

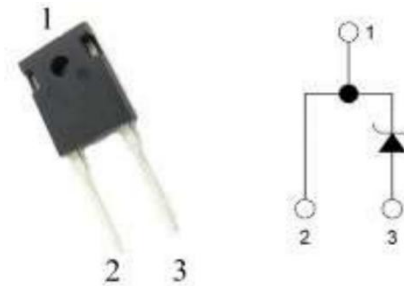
Silicon Carbide Schottky Diode 650V, 20A, 44nC

General Description

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

Features

- Zero Forward/Reverse Recovery Current
- High Blocking Voltage
- High Frequency Operation
- Positive Temperature Coefficient on VF
- Temperature Independent Switching Behavior



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 $T_C=145^\circ C$	Q_C
NF3D20065H	650V	20A	44nC

Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedures.

Maximum Ratings

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

Parameter	Symbol	Value	Unit	Test conditions
Peak Repetitive Reverse Voltage	V_{RRM}	650	V	-
Peak Reverse Surge Voltage	V_{RSM}	650	V	-
DC Blocking Voltage	V_R	650	V	-
Continuous Forward Current	I_F	55 24 20	A	$T_C = 25^{\circ}\text{C}$ $T_C = 135^{\circ}\text{C}$ $T_C = 145^{\circ}\text{C}$
Non repetitive Forward Surge Current	I_{FSM}	120 110	A	$t_p = 10\text{ ms}$, Half Sine Pulse $T_C = 25^{\circ}\text{C}$, $T_C = 110^{\circ}\text{C}$
Repetitive peak Forward Surge Current	I_{FRM}	110 100	A	$t_p = 10\text{ ms}$, Freq = 0.1Hz 100 cycles, Half Sine Pulse $T_C = 25^{\circ}\text{C}$ $T_C = 110^{\circ}\text{C}$
Total power dissipation	P_D	167	W	$T_C = 25^{\circ}\text{C}$
Operating Junction Temperature	T_J	-55 to 175	$^{\circ}\text{C}$	
Storage Temperature	T_{STG}	-55 to 175	$^{\circ}\text{C}$	

Thermal Characteristics

Parameter	Condition	Symbol	Typ.	Unit
Thermal resistance(per device)	junction-case	$R_{th(j-c)}$	0.9	$^{\circ}\text{C}/\text{W}$

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Electrical Characteristics

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

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
DC Blocking Voltage	V_{DC}	650	-	-	V	$I_R = 250\mu\text{A}$ $T_J = 25^\circ\text{C}$
Forward Voltage	V_F	-	1.50	1.80	V	$I_F = 20\text{A}$ $T_J = 25^\circ\text{C}$
		-	1.60	-		$T_J = 125^\circ\text{C}$
		-	1.70	-		$T_J = 175^\circ\text{C}$
Reverse Current	I_R	-	20	80	μA	$V_R = 650\text{V}$ $T_J = 25^\circ\text{C}$
		-	120	-		$T_J = 125^\circ\text{C}$
		-	250	-		$T_J = 175^\circ\text{C}$
Total Capacitance Charge	Q_C	-	44	-	nC	$V_R = 400\text{V}$ $T_J = 25^\circ\text{C}$
Total Capacitance	C	-	770	-	pF	$T_J = 25^\circ\text{C}$, Freq = 1MHz $V_R = 1\text{V}$
		-	90	-		$V_R = 200\text{V}$
		-	64	-		$V_R = 400\text{V}$

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Characteristics Curves

Figure 1. Forward Characteristics

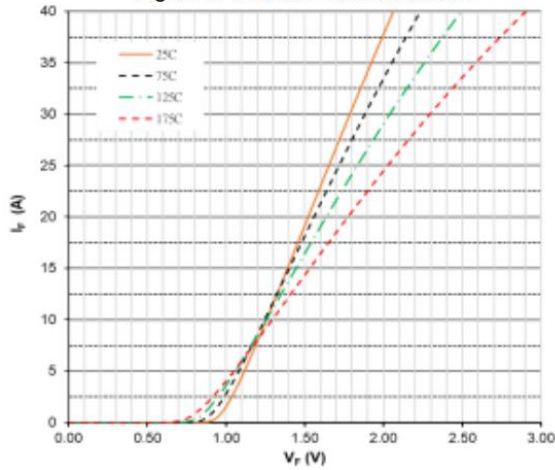


Figure 2. Forward Characteristics

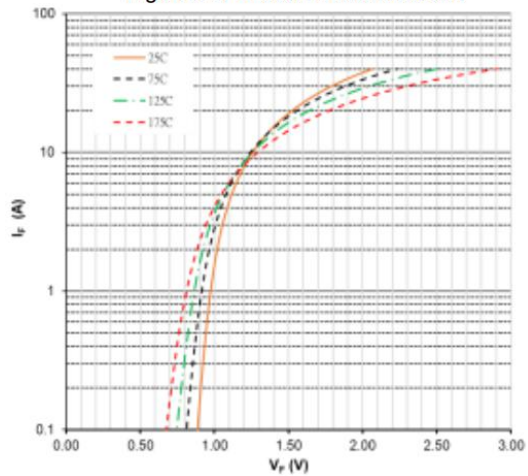


Figure 3. Reverse Characteristics

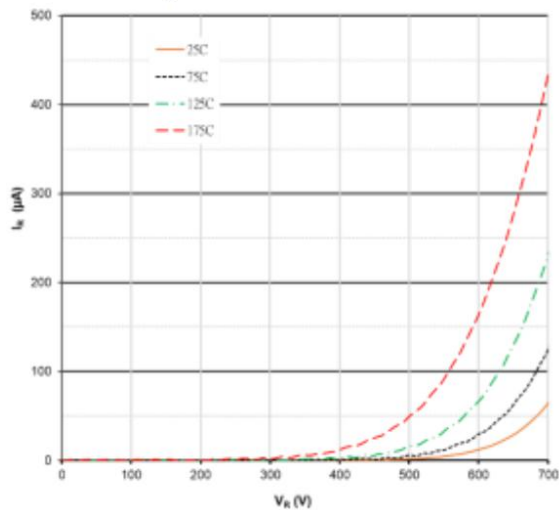


Figure 4. Power Derating

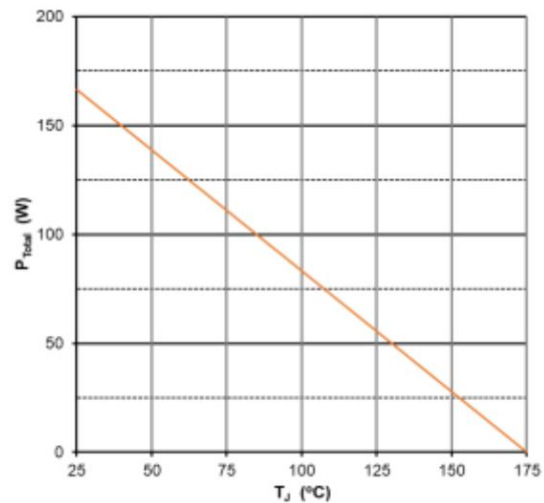


Figure 5. Capacitance vs Reverse Voltage

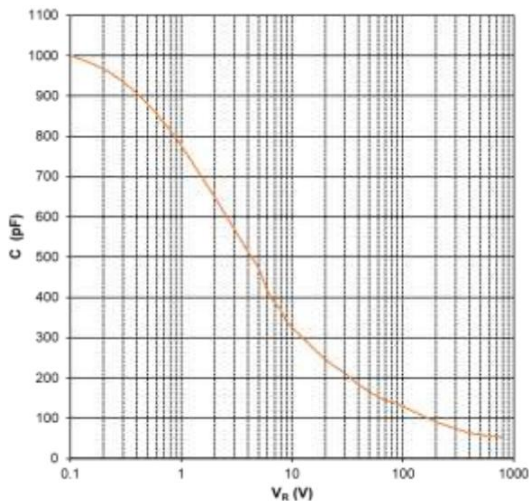
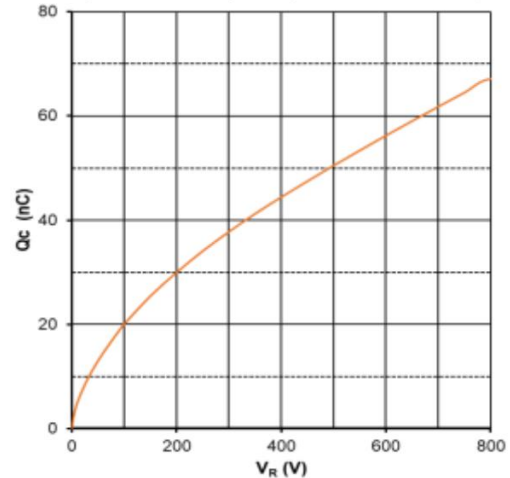


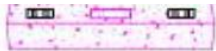
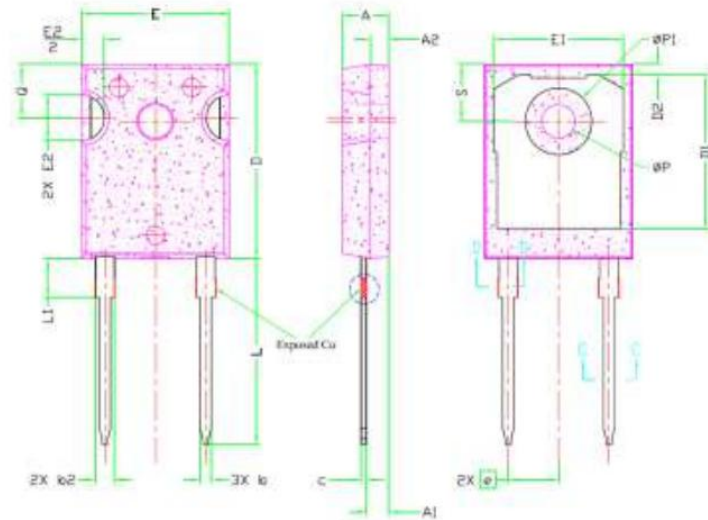
Figure 6. Recovery Charge vs Reverse Voltage



SSS

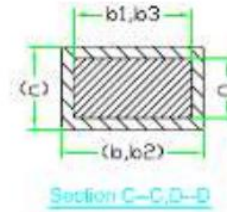
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Package Dimensions: TO-247-2



1. ALL DIMENSIONS ARE IN MM.
2. Slot Required, Notch May Be Rounded
3. Dimension D & E Do Not Include Mold Flash. Mold Flash Shall Not Exceed 0.127mm Per Side. These Dimensions Are Measured At The Outermost Extreme Of The Plastic Body.
4. Thermal Pad Contour Optional Within Dimension D1 & E1.
5. Lead Finish Uncontrolled In L1.
6. OP To Have A Maximum Draft Angle Of 1.5° To The Top Of The Part With A Maximum Hole Diameter Of 3.91mm.
7. Dimension "b2" And "b4" Does Not Include Dumbar Protrusion. Allowable Dumbar Protrusion Shall Be 0.10mm Total In Excess Of "b2" And "b4" Dimension At Maximum Material Condition.

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
			14.16	5
			5.49	3
C			20.32	
			4.40	6
			3.65	7
F			6.20	
			6.30	



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