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FAIRCHILD SEMICONDUCTOR®

June 2007

RHRA1560CC
Hyperfast Rectifier

Features

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

Applications

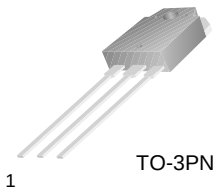
- General Purpose
- Switching Mode Power Supply
- Free-wheeling diode for motor application
- Power switching circuits

15A, 600V Hyperfast Rectifier

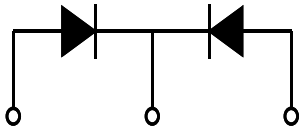
The RHRA1560CC is a hyperfast rectifier (t_{rr}<35ns) with soft recovery characteristics. It has half the recovery time of ultrafast diodes and is silicon nitride passivated ion-implanted epitaxial planar construction.

This device is intended for use as freewheeling/clamping diodes and rectifier in a variety of switching power supplies and other power swithching 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



1. Anode 2. Cathode 3. Anode



1. Anode 2. Cathode 3. Anode

Absolute Maximum Ratings T_C = 25°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 °C	15	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	200	A
T_J, T_{STG}	Operating Junction and Storage Temperature	- 65 to +175	°C

Thermal Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	1.5	°C/W

Package Marking and Ordering Information

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

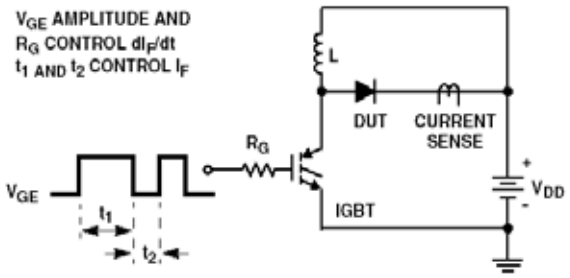
Electrical Characteristics T_C = 25°C unless otherwise noted

Parameter	Conditions		Min.	Typ.	Max	Units
V_{FM}[1]	I_F = 15A I_F = 15A	T_C = 25 °C T_C = 150 °C	- -	- -	2.1 1.7	V V
I_{RM}[1]	V_R = 600V V_R = 600V	T_C = 25 °C T_C = 150 °C	- -	- -	100 500	µA µA
t_{rr}	I_F =1A, di/dt = 100A/µs, V_{CC} = 30V I_F =15A, di/dt = 100A/µs, V_{CC} = 390V	T_C = 25 °C T_C = 25 °C	- -	- -	35 40	ns ns
t_a t_b Q_{rr}	I_F =15A, di/dt = 100A/µs, V_{CC} = 390V	T_C = 25 °C T_C = 25 °C T_C = 25 °C	- - -	20 15 40	- - -	ns ns nC
C_J	V_R = 10V, I_F =0A		-	60	-	pF
W_{AVL}	Avalanche Energy (L = 40mH)		20	-	-	mJ

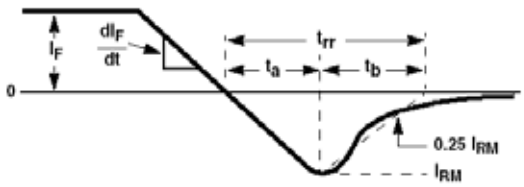
Notes:

1. Pulse : Test Pulse width = 300µs, Duty Cycle = 2%

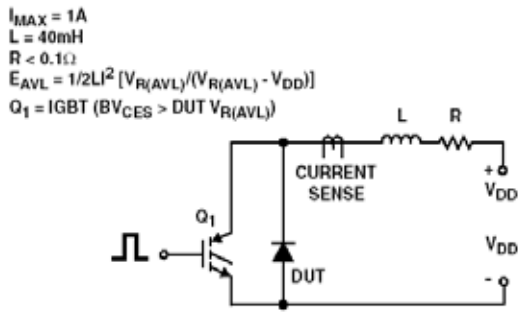
Test Circuit and Waveforms



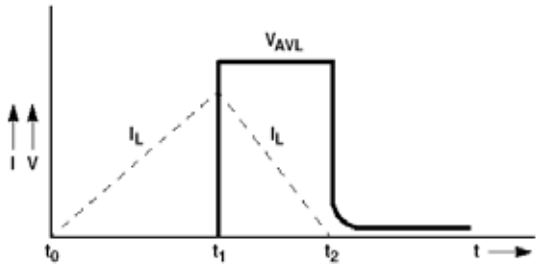
t_{rr} TEST CIRCUIT



t_{rr} WAVEFORMS AND DEFINITIONS



AVALANCHE ENERGY TEST CIRCUIT



AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Typical Performance Characteristics T_C = 25°C unless otherwise noted

Figure 1. Typical Forward Voltage Drop

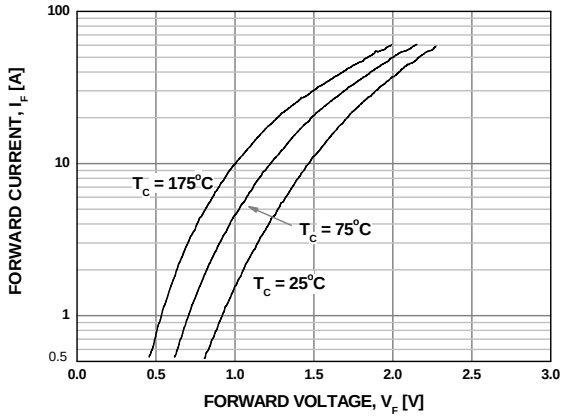


Figure 2. Typical Reverse Current

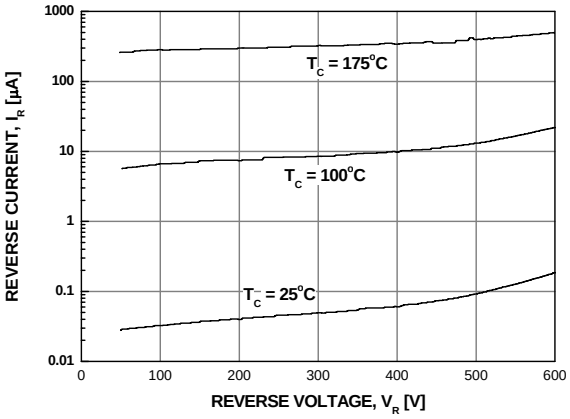


Figure 3. Typical Junction Capacitance

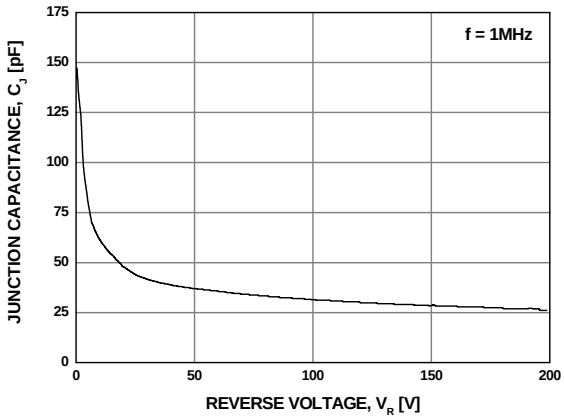


Figure 4. Recovery Time vs. Forward Current

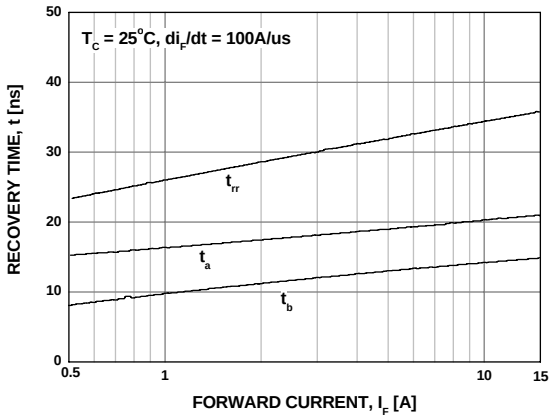


Figure 5. Recovery Time vs. Forward Current

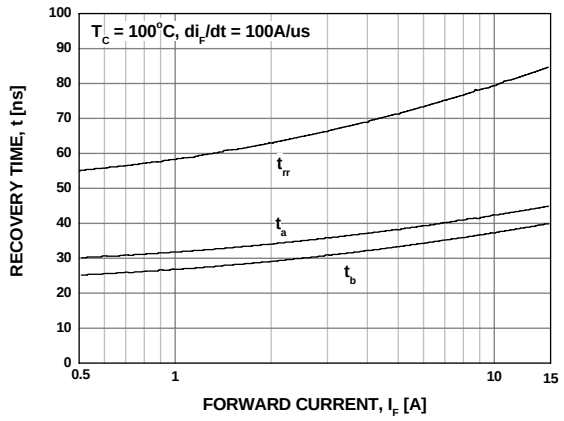
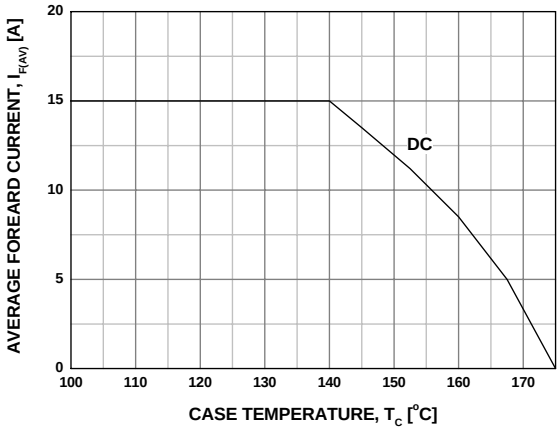
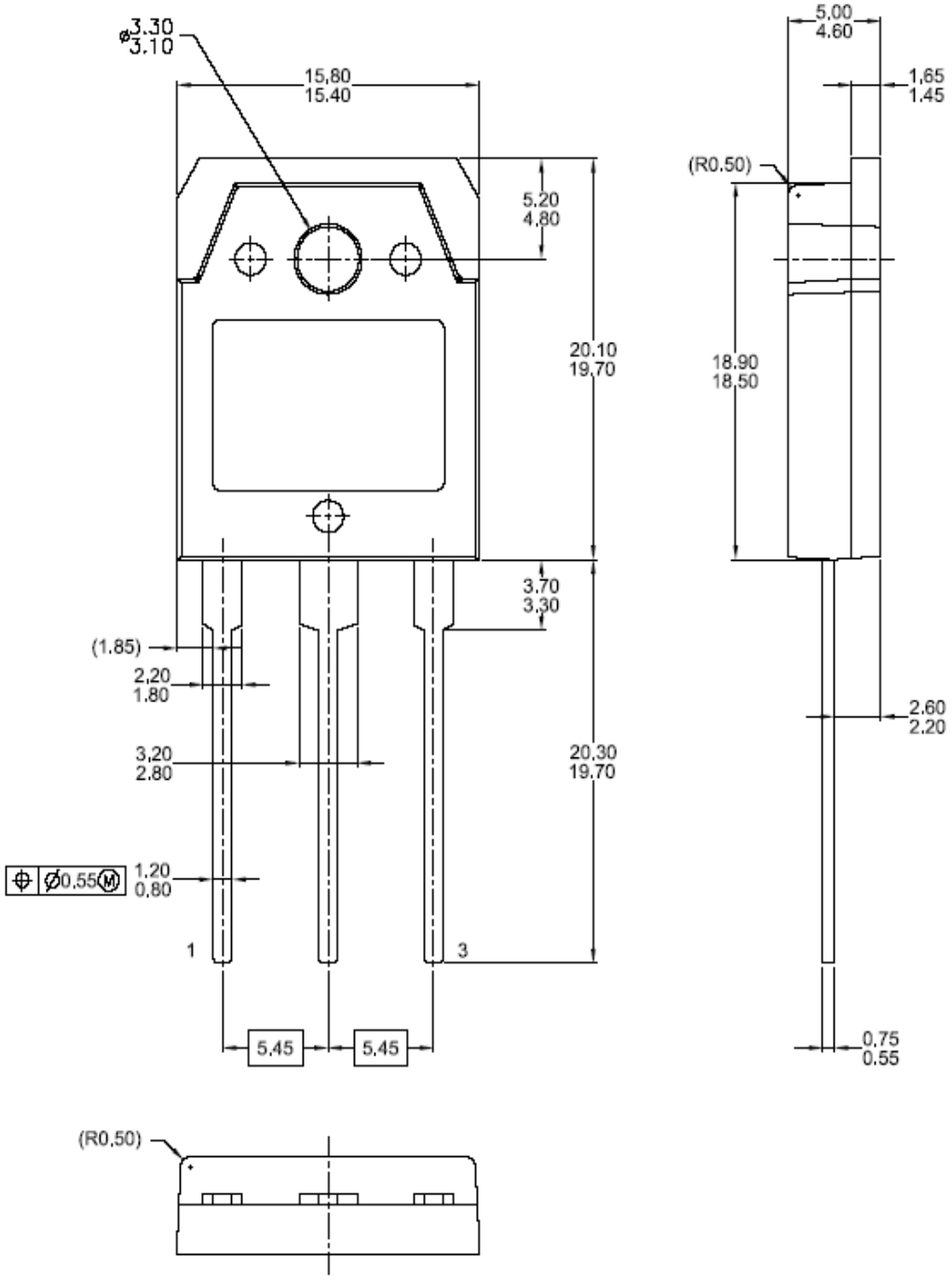


Figure 6. Forward Current Deration Curve



Mechanical Dimensions

TO-3PN



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