

FFPF10UP20S

10 A, 200 V, Ultrafast Diode

Description

The FFPF10UP20S 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 $t_{rr} = 35 \text{ ns}$ (@ $I_F = 1 \text{ A}$)
- Max Forward Voltage, $V_F = 1.15 \text{ V}$ (@ $T_C = 25^\circ\text{C}$)
- Reverse Voltage, $V_{RRM} = 200 \text{ V}$
- Avalanche Energy Rated
- This Device is Pb-Free and is RoHS Compliant

Applications

- Power Switching Circuits, SMPS
- Output Rectifiers
- Freewheeling Diodes

ABSOLUTE MAXIMUM RATINGS

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

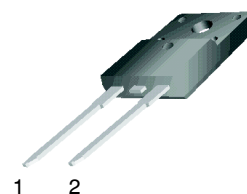
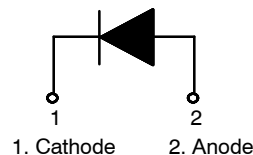
| Symbol | Parameter | Rating | Unit |
|----------------|--|----------------|------------------|
| V_{RRM} | Peak Repetitive Reverse Voltage | 200 | V |
| V_{RWM} | Working Peak Reverse Voltage | 200 | V |
| $I_{F(AV)}$ | Average Rectified Forward Current @ $T_C = 25^\circ\text{C}$ | 10 | A |
| I_{FSM} | Non-repetitive Peak Surge Current 60 Hz Single Half-Sine Wave | 100 | A |
| T_J, T_{STG} | Operating Junction and Storage Temperature | -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.



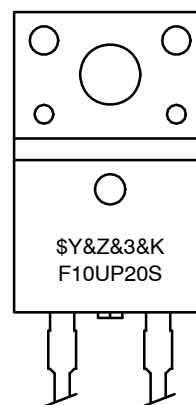
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TO-220, 2-Lead
CASE 221AS

MARKING DIAGRAM



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|----------|---------------------------|
| \$Y | = ON Semiconductor Logo |
| &Z&3 | = Data Code (Year & Week) |
| &K | = Lot |
| F10UP20S | = Specific Device Code |

ORDERING INFORMATION

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

FFPF10UP20S

THERMAL CHARACTERISTICS $T_C = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Max. | Unit |
|-----------------|--|------|--------------------|
| $R_{\theta JC}$ | Maximum Thermal Resistance, Junction to Case | 4.3 | $^\circ\text{C/W}$ |

PACKAGE MARKING AND ORDERING INFORMATION

| Part Number | Top Mark | Package | Packing Method | Reel Size | Tape Width | Quantity |
|---------------|----------|------------|----------------|-----------|------------|----------|
| FFPF10UP20STU | F10UP20S | TO-220F-2L | Tube | N/A | N/A | 50 |

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

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------------------------------|--|-------------|--------------------|--------------|---------------|
| V_F (Note 1) | Forward Voltage $I_F = 10\text{ A}$ $I_F = 10\text{ A}$ $T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$ | – – | – – | 1.15 1.10 | V |
| I_R (Note 1) | Reverse Current @ rated V_R $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$ | – – | – – | 100 500 | μA |
| t_{rr} I_{rr} Q_{rr} | Reverse Recovery Time Reverse Recovery Current Reverse Recovery Charge ($I_F = 6\text{ A}$, $di_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 130\text{ V}$) $T_C = 25^\circ\text{C}$ | – – – | 32 1.65 24.4 | – – – | ns A nC |
| W_{AVL} | Avalanche Energy ($L = 40\text{ mH}$) | 5 | – | – | 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

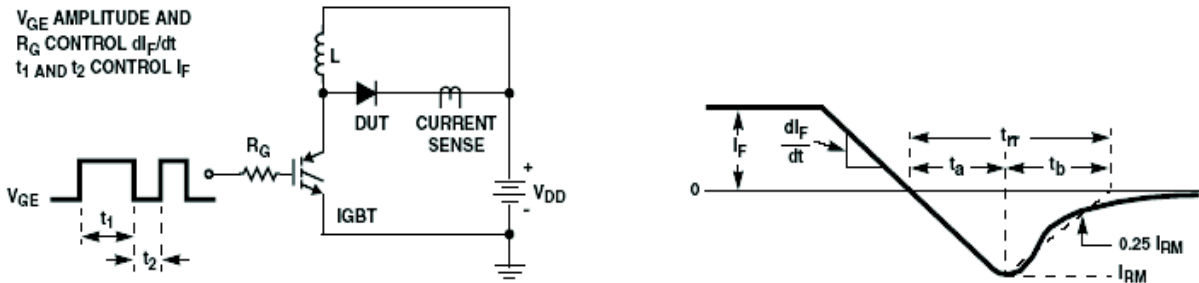


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

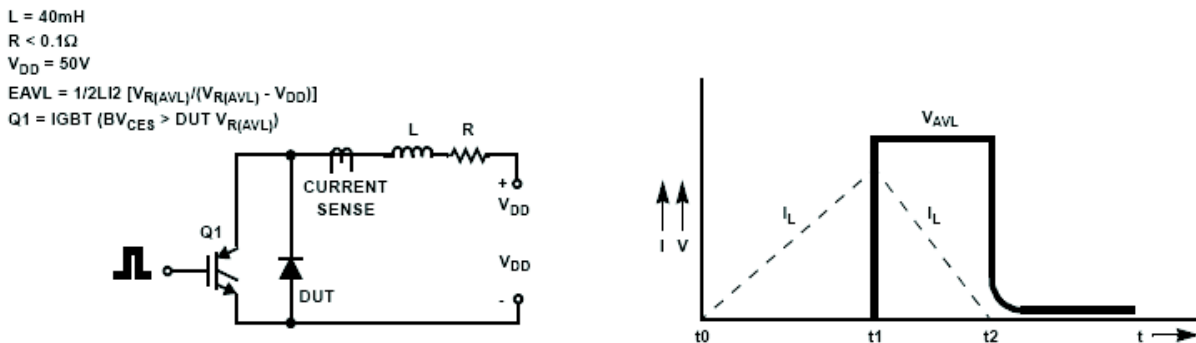


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

TYPICAL CHARACTERISTICS

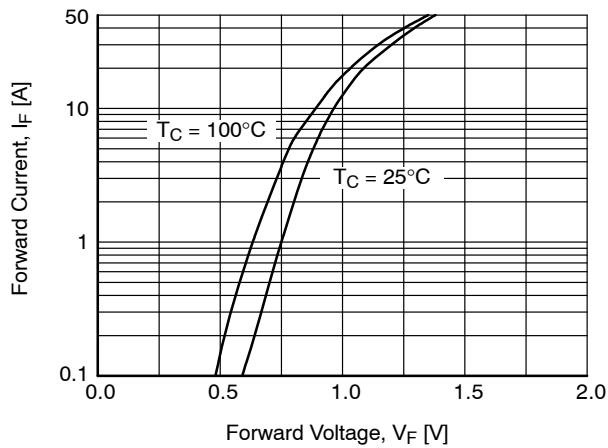


Figure 3. Typical Forward Voltage Drop vs. Forward Current

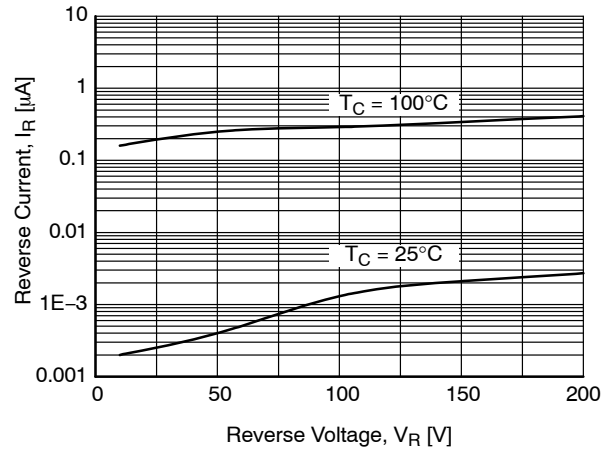


Figure 4. Typical Reverse Current vs. Reverse Voltage

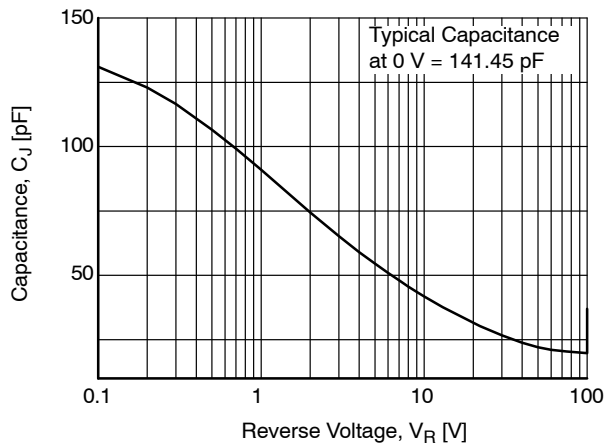


Figure 5. Typical Junction Capacitance

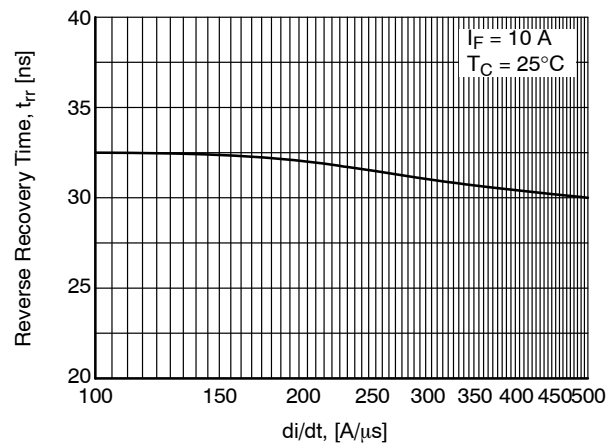


Figure 6. Typical Reverse Recovery Time vs. di_F/dt

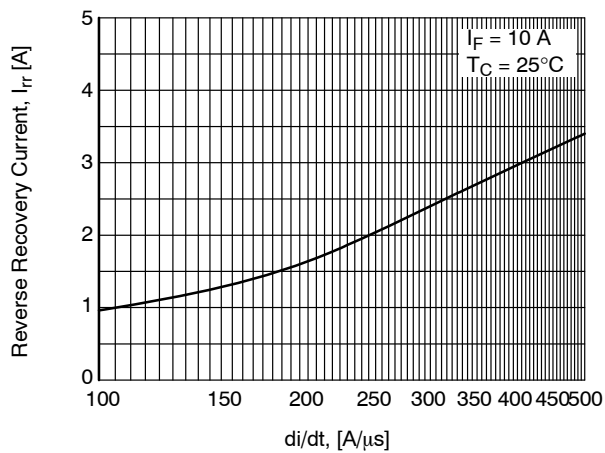


Figure 7. Typical Reverse Recovery Current vs. di_F/dt

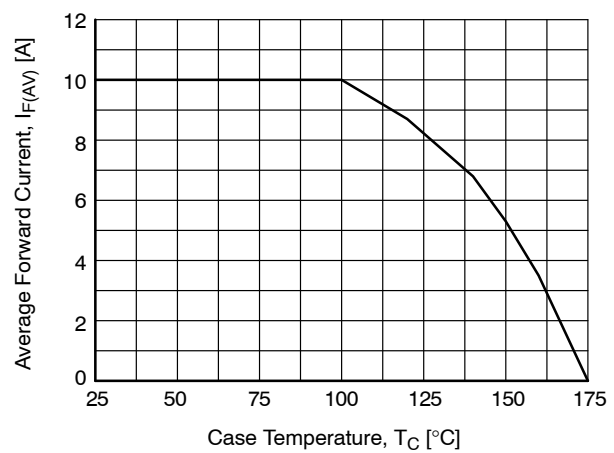
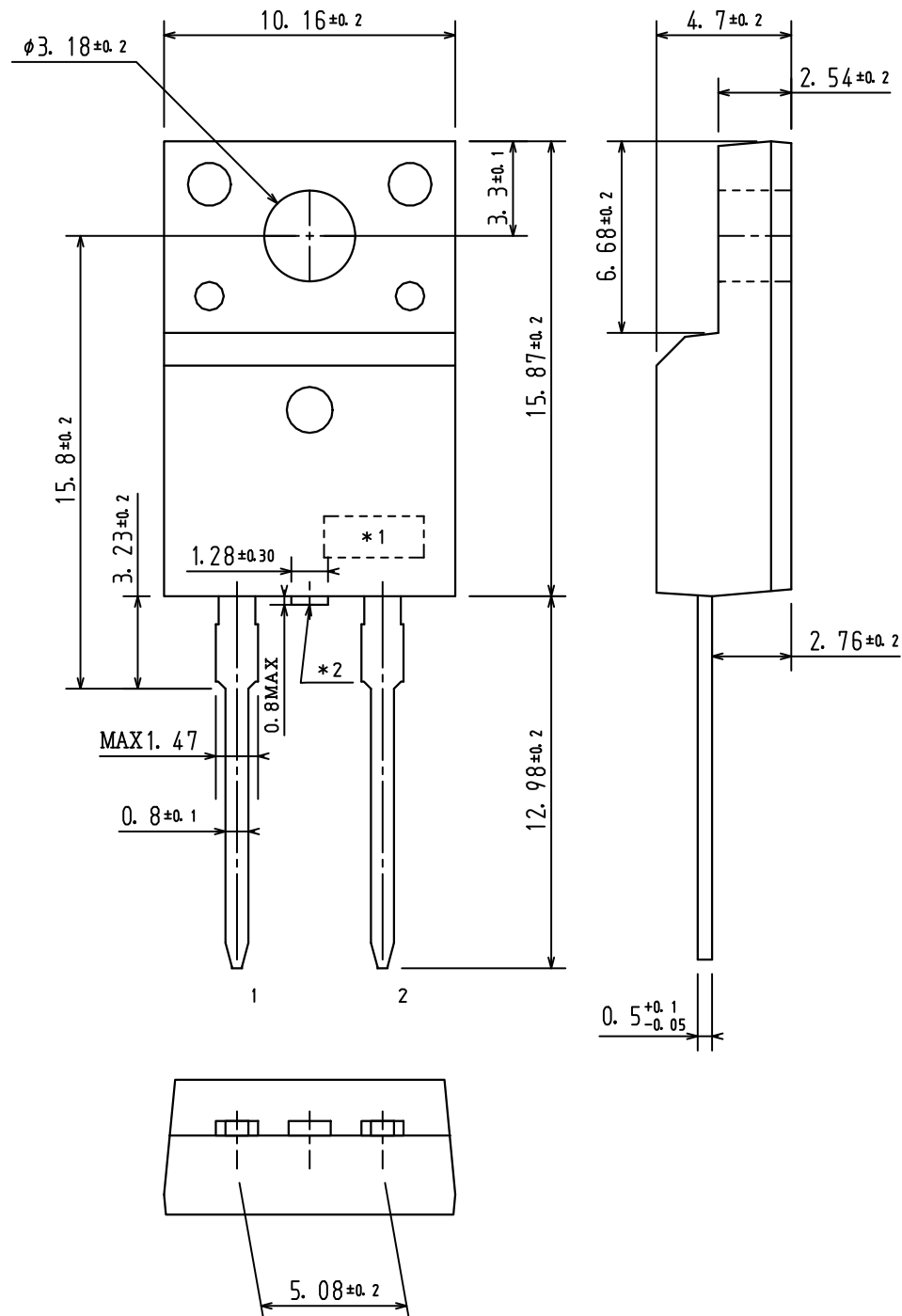



Figure 8. Forward Current Derating Curve


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DATE 29 FEB 2012



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