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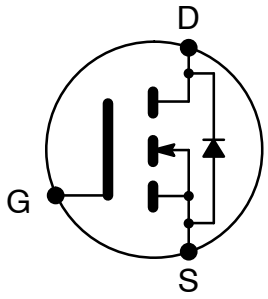
NTE2969
MOSFET
N–Channel, Enhancement Mode
High Speed Switch
TO3P Type Package

Description:

The NTE2969 is an N–channel enhancement mode power field effect transistor in a TO3P type package especially tailored to minimize on–state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. This device is well suited for use in applications such as a high efficiency switch mode power supply or an electronic lamp ballast on half bridge.

Features:

- 30A, 400V, $R_{DS(on)}$ = 0.14± @ V_{GS} = 10V
- Low gate Charge (90nC Typ)
- Low C_{rss} (60pF Typ)
- Fast Switching
- 100% Avalanche Tested
- Improved dv/dt Capability



Absolute Maximum Ratings: (T_C = +25°C unless otherwise specified)

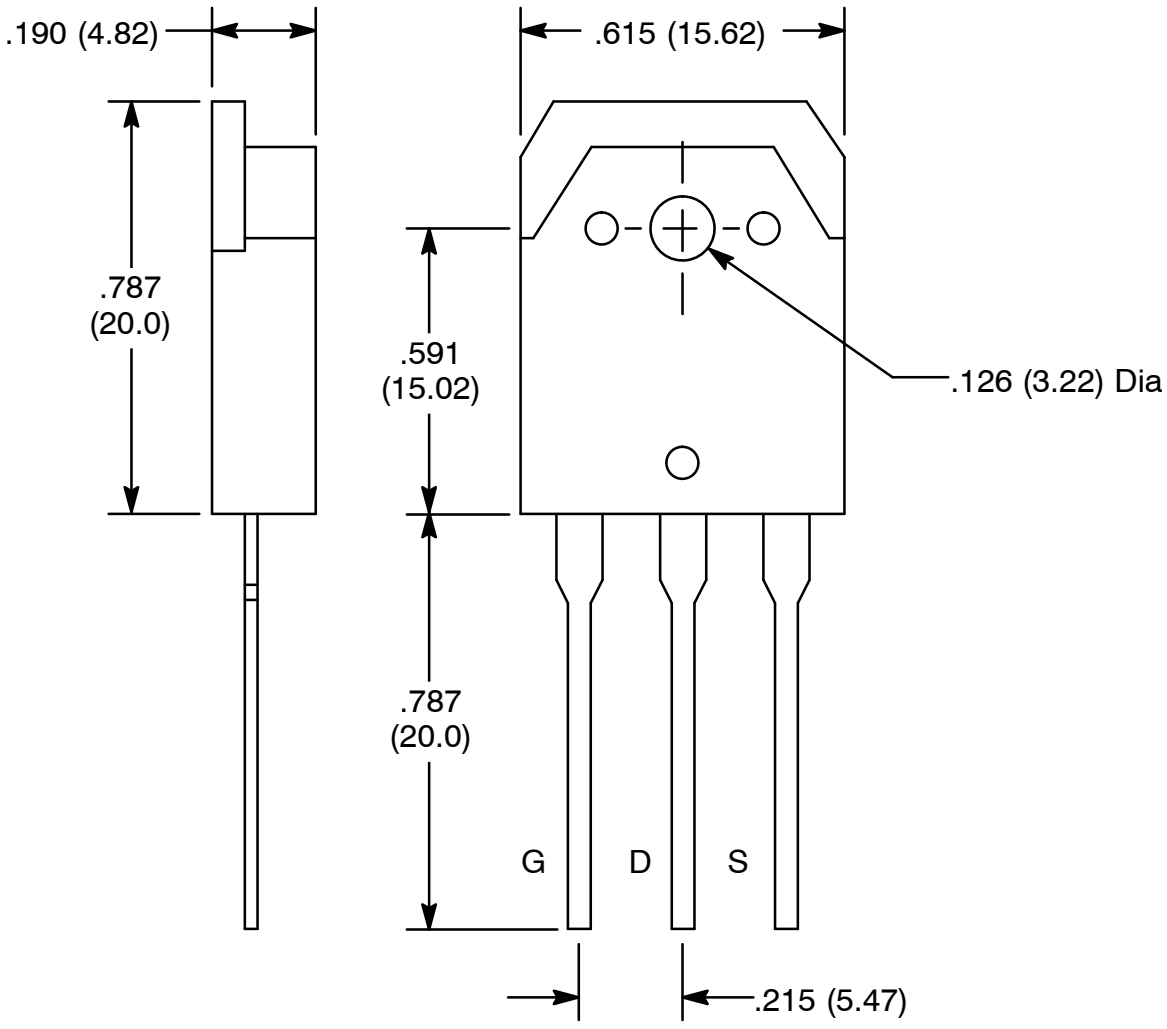
Drain–Source Voltage, V_{DSS} 400V
Drain Current, I_D
  Continuous
    T_C = +25°C 30A
    T_C = +100°C 19A
  Pulsed (Note 1) 120A
Gate–Source Voltage, V_{GS} . . . . . ±30V
Gate Current (Pulsed), I_{GM} . . . . . ±1.5A
Single Pulsed Avalanche Energy (Note 2), E_{AS} 1400mJ
Avalanche Current (Note 1), I_{AS} 30A
Repetitive Avalanche Energy (Note 1), E_{AR} 29mJ
Peak Diode Recovery dv/dt (Note 3), dv/dt 4.5V/ns
Total Power Dissipation (T_C = +25°C), P_D 290W
  Derate Above 25°C . . . . . 2.33W/°C
Operating Junction Temperature Range, T_J . . . . . –55° to +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Maximum Lead Temperature (During Soldering, 1/8” from case, 5sec), T_L . . . . . +300°C
Thermal Resistance:
  Maximum Junction–to–Case, R_{thJC} . . . . . 0.43°C/W
  Typical Case–to–Sink, R_{thCS} . . . . . 0.24°C/W
  Maximum Junction–to–Ambient, R_{thJA} . . . . . 40°C/W

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
Note 2. L = 2.7mH, I_{AS} = 30A, V_{DD} = 50V, R_G = 27± , Starting T_J = +25°C.
Note 3. I_{SD} ≤ 30A, di/dt ≤ 200A/≤s, V_{DD} ≤ BV_{DSS}, Starting T_J = +25°C.

Electrical Characteristics: (T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Drain–Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250≤A	400	–	–	V
Breakdown Voltage Temperature Coefficient	$\Delta BV/\Delta T_J$	I_D = 250≤A, Referenced to +25°C	–	0.4	–	V/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 400V, V_{GS} = 0	–	–	1	≤A
		V_{DS} = 320V, T_C = +125°C	–	–	10	≤A
Gate–Source Leakage Forward	I_{GSSF}	V_{GS} = 30V, V_{DS} = 0V	–	–	100	nA
Gate–Source Leakage Reverse	I_{GSSR}	V_{GS} = –30V, V_{DS} = 0V	–	–	–100	nA
ON Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250≤A	3.0	–	5.0	V
Static Drain–Source ON Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 12.5A	–	0.107	0.14	±
Forward Transconductance	g_{fs}	V_{DS} = 50V, I_D = 15A, Note 4	–	20	–	mhos
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	–	3400	4400	pF
Output Capacitance	C_{oss}		–	580	750	pF
Reverse Transfer Capacitance	C_{rss}		–	60	80	pF
Switching Characteristics						
Turn–On Delay Time	$t_{d(on)}$	V_{DD} = 200V, I_D = 30A, R_G = 25±, Note 4, Note 5	–	80	170	ns
Rise Time	t_r		–	320	650	ns
Turn–Off Delay Time	$t_{d(off)}$		–	190	390	ns
Fall Time	t_f		–	170	350	ns
Total Gate Charge	Q_g	V_{GS} = 10V, I_D = 30A, V_{DS} = 320V, Note 4, Note 5	–	90	120	nC
Gate–Source Charge	Q_{gs}		–	22	–	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		–	46	–	nC
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current	I_S	(Body Diode)	–	–	30	A
Pulse Source Current	I_{SM}	(Body Diode)	–	–	120	A
Diode Forward Voltage	V_{SD}	I_S = 30A, V_{GS} = 0V	–	–	1.5	V
Reverse Recovery Time	t_{rr}	V_{GS} = 0V, I_S = 30A, dI_F/dt = 100A/≤s, Note 4	–	370	–	ns
Reverse Recovery Charge	Q_{rr}		–	3.9	–	≤C

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
Note 4. Pulse Test: Pulse Width ≤ 300≤s, Duty Cycle ≤ 2%.
Note 5. Essentially independent of operating temperature.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