

NTE2969 MOSFET N-Channel, Enhancement Mode High Speed Switch

Features:

- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Low Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- Lower Leakage Current
- Low Static Drain-Source On-State Resistance

Absolute Maximum Ratings:

Drain-Source Voltage, V_{DSS}	400V
Drain Current, I_D	
Continuous	
$T_C = +25^\circ\text{C}$	25A
$T_C = +100^\circ\text{C}$	15.1A
Pulsed (Note 1)	100A
Gate-Source Voltage, V_{GS}	$\pm 30\text{V}$
Gate Current (Pulsed), I_{GM}	$\pm 1.5\text{A}$
Single Pulsed Avalanche Energy (Note 2), E_{AS}	1429mJ
Avalanche Current (Note 1), I_{AS}	25A
Repetitive Avalanche Energy (Note 1), E_{AR}	27.8mJ
Peak Diode Recovery dv/dt (Note 3), dv/dt	4.0V/ns
Total Power Dissipation ($T_C = +25^\circ\text{C}$), P_D	278W
Derate Above 25°C	2.22W/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Maximum Lead Temperature (During Soldering, 1/8" from case, 5sec), T_L	$+300^\circ\text{C}$
Thermal Resistance:	
Maximum Junction-to-Case, R_{thJC}	0.45 $^\circ\text{C/W}$
Typical Case-to-Sink, R_{thCS}	0.24 $^\circ\text{C/W}$
Maximum Junction-to-Ambient, R_{thJA}	40 $^\circ\text{C/W}$

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

Note 2. $L = 4\text{mH}$, $I_{AS} = 25\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 27\Omega$, Starting $T_J = +25^\circ\text{C}$.

Note 3. $I_{SD} \leq 25\text{A}$, $di/dt \leq 320\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = +25^\circ\text{C}$.

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 = 250μA	400	–	–	V
Breakdown Voltage Temperature Coefficient	ΔBV/ΔT _J	I _D = 250μA	–	0.20	–	V/°C
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = 5V, I _D = 250μA	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
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 400V, V _{GS} = 0	–	–	10	μA
		V _{DS} = 320V, T _C = +150°C	–	–	100	μA
Static Drain–Source ON Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 12.5A, Note 4	–	–	0.2	Ω
Forward Transconductance	g _{fs}	V _{DS} = 50V, I _D = 12.5A, Note 4	–	18.91	–	mhos
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 25V, f = 1MHz	–	3180	4130	pF
Output Capacitance	C _{oss}		–	435	500	pF
Reverse Transfer Capacitance	C _{rss}		–	200	240	pF
Turn–On Delay Time	t _{d(on)}	V _{DD} = 200V, I _D = 25A, R _G = 5.3Ω, Note 4, Note 5	–	22	55	ns
Rise Time	t _r		–	22	60	ns
Turn–Off Delay Time	t _{d(off)}		–	127	260	ns
Fall Time	t _f		–	38	85	ns
Total Gate Charge	Q _g	V _{GS} = 10V, I _D = 25A, V _{DS} = 320V, Note 4, Note 5	–	140	182	nC
Gate–Source Charge	Q _{gs}		–	21	–	nC
Gate–Drain (“Miller”) Charge	Q _{gd}		–	64.8	–	nC
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current	I _S	(Body Diode)	–	–	25	A
Pulse Source Current	I _{SM}	(Body Diode) Note 1	–	–	100	A
Diode Forward Voltage	V _{SD}	T _J = +25°C, I _S = 25A, V _{GS} = 0V, Note 4	–	–	1.5	V
Reverse Recovery Time	t _{rr}	T _J = +25°C, I _F = 25A, dI _F /dt = 100A/μs	–	484	–	ns
Reverse Recovery Charge	Q _{rr}		–	7.6	–	μC

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

Note 4. Pulse Test: Pulse Width $\leq 250\mu s$, Duty Cycle $\leq 2\%$.

Note 5. Essentially independent of operating temperature.

