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°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	°C/W
Junction and Storage Temperature	T_J, T_{STG}	-55 to +150	°C

Max. Ratings & Characteristics : T_A = 25°C unless otherwise specified

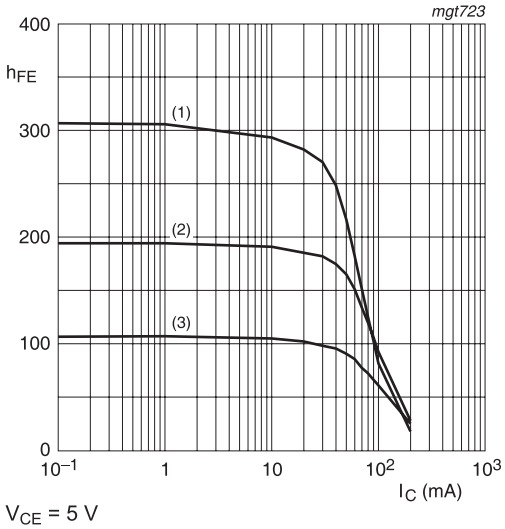
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector - Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=-10μA I_E=0	80	-	-	V
Collector - Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=-10mA I_B=0	65	-	-	V
Emitter - Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=10μA I_C=0	6	-	-	V

Max. Ratings & Characteristics : T_A = 25°C unless otherwise specified (Cont.)

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

Typical Characteristics : T_A = 25°C unless otherwise specified

Ratings & Characteristic Curves



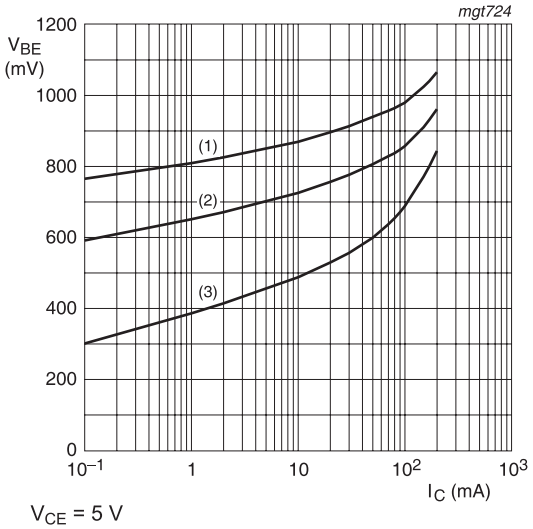
V_{CE} = 5 V

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = –55 °C

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



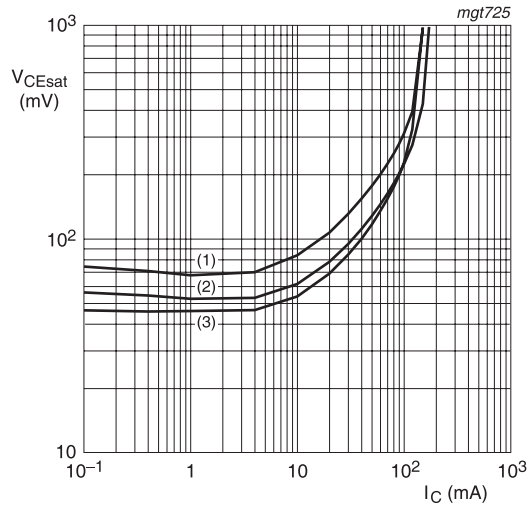
V_{CE} = 5 V

(1) T_{amb} = –55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

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



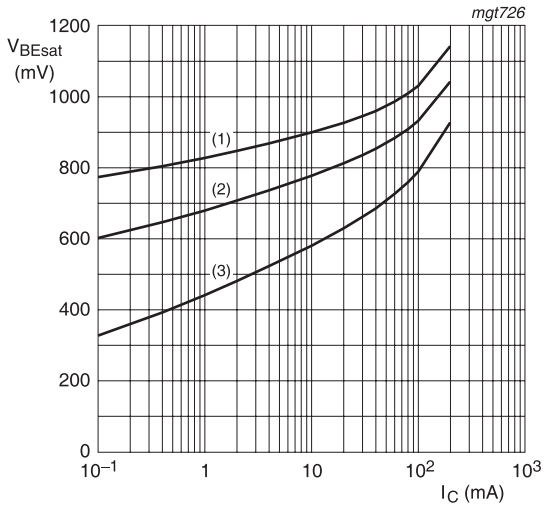
I_C/I_B = 20

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = –55 °C

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



I_C/I_B = 10

(1) T_{amb} = –55 °C

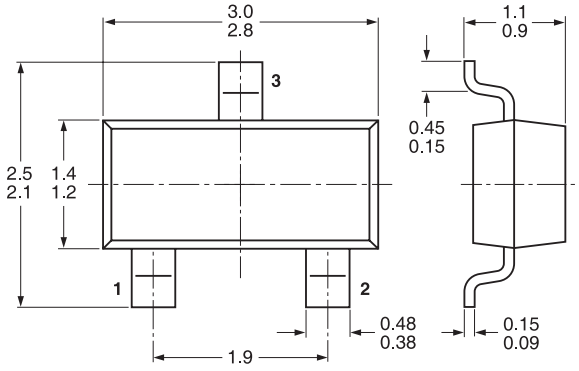
(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

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

Package Outline

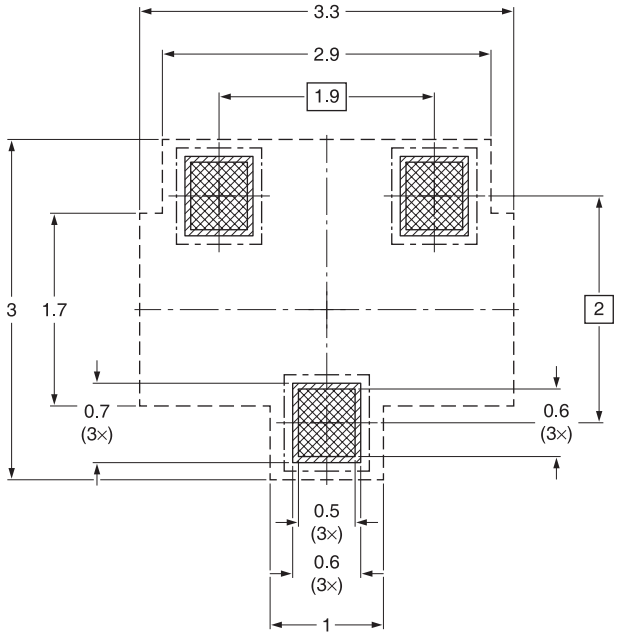
Plastic surface mounted package



Dimensions : Millimetres

Package outline SOT23

Soldering Footprint



solder lands

solder resist

solder paste

occupied area

Dimensions : Millimetres

Reflow soldering footprint SOT23

Package Information :

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

Part Number Table

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