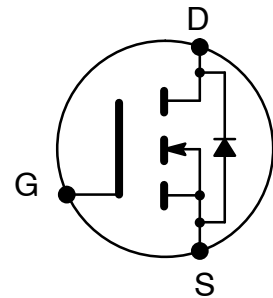




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NTE2939
MOSFET
N-Ch, Enhancement Mode
High Speed Switch
TO-220 Full Pack Type Package



Features:

- Low Drain-Source ON Resistance: $R_{DS(ON)} = 0.33\Omega$ Typ.
- High Forward Transfer Admittance: $|Y_{fs}| = 6.5$ S Typ.
- Low Leakage Current: $I_{DSS} = 10\mu A$ Max. ($V_{DS} = 600V$)
- Enhancement-Mode: $V_{th} = 2.0V$ to $4.0V$ ($V_{DS} = 10V$, $I_D = 1mA$)

Absolute Maximum Ratings: ($T_A = +25^\circ C$, Note 1 unless otherwise specified)

Drain-Source Voltage, V_{DSS}	600V
Gate-Source Voltage, V_{GSS}	± 30
Drain Current (Note 2), I_D	
DC	13A
Pulsed	52A
Drain Power Dissipation ($T_C = +25^\circ C$), P_D	50W
Single Pulse Avalanche Energy (Note 3), E_{AS}	511mJ
Avalanche Current, I_{AR}	13A
Repetitive Avalanche Energy (Note 4), E_{AR}	5mJ
Channel Temperature, T_{ch}	$+150^\circ C$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ C$
Thermal Resistance, Channel-to-Case, R_{thCH-C}	$2.5^\circ C/W$
Thermal Resistance, Channel-to-Ambient, R_{thCH-A}	$62.5^\circ C/W$

Note 1. Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc. may cause this device to decrease in reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the Absolute Maximum Ratings. This transistor is an electrostatic sensitive device. Please handle with caution.

Note 2. Make sure that the device channel temperature is below $+150^\circ C$.

Note 3. $V_{DD} = 90V$, $T_{ch} = +25^\circ C$ (Initial), $L = 5.3mH$, $R_G = 25\Omega$, $I_{AR} = 13A$

Note 4. Repetitive rating; pulse width limited by maximum channel temperature.



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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 30\text{V}, V_{DS} = 0\text{V}$	–	–	± 1	μA
Drain Cut-Off Current	I_{DSS}	$V_{DS} = 600\text{V}, V_{GS} = 0\text{V}$	–	–	10	μA
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 10\text{mA}$	600	–	–	V
Gate Threshold Voltage	V_{th}	$V_{DS} = 10\text{V}, I_D = 1\text{mA}$	2.0	–	4.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 6.5\text{A}$	–	0.33	0.43	Ω
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 10\text{V}, I_D = 6.5\text{A}$	1.8	6.5	–	S
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$	–	2300	–	pF
Output Capacitance	C_{oss}		–	250	–	pF
Reverse Transfer Capacitance	C_{rss}		–	10	–	pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 200\text{V}, I_D = 6.5\text{A}, R_L = 30\Omega,$ Note 5	–	100	–	ns
Rise Time	t_r		–	50	–	ns
Turn-Off Delay Time	$t_{d(off)}$		–	140	–	ns
Fall Time	t_f		–	25	–	ns
Total Gate Charge	Q_g	$I_D = 13\text{A}, V_{DS} = 400\text{V}, V_{GS} = 10\text{V}$	–	40	–	nC
Gate-to-Source Charge	Q_{gs}		–	25	–	nC
Gate-to-Drain (“Miller”) Charge	Q_{gd}		–	15	–	nC

Note 5. Duty Cycle $\leq 1\%$, $t_w = 10\mu\text{s}$.

Source-Drain Ratings and Characteristics: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Drain Reverse Current	I_{DR}	Note 2	–	–	13	A
Pulsed Drain Reverse Current	I_{DRP}	Note 2	–	–	52	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 13\text{A}, V_{GS} = 0\text{V}$	–	–	-1.7	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 13\text{A}, V_{GS} = 0\text{V},$ $di_{DR}/dt = 100\text{A}/\mu\text{s}$	–	1600	–	ns
Reverse Recovery Charge	Q_{rr}		–	20	–	μC

Note 2. Make sure that the device channel temperature is below $+150^\circ\text{C}$.

