

NTE2941 MOSFET N–Ch, Enhancement Mode High Speed Switch

Features:

- Low Static Drain–Source ON Resistance
- Improved Inductive Ruggedness
- Fast Switching Times
- Low Input Capacitance
- Extended Safe Operating Area
- TO220 Type Isolated Package

Absolute Maximum Ratings:

Drain–Source Voltage (Note 1), V_{DSS}	60V
Drain–Gate Voltage ($R_{GS} = 1M\Omega$, Note 1), V_{DGR}	60V
Gate–Source Voltage, V_{GS}	$\pm 20V$
Drain Current, I_D	
Continuous	
$T_C = +25^\circ C$	28A
$T_C = +100^\circ C$	19.6A
Pulsed (Note 2)	200A
Gate Current (Pulsed), I_{GM}	$\pm 1.5A$
Single Pulsed Avalanche Energy (Note 3), E_{AS}	48mJ
Avalanche Current, I_{AS}	28A
Total Power Dissipation ($T_C = +25^\circ C$), P_D	48W
Derate Above $25^\circ C$	0.52W/ $^\circ C$
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, 1/8" from case, 5sec), T_L	$+300^\circ C$
Thermal Resistance:	
Maximum Junction–to–Case, R_{thJC}	1.92K/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}	62.5K/W

Note 1. $T_J = +25^\circ$ to $+175^\circ C$.

Note 2. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 3. $L = 50\mu H$, $V_{DD} = 25V$, $R_G = 25\Omega$, Starting $T_J = +25^\circ C$.

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 = 250μA	60	–	–	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2.0	–	4.0	V
Gate–Source Leakage Forward	I _{GSS}	V _{GS} = 20V	–	–	100	nA
Gate–Source Leakage Reverse	I _{GSS}	V _{GS} = –20V	–	–	–100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = Max. Rating, V _{GS} = 0	–	–	250	μA
		V _{DS} = 0.8 Max. Rating, T _C = +150°C	–	–	1000	μA
Static Drain–Source ON Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 25A, Note 4	–	–	0.028	Ω
Forward Transconductance	g _{fs}	V _{DS} ≥ 50V, I _D = 25A, Note 4	15	–	–	mho s
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 25V, f = 1MHz	–	2450	–	pF
Output Capacitance	C _{oss}		–	740	–	pF
Reverse Transfer Capacitance	C _{rss}		–	360	–	pF
Turn–On Delay Time	t _{d(on)}	V _{DD} = 0.5 BV _{DSS} , I _D = 50A, Z _O = 9.1Ω, (MOSFET switching times are essentially independent of operating temperature)	–	–	32	ns
Rise Time	t _r		–	–	210	ns
Turn–Off Delay Time	t _{d(off)}		–	–	75	ns
Fall Time	t _f		–	–	130	ns
Total Gate Charge (Gate–Source Plus Gate–Drain)	Q _g	V _{GS} = 10V, I _D = 50A, V _{DS} = 0.8 Max. Rating, (Gate charge is essentially independent of operating temperature)	–	–	87	nC
Gate–Source Charge	Q _{gs}		–	26.6	–	nC
Gate–Drain (“Miller”) Charge	Q _{gd}		–	30.6	–	nC
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current	I _S	(Body Diode)	–	–	150	A
Pulse Source Current	I _{SM}	(Body Diode) Note 2	–	–	200	A
Diode Forward Voltage	V _{SD}	T _J = +25°C, I _S = 50A, V _{GS} = 0V, Note 4	–	–	2.5	V
Reverse Recovery Time	t _{rr}	T _J = +25°C, I _F = 50A, dI _F /dt = 100A/μs	–	–	250	ns

Note 2. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

