

7-35-19

**3W NPN SMALL SIGNAL HIGH-SPEED  
SWITCHING TRANSISTORS  
30V COLLECTOR-EMITTER VOLTAGE**

2N2218  
2N2219

The transistors are silicon planar epitaxial npn devices conforming to JEDEC TO-39, BS SO-134A and IEC C4/B4C outlines.

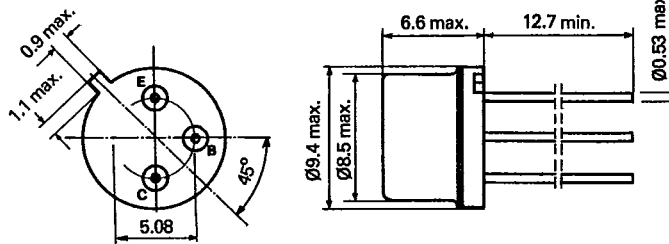
They are designed for high-speed switching applications requiring low leakage currents and low saturation voltages.

**QUICK REFERENCE DATA**

	2N2218	2N2219
V <sub>CB0</sub> max.		60V
V <sub>CE0</sub> max.		30V
V <sub>CE(sat)</sub> max. at I <sub>C</sub> = 0.5A, I <sub>B</sub> = 50mA and T <sub>amb</sub> = 25°C		1.6V
I <sub>C</sub> max.		0.8A
h <sub>FE</sub> min. at V <sub>CE</sub> = 10V, I <sub>C</sub> = 150mA and T <sub>amb</sub> = 25°C	40	100
P <sub>tot</sub> max. at T <sub>amb</sub> = 25°C		0.8W

**Outline and Dimensions**

JEDEC TO-39  
BS SO-134A  
IEC C4/B4C



All dimensions in millimetres  
For detail dimensions see Page 4

In the interest of improved product design, changes to this specification may be made at any time.



## RATINGS

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The ratings quoted are limiting values of operational and environmental conditions and are in accordance with the absolute maximum rating system defined in BS 3494 (Part 1) and IEC Publication 134.

## Voltage Ratings

V <sub>CBO</sub>	Collector-base voltage at I <sub>E</sub> = 0	60V
V <sub>CEO</sub>	Collector-emitter voltage at I <sub>B</sub> = 0	30V
V <sub>EBO</sub>	Emitter-base voltage at I <sub>C</sub> = 0	5V

## Current Rating

I <sub>C</sub>	Collector current (continuous)	0.8A
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## Power Ratings

P <sub>tot</sub>	Total power dissipation	
	T <sub>amb</sub> = 25°C	0.8W
	T <sub>case</sub> = 25°C	3W

## Thermal Ratings

T <sub>j</sub>	Maximum junction temperature	+175°C
T <sub>stg</sub>	Storage temperature range	-65°C to +200°C

## CHARACTERISTICS

## Electrical Characteristics

	Min.	Typ.	Max.
I <sub>CBO</sub>			
			10nA
			10μA
I <sub>EBO</sub>			10nA
V <sub>CBO</sub>	60V		
V <sub>CEO</sub>	30V		
V <sub>EBO</sub>	5V		
V <sub>BE(sat)</sub>			1.3V
			2.6V
V <sub>CE(sat)</sub>			0.4V
			1.6V

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**Electrical Characteristics (continued)**

		Min.	Typ.	Max.	
h <sub>FE</sub>	Static value of common emitter forward current transfer ratio V <sub>CE</sub> = 10V, I <sub>C</sub> = 0.1mA and T <sub>amb</sub> = 25°C				
		2N2218	20		
		2N2219	35		
		V <sub>CE</sub> = 10V, I <sub>C</sub> = 1.0mA and T <sub>amb</sub> = 25°C	2N2218	25	
			2N2219	50	
		V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA and T <sub>amb</sub> = 25°C	2N2218	35	
			2N2219	75	
		V <sub>CE</sub> = 10V, I <sub>C</sub> = 150mA* and T <sub>amb</sub> = 25°C	2N2218	40	120
			2N2219	100	300
		V <sub>CE</sub> = 10V, I <sub>C</sub> = 500mA* and T <sub>amb</sub> = 25°C	2N2218	20	
			2N2219	30	
		V <sub>CE</sub> = 1V, I <sub>C</sub> = 150mA* and T <sub>amb</sub> = 25°C	2N2218	20	
2N2219	50				
f <sub>T</sub>	Transition frequency at V <sub>CE</sub> = 20V, I <sub>C</sub> = 20mA, f = 100 MHz and T <sub>amb</sub> = 25°C	250MHz			
CCBO	Collector-base capacitance at V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 100 kHz and T <sub>amb</sub> = 25°C			8pF	

\*Pulsed; t<sub>p</sub> = 300 μs; duty cycle 1%

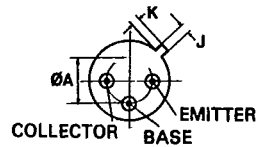
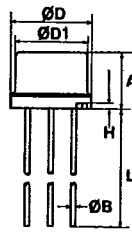
**Thermal Characteristics**

	Min.	Typ.	Max.
R <sub>th(j-case)</sub> Thermal resistance (junction to case)			50 deg C/W
R <sub>th(j-amb)</sub> Thermal resistance (junction to ambient)			187.5 deg C/W

## MECHANICAL DETAILS

### Outline and Dimensions

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Ref.	Millimetres		Inches		Notes
	Min.	Max.	Min.	Max.	
A	6.10	6.60	0.240	0.260	
ØA	4.83	5.33	0.190	0.210	
ØB	0.41	0.53	0.016	0.021	
ØD	8.89	9.39	0.350	0.370	
ØD1	8.01	8.50	0.315	0.335	
H	0.23	1.01	0.009	0.040	
J	0.71	0.86	0.028	0.034	
K	0.74	1.02	0.029	0.040	
L	12.70	—	0.500	—	

#### Notes

- The transistors conform to BS SO-134A, IEC C4/B4C and JEDEC TO-39 outlines.
- The millimetre dimensions are derived from the inch dimensions.

Weight 1 gramme.

#### INSTALLATION NOTES

The emitter, base and collector leads are identified on the transistor outline. Note the collector is connected also to the case.

The leads must not be bent within 0.06 in (1.5mm) of the seals.

When soldering, a thermal shunt should be used to protect the transistor.

The transistor leads may be dip-soldered at a temperature of 240°C for 10 seconds up to a point 0.1 in (2.54mm) from the seals.

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