

# RECTIFIERS

## High Efficiency, 30A Center-Tap

UES2604  
UES2605  
UES2606  
UES2604HR  
UES2605HR  
UES2606HR

### FEATURES

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

### DESCRIPTION

The UES2604 series is specifically designed for operation in power switching circuits operating at frequencies of at least 20 KHz.

This series combines two high efficiency devices into one package, simplifying installation, reducing heat sink requirements and the need to purchase matched components.

### ABSOLUTE MAXIMUM RATINGS

Peak Inverse Voltage, UES2604, UES2604HR.....	200V
Peak Inverse Voltage, UES2605, UES2605HR.....	300V
Peak Inverse Voltage, UES2606, UES2606HR.....	400V
Maximum Average D.C. Output Current @ $T_c = 100^\circ\text{C}$ .....	30A
Surge Current, 8.3mSec.....	300A
Thermal Resistance, Junction to Case.....	$1^\circ\text{C/W}$
Operating and Storage Temperature Range.....	$-55^\circ\text{C}$ to $+150^\circ\text{C}$

### POWER CYCLING

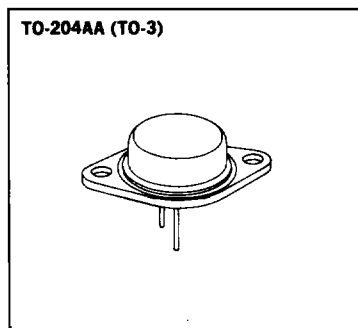
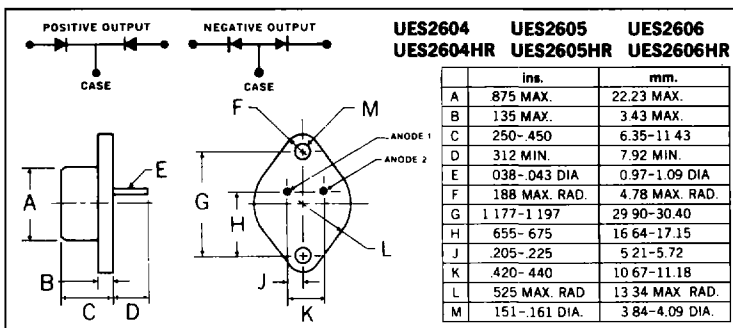
These devices possess the unique ability to pass many thousands of cycles of a stress test designed to evaluate the integrity of the bonding systems used in the construction of power rectifiers.

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  $75^\circ\text{C}$ , 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



#### Note:

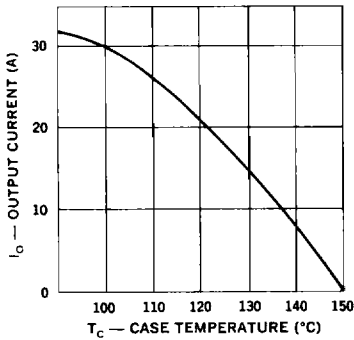
Standard polarity is positive output.  
For reverse polarity (negative output) add suffix "R", ie. UES2604R.

**ELECTRICAL SPECIFICATIONS, PER LEG**

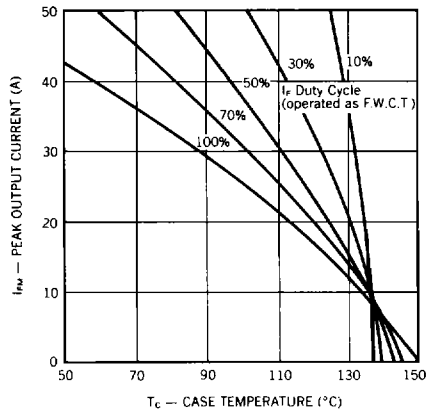
Type	PIV	Maximum Forward Voltage		Maximum Reverse Current		Maximum Reverse Recovery Time*
		$T_c = 25^\circ\text{C}$	$T_c = 125^\circ\text{C}$	$T_c = 25^\circ\text{C}$	$T_c = 125^\circ\text{C}$	
UES2604/2604HR	200V	1.25V	1.15V	$50\mu\text{A}$	10mA	50nS
UES2605/2605HR	300V	@ 15A	@ 15A			
UES2606/2606HR	400V	$t_p = 300\mu\text{S}$	$t_p = 300\mu\text{S}$			

\*Measured in circuit  $I_f = .5\text{A}$ ,  $I_R = 1\text{A}$ ,  $I_{REC} = .25\text{A}$

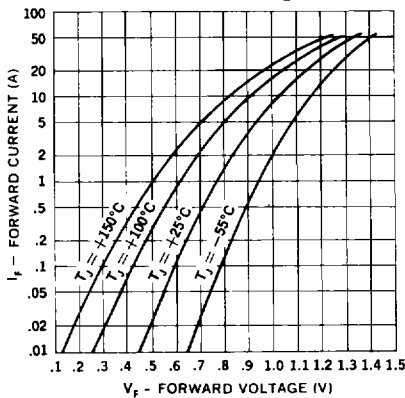
**Output Current vs. Case Temperature**



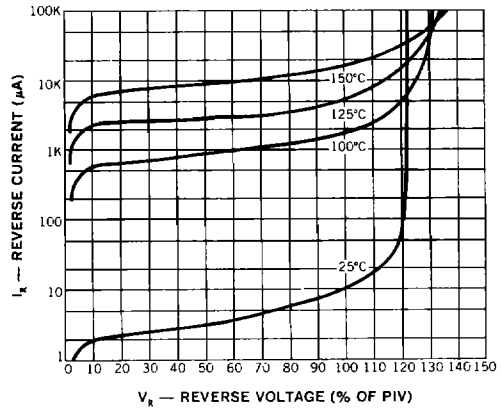
**Peak Output Current vs. Case Temperature**



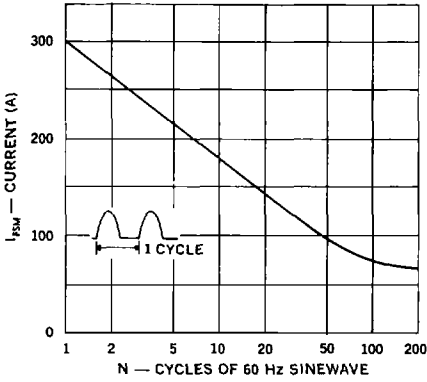
**Forward Current vs. Forward Voltage**



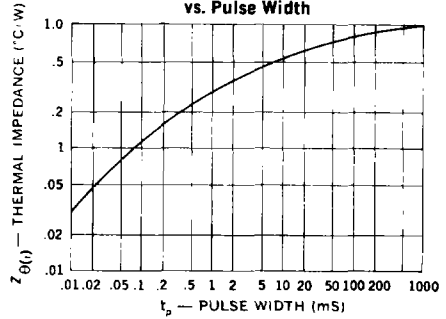
**Typical Reverse Current vs. Reverse Voltage**



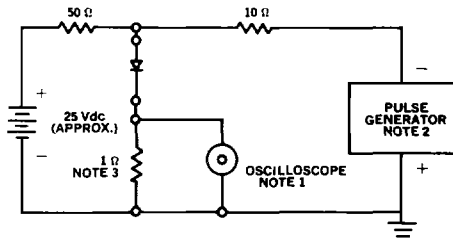
**Maximum Forward Surge vs. Number of Cycles**



**Thermal Impedance vs. Pulse Width**



**Reverse-Recovery Circuit**



**NOTES:**

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

**OPTIONAL HIGH RELIABILITY (HR) SCREENING**

The following tests are performed on 100% of the devices specified UES2604HR, 5HR, 6HR.

SCREEN	MIL-STD-750 METHOD	CONDITIONS
1. High Temperature Life (Stabilization Bake)	1032	24 Hours @ T <sub>A</sub> = 175°C
2. Thermal Shock (Temperature Cycling)	1051	10 Cycles @ T <sub>A</sub> = (-55°C to +150°C)
3. Hermetic Seal a. Fine b. Gross	1071	G or H A, C or D
4. Interim Electrical Parameters	—	V <sub>F</sub> and I <sub>R</sub> @ 25°C
5. High Temperature Reverse Bias (HTRB)	1038	48 Hours @ T <sub>C</sub> = 125°C V <sub>R</sub> = 80% Rated
6. Final Electrical and Delta Parameters	Go/No Go	$\Delta I_R \pm 100\%$ or $5\mu\text{A}$ (whichever is greater) V <sub>R</sub> = Rated