Nano Meter Coated (NMC)SIC Schottky Diode

650 V, 10 A Silicon Carbide Schottky Diode

Features

- Replace bipolar with unipolar rectifiers
- High heat dissipation and anti- EMI ability
- Zero reverse recovery current
- Zero forward recovery voltage
- High-frequency operation
- Temperature-independent switching behavior
- Extremely fast switching
- Positive temperature coefficient on V_F

Benefits

- Replace bipolar with unipolar rectifiers
- Essentially no switching losses
- Higher efficiency
- Reduction of heat sink requirements
- Parallel devices without thermal runaway

Applications

- Switch mode power supplies (SMPS)
- Boost diodes in PFC or DC/DC stages
- Free wheeling diodes in inverter stages
- AC/DC converters

TO-252-2

Halogen

RoHS

Top Mark: CSiCD65010T7		
Ordering P/N: CSiCD65010T7		
Parameter	**Value**	**Unit**
V_{DS}	650	V
I_D(Tc<150℃)	10	A

Absolute Maximum Ratings (Tj=25℃ unless otherwise specified)

Symbol	Parameter	Test conditions	Value	Unit	Note
V_{RRM}	Repetitive Peak Reverse Voltage		650	V	
V_{RSM}	Surge Peak Reverse Voltage		650	V	
V_{DC}	DC Blocking Voltage		650	V	
I_F	Continuous Forward Current	Tc=25°C	32	A	Fig. 3
		Tc=135°C	15	A	
		Tc=153°C	10	A	
I_{FRM}	Repetitive Peak Forward Surge Current	T_C = 25 °C, t_P = 10 ms, Half Sine Wave	43.5	A	
		T_C = 110 °C, t_P = 10 ms, Half Sine Wave	28	A	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	T_C = 25 °C, t_P = 10 ms, Half Sine Wave	90	A	Fig. 8
		T_C = 110 °C, t_P = 10 ms, Half Sine Wave	71	A	
$I_{F, Max}$	Non-Repetitive Peak Forward Surge Current	T_C = 25 °C, t_P = 10 µs, Pulse	860	A	Fig. 8
		T_C = 110 °C, t_P = 10 µs, Pulse	680	A	

P_{tot}	Power Dissipation	T_C = 25 °C	150	W	Fig. 4
		T_C = 110 °C	65	W	
dV/dt	Diode dV/dt Ruggedness	V_R = 0-650 V	200	V/ns	
$\int i^2dt$	i^2t Value	T_C = 25 °C, t_P =10 ms	40.5	A^2s	
		T_C = 110 °C, t_P = 10 ms	25	A^2s	
T_J , T_{stg}	Operating Junction and Storage Temperature		-55~175	°C	

■ Electrical Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage		1.5	1.8	V	I_F = 10 A, T_J = 25 °C	Fig. 1
			2.0	2.4		I_F = 10 A, T_J = 175 °C	
I_R	Reverse Current		12	60	μA	V_R = 650 V, T_J = 25 °C	Fig. 2
			24	220		V_R = 650 V, T_J = 175 °C	
Q_C	Total Capacitive Charge		24		nC	V_R = 400 V, I_F = 10 A di/dt = 500 A/μS T_J = 25 °C	Fig. 5
C	Total Capacitance		460.5		pF	V_R = 0 V, T_J = 25 °C, f = 1 MHz	Fig. 6
			44			V_R = 200 V, T_J = 25 °C, f = 1 MHz	
			40			V_R = 400 V, T_J = 25 °C, f = 1 MHz	
E_C	Capacitance Stored Energy		3.6		μJ	V_R = 400 V	Fig. 7

■ Thermal Data

SYMBOL	PARAMETER	Typ.	UNIT
R_{thJC}	Thermal Resistance from Junction to Case Fig. 9	1.0	°C/W

■ Typical Characteristics

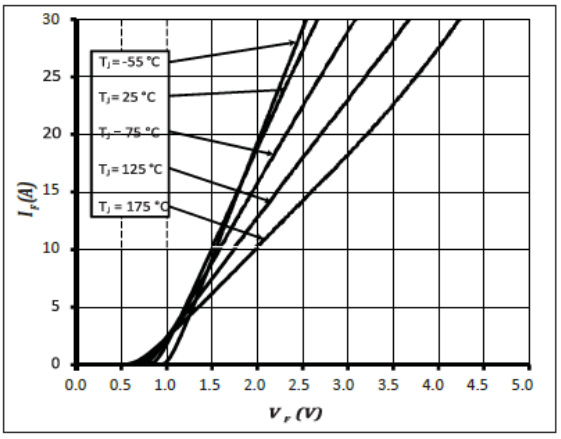


Figure 1. Forward Characteristics

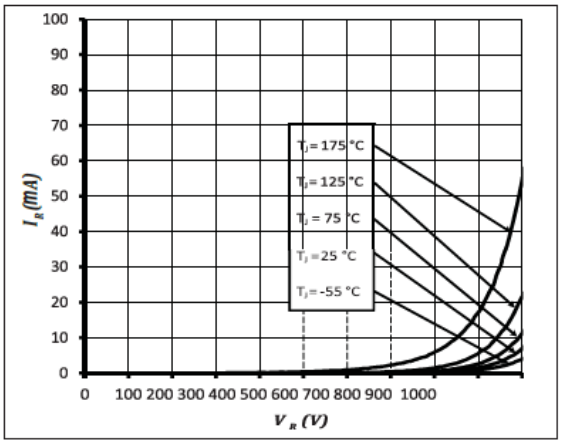


Figure 2. Reverse Characteristics

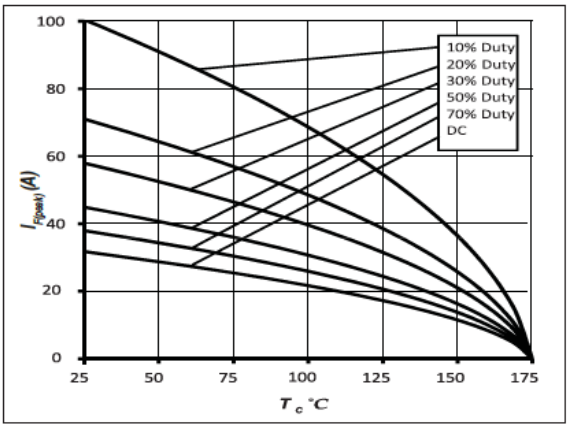


Figure 3. Current Derating

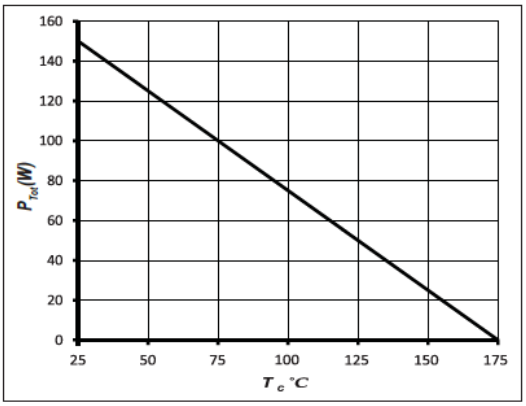


Figure 4. Power Derating

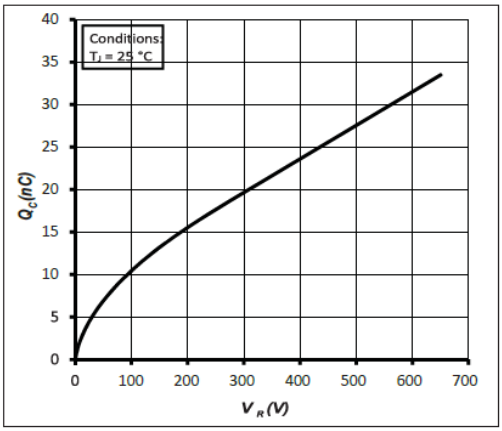


Figure 5. Total Capacitance Charge vs. Reverse Voltage

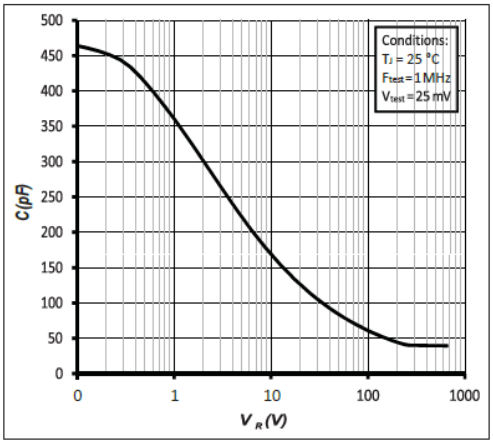


Figure 6. Capacitance vs. Reverse Voltage

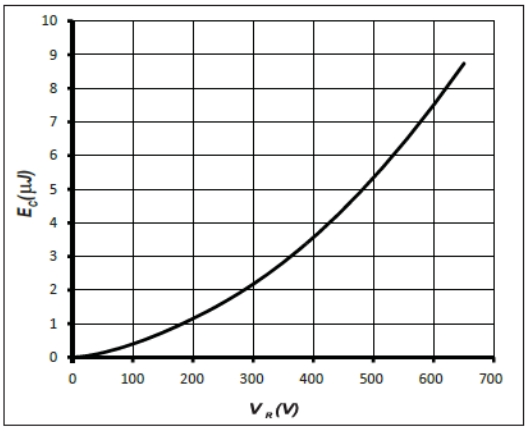


Figure 7. Capacitance Stored Energy

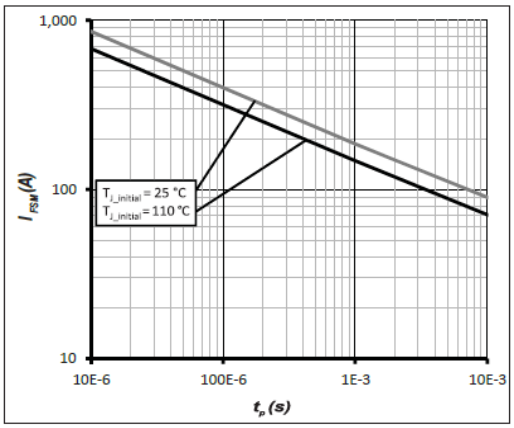


Figure 8. Non-Repetitive Peak Forward Surge Current Versus Pulse Duration (Sinusoidal Waveform

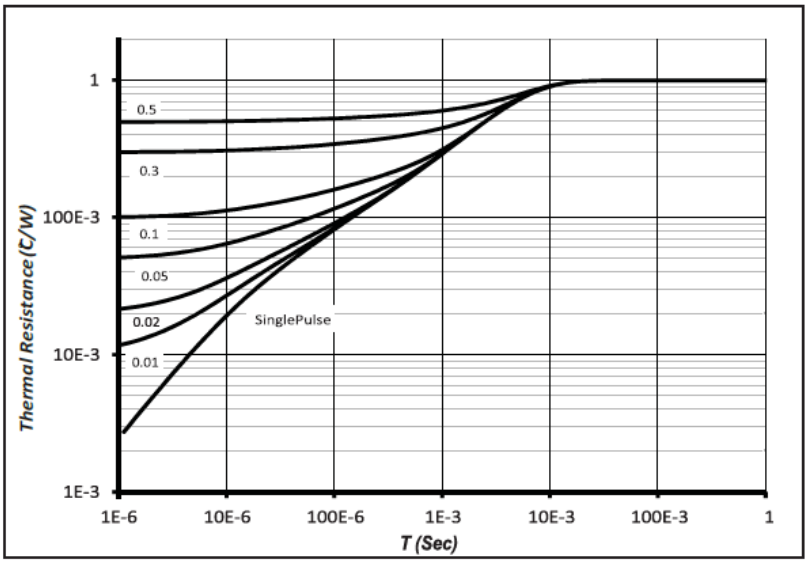
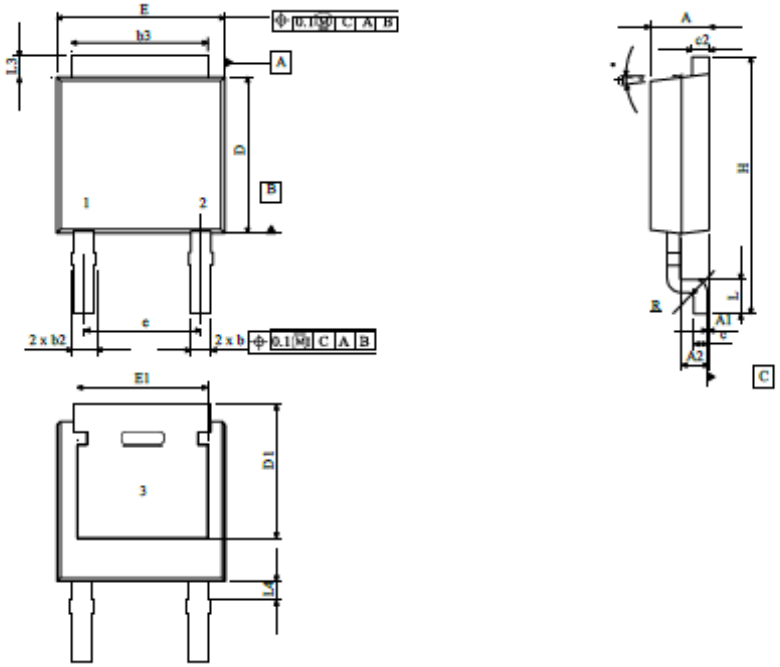


Figure 9. Transient Thermal Impedance

■ Package Outline Dimension

TO-252-2



SYMBOL	MIN (mm)	MAX (mm)
A	2.184	2.388
A1	0.00	0.127
A2	0.97	1.17
b	0.64	0.88
b2	0.635	1.143
b3	5.004	5.60
c	0.46	0.58
c2	0.457	0.864
D	5.867	6.248
D1	5.21	---
E	6.35	6.73
E1	4.32	---
e	4.521	4.623
H	9.652	10.414
L3	0.889	1.27
L	1.245	1.445
L4	0.462 REF	
R	0.254 TYP	

1	CATHODE
2	ANODE
3	CATHODE

NOTE
1. ALL METAL SURFACES ARE TIN PLATED (MATTE), EXCEPT AREA OF CUT.
2. DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.5M-1994.
3. ALL DIMENSIONS ARE LISTED IN MILLIMETERS. ANGLES ARE IN DEGREES.
4. PACKAGE BURR FLASH SIZE (0.5 mm) IS NOT INCLUDED IN THE DIMENSIONS