

Silicon Carbide Power Schottky Diode

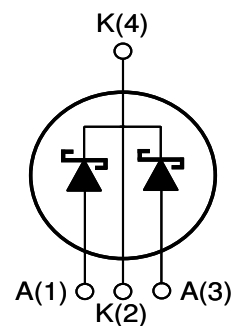
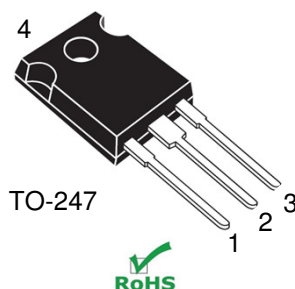
Features:

- 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	80	nC

Applications:

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



Internal Schematic

MAXIMUM RATINGS

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	$T_j = 25\text{ °C}$	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
		$T_C < 100\text{ °C}$	17 / 34	
Peak Repetitive Forward Current	I_{FRM}	$T_C = 125\text{ °C}, D = 0.1$	47 / 94	
Non-Repetitive Forward Surge Current (Per Leg / Per Device)	I_{FSM}	$T_C = 25\text{ °C}, t_p = 10\text{ ms}$	45 / 90	
		$T_C = 25\text{ °C}, t_p = 10\text{ us}$	225 / 450	
Power Dissipation (Per Leg / Per Device)	P_{TOT}	$T_C = 25\text{ °C}$	125 / 250	W
Operating and Storage Temperature	T_j, T_{stg}		-55 to +175	°C

THERMAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Thermal Resistance, junction-case	R_{thJC}	Per Leg	-	1.2	-	$^{\circ}\text{C} / \text{W}$
		Both Legs		0.6		
Thermal Resistance, junction-ambient	R_{thJA}		-	62	-	

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

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Forward Voltage	V_F	$I_F = 10\text{ A}, T_j = 25^{\circ}\text{C}$	-	1.6	1.8	V
		$I_F = 10\text{ A}, T_j = 175^{\circ}\text{C}$	-	2.4	2.9	
Reverse Current	I_R	$V_R = 1200\text{ V}, T_j = 25^{\circ}\text{C}$	-	10	100	μA
		$V_R = 1200\text{ V}, T_j = 175^{\circ}\text{C}$	-	200	-	
Total Capacitive Charge	Q_C	$V_R = 400\text{ V}, I_F = 10\text{ A}, di/dt = 500\text{ A/us}$	-	40	-	nC
Total Capacitance	C	$V_R = 1\text{ V}, f = 100\text{ kHz}$	-	1153	-	pF
		$V_R = 300\text{ V}, f = 100\text{ kHz}$	-	48	-	
		$V_R = 600\text{ V}, f = 100\text{ kHz}$	-	33	-	

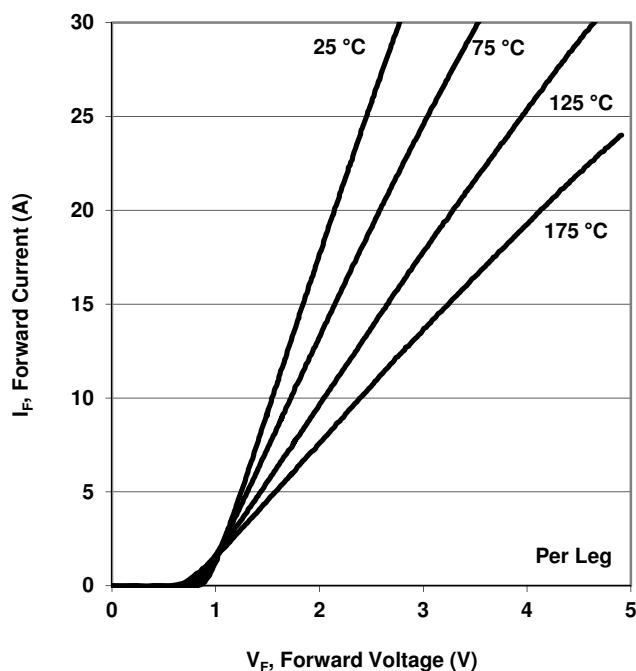


Figure 1. Typ. Forward Characteristics
 $I_F = f(V_F)$; parameter: T_j

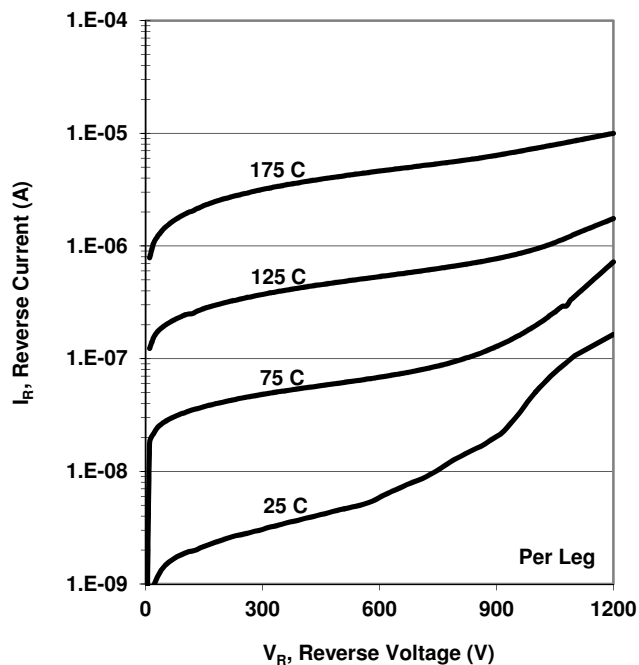


Figure 2. Typ. Reverse Characteristics
 $I_R = f(V_R)$

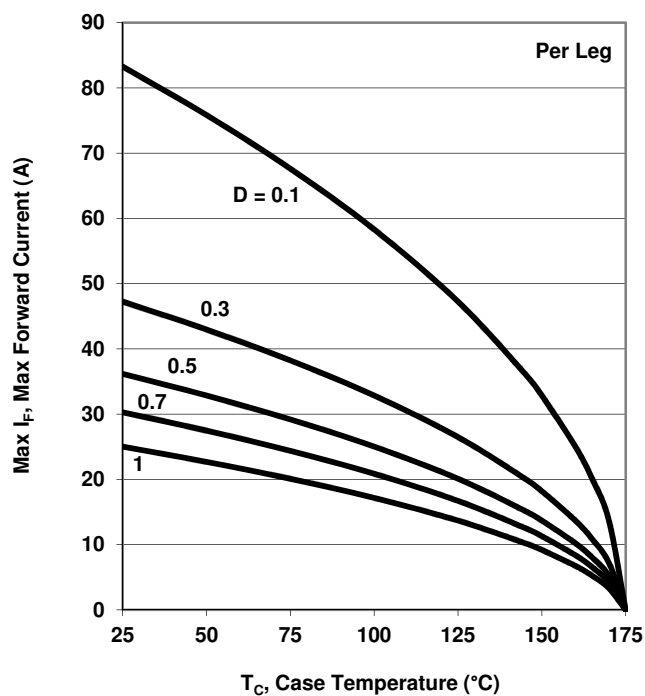


Figure 3. Max Forward Current
 $I_F = f(T_C)$; $T_j = 175^{\circ}\text{C}$; $R_{th,JC(max)}$

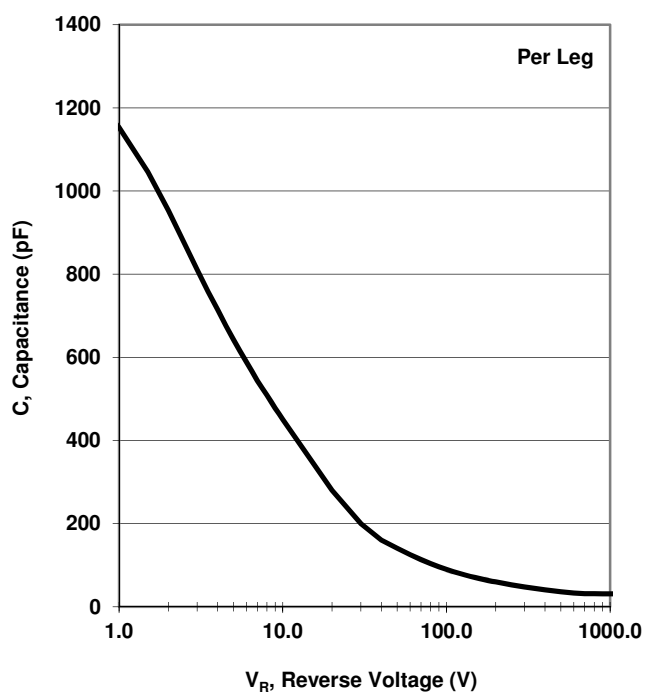


Figure 4. Typ. Capacitance vs.
Reverse Voltage
 $C = f(V_R)$; $T_C = 25^{\circ}\text{C}$; $f = 1\text{ MHz}$

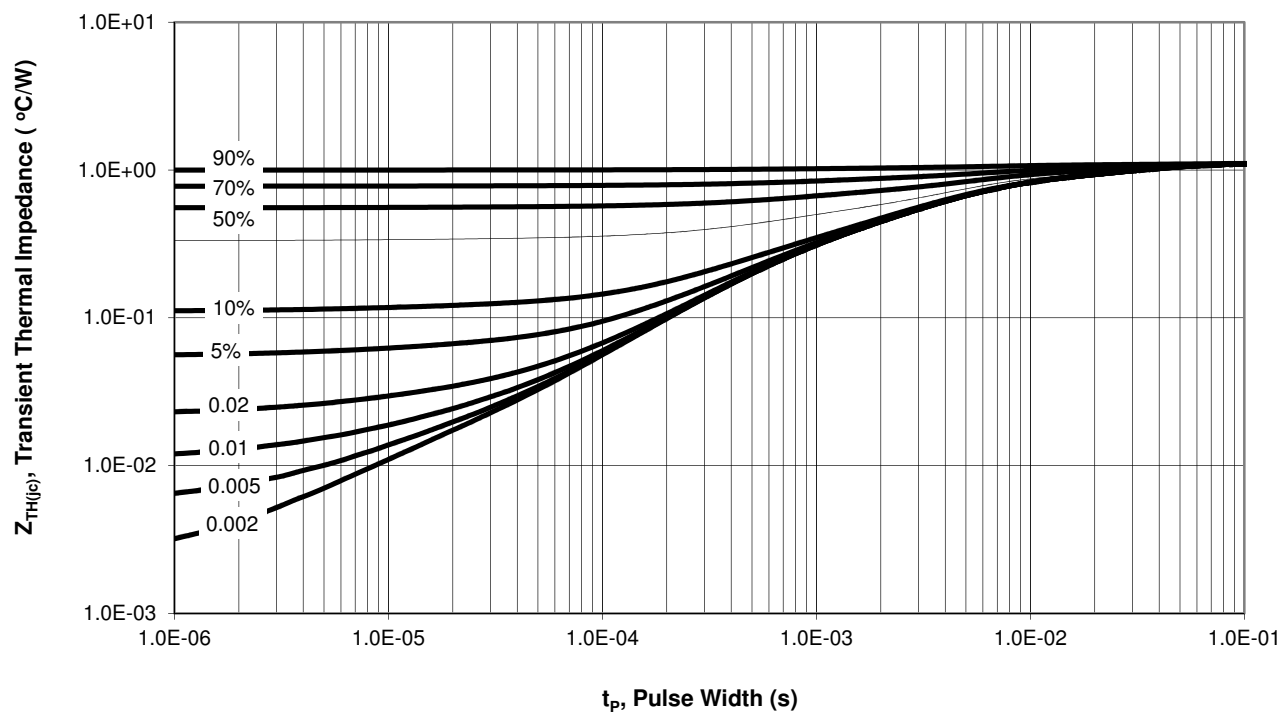
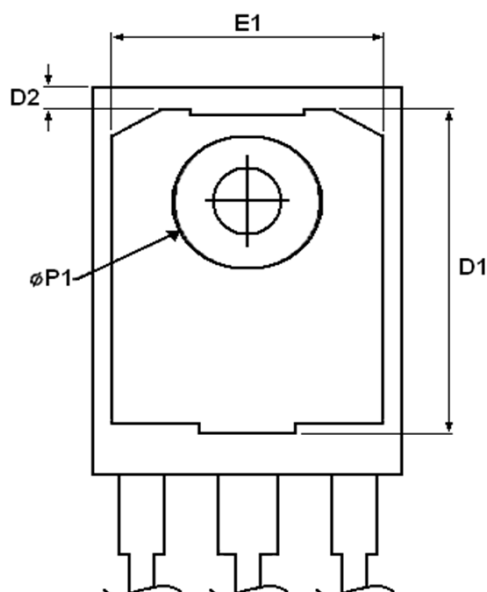
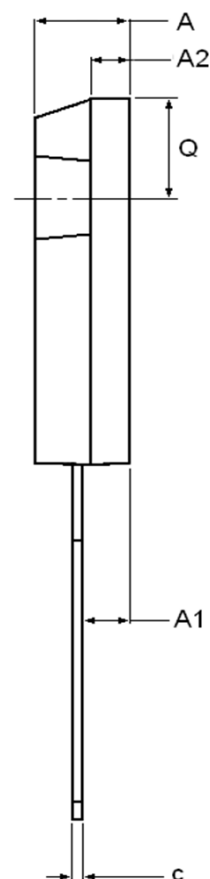
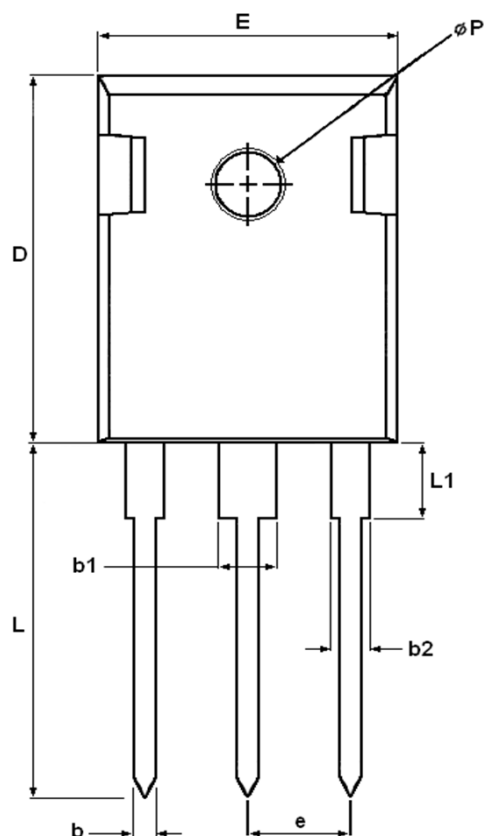


Figure 5. Transient Thermal Impedance
 $Z_{th(jc)} = f(t_P)$; parameter: Duty Ratio

Package Dimensions: TO-247



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.903	5.157	0.193	0.203
A1	2.273	2.527	0.090	0.100
A2	1.853	2.108	0.073	0.083
b	1.073	1.327	0.042	0.052
b1	2.873	3.381	0.113	0.133
b2	1.903	2.386	0.042	0.052
c	0.600	0.752	0.024	0.029
D	20.823	21.077	0.820	0.830
D1	17.393	17.647	0.685	0.695
D2	1.063	1.317	0.042	0.052
e	5.450		0.215	
E	15.773	16.027	0.621	0.631
E1	13.893	14.147	0.547	0.557
L	20.053	20.307	0.789	0.799
L1	4.168	4.472	0.165	0.175
Q	6.043	6.297	0.238	0.248
ØP	3.560	3.660	0.140	0.144
ØP1	7.063	7.317	0.278	0.288

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