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NTE2394
MOSFET
N–Channel Enhancement Mode, High Speed Switch

Description:

The NTE2394 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: 450V for Off–Line SMPS
- High Current: 12A 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, Note 1), V_{DS} 500V
Drain–Gate Voltage (R_{GS} = 20kΩ, Note 1), V_{DGR} 500V
Gate–Source Voltage, V_{GS} . . . . . ±20V
Pulsed Drain Current (Note 2), I_{DM} 56A
Clamped Drain Inductive Current (L = 100µH), I_{DLM} 56A
Continuous Drain Current, I_D
T_C = +25°C 14A
T_C = +100°C 8.8A
Total Dissipation (T_C = +25°C), P_{tot} 180W
Derate Above 25°C . . . . . 1.44W/°C
Maximum Operating Junction Temperature, T_J . . . . . +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C

Note 1. T_J = +25° to +125°C

Note 2. Repetitive Rating: Pulse width limited by maximum junction temperature.

Thermal Data:

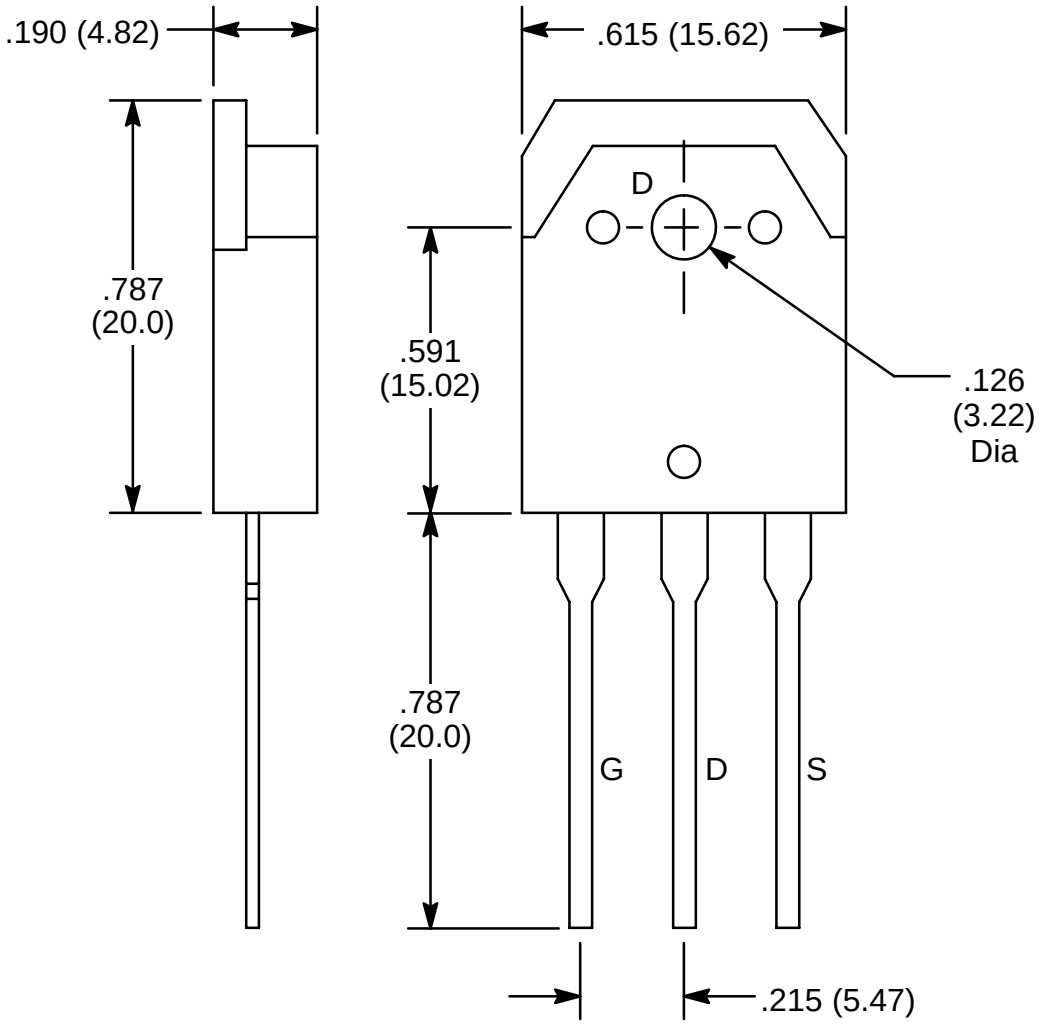
Maximum Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 0.69°C/W
Typical Thermal Resistance, Case–to–Sink, R_{thCS} . . . . . 0.1°C/W
Maximum Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 30°C/W
Maximum Lead Temperature (During Soldering), T_L . . . . . +300°C

Electrical Characteristics: (T_C = +25°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	–	–	±500	nA
ON Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	–	4	V
On–State Drain Current	$I_{D(on)}$	V_{DS} > $I_{D(on)}$ x $R_{DS(on)\ max}$, V_{GS} = 10V	14	–	–	A
Static Drain–Source On Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 7.9A	–	–	0.4	Ω
Dynamic Characteristics						
Forward Transconductance	g_{fs}	V_{DS} > $I_{D(on)}$ x $R_{DS(on)\ max}$, I_D = 7.9A, Note 4	9.3	–	–	mho
Input Capactiance	C_{iss}	V_{DS} = 25V, V_{GS} = 0, f = 1MHz	–	–	3000	pf
Output Capacitance	C_{oss}		–	–	600	pf
Reverse Transfer Capactiance	C_{rss}		–	–	200	pf
Switching Characteristics						
Turn–On Time	$t_{d(on)}$	V_{DD} = 210V, I_D = 7.0A, R_l = 4.7Ω	–	–	35	ns
Rise Time	t_r		–	–	50	ns
Turn–Off Delay Time	$t_{d(off)}$		–	–	150	ns
Fall Time	t_f		–	–	70	ns
Total Gate Charge	Q_g	V_{GS} = 10V, I_D = 13A, V_{DS} = 400V	–	–	120	nC
Source Drain Diode Characteristics						
Source–Drain Current	I_{SD}		–	–	14	A
Source–Drain Current (Pulsed)	I_{SDM}	Note 3	–	–	56	A
Forward ON Voltage	V_{SD}	I_{SD} = 14A, V_{GS} = 0	–	–	1.4	V
Reverse Recovery Time	t_{rr}	I_{DS} = 14A, di/dt = 100A/μs, T_J = +150°C	–	1300	–	ns
Reverse Recovered Charge	Q_{rr}		–	7.4	–	μC

Note 3. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 4. Pulsed: Pulse Duration = 300μs, Duty Cycle 1.5%


.190 (4.82)
.615 (15.62)
D
.787
(20.0)
.591
(15.02)
.126
(3.22)
Dia
.787
(20.0)
G
D
S
.215 (5.47)