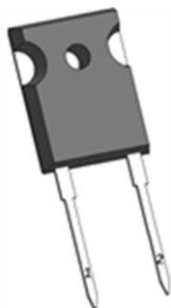


## IV3D12020T2 – 1200V 20A SiC Schottky Diode

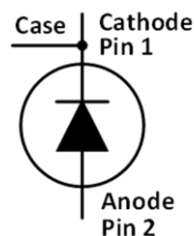
### Features

- Max Junction Temperature 175°C
- High Surge Current Capacity
- Extremely Fast Reverse Recovery Time
- Reduced Losses in Associated MOSFET
- High-Frequency Operation
- Temperature Independent Switching Behavior
- Positive Temperature Coefficient on  $V_F$

### Outline



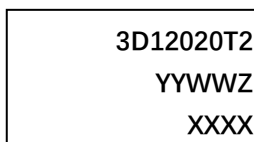
TO247-2



### Applications

- Solar Power Boost
- Inverter Free Wheeling Diodes
- Vienna 3-Phase PFC
- EV Charger Piles
- Switch Mode Power Supplies

### Marking Diagram



3D12020T2 = Specific Device Code  
 YY = Year  
 WW = Work Week  
 Z = Assembly Location  
 XXXX = Lot Traceability

### Absolute Maximum Ratings (Tc=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
$V_{RRM}$	Reverse voltage (repetitive peak)	1200	V
$V_{DC}$	DC blocking voltage	1200	V
$I_F$	Forward current (continuous) @Tc=25°C	80.6	A
	Forward current (continuous) @Tc=135°C	38.8	A
	Forward current (continuous) @Tc=161°C	20	A
$I_{FSM}$	Surge non-repetitive forward current sine halfwave @Tc=25°C tp=10ms	210	A
$I_{FRM}$	Surge repetitive forward current (Freq=0.1Hz, 100cycles) sine halfwave @Tamb=25°C tp=10ms	180	A
$P_{tot}$	Total power dissipation @ Tc=25°C	375	W
	Total power dissipation @ Tc=150°C	62.5	
$\int i^2 dt$	$i^2t$ value @Tc=25°C tp=10ms	220	A <sup>2</sup> s
Tstg	Storage temperature range	-55 to 175	°C
Tj	Operating junction temperature range	-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

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V <sub>F</sub>	Forward Voltage	1.31	1.60	V	I <sub>F</sub> = 20 A T <sub>J</sub> =25°C	Fig. 1
		1.72	2.20		I <sub>F</sub> = 20 A T <sub>J</sub> =175°C	
I <sub>R</sub>	Reverse Current	10	200	μA	V <sub>R</sub> = 1200 V T <sub>J</sub> =25°C	Fig. 2
		60	1000		V <sub>R</sub> = 1200 V T <sub>J</sub> =175°C	
C	Total Capacitance	1640		pF	V <sub>R</sub> = 1 V, T <sub>J</sub> = 25°C, f = 1 MHz	Fig. 3
		145			V <sub>R</sub> = 400 V, T <sub>J</sub> = 25°C, f = 1 MHz	
		107			V <sub>R</sub> = 800 V, T <sub>J</sub> = 25°C, f = 1 MHz	
Q <sub>C</sub>	Total Capacitive Charge	153		nC	V <sub>R</sub> = 800 V, T <sub>J</sub> = 25°C, $Q_C = \int_0^{V_R} C(V) dV$	Fig. 4
E <sub>C</sub>	Capacitance Stored Energy	43.8		μJ	V <sub>R</sub> = 800 V, T <sub>J</sub> = 25°C, $E_C = \int_0^{V_R} C(V) \cdot V dV$	Fig. 5

## Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
R <sub>th(j-c)</sub>	Thermal Resistance from Junction to Case	0.40	°C/W	Fig.7

## Typical Performance

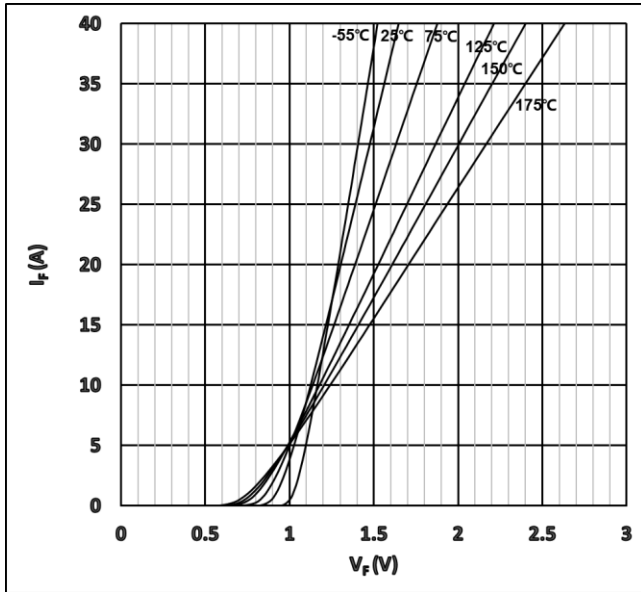


Figure 1. Typical Forward Characteristics

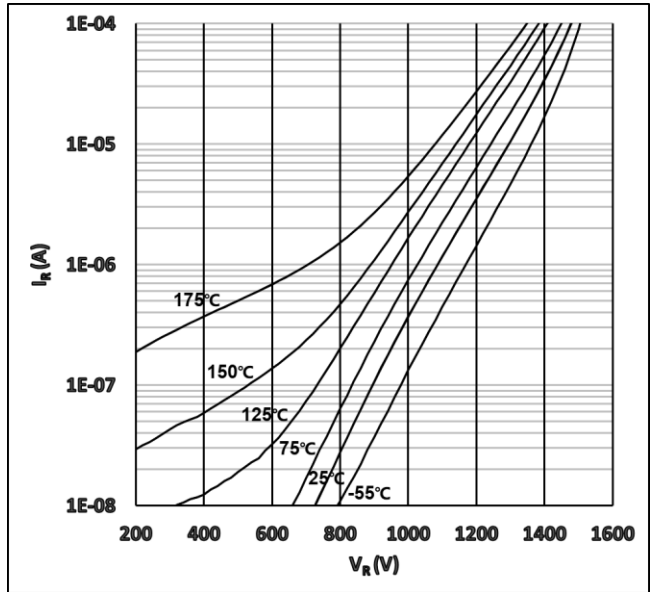


Figure 2. Typical Reverse Characteristics

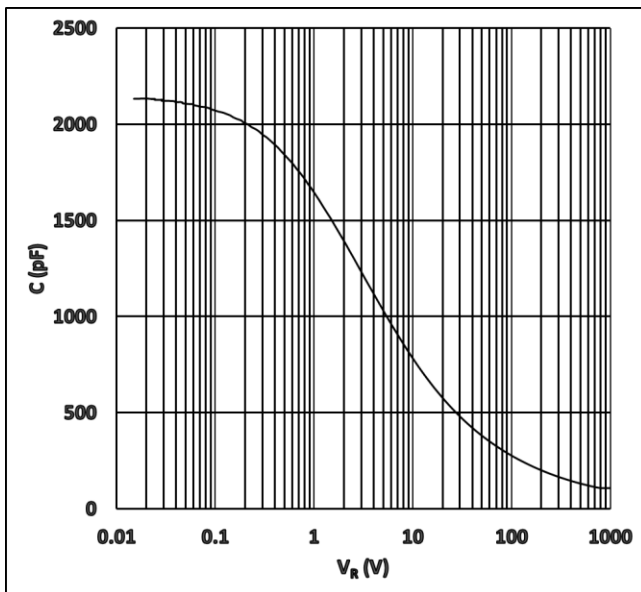


Figure 3. Capacitance vs. Reverse Voltage

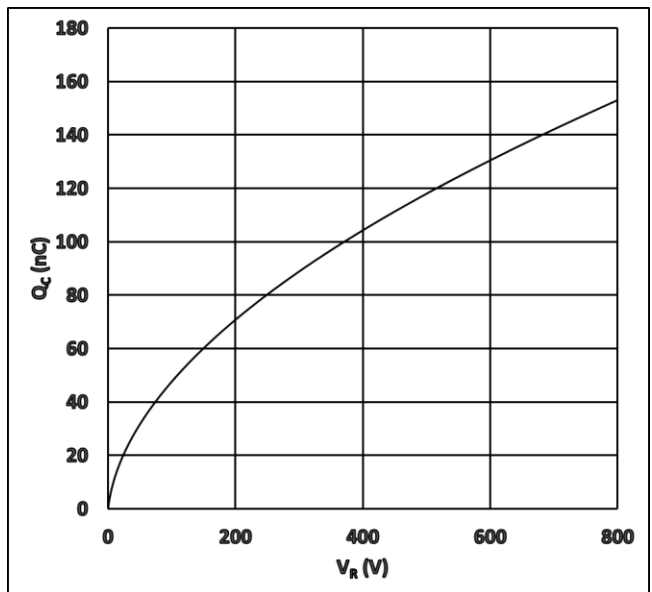


Figure 4. Recovery Charge vs. Reverse Voltage

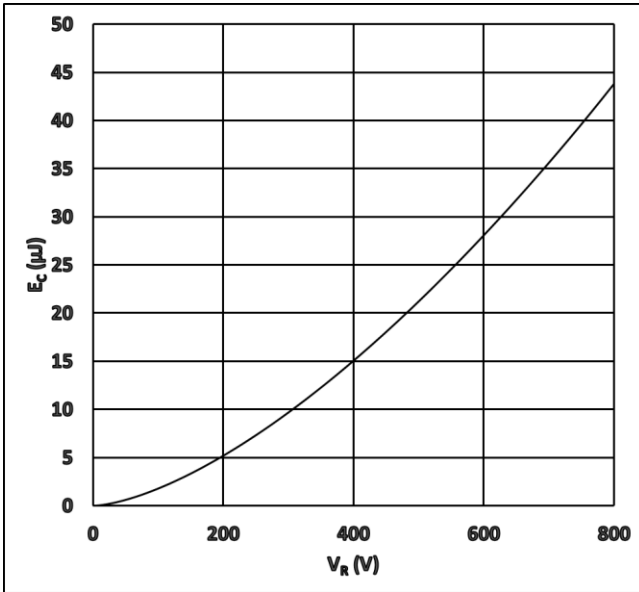


Figure 5. Capacitance Stored Energy

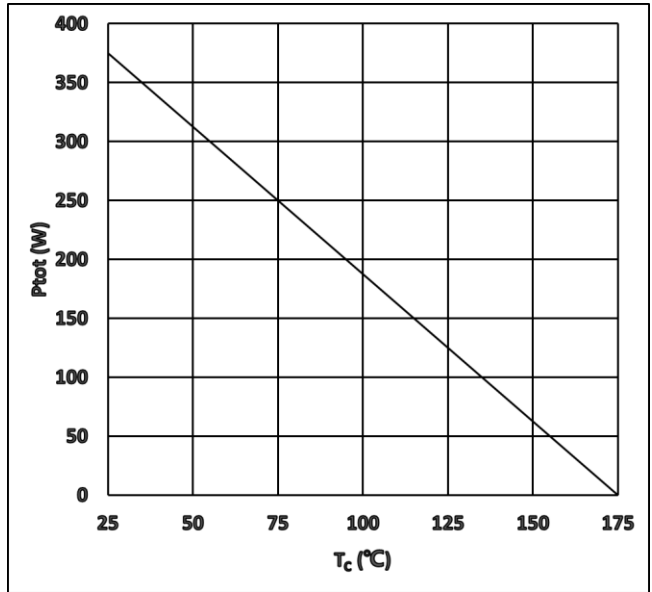


Figure 6. Power Derating

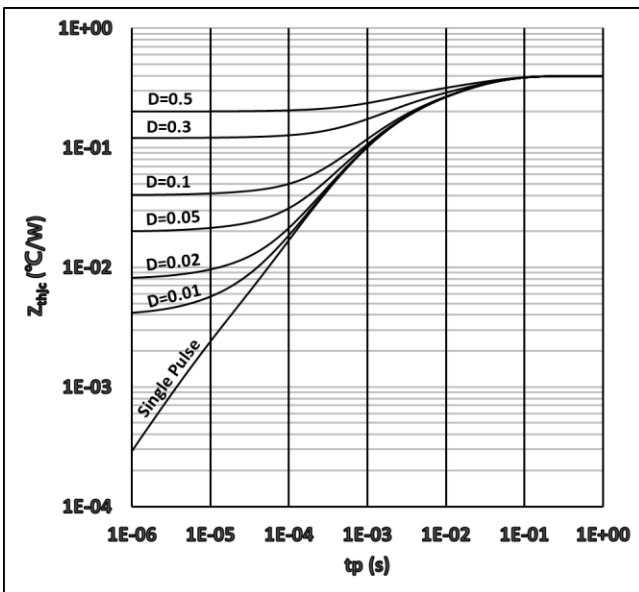


Figure 7. Transient Thermal Impedance

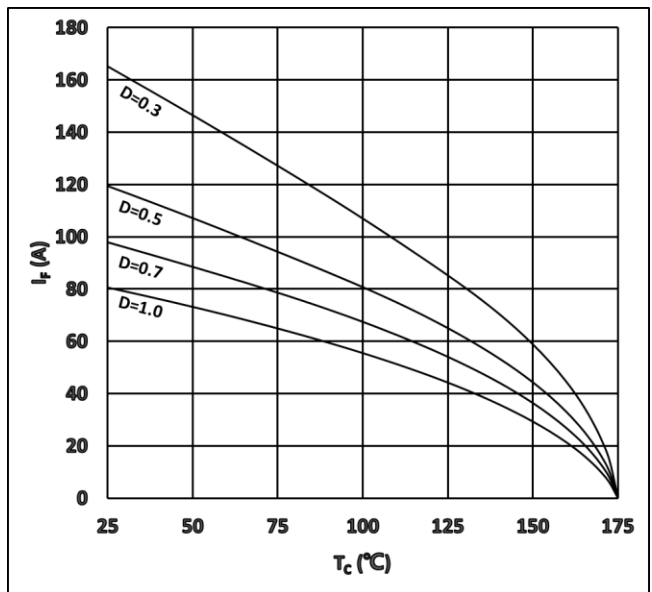
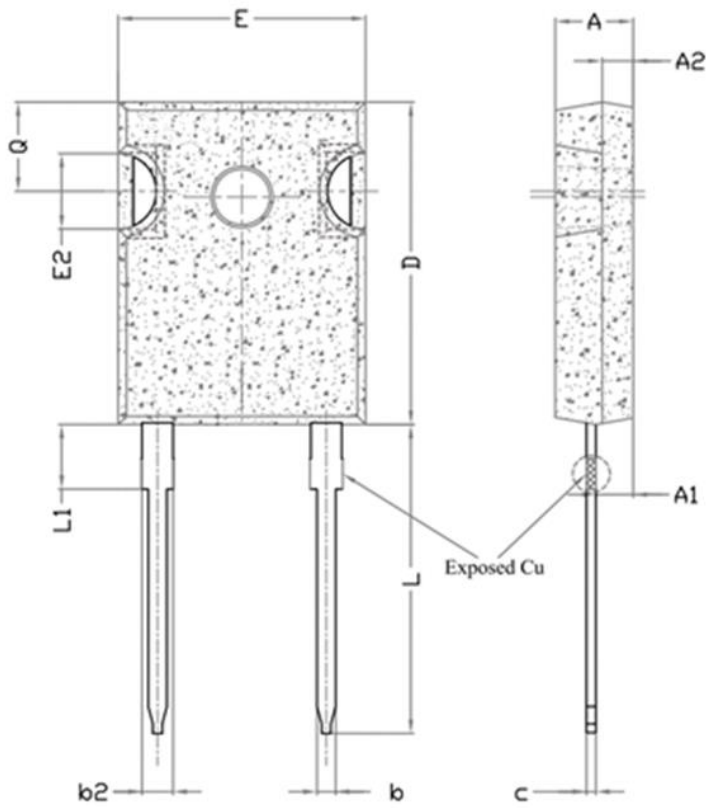
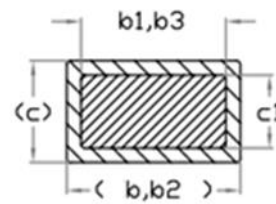
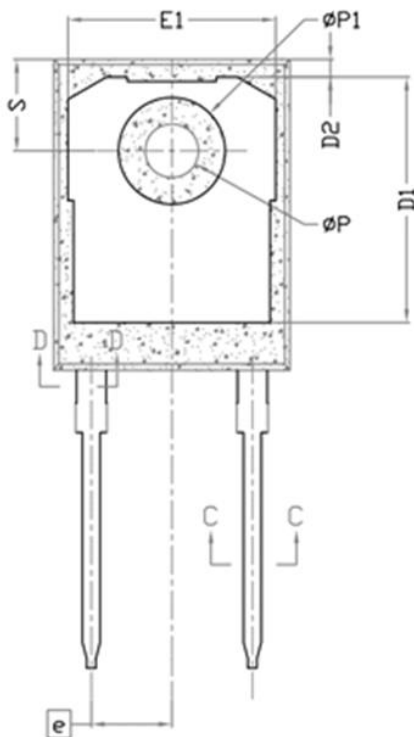


Figure 8.  $I_F$  as a Function of Temp.

## Package Dimensions



Dimensions In Millimeters		
SYMBOL	MIN.	MAX.
A	4.83	5.21
A1	2.20	2.60
A2	1.50	2.49
b	1.00	1.40
b1	0.99	1.35
b2	1.80	2.41
b3	1.65	2.39
c	0.50	0.70
c1	0.38	0.70
D	20.30	21.10
D1	13.08	-
D2	0.51	1.35
E	15.45	16.13
E1	13.10	-
E2	3.68	5.49
e	5.44 BSC	
L	19.80	21.00
L1	-	4.50
φP	3.50	3.70
φP1	-	7.40
Q	5.39	6.20
S	6.04	6.30



Section C--C,D--D

### Note:

1. Package Reference: JEDEC TO247, Variation AD
2. All Dimensions are in mm
3. Slot Required, Notch May Be Rounded or Rectangular
4. Dimension D&E Do Not Include Mold Flash
5. Subject to Change Without Notice

## Notes

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