

ESPEC

Super Thermal Plate

STTE-110(H)



CAT.No.E04521

Speedy and Compact High-Precision Thermal Tests Made Possible

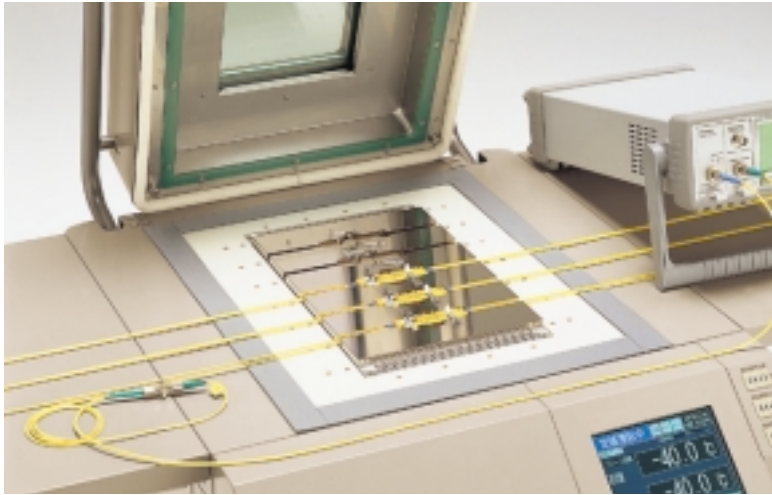
This thermal-plate system has been developed to enhance heat conductivity to the specimen. When the specimen is placed on the thermal plate, the preset test heat is directly transmitted to the specimen due to its high heat conductivity. Furthermore, time savings have been achieved in preparations for the measurement of specimen characteristics.

The applications of the system will extend from temperature-characteristic evaluations of optical devices, electronic components, FPDs, mounted PCBs, and the like to reliability evaluations, measurements in inspection processes, cell production systems, and so on.

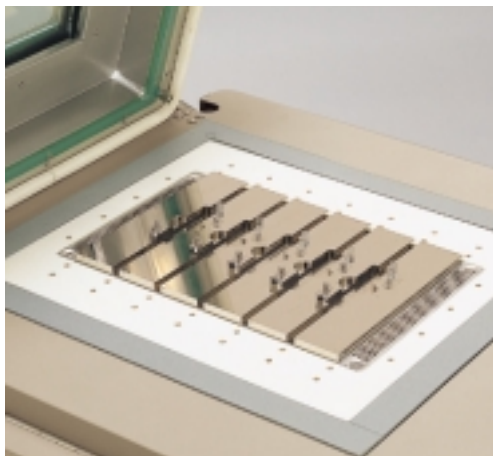
This is a new-style “Super Thermal Plate” for environmental tests that offers excellent heat characteristics in a compact body, and is capable of positively responding to the need for shorter test times.







An example of placing the specimen (Viewing window and side table are optional.)



The jig for placement of the specimen pictured here is an example.



● High heat conductivity to the specimen

A unique plate system has been developed that provides a temperature change rate up to 5 °C/min.*

As soon as the specimen is placed on plate, the heat is led to it, making it possible to reduce the time required for temperature-characteristic evaluations.

*Conform to the IEC-60068-3-5

● Compatible with heat loads of 50W at -40°C

The system is applicable to specimen heat loads of 50W in the low-temperature range of -40 °C, something that was practically impossible with conventional electronic cooling systems such as Peltier elements.

*Condensation may occur on the specimen and observation window at a temperature below room temperature. To avoid this, dry air must be introduced with the top cover closed.

● Free access to the specimen

The desk-type module allows the specimen to be placed on the table, making it easy to conduct probing for electrical measurements, to observe the specimen under test or photograph it using a conventional camera or video camera.

● High-precision measurements enabled

Access from the measurement instrument to the specimen can be performed simply across a flat table. This enables the measurement cable to be laid in the shortest distance and to be free from bends. The system is perfect for measuring optical fibers, and for conducting high-frequency measurements.

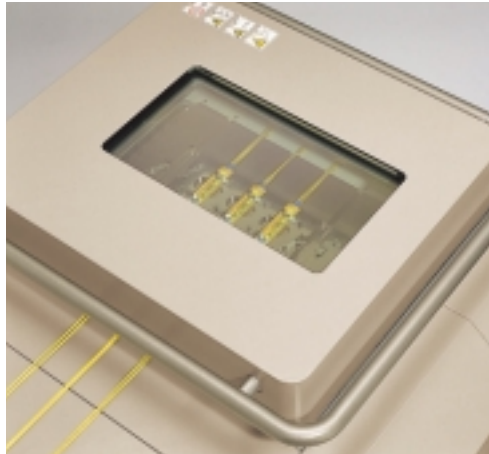
● Side tables available for improved workability (Optional)

Use of the optional side tables (on both sides) allows measurement instruments and the like to be provided directly next to the specimen. When not in use, the side tables are folded back.

(table size: 325W x 500D mm)

- **Large window for observation of a specimen (Optional)**

The specimen can be checked visually while a temperature-characteristic evaluation is underway. Changes in the specimen can thus be observed.



Viewing window (optional)

- **Equipped with a dry-air inlet for the prevention of condensation on the specimen**

In a test conducted in a low-temperature range, condensation on the specimen adversely affects the test results. The system now comes equipped with an inlet port to introduce dry air into the test area, thereby preventing condensation on the specimen and viewing window.

*Dry air must be provided by the customer.

- **Equipped with a specimen temperature-monitoring function**

This function enables monitoring of the specimen temperature simply by attaching a sensor to the specimen. The monitored temperature is indicated in the instrumentation section.



Image of cell production system

- **Perfect for cell production systems**

The compact dimensions allow easy incorporation into a production-line process for flexible application to the temperature-characteristic evaluation of any cell product.

- **Environmental testing centralized control software ERC-200M (sold separately)**

The application software allows centralized monitoring, control, and remote operation of up to 16 ESPEC chambers. You can drastically save time while your PC collects data for analysis and graphing.



Instrumentation panel

New environmental testing "Super Thermal Plate". Extend applications into new directions.

● Thermal plate system

Adopting a thermal plate system that transmits heat to the sample directly makes it possible to quickly heat up or cool down temperatures, thereby reducing the time required for temperature characteristic tests.

● Free access to the sample

A desk type module and top door allows easy connections between the sample and measurement instrument to enable a broader range of evaluations. (Also allows sample observations and probing for electrical measurements over a wide range of temperatures.)

● Compatible with heat loads (50W) at low temperatures

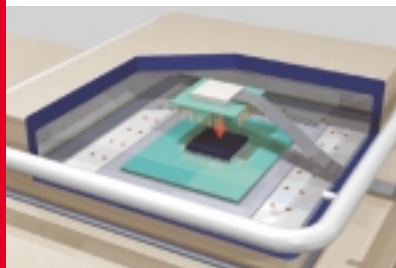
The compact body packs a powerful refrigerating circuit, capable of handling sample heat loads of 50W, even in the low temperature range of - 40 — formerly all but impossible with electronic cooling systems.

● Perfect for cell production systems

Compact dimensions allow easy incorporation into a production line process for flexible application to temperature characteristic evaluation of any cell product.



Temperature characteristic evaluations of ICs



Characteristic evaluations are performed at each pin, with the IC mounted on the PCB being tested.

The package can be subjected to thermal stress when placed in close contact with the thermal plate.

Temperature-frequency characteristic evaluations of high-frequency devices

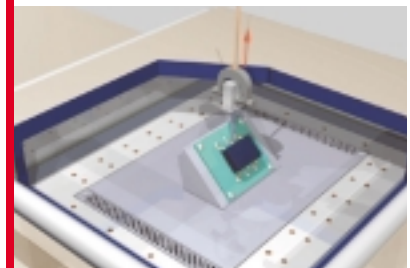


Measures the high-frequency characteristics of sample high-frequency devices while a certain temperature is applied to the devices.

Setup can be performed using very short high-frequency probe and measuring cables.

Measurements can be performed into high-frequency domains using LCR meters and impedance analyzers.

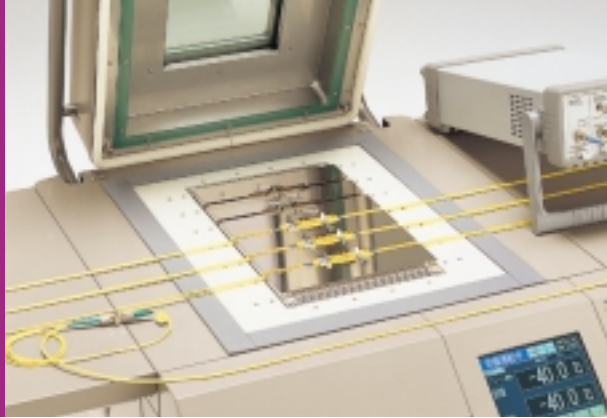
Tensile strength measurements for solder mounting



Enables testing of the mounting strength of electronic devices and other components soldered to PCBs.

Tension tests in thermal environments.

Temperature characteristic evaluations of passive optical components

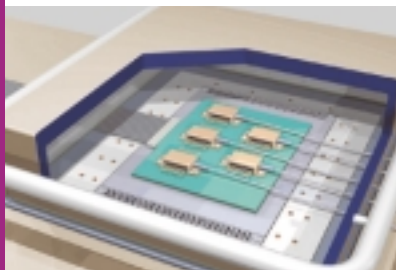


The temperature characteristics of passive optical components such as couplers and filters are evaluated and verified.

Passive optical elements can be placed in a straight line without imposing loads on the fiber or other parts.

Incorporation of a temperature characteristic test into a cell production process increases production line efficiency.

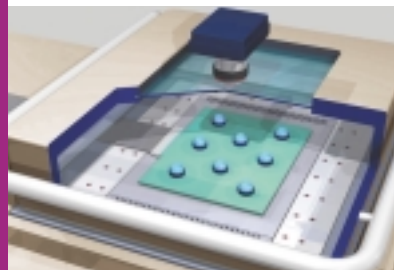
Temperature characteristic evaluations of active optical modules



Temperature characteristic evaluations of active optical devices such as laser diode modules for optical communications.

Active optical devices can be placed in a straight line without imposing loads on the fiber or other parts.

Optical characteristic evaluations of LEDs



The optical characteristics of light-emitting diodes are measured while they are subjected to heating.

Since the thermal load is applied to the sample while it is positioned on the thermal plate, no part other than the sample is affected by temperature variations. This makes it possible to position the camera or other measurement device close to the diode being measured.

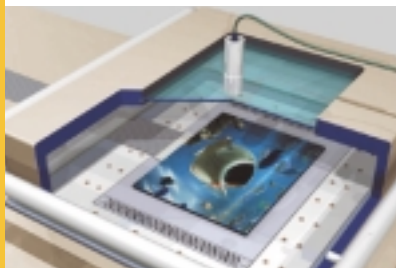
Characteristic evaluations of CCD elements at various temperatures and under light irradiation



The temperature characteristics of CCD elements are evaluated while light is irradiated onto samples from the fluorescent light unit in the cover.

Composite testing with thermal stress and light irradiation.

Temperature characteristic evaluations of flat panel display



Temperature characteristic evaluations of flat panel display, including TFT color LCDs and organic ELDs.

A CCD camera or other apparatus can be installed on top of the panel. Luminance, chromaticity, field angle, and other characteristics can be evaluated while subjecting the sample to a specific temperature.

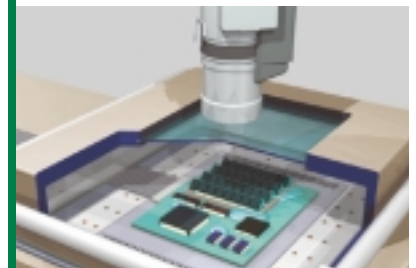
Fault analysis of mounted PCB under thermal stress



Fault of a mounted PCB can be reproduced or waveforms can be checked while subjecting the PCB to constant or varying temperatures.

Manual probing is also possible. (Condensation may occur at low temperatures if the equipment is left exposed.)

Observation of parts susceptible to condensation mounted PCBs.



The development of condensation in low temperature domains can be observed.

Parts susceptible to condensation and the development of tracking can be observed.

Examples is image of usage of the Super Thermal Plate.

SPECIFICATIONS

| Model | | STTE-110 | STTE-110H |
|---------------------------------|--|---|--|
| System | | Temperature plate system | |
| Operable ambient temperature | | + 5 ~ + 35 / + 41 ~ + 95° F | |
| Performance*1 | Temperature control range | - 40 ~ + 85 / - 40 ~ + 185° F | - 40 ~ + 150 / - 40 ~ + 302° F |
| | Temperature fluctuation*2 | ± 0.2 / ± 0.36° F | |
| | Temperature uniformity*3 | + 1.0 (- 40 ~ + 85) / + 1.8° F (- 40 ~ + 185° F) | + 1.0 (- 40 ~ + 85) / + 1.8° F (- 40 ~ + 185° F) + 1.5 (+ 85.1 ~ + 150) / + 2.7° F (+ 185.1 ~ + 302° F) |
| | Temperature change rate*4 | + 5 /min. or more | |
| | Temperature heat-up rate | Within 25 min. from - 40 to + 85 / - 40 to + 185° F | Within 38 min. from - 40 to + 150 / - 40 to + 302° F |
| | Temperature pull-down rate | Within 40 min. from + 85 to - 40 / + 185 to - 40° F | Within 48 min. from + 150 to - 40 / + 302 to - 40° F |
| | Lowest attainable temperature | - 40 / - 40° F | |
| | Permissible heat load | 50W (at - 40 / - 40° F) | |
| Construction | External material | Rustproofed cold-rolled steel plate (Meramin baked finish, Munsell 10YR7/1 (Semi-gloss)) | |
| | Internal material | 18-8 Cr-Ni stainless steel plate | |
| | Insulation material | Glass wool | |
| Heater | | Sheathed heater 0.9 kW | |
| Refrigeration system | | Mechanical-type single-stage compression refrigeration method | |
| Cooling system | | Direct cooling using primary coolant | |
| Refrigerator | | Fully enclosed compressor | |
| Coolant | | R404A | |
| Condenser | | Air-cooled condenser | |
| Plate | Surfacing | Electroless nickel-plating | |
| | Withstand load | 10 kg (Equally distributed load) | |
| | Dimensions (mm/in) | 210W × 300D / 8.2W × 11.8D | |
| | Effective test area dimensions (mm/in) | 170W × 260D / 6.7W × 10.2D | |
| Dimensions of test area (mm/in) | | 310W × 60H × 400D / 12.2W × 2.3H × 15.7D | |
| External dimensions (mm/in)*5 | | 580W × 810H × 728D / 22.8W × 31.9H × 28.6D | |
| Weight (kg) | | 100 | |
| Supply voltage | | 200V AC 3 3W 50/60Hz, 220V AC 3 3W 60Hz, 380V AC 3 4W 50Hz Voltage fluctuation: Within ± 10% of the rated value | |
| Maximum current*1 | 200V AC | 10A | |
| | 220V AC | 9.5A | |
| | 380V AC | 8.5A | |
| Appurtenances | | Specimen power supply control terminal, Time signal terminal (two), Dew-point temp attainment input terminal, External alarm terminal, Specimen temp monitoring terminal, Connecting terminal for temp recorder terminal, Dry-air inlet port, Drain tube, Casters (with adjuster feet) | |

The conditions for performance measurement are detailed in the product specification, which is available upon request.

*1 Measured when there is no specimen in place and no air flowing, applied with rated voltage at an ambient temperature of + 23

*2 Difference between the average maximum temperature and average minimum temperature at the dimensional center of the plate

*3 Temperature difference at an arbitrary point of the effective testing area

*4 Conforms to IEC60068-3-5

(Measurement method: Measure temperatures from the minimum temperature to the maximum temperature and from the maximum temperature to the minimum temperature within the specified temperature range, and determine the rate of temperature change for the temperature-change time during which monitoring was conducted between 10% and 90% of that temperature range.)

*5 Excluding protrusions.



Do not use specimens which are explosive or inflammable, or which contain such substances. To do so could be hazardous, as this may lead to fire or explosion.

Do not place corrosive materials in the test area. If corrosive substances or humidifying water is used, the life of the unit may be significantly shortened.

Do not place life forms or substances that exceed allowable heat generation.



Be sure to read the instruction manual before operation.

SAFETY DEVICES

Leakage breaker for power supply
 Thermal fuse
 Specimen power supply control terminals
 Refrigerator overload relay
 Short circuit protection fuse for control circuit
 Door switch
 Temperature switch
 SSR overload & short circuit protecting circuit breaker
 Overload relay for condenser heat exhaust fan
 Refrigerator high pressure switch
 Compressor temperature switch
 Electric parts compartment door switch
 Reverse prevention relay
 Overheat protector
 Upper and lower temperature limit alarms
 (built inside temperature controller)
 Self-diagnostic function
 (built inside temperature controller)
 Burn-out circuit
 (built inside temperature controller)
 Refrigerator automatic delay circuit
 (built inside temperature controller)

ACCESSORIES

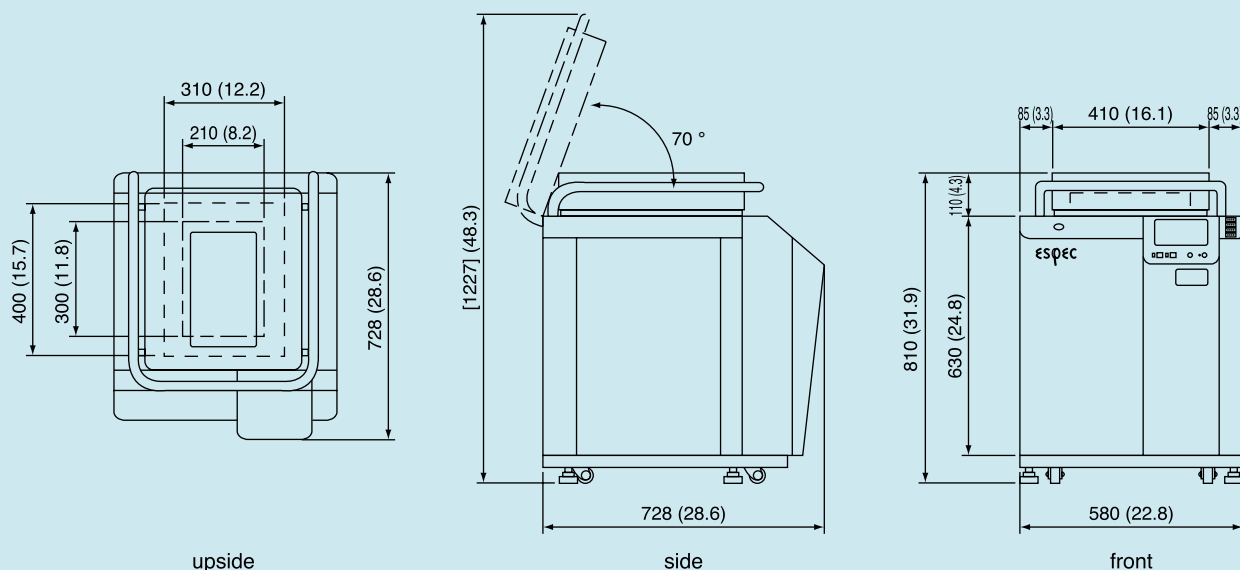
Glass-tube fuse (Class A, 250V, 3A) 1
 Handle(Stainless steel) 2
 For removing specimen plate.
 (M4 cross-recessed flat head machine screw x 4 included)
 Specimen temperature-monitoring sensor (with connector) 1
 Thermocouple type T (Copper/Copper-Nickel)
 Themally conductive sheet (200W x 290D x t3.0mm) 1
 User's manual

TEMPERATURE PROGRAM INDICATOR CONTROLLER

| Model | SCP-220 (TFT) |
|-----------------------------------|--|
| Operating mode | Program operation, Constant operation |
| Display | TFT Color LCD display (6.5in) |
| Setting | Analog touch panel method |
| Program Capacity | User's pattern: 20 program patterns (99 steps per one pattern) *Pattern linking possible |
| Setting and indication ranges | Temp: - 45 to + 90 (- 49 to + 194°F), - 45 to + 155 (- 49 to + 311°F) Time : 0 to 999 hours 59 minutes |
| Setting and indication resolution | Temp: 0.1 Time : 1 min. |
| Input | Thermocouple type T (Copper/Copper-Nickel) |
| Control | PID control |
| Communication function | RS-485 |
| Auxiliary functions | Time signal function Input burn-out detection function Upper and lower temperature limit alarm function Self-diagnostic function Alarm indication function Integration running time display Power cut protection function Time function (automatic start/stop) Refrigerator capacity automatic control function Trend graph display function Help function |

DIMENSIONS

unit : mm (inch)



OPTIONS

Additional overheat protector

In addition to the upper temperature alarm function and overheat protector, both provided as standard equipment, an additional temperature overheat protector is included.



Overheat protector and overcool protector

Overcool protector

Prevents the plate temperature from falling abnormally.

Emergency stop switch

In emergency stop status, this switch shuts off power to the Super Thermal Plate.

Specimen temperature monitor sensor

Measures the temperature of specimen.

- Thermocouple type T (Copper/Copper-Nickel)

Communication functions

Computer interface.

- GP-IB
- RS-232C

*Select one other than standard RS-485.

Communication cable

- RS-485 5, 10m
- GP-IB 2, 4m
- RS-232C 1.5, 3, 5, 10m

Viewing window

Glass window with a defogger for conducting visual checks of the specimen on the plate

- Window size: 170W × 305Dmm

Viewing window

Side tables (On either side)

Table for arranging measuring instruments, power supplies, and the like close to the plate.

- Size: 325W × 500Dmm (One on each side)
- Load capacity: 30kg (Equally distributed load)



Side tables

Thermally conductive sheet

The thermally conductive sheet improves the contact between specimens and the specimen plate.

- Size: 200W × 290Dmm
- Sheet thickness: t1.0, t3.0 mm

Power cord

Used when a cord longer than normal (2.5 m) is required.

- 5, 10 m



JIS Q 9001:2000
Registration Number
JSAQ 004



JAB Certificate Number
R001

ISO 9001/JIS Q 9001
Quality Management System Assessed and Registered

The Quality Management System of ESPEC CORP. has been assessed and registered based upon the International Standard ISO9001:2000 (JIS Q 9001:2000), by the Japanese Standards Association (JSA).



EMS Accreditation
RE 009



ISO 14001 (JIS Q 14001)
Environmental Management System Assessed and Registered

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ESPEC KANSAI CORP.
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