



## HIGH EFFICIENCY RECTIFIERS

### 30 A Center-Tap

**High-Reliability  
screening available**

#### DESCRIPTION

This series of UES2601 through UES2603 combines two high efficiency devices into one package, simplifying installation, reducing heat sink requirements and the need to purchase matched components. Microsemi also offers numerous other products to meet higher and lower power voltage regulation applications.



**TO-204AA (TO-3)  
Package**

**Important:** For the latest information, visit our website <http://www.microsemi.com>.

#### FEATURES

- Very low forward voltage.
- Very fast switching speed.
- High surge capability.
- Low thermal resistance.
- Positive and negative polarities available.
- RoHS compliant versions available.

#### APPLICATIONS / BENEFITS

- Catch diode.
- High power and high current applications.
- Convenient package.
- Mechanically rugged.

#### MAXIMUM RATINGS

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	$T_J$ and $T_{STG}$	-55 to +175	°C
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1	°C/W
Repetitive Peak Inverse Voltage	$V_{RRM}$	50	V
		100	
		150	
Maximum Average DC Output Current @ $T_C = 100^\circ\text{C}$	$I_O$	30	A
Non-Repetitive Sinusoidal Surge Current (8.3 ms)	$I_{FSM}$	400	A

#### **MSC – Lawrence**

6 Lake Street,  
Lawrence, MA 01841  
Tel: 1-800-446-1158 or  
(978) 620-2600  
Fax: (978) 689-0803

#### **MSC – Ireland**

Gort Road Business Park,  
Ennis, Co. Clare, Ireland  
Tel: +353 (0) 65 6840044  
Fax: +353 (0) 65 6822298

#### **Website:**

[www.microsemi.com](http://www.microsemi.com)

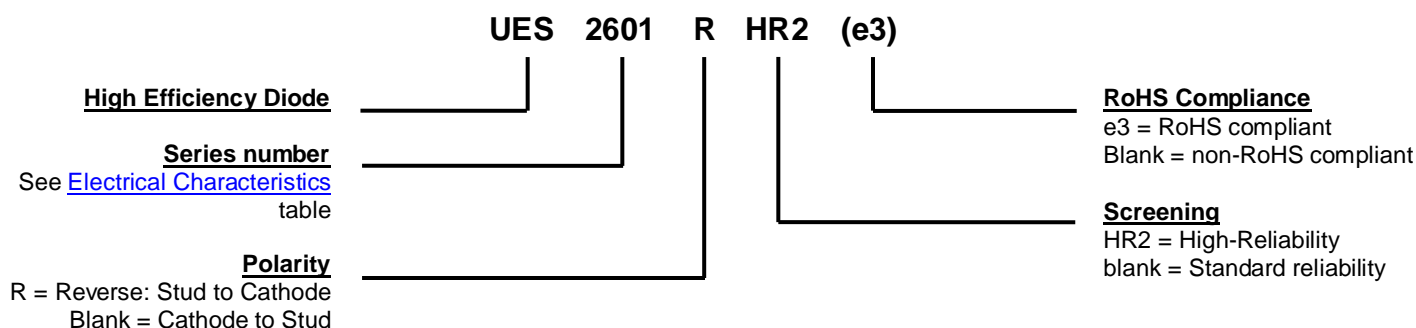
**MECHANICAL and PACKAGING**

- CASE: TO-3 metal can.
- TERMINALS: Solder dipped (Sn63/Pb37) over nickel plated alloy 52. RoHS compliant matte-tin plating is also available.
- MARKING: MSC part number, date code, polarity symbol.
- POLARITY: STANDARD (Positive Output): Anode 1 is pin #1, Anode 2 is pin #2, Common Cathode is the case.
- WEIGHT: Approximately 12.7 grams.
- See [Package Dimensions](#) on last page.

**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	G, 20 cycles, $-55^\circ\text{C}$ to $+150^\circ\text{C}$
3. Hermetic Seal <ul style="list-style-type: none"> <li>a. Fine</li> <li>b. Gross</li> </ul>	1071	H, Helium C, Liquid
4. Thermal Impedance	3101	n/a
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 $I_R$ @ $25^\circ\text{C}$

**PART NOMENCLATURE**


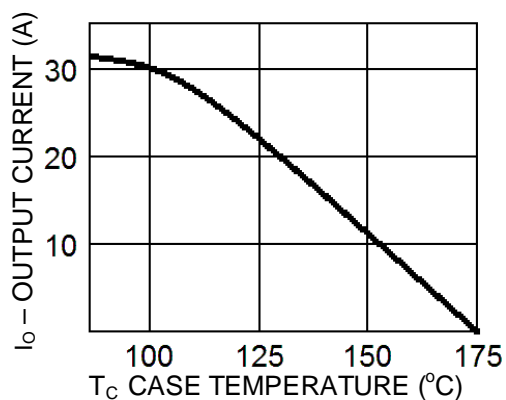
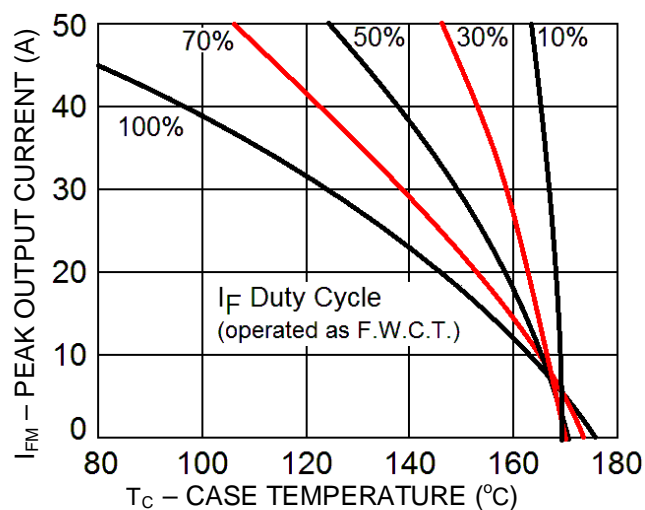
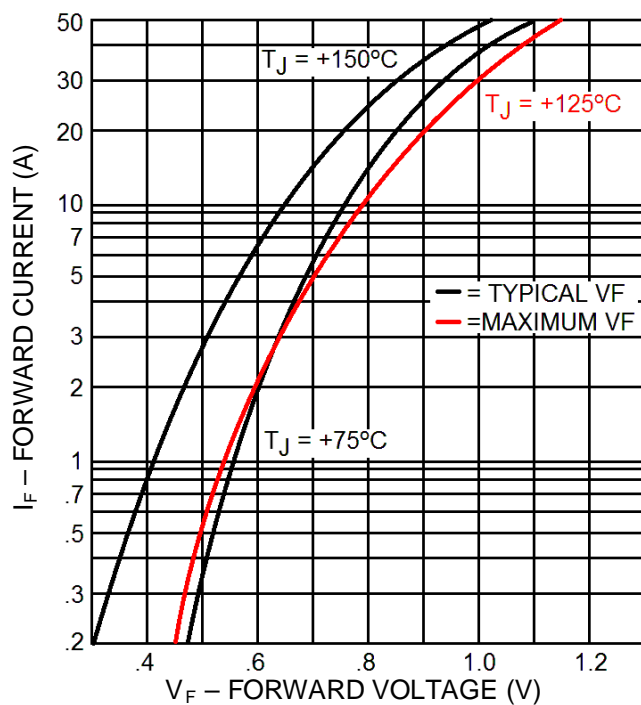
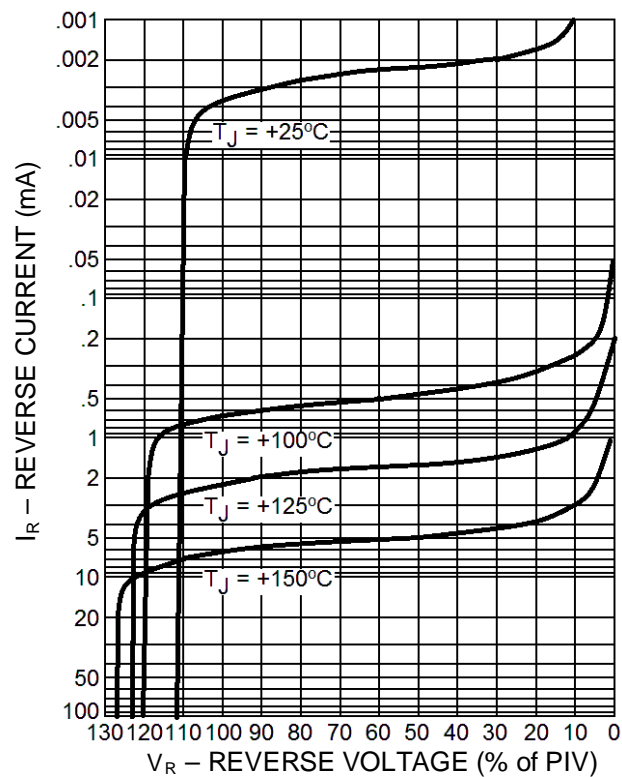
**SYMBOLS & DEFINITIONS**

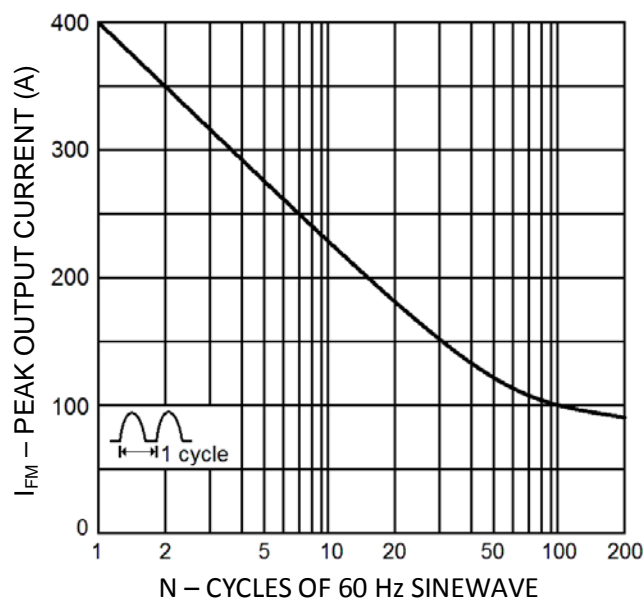
Symbol	Definition
$I_F$	Forward Current: The forward current dc value, no alternating component.
$I_{FM}$	Maximum Peak Forward Current: The peak total value of the forward current dc value.
$I_{FSM}$	Maximum Forward Surge Current: The forward current, surge peak or rated forward surge current.
$I_O$	Average Rectified Output Current: The Output Current averaged over a full cycle with a 50 Hz or 60 Hz sine-wave input and a 180 degree conduction angle.
$I_R$	Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.
$t_{rr}$	Reverse Recovery Time: The time interval between the instant the current passes through zero when changing from the forward direction to the reverse direction and a specified decay point after a peak reverse current occurs.
$V_F$	Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.
$V_R$	Reverse Voltage: The reverse voltage dc value, no alternating component.
$V_{RRM}$	Repetitive Peak Reverse Voltage: The peak reverse voltage including all repetitive transient voltages but excluding all non-repetitive transient voltages.

**ELECTRICAL CHARACTERISTICS**

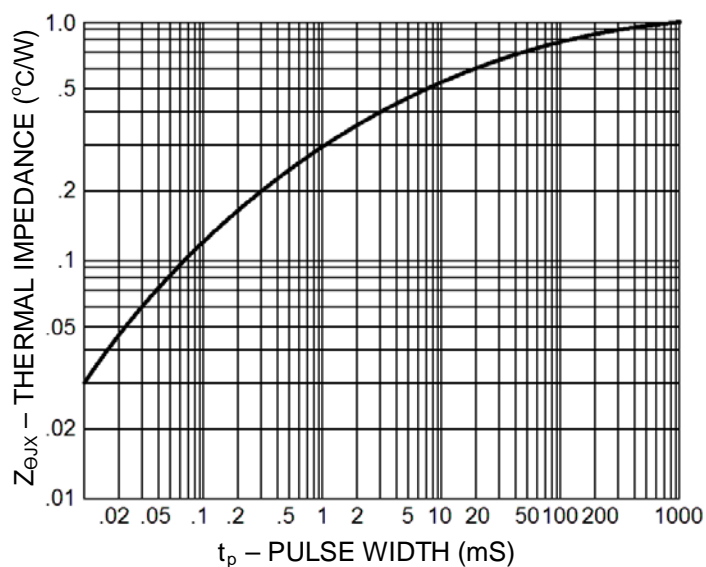
Type	PIV	Maximum Forward Voltage – $V_F$ @		Maximum Reverse Current - $I_R$ @		Maximum Reverse Recovery Time - $t_{rr}$ (Note 1)
		$T_c = 25^\circ C$	$T_c = 125^\circ C$	$T_c = 25^\circ C$	$T_c = 125^\circ C$	
UES2601/2601HR2	50 V	.930 V	.825 V			
UES2602/2602HR2	100 V	@ 15 A	@ 15 A	20 $\mu A$	4 mA	35 ns
UES2603/2603HR2	150 V	$T_P = 300 \mu s$	$T_P = 300 \mu s$			

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

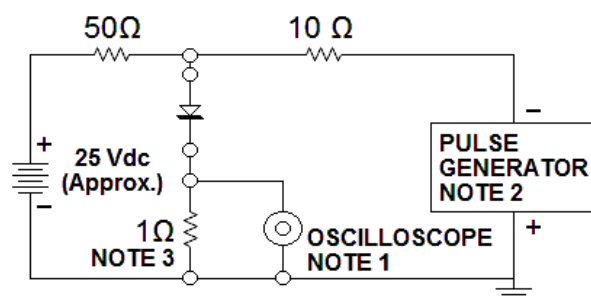
**GRAPHS**

**FIGURE 1**
Output Current vs. Case Temperature

**FIGURE 2**
Peak Output Current vs. Case Temperature

**FIGURE 3**
Forward Current vs. Forward Voltage

**FIGURE 4**
Typical Reverse Current vs. Reverse Voltage

**GRAPHS**

**FIGURE 5**

Maximum Forward Surge vs. Number of Cycles


**FIGURE 6**

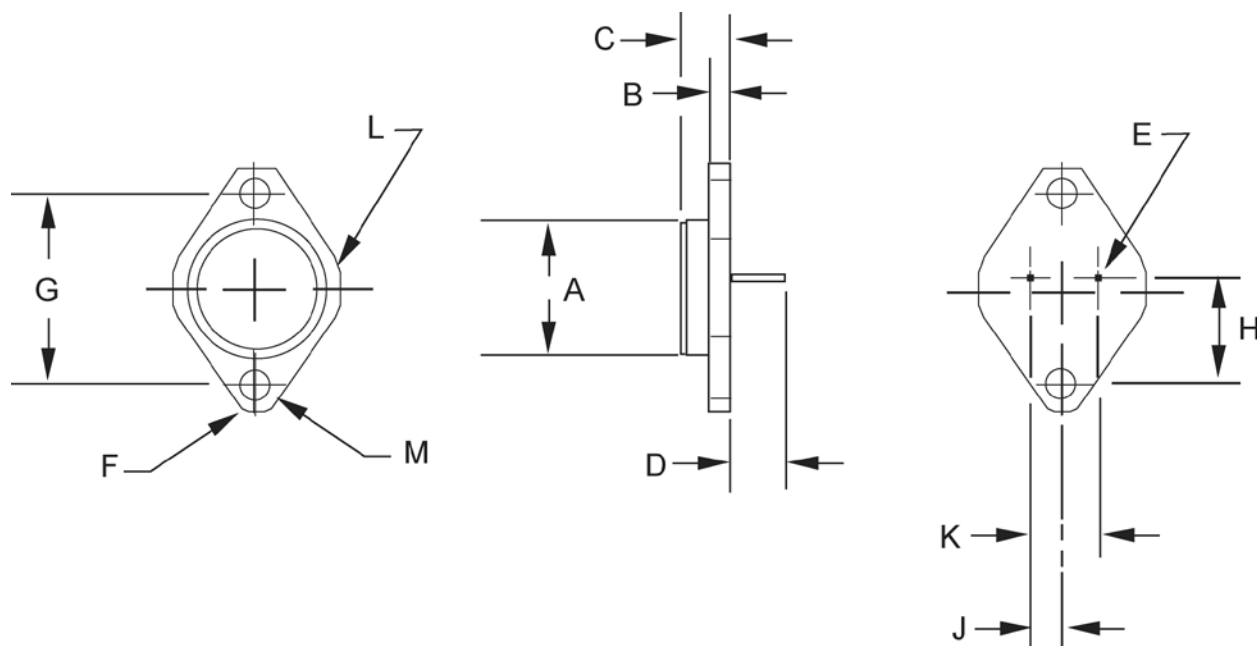
Thermal Impedance vs. Pulse Width


**FIGURE 7**

Reverse-Recovery Circuit

**NOTES:**

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

**PACKAGE DIMENSIONS**

**NOTE:**

Standard polarity is positive output.

For reverse polarity (negative output) add suffix "R", ie. UES2601R.

DIM	INCHES	MILLIMETERS
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.

**SCHEMATIC**
