

**Silicon Carbide Schottky Diode**

$V_{RRM}$	=	650 V
$I_F (T_C=153\text{ }^\circ\text{C})$	=	4 A
$Q_C$	=	11 nC

**Features**

- 650 V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching

**Benefits**

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- High Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

**Applications**

- Switching Mode Power Supply
- Boost Diodes in PFC
- DC/DC Converters
- AC/DC Converters
- Free Wheeling Diodes in Inverter

**Package**


TO-252-2


**Maximum Ratings** (  $T_C = 25\text{ }^\circ\text{C}$  unless otherwise specified )

Symbol	Parameter	Value	Unit	Test Conditions	Note
$V_{RRM}$	Repetitive Peak Reverse Voltage	650	V		
$V_{RSM}$	Surge Peak Reverse Voltage	650	V		
$V_R$	DC Peak Reverse Voltage	650	V		
$I_F$	Continuous Forward Current	13 6 4	A	$T_C=25\text{ }^\circ\text{C}$ $T_C=135\text{ }^\circ\text{C}$ $T_C=153\text{ }^\circ\text{C}$	Fig. 3
$I_{FSM}$	Non-Repetitive Forward Surge Current	26	A	$T_C=25\text{ }^\circ\text{C}$ , $t_p=10\text{ ms}$ , Half Sine Pulse	
$P_{tot}$	Power Dissipation	51 22	W	$T_C=25\text{ }^\circ\text{C}$ $T_C=110\text{ }^\circ\text{C}$	Fig. 4
$T_J$	Operating Junction Range	-55 to +175	$^\circ\text{C}$		
$T_{stg}$	Storage Temperature Range	-55 to +175	$^\circ\text{C}$		

## Silicon Carbide Schottky Diode

### Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$V_F$	Forward Voltage	1.41 1.8	1.65 2.4	V	$I_F = 4\text{ A}, T_J = 25\text{ }^\circ\text{C}$ $I_F = 4\text{ A}, T_J = 175\text{ }^\circ\text{C}$	Fig. 1
$I_R$	Reverse Current	2 10	30 100	$\mu\text{A}$	$V_R = 650\text{ V}, T_J = 25\text{ }^\circ\text{C}$ $V_R = 650\text{ V}, T_J = 175\text{ }^\circ\text{C}$	Fig. 2
$Q_C$	Total Capacitive Charge	11		nC	$V_R = 400\text{ V}, I_F = 4\text{ A},$ $T_J = 25\text{ }^\circ\text{C}$	Fig. 6
$C$	Total Capacitance	213 22 17		pF	$V_R = 0\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$ $V_R = 200\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$ $V_R = 400\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	Fig. 5
$E_C$	Capacitance Stored Energy	1.5		$\mu\text{J}$	$V_R = 400\text{ V}$	Fig. 7

Note: This is a majority carrier diode, so there is no reverse recovery charge.

### Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case		2.9		$^\circ\text{C/W}$	Fig.8

### Typical Performance

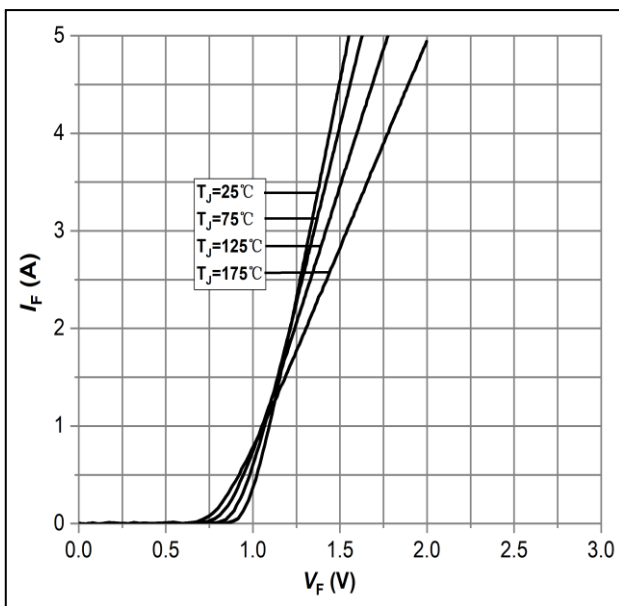


Figure 1: Forward Characteristics

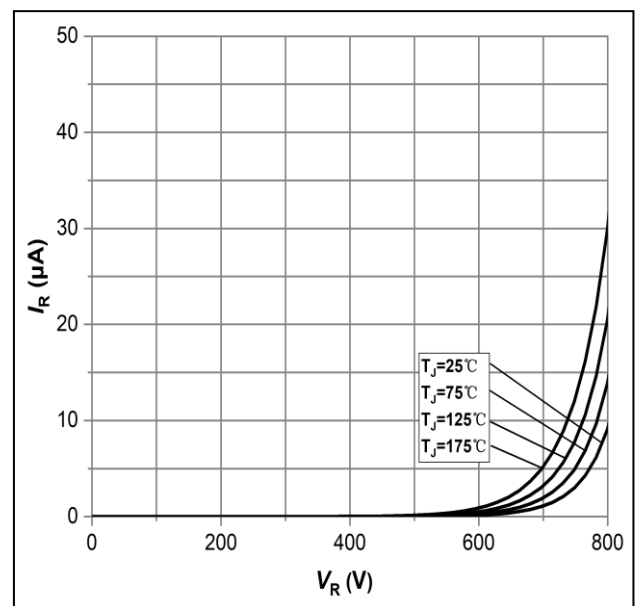


Figure 2: Reverse Characteristics

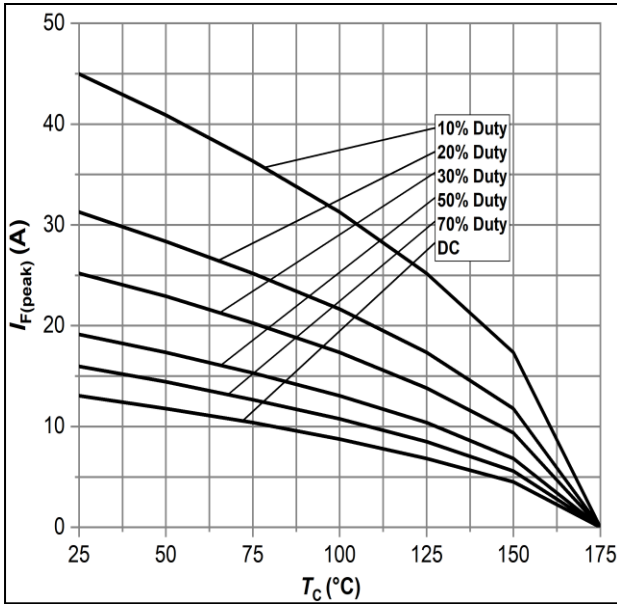
**Silicon Carbide Schottky Diode**
**Typical Performance**


Figure 3: Current Derating

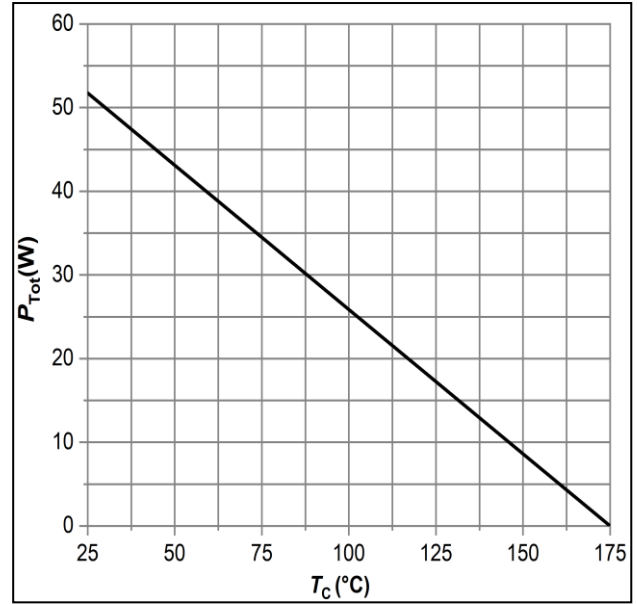


Figure 4: Power Derating

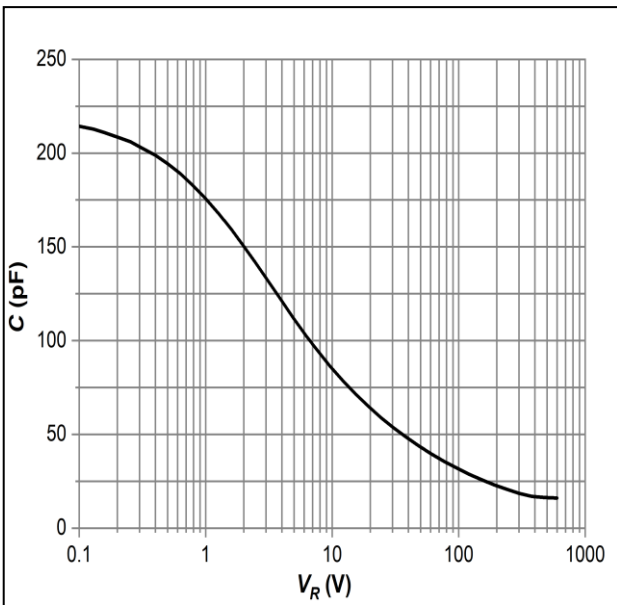


Figure 5: Capacitance vs. Reverse Voltage

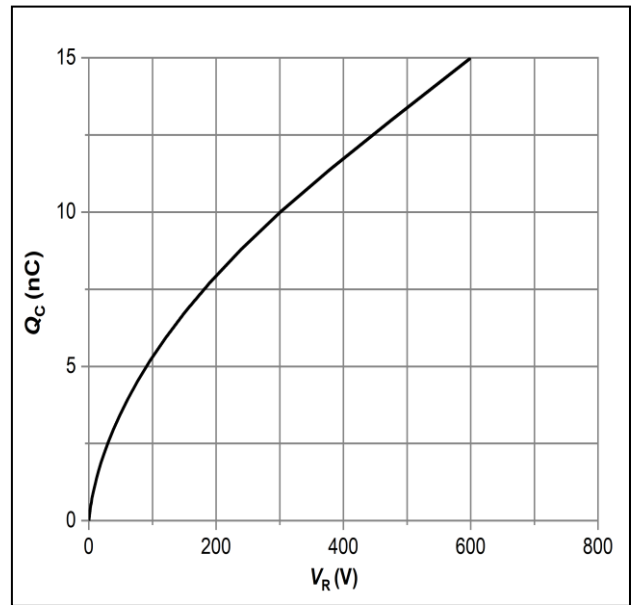


Figure 6: Total Capacitance Charge vs. Reverse Voltage

**Silicon Carbide Schottky Diode**

**Typical Performance**

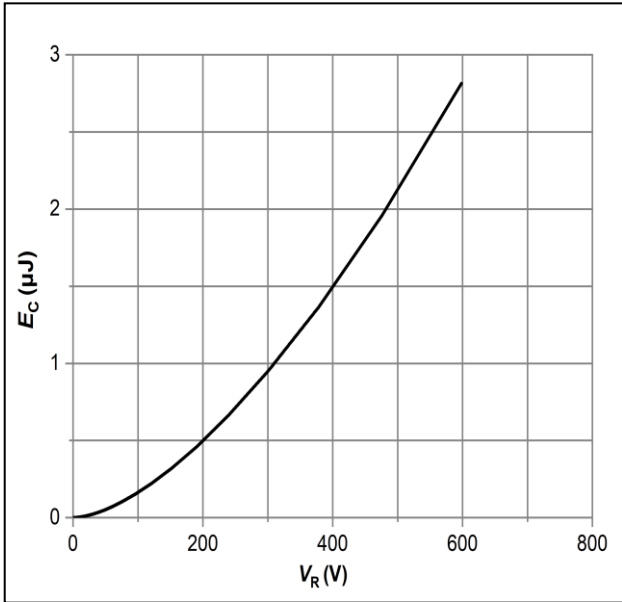


Figure 7: Typical Capacitance Stored Energy

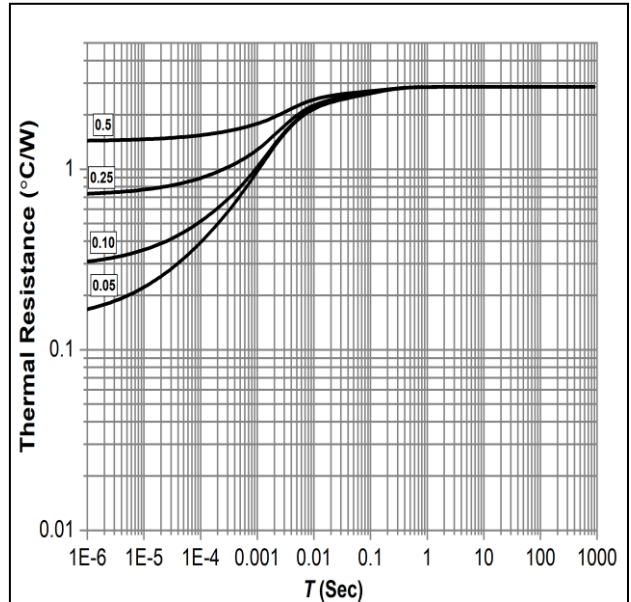


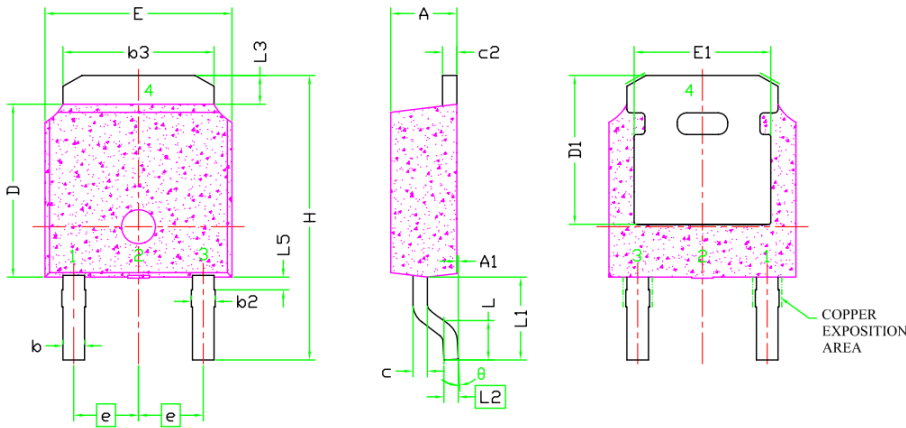
Figure 8: Transient Thermal Impedance



**Silicon Carbide Schottky Diode**

**Package Dimensions**

Package: TO-252-2



SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	1.40	1.52	1.77
L1	2.743 REF		
L2	0.508 BSC		
L3	0.89	--	1.27
L5	--	--	--
D	6.00	6.10	6.223
H	9.40	10.00	10.40
b	0.64	0.76	0.88
b2	0.77	0.84	1.14
b3	5.21	5.34	5.46
e	2.286 BSC		
A	2.20	2.30	2.38
A1	0	--	0.127
c	0.46	0.50	0.60
c2	0.46	0.50	0.58
D1	5.21	--	--
E1	4.40	--	--
θ	0°	--	10°