

# **SENSITRON**

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## **SEMICONDUCTOR**



# **Silicon Carbide Schottky Rectifiers and Bridges**

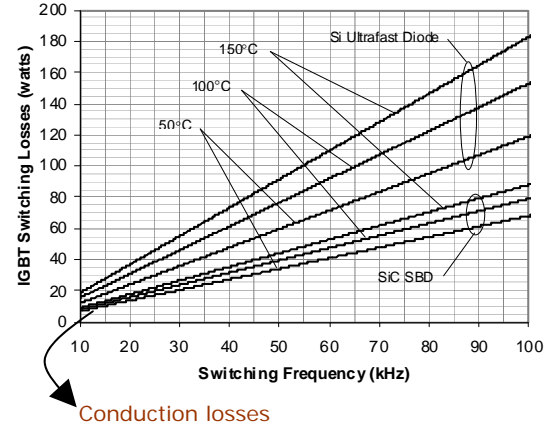
# Silicon Carbide Schottky Rectifiers

Sensitron

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## Features/Benefits:

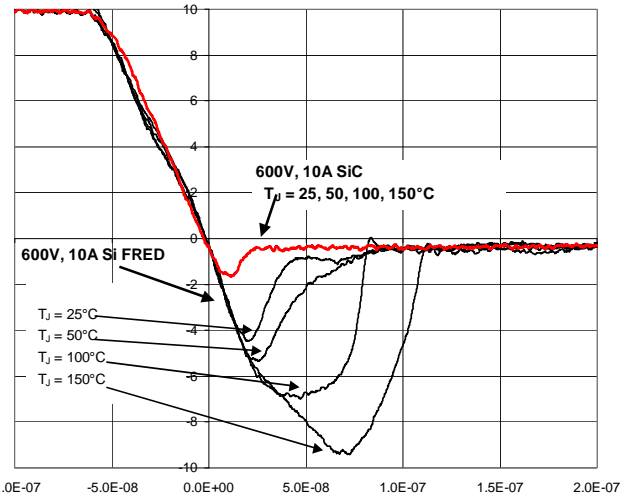
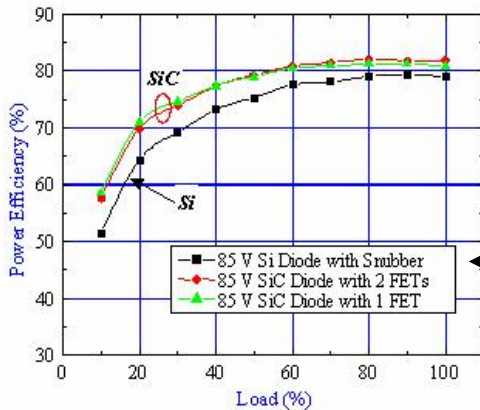
- Essentially zero forward and reverse recovery
- Temperature independent switching behavior
- Positive temperature coefficient of  $V_F$
- Easily paralleled for higher current
- Electrical breakdown field 10x more than Si & GaAs
- Thermal conductivity over 3x that of Si & almost 10x GaAs
- 3x Bandgap 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



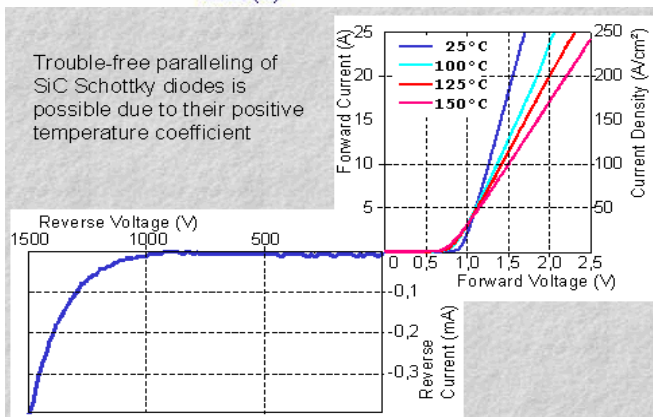
$I_c = 20A, V_{cc} = 500V, R_g = 10 \text{ ohm}$

Parameter	Units	Si Pin	SiC	% Reduction
Peak reverse current	$I_{pr}$ (A)	23	4	83%
Reverse recovery time	$T_{rr}$ (nS)	100	33	67%
Recovery charge	$Q_{rr}$ (nC)	1220	82	93%
Diode loss turn-off	$E_{off}$ Diode (mJ)	0.23	0.02	91%
Diode loss total	$E_{ts}$ Diode (mJ)	0.26	0.05	81%
IGBT loss turn-on	$E_{on}$ IGBT (mJ)	0.94	0.24	74%
IGBT loss total	$E_{ts}$ 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.

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## SiC Schottky Rectifier Discretes

Part Number	PIV	Max DC Output Current	Operating Temperature*	Package Type
	Volts	Amps	°C	
SHD626051/P/N/D	600	10A/ 20A/ 20A/ 10A	-55 to +200	TO-257
SHD620051/P	600	10A	-55 to +200	LCC-5
SHD625061/D/N/P	600	20A /40A	-55 to +200	TO-254
SHD620031 / P	600	4A /8A	-55 to +200	LCC-5
SHD626031/P /N /D	600	4A /8A /8A /4A	-55 to +200	TO-257
SHD625051/P /N /D	600	10A /20A/ 20A /10A	-55 to +200	TO-254
SHD620052/P	1200	5A/10A	-55 to +200	LCC-5
SHD620112/P	1200	10A/20A	-55 to +200	LCC-5
SHD619052/P	1200	5A/10A	-55 to +200	LCC-3P
SHDC626112/P/N/D	1200	20A/ 40A/ 20A/ 40A	-55 to +200	TO-257
SHDC624122/P/N/D	1200	20A/ 40A/ 20A/ 40A	-55 to +200	TO-258
SHDC626052/P/N/D	1200	5A/ 10A/ 10A/ 5A	-55 to +200	TO-257
SHD619112/P	1200	10A / 20A	-55 to +200	LCC-3P

## New! SiC Schottky Rectifier Bridges

Part Number	PIV	Max DC Output Current	Operating Temperature *	Package Type
	Volts	Amps	°C	
SHB601051E	600	20A	-55 to +200	TO-258
SHB601051E	600	8A	-55 to +200	TO-258
SHD601031E	600	8A	-55 to +200	TO-258
SHB601052FP/N	1200	5A	-55 to +200	TO-258
SHB601052G	1200	5A	-55 to +200	TO-258
SHB601052E	1200	10A	-55 to +200	TO-258
SHB645052E	1200	10A	-55 to +200	TO-257
SHB601112E	1200	10A	-55 to +200	TO-258
SHB681123E	2500	20A	-55 to +200	SCB-1
SHB636053E	2500	5A	-55 to +200	SCB-2

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

Sensitron • 221 West Industry Court • Deer Park, NY 11729-4681 •  
 Phone (631) 586 7600 • Fax (631) 242 9798 • World Wide Web - [www.sensitron.com](http://www.sensitron.com) • E-mail - [sales@sensitron.com](mailto:sales@sensitron.com)

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**Down Hole Applications**

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 Product Type:

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**Sensitron**  
**221 West Industry Court**  
**Deer Park, NY 11729-4681**  
**Phone: (631) 586-7600**  
**Fax: (631) 242-9798**  
**sales@sensitron.com**  
**www.sensitron.com**