

# RECTIFIERS

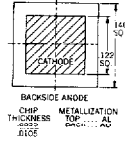
## High Efficiency, 20A

UES704  
UES705  
UES706  
UES704HR2  
UES705HR2  
UES706HR2

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### FEATURES

- Very Low Forward Voltage (1.15V)
- Very Fast Recovery Times (50nSec)
- Low Thermal Resistance
- High Surge Capability
- Mechanically Rugged
- Both Polarities Available



### DESCRIPTION

The UES704 series is specifically designed for operation in power switching circuits operating at frequencies of at least 20 KHz.

The low thermal resistance and forward voltage drop of this series allows the user to replace DO-5 size devices in many applications.

### ABSOLUTE MAXIMUM RATINGS

Peak Inverse Voltage, UES704, UES704HR2	200V
Peak Inverse Voltage, UES705, UES705HR2	300V
Peak Inverse Voltage, UES706, UES706HR2	400V
Average D.C. Output Current, $I_O$ @ $T_C = 100^\circ\text{C}$	20A
Surge Current, 8.3mS	300A
Thermal Resistance, Junction to Case	1.5°C/W
Operating and Storage Temperature Range	-55°C to +150°C

### POWER CYCLING

These devices possess the unique ability to pass many thousands of cycles of a stress test designed to evaluate the integrity of the bonding systems used in the construction of power rectifiers.

In this stress test, the case of the device is not heat sunk. Full rated forward current is supplied to force a case temperature increase at least 75°C, at which time, the current is removed and the case allowed to cool. The cycle is repeated a minimum of 5,000 times to simulate equipment being turned on and off. Extended power cycling tests demonstrate a product capability in excess of 25,000 cycles.

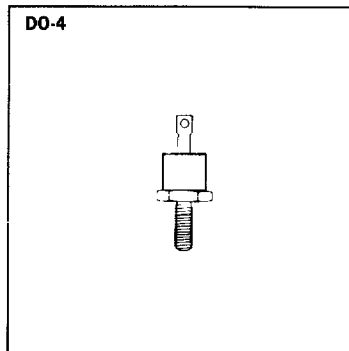
### SWITCHING CHARACTERISTICS

The switching times of these ultra-fast rectifiers increase relatively little, with temperature or at different currents. Even in severe applications, such as catch diodes for switching regulators and output rectifiers for high frequency square wave inverters, these devices switch many times faster than the fastest associated transistors. Thus, the stresses on and powers dissipated in the switching transistors are substantially less than when using other rectifiers.

### MECHANICAL SPECIFICATIONS

	UES704 UES704HR2	UES705 UES705HR2	UES706 UES706HR2
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	ins.	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:

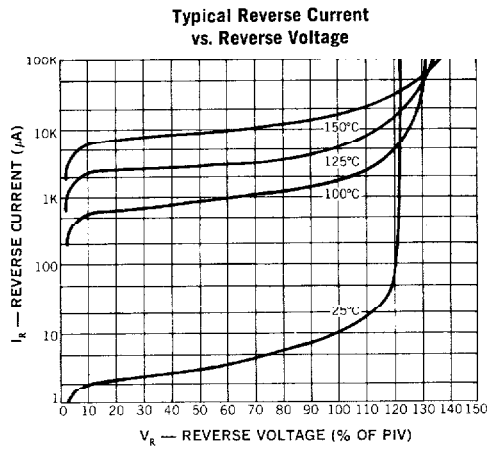
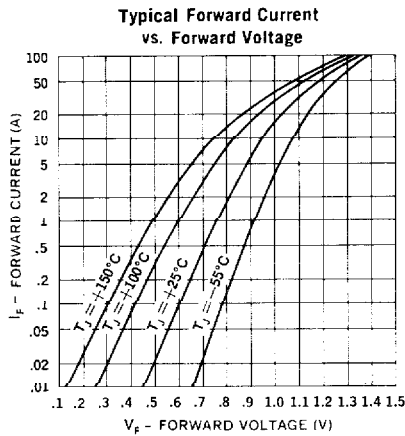
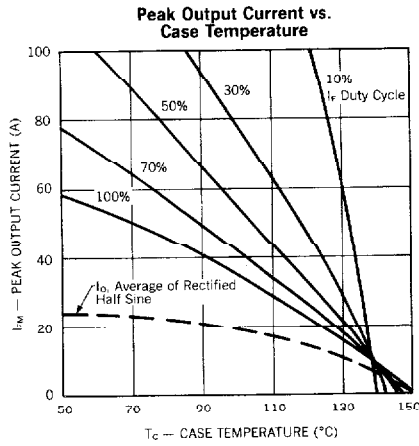
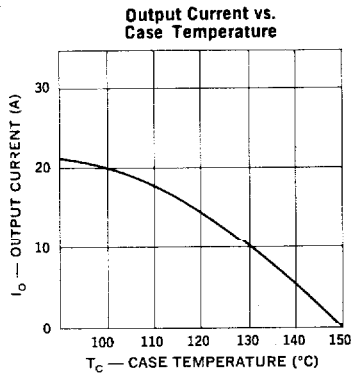
1. Standard polarity is cathode-to-stud.  
For reverse Polarity (anode-to-stud) add suffix "R". i.e. UES704R.
2. All metal surfaces tin plated.
3. Maximum unlubricated stud torque: 15 inch pounds.
4. Angular orientation of terminal is undefined.

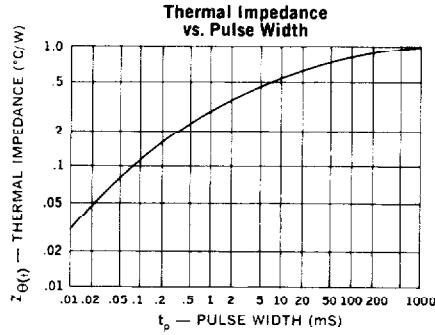
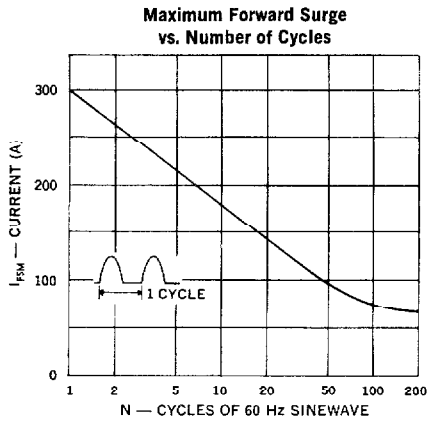
**Microsemi Corp.**  
**Watertown**  
*The diode experts*

**ELECTRICAL SPECIFICATIONS**

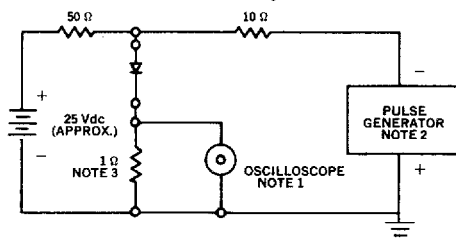
Type	PIV	Maximum Forward Voltage		Maximum Reverse Current		Maximum Reverse Recovery Time*
		T <sub>C</sub> = 25°C	T <sub>C</sub> = 125°C	T <sub>C</sub> = 25°C	T <sub>C</sub> = 125°C	
UES704/704HR2	200V	1.25V	1.15V	50μA	10mA	50nS
UES705/705HR2	300V	@ 20A	@ 20A			
UES706/706HR2	400V	t <sub>p</sub> = 300μS	t <sub>p</sub> = 300μS			

\* Measured in circuit I<sub>F</sub> = 0.5A, I<sub>R</sub> = 1A, I<sub>REC</sub> = 0.25A





Reverse-Recovery Circuit



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

**OPTIONAL HIGH RELIABILITY (HR2) SCREENING**

The following tests are performed on 100% of the devices specified UES704HR2, 5HR2, 6HR2.

SCREEN	MIL-STD-750 METHOD	CONDITIONS
1. High Temperature	1032	24 Hours @ $T_A = 150^\circ\text{C}$
2. Temperature Cycle	1051	F, 20 Cycles, $-55$ to $+150^\circ\text{C}$ . No dwell required @ $25^\circ\text{C}$ , $t \geq 10$ min. @ extremes
3. Hermetic Seal a. Fine Leak b. Gross Leak	1071	H, Helium G, Liquid
4. Thermal Impedance		Sage Test
5. Interim Electrical Parameters	GO/NO GO	$V_F$ and $I_R$ @ $25^\circ\text{C}$
6. High Temperature Reverse Blocking	Similar to Method 1040	$\frac{1}{2}$ Sine Reverse, $t = 48$ Hours, $T_C = 125^\circ\text{C}$ , $VRW_M = \text{rating}$ , $F = 50-60$ Hz, $I_O = OA$
7. Final Electrical Parameters	GO/NO GO	$V_F + I_R$ @ $25^\circ\text{C}$ PDA = 10% (Final Electricals)