Quality is more than a word

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Capacitor Temperature Characteristic Evaluation System (Dielectric Characteristic Evaluation System)

AMQ

CAT.NO.E99516-Y2004

Automatically record capacitors' temperature and frequency characteristics

"Capacitor Temperature Characteristics Evaluation System" is an automated multi-channel system that combines an environmental test chamber with measurement and evaluation system, to collect data efficiently.

Example of AMQ connected with a Compact ultra low temperature chamber

Electrochemical Migration Evaluation System AMI

The Electrochemical Migration Evaluation System easily and efficiently evaluates product life and insulation resistance, and has numerous applications from low-voltage testing to high-voltage testing.

■ Evaluation targets
- Printed boards
- Insulation materials
- Semiconductor materials

Example of AMI Connected with a temp. & humid. Chamber

Capacitor Leakage Test System AMI-C

The Capacitor Leakage Test System automatically evaluates insulation degradation characteristics of capacitors in high temperature and high temperature/humidity environments.

■ Evaluation targets
- Capacitors

Environmental Test Chambers

Platinous J Series Temperature Chamber

As a line of industry standard test chambers, the Platinous Series pursues new environmental standards for ideal, eco-friendly environmental test chambers in addition to reliability, performance, operability, and safety.

Model	Temperature range	Inside capacity (L)
PU	−40 to +100°C	120, 225, 408, 800
PG	−70 to +100°C	306, 800

Mini Subzero Compact Ultra Low Temperature Chamber

Mini Subzero supports a wide temperature range covering the ultra-low-temperature range (−75°C / −85°C) to the high-temperature range (+100°C / +180°C). This chamber also offers remote monitoring and operation.

Model	Temperature range	Inside capacity (L)
MC-712	−75 to +100°C	64
MC-812	−85 to +180°C	

Features

Example of AMQ connected with a Compact ultra low temperature chamber

Dedicated jigs for SMD components (option)

Applications

Capacitors

- Electrostatic capacity (C)
- Loss factor (D)
- Temperature characteristics of impedance (Z)
- Frequency characteristics

Electronic materials

- Printed boards
- Flux
- Insulation materials (resin, film, etc.)
- Dielectric materials
  (titanium, ceramic, tantalum, aluminum electrolytic materials, etc.)

This system can be used to evaluate the electrostatic capacity (C), loss factor (D), and impedance (Z) of capacitors and various materials in a specific temperature environment.

Automatic measurement of up to 64 channels

The system can measure multiple channels of electrostatic capacity (C), loss factor (D), and impedance (Z) in different temperature environments.
You can select the number of channels in the multiple of eight, up to 64 channels.

The graph function allows for real-time review of measurement results

Collected data, including the values of electrical characteristics and rate of change at different temperatures, frequencies, and time, can be reviewed in real time through a variety of graph functions.

Selectable from different test modes

Three test modes are available: temperature characteristic evaluation test, constant operation test, and frequency characteristics test.

<Temperature characteristic evaluation test>
In this test mode, characteristic data is automatically recorded and synchronized with changes in temperature up to 40 steps.

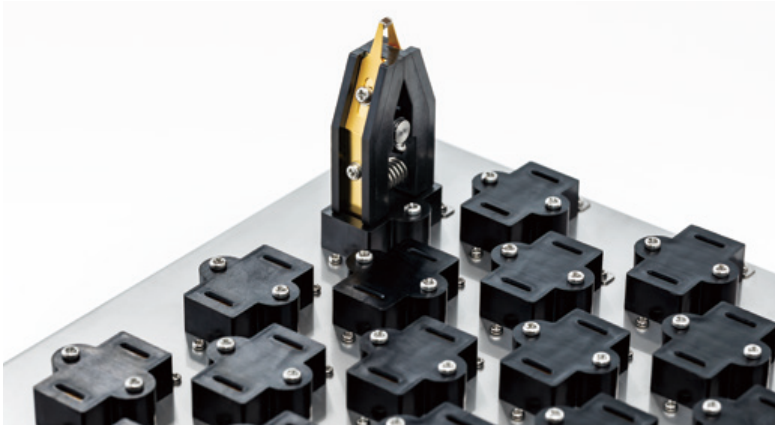
<Constant operation test>
This test mode measures changes in characteristics over time in a specific temperature environment and automatically records data.

<Frequency characteristic evaluation test>
This test mode automatically records characteristic data at various frequencies while changing the frequency in a specific temperature environment.
Testing can be combined with a temperature characteristic evaluation test or constant operation test.

Features

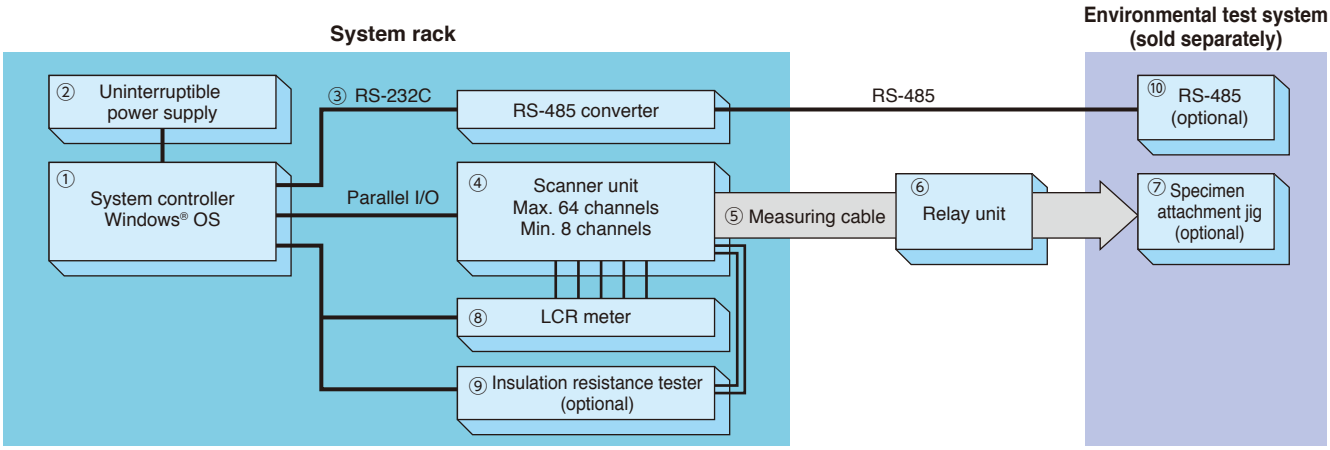
A variety of optional jigs are available for different test samples (optional)

In addition to dedicated jigs for SMD components, we offer jigs customized to the shape of discrete devices.



Dedicated jigs for SMD components (option)

System Block Diagram



① System controller
Computer and monitor for system management to register test conditions, check operating status, and perform data processing.

② Uninterruptible power supply
Backup power supply for the system controller.

③ RS-232C
Operator controls and monitors the temperature of the environmental test system from the system controller.

④ Scanner unit
This unit measures the electrostatic capacity (C), loss factor (D), and impedance (Z) of standard 8 channels with the tip of the measuring cable.
You can increase the number of channels up to 64 per unit, in 8 channel increments.

⑤ Measuring cable
Coaxial cable made of Teflon connected to the specimen or jig inside the test system.

⑥ Relay unit
This unit connects the measuring cable attached to the specimen or jig inside the test system to the scanner unit.
The relay unit makes connection easy.

⑦ Specimen attachment jig (optional)
Snap-on jig for attaching SMD components or discrete devices.

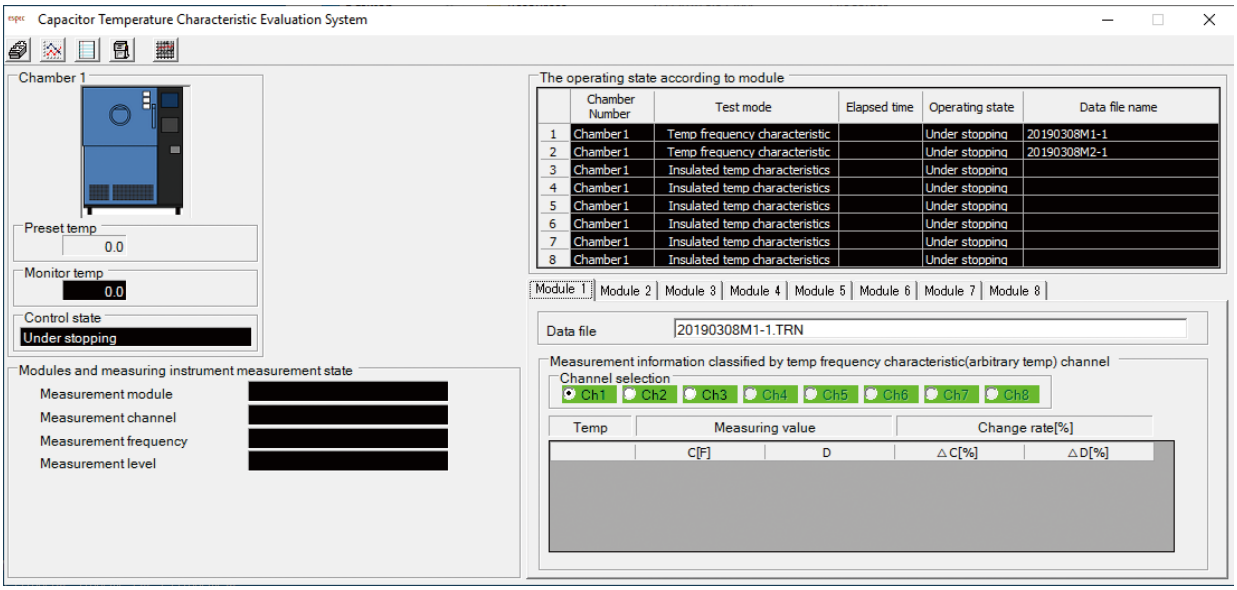
⑧ LCR meter
This meter measures electrostatic capacity (C), loss factor (D), and impedance (Z).

⑨ Insulation resistance tester (optional)
This tester measures insulation resistance.

⑩ RS-485 (optional)
From the environmental test system Options menu, RS-485 communication can be selected as the communication protocol for the system controller and environmental test system.

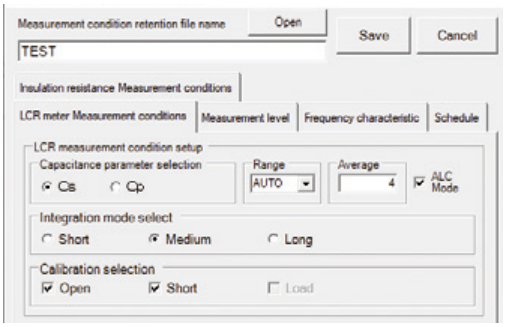
TESTING PROCEDURE

Main monitor screen



- Displays the system's temperature setting and monitor temperature.
- Shows the measurement result for each channel.
- Shows the progress of the test.

Setting the test conditions



Set the test conditions: LCR Meter Measurement Conditions, Measurement Level, Frequency Characteristics, Schedule *1, Insulation Resistance Measurement *1. The conditions set up can be saved as a file.

*1 Available as optional add-ons

Temperature characteristics test *2

- Select "Temp characteristics test" under Test mode.
- In Temp setting mode, you can select "Step setup" or "Arbitrary setup."

Constant operation test *2

- Select "Constant operation test" under Test mode.

・Step setup

・Arbitrary setup

*2 DC bias is only applied during measurement.

Start test

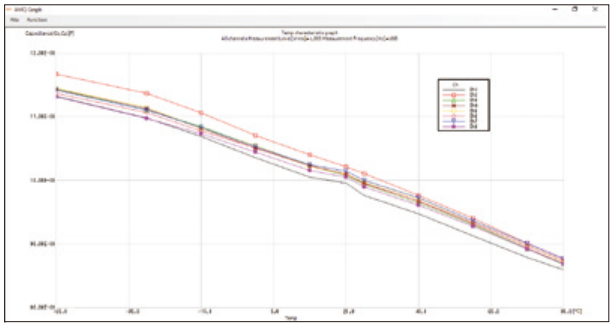
- Parameter measurement starts automatically with the set conditions after starting the test.
- You can check the progress of the test and test results in real time.

TEST ITEMS, MEASUREMENT ITEMS and CONDITIONS, and DATA PROCESSING

Test item	Measurement items and conditions		Data recording and graph display*
Temperature characteristics test (Changes in characteristics with respect to temperature)	· Measurement method · Measurement parameters	AC four-terminal pair measurement Electrostatic capacity (C), loss factor (D), and impedance (Z)	Records the changes in measurements for each temperature value. X axis: Temperature Y axis: Selectable from measurement items
	· Measured frequency · Temperature	Measurement range: 20 Hz to 1 MHz Temperature range: −40°C to +180°C * Depends on the specifications of the separately sold environmental test system.	
Constant operation test (Changes in characteristics with respect to time)	· Compensation function	Set whether or not to use Open/Short compensation.	Records the changes in measurements for each time value. X axis: Time Y axis: Selectable from measurement items

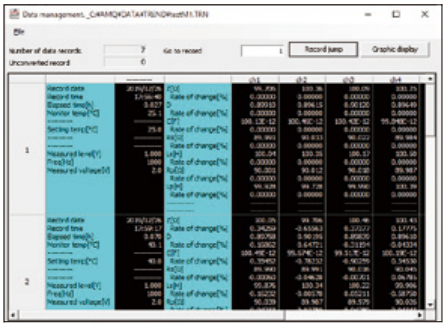
* The recorded measurement results can be reviewed in a graph and list in real time. Eight channels worth of data can be displayed on a graph. Channels to be displayed can be selected according to preference.

Graph display



Graphs showing the time, temperature, and frequency for a measurement item cana be displayed.
Display can be switched between absolute values and rate of change.

Data display



Measured data is displayed.
Data on screen can be converted to CSV format.

SPECIFICATIONS

Model		AMQ
Measurement items		Electrostatic capacity (C), loss factor (D), impedance (Z), resistance (Rs, Rp)*, and inductance (Ls, Lp)*
Test items		· Temperature characteristic evaluation test (change with respect to temperature) · Constant operation test (change with respect to test time) · Frequency characteristic evaluation test (change with respect to frequency)
Channel configuration		8 channels (standard); max. 64 channels expandable in 8 channel increments
Measurement control	Measurement method	AC four-terminal pair measurement (measuring cable tip)
	Measurement range	· Measured frequency: 20 Hz to 1 MHz · Electrostatic capacity (C): 50 pF to 5 mF · Loss factor (D): 0.0001 to 9.9999 · Impedance (Z): 10 mΩ to 100 MΩ
	Measuring instrument	LCR meter (Keysight Technologies)
	Measurement range	Select AUTO, 10 Ω, 100 Ω, 300 Ω, 1 kΩ, 3 kΩ, 10 kΩ, 30 kΩ, or 100 kΩ
	DC bias	±0 to ±40V
	Measurement interval	1 min. to 1,500 min. (during constant operation)
	Temperature steps	Select from mode that specifies 40-step start/end temperature and step interval and mode for entering desired temperature
	Frequency steps	Max. 50 steps (set to desired value)
	Compensation	Short compensation, open compensation
Environmental test system control		Enables temperature data capture synchronized with measurement and the temperature control of the environmental test system with RS-485 function.
Measuring cable		Coaxial cable made of Teflon (Characteristic impedance (Z), 50 Ω, 95 pF/m)
External dimensions		530 (W) × 1832 (H) × 800 (D) mm (excluding protrusions)
Power supply equipment		Power supply 100 VAC ±10% 1φ 50/60 Hz 15 A

* Measured data depends on the specimen and test conditions.

Model

AMQ −□−C

Number of channels

Options

- Insulation resistance measurement function
- Internal chamber temperature monitoring function
- Dedicated jigs for SMD components

- Dedicated jigs for discrete devices

  Jigs can be made to order according to samples

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