

## HIGH TEMP FAN HEAT SINKS - FHS-090 SERIES

### High Operating Temperature Integrated Fan Heat Sinks

#### DESIGN FEATURES

- Industry-leading maximum operating temperature of 90°C
- Compatible with chipset footprints ranging from 21x21 mm to 55x55 mm
- Total heights from 17 mm for low profile applications to 44.6 mm for lowest thermal resistance
- Common 5VDC @ 0.5 A (max) USB 2.0 fan electrical specifications
- Forged and extruded versions available
- Choice of elliptical, round pin, and plate fin styles



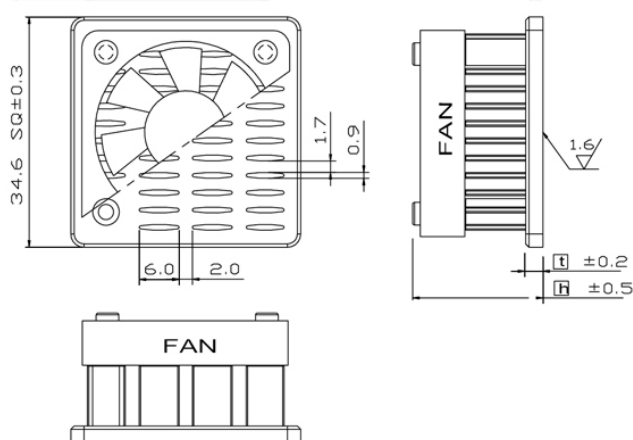
#### DESCRIPTION

The FHS-090 Series of integrated-fan heat sinks is uniquely designed to absorb and disperse heat away from high temperature devices while offering key features such as an operating temperature range of -10°C to 90°C, calculated MTTF @ 90°C: 86,858 hours (GEM, 90% confidence) and various package sizes to best fit the application. Thermal resistance values range from 4.11°C/W to as low as 0.53°C/W.

These new fansinks can maintain superior thermal dissipation for devices that emit high amount of heat. CTS' fansinks are available in a wide range of footprints and fin heights which make them suitable for many elevated temperature applications such as component testing, burn-in, high density servers, high- speed computing and video, and use in areas where the system airflow is constrained.

#### Elliptical Fins

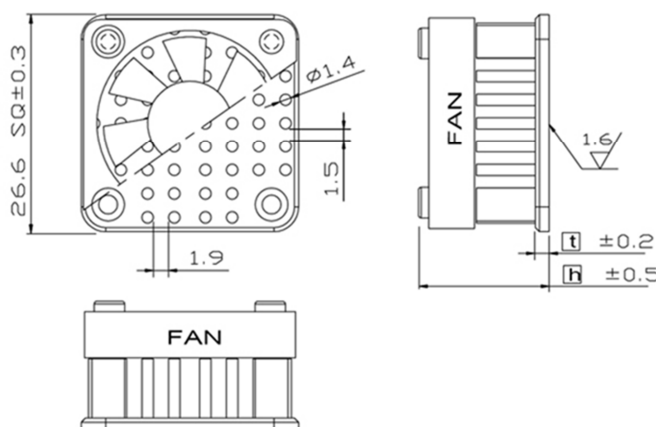
| Available Part Numbers | Length x Width x Height (mm) | Thermal Resistance (R <sub>TH</sub> ) (°C/W) | Case Height Range (mm)<br>See Below |
|------------------------|------------------------------|----------------------------------------------|-------------------------------------|
| FHE35-35-26/T410/M     | 35 x 35 x 26                 | 2.19                                         | 1.4~2.0                             |
| FHE35-35-26/T710/T     | 35 x 35 x 26                 | 1.68                                         | 3.0~3.6                             |
| FHE45-45-22/T710/T     | 45 x 45 x 22                 | 1.60                                         | 3.0~3.6                             |
| FHE45-45-45/T710/T     | 45 x 45x 44                  | 1.12                                         | 3.0~3.6                             |



**FHE35-35-XX is shown, clip removed for clarity**

## Pin Fins

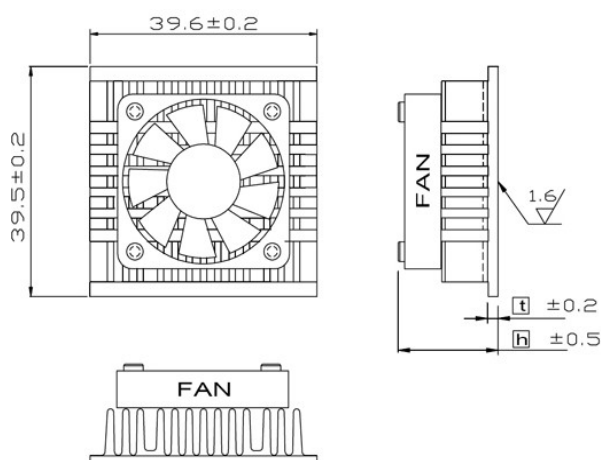
| Available Part Numbers | Length x Width x Height (mm) | Thermal Resistance ( $R_{TH}$ ) ( $^{\circ}\text{C/W}$ ) | Case Height Range (mm)<br>See Below |
|------------------------|------------------------------|----------------------------------------------------------|-------------------------------------|
| FHP27-27-20/T710/M     | 27 x 27 x 20                 | 3.41                                                     | 1.4~2.0                             |
| FHP48-48-28/A01/T      | 48 x 48 x 28.5               | 1.18                                                     | 3.0~3.6                             |
| FHP48-48-28/T710/T     | 48 x 48 x 28.5               | 1.00                                                     | 3.0~3.6                             |
| FHP55-55-28/T710/T     | 55 x 55 x 28.5               | 0.82                                                     | 3.0~3.6                             |
| FHP55-55-45/T710/T     | 55 x 55 x 44                 | 0.53                                                     | 3.0~3.6                             |



**FHP27-27-XX** is shown, clip removed for clarity

## Extruding Fins

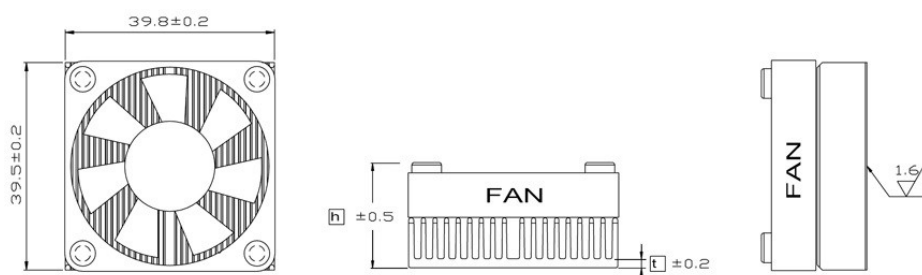
| Available Part Numbers | Length x Width x Height (mm) | Thermal Resistance ( $R_{TH}$ ) ( $^{\circ}\text{C/W}$ ) | Case Height Range (mm)<br>See Below |
|------------------------|------------------------------|----------------------------------------------------------|-------------------------------------|
| FEX35-35-21/T710/M2    | 35 x 35 x 21.0               | 1.95                                                     | 0.9~1.7                             |
| FEX40-40-21/T710/M2    | 40 x 40 x 21.2               | 1.82                                                     | 0.9~1.7                             |



**FEX40-40-21** is shown, clip removed for clarity

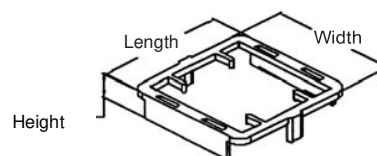
## Line Fins

| Available Part Numbers | Length x Width x Height (mm) | Thermal Resistance ( $R_{TH}$ ) | Case Height Range (mm)<br>See Below |
|------------------------|------------------------------|---------------------------------|-------------------------------------|
| FHL21-21-18/T710/M     | 21 x 21 x 18                 | 3.54                            | 1.4~2.0                             |
| FHL21-21-21/A01/S      | 21 x 21 x 21                 | 4.11                            | 0.9~1.4                             |
| FHL23-23-18/T710/S     | 23 x 23 x 17.5               | 3.22                            | 0.9~1.4                             |
| FHL27-27-18/T710/M     | 27 x 27 x 18                 | 2.79                            | 1.4~2.0                             |
| FHL27-27-2314/A01/T    | 27 x 27 x 24                 | 2.85                            | 2.1~2.6                             |
| FHL29-29-18/A01/T      | 29 x 29 x 18                 | 2.99                            | 2.1~2.6                             |
| FHL31-31-17/T710/T     | 31 x 31 x 18                 | 2.36                            | 2.1~2.6                             |
| FHL35-35-18/T710/T     | 35 x 35 x 18                 | 2.06                            | 2.1~2.6                             |
| FHL40-40-18/T710/T     | 40 x 40 x 18                 | 1.88                            | 2.1~2.6                             |
| FHL43-43-17/T710/T     | 42.5 x 42.5 x 18             | 1.79                            | 2.1~2.6                             |
| FHL45-45-23/T710/T     | 45 x 45 x 23                 | 1.43                            | 2.1~2.6                             |



**FHL40-40-XX is shown, clip removed for clarity**

## CHIPSET CASE HEIGHT



## THERMAL INTERFACE MATERIAL STYLES

| Thermal Interface Material | Supplier  | Thickness (mm) | Thermal Impedance (°C-in. <sup>2</sup> /W) | Dielectric Strength (V/mil) | Description                                                                                 |
|----------------------------|-----------|----------------|--------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------|
| A01                        | CTS       | 0.13           | 0.82                                       | 4,000                       | Double-sided acrylic adhesive on a Kapton® MT carrier                                       |
| T410                       | Chomerics | 0.18           | 1.10                                       | N/A                         | Double-sided acrylic adhesive loaded with aluminum oxide on an aluminum foil carrier        |
| T411                       | Chomerics | 0.28           | 1.00                                       | N/A                         | Double-sided silicone adhesive with expanded aluminum mesh carrier                          |
| T412                       | Chomerics | 0.23           | 0.25                                       | N/A                         | Double-sided acrylic adhesive loaded with titanium diboride on an expanded aluminum carrier |
| T710                       | Chomerics | 0.13           | 0.16                                       | N/A                         | Phase change thermal pad                                                                    |

## PART NUMBER CODE

