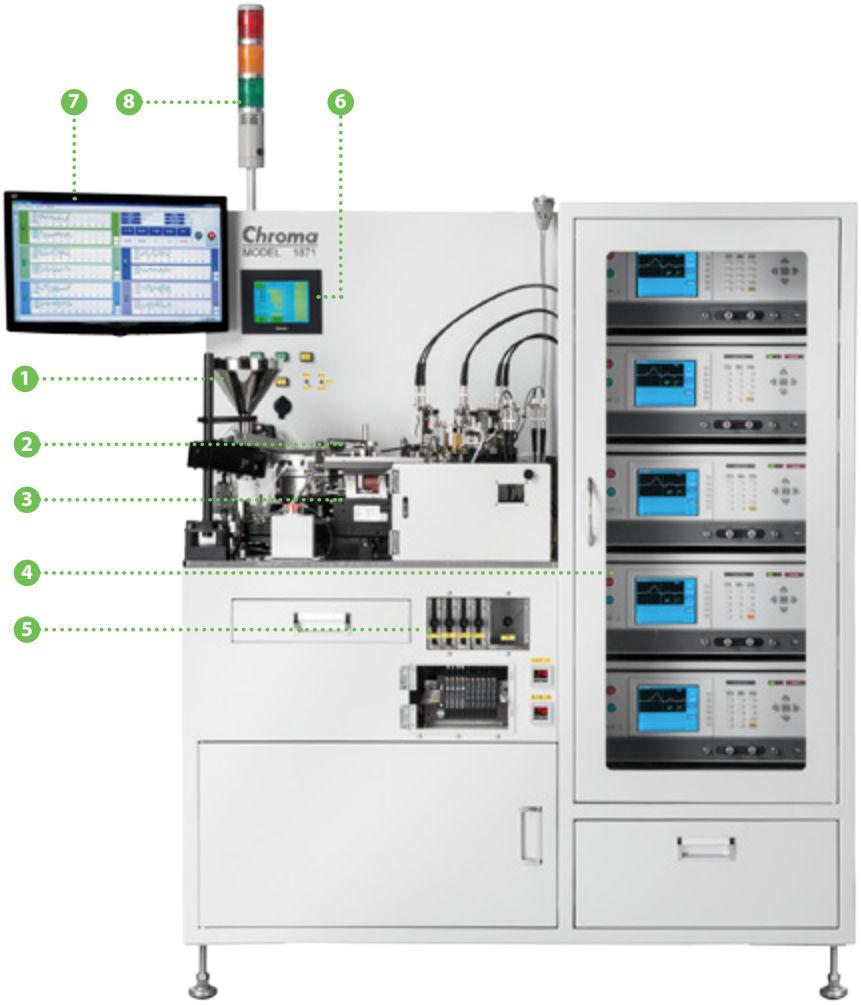
The system level and authority management is divided into administrator, engineer and operator levels to facilitate equipment control, preventing any production loss caused by human error.


User level window

Barcode scanner support

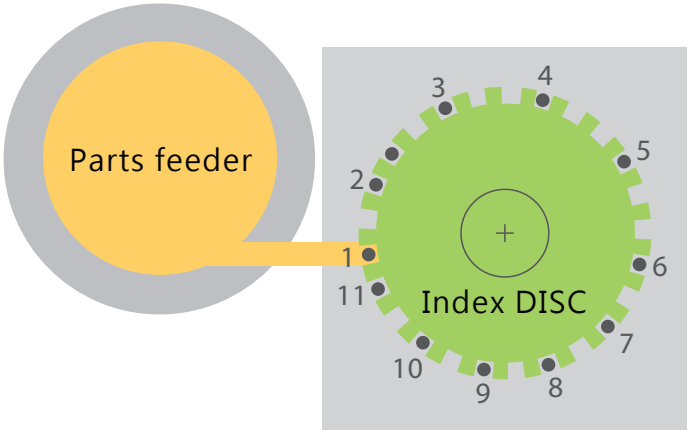
Barcode scanners are supported in order to scan the inductor model and lot number, and save them to a parameter setting file for recall automatically

EQUIPMENT STRUCTURE



1. Storage hopper
2. Index disc
3. Parts feeder
4. Instruments cabinet
5. Parts collection box
6. User interface
7. Software window
8. Signal lights

TEST ZONE AND STATIONS



1871 Stations

1. Feeding detect
2. Layer short test station 1 (works with 19301A)
3. Layer short test station 2 (works with 19301A)
4. Layer short test station 3 (works with 19301A)
5. Layer short test station 4 (works with 19301A)
6. Layer short test station 5 (works with 19301A)
7. Good inductor receiver
8. Area NG inductor discharge
9. Laplacian NG inductor discharge
10. Contact check NG inductor discharge
11. Clean remaining inductors

* Layer short test stations 3 to 5 are reserved when 2 stations are selected.

SPECIFICATIONS

1871 Application Size Maximum Productivity										Unit : pcs/min
WxD(mm)	3.2 x 2.5		2.5 x 2.0		2.0 x 1.6 / 2.0 x 1.2			1.6 x 0.8		
H(mm)	1.2	1.0	1.2	1.0	1.2	1.0	0.8	1.0	0.8	0.6
Single-sided electrode	600	600	800	800	800	800	800	800	800	800
Five-sided electrodes	900	900	1,200	1,200	1,500	1,500	1,500	1,500	1,500	1,500

* The maximum productivity listed above does not include layer short testing, insulation resistance testing, or bias current testing.

General Specifications	
Power requirement	Single phase 220V ; frequency 60 Hz / 2.0kW
Air pressure system	CDA Pressure 5~6 kg/cm^2 , CDA Flow150~200 L/min
Operating environment	8~38°C , < 70%RH
Weight	Approx. 500 kg
Dimension (W x H x D)	W 1280 x H 1495 x D 900 mm

*All specifications are subject to change without notice.

ORDERING INFORMATION

1871 : Inductor Layer Short ATS
19301A : Impulse Winding Tester
A187100 : 1871 Data collection software

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