

# 2N5679 & 2N5680



## PNP Silicon Amplifier

Rev. V6

### Features

- JAN, JANTX and JANTXV per MIL-PRF-19500/582
- TO-39 (TO-205AD) Package
- Ideal for General Purpose Amplifier and Switching Applications Where High Voltages are Required



### Electrical Characteristics ( $T_A = +25^\circ\text{C}$ unless otherwise noted)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	$I_C = -10 \text{ mA dc}$ , 2N5679 $I_C = -10 \text{ mA dc}$ , 2N5680	$V_{(BR)CEO}$	V dc	-100 -120	—
Collector - Emitter Cutoff Current	$V_{CE} = -70 \text{ V dc}$ , 2N5679 $V_{CE} = -80 \text{ V dc}$ , 2N5680	$I_{CEO}$	$\mu\text{A dc}$	—	-10 -10
Collector - Emitter Cutoff Current	$V_{CE} = -100 \text{ V dc}$ , $V_{BE} = +1.5 \text{ Vdc}$ , 2N5679 $V_{CE} = -120 \text{ V dc}$ , $V_{BE} = +1.5 \text{ Vdc}$ , 2N5680	$I_{CEX1}$	nA dc	—	-100 -100
Collector - Base Cutoff Current	$V_{CE} = -100 \text{ V dc}$ , 2N5679 $V_{CE} = -120 \text{ V dc}$ , 2N5680	$I_{CBO}$	nA dc	—	-100 -100
Emitter - Base Cutoff Current	$V_{BE} = -4.0 \text{ V dc}$	$I_{EBO}$	$\mu\text{A dc}$	—	-1.0
Forward Current Transfer Ratio	$I_C = -250 \text{ mA dc}$ , $V_{CE} = -2.0 \text{ V dc}$ $I_C = -500 \text{ mA dc}$ , $V_{CE} = -2.0 \text{ V dc}$ $I_C = -1.0 \text{ A dc}$ , $V_{CE} = -2.0 \text{ V dc}$	$h_{FE}$	-	40 20 5	150
Collector - Emitter Saturation Voltage	$I_C = -250 \text{ mA dc}$ , $I_B = -25 \text{ mA dc}$ $I_C = -500 \text{ mA dc}$ , $I_B = -50 \text{ mA dc}$	$V_{CE(sat)1}$ $V_{CE(sat)2}$	V dc	—	-0.6 -1.0
Emitter - Base Saturation Voltage	$I_C = -250 \text{ mA dc}$ , $I_B = -25 \text{ mA dc}$ $I_C = -500 \text{ mA dc}$ , $I_B = -50 \text{ mA dc}$	$V_{BE(sat)1}$ $V_{BE(sat)2}$	V dc	—	-1.1 -1.3
Collector - Emitter Cutoff Current	$T_A = +150^\circ\text{C}$ $V_{CE} = -100 \text{ V dc}$ , $V_{BE} = +1.5 \text{ Vdc}$ , 2N5679 $V_{CE} = -120 \text{ V dc}$ , $V_{BE} = +1.5 \text{ Vdc}$ , 2N5680	$I_{CEX2}$	mA dc	—	-1.0 -1.0
Forward Current Transfer Ratio	$T_A = -55^\circ\text{C}$ $I_C = -250 \text{ mA dc}$ , $V_{CE} = -2.0 \text{ V dc}$	$h_{FE4}$	-	20	
<b>Dynamic Characteristics</b>					
Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = -0.1 \text{ A dc}$ , $V_{CE} = -10 \text{ V dc}$ , $f = 10 \text{ MHz}$	$ h_{FE} $	-	3	
Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = -0.2 \text{ A dc}$ , $V_{CE} = -1.5 \text{ V dc}$ , $f = 1.0 \text{ kHz}$	$h_{fe}$	-	40	
Open Circuit Output Capacitance	$V_{CB} = -20 \text{ V dc}$ , $I_E = 0$ , $f = 1 \text{ MHz}$	$C_{obo}$	pF	—	50

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### Absolute Maximum Ratings ( $T_A = +25^\circ\text{C}$ unless otherwise noted)

Ratings	Symbol	Value
Collector - Emitter Voltage 2N5679 2N5680	$V_{CEO}$	-100 V dc -120 V dc
Collector - Base Voltage 2N5679 2N5680	$V_{CBO}$	-100 V dc -120 V dc
Emitter - Base Voltage	$V_{EBO}$	-4.0 V dc
Base Current	$I_B$	-0.5 A dc
Collector Current	$I_C$	-1.0 A dc
Total Power Dissipation @ $T_A = +25^\circ\text{C}$ <sup>(1)</sup> @ $T_C = +25^\circ\text{C}$ <sup>(2)</sup>	$P_T$	1.0 W 10 W
Operating & Storage Temperature Range	$T_J, T_{STG}$	-65°C to +200°C

(1) Derate linearly 5.7 mW/°C for  $T_A > +25^\circ\text{C}$ .

(2) Derate linearly 57mW/°C for  $T_C > +25^\circ\text{C}$ .

### Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	17.5°C

### Safe Operating Area

DC Tests:	$T_C = +25^\circ\text{C}$ , 1 Cycle, $t \geq 0.5$ s
Test 1:	$I_C = -1.0$ A dc, $V_{CE} = -2$ V dc
Test 2:	$I_C = -1.0$ A dc, $V_{CE} = -10$ V dc
Test 3:	$I_C = -50$ mA dc, $V_{CE} = -90$ V dc

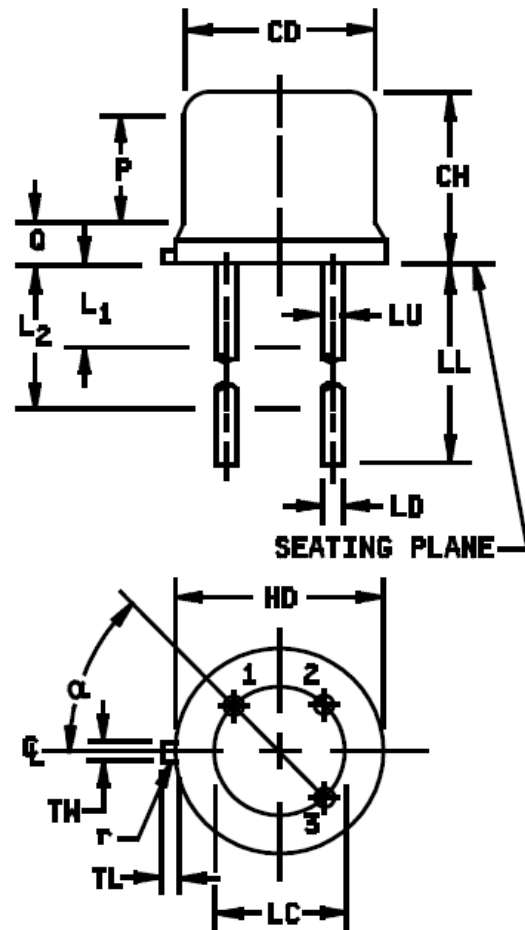
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### Outline Drawing (TO-39)

Symbol (see note 3)	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	0.305	.335	7.75	8.51	
CH	0.240	.260	6.10	6.60	
HD	0.335	.370	8.51	9.39	
LC	0.200 BSC		5.08 BSC		9
LD	0.016	0.021	0.41	0.53	9, 10
LL	0.500	0.750	12.70	19.05	10, 11
LU	0.016	0.019	0.41	0.48	10, 11
L <sub>1</sub>		0.050		1.27	10, 11
L <sub>2</sub>	0.250		6.35		10, 11
P	0.100		2.54		8
Q		0.050		1.27	7
r		0.010		0.25	12
TL	0.029	0.045	0.74	1.14	6
TW	0.028	0.034	0.72	0.86	5
α	45° BSC				9
Term 1	Emitter				
Term 2	Base				
Term 3	Collector				



#### NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Refer to applicable symbol list.
4. Lead number 1 is the emitter, lead number 2 is the base, lead number 4 is omitted from this outline. The collector is number 3 and is electrically connected to the case.
5. Beyond r (radius) max, TW shall be held for a minimum length of .011 inch (0.28 mm).
6. TL measured from maximum HD.
7. Outline in this zone is not controlled.
8. CD shall not vary more than .010 inch (0.25 mm) in zone P. This zone is controlled for automatic handling.
9. Leads at gauge plane .054 + .001 - .000 inch (1.37 +0.03 - 0.00 mm) below seating plane shall be within .007 inch (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC.
10. LU applies between L<sub>1</sub> and L<sub>2</sub>. LD applies between L<sub>2</sub> and LL minimum. Diameter is uncontrolled in L<sub>1</sub> and beyond LL minimum.
11. All three leads.
12. r (radius) applies to both inside corners of tab.
13. In accordance with ASME Y14.5M, diameters are equivalent to φx symbology.

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