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NTE2987 Logic Level MOSFET N-Channel, Enhancement Mode High Speed Switch

Features:

- Avalanche Rugged Technology
- Logic Level Gate Drive
- $R_{DS(on)} = 0.09\Omega$ Typ. at $V_{GS} = 5V$
- +175°C Operating Temperature
- Fast Switching
- Low Gate Charge
- High Current Capability

Absolute Maximum Ratings:

Drain Current, I_D	
Continuous	
$T_C = +25^\circ C$	20A
$T_C = +100^\circ C$	14A
Pulsed (Note 1)	80A
Total Power Dissipation ($T_C = +25^\circ C$), P_D	105W
Derate Above 25°C	0.7W/°C
Gate-Source Voltage, V_{GS}	$\pm 15V$
Avalanche Current, Repetitive or Non-Repetitive (Note 2), I_{AR}	20A
Single Pulsed Avalanche Energy (Note 3), E_{AS}	120mJ
Repetitive Avalanche Energy (Note 2), E_{AR}	30mJ
Avalanche Current, Repetitive or Non-Repetitive (Note 4), I_{AR}	14A
Drain-Source Voltage ($V_{GS} = 0$), V_{DS}	100V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$), V_{DGR}	100V
Operating Junction Temperature, T_J	+175°C
Storage Temperature Range, T_{stg}	-65° to +175°C
Maximum Lead Temperature (During Soldering, 1.6mm from case, 10sec), T_L	+300°C
Thermal Resistance:	
Maximum Junction-to-Case, R_{thJC}	1.43°C/W
Typical Case-to-Sink (Mounting surface flat, smooth, and greased), R_{thCS}	0.5°C/W
Maximum Junction-to-Ambient (Free Air Operation), R_{thJA}	62.5°C/W

Note 1. Pulse width limited by safe operating area.

Note 2. Pulse width limited by T_J max, Duty Cycle < 1%.

Note 3. $V_{DD} = 25V$, $I_D = I_{AR}$, Starting $T_J = +175^\circ C$.

Note 4. $T_C = +100^\circ C$, Pulse width limited by T_J max, Duty Cycle < 1%.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF						
Drain–Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	100	–	–	V
Drain–to–Source Leakage Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0$	–	–	1	μA
		$V_{DS} = 80V, V_{GS} = 0V, T_C = +150^\circ\text{C}$	–	–	10	μA
Gate–Source Leakage Forward	I_{GSS}	$V_{GS} = 15V$	–	–	100	nA
Gate–Source Leakage Reverse	I_{GSS}	$V_{GS} = -15V$	–	–	-100	nA
ON (Note 5)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.6	2.5	V
Static Drain–Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 5V, I_D = 10A$	–	0.09	0.12	Ω
On–State Drain Current	$I_{D(on)}$	$V_{DS} > I_{D(on)} \times R_{DS(on)max}, V_{GS} = 10V$	20	–	–	A
Dynamic						
Forward Transconductance	g_{fs}	$V_{DS} > I_{D(on)} \times R_{DS(on)max}, I_D = 10A,$ Note 5	10	16	–	mhos
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$	–	1200	1500	pF
Output Capacitance	C_{oss}		–	250	350	pF
Reverse Transfer Capacitance	C_{rss}		–	60	90	pF
Switching						
Total Gate Charge	Q_g	$V_{GS} = 5V, I_D = 20A, V_{DD} = 80V$	–	22	30	nC
Gate–Source Charge	Q_{gs}		–	6	–	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		–	12	–	nC
Turn–On Delay Time	$t_{d(on)}$	$V_{DD} = 30V, I_D = 10A, R_G = 50\Omega,$ $V_{GS} = 5V$	–	50	70	ns
Rise Time	t_r		–	140	200	ns
Turn–Off Delay Time	$t_{d(off)}$	$V_{DD} = 80V, I_D = 20A, R_G = 50\Omega,$ $V_{GS} = 5V$	–	80	110	ns
Fall Time	t_f		–	80	110	ns
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current	I_S	(Body Diode)	–	–	20	A
Pulse Source Current	I_{SM}	(Body Diode) Note 1	–	–	80	A
Diode Forward Voltage	V_{SD}	$I_{SD} = 20A, V_{GS} = 0V, \text{Note 5}$	–	–	1.5	V
Reverse Recovery Time	t_{rr}	$T_J = +150^\circ\text{C}, V_{DD} = 50V, I_{SD} = 20A,$ $di/dt = 100A/\mu s$	–	130	–	ns
Reverse Recovery Charge	Q_{rr}		–	0.4	–	μC
Reverse Recovery Current	I_{RRM}		–	6	–	A

Note 1. Pulse width limited by safe operating area.

Note 5. Pulse Test: Pulse Width = 300 μs , Duty Cycle = 1.5%.

