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Vishay Intertechnology, Inc.

Alternative Energy

(Smart Grids)



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





**Alternative
Energy**

Smart Grids

Virtual Power Systems
Smart Meters
Smart Homes

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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 SMART GRIDS



THE VISHAY ADVANTAGE

- Long Useful Life
- High Voltage Capabilities
- Safety Approvals
- High Reliability
- High Surge Current Capabilities
- High Efficiency
- and more...

**Virtual
Power Systems**



Smart Meters



Smart Homes





Virtual Power Systems



CERAMIC CAPACITORS

AC Line Rated Disc Capacitors, Class X1, 760 V_{AC}, Class Y1, 500 V_{AC}



[VY1](#)

- X1 / Y1 safety rating according to IEC 60384-14, 3rd edition
- Highest reliability and lifetime, operating temperature: -40 °C to +125 °C

DIODES

Surface-Mount TRANSZORB® Transient Voltage Suppressors



[SMP TVS](#)

- Meets MSL level 1, per J-STD-020C, LF maximum peak of 260 °C
- Very low profile – typical height of 0.65 mm

INDUCTORS

Low-Profile, High-Current IHLP® Inductors



[IHLP-5050](#)

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

OPTOELECTRONICS

High-Speed, SPST Normally Open (1 Form A) Solid-State Relay in DIP-6 Package



[VO14641AT](#)

- Isolation test voltage of 5300 V_{RMS}, load voltage of 60 V, DC load current of 2 A
- Can be configured for AC/DC or DC only operation with clean, bounce-free switching

RESISTORS

High Pulse Load MELF Resistors



[CMB 0207](#)

- Ultimate surge handling up to 16 kV ESD, 17 kW 1.2 / 50, VDE safety approval
- AEC-Q200 qualified, sulfur resistant, GREEN product

CERAMIC CAPACITORS

Standard Reflow Process Assembly, High-Reliability Ceramic-Oxide Body Construction



[Ceramic Chip Antenna](#)

- Frequency range from 400 HMz to 5 GHz
- Wide operating temperature range: -40 °C to +85 °C

NON-LINEAR RESISTORS

SMD 0603, Glass Protected NTC Thermistors



[NTCS0603](#)

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

CERAMIC CAPACITORS

IEC 60384-14:2005, CAN/CSA/cCSAus, and ANSI/UL CB Certificates



[MLCC SMD Safety Capacitor](#)

- Surface-mount design: simpler assembly and reduced board space requirement
- Available in NP0 (COG) or X7R dielectrics

RESISTORS

Power Metal Strip® Resistors, Low Value (Down to 0.0005 Ω), Surface-Mount



[WSL](#)

- Extremely low resistance values from 0.0005 Ω to 0.5 Ω and tolerance of 1 %
- Power Metal Strip all-welded construction offers high pulse capacity

ENERGY STORAGE CAPACITORS

Hybrid Storage Capacitors

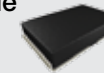


[196 HVC ENYCAP™](#)

- Polarized electrochemical storage capacitor with high capacity and energy density
- No cell balancing necessary, soft and low transient voltage controlled charging

RESISTORS

Power Metal Strip® SMD Resistors, High Power (7 W), Low Value (Down to 0.001 Ω)



[WSHM2818](#)

- Very high power rating of 7 W in small 2818 package
- Very low resistance values, 0.001 Ω to 0.10 Ω, with tolerance of 1 %

ALUMINUM CAPACITORS

Aluminum Capacitors, Power, High Ripple Current, Screw Terminals



[101/102 PHR-ST](#)

- Long life screw-terminal, high ripple current
- Custom made; the perfect aluminum capacitors for your application

View datasheets for these products www.vishay.com/ref/et3ae3a



Smart Meters




FILM CAPACITORS

Interference Suppression Film Capacitor, Class X2, MKT 310 V_{AC}

[F1772S](#)

- RFI X2 film capacitors for continuous across the line and series impedance app.
- Withstanding 85 °C / 85 % RH for 1000 h at 240 V_{AC}




OPTOELECTRONICS

High-Speed and High-Power Infrared Emitting Diodes with Peak Wavelength of 940 nm

[VSMB2020X01](#)

- Radiant intensity of 40 mW/sr at I_F = 100 mA and 15 ns rise and fall time
- Angle of half intensity of ± 12° in surface-mount gullwing and reverse gullwing pkg.




ICs

28 V, 56 mΩ Load Switch with Programmable Current Limit and Slew Rate Control

[SiP32419 / SiP32429](#)

- < 1 μs short circuit response time, and 20 % I_{LIM} accuracy over temperature
- High-voltage synchronous Buck converters




RESISTORS

High Surge Axial Cemented Wirewound Resistors

[Z300-C](#)

- High voltage surge (up to 12 kV) for special version
- Non-flammable cement coating




DIODES

Surface-Mount TRANSZORB® Transient Voltage Suppressors

[SMAJxx](#)

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




INDUCTORS

High-Current, Surface-Mount Inductors – Non-Shielded

[IDCP-2218](#)

- Low-cost filtering and DC/DC conversion inductor



MOSFETs

E Series 600 V Power MOSFET

[SiHD7N60E](#)

- High performance E Series high-voltage technology, maximum R_{DS(on)} 600 mΩ
- Popular DPAK packaging, maximum continuous current of 7 A



OPTOELECTRONICS

Widebody 10 MBd High-Speed Optocouplers 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




NON-LINEAR RESISTORS

VDR Metal Oxide Varistors, High Surge

[VDRH14 to VDRH20](#)

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




RESISTORS

Power Metal Strip® Meter Shunt Resistor, Very Low Value (Down to 0.0001 Ω)

[WSMS](#)

- Power Metal Strip construction offers accuracy for smart meter applications
- Extremely low resistance values: 100 μΩ to 1000 μΩ




RESISTORS

Thin Film Mini-MELF Resistors

[MM / SM](#)

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



CERAMIC CAPACITORS

Ultra-Stable Dielectric Formulation Low Dissipation Factor (DF)

[MLCC High Q Capacitors](#)

- Robust design build with wet process and noble metal electrodes



View datasheets for these products www.vishay.com/ref/et3ae3b



Smart Homes



OPTOELECTRONICS

Single- and Dual-Channel 10 MBd Optocouplers in an SOIC-8 Package



[VO06xxT](#)

- Integrated optical photodiode IC, isolation voltage of 4000 V_{RMS}
- Choice of common mode transient immunity of 15 kV/μs, 5 kV/μs, or 1 kV/μs

ICs

Enhanced Performance Quad CMOS Analog Switches



[DG201B](#)

- Wide ± 22 V supply voltage rating
- Improved charge injection compensation design minimizes switching transients

CERAMIC CAPACITORS

AC Line Rated Disc Capacitors Class X1, 440 V_{AC}, Class Y2, 300 V_{AC}



[VY2](#)

- X1 / Y2 safety rating according to IEC 60384-14, 3rd edition
- Highest reliability and lifetime, operating temperature: -40 °C to +125 °C

DIODES

Surface-Mount TRANSZORB® Transient Voltage Suppressors



[SMCJxx](#)

- Available in unidirectional and bidirectional
- AEC-Q101 qualified

RESISTORS

Metal Film Resistors, High Precision, High Stability



[PTF](#)

- Tolerances to ± 0.01 %
- TCR down to 5 ppm/°C, in temperature range of -20 °C to +85 °C

INDUCTORS

Low-Profile, High-Current IHLP® Inductors



[IHLP-2525](#)

- Compact size, high-current DC/DC conversion and filtering

CERAMIC CAPACITORS

Body Sizes: 0402 to 3838, Excellent Power Handling Capabilities



[MLCC RF Capacitors](#)

- Non-magnetic available with copper or epoxy bondable termination
- Lead-bearing termination available for hi-rel applications

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

RESISTORS

High-Voltage (up to 0.5 kV) Thick Film Chip Resistors



[RCV](#)

- High operating voltage (up to 500 V)
- Low resistance drift (maximum 1 %)

TANTALUM CAPACITORS

Solid Tantalum Chip Capacitors 298D MICROTAN®, 298W Extended Range MICROTAN



[298D](#)

- High capacitance in small case sizes including 0603 and 0402 footprint
- Perfect for space-constrained designs

NON-LINEAR RESISTORS

NTC Thermistors, Radial Leaded, Standard Precision



[NTCLE100](#)

- Standard classics series
- Color band coded

CERAMIC CAPACITORS

Standard Reflow Process Assembly, High-Reliability Ceramic-Oxide Body Construction



[Ceramic Chip Antenna](#)

- Frequency range from 400 MHz to 5 GHz
- Wide operating temperature range: -40 °C to +85 °C

View datasheets for these products www.vishay.com/ref/et3ae3c





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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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