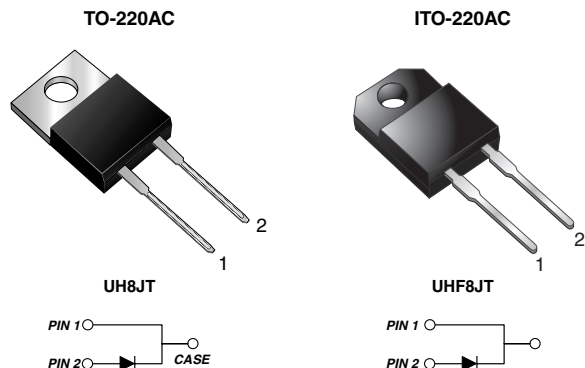


## High Voltage Ultrafast Rectifier



### FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC


RoHS  
COMPLIANT

### TYPICAL APPLICATIONS

For use in high voltage continuous mode power factor correctors (CCM PFC), switching mode power supplies, freewheeling diodes and secondary dc-to-dc rectification application.

### MECHANICAL DATA

**Case:** TO-220AC, ITO-220AC

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

### PRIMARY CHARACTERISTICS

|                      |        |
|----------------------|--------|
| $I_{F(AV)}$          | 8 A    |
| $V_{RRM}$            | 600 V  |
| $I_{FSM}$            | 80 A   |
| $t_{rr}$             | 25 ns  |
| $V_F$ at $I_F = 8$ A | 1.47 V |
| $T_J$ max.           | 175 °C |

### MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)

| PARAMETER                                                                          | SYMBOL         | UH8JT         | UHF8JT | UNIT |
|------------------------------------------------------------------------------------|----------------|---------------|--------|------|
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 600           |        | V    |
| Maximum average forward rectified current (Fig. 1)                                 | $I_{F(AV)}$    | 8             |        | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 80            |        | A    |
| Isolation voltage (ITO-220AC only)<br>from terminal to heatsink $t = 1$ min        | $V_{AC}$       | 1500          |        | V    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | - 55 to + 175 |        | °C   |

### ELECTRICAL CHARACTERISTICS ( $T_C = 25$ °C unless otherwise noted)

| PARAMETER                                    | TEST CONDITIONS | SYMBOL | TYP. | MAX. | UNIT |
|----------------------------------------------|-----------------|--------|------|------|------|
| Instantaneous forward voltage <sup>(1)</sup> | $I_F = 4$ A     | $V_F$  | 1.82 | -    | V    |
|                                              | $I_F = 8$ A     |        | 2.30 | 3.0  |      |
|                                              | $T_A = 25$ °C   |        |      |      |      |
|                                              | $T_A = 125$ °C  |        | 1.20 | -    |      |
|                                              |                 |        | 1.47 | 1.8  |      |

| ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted) |                                                                                                          |                                                   |                 |        |            |      |
|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------|--------|------------|------|
| PARAMETER                                                                  | TEST CONDITIONS                                                                                          |                                                   | SYMBOL          | TYP.   | MAX.       | UNIT |
| Reverse current <sup>(2)</sup>                                             | V <sub>R</sub> = 600 V                                                                                   | T <sub>A</sub> = 25 °C<br>T <sub>A</sub> = 125 °C | I <sub>R</sub>  | -<br>- | 5.0<br>100 | μA   |
| Maximum reverse recovery time                                              | I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A,<br>I <sub>rr</sub> = 0.25 A                              |                                                   | t <sub>rr</sub> | -      | 25         | ns   |
|                                                                            | I <sub>F</sub> = 1.0 A, dI/dt = 50 A/μs,<br>V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub> |                                                   |                 | -      | 45         |      |
| Typical softness factor (t <sub>b</sub> /t <sub>a</sub> )                  | I <sub>F</sub> = 8 A, dI/dt = 200 A/μs,<br>V <sub>R</sub> = 400 V, T <sub>J</sub> = 125 °C               |                                                   | S               | 0.5    | -          | -    |
| Typical reverse recovery current                                           |                                                                                                          |                                                   | I <sub>RM</sub> | 7.0    | 7.7        | A    |
| Typical stored charge                                                      |                                                                                                          |                                                   | Q <sub>rr</sub> | 160    | -          | nC   |
| Typical forward recovery time                                              | I <sub>F</sub> = 8 A, dI/dt = 64 A/μs,<br>V <sub>F</sub> = 1.1 x V <sub>F</sub> max.                     |                                                   | t <sub>fr</sub> | 150    | -          | ns   |

**Notes:**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

| <b>THERMAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |       |        |                             |
|---------------------------------------------------------------------------------------------|-----------------|-------|--------|-----------------------------|
| PARAMETER                                                                                   | SYMBOL          | UH8JT | UHF8JT | UNIT                        |
| Typical thermal resistance from junction to case                                            | $R_{\theta JC}$ | 2.0   | 4.0    | $^{\circ}\text{C}/\text{W}$ |

| <b>ORDERING INFORMATION</b> (Example) |               |                 |              |               |               |
|---------------------------------------|---------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC                              | UH8JT-E3/45   | 1.83            | 45           | 50/tube       | Tube          |
| ITO-220AC                             | UHF8JT-E3/45  | 1.72            | 45           | 50/tube       | Tube          |

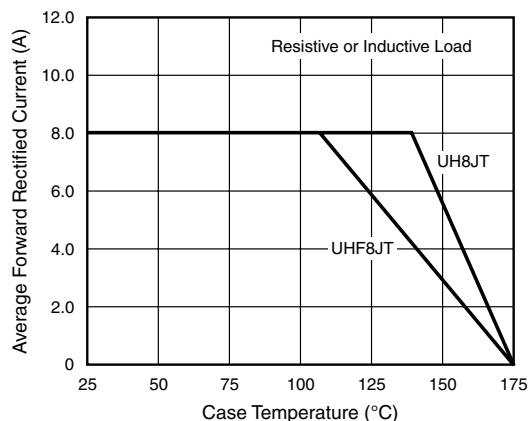
**RATINGS AND CHARACTERISTICS CURVES**( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Figure 1. Maximum Forward Current Derating Curve

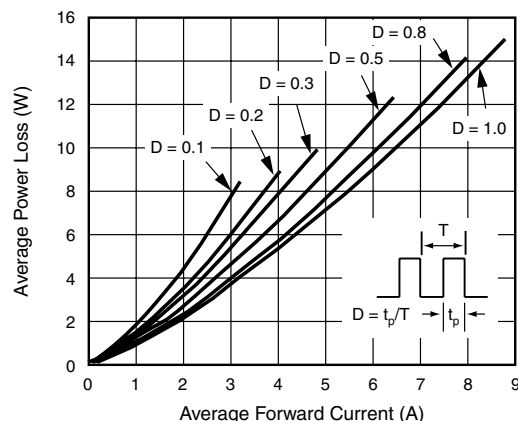


Figure 2. Forward Power Loss Characteristics

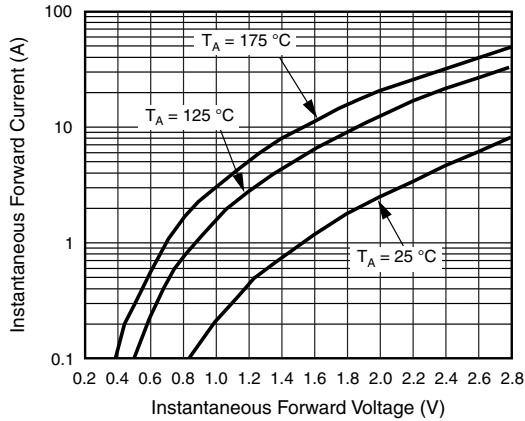


Figure 3. Typical Instantaneous Forward Characteristics

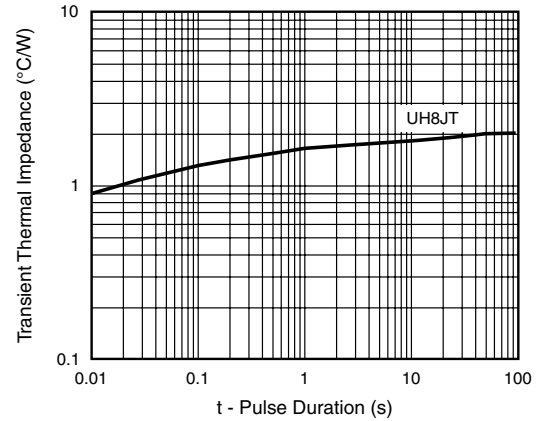


Figure 6. Typical Transient Thermal Impedance

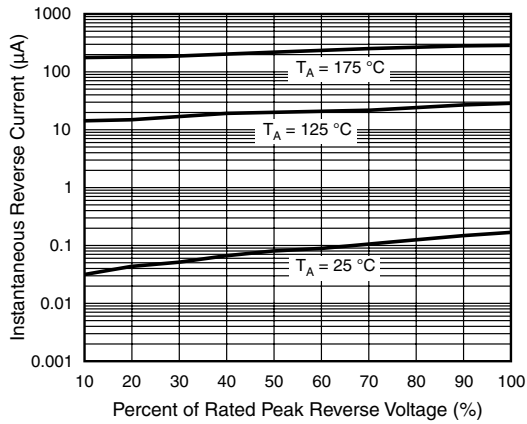


Figure 4. Typical Reverse Leakage Characteristics

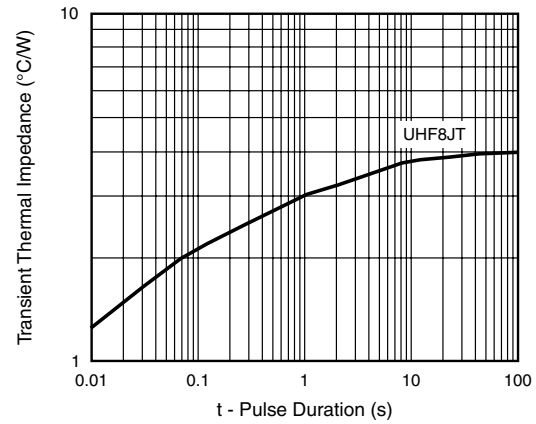


Figure 7. Typical Transient Thermal Impedance

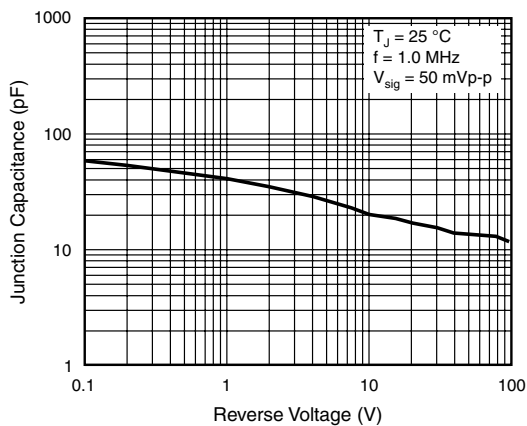
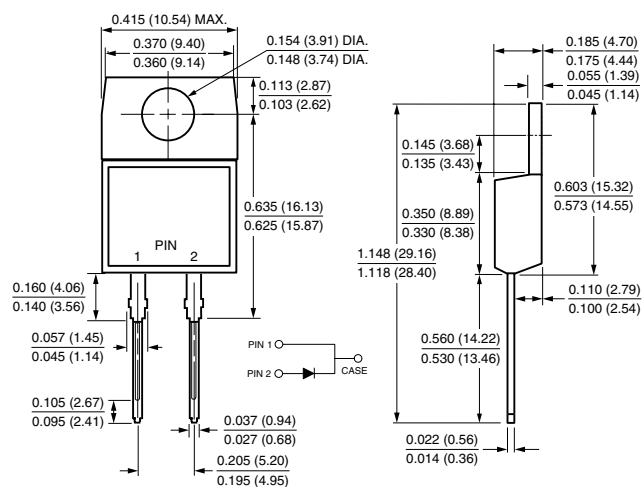


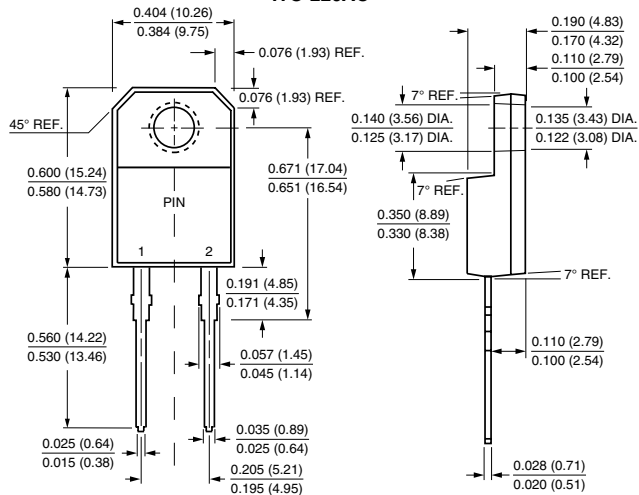
Figure 5. Typical Junction Capacitance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

TO-220AC



ITO-220AC





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