

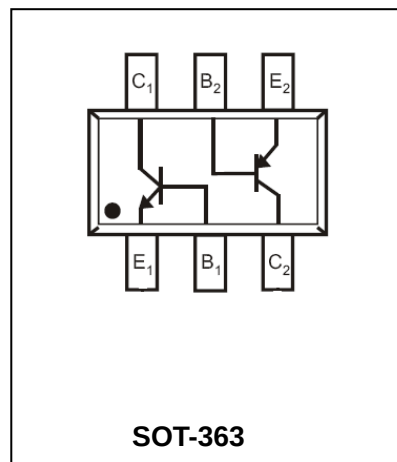
Small Surface Mount Transistor

BC846BPN

FEATURES

- Low collector capacitance
- Low collector-emitter saturation voltage
- Closely matched current gain
- Reduces number of components and board space
- No mutual interference between the transistors

HF



APPLICATIONS

- General-purpose switching and amplification

ORDERING INFORMATION

Type No.	Marking	Package Code
BC846BPN	PJ	SOT-363

MAXIMUM RATING @ Ta=25°C unless otherwise specified

Symbol	Parameter	NPN	PNP	Unit
V_{CBO}	Collector-Base Voltage	80	-80	V
V_{CEO}	Collector-Emitter Voltage	65	-65	V
V_{EBO}	Emitter-Base Voltage	6	-6	V
I_C	Collector Current -Continuous	100	-100	mA
I_{CM}	Collector Current -Peak	200	-200	mA
I_{BM}	Base Current -Peak	200	-200	mA
P_D	Power Dissipation	200		mW
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	625		°C/W
T_J, T_{stg}	Operating and Storage Temperature	-65 to +150		°C

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Electrical Characteristics Of TR1 NPN Transistor @ Ta=25°C unless otherwise specified

Parameter	Symbol	Test conditions	MIN.	TYP.	MAX.	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 10\mu A, I_E = 0$	80	-	-	V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 10mA, I_B = 0$	65	-	-	V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 10\mu A, I_C = 0$	6	-	-	V
Collector cut-off current	I_{CBO}	$V_{CB} = 50V, I_E = 0, T_J = 25^\circ C$	-	-	15	nA
		$V_{CB} = 50V, I_E = 0, T_J = 100^\circ C$	-	-	0.5	μA
		$V_{CB} = 50V, I_E = 0, T_J = 125^\circ C$	-	-	1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 6V, I_C = 0, T_J = 25^\circ C$	-	-	100	nA
		$V_{EB} = 6V, I_C = 0, T_J = 100^\circ C$	-	-	1	μA
		$V_{EB} = 6V, I_C = 0, T_J = 125^\circ C$	-	-	2	μA
DC current gain	h_{FE}	$V_{CE} = 5V, I_C = 10\mu A$	-	280	-	-
		$V_{CE} = 5V, I_C = 2mA$	200	290	450	-
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10mA, I_B = 0.5mA$	-	0.05	0.1	V
		$I_C = 100mA, I_B = 5mA$	-	0.2	0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 10mA, I_B = 0.5mA$	-	0.755	0.85	V
		$I_C = 100mA, I_B = 5mA$	-	1	-	V
Base-emitter voltage	$V_{BE(on)}$	$V_{CE} = 5V, I_C = 2mA$	0.58	0.65	0.7	V
		$V_{CE} = 5V, I_C = 10mA$	-	-	0.77	V
Transition frequency	f_T	$V_{CE}=5V, I_C=10mA, f=100MHz$	100	-	-	MHz
collector capacitance	C_c	$V_{CB} = 10V, f = 1.0MHz$	-	1.9	-	pF
emitter capacitance	C_e	$V_{CB} = 0.5V, f = 1.0MHz$	-	11	-	pF

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Electrical Characteristics Of TR2 PNP Transistor

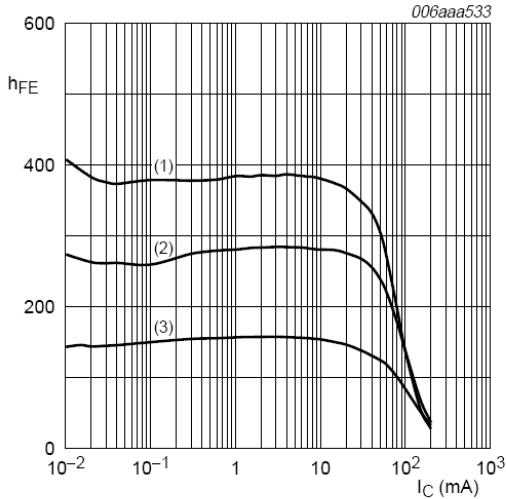
@ Ta=25°C unless otherwise specified

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = -10\mu A, I_E = 0$	-80	-	-	V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -10mA, I_B = 0$	-65	-	-	V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -10\mu A, I_C = 0$	-6	-	-	V
Collector cut-off current	I_{CBO}	$V_{CB} = -50V, I_E = 0, T_J = 25^\circ C$	-	-	-15	nA
		$V_{CB} = -50V, I_E = 0, T_J = 100^\circ C$	-	-	-0.5	μA
		$V_{CB} = -50V, I_E = 0, T_J = 125^\circ C$	-	-	-1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = -6V, I_C = 0, T_J = 25^\circ C$	-	-	-100	nA
		$V_{EB} = -6V, I_C = 0, T_J = 100^\circ C$	-	-	-1	μA
		$V_{EB} = -6V, I_C = 0, T_J = 125^\circ C$	-	-	-2	μA
DC current gain	h_{FE}	$V_{CE} = -5V, I_C = -10\mu A$	-	280	-	-
		$V_{CE} = -5V, I_C = -2mA$	200	290	450	-
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -10mA, I_B = -0.5mA$	-	-0.055	-0.1	V
		$I_C = -100mA, I_B = -5mA$	-	-0.2	-0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = -10mA, I_B = -0.5mA$	-	-0.755	-0.85	V
		$I_C = -100mA, I_B = -5mA$	-	-0.9	-	V
Base-emitter on voltage	$V_{BE(on)}$	$V_{CE} = -5V, I_C = -2mA$	-0.6	-0.65	-0.75	V
		$V_{CE} = -5V, I_C = -10mA$	-	-	-0.82	V
Transition frequency	f_T	$V_{CE} = -5V, I_C = -10mA, f = 100MHz$	100	-	-	MHz
collector capacitance	C_c	$V_{CB} = -10V, f = 1.0MHz$	-	2.3	-	pF
emitter capacitance	C_e	$V_{CB} = -0.5V, f = 1.0MHz$	-	10	-	pF

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TYPICAL CHARACTERISTICS @ $T_a=25^\circ\text{C}$ unless otherwise specified



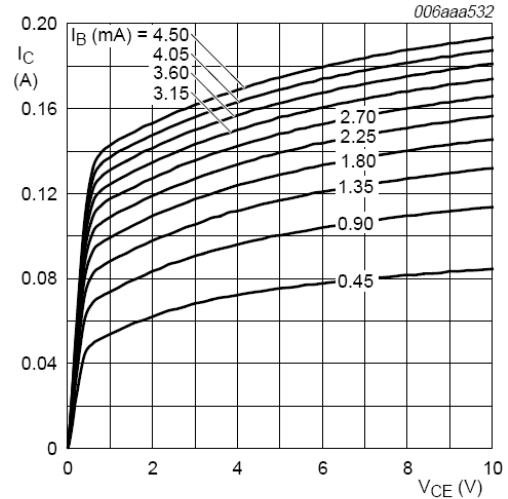
$V_{CE} = 5\text{ V}$

(1) $T_{amb} = 100^\circ\text{C}$

(2) $T_{amb} = 25^\circ\text{C}$

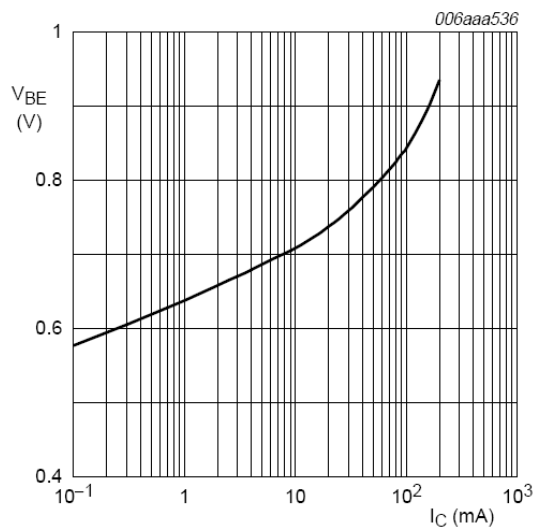
(3) $T_{amb} = -55^\circ\text{C}$

Fig1 . TR1 (NPN) :DC current gain as a function of collector current; typical values



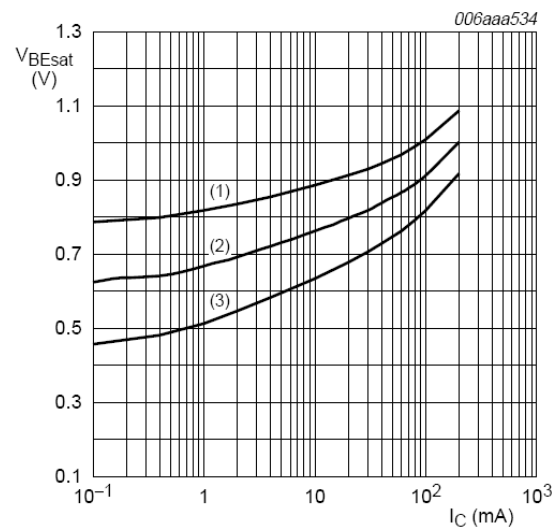
$T_{amb} = 25^\circ\text{C}$

Fig 2. TR1 (NPN): Collector current as a function of collector-emitter voltage; typical values



$V_{CE} = 5\text{ V}; T_{amb} = 25^\circ\text{C}$

Fig 3. TR1 (NPN): Base-emitter voltage as a function of collector current; typical values



$I_C/I_B = 20$

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

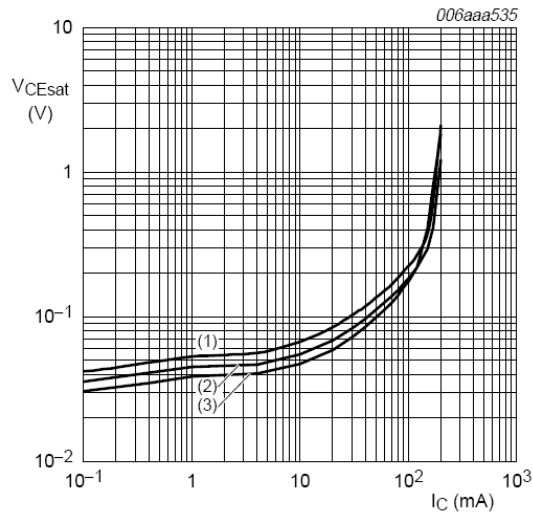
(2) $T_{amb} = 25^\circ\text{C}$

(3) $T_{amb} = 100^\circ\text{C}$

Fig 4. TR1 (NPN): Base-emitter saturation voltage as a function of collector current; typical values

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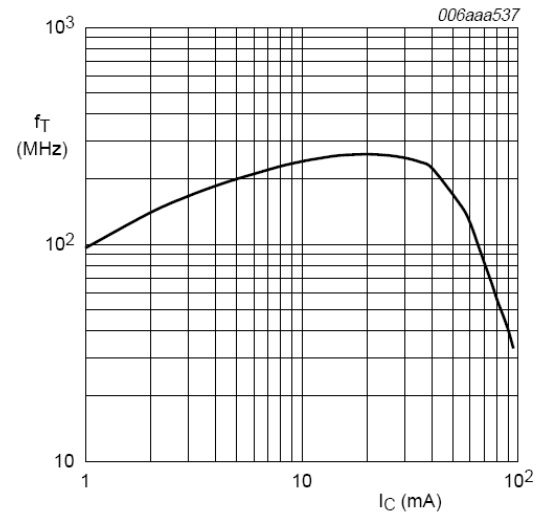
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$$I_C/I_B = 20$$

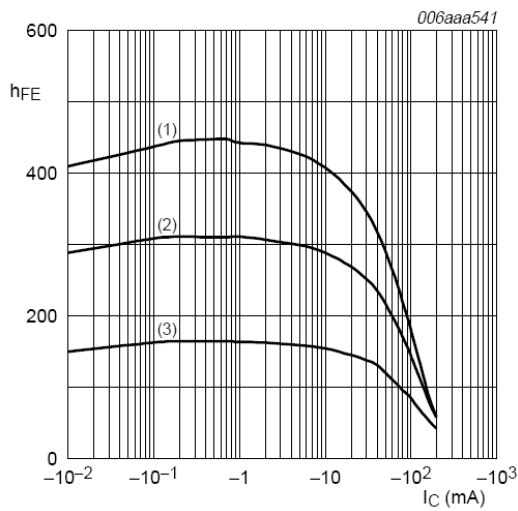
- (1) $T_{amb} = 100\text{ }^{\circ}\text{C}$
- (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (3) $T_{amb} = -55\text{ }^{\circ}\text{C}$

Fig 5. TR1 (NPN): Collector-emitter saturation voltage as a function of collector current; typical values



$$V_{CE} = 5\text{ V}; T_{amb} = 25\text{ }^{\circ}\text{C}$$

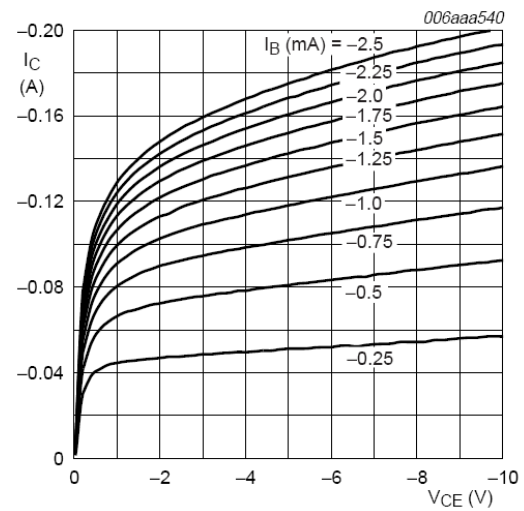
Fig 6. TR1 (NPN): Transition frequency as a function of collector current; typical values



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

- (1) $T_{amb} = 100\text{ }^{\circ}\text{C}$
- (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (3) $T_{amb} = -55\text{ }^{\circ}\text{C}$

Fig 7. TR2 (PNP): DC current gain as a function of collector current; typical values



$$T_{amb} = 25\text{ }^{\circ}\text{C}$$

Fig 8. TR2 (PNP): Collector current as a function of collector-emitter voltage; typical values

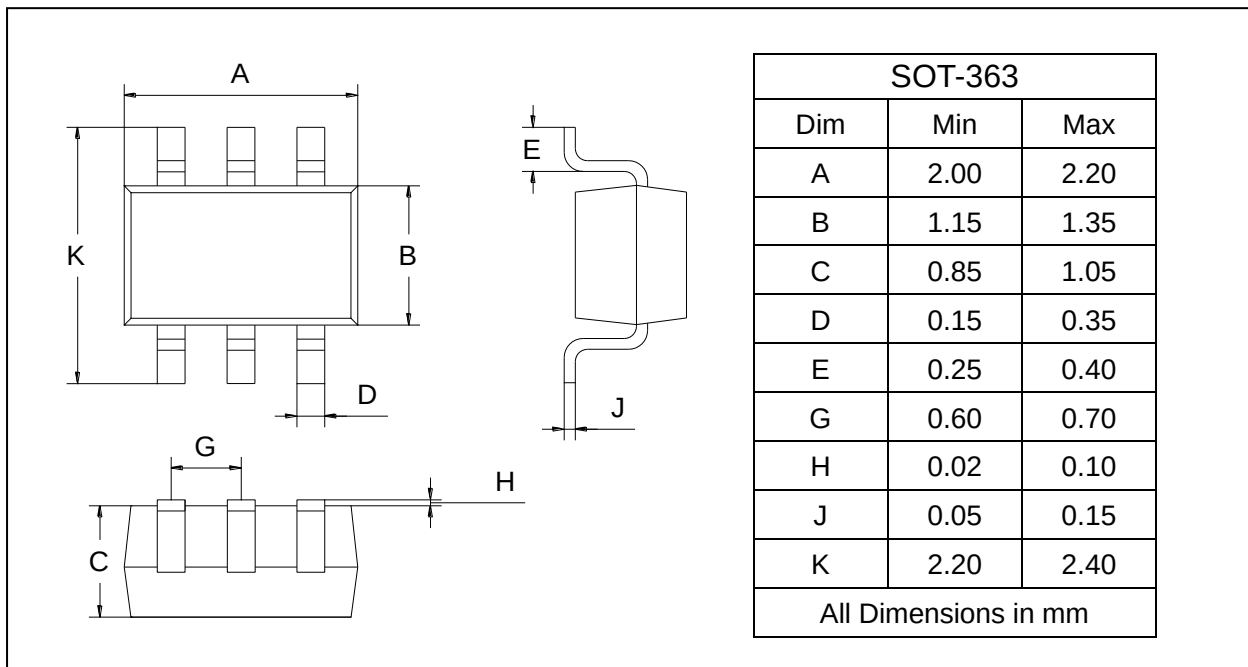
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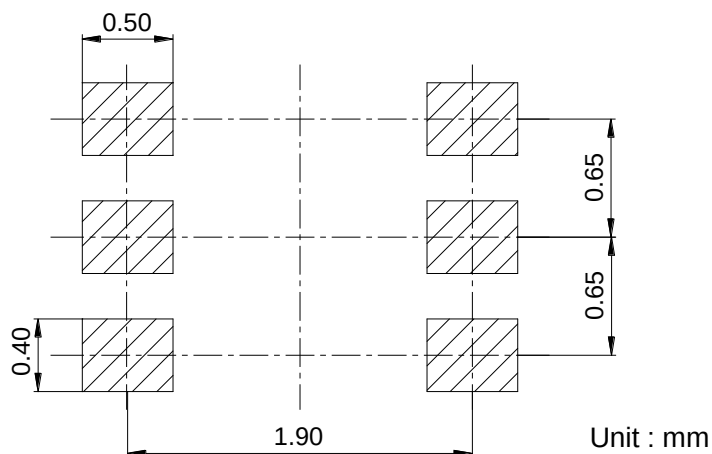
PACKAGE OUTLINE

Plastic surface mounted package

SOT-363



SOLDERING FOOTPRINT



PACKAGE INFORMATION

Device	Package	Shipping
BC846BPN	SOT-363	3000 pcs / Tape & Reel