



Vishay Intertechnology, Inc.

Alternative Energy

(Energy Exploration)



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





**Alternative
Energy**

Energy Exploration

Oil and Gas Prospecting	2
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Hydraulic Fracturing (Fracking)	4

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 ENERGY EXPLORATION



THE VISHAY ADVANTAGE

- Wide Operating Temperature Range
- Long Useful Life
- High Reliability
- Safety Approvals
- High Power Density
- High Surge Current Capability
- Ruggedized Construction
- and more....

Oil and Gas Prospecting



Mining



Hydraulic Fracturing (Fracking)





Oil and Gas Prospecting



THYRISTORS

**Phase Control Thyristors
(Hockey PUK Version),
1650 A**



[ST1200C12K0](#)

- International standard case A-24 (K-PUK)
- Metal case with ceramic insulator, designed and approved for industrial applications

INDUCTORS

**Toroid, High-Current,
High-Temperature,
Radial Leaded**



[TJ5-HT](#)

- High-temp. toroidal inductor available in several sizes and wind inductance range
- High temperature continuous operation up to 200 °C

TANTALUM CAPACITORS

**Solid Tantalum Surface-Mount Chip
Capacitors, TANTAMOUNT®,
Molded Case, HI-TMP®**



[TH5](#)

- Very high temperature molded tantalum capacitor HI-TMP – 200 °C
- Harsh environment filtering and decoupling

RESISTORS

**Thin Film, Center-Tapped Resistor
Divider Network**



[CTA](#)

- Tight ratio tolerances to $\pm 0.1\%$, wire bondable, center tap feature
- Low shunt capacitance < 0.2 pF, excellent stability: $\pm 0.025\%$ maximum DR/R

CERAMIC CAPACITORS

**High Operating Temperature
Dielectric up to +150 °C**



[MLCC X8R Capacitors](#)

- Maintains capacity at high temperature
- Robust design build with wet process and noble metal electrode system

ICs

**Precision Monolithic
Quad SPST CMOS
Analog Switches**



[DG1411, DG1412, DG1413](#)

- Low and flat switch resistance over a wide voltage range
- 50 % lower capacitance and 80 % lower charge injection versus competition

INDUCTORS

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



[IHL-2525CZ-8A](#)

- Ultra-high-temperature DC/DC conversion and filter inductor applications
- Continuous operation up to 180 °C

RESISTORS

**High-Stability, High-Temperature
230 °C Thin Film Wraparound
Chip Resistors**



[PHT \(Sizes 0402 to 2010\)](#)

- Operating temp. up to 215 °C, low TCR down to 15 ppm/°C (-55 °C to +215 °C)
- Sulfur resistant, from 10R up to 7.5M, tight tolerance down to 0.05 %

MOSFETs

**Dual N-Channel 1.2 V
(G-S) MOSFET**



[SiB914DK](#)

- TrenchFET® technology with $R_{DS(on)}$ guaranteed at a low gate voltage of 1.2 V
- 1.6 mm x 1.6 mm PowerPAK® SC-75 packaging

ESTA POWER CAPACITORS

HVAC Power Capacitor

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



- Harmonic distortion removal
- Improved voltage profile of the system

RESISTORS

**Universal Mount Edgewound
Power Wirewound Resistors**



[EDGU](#)

- High current capability
- Enclosures and mounting frames available

TANTALUM CAPACITORS

**Wet Tantalum HI-TMP Capacitors
Tantalum Case with Glass-to-
Tantalum Hermetic Seal**



[134D](#)

- Extended capacitance, voltage range 50 V to 125 V, -55 °C to +200 °C operation
- Axial leaded, industry standard case sizes (T1, T2, T3, T4)

View datasheets for these products
www.vishay.com/ref/et3ae4a



Mining



RESISTORS

Molded, 50 mil Pitch, High Temp. (215 °C); Thin Film Surface-Mount, Dual-In-Line Resistor Network

[HTRJ](#)

- Multiple resistance offerings with 0.05 % ratio tolerance and 5 ppm/°C tracking
- Ratio stability of 0.1 % at 2000 h, 215 °C at 25 % rated power

DIODES

Surface-Mount TRANSZORB® Transient Voltage Suppressors

[SMAJ](#)

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

SENSORS

Ten-Turns Servo or Bushing Mount Hall Effect Sensor in Size 09 (22.2 mm)

[34 THE](#)

- Accurate linearity: ± 0.5 %, long life: 50M cycles for servo, 10M for bushing
- All electrical angles available up to 3600°, dedicated to long-life applications

OPTOELECTRONICS

Optocoupler with Phototransistor Output and Trigger Current of $I_F = 1$ mA

[VOL618A](#)

- High current transfer ratio, and high isolation voltage of 5000 V_{RMS}
- Operating temp. from -55 °C to +110 °C in a 4-pin LSOP, mini-flat package

INDUCTORS

High-Current Through-Hole Inductor, High-Temperature Series

[IHTH](#)

- Composite through-hole design inductor for filtering and DC/DC conversion
- Compact solution to toroidal power inductors

MOSFETs

N-Channel 100 V (D-S) MOSFET

[SiR870ADP](#)

- Medium-voltage ThunderFET® technology, maximum $R_{DS(on)}$ 6.6 m Ω
- Thermally enhanced PowerPAK® SO-8 packaging

TANTALUM CAPACITORS

Wet Tantalum Capacitors Tantalum-Case with Glass-to-Tantalum Hermetic Seal

[135D](#)

- High capacitance, voltage range 6 V to 125 V, -55 °C to +200 °C operation
- Axial-leaded, industry-standard case sizes (T1, T2, T3, T4)

RESISTORS

Electro-Pyrotechnic Initiator Thin Film Chip Resistor

[EPIC](#)

- Low firing energy down to 50 μ J, fast firing time down to 50 μ s
- Standard SMD case 0603, alternative to bridge wire technology

OPTOELECTRONICS

Optocoupler with Phototransistor Output; ATEX Certified for Explosive Environments

[CNY65Exi](#)

- ATEX certificate: PTB 03 ATEX 2033 U, Gas: II (1) G (EX ia) IIC, Dust: II (1) D (EX ia) IIIC
- V_{ISO} of 11 600 V_{peak} for 1 minute

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

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

- Harmonic distortion removal
- Improved voltage profile of the system

RESISTORS

Stainless Steel Medium-Power Resistors

[Medium Power Grid Resistors](#)

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

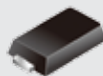
View datasheets for these products
www.vishay.com/ref/et3ae4b



Hydraulic Fracturing (Fracking)

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

**Massive Electro-Pyrotechnic
Initiator Chip Resistor**



[MEPIC](#)

- Low firing energy down to 1.5 mJ, fast firing time down to 250 µs
- Standard SMD case 0805, alternative to bridge wire technology, AKLV16 qualification

MODULES

**ADD-A-PAK Generation VII
Power Modules, Schottky
Rectifier, 200 A**

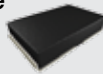


[VS-VSKDS409/150](#)

- 175 °C T_j operation
- UL approved file E78996

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 %

MOSFETs

**E Series 600 V
Power MOSFET**



[SiHG47N60E](#)

- High-performance E Series high-voltage technology, maximum R_{DS(on)} 64 mΩ
- Popular TO-247 packaging, maximum continuous current of 47 A

FILM CAPACITORS

**Metallized Polypropylene
Film DC-Link Capacitor**



[MKP1848](#)

- High-performance DC-Link capacitor with high RMS current capabilities
- Automotive Grade AEC-Q200 compliant

INDUCTORS

**Toroid, High-Current,
High-Temperature,
Radial Leaded**



[TJ3-HT](#)

- High-temp. toroidal inductor available in several sizes and wind inductance range
- High temperature continuous operation up to 200 °C

MELF RESISTORS

**Professional Thin Film
MELF Resistors**

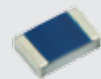


[MMB0207](#)

- Approved according to EN 140401-803, AEC-Q200 qualified
- High surge voltage capability

NON-LINEAR RESISTORS

**Platinum SMD Flat Chip
Temperature Sensor**



[PTS...AT](#)

- Standardized characteristics according to IEC 60751
- Short reaction times down to 2 s (in air)

RESISTORS

**Precision Low-TCR, High-
Temperature Thin Film
Resistor, Surface-Mount Chip**



[PLTT](#)

- Wide resistance range with 5 ppm/°C TCR tracking and 0.02 % tolerance
- Operation up to 230 °C with 0.5 % stability at 2000 h, 215 °C at 25 % rated power

RESISTORS

**High-Stability, High-Temperature
230 °C Thin Film
Chip Resistors**



[PHT / PRAHT / RMKHT / CHPHT](#)

- Operating temp. up to 215 °C, low TCR down to 15 ppm/°C (-55 °C to +215 °C)
- Sulfur resistant, from 10R up to 7.5M, tight tolerance down to 0.05 %

TANTALUM CAPACITORS

**Wet Tantalum
Capacitor Assembly**



[211D](#)

- High temperature of +200 °C, high vibration
- Standard and custom assemblies

View datasheets for these products
www.vishay.com/ref/et3ae4c





Vishay Intertechnology, Inc.



A *WORLD OF*
SOLUTIONS