

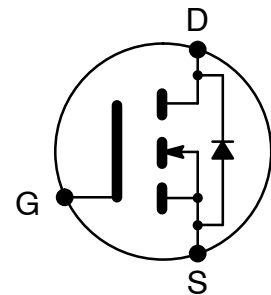


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## NTE2936 MOSFET N-Channel, Enhancement Mode High Speed Switch TO3PML Type Package

**Features:**

- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Lower Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- Lower  $R_{DS(on)}$ :  $0.308 \leq$  Typ
- Lower Leakage Current:  $10^{\circ}$  A (Max) @  $V_{DS} = 500V$



**Absolute Maximum Ratings:**

Drain-to-Source Voltage, $V_{DSS}$ .....	500V
Drain Current, $I_D$	
Continuous	
$T_C = +25^{\circ}C$ .....	9.6A
$T_C = +100^{\circ}C$ .....	6.1A
Pulsed (Note 1) .....	56A
Total Power Dissipation ( $T_C = +25^{\circ}C$ ), $P_D$ .....	96W
Derate Above $25^{\circ}C$ .....	0.77W/ $^{\circ}C$
Gate-Source Voltage, $V_{GS}$ .....	$\pm 30V$
Single Pulsed Avalanche Energy (Note 2), $E_{AS}$ .....	1024mJ
Avalanche Current (Note 1), $I_{AR}$ .....	9.6A
Repetitive Avalanche Energy (Note 1), $E_{AR}$ .....	9.6mJ
Peak Diode Recovery $dv/dt$ (Note 3), $dv/dt$ .....	3.5V/ns
Operating Junction Temperature Range, $T_J$ .....	$-55^{\circ}$ to $+150^{\circ}C$
Storage Temperature Range, $T_{stg}$ .....	$-55^{\circ}$ to $+150^{\circ}C$
Maximum Lead Temperature (During Soldering, 1/8" from case, 5sec), $T_L$ .....	$+300^{\circ}C$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	1.3 $^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	40 $^{\circ}C/W$

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 2.  $L = 20mH$ ,  $I_{AS} = 9.6A$ ,  $V_{DD} = 50V$ ,  $R_G = 27 \leq$ , Starting  $T_J = +25^{\circ}C$ .

Note 3.  $I_{SD} \leq 14A$ ,  $di/dt \leq 230A/^\circ s$ ,  $V_{DD} \leq V_{(BR)DSS}$ , Starting  $T_J = +25^\circ C$ .

**Electrical Characteristics:** ( $T_C = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250^\circ A$	500	–	–	V
Breakdown Voltage Temperature Coefficient	$\pm V_{(BR)DSS} / \pm T_J$	$I_D = 250^\circ A$	–	0.68	–	V/°C
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = 5V, I_D = 250^\circ A$	2.0	–	4.0	V
Gate–Source Leakage Forward	$I_{GSS}$	$V_{GS} = 30V$	–	–	100	nA
Gate–Source Leakage Reverse	$I_{GSS}$	$V_{GS} = -30V$	–	–	-100	nA
Drain–to–Source Leakage Current	$I_{DSS}$	$V_{DS} = 500V$	–	–	10	°A
		$V_{DS} = 400V, T_C = +125^\circ\text{C}$	–	–	100	°A
Static Drain–Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 4.8A, \text{Note 4}$	–	–	0.4	≤
Forward Transconductance	$g_{fs}$	$V_{DS} = 50V, I_D = 4.8A, \text{Note 4}$	–	8.96	–	mhos
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$	–	2500	3250	pF
Output Capacitance	$C_{oss}$		–	295	340	pF
Reverse Transfer Capacitance	$C_{rss}$		–	130	150	pF
Turn–On Delay Time	$t_{d(on)}$	$V_{DD} = 250V, I_D = 14A, R_G = 6.2\leq, \text{Note 4, Note 5}$	–	23	55	ns
Rise Time	$t_r$		–	26	60	ns
Turn–Off Delay Time	$t_{d(off)}$		–	125	260	ns
Fall Time	$t_f$		–	37	85	ns
Total Gate Charge	$Q_g$	$V_{GS} = 10V, I_D = 14A, V_{DS} = 400V, \text{Note 4, Note 5}$	–	121	157	nC
Gate–Source Charge	$Q_{gs}$		–	16.2	–	nC
Gate–Drain (“Miller”) Charge	$Q_{gd}$		–	61	–	nC
<b>Source–Drain Diode Ratings and Characteristics</b>						
Continuous Source Current	$I_S$	(Body Diode)	–	–	9.6	A
Pulse Source Current	$I_{SM}$	(Body Diode) Note 1	–	–	56	A
Diode Forward Voltage	$V_{SD}$	$T_J = +25^\circ\text{C}, I_S = 9.6A, V_{GS} = 0V, \text{Note 4}$	–	–	1.4	V
Reverse Recovery Time	$t_{rr}$	$T_J = +25^\circ\text{C}, I_F = 14A, di_F/dt = 100A/^\circ\text{s}, \text{Note 4}$	–	437	–	ns
Reverse Recovery Charge	$Q_{rr}$		–	5.5	–	°C

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 4. Pulse Test: Pulse Width = 250° s, Duty Cycle ≤ 2%.

Note 5. Essentially independent of operating temperature.

