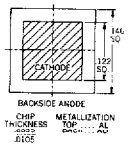
RECTIFIERS
High Efficiency, 20A

UES704
UES705
UES706
UES704HR2
UES705HR2
UES706HR2

2

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°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

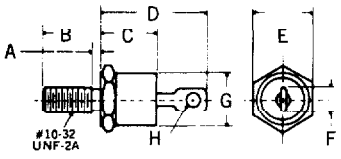
POWER CYCLING
These devices possess the unique ability to pass many thousands of cycles of a stress test designed to evaluate the integrity of the bonding systems used in the construction of power rectifiers.

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.

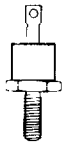
MECHANICAL SPECIFICATIONS

UES704 UES705 UES706
UES704HR2 UES705HR2 UES706HR2



	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.

DO-4



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

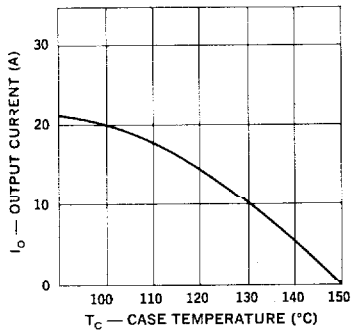
Microsemi Corp.
Watertown
The diode experts

ELECTRICAL SPECIFICATIONS

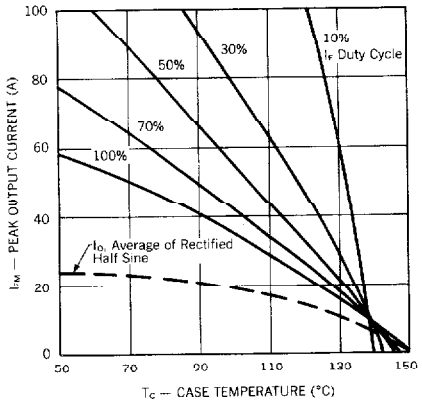
Type	PIV	Maximum Forward Voltage		Maximum Reverse Current		Maximum Reverse Recovery Time*
		$T_C = 25°C$	$T_C = 125°C$	$T_C = 25°C$	$T_C = 125°C$	
UES704/704HR2 UES705/705HR2 UES706/706HR2	200V 300V 400V	1.25V @ 20A $t_p = 300\mu S$	1.15V @ 20A $t_p = 300\mu S$	50μA	10mA	50nS

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

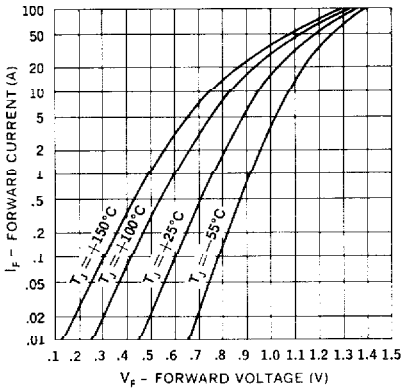
Output Current vs. Case Temperature



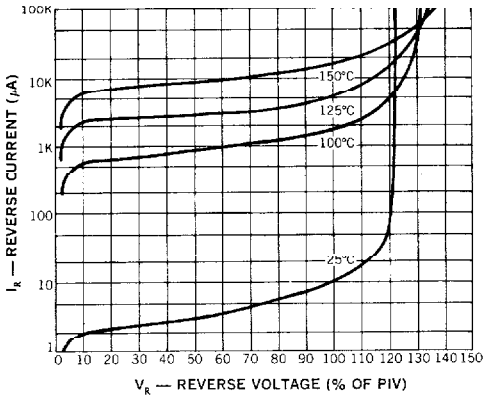
Peak Output Current vs. Case Temperature



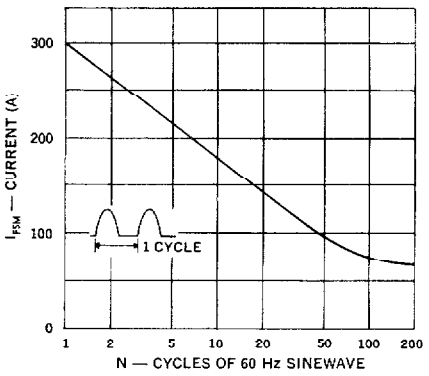
Typical Forward Current vs. Forward Voltage



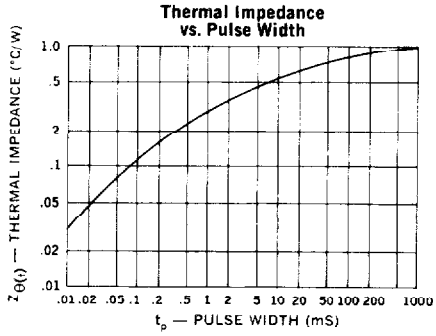
Typical Reverse Current vs. Reverse Voltage



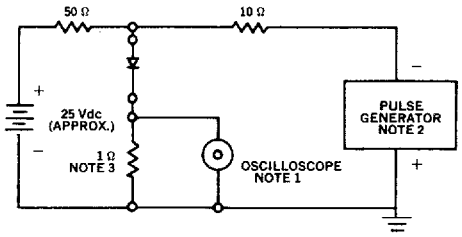
Maximum Forward Surge vs. Number of Cycles



Thermal Impedance vs. Pulse Width



Reverse-Recovery Circuit



NOTES:
1. Oscilloscope: Rise time ≤ 3ns; input impedance = 50Ω.
2. Pulse Generator: Rise time < 8ns; source impedance 10Ω.
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°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		Sage Test
5. Interim Electrical Parameters	GO/NO GO	V_F and I_R @ 25°C
6. High Temperature Reverse Blocking	Similar to Method 1040	½ Sine Reverse, t = 48 Hours, T_C = 125°C, VRW_M = rating, F = 50-60 Hz, I_O = OA
7. Final Electrical Parameters	GO/NO GO	V_F + I_R @ 25°C PDA = 10% (Final Electricals)