

FFP30S60S

Features

- High Speed Switching, $t_{rr} < 40\text{ns}$ @ $I_F = 30\text{A}$
- High Reverse Voltage and High Reliability
- RoHS compliant

Applications

- General Purpose
- Switching Mode Power Supply
- Boost Diode in continuous mode power factor corrections
- Power switching circuits



30A, 600V STEALTH™ II Rectifier

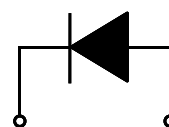
The FFP30S60S is STEALTH™ II rectifier with soft recovery characteristics. It is silicon nitride passivated ion-implanted epitaxial planar construction.

This device is intended for use as freewheeling of 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.

Pin Assignments



1. Cathode 2. 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	600	V
V_{RWM}	Working Peak Reverse Voltage	600	V
V_R	DC Blocking Voltage	600	V
$I_{F(AV)}$	Average Rectified Forward Current @ $T_C = 103^\circ\text{C}$	30	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 +150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Ratings	Units
$R_{\theta JC}$	Maximum Thermal Resistance, Junction to Case	1.1	$^\circ\text{C/W}$

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
F30S60S	FFP30S60STU	TO-220-2L	-	-	50

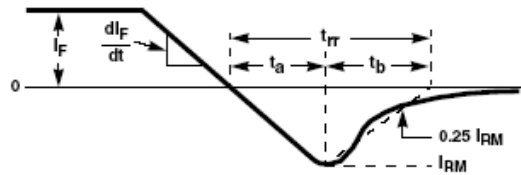
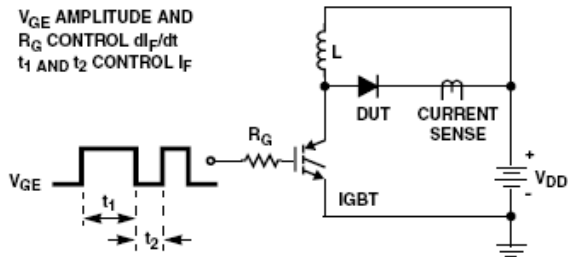
Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Min.	Typ.	Max.	Units
V_{FM1}	$I_F = 30\text{A}$ $I_F = 30\text{A}$	-	2.1 1.6	2.6 -	V
I_{RM1}	$V_R = 600\text{V}$ $V_R = 600\text{V}$	-	-	100 500	μA
t_{rr}	$I_F = 1\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, $V_R = 30\text{V}$	-	25	35	ns
t_{rr} I_{rr} S factor Q_{rr}	$I_F = 30\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_R = 390\text{V}$	- - - -	28 2.4 0.9 34	40 - - -	ns A nC
t_{rr} I_{rr} S factor Q_{rr}	$I_F = 30\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$, $V_R = 390\text{V}$	- - - -	75 6.3 0.9 236	- - - -	ns A nC
W_{AVL}	Avalanche Energy ($L = 40\text{mH}$)	20	-	-	mJ

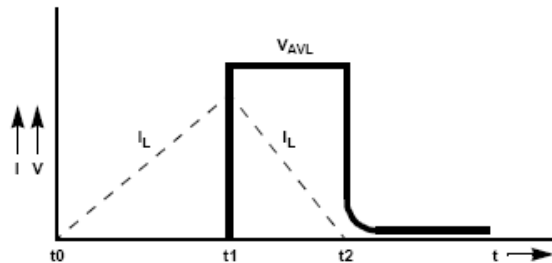
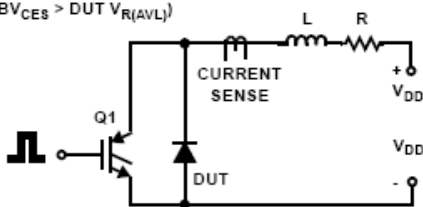
Notes:

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

Test Circuit and Waveforms



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



Typical Performance Characteristics

Figure 1. Typical Forward Voltage Drop vs. Forward Current

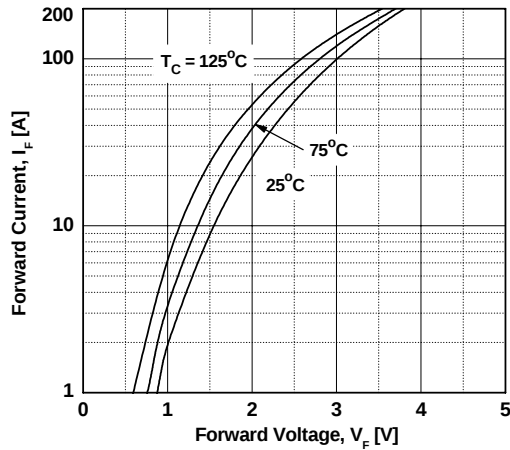


Figure 2. Typical Reverse Current vs. Reverse Voltage

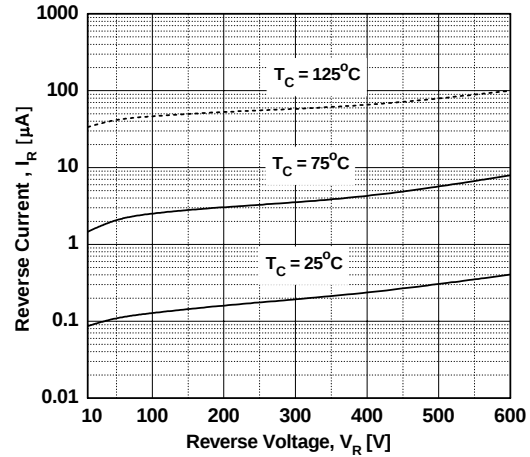


Figure 3. Typical Junction Capacitance

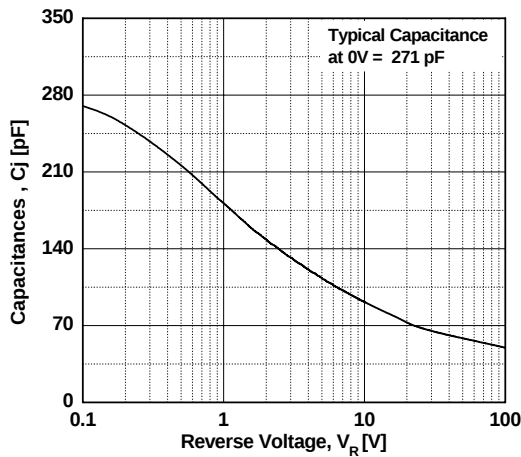


Figure 4. Typical Reverse Recovery Time vs. di/dt

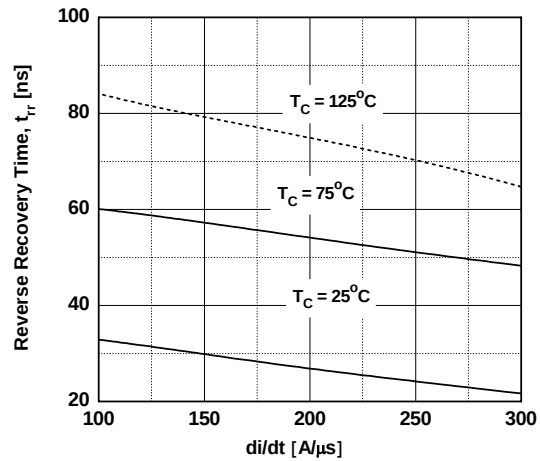


Figure 5. Typical Reverse Recovery Current vs. di/dt

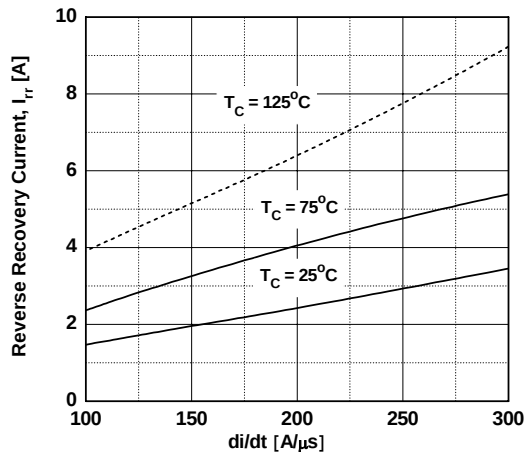
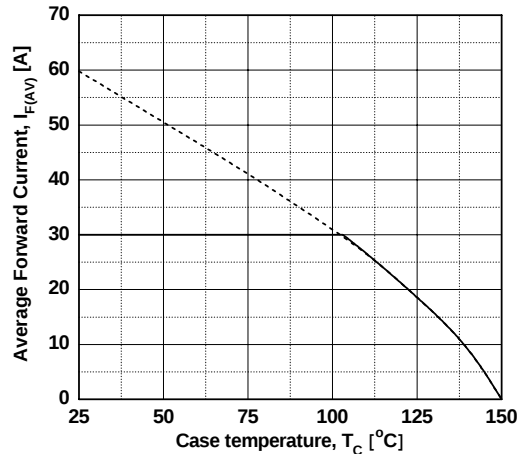
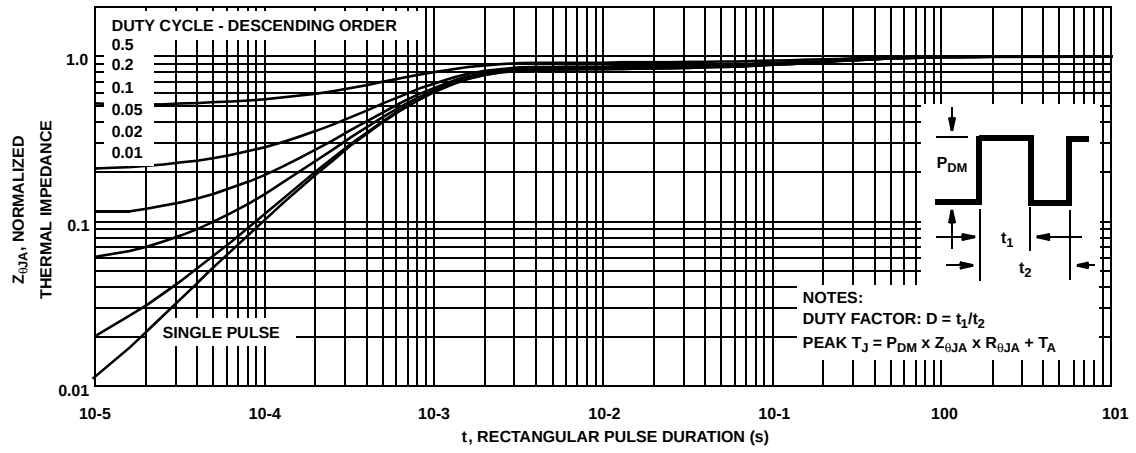


Figure 6. Forward Current Derating Curve



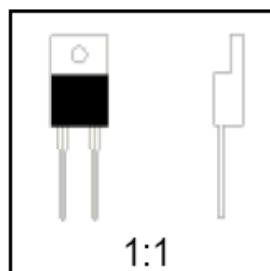
Typical Performance Characteristics

Figure 7. Normalized Maximum Transient Thermal Impedance



Mechanical Dimensions

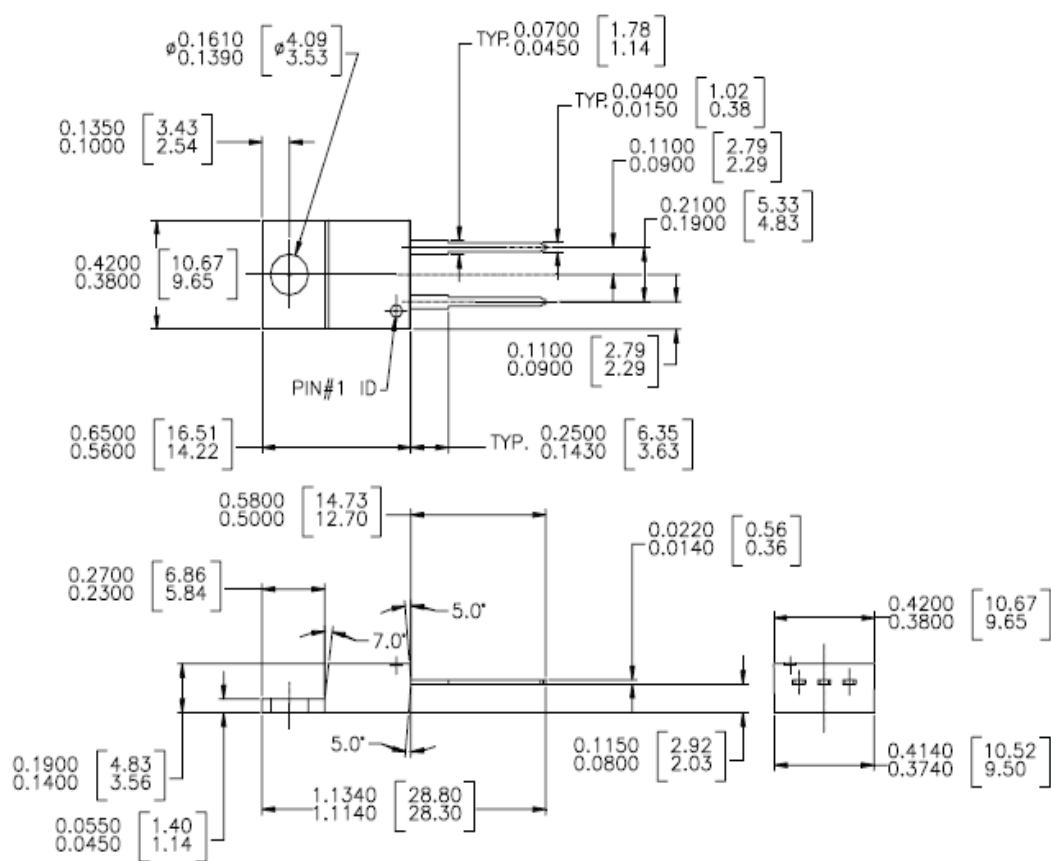
TO-220-2L



Scale 1:1 on letter size paper

Dimensions shown below are in:
inches [millimeters]

Part Weight per unit (gram): 2.24



TO 220 2 LEAD

NOTE : UNLESS OTHERWISE SPECIFIED

1. STANDARD LEAD FINISH :
200 MICROINCHES / 5.08 MICRON MINIMUM
LEAD / TIN 15/85 ON OLIN 194 COPPER OR EQUIVALENT
2. DIMENSION BASED ON JEDEC STANDARD TO-220
VARIATION AB, ISSUE J, DATED 3/24/87

Dimensions in Millimeters



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Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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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