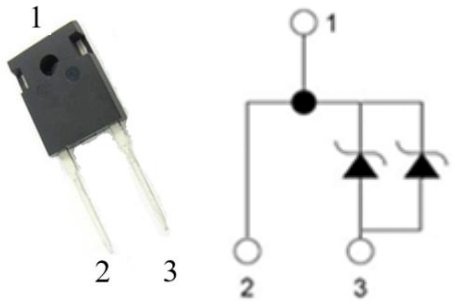
Silicon Carbide Schottky Diode

Product Summary

V_R = 1200 V
I_F = 50A (T_C=150°C)
Qc = 310nC (V_R=800V)



TO-247-2

Features

- Zero Forward/Reverse Recovery Current
- High Blocking Voltage
- High Frequency Operation
- Positive Temperature Coefficient on V_F
- Temperature Independent Switching Behavior
- High surge current capability
- 100% avalanche tested

Benefits

- Higher System Efficiency
- Parallel Device Convenience without thermal runaway
- Higher Temperature Application
- No Switching loss
- Hard Switching & Higher Reliability
- Environmental Protection

Applications

- Motor Drives
- Solar / Wind Inverters
- AC/DC converters
- DC/DC converters
- Uninterruptable power supplies

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

Parameter	Symbol	Test conditions	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}		1200	V
Continuous Forward Current	I_F	T_C=25°C T_C=135°C T_C=150°C	155 75 50	A
Non repetitive Forward Surge Current	I_{FSM}	T_C = 25°C, t_p=10 ms, Half Sine Pulse T_C = 110°C, t_p=10 ms, Half Sine Pulse	350 330	A
Repetitive peak Forward Surge Current	I_{FRM}	T_C = 25°C, t_p=10 ms, Freq = 0.1Hz, 100 cycles, Half Sine Pulse T_C = 110°C, t_p=10 ms, Freq = 0.1Hz, 100 cycles, Half Sine Pulse	320 300	A
Total power dissipation	P_D	T_C=25°C T_C=110°C	625 271	W
Single Pulse Avalanche Energy	E_{AS}	L=2mH, I_{AS}= 22A	484	mJ
Diode dv/dt ruggedness	dv/dt	V_R = 0-1200V	80	V/ns
Operating Junction Temperature	T_J		-55 to 175	°C
Storage Temperature	T_{STG}		-55 to 175	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Electrical Characteristics

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
DC Blocking Voltage	V_{DC}	T_J = 25°C	1200			V
Forward Voltage	V_F	I_F = 50A, T_J = 25°C		1.40	1.7	V
		I_F = 50A, T_J = 125°C		1.65		V
		I_F = 50A, T_J = 175°C		1.85		V
Reverse Current	I_R	V_R = 1200V, T_J = 25°C		30	200	uA
		V_R = 1200V, T_J = 125°C		180		uA
		V_R = 1200V, T_J = 175°C		540		uA
Total Capacitive Charge	Q_C	V_R = 800V, T_J = 25°C		310		nC
Total Capacitance	C	V_R = 1V, T_J = 25°C, Freq = 1MHz		3620		pF
		V_R = 400V, T_J = 25°C, Freq = 1MHz		293		
		V_R = 800V, T_J = 25°C, Freq = 1MHz		207		

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

Thermal Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Thermal Resistance	$R_{th(j-c)}$	junction-case		0.24		^{0}C/W

Typical Electrical Curves

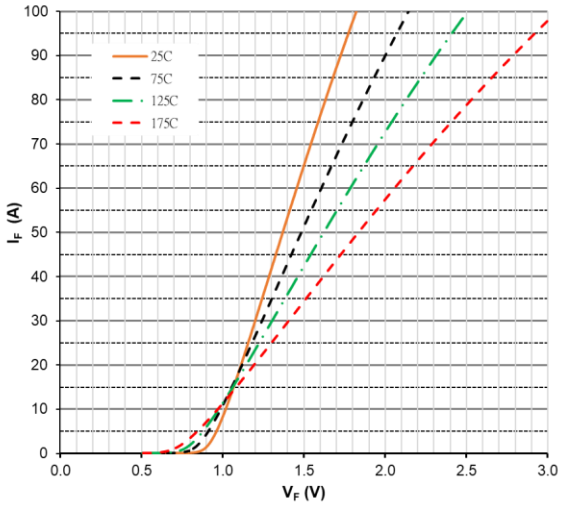


Figure 1. Forward Characteristics

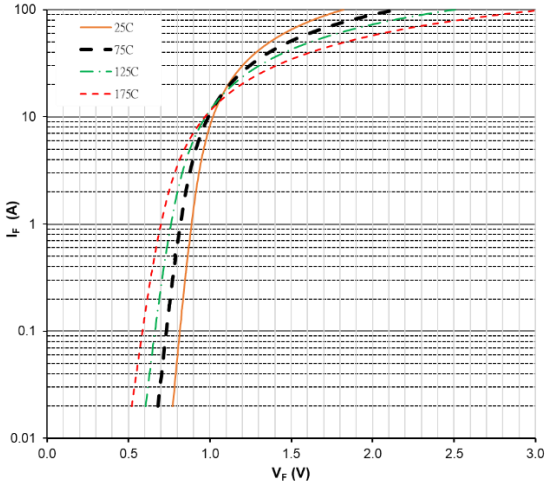


Figure 2. Forward Characteristics

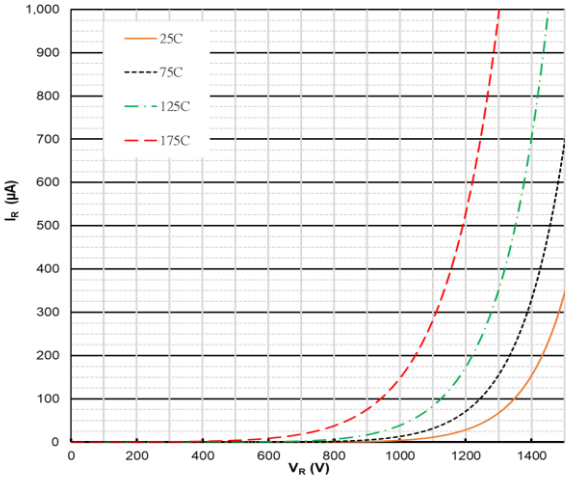


Figure 3. Reverse Characteristics

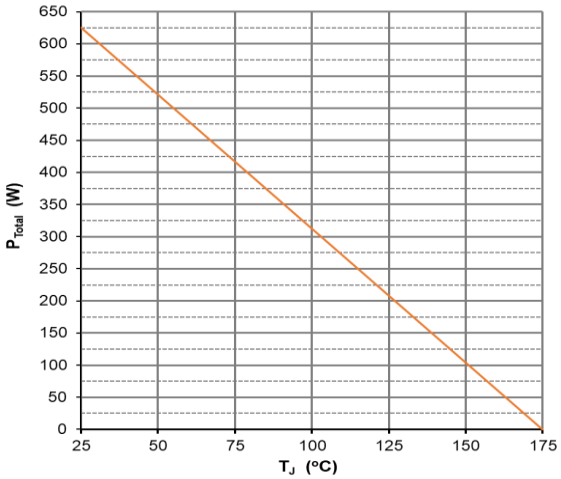


Figure 4. Power Derating

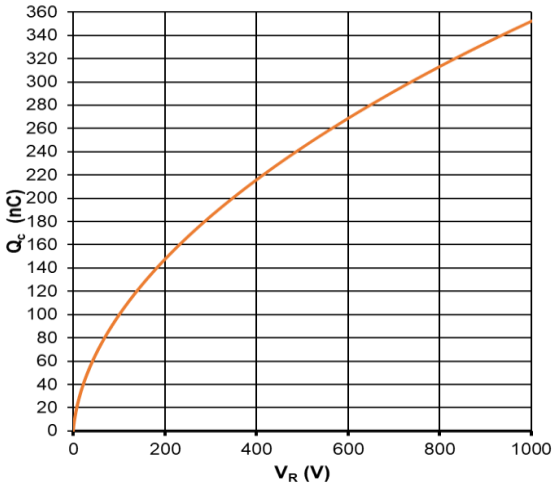


Figure 5. Reverse charge vs. Reverse Voltage

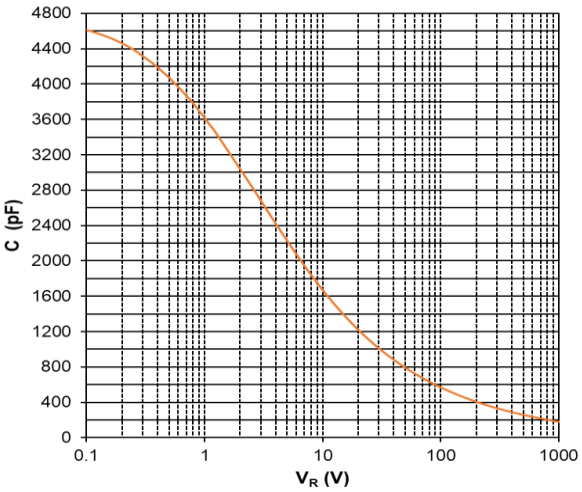
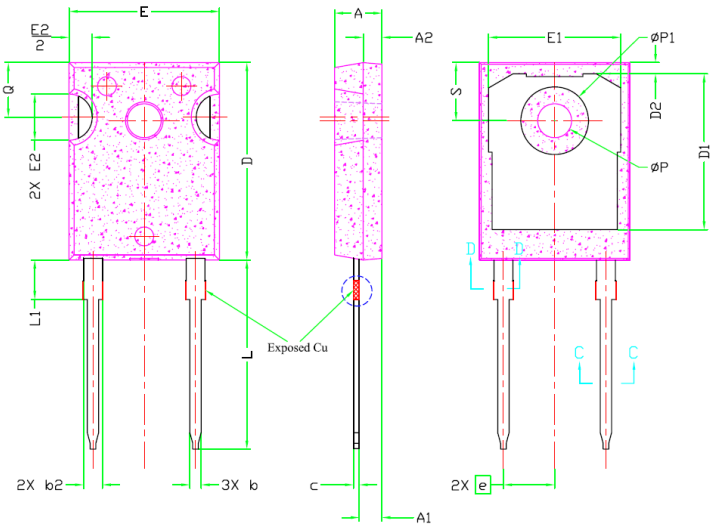


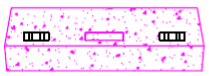
Figure 6. Capacitance vs. Reverse Voltage

Package Dimensions

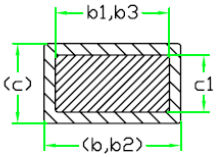
(TO-247-2 Package)



SYMBOL	DIMENSIONS			NOTES
	MIN.	NOM.	MAX.	
A	4.83	5.02	5.21	
A1	2.29	2.41	2.55	
A2	1.50	2.00	2.49	
b	1.12	1.20	1.33	
b1	1.12	1.20	1.28	
b2	1.91	2.00	2.39	6
b3	1.91	2.00	2.34	
c	0.55	0.60	0.69	6
c1	0.55	0.60	0.65	
D	20.80	20.95	21.10	4
D1	16.25	16.55	17.65	5
D2	0.51	1.19	1.35	
E	15.75	15.94	16.13	4
E1	13.46	14.02	14.16	5
E2	4.32	4.91	5.49	3
e	5.44BSC			
L	19.81	20.07	20.32	
L1	4.10	4.19	4.40	6
ØP	3.56	3.61	3.65	7
ØP1	7.19REF.			
Q	5.39	5.79	6.20	
S	6.04	6.17	6.30	



Note:
1. Package Reference: JEDEC TO247, Variation AD.
2. All Dimensions Are In mm.
3. Slot Required, Notch May Be Rounded
4. Dimension D & E Do Not Include Mold Flash. Mold Flash Shall Not Exceed 0.127mm Pre Side. These Dimensions Are Measured At The Outermost Extreme Of The Plastic Body.
5. Thermal Pad Contour Optional Within Dimension D1 & E1.
6. Lead Finish Uncontrolled In L1.
7. ØP To Have A Maximum Draft Angle Of 1.5° To The Top Of The Part With A Maximum Hole Diameter Of 3.91mm.
8. Dimension "b2" And "b4" Does Not Include Dambar Protrusion. Allowable Dambar Protrusion Shall Be 0.10mm Total In Excess Of "b2" And "b4" Dimension At Maximum Material Condition.



Section C–C,D–D