RoHS Available

HIGH EFFICIENCY RECTIFIERS
30A Center-Tap

High-Reliability screening available

DESCRIPTION

The UES2604 through UES2606 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. 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 (see Figure 3).
- Very fast recovery times (50 nsec).
- High surge capability.
- Low thermal resistance.
- High-reliability screening option.
- Both polarities available.
- RoHS compliant devices available.

APPLICATIONS / BENEFITS

- Catch diodes for switching regulators.
- Output rectifiers for high frequency square-wave inverters.
- Low-profile package.
- Mechanically rugged.

MAXIMUM RATINGS

Parameters/Test Conditions		Symbol	Value	Unit
Junction and Storage Temperature		T_J and T_{STG}	-55 to +150	°C
Thermal Resistance Junction-to-Case		$R_{\Theta JC}$	1	°C/W
Repetitive Peak Inverse Voltage	UES2604(HR2)	V_{RRM}	200	V
	UES2605(HR2)		300	
	UES2606(HR2)		400	
Maximum Average DC Output Current @ T_C = 100 °C		I_O	30	A
Non-Repetitive Sinusoidal Surge Current (8.3 ms)		I_{FSM}	300	A

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MECHANICAL and PACKAGING

- CASE: TO-204AA (TO-3) metal can.
- TERMINALS: Tin-lead plating over nickel. 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. REVERSE (Negative Output) Cathode 1 is pin #1, Cathode 2 is pin #2, Common Anode 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 UES2604HR2, 5HR2, 6HR.

SCREEN	MIL-STD-750 METHOD	CONDITIONS
1. High Temperature	1032	24 Hours @ T_A = 150 °C
2. Thermal Shock (Temperature Cycling)	1051	G, 20 Cycles, -55 to +150 °C. No dwell required @ 25 °C, t ≥ 1 minute @ extremes
3. Hermetic Seal a. Fine b. Gross	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, V_{RWM} = rating, f = 50-60 Hz, I_O = 0 A
7. Final Electrical Parameters	GO/NO GO	V_F + I_R @ 25 °C PDA = 10% (Final Electricals)

PART NOMENCLATURE

UES 2604 R HR2 (e3)

High Efficiency Diode

Series number
(see Electrical Characteristics table)

Polarity
R = Reverse
Blank = Standard

RoHS Compliance
e3 = RoHS compliant
Blank = non-RoHS compliant

Screening
HR2 = High-Reliability
blank = Standard reliability

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.
V_{RWM}	Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range excluding all transient voltages (ref JESD282-B). Also sometimes known as PIV.

ELECTRICAL CHARACTERISTICS per Leg

Type	PIV	Maximum Forward Voltage – V_F @		Maximum Reverse Current – I_R @		Maximum Reverse Recovery Time - t_{rr} (Note 1)
		T_C = 25°C	T_C = 125°C	T_C = 25°C	T_C = 125°C	
UES2604/2604HR2 UES2605/2605HR2 UES2606/2606HR2	200 V 300 V 400 V	1.25 V @ 15 A T_P = 300 µs	1.15 V @ 15 A T_P = 300 µs	50 µA	10 mA	50 ns

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

GRAPHS

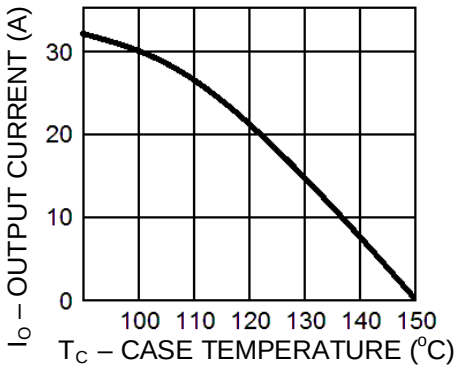


FIGURE 1
Output Current vs. Case Temperature

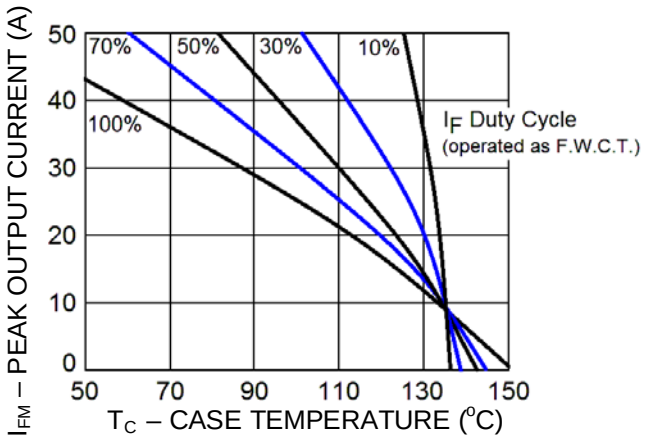


FIGURE 2
Peak Output Current vs. Case Temperature

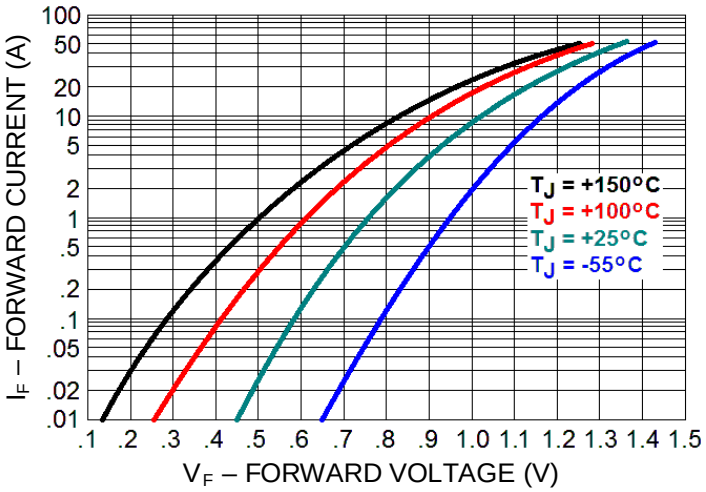


FIGURE 3
Forward Current vs. Forward Voltage

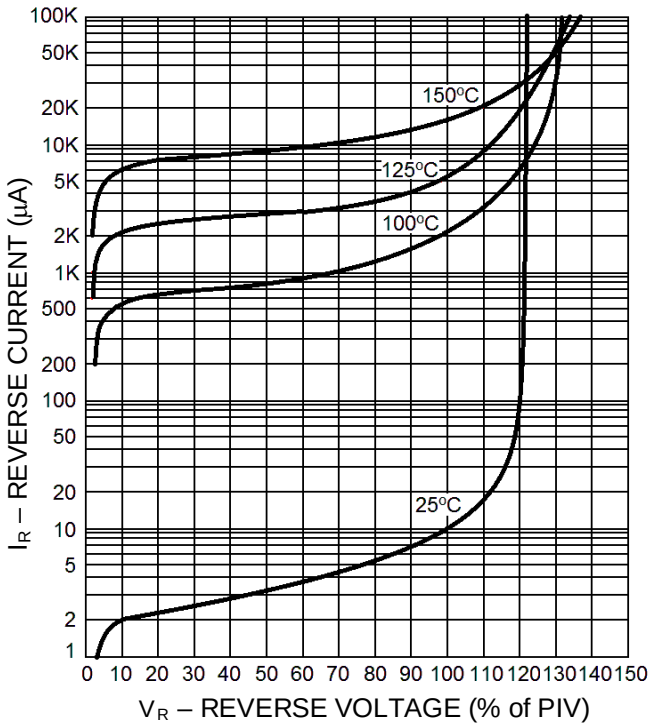


FIGURE 4
Typical Reverse Current vs. Reverse Voltage

GRAPHS (continued)

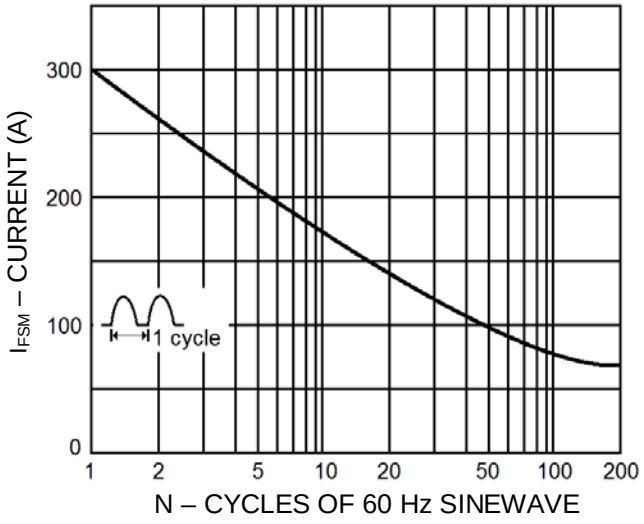


FIGURE 5
Maximum Forward Surge vs. Number of Cycles

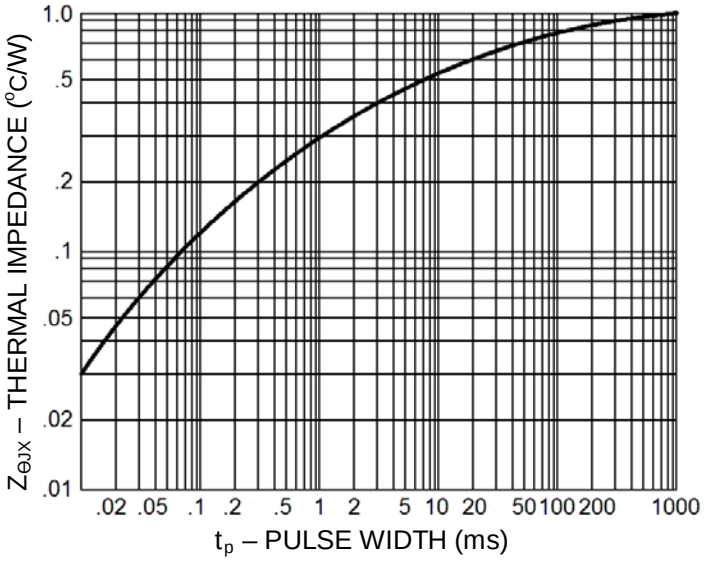


FIGURE 6
Thermal Impedance vs. Pulse Width

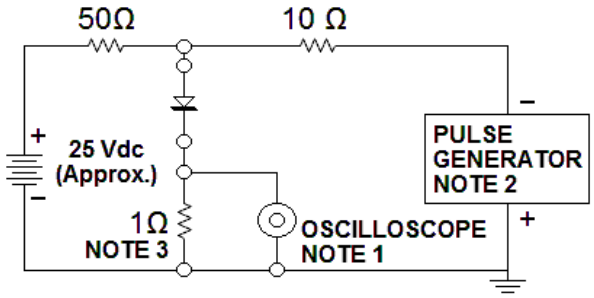
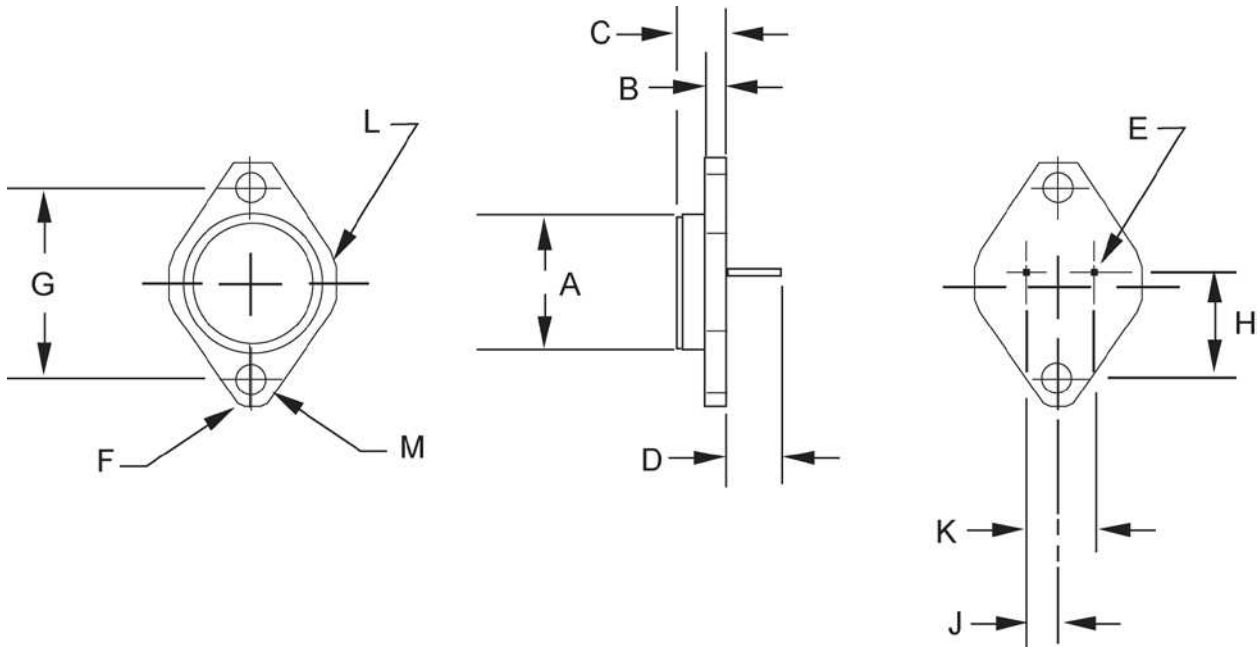


FIGURE 7
Reverse-Recovery Circuit

NOTES:

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

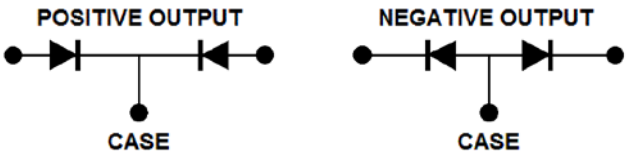
PACKAGE DIMENSIONS



NOTE:
Standard polarity is positive output.
For reverse polarity (negative output) add suffix “R”, i.e. UES2604R.
(See schematic below.)

DIM	INCH	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



Cathode to Case
(Standard)

Anode to Case
(Reverse)