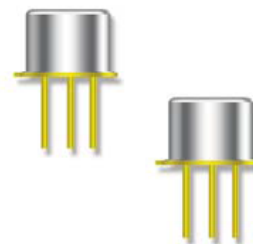


NPN Power Silicon Transistor

Rev. V1

Features

- Available in commercial, JAN, JANTX, JANTXV, JANS and JANSR 100K rads (Si) per MIL-PRF-19500/545
- TO-5 Package: 2N5151L, 2N5153L
- TO-39 (TO-205AD) Package: 2N5151, 2N5153



Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Off Characteristics					
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}	μAdc 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}	μAdc mAdc	—	1.0 1.0
Collector - Emitter Cutoff Current	$V_{CE} = 40 \text{ Vdc}$, $I_B = 0$	I_{CEO}	μAdc	—	50
On Characteristics					
Forward Current Transfer Ratio	$I_C = 50 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$ 2N5151	H_{FE}	-	20	—
	2N5153			50	—
	$I_C = 2.5 \text{ Adc}$, $V_{CE} = 5.0 \text{ Vdc}$ 2N5151			30	90
	2N5153			70	200
	$I_C = 5.0 \text{ Adc}$, $V_{CE} = 5.0 \text{ Vdc}$ 2N5151			20	—
	2N5153			40	—
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	$I_C = 2.5 \text{ Adc}$, $V_{CE} = 5 \text{ Vdc}$	$V_{BE(ON)}$	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
Dynamic Characteristics					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 500 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 10 \text{ mHz}$ 2N5151 2N5153	$ H_{FE} $	-	6 7	—
Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 100 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 10 \text{ mHz}$ 2N5151 2N5153	H_{FE}	-	20 50	—
Output Capacitance	$V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 1 \text{ MHz}$	C_{OBO}	pF	—	250

(Continued next page)

NPN Power Silicon Transistor

Rev. V1

Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Switching Characteristics					
Turn-On Time	$I_C = 5.0 \text{ Adc}$; $I_{B1} = 500 \text{ mAdc}$	T_{ON}	μs	—	0.5
Turn-Off Time	$R_L = 6 \Omega$	T_{OFF}	μs	—	1.5
Storage Time	$I_{B2} = -500 \text{ mAdc}$	T_S	μs	—	1.4
Fall Time	$V_{BE(OFF)} = 3.7 \text{ Vdc}$	T_f	μs	—	0.5
Safe Operating Area					
DC Tests:	$T_C = +25^\circ\text{C}$, 1 Cycle, $t = 1.0 \text{ s}$				
Test 1:	$V_{CE} = 5.0 \text{ Vdc}$, $I_C = 2.0 \text{ Adc}$				
Test 2:	$V_{CE} = 32 \text{ Vdc}$, $I_C = 310 \text{ mAdc}$				
Test 3:	$V_{CE} = 80 \text{ Vdc}$, $I_C = 12.5 \text{ mAdc}$				

Absolute Maximum Ratings

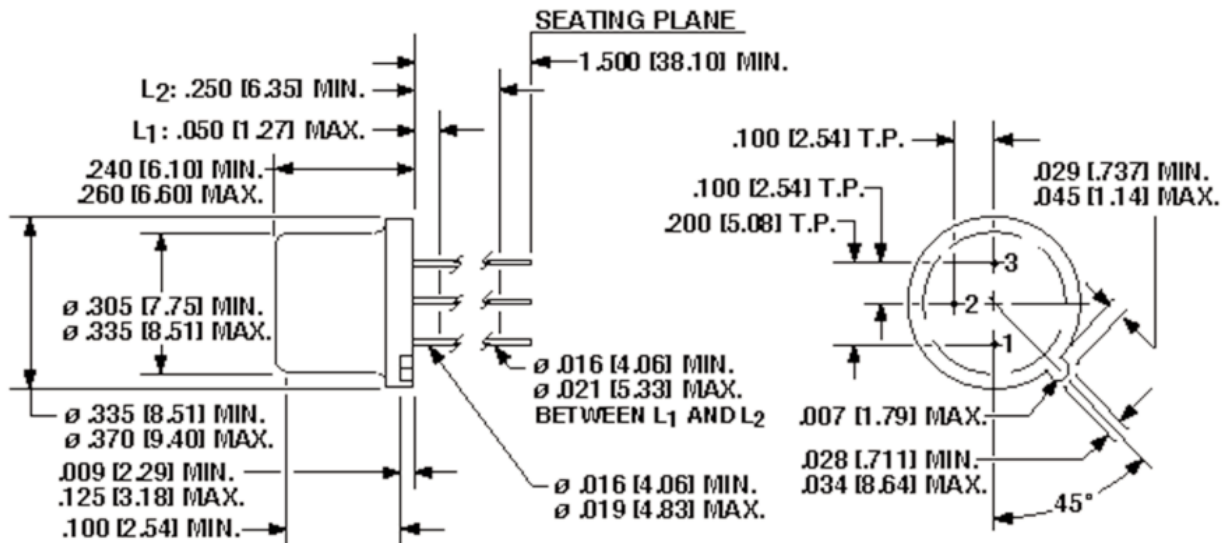
Ratings	Symbol	Value
Collector - Emitter Voltage	V_{CEO}	80 Vdc
Collector - Base Voltage	V_{CBO}	100 Vdc
Emitter - Base Voltage	V_{EBO}	5.5 Vdc
Collector Current	I_C	2 Adc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$	P_T	1.0 W 100 W
Operating & Storage Temperature Range	T_{OP} , T_{STG}	-65°C to $+200^\circ\text{C}$

Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	10°C/W

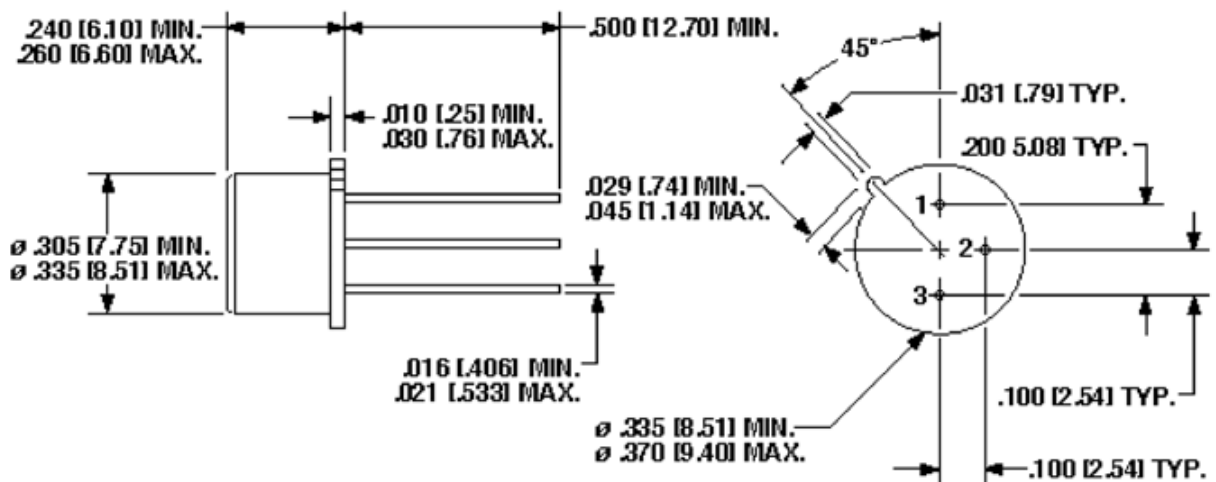
Outline Drawings

TO-5 Package (2N5151L, 2N5153L)



Dimensions are in inches.

TO-39 (TO-205AD) Package (2N5151, 2N5153)



Dimensions are in inches.

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