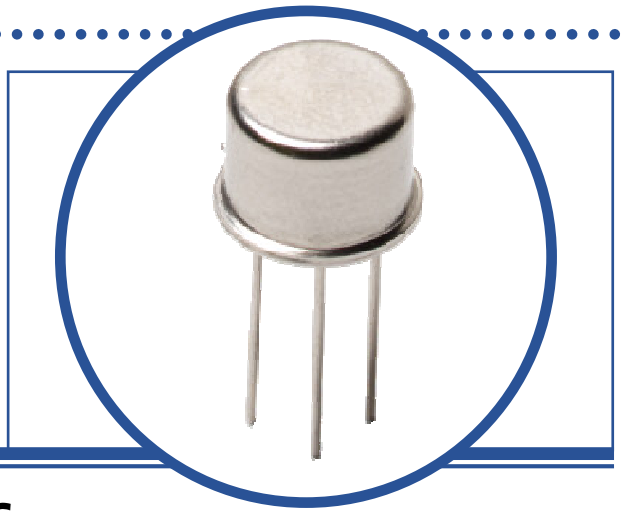
SILICON PLANAR NPN TRANSISTOR

TT electronics
Semelab Limited

2N1893



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

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise stated)

V_{CBO}	Collector – Base Voltage		120V
V_{CEO}	Collector – Emitter Voltage		80V
V_{EBO}	Emitter – Base Voltage		7V
I_C	Continuous Collector Current		500mA
P_D	Total Power Dissipation at	T_A = 25°C	800mW
		Derate Above 25°C	5.7mW/°C
P_D	Total Power Dissipation at	T_C = 25°C	3W
		Derate Above 25°C	17.2mW/°C
T_J	Junction Temperature Range		-65 to +200°C
T_{stg}	Storage Temperature Range		-65 to +200°C

THERMAL PROPERTIES

Symbols	Parameters	Min.	Typ.	Max.	Units
$R_{\theta JA}$	Thermal Resistance, Junction To Ambient			175	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction To Case			50	°C/W

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise stated)

Symbols	Parameters	Test Conditions		Min.	Typ	Max.	Units
$V_{(BR)CEO}$ [1]	Collector-Emitter Breakdown Voltage	I_C = 30mA	I_B = 0	80			V
$V_{(BR)CER}$	Collector-Emitter Breakdown Voltage	I_C = 10mA R_{BE} = 10Ω	I_E = 0	100			V
I_{CBO}	Collector-Base Cut-Off Current	V_{CB} = 120V	I_E = 0			100	µA
		V_{CB} = 90V	I_E = 0			10	nA
			T_A = 150°C			15	µA
I_{EBO}	Emitter Cut-Off Current	V_{EB} = 7V	I_C = 0			100	µA
		V_{EB} = 5V	I_C = 0			10	nA
$V_{CE(sat)}$ [1]	Collector-Emitter Saturation Voltage	I_C = 150mA	I_B = 15mA			5	V
$V_{BE(sat)}$ [1]	Base-Emitter Saturation Voltage	I_C = 150mA	I_B = 15mA			1.3	V
h_{FE} [1]	Forward-current transfer ratio	I_C = 1mA	V_{CE} = 10V	20			
		I_C = 10mA	V_{CE} = 10V	35			
			T_A = -55°C	20			
		I_C = 150mA	V_{CE} = 10V	40		120	

DYNAMIC CHARACTERISTICS

$\lvert h_{fe} \rvert$	Small signal forward-current transfer ratio	I_C = 50mA f = 20MHz	V_{CE} = 10V	3.0		10	
h_{fe}	Forward Current Transfer Ratio	V_{CE} = 5V f = 1.0kHz	I_C = 1mA	35		100	
		V_{CE} = 10V f = 1.0kHz	I_C = 5mA	45		150	
C_{obo}	Output Capacitance	V_{CB} = 10V	I_E = 0	2		15	pF
hie [2]	Short Circuit Input Impedance	V_{CB} = 10V	I_C = 5mA	4		8	Ω
hoe [2]	Short Circuit Output Admittance	V_{CB} = 10V	I_C = 5mA			0.5	µΩ
hre [2]	Open Circuit Reverse Voltage Transfer Ratio	V_{CB} = 10V	I_C = 5mA			1.5	$x10^{-4}$

Notes
(1) Pulse Width ≤ 380us, δ ≤ 2%
(2) Parameter guaranteed by design, not part of a production test.

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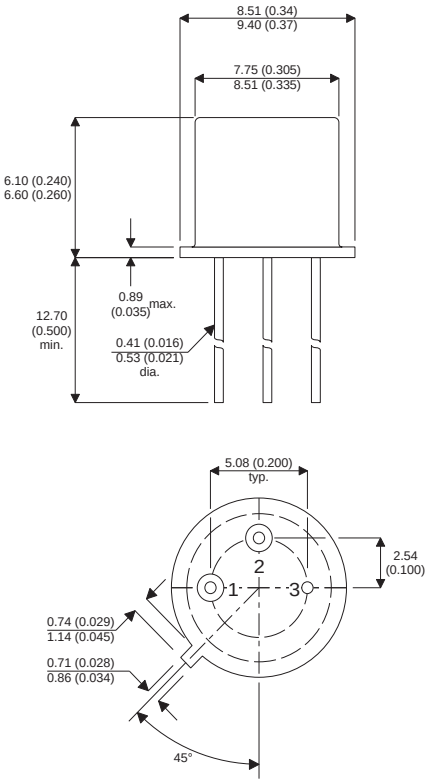
MECHANICAL DATA

Dimensions in mm (inches)



TO-39 (TO-205AD) METAL PACKAGE

Underside View

Pin 1 - Emitter Pin 2 - Base Pin 3 - Collector