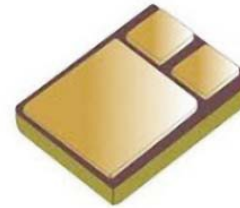


## NPN Power Silicon Transistor

Rev. V1

### Features

- JANS and JANSR Qualified to MIL-PRF-19500/544
- JEDEC Registered 2N5153
- Lightweight & Low Power
- Ideal for Space, Military, and Other High Reliability Applications
- Surface Mount U3 Package



### Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Off Characteristics</b>					
Collector - Emitter Breakdown Voltage	$I_C = 100 \text{ mAdc}, I_B = 0$	$V_{(BR)CEO}$	Vdc	80	—
Emitter - Base Cutoff Current	$V_{EB} = 4.0 \text{ Vdc}, I_C = 0$ $V_{EB} = 5.5 \text{ Vdc}, I_C = 0$	$I_{EBO}$	$\mu\text{Adc}$ mAdc	—	1.0 1.0
Collector - Emitter Cutoff Current	$V_{CE} = 60 \text{ Vdc}, V_{BE} = 0$ $V_{CE} = 100 \text{ Vdc}, V_{BE} = 0$	$I_{CES}$	$\mu\text{Adc}$ mAdc	—	1.0 1.0
Collector - Emitter Cutoff Current	$V_{CE} = 40 \text{ Vdc}, I_B = 0$	$I_{CEO}$	$\mu\text{Adc}$	—	50
<b>On Characteristics<sup>1</sup></b>					
Forward Current Transfer Ratio	$I_C = 50 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 2.5 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 5.0 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$	$H_{FE}$	-	50 70 40	— 200 —
Collector - Emitter Saturation Voltage	$I_C = 2.5 \text{ Adc}, I_B = 250 \text{ mAdc}$ $I_C = 5.0 \text{ Adc}, I_B = 500 \text{ mAdc}$	$V_{CE(SAT)}$	Vdc	—	0.75 1.50
Emitter - Base Voltage Non-Saturation	$I_C = 2.5 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$	$V_{BE(ON)}$	Vdc	—	1.45
Emitter - Base Saturation Voltage	$I_C = 2.5 \text{ Adc}, I_B = 250 \text{ mAdc}$ $I_C = 5.0 \text{ Adc}, I_B = 500 \text{ mAdc}$	$V_{BE(SAT)}$	Vdc	—	1.45 2.20
<b>Dynamic Characteristics</b>					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 500 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}, f = 10 \text{ mHz}$	$ H_{FE} $	-	7	—
Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 100 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}, f = 10 \text{ mHz}$	$H_{FE}$	-	50	—
Output Capacitance	$V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 1 \text{ MHz}$	$C_{OBO}$	pF	—	250
<b>Switching Characteristics</b>					
Turn-On Time	$I_C = 5.0 \text{ Adc}; I_{B1} = 500 \text{ mAdc}$	$T_{ON}$	$\mu\text{s}$	—	0.5
Turn-Off Time	$R_L = 6 \Omega$	$T_{OFF}$	$\mu\text{s}$	—	1.5
Storage Time	$I_{B2} = -500 \text{ mAdc}$	$T_S$	$\mu\text{s}$	—	1.4
Fall Time	$V_{BE(OFF)} = 3.7 \text{ Vdc}$	$T_f$	$\mu\text{s}$	—	0.5
<b>Safe Operating Area</b>					
DC Tests:	$T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$				
Test 1:	$V_{CE} = 5.8 \text{ Vdc}, I_C = 2.0 \text{ Adc}$				
Test 2:	$V_{CE} = 32 \text{ Vdc}, I_C = 360 \text{ mAdc}$				
Test 3:	$V_{CE} = 80 \text{ Vdc}, I_C = 14.5 \text{ mAdc}$				

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

**Absolute Maximum Ratings**<sup>2,3</sup>

Ratings	Symbol	Value
Collector - Emitter Voltage	$V_{CEO}$	80 Vdc
Collector - Base Voltage	$V_{CBO}$	100 Vdc
Emitter - Base Voltage	$V_{EBO}$	5.5 Vdc
Collector Current	$I_C$	2 Adc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$	$P_T$	1.16 W 100 W
Operating & Storage Temperature Range	$T_{OP}, T_{STG}$	$-65^\circ\text{C}$ to $+200^\circ\text{C}$

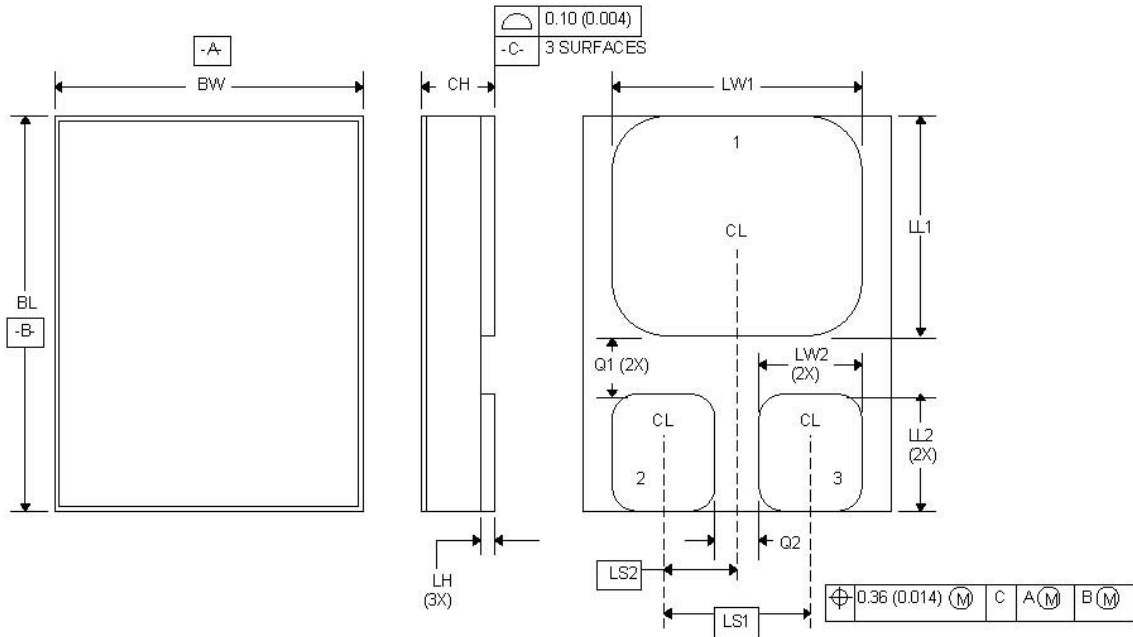
2. Derate linearly 5.7 mW/°C for  $T_A > +25^\circ\text{C}$

3. Derate linearly 571 mW/°C for  $T_A > +25^\circ\text{C}$

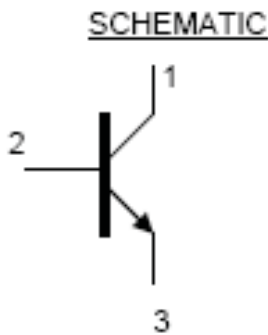
**Thermal Characteristics**

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.75°C/W

### Outline Drawing (U3)



1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi$ x symbology.
4. Terminal 1 - collector, terminal 2 - base, terminal 3 - emitter.



Ltr	Dimensions			
	Inches		Millimeters	
	Min.	Max.	Min.	Max.
BL	0.395	0.405	10.03	10.29
BW	0.291	0.301	7.40	7.65
CH	0.1085	0.1205	2.76	3.06
LH	0.010	0.020	0.25	0.51
LW <sub>1</sub>	0.281	0.291	7.14	7.39
LW <sub>2</sub>	0.090	0.100	2.29	2.54
LL <sub>1</sub>	0.220	0.230	5.59	5.84
LL <sub>2</sub>	0.115	0.125	2.92	3.18
LS <sub>1</sub>	0.150 BSC		3.81 BSC	
LS <sub>2</sub>	0.075 BSC		1.91 BSC	
Q <sub>1</sub>	0.030		0.762	
Q <sub>2</sub>	0.030		0.762	

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