

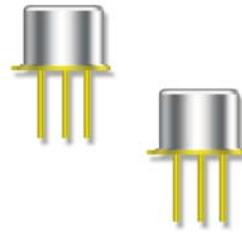
NPN Power Silicon Transistor

2N4150



Features

- Available in commercial, JAN, JANTX, JANTXV, JANS and JANSR 100K rads (Si) per MIL-PRF-19500/394
- TO-5 Package



Maximum Ratings

Ratings	Symbol	2N4150	Units
Collector - Emitter Voltage	V_{CEO}	70	Vdc
Collector - Base Voltage	V_{CBO}	100	Vdc
Emitter - Base Voltage	V_{EBO}	10.0	Vdc
Collector Current	I_C	10.0	Adc
Total Power Dissipation @ $T_A = +25^\circ\text{C}$ (1) @ $T_C = +25^\circ\text{C}$ (2)	P_T	160 15	W W
Operating & Storage Temperature Range	T_{op}, T_{stg}	-65 to +200	$^\circ\text{C}$
Thermal Resistance, Junction-to-Case Junction-to-Ambient	$R_{\theta JC}$ $R_{\theta JA}$	10.0 175.0	$^\circ\text{C/W}$

1) Derate linearly @ 5.7 mW/ $^\circ\text{C}$ for $T_A > +25^\circ\text{C}$

2) Derate linearly @ 100 mW/ $^\circ\text{C}$ for $T_C > +25^\circ\text{C}$

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

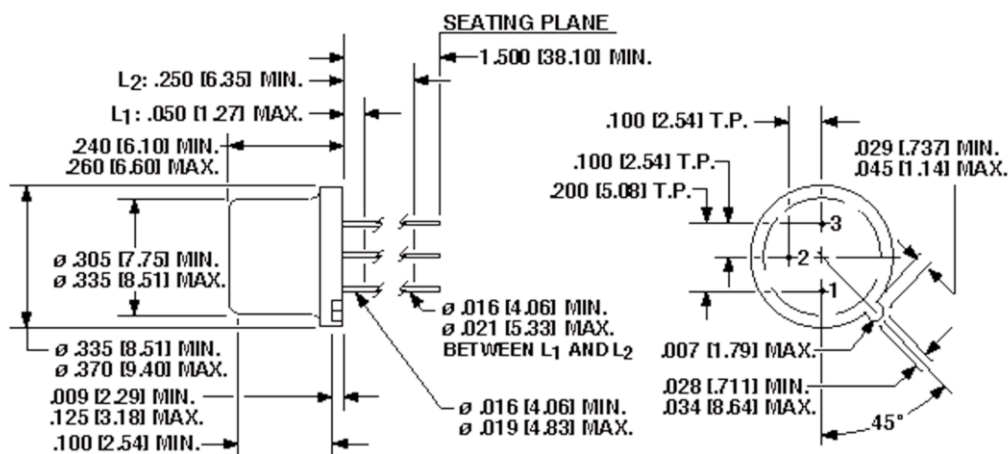
OFF Characteristics	Symbol	Minimum	Maximum	Units
Collector - Emitter Breakdown Voltage $I_C = 100 \text{ mAdc}$	$V_{(BR)CEO}$	70	---	Vdc
Collector - Emitter Cutoff Current $V_{BE} = 0.5 \text{ Vdc}, V_{CE} = 60 \text{ Vdc}$	I_{CEX}	---	10	μAdc
Collector - Emitter Cutoff Current $V_{CE} = 60 \text{ Vdc}$	I_{CEO}	---	10	μAdc
Emitter - Base Cutoff Current $V_{EB} = 7.0 \text{ Vdc}$ $V_{EB} = 5.0 \text{ Vdc}$	I_{EBO}	---	10 0.1	μAdc
Collector-Base Cutoff Current $V_{CB} = 100 \text{ Vdc}$ $V_{CB} = 80 \text{ Vdc}$	I_{CBO}	---	10 0.1	μAdc

Electrical Characteristics -con't

ON Characteristics		Symbol	Minimum	Maximum	Units
Collector-Base Cutoff Current $I_C = 1.0 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 5.0 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 10.0 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$		H_{FE}	50 40 10	200 120 ---	
Collector-Emitter Saturation Voltage $I_C = 5.0 \text{ Adc}, I_B = 0.5 \text{ Adc}$ $I_C = 10.0 \text{ Adc}, I_B = 1.0 \text{ Adc}$		$V_{CE(sat)}$	--- ---	0.6 2.5	Vdc
Base-Emitter Saturation Voltage $I_C = 5.0 \text{ Adc}, I_B = 0.5 \text{ Adc}$ $I_C = 10.0 \text{ Adc}, I_B = 1.0 \text{ Adc}$		$V_{BE(sat)}$	--- ---	1.5 2.5	Vdc
DYNAMIC Characteristics					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 0.2 \text{ Adc}, V_{CE} = 10.0 \text{ Vdc}, f = 10 \text{ MHz}$		$ h_{fe} $	1.5	7.5	
Output Capacitance $I = 0, V_{CB} = 10.0 \text{ V}, f = <1.0 \text{ Hz}$		C_{obo}	---	350	pF
SWITCHING Characteristics					
Delay Time	$V_{CC} = 20 \text{ Vdc}, V_{BB} = 5.0 \text{ Vdc},$	t_d	---	50	ns
Rise Time	$I_C = 5.0 \text{ Adc}, I_{B1} = 0.5 \text{ Adc}$	t_r	---	500	ns
Storage Time	$V_{CC} = 20 \text{ Vdc}, V_{BB} = 5.0 \text{ Adc},$	t_s	---	1.5	μs
Fall Time	$I_C = 5.0 \text{ Adc}, I_{B1} = -I_{B2} = -0.5 \text{ Adc}$	t_f	---	500	ns
SAFE OPERATING AREA					
DC Tests: $T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$ Test 1: $V_{CE} = 40.0 \text{ Vdc}, I_C = 0.22 \text{ Adc}$ Test 2: $V_{CE} = 70 \text{ Vdc}, I_C = 90 \text{ mAdc}$					

(1) Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

Outline Drawing



Note: All dimensions are inches [mm].

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