



NES

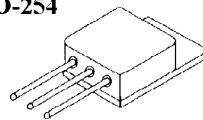
NEW ENGLAND SEMICONDUCTOR

NESM140
NESM140Z

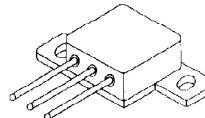
POWER MOSFET N CHANNEL

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

TO-254



TO-254Z



28 AMPERE

100 VOLTS

0.077 Ω

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

PARAMETERS / TEST CONDITIONS	SYMBOL	VALUE	UNITS
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	28	A
Pulsed Drain Current (1)	I_{DM}	112	A
Power Dissipation	P_D	125	W
Operating Junction & Storage Temperature Range	T_J, T_{stg}	-55 to +175	$^\circ\text{C}$
Lead Temperature (1/16" from case for 10 secs.)	T_L	300	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYP.	MAX.	UNITS
Junction-to-Case	R_{thJC}		1.2	K/W
Junction-to-Ambient	R_{thJA}		48	K/W
Case-to-Sink	R_{thCS}	0.21		K/W

(1) Pulse width limited by maximum junction temperature.

MECHANICAL OUTLINE

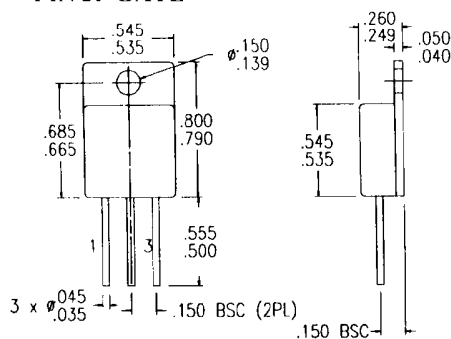
TO-254

PIN OUT:

PIN 1: DRAIN

PIN 2: SOURCE

PIN 3: GATE



MECHANICAL OUTLINE

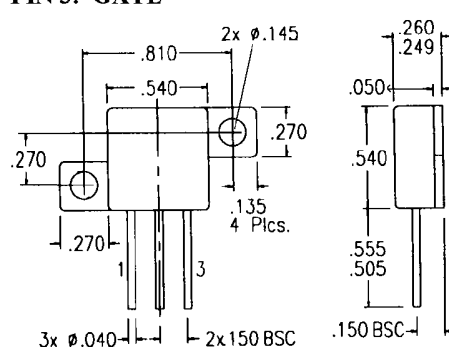
TO-254 Z

PIN OUT:

PIN 1: DRAIN

PIN 2: SOURCE

PIN 3: GATE



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

T4-4.8-860-927 REV: --



NESM

NEW ENGLAND SEMICONDUCTOR

NESM140
NESM140Z

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

PARAMETERS / TEST CONDITIONS		SYMBOL	MIN.	TYP.	MAX.	UNITS
Drain-Source Breakdown Voltage $V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$		$V_{(BR)DSS}$	100			V
Gate Threshold Voltage $V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$		$V_{GS(th)}$	2.0		4.0	V
Gate-Body Leakage $V_{GS} = \text{At Rated } V_{GS}$		I_{GSS}			± 100	nA
Zero Gate Voltage Drain Current $V_{DS} = 0.8 \text{ max Rating}, V_{GS} = 0\text{ V}$		I_{DSS}			250	μA
Zero Gate Voltage Drain Current $V_{DS} = 80\% V_{(BR)DSS}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$		I_{DSS}			1000	μA
Drain-Source On-State Resistance (2) $V_{GS} = 10\text{ V}, I_D = 28\text{ A}$		$r_{DS(on)}$			0.077	Ω
Forward Transconductance (2) $V_{DS} = 15\text{ V}, I_D = 28\text{ A} (V_{DS} \geq I_{D(ON)} \times R_{DS(ON)} \text{ max})$		g_{fs}	8.7			S(Ω)
Input Capacitance	$V_{GS} = 0\text{ V}$	C_{iss}		1500		pF
Output Capacitance	$V_{DS} = 25\text{ V}$	C_{oss}		500		
Reverse Transfer Capacitance	$f = 1.0\text{ MHz}$	C_{rss}		90		
Total Gate Charge	$V_{DS} = 80\% V_{(BR)DSS}$ $V_{GS} = 10\text{ V}, I_D = 28\text{ A}$ (Gate charge is essentially independent of operating temperature.)	Q_g			60	nC
Gate-Source Charge		Q_{gs}			12	
Gate -Drain Charge		Q_{gd}			28	
Turn-On Delay Time	$V_{dd} = 50\% V,$ $I_D = 28\text{ A},$ $R_G = 9.1\text{ }\Omega$ (Switching time is essentially independent of operating temperature.)	$t_{d(on)}$			23	ns
Rise Time		t_r			110	
Turn-Off Delay Time		$t_{d(off)}$			60	
Fall Time		t_f			75	

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			28	A
Pulsed Current (1)		I_{SM}			112	A
Forward Voltage (2) $I_F = I_S, V_{GS} = 0\text{ V}$		V_{SD}			2.5	V
Reverse Recovery Time $I_F = I_S, dI/dt = 100\text{ A}/\mu\text{S}, V_{DD} = 50\text{ v}$		t_{rr}			300	ns
Reverse Recovered Charge $I_F = I_S, dI/dt = 100\text{ A}/\mu\text{S}, V_{DD} = 50\text{ v}$		Q_{rr}			2.9	μC

(1) Pulsed width limited by maximum junction temperature.

(2) Pulse Test: Pulse width < 300 μsec . Duty cycle $\leq 2\%$.

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