



Components for SiC and GaN Topologies

A **WORLD OF**
SOLUTIONS





VISHAY & WIDE BANDGAP TECHNOLOGIES

The growth of wide bandgap semiconductors has driven demand for **enhanced performance in passive components.**

VISHAY, well known as a market leader, is eager to support complementary passive component requirements in power conversion utilizing SiC and GaN technologies.

Technologies available from Vishay are designed to meet the needs of circuit topologies using wide band-gap semiconductors that operate at high voltages, temperatures and frequencies.



FEATURING SiC AND GaN

- Higher **temperature** ranges
 - Stable Parameters with temperature
- SiC typical for **higher voltage**
 - High DC-Link Voltage
- GaN for **higher frequencies**
 - EMI Filtering (Capacitors and Inductors) and Inductive Transients
- New topologies such as **GHz DC-DC Converter**
 - Resonant rectification in HV path
 - High Frequency Inductors



HIGH TEMP OPERATION

- **Inductors**
 - New IHLP Material up to 180° C (<http://www.vishay.com/docs/34403/ihlp3232dz8a.pdf>)
 - Soft saturation independent of temperature IHLP Series

- **Resistors** Low TCR values, Small temperature aging
 - Thin Film PLTT Series, PHT Series, PATT Series, IGBR Series
 - Arrays ACAS, CDMV, CDMM, CDHV

- **Capacitors** Long lifetime, High Ripple current
 - Aluminum 150° C 260CLA-V Series & 160CLA Series
 - MLCCs up to 200° C VJ HIFREQ HT Series
 - Leaded MLCC up to 200° C HOTCAP K.H Series
 - Film up to 125° C MKT1820 Series



HIGHER DC-LINK VOLTAGE

- **Precise reference voltage/ divider**
 - TNPV Series (1000V in 1210) and only 1ppm/V
 - CDMV, CDHV, CDMM Series
- **High voltage filter and resonant inductor (LLC- converter)**
 - New IHDF Series (edge wound) up to 230A
- **Discharge of DC-Link ⇔ Isolation** Safety reasons and some kV of isolation
 - From 20W up to 1,1kW LTO, DTO, D2TO, RCEC & LPS Series
- **High Voltage**
 - SMD HV up to 1kV in X7R VJ Series
 - Leaded HV up to 20kV HVCC Series
 - HV Screw Terminal up to 50kV 715C Series
- **High Voltage DC-Capacitors**
 - MKP1848 Series widest portfolio of voltage / capacitance & packages



EMI FILTERING

- **Low Voltage - Inductors**

- IHLP-0H Series ⇔ higher resonance frequency of 10MHz
- IHSR-1616AB-01 ⇔ ~100nH => Fit to high frequency DC-DC converters

- **Ceramic Safety capacitors**

- VY and AY - VY1 Compact Series & AY1/AY2 Series
- MLCCs - VJ Safety Certified Capacitors X7R & NP0

HIGH FREQUENCY DC-DC

- **Need for low inductance**

- IHLP -0H Series - IHLP-1616BZ-0H High Frequency, Low Profile
- IHSR-1616AB-01 Ultra Low DCR, High Saturation Series
- IHVR Series Ultra Low DCR, High Saturation Series - vertical



THERMAL MANAGEMENT

ThermaWick™ Thermal Jumper Surface Mount Chip

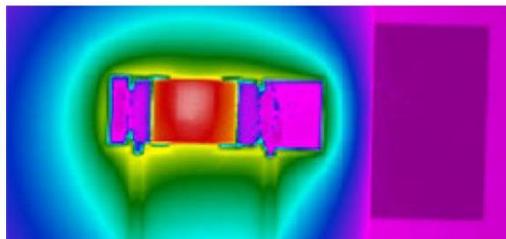
➤ THJP Series

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.

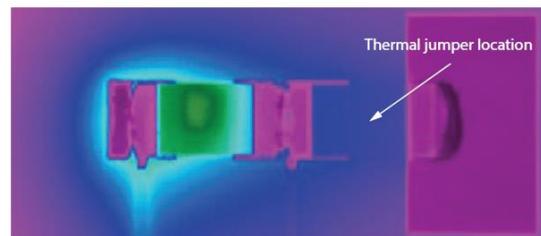
HEAT TRANSFER DEMONSTRATION

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.

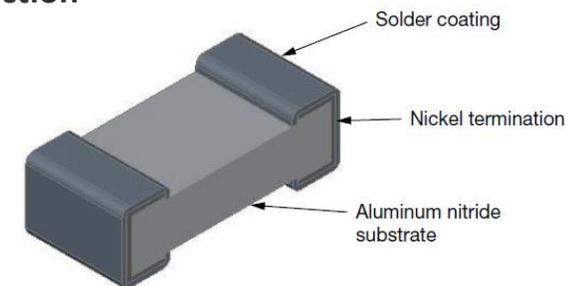
Example THJP 1206 Thermal Jumper Showing 36 % Surface Temperature Reduction



Ceramic Resistor Chip Without Thermal Jumper (149.8 °C)



Ceramic Chip Resistor With Thermal Jumper (95.5 °C)



VISHAY SUPPORT AND COLLATERAL MATERIAL

- **For the best common success a closed cooperation and involvement of the local Vishay Sales and Marketing teams is needed and supported.**
- Design registration Program for selected Passives Series
- Product Selection Guides/ Sheets, Cross Reference bomcon@vishay.com
- [Infographics](#) and further application and products related materials
- **Customer Webinars**, Distribution training modules, presentations & product demo video
- Sample Kits

INFOGRAPHICS

Products

Capacitors
 Diodes
 Inductors and Magnetics
 MOSFETs
 Optoelectronics
 Power ICs
 Resistors

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Applications

IoT - Batteryless Sensor
 5G - Power Supplies for Small Cells



Thank you! QUESTIONS?

