

## 600V, 20A ULTRAFast DUAL RECTIFIERS

### Features

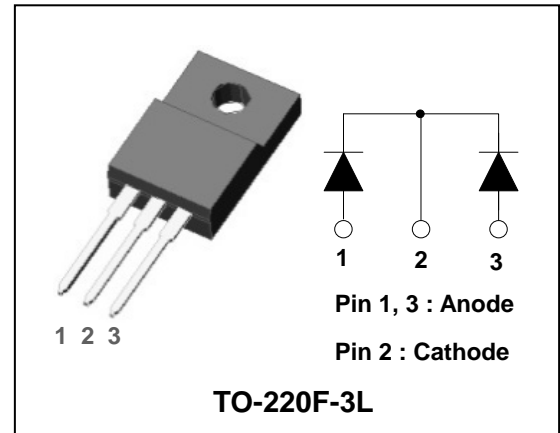
- Low forward voltage drop and leakage current
- Ultrafast reverse recovery time ( $t_{rr} < 35\text{ns}$ )
- Low power loss and high efficiency
- Dual common cathode rectifier construction
- Full lead (Pb)-free and RoHS compliant device

### Applications

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

### Description

The SF20A600HPI is an ultrafast rectifier. It has a low forward voltage drop and reverse recovery time ( $t_{rr} < 35\text{ns}$ ). The device is intended for use as a free wheeling, clamping rectifier in a variety of switching power supplies and other power switching applications.



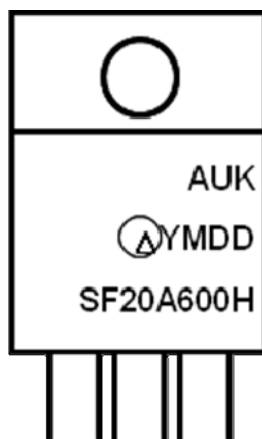
### Product Characteristics

|                                  |         |
|----------------------------------|---------|
| $I_{F(AV)}$                      | 2 x 10A |
| $V_{RRM}$                        | 600V    |
| $V_{FM} @ T_j=125^\circ\text{C}$ | 1.68V   |
| $t_{rr}$                         | 35ns    |

### Ordering Information

| Device      | Marking Code | Package    | Packaging |
|-------------|--------------|------------|-----------|
| SF20A600HPI | SF20A600H    | TO-220F-3L | Tube      |

### Marking Information



- AUK = Manufacture Logo
- $\Delta$  = Control Code of Manufacture
- YMDD = Date Code Marking
  - . Y = Year Code
  - . M = Monthly Code
  - . DD = Daily Code
- SF20A600H = Specific Device Code

## Absolute Maximum Ratings (Limiting Values)

| Characteristic  |              | Symbol                          | Value           | Unit |
|---|--------------|---------------------------------|-----------------|------|
| Maximum repetitive reverse voltage<br>Maximum working peak reverse voltage<br>Maximum DC blocking voltage |              | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 600             | 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 diode               |              | $I_{FSM}$                       | 100             | A    |
| Storage temperature range   |              | $T_{stg}$                       | -45°C to +150°C | °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   |      |

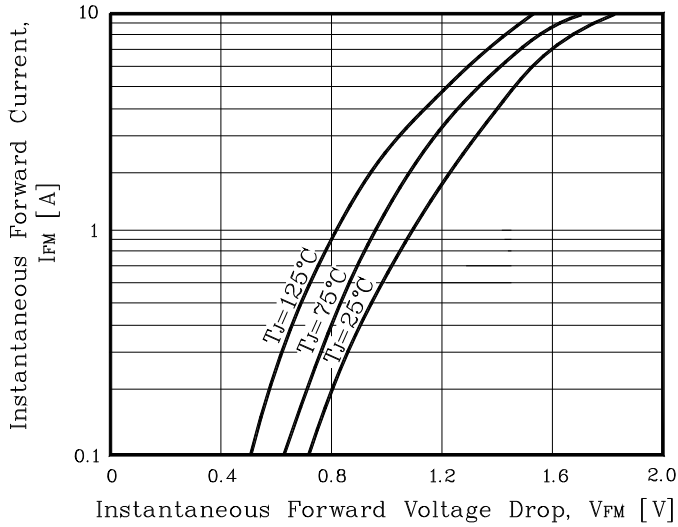
## Electrical Characteristics (Per Diode)

| Characteristic            | Symbol         | Test Condition                | Min.              | Typ. | Max. | Unit |    |
|---------------------------|----------------|-------------------------------|-------------------|------|------|------|----|
| Peak forward voltage drop | $V_{FM}^{(1)}$ | $I_{FM} = 10A$                | $T_j=25^\circ C$  | -    | -    | 1.90 | V  |
|                           |                |                               | $T_j=125^\circ C$ | -    | -    | 1.68 | V  |
| Reverse leakage current   | $I_{RM}^{(1)}$ | $V_R = V_{RRM}$               | $T_j=25^\circ C$  | -    | -    | 20   | uA |
|                           |                |                               | $T_j=125^\circ C$ | -    | -    | 200  | uA |
| Reverse recovery time     | $t_{rr}$       | $I_F = 1A, di/dt = -100 A/us$ | -                 | -    | 35   | ns   |    |
| Junction capacitance      | $C_j$          | $V_R = 4V_{DC}, f=1MHz$       | -                 | 70   | -    | pF   |    |

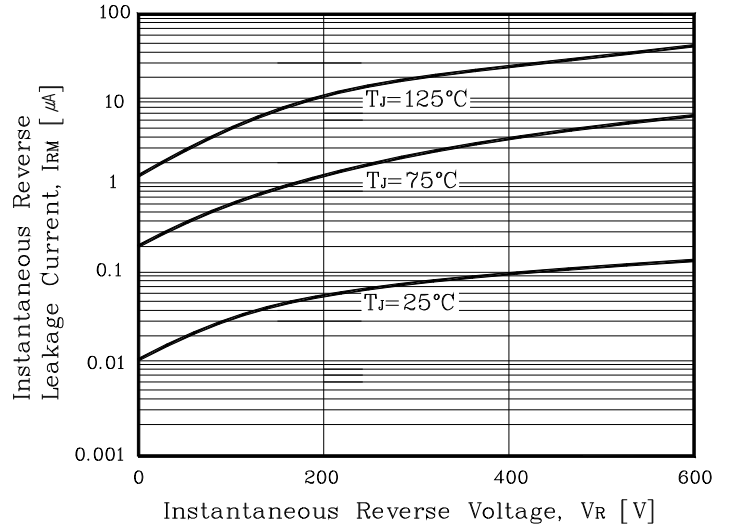
**Note :** (1) Pulse test :  $t_p \leq 380 \mu s$ , Duty cycle  $\leq 2\%$

## Rating and Characteristic Curves (Per Diode)

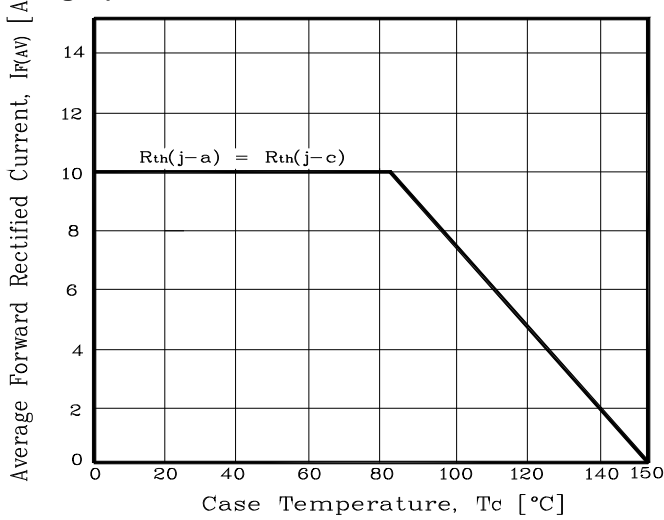
**Fig. 1) Typical Forward Characteristics**



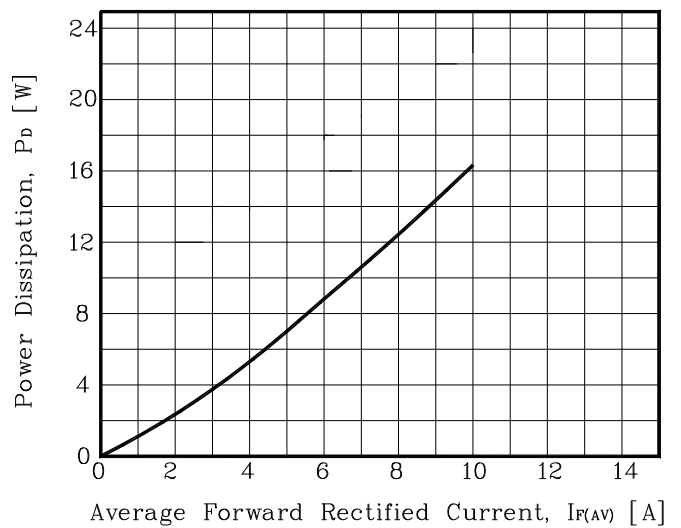
**Fig. 2) Typical Reverse Characteristics**



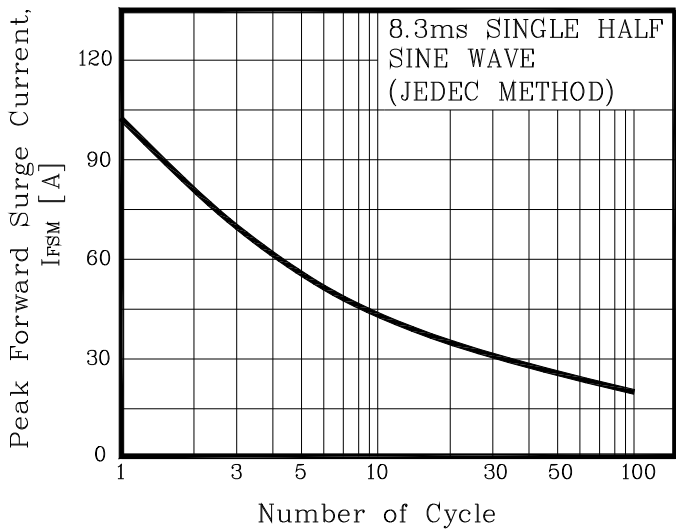
**Fig. 3) Maximum Forward Derivative Curve**



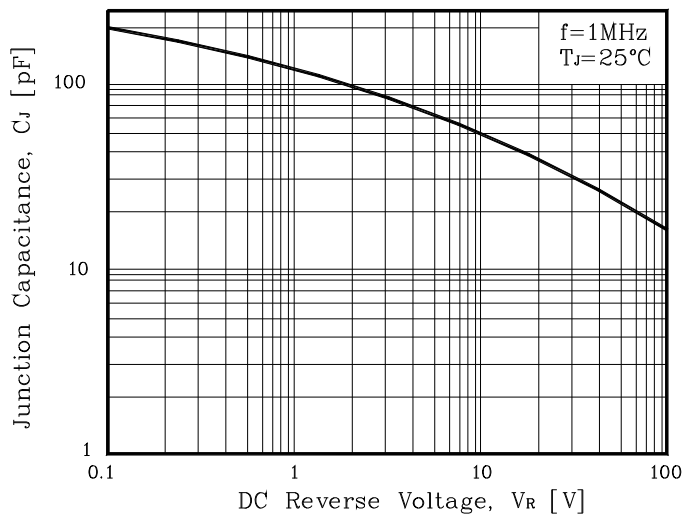
**Fig. 4) Forward Power Dissipation**



**Fig. 5) Maximum Non-Repetitive Peak Forward Surge Current**



**Fig. 6) Typical Junction Capacitance**



## Package Outline Dimension



| 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      | 28.00       | -       | 28.60   |      |
| 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      | 2.54 BSC    |         |         |      |
| L      | 12.40       | -       | 13.00   |      |
| L1     | 3.46 BSC    |         |         |      |

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