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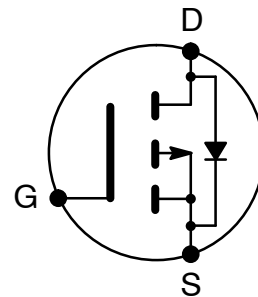
NTE2391 MOSFET P-Channel Enhancement Mode, High Speed Switch TO-220 Type Package

Description:

The NTE2391 is a P-Channel Enhancement Mode Power MOS Field Effect Transistor that utilizes advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

Features:

- Ultra Low On-Resistance
- Dynamic dv/dt Rating
- +175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated



Absolute Maximum Ratings:

Continuous Drain Current ($V_{GS} = -10V$), I_D	
$T_C = +25^\circ C$	-40A
$T_C = +100^\circ C$	-29A
Pulsed Drain Current (Note 1), I_{DM}	-140A
Power Dissipation ($T_C = +25^\circ C$), P_D	200W
Derate Above $25^\circ C$	1.3W/ $^\circ C$
Gate-Source Voltage, V_{GS}	$\pm 20V$
Single Pulse Avalanche Energy (Note 2), E_{AS}	780mJ
Avalanche Current (Note 1), I_{AR}	-21A
Repetitive Avalanche Energy (Note 1), E_{AR}	20mJ
Peak Diode Recovery (Note 3), dv/dt	-5.0V/ns
Operating Junction Temperature Range, T_J	-55° to $+175^\circ C$
Storage Temperature Range, T_{stg}	-55° to $+175^\circ C$
Lead Temperature (During Soldering, 0.063 in. (1.6mm) from case, 10sec), T_L	$+300^\circ C$
Mounting Torque, 6-32 or M3 Screw	10 lbf•in (1.1N•m)
Maximum Thermal Resistance, Junction-to-Case, R_{thJC}	$0.75^\circ C/W$
Typical Thermal Resistance, Case-to-Sink, R_{thCS}	$0.5^\circ C/W$
Maximum Thermal Resistance, Junction-to-Ambient, R_{thJA}	$62^\circ C/W$

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
 Note 2. $V_{DD} = -25V$, starting $T_J = +25^\circ C$, $L = 3.5mH$, $R_G = 25\Omega$, $I_{AS} = -21A$.
 Note 3. $I_{SD} \leq -21A$, $di/dt \leq -480A/s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J +175^\circ C$.



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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = -250\mu\text{A}$, $V_{GS} = 0$	-100	-	-	V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS} / \Delta T_J$	Reference to $+25^\circ\text{C}$, $I_D = -1\text{mA}$	-	-0.11	-	V/ $^\circ\text{C}$
Static Drain–Source On Resistance	$R_{DS(on)}$	$V_{GS} = -10\text{V}$, $I_D = -24\text{A}$, Note 4	-	-	0.06	Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\mu\text{A}$	-2	-	-4	V
Forward Transconductance	g_{fs}	$V_{DS} = -50\text{V}$, $I_D = -21\text{A}$	10	-	-	S
Drain–Source Leakage Current	I_{DSS}	$V_{GS} = 0$, $V_{DS} = -100\text{V}$	-	-	-25	μA
		$V_{GS} = 0$, $V_{DS} = -80\text{V}$, $T_C = +150^\circ\text{C}$	-	-	-250	μA
Gate–Body Leakage Current	I_{GSS}	$V_{DS} = 0$, $V_{GS} = \pm 20\text{V}$	-	-	± 100	nA
Total Gate Charge	Q_g	$V_{GS} = -10\text{V}$, $I_D = -21\text{A}$, $V_{DS} = -80\text{V}$, Note 4	-	-	180	nC
Gate–Source Charge	Q_{gs}		-	-	25	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		-	-	97	nC
Turn–On Time	$t_{d(on)}$	$V_{DD} = -50\text{V}$, $I_D = -21\text{A}$, $R_G = 2.5\Omega$, $R_D = 2.4\Omega$, Note 4	-	17	-	ns
Rise Time	t_r		-	86	-	ns
Turn–Off Delay Time	$t_{d(off)}$		-	79	-	ns
Fall Time	t_f		-	81	-	ns
Input Capacitance	C_{iss}	$V_{DS} = -25\text{V}$, $V_{GS} = 0$, $f = 1\text{MHz}$	-	2700	-	pf
Output Capacitance	C_{oss}		-	790	-	pf
Reverse Transfer Capacitance	C_{rss}		-	450	-	pf
Internal Drain Inductance	L_D	Between lead, 6mm (0.25 in.) from package and center of die contact	-	4.5	-	nH
Internal Source Inductance	L_S		-	7.5	-	nH
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S		-	-	-40	A
Pulsed Source Current (Body Diode)	I_{SM}	Note 1	-	-	-140	A
Diode Forward Voltage	V_{SD}	$I_S = -21\text{A}$, $V_{GS} = 0$, $T_J = +25^\circ\text{C}$, Note 4	-	-	-1.6	V
Reverse Recovery Time	t_{rr}	$I_F = -21\text{A}$, $di/dt = -100\text{A}/\mu\text{s}$, $T_J = +25^\circ\text{C}$, Note 4	-	170	260	ns
Reverse Recovered Charge	Q_{rr}		-	1.2	1.8	μC
Forward Turn–On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$)				

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 4. Pulse test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

