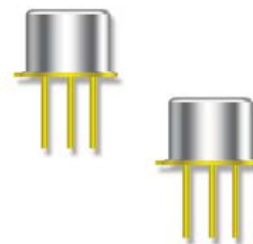


NPN Power Silicon Transistor

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 | $V_{EB} = 4.0 \text{ Vdc}, I_C = 0$ | I_{EBO} | μAdc | — | 1.0 |
| | $V_{EB} = 5.5 \text{ Vdc}, I_C = 0$ | | mAdc | — | 1.0 |
| Collector - Emitter Cutoff Current | $V_{CE} = 60 \text{ Vdc}, V_{BE} = 0$ | I_{CES} | μAdc | — | 1.0 |
| | $V_{CE} = 100 \text{ Vdc}, V_{BE} = 0$ | | mAdc | — | 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 | | | |
| Collector - Emitter Saturation Voltage | $I_C = 2.5 \text{ Adc}, I_B = 250 \text{ mAdc}$ | $V_{CE(SAT)}$ | Vdc | — | 0.75 |
| | $I_C = 5.0 \text{ Adc}, I_B = 500 \text{ mAdc}$ | | | — | 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

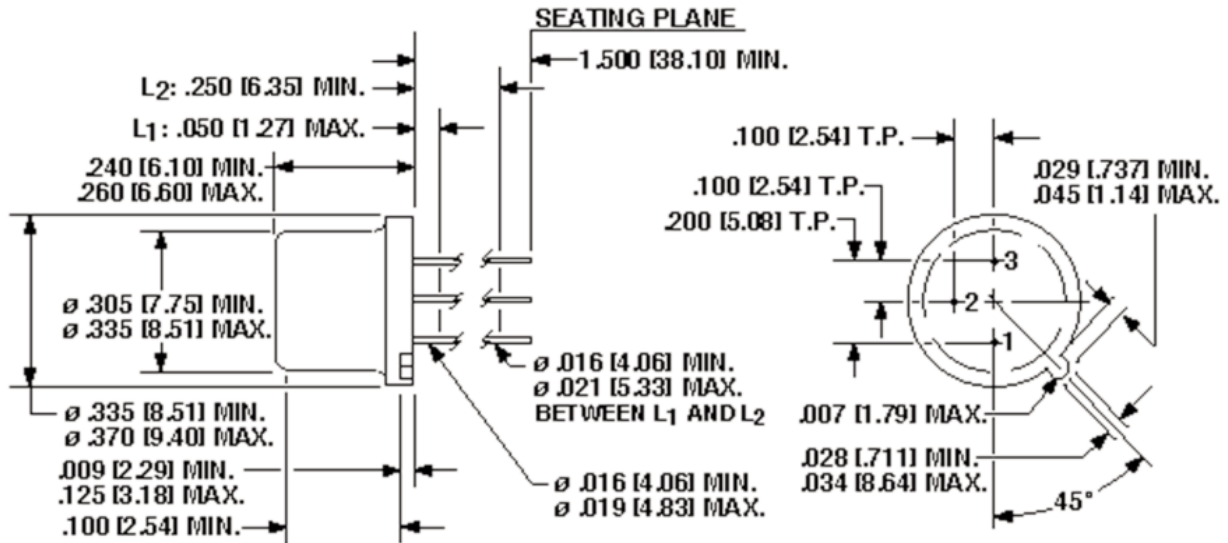
| Ratings | Symbol | Value |
|---|-------------------|---|
| Collector - Emitter Voltage | V_{CEO} | 80 Vdc |
| Collector - Base Voltage | V_{CBO} | 100 Vdc |
| Emitter - Base Voltage | V_{EBO} | 5.5 Vdc |
| Collector Current | I_C | 2 Adc |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$ | 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 |

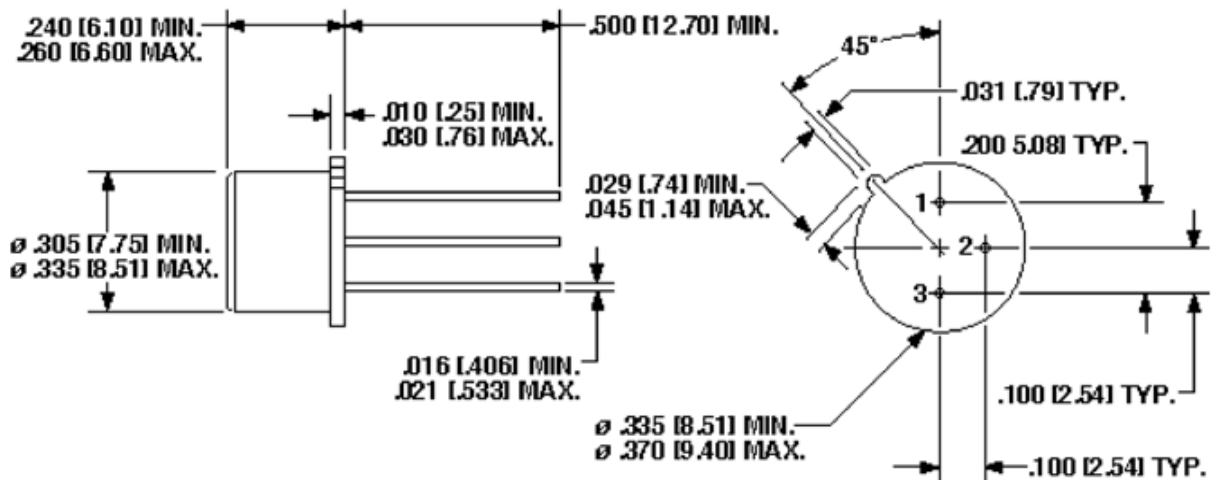
Outline Drawings

TO-5 Package (2N5151L, 2N5153L)



Dimensions are in inches.

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



Dimensions are in inches.

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