

## NTE2389 MOSFET N-Ch, Enhancement Mode High Speed Switch

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Drain–Source Voltage, $V_{DS}$ .....	60V
Drain–Gate Voltage ( $R_{GS} = 20\text{k}\Omega$ ), $V_{DGR}$ .....	60V
Drain Current, $I_D$	
Continuous .....	35A
Pulsed .....	152A
Gate–Source Voltage, $V_{GS}$ .....	$\pm 30\text{V}$
Maximum Power Dissipation, $P_D$ .....	125W
Operating Junction Temperature, $T_J$ .....	$+175^\circ\text{C}$
Storage Temperature range, $T_{stg}$ .....	$-55^\circ$ to $+175^\circ\text{C}$
Maximum Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	$1.2^\circ\text{C/W}$
Typical Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....	$60^\circ\text{C/W}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
<b>Static Ratings</b>							
Drain–Source Breakdown Voltage	$BV_{DSS}$	$I_D = 0.25\text{mA}$ , $V_{GS} = 0$	60	–	–	V	
Gate Threshold Voltage	$V_{GS(th)}$	$I_D = 1\text{mA}$ , $V_{DS} = V_{GS}$	2.1	3.0	4.0	V	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 60\text{V}$ , $V_{GS} = 0$	$T_J = +25^\circ\text{C}$	–	1	10	$\mu\text{A}$
			$T_J = +125^\circ\text{C}$	–	0.1	1.0	mA
Gate–Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30\text{V}$ , $V_{DS} = 0$	–	10	100	nA	
Drain–Source On–State Resistance	$R_{DS(on)}$	$I_D = 20\text{A}$ , $V_{GS} = 10\text{V}$	–	40	45	$\text{m}\Omega$	
<b>Dynamic Ratings</b>							
Forward Transconductance	$g_{fs}$	$I_D = 20\text{A}$ , $V_{DS} = 25\text{V}$	8	13.5	–	mhos	
Input Capacitance	$C_{iss}$	$V_{DS} = 25\text{V}$ , $V_{GS} = 0$ , $f = 1\text{MHz}$	–	1650	2000	pF	
Output Capacitance	$C_{oss}$		–	560	750	pF	
Reverse Transfer Capacitance	$C_{rss}$		–	300	400	pF	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Dynamic Ratings (Cont'd)</b>						
Turn-On Time	$t_{d(on)}$	$V_{CC} = 30\text{V}, V_{GS} = 10\text{V},$ $I_D = 3\text{A}, R_{GS} = 50\Omega$	–	25	40	ns
	$t_r$		–	60	90	ns
Turn-Off Time	$t_{d(off)}$		–	125	160	ns
	$t_f$		–	100	130	ns
Internal Drain Inductance	$L_d$	Measured from contact screw on tab to center of die	–	3.5	–	nH
		Measured from drain lead 6mm from package to center of die	–	4.5	–	nH
Internal Source Inductance	$L_s$	Measured from source lead 6mm from package to source bond pad	–	7.5	–	nH
<b>Reverse Diode</b>						
Continuous Reverse Drain Current	$I_{DR}$		–	–	41	A
Pulsed Reverse Drain Current	$I_{DRM}$		–	–	164	A
Diode Forward On-Voltage	$V_{SD}$	$I_F = 41\text{A}, V_{GS} = 0$	–	1.4	2.0	V
Reverse Recovery Time	$t_{rr}$	$I_F = 41\text{A}, V_{GS} = 0, V_R = 30\text{V}$ $-di_F/dt = 100\text{A}/\mu\text{s}$	–	60	–	ns
Reverse Recovery Charge	$Q_{rr}$		–	0.3	–	$\mu\text{C}$

