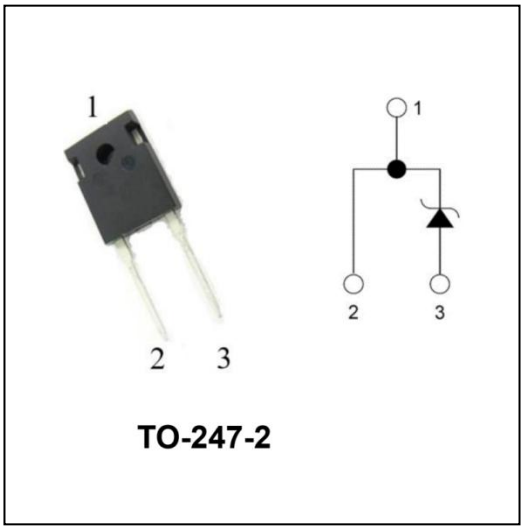
Silicon Carbide Schottky Diode 900V, 42A, 145nC

General Description

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

Applications

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

Benefits

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

Key performance parameters

Type	V_R	I_F T_C=136°C	Q_C
TK3D42090H	900V	42A	145nC

Maximum Ratings

T_C=25°C, unless otherwise specified

Parameter	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	900	V

Maximum Ratings

T_C=25°C, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous Forward Current T_C = 25°C T_C = 130°C T_C = 136°C	I_F	 91 46 42	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}	 240 230	A
Repetitive peak Forward Surge Current Freq = 0.1Hz, 100 cycles T_C = 25°C, t_p=10ms, Half Sine Pulse T_C = 110°C, t_p=10ms, Half Sine Pulse	I_{FRM}	 220 200	A
Total power dissipation T_C = 25°C T_C = 110°C	P_D	 313 135	W
Single Pulse Avalanche Energy: L=2mH, I_{AS}=17A	E_{AS}	289	mJ
Diode dv/dt ruggedness: V_R=0-900v	dv/dt	80	V/ns
Operating Junction Temperature:	T_J	-55 to 175	°C
Storage Temperature :	T_{STG}	-55 to 175	°C

Thermal Resistance

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance, junction-case	$R_{th\ (j-c)}$	0.48		°C/W

Electrical Characteristic

TC =25℃, unless otherwise specified

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
DC Blocking Voltage	V_{DC}	900			V	T_J=25°C
Forward Voltage	V_F		1.45 1.70 1.90	1.75	V	I_F = 42A T_J=25°C T_J= 125°C T_J=175°C
Reverse Current	I_R		9 50 160	150	μA	V_R=900V T_J=25°C T_J= 125°C T_J=175°C
Total Capacitance Charge	Q_C		145		nC	V_R = 600V, T_J=25°C
Total Capacitance	C		1950 178 150		pF	T_J = 25°C , F_{req} = 1MHz V_R = 1V V_R = 300V V_R = 600V
Note: This is a majority carrier diode, so there is no reverse recovery charge						

Characteristics Curves

Figure 1. Forward Characteristics

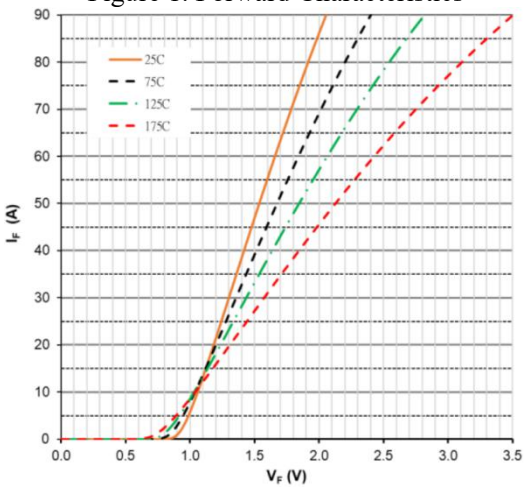


Figure 2. Forward Characteristics

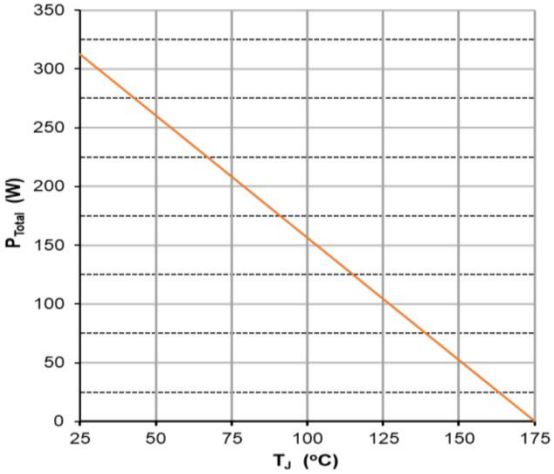


Figure 3. Reverse Characteristics

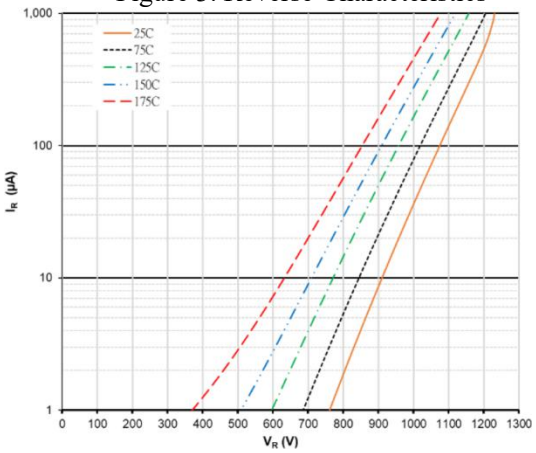


Figure 4. Power Derating

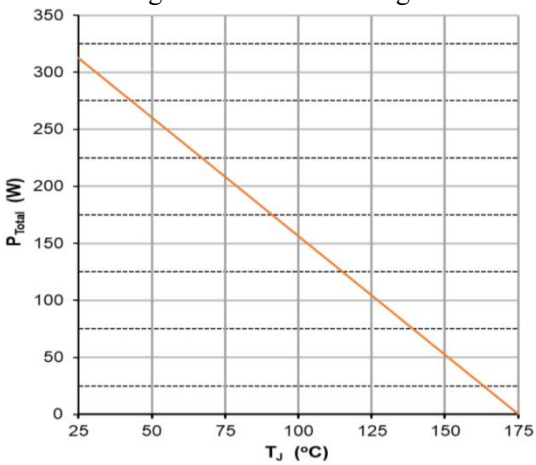


Figure 5. Reverse charge vs. Reverse Voltage

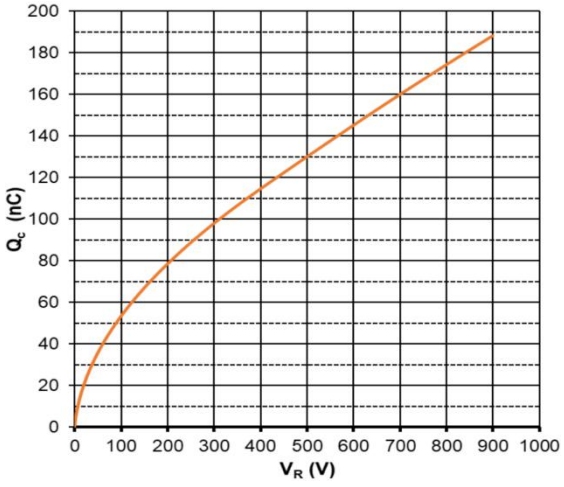
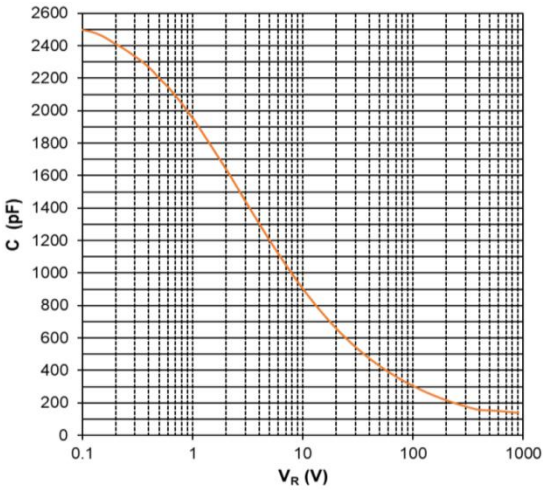
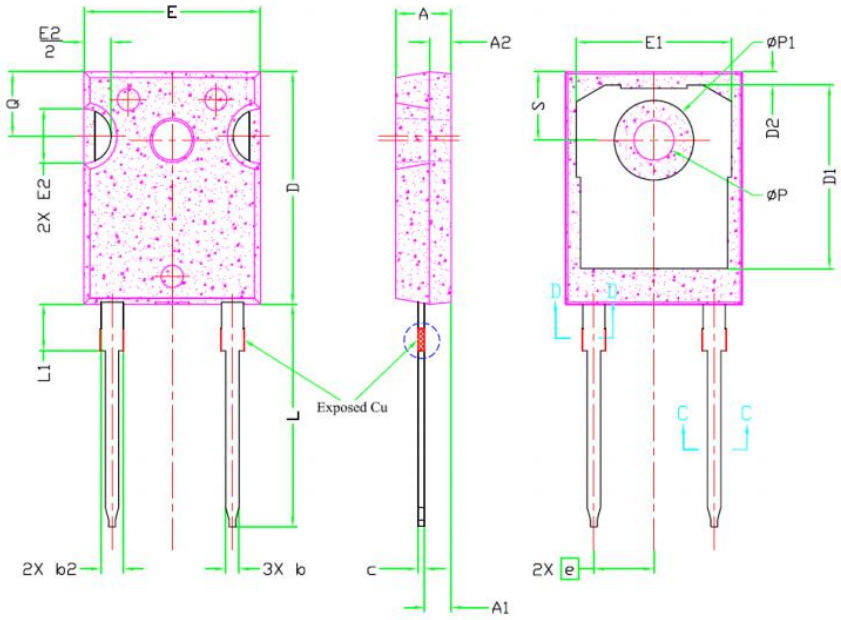


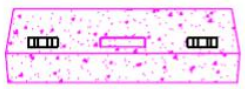
Figure 6. Capacitance vs. Reverse Voltage



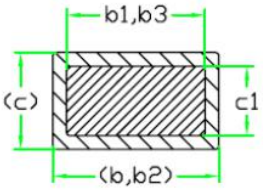
Package Dimensions: (TO-247-2 Package)



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