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NTE2903 MOSFET N-Ch, Enhancement Mode High Speed Switch

Features:

- Low Drain-Source ON Resistance: $R_{DS(ON)} = 1.35\Omega$ Typ
- High Forward Transfer Admittance: $|y_{fs}| = 3.5S$ Typ
- Low Leakage Current: $I_{DSS} = 100\mu A$ ($V_{DS} = 500V$)
- Enhancement Mode: $V_{th} = 2.0$ to $4.0V$ ($V_{DS} = 10V$, $I_D = 1mA$)

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

Drain-Source Voltage, V_{DSS}	500V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$), V_{DGR}	500V
Gate-Source Voltage, V_{GSS}	$\pm 30V$
Drain Current (Note 2), I_D	
Continuous	5A
Pulsed ($t = 1ms$)	20A
Drain Power Dissipation ($T_C = +25^\circ C$), P_D	35W
Single Pulse Avalanche Energy (Note 3), E_{AS}	180mJ
Avalanche Current, I_{AR}	5A
Repetitive Avalanche Energy (Note 4), E_{AR}	3.5mJ
Channel Temperature, T_{CH}	$+150^\circ C$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ C$
Thermal Resistance, Channel-to-Case, R_{thCHC}	$3.57^\circ C/W$
Thermal Resistance, Channel-to-Ambient, R_{thCHA}	$62.5^\circ C/W$

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

Note 2. Ensure that the channel temperature does not exceed $+150^\circ C$.

Note 3. $V_{DD} = 90V$, $T_{CH} = +25^\circ C$ (initial), $L = 12.2mH$, $I_{AR} = 5A$, $R_G = 25\Omega$.

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}	$V_{GS} = \pm 25\text{V}, V_{DS} = 0\text{V}$	–	–	± 10	μA
Gate–Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = \pm 10\mu\text{A}, V_{DS} = 0\text{V}$	± 30	–	–	V
Drain Cut-Off Current	I_{DSS}	$V_{DS} = 500\text{V}, V_{GS} = 0\text{V}$	–	–	100	μA
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 10\text{mA}, V_{GS} = 0\text{V}$	500	–	–	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = 10\text{V}, I_D = 1\text{mA}$	2.0	–	4.0	V
Drain–Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 2.5\text{A}$	–	1.35	1.50	Ω
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = 10\text{V}, I_D = 2.5\text{A}$	1.5	3.5	–	S
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$	–	550	–	pF
Output Capacitance	C_{oss}		–	70	–	pF
Reverse Transfer Capacitance	C_{rss}		–	7	–	pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} \approx 225\text{V}, V_{GS} = 10\text{V},$ $I_D = 2.5\text{A}, R_L = 90\Omega, \text{Duty} \leq 1\%,$ $t_w = 10\mu\text{s}$	–	20	–	ns
Rise Time	t_r		–	10	–	ns
Turn-Off Delay Time	$t_{d(off)}$		–	50	–	ns
Fall Time	t_f		–	10	–	ns
Total Gate Charge	Q_g	$I_D = 5\text{A}, V_{DD} \approx 400\text{V}, V_{GS} = 10\text{V}$	–	16	–	nC
Gate–Source Charge	Q_{gs}		–	10	–	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		–	6	–	nC

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	–	–	5	A
Pulsed Drain Reverse Current	I_{DRP}	Note 2	–	–	20	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 5\text{A}, V_{GS} = 0\text{V}$	–	–	–1.7	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 5\text{A}, V_{GS} = 0\text{V}$ $dI_{DR}/dt = 100\text{A}/\mu\text{s}$	–	1400	–	ns
Reverse Recovery Charge	Q_{rr}		–	9	–	μC

Note 2. Ensure that the channel temperature does not exceed $+150^{\circ}\text{C}$.

