

## N-CHANNEL LOGIC LEVEL MOSFET

Qualified per MIL-PRF-19500/570

DEVICES

**2N6901**

LEVELS  
**JAN**  
**JANTX**  
**JANTXV**

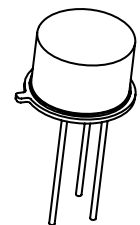
### ABSOLUTE MAXIMUM RATINGS ( $T_C = +25^\circ\text{C}$ unless otherwise noted)

Parameters / Test Conditions	Symbol	Value	Unit
Drain – Source Voltage	$V_{DS}$	100	Vdc
Gate – Source Voltage	$V_{GS}$	$\pm 10$	Vdc
Continuous Drain Current $T_C = +25^\circ\text{C}$	$I_{D1}$	1.69	A <sub>dc</sub>
Continuous Drain Current $T_C = +100^\circ\text{C}$	$I_{D2}$	1.07	A <sub>dc</sub>
Max. Power Dissipation	$P_{tl}$	8.33 <sup>(1)</sup>	W
Drain to Source On State Resistance	$R_{ds(on)}$	1.4 <sup>(2)</sup>	$\Omega$
Operating & Storage Temperature	$T_{op}, T_{stg}$	-55 to +150	$^\circ\text{C}$

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

### ELECTRICAL CHARACTERISTICS ( $T_A = +25^\circ\text{C}$ , unless otherwise noted)

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS</b>				
Drain-Source Breakdown Voltage $V_{GS} = 0\text{V}$ , $I_D = -1\text{mA}_{dc}$	$V_{(BR)DSS}$	100		Vdc
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}$ , $I_D = 1.0\text{mA}$ $V_{DS} \geq V_{GS}$ , $I_D = 1.0\text{mA}$ , $T_j = +125^\circ\text{C}$ $V_{DS} \geq V_{GS}$ , $I_D = 1.0\text{mA}$ , $T_j = -55^\circ\text{C}$	$V_{GS(th)1}$ $V_{GS(th)2}$ $V_{GS(th)3}$	1.0 0.5	2.0 3.0	Vdc
Gate Current $V_{GS} = \pm 10\text{V}$ , $V_{DS} = 0\text{V}$ $V_{GS} = \pm 10\text{V}$ , $V_{DS} = 0\text{V}$ , $T_j = +125^\circ\text{C}$	$I_{GSS1}$ $I_{GSS2}$		$\pm 100$ $\pm 200$	nA <sub>dc</sub>
Drain Current $V_{GS} = 0\text{V}$ , $V_{DS} = 80\text{V}$ $V_{GS} = 0\text{V}$ , $V_{DS} = 80\text{V}$ , $T_j = +125^\circ\text{C}$	$I_{DSS1}$ $I_{DSS2}$		1.0 50.0	$\mu\text{A}_{dc}$ uA <sub>dc</sub>
Static Drain-Source On-State Resistance $V_{GS} = 5\text{V}$ , $I_D = 1.07\text{A}$ pulsed	$r_{DS(on)1}$		1.4	$\Omega$
$T_j = -125^\circ\text{C}$ $V_{GS} = 5\text{V}$ , $I_D = 1.07\text{A}$ pulsed	$r_{DS(on)2}$		2.6	$\Omega$
Diode Forward Voltage $V_{GS} = 0\text{V}$ , $I_D = 1.69\text{A}$ pulsed	$V_{SD}$	0.8	1.6	Vdc



**2N6901**  
**TO-205AF**  
 (formerly TO-39)

SEE FIGURE 1

## DYNAMIC CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Gate Charge:				
On-State Gate Charge	$Q_{g(on)}$		5.0	nC
Gate to Source Charge	$Q_{gs}$		1.0	
Gate to Drain Charge	$Q_{gd}$		2.9	

$V_{GS} = 5V, I_D = 1.69A$   
 $V_{DS} = 50V$

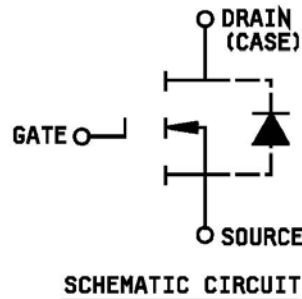
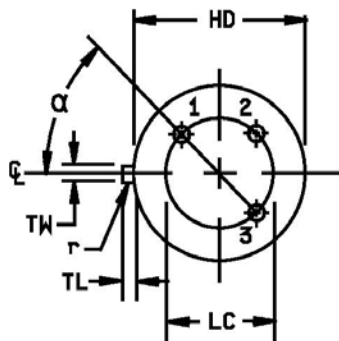
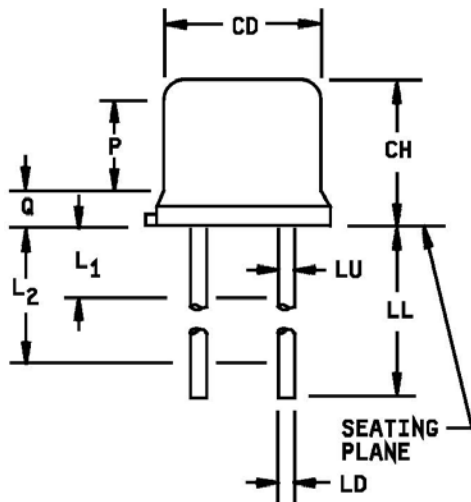
## SWITCHING CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Switching time tests:				
Turn-on delay time	$t_{d(on)}$		25	ns
Rinse time	$t_r$		80	
Turn-off delay time	$t_{d(off)}$		45	
Fall time	$t_f$		80	
Diode Reverse Recovery Time	$t_{rr}$		250	ns

$I_D = 1.69A, V_{GS} = 5Vdc,$   
 Gate drive impedance =  $25\Omega,$   
 $V_{DD} = 50Vdc$

$di/dt \leq 100A/\mu s, V_{DD} \leq 30V,$   
 $I_F = 1.0A$

## PACKAGE DIMENSIONS



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
$\alpha$	45° TP		45° TP		6

### NOTE:

- Dimensions are in inches.
- Millimeters are given for general information only.
- Beyond radius(r) maximum, TW shall be held for a minimum length of .011 (0.28 mm).
- Dimension TL measured from maximum HD.
- Outline in this zone is not controlled.
- Dimension CD shall not vary more than .010 (0.25 mm) in zone P. This zone is controlled for automatic handling.
- Leads at gauge plane  $.054 +.001, -.000$  (1.37 +0.03, -0.00 mm) below seating plane shall be within .007 (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC.
- LU applies between L1 and L2. LD applies between L2 and LL minimum. Diameter is uncontrolled in L1 and beyond LL minimum.
- All three leads.
- Radius(r) applies to both inside corners of tab.
- Drain is electrically connected to the case.
- Pin out: 1 - source, 2 - gate, 3 - drain (case).
- In accordance with ASME Y14.5M, diameters are equivalent to  $\phi x$  symbology.

**FIGURE 1.** Physical dimensions for TO-205 AF