
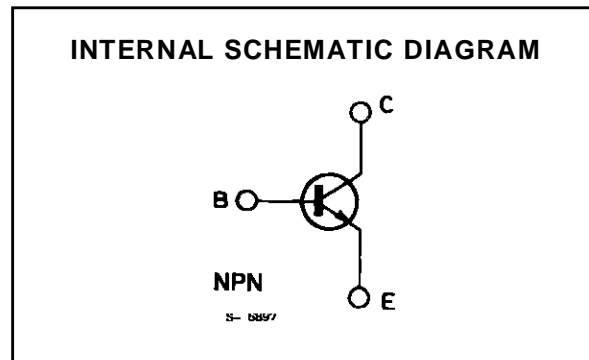
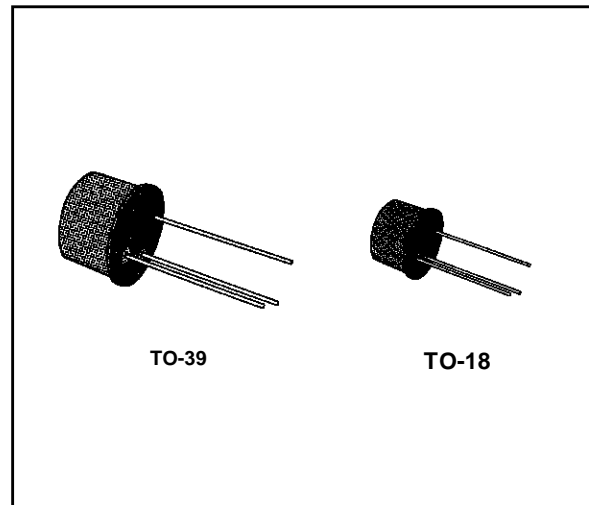


HIGH-SPEED SWITCHES

DESCRIPTION

The 2N2218, 2N2219, 2N2221 and 2N2222 are silicon planar epitaxial NPN transistors in Jedec TO-39 (for 2N2218 and 2N2219) and in Jedec TO-18 (for 2N2221 and 2N2222) metal cases. They are designed for high-speed switching applications at collector currents up to 500 mA, and feature useful current gain over a wide range of collector current, low leakage currents and low saturation voltages.

 2N2218/2N2219 approved to CECC 50002-100, 2N2221/2N2222 approved to CECC 50002-101 available on request.



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage ($I_E = 0$)	60	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	30	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	5	V
I_C	Collector Current	0.8	A
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$ for 2N2218 and 2N2219 for 2N2221 and 2N2222 at $T_{case} \leq 25\text{ }^\circ\text{C}$ for 2N2218 and 2N2219 for 2N2221 and 2N2222	0.8	W
		0.5	W
		3	W
		1.8	W
T_{stg}	Storage Temperature	- 65 to 200	$^\circ\text{C}$
T_j	Junction Temperature	175	$^\circ\text{C}$

2N2218-2N2219-2N2221-2N2222

THERMAL DATA

			2N2218 2N2219	2N2221 2N2222
R _{th j-case}	Thermal Resistance Junction-case	Max	50 °C/W	83.3 °C/W
R _{th j-amb}	Thermal Resistance Junction-ambient	Max	187.5 °C/W	300 °C/W

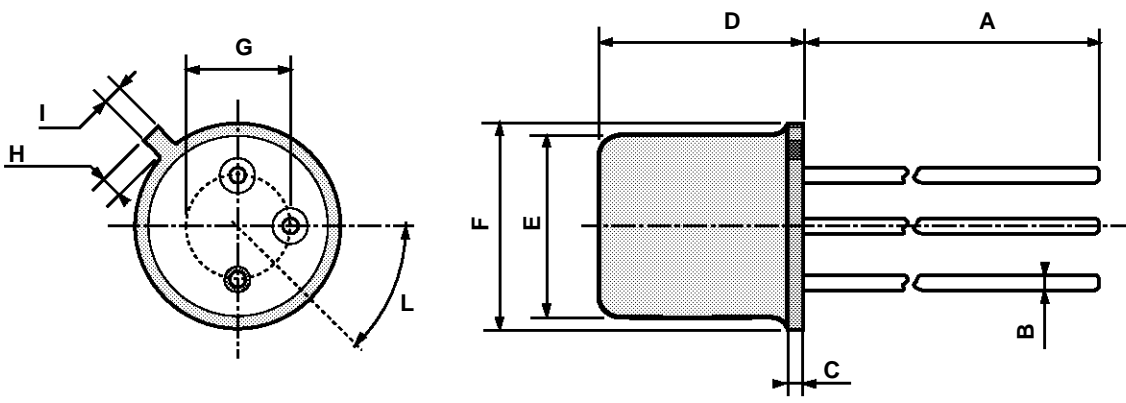
ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CBO}	Collector Cutoff Current (I _E = 0)	V _{CB} = 50 V V _{CB} = 50 V T _{amb} = 150 °C			10 10	nA μA
I _{EBO}	Emitter Cutoff Current (I _C = 0)	V _{EB} = 3 V			10	nA
V _{(BR) CBO}	Collector-base Breakdown Voltage (I _E = 0)	I _C = 10 μA	60			V
V _{(BR) CEO} *	Collector-emitter Breakdown Voltage (I _B = 0)	I _C = 10 mA	30			V
V _{(BR) EBO}	Emitter-base Breakdown Voltage (I _C = 0)	I _E = 10 μA	5			V
V _{CE (sat)} *	Collector-emitter Saturation Voltage	I _C = 150 mA I _B = 15 mA I _C = 500 mA I _B = 50 mA			0.4 1.6	V V
V _{BE (sat)} *	Base-emitter Saturation Voltage	I _C = 150 mA I _B = 15 mA I _C = 500 mA I _B = 50 mA			1.3 2.6	V V
h _{FE} *	DC Current Gain	for 2N2218 and 2N2221 I _C = 0.1 mA V _{CE} = 10 V I _C = 1 mA V _{CE} = 10 V I _C = 10 mA V _{CE} = 10 V I _C = 150 mA V _{CE} = 10 V I _C = 500 mA V _{CE} = 10 V I _C = 150 mA V _{CE} = 1 V for 2N2219 and 2N2222 I _C = 0.1 mA V _{CE} = 10 V I _C = 1 mA V _{CE} = 10 V I _C = 10 mA V _{CE} = 10 V I _C = 150 mA V _{CE} = 10 V I _C = 500 mA V _{CE} = 10 V I _C = 150 mA V _{CE} = 1 V	20 25 35 40 20 20		120	
f _T	Transition Frequency	I _C = 20 mA V _{CE} = 20 V f = 100 MHz	250			MHz
C _{CBO}	Collector-base Capacitance	I _E = 0 V _{CB} = 10 V f = 100 kHz			8	pF
R _{e(hie)}	Real Part of Input Impedance	I _C = 20 mA V _{CE} = 20 V f = 300 MHz			60	Ω

* Pulsed : pulse duration = 300 μs, duty cycle = 1 %.

TO-18 MECHANICAL DATA

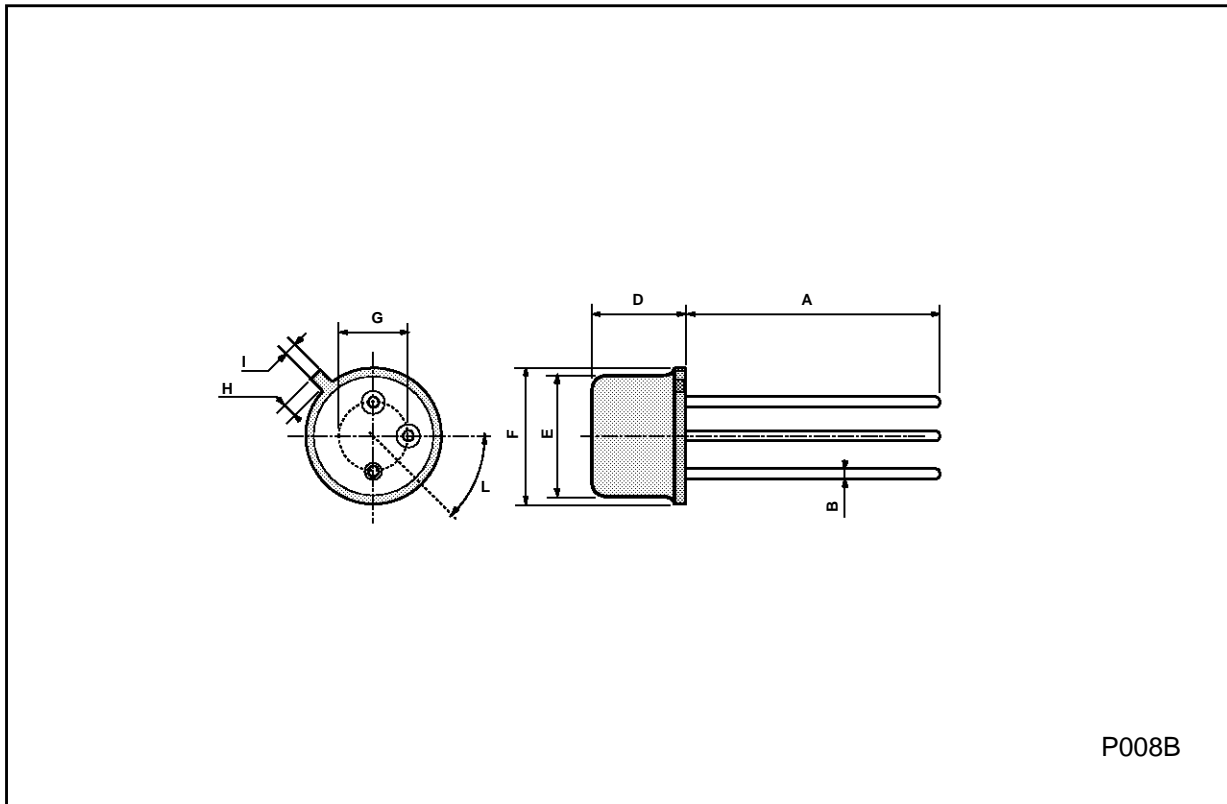
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		12.7			0.500	
B			0.49			0.019
D			5.3			0.208
E			4.9			0.193
F			5.8			0.228
G	2.54			0.100		
H			1.2			0.047
I			1.16			0.045
L	45°			45°		



0016043

TO39 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	12.7			0.500		
B			0.49			0.019
D			6.6			0.260
E			8.5			0.334
F			9.4			0.370
G	5.08			0.200		
H			1.2			0.047
I			0.9			0.035
L	45° (typ.)					



P008B