

Silicon Carbide Power Schottky Diode

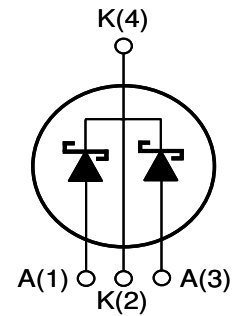
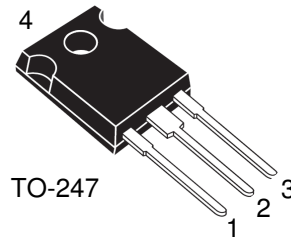
Features:

- Positive Temperature Coefficient for Ease of Paralleling
- Temperature Independent Switching Behavior
- 175 °C Maximum Operating Temperature
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage

Product Summary		
V_{DC}	1200	V
I_F	20	A
Q_c	129	nC

Applications:

- Solar Inverter
- SMPS
- Power Factor Correction
- Induction Heating
- UPS
- Motor Drive



Internal Schematic

MAXIMUM RATINGS, at $T_j = 25\text{ C}$ unless otherwise stated

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}		1200	V
DC Blocking Voltage	V_{DC}		1200	
Continuous Forward Current (Per Leg / Per Device)	I_F	$T_C < 145\text{ °C}$	10 / 20	A
		$T_C < 100\text{ °C}$	18 / 36	
Repetitive Peak Forward Current	$I_{F, RM}$	$T_j = 125\text{ °C}, D = 0.1$	46 / 92	
Surge Non-Repetitive Forward Current, Half Sine Wave (Per Leg / Per Device)	$I_{F, SM}$	$T_C = 25\text{ °C}, t_p = 10\text{ ms}$	45 / 90	
Non-Repetitive Peak Forward Current (Per Leg / Per Device)	$I_{F, max}$	$T_C = 25\text{ °C}, t_p = 10\text{ us}$	225 / 450	
Power Dissipation (Per Leg / Per Device)	P_D	$T_C = 25\text{ °C}$	136 / 272	W
Operating and Storage Temperature	$T_j, T_{j, stg}$		-55 to +175	°C

THERMAL CHARACTERISTICS (Per Leg)

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Thermal Resistance, junction-case	$R_{th,JC}$		-	1.18	-	°C / W
Thermal Resistance, junction-ambient	$R_{th,JA}$		-	62	-	

ELECTRICAL CHARACTERISTICS (Per Leg), at $T_j = 25\text{ C}$ unless otherwise stated

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Forward Voltage	V_F	$I_F = 10\text{ A}, T_j = 25\text{ °C}$	-	1.6	1.8	V
		$I_F = 10\text{ A}, T_j = 175\text{ °C}$	-	2.4	2.9	
Reverse Current	I_R	$V_R = 1200\text{ V}, T_j = 25\text{ °C}$	-	10	100	uA
		$V_R = 1200\text{ V}, T_j = 175\text{ °C}$	-	200	-	
Total Capacitive Charge	Q_C	$V_R = 1200\text{ V}, I_F = 10\text{ A}, di/dt = 500\text{A/us}$	-	64	-	nC
Total Capacitance	C	$V_R = 0\text{ V}, f = 100\text{kHz}$	-	1137	-	pF
		$V_R = 300\text{ V}, f = 100\text{kHz}$	-	42	-	
		$V_R = 600\text{ V}, f = 100\text{kHz}$	-	35	-	

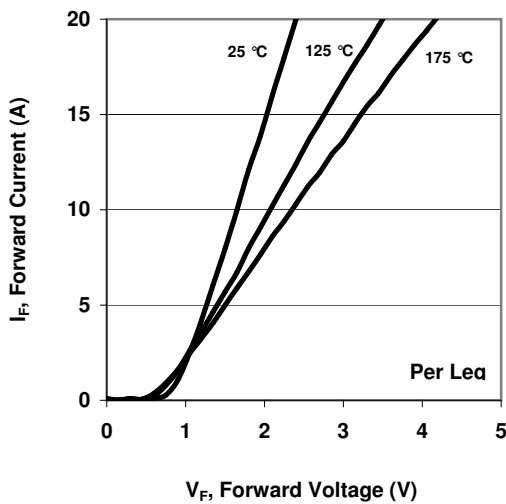


Figure 1. Typ. Forward Characteristics
 $I_F = f(V_F)$; parameter: T_j

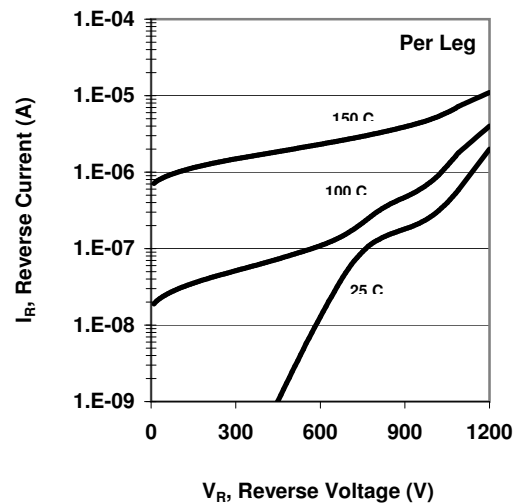


Figure 2. Typ. Reverse Characteristics
 $I_R = f(V_R)$

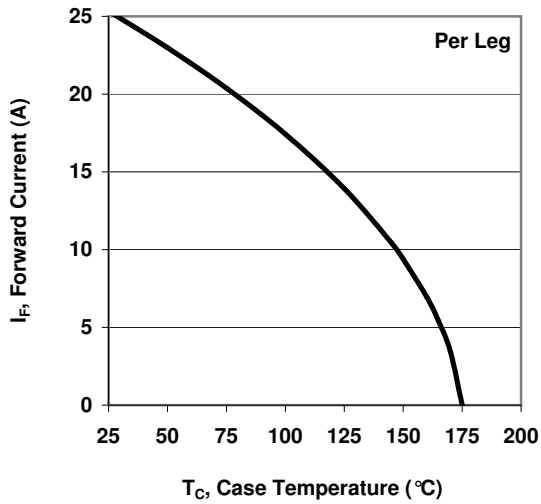


Figure 3. Diode Forward Current
 $I_F = f(T_C); T_j < 175\text{ }^\circ\text{C}; R_{th,JC(max)}$

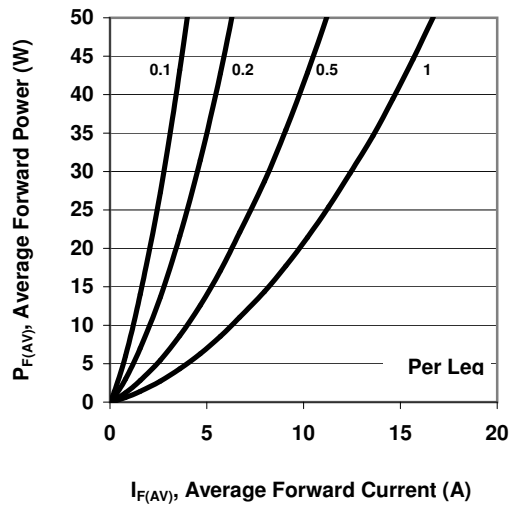


Figure 4. Typ. Forward Power Dissipation vs. Average Forward Current
 $P_F = f(I_F); T_C = 100\text{ }^\circ\text{C}; \text{parameter: } D = t_P/T$

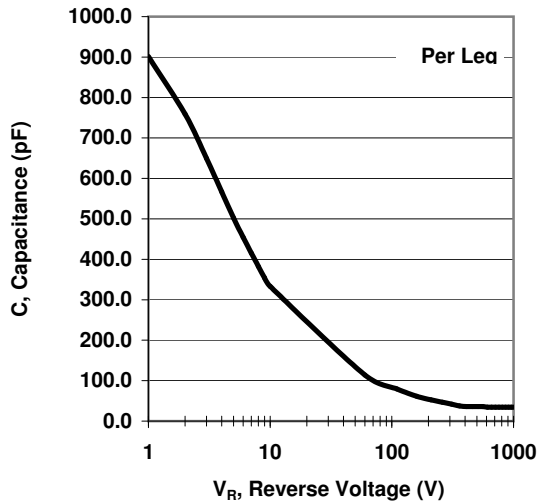


Figure 5. Typ. Capacitance vs. Reverse Voltage
 $C = f(V_R); T_C = 25\text{ }^\circ\text{C}; f = 1\text{ MHz}$

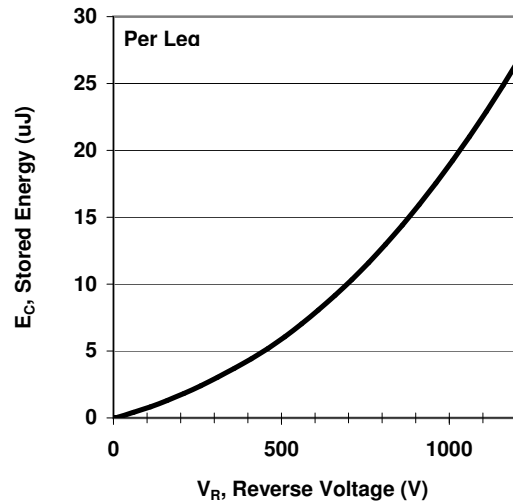


Figure 6. Typical Stored Energy vs. Reverse Voltage
 $E_C = f(V_R)$

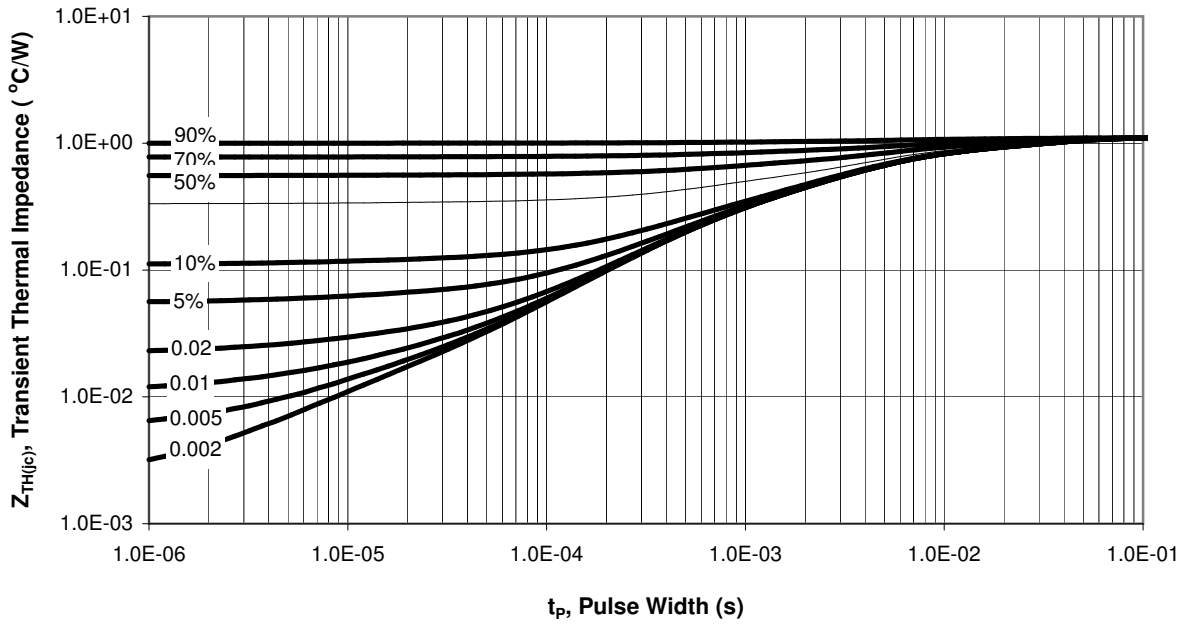


Figure 7. Transient Thermal Impedance
 $Z_{th(jc)} = f(t_p)$; parameter: Duty Ratio

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