

## PNP Darlington Power Silicon Transistors

Rev. V1

### Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/501
- TO-3 (TO-204AA) Package



### Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Off Characteristics</b>					
Collector - Emitter Breakdown Voltage	$I_C = 10 \text{ mAdc}$ , 2N6051 $I_C = 10 \text{ mAdc}$ , 2N6052	$V_{(BR)CEO}$	Vdc	80 100	—
Collector - Emitter Cutoff Current	$V_{CE} = 40 \text{ Vdc}$ , 2N6051 $V_{CE} = 50 \text{ Vdc}$ , 2N6052	$I_{CEO}$	mAdc	—	1
Collector - Emitter Cutoff Current	$V_{CE} = 80 \text{ Vdc}$ , $V_{BE} = 1.5 \text{ Vdc}$ , 2N6051 $V_{CE} = 100 \text{ Vdc}$ , $V_{BE} = 1.5 \text{ Vdc}$ , 2N6052	$I_{CEX}$	mAdc	—	0.5
Collector - Base Cutoff Current	$V_{EB} = 5 \text{ Vdc}$	$I_{EBO}$	mAdc	—	2.0
<b>On Characteristics<sup>1</sup></b>					
Forward Current Transfer Ratio	$I_C = 1 \text{ Adc}$ , $V_{CE} = 3 \text{ Vdc}$ $I_C = 6 \text{ Adc}$ , $V_{CE} = 3 \text{ Vdc}$ $I_C = 12 \text{ Adc}$ , $V_{CE} = 3 \text{ Vdc}$	$h_{FE}$	-	1000 1000 150	18000
Collector - Emitter Saturation Voltage	$I_C = 12 \text{ Adc}$ , $I_B = 120 \text{ mAdc}$ $I_C = 6 \text{ Adc}$ , $I_B = 24 \text{ mAdc}$	$V_{CE(SAT)}$	Vdc	—	3.0 2.0
Base - Emitter Saturation Voltage	$I_C = 12 \text{ Adc}$ , $I_B = 120 \text{ mAdc}$	$V_{BE(SAT)}$	Vdc	—	4.0
Base - Emitter Voltage	$I_C = 6 \text{ Adc}$ , $V_{CE} = 3 \text{ Vdc}$	$V_{BE}$	Vdc	—	2.8
<b>Dynamic Characteristics</b>					
Magnitude of Common Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 5 \text{ Adc}$ , $V_{CE} = 3 \text{ Vdc}$ , $f = 1 \text{ MHz}$	$ h_{FE} $	-	10	250
Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 5 \text{ Adc}$ , $V_{CE} = 3 \text{ Vdc}$ , $f = 1 \text{ kHz}$	$h_{FE}$	-	1000	—
Output Capacitance	$V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	$C_{OBO}$	pF	—	300
<b>Switching Characteristics</b>					
Turn-On Time	$V_{CC} = 30 \text{ Vdc}$ ; $I_C = 5 \text{ Adc}$ ; $I_B = 20 \text{ mAdc}$	$T_{ON}$	$\mu\text{s}$	—	2
Turn-Off Time	$V_{CC} = 30 \text{ Vdc}$ ; $I_C = 5 \text{ Adc}$ ; $I_B = 20 \text{ mAdc}$	$T_{OFF}$	$\mu\text{s}$	—	10
<b>Safe Operating Area</b>					
DC Tests:	$T_C = +25^\circ\text{C}$ , $+10^\circ\text{C}$ , 1 Cycle, $t \geq 1\text{s}$ ; 1 cycle				
Test 1:	$V_{CE} = 12.5 \text{ Vdc}$ , $I_C = 12 \text{ Adc}$				
Test 2:	$V_{CE} = 30 \text{ Vdc}$ , $I_C = 5 \text{ Adc}$				
Test 3:	$V_{CE} = 70 \text{ Vdc}$ , $I_C = 200 \text{ mAdc}$ , 2N6051				
	$V_{CE} = 90 \text{ Vdc}$ , $I_C = 155 \text{ mAdc}$ , 2N6052				

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

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### Absolute Maximum Ratings

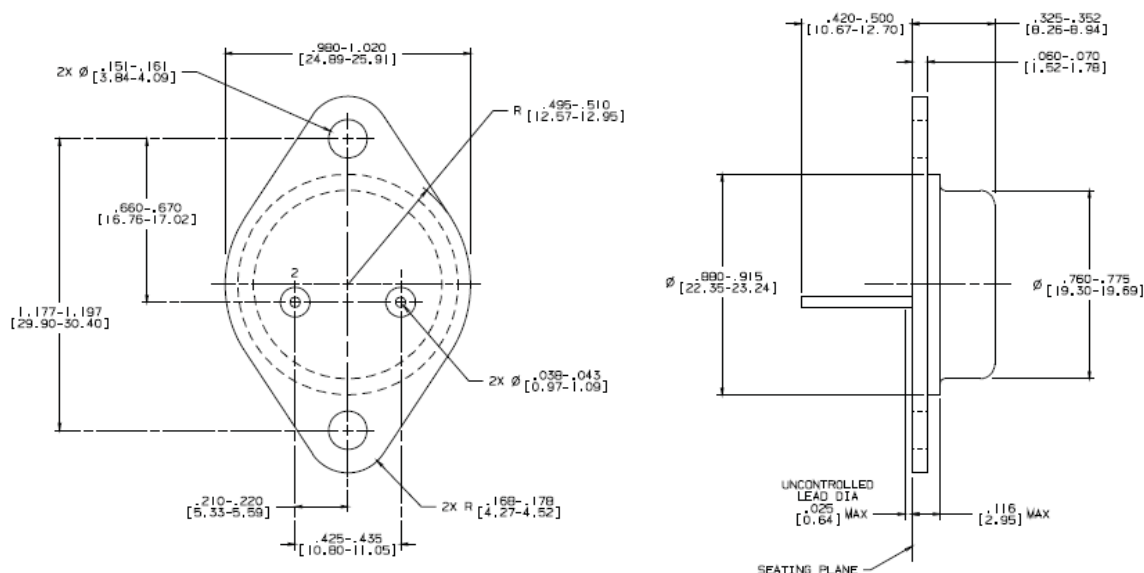
Ratings	Symbol	Value
Collector - Emitter Voltage 2N6051 2N6052	$V_{CEO}$	80 Vdc 100 Vdc
Collector - Base Voltage 2N6051 2N6052	$V_{CBO}$	80 Vdc 100 Vdc
Emitter - Base Voltage	$V_{EBO}$	5 Vdc
Collector Current	$I_C$	12 Adc
Base Current	$I_B$	0.2 Adc
Total Power Dissipation @ $T_A = +25^\circ\text{C}$ @ $T_C = +100^\circ\text{C}$	$P_T$	150 W 75 W
Operating & Storage Temperature Range	$T_{OP}, T_{STG}$	$-55^\circ\text{C}$ to $+175^\circ\text{C}$

2. Derate linearly @ 1 W/°C for  $T_C > +25^\circ\text{C}$ .

### Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1°C/W

### Outline Drawing



**NOTES:**

1. STANDARD HEADER TYPE SOLID BASE.
2. STANDARD LEAD FINISH PER MIL-M-38510 TYPE X OR EQUIVALENT.
3. LEAD NOT BENT GREATER THAN 15°.
4. DIMENSIONS BASED ON JEDEC STANDARD TO-3 PUBLICATION 95, PA

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