



NES

NEW ENGLAND SEMICONDUCTOR

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

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 @ $T_c = 100^\circ\text{C}$	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}
NES701 NES702 NES703	50V 100V 150V	$T_c = 25^\circ\text{C}$	$T_c = 125^\circ\text{C}$	$T_c = 25^\circ\text{C}$	$T_c = 125^\circ\text{C}$	35ns ⁽¹⁾
		0.95V @ $I_F = 25A$	0.825V @ $I_F = 25A$	20μA @ Rated V_R	4mA @ Rated V_R	
BYW31-50 BYW31-100 BYW31-150	50V 100V 150V	$T_c = 25^\circ\text{C}$	$T_c = 100^\circ\text{C}$	$T_c = 25^\circ\text{C}$	$T_c = 100^\circ\text{C}$	50ns ⁽²⁾
		1.3V @ $I_F = 100A$	0.85V @ $I_F = 20A$	20μA @ Rated V_R	2.5mA @ Rated V_R	
BYW77-50 BYW77-100 BYW77-150	50V 100V 150V	$T_c = 25^\circ\text{C}$	$T_c = 100^\circ\text{C}$	$T_c = 25^\circ\text{C}$	$T_c = 100^\circ\text{C}$	50ns ⁽²⁾
		1.1V @ $I_F = 63A$	V_F 0.75V @ 10A 0.85V @ 20A 1.2V @ 100A	25μA @ Rated V_R	2.5mA @ Rated V_R	

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

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

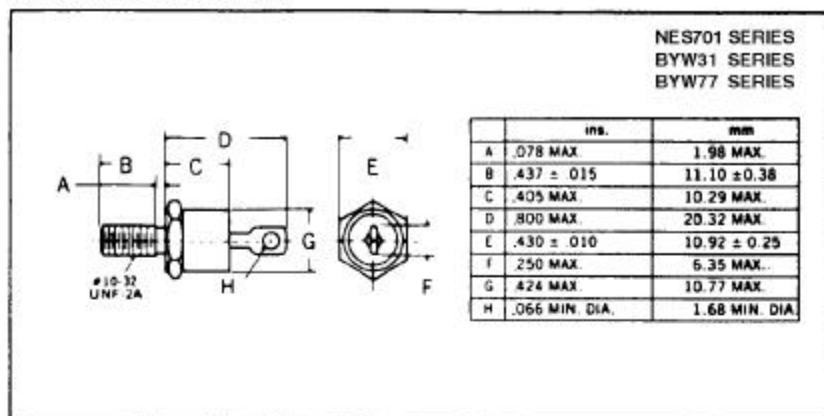
NEW ENGLAND SEMICONDUCTOR

6 Lake Street Lawrence, MA 01841

1-800-446-1158 / (978) 794-1666 / FAX: (978) 689-0803

T4-4.8-860-1200 REV: --

MECHANICAL SPECIFICATIONS

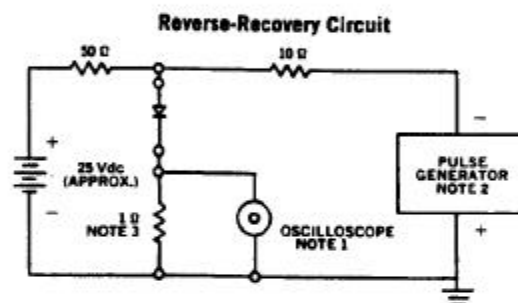
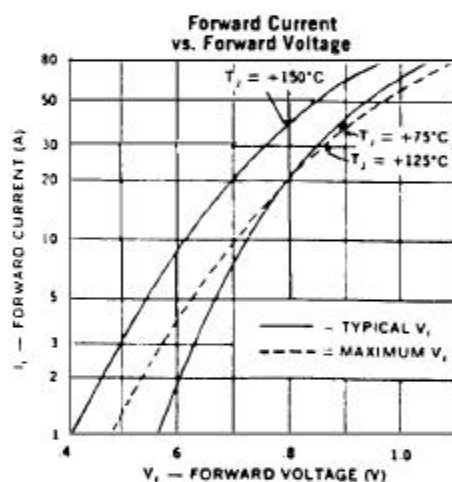


DO-4



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 ≤ 3 ns; input impedance $\approx 50\Omega$.
2. Pulse Generator: Rise time ≤ 8 ns; source impedance 10Ω .
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_R @ 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_R @ 25°C

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