Microsemi
SCOTTSDALE DIVISION

UES704 UES704HR2
UES705 UES705HR2
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ULTRAFAST RECTIFIERS, High Efficiency, 20A™

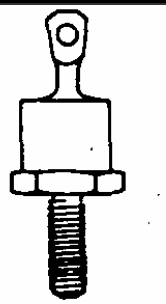
DESCRIPTION

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 temperature or at different currents.

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

APPEARANCE

DO-4



FEATURES

- Very Low Forward Voltage
- Very Fast Recovery Times
- Low Thermal Resistance
- High Reliability Screening Option with HR2 Suffix (ie. UES704HR2)
- Mechanically rugged
- Standard Polarity is Cathode to Stud. For Reverse Polarity, Add Suffix R (ie. UES704R)

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
- Marking: Part Number and Logo

ABSOLUTE MAXIMUM RATINGS

- Peak Inverse Voltage, UES704, UES704HR2.....200 V
- Peak Inverse Voltage, UES705, UES705HR2.....300 V
- Peak Inverse Voltage, UES706, UES706HR2.....400 V
- Average DC Output Current, I_O @ T_C = 100°C.....20 A
- Surge Current, 8.3 ms.....300 A
- Thermal Resistance, Junction to Case.....1.5°C/W
- Operating and Storage Temp. Range.....-55°C to +150°C

MECHANICAL AND PACKAGING

- Industry Standard DO-4 (DO-203AA) Package with 7/16 inch Hex and 10-32 Threaded Stud
- Hermetically Sealed Metal and Glass Case Body
- Metal Surface Finish: Tin Plated
- Weight: 10 grams (approximate)
- Maximum unlubricated stud Torque: 15 inch pounds
- Angular Orientation of Terminal is Undefined
- Marking: Part Number

ELECTRICAL CHARACTERISTICS @ 25°C unless otherwise stated

Microsemi Part Number		Working Peak Reverse Voltage V_{RWM}	Maximum Forward Voltage V_F @ 20 A t_p = 300 µs		Maximum Reverse Current I_R @ V_{RWM}		Maximum Reverse Recovery Time* t_{rr}
			T_C = 25°C	T_C = 125°C	T_C = 25°C	T_C = 125°C	
UES704 UES705 UES706	UES704HR2 UES705HR2 UES706HR2	200 V 300 V 400 V	1.25 V	1.15 V	50 µA	10 mA	50 ns

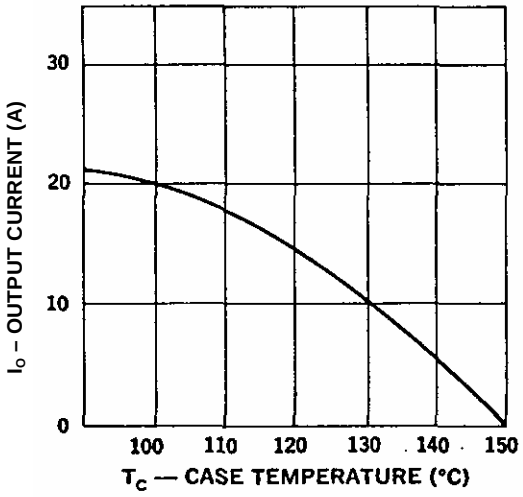
* Measured in circuit I_F = 0.5 A, I_R = 1 A, I_{REC} = 0.25 A

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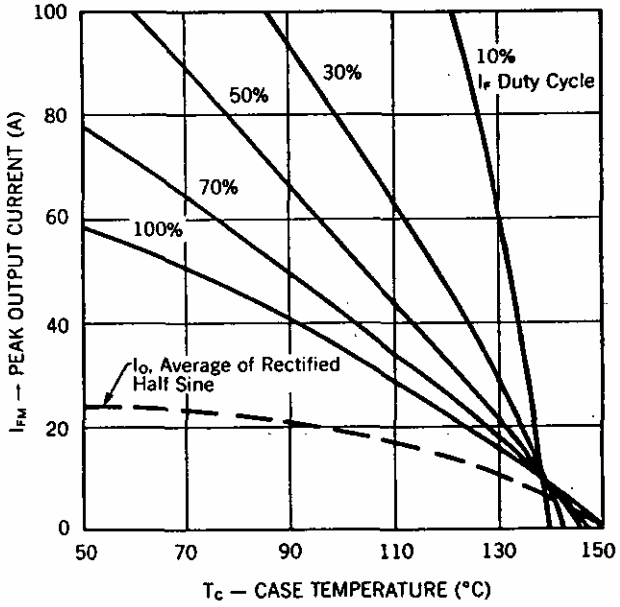
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OUTLINE AND CIRCUIT

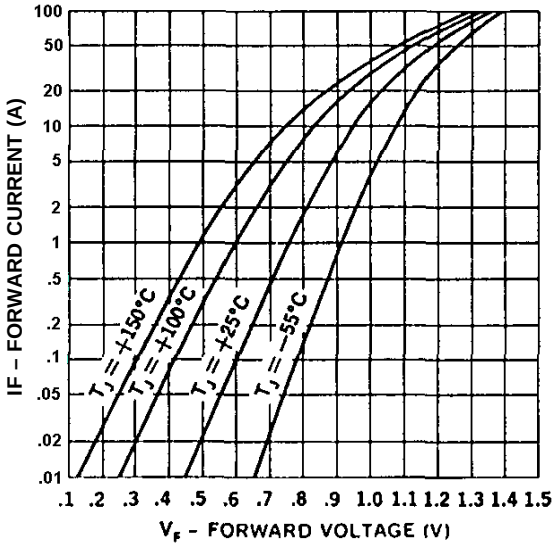
Output Current vs. Case Temperature



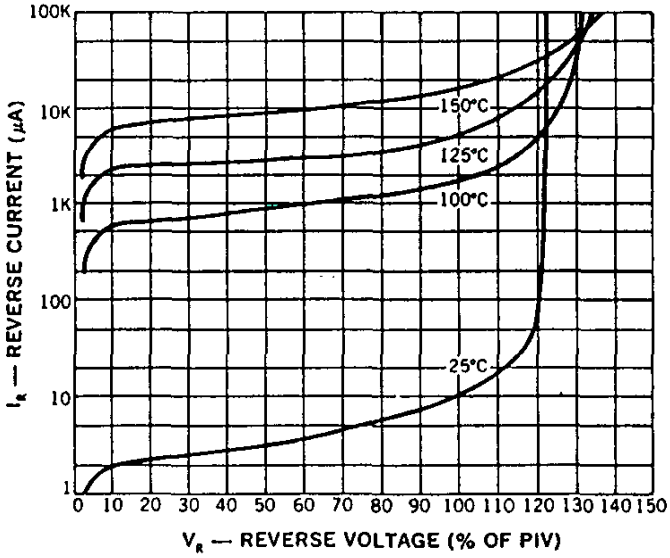
Peak Output Current vs. Case Temperature



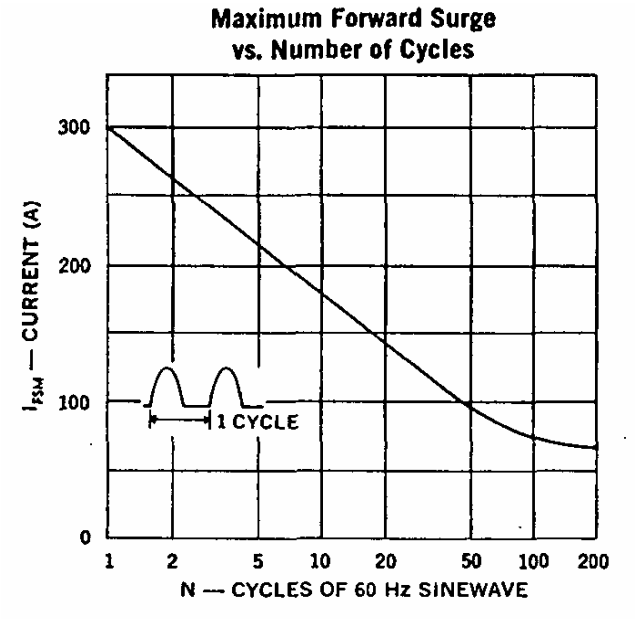
Typical Forward Current vs. Forward Voltage

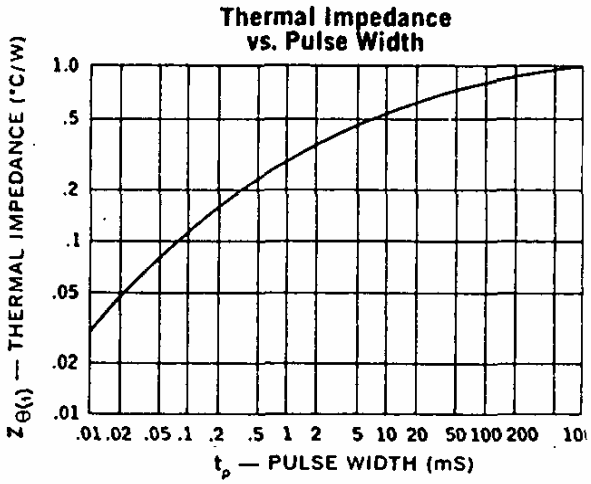


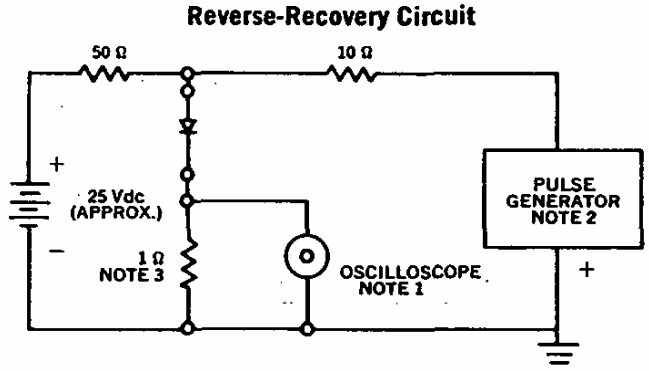
Typical Reverse Current vs. Reverse Voltage



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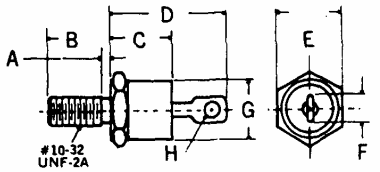




NOTES:

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

MECHANICAL SPECIFICATIONS



	INCHES	MM
A	.078 MAX	1.98 MAX.
B	.437 +/- .015	11.10 +/- 0.38
C	.405 MAX	10.29 MAX.
D	.800 MAX	20.32 MAX.
E	.430 +/- .010	10.92 +/- 0.25
F	.250 MAX	6.35 MAX.
G	.424 MAX	10.77 MAX.
H	.066 MIN. DIA	1.68 MIN. DIA

Notes:

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

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≥10 min. @ extremes
3. Hermetic Seal a. Fine Leak b. Gross Leak	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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