



$$V_{RRM} = 1700 \text{ V}$$

$$I_F, T_c < 135^\circ \text{C} = 14.4 \text{ A}$$

$$Q_c = 96 \text{ nC}$$

Features

- 1700-Volt Schottky Rectifier
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Halogen-Free; RoHS Compliant

Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

| Part Number | Package | Marking |
|-------------|----------|------------|
| GC3D10170H | TO-247-2 | GC3D10170H |



Package

TO-247-2



Maximum Ratings

| Symbol | Parameter | Value | Unit | Test Conditions | Note |
|-----------|---|----------------|-------------------|---|------|
| V_{RRM} | Repetitive Peak Reverse Voltage | 1700 | V | | |
| V_{RSM} | Surge Peak Reverse Voltage | 1700 | V | | |
| V_{DC} | DC Blocking Voltage | 1700 | V | | |
| I_F | Continuous Forward Current | 14.4 | A | $T_c < 135^\circ \text{C}$ | |
| I_{FRM} | Repetitive Peak Forward Surge Current | 45 26 | A | $T_c = 25^\circ \text{C}, t_p = 10 \text{ ms}, \text{Half Sine Wave}, D = 1$ $T_c = 110^\circ \text{C}, t_p = 10 \text{ ms}, \text{Half Sine Wave}, D = 1$ | |
| I_{FSM} | Non-Repetitive Peak Forward Surge Current | 55 41 | A | $T_c = 25^\circ \text{C}, t_p = 10 \text{ ms}, \text{Half Sine Wave}, D = 1$ $T_c = 110^\circ \text{C}, t_p = 10 \text{ ms}, \text{Half Sine Wave}, D = 1$ | |
| P_{tot} | Power Dissipation | 231 100 | W | $T_c = 25^\circ \text{C}$ $T_c = 110^\circ \text{C}$ | |
| T_c | Maximum Case Temperature | 135 | $^\circ \text{C}$ | | |
| T_j | Operating Junction Range | -55 to +175 | $^\circ \text{C}$ | | |
| T_{stg} | Storage Temperature Range | -55 to +135 | $^\circ \text{C}$ | | |
| | TO-247 Mounting Torque | 1 8.8 | Nm lbf-in | M3 Screw 6-32 Screw | |

Electrical Characteristics

| Symbol | Parameter | Typ. | Max. | Unit | Test Conditions | Note |
|--------|-------------------------|-----------------|-----------|---------------|--|------|
| V_F | Forward Voltage | 1.7 3 | 2 3.5 | V | $I_F = 10\text{ A}$ $T_J = 25^\circ\text{C}$ $I_F = 10\text{ A}$ $T_J = 175^\circ\text{C}$ | |
| I_R | Reverse Current | 20 100 | 60 300 | μA | $V_R = 1700\text{ V}$ $T_J = 25^\circ\text{C}$ $V_R = 1700\text{ V}$ $T_J = 175^\circ\text{C}$ | |
| Q_C | Total Capacitive Charge | 96 | | nC | $V_R = 1700\text{ V}$, $I_F = 10\text{ A}$ $di/dt = 200\text{ A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$ | |
| C | Total Capacitance | 827 78 41 | | pF | $V_R = 0\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 200\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 800\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ | |

Note:

1. This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

| Symbol | Parameter | Typ. | Unit |
|-----------------|--|------|---------------------------|
| $R_{\theta JC}$ | Thermal Resistance from Junction to Case | 0.65 | $^\circ\text{C}/\text{W}$ |

Typical Performance

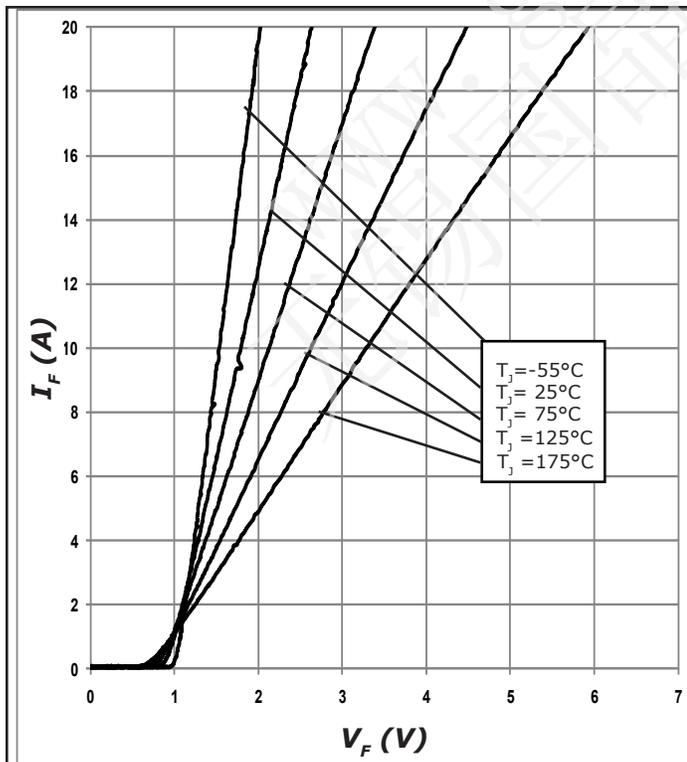


Figure 1. Forward Characteristics

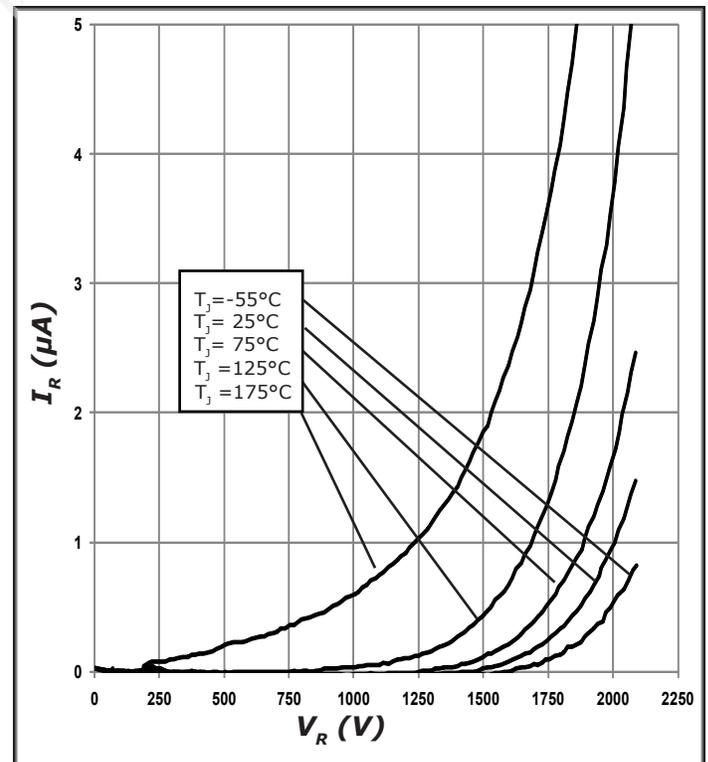


Figure 2. Reverse Characteristics

Typical Performance

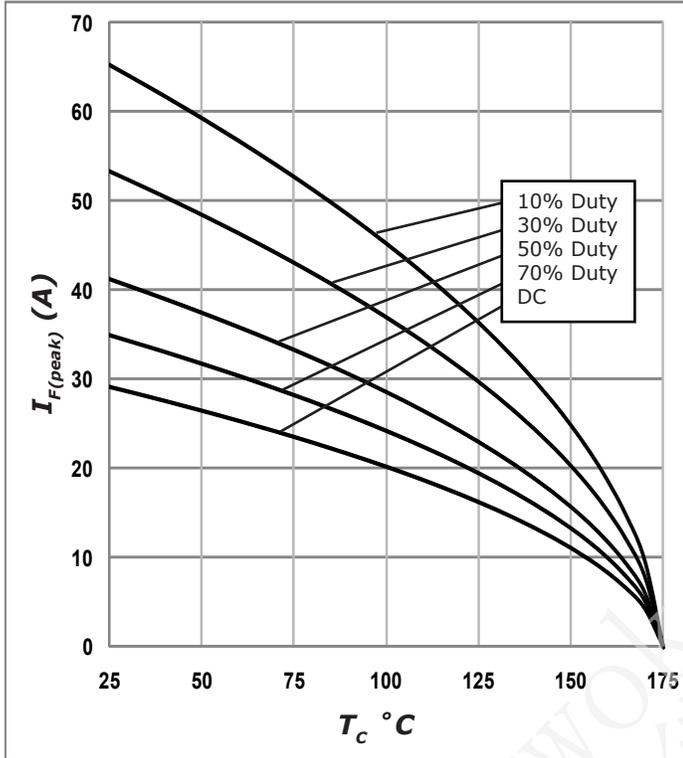


Figure 3. Current Derating

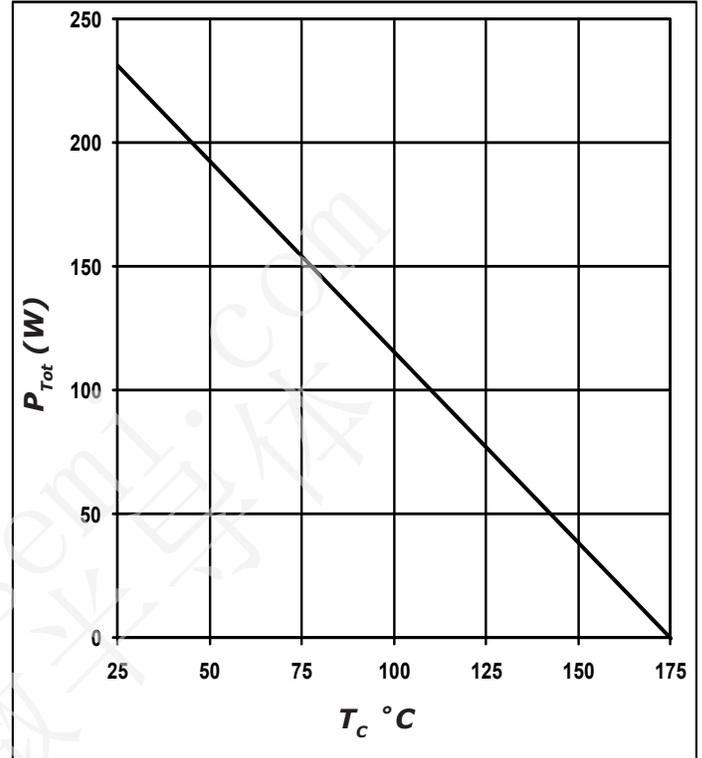


Figure 4. Power Derating

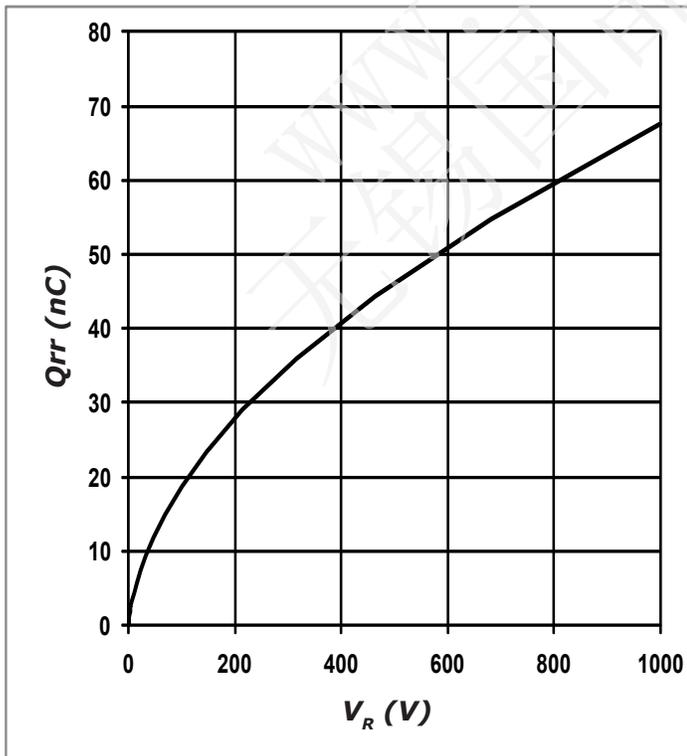


Figure 5. Recovery Charge vs. Reverse Voltage

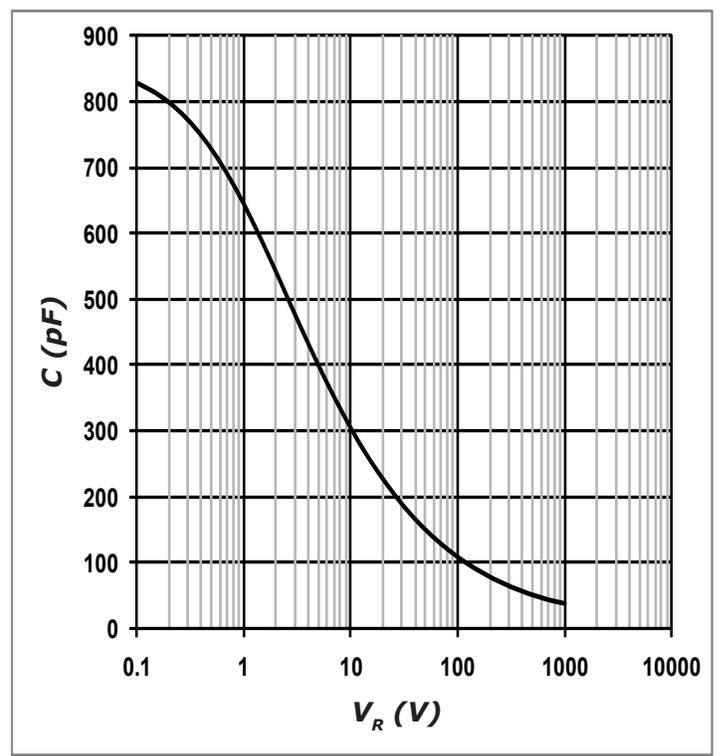


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

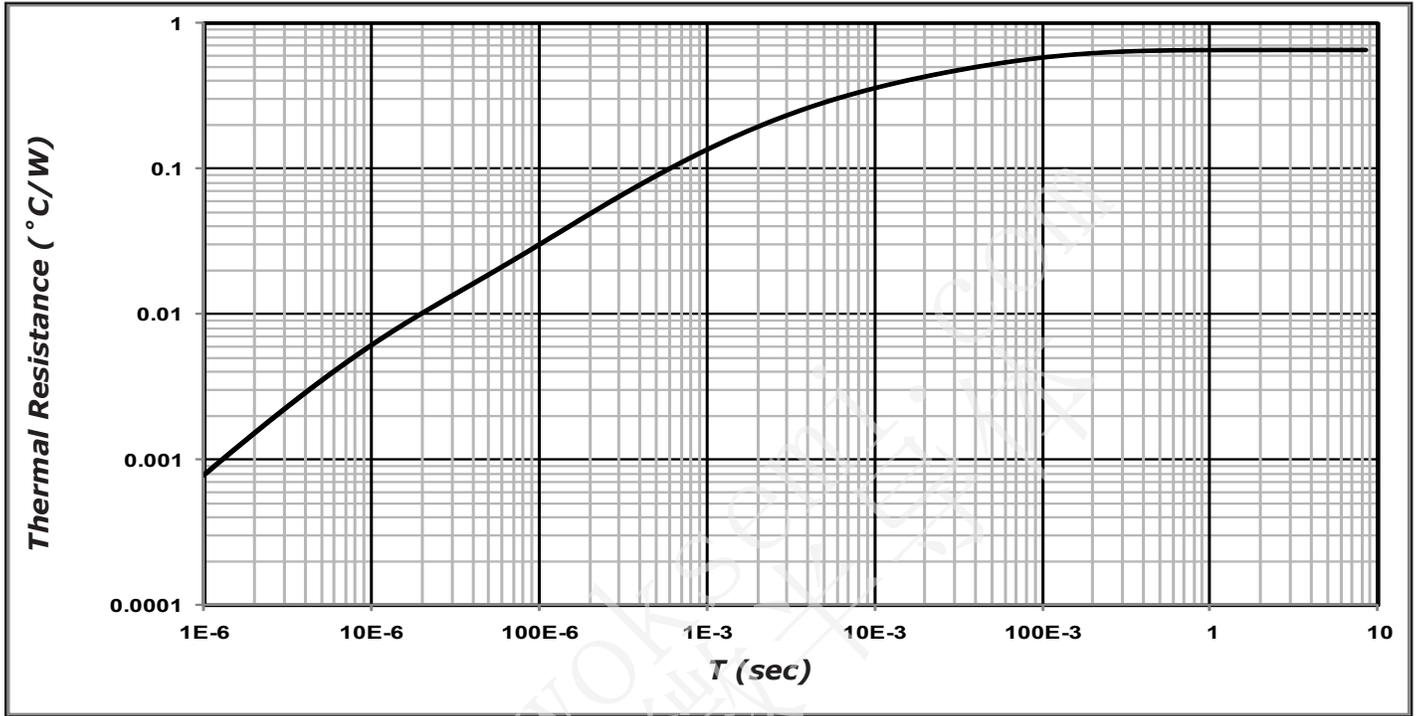
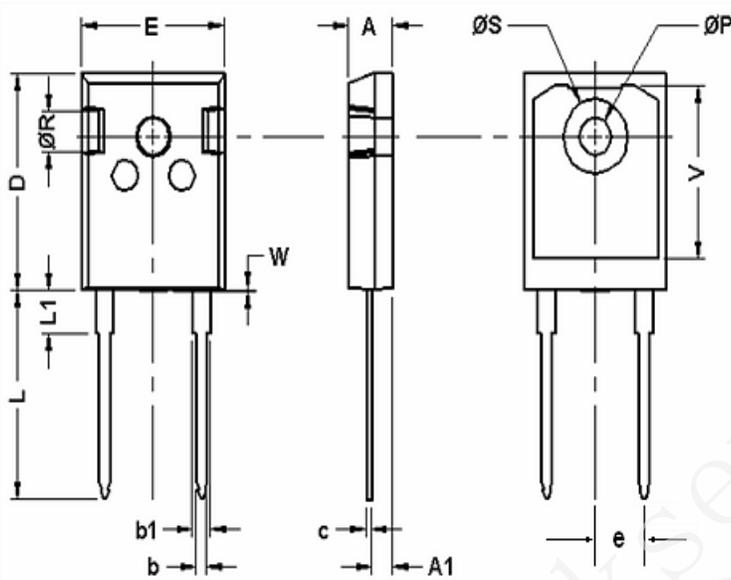


Figure 7. Transient Thermal Impedance

Package Dimensions

Package TO-247-2

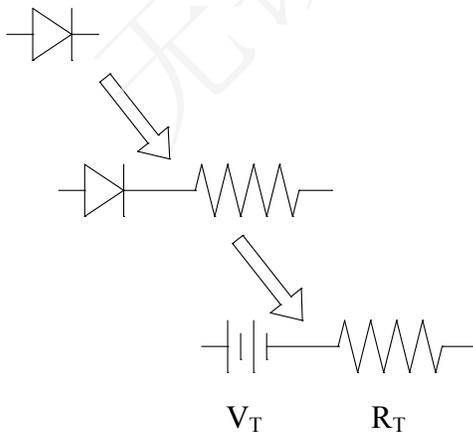


| POS | Inches | | Millimeters | |
|-----|--------|-------|-------------|-------|
| | Min | Max | Min | Max |
| A | 0.185 | 0.209 | 4.70 | 5.31 |
| A1 | 0.087 | 0.102 | 2.21 | 2.59 |
| b | 0.040 | 0.055 | 1.02 | 1.40 |
| b1 | 0.065 | 0.088 | 1.65 | 2.23 |
| C | 0.016 | 0.031 | 0.41 | 0.79 |
| D | 0.819 | 0.845 | 20.80 | 21.46 |
| E | 0.61 | 0.640 | 15.49 | 16.26 |
| e | 0.215 | 0.215 | 5.46 | 5.46 |
| L | 0.78 | 0.80 | 19.81 | 20.32 |
| L1 | 0.164 | 0.176 | 4.17 | 4.47 |
| øP | 0.140 | 0.144 | 3.56 | 3.66 |
| Q | 0.212 | 0.244 | 5.38 | 6.20 |
| øR | 0.135 | 0.157 | 3.43 | 3.99 |
| øS | 0.278 | 0.288 | 7.06 | 7.32 |
| V | 0.652 | 0.662 | 16.56 | 16.81 |
| W | 0.000 | 0.006 | 0.00 | 0.15 |



| Part Number | Package | Marking |
|-------------|----------|------------|
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Diode Model



$$V_{fT} = V_T + I_f \cdot R_T$$

$$V_T = 0.975 + (T_j \cdot -1.4 \cdot 10^{-3})$$

$$R_T = 0.053 + (T_j \cdot 1.1 \cdot 10^{-3})$$

Note: T_j = Diode Junction Temperature In Degrees Celcius