

300V, 20A ULTRAFAST DUAL RECTIFIERS

Features

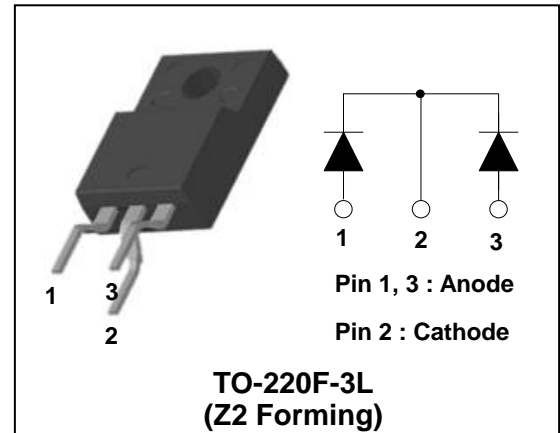
- Low forward voltage drop and leakage current
- Ultrafast reverse recovery time ($t_{rr} < 30\text{ns}$)
- Low power loss and high efficiency
- Dual common cathode rectifier construction
- Full lead (Pb)-free and RoHS compliant device

Applications

- Switching power supply
- Power inverters
- Free-wheeling diode
- Power conversion system
- Motor drives

Description

The SF20A300HZ2 is an ultrafast rectifier. It has a low forward voltage drop and reverse recovery time ($t_{rr} < 30\text{ns}$). The device is intended for use as a free wheeling, clamping rectifier in a variety of switching power supplies and other power switching applications.



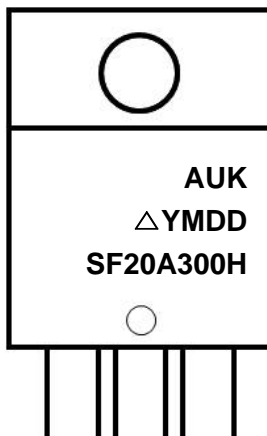
Product Characteristics

| | |
|------------------------------------|--------------|
| $I_{F(AV)}$ | 2 x 10A |
| V_{RRM} | 300V |
| $V_{FM} @ T_j = 125^\circ\text{C}$ | 0.95V (Max.) |
| t_{rr} | 30ns |

Ordering Information

| Device | Marking Code | Package | Packaging |
|-------------|--------------|----------------------------|-----------|
| SF20A300HZ2 | SF20A300H | TO-220F-3L (Z2 Forming) | Tube |

Marking Information



AUK = Manufacture Logo

Δ = Control Code of Manufacture

YMDD = Date Code Marking

-. Y = Year Code

-. M = Monthly Code

-. DD = Daily Code

SF20A300H = Specific Device Code

Absolute Maximum Ratings (Limiting Values)

| Characteristic | | Symbol | Value | Unit |
|-----------------------------------------------------------------------------------------------------------|--------------|---------------------------------|-------------|------|
| Maximum repetitive reverse voltage Maximum working peak reverse voltage Maximum DC blocking voltage | | V_{RRM} V_{RWM} V_R | 300 | V |
| Maximum average forward rectified current | per diode | $I_{F(AV)}$ | 10 | A |
| | total device | | 20 | |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load per 1 chip | | I_{FSM} | 120 | A |
| Storage temperature range | | T_{stg} | -45 to +150 | °C |
| Maximum operating junction temperature | | T_j | 150 | °C |

Thermal Characteristics

| Characteristic | | Symbol | Value | Unit |
|---------------------------------------------|--------------|---------------|-------|------|
| Maximum thermal resistance junction to case | per diode | $R_{th(j-c)}$ | 4.0 | °C/W |
| | total device | | 3.6 | |

Electrical Characteristics (Per Diode)

| Characteristic | Symbol | Test Condition | Min. | Typ. | Max. | Unit | |
|---------------------------|----------------|-------------------------------|-------------------|------|------|------|----|
| Peak forward voltage drop | $V_{FM}^{(1)}$ | $I_{FM} = 10A$ | $T_j=25^\circ C$ | - | - | 1.30 | V |
| | | | $T_j=125^\circ C$ | - | - | 0.95 | |
| Reverse leakage current | $I_{RM}^{(1)}$ | $V_R = V_{RRM}$ | $T_j=25^\circ C$ | - | - | 20 | uA |
| | | | $T_j=125^\circ C$ | - | - | 500 | |
| Reverse recovery time | t_{rr} | $I_F = 1A, di/dt = -100 A/us$ | - | - | 30 | ns | |
| Junction capacitance | C_j | $V_R = 10V_{DC}, f=1MHz$ | - | 65 | - | pF | |

Note : (1) Pulse test : $t_p \leq 380us$, Duty cycle $\leq 2\%$

Electrical Characteristic Curves (Per Diode)

Fig. 1 $I_F - V_F$

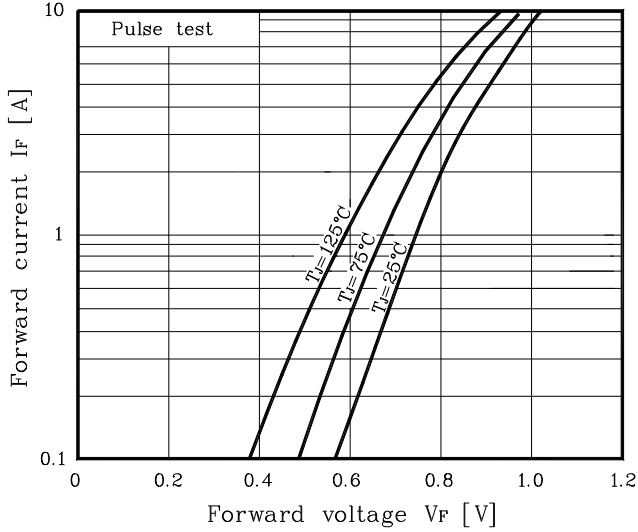


Fig. 2 $I_R - V_R$

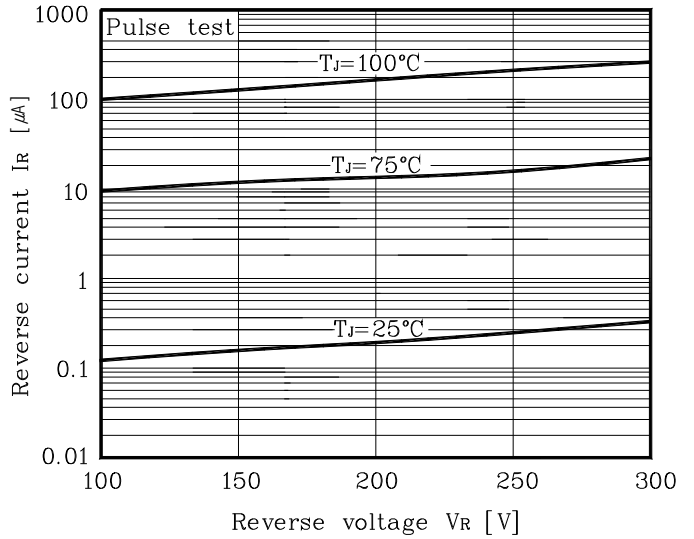


Fig. 3 $I_O - P_F$

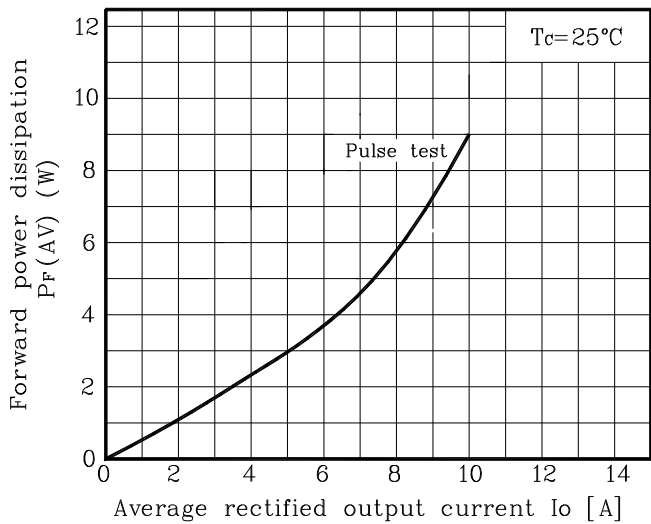


Fig. 4 $C_T - V_R$

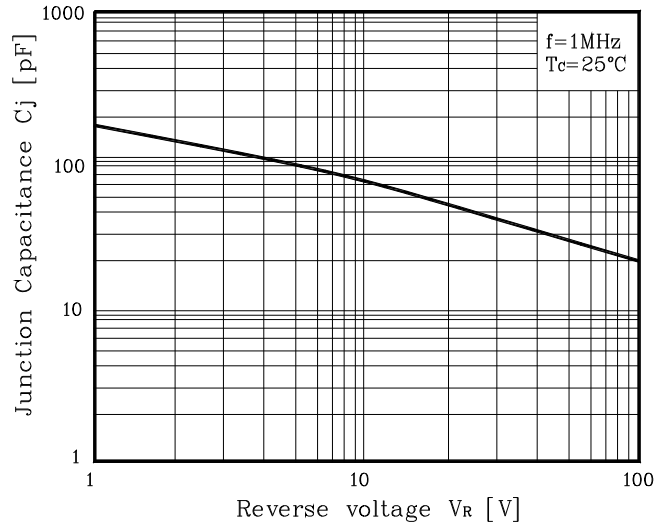


Fig. 5 $I_{FSM} - \text{Number of cycle}$

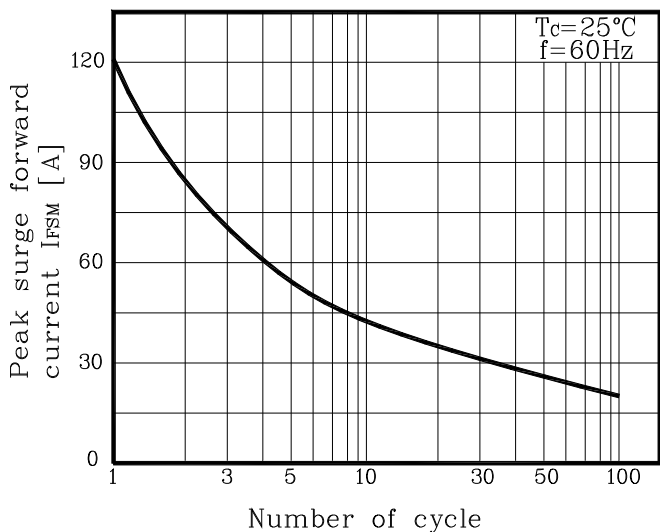
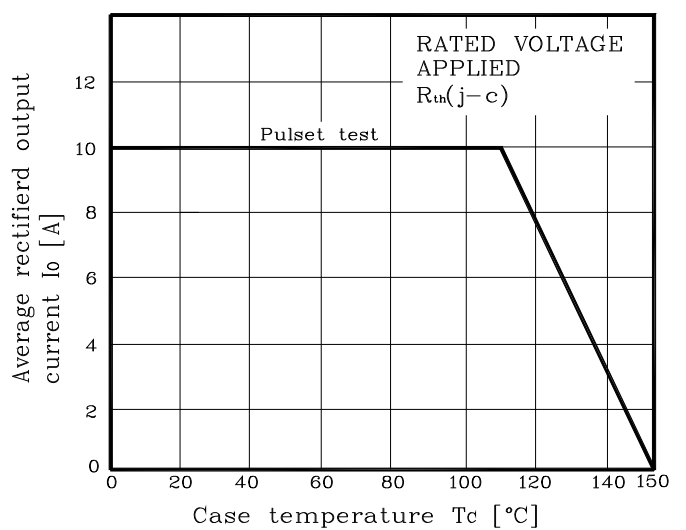
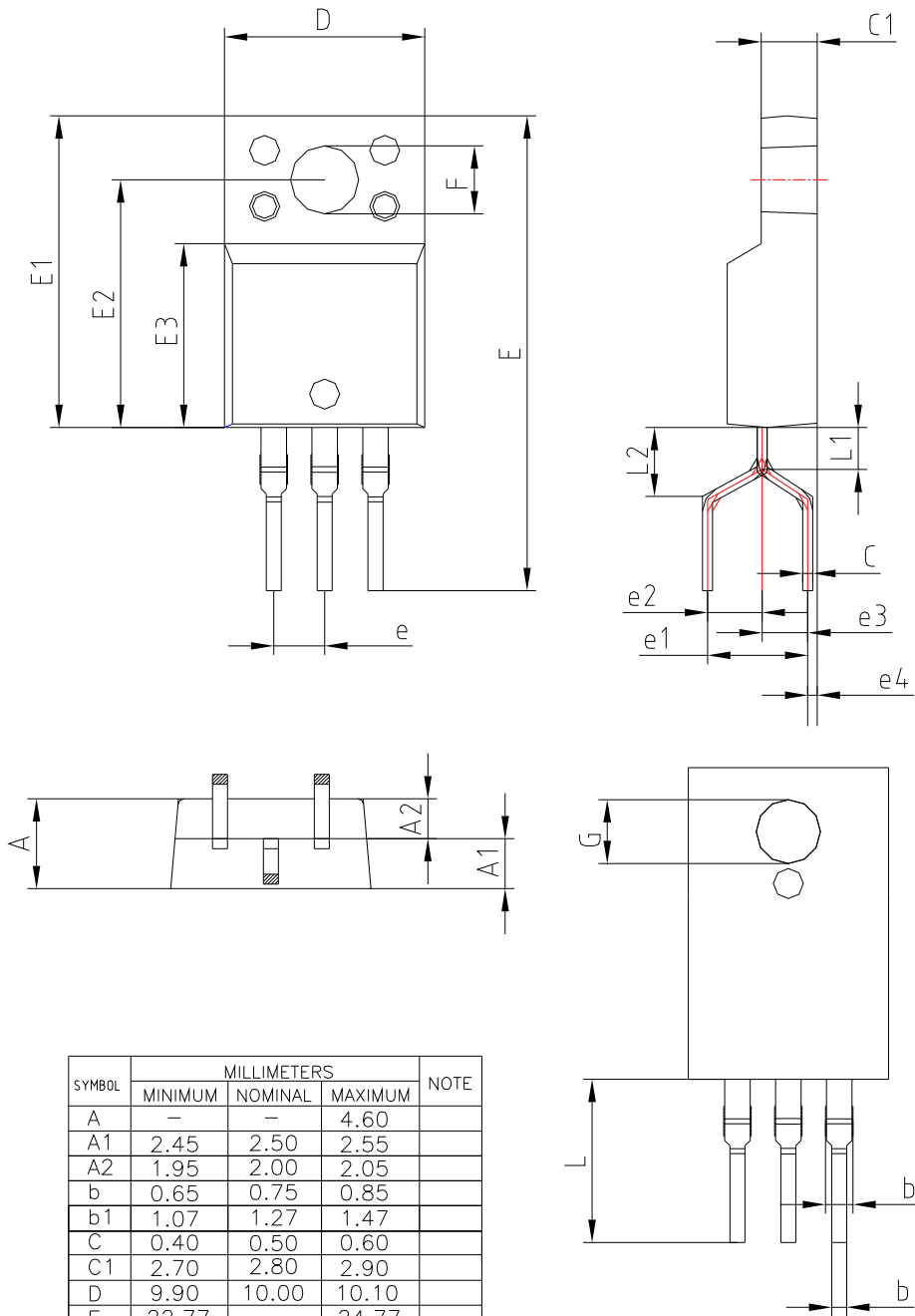


Fig. 6 I_O derating - T_C



Package Outline Dimension

unit: mm



| SYMBOL | MILLIMETERS | | | NOTE |
|--------|-------------|---------|---------|------|
| | MINIMUM | NOMINAL | MAXIMUM | |
| A | — | — | 4.60 | |
| A1 | 2.45 | 2.50 | 2.55 | |
| A2 | 1.95 | 2.00 | 2.05 | |
| b | 0.65 | 0.75 | 0.85 | |
| b1 | 1.07 | 1.27 | 1.47 | |
| C | 0.40 | 0.50 | 0.60 | |
| C1 | 2.70 | 2.80 | 2.90 | |
| D | 9.90 | 10.00 | 10.10 | |
| E | 22.77 | — | 24.77 | |
| E1 | 15.50 | 15.60 | 15.70 | |
| E2 | 12.30 | 12.40 | 12.50 | |
| E3 | 9.15 | 9.20 | 9.25 | |
| F | 3.30 | 3.40 | 3.50 | |
| G | 3.10 | 3.20 | 3.30 | |
| e | 2.04 | 2.54 | 3.04 | |
| e1 | 4.70 | 5.00 | 5.30 | |
| e2 | 2.725 BSC | | | |
| e3 | 2.275 BSC | | | |
| e4 | 0.475 BSC | | | |
| L | 7.17 | — | 9.17 | |
| L1 | 2.11 BSC | | | |
| L2 | 3.45 BSC | | | |

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