

□ MHP Series

Superior Thermal Conductivity Solutions

- **MHP (Micro Heat Pipe)**

MHP with micro technology is a flat and slim shaped heat pipe. It has many usages for every type of electronic devices also LED application especially for slim, small and flat type of devices such as CPU Cooler, Memory Cooler, LED LCD TV, LED Projector, and UMPC even more application.

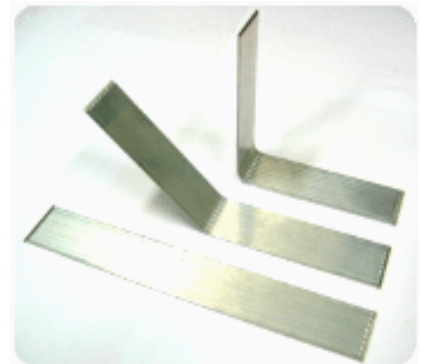
It has high performance, excellent heat transmitter and also heat dissipation through its flat area.

MHPs will make your product slim, lighter, fancy and distinguishable from others.

MHPs are the ultimate cooling solution for your fascinating products.. MHPs also meets all environmental requirement including RoHS.

- **Features**

- Micro Technology Applied
- Working Fluid : Acetone
- Thermal Performance up to 310W
- Ultra Slim & Flat Heat Pipe (1.2mm to 2.5mm)
- Light Weight & Great Uniformity
- Custom Size Available



- **Application Fields**

- CPU Cooler, GPU Cooler
- FBDIMM, UDIMM (Memory Module)
- LED Lighting System.
- Optical Communication Module
- Telecommunications Network Test Equipment
- Hi-power Module





Superior Thermal Conductivity Solutions

• General Information

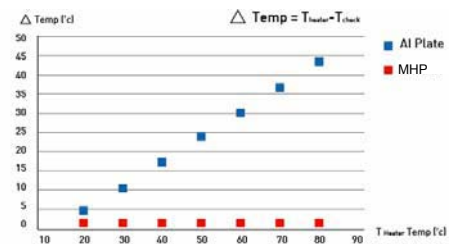
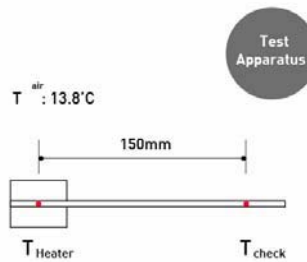
| ITEM | Description |
|---------------------------------|---------------|
| Material of Container | Aluminum 1050 |
| Wick Structure | Groove |
| Working Fluid | Acetone |
| Operating Inclination, θ | 0 ~ 90° |
| Leak Temperature Criterion | -40 ~ 100 °C |

• General Specification

| Part Name | Thickness | Width | Length | Heat Transfer Rate | Material |
|------------------|-----------|-------|-------------|--------------------|----------|
| MHP-1220B Series | 1.2 mm | 20 mm | 60 ~ 200 mm | 5 ~ 18 W | Aluminum |
| MHP-1223A Series | 1.2 mm | 23 mm | 60 ~ 200 mm | 5 ~ 18 W | |
| MHP-1630C Series | 1.6 mm | 30 mm | 60 ~ 500 mm | 11 ~ 50 W | |
| MHP-2040A Series | 2.0 mm | 40 mm | 60 ~ 500 mm | 40 ~ 170 W | |
| MHP-2550A Series | 2.5 mm | 50 mm | 60 ~ 500 mm | 75 ~ 270 W | |

• Thermal Characteristic

Horizontal Mode Test Result
 Superior Thermal Conductivity
 Superior Thermal Uniformity

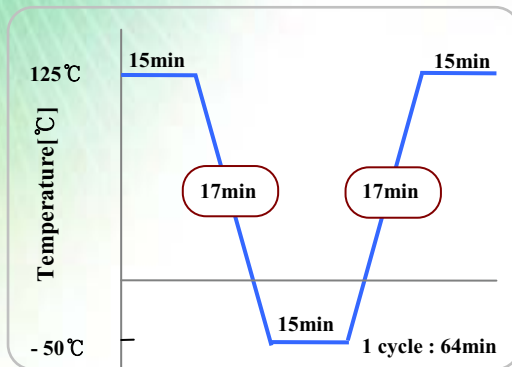




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- Reliability Certification
- Thermal Cycle (1,500 Cycle - Min(-50°C) ~ Max(125°C))

▷ Test Condition & Samples

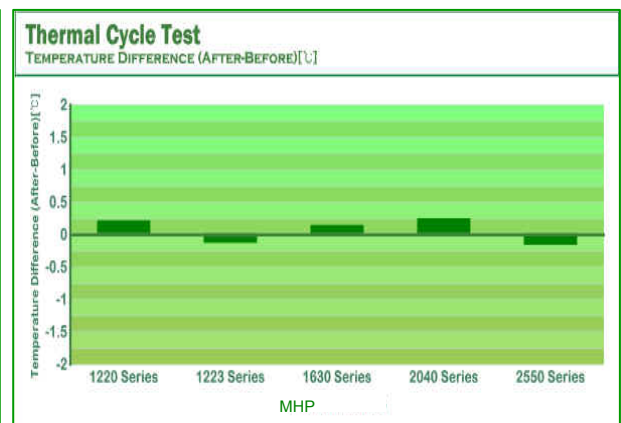
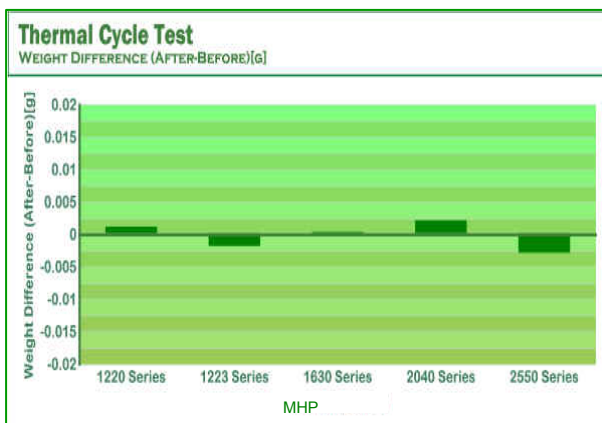


▷ Sample Used

- MHP-1220B Series
- MHP-1223A Series
- MHP-1630C Series
- MHP-2040A Series
- MHP-2550A Series

▷ Test Results

| Check Item | MHP Thermal Cycle Test (-50°C~125°C) 1500 Cycle |
|---------------------|---|
| Weight | No Weight Loss |
| Thermal Performance | No Performance Drop |
| Surface Flatness | No Bulging Plane |



<Weight Difference (AFTER-BEFORE) [g]>

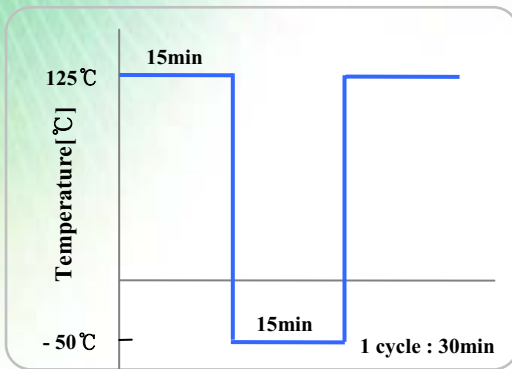
< Temperature Difference (AFTER-BEFORE) [°C] >



Superior Thermal Conductivity Solutions

- Reliability Certification
- Thermal Shock (1,500 Cycle - Min(-50℃) ~ Max(125℃))

▷ Test Condition & Samples

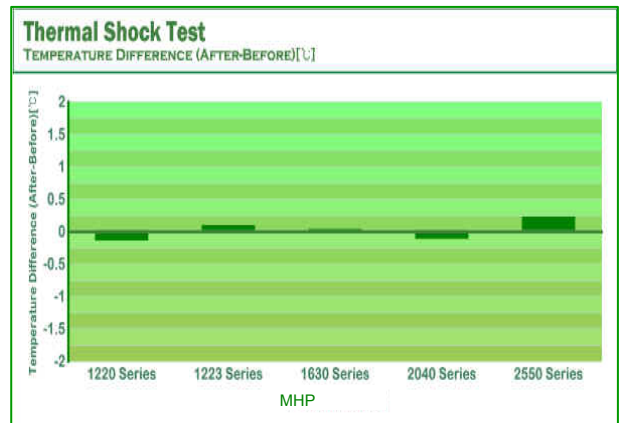
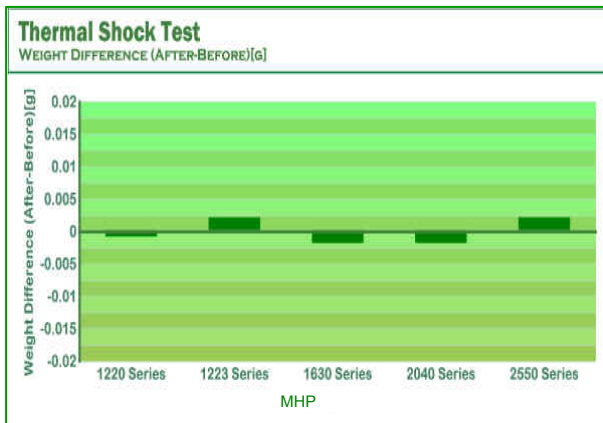


▷ Sample Used

- MHP-1220B Series
- MHP-1223A Series
- MHP-1630C Series
- MHP-2040A Series
- MHP-2550A Series

▷ Test Results

| Check Item | MHP Thermal Shock Test (-50℃~125℃) 1500 Cycle |
|---------------------|---|
| Weight | No Weight Loss |
| Thermal Performance | No Performance Drop |
| Surface Flatness | No Bulging Plane |



<Weight Difference (AFTER-BEFORE) [g]>

< Temperature Difference (AFTER-BEFORE) [°C] >



Superior Thermal Conductivity Solutions

- Reliability Certification

- High Temperature Test

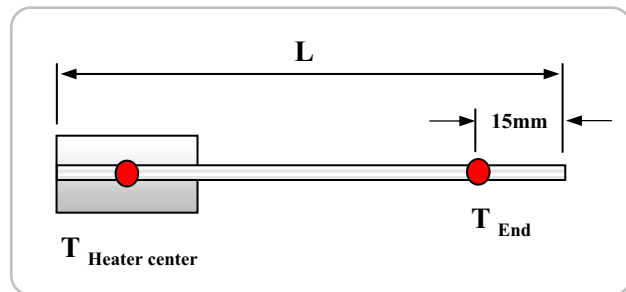
- ▷ Test Process

- Measuring weight & ΔT of the samples before the test.
 - Exposing the samples to the dry oven & oil bath. (@ 150°C, 1hr)
 - Measuring weight & ΔT of the samples after the test. And checking the surface state.

- ▷ Test Condition & Samples

- ▷ Sample Used

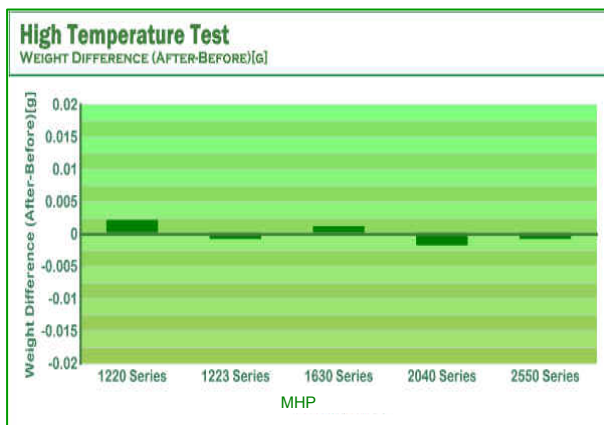
- MHP-1220B125A (L:125mm)
 - MHP-1223A125A (L:125mm)
 - MHP-1630C200A (L:150mm)
 - MHP-2040A150A (L:150mm)
 - MHP-2550A150A (L:150mm)



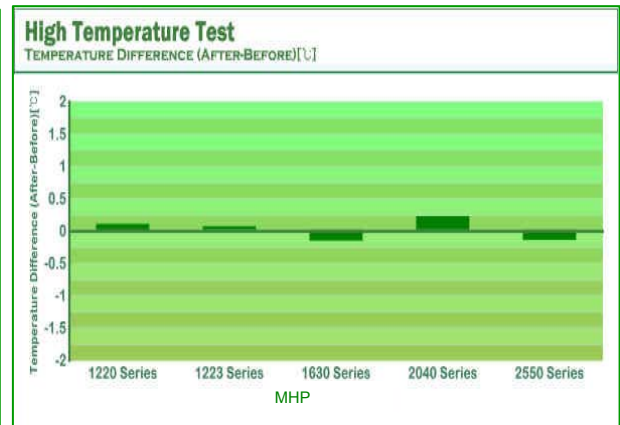
< ΔT Measurement Apparatus >

- ▷ Test Results

| Check Item | High Temperature Reliability Test (@ 150°C) | |
|---------------------|---|---------------------|
| | Dry Oven | Oil Bath |
| Weight | No Weight Loss | No Weight Loss |
| Thermal Performance | No Performance Drop | No Performance Drop |
| Surface Flatness | No Bulging Plane | No Bulging Plane |



<Weight Difference (AFTER-BEFORE) [g]>



< Temperature Difference (AFTER-BEFORE) [°C] >

MHP

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• Reliability Certification

▪ Vibration Test

▷ Test Process

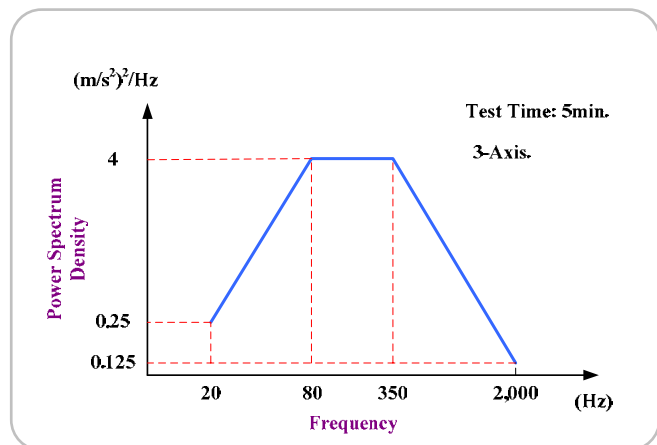
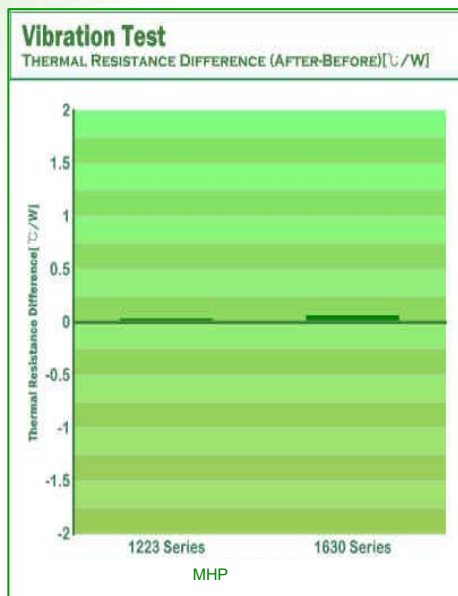
- Measuring thermal resistance of the samples before the vibration test.
 - Exposing the samples to the vibration chamber. (20°C, 60m/s², 20~2,000Hz, 3-Axis., 5min.)
 - Measuring thermal resistance of the samples after vibration test.
- ※ 3-Axis. : Horizontal Mode (Left/Right, Front/Rear), Vertical Mode (Up/Down).

▷ Test Condition & Results

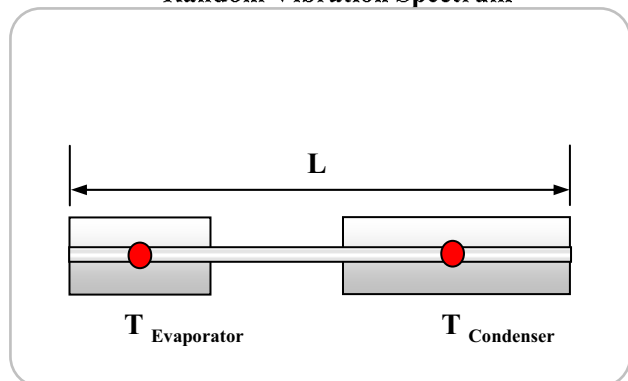
▷ Sample Used

MHP-1223A125A (L:125mm)

MHP-1630C200A (L:150mm)



<Random Vibration Spectrum>



< Test Section Schematic >

| Check Item | MHP Vibration TEST |
|---------------------|---------------------|
| Appearance | No Change |
| Thermal Performance | No Performance Drop |
| Surface Flatness | No Bulging Plane |