

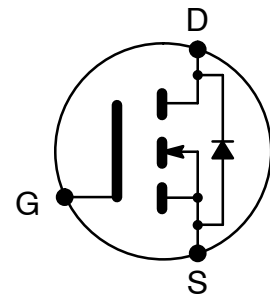


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NTE2981 Logic Level MOSFET N-Channel, Enhancement Mode High Speed Switch TO251 Type Package

Features:

- Dynamic dv/dt Rating
- Repetitive Avalanche rated
- Logic Level Gate Drive
- R_{DS(on)} Specified at V_{GS} = 4V & 5V
- TO251 Type Package



Absolute Maximum Ratings:

Drain Current, I _D	
Continuous (V _{GS} = 5V)	
T _C = +25°C	7.7A
T _C = +100°C	4.9A
Pulsed (Note 1)	31A
Total Power Dissipation (T _C = +25°C), P _D	42W
Derate Above 25°C	0.33W/°C
Total Power Dissipation (PC Board Mount, T _C = +25°C, Note 2), P _D	2.5W
Derate Above 25°C	0.02W/°C
Gate-Source Voltage, V _{GS}	±10V
Single Pulsed Avalanche Energy (Note 3), E _{AS}	210mJ
Avalanche Current (Note 1), I _{AR}	7.7A
Repetitive Avalanche Energy (Note 1), E _{AR}	4.2mJ
Peak Diode Recovery dv/dt (Note 4), dv/dt	5.5V/ns
Operating Junction Temperature Range, T _J	-55° to +150°C
Storage Temperature Range, T _{stg}	-55° to +150°C
Maximum Lead Temperature (During Soldering, 1.6mm from case, 10sec), T _L	+260°C
Maximum Thermal Resistance:	
Junction-to-Case, R _{thJC}	3.0°C/W
Junction-to-Ambient (PCB Mount, Note 2), R _{thJA}	50°C/W
Junction-to-Ambient, R _{thJA}	110°C/W

- Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
 Note 2. When mounted on a 1" square PCB (FR-4 or G-10 material).
 Note 3. L = 5.3mH, V_{DD} = 25V, R_G = 25Ω, Starting T_J = +25°C, I_{AS} = 7.7A.
 Note 4. I_{SD} ≤ 9.2A, di/dt ≤ 110A/°s, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ +150°C.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250^\circ A$	100	–	–	V
Breakdown Voltage Temperature Coefficient	$\pm V_{(BR)DSS} / \pm T_J$	Reference to $+25^\circ\text{C}$, $I_D = 1\text{mA}$	–	0.13	–	$V/^\circ\text{C}$
Static Drain–Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 5V, I_D = 4.6A$, Note 5	–	–	0.27	\leq
		$V_{GS} = 4V, I_D = 3.9A$, Note 4	–	–	0.38	\leq
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250^\circ A$	1.0	–	2.0	V
Forward Transconductance	g_{fs}	$V_{DS} = 50V, I_D = 4.6A$, Note 5	4.4	–	–	mhos
Drain–to–Source Leakage Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0$	–	–	25	$^\circ A$
		$V_{DS} = 80V, V_{GS} = 0V, T_C = +125^\circ\text{C}$	–	–	250	$^\circ A$
Gate–Source Leakage Forward	I_{GSS}	$V_{GS} = 10V$	–	–	100	nA
Gate–Source Leakage Reverse	I_{GSS}	$V_{GS} = -10V$	–	–	-100	nA
Total Gate Charge	Q_g	$V_{GS} = 5V, I_D = 9.2A, V_{DS} = 80V$, Note 5	–	–	12	nC
Gate–Source Charge	Q_{gs}		–	–	3.0	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		–	–	7.1	nC
Turn–On Delay Time	$t_{d(on)}$	$V_{DD} = 50V, I_D = 9.2A, R_G = 9.0\leq, R_D = 5.2\leq$, Note 5	–	9.8	–	ns
Rise Time	t_r		–	64	–	ns
Turn–Off Delay Time	$t_{d(off)}$		–	21	–	ns
Fall Time	t_f		–	27	–	ns
Internal Drain Inductance	L_D	Between lead, 6mm (0.25”) from package and center of die contact	–	4.5	–	nH
Internal Source Inductance	L_S		–	7.5	–	nH
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$	–	490	–	pF
Output Capacitance	C_{oss}		–	150	–	pF
Reverse Transfer Capacitance	C_{rss}		–	30	–	pF
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current	I_S	(Body Diode)	–	–	7.7	A
Pulse Source Current	I_{SM}	(Body Diode) Note 1	–	–	31	A
Diode Forward Voltage	V_{SD}	$T_J = +25^\circ\text{C}, I_S = 7.7A, V_{GS} = 0V$, Note 5	–	–	2.5	V
Reverse Recovery Time	t_{rr}	$T_J = +25^\circ\text{C}, I_F = 9.2A, di/dt = 100A/^\circ s$, Note 5	–	110	140	ns
Reverse Recovery Charge	Q_{rr}		–	0.8	1.0	$^\circ C$
Forward Turn–On Time	t_{on}	Intrinsic turn–on time is negligible (turn–on is dominated by $L_S + L_D$)				

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

Note 5. Pulse Test: Pulse Width $\leq 300^\circ s$, Duty Cycle $\leq 2\%$.

