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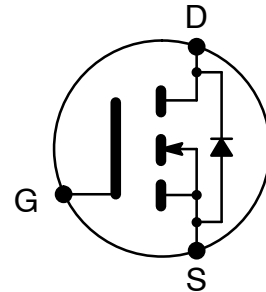
## NTE2382 MOSFET N-Channel Enhancement Mode, High Speed Switch (Compl to NTE2383)

**Description:**

The NTE2382 is a MOS power N-Channel FET in a TO220 type package designed for high voltage, high speed power switching applications such as switching regulators, converters, solenoid, and relay drivers.

**Features:**

- Lower  $R_{DS(ON)}$
- Improved Inductive Ruggedness
- Fast Switching Times
- Rugged Polysilicon Gate Cell Structure
- Lower Input Capacitance
- Extended Safe Operating Area
- Improved High Temperature Reliability



**Absolute Maximim Ratings:**

Drain-Source Voltage (Note 1), $V_{DSS}$ .....	100V
Drain-Gate Voltage ( $R_{GS} = 1M\pm$ , Note 1), $V_{DGR}$ .....	100V
Gate-Source Voltage, $V_{GS}$ .....	$\pm 20V$
Continuous Drain Current, $I_D$	
$T_C = +25^\circ C$ .....	9.2A
$T_C = +100^\circ C$ .....	6.5A
Drain Current, Pulsed (Note 3), $I_{DM}$ .....	37A
Gate Current, Pulsed, $I_{GM}$ .....	$\pm 1.5A$
Single Pulsed Avalanche Energy (Note 4), $E_{AS}$ .....	36mJ
Avalanche Current, $I_{AS}$ .....	9.2A
Total Power Dissipation ( $T_C = +25^\circ C$ ), $P_D$ .....	50W
Derate Above $25^\circ C$ .....	0.4W/ $^\circ C$
Operating Junction Temperature Range, $T_{opr}$ .....	$-55^\circ$ to $+150^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ C$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	62.5 $^\circ C/W$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	2.5 $^\circ C/W$
Thermal Resistance, Case-to-Sink (Note 5), $R_{thCS}$ .....	0.5 $^\circ C/W$
Maximum Lead Temperature (During Soldering, 1/8" from case, 5sec), $T_L$ .....	$+300^\circ C$

Note 1.  $T_J = +25^\circ$  to  $+150^\circ C$

Note 2. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

Note 3. Repetitive rating: Pulse width limited by max. junction temperature.

Note 4.  $L = 64\text{mH}$ ,  $V_{DD} = 25\text{V}$ ,  $R_G = 25\pm$ , Starting  $T_J = +25^\circ\text{C}$ .

Note 5. Mounting surface flat, smooth, and greased.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0, I_D = 0.25\text{mA}$	100	–	–	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 100\text{V}, V_{GS} = 0$	–	–	0.25	mA
		$V_{DS} = 80\text{V}, V_{GS} = 0, T_J = +125^\circ\text{C}$	–	–	1.0	mA
Gate–Body Leakage Current, Forward	$I_{GSS}$	$V_{GS} = 20\text{V}$	–	–	100	nA
Gate–Body Leakage Current, Reverse	$I_{GSS}$	$V_{GS} = 20\text{V}$	–	–	–100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 0.25\text{mA}$	2.0	–	4.0	V
Static Drain–Source On–Resistance	$r_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 4.6\text{A}$ , Note 2	–	–	0.27	$\pm$
Forward Transconductance	$g_{FS}$	$V_{DS} \geq 50\text{V}, I_D = 4.6\text{A}$ , Note 2	2.7	4.1	–	mhos
Input Capacitance	$C_{iss}$	$V_{DS} = 25\text{V}, V_{GS} = 0, f = 1\text{MHz}$	–	400	–	pF
Output Capacitance	$C_{oss}$		–	130	–	pF
Reverse Transfer Capacitance	$C_{rss}$		–	40	–	pF
Turn–On Delay Time	$t_{d(on)}$	$V_{DD} = 50\text{V}, I_D = 9.2\text{A}, Z_O = 18\pm$ , MOSFET switching times are essentially independent of operating temperature	–	8.8	13.0	ns
Rise Time	$t_r$		–	30	45	ns
Turn–Off Delay Time	$t_{d(off)}$		–	19	27	ns
Fall Time	$t_f$		–	20	30	ns
Total Gate Charge	$Q_g$	$V_{GS} = 10\text{V}, V_{DS} = 80\text{V}, I_D = 9.2\text{A}$ , Gate charge is essentially independent of operating temperature	–	–	23	nC
Gate–Source Charge	$Q_{gs}$		–	4.6	–	nC
Gate–Drain (“Miller”) Charge	$Q_{gd}$		–	9.1	–	ns
<b>Source–Drain Diode Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_S$		–	–	9.2	A
Pulse Source Current (Body Diode)	$I_{SM}$	Note 3	–	–	37	A
Diode Forward Voltage	$V_{SD}$	$T_J = +25^\circ\text{C}, I_S = 9.2\text{A}, V_{GS} = 0\text{V}$ , Note 2	–	–	2.5	V
Reverse Recovery Time	$t_{rr}$	$T_J = +25^\circ\text{C}, I_F = 9.2\text{A}$ , $dI_F/dt = 100\text{A}/\mu\text{s}$	–	110	240	ns

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

Note 3. Repetitive rating: Pulse width limited by max. junction temperature.



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