FFPF10UP60S

10 A, 600 V Ultrafast Diode

Description

The FFPF10UP60S 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 switching applications. It is specially suited for use in switching power supplies and industrial applications as welder and UPS application.

Features

- Ultrafast Recovery, t_{RR} = 40 ns (@ I_F = 1 A)
- Max Forward Voltage, V_F = 2.2 V (@ T_C = 25°C)
- 600 V Reverse Voltage and High Reliability
- Avalanche Energy Rated
- This Device is Pb−Free and is RoHS Compliant

Applications

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

ABSOLUTE MAXIMUM RATINGS

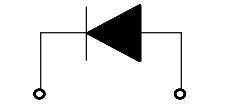
T_C = 25°C unless otherwise noted

Symbol	Parameter	Rating	Unit
V_{RRM}	Peak Repetitive Reverse Voltage	600	V
V_{RWM}	Working Peak Reverse Voltage	600	V
$I_{F(AV)}$	Average Rectified Forward Current @ T_C = 60°C	10	A
I_{FSM}	Non−repetitive Peak Surge Current 60Hz Single Half−Sine Wave	50	A
T_J, T_{STG}	Operating Junction and Storage Temperature	− 65 to +175	°C

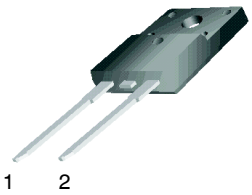
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ON Semiconductor®

www.onsemi.com

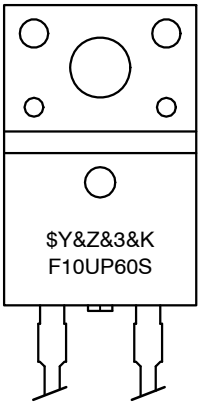


1. Cathode 2. Anode



TO−220, 2−Lead
CASE 221AS

MARKING DIAGRAM



$Y	= ON Semiconductor Logo
&Z&3	= Data Code (Year & Week)
&K	= Lot
F10UP60S	= Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

© Semiconductor Components Industries, LLC, 2004

THERMAL CHARACTERISTICS T_C = 25°C unless otherwise noted

Symbol	Parameter	Max.	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	4.5	°C/W

PACKAGE MARKING AND ORDERING INFORMATION

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFPF10UP60STU	F10UP60S	TO−220F−2L	Tube	N/A	N/A	30

ELECTRICAL CHARACTERISTICS T_C = 25°C unless otherwise noted

Parameter	Conditions		Min.	Typ.	Max.	Unit
V_F (Note 1)	Maximum Instantaneous Forward Voltage I_F = 10 A I_F = 10 A	 T_C = 25°C T_C = 100°C	 – –	 – –	 2.2 2.0	V
I_R (Note 1)	Maximum Instantaneous Reverse Current @ rated V_R	 T_C = 25°C T_C = 100°C	 – –	 – –	 100 500	μA
t_{RR}	I_F = 1 A, di_F/dt = 100 A/μs, V_R = 30 V	T_C = 25°C	–	–	25	ns
t_{RR} I_{RR} Q_{RR}	Reverse Recovery Time Reverse Recovery Current Reverse Recovery Charge (I_F = 8 A, di_F/dt = 200 A/μs, V_R = 390 V)		– – –	34 1.0 17	40 1.5 30	ns A nC
t_{RR}	Maximum Reverse Recovery Time (I_F =10 A, di_F/dt = 200 A/μs, V_R = 390 V)		–	58	–	ns
W_{AVL}	Avalanche Energy (L = 40 mH)		20	–	–	mJ

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

Test Circuit and Waveforms

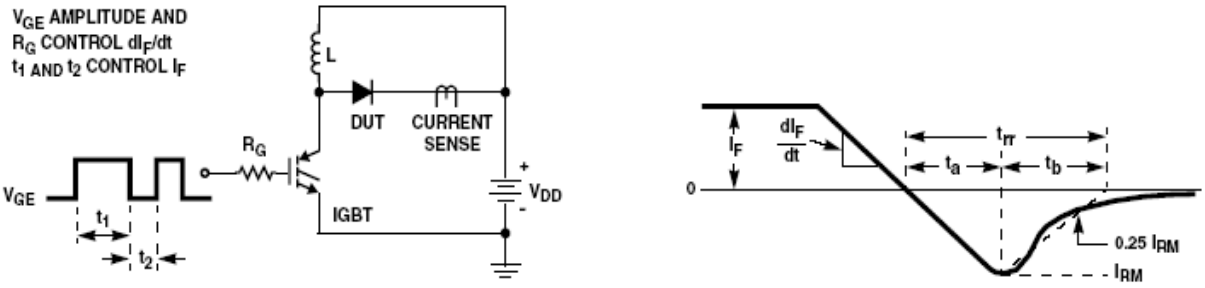


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

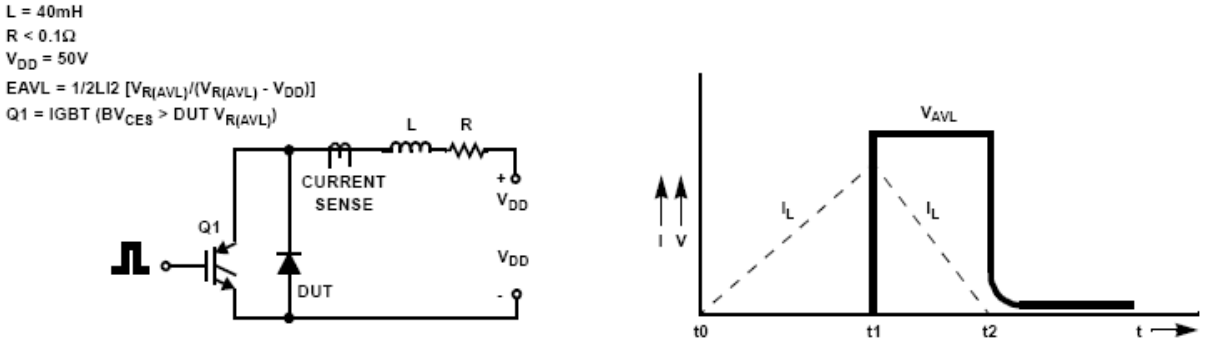


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

TYPICAL PERFORMANCE CHARACTERISTICS

T_C = 25°C unless otherwise noted

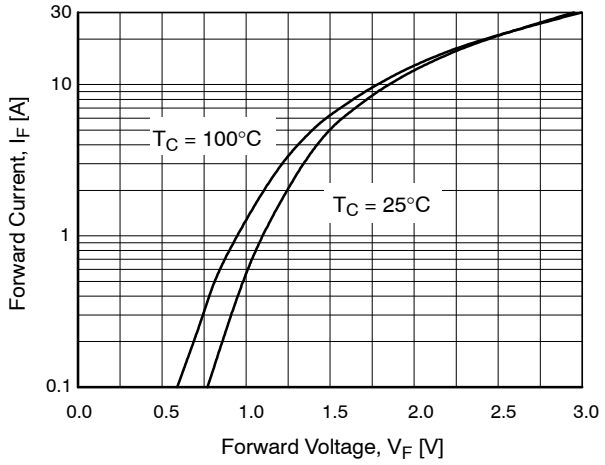


Figure 3. Typical Forward Voltage Drop

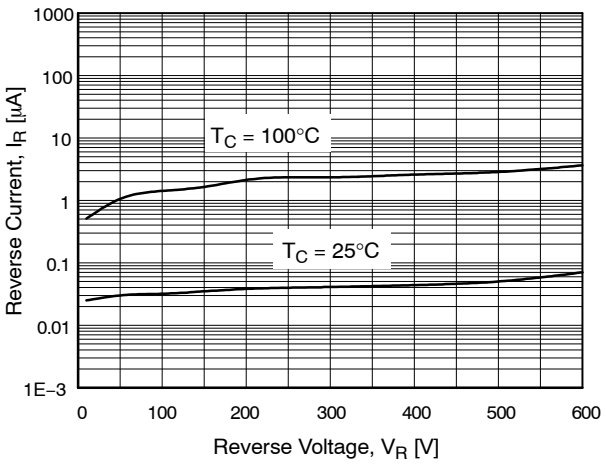


Figure 4. Typical Reverse Current

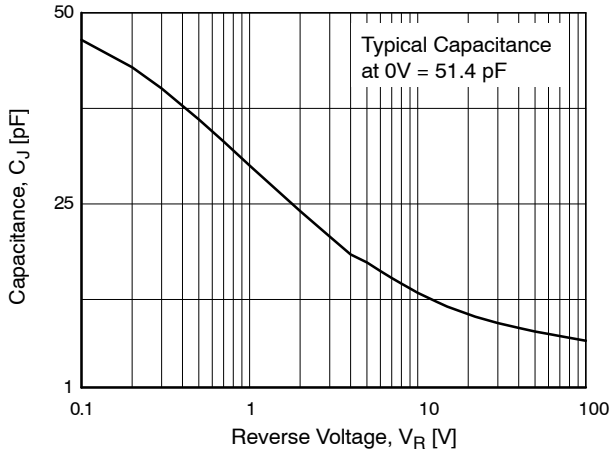


Figure 5. Typical Junction Capacitance

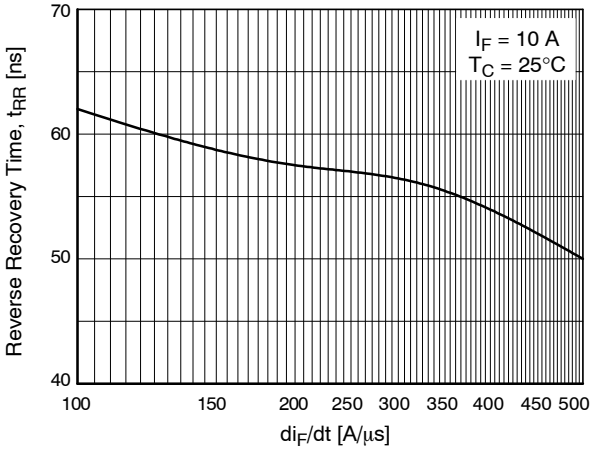


Figure 6. Typical Reverse Recovery Time

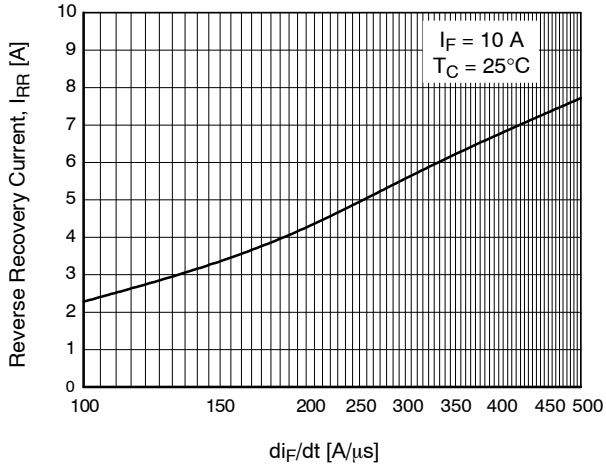


Figure 7. Typical Reverse Recovery Current

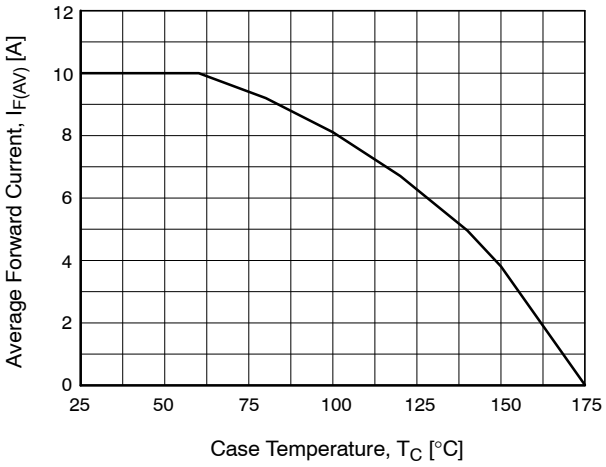
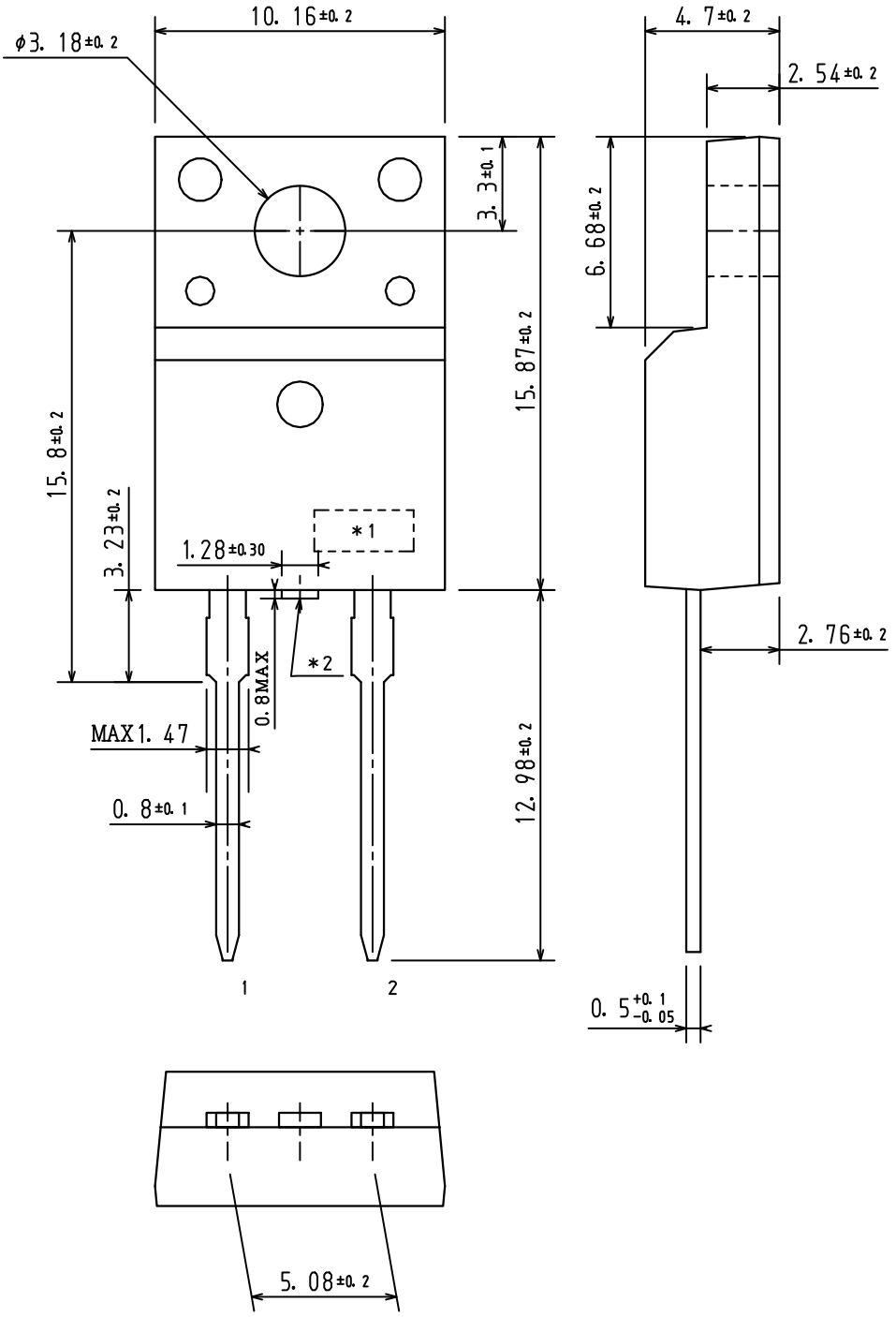


Figure 8. Forward Current Derating Curve

TO−220 Fullpack, 2−Lead / TO−220F−2FS
CASE 221AS
ISSUE O

DATE 29 FEB 2012



DOCUMENT NUMBER:	**98AON67438E**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.	
STATUS:	**ON SEMICONDUCTOR STANDARD**		
NEW STANDARD:			
DESCRIPTION:	**TO−220 FULLPACK, 2−LEAD / TO−220F−2FS**		**PAGE 1 OF 2**

ISSUE	REVISION	DATE
O	RELEASED FOR PRODUCTION FROM SANYO ENACT# TC−00002258 TO ON SEMICONDUCTOR. REQ. BY D. TRUHITTE.	29 FEB 2012

ON Semiconductor and ON are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ON Semiconductor and ON are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent−Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

◊