



Vishay Intertechnology, Inc.

**Consumer** *(Home Appliances) /*  
**Telecommunications**  
*(Infrastructure)*



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



**Consumer**



**Consumer**



**Telecom**

Home Appliances

Air Conditioners	2
Induction Cooking	3
Washing Machines	4
Refrigerators / Freezers	5

Robotic Applications /  
Domestic Robots

Robotic Vacuum Cleaners / Robovacs	8
Robotic Lawn Mowers	9
Companion Robots	10

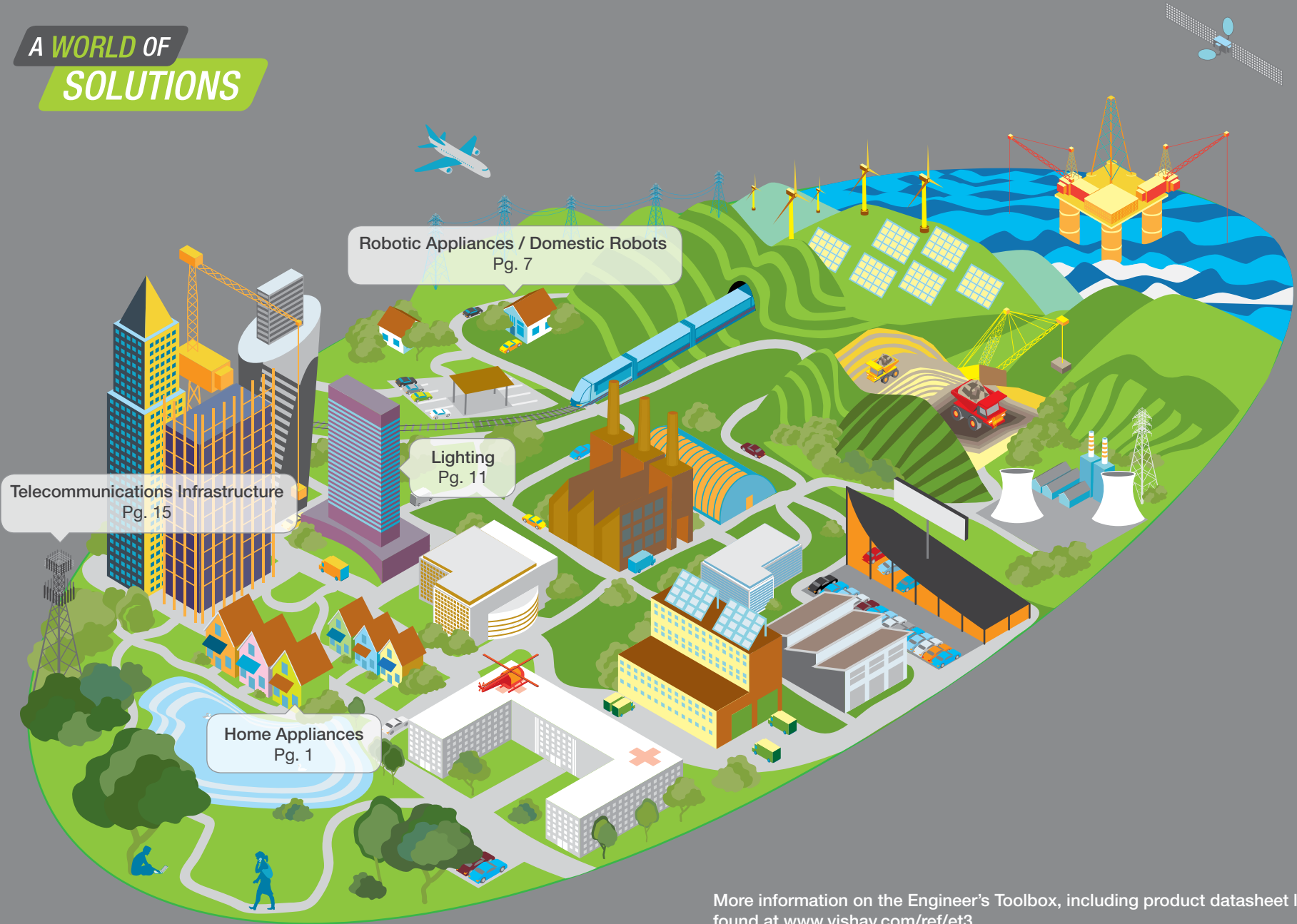
Lighting

LED SSD Lighting	12
OLED Displays for Illumination	13
Conventional Lighting Control Gear	14

Infrastructure

Line Cards	16
Modems	17
Transmitters / Base Stations	18
DC/DC Bricks	19
AC/DC SMPS	20

A **WORLD OF SOLUTIONS**



Robotic Appliances / Domestic Robots  
Pg. 7

Telecommunications Infrastructure  
Pg. 15

Lighting  
Pg. 11

Home Appliances  
Pg. 1

More information on the Engineer's Toolbox, including product datasheet links, can be found at [www.vishay.com/ref/et3](http://www.vishay.com/ref/et3).

For inquiries, please contact your local sales representative.

*Key components for*  
**HOME APPLIANCES**



**Air Conditioners**



**Induction  
Cooking**



**Washing  
Machines**



**Refrigerators /  
Freezers**



**THE VISHAY ADVANTAGE**

- Efficiency
- Compact Dimensions
- Low Weight
- Safety Approvals
- ESD Protection
- High-Voltage Capabilities
- Long Useful Life  
and more....




# Air Conditioners



RESISTORS

**High Pulse Load MELF Resistors**

[CMA0204...e3](#)



- Extreme surge capability up to 6 kV ESD, 4 kV 1.2 / 50 pulse
- Advanced carbon film technology, sulfur resistant, GREEN product

MOSFETs

**N-Channel 100 V (D-S) 175 °C MOSFET**

[SUP85N10-10](#)




- Classic TrenchFET® technology, maximum  $R_{DS(on)}$  10 m $\Omega$
- Popular TO-220 packaging

RECTIFIERS

**Enhanced isoCink+™ Bridge Rectifiers**

[PB3510](#)



- Enhanced high current density single in-line
- UL recognition file number E312394

MOSFETs

**P-Channel 60 V (D-S) Power MOSFET**

[IRFI9Z34G](#)




- Rugged planar technology, maximum  $R_{DS(on)}$  140 m $\Omega$
- FullPAK packaging eliminates isolation, maximum continuous current of -12 A

DIODES

**TRANSZORB® Transient Voltage Suppressors**

[P6KE200A](#)



- 600 W peak pulse power capability with a 100/1000  $\mu$ s waveform
- AEC-Q101 qualified

RESISTORS

**Power Metal Strip® Resistors, High Power (7 W) Low Value, Surface-Mount**

[WSHM2818](#)




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

RECTIFIERS

**Dual Common Cathode Ultrafast Rectifier**

[FEP30JP](#)




- Ultrafast recovery time
- Low switching losses, high efficiency

RESISTORS

**Power Metal Strip® Resistors, Low Value (Down to 0.001  $\Omega$ ), Surface-Mount**

[WSR](#)




- High power ratings to 5 W in molded 4527 size package
- Molded package with compliant leads, give superior thermal shock resilience

OPTOELECTRONICS

**Optocoupler, Power Phototriac**

[VO2223A](#)




- Optically coupled phototriac driving a power triac in a DIP-8 package
- Load current of 1 A<sub>RMS</sub> and 5300 V of input-to-output isolation

NON-LINEAR RESISTORS

**NTC Thermistor Sensors – Pipe Type with Fast Time Response**

[NTCLP450...](#)




- Miniature pipe sensor
- Fast time response vs. industry standards

OPTOELECTRONICS

**IR Receiver with Copper Leadframe for High Humidity / Saline Atmosphere**

[TSOP34xxxR](#)



- Industry leading range of 45 m, directivity of  $\pm 45^\circ$ , and 38 kHz carrier frequency
- Minimum irradiance of 0.08 mW/m<sup>2</sup>, and featuring AGC-4 noise suppression

FILM CAPACITORS

**Metallized Polypropylene Film Capacitor, DC-Link Capacitor**

[MKP1848C](#)



- Compact and high-performance DC-Link
- Environment-friendly materials (halogen-free and Vishay GREEN)

View datasheets for these products [www.vishay.com/ref/et3cn6a](http://www.vishay.com/ref/et3cn6a)



# Induction Cooking



### CERAMIC CAPACITORS

**AC Line Rated Disc Capacitors,**  
Class X1, 760 V<sub>AC</sub>;  
Class Y1, 500 V<sub>AC</sub>



[VY1](#)

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

### RECTIFIERS

**Enhanced isoCink+™  
Bridge Rectifiers**



[PB3006-E3](#)

- UL recognition file number E312394
- Enhanced high current density single in-line package

### FILM CAPACITORS

**AC and Pulse Metallized  
Polypropylene Film  
Capacitors, MKP Axial Type**



[MKP1839HQ](#)

- For low building height applications
- For precision applications, with tolerances down to ± 1 %

### NON-LINEAR RESISTORS

**NTC Thermistors,  
Standard Lug Sensors**



[NTCALUG01A](#)

- Robust surface temperature sensor
- AEC-Q200 compliant, UL recognized

### RESISTORS

**Cemented Wirewound Resistors**

[AC03](#)

- Non-flammable cement coating, good size-to-power ratio
- Power: 3 W, excellent pulse handling capability, various lead forming options



### MOSFETs

**E Series 600 V N-Channel  
Power MOSFET**



[SiHB15N60E](#)

- High-performance E Series, high-voltage technology, maximum R<sub>DS(on)</sub> 280 mΩ
- Popular D<sup>2</sup>PAK packaging, maximum continuous current of 15 A

### RESISTORS

**Power Metal Strip® Resistors,  
Very High Power (to 3 W)**



[WSLP2512](#)

- Very high power rating of 3 W in 2512 package
- Extremely low resistance values from 0.0005 Ω to 0.01 Ω, and tolerance of 1 %

### OPTOELECTRONICS

**1 MBd High-Speed Optocoupler with  
Photodiode-to-Transistor Output**



[6N136](#)

- Transmit signals between two optically separated circuits to frequencies of 2 MHz
- Isolation test voltage of 5300 V<sub>RMS</sub>, TTL compatible, 1 Mbit/s data rate

### MOSFETs

**P-Channel 30 V  
(D-S) MOSFET**



[Si2307CDS](#)

- Classic TrenchFET® technology, maximum R<sub>DS(on)</sub> 88 mΩ
- Popular SOT-23 packaging

### DIODES

**Small-Signal Schottky Diodes,  
Single and Dual**



[BAT54 / MMSZ5242B](#)

- AEC-Q101 qualified
- Very low turn-on voltage

### OPTOELECTRONICS

**Fully Integrated Proximity and  
Ambient Light Sensor with  
I<sup>2</sup>C Interface**



[VCNL4010](#)

- Infrared emitter is included in the 3.95 mm x 3.95 mm x 0.75 mm SMD pkg.
- 16-bit resolution, proximity range of up to 20 cm with programmable thresholds

### FILM CAPACITORS

**Metallized Polypropylene  
Film Capacitors,  
DC-Link Capacitor**



[MKP1848C](#)

- Compact and high-performance DC-Link
- Environment-friendly materials (halogen-free and Vishay GREEN)

View datasheets for these products  
[www.vishay.com/ref/et3cn6b](http://www.vishay.com/ref/et3cn6b)



# Washing Machines



### RESISTORS

#### High-Ohmic / High-Voltage Metal Glaze Ledged Resistors



##### [VR25](#)

- Small size (0207), suitable for high-humidity environments
- High continuous voltage of 1600 V, and high pulse loading capability of 7 kV

### MOSFETs

#### P-Channel 30 V (D-S) MOSFET

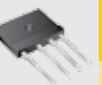


##### [Si2307CDS](#)

- Classic TrenchFET® technology, maximum  $R_{DS(on)}$  88 m $\Omega$
- Popular SOT-23 packaging

### RECTIFIERS

#### Single-Phase, Single In-Line Bridge Rectifiers



##### [GSIB2560-E3](#)

- UL recognition file number E54214
- High surge current capability

### DIODES

#### TRANSZORB® Transient Voltage Suppressors



##### [P6KE200A](#)

- 600 W peak pulse power capability with a 100/1000  $\mu$ s waveform
- Excellent clamping capability, very fast response time, low incremental surge resistance

### NON-LINEAR RESISTORS

#### SMD 0603, Glass Protected NTC Thermistors



##### [NTCS0603](#)

- AEC-Q200 compliant
- Glass protected with flex terminations

### CERAMIC CAPACITORS

#### Internal Design Reduces Risk of Shorts Caused by Board Flex, High Breakdown Voltage

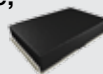


##### [VJ OMD Series](#)

- Polymer termination available for intensive board flex requirements
- 100 % voltage conditioning available up to 630 V<sub>DC</sub> rating (process code "5H")

### RESISTORS

#### Power Metal Strip® Resistors, High Power (7 W), Low Value, Surface-Mount



##### [WSHM2818](#)

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

### OPTOELECTRONICS

#### Optocoupler, Phototransistor Output with Broad Operating Temperature Range



##### [VO615A](#)

- 6 kV peak transient overvoltage protection in a 4-pin DIP or SMD package
- Temp. range -55 °C to +110 °C with VDE, BSI, FIMKO, UL, cUL, and CQC certification

### FILM CAPACITORS

#### Interference Suppression Film Capacitors, MKP Radial Potted Type



##### [MKP339](#)

- RFI X2 capacitor for standard across-the-line applications

### MOSFETs

#### N-Channel 800 V (D-S) Power MOSFET



##### [IRFBE20](#)

- Rugged planar technology, maximum  $R_{DS(on)}$  6.5  $\Omega$
- Popular TO-220 packaging, maximum continuous current of 1.8 A

### ALUMINUM CAPACITORS

#### Aluminum Capacitors, Power Miniaturized, General Purpose Snap-In



##### [093PMG-SI](#)

- Standard snap-in series
- Useful life: 2000 h at 85 °C

### RESISTORS

#### Cemented Fusible Wirewound Safety Resistors



##### [AC03...CS](#)

- 3 W, UL 1412 approved, non-flammable cement coating
- Surge handling of 4 kV, safe and silent fusing without flame and explosion

View datasheets for these products  
[www.vishay.com/ref/et3cn6c](http://www.vishay.com/ref/et3cn6c)



# Refrigerators / Freezers



### CERAMIC CAPACITORS

**AC Line Rated Disc Capacitors, Class X1, 760 V<sub>AC</sub>; Class Y1, 500 V<sub>AC</sub>**



[VY1](#)

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

### RECTIFIERS

**Surface-Mount Ultrafast Plastic Rectifier**



[MURS160-M3](#)

- Low switching losses, high efficiency
- Ultrafast reverse recovery time

### CERAMIC CAPACITORS

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



[VJ2220Y182KXUSTX1](#)

- Surface-mount design: simpler assembly and reduced board space requirement
- Robust design build with wet process

### MOSFETs

**High-Voltage 400 V V<sub>DS</sub> Power MOSFET**



[IRF740PBF](#)

- Dynamic dV/dt rating, repetitive avalanche rated
- Fast switching, ease of paralleling, simple drive requirement

### RESISTORS

**Cemented Wirewound Resistors**



[AC03](#)

- Non-flammable cement coating, good size-to-power ratio
- Power: 3 W, excellent pulse handling capability, various lead forming options

### DIODES

**Small-Signal Schottky Diodes, Single and Dual**



[BAT54S-V-GS08](#)

- AEC-Q101 qualified
- Feature very low turn-on voltage

### NON-LINEAR RESISTORS

**NTC Thermistors, Refrigerator Sensors**



[NTCACAPE3...](#)

- Refrigerator sensor
- Double insulated

### RESISTORS

**Cemented Fusible Wirewound Safety Resistors**



[AC05...CS](#)

- 5 W, UL 1412 approved, non-flammable cement coating
- Surge handling of 6 kV, safe and silent fusing without flame and explosion

### MOSFETs

**P-Channel 60 V (D-S) MOSFET**



[Si9407BDY](#)

- Classic TrenchFET® technology, maximum R<sub>DS(on)</sub> 120 mΩ
- Popular SO-8 packaging

### RESISTORS

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



[WSL2512](#)

- Extremely low resistance values from 0.0005 Ω to 0.5 Ω and tolerance of 1 %
- High power of 1 W in 2512 size resistor

### FILM CAPACITORS

**Interference Suppression Film Capacitors, MKP Radial Potted Type**



[MKP339](#)

- RFI X2 capacitor for standard across-the-line applications

### OPTOELECTRONICS

**Optocoupler, Phototransistor Output with Broad Operating Temperature Range**



[VO615A](#)

- 6 kV peak transient overvoltage protection in a 4-pin DIP or SMD package
- Temp. range -55 °C to +110 °C with VDE, BSI, FIMKO, UL, cUL, and CQC certification

View datasheets for these products  
[www.vishay.com/ref/et3cn6d](http://www.vishay.com/ref/et3cn6d)



# Spotlight on IHLP® Inductor Loss Calculator Tool

Vishay’s new “IHLP Core Loss Calculator” is a free tool that assists designers in selecting the correct IHLP inductor based on the operating conditions of their circuit. This tool will simulate the losses in the inductor, including core and both AC and DC copper losses. The temperature rise and final component temperature will also be predicted based on the estimated losses. This tool will allow designers to compare several different inductors, both in size and value, to assist in the selection process. The calculator can be used for buck, boost and buck/boost style converters.

The calculator requires eight inputs: input voltage, output voltage, switch (FET) voltage drop, diode (or sync FET) voltage drop, output current, frequency, ambient temperature and inductance. The calculator will do the rest based on these inputs. Inductance can be selected by using the “radio” buttons on the left hand side.

Please note: all designs should be verified in circuit as this tool is for simulation only.

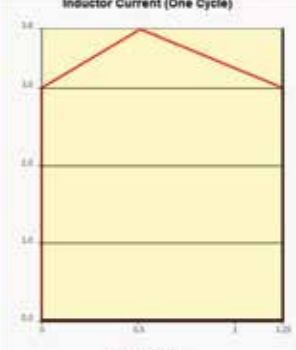
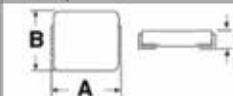
Access the core loss calculator tool at: [www.vishay.com/inductors/calculator-home-list/](http://www.vishay.com/inductors/calculator-home-list/)

Access the user guide at: [www.vishay.com/doc?49421](http://www.vishay.com/doc?49421)

## Important Design Criteria

IHLP inductors have a recommended maximum component temperature of 125 °C. Subtracting the ambient temperature will give us the maximum allowed temperature rise for the part. If this number should exceed 40 °C it is recommended that 40 °C be used for the allowed temperature rise. Core losses should be limited to  $\leq 1/3$  of the total losses to mitigate any aging effects associated with the powdered iron in the core at temperatures exceeding 125 °C. The recommended range for the ripple current is 30 % to 50 % of inductor current. This is based on a trade-off of inductor size and cost versus output capacitor size and cost. The maximum peak current should be kept below the Isat value of the selected inductor, although it can be exceeded with caution due to the soft saturation characteristics of the powdered iron core material. The calculators are based on operation in the continuous conduction mode only, information determined in the discontinuous conduction mode should be considered suspect and in need of verification by the user.

**IHLP® INDUCTOR LOSS CALCULATOR TOOL**

Choose Calculator Type	IHLP-1616AB-01-1 Boost $\mu$ H Ind. Loss Calculator						Ratings		
Boost							Inductance	1	$\mu$ H
Choose Available Series							25° C DC Res	0.045	Ohms
IHLP-1616AB-01							Isat	8.5	Amps
							(Heat)	4	Amps
<b>Select Inductance:</b>	<b>Inputs:</b>			<b>Outputs:</b>			<b>Inductor Current (One Cycle)</b>		
0.047 $\mu$ H	Enter data into yellow fields								
0.10 $\mu$ H	Frequency =	800000	Hz	ET <sub>core</sub>	0.76	V-usec			
0.22 $\mu$ H	Output Current =	2	Amps	F <sub>(eff)</sub>	526349.5	Hertz			
0.47 $\mu$ H	Ambient Temp =	25	°C	Res	0.051936	Ohms			
1 $\mu$ H	Volts In =	1.5	Volts	I <sub>core</sub>	3.77	Amps			
	Volts Out =	2.5	Volts	I <sub>case</sub>	3.01	Amps			
	V <sub>DS</sub> =	0.025	Volts	I <sub>temp</sub>	0.76	Amps			
	V <sub>D</sub> =	0.025	Volts	Duty	0.41				
	I <sub>sat</sub> =	3.4	Amps	P <sub>core</sub>	0.012	Watts			
	ET <sub>loss</sub> =	0.27	V-usec	P <sub>cc</sub>	0.097	Watts			
	B <sub>50</sub> =	260.0	G	P <sub>ac</sub>	0.014	Watts			
	A	0.175	Inch	4.13	mm	P <sub>tot</sub>	0.623	Watts	
	B	0.160	Inch	4.13	mm	Temp Coeff	48.1	°C/W	
	C	0.047	Inch	1.13	mm	Temp Rise	30.0	°C	
						Comp Temp	55.0	°C	
Reference Cost	0.9			Compared to IHLP-2629CZ-01					
				Warning Messages		Notes May Be Added Here:			

*Key components for*  
**ROBOTIC APPLIANCES / DOMESTIC ROBOTS**



**THE VISHAY ADVANTAGE**

- Fast Response
- Superior Sensitivity
- Low Self-Weight
- ESD Protection
- Low Switching Loss
- and more....

**Robotic Vacuum Cleaners / Robovacs**



**Robotic Lawn Mowers**



**Companion Robots**





# Robotic Vacuum Cleaners / Robovac



MOSFETs

**Dual N-Channel 40 V (D-S) MOSFET**




[Si7938DP](#)

- TrenchFET® Gen III technology, maximum  $R_{DS(on)}$  5.8 mΩ
- Thermally enhanced PowerPAK® SO-8 packaging

RECTIFIERS

**High-Current Density Surface-Mount Schottky Barrier Rectifier**




[SS10P6-M3/86A](#)

- AEC-Q101 qualified
- Very low profile: typical height of 1.1 mm

OPTOELECTRONICS

**Silicon NPN Phototransistor**




[TEFT4300](#)

- Peak sensitivity of 925 nm with spectral bandwidth from 875 nm to 1000 nm ( $\lambda_{0.5}$ )
- Angle of half sensitivity of  $\pm 30^\circ$ , output current of 3.2 mA at  $E_o = 1 \text{ mW/cm}^2$

OPTOELECTRONICS

**IR Receiver Modules for Remote Control Systems**




[TSOP34438](#)

- Industry leading range of 45 m, directivity of  $\pm 45^\circ$ , and 38 kHz carrier frequency
- Minimum irradiance of 0.08 mW/m<sup>2</sup>, and featuring AGC-4 noise suppression

DIODES

**Surface-Mount TRANSZORB® Transient Voltage Suppressors**




[SMBJ26CA-E3/52](#)

- 600 W peak pulse power capability with a 100/1000  $\mu\text{s}$  waveform
- Available in unidirectional and bidirectional

OPTOELECTRONICS

**High-Speed Infrared-Emitting Diode with Peak Wavelength of 940 nm**




[VSLB3948](#)

- 940 nm emitter in a T-1 clear package with intensity of 65 mW/sr,  $I_F = 100 \text{ mA}$
- Angle of half intensity:  $\phi = \pm 22^\circ$ , and rise and fall time of 15 ns

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

OPTOELECTRONICS

**Optocoupler, Power Phototriac**




[VO2223A](#)

- Optically coupled phototriac driving a power triac in a DIP-8 package
- Load current of 1 A<sub>RMS</sub> and 5300 V of input-to-output isolation

DISPLAYS

**High-Quality Displays Offer Excellent Human-to-Machine Interface Solutions**




[LCD, Color TFT, OLED](#)

- Standard / custom options for LCD, OLED, and color TFT for operator monitoring
- High-brightness options as well as dimable for low-light operation

INDUCTORS

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




[IHLP-6767GZ](#)

- Large size, high-current, low-saturation SMD inductor
- DC/DC conversion, filter applications

OPTOELECTRONICS

**High-Power Infrared-Emitting Diode with Peak Wavelength of 940 nm in a T-1¾ Package**




[TSAL6100](#)

- Typical radiant intensity of 170 mW/sr at  $I_F = 100 \text{ mA}$ , 1450 mW/sr at  $I_F = 1 \text{ mA}$
- Angle of half intensity:  $\phi = \pm 10^\circ$

OPTOELECTRONICS

**Optocoupler, Non-Zero Crossing Phototriac**



[VO3052](#)

- 1500 V/ $\mu\text{s}$  dV/dt minimum, 2000 V/ $\mu\text{s}$  typical, 600 V blocking voltage
- 100 mA on-state output current, and 10 mA trigger current with  $V_{ISO}$  of 5300 V

View datasheets for these products [www.vishay.com/ref/et3cn7a](http://www.vishay.com/ref/et3cn7a)



# Robotic Lawn Mowers



**RECTIFIERS**

**Surface-Mount Glass Passivated Rectifier**

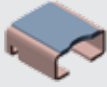


[S1J-E3/61T](#)

- AEC-Q101 qualified
- High forward surge capability

**RESISTORS**

**Power Metal Strip® SMD Resistors, Very High Power (to 7 W), Low Value (to 0.0005 Ω)**




[WSLP2726](#)

- High power rating of 5 W to 7 W in WSLP2726 package
- Very low resistance values from 0.0005 Ω to 0.002 Ω, in 4-terminal package

**DISPLAYS**

**High-Quality Displays Offer Excellent Human-to-Machine Interface Solutions**




[LCD, Color TFT, OLED](#)

- Standard / custom options for LCD, OLED, and color TFT for operator monitoring
- High-brightness options as well as dimmable for low-light operation

**NON-LINEAR RESISTORS**

**SMD 0603, Glass Protected NTC Thermistors**




[NTCS0603](#)

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

**INDUCTORS**

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



[IHLP-5050](#)

- High-current, very low-profile power inductor for DC/DC conversion and filtering
- High-frequency operation up to 5 MHz

**CERAMIC CAPACITORS**

**Ultra-Stable Dielectric, Low Dissipation Factor (DF)**




[MLCC High Q Capacitors](#)

- Non-magnetic available with copper or epoxy bondable termination
- Robust design build with wet process

**ICs**

**Dual 2 A, 1.2 V, Slew Rate Controlled Load Switch**

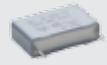


[SiP32416](#)

- Low and flat  $R_{ON}$  over the full operation voltage range of 1.2 V to 5.5 V
- Features 2 ms turn-on rise time, switch-off reverse blocking, and output discharge

**FILM CAPACITORS**

**Interference Suppression Film Capacitor – Class Y2, Radial MKP 300 V<sub>AC</sub>**




[MKP338 6](#)

- RFI Y2 capacitor for bypass applications

**ALUMINUM CAPACITORS**

**Aluminum Capacitors, SMD (Chip), High Temperature, Low Impedance**




[146 CTI](#)

- High temperature to 125 °C, long life, low impedance, high ripple current
- Soldering according JEDEC-J-STD-020

**TVS DIODES**

**Surface-Mount TRANSZORB® Transient Voltage Suppressors**




[P4SMA220A](#)

- Glass passivated chip junction, available as unidirectional and bidirectional
- 400 W peak pulse power capability with a 10/1000 μs waveform, excellent clamping capability

**OPTOELECTRONICS**

**IR Receiver Modules for Remote Control Systems**



[TSOP31230](#)

- Very low supply current, photo detector, and preamplifier in one package
- Internal filter for PCM frequency, supply voltage from 2.5 V to 5.5 V

**MOSFETS**

**N-Channel 40 V (D-S) MOSFET**



[SiR640ADP](#)

- TrenchFET® Gen IV technology for increased power density, maximum  $R_{DS(on)}$  of 2 mΩ
- Thermally enhanced PowerPAK® SO-8 packaging

View datasheets for these products [www.vishay.com/ref/et3cn7b](http://www.vishay.com/ref/et3cn7b)



# Companion Robots



**MOSFETs**

**P-Channel 20 V (D-S) MOSFET**




[Si7655ADN](#)

- Industry leading p-channel Gen III technology, maximum  $R_{DS(on)}$  3.6 m $\Omega$
- Thermally enhanced PowerPAK® 1212-8 is 1/3 the size of an SO-8

**RESISTORS**

**Power Metal Strip® Resistors, Low Value (Down to 0.0005  $\Omega$ ), Surface-Mount**




[WSL](#)

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

**OPTOELECTRONICS**

**Fully Integrated Proximity and Ambient Light Sensor with I<sup>2</sup>C Interface**




[VCNL4020](#)

- Infrared emitter is included in the 4.9 mm x 2.4 mm x 0.83 mm SMD pkg.
- 16-bit resolution, proximity range of up to 20 cm with programmable thresholds

**INDUCTORS**

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




[IHLP-2525](#)

- Compact, high-current power inductor for DC/DC conversion and filter applications
- High-frequency operation up to 5 MHz

**RECTIFIERS**

**High Current Density, Surface-Mount Trench MOS Barrier Schottky Rectifier**




[V10PL45](#)

- Trench MOS Schottky technology
- Very low profile – typical height of 1.1 mm

**RECTIFIERS**

**Surface-Mount Schottky Barrier Rectifiers**

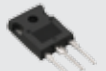


[MSS2P3](#)

- Very low profile: typical height of 0.65 mm
- AEC-Q101 qualified

**MOSFETs**

**E Series 600 V N-Channel Power MOSFET**



[SiHG33N60E](#)

- High-performance E Series, high-voltage technology, maximum  $R_{DS(on)}$  99 m $\Omega$
- Popular TO-247 packaging, maximum continuous current of 33 A

**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

**DIODES**

**4-Line Bus-Port ESD Protection, Flow-Through Design**




[VBUS54ED-FBL](#)

- Compact LLP2510-10L package
- Soldering can be checked by standard vision inspection

**DISPLAYS**

**High-Quality Displays Offer Excellent Human-to-Machine Interface Solutions**




[LCD, Color TFT, OLED](#)

- Standard / custom options for LCD, OLED, and color TFT for operator monitoring
- High-brightness options as well as dimmable for low-light operation

**NON-LINEAR RESISTORS**

**SMD 0603, Glass Protected NTC Thermistors**



[NTCS0603](#)

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

**ICs**

**6 A microBUCK® Integrated FET Buck Regulator with Programmable LDO**

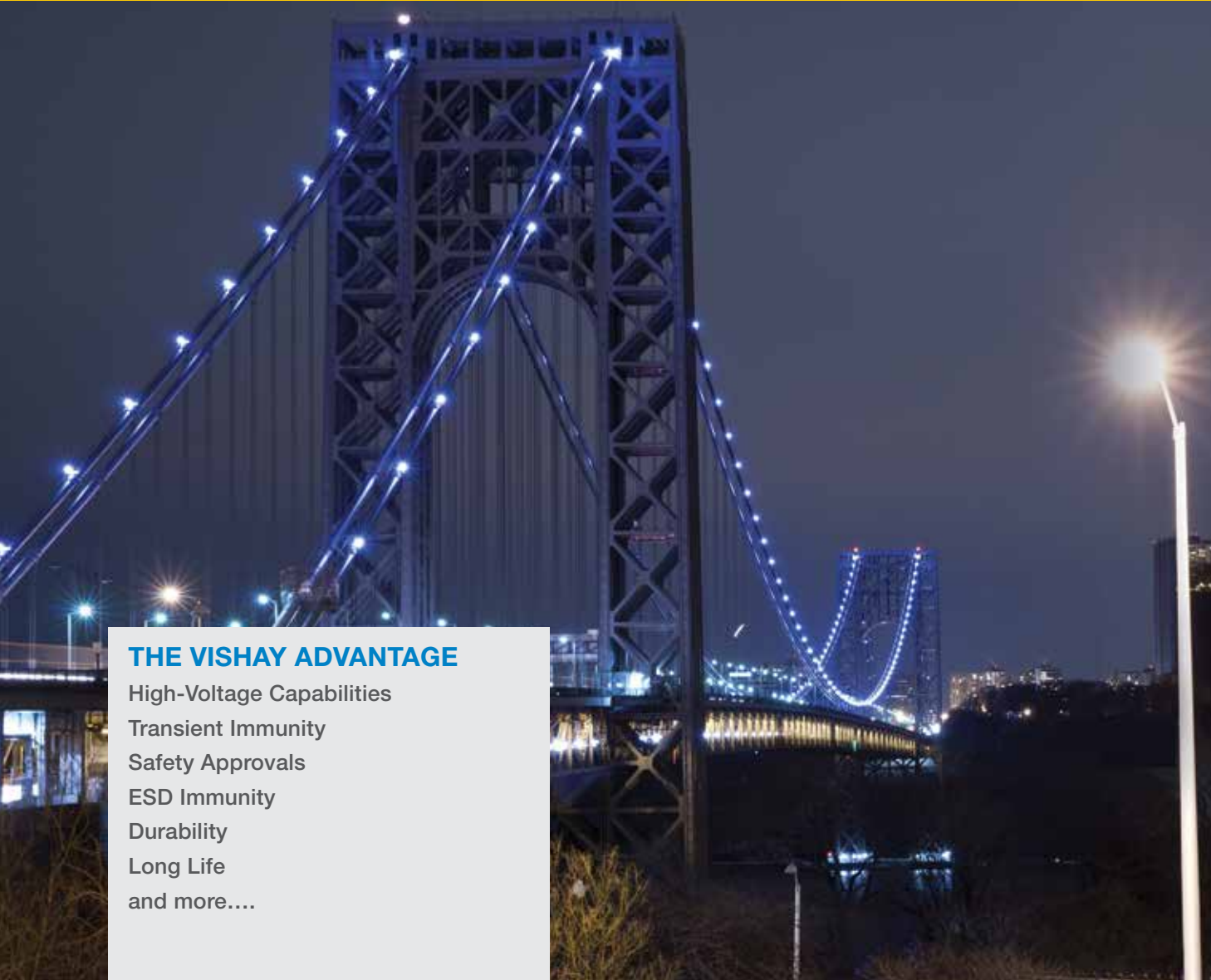


[SiC403A](#)

- Offers a scalable design with 10 A and 15 A parts in the same footprint
- Soft-start, UVP / OVP, OCP, selectable power-saving mode, LDO, PGOOD, OTP

View datasheets for these products [www.vishay.com/ref/et3cn7c](http://www.vishay.com/ref/et3cn7c)

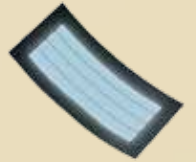
Key components for  
**LIGHTING**



**LED SSD  
Lighting**



**OLED Displays  
for Illumination**



**Conventional  
Lighting Control  
Gear**



**THE VISHAY ADVANTAGE**

- High-Voltage Capabilities
- Transient Immunity
- Safety Approvals
- ESD Immunity
- Durability
- Long Life
- and more....

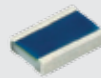


# LED SSD Lighting



### RESISTORS

#### Low-Ohmic Wide Terminal Thin Film Chip Resistors



[NCW 0406 AT](#)

- Power handling up to 300 mW, extreme thermocycling robustness up to 3000 cycles
- Available from 0.33 Ω to 0.91 Ω with TCR of 50 ppm/K and 1 % tolerance

### MOSFETs

#### N-Channel 60 V (D-S) Fast Switching MOSFET



[Si7460DP](#)

- Classic TrenchFET® technology, maximum  $R_{DS(on)}$  9.6 mΩ
- Thermally enhanced PowerPAK® SO-8 packaging

### RECTIFIERS

#### Surface-Mount Trench MOS Barrier Schottky Rectifier



[VSSB420S](#)

- Trench MOS Schottky technology
- Low power losses, high efficiency

### MOSFETs

#### E Series 600 V N-Channel 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

### DIODES

#### Zener Diodes with Surge Current Specification



[BZD27CxxP](#)

- AEC-Q101 qualified
- Zener and surge current specification

### OPTOELECTRONICS

#### High-Brightness LED Power Module



[VLPC1201A2J](#)

- 240 mm x 14 mm metal core based LED power modules assembled with 12 white LEDs
- Luminous flux of 2100 lm, color temperature range from 5000 K to 7000 K

### NON-LINEAR RESISTORS

#### SMD 0603, Glass Protected NTC Thermistors



[NTCS0603E3](#)

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

### OPTOELECTRONICS

#### Optocoupler, Power Phototriac



[VO2223A](#)

- Optically coupled phototriac driving a power triac in a DIP-8 package
- Load current of 1 A<sub>RMS</sub> and 5300 V of input-to-output isolation

### NON-LINEAR RESISTORS

#### NTC Thermistors, Standard Lug Sensors



[NTCALUG03](#)

- Miniature surface temperature sensor
- Low thermal gradient, best in class

### INDUCTORS

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



[IHLP-3232DZ-5A](#)

- High-temperature, high-efficiency power inductor for DC/DC conversion and filtering
- Continuous operation at 155 °C

### CERAMIC CAPACITORS

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



[MLCC SMD Safety Caps](#)

- Surface-mount design: simpler assembly and reduced board space requirement
- Available in NP0 (C0G) or X7R dielectrics

### TANTALUM CAPACITORS

#### Solid Tantalum Surface-Mount Chip Capacitors, TANTAMOUNT®, Standard Industrial Grade



[293D](#)

- Molded tantalum capacitor, standard industrial grade
- General purpose capacitor

View datasheets for these products  
[www.vishay.com/ref/et3cn8a](http://www.vishay.com/ref/et3cn8a)



# OLED Displays for Illumination



### CERAMIC CAPACITORS

**AC Line Rated Disc Capacitors, Class X1, 760 V<sub>AC</sub>, Class Y1, 500 V<sub>AC</sub>**

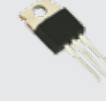


[VY1](#)

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

### MOSFETs

**N-Channel 60 V (D-S) MOSFET**



[SUP90N06-6m0P](#)

- TrenchFET® technology, maximum R<sub>DS(on)</sub> 6 mΩ
- Popular TO-220 packaging

### RECTIFIERS

**Dual High-Voltage Trench MOS Barrier Schottky Rectifier**



[V80100PW](#)

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses

### RESISTORS

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



[WSLx](#)

- 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

### 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, Flex Foil Sensors**



[NTCAFLEX05](#)

- Rapid response time on surface down to 2 s
- Suitable for narrow space applications

### RECTIFIERS

**Schottky Barrier Rectifier**

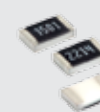


[MBR1060](#)

- Low power loss, high efficiency, low forward voltage drop
- High forward surge capability

### RESISTORS

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



[RCV](#)

- High operating voltage (up to 500 V)
- Metal glaze on high-quality ceramic

### ALUMINUM CAPACITORS

**Aluminum Capacitors SMD (Chip), High Temperature, Low Impedance**



[146 RTI / 146 CTI](#)

- High temperature: 125 °C, long life, low impedance, high ripple current
- SMD: soldering according to JEDEC-J-STD-020

View datasheets for these products  
[www.vishay.com/ref/et3cn8b](http://www.vishay.com/ref/et3cn8b)





# Conventional Lighting Control Gear



RECTIFIERS

**Trench MOS Barrier Schottky Rectifier**



[VT10200C](#)

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses

RESISTORS

**High-Ohmic / High-Voltage Metal Glaze Led Resistors**



[VR25](#)

- Small size (0207), ohmic range 100 kΩ to 22 MΩ
- High continuous voltage of 1600 V, and high pulse loading capability of 7 kV

MOSFETs

**E Series 600 V N-Channel 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

RESISTORS

**Power Metal Film Led Resistors**



[PR01/02/03](#)

- High power (1 W, 2 W, 3 W) in small package, non-flammable lacquer coating
- Various lead forming options

DIODES

**Zener Diodes with Surge Current Specification**



[BZD27CxxP Series](#)

- AEC-Q101 qualified
- Zener and surge current specification

RESISTORS

**Metal Oxide Resistors, Special Purpose, High Voltage**



[ROX](#)

- High voltage (up to 45 kV)
- Wide value range (100 Ω to 3 GΩ)

OPTOELECTRONICS

**Ambient Light Sensor in Miniature 0805 Package with Phototransistor Output**



[TEMT6200FX01](#)

- Wavelength of peak sensitivity of 550 nm; similar to human eye sensitivity
- Excellent linearity over operating temp. range of -40 °C to +100 °C

RESISTORS

**Carbon Film (Metal Alloy) Resistors, Special Purpose, High Voltage**



[HVW](#)

- High voltage (up to 15 kV)
- Wide value range (1 kΩ to 200 MΩ)

FILM CAPACITORS

**Single Metallized AC and Pulse Capacitors, MKP Radial Potted Type**

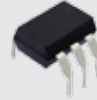


[MKP385](#)

- For pulse and resonant applications
- Low loss dielectric, small dimensions for high density packaging

OPTOELECTRONICS

**Optocoupler, Zero Crossing Phototriac**



[VO4157](#)

- 5000 V/μs dV/dt minimum with 800 V blocking voltage
- 300 mA on-state output current, and 1.6 mA trigger current with  $V_{ISO}$  of 5300 V

NON-LINEAR RESISTORS

**PTC Thermistors for Overload Protection**



[PTCCL...](#)

- Best current-size ratio
- UL recognized

OPTOELECTRONICS

**Optocoupler, Power Phototriac**

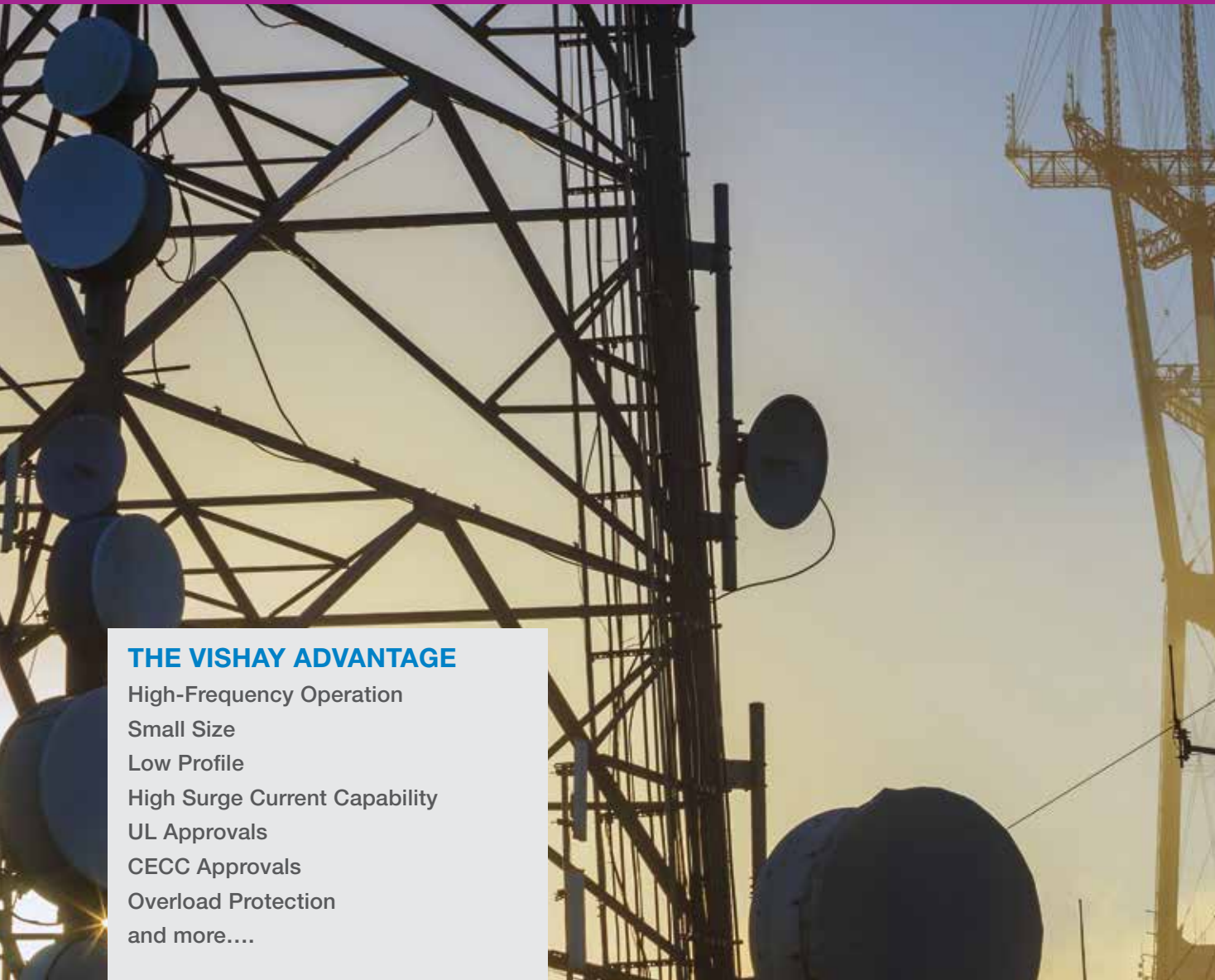


[VO2223A](#)

- Optically coupled phototriac driving a power triac in a DIP-8 package
- Load current of 1 A<sub>RMS</sub> and 5300 V of input to output isolation

View datasheets for these products  
[www.vishay.com/ref/et3cn8c](http://www.vishay.com/ref/et3cn8c)

## Key components for INFRASTRUCTURE



### THE VISHAY ADVANTAGE

- High-Frequency Operation
- Small Size
- Low Profile
- High Surge Current Capability
- UL Approvals
- CECC Approvals
- Overload Protection  
and more....

### Line Cards



### Modems



### Transmitters / Base Stations



### DC/DC Bricks



### AC/DC SMPS





# Line Cards




RESISTORS

**Professional Thin Film Chip Resistors** 

[MC0402](#)

- Excellent stability class 0.5, cost efficient
- CECC approved acc. EN 140401-801, sulfur resistant


NON-LINEAR RESISTORS

**TWIN Vertical SMD PTC Thermistors for Telecom Overload Protection** 

[PTCTI](#)

- Very small footprint, allowing an increased number of lines
- Thermal coupled PTCs for enhanced protection


INDUCTORS

**Wirewound, Surface-Mount Molded Inductors** 

[IMC-1210](#)

- SMD, RF filter inductor
- Vertical bobbin configuration provides low cross talk to nearby components


NON-LINEAR RESISTORS

**NTC Thermistors, SMD 0402, 0603, 0805, and 1206 Chips** 

[NTHS](#)

- Standard series
- Glass protected


RECTIFIERS

**Surface-Mount Trench MOS Barrier Schottky Rectifier** 

[V3P6](#)

- Trench MOS Schottky technology
- AEC-Q101 qualified


INDUCTORS

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

[IHLP-2525CZ](#)

- Compact, high-current power inductor for DC/DC conversion and filtering
- High-frequency energy storage up to 5 MHz


RESISTORS

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

[WSL2512](#)

- Extremely low resistance values from 0.0005 Ω to 0.5 Ω and tolerance of 1 %
- High power of 1 W in 2512 size resistor

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<sub>DC</sub> rating (process code “5H”)


OPTOELECTRONICS

**High-Speed, SPST Normally Open (1 form A), Solid-State Relay in an SOP-4 Package** 

[LH1546AEF](#)

- Isolation test voltage 3750 V<sub>RMS</sub>, load voltage 350 V, DC load current 120 mA
- Can be configured for AC/DC or DC only operation w/clean, bounce-free switching

CERAMIC CAPACITORS

**Robust Design Build with Wet Process** 

[VJ0402Y](#)

- Reliable wet build process and noble metal electrode technology
- Polymer (soft) termination options


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

ICs

**4 A, 4.5 V to 15 V Input, Synchronous Buck Regulator Enables Compact Design** 

[SiP12109](#)

- Current mode constant on time architecture enables fast transient response
- OVP, UVP, OTP, PGOOD, and soft start

View datasheets for these products [www.vishay.com/ref/et3te2a](http://www.vishay.com/ref/et3te2a)





# Modems





CERAMIC CAPACITORS  
**AC Line Rated Disc Capacitors,**   
 Class X1, 760 V<sub>AC</sub>;  
 Class Y1, 500 V<sub>AC</sub>  
[VY1](#)  
 • X1 / Y1 safety rating according to IEC 60384-14, 3rd edition  
 • Highest reliability and lifetime, operating temperature: -40 °C to +125 °C


MOSFETs  
**N-Channel 100 V (D-S) MOSFET**   
[Si4056DY](#)  
 • ThunderFET® technology providing maximum R<sub>DS(on)</sub> of 23 mΩ and low gate charge  
 • Efficient solution in the popular SO-8 package


RECTIFIERS  
**Surface-Mount Trench MOS Barrier Schottky Rectifier**   
[V3P6](#)  
 • Trench MOS Schottky technology  
 • AEC-Q101 qualified


DIODES  
**Surface-Mount TRANSZORB® Transient Voltage Suppressors**   
[SMAJ75A-E3](#)  
 • 400 W peak pulse power capability with a 10/1000 μs waveform  
 • AEC-Q101 qualified


RESISTORS  
**Power Metal Strip® Resistors, Low Value (Down to 0.001 Ω), Surface-Mount**   
[WSL1206](#)  
 • Low TCR element (< 20 ppm/°C) results in accurate current sensing in application  
 • Power Metal Strip construction offers high reliability in critical applications

OPTOELECTRONICS  
**DPST Normally Open Switches (2 form A), Solid-State Relay in a DIP-8 or SMD Package**   
[LH1513xx](#)  
 • Isolation test voltage 5300 V<sub>RMS</sub>, load voltage 200 V, DC load current 140 mA  
 • Can be configured for AC/DC or DC only operation w/clean, bounce-free switching


NON-LINEAR RESISTORS  
**SMD PTC – Nickel Thin Film Linear Thermistors**   
[TFPT0603](#)  
 • Available in R<sub>25</sub> tolerances: ± 0.5 %, ± 1 %  
 • cUL recognized component: File E148885

INDUCTORS  
**Low-Profile, High-Current IHLP® Inductors**   
[IFSC-1515AH](#)  
 • Very small, low-profile power inductor for DC/DC conversion

CERAMIC CAPACITORS  
**Robust Design Build with Wet Process**   
[VJ1812](#)  
 • High breakdown voltage  
 • Polymer (soft) termination options

INDUCTORS  
**Wirewound, Surface-Mount, Molded Inductors**   
[IMC-1812](#)  
 • SMD, RF filter inductor  
 • Vertical bobbin configuration provides low cross talk to nearby components

TANTALUM CAPACITORS  
**Solid Tantalum Surface-Mount Chip Capacitors, TANTAMOUNT®, Molded Case**   
[293D](#)  
 • Molded tantalum capacitor, standard industrial grade  
 • General purpose capacitor

ICs  
**Low Power Consumption, Current Mode Controller**   
[SiP2802DY-T1-E3](#)  
 • Pin-for-pin compatible with UCC280X, enhanced performance UC284X  
 • Advanced architecture enables complete offline and DC/DC designs with few components

View datasheets for these products  
www.vishay.com/ref/et3te2b




# Transmitters / Base Stations



RESISTORS

**Conductive Plastic Motion Transducer KIT**



[LMF](#)

- Electrical stroke can be set up at any length, easy mounting in the base station
- Reduced bulk for fitting in small spaces, flying leads, tighter linearity

MOSFETs

**P-Channel 8 V (D-S) MOSFET**




[SiA427ADJ](#)

- Low on-resistance guaranteed with gate voltages down to 1.2 V
- 2 mm x 2 mm PowerPAK® SC-70 packaging

RESISTORS

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




[WSL](#)

- Low TCR element (< 20 ppm/°C) results in accurate current sensing in application
- Power Metal Strip construction offers high reliability in critical applications

RECTIFIERS

**Dual High-Voltage Trench MOS Barrier Schottky Rectifier**




[VB30100C-E3](#)

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses

DIODES

**Surface-Mount PAR® Transient Voltage Suppressors**



[3KASMCxx](#)

- T<sub>J</sub> = 185 °C capability suitable for high reliability
- 3000 W peak pulse power capability with a 10/1000 μs waveform

MOSFETs

**N-Channel 80 V (D-S) MOSFET**



[SiR880ADP](#)

- ThunderFET® technology providing maximum R<sub>DS(on)</sub> of 6.3 mΩ and low gate charge
- Efficient high-frequency switching in the PowerPAK SO-8 package

RESISTORS

**Thin Film Top-Contact Miniature Wirebondable Resistor**




[MSFM](#)

- 0.015 in x 0.015 in ultra-small form factor with value range from 2.5 Ω to 400 KΩ
- Self-passivating tantalum nitride film well suited for high-moisture environments

OPTOELECTRONICS

**Optocoupler with Phototransistor Output in an SSOP-4, Half Pitch, Mini-Flat Package**



[VO617A](#)

- Low input current I<sub>F</sub> = 5 mA with current transfer ratios of 600 % maximum
- SSOP-4 package provides 5 mm of clearance, isolation test voltage = 3750 V<sub>RMS</sub>

MOSFETs

**E Series 600 V N-Channel Power MOSFET**




[SiHG33N60E](#)

- High-performance E Series, high-voltage technology, maximum R<sub>DS(on)</sub> 99 mΩ
- Popular TO-247 packaging, maximum continuous current of 33 A

TANTALUM CAPACITORS

**vPolyTan™ Polymer Tantalum Capacitors**




[T55 Series](#)

- High-capacitance, low-ESR polymer tantalum capacitors
- Stable electrical performance over temperature and voltage

NON-LINEAR RESISTORS

**For Transient and Overvoltage Protection**




[VDRS10P060TME](#)

- Standard overvoltage surge protector
- UL recognized

INDUCTORS

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



[IHLP-6767GZ](#)

- Very large SMD, high-current power inductor for DC/DC conversion and filtering
- Current handling capacity up to 100 A

View datasheets for these products  
[www.vishay.com/ref/et3te2c](http://www.vishay.com/ref/et3te2c)




# DC/DC Bricks



MOSFETs

**N-Channel 100 V (D-S) MOSFET**




[SiR846ADP](#)

- ThunderFET® technology providing maximum  $R_{DS(on)}$  of 7.8 mΩ and low gate charge
- Efficient high-frequency switching in the PowerPAK® SO-8 package

RESISTORS

**Thick Film Surface-Mount Chip Resistors, Wraparound, Extremely Low Value**




[RCWE0402](#)

- Low resistance values from 0.01 Ω to 0.99 Ω and tolerance of 1 %
- Thick film construction with high power, 2x power capacity

OPTOELECTRONICS

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




[VO14642AAB](#)

- Isolation test voltage 5300 V<sub>RMS</sub>, load voltage 60 V, DC load current 2 A
- Can be configured for AC/DC or DC only operation w/clean, bounce-free switching

RESISTORS

**Professional Thin Film MELF Resistors**




[MMB0207](#)

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

RECTIFIERS

**High Current Density Surface-Mount Trench MOS Barrier Schottky Rectifier**




[V10P10](#)

- Very low profile: typical height of 1.1 mm
- Trench MOS Schottky technology

MOSFETs

**N-Channel 30 V (D-S) MOSFET**




[SiRA02DP](#)

- TrenchFET® Gen IV synchronous rectifier with maximum  $R_{DS} = 2$  mΩ and low gate charge
- Low power losses in the thermally enhanced PowerPAK SO-8 packaging

INDUCTORS

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




[IHLP-2525](#)

- Compact, high-current power inductor for DC/DC conversion and filtering
- High-frequency energy storage up to 5 MHz

TANTALUM CAPACITORS

**vPolyTan™ Polymer Tantalum Capacitors**



[T55 Series](#)

- High-capacitance, low-ESR polymer tantalum capacitors
- Stable electrical performance over temperature and voltage

DIODES

**Small-Signal Zener Diodes, Dual**

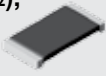


[AZ23-C12](#)

- Dual silicon planar Zener diodes, common anode
- AEC-Q101 qualified

RESISTORS

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




[WSL](#)

- Low TCR element (< 20 ppm/°C) results in accurate current sensing in application
- Power Metal Strip construction offers high reliability in critical applications

CERAMIC CAPACITORS

**Internal Design Reduces Risk of Shorts Caused by Board Flex, High Breakdown Voltage**




[MLCC OMD Capacitors](#)

- Compact, high-current power inductor for DC/DC conversion and filtering
- 100 % voltage conditioning available up to 630 V<sub>DC</sub> rating (process code “5H”)

MOSFETs

**N-Channel 150 V (D-S) MOSFET**



[SiR872ADP](#)

- TrenchFET technology providing maximum  $R_{DS} = 18$  mΩ and low gate charge
- Reducing power loss from conduction and switching simultaneously

View datasheets for these products [www.vishay.com/ref/et3te2d](http://www.vishay.com/ref/et3te2d)



# AC/DC SMPS




RECTIFIERS  
**Hyperfast Rectifier, 8 A FRED Pt®**  
  
[ETH0806-M3](#)  

- 175 °C operating junction temperature
- Hyperfast soft recovery time

MOSFETS  
**N-Channel 30 V (D-S) MOSFET**  
  
[SIRA00DP](#)  

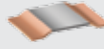
- TrenchFET® Gen IV technology with very low maximum  $R_{DS} = 1 \text{ m}\Omega$  for hotswap and ORing
- Low power losses in the thermally enhanced PowerPAK® SO-8 packaging

RECTIFIERS  
**Hyperfast Rectifier, 6 A FRED Pt**  
  
[6ESH06](#)  


- 175 °C maximum operating junction temperature
- For PFC, CRM / CCM, and snubber operation

RECTIFIERS  
**Dual High-Voltage Trench MOS Barrier Schottky Rectifier**  
  
[V40120C](#)  


- Trench MOS Schottky technology
- Low forward voltage drop, low power losses

RESISTORS  
**Power Metal Strip® SMD Resistors, Very High Power (to 9 W), Low Value (Down to 0.0002  $\Omega$ )**  
  
[WSL3921](#)  


- High power rating of 5 W to 9 W in WSLP3921 package
- Very low resistance values from 0.0002  $\Omega$  to 0.004  $\Omega$ , with tolerance of 1 %

OPTOELECTRONICS  
**Optocoupler with Phototransistor Output with Reinforced, CAT IV Isolation**  
  
[CNY651](#)  

- Reinforced isolation for class I to IV at mains voltage  $\leq 600 \text{ V}$
- Rated recurring peak voltage (repetitive)  $V_{IORM}$  of 1450  $V_{peak}$

OPTOELECTRONICS  
**Optocoupler with Phototransistor Output and Trigger Current of  $I_F = 5 \text{ mA}$**   
  
[VO617A](#)  


- High current transfer ratio, and high isolation voltage of 5300  $V_{RMS}$
- Operating temperature from -55 °C to +110 °C in a DIP-4 or SMD package

FILM CAPACITORS  
**Interference Suppression Film Capacitors, MKP Radial Potted Type**  
  
[MKP339](#)  


- RFI X2 capacitor for standard across-the-line applications

CERAMIC CAPACITORS  
**IEC 60384-14:2005, CAN/CSA/cCSAus, and ANSI/UL CB Certificates**  
  
[MLCC SMD Safety Capacitors](#)  


- Surface-mount design: simpler assembly and reduced board space requirement
- Available in NP0 (C0G) or X7R dielectrics

MOSFETS  
**High-Voltage E Series Power MOSFET**  
  
[SiHG73N60E](#)  

- Low figure of merit (FOM):  $R_{ON} \times Q_g$ , low input capacitance ( $C_{iss}$ )
- Reduced switching and conduction losses

RECTIFIERS  
**High-Performance Schottky Rectifier, 2 x 30 A**  
  
[VS-60CTQ150PbF](#)  

- 175 °C  $T_J$  operation, low forward voltage drop, high-frequency operation
- Guard ring for enhanced ruggedness and long-term reliability

OPTOELECTRONICS  
**Optocoupler with Phototransistor Output and Trigger Current of  $I_F = 1 \text{ mA}$**   
  
[VO618A](#)  

- High current transfer ratio, and high isolation voltage of 5300  $V_{RMS}$
- Operating temperature from -55 °C to +110 °C in a DIP-4 or SMD package

View datasheets for these products  
[www.vishay.com/ref/et3te2e](http://www.vishay.com/ref/et3te2e)

# Spotlight on Solid State Relays



Vishay's solid-state relays (SSRs) deliver fast switching while optically isolating and protecting equipment from damaging external high-voltage spikes. By eliminating the majority of wire bonds found in other SSRs, Vishay's monolithic structure has set the performance standard.

With no moving parts, our SSRs relays are noiseless, bounce-free and reliable, commonly replacing electromechanical relays. Used in industrial, automotive, and communication applications, all of our SSRs feature low power consumption, small packaging, and low turn-on current. Exceeding industry standards, they are approved by VDE, UL, CSA and other safety regulatory agencies.

### FEATURES

- Reliable, long life, no noise, contact bounce or arcing
- Low power consumption at 75 % lower than EMR
- Low capacitance SSRs (3.5 pF)
- High-frequency SSRs (< 50 MHz)

### RESOURCES

- Datasheets: [www.vishay.com/solid-state-relays/](http://www.vishay.com/solid-state-relays/)
- SSR application notes: [www.vishay.com/solid-state-relays/related/#appnot](http://www.vishay.com/solid-state-relays/related/#appnot)
- Optocoupler product portfolio: [www.vishay.com/optocouplers/](http://www.vishay.com/optocouplers/)
- Technical support: [optocoupleranswers@vishay.com](mailto:optocoupleranswers@vishay.com)
- Sales contacts: [www.vishay.com/doc?99914](http://www.vishay.com/doc?99914)

## Product Parameters for Select Solid State Relays

Relay Type	Description		Load Voltage Max. (V)	Load Current Max. Recommended (mA)		On-Resistance Max. at 25 °C (Ω)		Current Limit (mA) Typ. at 25 °C I <sub>F</sub> = 5 mA	Switching Time (msec) Max. at 25 °C I <sub>F</sub> = 5 mA	
	Package	Pins		AC/DC	DC	AC/DC	DC		t <sub>on</sub>	t <sub>off</sub>
LH1546 <sup>(2)</sup>	1 Form A	4	350	120	—	35	—	—	3.0	3.0
V01400AEFTR <sup>(2)</sup>			60	100	—	5	—	—	0.5	0.5
LH1510 <sup>(3)</sup>	1 Form A	6	200	200	350	15	3.75	360	2.0*	2.0*
LH1518			250	155	300	20	5	280 <sup>(4)</sup>	3.0	3.0
LH1500			350	150	250	25	6.25	270	2.0	2.0
LH1540			350	120	250	25	6.25	210	2.0	2.0
LH1546			350	120	—	35	—	200	3.0	3.0
LH1550 <sup>(1)</sup>			350	100	—	50	—	200	3.0	3.0
LH1535			400	120	250	25	6.25	250 <sup>(4)</sup>	2.0	2.0
V014642			60	1000	2000	0.25	0.07	—	0.8*	0.8*
LH1513			2 Form A	8	200	140	—	15	—	360
LH1503	350	110			—	25	—	270	2.5*	2.5*
LH1522	Dual 1 Form A	8	200	140	—	15	—	360	2.0*	2.0*
LH1544 <sup>(1)</sup>			200	40	—	160	—	—	0.5	0.5
LH1505			250	120	—	20	—	200	4.0	4.0
LH1520			350	110	—	25	—	270	2.0	2.0
LH1526			400	100	—	36	—	210	1.0	1.5
LH1532 <sup>(2)</sup>			350	110	—	25	—	210	2.0	2.5
LH1533			350	70	—	50	—	200	3.0	3.0
LH1556 <sup>(2)</sup>			350	120	—	35	—	210	3.0	3.0
V01263	MOSFET Driver	8	15	—	23 μA*	—	—	—	26 μs**	73 μs**
V0M1271T <sup>(2)</sup>	Driver	4	7.8	—	6 μA*	—	—	—	53 μs**	24 μs**

Notes:

\* I<sub>F</sub> = 10 mA

\*\* I<sub>F</sub> = 20 mA

(1) Low capacitance SSR (3.5 pF)

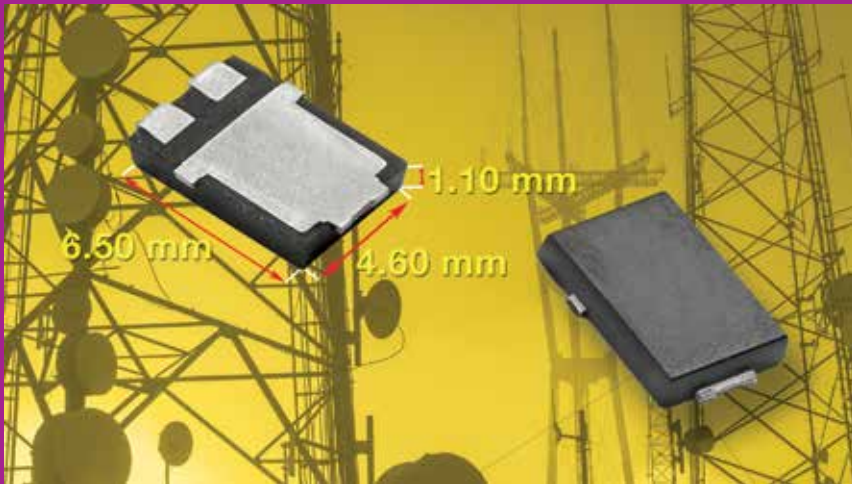
(2) Surface-mount flat-pack available

(3) DC current limit 720 mA

(4) AC only



# Spotlight on FRED Pt<sup>®</sup> 4 A to 10 A Hyperfast and Ultrafast Recovery Rectifiers in Compact SMPC Package for Telecom Applications



With their extremely fast and soft recovery characteristics, low leakage current, and low forward voltage drop, the new Vishay Semiconductors FRED Pt<sup>®</sup> rectifiers reduce switching losses and over-dissipation in telecom applications. With a compact footprint and low profile, the devices' SMPC (TO-277A) package saves significant PCB space compared to standard DPAK packages, while increasing power density to lower overall costs. The rectifiers feature a planar structure and platinum-doped lifetime control to guarantee high overall performance, ruggedness, and reliability characteristics, while their operating junction temperature to +175 °C provides a more robust design.

## KEY BENEFITS

- Compact SMPC (TO-277A) eSMP<sup>®</sup> series package
- Fast recovery time down to 24 ns
- Low leakage current
- Low typical forward voltage drop down to 0.72 V
- RoHS-compliant and halogen-free
- Ideal for automated placement
- Allow for automated optical inspection (AOI) in automotive systems

## APPLICATIONS

- DC/DC converters and power factor correction (PFC)

Part Number	Type	Diode Variation	I <sub>F(AV)</sub> (A)	V <sub>R</sub> (V)	V <sub>F</sub> Typ. (V)	t <sub>tr</sub> Typ. (ns)
VS-4CSH02HM3	Hyperfast	Dual	2 x 2	200	0.75	24
VS-10CSH02-M3	Hyperfast	Dual	2 x 5	200	0.75	25
VS-10CSH02HM3	Hyperfast	Dual	2 x 5	200	0.75	25
VS-4CSH02-M3	Hyperfast	Dual	2 x 2	200	0.75	24
VS-4ESH02-M3	Hyperfast	Single	4	200	0.73	27
VS-4ESH02HM3	Hyperfast	Single	4	200	0.73	27
VS-6CSH02-M3	Hyperfast	Dual	2 x 3	200	0.75	27
VS-6CSH02HM3	Hyperfast	Dual	2 x 3	200	0.75	27
VS-6ESH02-M3	Hyperfast	Single	6	200	0.74	28
VS-6ESH02HM3	Hyperfast	Single	6	200	0.74	28
VS-6ESH06-M3	Hyperfast	Single	6	600	1.05	33
VS-6ESH06HM3	Hyperfast	Single	6	600	1.05	33
VS-6ESU06-M3	Ultrafast	Single	6	600	0.95	42
VS-6ESU06HM3	Ultrafast	Single	6	600	0.95	42
VS-8CSH02-M3	Hyperfast	Dual	2 x 4	200	0.72	25
VS-8CSH02HM3	Hyperfast	Dual	2 x 4	200	0.72	25
VS-10CSH01-M3	Hyperfast	Dual	2 x 5	100	0.75	25
VS-10CSH01HM3	Hyperfast	Dual	2 x 5	100	0.75	25
VS-4CSH01-M3	Hyperfast	Dual	2 x 2	100	0.75	24
VS-4CSH01HM3	Hyperfast	Dual	2 x 2	100	0.75	24
VS-4ESH01-M3	Hyperfast	Single	4	100	0.73	27
VS-4ESH01HM3	Hyperfast	Single	4	100	0.73	27
VS-6CSH01-M3	Hyperfast	Dual	2 x 3	100	0.75	27
VS-6CSH01HM3	Hyperfast	Dual	2 x 3	100	0.75	27
VS-6ESH01-M3	Hyperfast	Single	6	100	0.74	28
VS-6ESH01HM3	Hyperfast	Single	6	100	0.74	28
VS-8CSH01-M3	Hyperfast	Dual	2 x 4	100	0.72	25

## RESOURCES

- For technical questions contact: [Rectifiers@vishay.com](mailto:Rectifiers@vishay.com)







Vishay Intertechnology, Inc.



A *WORLD OF*  
*SOLUTIONS*