

FFA40UP35S

Features

- High Speed Switching, $t_r < 55\text{ns}$ @ $I_F = 40\text{A}$
- High Reverse Voltage and High Reliability
- Avalanche Energy Rated
- Low Forward Voltage, $V_F < 1.6\text{V}$
- RoHS compliant

Applications

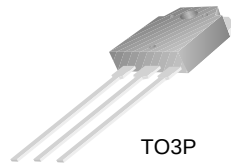
- General Purpose
- Switching Mode Power Supply
- Free-wheeling diode for motor application
- Power switching circuits



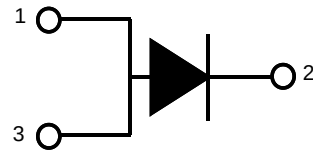
40A, 350V Ultrafast Rectifier

The FFA40UP35S is ultrafast rectifier with low forward voltage drop. It is silicon nitride passivated ion-implanted epitaxial planar construction.

This device is intended for use as freewheeling/clamping rectifiers 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.



1. Anode 2. Cathode 3. Anode



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

Symbol	Parameter	Ratings	Units
V_{RRM}	Peak Repetitive Reverse Voltage	350	V
V_{RWM}	Working Peak Reverse Voltage	350	V
V_R	DC Blocking Voltage	350	V
$I_{F(AV)}$	Average Rectified Forward Current @ $T_C = 111^\circ\text{C}$	40	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	400	A
T_J, T_{STG}	Operating and Storage Temperature Range	-65 to +150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Ratings	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	0.8	$^\circ\text{C/W}$

Package Marking and Ordering Information

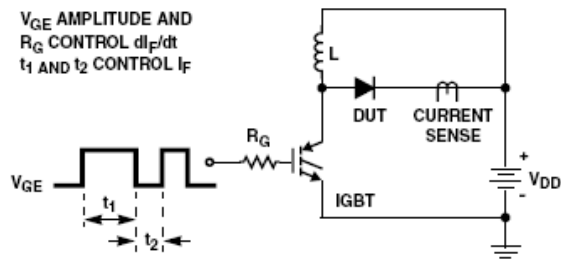
Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F40UP35S	FFA40UP35STU	TO3P	-	-	30

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

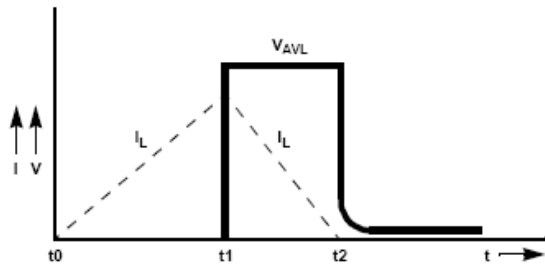
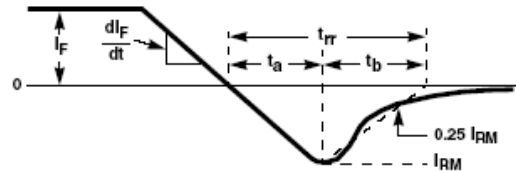
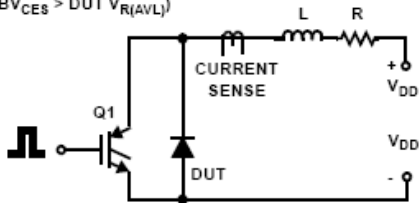
Symbol	Parameter	Min.	Typ.	Max.	Units
V_{FM1}	$I_F = 40\text{A}$ $I_F = 40\text{A}$	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	- -	1.6 1.5	V
I_{RM1}	$V_R = 350\text{V}$ $V_R = 350\text{V}$	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	- -	100 500	μA
t_{rr}	$I_F = 1\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, $V_R = 30\text{V}$ $I_F = 40\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_R = 230\text{V}$	$T_C = 25^\circ\text{C}$	26 28	53 55	ns
t_a	$I_F = 40\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_R = 230\text{V}$	$T_C = 25^\circ\text{C}$	17	-	ns
t_b			11	-	ns
Q_{rr}			36	-	nC
W_{AVL}	Avalanche Energy ($L = 40\text{mH}$)	20	-	-	mJ

Notes:

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

Test Circuit and Waveforms


$L = 40\text{mH}$
 $R < 0.1\Omega$
 $V_{DD} = 50\text{V}$
 $E_{AVL} = 1/2 L I_2^2 [V_{R(AVL)} / (V_{R(AVL)} - V_{DD})]$
 $Q1 = \text{IGBT } (BV_{CES} > DUT V_{R(AVL)})$



Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop vs. Forward Current

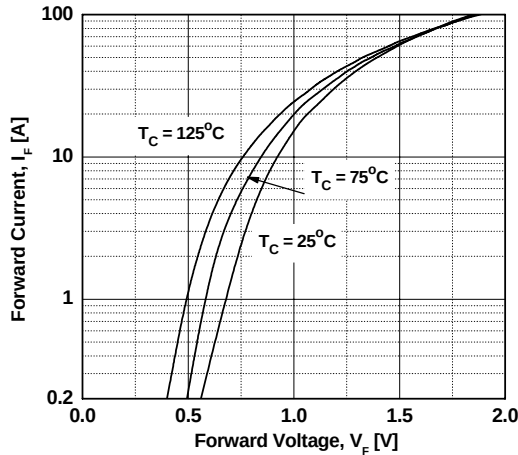


Figure 2. Typical Reverse Current vs. Reverse Voltage

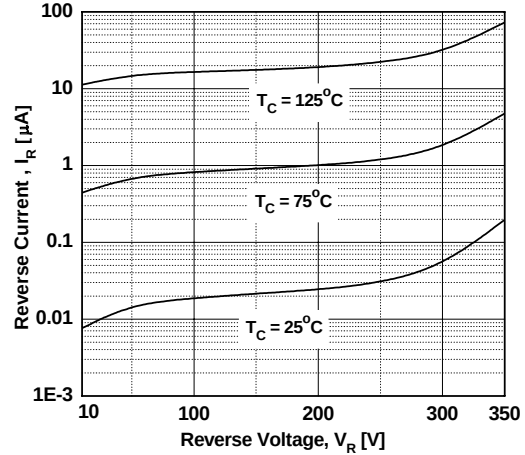


Figure 3. Typical Junction Capacitance

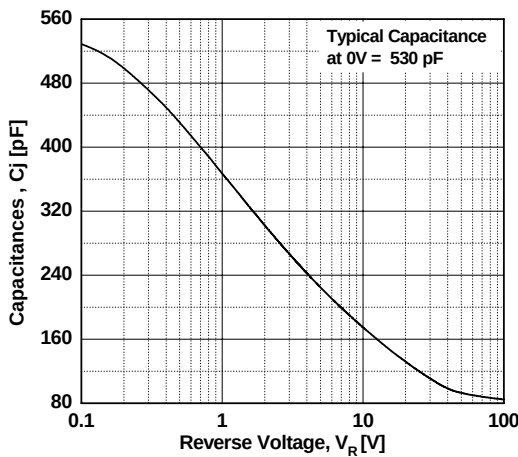


Figure 4. Typical Reverse Recovery Time vs. di/dt

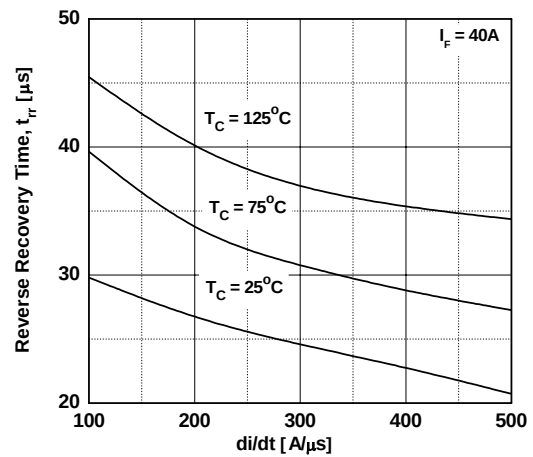


Figure 5. Typical Reverse Recovery Current vs. di/dt

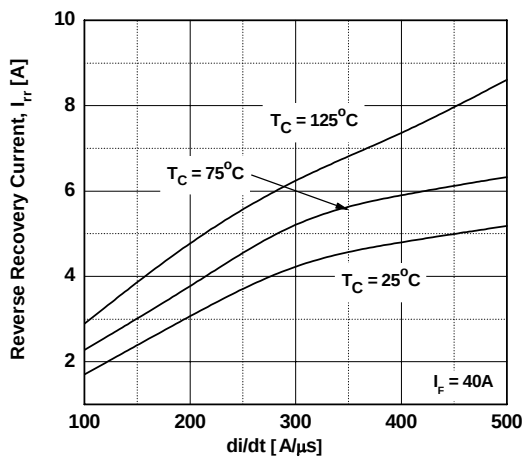
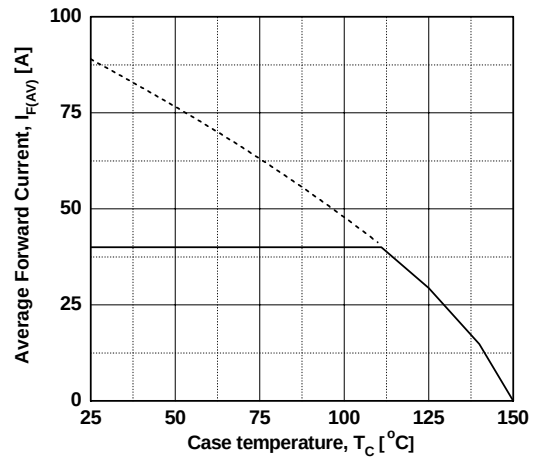
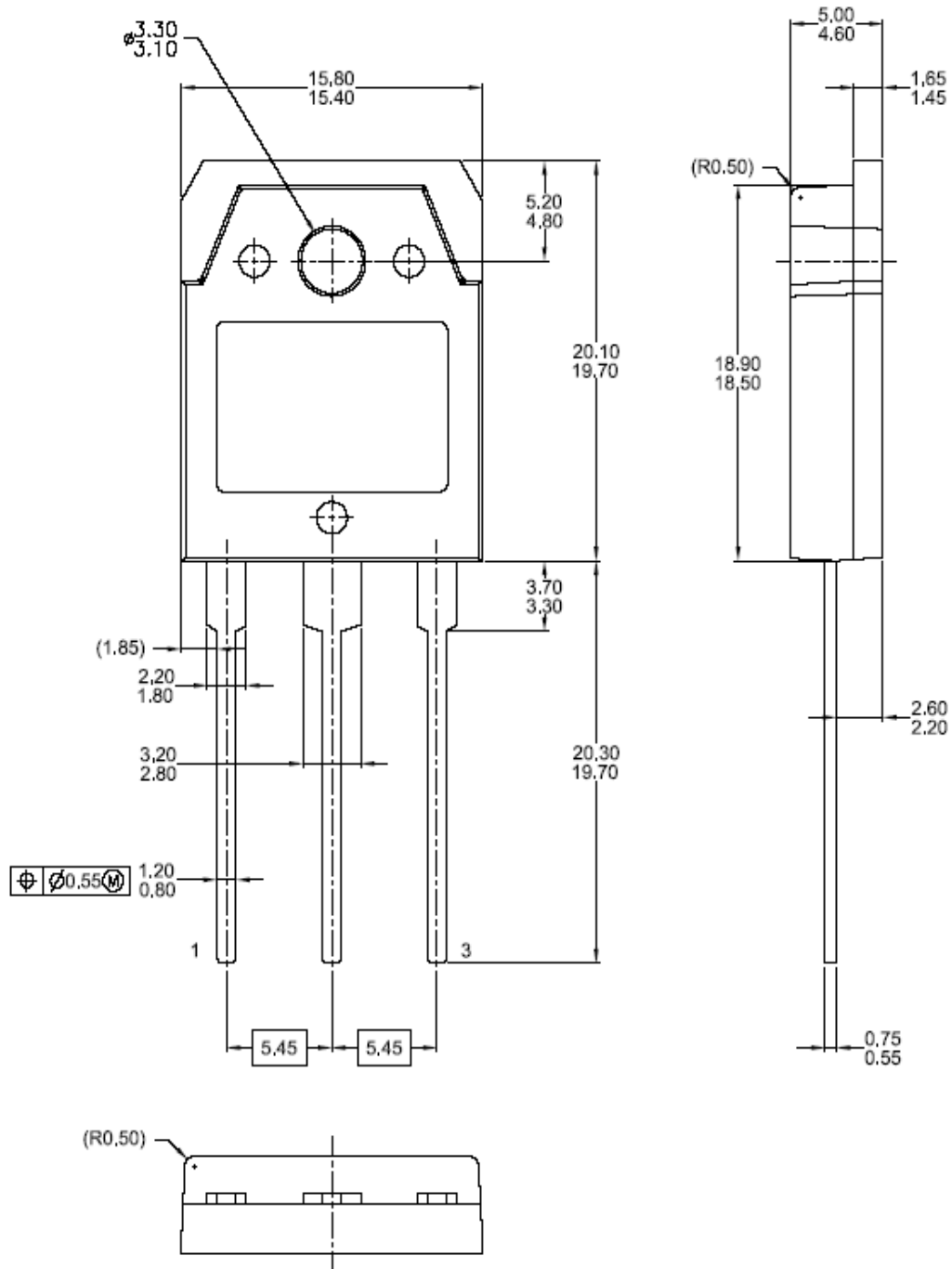


Figure 6. Forward Current Derating Curve



Mechanical Dimensions

TO3P

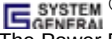


Dimensions in Millimeters



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Rev. I32