

# New Jersey Semi-Conductor Products, Inc.

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## RECTIFIERS

### High Efficiency, 30A Center-Tap

UES2601  
 UES2602  
 UES2603  
 UES2601HR2  
 UES2602HR2  
 UES2603HR2

#### FEATURES

- Very Low Forward Voltage
- Very Fast Switching Speed
- Convenient Package
- High Surge
- Low Thermal Resistance
- Mechanically Rugged
- Both Polarities Available

#### DESCRIPTION

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, UES2601, UES2601HR2                        | 50V   |
| Peak Inverse Voltage, UES2602, UES2602HR2                        | 100V  |
| Peak Inverse Voltage, UES2603, UES2603HR2                        | 150V  |
| Maximum Average D.C. Output Current at $T_C = 100^\circ\text{C}$ | 30A   |
| Non-Repetitive Sinusoidal Surge Current 8.3 ms                   | 400A  |
| Thermal Resistance, Junction to Case                             | $1^\circ\text{C/W}$                         |
| Operating and Storage Temperature Range                          | $-55^\circ\text{C}$ to $+175^\circ\text{C}$ |

#### 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.

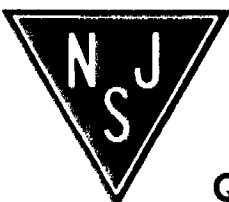
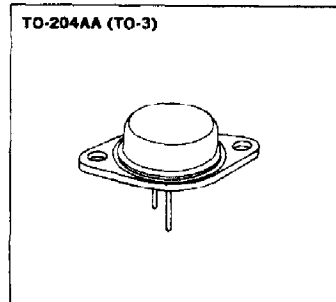
In this stress test, the case of the device is not heat sunk. Full rated forward current is supplied to force a case temperature increase at least  $75^\circ\text{C}$ , at which time, the current is removed and the case allowed to cool. The cycle is repeated a minimum of 5,000 times to simulate equipment 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

|   | UES2601<br>UES2601HR2 | UES2602<br>UES2602HR2 | UES2603<br>UES2603HR2 |
|---|-----------------------|-----------------------|-----------------------|
|   | ins.                  |                       | mm.                   |
| A | .875 MAX.             | 22.23 MAX.            |                       |
| B | .135 MAX.             | 3.43 MAX.             |                       |
| C | 250-450               | 6.35-11.43            |                       |
| D | 312 MIN               | 7.92 MIN              |                       |
| E | .038-.043 DIA         | 0.97-1.09 DIA.        |                       |
| F | .188 MAX RAD.         | 4.78 MAX RAD.         |                       |
| G | 1.177-1.197           | 29.90-30.40           |                       |
| H | .655-.675             | 16.64-17.15           |                       |
| J | .205-.225             | 5.21-5.72             |                       |
| K | .420-.440             | 10.67-11.18           |                       |
| L | .525 MAX. RAD.        | 13.34 MAX. RAD.       |                       |
| M | .151-.161 DIA.        | 3.84-4.09 DIA.        |                       |



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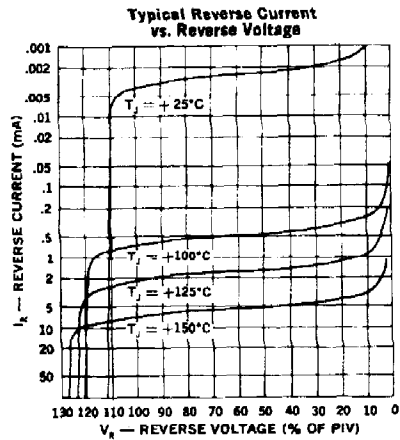
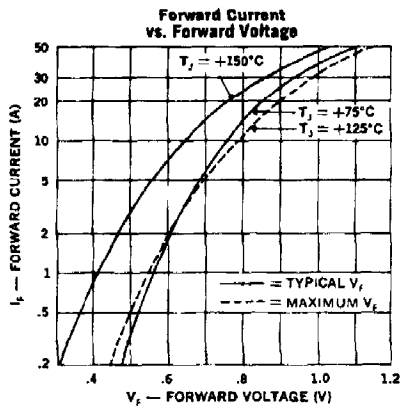
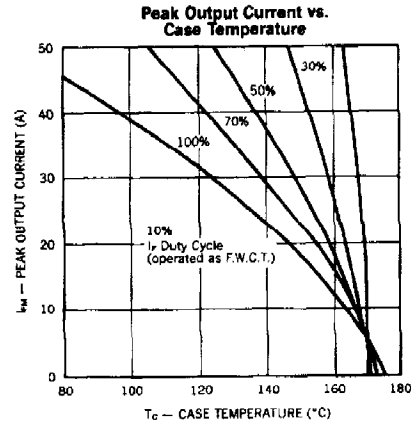
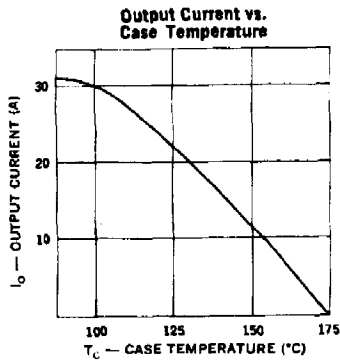
Quality Semi-Conductors

UES2601    UES2602    UES2603  
UES2601HR2   UES2602HR2   UES2603HR2

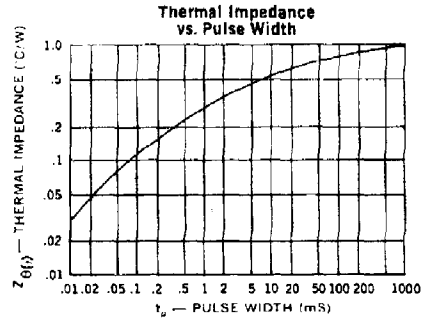
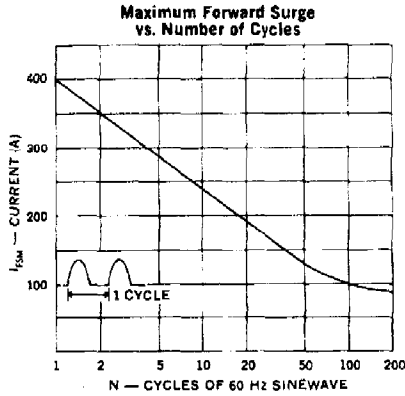
**ELECTRICAL SPECIFICATIONS**

| Type  | PIV                 | Maximum Forward Voltage @                   |   | Maximum Reverse Current @ |                           | Maximum Reverse Recovery Time* |
|---|---------------------|---|---|---------------------------|---------------------------|--------------------------------|
|   |                     | $T_c = 25^\circ\text{C}$                    | $T_c = 125^\circ\text{C}$                   | $T_c = 25^\circ\text{C}$  | $T_c = 125^\circ\text{C}$ |                                |
| UES2601/2601HR2<br>UES2602/2602HR2<br>UES2603/2603HR2 | 50V<br>100V<br>150V | .930V<br>@<br>15A<br>$t_p = 300\mu\text{S}$ | .825V<br>@<br>15A<br>$t_p = 300\mu\text{S}$ | 20 $\mu\text{A}$          | 4mA                       | 35nS                           |

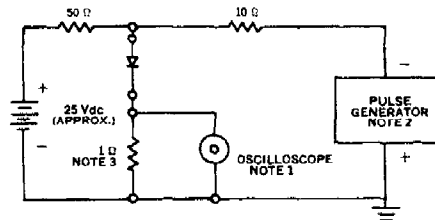
\* Measured in circuit  $I_F = 0.5A$ ,  $I_R = 1A$ ,  $I_{REC} = 0.25A$



UES2601      UES2602      UES2603  
UES2601HR2   UES2602HR2   UES2603HR2



**Reverse-Recovery Circuit**



- 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 UES2601HR2, 2HR2, 3HR2.

| SCREEN                                  | MIL-STD-750 METHOD | CONDITIONS   |
|---|--------------------|--|
| 1. High Temperature                     | 1032               | 24 Hours @ $T_A = 150^\circ\text{C}$   |
| 2. Thermal Shock (Temperature Cycling)  | 1051               | F, 20 Cycles, $-55$ to $+150^\circ\text{C}$ . No dwell required @ $25^\circ\text{C}$ , $t \geq 10$ min. at extremes. |
| 3. Hermetic Seal<br>a. Fine<br>b. Gross | 1071               | H, Helium<br>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 Bias (HTRB) | 1038               | A, 48 Hours, $T_C = 125^\circ\text{C}$ , $V_R = 80\%$ of rating  |
| 7. Final Electrical Parameters          | GO/NO GO           | $V_F$ and $I_R$ @ $25^\circ\text{C}$   |