

Nano Meter Coated (NMC)SiC Schottky Diode

650 V, 10 A Silicon Carbide Schottky Diode

■ Features

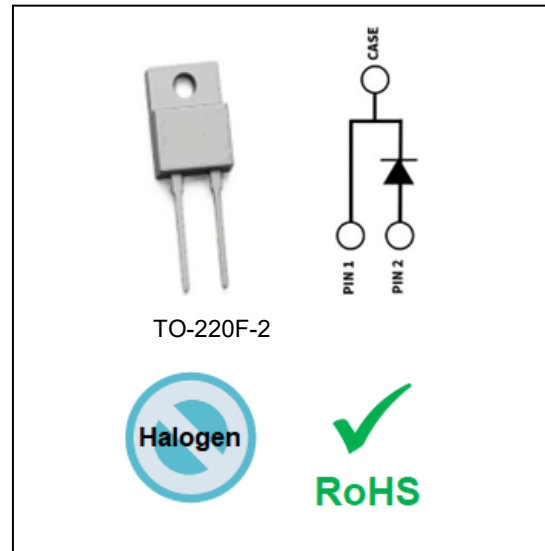
- Replace bipolar with unipolar rectifiers
- High heat dissipation and anti-EMI ability
- Zero reverse recovery current
- Zero forward recovery voltage
- High-frequency operation
- Temperature-independent switching behavior
- Extremely fast switching
- Positive temperature coefficient on V_F

■ 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



Top Mark: CSiCD65010T6		
Ordering P/N: CSiCD65010T6		
Parameter	Value	Unit
V_{DC}	650	V
$I_D(T_C < 150^\circ C)$	10	A

■ Absolute Maximum Ratings ($T_J = 25^\circ C$ 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	$T_C = 25^\circ C$	28	A	Fig. 3
		$T_C = 135^\circ C$	13	A	
		$T_C = 153^\circ C$	10	A	
I_{FRM}	Repetitive Peak Forward Surge Current	$T_C = 25^\circ C$, $t_p = 10$ ms, Half Sine Wave	40	A	
		$T_C = 110^\circ C$, $t_p = 10$ ms, Half Sine Wave	28	A	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	$T_C = 25^\circ C$, $t_p = 10$ ms, Half Sine Wave	85	A	Fig. 8
		$T_C = 110^\circ C$, $t_p = 10$ ms, Half Sine Wave	71	A	
$I_{F, Max}$	Non-Repetitive Peak Forward Surge Current	$T_C = 25^\circ C$, $t_p = 10$ μs , Pulse	860	A	Fig. 8
		$T_C = 110^\circ C$, $t_p = 10$ 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	
j _i ² dt	i _t ² Value	T _C = 25 °C, t _p =	40.5	A ² s	
		T _C = 110 °C, t _p	25	A ² s	
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

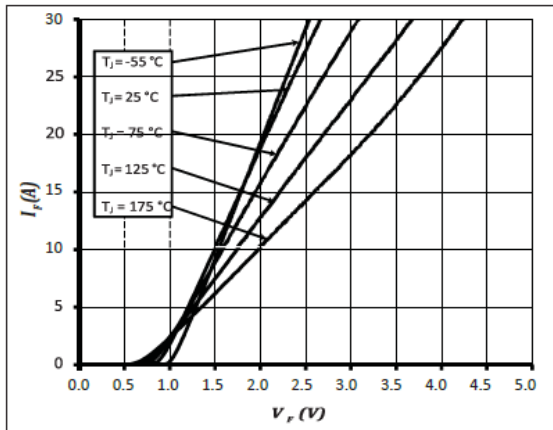


Figure 1. Forward Characteristics

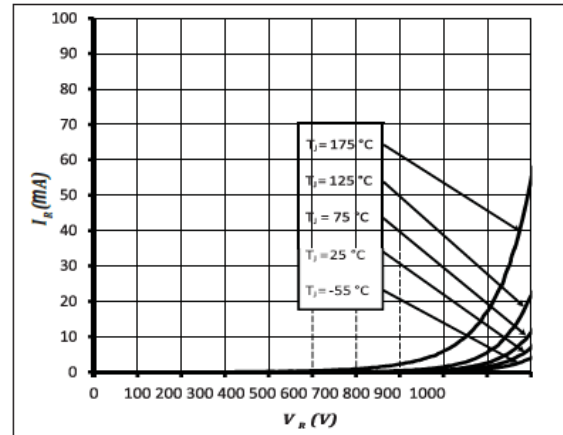


Figure 2. Reverse Characteristics

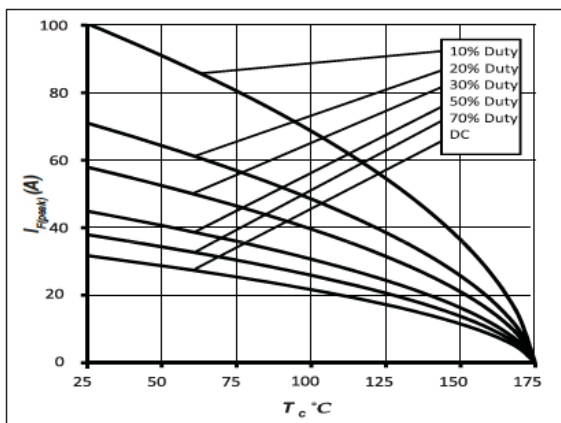


Figure 3. Current Derating

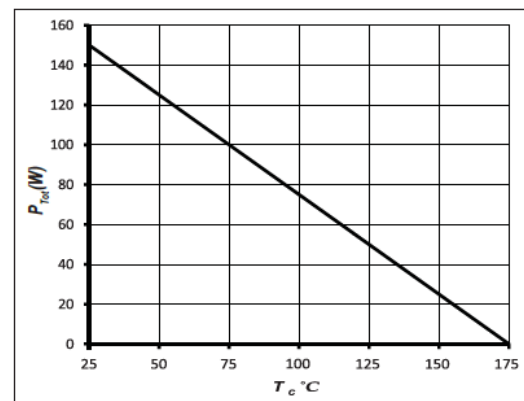


Figure 4. Power Derating

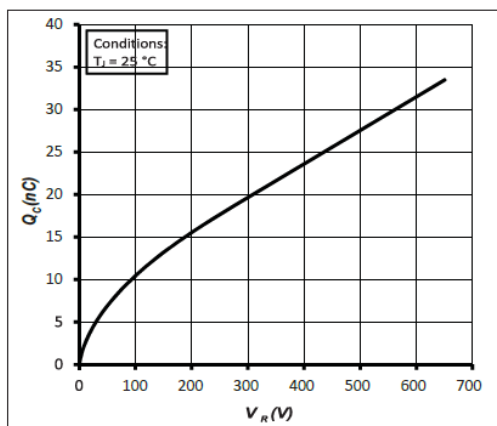


Figure 5. Total Capacitance Charge vs. Reverse Voltage

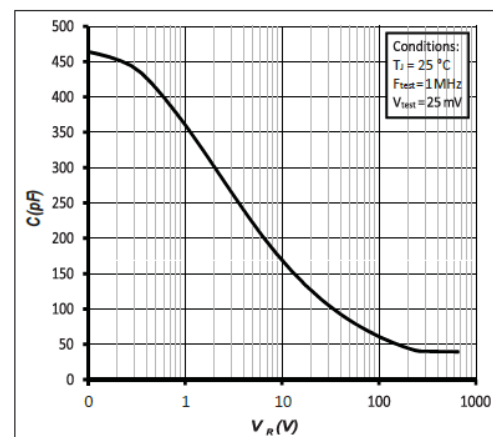


Figure 6. Capacitance vs. Reverse Voltage

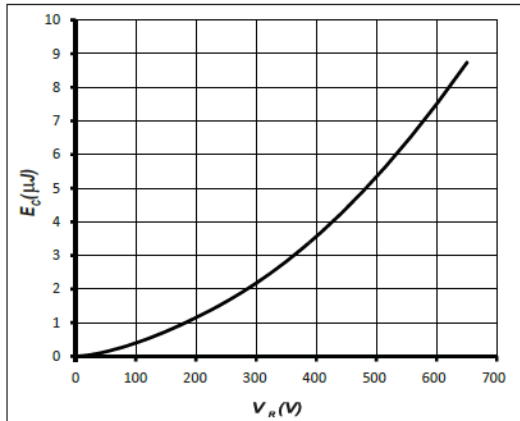


Figure 7. Capacitance Stored Energy

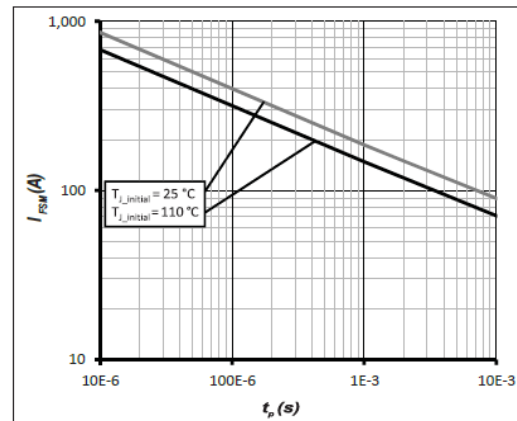


Figure 8. Non-Repetitive Peak Forward Surge Current Versus Pulse Duration (Sinusoidal Waveform)

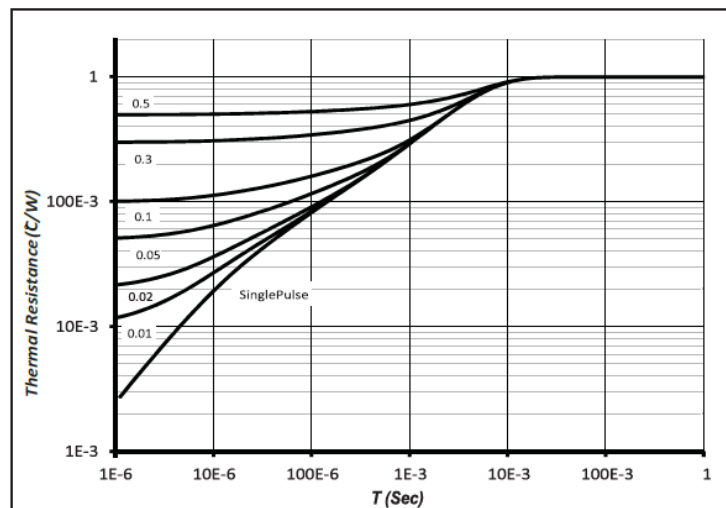


Figure 9. Transient Thermal Impedance

■ Package Outline Dimension

TO-220F-2

