

# ThermaWick™ Thermal Jumper Surface Mount Chip

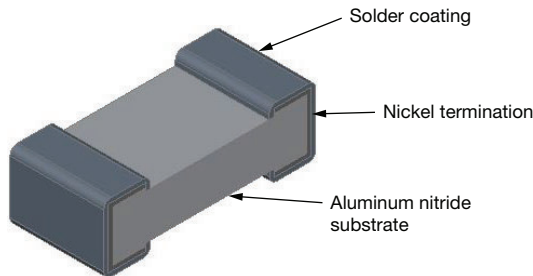


## LINKS TO ADDITIONAL RESOURCES



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.

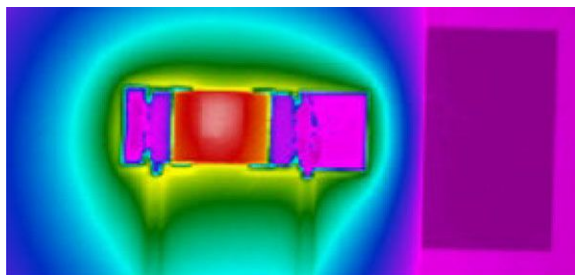
## CONSTRUCTION



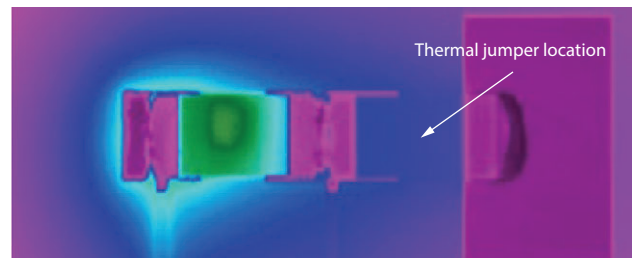
## HEAT TRANSFER DEMONSTRATION

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 36 % 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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

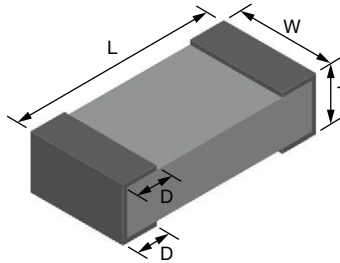


## APPLICATIONS

- 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
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 <sub>R</sub>	14	4	13	15	4	15
Thermal conductance (mW/°C), T <sub>C</sub>	70	259	77	65	259	65
Capacitance (pF)	0.07	0.26	0.15	0.07	0.26	0.07
Dielectric withstanding voltage kV <sub>AC</sub> , RMS (60 Hz)	> 1.5	> 1.5	> 1.5	> 1.5	> 1.5	> 1.5

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



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