

NPN Transistor



General Description:

NPN general purpose transistors in Surface-Mounted Device (SMD) plastic packages

Features:

- General-purpose transistors
- SMD plastic packages
- Two different gain selections
- High current gain
- Excellent h_{FE} linearity
- Low noise between 30Hz and 15kHz
- For AF input stages and driver applications

Applications:

General-purpose switching and amplification

Max. Ratings & Characteristics : $T_A = 25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Value	Unit
Collector - Base Voltage	V_{CBO}	80	V
Collector - Emitter Voltage	V_{CEO}	65	V
Emitter - Base Voltage	V_{EBO}	6	V
Collector Current - Continuous	I_C	0.1	A
Collector Dissipation	P_C	250	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^{\circ}\text{C/W}$
Junction and Storage Temperature	T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$

Max. Ratings & Characteristics : $T_A = 25^{\circ}\text{C}$ unless otherwise specified

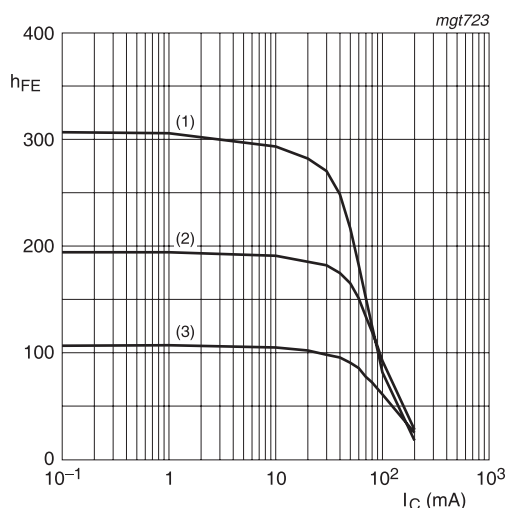
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector - Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -10\mu\text{A}$ $I_E = 0$	80	-	-	V
Collector - Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -10\text{mA}$ $I_B = 0$	65	-	-	V
Emitter - Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$ $I_C = 0$	6	-	-	V

Max. Ratings & Characteristics : $T_A = 25^\circ\text{C}$ unless otherwise specified (Cont.)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector Base Cut-off Current	I_{CBO}	$V_{CB} = 30\text{V}, I_E = 0$ $V_{CB} = 30\text{V}, I_E = 0, T_J = 150^\circ\text{C}$	-	-	15 5	nA uA
Emitter Base Cut-off Current	I_{EBO}	$V_{EB} = -5\text{V}, I_C = 0$	-	-	100	μA
DC Current Gain BC846A BC846B	h_{FE}	$V_{CE} = 5\text{V}, I_C = -2\text{mA}$	-	90 150	-	-
DC Current Gain BC846 BC846A BC846B	h_{FE}	$V_{CE} = 5\text{V}, I_C = 10\mu\text{A}$	110 110 200	-	450 220 450	-
Collector - Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$ $I_C = 10\text{mA}, I_B = 5\text{mA}$	-	0.09 0.2	0.25 0.6	V
Base - Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$ $I_C = 100\text{mA}, I_B = 5\text{mA}$	-	0.7 0.9		V
Base Emitter Voltage	$V_{BE(ON)}$	$I_C = 2\text{mA}, V_{CE} = 5\text{V}$ $I_C = 10\text{mA}, V_{CE} = 5\text{V}$	0.58 -	0.66 -	0.7 0.77	V
Collector Capacitance	C_C	$V_{CB} = 10\text{V}, I_E = I_C = 0$ $f = 1\text{MHz}$	-	2.5	-	pF
Transition Frequency	F_T	$V_{CE} = -5\text{V}, I_C = 10\text{mA},$ $f = 100\text{MHz}$	100	-	-	MHz

Typical Characteristics : $T_A = 25^\circ\text{C}$ unless otherwise specified

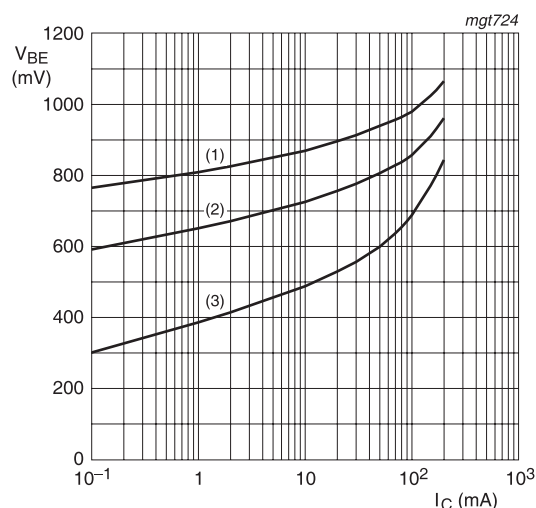
Ratings & Characteristic Curves



$V_{CE} = 5\text{V}$

- (1) $T_{amb} = 150^\circ\text{C}$
- (2) $T_{amb} = 25^\circ\text{C}$
- (3) $T_{amb} = -55^\circ\text{C}$

Selection A : DC current gain as a function of collector current; typical values

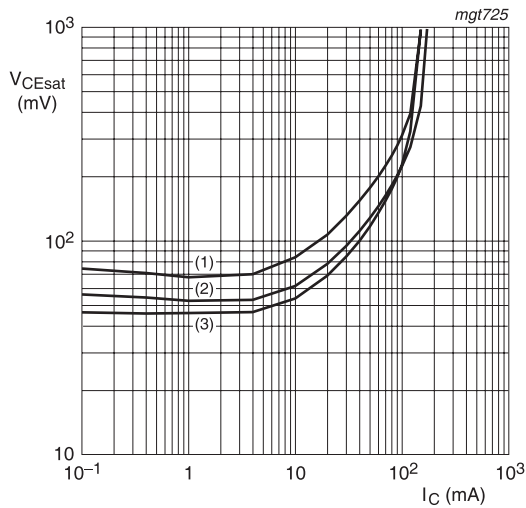


$V_{CE} = 5\text{V}$

- (1) $T_{amb} = -55^\circ\text{C}$
- (2) $T_{amb} = 25^\circ\text{C}$
- (3) $T_{amb} = 150^\circ\text{C}$

Selection A : Base-emitter voltage as a function of collector current; typical values

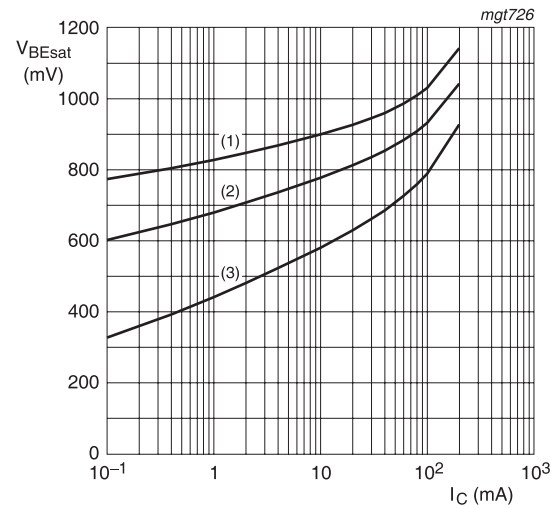
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$$I_C/I_B = 20$$

- (1) $T_{amb} = 150\text{ }^{\circ}\text{C}$
- (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (3) $T_{amb} = -55\text{ }^{\circ}\text{C}$

Selection A : Collector-emitter saturation voltage as a function of collector current; typical values



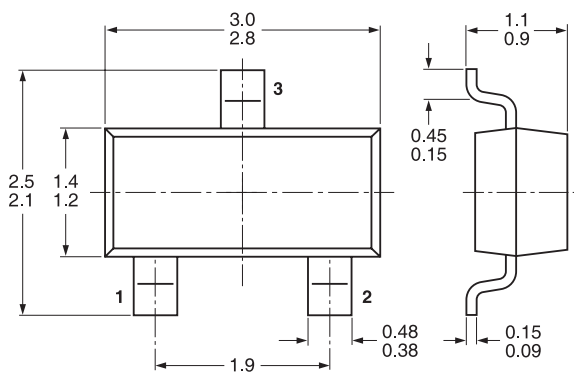
$$I_C/I_B = 10$$

- (1) $T_{amb} = -55\text{ }^{\circ}\text{C}$
- (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (3) $T_{amb} = 150\text{ }^{\circ}\text{C}$

Selection A : Base-emitter saturation voltage as a function of collector current; typical values

Package Outline

Plastic surface mounted package



Dimensions : Millimetres

Package outline SOT23

Technical drawing of a rectangular plate with three square holes. The plate has overall dimensions of 3.3 by 3.0. The top two holes are spaced 2.9 apart, with a 1.9 gap between their centers. The bottom hole is centered horizontally. Vertical dimensions show the top holes are 1.7 from the top edge and 0.7 from the bottom edge. The bottom hole is 0.6 from the bottom edge. Horizontal dimensions show the bottom hole is 0.5 from the left edge and 0.6 from the right edge. A dimension of 2.0 is shown on the right side.

Dimensions : Millimetres

Package Information :

Device	Package	Shipping
BC846 BC846A BC846B	SOT-23	3,000 / Tape & Reel

Description	Part Number
Transistor, NPN, 0.1A, 65V, SOT23	BC846
	BC846A
	BC846B

www.element14.com
www.farnell.com
www.newark.com