



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

2

Smart Meters

3

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

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

NON-LINEAR RESISTORS

**SMD 0603, Glass Protected
NTC Thermistors**



[NTCS0603](#)

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

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

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

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

**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 (C0G) or X7R dielectrics

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 %

INDUCTORS

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



[IHLP-5050](#)

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

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

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

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}¹ High Stability Grade



[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](#)

- Unrivalled 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
IHL® 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**

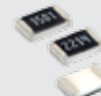


[LCD, Color TFT, OLED](#)

- 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

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A *WORLD OF*
SOLUTIONS