

Ultrafast Dual Diode 60 A, 200 V

FFA60UP20DN

Description

The FFA60UP20DN 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, $T_{rr} < 32 \text{ ns}$ (@ $I_F = 30 \text{ A}$)
- Max. Forward Voltage, $V_F = 1.15 \text{ V } (@ T_C = 25^{\circ}\text{C})$
- Reverse Voltage: V_{RRM} = 200 V
- Avalanche Energy Rated
- These Devices are Pb-Free and are RoHS Compliant

Applications

- Power Switching Circuits
- Output Rectifiers
- Free-Wheeling Diodes
- SMPS
- Welder
- UPS

ABSOLUTE MAXIMUM RATINGS

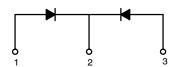
(per diode) T_C = 25°C unless otherwise noted

| Parameter | Symbol | Value | Unit |
|--|-----------------------------------|----------------|------|
| DC Blocking Voltage | V_{R} | 200 | V |
| Peak Repetitive Reverse Voltage | V_{RBM} | 200 | V |
| Working Peak Reverse Voltage | V _{RWM} | 200 | V |
| Average Rectified Forward Current (@ T _C = 100°C) | I _{F(AV)} | 30 | Α |
| Non-repetitive Peak Surge Current 60 Hz Single Half-Sine Wave | I _{FSM} | 300 | Α |
| Operating Junction and Storage Temperature | T _J , T _{STG} | -65 to +175 | °C |

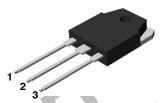
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

| Parameter | Symbol | Value | Unit |
|---|-----------------|-------|------|
| Maximum Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 1.4 | °C/W |



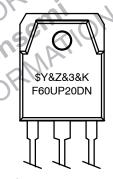
1. Anode 2. Cathode 3. Anode



1.Anode 2.Cathode 3.Anode

TO-3P-3LD / EIAJ SC-65, ISOLATED CASE 340BZ

MARKING DIAGRAM



\$Y = Logo

&Z = Assembly Plant Code

&3 = Date Code

&K = Lot Run Traceability Code F60UP20DN = Specific Device Code

ORDERING INFORMATION

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

FFA60UP20DN

ELECTRICAL CHARACTERISTICS

(per diode) $T_C = 25^{\circ}C$ unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Тур | Max | Unit |
|-------------------------|--|---|--------|--------|-------------|------|
| V _F (Note 1) | Maximum Instantaneous Forward Voltage | I _F = 30 A, T _C = 25°C I _F = 30 A, T _C = 100°C | - - | - - | 1.15 1.0 | V |
| I _R (Note 1) | Maximum Instantaneous Reverse Current | V _R = 200 V, T _C = 25°C V _R = 200 V, T _C = 100°C | | - - | 10 100 | μΑ |
| t _{rr} | Reverse Recovery Time | $I_F = 30 \text{ A}, \text{ di}_F/\text{dt} = 200 \text{ A}/\mu\text{s}, \text{ V}_R = 130 \text{ V}$ | - | 32 | - | ns |
| I _{rr} | Reverse Recovery Current | | - | 2.4 | - | Α |
| Q _{rr} | Reverse Recovery Charge | | - | 38.4 | _ | nC |
| t _{rr} | Maximum Reverse Recovery Time | I _F = 1 A, di _F /dt = 100 A/μs | - | _ | 40 | ns |
| W _{AVL} | Avalanche Energy | L = 40 mH | 2 | _ | _ | 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.

TEST CIRCUIT AND WAVEFORMS

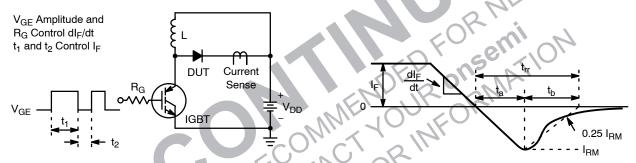


Figure 1. Diode Reverse Recovery Test Circuit & Waveform

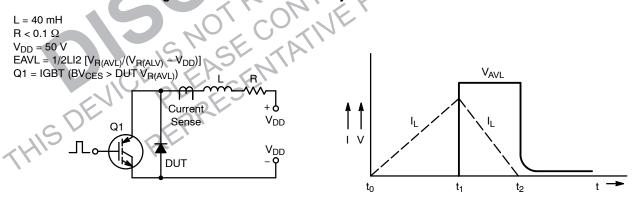


Figure 2. Unclamped Inductive Switching Test Circuit & Waveform

ORDERING INFORMATION

| Part Number | Top Mark | Package | Shipping |
|---------------|-----------|---------------------|-----------------|
| FFA60UP20DNTU | F60UP20DN | TO-3P-3LD (Pb-Free) | 30 Units / Tube |

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

FFA60UP20DN

TYPICAL CHARACTERISTICS

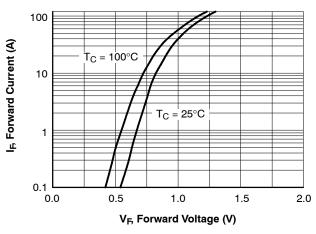


Figure 3. Typical Forward Voltage Drop vs. Forward Current

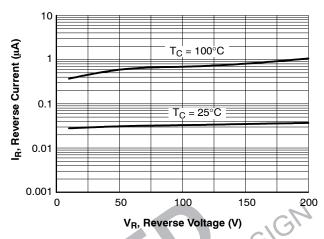


Figure 4. Typical Reverse Current vs. Reverse Voltage

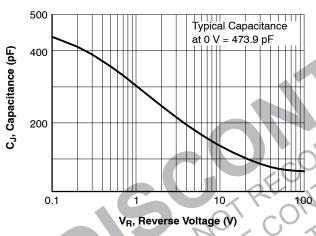


Figure 5. Typical Junction Capacitance

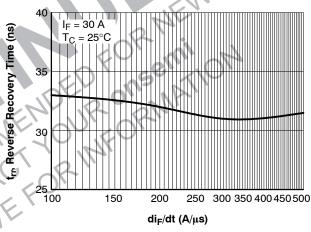


Figure 6. Typical Reverse Recovery Time vs. di_F/dt

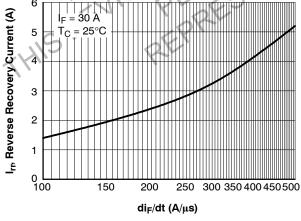


Figure 7. Typical Reverse Recovery Current vs. di_F/dt

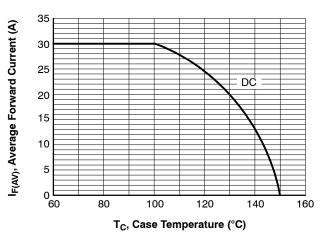
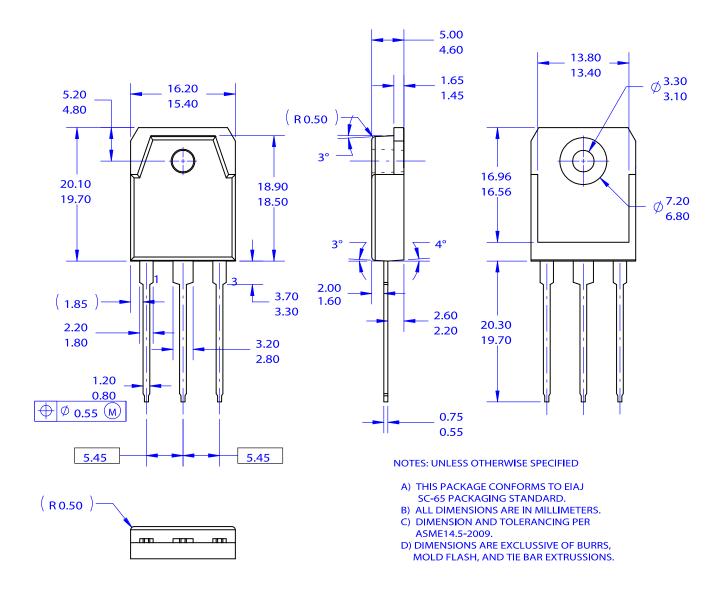


Figure 8. Forward Current Derating Curve



TO-3P-3LD / EIAJ SC-65, ISOLATED CASE 340BZ ISSUE O

DATE 31 OCT 2016



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