



ELECTRONICS, INC.  
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## NTE3301 Insulated Gate Bipolar Transistor N-Channel Enhancement Mode, High Speed Switch TO220 Full Pack

**Features:**

- High Input Impedance
- Low Saturation Voltage
- Enhancement Mode
- 20V Gate Drive

**Applications:**

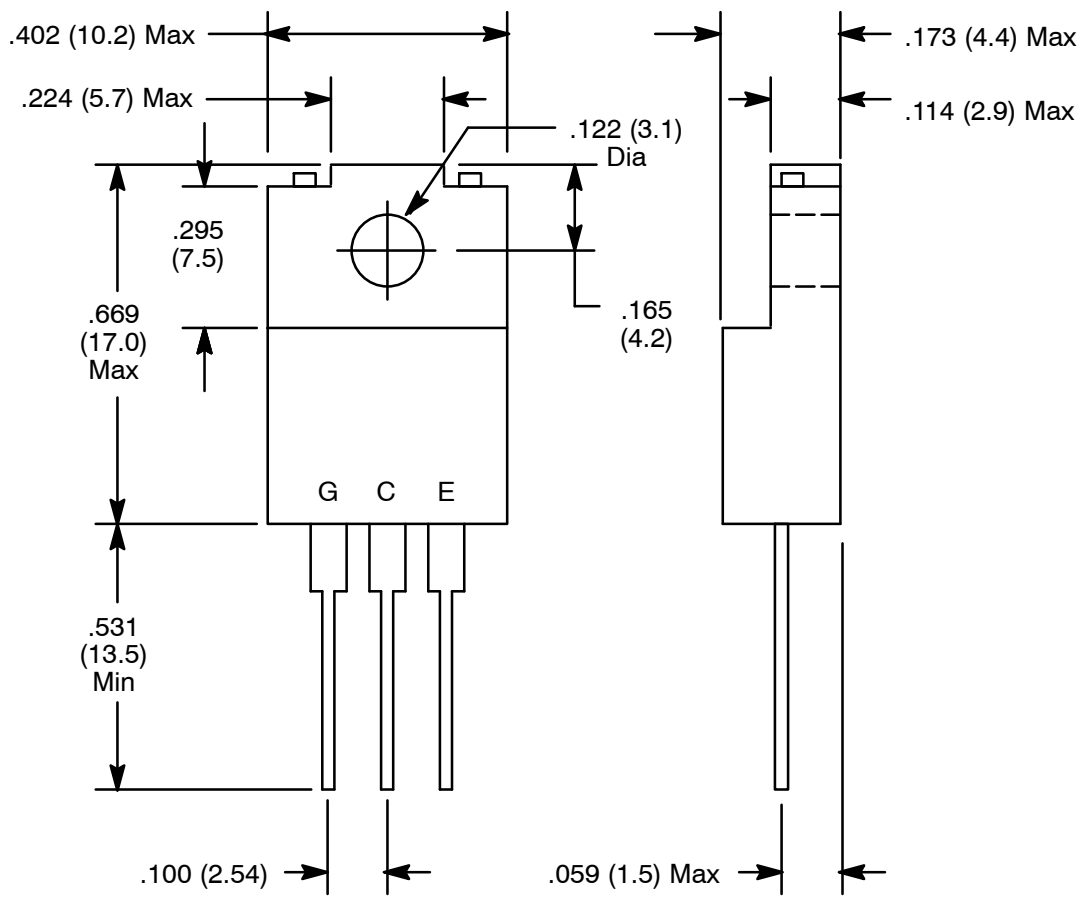
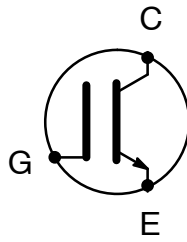
- High Power Switching
- Motor Control

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Collector-Emitter Voltage, $V_{CES}$ .....	400V
Gate-Emitter Voltage, $V_{GES}$ .....	$\pm 25\text{V}$
Collector Current, $I_C$	
DC .....	15A
Pulse (1ms) .....	170A
Collector Power Dissipation, $P_C$	
$T_A = +25^\circ\text{C}$ .....	2W
$T_C = +25^\circ\text{C}$ .....	40W
Operating Junction Temperature, $T_J$ .....	$+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	$3.12^\circ\text{C/W}$
Screw Torque .....	$0.6\text{N}\cdot\text{m}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Gate Leakage Current	$I_{GES}$	$V_{GE} = \pm 25\text{V}, V_{CE} = 0$	-	-	$\pm 100$	nA
Collector Cutoff Current	$I_{CES}$	$V_{CE} = 400\text{V}, V_{GE} = 0$	-	-	1.0	$\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C = 2\text{mA}, V_{GE} = 0$	400	-	-	V
Gate-Emitter Cutoff Voltage	$V_{GE(off)}$	$I_C = 1\text{mA}, V_{CE} = 5\text{V}$	4.0	5.0	7.0	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 170\text{A}, V_{GE} = 20\text{V}$ (Pulsed)	-	5.0	8.0	V
Input Capacitance	$C_{ies}$	$V_{CE} = 10\text{V}, V_{GE} = 0, f = 1\text{MHz}$	-	2000	-	pF
Rise Time	$t_r$	$V_{CC} = 300\text{V}$	-	0.1	0.5	$\mu\text{s}$
Turn-On Time	$t_{on}$		-	0.15	0.50	$\mu\text{s}$
Fall Time	$t_f$		-	4.0	6.0	$\mu\text{s}$
Turn-Off Time	$t_{off}$		-	4.5	7.0	$\mu\text{s}$



**NOTE:** Tab is isolated

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