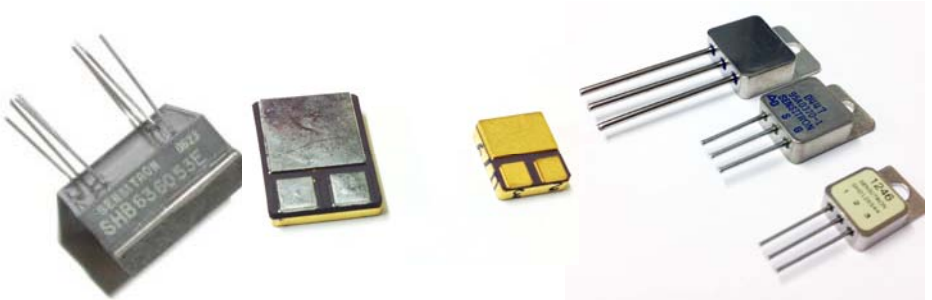


# **SENSITRON** **SEMICONDUCTOR**

*Powered by Sensitron*



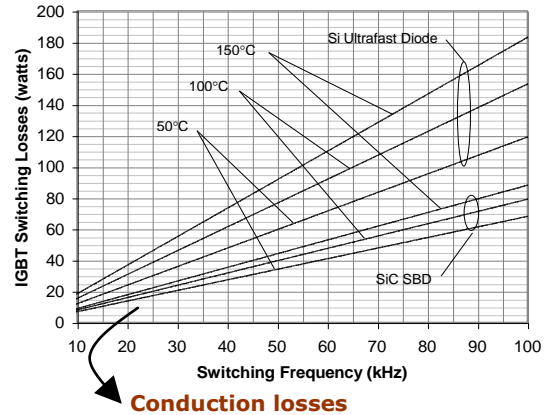
## **Silicon Carbide (SiC) Products** **Power MOSFETs** **Schottky Rectifier Discretes** **Schottky Rectifier Bridges**

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133-0214

## Silicon Carbide Schottky Rectifier Discretes & Bridges

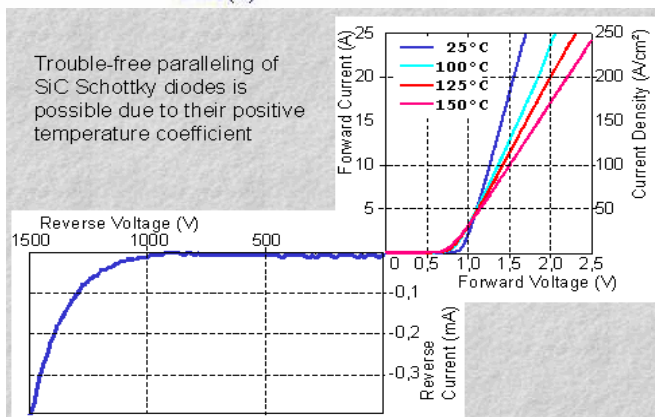
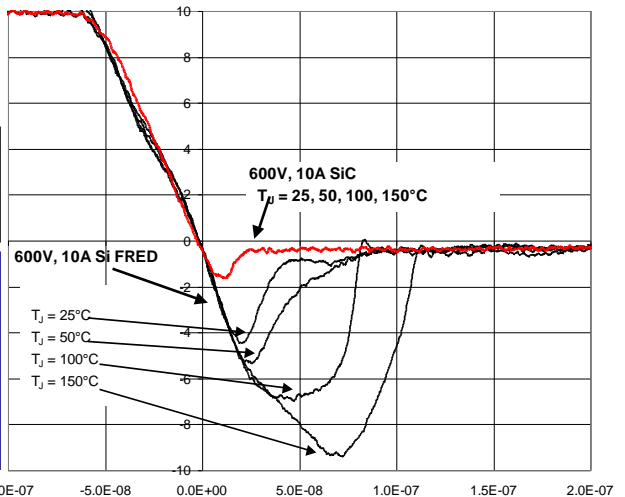
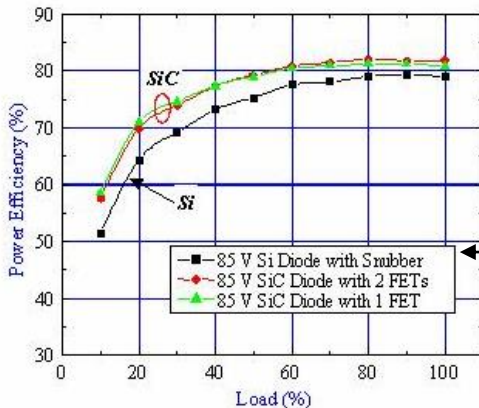
### Features/Benefits:

- Essentially zero forward and reverse recovery
- Temperature independent switching behavior
- Positive temperature coefficient of  $V_F$
- Easily paralleled for higher current
- Electrical breakdown field 10x more than Si & GaAs
- Thermal conductivity over 3x that of Si & almost 10x GaAs
- 3x Bandgap of silicon
- Can operate at temperatures up to 300°C and frequencies in excess of 1MHz
- Smaller, lighter, more reliable
- Available screened to Mil-PRF-19500, TX, TXV or S-level
- Custom high voltage bridges are also available



Ic = 20A, Vcc = 500V, Rg = 10 ohm				
Parameter	Units	Si Pin	SiC	% Reduction
Peak reverse current	Ipr (A)	23	4	83%
Reverse recovery time	Trr (nS)	100	33	67%
Recovery charge	Qrr (nC)	1220	82	93%
Diode loss turn-off	Eoff Diode (mJ)	0.23	0.02	91%
Diode loss total	Ets Diode (mJ)	0.26	0.05	81%
IGBT loss turn-on	Eon IGBT (mJ)	0.94	0.24	74%
IGBT loss total	Ets IGBT (mJ)	1.83	0.88	52%

SiC Schottky diodes saved 8W at 10KHz.  
SiC Schottky diodes saved 80W at 100KHz.  
**The higher the switching frequency, the more apparent the SiC advantages.**



SiC Schottky diode switching characteristics are unaffected by temperature, di/dt or forward current; all of which **increase reverse recovery current in silicon diodes.**

**Conclusion:** Due to the lack of recovery charge, Schottky Diodes in SiC technology make very high pulse frequencies possible. Switching losses in the diode are negligible, and turn-on switching losses in a related switch become dramatically reduced. The soft switching characteristics guarantee good EMC behavior.

## Silicon Carbide Power MOSFETs

Part Number	PIV	Max DC Output Current	Operating Temperature (° C)	Package Type
SHD619532	1200V	23A	-55 to +150	LCC-3P
SHD626532	1200V	20A	-55 to +150	TO-257
SHDC626822	1200V	22A	-55 to +150	TO-257
SHDC625822	1200V	31A	-55 to +150	TO-254
SHDC625812	1200V	31A	-55 to +150	TO-257

## Silicon Carbide Schottky Rectifier Discretes

Part Number	PIV (V)	Max DC Output Current	Operating Temperature(° C) <sup>1</sup>	Package Type
SHD626160/P/N/D*	300V	20A/ 40A/ 40A/ 20A	-55 to +175	TO-257
SHD625160/P/N/D*	300V	20A/ 40A/ 40A/ 20A	-55 to +175	TO-254
SHD626051/P/N/D*	600V	10A/ 20A/ 20A/ 10A	-55 to +200	TO-257
SHD620051/P	600V	10A	-55 to +200	LCC-5
SHD625061/D/N/P*	600V	20A /40A/ 40A/ 10A	-55 to +200	TO-254
SHD620031 / P	600V	4A /8A	-55 to +200	LCC-5
SHD626031/P/N/D*	600V	4A /8A /8A /4A	-55 to +200	TO-257
SHD625051/P/N/D*	600V	10A /20A/ 20A /10A	-55 to +200	TO-254
SHD687182	1200V	2A	-55 to +200	SMD 0.2
SHD620052/P	1200V	5A/10A	-55 to +200	LCC-5
SHD619052/P	1200V	5A/10A	-55 to +200	LCC-3P
SHD625052/P*	1200V	5A/10A	-55 to +200	TO-254
SHD620112/P	1200V	10A/20A	-55 to +200	LCC-5
SHD619112/P	1200V	10A/20A	-55 to +200	LCC-3P
SHDC624112/P/N/D*	1200V	10A/20A/ 20A/ 10A	-55 to +200	TO-258
SHDC626112/P/N/D*	1200V	20A/ 40A/ 20A/ 40A	-55 to +200	TO-257
SHDC624122/P/N/D*	1200V	20A/ 40A/ 20A/ 40A	-55 to +200	TO-258
SHDC626052/P/N/D*	1200V	5A/ 10A/ 10A/ 5A	-55 to +200	TO-257
SHDC624172/P/N/D*	1200V	50A/100A/ 100A/ 50A	-55 to +200	TO-258
SHD619112/P	1200V	10A/ 20A	-55 to +200	LCC-3P
SHDC626182/P/N/D*	1200V	2A/ 4A/ 4A/ 2A	-55 to +175	TO-257
SHD625112/D/N/P*	1200V	10A/ 20A/ 20A/ 10A	-55 to +200	TO-254

\*TO-254, TO-257, and TO-258 packages, high frequency option and ceramic seal options are available.

High Frequency Option: Non-magnetic Gildcop leads are available for improved performance at high frequency; use part number prefix SHDG to order.

Ceramic Seal Option: For ceramic seals, use part number prefix SHDC to order

## Silicon Carbide Schottky Rectifier Bridges

Part Number	PIV (V)	Max DC Output Current	Operating Temperature (° C) <sup>1</sup>	Package Type
SHB601031E	600V	8A	-55 to +200	TO-258
SHD601051E	600V	14A	-55 to +200	TO-258
SHB601052FP/N	1200V	5A	-55 to +200	TO-258
SHB601052G	1200V	5A	-55 to +200	TO-258
SHB601052E	1200V	10A	-55 to +200	TO-258
SHB601112E	1200V	10A	-55 to +200	TO-258
SHB681123E	2500V	20A	-55 to +200	SCB-2

Note1: SiC semiconductors will handle at or above this operating and storage temperature. However, extended operational use of the packaged device above 175°C may reduce its future performance. All qualification testing and screening per MIL-PRF-19500 will only be performed to 175C.



**Applications**  
**High Temperature, High Current Environments**  
**AC DC Conversion**  
**Radar and Communications**  
**Continuous Current Mode Applications**  
**Space (Laser and Satellites)**  
**Down Hole Applications**

**SENSITRON SEMICONDUCTOR**

Part Number:

Product Type:

**PRODUCT HIGHLIGHT:**  
**RF AMPLIFIERS, LIMITERS & POWER DIVIDERS**

Sensitron has added RF devices to our high reliability product portfolio. The RF Broadband Low Noise Amplifiers and Ultra Flat Gain High Linearity Amplifiers form a core product [more...](#)

**SPECIALISTS in SYSTEM DESIGN INTEGRATION**

Sensitron is a leading manufacturer of high reliability power electronic solutions. Markets served include the complete spectrum of high reliability markets including space, aerospace, and defense.

**Discrete Diodes and Die Products**

JANS, JANTX/V, JAN, Diodes, Zener Diodes, TVS Diodes, Power Rectifier Diodes, Schottky Diodes, Small Signal Switching Diodes, Space Level Diodes, Zener Die, TVS Die, Schottky Rectifier Die, [more...](#)

**Motor Controllers and Drivers**

Fully Integrated Motor Controllers with Ethernet, CAN, Discrete or Analog Controls, MOSFET and IGBT Drivers, Three-Phase Brushless DC Motor Control, Field Oriented Controller, [more...](#)

**In The News:**

**November 2013**-Sensitron now offers a high pulse power SAE J1113-11 compliant Transorb for 12Vdc systems. The SAE-5282-12 features [more...](#)

**March 2013**-Sensitron introduces a lightweight (20oz) all-in-one digital motor controller, EMI filter and heatsink, available in [more...](#)

**Power Rectification**

Schottky Rectifiers, Discrete Power Rectifier Diodes, SiC Schottky Rectifiers and Bridges, Three Phase Bridge Rectifier Assemblies, Primary Power Generation [more...](#)

**Solid State Power Management**

Multi-Channel Solid State Power Controller boards, Remote Power Controllers, High Current / High Voltage Modules, Solid State Power Controller Modules, Solid State Relays [more...](#)

**New Product:**

**SENSITRON SEMICONDUCTOR IS A CERTIFIED JANS FACILITY**

Sensitron has received qualification for various JANS, JANTX/V, JAN QPL Diodes, per MIL-PRF-19500 slash sheets including /228, /286, /359, [more...](#)

Visit online at: [www.sensitron.com](http://www.sensitron.com)