

# ThermaWick® Thermal Jumper Surface Mount Chip



## LINKS TO ADDITIONAL RESOURCES



3D Models



Product Page



Infographics



Videos



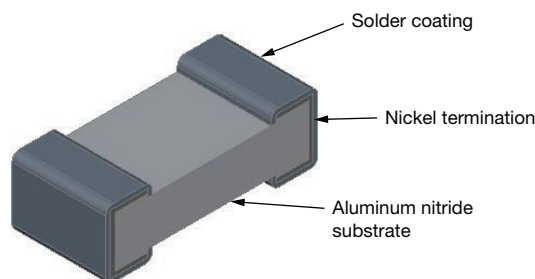
Packages



Footprints

THJP surface-mount chips are designed to provide an electrically isolated thermal conductive pathway to a ground plane or heat sink while maintaining the electrical isolation of the device. The devices are constructed with aluminum nitride substrates in both SnPb and Pb-free wraparound termination styles. The low capacitance of the device makes them an excellent choice for high frequency and thermal ladder applications. Custom sizes available.

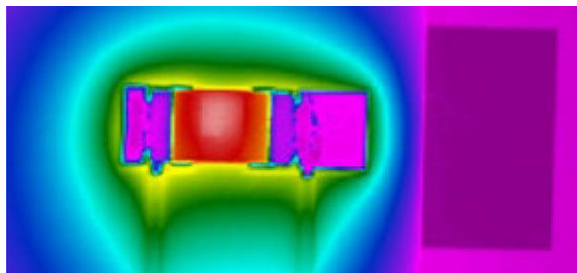
## CONSTRUCTION



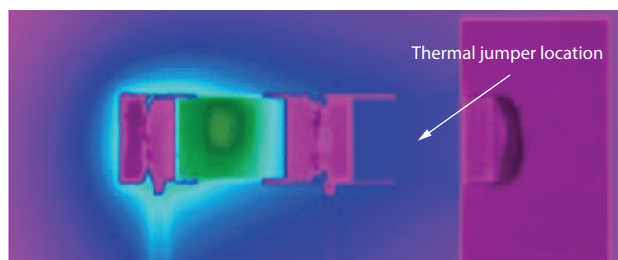
## HEAT TRANSFER DEMONSTRATION

Chip surface temperature was measured using a FLIR SC645 thermal imaging system under ambient conditions. The devices were mounted to an FR4 test card designed with a 25 mm x 19 mm copper heat sink. Power was supplied to device to cause the surface temperature to stabilize at 150 °C. The device was then retested at the same power level with the thermal jumper connecting the device to the heat sink.

### Example THJP 1206 Thermal Jumper Showing 54.3 °C Surface Temperature Reduction



Ceramic Resistor Chip Without Thermal Jumper (149.8 °C)



Ceramic Chip Resistor With Thermal Jumper (95.5 °C)

## FEATURES

- Electrically isolated thermal conductor
- High thermal conductivity AlN substrate (170 W/mK)
- Electrically isolated terminations (> 999 MΩ)
- Low capacitance
- Available with SnPb or lead (Pb)-free wrap terminations
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS\*

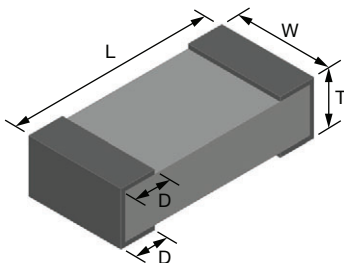
Available  
HALOGEN  
FREE  
GREEN  
(5-2008)  
Available

## APPLICATIONS

- Power supplies and converters
- RF amplifiers
- Synthesizers
- Switch mode power supplies
- Pin and laser diodes
- Filters

## FUNCTIONAL APPLICATIONS / CONNECTION OPTIONS

- Component to heat sink
- Component to case
- Component to ground plane
- Pad to pad
- Pad to via
- Pad to trace

**DIMENSIONS** in inches


| CASE SIZE | L             | W             | T             | D             | WEIGHT (g) |
|-----------|---------------|---------------|---------------|---------------|------------|
| 0603      | 0.061 ± 0.005 | 0.033 ± 0.005 | 0.030 ± 0.005 | 0.015 ± 0.005 | 0.003      |
| 0612      | 0.063 ± 0.005 | 0.126 ± 0.005 | 0.030 ± 0.005 | 0.015 ± 0.005 | 0.013      |
| 0805      | 0.079 ± 0.005 | 0.047 ± 0.005 | 0.030 ± 0.005 | 0.020 ± 0.005 | 0.006      |
| 1206      | 0.126 ± 0.005 | 0.063 ± 0.005 | 0.030 ± 0.005 | 0.020 ± 0.005 | 0.013      |
| 1225      | 0.126 ± 0.005 | 0.252 ± 0.005 | 0.030 ± 0.005 | 0.020 ± 0.005 | 0.052      |
| 2512      | 0.252 ± 0.005 | 0.126 ± 0.005 | 0.030 ± 0.005 | 0.020 ± 0.005 | 0.052      |

**TYPICAL CHARACTERISTICS**

| CASE SIZE                                               | 0603  | 0612  | 0805  | 1206  | 1225  | 2512  |
|---------------------------------------------------------|-------|-------|-------|-------|-------|-------|
| Thermal resistance (°C/W), $T_R$                        | 14    | 4     | 13    | 15    | 4     | 15    |
| Thermal conductance (mW/°C), $T_C$                      | 70    | 259   | 77    | 65    | 259   | 65    |
| Capacitance (pF)                                        | 0.07  | 0.26  | 0.15  | 0.07  | 0.26  | 0.07  |
| Dielectric withstanding voltage $kV_{AC}$ , RMS (60 Hz) | > 1.5 | > 1.5 | > 1.5 | > 2.5 | > 1.5 | > 3.5 |

**Note**

$$T_R = \frac{L}{k(T \cdot W)}$$

where k is the thermal conductivity of AlN, 170 W/mK

$$T_C = \frac{1}{T_R}$$

**STANDARD ELECTRICAL SPECIFICATIONS**

| TEST                        | SPECIFICATIONS    |
|-----------------------------|-------------------|
| Operating temperature range | -65 °C to +150 °C |
| Storage temperature range   | -65 °C to +150 °C |

**STANDARD MATERIAL SPECIFICATIONS**

|                              |                                                  |
|------------------------------|--------------------------------------------------|
| Substrate material           | Aluminum nitride (170 W/mK)                      |
| Termination (tin / lead)     | Electroplate tin / lead over electroplate nickel |
| Termination (lead (Pb)-free) | Electroplate tin (e3) over electroplate nickel   |

**ENVIRONMENTAL TESTS** (Vishay Performance vs. MIL-PRF-55342 / AEC-Q200 Requirements)

| ENVIRONMENTAL TEST        | CONDITIONS | LIMITS                              | TYPICAL VISHAY PERFORMANCE |
|---------------------------|------------|-------------------------------------|----------------------------|
| Solderability             | Visual     | J-STD-002, method B and B1          | 95 %                       |
| Solder mounting integrity | Visual     | MIL-PRF-55342, method par. 4.8.13.1 | Pass / fail                |
| Board flex                | Visual     | AEC-Q200, method 005                | Pass / fail                |



## GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: THJP1206AST1

T H J P 1 2 0 6 A S T 1

| GLOBAL MODEL | CASE SIZE                                    | THICKNESS  | TERMINATION                                                                                                                    | PACKAGING                                                                                                                                                                                                                                                                                                                                |
|--------------|----------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| THJP         | 0603<br>0805<br>0612<br>1206<br>1225<br>2512 | A = 0.030" | B = wraparound Sn/Pb solder with nickel termination<br>S = wraparound Sn (e3) solder with nickel termination<br>RoHS compliant | BS = BULK 100 min., 1 mult.<br><br>TAPE AND REEL<br>T0 = 100 min., 100 mult.<br>T1 = 1000 min., 1000 mult.<br>T3 = 300 min., 300 mult.<br>T5 = 500 min., 500 mult.<br>TF = full reel<br>TS = 100 min., 1 mult.<br>TI = 100 min., 1 mult.<br>(item single lot date code)<br>TP = 100 min., 1 mult.<br>(package unit single lot date code) |



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.