

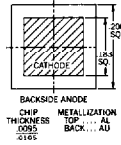
# RECTIFIERS

## High Efficiency, 50A

UES804  
UES805  
UES806  
UES804HR2  
UES805HR2  
UES806HR2

### FEATURES

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



### DESCRIPTION

The UES804 is specifically designed for operation in power switching circuits operating at frequencies of at least 20 KHz.

### ABSOLUTE MAXIMUM RATINGS

Peak Inverse Voltage, UES804, UES804HR2	200V
Peak Inverse Voltage, UES805, UES805HR2	300V
Peak Inverse Voltage, UES806, UES806HR2	400V
Maximum Average D.C. Output Current @ $T_c = 100^\circ\text{C}$	50A
Surge Current, 8.3mS	600A
Thermal Resistance, Junction to Case	.8°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

	UES804 UES804HR2	UES805 UES805HR2	UES806 UES806HR2	
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	Inch.	mm
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	.796 ± .015	11.13 ± 0.38
N	.078 MAX.	1.98 MAX.

#### Notes:

1. Standard polarity is cathode-to-stud.  
For reverse polarity (anode-to-stud) add suffix "R", ie. UES804R.
2. All metal surfaces tin plated.
3. Maximum unlubricated stud torque: 30 inch pounds.
4. Angular orientation of terminal is undefined.

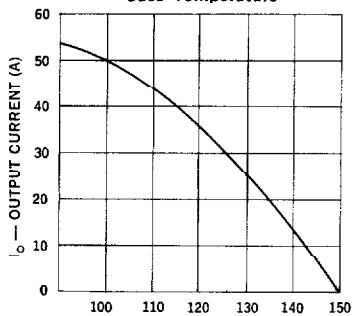
**Microsemi Corp.**  
**Watertown**  
*The diode experts*

ELECTRICAL SPECIFICATIONS

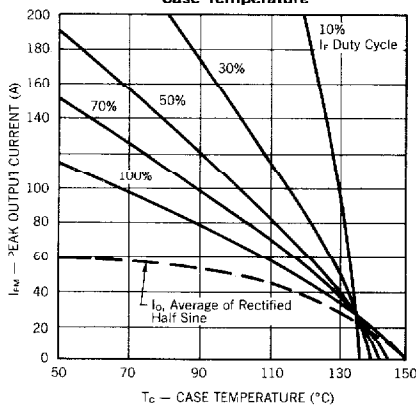
Type	PIV	Maximum Forward Voltage		Maximum Reverse Current		Maximum Reverse Recovery Time*
		T <sub>C</sub> = 25°C	T <sub>C</sub> = 125°C	T <sub>C</sub> = 25°C	T <sub>C</sub> = 125°C	
UES804/804HR2	200V	1.25V @ I <sub>F</sub> = 50A t <sub>p</sub> = 300μS	1.15V @ I <sub>F</sub> = 50A t <sub>p</sub> = 300μS	70μA	30mA	50nS
UES805/805HR2	300V					
UES806/806HR2	400V					

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

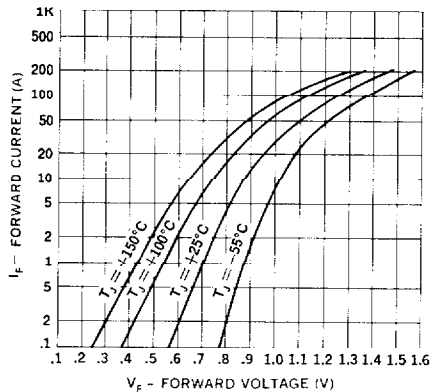
Output Current vs. Case Temperature



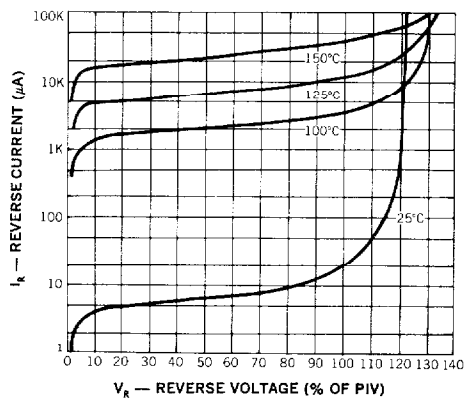
Peak Output Current vs. Case Temperature

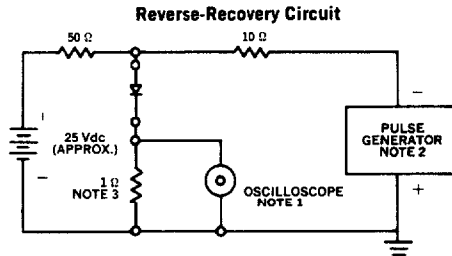
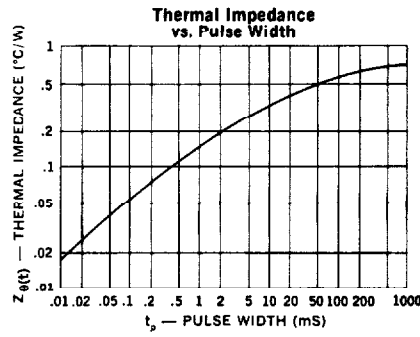
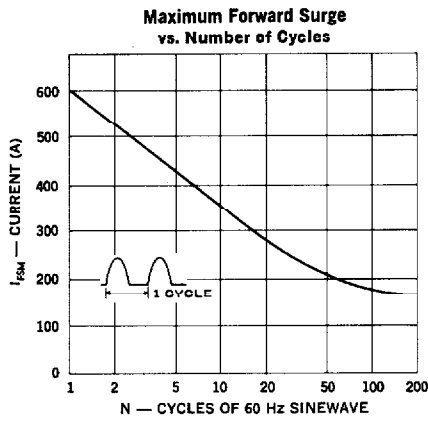


Typical Forward Current vs. Forward Voltage



Typical Reverse Current vs. Reverse Voltage





- NOTES:**
- Oscilloscope: Rise time  $\leq 3$ ns; input impedance = 50 $\Omega$ .
  - Pulse Generator: Rise time  $\leq 8$ 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 specified UES804HR2, 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 C, 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, $T_C = 125^\circ\text{C}$ , $VRW_M = \text{rating}$ , $F = 50\text{-}60$ Hz, $I_O = \text{OA}$
7. Final Electrical Parameters	GO/NO GO	$V_F + I_R$ @ $25^\circ\text{C}$ PDA = 10% (Final Electricals)