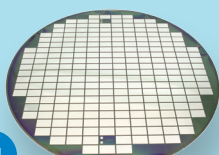




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FRED Pt® Ultra-Soft Recovery Diode Chips

Fast Rectifier Epitaxial Diode

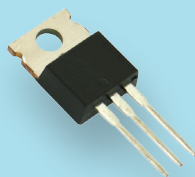
01



196 HVC ENYCAP™

Hybrid Energy Storage Capacitor

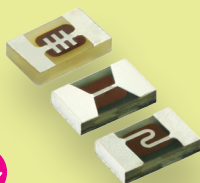
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SiHP33N60EF / EF Series

High-Voltage MOSFETs with Fast Body Diode

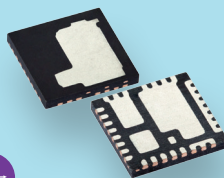
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MEPIC

Massive Electro-Pyrotechnic Initiator Chip Resistor

04

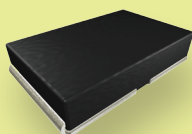


SiC620R

Next Generation DrMOS

60 A VRPower® Integrated Power Stage

05

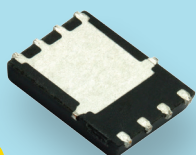
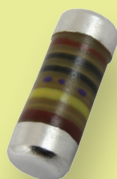
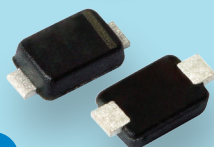
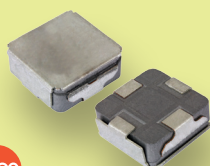
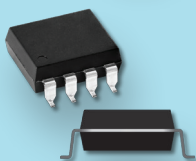


WSHM2818

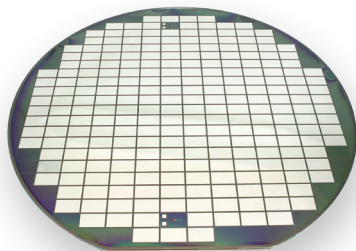
Current Sense Resistor

7 W Power Rating

06

**Si7157DP - P-Channel MOSFET***Lowest $R_{DS(on)}$, Down to $0.0016\ \Omega$* **07****MMA 0204 HV and MMB 0207 HV***High-Voltage MELF Resistors***08****PLZ Series - Zener Diodes***Very Low Profile, 0.6 mm Typical Height***09****IHLE-4040DC-5A****Power Inductor***E-Field Shielded***10****VOW3120****IGBT and MOSFET Driver***Widebody, High-Isolation***11****AY2 Series****Ceramic Safety Capacitors***Automotive Grade X1 / Y2***12**

01



FRED Pt® Gen 4 Diode Chips

*Part of an Ideal Match
with Vishay's New
Trench IGBT*

Features:

- ▶ Optimized (600 V / 650 V) to operate in combination with Vishay's new Trench IGBT, available as a kit for easy design
- ▶ Offers superior performance, extreme softness, ultra-low V_F (down to 1.4 V) and low I_{RRM} ; all the best parameters combined into one product
- ▶ Ultra-soft recovery under any switching condition
- ▶ Polyimide passivated chip for high reliability
- ▶ High operating temperature to +175 °C

Applications / Market Segments:

- ▶ High-frequency converters in power modules, motor drives, UPS, solar inverters, and welding machine inverters
- ▶ Single- and three-phase inverters, full- and half-bridge DC/DC converters
- ▶ Power factor correction (PFC) circuits, boosters, choppers, and secondary-side rectification

02



196 HVC ENYCAP™

***High-Energy Storage Capacitor
Saves Space with the
Industry's Highest Energy
Density (13 Ws/g)***

INDUSTRY
FIRST

Features:

- ▶ Industry-first, polarized energy storage capacitor with high capacitance (up to 90 F) and energy density (13 Ws/g)
- ▶ Voltage flexibility: 1.4 V (single cell) to 2.8 V / 4.2 V / 5.6 V / 7.0 V / 8.4 V (multiple cells)
- ▶ Available in stacked through-hole (STH, radial), surface-mount flat (SMF) and lay-flat configurations (LFC) with wire and connectors
- ▶ Low profile (2.5 mm) to fit portable and compact designs
- ▶ Wide variety of layouts

Applications / Market Segments:

- ▶ Power backup for memory controllers, flash backup, RAID systems, SRAM, DRAM
- ▶ Power failure and write-cache protection for enterprise SSD and HDD
- ▶ Real-time clock power source
- ▶ Burst power support for flash lights, wireless transmitters
- ▶ Backup power for industrial PCs and industrial controls
- ▶ Storage device for energy harvesting
- ▶ Emergency lights and micro UPS power sources



SiHP33N60EF / EF Series

***HV Fast Body Diode Power
MOSFET Offers up to 10x
Reduction in Q_{rr}***

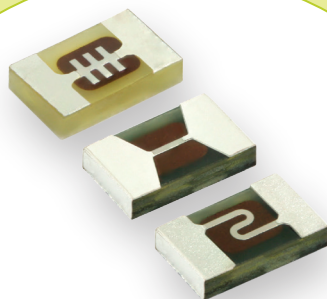
Features:

- ▶ Based on E Series Super Junction technology
- ▶ Fast body diode provides as much as 10x reduction in Q_{rr} over the standard E Series MOSFET for lifetime control
- ▶ Designed and developed for soft switching topologies along with similar standard E Series on-resistance values
 - Scales of economy can be achieved within a system using EF series throughout the design (in place of standard E Series MOSFETs with similar on resistance) in the hard switched topology
- ▶ 600 V, 33 A maximum, $R_{DS(on)}$ max of 98 m Ω
- ▶ 28 A maximum, $R_{DS(on)}$ max of 123 m Ω option also available (SiHx28N60EF)
- ▶ Package options including TO-220, TO-263 (D²PAK), and TO-247AC

Applications / Market Segments:

- ▶ Hard and soft switching (focus) topologies
 - Zero voltage switching (ZVS) and LLC converters
- ▶ Applications
 - Renewable energy: PV inverters
 - Industrial: battery chargers
 - Telecom: servers
 - Computing: ATX / silver box SMPS

04



MEPIC

***Initiator Resistor with
Predictable, Reproducible
and Reliable Behavior
Meets USCAR and
AKLV16***

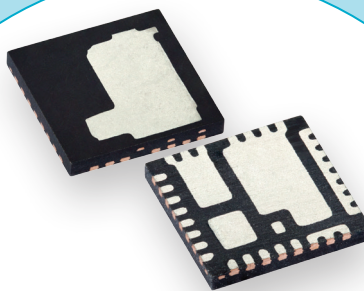
INDUSTRY
FIRST

Features:

- ▶ Industry-first Massive Electro-Pyrotechnic Iniator Chip resistor
- ▶ SMD (0805)
- ▶ Ohmic value : 1 Ω to 8 Ω
- ▶ Firing energy down to 1.5 mJ
- ▶ Firing time down to 250 μ s
- ▶ Joule effect ignition
- ▶ No fire, all fire, ESD, withstands USCAR and AKLV16 standards
- ▶ Very predictable, reproducible, and reliable behavior
- ▶ Can be adapted for use with various pyrotechnic materials

Applications / Market Segments:

- ▶ Mining electronic detonators (digital blasting)
- ▶ Fireworks, electric matches
- ▶ Civil detonators for precision blasting



SiC620R Integrated Power Stage

*Next Generation
DrMOS*

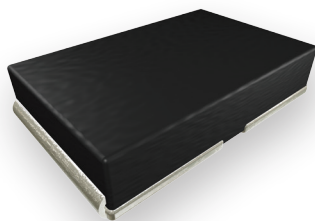
Features:

- ▶ 20 % lower power losses
- ▶ Dual-cooled package enables a 70 A power stage
- ▶ 95 % peak efficiency, over 3 % better efficiency than previous generation
- ▶ Optimized package design for up to 1.5 MHz operation
- ▶ 50 °C lower operating temperatures for improved reliability
- ▶ Zero current detect control for light load efficiency improvement
- ▶ Thermally enhanced PowerPAK® MLP55-31L double cooling package
- ▶ Low PWM propagation delay (< 20 ns)
- ▶ Thermal and undervoltage monitoring

Applications / Market Segments:

- ▶ Servers and workstations
- ▶ Telecom ASIC power
- ▶ Game consoles
- ▶ POL modules
- ▶ Graphic cards
- ▶ Bitcoin mining hardware

06



WSHM2818

***7 W Current Sense Resistor in
2818 Case Size with
Resistance Down
to 1 mΩ***

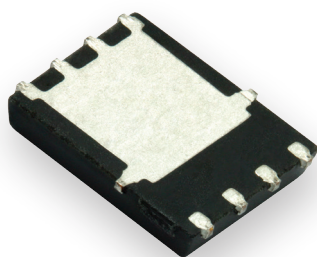
Features:

- ▶ 7 W power rating
- ▶ Compact 2818 case size
- ▶ Very low resistance values: down to 0.001 Ω
- ▶ Low thermal EMF: < 3 $\mu\text{V}/^\circ\text{C}$
- ▶ Low inductance: < 5 nH
- ▶ Power Metal Strip® technology
- ▶ Improved thermal management incorporated into design
- ▶ All welded construction
- ▶ Low TCR (< 20 ppm/°C)

Applications / Market Segments:

- ▶ Automotive: electronic controls, brushless DC motor controls, battery management
- ▶ Industrial: air conditioning / heat pump inverter controls
- ▶ Computer: DC/DC converters, VRMs for servers, power management
- ▶ Consumer: inverter controls for white goods

07



Si7157DP

***Lowest On-Resistance Ever
for a P-Channel MOSFET,
Down to 0.0016 Ω (max.)***

INDUSTRY
FIRST

Features:

- ▶ On-resistance at $V_{GS} = -10\text{ V}$: 0.0016 Ω (max.)
- ▶ On-resistance at $V_{GS} = -4.5\text{ V}$: 0.002 Ω (max.)
- ▶ Thermally-enhanced PowerPAK® SO-8 package (6.15 mm by 5.15 mm)
- ▶ Lead (Pb)-free and halogen-free
- ▶ TrenchFET® Gen III P-Channel Power MOSFET
- ▶ 100 % R_g and UIS tested

Applications / Market Segments:

- ▶ Power management
 - Load switches
 - Battery switches
 - Adapter switches
- ▶ Hot-swap applications

08



MMA 0204 HV / MMB 0207 HV

*High-Voltage MELF Resistors
with 500 V and 1000 V
Voltage Ratings*

INDUSTRY
FIRST

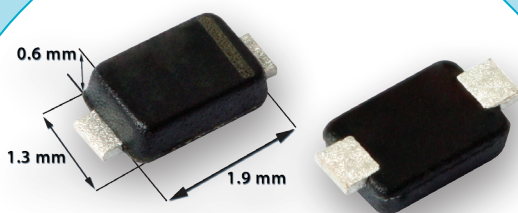
Features:

- ▶ Industry-first high-voltage SMD metal film resistor
- ▶ High-operating voltage up to 1 kV
- ▶ High-surge capability up to 3 kV
- ▶ Extremely low voltage coefficient < 0.1 ppm/V
- ▶ High accuracy and stability over lifetime
- ▶ Matte Sn termination on Ni barrier layer

Applications / Market Segments:

- ▶ Lighting
- ▶ Industrial inverters
- ▶ Electrical and hybrid vehicles
- ▶ Power meters
- ▶ High-voltage monitoring of power distribution lines
- ▶ Medical power supplies
- ▶ Test and measurement equipment

09



PLZ Series

Zener Diodes in Very Low Profile MicroSMF Package with 0.6 mm Typical Height

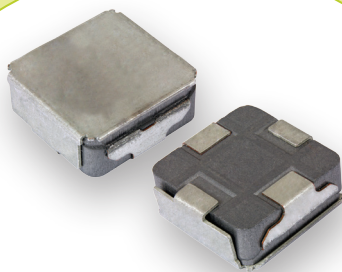
Features:

- ▶ New very low profile surface-mount **MicroSMF** eSMP® Series package with 0.6 mm typical height
- ▶ Power dissipation: 500 mW (despite very small SOD-323 flat lead package style)
- ▶ Symmetrical flat leads are double wave (IEC 61760-1) and reflow (JPC/JEDEC J-STD020) solderable for use in automated optical inspection (AOI) systems
- ▶ Very tight voltage tolerance: $\pm 2.5\%$
- ▶ Designed to withstand ESD pulses
- ▶ Excellent stability
- ▶ Low leakage current
- ▶ RoHS-compliant, halogen-free, and Vishay GREEN

Applications / Market Segments:

- ▶ Switching power supplies
- ▶ Electronic lighting
- ▶ Computers
- ▶ Telecommunications
- ▶ Industrial

10



IHLE-4040DC-5A

*The **Only** E-Field Shielded
IHLP® Power Inductor*

INDUSTRY
FIRST

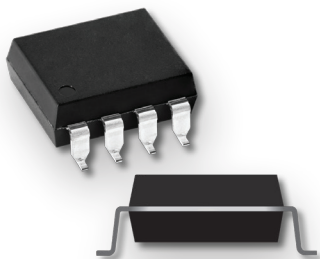
Features:

- ▶ Industry-first integrated e-field shield / IHLP
- ▶ Reduces e-field up to 20 dB at 1 cm
- ▶ Available in 4040 case size
- ▶ Eliminates the need for additional Faraday shields
- ▶ Available in any standard IHLP value
- ▶ Provides a four-terminal contact to the PCB for higher vibration reliability
- ▶ AEC-Q200

Applications / Market Segments:

- ▶ DC/DC converter circuits near noise-sensitive components
- ▶ Automotive control circuitry
- ▶ Engine and transmission control units
- ▶ Diesel injection drivers
- ▶ Computer and other high-current, noisy power supplies
- ▶ Noise suppression for electrical motors
- ▶ LED drivers
- ▶ HID lighting

11



VOW3120

***Widebody High-Isolation and
High-Creepage at > 10 mm
IGBT and MOSFET Driver***

Features:

- ▶ 1414 V working voltage with 2.5 A peak output current enables direct driving of high power IGBTs up to 1200 V / 100 A
- ▶ 8000 V transient voltage and superior common mode rejection (CMR) up to 50 000 V/ μ s for improved noise isolation
- ▶ Integrated undervoltage lock-out function protects IGBTs in case of supply voltage failure
- ▶ Wide operating supply voltage range up to 32 V saves voltage regulator
- ▶ 1:1 replacement and industry standard second source

Applications / Market Segments:

- ▶ Industrial:
 - 1 to 3 phase inverters
 - Fixed and variable frequency industrial motor drives
 - Inverter stage in welding equipment
- ▶ Alternative energy: voltage converter stage in commercial and residential solar inverters
- ▶ Automotive: inverter stage in EV and plug-in HEV chargers

12



AY2 Series

***Automotive-Grade X1 / Y2
Ceramic Safety Capacitors***

Features:

- ▶ Automotive Grade*
- ▶ AEC-Q200 qualified
- ▶ Can pass 3000 temperature cycles from -55 °C to +125 °C (AEC-Q200 requires 1000)
- ▶ X1 / Y2 safety capacitor acc. to IEC 60384-14, 3rd edition
- ▶ Widest operating temperature in the market
- ▶ Halogen-free epoxy coating

Applications / Market Segments:

- ▶ Automotive
 - On-board chargers in e-cars/PHEVs
 - Battery management in e-cars/PHEVs
 - DC line filtering in DC/DC converters
- ▶ Industrial
 - Smart / power meters
 - High-reliability industrial applications and power supplies
 - Automation

* For more information, please visit www.vishay.com/doc?49924

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