



NES701
 NES702
 NES703
 BYW31-50
 BYW31-100
 BYW31-150
 BYW77-50
 BYW77-100
 BYW77-150

RECTIFIERS

High Efficiency, 25 A

FEATURES

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

DESCRIPTION

Designed to meet the efficiency demand of switching type power supplies, these devices are useful in many switching applications.

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

	NES701	NES702	NES703
Peak Inverse Voltage, V_R	50V	100V	150V
Repetitive Peak Inverse Voltage, V_{RRM}	50V	100V	150V
Non-Repetitive Peak Inverse Voltage, V_{RSM}	50V	100V	150V
Maximum Average D.C. Output Current I_o @ T_c	25A @ 100°C		
RMS Forward Current, I_F (RMS)	40A		
Non-Repetitive Sinusoidal Surge Current (8.3ms), I_{FSM}	400A		
Thermal Resistance, Junction to Case, $R_{\theta JC}$	1.5°C/W		
Storage Temperature Range, T_{STG}	-55°C to +175°C		
Maximum Operating Junction Temperature, $T_{J MAX}$	+175°C		

ABSOLUTE MAXIMUM RATINGS

	BYW31-50	BYW31-100	BYW31-150	BYW77-50	BYW77-100	BYW77-150
Peak Inverse Voltage, V_R	50V	100V	150V	50V	100V	150V
Repetitive Peak Inverse Voltage, V_{RRM}	50V	100V	150V	50V	100V	150V
Non-Repetitive Peak Inverse Voltage, V_{RSM}	50V	100V	150V	50V	100V	150V
Maximum Average D.C. Output Current, I_o @ $T_c = 100^\circ C$	25A @ 100°C			30A @ 107°C		
RMS Forward Current, I_F (RMS)	40A			50A		
Non-Repetitive Sinusoidal Surge Current (8.3ms), I_{FSM}	320A			500A		
Thermal Resistance, Junction to Case, $R_{\theta JC}$	1.5°C/W			1.5°C/W		
Storage Temperature Range, T_{STG}	-55°C to +150°C			-55°C to +150°C		
Maximum Operating Junction Temperature, $T_{J MAX}$	+150°C			+150°C		

ELECTRICAL SPECIFICATIONS

Type	Maximum Reverse Voltage V_R	Maximum Forward Voltage V_F		Maximum Reverse Current I_R		Maximum Reverse Recovery Time t_{RR}								
		$T_c = 25^\circ C$	$T_c = 125^\circ C$	$T_c = 25^\circ C$	$T_c = 125^\circ C$									
NES701 NES702 NES703	50V 100V 150V	0.95V @ $I_F = 25A$	0.825V @ $I_F = 25A$	20µA @ Rated V_R	4mA @ Rated V_R	35ns ⁽¹⁾								
BYW31-50 BYW31-100 BYW31-150	50V 100V 150V	1.3V @ $I_F = 100A$	0.85V @ $I_F = 20A$	20µA @ Rated V_R	2.5mA @ Rated V_R	50ns ⁽²⁾								
BYW77-50 BYW77-100 BYW77-150	50V 100V 150V	1.1V @ $I_F = 63A$	<table border="1"> <tr> <th>V_F</th> <th>I_F</th> </tr> <tr> <td>0.75V</td> <td>10A</td> </tr> <tr> <td>0.85V</td> <td>20A</td> </tr> <tr> <td>1.2V</td> <td>100A</td> </tr> </table>	V_F	I_F	0.75V	10A	0.85V	20A	1.2V	100A	25µA @ Rated V_R	2.5mA @ Rated V_R	50ns ⁽²⁾
V_F	I_F													
0.75V	10A													
0.85V	20A													
1.2V	100A													

(1) Measured in circuit $I_F = 0.5A$, $I_R = 1A$, $t_{REC} = 0.25A$

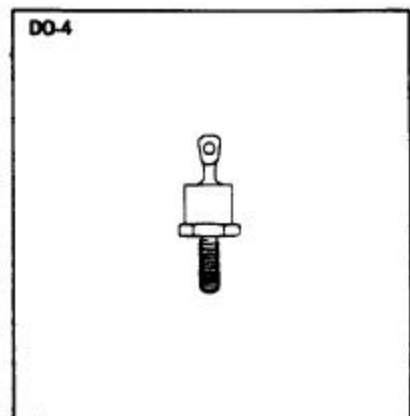
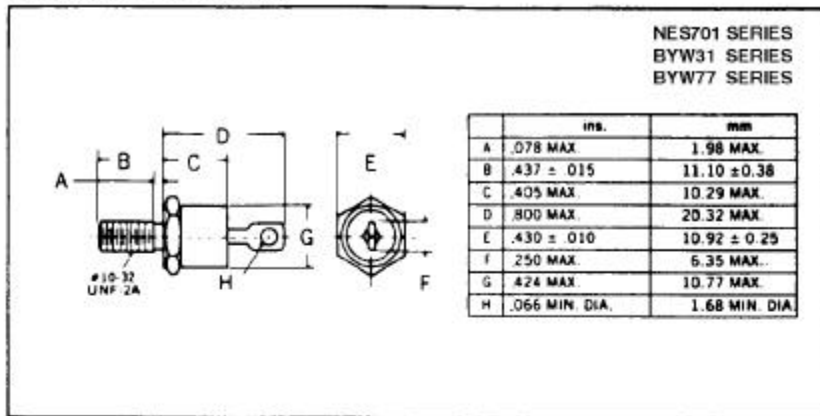
(2) Measured in circuit $I_F = 1A$ to $V_R > 30V$ $di_F/dt = 20A/\mu s$

NEW ENGLAND SEMICONDUCTOR

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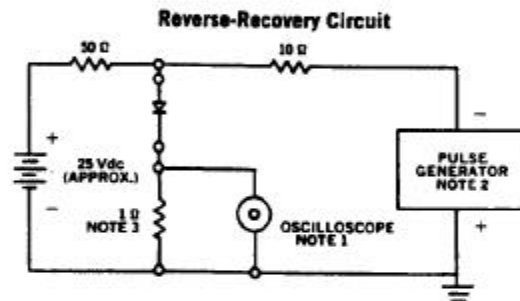
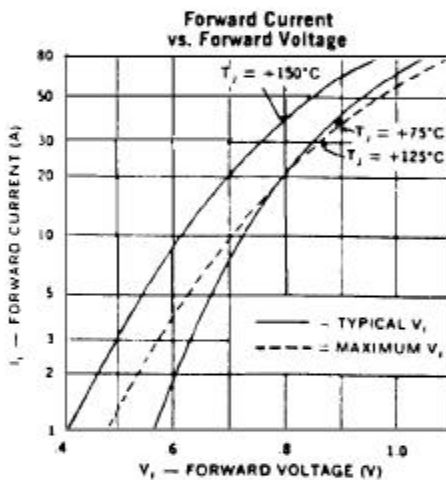
T4-4.8-860-1200 REV: --

MECHANICAL SPECIFICATIONS



Notes:

1. Cathode is stud
2. All metal surfaces tin plated
3. Maximum unlubricated stud torque 10 inch pound
4. Angular Orientation of terminal is undefined



NOTES:

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

OPTIONAL HIGH RELIABILITY (HR2) SCREENING

The following tests are performed on 100% of the devices as specified.

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°C , $t \geq 10$ min. at 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_B @ 25°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_B @ 25°C

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