

## PNP POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/441

**DEVICES**

**2N3740      2N3741**

**LEVELS**

**JAN  
 JANTX  
 JANTXV  
 JANS**

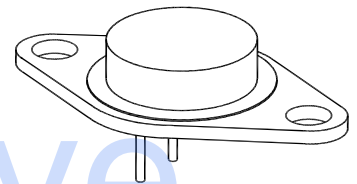
**ABSOLUTE MAXIMUM RATINGS ( $T_C = +25^\circ\text{C}$  unless otherwise noted)**

Parameters / Test Conditions	Symbol	2N3740	2N3741	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	80	Vdc
Collector-Base Voltage	$V_{CBO}$	60	80	Vdc
Emitter-Base Voltage	$V_{EBO}$	7.0		Vdc
Base Current	$I_B$	2.0		Adc
Collector Current	$I_C$	4.0		Adc
Total Power Dissipation @ $T_A = +25^\circ\text{C}$ <sup>(1)</sup> @ $T_C = +100^\circ\text{C}$	$P_T$	25 14		W
Operating & Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200		$^\circ\text{C}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	7.0		$^\circ\text{C/W}$

**Note:** (1) Derate linearly @ 143 mW/ $^\circ\text{C}$  for  $T_C > +25^\circ\text{C}$

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

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage $I_C = 100\text{mAdc}$	$V_{(BR)CEO}$	60 80		Vdc
Collector-Emitter Cutoff Current $V_{CE} = 40\text{Vdc}$ $V_{CE} = 60\text{Vdc}$	$I_{CEO}$		10 10	$\mu\text{Adc}$
Collector-Emitter Cutoff Current $V_{CE} = 60\text{Vdc}, V_{BE} = 1.5\text{Vdc}$ $V_{CE} = 80\text{Vdc}, V_{BE} = 1.5\text{Vdc}$	$I_{CEX}$		300 300	$\eta\text{Adc}$
Collector-Base Cutoff Current $V_{CB} = 60\text{Vdc}$ $V_{CB} = 80\text{Vdc}$	$I_{CBO}$		100 100	$\eta\text{Adc}$
Emitter-Base Cutoff Current $V_{EB} = 7.0\text{Vdc}$	$I_{EBO}$		100	$\eta\text{Adc}$



**TO-66 (TO-213AA)**

\* See Appendix A for Package Outline

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

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>ON CHARACTERISTICS <sup>(2)</sup></b>				
Forward-Current Transfer Ratio $I_C = 100\text{mA}$ , $V_{CE} = 1.0\text{Vdc}$ $I_C = 250\text{mA}$ , $V_{CE} = 1.0\text{Vdc}$ $I_C = 500\text{mA}$ , $V_{CE} = 1.0\text{Vdc}$ $I_C = 1.0\text{A}$ , $V_{CE} = 1.0\text{Vdc}$ $I_C = 4.0\text{A}$ , $V_{CE} = 5.0\text{Vdc}$	$h_{FE}$	40 30 20 10 3.0	120	
Collector-Emitter Saturation Voltage $I_C = 250\text{mA}$ , $I_B = 25\text{mA}$ $I_C = 1.0\text{A}$ , $I_B = 125\text{mA}$	$V_{CE(sat)}$		0.4 0.6	Vdc
Base-Emitter Voltage $I_C = 250\text{mA}$ , $V_{CE} = 1.0\text{Vdc}$	$V_{BE(on)}$		1.0	Vdc

## DYNAMIC CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 100\text{mA}$ , $V_{CE} = 10\text{Vdc}$ , $f = 5.0\text{MHz}$	$ h_{fe} $	1.0	12	
Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 50\text{mA}$ , $V_{CE} = 10\text{Vdc}$ , $f = 1.0\text{kHz}$	$h_{fe}$	25	250	
Output Capacitance $V_{CB} = 10\text{Vdc}$ , $I_E = 0$ , $100\text{kHz} \leq f \leq 1.0\text{MHz}$	$C_{obo}$		100	pF

## SWITCHING CHARACTERISTICS

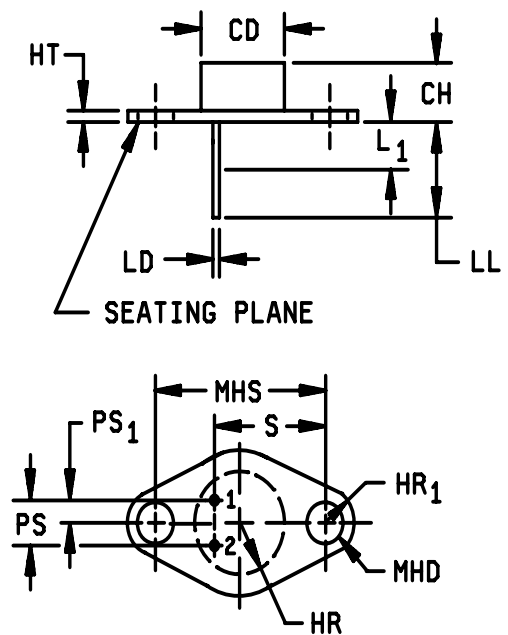
Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Turn-On Time $V_{CC} = 30\text{Vdc}$ ; $I_C = 1.0\text{A}$ ; $I_B = 0.1\text{A}$	$t_{on}$		400	$\mu\text{s}$
Turn-Off Time $V_{CC} = 30\text{Vdc}$ ; $I_C = 1.0\text{A}$ ; $I_{B1} = I_{B2} = 0.1\text{A}$	$t_{off}$		1.0	$\mu\text{s}$

## SAFE OPERATING AREA

<b>DC Tests</b>	
$T_C = +25^\circ\text{C}$ , 1 Cycle, $t = 1.0\text{s}$	
<b>Test 1</b>	
$V_{CE} = 6.25\text{Vdc}$ , $I_C = 4.0\text{A}$	
<b>Test 2</b>	
$V_{CE} = 20\text{Vdc}$ , $I_C = 1.25\text{A}$	
<b>Test 3</b>	
$V_{CE} = 50\text{Vdc}$ , $I_C = 150\text{mA}$	2N3740
$V_{CE} = 65\text{Vdc}$ , $I_C = 150\text{mA}$	2N3741

(2) Pulse Test: Pulse Width =  $300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

## PACKAGE DIMENSIONS



Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.620		15.75	9
CH	.250	.340	6.35	8.64	
HT	.050	.075	1.27	1.91	
HR		.350		8.89	
HR <sub>1</sub>	.115	.145	2.92	3.68	5
LD	.028	.034	0.71	0.86	4, 8, 9
LL	.360	.500	9.14	12.70	4, 8
L <sub>1</sub>		.050		1.27	4, 8
MHD	.142	.152	3.61	3.86	6, 9
MHS	.958	.962	24.33	24.43	
PS	.190	.210	4.83	5.33	3
PS <sub>1</sub>	.093	.107	2.36	2.72	3
S	.570	.590	14.48	14.99	3

**NOTES:**

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. These dimensions should be measured at points .050 to .055 inch (1.27 to 1.40 mm) below seating plane. When gauge is not used, measurement will be made at seating plane.
4. Both terminals.
5. At both ends.
6. Two holes.
7. The collector shall be electrically connected to the case.
8. LD applies between L1 and LL. Lead diameter shall not exceed twice LD within L1.
9. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi$  symbology.
10. Lead 1 is the emitter, lead 2 is the base, collector is the case.

**FIGURE 1.** Physical dimensions, TO-66 (2N3740, 2N3741)