

## N-CHANNEL MOSFET

Qualified per MIL-PRF-19500/543

### DEVICES

**2N6770 2N6770T1**

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

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

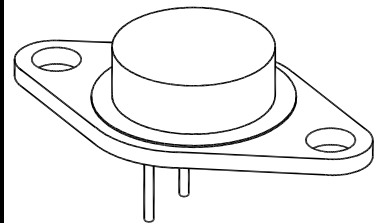
Parameters / Test Conditions	Symbol	Value	Unit
Drain – Source Voltage	$V_{DS}$	500	Vdc
Gate – Source Voltage	$V_{GS}$	$\pm 20$	Vdc
Continuous Drain Current $T_C = +25^\circ\text{C}$	$I_{D1}$	12	Adc
Continuous Drain Current $T_C = +100^\circ\text{C}$	$I_{D2}$	7.75	Adc
Max. Power Dissipation $T_C = +25^\circ\text{C}$	$P_{tl}$	150 <sup>(1)</sup>	W
Drain to Source On State Resistance	$R_{ds(on)}$	0.4 <sup>(2)</sup>	$\Omega$
Operating & Storage Temperature	$T_{op}, T_{stg}$	-55 to +150	$^\circ\text{C}$

**Note:** (1) Derated Linearly by 1.2 W/ $^\circ\text{C}$  for  $T_C > +25^\circ\text{C}$

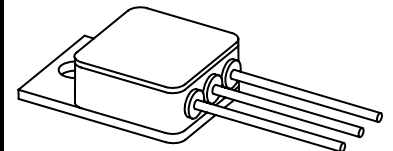
(2)  $V_{GS} = 10\text{Vdc}$ ,  $I_D = 7.75\text{A}$

### 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 $V_{GS} = 0\text{V}$ , $I_D = 1\text{mA}$	$V_{(BR)DSS}$	500		Vdc
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}$ , $I_D = 0.25\text{mA}$ $V_{DS} \geq V_{GS}$ , $I_D = 0.25\text{mA}$ , $T_j = +125^\circ\text{C}$ $V_{DS} \geq V_{GS}$ , $I_D = 0.25\text{mA}$ , $T_j = -55^\circ\text{C}$	$V_{GS(th)1}$ $V_{GS(th)2}$ $V_{GS(th)3}$	2.0 1.0	4.0 5.0	Vdc
Gate Current $V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$ $V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$ , $T_j = +125^\circ\text{C}$	$I_{GSS1}$ $I_{GSS2}$		$\pm 100$ $\pm 200$	nAdc
Drain Current $V_{GS} = 0\text{V}$ , $V_{DS} = 400\text{V}$ $V_{GS} = 0\text{V}$ , $V_{DS} = 500\text{V}$ , $T_j = +125^\circ\text{C}$ $V_{GS} = 0\text{V}$ , $V_{DS} = 400\text{V}$ , $T_j = +125^\circ\text{C}$	$I_{DSS1}$ $I_{DSS2}$ $I_{DSS3}$		25 1.0 0.25	$\mu\text{Adc}$ mAdc mAdc
Static Drain-Source On-State Resistance $V_{GS} = 10\text{V}$ , $I_{D2} = 7.75\text{A}$ pulsed $V_{GS} = 10\text{V}$ , $I_{D1} = 12\text{A}$ pulsed $T_j = +125^\circ\text{C}$ $V_{GS} = 10\text{V}$ , $I_{D2} = 7.75\text{A}$ pulsed	$r_{DS(on)1}$ $r_{DS(on)2}$ $r_{DS(on)3}$		0.4 0.5 0.88	$\Omega$ $\Omega$ $\Omega$
Diode Forward Voltage $V_{GS} = 0\text{V}$ , $I_{D1} = 12\text{A}$ pulsed	$V_{SD}$		1.7	Vdc



**2N6770**  
**TO-204AA (TO-3)**



**2N6770T1 (TO-254AA)**

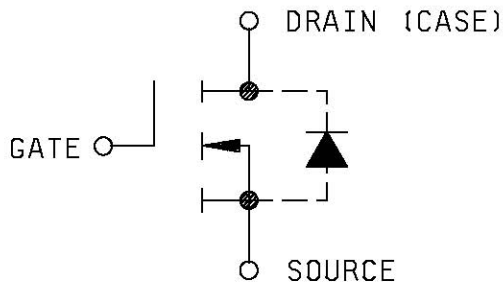
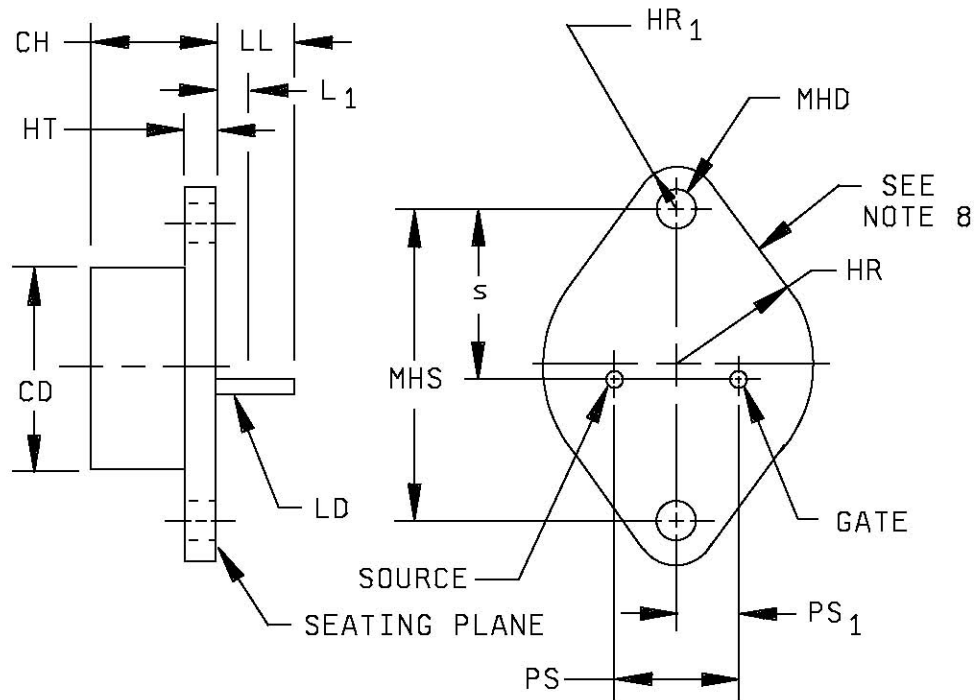
## DYNAMIC CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Gate Charge:				
On-State Gate Charge	$Q_{g(on)}$		120	nC
Gate to Source Charge	$Q_{gs}$		19	
Gate to Drain Charge	$Q_{gd}$		70	

## SWITCHING CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Switching time tests:				
Turn-on delay time	$t_{d(on)}$		35	ns
Rinse time	$t_r$		190	
Turn-off delay time	$t_{d(off)}$		170	
Fall time	$t_f$		130	
Diode Reverse Recovery Time	$t_{rr}$		1600	ns

**PACKAGE DIMENSIONS**



CIRCUIT SCHEMATIC



## PACKAGE DIMENSIONS

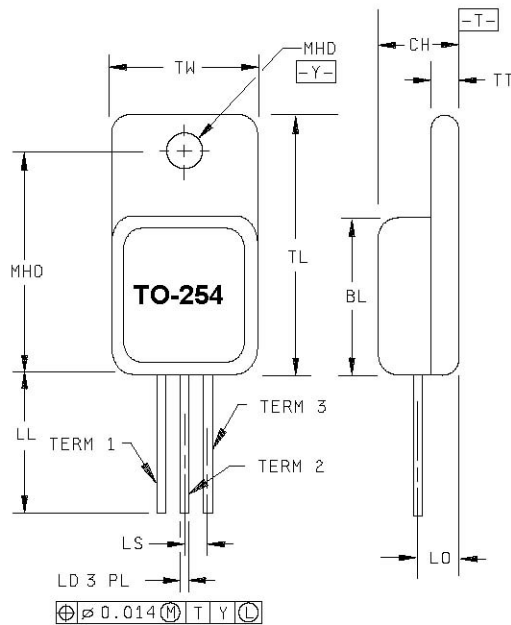
Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.23	
CH	.250	.360	6.35	9.15	
HR	.495	.525	12.57	13.3	
HR <sub>1</sub>	.131	.188	3.33	4.78	
HT	.060	.135	1.52	3.43	
LD	.057	.063	1.45	1.60	5
	.038	.043	0.97	1.10	6
LL	.312	.500	7.92	12.70	
L <sub>1</sub>		.050		1.27	3
MHD	.151	.161	3.84	4.09	7
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	
PS <sub>1</sub>	.205	.225	5.21	5.72	
S	.655	.675	16.64	17.15	

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. These dimensions shall be measured at points .050 inch (1.27 mm) and .055 inch (1.40 mm) below the seating plane. When gauge is not used, measurement will be made at the seating plane.
4. The seating plane of the header shall be flat within .001 inch (0.03 mm) concave to .004 inch (0.10 mm) convex inside a .930 inch (23.62 mm) diameter circle on the center of the header and flat within .001 inch (0.03 mm) concave to .006 inch (0.15 mm) convex overall.
5. These dimensions pertain to the 2N6764 and 2N6766 types.
6. These dimensions pertain to the 2N6768 and 2N6770 types.
7. Mounting holes shall be deburred on the seating plane side.
8. Drain is electrically connected to the case.
9. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi$ x symbology.

**FIGURE 1.** Physical dimensions of transistor types 2N6764 and 2N6766 TO-204AE;  
for types 2N6768 and 2N6770, TO-204AA

## PACKAGE DIMENSIONS



Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
BL	.535	.545	13.59	13.84	
CH	.249	.260	6.32	6.60	
LD	.035	.045	0.89	1.14	
LL	.510	.570	12.95	14.48	
LO	.150 BSC		3.81 BSC		3, 4
LS	.150 BSC		3.81 BSC		
MHD	.139	.149	3.53	3.78	
MHO	.665	.685	16.89	17.40	
TL	.790	.800	20.07	20.32	
TT	.040	.050	1.02	1.27	
TW	.535	.545	13.59	13.84	
Term 1	Drain				
Term 2	Source				
Term 3	Gate				

**NOTES:**

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Protrusion thickness of ceramic eyelets included in dimension LL.
4. All terminals are isolated from case.
5. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi x$  symbology.

**FIGURE 2.** Physical dimensions for 2N6764T1, 2N6766T1, 2N6768T1, and 2N6770T1 (TO-254AA).