

BCV65

NPN/PNP general-purpose transistor

Rev. 4 — 27 July 2010

Product data sheet

1. Product profile

1.1 General description

NPN/PNP general-purpose transistor in a small SOT143B Surface-Mounted Device (SMD) plastic package.

1.2 Features and benefits

- Low current (max. 100 mA)
- Low voltage (max. 30 V)
- Matched pair
- AEC-Q101 qualified
- Small SMD plastic package

1.3 Applications

- General-purpose switching and amplification

1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor; for the PNP transistor with negative polarity						
V_{CEO}	collector-emitter voltage	open base	-	-	30	V
I_C	collector current		-	-	100	mA
h_{FE}	DC current gain	$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}$	75	-	800	

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1, 3	collector		
2	common base		
4	common emitter		

006aab22s



3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BCV65	-	plastic surface-mounted package; 4 leads	SOT143B

4. Marking

Table 4. Marking codes

Type number	Marking code ^[1]
BCV65	97*

- [1] * = -: made in Hong Kong
 * = p: made in Hong Kong
 * = t: made in Malaysia
 * = W: made in China

5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
Per transistor; for the PNP transistor with negative polarity					
V_{CBO}	collector-base voltage	open emitter	-	30	V
V_{CEO}	collector-emitter voltage	open base	-	30	V
I_C	collector current		-	100	mA
I_{CM}	peak collector current		-	200	mA
I_{BM}	peak base current		-	200	mA
Per device					
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	-	250	mW
T_j	junction temperature		-	150	°C
T_{amb}	ambient temperature		-65	+150	°C
T_{stg}	storage temperature		-65	+150	°C

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500 K/W

[1] Device mounted on an FR4 Printed-Circuit Board (PCB).

7. Characteristics

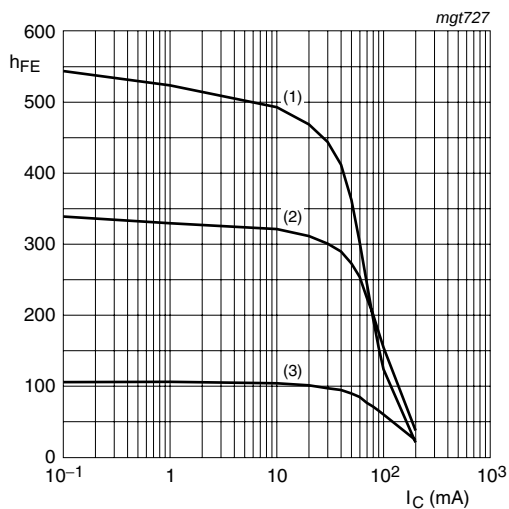
Table 7. Characteristics

$T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor; for the PNP transistor with negative polarity						
I_{CBO}	collector-base cut-off current	$V_{CB} = 30\text{ V}; I_E = 0\text{ A}$	-	-	15	nA
		$V_{CB} = 30\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ }^{\circ}\text{C}$	-	-	5	μA
h_{FE}	DC current gain	$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}$	75	-	800	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$	-	90	300	mV
		$I_C = 100\text{ mA}; I_B = 5\text{ mA}$	-	250	650	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$	[1]	-	700	- mV
		$I_C = 100\text{ mA}; I_B = 5\text{ mA}$	[1]	-	900	- mV
V_{BE}	base-emitter voltage	$I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$	[2]	580	650	750 mV
		$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$	[2]	-	-	820 mV

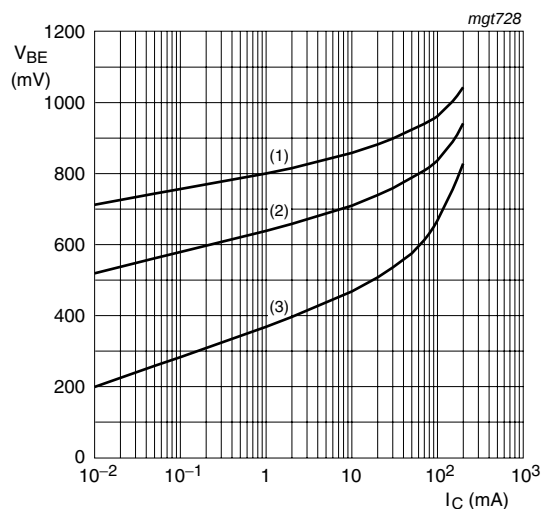
[1] V_{BEsat} decreases by about 1.7 mV/K with increasing temperature.

[2] V_{BE} decreases by about 2 mV/K with increasing temperature.



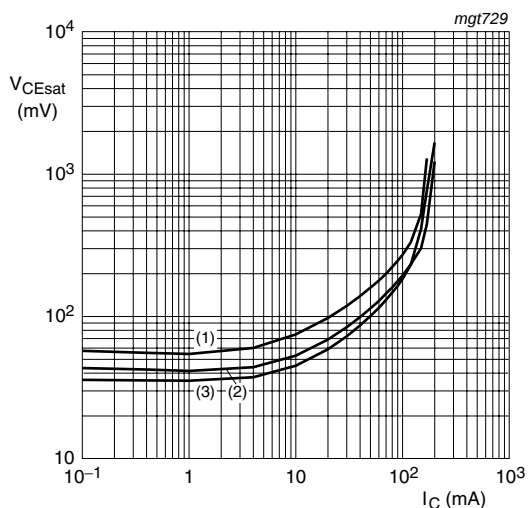
- $V_{CE} = 5\text{ V}$
- (1) $T_{amb} = 150\text{ }^{\circ}\text{C}$
 - (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$
 - (3) $T_{amb} = -55\text{ }^{\circ}\text{C}$

Fig 1. TR1 (NPN): DC current gain as a function of collector current; typical values



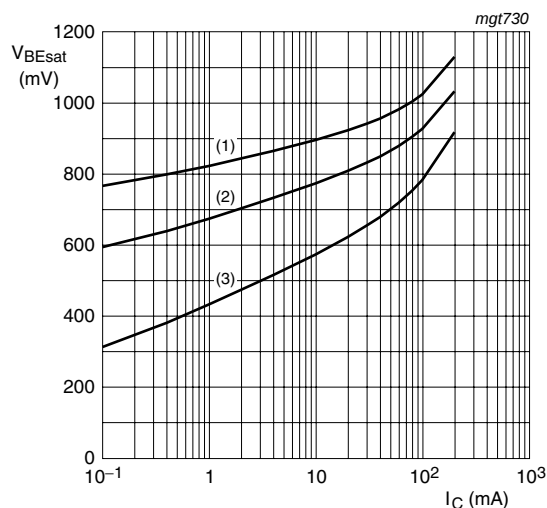
- $V_{CE} = 5\text{ V}$
- (1) $T_{amb} = -55\text{ }^{\circ}\text{C}$
 - (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$
 - (3) $T_{amb} = 150\text{ }^{\circ}\text{C}$

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



- $I_C/I_B = 20$
- (1) $T_{amb} = 150\text{ }^{\circ}\text{C}$
 - (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$
 - (3) $T_{amb} = -55\text{ }^{\circ}\text{C}$

Fig 3. TR1 (NPN): 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) $T_{amb} = 150\text{ }^{\circ}\text{C}$

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

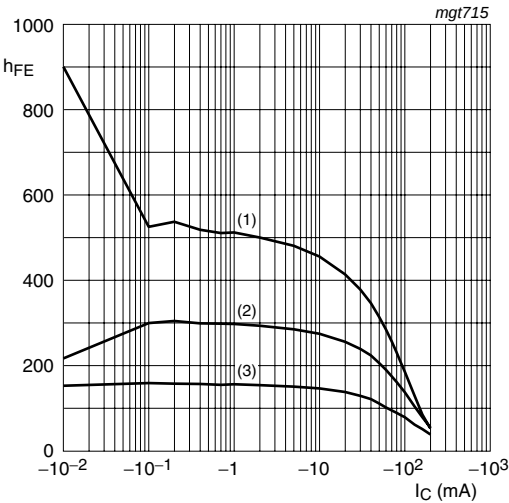


Fig 5. TR2 (PNP): DC current gain as a function of collector current; typical values

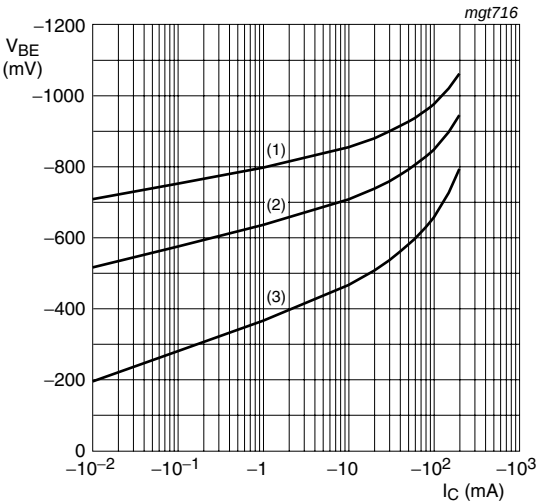


Fig 6. TR2 (PNP): Base-emitter voltage as a function of collector current; typical values

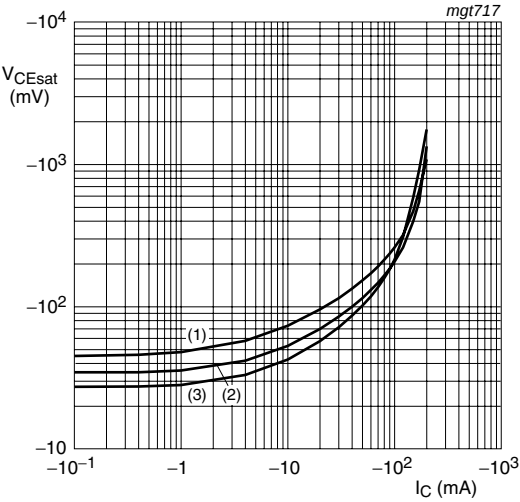


Fig 7. TR2 (PNP): Collector-emitter saturation voltage as a function of collector current; typical values

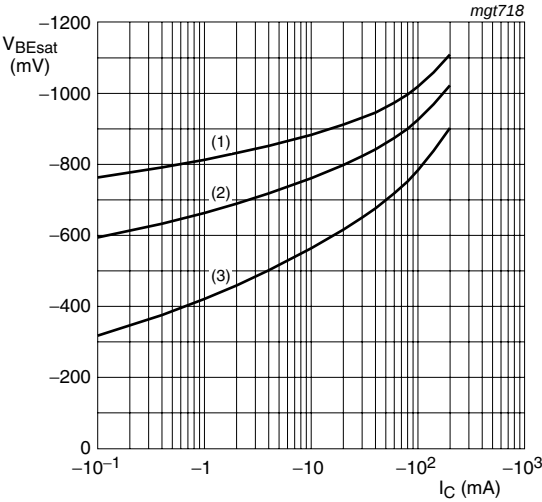


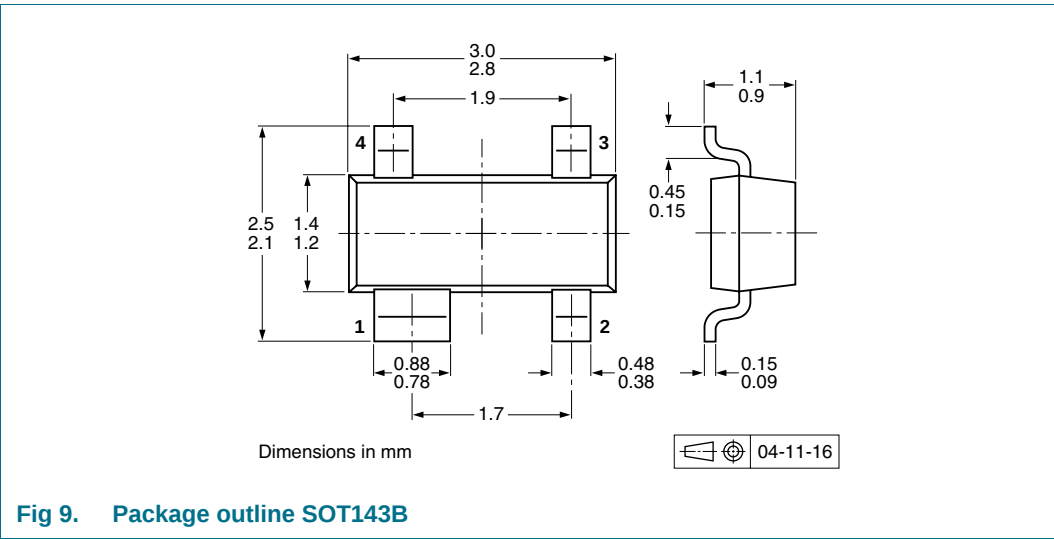
Fig 8. TR2 (PNP): Base-emitter saturation voltage as a function of collector current; typical values

8. Test information

8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

9. Package outline



10. Packing information

Table 8. Packing methods
The indicated -xxx are the last three digits of the 12NC ordering code.^[1]

Type number	Package	Description	Packing quantity	
			3000	10000
BCV65	SOT143B	4 mm pitch, 8 mm tape and reel	-215	-235

[1] For further information and the availability of packing methods, see [Section 14](#).

11. Soldering

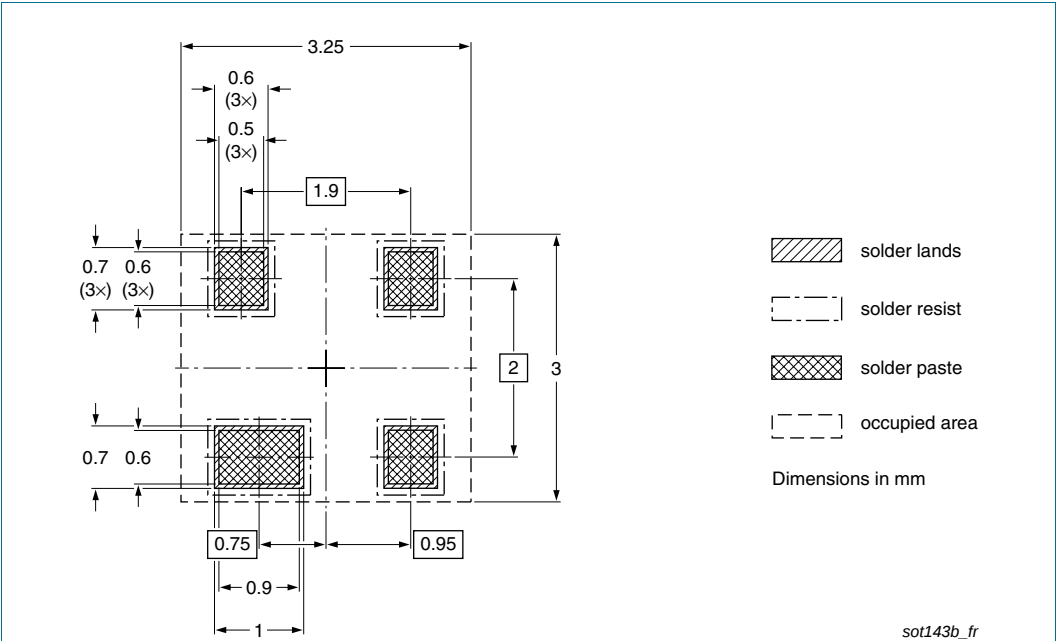


Fig 10. Reflow soldering footprint SOT143B

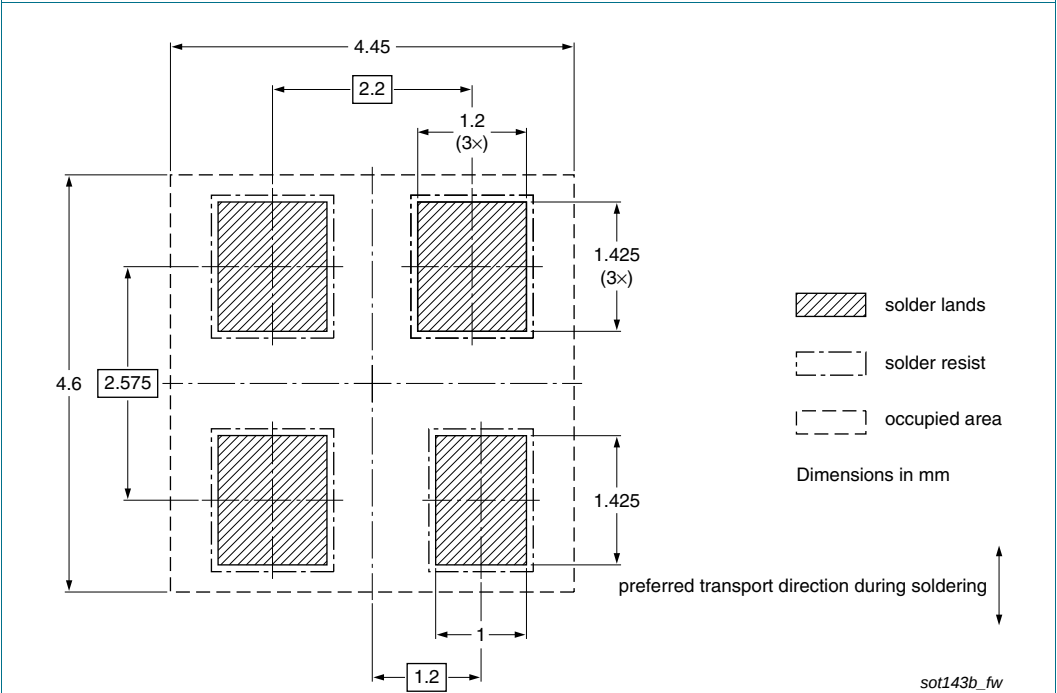


Fig 11. Wave soldering footprint SOT143B