ELECTRONICS, INC.
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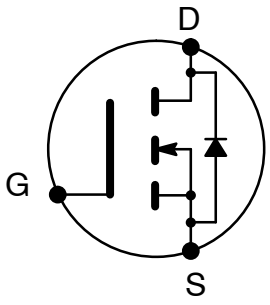
NTE2939
MOSFET
N–Ch, Enhancement Mode
High Speed Switch
TO–220 Full Pack Type Package



Features:

- Low Drain–Source ON Resistance: $R_{DS(ON)}$ = 0.33Ω Typ.
- High Forward Transfer Admittance: $|Y_{fs}|$ = 6.5 S Typ.
- Low Leakage Current: I_{DSS} = 10μA Max. (V_{DS} = 600V)
- Enhancement–Mode: V_{th} = 2.0V to 4.0V (V_{DS} = 10V, I_D = 1mA)

Absolute Maximum Ratings: (T_A = +25°C, Note 1 unless otherwise specified)

Drain–Source Voltage, V_{DSS} 600V
Gate–Source Voltage, V_{GSS} . . . . . ±30
Drain Current (Note 2), I_D
DC 13A
Pulsed 52A
Drain Power Dissipation (T_C = +25°C), P_D 50W
Single Pulse Avalanche Energy (Note 3), E_{AS} 511mJ
Avalanche Current, I_{AR} 13A
Repetitive Avalanche Energy (Note 4), E_{AR} 5mJ
Channel Temperature, T_{ch} . . . . . +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Thermal Resistance, Channel–to–Case, $R_{thCH–C}$ . . . . . 2.5°C/W
Thermal Resistance, Channel–to–Ambient, $R_{thCH–A}$ . . . . . 62.5°C/W

Note 1. Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc. may cause this device to decrease in reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the Absolute Maximum Ratings. This transistor is an electrostatic sensitive device. Please handle with caution.

Note 2. Make sure that the device channel temperature is below +150°C.

Note 3. V_{DD} = 90V, T_{ch} = +25°C (Initial), L = 5.3mH, R_G = 25Ω, I_{AR} = 13A

Note 4. Repetitive rating; pulse width limited by maximum channel temperature.

RoHS 2002/95/EC

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

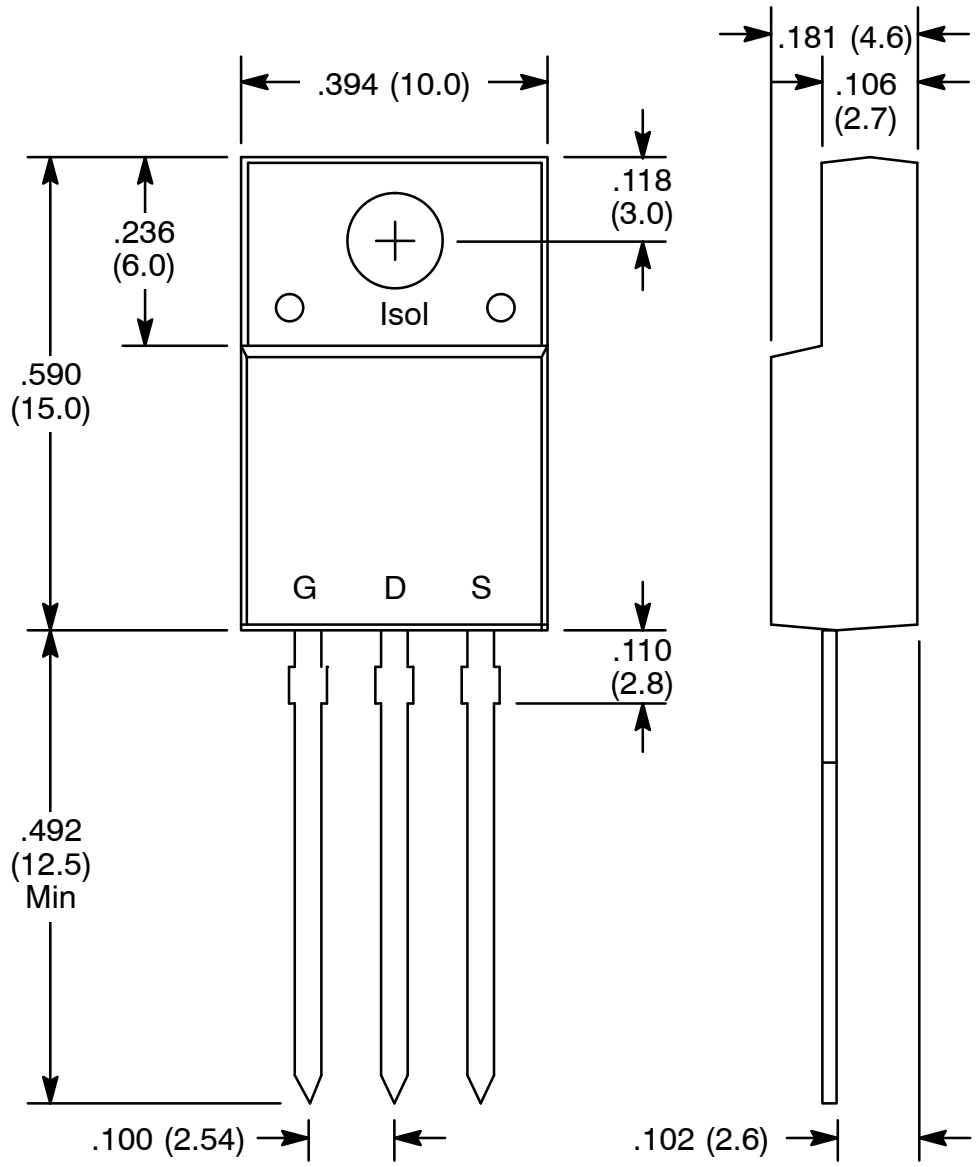
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Gate Leakage Current	I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V	–	–	±1	μA
Drain Cut−Off Current	I_{DSS}	V_{DS} = 600V, V_{GS} = 0V	–	–	10	μA
Drain−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 10mA	600	–	–	V
Gate Threshold Voltage	V_{th}	V_{DS} = 10V, I_D = 1mA	2.0	–	4.0	V
Drain−Source On−Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 6.5A	–	0.33	0.43	Ω
Forward Transfer Admittance	$\|Y_{fs}\|$	V_{DS} = 10V, I_D = 6.5A	1.8	6.5	–	S
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	–	2300	–	pF
Output Capacitance	C_{oss}		–	250	–	pF
Reverse Transfer Capacitance	C_{rss}		–	10	–	pF
Turn−On Delay Time	$t_{d(on)}$	V_{DD} = 200V, I_D = 6.5A, R_L = 30Ω, Note 5	–	100	–	ns
Rise Time	t_r		–	50	–	ns
Turn−Off Delay Time	$t_{d(off)}$		–	140	–	ns
Fall Time	t_f		–	25	–	ns
Total Gate Charge	Q_g	I_D = 13A, V_{DS} = 400V, V_{GS} = 10V	–	40	–	nC
Gate−to−Source Charge	Q_{gs}		–	25	–	nC
Gate−to−Drain (“Miller”) Charge	Q_{gd}		–	15	–	nC

Note 5. Duty Cycle ≤ 1%, t_w = 10μs.

Source−Drain Ratings and Characteristics: (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Drain Reverse Current	I_{DR}	Note 2	–	–	13	A
Pulsed Drain Reverse Current	I_{DRP}	Note 2	–	–	52	A
Diode Forward Voltage	V_{DSF}	I_{DR} = 13A, V_{GS} = 0V	–	–	−1.7	V
Reverse Recovery Time	t_{rr}	I_{DR} = 13A, V_{GS} = 0V, di_{DR}/dt = 100A/μs	–	1600	–	ns
Reverse Recovery Charge	Q_{rr}		–	20	–	μC

Note 2. Make sure that the device channel temperature is below +150°C.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