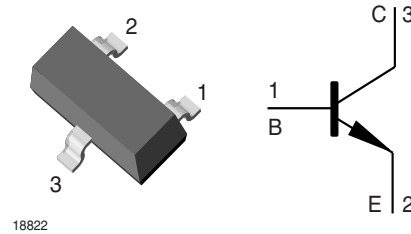


## Small Signal Transistors (NPN)

### Features

- NPN Silicon Epitaxial Planar Transistors for switching, AF driver and amplifier applications.
- Especially suited for automatic insertion in thick and thin-film circuits.
- These transistors are subdivided into three groups - 16, - 25, and - 40 according to their current gain.
- As complementary types, the PNP transistors BC807 and BC808 are recommended.



### Mechanical Data

**Case:** SOT-23 Plastic case

**Weight:** approx. 8.8 mg

#### Marking:

BC817-16 = 6A	BC818-16 = 6E
BC817-25 = 6B	BC818-25 = 6F
BC817-40 = 6C	BC818-40 = 6G

### Packaging Codes/Options:

GS18 / 10 k per 13" reel (8 mm tape), 10 k/box

GS08 / 3 k per 7" reel (8 mm tape), 15 k/box

#### Pinning:

1 = Base, 2 = Emitter, 3 = Collector

### Absolute Maximum Ratings

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

Parameter	Test condition	Part	Symbol	Value	Unit
Collector - emitter voltage (Base shorted)		BC817	$V_{CES}$	50	V
		BC818	$V_{CES}$	30	V
Collector - emitter voltage (Base open)		BC817	$V_{CEO}$	45	V
		BC818	$V_{CEO}$	25	V
Emitter - base voltage			$V_{EBO}$	5	V
Collector current			$I_C$	800	mA
Collector peak current			$I_{CM}$	1000	mA
Peak base current			$I_{BM}$	200	mA
Peak emitter current			$I_{EM}$	1000	mA
Power dissipation	$T_{SB} = 50\text{ }^{\circ}\text{C}$		$P_{tot}$	310 <sup>1)</sup>	mW <sup>1)</sup>

<sup>1)</sup> Device on fiberglass substrate, see layout on third page.

## Maximum Thermal Resistance

Parameter	Test condition	Symbol	Value	Unit
Thermal resistance junction to ambient air		$R_{thJA}$	450 <sup>1)</sup>	°C/W
Thermal resistance junction to substrate backside		$R_{thSB}$	320 <sup>1)</sup>	°C/W
Junction temperature		$T_j$	150	°C
Storage temperature range		$T_S$	- 65 to + 150	°C

<sup>1)</sup> Device on fiberglass substrate, see layout on third page.

## Electrical DC Characteristics

Parameter	Test condition	Part	Symbol	Min	Typ	Max	Unit
DC current gain (current gain group - 16)	$V_{CE} = 1 \text{ V}$ , $I_C = 100 \text{ mA}$		$h_{FE}$	100		250	
DC current gain (current gain group - 25)	$V_{CE} = 1 \text{ V}$ , $I_C = 100 \text{ mA}$		$h_{FE}$	160		400	
DC current gain (current gain group - 40)	$V_{CE} = 1 \text{ V}$ , $I_C = 100 \text{ mA}$		$h_{FE}$	250		600	
DC current gain	$V_{CE} = 1 \text{ V}$ , $I_C = 500 \text{ mA}$		$h_{FE}$	40			
Collector saturation voltage	$I_C = 500 \text{ mA}$ , $I_B = 50 \text{ mA}$		$V_{CEsat}$			0.7	V
Base saturation voltage	$I_C = 500 \text{ mA}$ , $I_B = 50 \text{ mA}$		$V_{BEsat}$			1.3	V
Base - emitter voltage	$V_{CE} = 1 \text{ V}$ , $I_C = 500 \text{ mA}$		$V_{BEon}$			1.2	V
Collector-emitter cut-off current	$V_{CE} = 45 \text{ V}$	BC817	$I_{CES}$			100	nA
	$V_{CE} = 25 \text{ V}$	BC818	$I_{CES}$			100	nA
	$V_{CE} = 25 \text{ V}$ , $T_j = 150 \text{ °C}$		$I_{CES}$			5	μA
Emitter-base cut-off current	$V_{EB} = 4 \text{ V}$		$I_{EBO}$			100	V

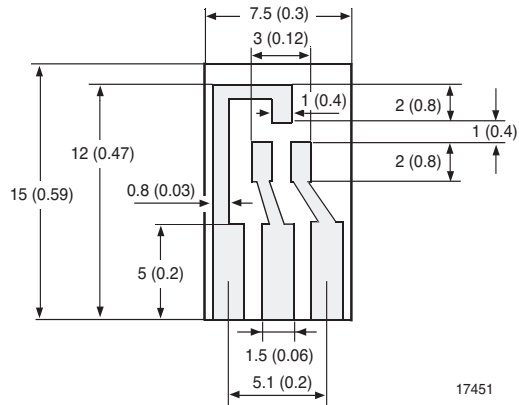
## Electrical AC Characteristics

Parameter	Test condition	Symbol	Min	Typ	Max	Unit
Gain - bandwidth product	$V_{CE} = 5 \text{ V}$ , $I_C = 10 \text{ mA}$ , $f = 50 \text{ MHz}$	$f_T$		100		MHz
Collector - base capacitance	$V_{CB} = 10 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{CBO}$		12		pF

## Layout for $R_{thJA}$ test

Thickness: Fiberglass 1.5 mm (0.059 in.)

Copper leads 0.3 mm (0.012 in.)



## Typical Characteristics ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

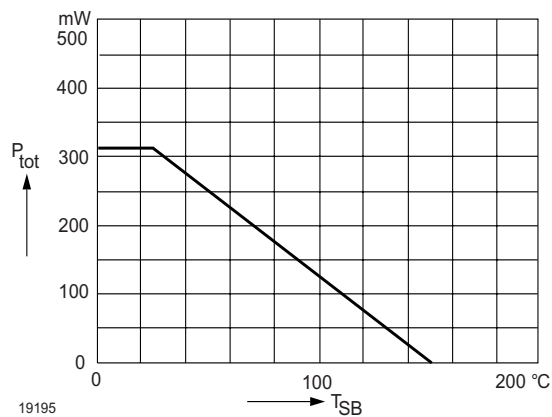


Figure 1. Admissible Power Dissipation vs. Temperature of Substrate Backside

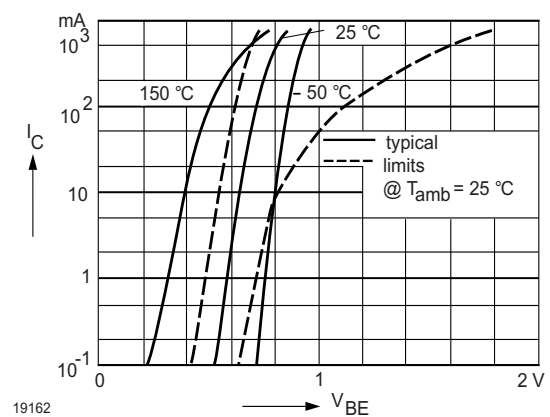


Figure 2. Collector Current vs. Base-Emitter Voltage

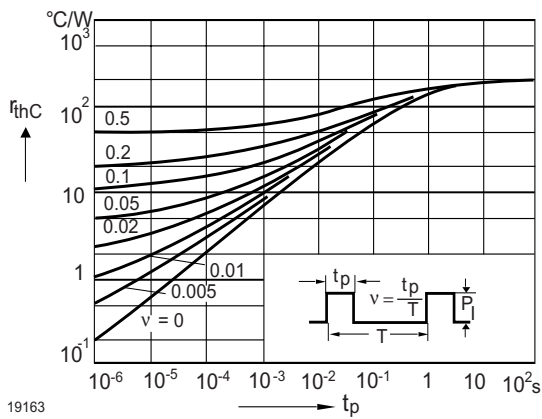


Figure 3. Pulse Thermal Resistance vs. Pulse Duration

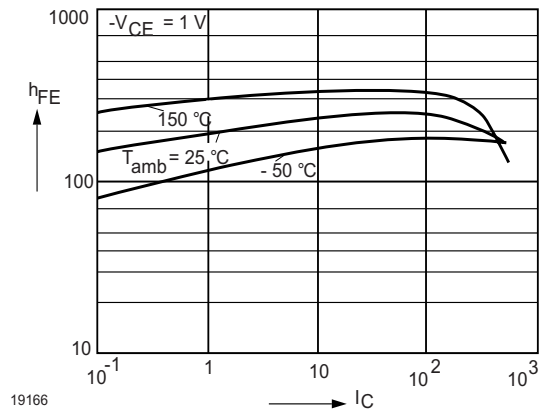


Figure 6. DC Current Gain vs. Collector Current

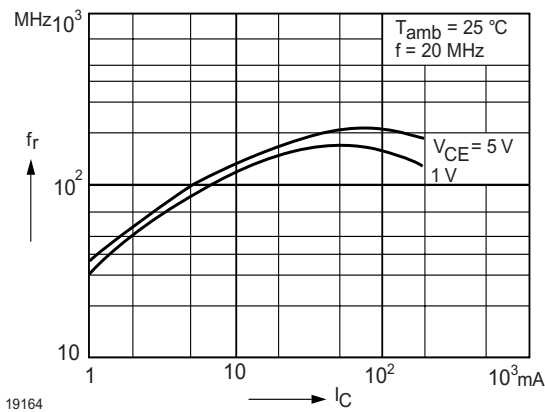


Figure 4. Gain-Bandwidth Product vs. Collector Current

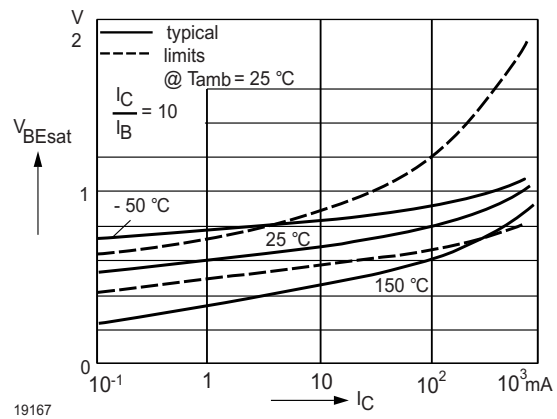


Figure 7. Base Saturation Voltage vs. Collector Current

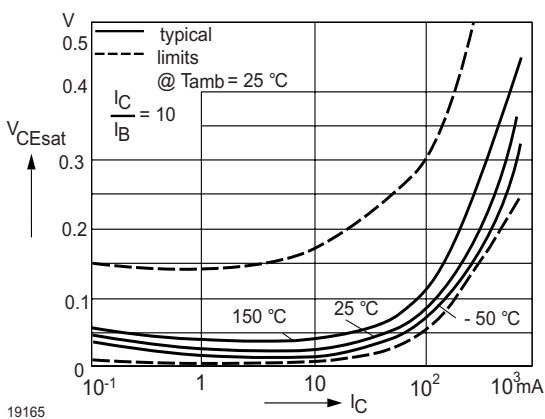


Figure 5. Collector Saturation Voltage vs. Collector Current

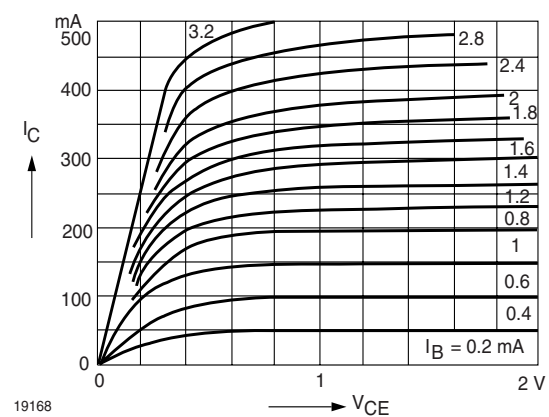


Figure 8. Common Emitter Collector Characteristics

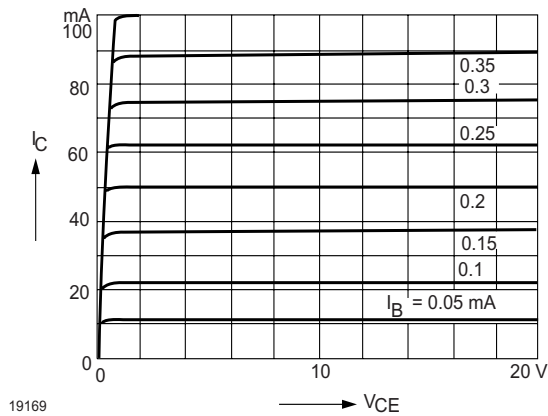


Figure 9. Common Emitter Collector Characteristics

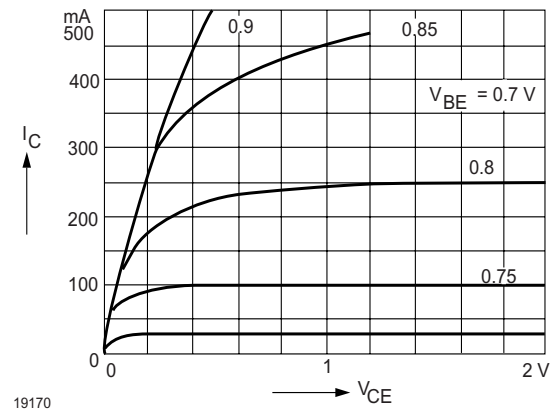
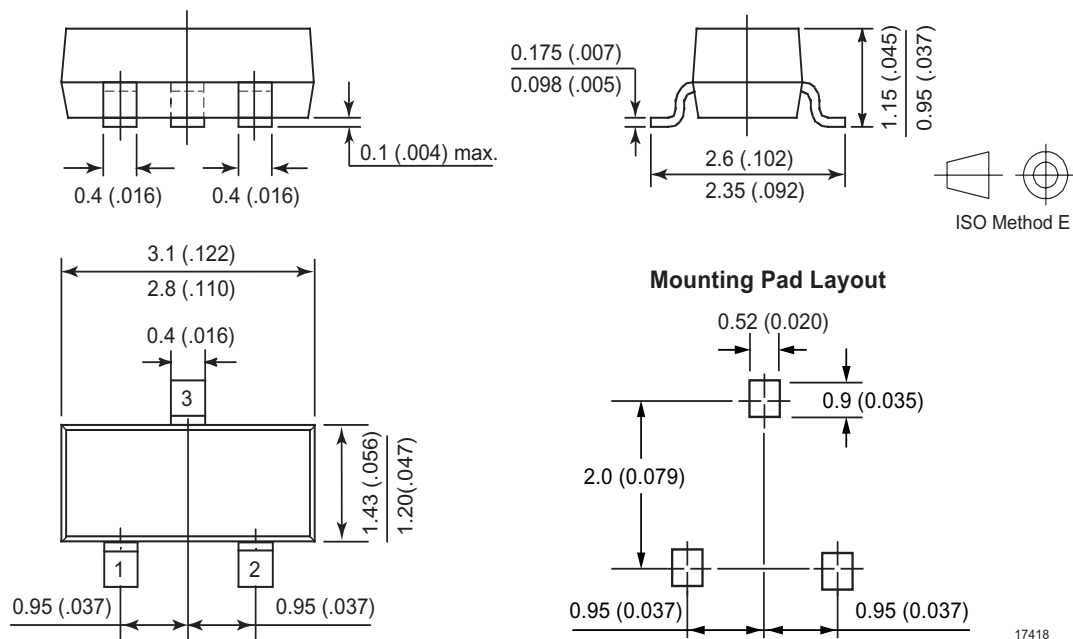


Figure 10. Common Emitter Collector Characteristics

## Package Dimensions in mm (Inches)



## Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**Vishay Semiconductor GmbH** has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**Vishay Semiconductor GmbH** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

**We reserve the right to make changes to improve technical design  
and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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