



NES

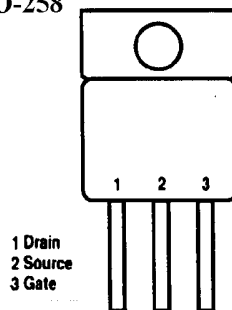
NEW ENGLAND SEMICONDUCTOR

NSF40604

POWER MOSFET N CHANNEL

- REPETITIVE AVALANCHE RATINGS
- LOW $R_{DS(ON)}$
- LOW DRIVE REQUIREMENT
- DYNAMIC dv/dt RATING

TO-258



600 VOLTS

20.0 AMPS

0.4 A

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

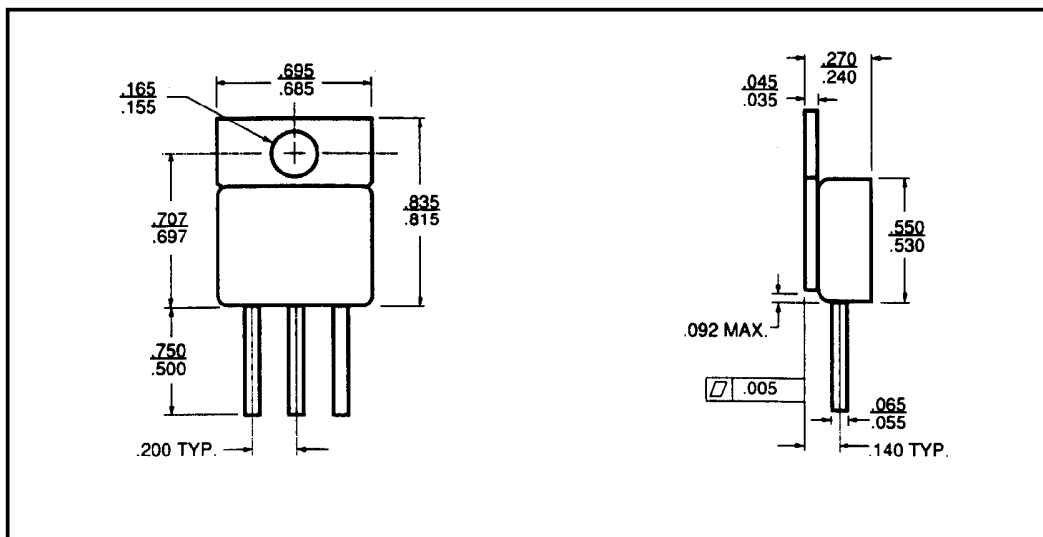
PARAMETERS / TEST CONDITIONS		SYMBOL	VALUE	UNITS
Drain-Source Voltage		V_{DS}	600	V
Gate-Source Voltage		V_{GS}	± 30	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	20	A
Pulsed Drain Current (1)		I_{DM}	65	A
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	250	W
Operating Junction & Storage Temperature Range		T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYP.	MAX.	UNITS
Junction-to-Case	R_{thJC}		0.5	K/W
Junction-to-Ambient	R_{thJA}		40	K/W

(1) Pulse width limited by maximum junction temperature.

MECHANICAL OUTLINE



NEW ENGLAND SEMICONDUCTOR

6 Lake Street Lawrence, MA 01841
1-800-446-1158 / (978) 794-1666 / FAX: (978) 689-0803

T4-4.8-860-933 REV: --

**NES****NEW ENGLAND SEMICONDUCTOR****NSF40604****ELECTRICAL CHARACTERISTICS ($T_J = 25^{\circ}\text{C}$ unless otherwise noted)**

PARAMETERS / TEST CONDITIONS		SYMBOL	MIN.	TYP.	MAX.	UNITS
Drain-Source Breakdown Voltage $V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$		$V_{(BR)DSS}$	600			V
Gate Threshold Voltage $V_{DS} = 0\text{ V}, I_D = 1.0\text{ mA}$		$V_{GS(th)}$	2.0		4.0	V
Gate-Body Leakage $V_{GS} = \text{At Rated } V_{GS}$		I_{GSS}			± 100	nA
Zero Gate Voltage Drain Current $V_{DS} = \text{max Rating}, V_{GS} = 0\text{ V}$		I_{DSS}			250	μA
Zero Gate Voltage Drain Current $V_{DS} = 80\% \text{ max } V_{(BR)DSS}, V_{GS} = 0\text{ V}, T_J = 125^{\circ}\text{C}$		I_{DSS}			1000	μA
Drain-Source On-State Resistance (2) $V_{GS} = 10\text{ V}, I_D = 0.5 \text{ Rated } I_D$		$r_{DS(on)}$			0.4	Ω
Input Capacitance	$V_{GS} = 0\text{ V}$	C_{iss}		2950		pF
Output Capacitance	$V_{DS} = 25\text{ V}$	C_{oss}		610		
Reverse Transfer Capacitance	$f = 1.0\text{ MHz}$	C_{rss}		230		
Total Gate Charge	$V_{DS} = V_{(BR)DSS}$ $V_{GS} = 10\text{ V}, I_D = 10\text{ A}$ (Gate charge is essentially independent of operating temperature.)	Q_g			130	nC
Gate-Source Charge		Q_{gs}			16	
Gate -Drain Charge		Q_{gd}			69	
Turn-On Delay Time	$V_{dd} = 50\% V_{DS},$ $I_D = 16\text{ A},$ $R_G = 1.8\text{ }\Omega$ (Switching time is essentially independent of operating temperature.)	$t_{d(on)}$			28	ns
Rise Time		t_r			46	
Turn-Off Delay Time		$t_{d(off)}$			45	
Fall Time		t_f			46	

SOURCE-DRAIN DIODE RATINGS & CHARACTERISTICS ($T_J = 25^{\circ}\text{C}$ unless otherwise noted)

PARAMETERS / TEST CONDITIONS		SYMBOL	MIN.	TYP.	MAX.	UNITS
Continuous Current		I_S			16.5	A
Pulsed Current (1)		I_{SM}			66	A
Forward Voltage (2) $I_F = I_S, V_{GS} = 0\text{ V}$		V_{SD}			1.3	V
Reverse Recovery Time $I_F = I_S, dI/dt = 100\text{ A}/\mu\text{S}, V_{DD} = \text{V}$		t_{rr}			668	ns
Reverse Recovered Charge		Q_{rr}			10	μC

(1) Pulsed width limited by maximum junction temperature.

(2) Pulse Test: Pulse width < 300 μsec . Duty cycle $\leq 2\%$.**NEW ENGLAND SEMICONDUCTOR**6 Lake Street Lawrence, MA 01841
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