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Vishay Intertechnology, Inc.

# *Automotive*

*(48 V<sub>DC</sub> Boardnet)*



One of the World's Largest Manufacturers of  
**Discrete Semiconductors and Passive Components**





**Automotive**

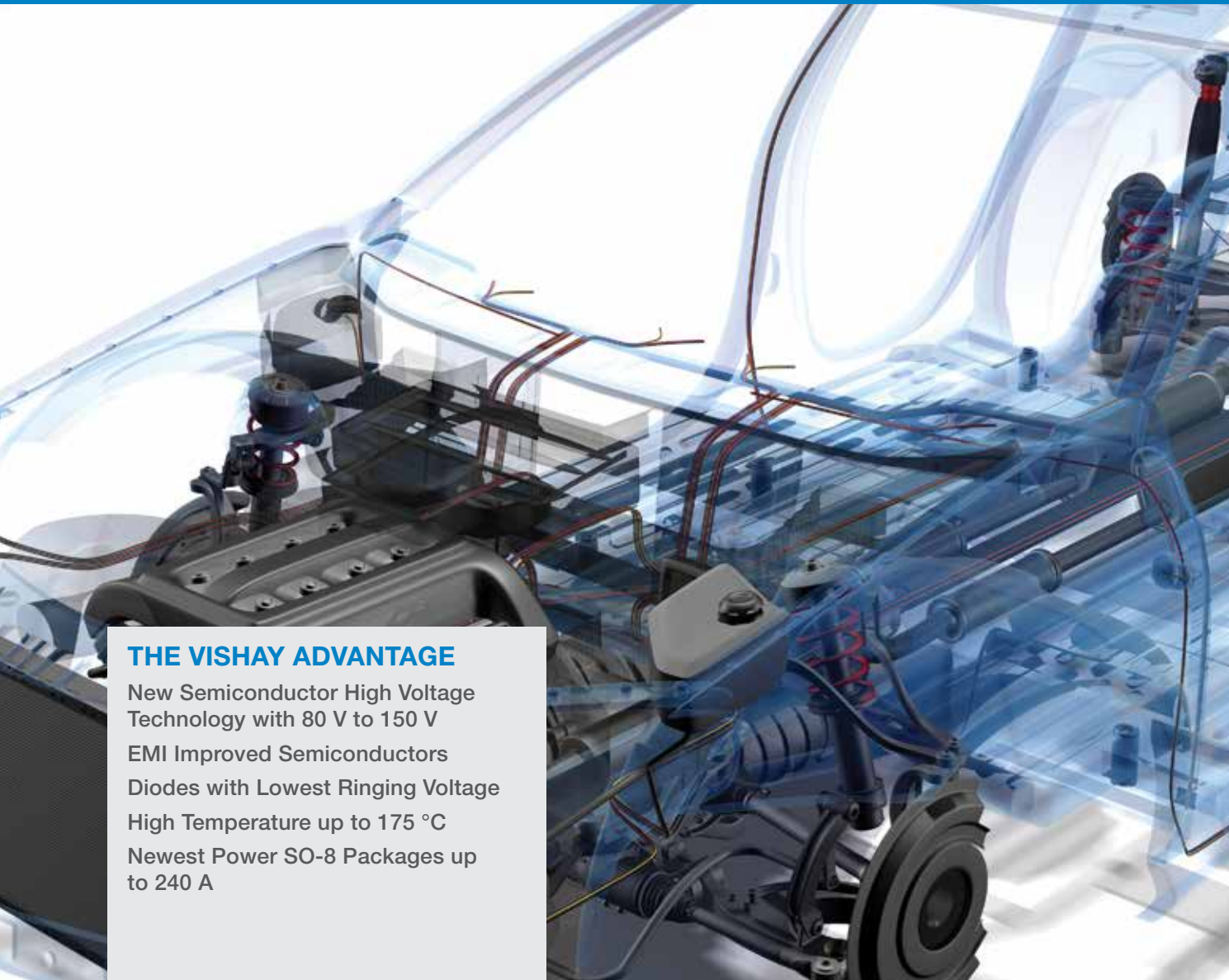
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More information on the Engineer's Toolbox, including product datasheet links, can be found at [www.vishay.com/ref/et3](http://www.vishay.com/ref/et3).

For inquiries, please contact your local sales representative.

# Key components for 48 V<sub>DC</sub> BOARDNET



**Integrated Starter  
Generators  
(48 V<sub>DC</sub>)**



**DC/DC  
Converters,  
Bidirectional  
(48 V<sub>DC</sub>)**



**HVAC  
(E-Compressor  
for 48 V<sub>DC</sub>)**



**Steering (BLDC  
Motor Drive for  
48 V<sub>DC</sub>)**



## THE VISHAY ADVANTAGE

- New Semiconductor High Voltage Technology with 80 V to 150 V
- EMI Improved Semiconductors
- Diodes with Lowest Ringing Voltage
- High Temperature up to 175 °C
- Newest Power SO-8 Packages up to 240 A



# Integrated Starter Generators (48 V<sub>DC</sub>)



RESISTORS

**Power Metal Strip® Meter Shunt Resistor, Very Low Value (Down to 0.0003 Ω)**



[WSMS2906](#)

- Extremely low resistance values: 300 μΩ to 660 μΩ
- 3 W power capability with sensing terminals to mount in PCB

MOSFETs

**Automotive Bare Die MOSFET Family, Available in Tape-and-Reel Format**



[SQC100N08-3m5](#)

- High-performance MOSFET technologies available in bare die
- Known good die processing with comprehensive testing

FILM CAPACITORS

**DC Film Capacitors, MKT Radial Potted Type**



[MKT1820S](#)

- Automotive general purpose MKT capacitor with high-temperature capabilities
- Featuring capacitance up to 560 μF

MODULES

**EMIPAK-1B / 2B PressFit Power Module**



[Custom EMIPAK-1B / 2B](#)

- UL approved file E78996
- Exposed Al<sub>2</sub>O<sub>3</sub> substrate with low thermal optimized for low internal inductance

NON-LINEAR RESISTORS

**2-Point Radial Leaded, Automotive-Grade NTC Thermistors**



[NTCLE...E3...SB](#)

- Automotive line
- Thermal cycling resistant, suitable for potting

INDUCTORS

**Low-Profile, High-Current IHLP® Inductors**



[IHLP-8787MZ-5A](#)

- Highest current composite inductor available
- High temperature up to 155 °C, shielded construction

RESISTORS

**Surface-Mount Molded Divider, High Precision**



[CDMP4527](#)

- High precision to ± 0.25 % with low TCR to 50 ppm/°C, sulfur resistant
- Automotive-compliant terminations with wide range of resistance values and ratios

INDUCTORS

**Custom Magnetics**



- High-current, high-temperature designs for boardnet and DC/DC conversion

- Current handling capability to several hundred amps

CERAMIC CAPACITORS

**AEC-Q200 Qualified, Broad Range of Sizes and Working Voltages, C0G (NP0), X7R, and X8R**



[VJ...31/VJ...34 Automotive MLCC](#)

- RoHS and GREEN compliant parts available
- AgPd termination available for epoxy bonding

RESISTORS

**Power Metal Strip Battery Shunt Resistor, Very Low Value (100 μΩ, 125 μΩ, and 250 μΩ)**



[WSBS8518](#)

- Extremely low resistance values: 50 μΩ to 1000 μΩ
- 36 W (850 A) power capability in an 8518 package

View datasheets for these products  
[www.vishay.com/ref/et3au7a](http://www.vishay.com/ref/et3au7a)



# DC/DC Converters, Bidirectional (48 V<sub>DC</sub>)




MOSFETs

**Automotive N-Channel 100 V (D-S) 175 °C MOSFET** 

[SQM120N10-3m8](#)

- Medium-voltage ThunderFET® technology, AEC-Q101 qualified, maximum R<sub>DS(on)</sub> 3.8 mΩ
- Popular D<sup>2</sup>PAK packaging


RESISTORS

**Power Metal Strip® SMD Resistors, Very High Power (to 9 W), Low Value (Down to 0.0002 Ω)** 

[WSLP3921](#)

- High power rating of 5 W to 9 W in WSLP3921 package
- Very low resistance values from 0.0002 Ω to 0.004 Ω, with tolerance of 1 %


CERAMIC CAPACITORS

**AEC-Q200 Qualified, Broad Range of Sizes and Working Voltages, C0G (NP0), X7R, and X8R** 

[VJ....31/VJ....34 Automotive MLCC](#)

- RoHS and GREEN compliant parts available
- AgPd termination available for epoxy bonding

RESISTORS

**Surface-Mount Power Resistor Thick Film Technology** 

[D2TO](#)

- AEC-Q200-qualified D<sup>2</sup>PAK TO-263 standard package, 20 W and 35 W at 25 °C case temperature
- High-pulse capability up to 10 J for short pulse, high-temp. soldering, RoHS-comp.

RESISTORS

**Professional Thin Film MELF Resistors** 

[MMA0204](#)

- Unrivaled surge handling capability, ultimate stability over lifetime
- AEC-Q200 qualified, approved acc. EN 140401-803, sulfur resistant, GREEN product


FILM CAPACITORS

**DC Film Capacitors MKT Radial Potted Type** 

[MKT1820S](#)

- Automotive general purpose MKT capacitor, with high-temperature capabilities
- Featuring capacitance up to 560 μF


MODULES

**EMIPAK-1B / 2B PressFit Power Module** 

[Custom EMIPAK-1B / 2B](#)

- UL approved file E78996
- Exposed Al<sub>2</sub>O<sub>3</sub> substrate with low thermal optimized for low internal inductance

INDUCTORS

**Low-Profile, High-Current IHLP Inductors** 

[IHLP-8787MZ-5A](#)

- Highest current composite inductor available
- High temperature up to 155 °C, shielded construction


RESISTORS

**High-Stability Thin Film Flat Chip Resistors** 

[TNPW...e3](#)

- Excellent overall stability, endurance < 0.05 %, resistance range from 10 Ω to 3 MΩ
- AEC-Q200-qualified, sulfur resistant, halogen-free

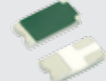
INDUCTORS

**Low-Profile, High-Current IHLP® Inductors** 

[IHLP-6767GZ-5A](#)

- Very high-current, low-saturation inductor for DC/DC conversion and filtering
- High-temperature continuous operation at 155 °C


RESISTORS

**High-Voltage Thin Film Resistor Divider Network** 

[HVRD1206](#)

- High-precision thin film construction with 0.1 % tol. and 10 ppm/°C TCR track
- High-voltage divider with 120 V operating voltage, R1 = 3 KΩ to 9 KΩ and R2 = 1 MΩ

RESISTORS

**Power Metal Strip SMD Resistors, Very High Power (3 W), Low Value (to 0.0005 Ω)** 

[WSLP2512](#)

- Very high power rating of 3 W in 2512 package
- Extremely low resistance values from 0.0005 Ω to 0.01 Ω and tolerance of 1 %

View datasheets for these products  
[www.vishay.com/ref/et3au7b](http://www.vishay.com/ref/et3au7b)

# HVAC

## (E-Compressor for 48 V<sub>DC</sub>)


**CERAMIC CAPACITORS**

**Axial Leaded Multilayer Ceramic Capacitors for Automotive Applications**



[A...V](#)

- High-reliability MLCC insert with wet build process
- High operating temp. up to 160 °C, rated voltages: 50 V, 100 V, and 200 V

**MOSFETs**

**Automotive N-Channel 100 V (D-S) 175 °C MOSFET**

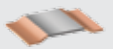


[SQM100N10-10](#)

- Classic TrenchFET® technology, AEC-Q101 qualified, maximum R<sub>DS(on)</sub> 10.5 mΩ
- Popular D<sup>2</sup>PAK packaging

**RESISTORS**

**Power Metal Strip® SMD Resistors, Very High Power (to 9 W), Low Value (Down to 0.0002 Ω)**



[WSLP3921](#)

- High power rating of 5 W to 9 W in WSLP3921 package
- Very low resistance values from 0.0002 Ω to 0.004 Ω, with tolerance of 1 %

**INDUCTORS**

**Low-Profile, High-Current IHLP® Inductors**



[IHLP-8787MZ-5A](#)

- Highest current composite inductor available
- High temperature up to 155 °C, shielded construction

**CERAMIC CAPACITORS**

**AEC-Q200 Qualified, Broad Range of Sizes and Working Voltages, C0G (NP0), X7R, and X8R**



[VJ...31/VJ...34 Automotive MLCC](#)

- RoHS and GREEN compliant parts available
- AgPd termination available for epoxy bonding

**INDUCTORS**

**Custom Ferrite Filters and Transformers; High-Current PressFit Customized Topologies High Isolation Voltage**

- Many options available for low-loss, high-efficiency filtering

**NON-LINEAR RESISTORS**

**SMD Glass Protected NTC Thermistors**



[NTCS...e3](#)

- Standard series, AEC-Q200 compliant
- Glass protected with soft terminations

**FILM CAPACITORS**

**DC Film Capacitors, MKT Radial Potted Type**




[MKT1820](#)

- Automotive general purpose MKT capacitor with high-temperature capabilities
- Featuring capacitance up to 560 μF




# Steering (BLDC Motor Drive for 48 V<sub>DC</sub>)



**DIODES**  
**Surface-Mount TRANSZORB<sup>®</sup> Transient Voltage Suppressors**  
  
[1.5SMC86A](#)  


- 1500 W peak pulse power capability with a 10/1000 μs waveform
- AEC-Q101 qualified

**INDUCTORS**  
**Low-Profile, High-Current IHLP<sup>®</sup> Inductors**  
  
[IHLP-6767GZ-5A](#)  


- High-current, high-temperature designs for boardnet and DC/DC conversion

**CERAMIC CAPACITORS**  
**Radial Leaded Multilayer Ceramic Capacitors for Automotive Applications**  
  
[K...V](#)  

- High-reliability MLCC insert with wet build process
- High operating temp. up to 160 °C, rated voltages: 50 V, 100 V, and 200 V

**FILM CAPACITORS**  
**DC Film Capacitors, MKT Radial Potted Type**  
  
[MKT1820](#)  


- Automotive general purpose MKT capacitor with high-temperature capabilities
- Featuring capacitance up to 560 μF

**RESISTORS**  
**Pulse-Proof, High-Power Thick Film Chip Resistors**  
  
[CRCW...HP e3](#)  


- Excellent pulse load capability
- Enhanced power rating

**MOSFETs**  
**Automotive N-Channel 100 V (D-S) 175 °C MOSFET**  
  
[SCQ120N04-1m7KGD](#)  


- Medium-voltage ThunderFET<sup>®</sup> technology, AEC-Q101 qualified, maximum R<sub>DS(on)</sub> 3.8 mΩ
- Popular D<sup>2</sup>PAK packaging

**NON-LINEAR RESISTORS**  
**SMD Glass Protected NTC Thermistors**  
  
[NTCS...e3](#)  

- Standard series, AEC-Q200 compliant
- Glass protected with soft terminations

**RESISTORS**  
**Power Metal Strip<sup>®</sup> SMD Resistors, Very High Power (to 9 W), Low Value (Down to 0.0002 Ω)**  
  
[WSLP3921](#)  


- High power rating of 5 W to 9 W in WSLP3921 package
- Very low resistance values from 0.0002 Ω to 0.004 Ω, with tolerance of 1 %

**OPTOELECTRONICS**  
**Subminiature Dual-Channel Transmissive Optical Sensor with Phototransistor Outputs**  
  
[TCUT1350X01](#)  


- Resolve direction and speed with dual-channel transmissive (interrupter) sensor
- Wide operating temperature range from -40 °C to +125 °C

**TANTALUM CAPACITORS**  
**Solid Tantalum Surface-Mount Chip Capacitors, TANTAMOUNT<sup>®</sup> Molded Case, Automotive Grade**  
  
[TP3](#)  

- High-performance molded tantalum capacitor, AEC-Q200-qualified
- Automotive applications: motor control, body electronics, dash board

**DIODES**  
**Small-Signal Zener Diodes**  
  
[BZX84B](#)  

- ESD capability acc. to AEC-Q101
- The Zener voltages are graded according to the international E24 standard

**CERAMIC CAPACITORS**  
**AEC-Q200 Qualified, Broad Range of Sizes and Working Voltages, C0G (NP0), X7R, and X8R**  
  
[VJ...31/VJ...34 Automotive MLCC](#)  

- RoHS and GREEN compliant parts available
- AgPd termination available for epoxy bonding

View datasheets for these products  
[www.vishay.com/ref/et3au7d](http://www.vishay.com/ref/et3au7d)



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## ***ABOUT TTI, INC.***

TTI Inc., a subsidiary of Berkshire Hathaway, is a world leading specialist distributor of connectors and passive, electromechanical and discrete components. TTI's philosophy is "Lead by Design", and the company differentiates itself by focusing on people, parts and processes. The company's aim is to become the distributor of choice for customers and suppliers in Europe alike by introducing new product technologies and by stocking broad and deep across its franchise base. TTI employs sophisticated inventory management processes which ensure that the company can react immediately to changes in component demand due to fluctuating markets and supply chains. For further information about TTI, please refer to: [www.ttieurope.com](http://www.ttieurope.com).



**A WORLD OF**  
**SOLUTIONS**

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