

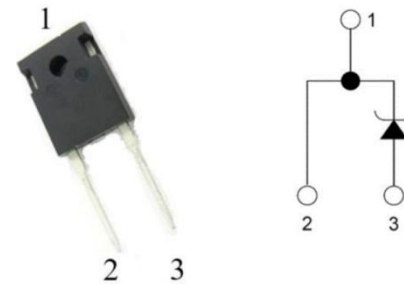
Silicon Carbide Schottky Diode 900V, 42A, 145nC

General Description

This product family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.

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



TO-247-2

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 $T_C=136^\circ\text{C}$	Q_C
CC3D42090H	900V	42A	145nC

Maximum Ratings

$T_C=25^{\circ}\text{C}$, unless otherwise specified

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

Maximum Ratings

$T_C=25^{\circ}\text{C}$, unless otherwise specified

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

Thermal Resistance

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

Electrical Characteristic

T_C = 25°C, unless otherwise specified

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

Characteristics Curves

Figure 1. Forward Characteristics

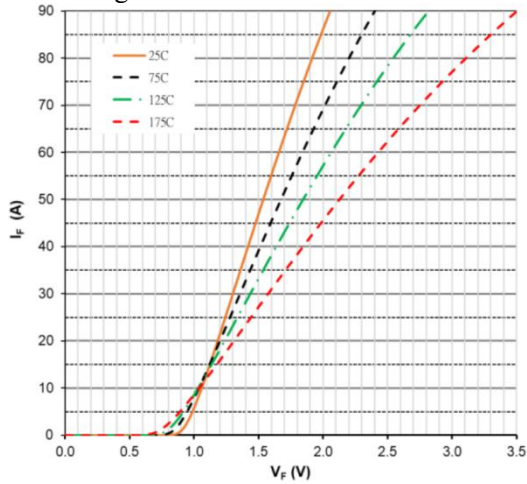


Figure 2. Forward Characteristics

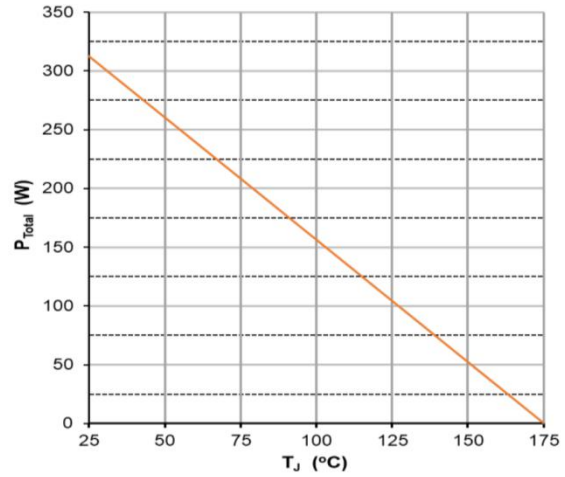


Figure 3. Reverse Characteristics

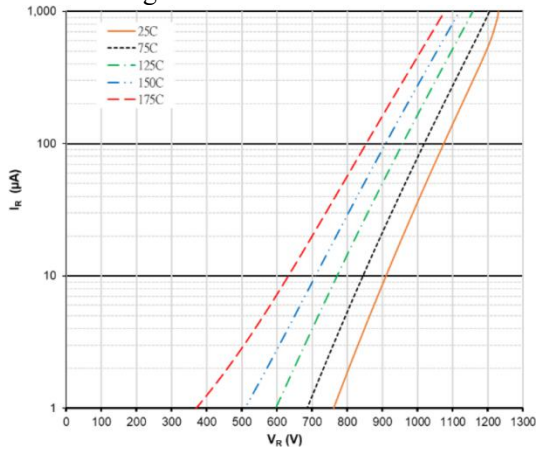


Figure 4. Power Derating

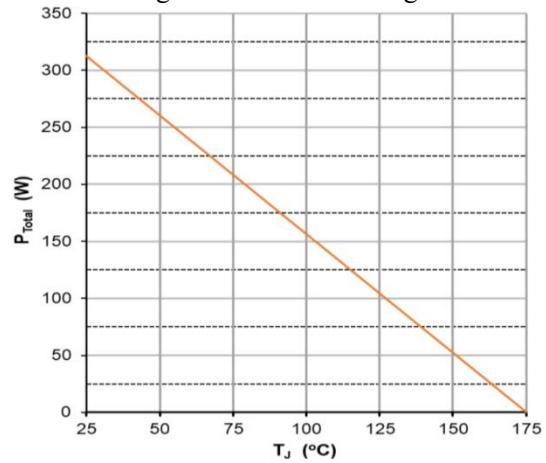


Figure 5. Reverse charge vs. Reverse Voltage

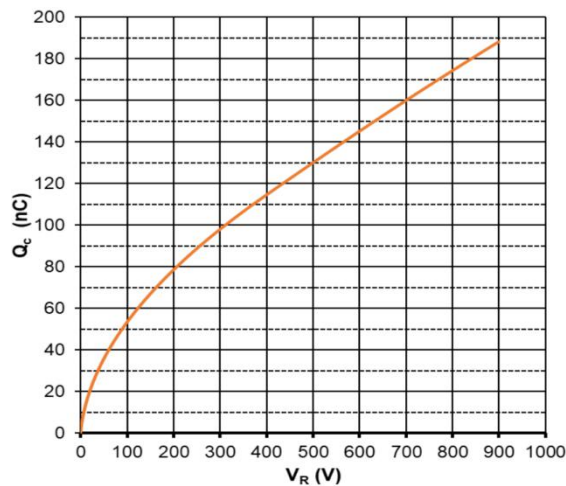
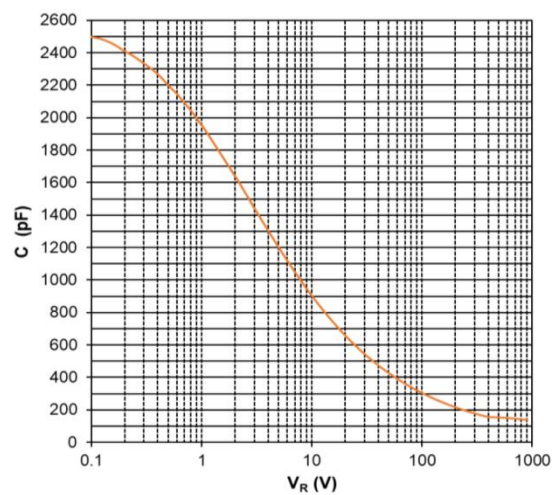
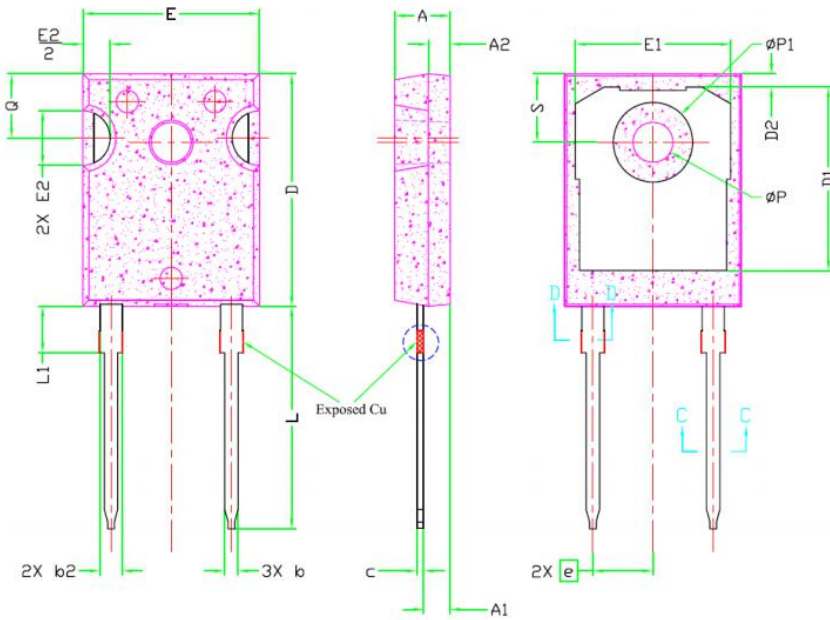


Figure 6. Capacitance vs. Reverse Voltage



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.

