

# High Performance Thermode

## Compliant Thermal Contactor for Semiconductor Burn-in and Test

Centipede’s high performance thermode provides “best in its class” thermal management for testing high power semiconductor products. The thermode establishes test temperature conditions rapidly and uniformly across the device to achieve high first pass yields. The all metal construction and clean contact to the device allow low maintenance operation and a minimum of ATE down time.



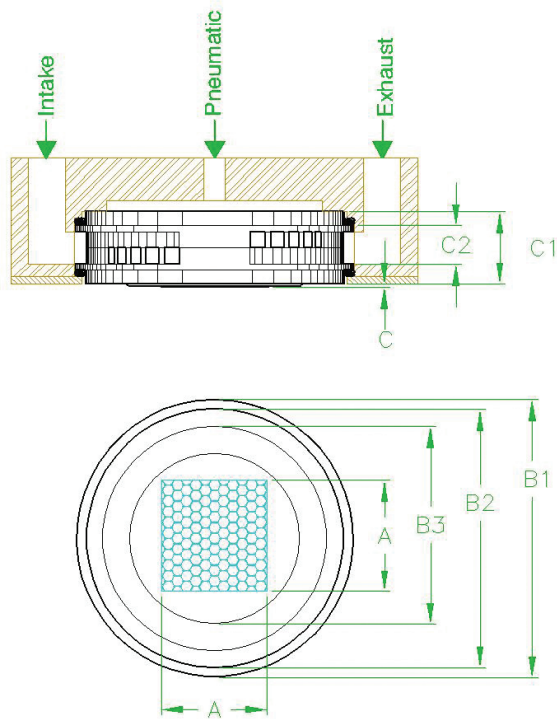
Designed to meet the highest power density requirements for burn-in and test of high performance devices, the thermode has the best thermal resistance performance in the world today. Thermodes have demonstrated a cooling capability to 500 W and to greater than 200 W/cm<sup>2</sup>. Heat is coupled efficiently from a compliant membrane contacting the device to a thermal transfer fluid flowing through a honeycomb network of thermal pins.

- **Lowest Thermal Resistance**
- **Wide temperature Range**
- **Mechanically Compliant**
- **Fast Response**
- **Pneumatically Actuated Contact**
- **All Metal Construction**

Intimate contact to the device surface is achieved by pneumatic actuation that moves the active surface onto the device with a precision controlled force. The compliant surface of the thermode conforms to warp and imperfections in the device in order to establish a uniform thermal contact and accurately controlled test conditions.

	PAT – 10C		PAT – 18C		PAT – 25C	
Active Area	10x10	mm	18x18	mm	25x25	mm
Thermal Resistance*	0.05	°C-cm <sup>2</sup> /W	0.05	°C-cm <sup>2</sup> /W	0.05	°C-cm <sup>2</sup> /W
Temperature Range	-65 to +160	°C	-65 to +160	°C	-65 to +160	°C
Ambient Gas	Air, He, N <sub>2</sub>		Air, He, N <sub>2</sub>		Air, He, N <sub>2</sub>	
Response Time	75	mS	100	mS	150	ms
Cooling Capacity	250	W/cm <sup>2</sup>	250	W/cm <sup>2</sup>	250	W/cm <sup>2</sup>
Pneumatic Actuator	Yes		Yes		Yes	
Vertical Travel	0.5	mm	0.5	mm	0.5	mm
Contact Pressure	0.6	MPa	0.6	MPa	0.6	MPa

\* in He ambient



- A Active Dimension
- B1 Overall Diameter
- B2 O-Ring Gland
- B3 Stop Diameter
- C Deflection (max)
- C Deflection (min)
- C1 Overall Height
- C2 O-Ring Gland

	10	18	25
A Active Dimension	10.0	18.0	25.0
B1 Overall Diameter	26.0	38.0	48.0
B2 O-Ring Gland	24.2	36.2	46.2
B3 Stop Diameter	21.0	33.0	46.2
C Deflection (max)	+0.2	+0.2	+0.2
C Deflection (min)	-0.3	-0.3	-0.3
C1 Overall Height	7.0	7.0	7.0
C2 O-Ring Gland	4.2	4.2	4.2

Dimensions in mm ± 0.05

	PAT – 10C		PAT – 18C		PAT – 25C	
Surface Material	Silver		Silver		Silver	
Surface Flatness	20	nm	20	nm	20	nm
Surface Roughness	5	nm	5	nm	7	nm
Local Compliance	0.02	mm	0.02	mm	0.02	mm
Warp Compliance	0.05	Mm	0.10	mm	0.10	mm
Gimbal Action	±2°		±2°		±2°	
Surface Reticulation	1.0	mm	1.0	mm	1.0	mm
Cooling Capacity	250	W/cm <sup>2</sup>	250	W/cm <sup>2</sup>		
Coolant Types	Liquid, Gas		Liquid, Gas		Liquid, Gas	
Coolant Pressure	1.0	MPa	1.0	MPa	1.0	MPa
Heat Capacity	4.3	J / °C	7.1	J / °C	12.9	J / °C
Internal Seals	metal		metal		metal	
Thermode Diameter	26	mm	38	mm	48	mm
Thermode Thickness	7	mm	7	mm	7	mm
Mounting Centers	32	mm	45	mm	56	mm
Weight	18	gm	30	gm	55	gm