

Silicon Carbide Schottky Diode

$$V_{RRM} = 650 \text{ V}$$

$$I_F (T_C=155^\circ\text{C}) = 10\text{A}$$

$$Q_C = 27\text{nC}$$

Features

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

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)
- Power Factor Correction
- Motor Drives

Package



Maximum Ratings (at T_c = 25 °C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	V _{RRM}	650	V
Surge Peak Reverse Voltage	V _{RSM}	650	V
DC Peak Reverse Voltage	V _R	650	V
Continuous Forward Current T _C = 25°C T _C = 135°C T _C = 158°C	I _F	34 17 10	A
Repetitive Peak Forward Surge Current T _C = 25°C, t _p = 10ms, Half Sine Pulse T _C = 110°C, t _p = 10ms, Half Sine Pulse	I _{FRM}	45 27	A
Non-Repetitive Forward Surge Current T _C = 25°C, t _p = 10ms, Half Sine Pulse T _C = 110°C, t _p = 10ms, Half Sine Pulse	I _{FSM}	80 70	A
i ² dt value T _C = 25°C, t _p = 10ms, Half Sine Pulse T _C = 110°C, t _p = 10ms, Half Sine Pulse	∫i ² dt	31.7 24.3	A ² s
Power dissipation T _C = 25°C T _C = 110°C	P _{tot}	93 40	W
Operating junction Range	T _j	-55 to +175	°C
Storage temperature Range	T _{stg}	-55 to +150	°C

Thermal Resistance

Parameter	Symbol	Typ.	Unit
Thermal resistance, junction – case.	R _{thJC}	1.60	°C/W

Electrical Characteristic (at T_c = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Forward Voltage	V _F	- -	1.4 1.5	1.5	V	I _F = 10A T _j = 25°C T _j = 175°C
Reverse Current	I _R	- -	- -	50 200	μA	V _R = 650V T _j = 25°C T _j = 175°C
Total Capacitive Charge	Q _C	-	27	-	nC	V _R = 400V, T _j = 25°C $Q_C = \int_0^{V_R} C(V) dV$
Total Capacitance	C	- - -	561 55 43	- - -	pF	T _j = 25°C, f = 1MHz V _R = 0V V _R = 200V V _R = 400V

Characteristics Curve:

Fig 1: Forward Characteristics

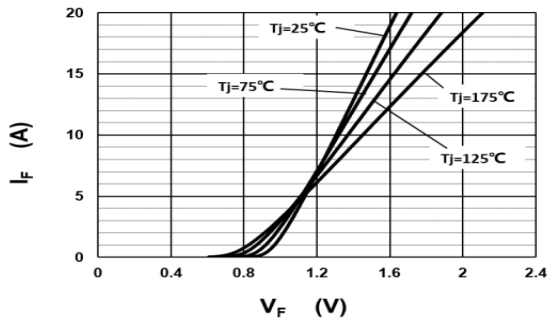


Fig 2: Reverse Characteristics

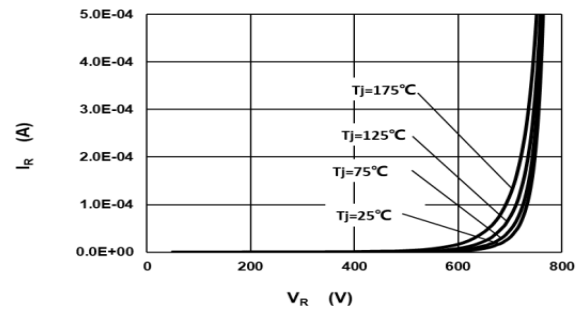


Fig 3: Current Derating

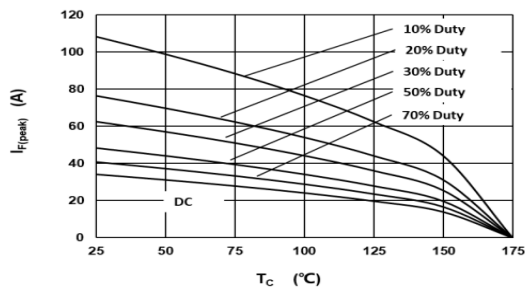


Fig 4: Power Derating

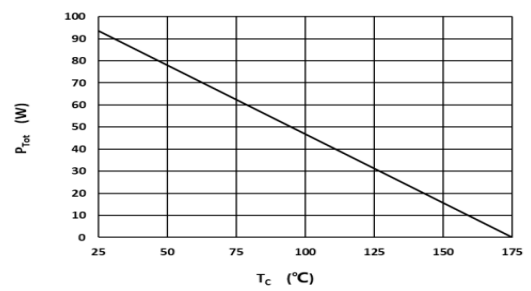


Fig 5: Capacitance vs. Reverse Voltage

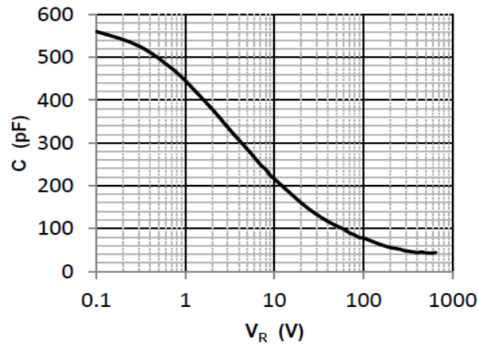


Fig 6: Reverse Charge vs. Reverse Voltage

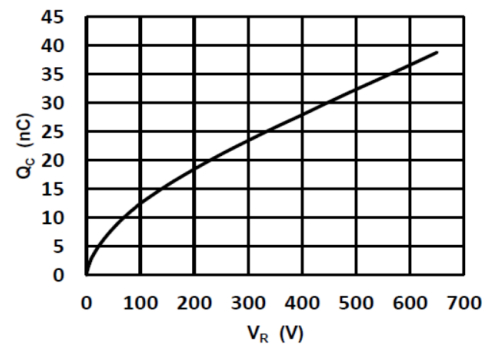


Fig 7: Typical Capacitance Stored Energy

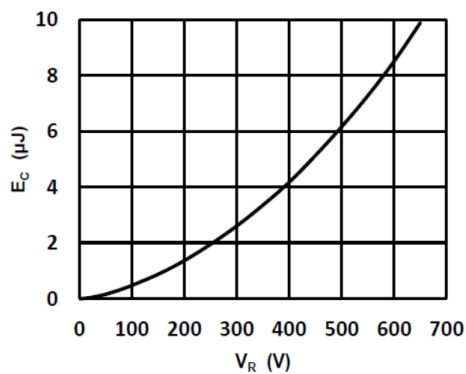


Fig 8: Transient Thermal Impedance

