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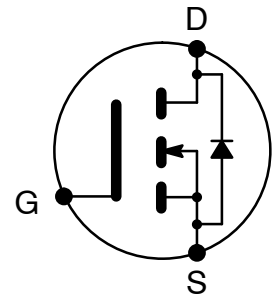
NTE2387 MOSFET N-Channel Enhancement Mode, High Speed Switch TO-220 Type Package

Description:

The NTE2387 is an N-Channel Enhancement Mode Power MOSFET in a TO-220 type package designed with the best combination of fast switching, ruggedized device design, low on-resistance, and cost-effectiveness.

Features:

- Dynamic dV/dt rating
- Repetitive Avalanche Rated
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements



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

Drain-Source Voltage, V_{DS}	800V
Gate-Source Voltage, V_{GS}	$\pm 20\text{V}$
Pulsed Drain Current (Note 1), I_{DM}	16A
Continuous Drain Current ($V_{GS} = 10\text{V}$), I_D	
$T_C = +25^\circ\text{C}$	4.1A
$T_C = +100^\circ\text{C}$	2.6A
Maximum Power Dissipation ($T_C = +25^\circ\text{C}$), P_D	125W
Derate Linearly Above 25°C	1.0W/ $^\circ\text{C}$
Single Pulse Avalanche Energy (Note 2), E_{AS}	260mJ
Avalanche Current (Note 1), I_{AR}	4.1A
Repetitive Avalanche Energy (Note 1), E_{AR}	13mJ
Peak Diode Recovery dv/dt (Note 3), dv/dt	2.0V/ns
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Lead Temperature (During Soldering, 1.6mm from case for 10sec), T_L	$+300^\circ\text{C}$
Mounting Torque (6-32 or M3 Screw)	10 lbf•in (1.1N•m)
Thermal Resistance, Junction-to-Case, R_{thJC}	1.0 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient, R_{thJA}	62 $^\circ\text{C}/\text{W}$
Typical Thermal Resistance, Case-to-Sink (Flat, Greased Surface), R_{thCS}	0.5 $^\circ\text{C}/\text{W}$

Note 1. Repetitive rating; pulse width limited by maximum junction temperature.

Note 2. $V_{DD} = 50\text{V}$, starting $T_J = +25^\circ\text{C}$, $L = 29\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 4.1\text{A}$

Note 3. $I_{SD} \leq 4.1\text{A}$, $di/dt \leq 100\text{A}/\mu\text{s}$, $V_{DD} \leq 600\text{V}$, $T_J \leq +150^\circ\text{C}$

Rev. 9-19



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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$, $V_{GS} = 0$	800	–	–	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	Reference to $+25^\circ\text{C}$, $I_D = 1\text{mA}$	–	0.9	–	$\text{V}/^\circ\text{C}$
Zero–Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0$, $V_{DS} = 800\text{V}$	–	–	100	μA
		$V_{GS} = 0$, $V_{DS} = 640\text{V}$, $T_J = +125^\circ\text{C}$	–	–	500	μA
Gate–Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{V}$	–	–	± 100	nA
Gate–Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	2.0	–	4.0	V
Drain–Source On–State Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 2.5\text{A}$, Note 4	–	–	3.0	Ω
Forward Transconductance	g_{fs}	$V_{DS} = 100\text{V}$, $I_D = 2.5\text{A}$, Note 4	2.5	–	–	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 25\text{V}$, $V_{GS} = 0$, $f = 1\text{MHz}$	–	1300	–	pf
Output Capacitance	C_{oss}		–	310	–	pf
Reverse Transfer Capacitance	C_{rss}		–	190	–	pf
Total Gate Charge	Q_g	$V_{DS} = 400\text{V}$, $V_{GS} = 10\text{V}$, $I_D = 4.1\text{A}$, Note 4	–	–	78	nC
Gate–Source Charge	Q_{gs}		–	–	9.6	nC
Gate–Drain Charge	Q_{gd}		–	–	45	nC
Turn–On Delay Time	$t_{d(on)}$	$V_{DD} = 400\text{V}$, $I_D = 4.1\text{A}$, $R_D = 95\Omega$, $R_g = 12\Omega$, Note 4	–	12	–	ns
Rise Time	t_r		–	33	–	ns
Turn–Off Delay Time	$t_{d(off)}$		–	82	–	ns
Fall Time	t_f		–	30	–	ns
Internal Drain Inductance	L_D	Measured from drain lead 6mm from package to center of die	–	4.5	–	nH
Internal Source Inductance	L_S	Measured from drain lead 6mm from package to center of die	–	7.5	–	nH
Drain–Source Body Diode Characteristics						
Continuous Source–Drain Diode Current	I_S		–	–	4.1	A
Pulsed Diode Forward Current	I_{SM}	Note 1	–	–	16	A
Body Diode Voltage	V_{SD}	$T_J = +25^\circ\text{C}$, $I_S = 4.1\text{A}$, $V_{GS} = 0$, Note 1	–	–	1.8	V
Reverse Recovery Time	t_{rr}	$T_J = +25^\circ\text{C}$, $I_F = 4.1\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, Note 4	–	480	720	ns
Reverse Recovered Charge	Q_{rr}		–	1.8	2.7	μC
Forward Turn–On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S and L_D)				

Note 1. Repetitive rating; pulse width limited by maximum junction temperature.

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

