



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

**HVDC
Transmission**



**STATCOM SVC
(Static VAR
Compensator)**



**Transformer
Stations**



Circuit Breakers



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



THE VISHAY ADVANTAGE

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



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



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 μ H, high pulse capability up to 1000 J for short pulse



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

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





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



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 m Ω
- 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

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



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



MODULES

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

[EMIPAK1B](#)

- PressFit pins technology
- UL approved file E78996



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/ μ s common mode rejection



DIODES

Small-Signal Zener Diodes

[BZX84C8V2-HE3](#)

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



FILM CAPACITORS

Metallized Polypropylene Film Capacitor, AC Filtering Radial Type

[MKP1847](#)

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



MOSFETS

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

[SQM200N04-1m1L](#)

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



RESISTORS

Thin Film MELF Resistors

[SMM0207](#)

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



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



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/ μ s



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")



INDUCTORS

Low-Profile, High-Current IHLP® Inductors

[IHLP-5050](#)

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



RESISTORS

Power Metal Strip® Battery Shunt Resistor, Very Low Value (100 $\mu\Omega$, 125 $\mu\Omega$, and 250 $\mu\Omega$)

[WSBM](#)

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



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





Vishay Intertechnology, Inc.



A *WORLD OF*
SOLUTIONS