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## NTE2990 MOSFET P-Channel, Enhancement Mode High Speed Switch

### **Features:**

- Low Drain-Source On-Resistance
- Low Input Capacitance
- High Avalanche Capability Ratings

### **Applications:**

- Switching Regulators
- UPS
- DC-DC Converters
- General Purpose Power Amplifier

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

Drain-Source Voltage, $V_{DSS}$ .....	250V
Gate-Source Voltage, $V_{GSS}$ .....	$\pm 30\text{V}$
Drain Current, $I_D$	
Continuous .....	$\pm 6\text{A}$
Pulsed (Note 1) .....	$\pm 24\text{A}$
Maximum Power Dissipation, $P_D$	
$T_C = +25^\circ\text{C}$ .....	35W
$T_A = +25^\circ\text{C}$ .....	2.0W
Single Avalanche Current (Note 2), $I_{AS}$ .....	6A
Single Avalanche Energy (Note 2), $E_{AS}$ .....	180mJ
Channel Temperature, $T_{ch}$ .....	$+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	$62.5^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	$2.77^\circ\text{C/W}$

Note 1. Pulse Width  $\leq 10\mu\text{s}$ , Duty Cycle  $\leq 1\%$ .

Note 2. Starting  $T_{ch} = +25^\circ\text{C}$ ,  $R_G = 25\Omega$ ,  $V_{GS} = -20\text{V} \rightarrow 0$ .

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source On-State Resistance	$R_{DS(on)}$	$I_D = 3A, V_{GS} = 10V$	-	0.55	0.80	$\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$I_D = 1mA, V_{DS} = 10V$	4.0	4.8	5.5	V
Forward Transfer Admittance	$g_{fs}$	$I_D = 3A, V_{DS} = 10V$	2.0	3.5	-	S
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 250V, V_{GS} = 0V$	-	-	100	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	$\pm 100$	nA
Input Capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1\text{MHz}$	-	1040	-	pF
Output Capacitance	$C_{oss}$		-	360	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	70	-	pF
Turn-On Time	$t_{d(on)}$	$V_{DD} = 125V, I_D = 3A, V_{GS(on)} = 10V, R_G = 10\Omega, R_L = 42\Omega$	-	25	-	ns
Rise Time	$t_r$		-	16	-	ns
Turn-Off Time	$t_{d(off)}$		-	47	-	ns
Fall Time	$t_f$		-	14	-	ns
Total Gate Charge	$Q_g$	$V_{DD} = 200V, V_{GS} = 10V, I_D = 6A$	-	23.1	-	nC
Gate-Source Charge	$Q_{gs}$		-	7.1	-	nC
Gate-Drain ("Miller") Charge	$Q_{gd}$		-	12.9	-	nC

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

Diode Forward Voltage	$V_{DSF}$	$I_{DR} = 6A, V_{GS} = 0V$	-	0.92	-	V
Reverse Recovery Time	$t_{rr}$	$I_{DR} = 6A, V_{GS} = 0V, di/dt = 50A/\mu\text{s}$	-	155	-	ns
Reverse Recovered Charge	$Q_{rr}$		-	930	-	nC

