# 2N2218-2N2219 2N2221-2N2222

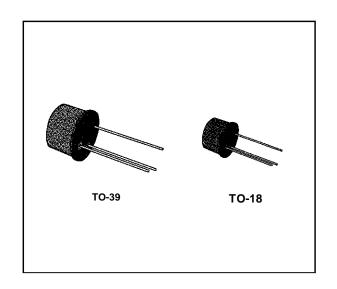
## HIGH-SPEED SWITCHES

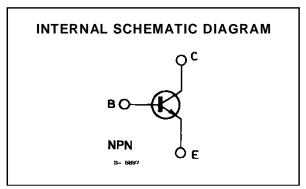
#### **DESCRIPTION**

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 <sub>CBO</sub>	Collector-base Voltage (I <sub>E</sub> = 0)	60	V
$V_{CEO}$	Collector-emitter Voltage (I <sub>B</sub> = 0)	30	V
V <sub>EBO</sub>	Emitter-base Voltage (I <sub>C</sub> = 0)	5	V
Ic	Collector Current	0.8	Α
P <sub>tot</sub>	Total Power Dissipation at T $_{amb} \le 25$ °C for 2N2218 and 2N2219 for 2N2221 and 2N2222 at T $_{case} \le 25$ °C for 2N2218 and 2N2219 for 2N2221 and 2N2222	0.8 0.5 3 1.8	W W W
T <sub>stg</sub>	Storage Temperature	- 65 to 200	°C
Tj	Junction Temperature	175	°C

January 1989 1/5

#### THERMAL DATA

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

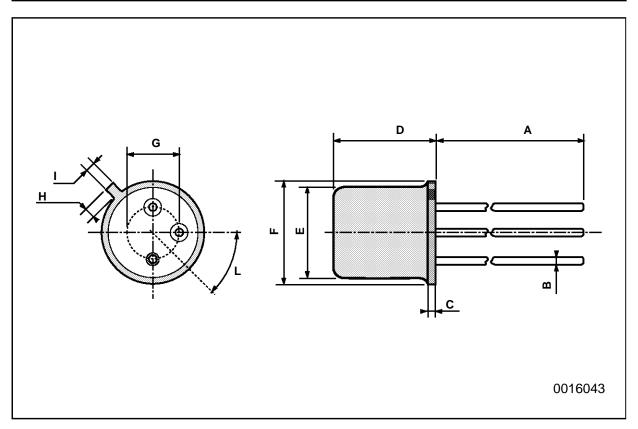
## **ELECTRICAL** CHARACTERISTICS (T<sub>amb</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Condition	ns Min.	Тур.	Max.	Unit
I <sub>CBO</sub>	Collector Cutoff Current (I <sub>E</sub> = 0)	$V_{CB} = 50 \text{ V}$ $V_{CB} = 50 \text{ V}$ $T_{amb}$	= 150 °C		10 10	nA μA
I <sub>EBO</sub>	Emitter Cutoff Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 3 V			10	nA
$V_{(BR)\ CBO}$	Colllector-base Breakdown Voltage (I <sub>E</sub> = 0)	I <sub>C</sub> = 10 μA	60			V
V <sub>(BR)CEO</sub> *	Collector-emitter Breakdown Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 10 mA	30			٧
$V_{(BR)\;EBO}$	Emitter-base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 10 μA	5			٧
V <sub>CE (sat)</sub> *	Collector-emitter Saturation Voltage		5 mA 50 mA		0.4 1.6	V V
V <sub>BE (sat)</sub> *	Base-emitter Saturation Voltage		5 mA 50 mA		1.3 2.6	V V
h <sub>FE</sub> *	DC Current Gain	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	= 10 V		120 300	
f⊤	Transition Frequency	$I_C = 20 \text{ mA}$ $f = 100 \text{ MHz}$ $V_{CE} =$	= 20 V 250			MHz
ССВО	Collector-base Capacitance	I <sub>E</sub> = 0 f = 100 kHz V <sub>CB</sub> =	= 10 V		8	pF
R <sub>e(hie)</sub>	Real Part of Input Impedance	$I_C = 20 \text{ mA}$ $f = 300 \text{ MHz}$ $V_{CE} =$	= 20 V		60	Ω

<sup>\*</sup> Pulsed : pulse duration = 300  $\mu$ s, duty cycle = 1 %.

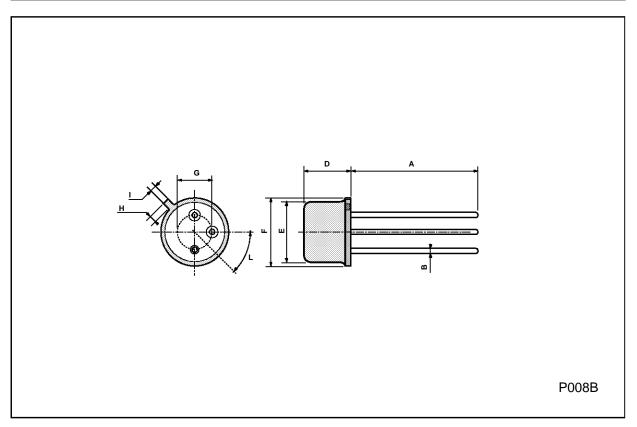
## **TO-18 MECHANICAL DATA**

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



## **TO39 MECHANICAL DATA**

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



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