

15 A, 600 V, STEALTH™ II Diode

FFPF15S60S

Description

The FFPF15S60S is STEALTH™ II rectifier with soft recovery characteristics. It is silicon nitride passivated ion-implanted epitaxial planar construction.

This device is intended for use as freewheeling or boost diode in switching power supplies and other power switching applications. Their low stored charge and hyperfast soft recovery minimize ringing and electrical noise in many power switching circuits reducing power loss in the switching transistors.

Features

- Stealth Recovery $T_{rr} = 35$ ns (@ $I_F = 15$ A)
- Max Forward Voltage, $V_F = 2.6$ V (@ $T_C = 25^\circ\text{C}$)
- 600 V Reverse Voltage and High Reliability
- Improved dv/dt Capability
- This Device is Pb-Free and is RoHS Compliant

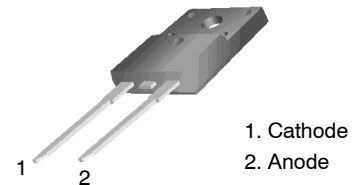
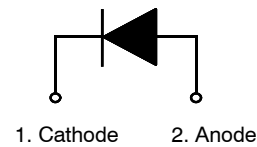
Applications

- General Purpose
- Switching Mode Power Supply
- Boost Diode in Continuous Mode Power Factor Corrections
- Power Switching Circuits

ABSOLUTE MAXIMUM RATINGS $T_C = 25^\circ\text{C}$ unless otherwise noted

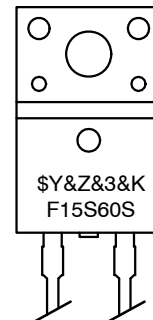
Symbol	Parameter	Value	Unit
V_{RRM}	Peak Repetitive Reverse Voltage	600	V
V_{RWM}	Working Peak Reverse Voltage	600	V
V_R	DC Blocking Voltage	600	V
$I_{F(AV)}$	Average Rectified Forward Current @ $T_C = 52^\circ\text{C}$	15	A
I_{FSM}	Non-repetitive Peak Surge Current 60 Hz Single Half-Sine Wave	150	A
T_J, T_{STG}	Operating and Storage Temperature Range	- 65 to +175	$^\circ\text{C}$

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.



TO-220F-2L
CASE 221AS

MARKING DIAGRAM



$\$Y$ = onsemi Logo
 $\&Z\&3$ = Date Code (Year & Week)
 $\&K$ = Lot
 F15S60S = Specific Device Code

ORDERING INFORMATION

Device	Package	Shipping
FFPF15S60STU	TO-220F-2L	50 / Tube

THERMAL CHARACTERISTICS

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	4.6	$^{\circ}\text{C/W}$

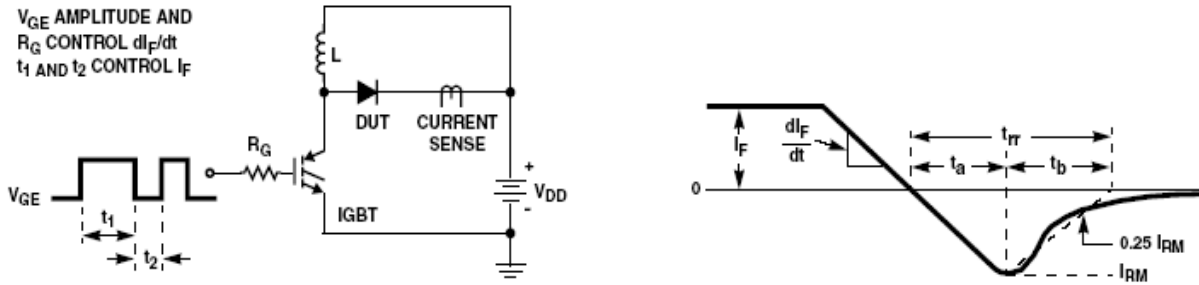
ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max	Unit
V_{FM} (Note 1)	$I_F = 15\text{ A}$	$T_C = 25^{\circ}\text{C}$	2.1	2.6	V
	$I_F = 15\text{ A}$	$T_C = 125^{\circ}\text{C}$	1.6	–	
I_{RM} (Note 1)	$V_R = 600\text{ V}$	$T_C = 25^{\circ}\text{C}$	–	100	μA
	$V_R = 600\text{ V}$	$T_C = 125^{\circ}\text{C}$	–	500	
t_{rr}	$I_F = 1\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	$T_C = 25^{\circ}\text{C}$	21	30	ns
t_{rr} I_{rr} S factor Q_{rr}	$I_F = 15\text{ A}$, $di_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 390\text{ V}$	$T_C = 25^{\circ}\text{C}$	23	35	ns
			2.5	–	A
			0.7	–	
			29	–	nC
t_{rr} I_{rr} S factor Q_{rr}	$I_F = 15\text{ A}$, $di_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 390\text{ V}$	$T_C = 125^{\circ}\text{C}$	55	–	ns
			4.3	–	A
			1.1	–	
			118	–	nC
W_{AVL}	Avalanche Energy ($L = 40\text{ mH}$)	20	–	–	mJ

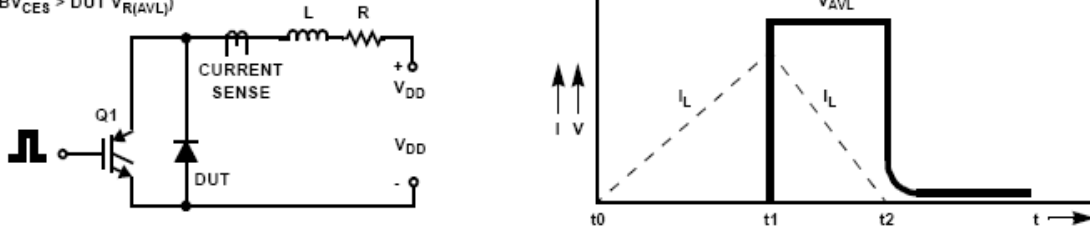
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

TEST CIRCUIT AND WAVEFORMS



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



TYPICAL PERFORMANCE CHARACTERISTICS

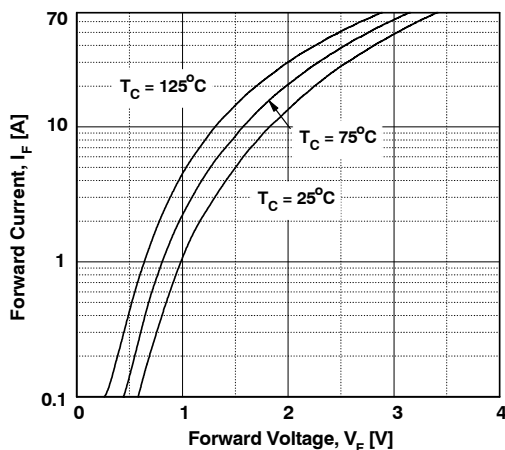


Figure 3. Typical Forward Voltage Drop vs. Forward Current

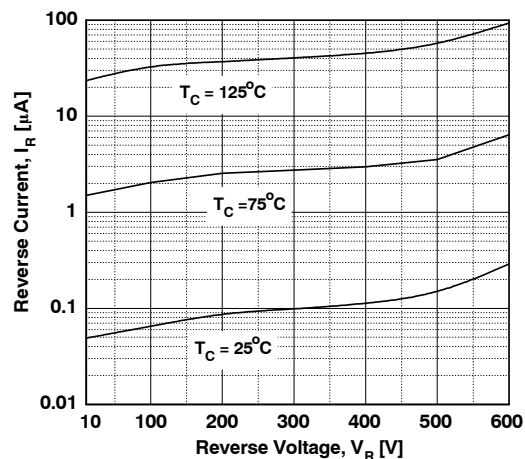


Figure 4. Typical Reverse Current vs. Reverse Voltage

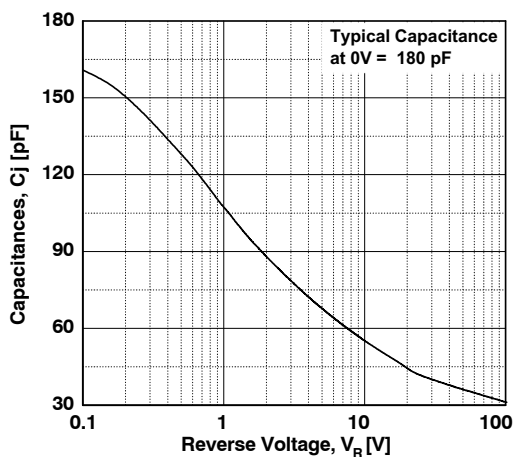


Figure 5. Typical Junction Capacitance

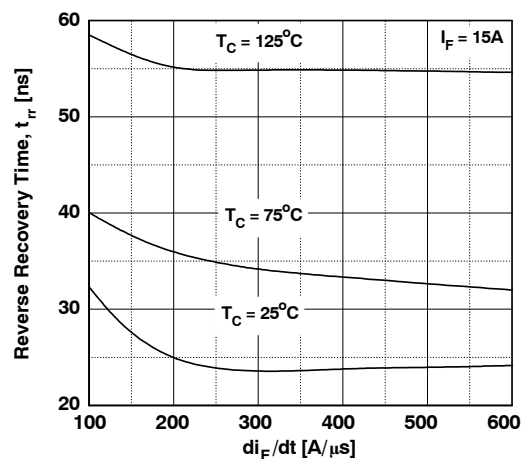


Figure 6. Typical Reverse Recovery Time vs. di/dt

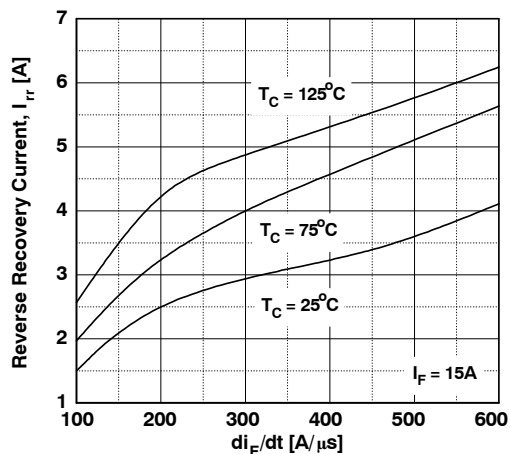


Figure 7. Typical Reverse Recovery Current vs. di/dt

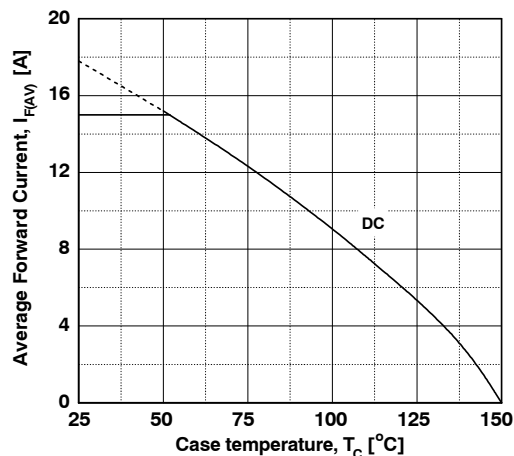
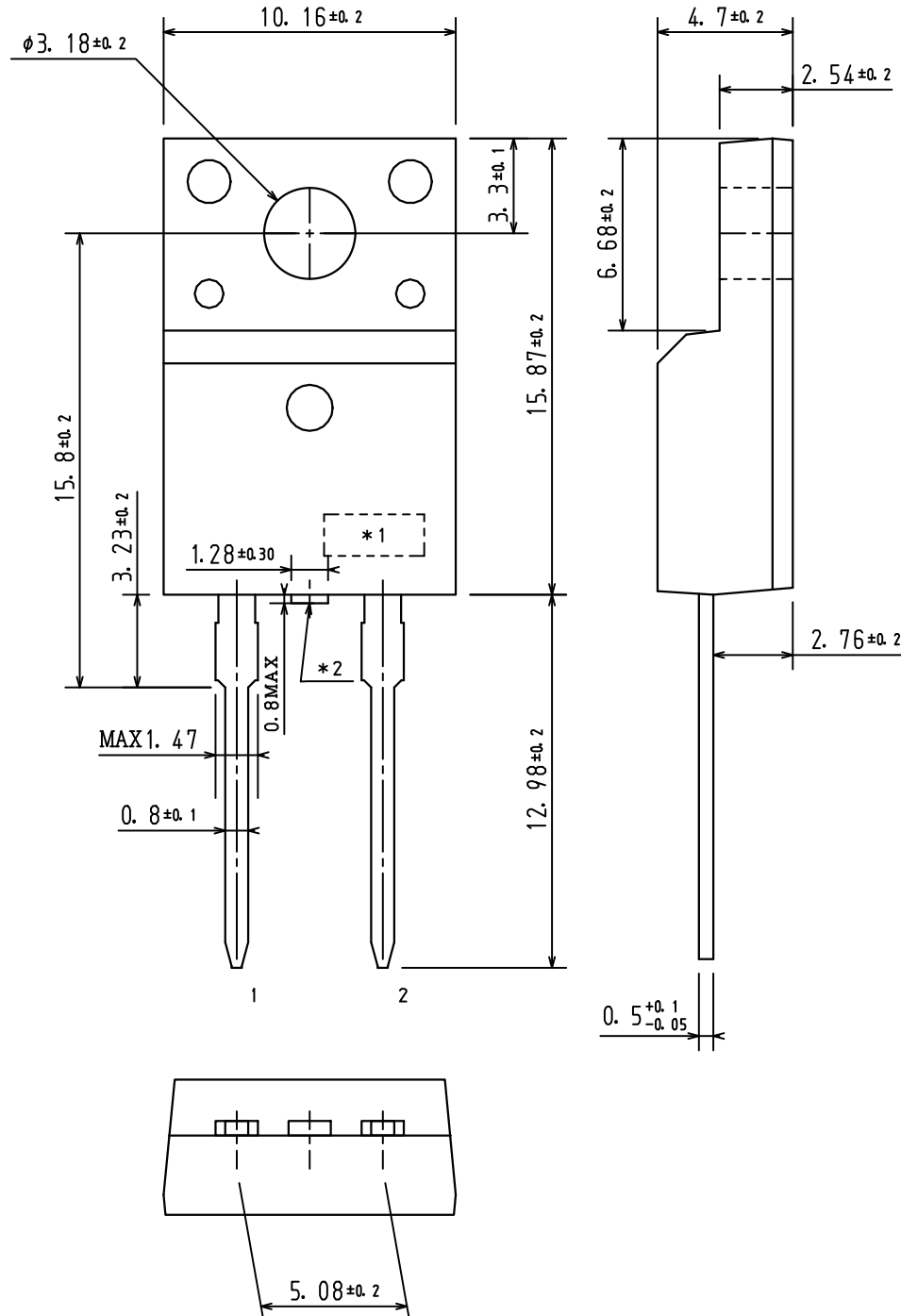


Figure 8. Forward Current Derating Curve

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

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DESCRIPTION:	TO-220 FULLPACK, 2-LEAD / TO-220F-2FS	PAGE 1 OF 1

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