Vishay Dale Thin Film

## ThermaWick<sup>™</sup> Thermal Jumper Surface Mount Chip



www.vishay.com

#### 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



#### FEATURES

- · Electrically isolated thermal conductor
- High thermal conductivity AIN 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 <u>www.vishay.com/doc?99912</u>

#### 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 Chip Resistor With Thermal Jumper (95.5 °C)

Available RoHS\* Available HALOGEN FREE

GREEN

(5-2008)

THJP

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1 For technical questions, contact: thinfilm@visbay.c Document Number: 60157

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THJP

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#### **DIMENSIONS** in inches



×D						
CASE SIZE	L	W	Т	D		
0603	$0.061 \pm 0.005$	$0.033 \pm 0.005$	$0.030 \pm 0.005$	$0.015 \pm 0.005$		
0612	$0.063 \pm 0.005$	$0.126 \pm 0.005$	$0.030 \pm 0.005$	$0.015 \pm 0.005$		
0805	$0.079 \pm 0.005$	$0.047 \pm 0.005$	$0.030 \pm 0.005$	$0.020 \pm 0.005$		
1206	$0.126 \pm 0.005$	$0.063 \pm 0.005$	$0.030 \pm 0.005$	$0.020 \pm 0.005$		
1225	$0.126 \pm 0.005$	$0.252 \pm 0.005$	$0.030 \pm 0.005$	$0.020 \pm 0.005$		
2512	$0.252 \pm 0.005$	$0.126 \pm 0.005$	$0.030 \pm 0.005$	$0.020 \pm 0.005$		

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

•  $T_R = \frac{L}{k (T \bullet W)}$ 

L

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

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