

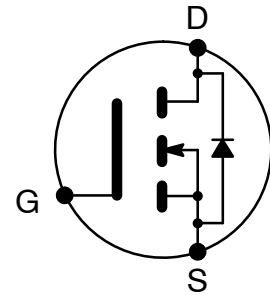


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NTE2985 Logic Level MOSFET N-Channel, Enhancement Mode High Speed Switch TO-220 Type Package

Features:

- Logic Level Gate Drive
- Advanced Process Technology
- Dynamic dv/dt Rating
- +175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated



Absolute Maximum Ratings:

Drain Current, I_D	
Continuous ($V_{GS} = 10V$)	
$T_C = +25^\circ C$	30A
$T_C = +100^\circ C$	21A
Pulsed (Note 1)	110A
Total Power Dissipation ($T_C = +25^\circ C$), P_D	68W
Derate Above $25^\circ C$	0.45W/ $^\circ C$
Gate-Source Voltage, V_{GS}	$\pm 16V$
Single Pulsed Avalanche Energy (Note 2), E_{AS}	110mJ
Avalanche Current (Note 1), I_{AR}	16A
Repetitive Avalanche Energy (Note 1), E_{AR}	6.8mJ
Peak Diode Recovery dv/dt (Note 3), dv/dt	5.0V/ns
Operating Junction Temperature Range, T_J	-55° to $+175^\circ C$
Storage Temperature Range, T_{stg}	-55° to $+175^\circ C$
Maximum Lead Temperature (During Soldering, 1.6mm from case, 10sec), T_L	$+300^\circ C$
Mounting Torque, 6-32 or M3 Screw	10 lbf•in (1.1 N•m)
Thermal Resistance:	
Maximum Junction-to-Case, R_{thJC}	2.2K/W
Typical Case-to-Sink (Mounting surface flat, smooth, and greased), R_{thCS}	0.5K/W
Maximum Junction-to-Ambient (Free Air Operation), R_{thJA}	62K/W

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
 Note 2. $L = 610\mu H$, $V_{DD} = 25V$, $R_G = 25\Omega$, Starting $T_J = +175^\circ C$, $I_{AS} = 16A$.
 Note 3. $I_{SD} \leq 16A$, $di/dt \leq 270A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq +175^\circ C$.



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}	$V_{GS} = 0V, I_D = 250\mu A$	55	–	–	V
Breakdown Voltage Temperature Coefficient	$\Delta V_{(BR)DSS} / \Delta T_J$	Reference to $+25^\circ\text{C}$, $I_D = 1mA$	–	0.065	–	V/ $^\circ\text{C}$
Static Drain–Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 16A$, Note 4	–	–	0.035	Ω
		$V_{GS} = 5V, I_D = 16A$, Note 4	–	–	0.046	Ω
		$V_{GS} = 4V, I_D = 14A$, Note 4	–	–	0.060	Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	–	2.0	V
Forward Transconductance	g_{fs}	$V_{DS} = 25V, I_D = 16A$	11	–	–	mhos
Drain–to–Source Leakage Current	I_{DSS}	$V_{DS} = 55V, V_{GS} = 0$	–	–	25	μA
		$V_{DS} = 44V, V_{GS} = 0V, T_C = +150^\circ\text{C}$	–	–	250	μA
Gate–Source Leakage Forward	I_{GSS}	$V_{GS} = 16V$	–	–	100	nA
Gate–Source Leakage Reverse	I_{GSS}	$V_{GS} = -16V$	–	–	-100	nA
Total Gate Charge	Q_g	$V_{GS} = 5V, I_D = 16A, V_{DS} = 44V$	–	–	25	nC
Gate–Source Charge	Q_{gs}		–	–	5.2	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		–	–	14	nC
Turn–On Delay Time	$t_{d(on)}$	$V_{DD} = 28V, I_D = 16A, R_G = 6.5\Omega, V_{GS} = 5V, R_D = 1.8\Omega$	–	8.9	–	ns
Rise Time	t_r		–	100	–	ns
Turn–Off Delay Time	$t_{d(off)}$		–	21	–	ns
Fall Time	t_f		–	29	–	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}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$	–	880	–	pF
Output Capacitance	C_{oss}		–	220	–	pF
Reverse Transfer Capacitance	C_{rss}		–	94	–	pF
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current	I_S	(Body Diode)	–	–	30	A
Pulse Source Current	I_{SM}	(Body Diode) Note 1	–	–	110	A
Diode Forward Voltage	V_{SD}	$T_J = +25^\circ\text{C}, I_S = 16A, V_{GS} = 0V$, Note 4	–	–	1.3	V
Reverse Recovery Time	t_{rr}	$T_J = +25^\circ\text{C}, I_F = 16A, di/dt = 100A/\mu s$, Note 4	–	76	110	ns
Reverse Recovery Charge	Q_{rr}		–	190	290	nC
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 4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

