

Silicon Carbide Schottky Rectifiers

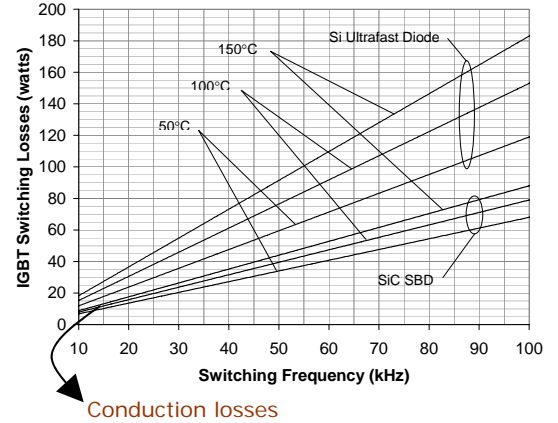
Silicon Carbide Schottky Rectifiers

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www.sensitron.com/sic.htm

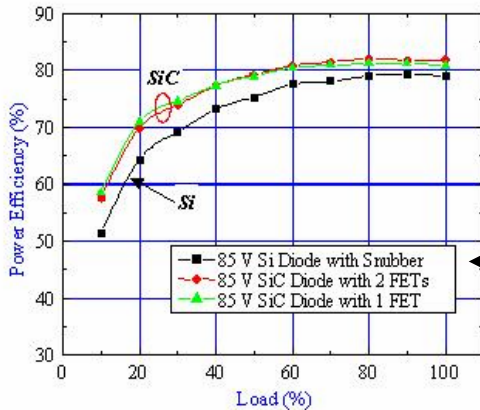
Features/Benefits:

- 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



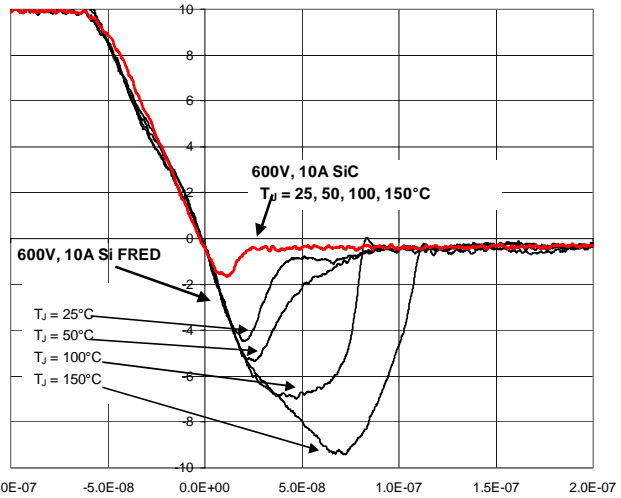
Ic = 20A, Vcc = 500V, Rg = 10 ohm				
Parameter	Units	Si Pin	SiC	% Reduction
Peak reverse current	Ipr (A)	23	4	83%
Reverse recovery time	Trr (nS)	100	33	67%
Recovery charge	Qrr (nC)	1220	82	93%
Diode loss turn-off	Eoff Diode (mJ)	0.23	0.02	91%
Diode loss total	Ets Diode (mJ)	0.26	0.05	81%
IGBT loss turn-on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

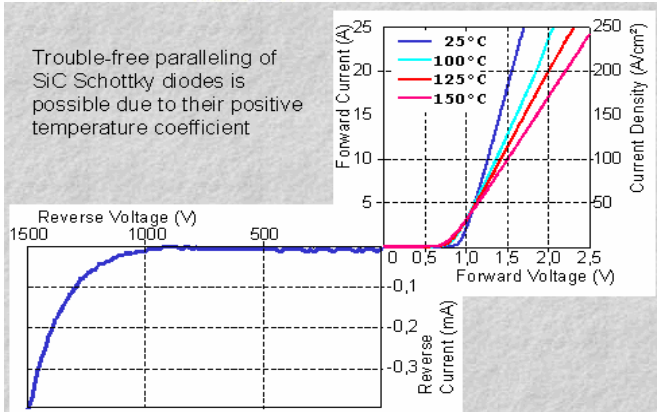


By using SiC Schottky diodes, **inverter losses are cut up to 30+ %**

Efficiency is improved due to the reduction in switching losses allowing the boost switch to operate at lower temperature.



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



Trouble-free paralleling of SiC Schottky diodes is possible due to their positive temperature coefficient

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	
SHD626150/D/N/P	300	10A /10A /20A /20A	-55 to +175	TO-257
SHD626160/D/N/P	300	20A /20A /40A /40A	-55 to +175	TO-257
SHD620150/P	300	10A /20A	-55 to +175	LCC-5
SHD626051/P/N/D	600	10A/ 20A/ 20A/ 10A	-55 to +175	TO-257
SHD620051	600	10A	-55 to +175	LCC-5
SHD625061/D/N/P	600	20A /40A	-55 to +175	TO-254
SHD620031 / P	600	4A /8A	-55 to +175	LCC-5
SHD626031/P /N /D	600	4A /8A /8A /4A	-55 to +175	TO-257
SHD625051/P /N /D	600	10A /20A/ 20A /10A	-55 to +175	TO-254
SHD620052	1200	5A	-55 to +175	LCC-5
SHD620112	1200	10A	-55 to +175	LCC-5
SHD619052/P	1200	5A/10A	-55 to +175	LCC-3P
SHDC626112/P/N/D	1200	20A/ 40A/ 20A/ 40A	-55 to +175	TO-257
SHDC624122/P/N/D	1200	20A/ 40A/ 20A/ 40A	-55 to +175	TO-258
SHDC626052/P/N/D	1200	5A/ 10A/ 10A/ 5A	-55 to +175	TO-257

New! SiC Schottky Rectifier Bridges

Part Number	PIV	Max DC Output Current	Operating Temperature	Package Type	Type
	Volts	Amps	°C		
SHB601051E	600	20A	-55 to +175	TO-258 (modified)	Single Phase Full Wave
SHB601051E	600	8A	-55 to +175	TO-258 (modified)	Single Phase Full Wave
SHB601052FP/N	1200	5A	-55 to +175	TO-258 (modified)	3 Phase Half Wave
SHB601052G	1200	5A	-55 to +175	TO-258 (modified)	3 Phase Full Wave
SHB601052E	1200	10A	-55 to +175	TO-258 (modified)	Single Phase Full Wave
SHB601112E	1200	10A	-55 to +200	TO-258 (modified)	Single Phase Full Wave
SHB681123E	2500	20A	-55 to +150	SCB-1	High Voltage Single Phase Full Wave
SHB636053E	2500	5A	-55 to +175	SCB-2	High Voltage Single Phase Full Wave

Applications

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April 2008- Sensitron offers **Three Phase Fully Integrated** Torque Motor Controllers from 40V to 600V and 5A to 60A. Evaluation boards are available for these units [more...](#)

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