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Vishay Intertechnology, Inc.

Alternative Energy

*(Power Transmission /
Distribution / Grid Quality)*



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





**Alternative
Energy**

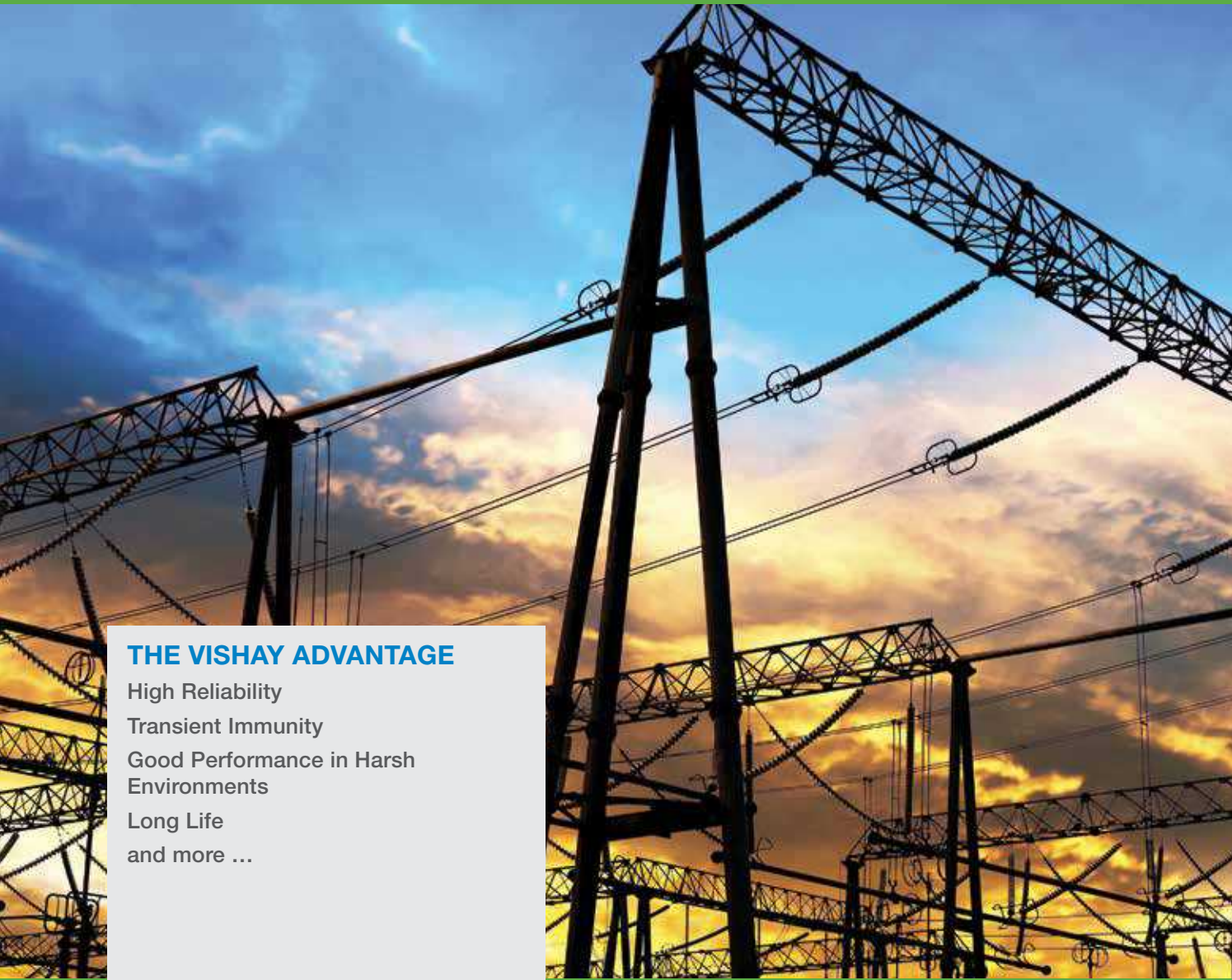
Power Transmission /
Distribution / Grid Quality

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

For inquiries, please contact your local sales representative.

Key components for
POWER TRANSMISSION / DISTRIBUTION / GRID QUALITY



THE VISHAY ADVANTAGE

- High Reliability
- Transient Immunity
- Good Performance in Harsh Environments
- Long Life
- and more ...

**HVDC
Transmission**



**STATCOM SVC
(Static VAR
Compensator)**



**Transformer
Stations**



Circuit Breakers



**Charging Stations /
Infrastructure
for Vehicles and
E-Bikes**





HVDC Transmission



ESTA POWER CAPACITORS

Capacitors for Power Electronic (PEC) – Cylindrical



[ACMKP Tubular](#)

- Flexible design up to 3.6 kV_{AC}
- Internal safety device

OPTOELECTRONICS

Widebody 1 MBd High-Speed Optocoupler with High Creepage and Clearance of 10 mm



[VOW136](#)

- 8000 V max. transient isolation voltage
- Integrated Faraday shield provides very high input-to-output noise isolation of 40 kV/μs

RESISTORS

High-Power, High-Current Grid Resistors, 1 kW and Larger



[GRE1](#)

- High active mass with good thermal dissipation
- IP00, IP20, and IP23 rated enclosures available

OPTOELECTRONICS

Optocoupler with Phototransistor Output with Reinforced, CAT IV Isolation



[CNY66](#)

- Isolation test voltage of 13.9 kV, rated recurring peak voltage V_{IORM} of 1450 V_{peak}
- For class I - IV at mains voltage up to 600 V and class I - III up to 1000 V

ESTA POWER CAPACITORS

HVAC Power Capacitor



[MRTB Capacitor](#)

- For high-speed DC switches
- Proven design with high reliability

OPTOELECTRONICS

Widebody 10 MBd High-Speed Optocoupler with High Creepage and Clearance of 10 mm



[VOW2611](#)

- 8000 V max. transient isolation voltage
- Integrated Faraday shield provides very high input to output noise isolation of 40 kV/μs

RESISTORS

Aluminum Housed Compact Wirewound Resistor



[VACR](#)

- Power rating up to 500 W
- Easy to mount due to rectangular design

RESISTORS

Universal Mount Edgewound Power Wirewound Resistors



[EDGU](#)

- High current capability
- Enclosures and mounting frames available

ESTA POWER CAPACITORS

HVAC Power Capacitor



[HV Harmonic Filter \(AC\)](#)

- For HVDC lines up to 800 kV
- Harmonic distortion removal

RESISTORS

High-Power Thick Film Resistor with Low Partial Discharge



[RCEC 750](#)

- Partial discharge < 10 pC at 5000 V
- Rated dissipation 750 W at 75 °C

ESTA POWER CAPACITORS

HVDC Power Capacitor



[HV Harmonic Filter \(DC\)](#)

- For HVDC lines up to 800 kV
- Harmonic distortion removal

RESISTORS

Very High Power 2500 W, 2000 W, and 1500 W with Multiple Resistive Functions



[WCR](#)

- Power up to 2500 W at 60 °C water inlet temperature and 5 l/min
- Possible to have up to 8 resistive functions on the same support

View datasheets for these products
www.vishay.com/ref/et3ae5a



STATCOM SVC (Static VAR Compensator)



MODULES

Thyristor / Diode and Thyristor / Thyristor (SUPER MAGN-A-PAK Power Modules), 430 A



[VS-VSK.430...PbF Series](#)

- UL approved file E78996
- High voltage ratings up to 2000 V

ESTA POWER CAPACITORS

HVAC Power Capacitor



[Shunt Capacitor Bank](#)

- Reduced power system losses
- Release power system capacity

RESISTORS

Vitreous Wirewound Resistors with Corrugated Ribbon



[GBS](#)

- High power rating up to 1000 W
- Complete vitreous coating for perfect humidity protection

ESTA POWER CAPACITORS

HVAC Power Capacitor



[HV Harmonic Filter \(AC\)](#)

- Harmonic distortion removal
- High reliability

RESISTORS

Power Resistor for Mounting onto a Heatsink, Thick Film Technology



[LPS](#)

- High power, 57 mm x 57 mm, up to 1100 W at 25 °C on heatsink, low weight of 83 g
- Non-inductive down to 1 μH, high pulse capability up to 1000 J for short pulse

ESTA POWER CAPACITORS

Capacitors for Power Electronic (PEC) – Rectangular



[DCMKP Rectangular](#)

- Heavy duty
- Low self-inductance

RESISTORS

Very High Power Water Cooled Resistor with Multiple Resistive Functions



[WCR](#)

- Power up to 2500 W at 60 °C water inlet temperature and 5 l/min
- Possible to have up to 8 resistive functions on the same support

View datasheets for these products
www.vishay.com/ref/et3ae5b



Transformer Stations



RESISTORS

Wirewound Resistors, Industrial Power, Tubular



[RBSF](#)

- High-temperature silicone or vitreous enamel coatings
- Designed to meet heavy-duty requirements where space is at a premium

DISPLAYS

High-Quality Displays Offer Excellent Human-to-Machine Interface Solutions



[LCD, Color TFT, OLED](#)

- Standard or customized glass / modules for specific applications and monitoring
- Can withstand extensive temperatures and extreme conditions

OPTOELECTRONICS

Widebody 10 MBd High-Speed Optocoupler with High Creepage and Clearance of 10 mm



[VOW2611](#)

- 8000 V max. transient isolation voltage
- Integrated Faraday shield provides very high input-to-output noise isolation of 40 kV/μs

ESTA POWER CAPACITORS

Surge Suppressor Capacitor



[Surge Suppressor](#)

- Protection against steep-fronted voltage impulses
- Flexible design for indoor or outdoor application

OPTOELECTRONICS

Optocoupler with Phototransistor Output with Reinforced, CAT IV Isolation



[CNY66](#)

- Isolation test voltage of 13.9 kV, rated recurring peak voltage V_{IORM} of 1450 V_{peak}
- For class I - IV at mains voltage up to 600 V and class I - III up to 1000 V

RESISTORS

Universal Mount Edgewound Power Wirewound Resistors



[EDGU](#)

- High current capability
- Enclosures and mounting frames available

OPTOELECTRONICS

Widebody 1 MBd High-Speed Optocoupler with High Creepage and Clearance of 10 mm



[VOW136](#)

- 8000 V max. transient isolation voltage
- Integrated Faraday shield provides very high input-to-output noise isolation of 40 kV/μs

RESISTORS

High-Power, High-Current Grid Resistors, 1 kW and Larger



[GRE1](#)

- High active mass with good thermal dissipation
- IP00, IP20, and IP23 rated enclosures available

ESTA POWER CAPACITORS

HVAC Power Capacitor



[Shunt Capacitor Bank](#)

- Reduced power system losses
- Release power system capacity

RESISTORS

Stainless Steel Medium-Power Resistors



[Medium Power Grid Resistors](#)

- High permanent power dissipation, high pulse energy dissipation
- Rugged construction

HIGH POWER RESISTORS

Stainless Steel Neutral Ground / Braking / Crowbar Resistor



[ULDCR](#)

- High pulse energy capability up to 3.46 MJ, surface temperature increase below 450K for single pulse
- Operating temperature: -55 °C to +375 °C, modular system – user expandable

View datasheets for these products
www.vishay.com/ref/et3ae5c



Circuit Breakers



View datasheets for these products
www.vishay.com/ref/et3ae5d

RECTIFIERS

Standard Recovery Rectifier High-Voltage Surface-Mount



[S07M](#)

- AEC-Q101 qualified
- Wave and reflow solderable

RESISTORS

Professional Thin Film Chip Resistors



[MCT0603 1 % 25 ppm/K](#)

- Best-in-class surge handling capability, excellent overall stability class 0.5
- CECC approved acc. EN 140401-801, sulfur resistant

DIODES

Small Signal Zener Diodes



[BZX384C](#)

- AEC-Q101 qualified
- ESD capability according to AEC-Q101

INDUCTORS

High-Current, Surface-Mount Inductors – Shielded



[IDCS-2512](#)

- Low-cost filtering and DC/DC conversion inductor

MOSFETs

N-Channel 30 V (D-S) MOSFET



[SiS402DN](#)

- TrenchFET® Gen III technology, maximum $R_{DS(on)}$ 6 mΩ
- Thermally enhanced PowerPAK® 1212-8 is 1/3 the size of an SO-8

OPTOELECTRONICS

Optocoupler, Power Phototriac



[VO2223A](#)

- Optically coupled phototriac driving a power triac in a DIP-8 package
- Load current of 1 A_{RMS} and 5300 V of input-to-output isolation

CERAMIC CAPACITORS

Internal Design Reduces Risk of Shorts Caused by Board Flex, High Breakdown Voltage



[VJ2220Y273KXFAT4X](#)

- Polymer termination available for intensive board flex requirements
- 100 % voltage conditioning available up to 630 V_{DC} rating (process code “5H”)

NON-LINEAR RESISTORS

VDR Metal Oxide Varistors High Surge



[VDRH.....E](#)

- Extended operating temperature to 125 °C
- UL recognized up to 105 °C (selected types)

TANTALUM CAPACITORS

Solid Tantalum Surface-Mount Chip Capacitors, TANTAMOUNT®, Molded Case, Low ESR



[TR3D](#)

- Molded tantalum capacitor, low ESR
- Automation and control, SMPS, motion and drives, telecom infrastructure, networking and multiplexer, general purpose

RESISTORS

Thick Film Chip Resistors, High-Voltage



[CRHV](#)

- High-voltage capability (up to 3 kV), with outstanding stability (< 0.5 %)
- Can be customized to meet specific customer needs

CERAMIC CAPACITORS

Approved IEC 60384-14



[VJ2220 X7R Safety](#)

- Surface-mount design: simpler assembly and reduced board space requirement
- GREEN compliant products

INDUCTORS

Wirewound, Surface-Mount, Molded Inductors



[IMC-1812](#)

- RF Inductor for high density filter applications
- Vertical bobbin construction eliminates cross talk with nearby components



Charging Stations / Infrastructure for Vehicles and E-Bikes




NON-LINEAR RESISTORS

SMD 0603, Glass Protected NTC Thermistors

[NTCS0603E3...](#)

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




DIODES

Small-Signal Zener Diodes

[BZX84C8V2-HE3](#)

- ESD capability acc. to AEC-Q101
- AEC-Q101 qualified



RESISTORS

Thin Film MELF Resistors

[SMM0207](#)

- Unrivaled surge handling capability, ultimate stability over lifetime
- Automotive Grade quality, halogen-free, GREEN product




CERAMIC CAPACITORS

Internal Design Reduces Risk of Shorts Caused by Board Flex, High Breakdown Voltage

[MLCC OMD Capacitors](#)

- Polymer termination available for intensive board flex requirements
- 100 % voltage conditioning available up to 630 V_{DC} rating (process code "5H")



MODULES

EMIPAK-1B PressFit Power Module, Neutral Point Clamp Topology, 30 A

[EMIPAK1B](#)

- PressFit pins technology
- UL approved file E78996




FILM CAPACITORS

Metallized Polypropylene Film Capacitor, AC Filtering Radial Type

[MKP1847](#)

- AC filter capacitor with high RMS current capabilities
- Safe design using segmented film




RECTIFIERS

High-Voltage Surface-Mount Schottky Rectifier

[SS2H10HE3](#)

- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified




INDUCTORS

Low-Profile, High-Current IHLP® Inductors

[IHLP-5050](#)

- High-current, low-saturation inductor for DC/DC conversion and filtering




OPTOELECTRONICS

Widebody IGBT and MOSFET Driver with High Creepage and Clearance of 10 mm

[VOW3120](#)

- 10 mm min. external creepage distance, 8000 V max. transient isolation voltage
- 2.5 A peak output current, 45 kV/μs common mode rejection




MOSFETS

Automotive N-Channel 40 V (D-S) 175 °C MOSFET

[SQM200N04-1m1L](#)

- TrenchFET® Gen III technology, maximum R_{DS(on)} 1.1 mΩ
- 7-leaded D²PAK packaging




OPTOELECTRONICS

Widebody 10 MBd High-Speed Optocoupler with High Creepage and Clearance of 10 mm

[VOW2611](#)

- 8000 V max. transient isolation voltage
- Integrated Faraday shield provides very high input-to-output noise isolation of 40 kV/μs




RESISTORS

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

[WSBM](#)

- Includes a molded enclosure, providing easy PCB connection to the shunt resistor
- Extremely low resistance values: 50 μΩ to 1000 μΩ



View datasheets for these products www.vishay.com/ref/et3ae5e





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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.



**A WORLD OF
SOLUTIONS**

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