New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

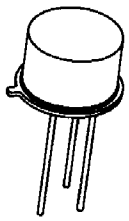
TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

# 2N6901

## ABSOLUTE MAXIMUM RATINGS *($T_C$ = +25°C unless otherwise noted)*

| Parameters / Test Conditions | Symbol | Value | Unit |
|---|---|---|---|
| Drain – Source Voltage | $V_{DS}$ | 100 | Vdc |
| Gate – Source Voltage | $V_{GS}$ | ± 10 | Vdc |
| Continuous Drain Current $T_C$ = +25°C | $I_{D1}$ | 1.69 | Adc |
| Continuous Drain Current $T_C$ = +100°C | $I_{D2}$ | 1.07 | Adc |
| Max. Power Dissipation | $P_{tl}$ | 8.33 (1) | W |
| Drain to Source On State Resistance | $R_{ds(on)}$ | 1.4 (2) | Ω |
| Operating & Storage Temperature | $T_{op}$, $T_{stg}$ | -55 to +150 | °C |

**Note:** (1) Derated Linearly by 0.067 W/°C for $T_C$ > +25°C
(2) $V_{GS}$ = 5Vdc, $I_D$ = 1.07A



**2N6901**

**(formerly TO-39)**

## ELECTRICAL CHARACTERISTICS *($T_A$ = +25°C, unless otherwise noted)*

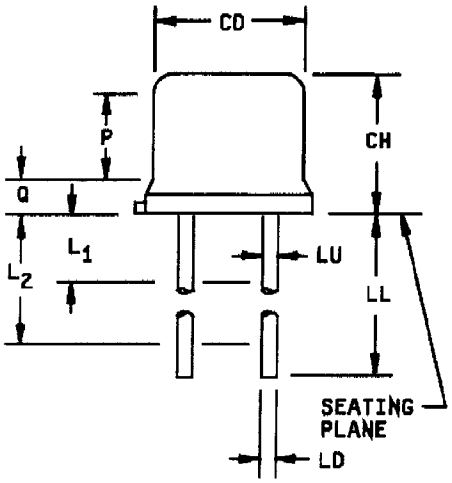
| Parameters / Test Conditions | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| **OFF CHARACTERTICS** | | | | |
| Drain-Source Breakdown Voltage<br>$V_{GS}$ = 0V, $I_D$ = -1mAdc | $V_{(BR)DSS}$ | 100 | | Vdc |
| Gate-Source Voltage (Threshold)<br>$V_{DS} \geq V_{GS}$, $I_D$ = 1.0mA<br>$V_{DS} \geq V_{GS}$, $I_D$ = 1.0mA, $T_j$ = +125°C<br>$V_{DS} \geq V_{GS}$, $I_D$ = 1.0mA, $T_j$ = -55°C | $V_{GS(th)1}$<br>$V_{GS(th)2}$<br>$V_{GS(th)3}$ | 1.0<br>0.5 | 2.0<br><br>3.0 | Vdc |
| Gate Current<br>$V_{GS}$ = ±10V, $V_{DS}$ = 0V<br>$V_{GS}$ = ±10V, $V_{DS}$ = 0V, $T_j$ = +125°C | $I_{GSS1}$<br>$I_{GSS2}$ | | ±100<br>±200 | nAdc |
| Drain Current<br>$V_{GS}$ = 0V, $V_{DS}$ = 80V<br>$V_{GS}$ = 0V, $V_{DS}$ = 80V, $T_j$ = +125°C | $I_{DSS1}$<br>$I_{DSS2}$ | | 1.0<br>50.0 | µAdc<br>uAdc |
| Static Drain-Source On-State Resistance<br>$V_{GS}$ = 5V, $I_D$ = 1.07A pulsed<br><br>$T_j$ = -125°C<br>$V_{GS}$ = 5V, $I_D$ = 1.07A pulsed | $r_{DS(on)1}$<br><br><br>$r_{DS(on)2}$ | | 1.4<br><br><br>2.6 | Ω<br><br><br>Ω |
| Diode Forward Voltage<br>$V_{GS}$ = 0V, $I_D$ = 1.69A pulsed | $V_{SD}$ | 0.8 | 1.6 | Vdc |

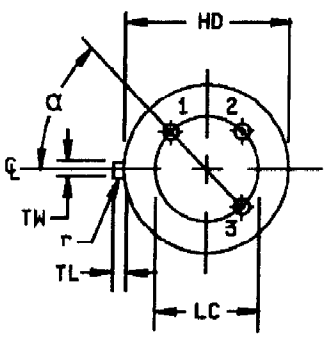
## DYNAMIC CHARACTERISTICS

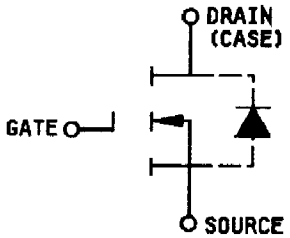
| Parameters / Test Conditions | | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|---|
| Gate Charge:<br>On-State Gate Charge<br>Gate to Source Charge<br>Gate to Drain Charge | $V_{GS}$ = 5V, $I_D$ = 1.69A<br>$V_{DS}$ = 50V | <br>$Q_{g(on)}$<br>$Q_{gs}$<br>$Q_{gd}$ | | <br>5.0<br>1.0<br>2.9 | nC |

## SWITCHING CHARACTERISTICS

| Parameters / Test Conditions | | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|---|
| Switching time tests:<br>Turn-on delay time<br>Rinse time<br>Turn-off delay time<br>Fall time | $I_D$ = 1.69A, $V_{GS}$ = 5Vdc,<br>Gate drive impedance = 25Ω,<br>$V_{DD}$ = 50Vdc | <br>$t_{d(on)}$<br>$t_r$<br>$t_{d(off)}$<br>$t_f$ | | <br>25<br>80<br>45<br>80 | ns |
| Diode Reverse Recovery Time | di/dt ≤ 100A/μs, $V_{DD}$ ≤ 30V,<br>$I_F$ = 1.0A | $t_{rr}$ | | 250 | ns |




SCHEMATIC CIRCUIT

| Symbol | Dimensions | | | | |
|---|---|---|---|---|---|
| | Inches | | Millimeters | | |
| | Min | Max | Min | Max | |
| CD | .305 | .335 | 7.75 | 8.51 | |
| CH | .160 | .180 | 4.07 | 4.57 | |
| HD | .335 | .370 | 8.51 | 9.40 | |
| LC | .200 TP | | 5.08 TP | | |
| LD | .016 | .021 | 0.41 | 0.53 | 8,9 |
| LL | .500 | .750 | 12.70 | 19.05 | 8,9 |
| LU | .016 | .019 | 0.41 | 0.48 | 8,9 |
| L1 | | .050 | | 1.27 | 8,9 |
| L2 | .250 | | 6.35 | | 8,9 |
| P | .100 | | 2.54 | | 6 |
| Q | | .050 | | 1.27 | 5 |
| TL | .029 | .045 | 0.74 | 1.14 | 4 |
| TW | .028 | .034 | 0.71 | 0.86 | 3 |
| r | | .010 | | 0.25 | 10 |
| α | 45° TP | | 45° TP | | 6 |