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Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

March 2016

FFA40UP35S

40 A, 350 V Ultrafast Diode

Features

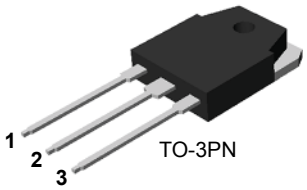
- Ultrafast Recovery, t_{rr} < 55 ns (@ I_F = 40 A)
- Max. Forward Voltage, V_F =1.6 V(T_c = 25°C)
- Reverse Voltage: V_{RRM} = 350 V
- Avalanche Energy Rated
- RoHS Compliant

Applications

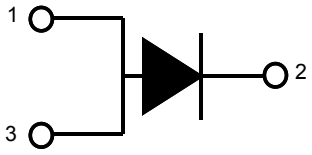
- General Purpose
- SMPS, Free-Wheeling Diode for Motor Application
- Power Switching Circuits, Welder, UPS

Description

The FFA40UP35S is an ultrafast diode with low forward voltage drop and rugged UIS capability. This device is intended for use as freewheeling and clamping diodes in a variety of switching power supplies and other power swithching applications. It is specially suited for use in switching power supplies and industrial applicationa as welder and UPS application.



1. Anode 2. Cathode 3. Anode



1. Anode 2. Cathode 3. Anode

Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter	Ratings	Unit
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 = 125°C	40	A
I_{FSM}	Non-repetitive Peak Surge Current 60Hz Single Half-Sine Wave	300	A
T_J, T_{STG}	Operating and Storage Temperature Range	-65 to +175	°C

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	0.8	°C/W

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFA40UP35STU	F40UP35S	TO-3P	Tube	N/A	N/A	30

Electrical Characteristics $T_C = 25^oC$ unless otherwise noted

Symbol	Parameter		Min.	Typ.	Max.	Unit
V_F1	I_F = 40 A I_F = 40 A	$T_C = 25^oC$ $T_C = 125^oC$	- -	- -	1.6 1.5	V
I_R1	V_R = 350 V V_R = 350 V	$T_C = 25^oC$ $T_C = 125^oC$	- -	- -	100 500	μA
t_{rr}	I_F = 1 A, di_F/dt = 100 A/μs, V_R = 30 V I_F = 40 A, di_F/dt = 200 A/μs, V_R = 230 V	$T_C = 25^oC$	- -	26 28	53 55	ns
t_a t_b Q_{rr}	I_F = 40 A, di_F/dt = 200 A/μs, V_R = 230V	$T_C = 25^oC$	- - -	17 11 36	- - -	ns ns nC
W_{AVL}	Avalanche Energy (L = 40 mH)		20	-	-	mJ

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

Test Circuit and Waveforms

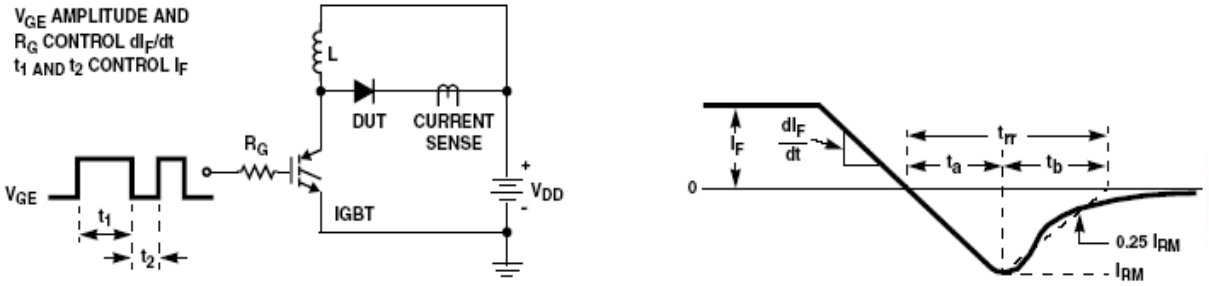


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

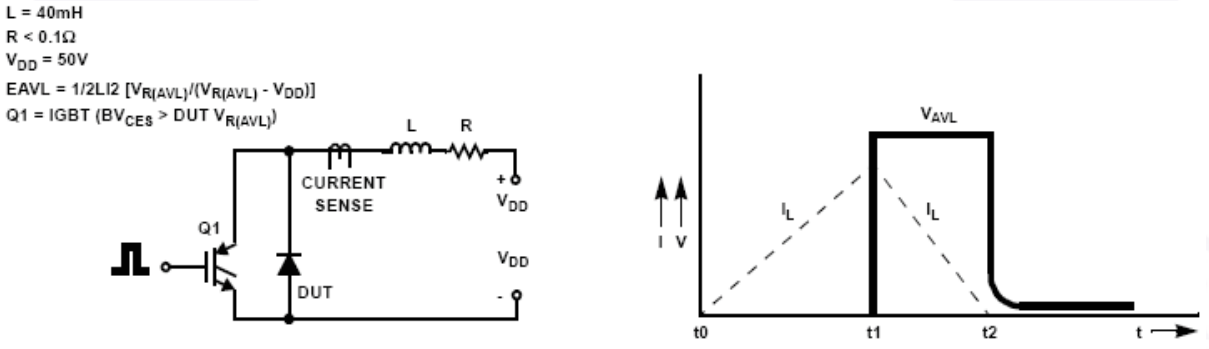


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

Typical Performance Characteristics

Figure 3. Typical Forward Voltage Drop vs. Forward Current

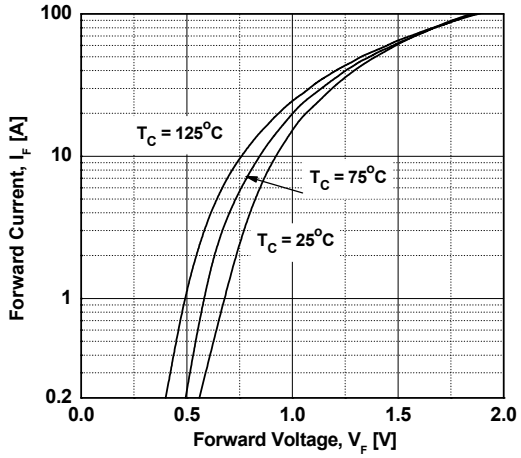


Figure 4. Typical Reverse Current vs. Reverse Voltage

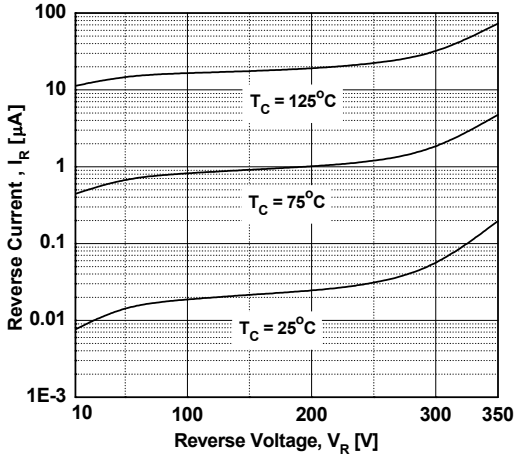


Figure 5.Typical Junction Capacitance

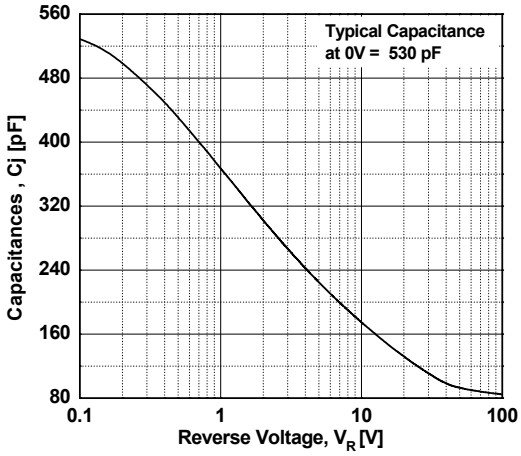


Figure 6. Typical Reverse Recovery Time vs. di_F/dt

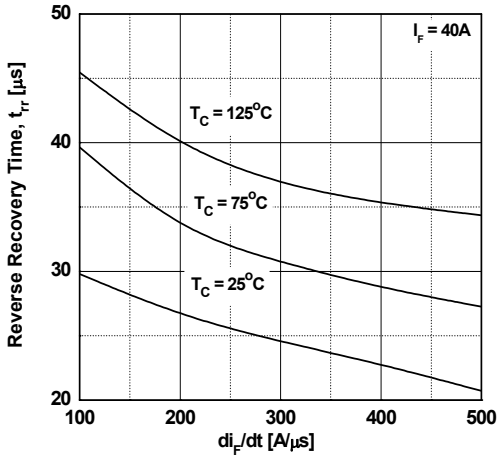


Figure 7. Typical Reverse Recovery Current vs. di_F/dt

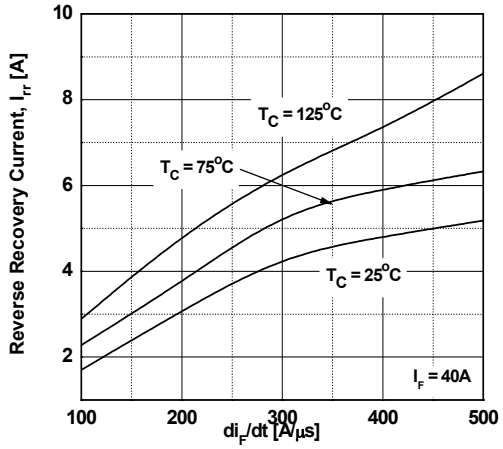
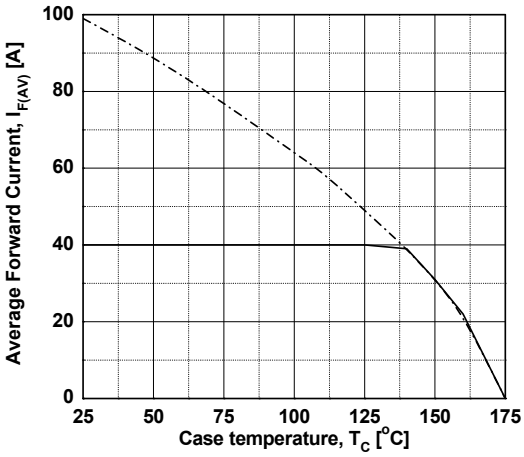
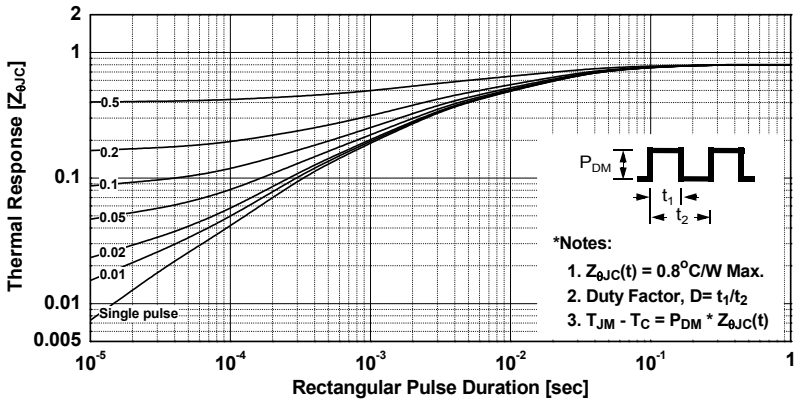


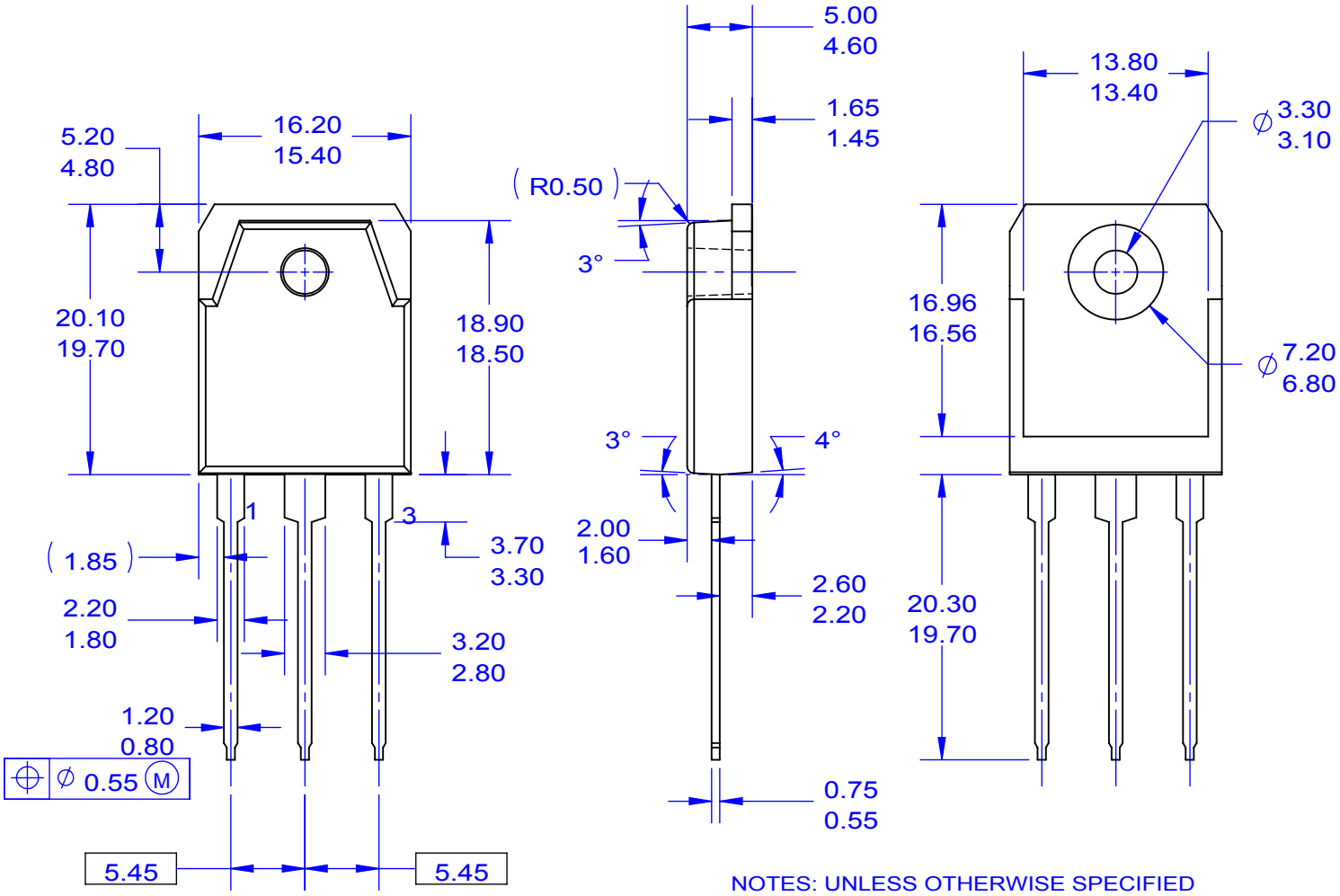
Figure 8. Forward Current Derating Curve

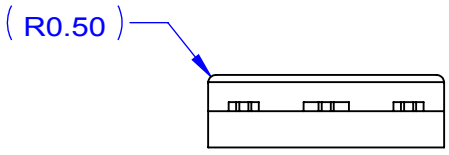


Typical Performance Characteristics (Continued)

Figure 9. Transient Thermal Response Curve







NOTES: UNLESS OTHERWISE SPECIFIED

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B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSION AND TOLERANCING PER ASME14.5-2009.
D) DIMENSIONS ARE EXCLUSSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSSIONS.
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