ELECTRONICS, INC.
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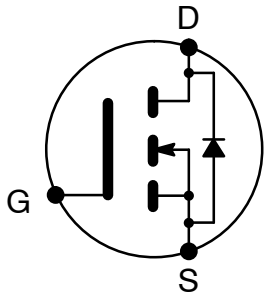
NTE2903
MOSFET
N–Ch, Enhancement Mode
High Speed Switch
TO–220 Full Pack Type Package



Features:

- Low Drain–Source ON Resistance: $R_{DS(ON)}$ = 1.35Ω Typ
- High Forward Transfer Admittance: $|y_{fs}|$ = 3.5S Typ
- Low Leakage Current: I_{DSS} = 100μA (V_{DS} = 500V)
- Enhancement Mode: V_{th} = 2.0 to 4.0V (V_{DS} = 10V, I_D = 1mA)

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

Drain–Source Voltage, V_{DSS} 500V
Drain–Gate Voltage (R_{GS} = 20kΩ), V_{DGR} 500V
Gate–Source Voltage, V_{GSS} . . . . . ±30V
Drain Current (Note 2), I_D
  Continuous 5A
  Pulsed (t = 1ms) 20A
Drain Power Dissipation (T_C = +25°C), P_D 35W
Single Pulse Avalanche Energy (Note 3), E_{AS} 180mJ
Avalanche Current, I_{AR} 5A
Repetitive Avalanche Energy (Note 4), E_{AR} 3.5mJ
Channel Temperature, T_{CH} . . . . . +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Thermal Resistance, Channel–to–Case, R_{thCHC} . . . . . 3.57°C/W
Thermal Resistance, Channel–to–Ambient, R_{thCHA} . . . . . 62.5°C/W

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

Note 2. Ensure that the channel temperature does not exceed +150°C.

Note 3. V_{DD} = 90V, T_{CH} = +25°C (initial), L = 12.2mH, I_{AR} = 5A, R_G = 25Ω.

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

Rev. 9–14

RoHS 2002/95/EC

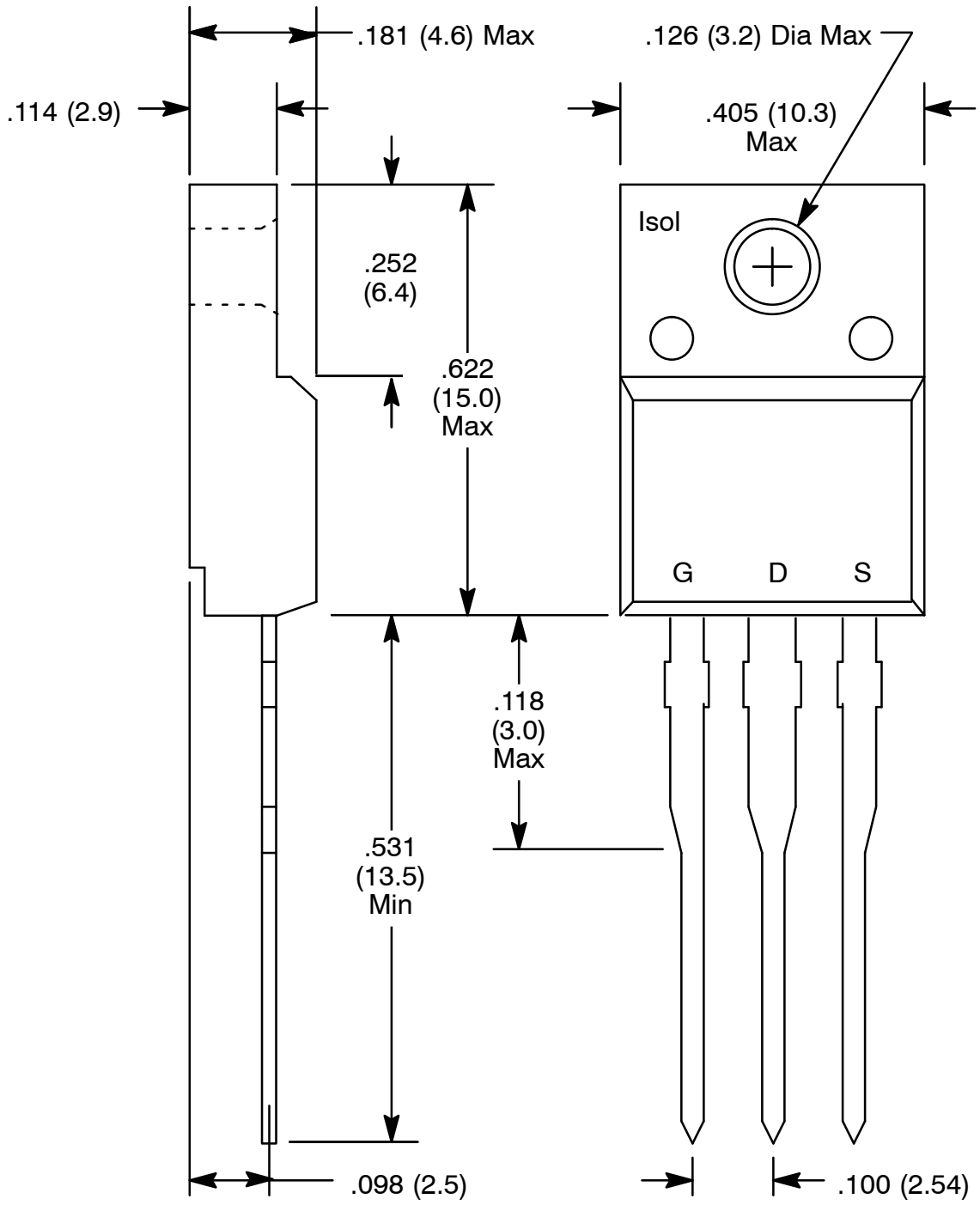
Electrical Characteristics: (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Gate Leakage Current	I_{GSS}	V_{GS} = ±25V, V_{DS} = 0V	–	–	±10	μA
Gate−Source Breakdown Voltage	$V_{(BR)GSS}$	I_G = ±10μA, V_{DS} = 0V	±30	–	–	V
Drain Cut−Off Current	I_{DSS}	V_{DS} = 500V, V_{GS} = 0V	–	–	100	μA
Drain−Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 10mA, V_{GS} = 0V	500	–	–	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = 10V, I_D = 1mA	2.0	–	4.0	V
Drain−Source ON Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 2.5A	–	1.35	1.50	Ω
Forward Transfer Admittance	$\|y_{fs}\|$	V_{DS} = 10V, I_D = 2.5A	1.5	3.5	–	S
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	–	550	–	pF
Output Capacitance	C_{oss}		–	70	–	pF
Reverse Transfer Capacitance	C_{rss}		–	7	–	pF
Turn−On Delay Time	$t_{d(on)}$	$V_{DD} \simeq$ 225V, V_{GS} = 10V, I_D = 2.5A, R_L = 90Ω, Duty ≦ 1%, t_w = 10μs	–	20	–	ns
Rise Time	t_r		–	10	–	ns
Turn−Off Delay Time	$t_{d(off)}$		–	50	–	ns
Fall Time	t_f		–	10	–	ns
Total Gate Charge	Q_g	I_D = 5A, $V_{DD} \simeq$ 400V, V_{GS} = 10V	–	16	–	nC
Gate−Source Charge	Q_{gs}		–	10	–	nC
Gate−Drain (“Miller”) Charge	Q_{gd}		–	6	–	nC

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	–	–	5	A
Pulsed Drain Reverse Current	I_{DRP}	Note 2	–	–	20	A
Diode Forward Voltage	V_{DSF}	I_{DR} = 5A, V_{GS} = 0V	–	–	−1.7	V
Reverse Recovery Time	t_{rr}	I_{DR} = 5A, V_{GS} = 0V, dI_{DR}/dt = 100A/μs	–	1400	–	ns
Reverse Recovery Charge	Q_{rr}		–	9	–	μC

Note 2. Ensure that the channel temperature does not exceed +150°C.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G
D
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(3.0)
Max
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(13.5)
Min
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.100 (2.54)