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## NTE2393 MOSFET N-Channel Enhancement Mode, High Speed Switch TO3P Type Package

**Description:**

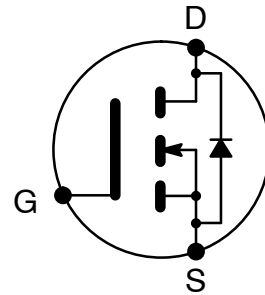
The NTE2393 is an N-Channel Enhancement Mode Power MOS Field Effect Transistor. Easy drive and very fast switching times make this device ideal for high speed switching applications. Typical applications include switching mode power supplies, uninterruptible power supplies, and motor speed control.

**Features:**

- High Voltage: 500V for Off-Line SMPS
- High Current: 9A for up to 350W SMPS
- Ultra Fast Switching for Operation at less than 100kHz

**Industrial Applications:**

- Switching Mode Power Supplies
- Motor Controls



**Absolute Maximum Ratings:**

Drain-Source Voltage ( $V_{GS} = 0$ ), $V_{DS}$ .....	500V
Drain-Gate Voltage ( $R_{GS} = 20k\Omega$ ), $V_{DGR}$ .....	500V
Gate-Source Voltage, $V_{GS}$ .....	20V
Continuous Drain Current, $I_D$	
$T_C = +25, C$ .....	9A
$T_C = +100, C$ .....	5.6A
Pulsed Drain Current (Note 1), $I_{DM}$ .....	36A
Clamped Drain Inductive Current (Note 1), $I_{DLM}$ .....	36A
Total Dissipation ( $T_C = +25, C$ ), $P_{tot}$ .....	150W
Derate Above 25, C .....	1.2W/, C
Maximum Operating Junction Temperature, $T_J$ .....	+150, C
Storage Temperature Range, $T_{stg}$ .....	-65, to +150, C
Maximum Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	0.83, C/W
Maximum Lead Temperature (During Soldering), $T_L$ .....	+275, C

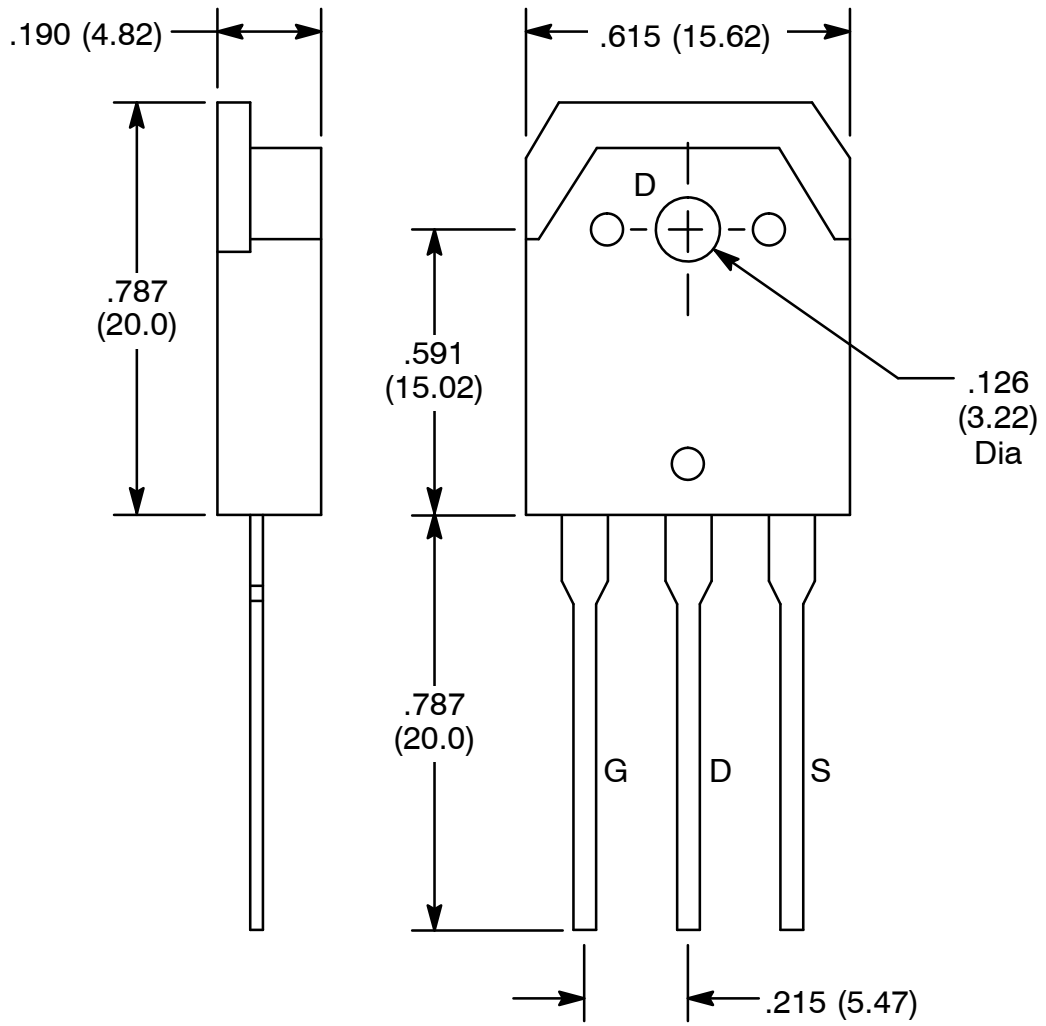
Note 1. Pulse width limited by safe operating area.

**Electrical Characteristics:** ( $T_C = +25, C$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu A, V_{GS} = 0$	500	–	–	V
Zero–Gate Voltage Drain Current	$I_{DSS}$	$V_{GS} = 0, V_{DS} = \text{Max Rating}$	–	–	250	$\mu A$
		$V_{GS} = 0, V_{DS} = 400V, T_C = +125, C$	–	–	1000	$\mu A$
Gate–Body Leakage Current	$I_{GSS}$	$V_{DS} = 0, V_{GS} = 20V$	–	–	100	nA
<b>ON Characteristics (Note 2)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	–	4	V
Static Drain–Source On Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 4.5A$	–	–	0.7	$\Omega$
		$V_{GS} = 10V, I_D = 4.5A, T_C = 100, C$	–	–	1.4	$\Omega$
<b>Dynamic Characteristics</b>						
Forward Transconductance	$g_{fs}$	$V_{DS} = 25V, I_D = 4.5A$	5	–	–	mho
Input Capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0, f = 1MHz$	–	1600	1900	pf
Output Capacitance	$C_{oss}$		–	–	280	pf
Reverse Transfer Capacitance	$C_{rss}$		–	–	170	pf
<b>Switching Characteristics</b>						
Turn–On Time	$t_{d(on)}$	$V_{DD} = 250V, I_D = 4.5A, R_l = 4.7\Omega, V_l = 10V$	–	30	40	ns
Rise Time	$t_r$		–	40	60	ns
Turn–Off Delay Time	$t_{d(off)}$		–	130	170	ns
Fall Time	$t_f$		–	30	40	ns
<b>Source Drain Diode Characteristics</b>						
Source–Drain Current	$I_{SD}$		–	–	9	A
Source–Drain Current (Pulsed)	$I_{SDM}$	Note 2	–	–	36	A
Forward ON Voltage	$V_{SD}$	$I_{SD} = 9A, V_{GS} = 0$	–	–	1.15	V
Reverse Recovery Time	$t_{rr}$	$I_{DS} = 9A, V_{GS} = 0, di/dt = 100A/\mu s$	–	420	–	ns

Note 2. Pulse width limited by safe operating area.

Note 3. Pulsed: Pulse Duration = 300 $\mu s$ , Duty Cycle 1.5%



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