

NTE2371 MOSFET P–Ch, Enhancement Mode High Speed Switch

Features:

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- P–Channel
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements

Absolute Maximum Ratings:

Continuous Drain Current ($V_{GS} = 10V$), I_D

$T_C = +25^\circ C$ 19A

$T_C = +100^\circ C$ 13A

Pulsed Drain Current (Note 1), I_{DM} 72A

Power Dissipation ($T_C = +25^\circ C$), P_D 150W

Derate Linearly Above $25^\circ C$ 1.0W/ $^\circ C$

Gate–to–Source Voltage, V_{GS} ± 20

Single Pulse Avalanche Energy (Note 2), E_{AS} 640mJ

Avalanche Current (Note 1), I_{AR} 19A

Peak Diode Recovery dv/dt (Note 3), dv/dt 5.5V/ns

Operating Junction Temperature Range, T_J -55° to $+175^\circ C$

Storage Temperature Range, T_{stg} -55° to $+175^\circ C$

Lead Temperature (During Soldering, 1.6mm from case for 10sec), T_L $+300^\circ C$

Mounting Torque (6–32 or M3 Screw) 10 lbf•in (1.1N•m)

Thermal Resistance, Junction–to–Case, R_{thJC} $1.0^\circ C/W$

Thermal Resistance, Junction–to–Ambient, R_{thJA} $62^\circ C/W$

Typical Thermal Resistance, Case–to–Sink (Flat, Greased Surface), R_{thCS} $0.5^\circ C/W$

Note 1. Repetitive rating; pulse width limited by maximum junction temperature.

Note 2. $V_{DD} = 25V$, starting $T_J = +25^\circ C$, $L = 2.7mH$, $R_G = 25\Omega$, $I_{AS} = 19A$

Note 3. $I_{SD} \leq 19A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq +175^\circ C$

Note 4. Pules Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}$, $I_D = 250\mu\text{A}$	100	–	–	V
Breakdown Voltage Temp. Coefficient	$\frac{\Delta V_{(BR)DSS}}{\Delta T_J}$	Reference to $+25^{\circ}\text{C}$, $I_D = 1\text{mA}$	–	0.087	–	V/ $^{\circ}\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 11\text{A}$, Note 4	–	–	0.20	Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	2.0	–	4.0	V
Forward Transconductance	g_{fs}	$V_{DS} = 50\text{V}$, $I_D = 11\text{A}$, Note 4	6.2	–	–	mhos
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS} = 100\text{V}$, $V_{GS} = 0\text{V}$	–	–	100	μA
		$V_{DS} = 80\text{V}$, $V_{GS} = 0\text{V}$, $T_J = +150^{\circ}\text{C}$	–	–	500	μA
Gate-to-Source Forward Leakage	I_{GSS}	$V_{GS} = -20\text{V}$	–	–	-100	nA
Gate-to-Source Reverse Leakage	I_{GSS}	$V_{GS} = 20\text{V}$	–	–	100	nA
Total Gate Charge	Q_g	$I_D = 19\text{A}$, $V_{DS} = 80\text{V}$, $V_{GS} = 10\text{V}$, Note 4	–	–	61	nC
Gate-to-Source Charge	Q_{gs}		–	–	14	nC
Gate-to-Drain ("Miller") Charge	Q_{gd}		–	–	29	nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50\text{V}$, $I_D = 19\text{A}$, $R_G = 9.1\Omega$, $R_D = 2.4\Omega$, Note 4	–	16	–	ns
Rise Time	t_r		–	73	–	ns
Turn-Off Delay Time	$t_{d(off)}$		–	34	–	ns
Fall Time	t_f		–	57	–	ns
Internal Drain Inductance	L_D	Between lead, .250in. (6.0) mm from package and center of die contact	–	4.5	–	nH
Internal Source Inductance	L_S		–	7.5	–	nH
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$	–	1400	–	pF
Output Capacitance	C_{oss}		–	590	–	pF
Reverse Transfer Capacitance	C_{rss}		–	140	–	pF

Source-Drain Ratings and Characteristics:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Source Current (Body Diode)	I_S		–	–	19	A
Pulsed Source Current (Body Diode)	I_{SM}	Note 1	–	–	72	A
Diode Forward Voltage	V_{SD}	$T_J = +25^{\circ}\text{C}$, $I_S = 3.5\text{A}$, $V_{GS} = 0\text{V}$, Note 3	–	–	5.0	V
Reverse Recovery Time	t_{rr}	$T_J = +25^{\circ}\text{C}$, $I_F = 3.5\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, Note 3	–	130	260	ns
Reverse Recovery Charge	Q_{rr}		–	0.35	0.70	μC
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 width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

