

temperature or at different currents.

SCOTTSDALE DIVISION

### UES704 UES704HR2 UES705 UES705HR2 UES706 UES706HR2

## ULTRAFAST RECTIFIERS, High Efficiency, 20A<sup>™</sup>

APPEARANCE				
DO-4				

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

DESCRIPTION

The UES704 series of ultrafast high-efficiency rectifiers is specifically designed for operation in power switching circuits operating at frequencies of 20 kHz or higher. The low thermal resistance and forward voltage drop of this series allows the user to replace DO-5 size devices in many applications. These devices have also been 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

	FEATURES	APPLICATIONS / BENEFITS
	<ul> <li>Very Low Forward Voltage</li> <li>Very Fast Recovery Times</li> <li>Low Thermal Resistance</li> <li>High Reliability Screening Option with HR2 Suffix (ie. UES704HR2)</li> <li>Mechanically rugged</li> <li>Standard Polarity is Cathode to Stud. For Reverse Polarity, Add Suffix R (ie. UES704R)</li> </ul>	<ul> <li>Power Switching Circuits 20 kHz and above with minimal parasitic switching losses</li> <li>Catch Diodes for Switching Regulators</li> <li>Output Rectifiers for High Frequency Square-Wave Inverters</li> <li>Extremely Robust in Power Cycling</li> <li>High Surge Capability</li> <li>Hermetically Sealed</li> <li>Marking: Part Number and Logo</li> </ul>
	ABSOLUTE MAXIMUM RATINGS	MECHANICAL AND PACKAGING
r	<ul> <li>Peak Inverse Voltage, UES704, UES704HR2200 V</li> <li>Peak Inverse Voltage, UES705, UES705HR2300 V</li> <li>Peak Inverse Voltage, UES706, UES706HR2400 V</li> <li>Average DC Output Current, I<sub>0</sub> @ T<sub>c</sub> = 100°C20 A</li> <li>Surge Current, 8.3 ms</li></ul>	<ul> <li>Industry Standard DO-4 (DO-203AA) Package with 7/16 inch Hex and 10-32 Threaded Stud</li> <li>Hermetically Sealed Metal and Glass Case Body</li> <li>Metal Surface Finish: Tin Plated</li> <li>Weight: 10 grams (approximate)</li> <li>Maximum unlubricated stud Torque: 15 inch pounds</li> <li>Angular Orientation of Terminal is Undefined</li> <li>Marking: Part Number</li> </ul>

ELECTRICAL CHARACTERISTICS @ 25°C unless otherwise stated Maximum Maximum Maximum Working Reverse Recovery Forward Reverse Peak Voltage Time\* Current Reverse Microsemi Part Number VF t<sub>rr</sub> Voltage  $I_R$ @ 20 A VRWM @  $V_{RWM}$  $t_{\rm p} = 300 \ \mu s$  $T_C =$  $T_c = 125^{\circ}C$  $T_{C} = 125^{\circ}C$  $T_{\rm C} = 25^{\circ}C$ 25°C UES704HR2 **UES704** 200 V 50 µA 10 mA UES705HR2 1.15 V **UES705** 300 V 1.25 V 50 ns **UES706** UES706HR2 400 V

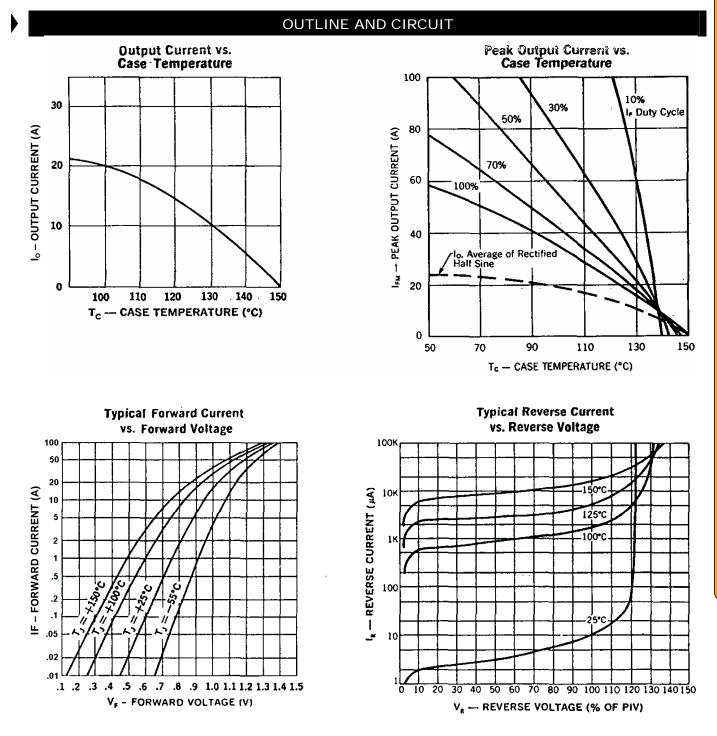
\* Measured in circuit  $I_F = 0.5 \text{ A}$ ,  $I_R = 1 \text{ A}$ ,  $I_{REC} = 0.25 \text{ A}$ 

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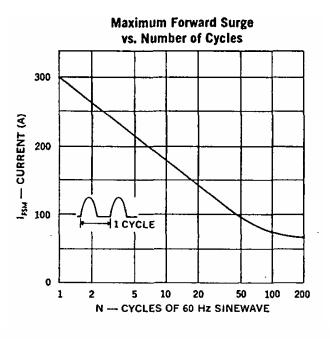
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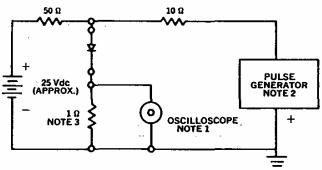


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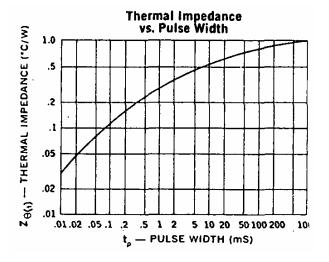


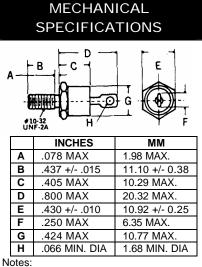


#### NOTES:

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

#### **OPTIONAL HIGH RELIABILITY** (HR2) SCREENING The following tests are performed on 100% of the devices.





1 Cath

- 1. Cathode is stud.
- All metal surfaces tin plated.
   Maximum unlubricated stud
- torque: 10 inch pounds.
- 4. Angular Orientation of terminal is undefined.

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 @ $25^{\circ}$ C, T $\geq$ 10 min. @ extremes
<ol> <li>Hermetic Seal         <ol> <li>Fine Leak</li> <li>Gross Leak</li> </ol> </li> </ol>	1071	H, Helium 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

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#### Microsemi Scottsdale Division

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**UES704** series