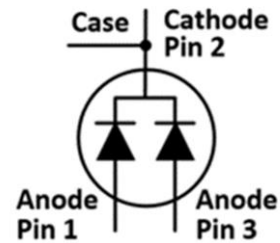
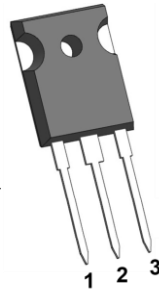


IV1D06020U3Z – 650V 20A Automotive SiC Schottky Diode

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
- AEC-Q101 qualified

Outline

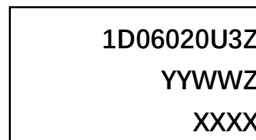


TO247-3

Applications

- PV Micro Inverter
- TV Power
- Power Factor Correction
- Telecom / Server SMPS

Marking Diagram



1D06020U3Z= 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)	650	V
V_{DC}	DC blocking voltage	650	V
I_F^*	Forward current (continuous) @Tc=25°C	30.4*	A
	Forward current (continuous) @Tc=135°C	14.5*	A
	Forward current (continuous) @Tc=152°C	10*	A
I_{FSM}^*	Surge non-repetitive forward current sine halfwave @Tc=25°C tp=10ms	60*	A
I_{FSM}	Surge non-repetitive forward current (two anodes tested in parallel) sine halfwave @Tc=25°C tp=10ms	120	A
I_{FRM}^*	Surge repetitive forward current (Freq=0.1Hz, 100cycles) sine halfwave @Tamb=25°C tp=10ms	48*	A
P_{tot}^*	Total power dissipation @ Tc=25°C	115.3*	W
	Total power dissipation @ Tc=150°C	19.2*	
$\int i^2 dt$	I^2t value @Tc=25°C tp=10ms (two anodes tested in parallel)	72	A ² s
Tstg	Storage temperature range	-55 to 175	°C
Tj	Operating junction temperature range	-55 to 175	°C
M	Mounting torque (M3 screw)	0.7	Nm

*Per Leg

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.

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Electrical Characteristics (Per Leg)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V _F	Forward Voltage	1.37	1.55	V	I _F = 10 A T _J =25°C	Fig. 1
		1.70	2.00		I _F = 10 A T _J =175°C	
I _R	Reverse Current	1	10	μA	V _R = 650 V T _J =25°C	Fig. 2
		10	100		V _R = 650 V T _J =175°C	
C	Total Capacitance	398		pF	V _R = 1 V, T _J = 25°C, f = 1 MHz	Fig. 3
		47.6			V _R = 200 V, T _J = 25°C, f = 1 MHz	
		41.9			V _R = 400 V, T _J = 25°C, f = 1 MHz	
Q _C	Total Capacitive Charge	25.5		nC	V _R = 400 V, T _J = 25°C, $Q_C = \int_0^{V_R} C(V) dV$	Fig. 4
E _C	Capacitance Stored Energy	3.80		μJ	V _R = 400 V, T _J = 25°C, $E_C = \int_0^{V_R} C(V) \cdot V dV$	Fig. 5

Thermal Characteristics (Per Leg)

Symbol	Parameter	Typ.	Unit	Note
R _{th(j-c)}	Thermal Resistance from Junction to Case	1.3	°C/W	Fig.7

Typical Performance (Per Leg)

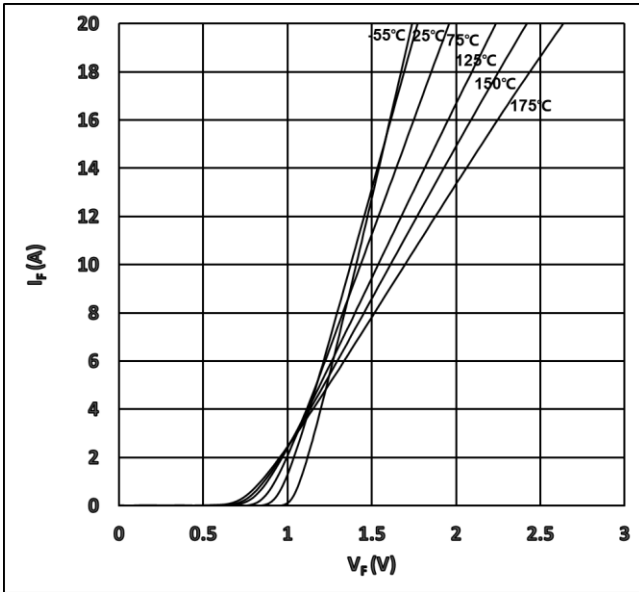


Figure 1. Typical Forward Characteristics

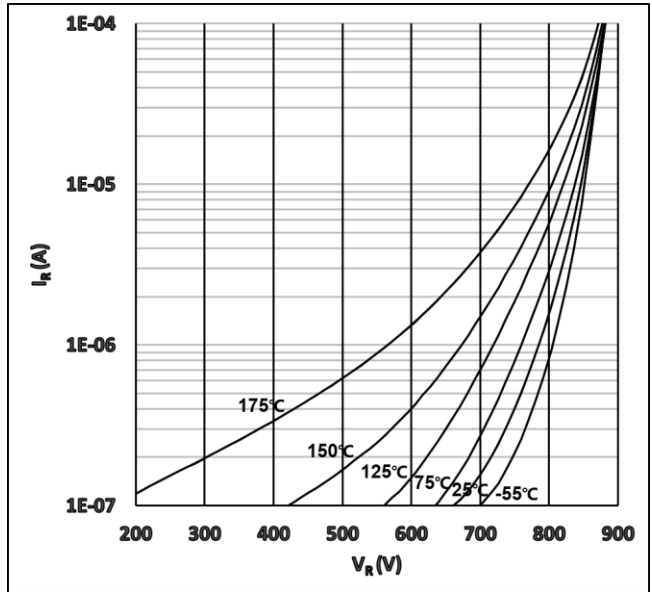


Figure 2. Typical Reverse Characteristics

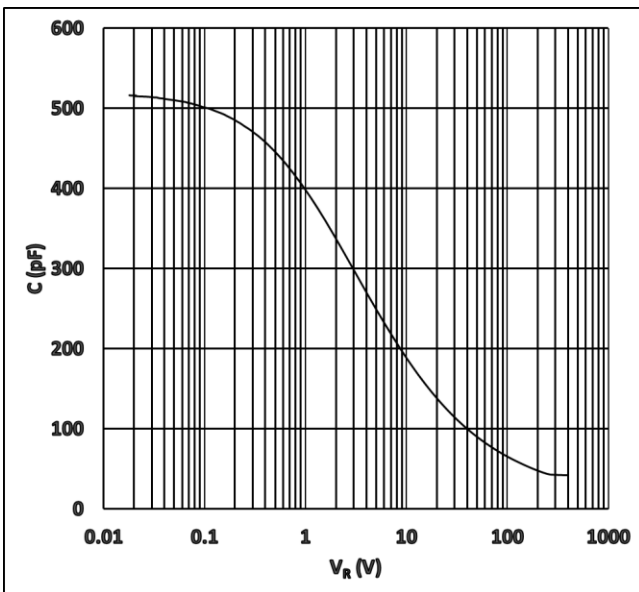


Figure 3. Capacitance vs. Reverse Voltage

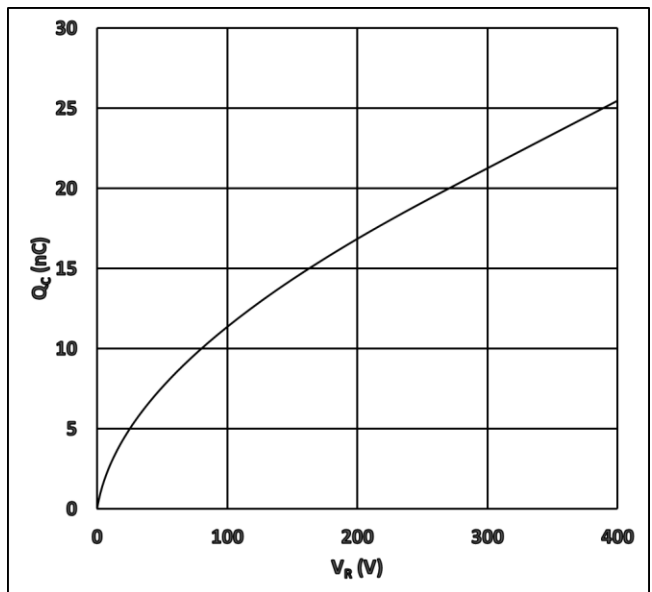


Figure 4. Recovery Charge vs. Reverse Voltage

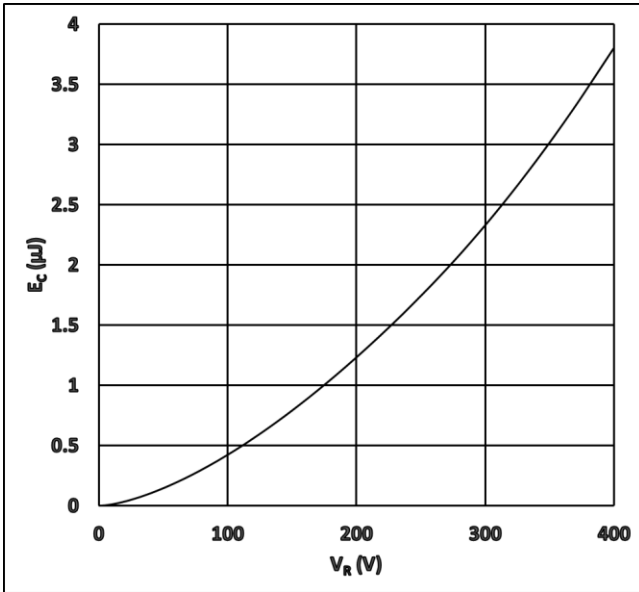


Figure 5. Capacitance Stored Energy

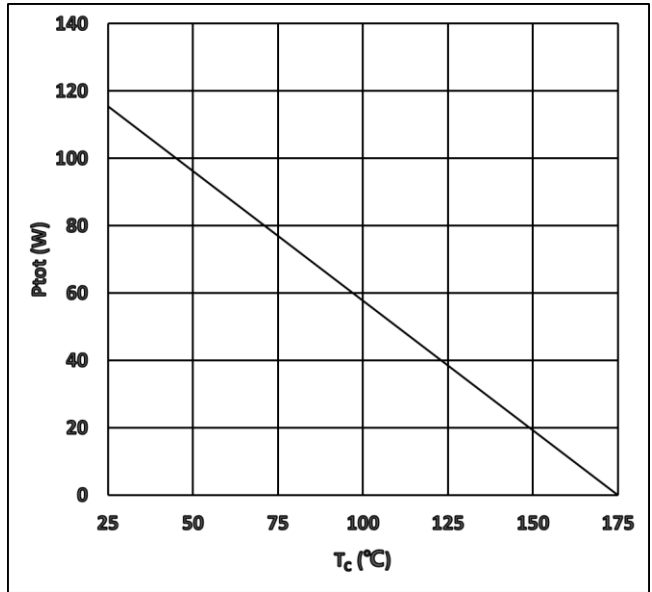


Figure 6. Power Derating

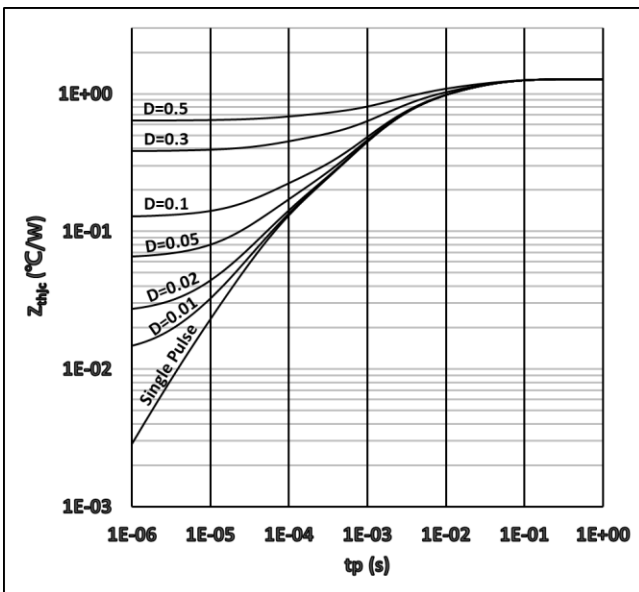


Figure 7. Transient Thermal Impedance

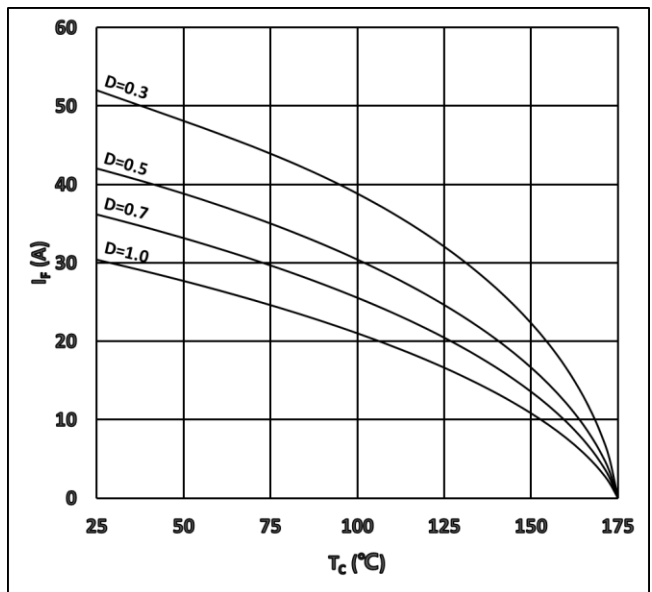
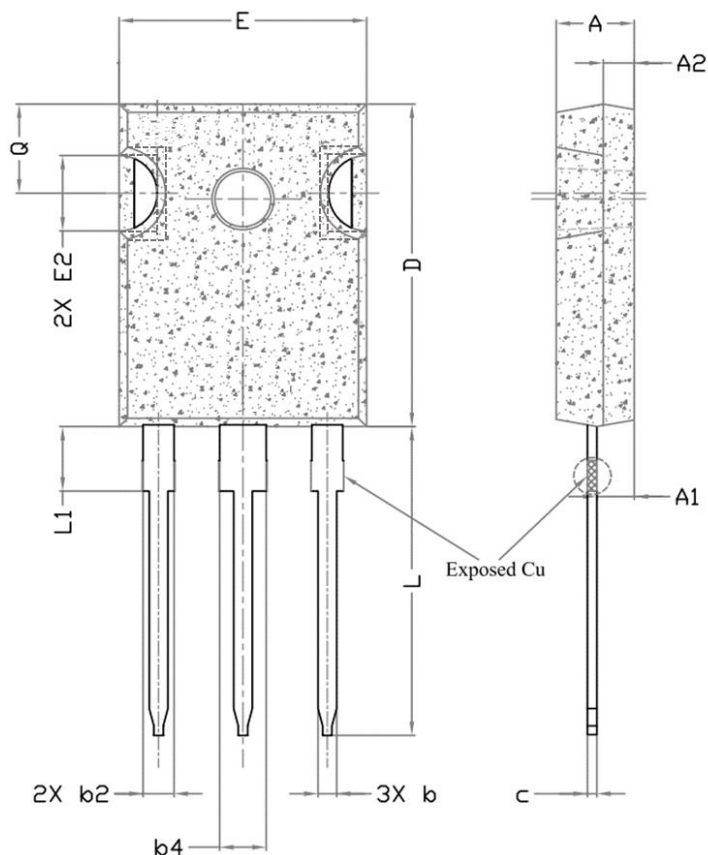
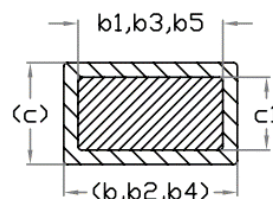
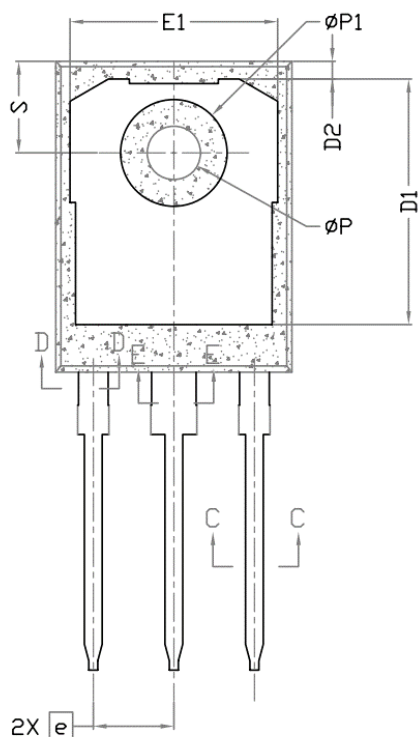


Figure 8. I_F as a Function of Temp.

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
b4	2.80	3.38
b5	2.65	3.18
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,E--E

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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