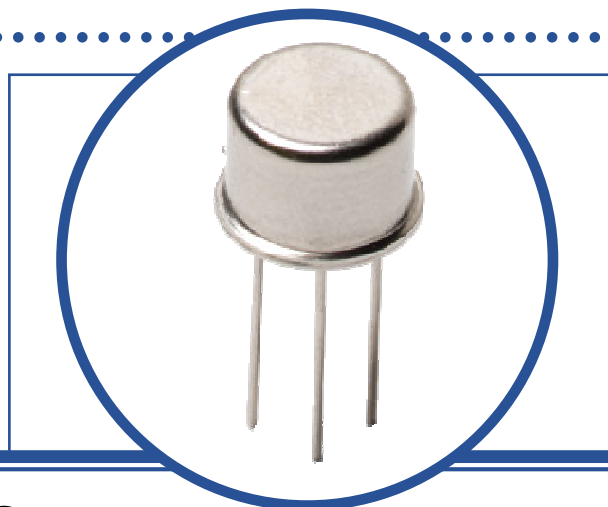


SILICON PLANAR EPITAXIAL PNP TRANSISTOR

2N2904A

- Low Power
- Hermetic TO-39 Metal package.
- Ideally suited for High Speed Switching and General Purpose Applications
- Screening Options Available



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

V_{CBO}	Collector – Base Voltage	-60V
V_{CEO}	Collector – Emitter Voltage	-60V
V_{EBO}	Emitter – Base Voltage	-5V
I_C	Continuous Collector Current	-600mA
P_D	Total Power Dissipation at $T_A = 25^\circ\text{C}$	600mW
	Derate Above 25°C	3.43mW/ $^\circ\text{C}$
P_D	Total Power Dissipation at $T_C = 25^\circ\text{C}$	3W
	Derate Above 25°C	17.2mW/ $^\circ\text{C}$
T_J	Junction Temperature Range	-65 to $+200^\circ\text{C}$
T_{stg}	Storage Temperature Range	-65 to $+200^\circ\text{C}$

THERMAL PROPERTIES

Symbols	Parameters	Min.	Typ.	Max.	Units
$R_{\theta JA}$	Thermal Resistance, Junction To Ambient			291.7	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction To Case			58.3	$^\circ\text{C/W}$

Semelab Limited reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

SILICON PLANAR EPITAXIAL PNP TRANSISTOR 2N2904A

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min.	Typ	Max.	Units
$V_{(BR)CEO}^{(1)}$	Collector-Emitter Breakdown Voltage	$I_C = -10\text{mA}$ $I_B = 0$	-60			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -10\mu\text{A}$ $I_E = 0$	-60			
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10\mu\text{A}$ $I_C = 0$	-5			
I_{CEX}	Collector Cut-Off Current	$V_{CE} = -30\text{V}$ $V_{BE} = -0.5\text{V}$			-50	nA
I_{CBO}	Collector Cut-Off Current	$V_{CB} = -50\text{V}$ $I_E = 0$			-0.01	μA
		$T_A = 150^\circ\text{C}$			-10	
$V_{CE(sat)}^{(1)}$	Collector-Emitter Saturation Voltage	$I_C = -150\text{mA}$ $I_B = -15\text{mA}$			-0.4	V
		$I_C = -500\text{mA}$ $I_B = -50\text{mA}$			-1.6	
$V_{BE(sat)}^{(1)}$	Base-Emitter Saturation Voltage	$I_C = -150\text{mA}$ $I_B = -15\text{mA}$			-1.3	
		$I_C = -500\text{mA}$ $I_B = -50\text{mA}$			-2.6	
$h_{FE}^{(1)}$	Forward-current transfer ratio	$I_C = -0.1\text{mA}$ $V_{CE} = -10\text{V}$	40			
		$I_C = -1.0\text{mA}$ $V_{CE} = -10\text{V}$	40			
		$I_C = -10\text{mA}$ $V_{CE} = -10\text{V}$	40			
		$I_C = -150\text{mA}$ $V_{CE} = -10\text{V}$	40		120	
		$I_C = -500\text{mA}$ $V_{CE} = -10\text{V}$	40			

DYNAMIC CHARACTERISTICS

f_T	Transition Frequency	$I_C = -50\text{mA}$ $V_{CE} = -20\text{V}$ $f = 100\text{MHz}$	170			MHz
C_{obo}	Output Capacitance	$V_{CB} = -10\text{V}$ $I_E = 0$ $f = 1.0\text{MHz}$			8	pF
C_{ibo}	Input Capacitance	$V_{EB} = -2\text{V}$ $I_C = 0$ $f = 1.0\text{MHz}$			30	
t_{on}	Turn-On Time	$I_C = -150\text{mA}$ $V_{CC} = -30\text{V}$ $I_{B1} = -15\text{mA}$			45	ns
t_{off}	Turn-Off Time	$I_C = -150\text{mA}$ $V_{CC} = -30\text{V}$ $I_{B1} = -I_{B2} = -15\text{mA}$			300	

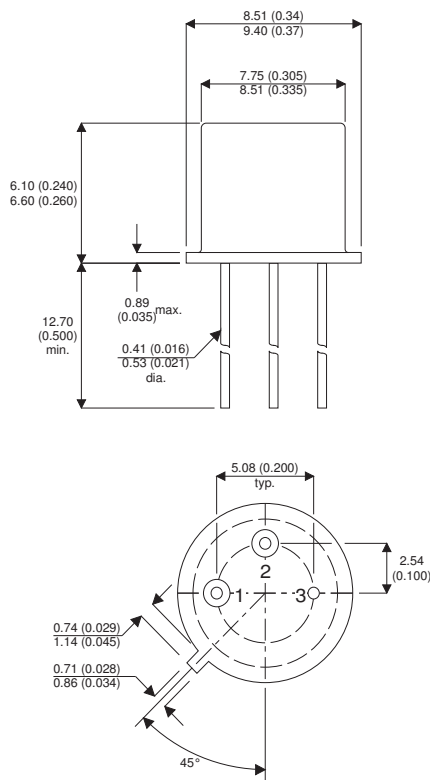
Notes

(1) Pulse Width $\leq 300\mu\text{s}$, $\delta \leq 2\%$

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MECHANICAL DATA

Dimensions in mm (inches)



TO-39 (TO-205AD) METAL PACKAGE Underside View

Pin 1 - Emitter

Pin 2 - Base

Pin 3 - Collector