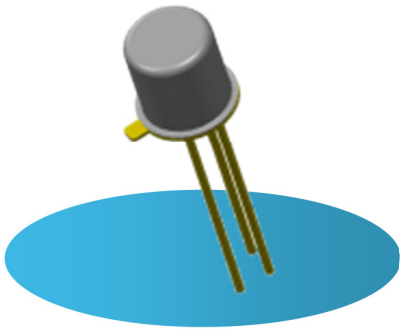
High Speed Switching PNP Silicon Bipolar Transistor

2N4209

- Hermetic TO-18 Metal Package
- Silicon Planar Epitaxial PNP Transistor
- High Speed Low Saturation Switching
- High Reliability Screening Options Available



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

V_{CBO}	Collector - Base Voltage		-15V
V_{CEO}	Collector - Emitter Voltage		-15V
V_{EBO}	Emitter - Base Voltage		-4.5V
I_C	Continuous Collector Current		-50mA
P_D	Power Dissipation	T_A = 25°C	360mW
		Derate Above 25°C	2.05mW/°C
	Total Power Dissipation	T_C = 25°C	547mW
		Derate Above 25°C	3.13mW/°C
T_J	Junction Temperature Range		-65 to +200°C
T_{stg}	Storage Temperature Range		-65 to +200°C

THERMAL PROPERTIES

Symbols	Parameters	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction To Case	320	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction To Ambient	486	°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 = -3mA		-15			V
$V_{(BR)CES}$	Collector - Emitter Breakdown Voltage	I_C = -100µA		-15			V
I_{CES}	Collector - Emitter Cut Off Current	V_{CE} = -10V				-10	nA
			T_A = 125°C			-5.0	µA
I_{EBO}	Emitter Cut Off Current		V_{EB} = -4.5V			-10	µA
			V_{EB} = -3.5V			-10	nA
I_{CBO}	Collector Cut Off Current	V_{CB} = -15V	I_E = 0			-10	µA
h_{FE}(1)	Forward Current Transfer Ratio	I_C = -1.0mA	V_{CE} = -0.5V	35			
		I_C = -10mA	V_{CE} = -0.3V	50		120	
		I_C = -10mA	V_{CE} = -1.0V	55		125	
			T_A = -55°C	25			
		I_C = -50mA	V_{CE} = -1.0V	40			
$V_{CE(sat)}$(1)	Collector-Emitter Saturation Voltage	I_C = -1.0mA	I_B = -0.1mA			-0.15	V
		I_C = -10mA	I_B = -1.0mA			-0.18	
		I_C = -50mA	I_B = -5.0mA			-0.60	
$V_{BE(sat)}$(1)	Base-Emitter Saturation Voltage	I_C = -1.0mA	I_B = -0.1mA			-0.80	V
		I_C = -10mA	I_B = -1.0mA	-0.70		-0.95	
		I_C = -50mA	I_B = -5.0mA			-1.50	

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

Symbols	Parameters	Test Conditions	Min.	Typ.	Max.	Units
$\lvert h_{fe} \rvert$	Small Signal Forward Current Transfer Ratio	I_C = -10mA V_{CE} = -10V f = 100MHz	8.5			
C_{obo}	Output Capacitance f = 1.0MHz	V_{CB} = -5.0V I_E = 0			3.0	pF
C_{ibo}	Input Capacitance f = 1.0MHz	V_{BE} = -0.5V I_C = 0			3.5	
t_{on}	Turn-On Time	V_{CC} = -1.5V I_C = -10mA I_B = -1.0mA			25	ns
t_{off}	Turn-Off Time				20	
$T_{d(on)}$	Turn-On Delay Time				15	
t_r	Rise Time				10	

Notes

(1) Pulse Width ≤ 380µs, duty cycle δ ≤ 2%

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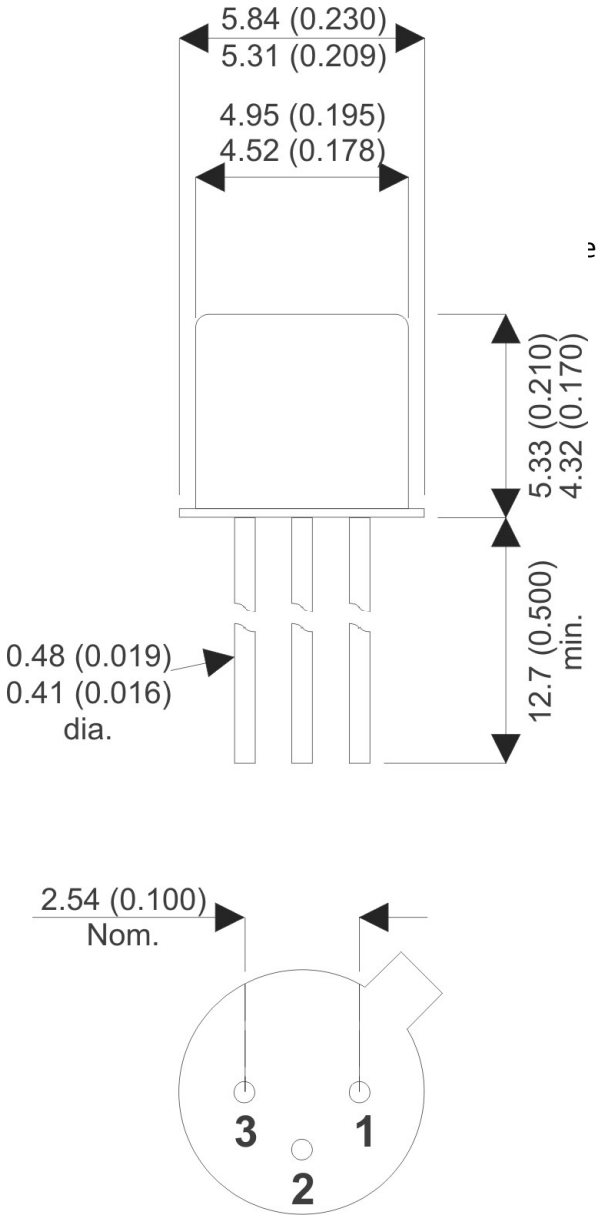
MECHANICAL DATA

Dimensions in mm (inches)



TO-18 (TO-206AA) METAL PACKAGE

Underside View

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