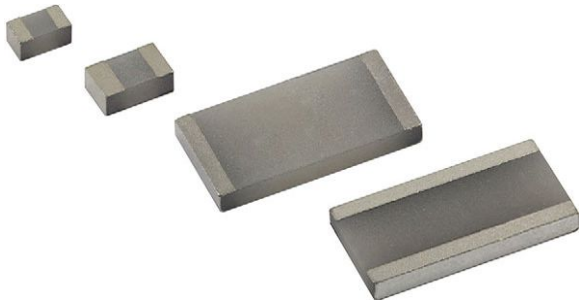
ThermaWick® Thermal Jumper Surface Mount Chip



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

Pb-free Available

RoHS* Available

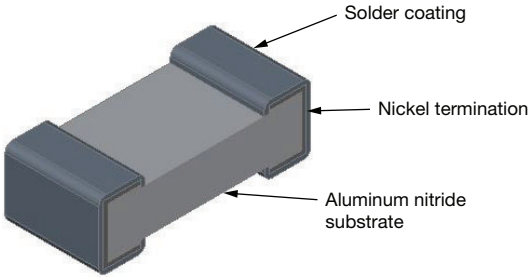
HALOGEN FREE GREEN (5-2008) Available

LINKS TO ADDITIONAL RESOURCES

3D Models Infographics Videos

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



APPLICATIONS

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

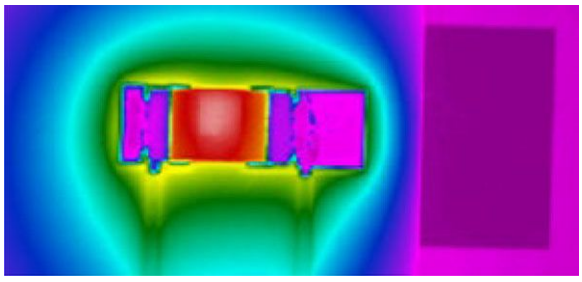
FUNCTIONAL APPLICATIONS / CONNECTION OPTIONS

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

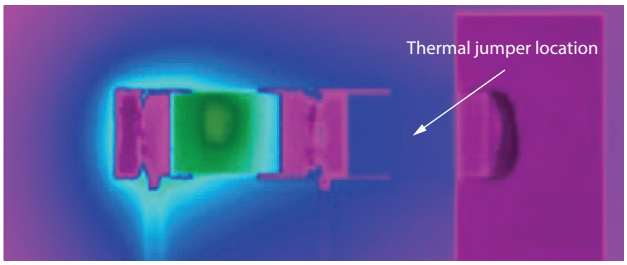
HEAT TRANSFER DEMONSTRATION

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 36 % Surface Temperature Reduction

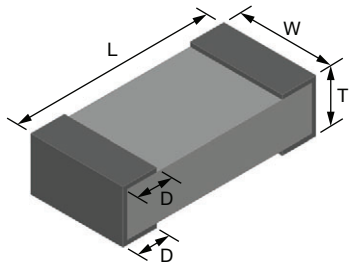


Ceramic Resistor Chip Without Thermal Jumper (149.8 °C)



Ceramic Chip Resistor With Thermal Jumper (95.5 °C)

DIMENSIONS in inches



CASE SIZE	L	W	T	D
0603	0.061 ± 0.005	0.033 ± 0.005	0.030 ± 0.005	0.015 ± 0.005
0612	0.063 ± 0.005	0.126 ± 0.005	0.030 ± 0.005	0.015 ± 0.005
0805	0.079 ± 0.005	0.047 ± 0.005	0.030 ± 0.005	0.020 ± 0.005
1206	0.126 ± 0.005	0.063 ± 0.005	0.030 ± 0.005	0.020 ± 0.005
1225	0.126 ± 0.005	0.252 ± 0.005	0.030 ± 0.005	0.020 ± 0.005
2512	0.252 ± 0.005	0.126 ± 0.005	0.030 ± 0.005	0.020 ± 0.005

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	> 1.5	> 1.5	> 1.5

Note

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

  where k is the thermal conductivity of AIN, 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 %	Acceptable
Solder mounting integrity	Visual	MIL-PRF-55342, method par. 4.8.13.1	Pass / fail	Pass
Board flex	Visual	AEC-Q200, method 005	Pass / fail	Pass

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** **0805** **0612** **1206** **1225** **2512**	**A** = 0.030"	**B** = wraparound Sn/Pb solder with nickel termination **S** = wraparound Sn (e3) solder with nickel termination RoHS compliant	**BS** = BULK 100 min., 1 mult. TAPE AND REEL **T0** = 100 min., 100 mult. **T1** = 1000 min., 1000 mult. **T3** = 300 min., 300 mult. **T5** = 500 min., 500 mult. **TF** = full reel **TS** = 100 min., 1 mult. **TI** = 100 min., 1 mult. (item single lot date code) **TP** = 100 min., 1 mult. (package unit single lot date code)

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