BCV63; BCV63B

NPN general-purpose double transistors

Rev. 4 — 4 August 2010 Product data sheet

1. Product profile

1.1 General description

NPN general-purpose double transistors in a small SOT143B Surface-Mounted Device (SMD) plastic package.

Table 1. Product overview

Type number	Package		PNP complement
	Nexperia	JEITA	
BCV63	SOT143B	-	-
BCV63B			BCV64B

1.2 Features and benefits

- Low current (max. 100 mA)
- Low voltage (max. 30 V and 6 V)
- AEC-Q101 qualified
- Small SMD plastic package

1.3 Applications

- General-purpose switching and amplification
- For use in Schmitt trigger applications

1.4 Quick reference data

Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor						
I_C	collector current		-	-	100	mA
Transistor TR1						
V_{CEO}	collector-emitter voltage	open base	-	-	30	V
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 2 mA				
	BCV63		110	-	800	
	BCV63B		200	-	450	

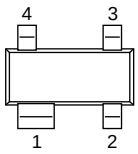
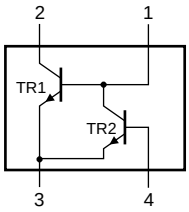
Table 2. Quick reference data *...continued*

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Transistor TR2							
V_{CEO}	collector-emitter voltage	open base		-	-	6	V
h_{FE}	DC current gain	V_{CE} = 700 mV; I_C = 2 mA	[1]				
	BCV63			110	-	800	
	BCV63B			200	-	450	

[1] Group selection will be done on TR1. Due to matched dies, h_{FE} values for TR2 are the same as for TR1.

2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	collector TR2 and base TR1		
2	collector TR1		
3	emitter TR1 and TR2		
4	base TR2		

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3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
BCV63	-	plastic surface-mounted package; 4 leads	SOT143B
BCV63B			

4. Marking

Table 5. Marking codes

Type number	Marking code[1]
BCV63	*D5
BCV63B	*D6

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

5. Limiting values

Table 6. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per transistor						
V_{EBO}	emitter-base voltage	open collector		-	6	V
I_C	collector current			-	100	mA
I_{CM}	peak collector current			-	200	mA
I_B	base current			-	100	mA
Transistor TR1						
V_{CBO}	collector-base voltage	open emitter		-	30	V
V_{CEO}	collector-emitter voltage	open base		-	30	V
Transistor TR2						
V_{CBO}	collector-base voltage	open emitter		-	6	V
V_{CEO}	collector-emitter voltage	open base		-	6	V
Per device						
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	250	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			−65	+150	°C
T_{stg}	storage temperature			−65	+150	°C

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

6. Thermal characteristics

Table 7. 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 PCB.

7. Characteristics

Table 8. Characteristics

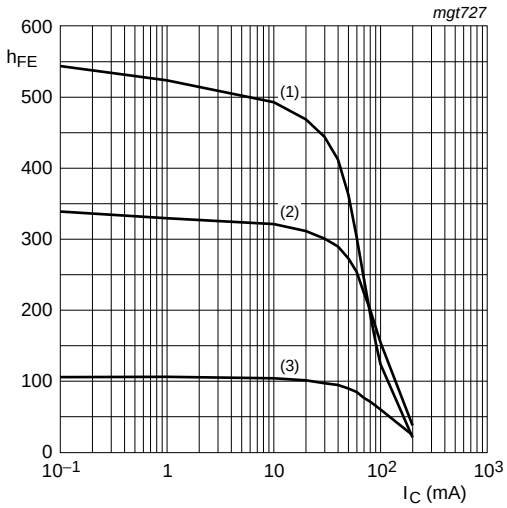
T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
I_{CBO}	collector-base cut-off current	V_{CB} = 30 V; I_E = 0 A		-	-	15	nA
		V_{CB} = 30 V; I_E = 0 A; T_j = 150 °C		-	-	5	µA
V_{CEsat}	collector-emitter saturation voltage	I_C = 10 mA; I_B = 0.5 mA		-	75	300	mV
V_{BEsat}	base-emitter saturation voltage	I_C = 10 mA; I_B = 0.5 mA	[2]	-	700	-	mV
Transistor TR1							
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 2 mA					
	BCV63			110	-	800	
	BCV63B			200	-	450	
V_{CEsat}	collector-emitter saturation voltage	I_C = 100 mA; I_B = 5 mA		-	250	650	mV
V_{BEsat}	base-emitter saturation voltage	I_C = 100 mA; I_B = 5 mA	[2]	-	850	-	mV
V_{BE}	base-emitter voltage	I_C = 2 mA; V_{CE} = 5 V	[3]	600	650	750	mV
		I_C = 10 mA; V_{CE} = 5 V	[3]	-	-	820	mV
f_T	transition frequency	V_{CE} = 5 V; I_C = 10 mA; f = 100 MHz		100	-	-	MHz
C_c	collector capacitance	V_{CB} = 10 V; I_E = i_e = 0 A; f = 1 MHz		-	4	-	pF
Transistor TR2							
h_{FE}	DC current gain	V_{CE} = 700 mV; I_C = 2 mA	[1]				
	BCV63			110	-	800	
	BCV63B			200	-	450	
V_{CEsat}	collector-emitter saturation voltage	I_C = 100 mA; I_B = 5 mA		-	250	-	mV
V_{BE}	base-emitter voltage	I_C = 2 mA; V_{CE} = 700 mV	[3]	-	700	-	mV

[1] Group selection will be done on TR1. Due to matched dies, h_{FE} values for TR2 are the same as for TR1.

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

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



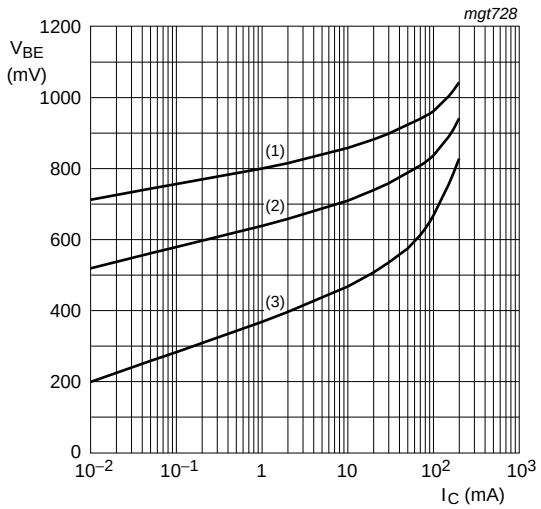
V_{CE} = 5 V

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

Fig 1. BCV63B: DC current gain as a function of collector current; typical values



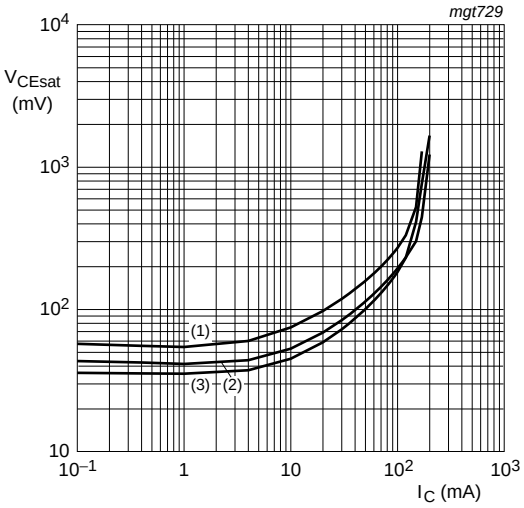
V_{CE} = 5 V

(1) T_{amb} = −55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

Fig 2. BCV63B: Base-emitter voltage as a function of collector current; typical values



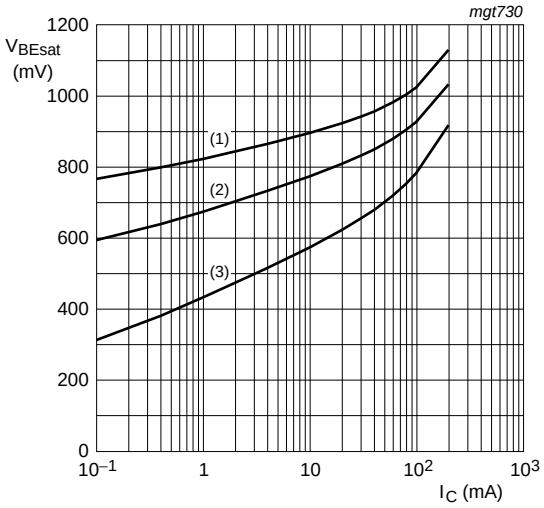
I_C/I_B = 20

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

Fig 3. BCV63B: 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

Fig 4. BCV63B: Base-emitter saturation voltage as a function of collector current; typical values

8. Application information

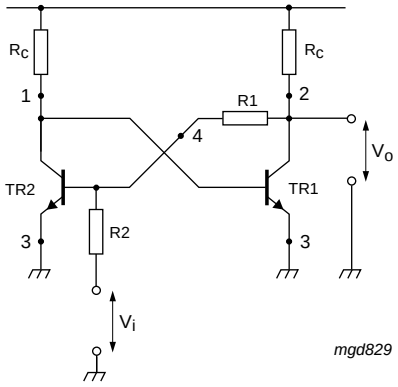


Fig 5. Schmitt trigger application

9. Test information

9.1 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.

10. Package outline

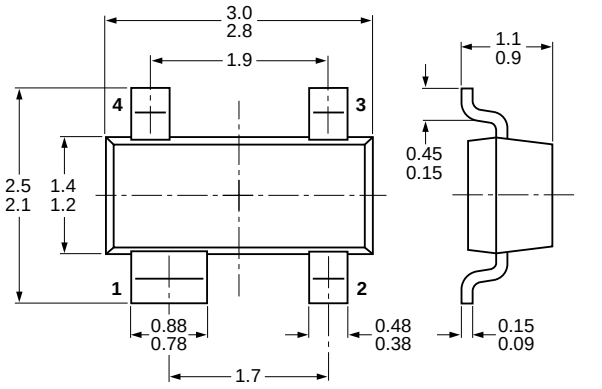


Fig 6. Package outline SOT143B

11. Packing information

Table 9. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity	
			3000	10000
BCV63	SOT143B	4 mm pitch, 8 mm tape and reel	-215	-235
BCV63B				

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

12. Soldering

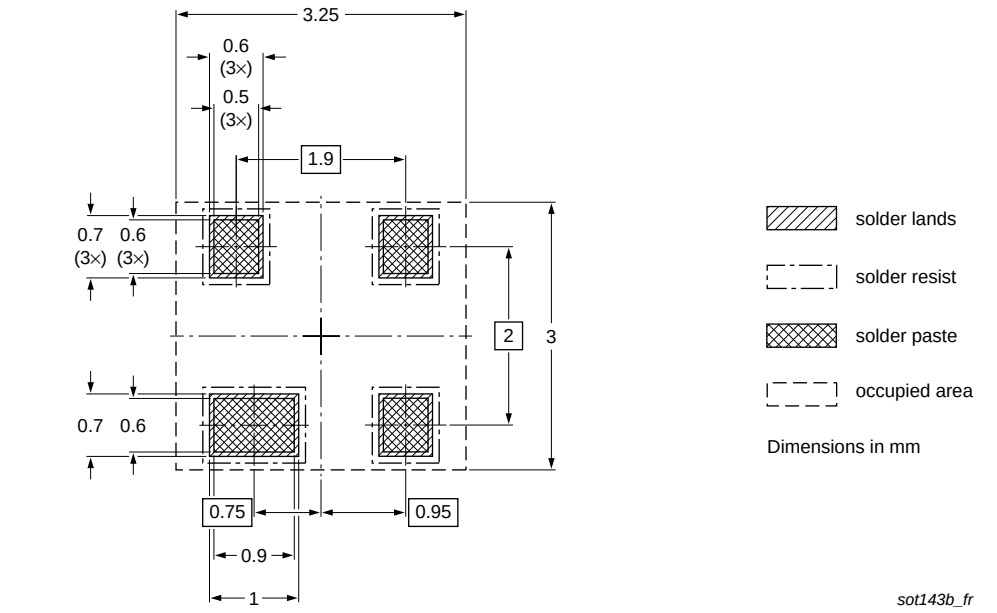


Fig 7. Reflow soldering footprint SOT143B

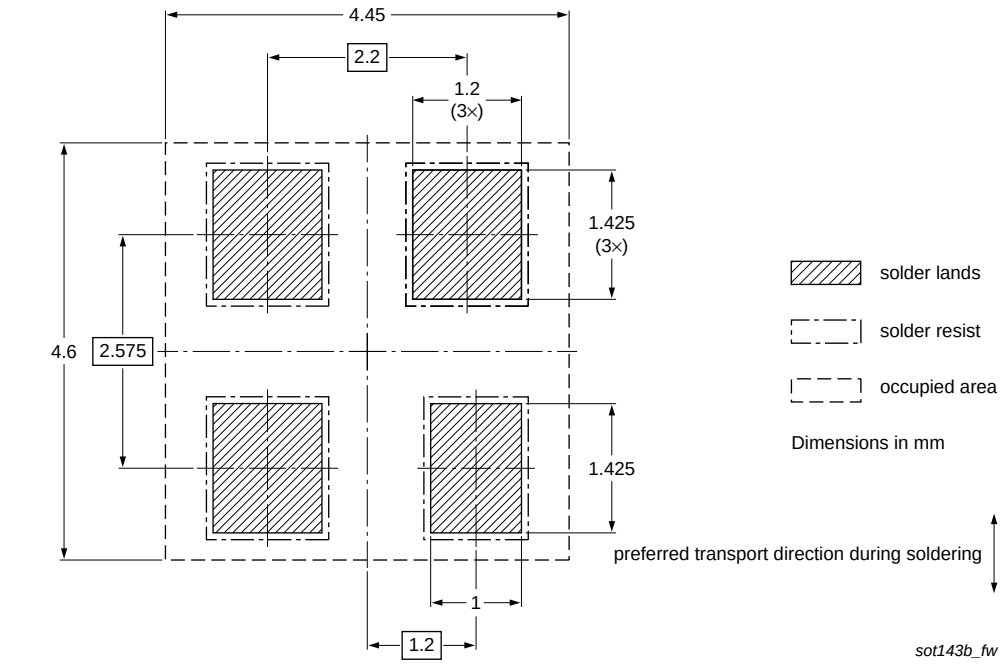


Fig 8. Wave soldering footprint SOT143B

13. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BCV63_63B v.4	20100804	Product data sheet	-	BCV63_BCV63B_3
Modifications:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Section 1 “Product profile”: amended • Section 3 “Ordering information”: added • Section 4 “Marking”: updated • Figure 1, 2, 3 and 4: added • Section 8 “Application information”: added • Section 9 “Test information”: added • Figure 6: superseded by minimized package outline drawing • Section 11 “Packing information”: added • Section 12 “Soldering”: added • Section 14 “Legal information”: updated			
BCV63_BCV63B_3	19990521	Product specification	-	BCV63_CNV_2
BCV63_CNV_2	19970310	Product specification	-	-

14. Legal information

14.1 Data sheet status

Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nexperia.com.

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