High Power Density Thermal Test Vehicle System

TTV-12000 Series



Up to 1000W/cm² Heat Flux per Zone For High-Power Thermal Testing

12000W

Up to 12000W Rated Power per Heater

Simulates high-power chip thermal loads for AI server cooling validation.

325W/cm²

67 × 55 mm Heated Area with Average Heat Flux up to 325W/cm²

At 12 kW output, a single heater delivers an average heat flux of approximately 325W/cm².Ideal for validating cold plate and liquid cooling performance under high thermal loads.



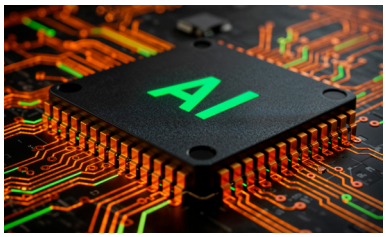
Feature

- Up to 12kW High-Power Output per Heater
- Maximum Heat Flux of 1,000W/cm² per Zone
- 24 Zone Heating Configuration for Thermal Load Distribution Simulation
- Maximum Power Ramp Rate of 2,000W/s
- Up to 7 Temperature Monitoring Points for Thermal Distribution Analysis
- 24 Channel PWM Power Control for High-Power Thermal Load Simulation
- Dedicated Interlock and Insulation Relays for Enhanced Power Safety
- 80V Low-Voltage, High-Current Thermal Load Drive Architecture
- High-Power Thermal Load Simulation for Cold Plate and Liquid Cooling Performance Validation

Application

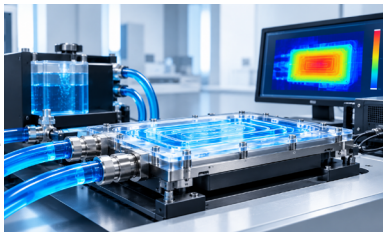
01 | AI Server and GPU High-Power Thermal Validation

Simulates heat generation in high-performance computing chips using high-power thermal loads and multi-zone heating, enabling validation of cold plate performance, liquid cooling systems, and heat transfer paths.



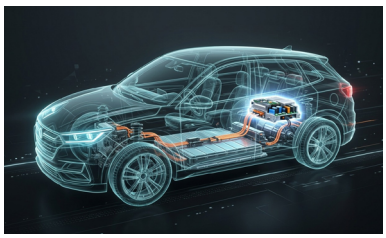
02 | Liquid Cooling, Cold Plate, and Advanced Thermal Solution Validation

Provides repeatable thermal load conditions to evaluate the thermal performance of thermal interface materials (TIMs), cold plate designs, and liquid cooling loops at different power levels, supporting thermal resistance measurement and cooling design optimization.



03 | EV Power Electronics and High-Power Module Thermal Management

Simulates heat generation in automotive power modules, DC-DC converters, and inverters to validate cooling structures and thermal management performance.

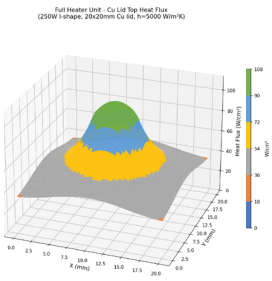


SPEC

High Power Density Thermal Test Vehicle System | TTV-12000 Series

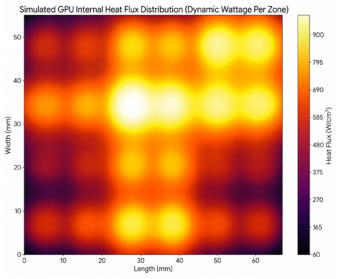
Heater Rated Power	Max. 12000W	
TTV Element - Total Heated Area	67 × 55mm, approximately 36.85/cm^2 (Customizable)	
TTV Element - Zoned Heating	24 Zones	Max. Power / Zone: 500W
Heat Flux	Max. Heat Flux / Zone	1000W/cm^2
	Avg. Heat Flux (Total Area)	325W/cm^2
Power Control	PWM Channel	24
	Control Resolution：100-step linear adjustment per channel for output power control	
Max. Power Ramp Rate	2000W/s	
Operating Voltage (Max)	80V	
Power Supply Configuration	2 units KIKUSUI DC Power Supply PAT80-100T	
Safety Features	Dedicated Interlock Contacts, Reinforced Isolation Relays	
Protection Mechanisms	Overcurrent Protection (OCP), Overtemperature Protection (OTP), Soft-Start Protection	

TTV | Thermal Simulation



Single Heat Source Thermal Simulation

Analyze the heat flux distribution of an isolated heat source through thermal simulation profiles.



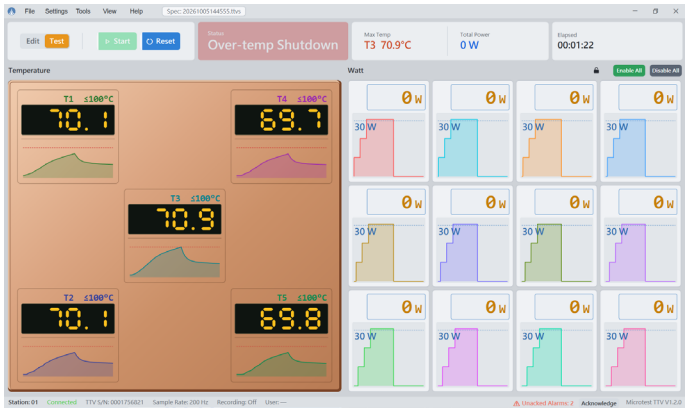
Heat Flux Density and Thermal Profile Simulation

24-zone TTV heating array realistically simulates AI GPU hotspots. With up to 1000W/cm^2 heat flux per zone, it evaluates thermal conductivity and cooling limits for cold plates and vapor chambers.

TTV | PC Software

Data Visualization	Display Modes	Compact Mode
		Dynamic Marquee Display Mode
	Axis Display Settings	Supports X-axis / Y-axis toggle
Data Logging & Export	CSV, Binary	
Interface	USB Type-C (Connects to TTV Control Module)	
Operating System	Windows 10 or later	

TTV | PC Software — Intuitive User Interface Design



Temperature Monitoring Trend Chart

Temperature Monitoring Range ：0°C ~ 130°C

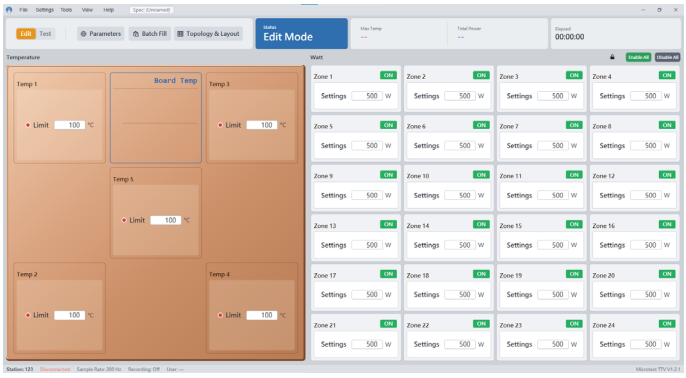
Resolution ： 0.1°C

Power Monitoring Trend Chart

Power Monitoring Range ：0W ~ 500W

Resolution ：1W

TTV | PC Software — Power / Temperature Settings



Temperature Setting

Temperature Setting Range ：1°C ~ 120°C

Resolution ：1°C

Power Setting

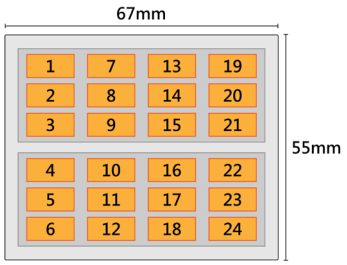
Power Input Range ：0W ~ 500W

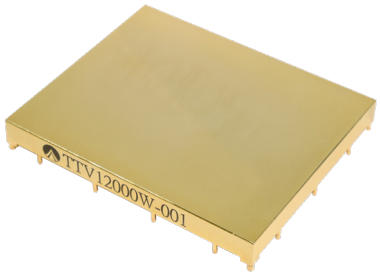
Resolution ：1W



TTV | Control Module

High-Speed Dynamic Power Control	PWM Control Channels: 24 Channels Resolution: 100-step linear adjustment per channel for output power control		
Max. Power Ramp Rate	2000W/s		
Power Safety Protection	Dedicated Interlock Contacts, Reinforced Isolation Relays		
Temperature Monitoring	Control Board Temp. Sensing	1x Temp. Sensor IC on PCB	
	TTV System Temp. Sensing Points	5 points standard (Expandable to 7)	
	Max. Ambient Temperature	≤ 70°C	
Power Terminals	Terminal Sets	6 sets	
	Max. Current / Terminal Set	30A	
	Max. Current / Cable Assembly	25A	
	Total Current Capacity	150A(Sum of 6 terminal sets rated current)	
Wiring Specifications	TL-PM0001 | Banana Plug Test Leads (Red) TL-PM0002 | Banana Plug Test Leads (Black)	Safety Rating	1000V CAT III
		Current Rating	25A
		Wire Gauge	12AWG
		Cable Type	UL 3239 Silicone High-Voltage Wire
		Length	1m





TTV | Thermal Test Element

Heat Flux Density	Max. Heat Flux / Zone	1000W/cm^2
	Avg. Heat Flux (Total Area)	325W/cm^2
Total Heated Area	67 × 55mm (Customizable)	
Multi-Zone Heating Configuration	24 Zones	Configurable thermal load distribution for diverse test requirements
	Max. Power / Zone: 500W	
TTV Heating Zone | Temp. Monitoring	Multi-Point Temp. Monitoring	5 points standard (Expandable to 7)
	Recommended Operating Temp	< 100°C
	Maximum Temperature	120°C



TTV | DC Power Supply

Model	2 units KIKUSUI DC Power Supply PAT80-100T
Power Supply Type	High-Efficiency Switching DC Power Supply
Rated Output Power	8000W
Rated Output Voltage	80VDC
Rated Output Current	100A
Output Control Mode	CV/CC
Rated Input Power	Three-Phase AC 200V ~ 240V, 50Hz ~ 60Hz
Input Voltage Range	AC 180V~250V
Input Frequency Range	47Hz~63Hz
Max. Input Current	32A(Rated Load)
Max. Input Power	10kVA
Voltage Setting Accuracy	±(0.2% of Rated Value + 50mV)
Voltage Load Regulation	±(0.1% of Rated Value + 5mV)
Voltage Ripple & Noise	350mVp-p (10Hz ~ 20MHz) ; 30mVrms (5Hz ~ 1MHz)
Current Setting Accuracy	±(0.5% of Rated Value + 50mA)
Transient Response Time	5ms (under specified condition of load current varying from 50% to 100%)
Standard Interface	RS-232C
Option Interface	USB, GPIB, LAN
External Analog Control	Supports Voltage / Resistance Control and Output ON/OFF Control
Safety Protections	Overvoltage Protection (OVP) Overcurrent Protection (OCP) Overtemperature Protection (OTP) Input Phase Failure, Fan Failure, and Remote Sensing Line Abnormality Protections
Max. Dimensions	Approx. 430 × 129.2 × 550mm (Max. dimensions marked per specification definition)
Weight	Approx. 23kg