

NTE2393 MOSFET N-Channel Enhancement Mode, High Speed Switch

Description:

The NTE2393 is an N-Channel Enhancement Mode Power MOS Field Effect Transistor. Easy drive and very fast switching times make this device ideal for high speed switching applications. Typical applications include switching mode power supplies, uninterruptible power supplies, and motor speed control.

Features:

- High Voltage: 500V for Off-Line SMPS
- High Current: 9A for up to 350W SMPS
- Ultra Fast Switching for Operation at less than 100kHz

Industrial Applications:

- Switching Mode Power Supplies
- Motor Controls

Absolute Maximum Ratings:

Drain-Source Voltage ($V_{GS} = 0$), V_{DS}	500V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$), V_{DGR}	500V
Gate-Source Voltage, V_{GS}	$\pm 20V$
Continuous Drain Current, I_D	
$T_C = +25^\circ C$	9A
$T_C = +100^\circ C$	5.6A
Pulsed Drain Current (Note 1), I_{DM}	36A
Clamped Drain Inductive Current (Note 1), I_{DLM}	36A
Total Dissipation ($T_C = +25^\circ C$), P_{tot}	150W
Derate Above $25^\circ C$	1.2W/ $^\circ C$
Maximum Operating Junction Temperature, T_J	$+150^\circ C$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ C$
Maximum Thermal Resistance, Junction-to-Case, R_{thJC}	0.83 $^\circ C/W$
Maximum Lead Temperature (During Soldering), T_L	$+275^\circ C$

Note 1. Pulse width limited by safe operating area.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Drain–Source Breakdown Voltage	V _{(BR)DSS}	I _D = 250μA, V _{GS} = 0	500	–	–	V
Zero–Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0, V _{DS} = Max Rating	–	–	250	μA
		V _{GS} = 0, V _{DS} = 400V, T _C = +125°C	–	–	1000	μA
Gate–Body Leakage Current	I _{GSS}	V _{DS} = 0, V _{GS} = ±20V	–	–	±100	nA
ON Characteristics (Note 2)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	–	4	V
Static Drain–Source On Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 4.5A	–	–	0.7	Ω
		V _{GS} = 10V, I _D = 4.5A, T _C = 100°C	–	–	1.4	Ω
Dynamic Characteristics						
Forward Transconductance	g _{fs}	V _{DS} = 25V, I _D = 4.5A	5	–	–	mho
Input Capacitance	C _{iss}	V _{DS} = 25V, V _{GS} = 0, f = 1MHz	–	1600	1900	pf
Output Capacitance	C _{oss}		–	–	280	pf
Reverse Transfer Capacitance	C _{rss}		–	–	170	pf
Switching Characteristics						
Turn–On Time	t _{d(on)}	V _{DD} = 250V, I _D = 4.5A, R _I = 4.7Ω, V _I = 10V	–	30	40	ns
Rise Time	t _r		–	40	60	ns
Turn–Off Delay Time	t _{d(off)}		–	130	170	ns
Fall Time	t _f		–	30	40	ns
Source Drain Diode Characteristics						
Source–Drain Current	I _{SD}		–	–	9	A
Source–Drain Current (Pulsed)	I _{SDM}	Note 2	–	–	36	A
Forward ON Voltage	V _{SD}	I _{SD} = 9A, V _{GS} = 0	–	–	1.15	V
Reverse Recovery Time	t _{rr}	I _{DS} = 9A, V _{GS} = 0, di/dt = 100A/μs	–	420	–	ns

Note 2. Pulse width limited by safe operating area.

Note 3. Pulsed: Pulse Duration = $300\mu\text{s}$, Duty Cycle 1.5%

