



TEMPTRONIC
an inTEST Company



Model TP04300A X-Stream

Delivering Essential Solutions for the Semiconductor Test Floor

04300A

Model TP04300A X-Stream

The High Power ThermoStream

Maximize Thermal Capacity and Throughput

Easy Touch Screen Control

Advanced Thermal Precision

Create up to 18 Thermal Profiling Sequences at the Cycling Screen

View Real-Time Temperature Status Graphically

Document with Color Graphing and Data Logging Features

User-Friendly Color Touch Screen

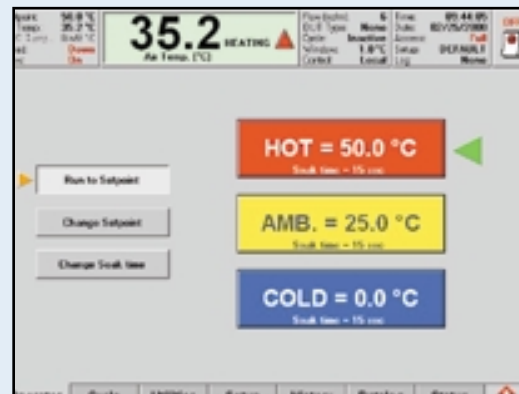
Simple, Efficient Setup and Thermal Testing

From **-80° to +225°C²**, select temperature setpoints to within $\pm 0.1^\circ\text{C}$.

Select cold/ambient/hot temperatures quickly and easily for **high throughput**.

With intuitive Windows[®]7-based menus and the real time Status Banner, system control is convenient and informed.

OPERATOR'S SCREEN



from -55° to $+125^\circ\text{C}$ in <5 seconds approximately¹
from $+125^\circ$ to -55°C in <13 seconds approximately¹

Highest Capacity Continuous Airflow

Faster Temperature Transitions, Greater Throughput

Providing continuous airflow of **9 liters/second (18 scfm)**, the high power X-Stream is the **largest capacity airstream system available**.

Test DUTs to PCBs of **all types and power dissipations** from -80° to $+225^\circ\text{C}^2$.

Achieve and maintain set temperature for standard to **higher wattage devices**.

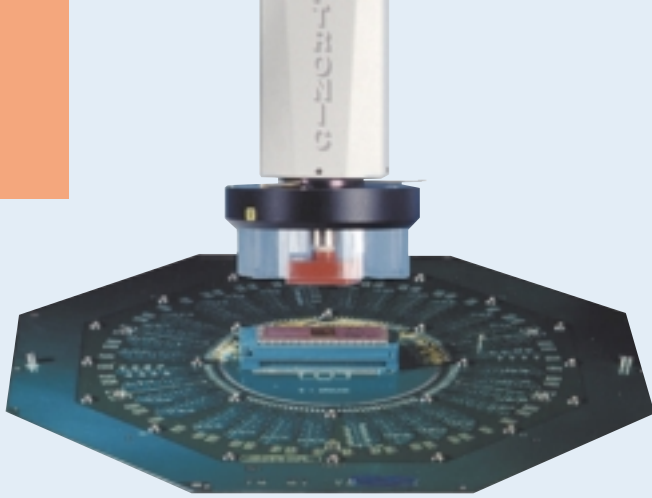
DUTs of all size—from devices to small subassemblies are cycled to temperature with speed, accuracy and control.

Ensure **thermal stability and repeatability throughout longer test times**.

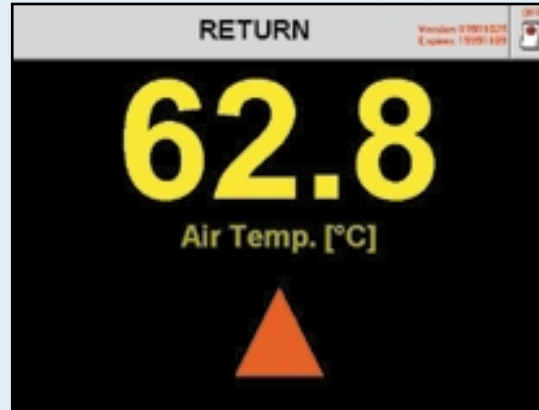
"Temptronic has been an excellent partner—providing us with an easy-to-use, reliable test solution..."

¹ Reduced performance may be encountered under operating conditions less than or greater than nominal

² Due to our utilization of HCFC-free refrigerants for 50 Hz systems, the low temperature extreme for these systems will be approximately 5°C less cold than that of a 60 Hz unit.



EXPANDED TEMPERATURE VIEW



Monitor temperature status from across the room

Streamlined and Full-Featured Control

Flexibility to Adapt to Each Application

Perform production testing, design verification and characterization at precise temperature.

Create and then view up to **18 ramp/soak/cycle thermal profile routines** at one screen.

Control via front panel touch screen or remote interface (IEEE-488, RS232, ST/ET/SFF, Ethernet).

Customize ramp/soak/cycle, "At Temperature" Windows, air flow rate and air/DUT temperature control.

Select from four DUT sensor inputs (Type T, Type K thermocouples, 100 ohm RTD or NEW Internal Diode).

Four color touch screen displays: Cycle Screen Graphic Display, Operator's Screen (Hot/Ambient/Cold) Display, Data Logging Display and Expanded Temperature View Display.

For repeatability, save thermal profiling routines and data logging files to the hard disk or diskettes.

Add **printer, monitor, mouse and keyboard** via I/O ports.

Using the optional ThermoFixture enclosure with a turnkey tester interface, test PCBs, MCMs and subassemblies of all sizes in a moisture-free environment from -80° to +225°C.

Real-Time Thermal Test Status

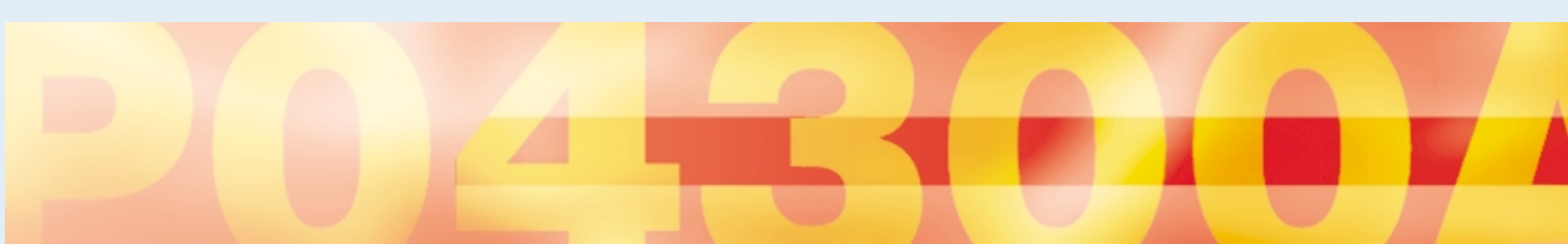
Graphically and Numerically

View the **air, DUT and set temperatures simultaneously** on Cycling Screen Graphs.

Produce **brilliant graphs** of thermal test results using data logging and full color graphing features.

The **Status Banner** at the top of most screens displays the current air, DUT and set temperatures, "At Temperature" window and set test parameters.

CYCLING SCREEN



Patented DUT Thermal Precision

+/- **0.1°C precision** is provided by Temptronic patented³ DUT Dual Loop Control™ which performs direct temperature control at the device case.

Flexibility to choose from four DUT sensors: **new Internal Diode Sensor, Type T or Type K Thermocouple, or 100 ohm RTD.**

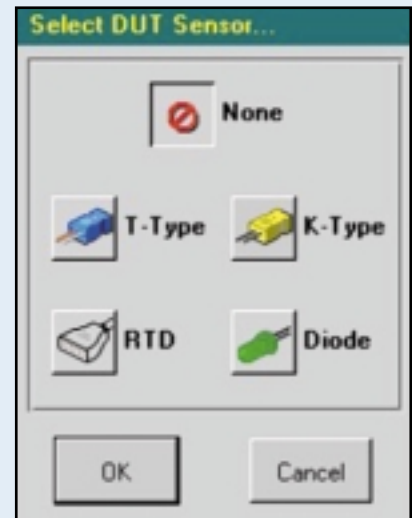
Temperature Sensors at the DUT (Device Under Test) assure optimum thermal accuracy⁴ (to within 1.0°C) and efficiency.

Temperature is sensed at the device once every 250 milliseconds, to bring the DUT as close as possible to the required temperature.

“At Temperature” Windows enable the operator to specify a required temperature range at which testing may be performed, for maximum test efficiency.

³ U.S. Patent No. 4,734,872

⁴ Temperature accuracy is calibrated to an NIST-traceable standard.



Full ATE Compatibility Plus

Interface to all major testers and rack and stack test equipment for a true and accurate tester interface.

Operate at the touch screen or via remote interface (**IEEE-488, RS232, ST/ET/SFF, Ethernet**).

Easily access input ports and drivers for **keyboard, mouse, printer and monitor** from the front panel.

Proper Coupling Assures Precise Temperature Control

Pneumatic control for raising and lowering the thermal head assists in its proper positioning over the DUT for highly repeatable accuracy. The arm may be manually rotated, moved in/out, up/down and locked in place for the optimum alignment and stability at the test site.

The **thermal cap's** double-layer glass or metal surrounds the DUT, creating a frost-free thermal test environment. All thermal caps may be removed or replaced without tools.

The **Thermal Interface Kit** is used to ensure maximum heat transfer to the DUT while protecting the tester from temperature extremes. Comprised of five non-conductive shrouds plus sheets of non-conductive foam, the kit facilitates proper coupling to the test site. Additional conductive or non-conductive interface kits, consisting of shrouds of various sizes, are also available.

The TPO4300A provides ionically balanced air (free of static charge). When coupled with a standard metal thermal cap and the optional conductive shroud kit for interfacing to the tester socket, an **ESD protected environment** is assured.

The tester socket and test fixture are maintained at temperature close to ambient while testing at high or low temperatures by the **Purge Air** feature, which prevents moisture, frost and overheating of tester electronics.



Automated Data Logging Enhances Documentation

Automated data logging is simple from Windows®-based menus.

View and store current and historical data and graphs.

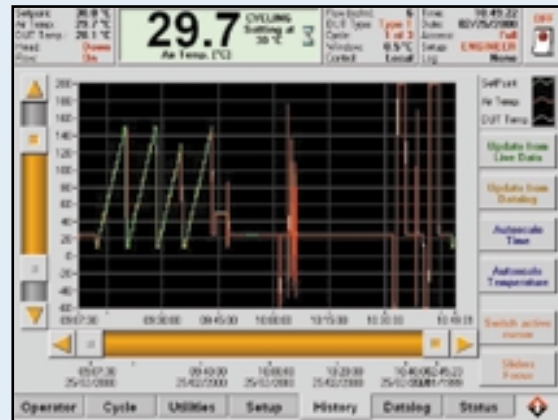
Adjust graph axes at the touch screen.

Save and recall thermal test routines and test results.

Save data logging of up to 75 sets of data (9 hours each) to the hard disk.

Additional data logging storage to diskettes is unlimited.

For software compatibility, data collection format is ASCII.



High Reliability and Dependability

New **quiet** air dryer is ideal for lab environments.

High quality components ensure long term dependability and maximum up-time.

Repeatable precision and productivity for the **24 hour/7 day test environment** and the design laboratory.

Modular system design ensures ease of maintenance, serviceability and upgrades.

Temptronic's **network of local service depots**, exceptional in the industry, provides quick response service and long term support.

Warranty ensures customer satisfaction.

"...Product yield
is way up.

Up-time on the

Temptronic units is
exceptional..."

Safety First

A bright, highly visible EMO switch is located on the system for power OFF.

Recessed rear panel circuit breakers assure that the system meets required safety standards.

The TP04300A uses only **CFC-free**⁵ refrigerants which are safe, non-toxic and non-flammable.

Large locking casters assure that the system is easily mobile between test sites and, when locked, the system is secured for safety and stability during testing.

The TP04300A is fully compliant and certified for the **European CE Mark**.

⁵50 Hz configuration TP04300 series system refrigerants are HCFC-free and CFC-free

ThermoStream Accessories

Expand Thermal Test Capabilities

Test Larger PCBs and Modules from -80° to $+225^{\circ}\text{C}$

Perform Moisture-free Thermal Testing for Longer Test Times

Turnkey ATE Interface



ThermoFixture[®] – The Complete Thermal Test Solution

Test the smallest device to the largest **PCB, MCM, hybrid, digital, high speed and high power devices** (from RF to microwave to 40 GHz) and **assemblies** from -80° to $+225^{\circ}\text{C}$.

Interfaces to Any Major Tester

For True Tester Signals and Turnkey Convenience

Thermal, mechanical and electronic interface hardware and software ensure **true and accurate tester signals**.

Perform **frost-free** testing at cold temperatures over extended test times.

Achieve **precise DUT temperature control** directly at the device case.

Optimize DUT thermal transition time with thermally efficient design and heat sink technology.

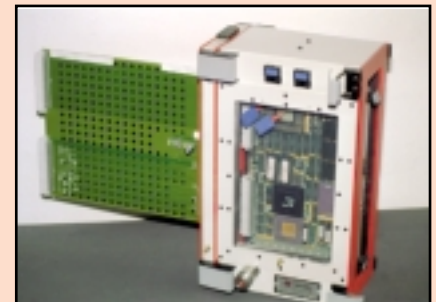
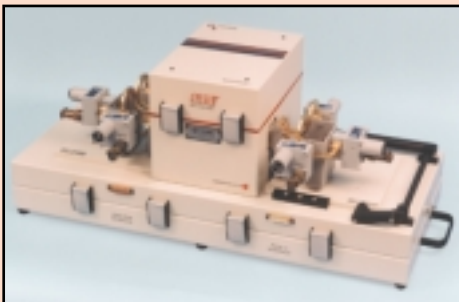
Clean, **ESD-free** test environment

All tester electronics are isolated from temperature extremes while the DUT is cycled to temperature.

Available in standard, application-specific and modular designs.

Optional **patented probe-through window⁶** permits viewing and probing the subject under test while at precise temperature to -55°C .

⁶U.S. Patent No. 4,426,619



TPO4300

Precise DUT Thermal Control

Greater Thermal Test Accuracy and Reliability

Provides a moisture-free environment to -80°C in a 24/7 test setting with the ThermoStream thermal source.

Improves load board performance and reliability, maximizing your investment.

Prevents condensation at the test site, which can lead to erroneous test results.

For true and accurate testing, ThermoFixture isolates the DUT from surrounding devices which, if brought to temperature, could impair accurate test results.

Impedance-matched connections ensure high quality results when testing **digital, high speed ($>40\text{ GHz}$) and low noise DUTs.**

Design protects the DUT from any interference from external noise and other environmental factors for optimal test accuracy.

Provides greater design efficiency. Utilizing Temptronic's tester interface and frost-free enclosure technologies, the ThermoFixture is designed and constructed with turnkey compatibility assured.

Large customer base includes leaders in the military, aerospace, semiconductor and electronics industries worldwide.

Developed in cooperation with the major ATE manufacturers. Temptronic's expertise in tester interface design is unique in the industry.

Recognized by its customers with **awards for exceptional quality.**



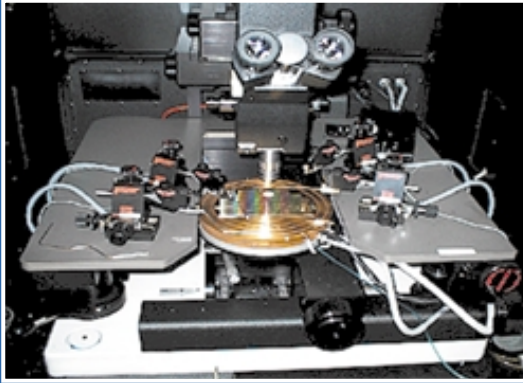
ThermoWand™

Test individual components on a printed circuit board or tester using a thermal wand, transforming the X-Stream into a ThermoSpot.®

Provides the operator with the flexibility to isolate individual components using the thermal wand with a rubber shroud attached, surrounding the DUT for testing over the -80° to $+225^{\circ}\text{C}$ temperature range.



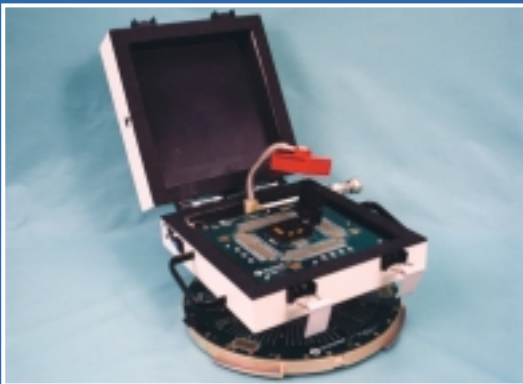
Complete Thermal Test Solutions



ThermoChuck® Systems for probing wafers, chips, hybrids and other flat devices at hot and cold temperature.



ThermoSocket® Systems for testing and locating micron size defects on chips in minutes, even at 30 microwatt power levels.



ThermoFixture® for testing hybrids, MCMs, modules, PCBs and other devices in a custom enclosure with fixturing for integration with ATE test systems.



ThermoZone® for testing in-circuit probing and troubleshooting component arrays, burn-in boards and small electronic and electromechanical subassemblies.



ThermoSpot® Systems for testing and fault isolation of individual components at precise hot and cold temperature at the tester socket or on a printed circuit board.



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