

# RHRA1560CC Hyperfast Rectifier

## Features

- High Speed Switching (  $t_{rr} < 35\text{ns}$  )
- High Reverse Voltage and High Reliability
- Avalanche Energy Rated
- High Operating Temperature

## Applications

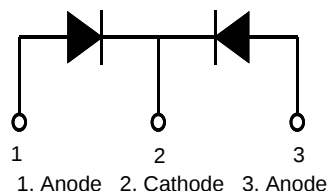
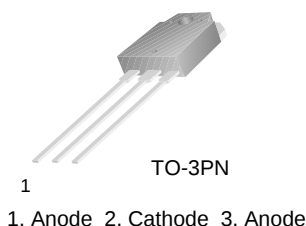
- General Purpose
- Switching Mode Power Supply
- Free-wheeling diode for motor application
- Power switching circuits

## 15A, 600V Hyperfast Rectifier

The RHRA1560CC is a hyperfast rectifier ( $t_{rr} < 35\text{ns}$ ) with soft recovery characteristics. It has half the recovery time of ultrafast diodes and is silicon nitride passivated ion-implanted epitaxial planar construction.

This device is intended for use as freewheeling/clamping diodes and rectifier in a variety of switching power supplies and other power switching applications. Its low stored charge and hyperfast soft recovery minimize ringing and electrical noise in many power switching circuits reducing power loss in the switching transistors.

## Pin Assignments



## Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted

| Symbol         | Parameter                                                       | Value        | Units            |
|----------------|-----------------------------------------------------------------|--------------|------------------|
| $V_{RRM}$      | Peak Repetitive Reverse Voltage                                 | 600          | V                |
| $V_{RWM}$      | Working Peak Reverse Voltage                                    | 600          | V                |
| $V_R$          | DC Blocking Voltage                                             | 600          | V                |
| $I_{F(AV)}$    | Average Rectified Forward Current @ $T_C = 140^\circ\text{C}$   | 15           | A                |
| $I_{FSM}$      | Non-repetitive Peak Surge Current<br>60Hz Single Half-Sine Wave | 200          | A                |
| $T_J, T_{STG}$ | Operating Junction and Storage Temperature                      | - 65 to +175 | $^\circ\text{C}$ |

## Thermal Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

| Symbol          | Parameter                                    | Max | Units              |
|-----------------|----------------------------------------------|-----|--------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 1.5 | $^\circ\text{C/W}$ |

## Package Marking and Ordering Information

| Device Marking | Device       | Package | Reel Size | Tape Width | Quantity |
|----------------|--------------|---------|-----------|------------|----------|
| RHRA1560CC     | RHRA1560CCTU | TO-3PN  | -         | -          | 30       |

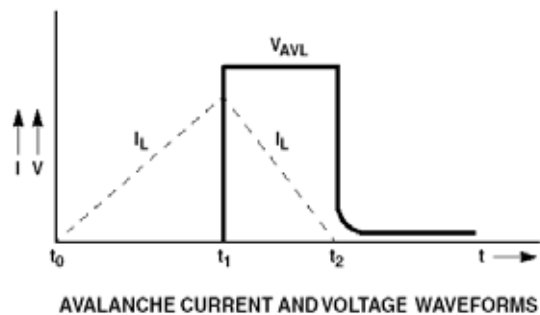
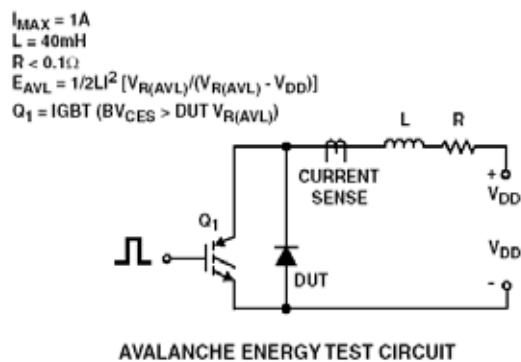
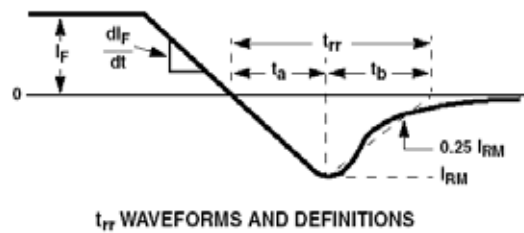
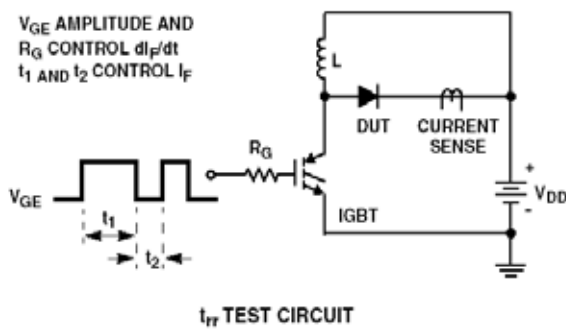
## Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

| Parameter                  | Conditions                                     |                              | Min. | Typ. | Max | Units   |
|----------------------------|------------------------------------------------|------------------------------|------|------|-----|---------|
| $V_{FM}^1$                 | $I_F = 15A$                                    | $T_C = 25\text{ }^{\circ}C$  | -    | -    | 2.1 | V       |
|                            | $I_F = 15A$                                    | $T_C = 150\text{ }^{\circ}C$ | -    | -    | 1.7 | V       |
| $I_{RM}^1$                 | $V_R = 600V$                                   | $T_C = 25\text{ }^{\circ}C$  | -    | -    | 100 | $\mu A$ |
|                            | $V_R = 600V$                                   | $T_C = 150\text{ }^{\circ}C$ | -    | -    | 500 | $\mu A$ |
| $t_{rr}$                   | $I_F = 1A, di/dt = 100A/\mu s, V_{CC} = 30V$   | $T_C = 25\text{ }^{\circ}C$  | -    | -    | 35  | ns      |
|                            | $I_F = 15A, di/dt = 100A/\mu s, V_{CC} = 390V$ | $T_C = 25\text{ }^{\circ}C$  | -    | -    | 40  | ns      |
| $t_a$<br>$t_b$<br>$Q_{rr}$ | $I_F = 15A, di/dt = 100A/\mu s, V_{CC} = 390V$ | $T_C = 25\text{ }^{\circ}C$  | -    | 20   | -   | ns      |
|                            |                                                | $T_C = 25\text{ }^{\circ}C$  | -    | 15   | -   | ns      |
|                            |                                                | $T_C = 25\text{ }^{\circ}C$  | -    | 40   | -   | nC      |
| $C_J$                      | $V_R = 10V, I_F = 0A$                          |                              | -    | 60   | -   | pF      |
| $W_{AVL}$                  | Avalanche Energy (L = 40mH)                    |                              | 20   | -    | -   | mJ      |

### Notes:

1. Pulse : Test Pulse width =  $300\mu\text{s}$ , Duty Cycle = 2%

## Test Circuit and Waveforms



## Typical Performance Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Figure 1. Typical Forward Voltage Drop

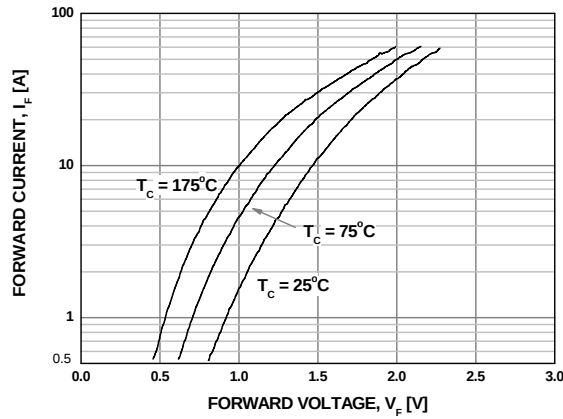


Figure 2. Typical Reverse Current

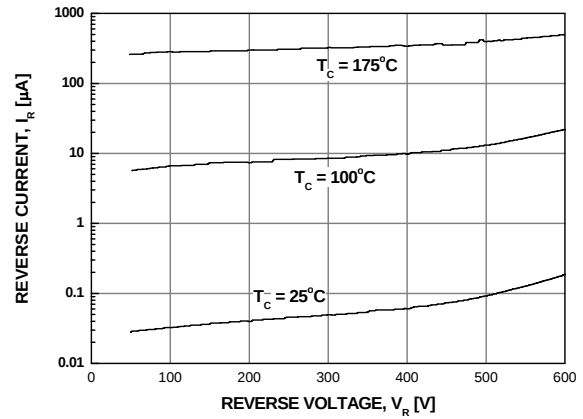


Figure 3. Typical Junction Capacitance

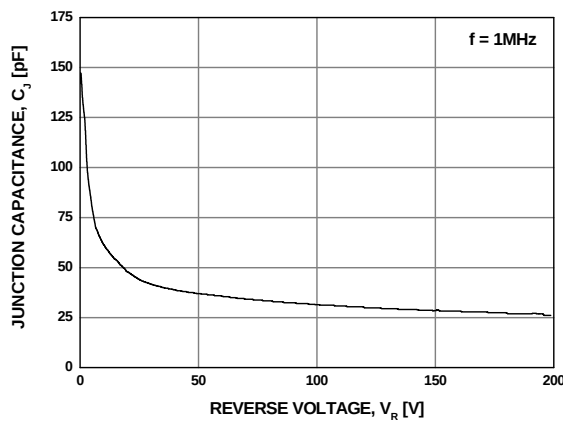


Figure 4. Recovery Time vs. Forward Current

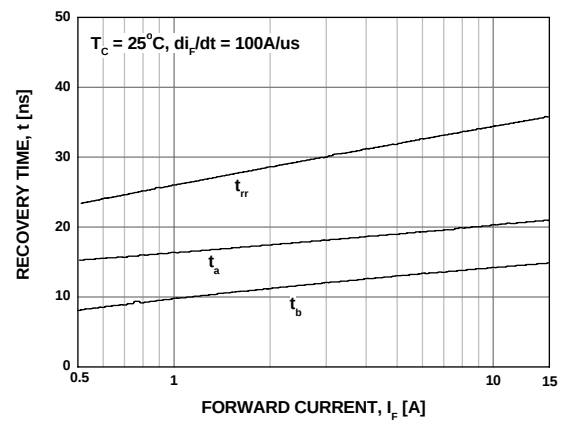


Figure 5. Recovery Time vs. Forward Current

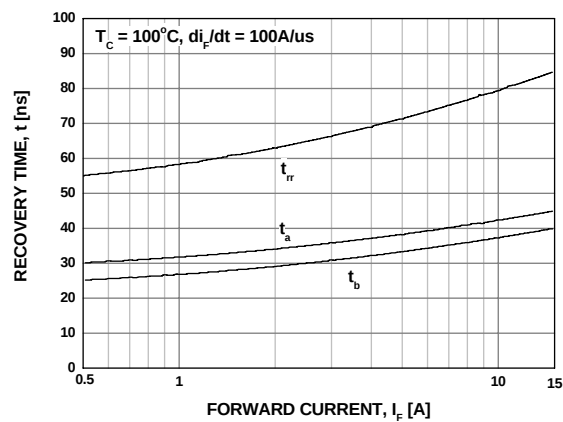
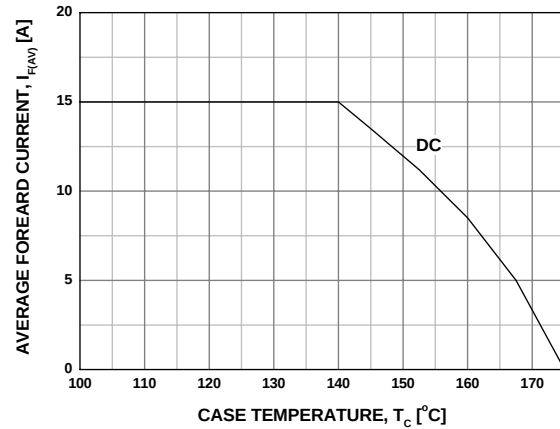
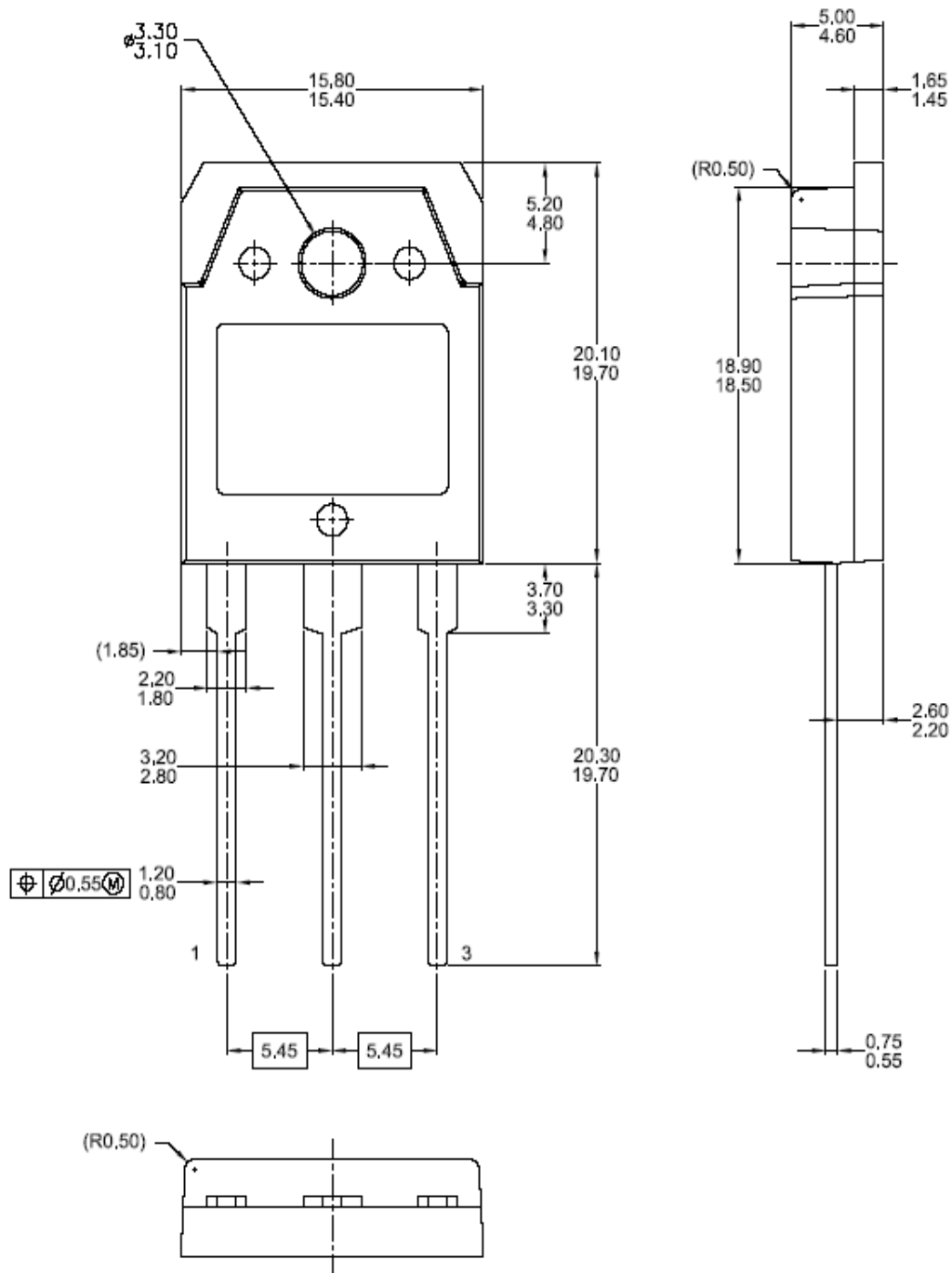


Figure 6. Forward Current Deration Curve



## Mechanical Dimensions

## TO-3PN



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