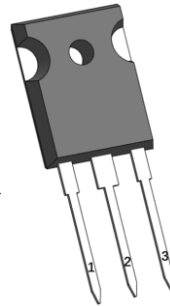


IV1D06020U3 – 650V 20A SiC Schottky Diode

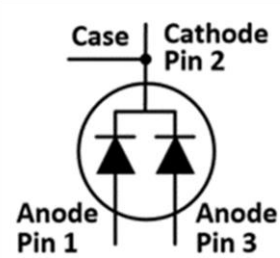
Features

- 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



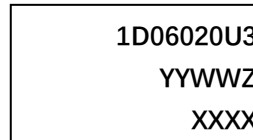
TO247-3



Applications

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

Marking Diagram



1D06020U3 = 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 | 29.5* | A |
| | Forward current (continuous) @Tc=135°C | 14.2* | 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_{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 | 18* | A ² s |
| Tstg | Storage temperature range | -55 to 175 | °C |
| Tj | Operating junction temperature range | -55 to 175 | °C |

*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.

Electrical Characteristics (Per Leg)

| Symbol | Parameter | Typ. | Max. | Unit | Test Conditions | Note |
|----------------|---------------------------|------|------|------|--|--------|
| V _F | Forward Voltage | 1.42 | 1.65 | V | I _F = 10 A T _J =25°C | Fig. 1 |
| | | 1.82 | 2.2 | | 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)

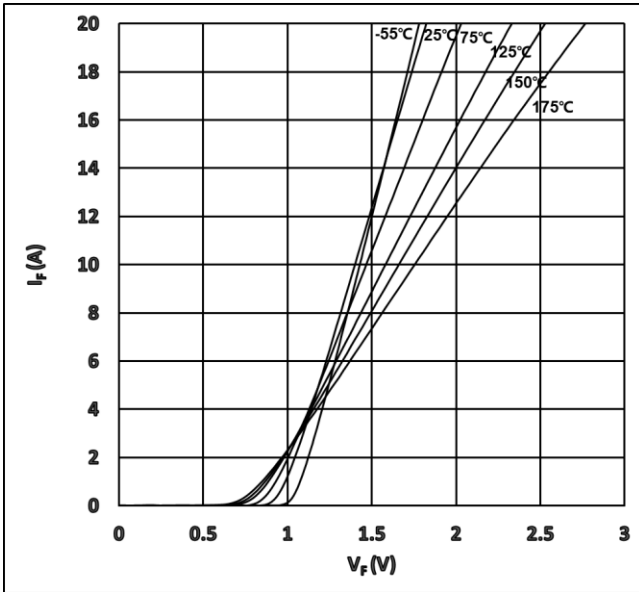


Figure 1. Typical Forward Characteristics

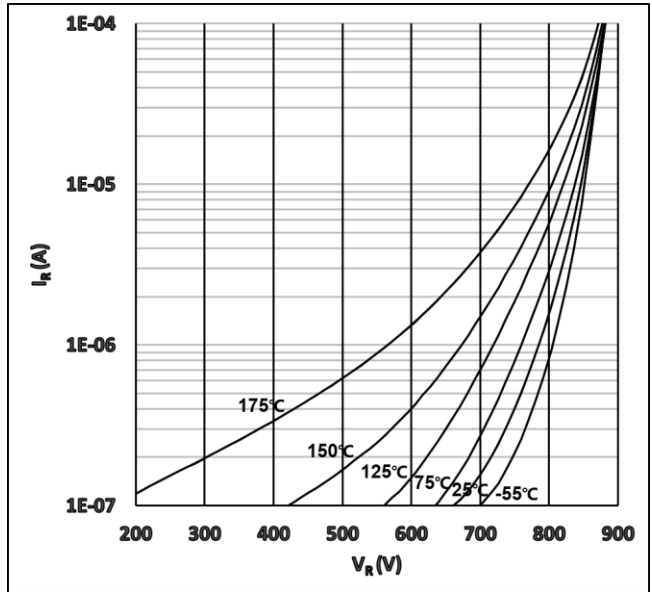


Figure 2. Typical Reverse Characteristics

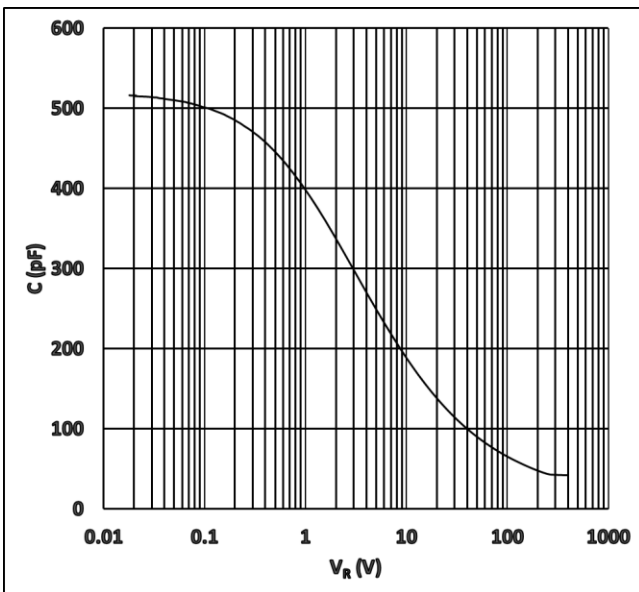


Figure 3. Capacitance vs. Reverse Voltage

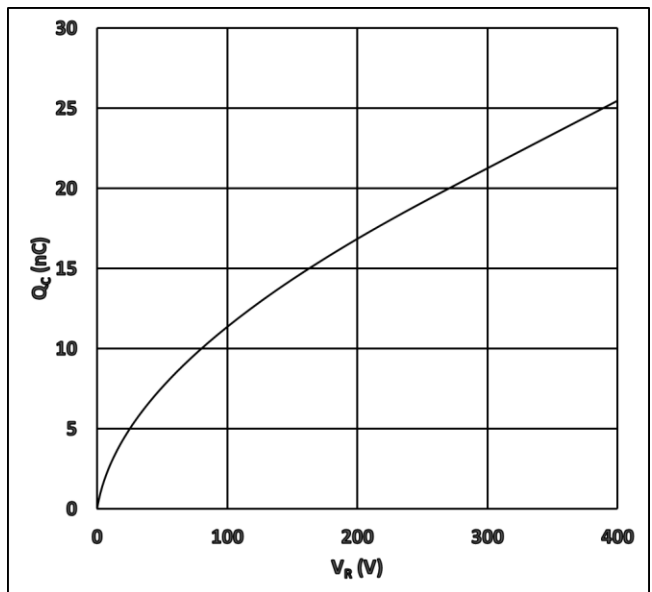


Figure 4. Recovery Charge vs. Reverse Voltage

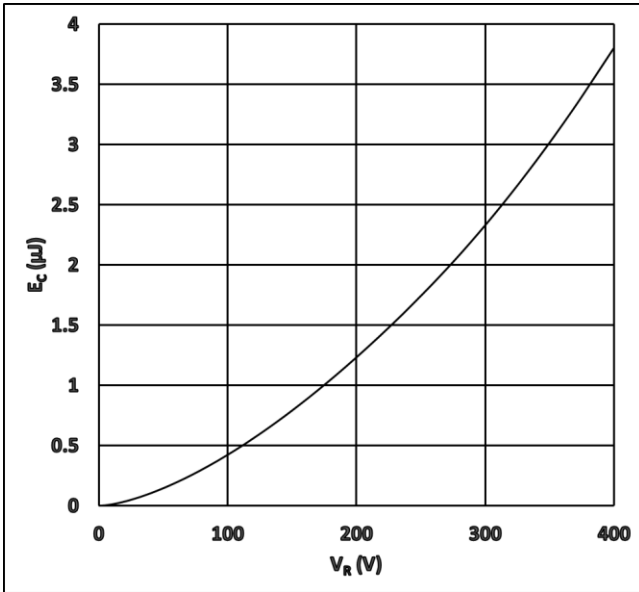


Figure 5. Capacitance Stored Energy

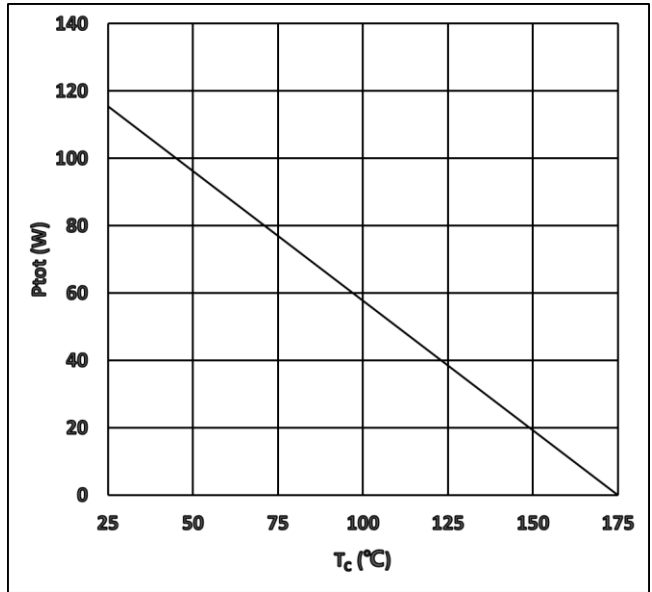


Figure 6. Power Derating

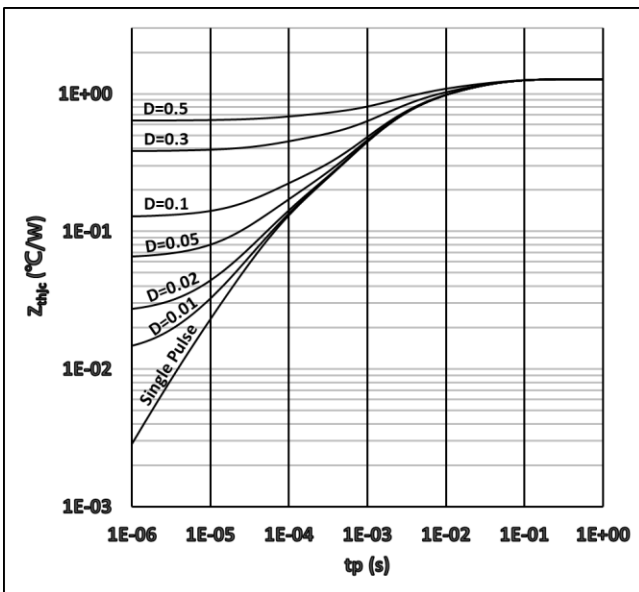


Figure 7. Transient Thermal Impedance

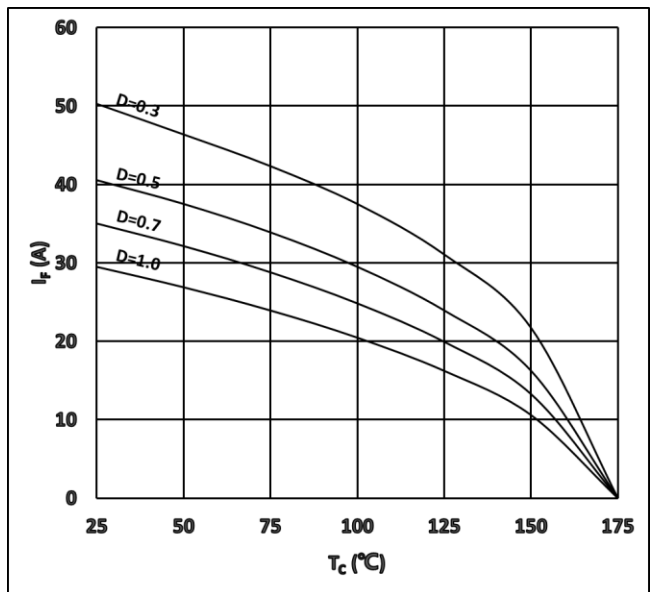
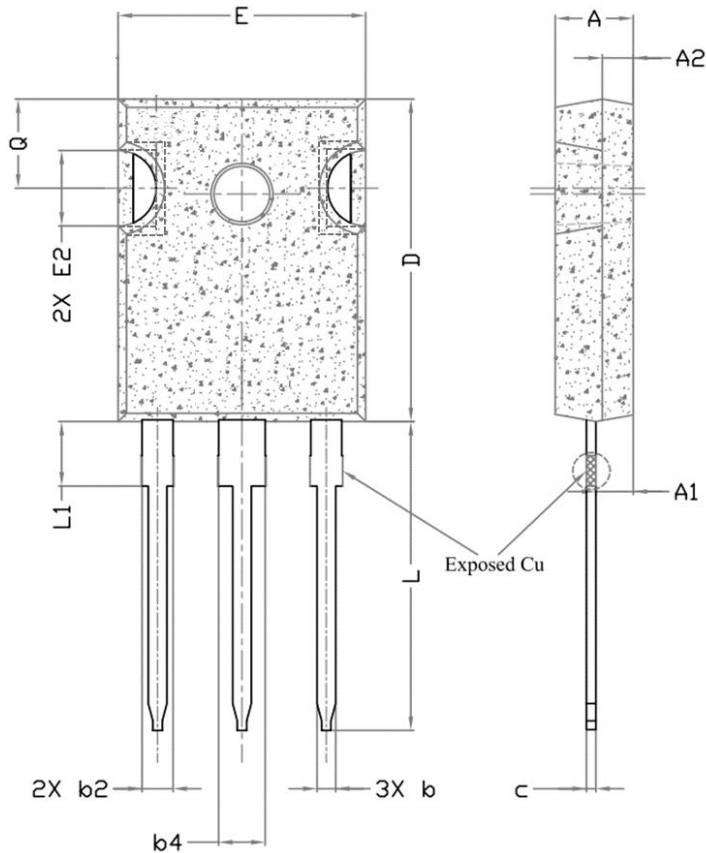
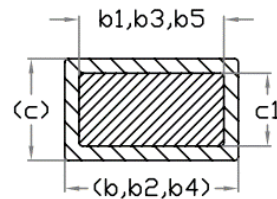
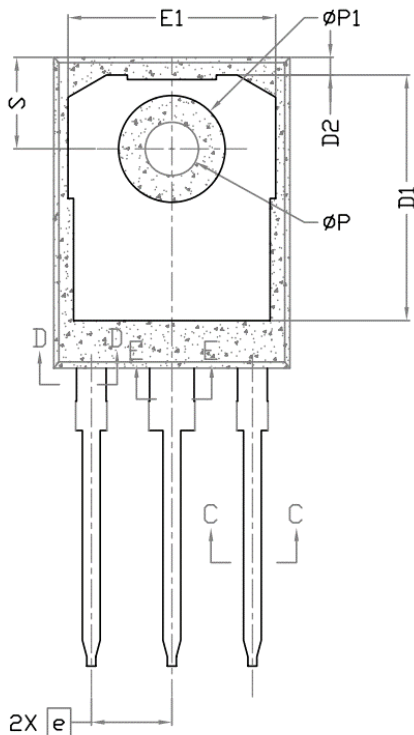


Figure 8. I_F as a Function of Temp.

Package Dimensions



| Dimensions In Millimeters | | |
|---------------------------|----------|-------|
| SYMBOL | MIN. | MAX. |
| A | 4.83 | 5.21 |
| A1 | 2.29 | 2.55 |
| A2 | 1.50 | 2.49 |
| b | 1.07 | 1.33 |
| b1 | 1.07 | 1.28 |
| b2 | 1.91 | 2.41 |
| b3 | 1.91 | 2.34 |
| b4 | 2.87 | 3.38 |
| b5 | 2.87 | 3.18 |
| c | 0.55 | 0.69 |
| c1 | 0.55 | 0.65 |
| D | 20.80 | 21.10 |
| D1 | 16.25 | 17.65 |
| D2 | 0.51 | 1.35 |
| E | 15.70 | 16.13 |
| E1 | 13.10 | 14.16 |
| E2 | 3.68 | 5.49 |
| e | 5.44 BSC | |
| L | 19.80 | 20.32 |
| L1 | 3.95 | 4.40 |
| Ø P | 3.50 | 3.70 |
| Ø P1 | 7.00 | 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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