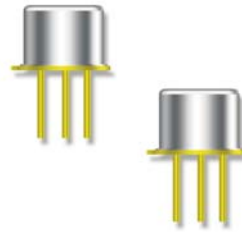# NPN Power Silicon Transistor

2N4150

NEW

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 °C [1] @ T_C = +25 °C [2]	P_T	160 15	W W
Operating & Storage Temperature Range	T_{op}, T_{stg}	-65 to +200	°C
Thermal Resistance, Junction-to-Case Junction-to-Ambient	$R_{\theta JC}$ $R_{\theta JA}$	10.0 175.0	°C/W

1) Derate linearly @ 5.7 mW/°C for T_A > +25°C

2) Derate linearly @ 100 mW/°C for T_C > +25°C

Electrical Characteristics (T_C = 25°C unless otherwise noted)

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

AEROFLEX

METELICS

Electrical Characteristics -con't

ON Characteristics	Symbol	Mimimum	Maximum	Units
Collector-Base Cutoff Current 　$I_C = 1.0$ Adc, $V_{CE} = 5.0$ Vdc 　$I_C = 5.0$ Adc, $V_{CE} = 5.0$ Vdc 　$I_C = 10.0$ Adc, $V_{CE} = 5.0$ Vdc	H_{FE}	50 40 10	200 120 - - -	
Collector-Emitter Saturation Voltage 　$I_C = 5.0$ Adc, $I_B = 0.5$ Adc 　$I_C = 10.0$ Adc, $I_B = 1.0$ Adc	$V_{CE(sat)}$	- - -	0.6 2.5	Vdc
Base-Emitter Saturation Voltage 　$I_C = 5.0$ Adc, $I_B = 0.5$ Adc 　$I_C = 10.0$ Adc, $I_B = 1.0$ Adc	$V_{BE(sat)}$	- - -	1.5 2.5	Vdc
DYNAMIC Characteristics				
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio 　$I_C = 0.2$ Adc, $V_{CE} = 10.0$ Vdc, f = 10 MHz	$\mid h_{fe} \mid$	1.5	7.5	
Output Capacitance 　$I = 0$, $VCB = 10.0$ V, f = <1.0 Hz	C_{obo}	- - -	350	pF

SWITCHING Characteristics		Symbol			
Delay Time	$V_{CC} = 20$ Vdc, $V_{BB} = 5.0$ Vdc,	t_d	- - -	50	ηs
Rise Time	$I_C = 5.0$ Adc, $I_{B1} = 0.5$ Adc	t_r	- - -	500	ηs
Storage Time	$V_{CC} = 20$ Vdc, $V_{BB} = 5.0$ Adc,	t_s	- - -	1.5	μs
Fall Time	$I_C = 5.0$ Adc, $I_{B1} = -I_{B2} = -0.5$ Adc	t_f	- - -	500	ηs

SAFE OPERATING AREA	
DC Tests:	$T_C = +25$ °C, 1 Cycle, t = 1.0 s
Test 1:	$V_{CE} = 40.0$ Vdc, $I_C = 0.22$ Adc
Test 2:	$V_{CE} = 70$ Vdc, $I_C = 90$ mAdc

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

Outline Drawing

SEATING PLANE

1.500 [38.10] MIN.

L₂: .250 [6.35] MIN.
L₁: .050 [1.27] MAX.

.240 [6.10] MIN.
.260 [6.60] MAX.

.100 [2.54] T.P.
.100 [2.54] T.P.
.200 [5.08] T.P.

.029 [.737] MIN.
.045 [1.14] MAX.

ø .305 [7.75] MIN.
ø .335 [8.51] MAX.

ø .016 [4.06] MIN.
ø .021 [5.33] MAX.
BETWEEN L₁ AND L₂

3
2
1

ø .335 [8.51] MIN.
ø .370 [9.40] MAX.

.007 [1.79] MAX.

.009 [2.29] MIN.
.125 [3.18] MAX.
.100 [2.54] MIN.

ø .016 [4.06] MIN.
ø .019 [4.83] MAX.

.028 [.711] MIN.
.034 [8.64] MAX.

45°
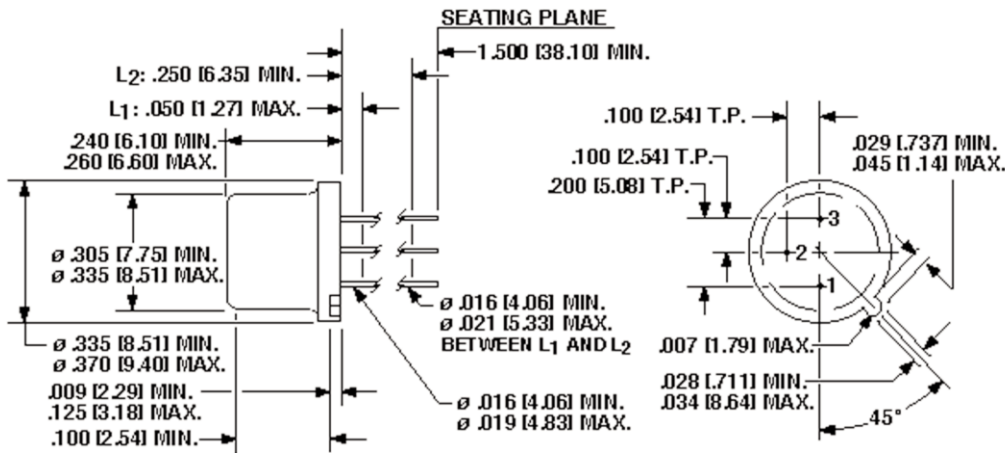
Note: All dimensions are inches [mm].

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