Silicon Carbide Schottky Diode

Features

- 1200V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching

V_{RRM}	=	1200V
I_F (T_C=150 ˚C)	=	40A
Q_C	=	194 nC

Benefits

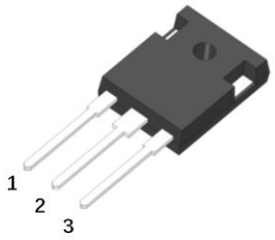
- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Applications

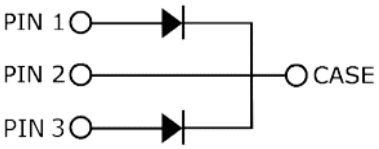
- Switch Mode Power Supplies (SMPS)
- Power Factor Correction
- Motor Drives

Package

TO-247-3L



Equivalent circuit



Halogen-Free

RoHS

Maximum ratings (T_C=25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Value	Unit	Note
Repetitive Peak Reverse Voltage	V_{RRM}		1200	V	
DC Peak Reverse Voltage	V_R		1200	V	
Continuous Forward Current	I_F	T_C=25˚C	89	A	Fig.3
		T_C=135˚C	48		
		Tc=150˚C	40		
Repetitive Peak Forward Surge Current	I_{FRM}	T_C=25˚C, t_P=10 ms, Half Sine Pulse	168	A	
		T_C=110˚C, t_P=10 ms, Half Sine Pulse	142		
Non-Repetitive Forward Surge Current	I_{FSM}	T_C=25˚C, t_P=10 ms, Half Sine Pulse	240	A	
		T_C=110˚C, t_P=10 ms, Half Sine Pulse	178		
Non-Repetitive Forward Surge Current	$I_{F,MAX}$	T_C=25˚C, t_P=10μs, Square Wave Pulse	990	A	
		T_C=110˚C, t_P=10μs, Square Wave Pulse	926		
i²t value	∫ i²dt	T_C=25˚C, t_P=10 ms	288	A^2s	
		T_C=110˚C, t_P=10 ms	158		
Power Dissipation	P_{tot}	T_C=25˚C	470	W	Fig.4
		T_C=110˚C	203		
Operating Temperature	T_J		-55 to +175	˚C	
Storage Temperature	T_{stg}		-55 to +175	˚C	
TO-247 Mounting Torque		M3 Screw 6-32 Screw	1 8.8	Nm lbf-in	

Electrical Characteristics (T_J=25℃)

Parameter	Symbol	Test Conditions	Value			Unit	Note
			Min.	Typ.	Max.		
Forward Voltage	V_F	I_F=40A, T_J=25°C		1.50	1.8	V	Fig.1
		I_F=40A, T_J=175°C		2.10	3		
Reverse Current	I_R	V_R=1200V, T_J=25°C		20	300	μA	Fig.2
		V_R=1200V, T_J=175°C		159	500		
Total Capacitive Charge	Q_C	V_R=800V, T_J=25°C		194		nC	Fig.5
Total Capacitance	C	V_R=0V,T_J=25°C,f=1MHz		2890		pF	Fig.6
		V_R=400V,T_J=25°C,f=1MHz		174			
		V_R=800V,T_J=25°C,f=1MHz		171			
Capacitance Stored Energy	E_C	V_R=800 V		48		μJ	Fig.7

Thermal Characteristics

Parameter	Symbol	Value	Unit	Note
Thermal Resistance(Junction to Case)	$R_{\theta JC}$	0.32	°C/W	Fig. 8

Typical Performance

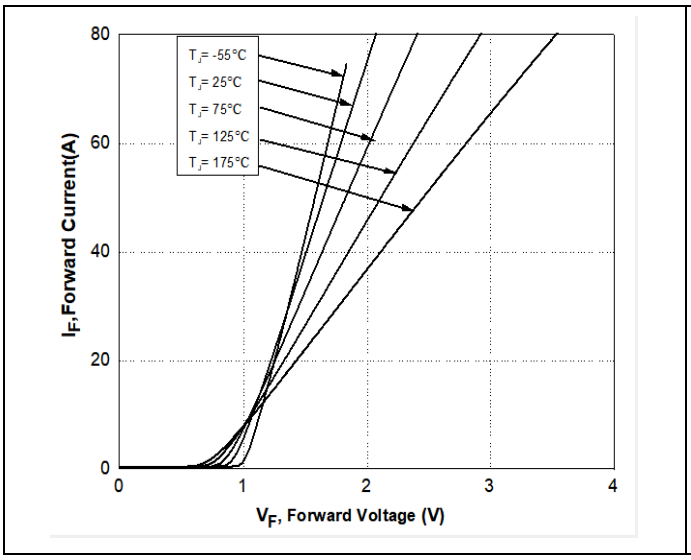


Figure 1. Forward Characteristics

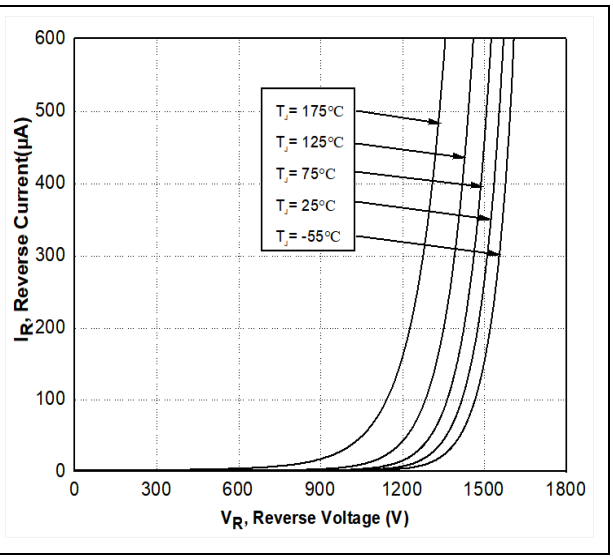


Figure 2. Reverse Characteristics

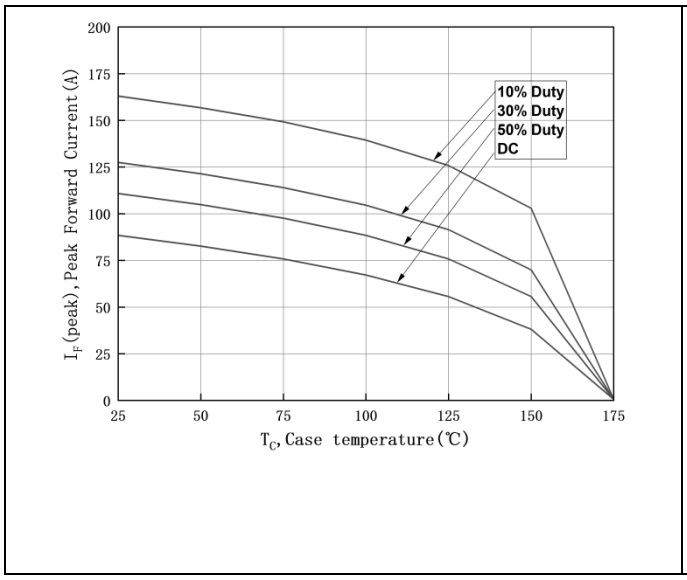


Figure 3. Current Derating

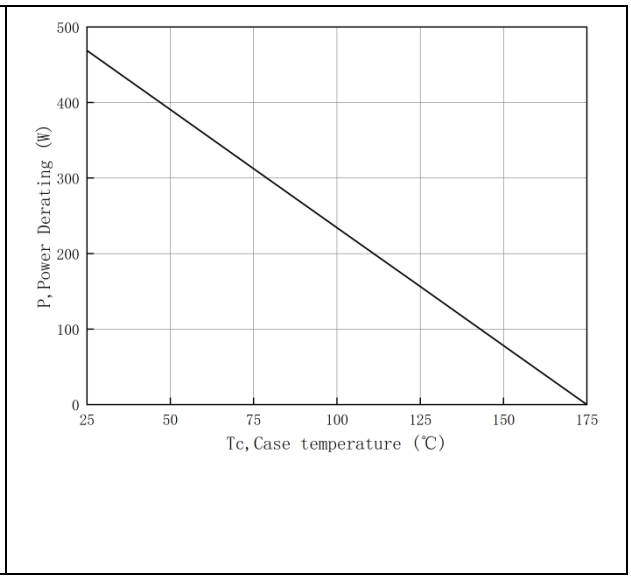


Figure 4. Power Derating

Typical Performance

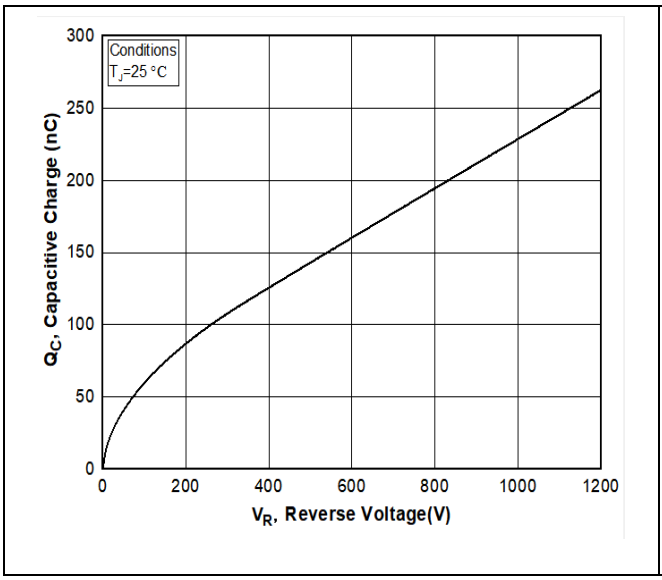


Figure 5. Capacitance Charge Vs. Reverse

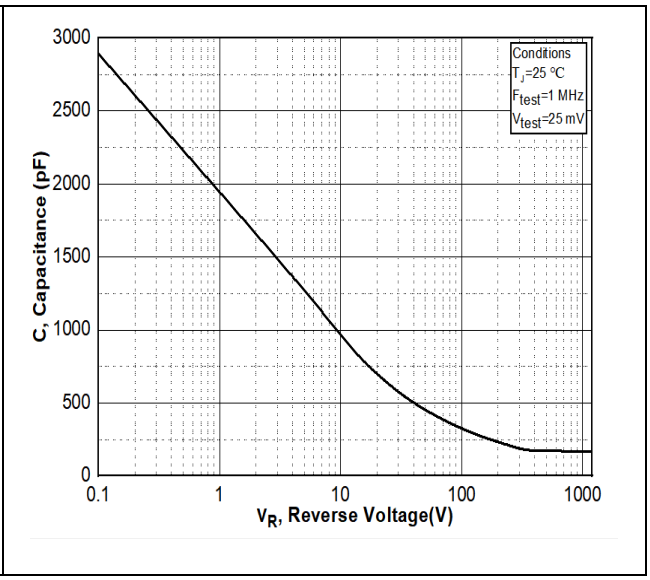


Figure 6. Capacitance Vs. Reverse Voltage

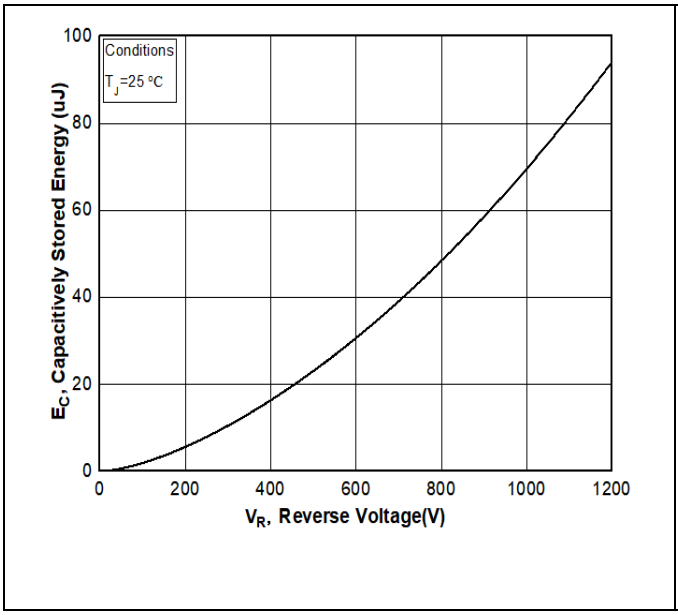


Figure 7. Capacitance Stored Energy

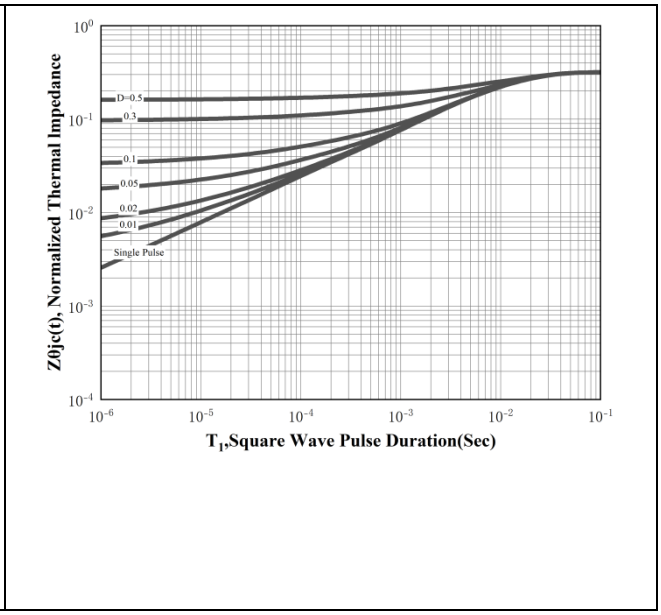
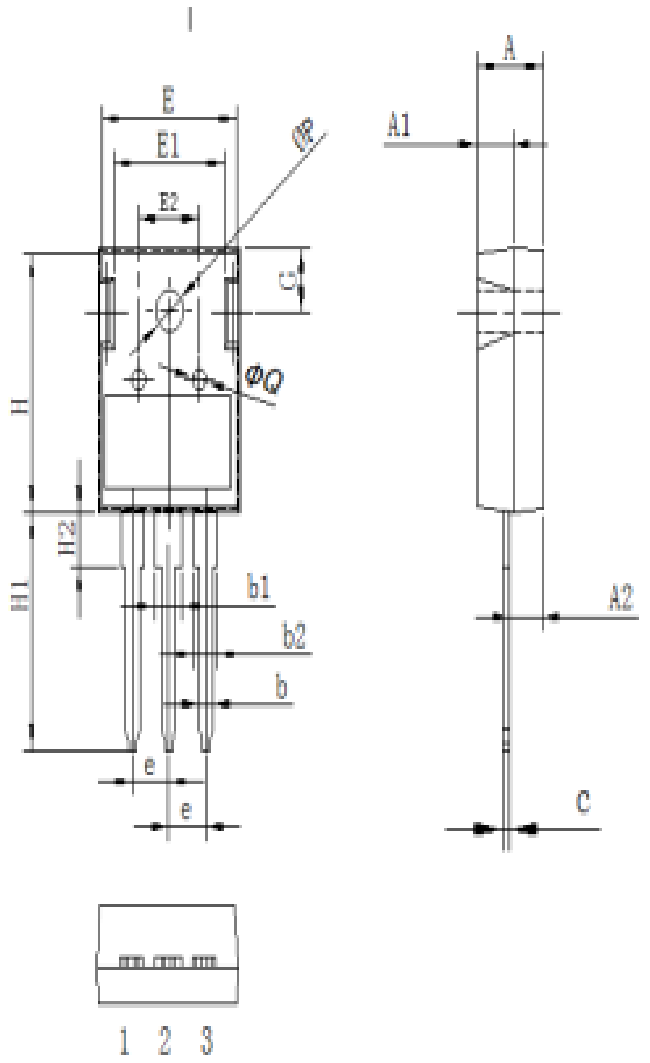


Figure 8. Transient Thermal Response Curve(Junction-to-Case)

Package Dimensions

Package TO-247-3L



Symbol	单位 mm		
	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.80	3.00	3.20
A2	2.20	2.40	2.60
b	1.05	1.20	1.35
b1	2.80	3.00	3.20
b2	1.80	2.00	2.20
c	0.50	0.60	0.70
e	5.35	5.45	5.75
E	15.6	15.80	16.0
E1	12.3	12.50	12.7
E2	6.00	6.20	6.40
H	20.8	21.0	21.2
H1	19.5	20.0	20.5
H2	3.70	4.00	4.30
G	5.70	5.90	6.10
ΦP	3.30	3.50	3.70
ΦQ	2.30	2.50	2.70