

# NPN Power Silicon Transistor

## 2N5152, 2N5152L & 2N5154, 2N5154L



### Features

- Available in commercial, JAN, JANTX, JANTXV, JANS and JANSR 100K rads (Si) per MIL-PRF-19500/544
- TO-5 Package: 2N5152L, 2N5154L  
TO-39 (TO-205AD) Package: 2N5152, 2N5154



### Maximum Ratings ( $T_C = +25^\circ\text{C}$ unless otherwise noted)

Ratings	Symbol	Value	Units
Collector - Emitter Voltage	$V_{CEO}$	80	Vdc
Collector - Base Voltage	$V_{CBO}$	100	Vdc
Emitter - Base Voltage	$V_{EBO}$	5.5	Vdc
Collector Current	$I_C$	2.0	Adc
Total Power Dissipation @ $T_A = +25^\circ\text{C}$ @ $T_C = +25^\circ\text{C}$	$P_T$	1.0 10	W
Operating & Storage Temperature Range	$T_{op}, T_{stg}$	-65 to +200	$^\circ\text{C}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	10	$^\circ\text{C/W}$

### Electrical Characteristics ( $T_A = +25^\circ\text{C}$ unless otherwise noted)

OFF Characteristics	Symbol	Minimum	Maximum	Units
Collector - Emitter Breakdown Voltage $I_C = 100 \text{ mAdc}, I_B = 0$	$V_{(BR)CEO}$	80	---	Vdc
Emitter - Base Cutoff Current $V_{EB} = 4.0 \text{ Vdc}, I_C = 0$ $V_{EB} = 5.5 \text{ Vdc}, I_C = 0$	$I_{EBO}$	---	1.0 1.0	$\mu\text{Adc}$ mAdc
Collector - Emitter Cutoff Current $V_{CE} = 60 \text{ Vdc}, V_{BE} = 0$ $V_{CE} = 100 \text{ Vdc}, V_{BE} = 0$	$I_{CES}$	---	1.0 1.0	$\mu\text{Adc}$ mAdc
Collector - Emitter Cutoff Current $V_{CE} = 40 \text{ Vdc}, I_B = 0$	$I_{CEO}$	---	50	$\mu\text{Adc}$

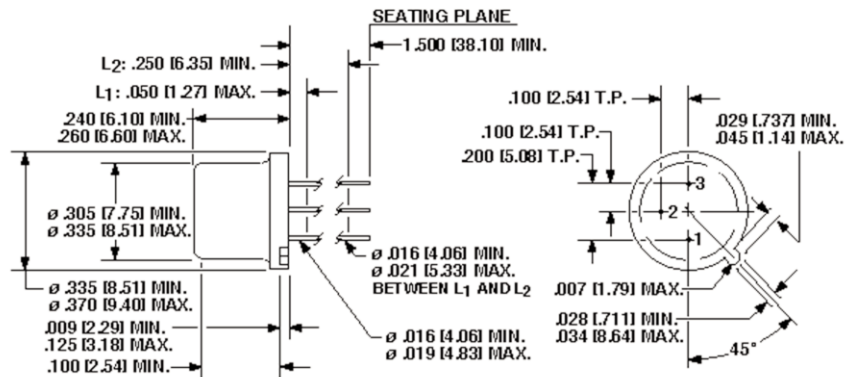


## Electrical Characteristics -con't

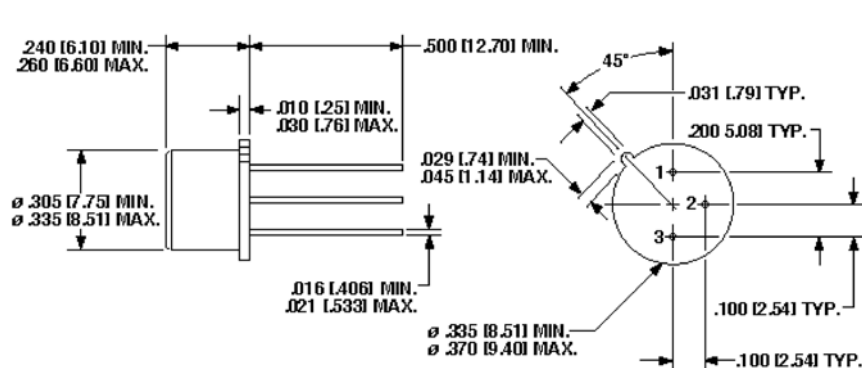
ON Characteristics			Symbol	Mimimum	Maximum	Units
Forward Current Transfer Ratio $I_C = 50 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 2.5 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 5.0 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$	2N5152	$H_{FE}$	20	---		
	2N5154		50	---		
	2N5152		30	90		
	2N5154		70	200		
	2N5152		20	---		
	2N5154		40	---		
Collector - Emitter Saturation Voltage $I_C = 2.5 \text{ Adc}, I_B = 250 \text{ mAdc}$ $I_C = 5.0 \text{ Adc}, I_B = 500 \text{ mAdc}$			$V_{CE(sat)}$	---	0.75 1.5	Vdc
Emitter - Base Voltage Non-Saturation $I_C = 2.5 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$			$V_{BE(ON)}$	---	1.45	Vdc
Emitter - Base Saturation Voltage $I_C = 2.5 \text{ Adc}, I_B = 250 \text{ mAdc}$ $I_C = 5.0 \text{ Adc}, I_B = 500 \text{ mAdc}$			$V_{BE(sat)}$	---	1.45 2.2	Vdc
DYNAMIC Characteristics						
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 500 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}, f = 10 \text{ MHz}$			$ h_{fe} $	6 7	---	
2N5152 2N5154				---		
Small-signal short Circuit FOI Ward-Current Transfer Ratio $I_C = 100 \text{ mAdc}, V_{CE} = 5 \text{ Vdc}, f = 1 \text{ KHz}$			$h_{fe}$	20 50	---	
2N5152 2N5154				---		
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$			$C_{obo}$	---	250	pF
SWITCHING Characteristics						
Turn-On Time $I_C = 5.0 \text{ Adc}; I_{B1} = 500 \text{ mAdc}$			$t_{on}$	---	0.5	$\mu\text{s}$
Turn-off Time $R_L = 6 \Omega$			$t_{off}$	---	1.5	$\mu\text{s}$
Storage Time $I_{B2} = -500 \text{ mAdc}$			$t_s$	---	1.4	$\mu\text{s}$
Fall Time $V_{BE(OFF)} = 3.7 \text{ Vdc}$			$t_f$	---	0.5	$\mu\text{s}$
SAFE OPERATING AREA						
DC Tests: $T_C = +25 \text{ }^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$						
Test 1: $V_{CE} = 5.0 \text{ Vdc}, I_C = 2.0 \text{ Adc}$						
Test 2: $V_{CE} = 32.0 \text{ Vdc}, I_C = 310 \text{ mAdc}$						
Test 3: $V_{CE} = 80 \text{ Vdc}, I_C = 12.5 \text{ mAdc}$						

## Outline Drawing

TO-5 Package: (2N5152L, 2N5154L)



TO-39 (TO-205AD) Package: (2N5152, 2N5154)



NOTE: Dimensions in Inches [mm]

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