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FAIRCHILD SEMICONDUCTOR®

October 2013

RURD660S9A_F085
Ultrafast Power Rectifier, 6A 600V

Features

- High Speed Switching (t_{rr}=63ns(Typ.) @ I_F=6A)
- Low Forward Voltage(V_F=1.26V(Typ.) @ I_F=6A)
- Avalanche Energy Rated
- AEC-Q101 Qualified

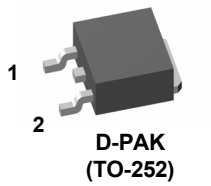
Applications

- General Purpose
- Switching Mode Power Supply
- Power switching circuits

6A, 600V Ultrafast Rectifier

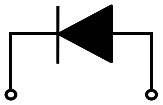
The RURD660S9A_F085 is an ultrafast diode with soft recovery characteristics (trr< 83ns). It has a low forward voltage drop and is of silicon nitride passivated ion-implanted epitaxial planar construction. This device is intended for use as a freewheeling/clamping diode and rectifier in a variety of switching power supplies and other power switching applications. Its low stored charge and ultrafast soft recovery minimize ringing and electrical noise in many power switching circuits, thus reducing powerloss in the switching transistors.

Pin Assignments



D-PAK
(TO-252)

1. Cathode 2. Anode



1. Cathode 2. Anode

Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter	Ratings	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 = 25°C	6	A
I_{FSM}	Non-repetitive Peak Surge Current	60	A
T_J, T_{STG}	Operating Junction and Storage Temperature	- 55 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	3	°C/W
$R_{\theta JA}$ [1]	Maximum Thermal Resistance, Junction to Ambient	140	°C/W
$R_{\theta JA}$ [2]	Maximum Thermal Resistance, Junction to Ambient	50	°C/W

Package Marking and Ordering Information

Device Marking	Device	Package	Tube	Quantity
RUR660	RURD660S9A_F085	TO-252-2L	-	60

Notes:

1. Mounted on a minimum pad follow by JEDEC standard.
2. Mounted on a 1 in2 pad of 2 oz copper follow by JEDEC standard.

Electrical Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter	Conditions		Min.	Typ.	Max	Units
I_R	Instantaneous Reverse Current	V_R = 600V	T_C = 25 °C	-	-	100	uA
			T_C = 175 °C	-	-	500	uA
V_{FM}[3]	Instantaneous Forward Voltage	I_F = 6A	T_C = 25 °C T_C = 175 °C	- -	1.26 1.04	1.5 -	V V
t_{rr}[4]	Reverse Recovery Time	I_F =1A, di/dt = 200A/µs, V_{CC}= 390V	T_C = 25 °C	-	25	33	ns
		I_F =6A, di/dt = 200A/µs, V_{CC}= 390V	T_C = 25 °C T_C = 175 °C	- -	63 119	83	ns ns
t_a t_b Q_{rr}	Reverse Recovery Time Reverse Recovery Charge	I_F =6A, di/dt = 200A/µs, V_{CC}= 390V	T_C = 25 °C	- - -	23 40 151	- - -	ns ns nC
W_{AVL}		Avalanche Energy (L = 20mH)		10	-	-	mJ

Notes:

3. Pulse : Test Pulse width = 300µs, Duty Cycle = 2%
4. Guaranteed by design

Test Circuit and Waveforms

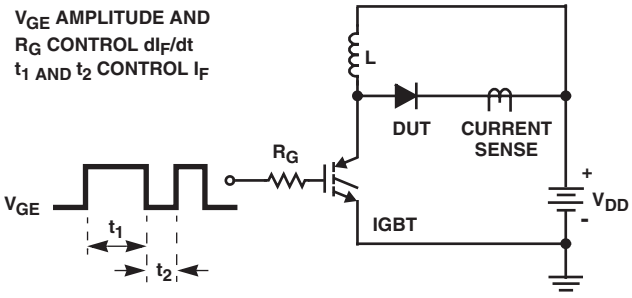


FIGURE 8. t_{rr} TEST CIRCUIT

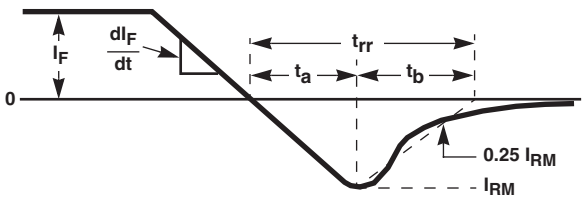


FIGURE 9. t_{rr} WAVEFORMS AND DEFINITIONS

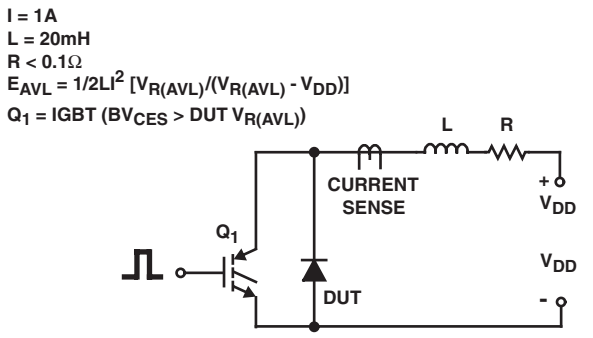


FIGURE 10. AVALANCHE ENERGY TEST CIRCUIT

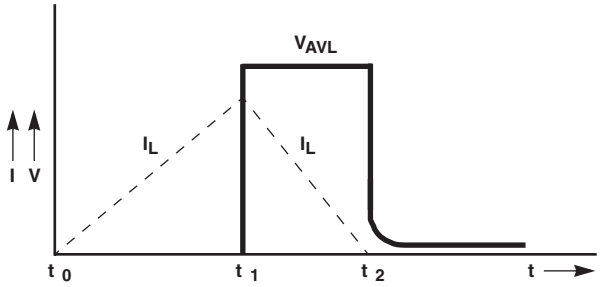


FIGURE 11. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop vs. Forward Current

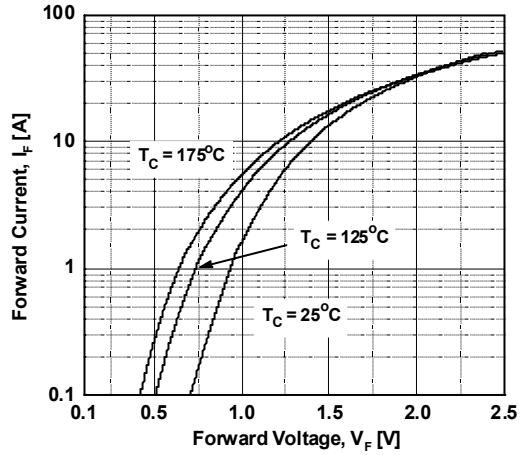


Figure 2. Typical Reverse Current vs. Reverse Voltage

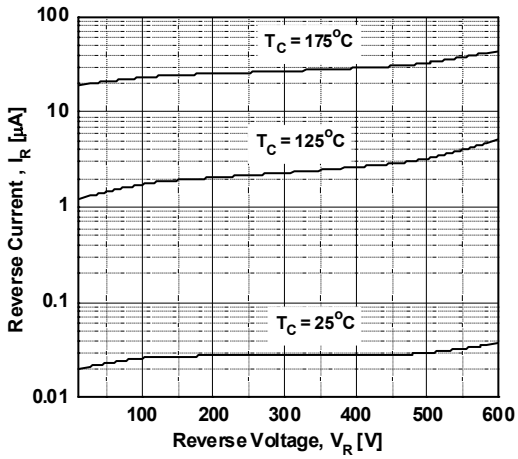


Figure 3.Typical Junction Capacitance

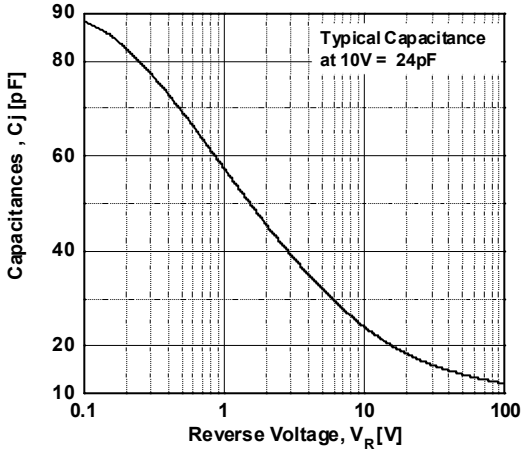


Figure 4. Typical Reverse Recovery Time vs. di/dt

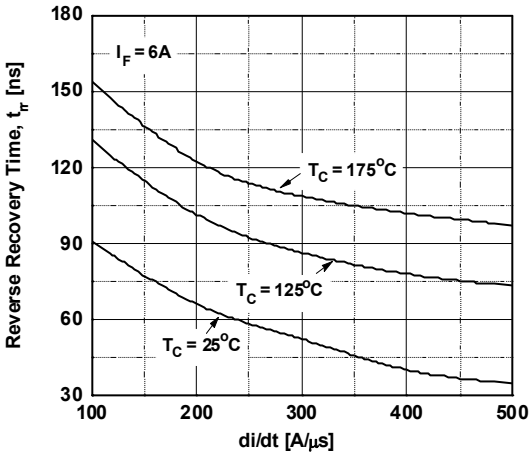


Figure 5. Typical Reverse Recovery Current vs. di/dt

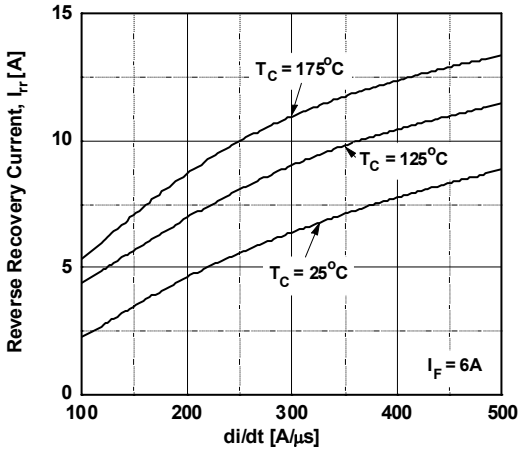
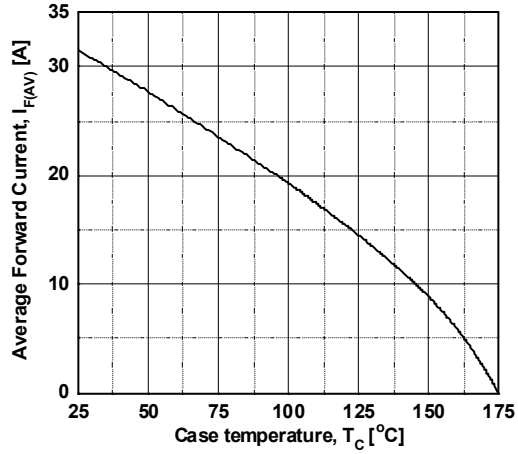


Figure 6. Forward Current Derating Curve



Typical Performance Characteristics (Continued)

Figure 7. Reverse Recovery Charge

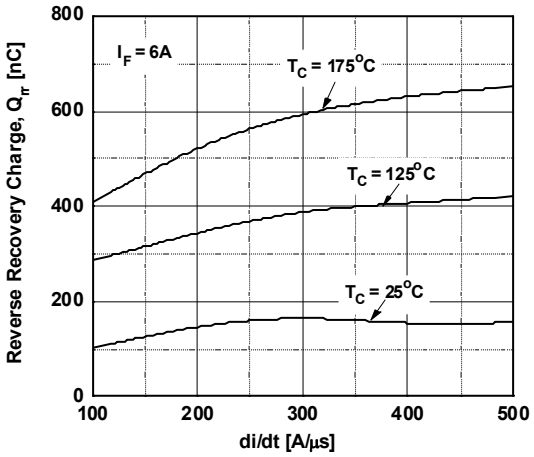
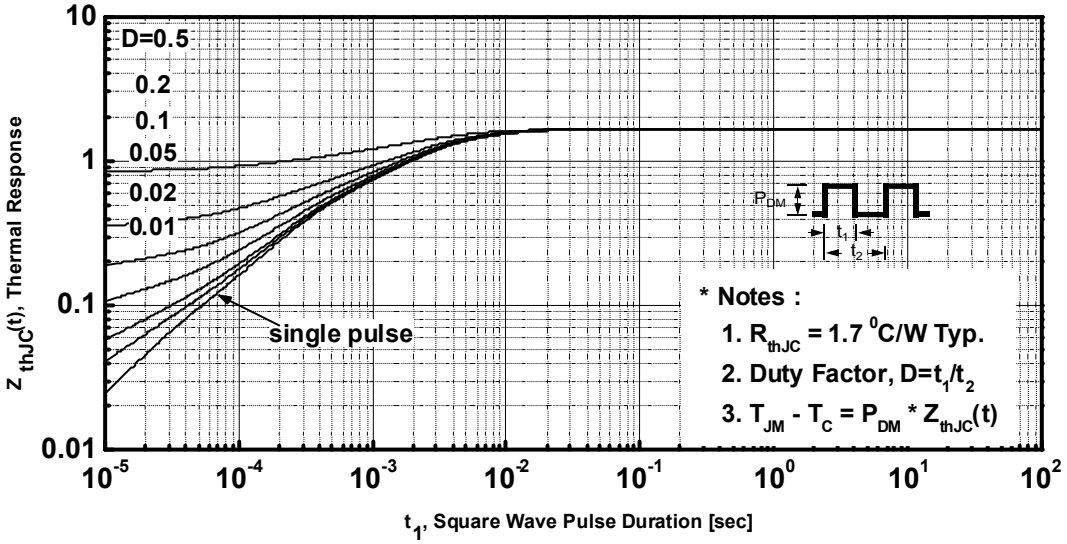
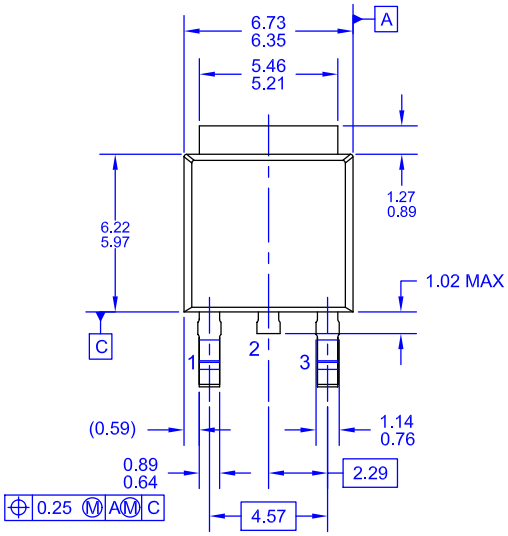


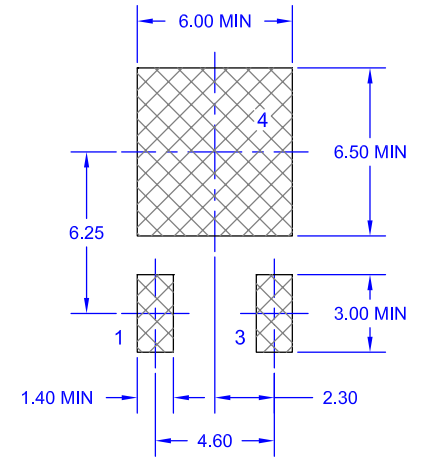
Figure 8. Transient Thermal Response Curve



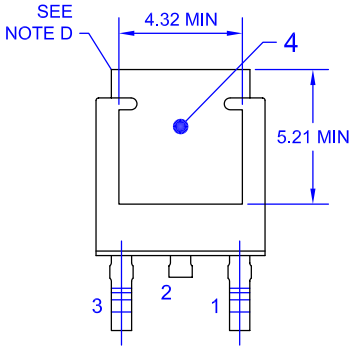
Mechanical Dimensions

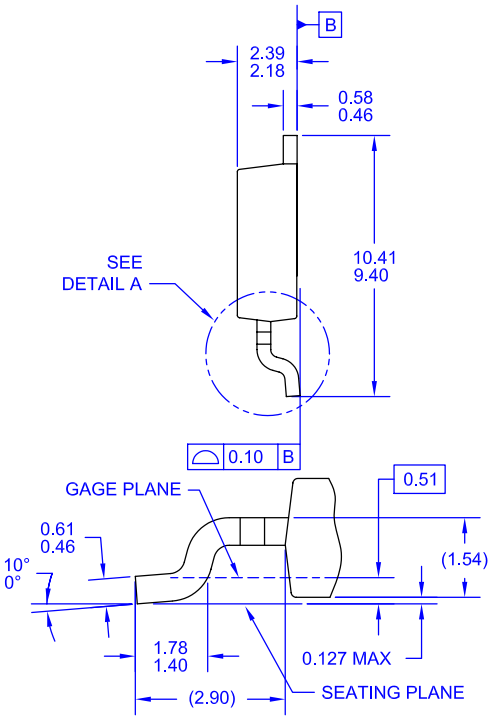
D-PAK





LAND PATTERN RECOMMENDATION





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A) THIS PACKAGE CONFORMS TO JEDEC, TO-252, ISSUE C, VARIATION AA.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
D) HEAT SINK TOP EDGE COULD BE IN CHAMFERED CORNERS OR EDGE PROTRUSION.
E) PRESENCE OF TRIMMED CENTER LEAD IS OPTIONAL.
F) DIMENSIONS ARE EXCLUSSIVE OF BURSS, MOLD FLASH AND TIE BAR EXTRUSIONS.
G) LAND PATTERN RECOMENDATION IS BASED ON IPC7351A STD TO220P1003X238-3N.
H) DRAWING NUMBER AND REVISION: MKT-TO252A03REV8

Dimensions in Millimeters

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No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
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