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NTE2954 MOSFET N-Channel, Enhancement Mode High Speed Switch

Features:

- Low Gate Charge: 147nC Typ
- Low Reverse Transfer Capacitance: 300pF Typ
- Fast Switching
- 100% Avalanche Tested
- Improved dv/dt Capability

Absolute Maximum Ratings: ($T_C = +25^\circ\text{C}$ unless otherwise specified)

Drain-Source Voltage, V_{DSS}	100V
Drain Current (Note 1), I_D	
Continuous	
$T_C = +25^\circ\text{C}$	90A
$T_C = +100^\circ\text{C}$	68A
Pulsed (Note 2)	360A
Drain-Source Diode Forward Current, I_S	
Continuous	90A
Pulsed	360A
Gate-Source Voltage, V_{GSS}	$\pm 30\text{V}$
Single Pulsed Avalanche Energy (Note 3), E_{AS}	2430mJ
Avalanche Current (Note 2), I_{AR}	90A
Repetitive Avalanche Energy (Note 2), E_{AR}	25mJ
Peak Diode Recovery (Note 4), dv/dt	4.5V/ns
Power Dissipation ($T_C = +25^\circ\text{C}$), P_D	83W
Derate Above $+25^\circ\text{C}$	0.55W/C
Operating Junction Temperature Range, T_J	-55° to $+175^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+175^\circ\text{C}$
Thermal Resistance, Junction-to-Case, R_{thJC}	1.8°C/W
Thermal Resistance, Junction-to-Ambient, R_{thJA}	62.5°C/W

- Note 1. Drain current limited by maximum junction temperature.
 Note 2. Repetitive Rating: Pulse width limited by maximum junction temperature.
 Note 3. $L = 0.3\text{mH}$, $I_{AS} = 90\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = +25^\circ\text{C}$.
 Note 4. $I_{SD} \leq 90\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \geq BV_{DSS}$, 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
OFF Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D = 250\mu A$, Referenced to $+25^\circ\text{C}$	-	0.1	-	V/ $^\circ\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0$	-	-	1	μA
		$V_{DS} = 80V, T_C = +150^\circ\text{C}$	-	-	10	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
ON Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	-	4.0	V
Static Drain-Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 45A$	-	8.5	10.0	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = 40V, I_D = 45A$, Note 5	-	72	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$	-	4730	6150	pF
Output Capacitance	C_{oss}		-	1180	1530	pF
Reverse Transfer Capacitance	C_{rss}		-	300	390	pF
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50V, I_D = 90A, R_G = 25\Omega$, Note5, Note 6	-	52	114	ns
Rise Time	t_r		-	492	944	ns
Turn-Off Delay Time	$t_{d(off)}$		-	304	618	ns
Fall Time	t_f		-	355	720	ns
Total Gate Charge	Q_g	$V_{DS} = 80V, I_D = 90A, V_{GS} = 10V$, Note5, Note 6	-	147	191	nC
Gate-Source Charge	Q_{gs}		-	28	-	nC
Gate-Drain Charge	Q_{gd}		-	60	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 90A$	-	-	1.4	V
Reverse Recovery Time	t_{rr}	$V_{GS} = 0V, I_S = 90A, di_F/dt = 100A/\mu s$, Note 5	-	114	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.54	-	μC

Note 5. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

Note 6. Essentially independent of operating temperature.

