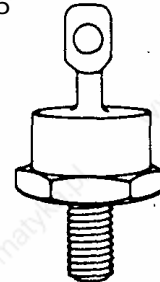


**DESCRIPTION**

The UES804 series of ultrafast high-efficiency rectifiers is specifically designed for operation in power switching circuits operating at frequencies of 20 kHz or higher. These devices have demonstrated capability in passing power-stress testing to 25 thousand cycles with full-rated forward current turned on and off without a heat sink. This forces case temperature increases of 75 °C at which time the current is removed to simulate worst case applications. The switching times increase relatively little with temperature or at different currents.

**APPEARANCE**

DO-5



**IMPORTANT:** For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

**FEATURES**

- Very Low Forward Voltage
- Very Fast Recovery Times
- High Reliability Screening Options with HR2 Suffix (ie. UES804HR2)
- Low Thermal Resistance
- Mechanically rugged
- Standard Polarity is Cathode to Case. For Reverse Polarity, Add Suffix R (ie. UES804R)

**APPLICATIONS / BENEFITS**

- Power Switching Circuits 20 kHz and above with minimal parasitic switching losses
- Catch Diodes for Switching Regulators
- Output Rectifiers for High Frequency Square-Wave Inverters
- Extremely Robust in Power Cycling
- High Surge Capability
- Hermetically Sealed

**ABSOLUTE MAXIMUM RATINGS**

- Peak Inverse Voltage, UES804, UES804HR2.....200 V
- Peak Inverse Voltage, UES805, UES805HR2.....300 V
- Peak Inverse Voltage, UES806, UES806HR2.....400 V
- Average DC Output Current,  $I_o$  @  $T_c = 100^\circ\text{C}$ .....50 A
- Surge Current, 8.3 ms .....600 A
- Thermal Resistance, Junction to Case.....0.8 °C/W
- Operating and Storage Temp. Range.....-55°C to +150°C

**MECHANICAL AND PACKAGING**

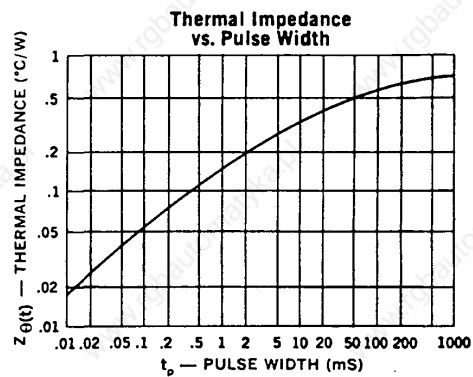
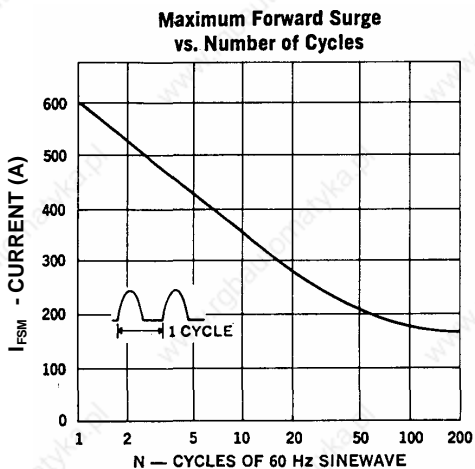
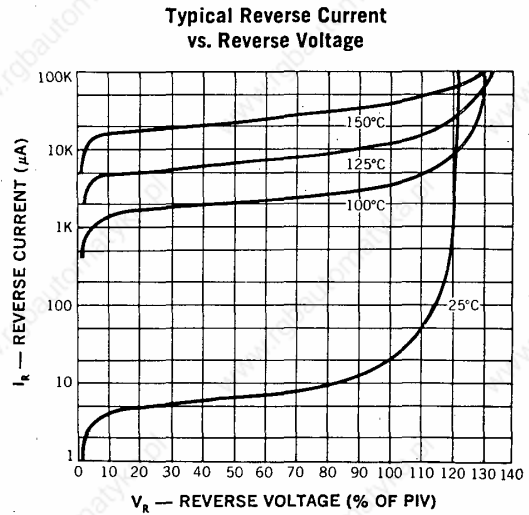
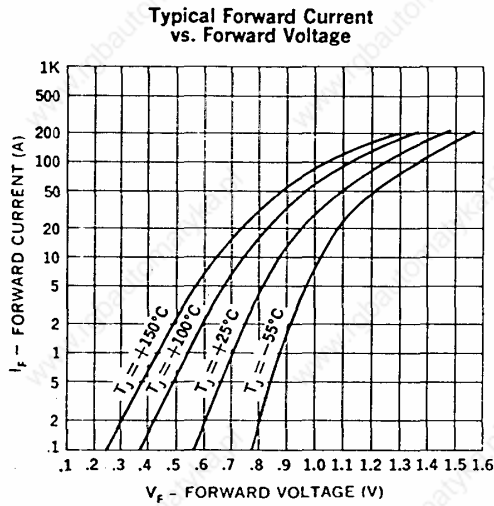
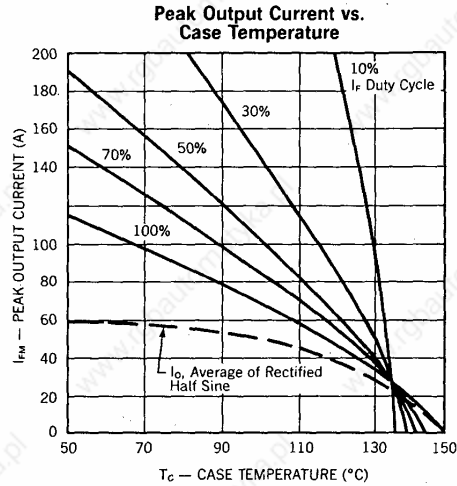
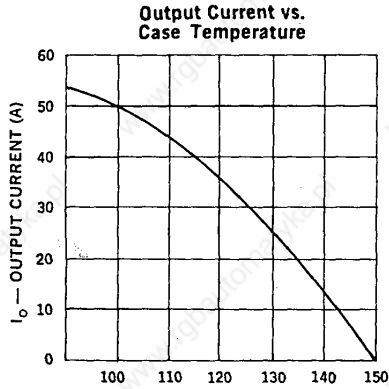
- Industry Standard DO-5 (DO-203AB) Package with 11/16 inch Hex and 1/4-28 Threaded Stud
- Hermetically Sealed Metal and Glass Case Body
- Metal Surface Finish: Tin Plated
- Weight: 15.5 grams (approximate)
- Maximum unlubricated stud Torque: 15 inch pounds
- Angular Orientation of Terminal is Undefined
- Marking: Part Number and Logo

**ELECTRICAL CHARACTERISTICS**

| Microsemi Part Number |           | Working Peak Reverse Voltage<br>$V_{RWM}$ | Maximum Forward Voltage<br>$V_F$<br>@ 50 A<br>$t_p = 300 \mu\text{s}$ |                           | Maximum Reverse Current<br>$I_R$<br>@ $V_{RWM}$ |                           | Maximum Reverse Recovery Time*<br>$t_{rr}$ |
|-----------------------|-----------|---|---|---------------------------|---|---------------------------|--|
|                       |           |   | $T_c = 25^\circ\text{C}$  | $T_c = 125^\circ\text{C}$ | $T_c = 25^\circ\text{C}$                        | $T_c = 125^\circ\text{C}$ |  |
| UES804                | UES804HR2 | 200 V                                     | 1.25 V  | 1.15 V                    | 70 $\mu\text{A}$                                | 30 mA                     | 50 ns                                      |
| UES805                | UES805HR2 | 300 V                                     |   |                           |   |                           |  |
| UES806                | UES806HR2 | 400 V                                     |   |                           |   |                           |  |

\* Measured in circuit  $I_F = 0.5 \text{ A}$ ,  $I_R = 1 \text{ A}$ ,  $I_{REC} = 0.25 \text{ A}$

GRAPHS and CIRCUIT





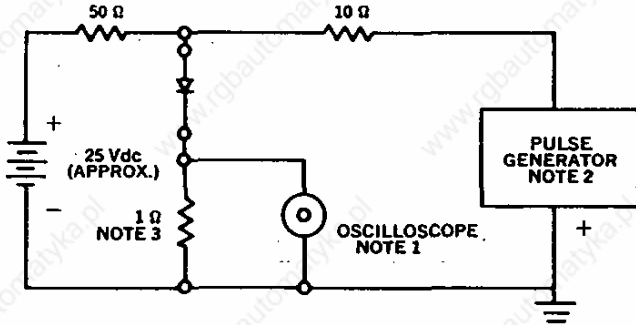
SCOTTSDALE DIVISION

UES804 UES804HR2  
 UES805 UES805HR2  
 UES806 UES806HR2

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**Reverse-Recovery Circuit**



**NOTES:**

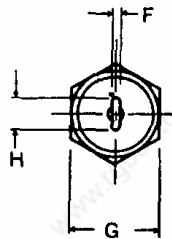
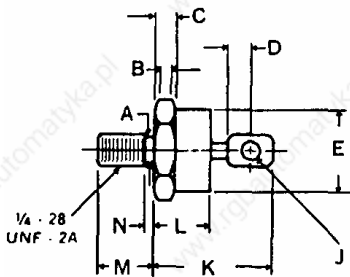
- Oscilloscope: Rise time  $\leq 3\text{ns}$ ; input impedance =  $50\Omega$ .
- Pulse Generator: Rise time  $\leq 8\text{ns}$ ; source impedance  $10\Omega$ .
- Current viewing resistor, non-inductive, coaxial recommended.

**OPTIONAL HIGH RELIABILITY (HR2) SCREENING**

The following tests are performed on 100% of the devices.

| SCREEN  | MIL-STD-750 METHOD | CONDITIONS   |
|---|--------------------|--|
| 1. High Temperature                               | 1032               | 24 Hours @ TA = 150°C  |
| 2. Temperature Cycle                              | 1051               | F, 20 Cycles, -55 to +150°C. No dwell required @ 25°C, T <sub>≥</sub> 10 min. @ extremes |
| 3. Hermetic Seal<br>a. Fine Leak<br>b. Gross Leak | 1071               | H, Helium<br>C, Liquid   |
| 4. Thermal Impedance                              | 3101               |  |
| 5. Interim Electrical Parameters                  | GO/NO GO           | As applicable  |
| 6. High Temperature Reverse Blocking              | As Applicable      | t = 48 hours, Tc = 125°C with applicable bias conditions                                 |
| 7. Final Electrical Parameters                    | GO/NO GO           | As applicable  |

**MECHANICAL SPECIFICATIONS**



|   | INCHES         | MILLIMETERS    |
|---|----------------|----------------|
| A | .225 +/- .005  | 5.72 +/- 0.13  |
| B | .060 MIN.      | 1.52 MIN.      |
| C | .156 +/- .020  | 3.96 +/- 0.51  |
| D | .156 MIN. FLAT | 3.96 MIN. FLAT |
| E | .667 DIA. MAX  | 16.94 DIA. MAX |
| F | .090 MAX       | 2.29 MAX.      |
| G | .677 +/- .010  | 17.20 +/- 0.25 |
| H | .375 MAX.      | 9.53 MAX.      |
| J | .140 MIN. DIA. | 3.56 MIN. DIA. |
| K | 1.000 MAX.     | 25.40 MAX.     |
| L | .450 MAX.      | 11.43 MAX.     |
| M | .438 +/- .015  | 11.13 +/- 0.38 |
| N | .078 MAX.      | 1.98 MAX.      |

**Notes:**

- Cathode is stud
- Maximum unlubricated stud torque: 30 inch pounds.
- Angular Orientation of terminal is undefined.
- Maximum tension (90°) anode terminal 15 pounds for 30 seconds

UES704 series