

Key components for FULL ELECTRIC VEHICLES (FEVs)



**Electric Motor
Drives (DC/AC)**



**Battery
Management
and DC/DC**



**On-Board
Chargers**

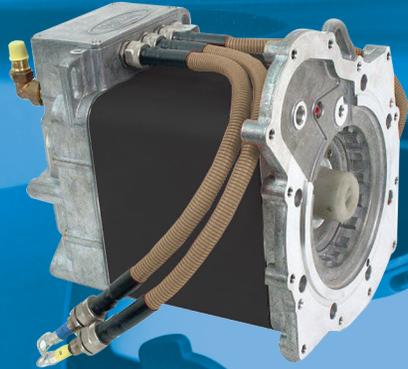


THE VISHAY ADVANTAGE

- AEC Qualifications
- High-Temperature Performance
- High Reliability
- New High-Voltage Passive Components in SMD Packages
- High-Voltage Semiconductors
- Transient-Voltage Capabilities



Electric Motor Drives (DC/AC)



CERAMIC CAPACITORS

High Operating Temperature, Automotive Grade Leaded MLCC Capacitors



[HOTcap® K...H, A...R, K...R](#)

- High-reliability MLCC insert with wet build process
- High operating temperature (up to 175 °C for K...H and up to 160 °C for A...R and K...R), rated voltages: 50 V, 100 V, 200 V

NON-LINEAR RESISTORS

NTC Thermistors, Low Thermal Gradient Lug Sensors

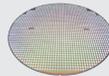


[NTCALUG02A](#)

- Low thermal gradient surface temperature sensor
- High insulation voltage

MODULES

Trench FS IGBT Modules

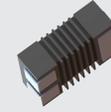


[VS-GC30C065TB](#)

- Optimized for use with FRED Pt® Gen 4 ultrafast diodes
- Low collector-to-emitter voltages, extremely low conduction losses

RESISTORS

Surface-Mount Molded Dividers, High-Voltage



[CDMx](#)

- High voltage up to 3000 V, sulfur-resistant
- Automotive compliant terminations, wide range of resistance values and ratios

*Preliminary

INDUCTORS

EMI Filters with Flat Copper Wire as SMD or Leaded Up to 260 A

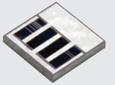


[Customized EMI Filters](#)

- Customized solutions for 48 V applications, low DCR, high current

RESISTORS

Wirebondable Gate Resistors for IGBT Applications



[IGBR](#)

- Back-contact resistors for single wirebond assembly with power ratings up to 4 W
- Available case sizes from 0202 to 2010

FILM CAPACITORS

Metallized Polypropylene DC-Link Film Capacitors, 450 V_{DC} to 1000 V_{DC}



[MKP1848S](#)

- OBC and HEV inverter DC link
- High ripple current and high capacitance up to 100 µF

FILM CAPACITORS

High Performance DC-Link Capacitors for Automotive Traction Applications (EV/HEV)



[MKP1849](#)

- High voltage, high capacitance, high ripple current

RECTIFIERS

600 V, 30 A Hyperfast Rectifiers



[VS-ETH3006SHM3](#)

- TO-263AB (D²PAK) power package optimized for fast battery charging systems and main inverter applications up to 20 kW

Battery Management and DC/DC



CERAMIC CAPACITORS
X1/Y2 AC Line Rated Ceramic Disc Capacitors for Automotive Applications

[AY2](#)

- AEC-Q200 qualified, X1/Y2 safety rating according to IEC 60384-14, 3rd edition
- Proven to withstand 3000 temperature cycles from -55 °C to +125 °C

RESISTORS
Long-Side Termination Thick Film Resistors, 250 mW to 2 W in 0406 to 1225 sizes, 1 Ω - 1 MΩ

[RCL e3](#)

- Operating temperature up to 155 °C , TCR = 100 ppm/K to 200 ppm/K

MOSFETs
Dual N-Channel MOSFETs in 5 mm x 6 mm PowerPAK SO-8L, 40 V, 33 mΩ

[SQJ946EP](#)

- AEC-Q101 qualified, 100 % UIS and RG tested with up to 175 °C operation
- Optimized for high-frequency DC/DC applications, lower switching losses

RESISTORS
High Pulse Load Carbon Film MELF Resistors, Pulse Handling Up to 3 kW, ESD Up to 16 kV

[CMB 0207](#)

- 1.0 W rated dissipation in MELF 0207 package
- Resistance from 2.2 Ω to 1.5 MΩ

RESISTORS
Thin Film Chip Resistors, Resistance = 1 Ω to 10 mΩ, TCR = 25 ppm/K to 50 ppm/K

[MCT 0603 AT](#)

- Tolerance = 0.5 % to 1 %
- Power rating 125 mW

RESISTORS
SMD Power Resistors, 35 W, 10 mΩ to 550 KΩ, Non-Inductive

[D2TO35](#)

- TO-263 package, TCR = 150 ppm/K
- AEC-Q200 qualified

DIODES
400 W PAR® TVS Diodes, Voltage = 6.8 V to 43 V, T_j = 185 °C

[TPSMA6.8](#)

- DO-214AC (SMA) package to protect ICs, MOSFETs, and signal lines of sensor units against voltage transients induced by inductive load switching and lightning

RESISTORS
Power Metal Strip® Battery Shunt Resistors, Very Low Values (100 μΩ, 125 μΩ, and 250 μΩ)

[WSBS8518](#)

- High power to resistor size ratio
- Low thermal EMF, < 3 μV / °C, for accurate current sensing

NON-LINEAR RESISTORS
NTC Thermistors, Mini Lug Sensors

[NTCALUG03](#)

- Robust surface temperature sensors
- AEC-Q200 compliant, UL recognized

DIODES
500 mW Zener diodes in < 0.6 mm low-profile MicroSMF package

[PLZ Series Zener Diode](#)

- Excellent stability for voltage stabilization and reference voltage generation
- AEC-Q101 qualified versions available



On-Board Chargers



CERAMIC CAPACITORS
X1/Y2 AC Line Rated Ceramic Disc Capacitors for Automotive Applications

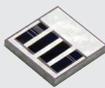
[AY2](#)

- AEC-Q200 qualified, X1/Y2 safety rating according to IEC 60384-14, 3rd edition
- Proven to withstand 3000 temperature cycles from -55 °C to +125 °C

RESISTORS
Power Resistors, 100 W, 15 mΩ to 1 MΩ, Non-Inductive

[LTO100](#)

- TO-247 package, TCR = 150 ppm/K
- AEC-Q200 qualified

RESISTORS
Wirebondable Gate Resistor for IGBT Applications

[IGBR](#)

- Back-contact resistors for single wirebond assembly with power rating up to 4 W
- Available case sizes from 0202 to 2010

INDUCTORS
High Isolation as Press-Fit or SMD Version Flyback Transformers

[Customized Transformers](#)

- Customized solutions up to kW ranges

RESISTORS
High Pulse Load Carbon Film MELF Resistors, Pulse Handling Up to 3 kW, ESD Up to 16 kV

[CMB 0207](#)

- 1.0 W rated dissipation in MELF 0207 package
- Resistance from 2.2 Ω to 1.5 MΩ

RECTIFIERS
15 A, 1200 V FRED Pt® Hyperfast Rectifiers

[VS-15ETU12HN3](#)

- AEC-Q101 qualified, hyperfast and soft recovery time with reduced Q_{rr} in TO-220AC package
- 175 °C maximum operating temperature

NON-LINEAR RESISTORS
NTCALUG, Custom Capabilities NTC LUG Ring Tongue

[NTCALUG](#)

- Minimum breakdown voltages: 500 V_{AC} Up to 3000 V_{AC}

MODULES
Press-Fit Semiconductor Power Modules for IGBT or MOSFET Drives

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

- 600 V to 650 V, or lower voltages upon customer request

RESISTORS
SMD Power Resistors, 35 W, 10 mΩ to 550 kΩ, Non-Inductive

[D2TO35](#)

- TO-263 package, TCR = 150 ppm/K
- AEC-Q200 qualified

RESISTORS
Surface-Mount Molded Dividers, High-Voltage

[CDMx](#)

- High voltage up to 3000 V, sulfur-resistant
- Automotive compliant terminations, wide range of resistance values and ratios

**Preliminary*

INDUCTORS
1 kW to 3 kW Standard Power Planar Transformers and Custom Power Planar Inductors

[Planar Series](#)

- Planar and flat wire designs available for improved efficiency

FILM CAPACITORS
Interference Suppression Film Capacitors, MKP Radial Potted Type

[MKP339](#)

- RFI X2 capacitor for standard across-the-line applications
- Automotive grade, AEC-Q200 compliant