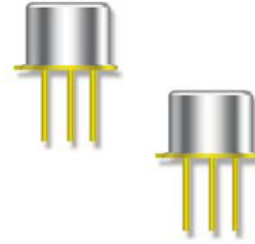


## PNP Power Silicon Transistor

Rev. V1

### Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/545
- TO-5 Package: 2N3867, 2N3868
- TO-39 (TO-205AD) Package: 2N3867S, 2N3868S



### Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Off Characteristics</b>					
Collector - Base Breakdown Voltage	$I_C = 100 \mu\text{Adc}$ , 2N3867, 2N3867S $I_C = 100 \mu\text{Adc}$ , 2N3868, 2N3868S	$V_{(BR)CEO}$	Vdc	40 60	—
Collector - Emitter Breakdown Voltage	$I_C = 20 \text{ mAdc}$ , 2N3867, 2N3867S $I_C = 20 \text{ mAdc}$ , 2N3868, 2N3868S	$V_{(BR)CEO}$	Vdc	40 60	—
Emitter - Base Breakdown Voltage	$I_C = 100 \text{ mAdc}$	$V_{(BR)EBO}$	Vdc	40	—
Collector - Emitter Cutoff Current	$V_{EB} = 2 \text{ Vdc}$ , $V_{CE} = 40 \text{ Vdc}$ , 2N3867, 2N3867S $V_{EB} = 2 \text{ Vdc}$ , $V_{CE} = 60 \text{ Vdc}$ , 2N3868, 2N3868S	$I_{CEX}$	$\mu\text{Adc}$	—	1.0 1.0
Collector - Base Cutoff Current	$V_{CB} = 60 \text{ Vdc}$ , 2N3867, 2N3867S $V_{CB} = 80 \text{ Vdc}$ , 2N3868, 2N3868S	$I_{CEO}$	$\mu\text{Adc}$	—	100
Emitter - Base Cutoff Current	$V_{EB} = 4.0 \text{ Vdc}$	$I_{EBO}$	$\mu\text{Adc}$	—	100
<b>On Characteristics<sup>1</sup></b>					
Forward Current Transfer Ratio	$I_C = 500 \text{ mAdc}$ , $V_{CE} = 1 \text{ Vdc}$ , 2N3867, 2N3867S 2N3868, 2N3868S $I_C = 1.5 \text{ Adc}$ , $V_{CE} = 2 \text{ Vdc}$ , 2N3867, 2N3867S 2N3868, 2N3868S $I_C = 2.5 \text{ Adc}$ , $V_{CE} = 3 \text{ Vdc}$ , 2N3867, 2N3867S 2N3868, 2N3868S $I_C = 3.0 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ , All Types	$H_{FE}$	-	50 35 40 30 25 20 20	— — 200 150 — — —
Collector - Emitter Saturation Voltage	$I_C = 500 \text{ mAdc}$ , $I_B = 50 \text{ mAdc}$ $I_C = 1.5 \text{ Adc}$ , $I_B = 150 \text{ mAdc}$ $I_C = 2.5 \text{ Adc}$ , $I_B = 250 \text{ mAdc}$	$V_{CE(SAT)}$	Vdc	—	0.50 0.75 1.50
Base - Emitter Saturation Voltage	$I_C = 500 \text{ mAdc}$ , $I_B = 50 \text{ mAdc}$ $I_C = 1.5 \text{ Adc}$ , $I_B = 150 \text{ mAdc}$ $I_C = 2.5 \text{ Adc}$ , $I_B = 250 \text{ mAdc}$	$V_{BE(SAT)}$	Vdc	—	1.0 1.4 2.0

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

(Continued next page)

## PNP Power Silicon Transistor

Rev. V1

### Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Dynamic Characteristics</b>					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 100 \text{ mAdc}$ , $V_{CE} = 5.0 \text{ Vdc}$ , $f = 20 \text{ MHz}$	$ h_{FE} $	-	3	12
Output Capacitance	$V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	$C_{OBO}$	pF	—	120
Input Capacitance	$V_{CB} = 3 \text{ Vdc}$ , $I_E = 0$ , $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	$C_{IBO}$	pF	—	800
<b>Switching Characteristics</b>					
Delay Time	$V_{CC} = -30 \text{ Vdc}$ , $V_{EB} = 0$	$T_D$	ns	—	35
Rise Time	$I_C = 1.5 \text{ Adc}$ , $I_{B1} = 150 \text{ mAdc}$	$T_R$	ns	—	65
Storage Time	$V_{CC} = -30 \text{ Vdc}$ , $V_{EB} = 0$	$T_S$	ns	—	500
Fall Time	$I_C = 1.5 \text{ Adc}$ , $I_{B1} = 150 \text{ mAdc}$	$T_F$	ns	—	100
Turn-On Time	$V_{CC} = 30$ , $I_C = 1.5 \text{ Adc}$ , $I_B = 150 \text{ mAdc}$	$T_{ON}$	ns	—	100
Turn-Off Time	$V_{CC} = 30$ , $I_C = 1.5 \text{ Adc}$ , $I_B = 150 \text{ mAdc}$	$T_{OFF}$	ns	—	100
<b>Safe Operating Area</b>					
DC Tests:	$T_C = +25^\circ\text{C}$ , 1 Cycle, $t = 1.0 \text{ s}$				
Test 1:	$V_{CE} = 3.3 \text{ Vdc}$ , $I_C = 3 \text{ Adc}$				
Test 2:	$V_{CE} = 40 \text{ Vdc}$ , $I_C = 160 \text{ mAdc}$ , 2N3867, 2N3867S				
Test 3:	$V_{CE} = 60 \text{ Vdc}$ , $I_C = 80 \text{ mAdc}$ , 2N3868, 2N3868S				

### Absolute Maximum Ratings

Ratings	Symbol	Value
Collector - Emitter Voltage 2N3867, 2N3867S 2N3868, 2N3868S	$V_{CEO}$	40 Vdc 60 Vdc
Collector - Base Voltage 2N3867, 2N3867S 2N3868, 2N3868S	$V_{CBO}$	40 Vdc 60 Vdc
Emitter - Base Voltage	$V_{EBO}$	4 Vdc
Collector Current	$I_C$	3 Adc
Total Power Dissipation @ $T_A = 25^\circ\text{C}^2$ @ $T_C = 25^\circ\text{C}^3$	$P_T$	1 W 10 W
Operating & Storage Temperature Range	$T_{OP}$ , $T_{STG}$	-55°C to +200°C

- Derate linearly 5.71 mW / °C for  $T_A > +25^\circ\text{C}$ .
- Derate linearly 57.1 mW / °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/W

2

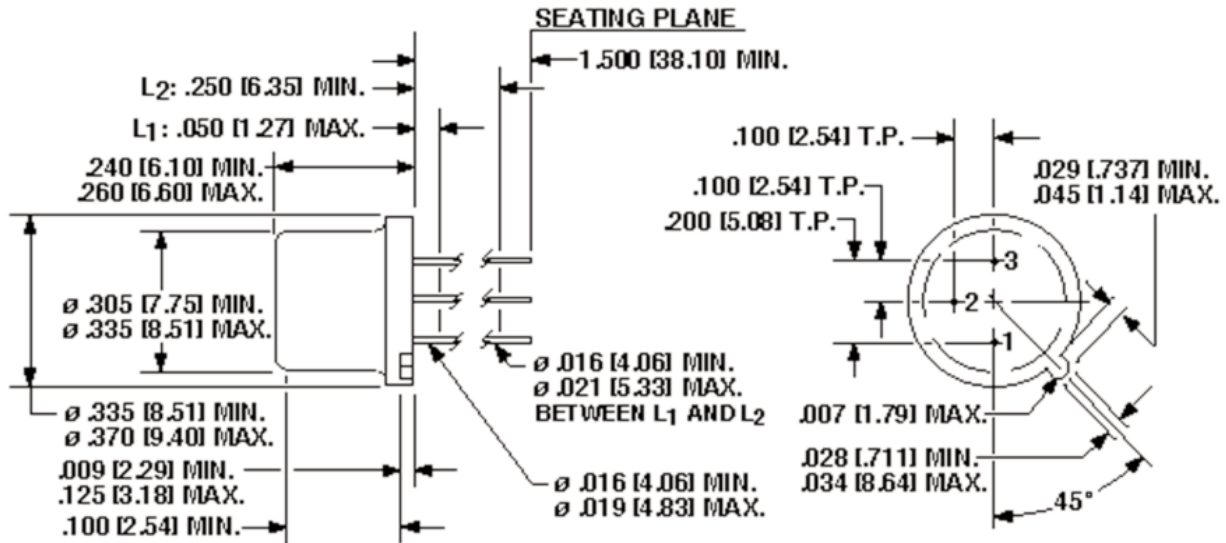
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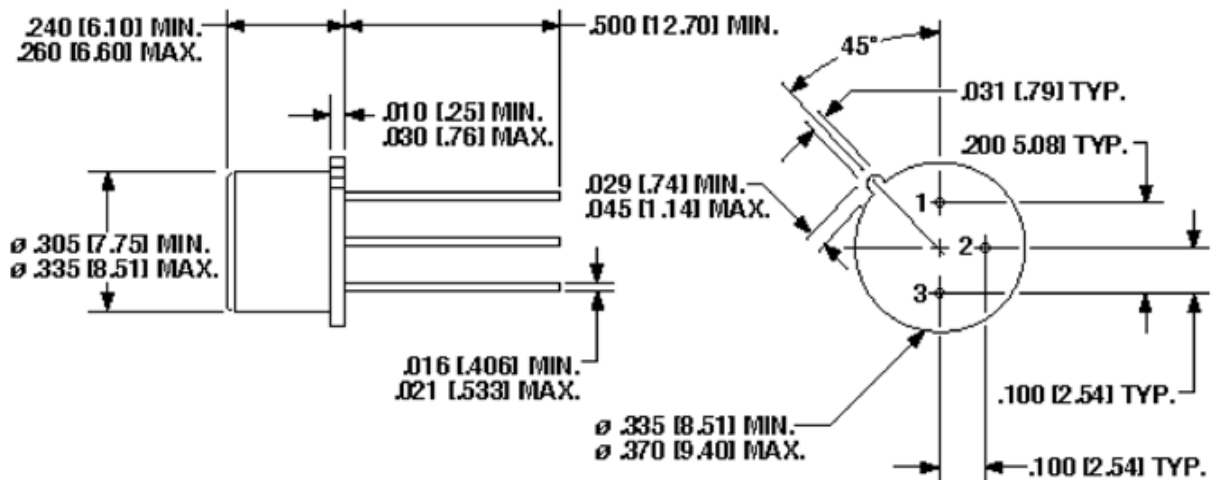
## Outline Drawings

### TO-5 Package (2N3867S, 2N3868S)



Dimensions are in inches.

### TO-39 (TO-205AD) Package (2N3867, 2N3868)



Dimensions are in inches.

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