



# 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
<b>Per transistor</b>						
$I_C$	collector current		-	-	100	mA
<b>Transistor TR1</b>						
$V_{CE0}$	collector-emitter voltage	open base	-	-	30	V
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}$				
			BCV63	110	-	800
			BCV63B	200	-	450

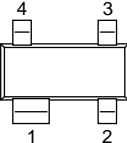
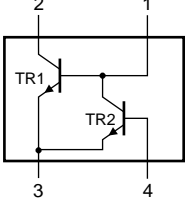
Table 2. Quick reference data ...continued

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Transistor TR2</b>						
$V_{CE0}$	collector-emitter voltage	open base	-	-	6	V
$h_{FE}$	DC current gain	$V_{CE} = 700 \text{ mV}; I_C = 2 \text{ mA}$ [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		

006aab22t

## 3. Ordering information

Table 4. Ordering information

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

## 4. Marking

Table 5. Marking codes

Type number	Marking code <sup>[1]</sup>
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
<b>Per transistor</b>					
$V_{EBO}$	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
<b>Transistor TR1</b>					
$V_{CBO}$	collector-base voltage	open emitter	-	30	V
$V_{CEO}$	collector-emitter voltage	open base	-	30	V
<b>Transistor TR2</b>					
$V_{CBO}$	collector-base voltage	open emitter	-	6	V
$V_{CEO}$	collector-emitter voltage	open base	-	6	V
<b>Per device</b>					
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[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**

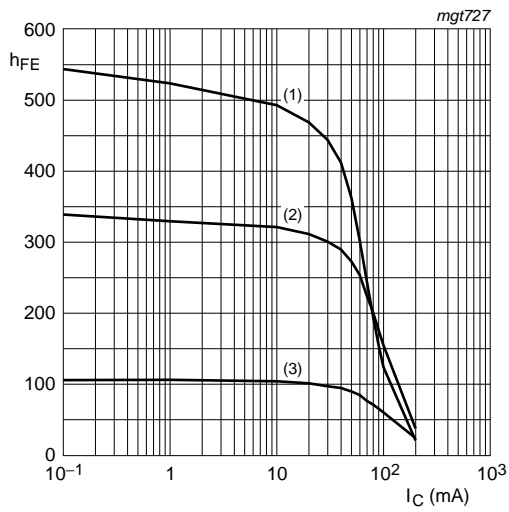
$T_j = 25\text{ °C}$  unless otherwise specified.

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

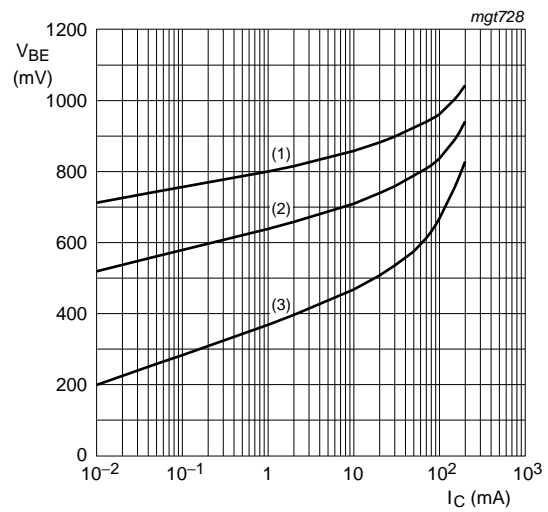
[2]  $V_{BEsat}$  decreases by about 1.7 mV/K with increasing temperature.

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



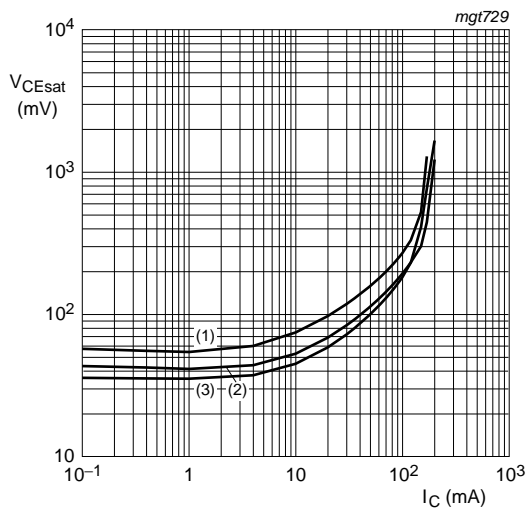
- $V_{CE} = 5\text{ V}$
- (1)  $T_{amb} = 150\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = -55\text{ °C}$

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



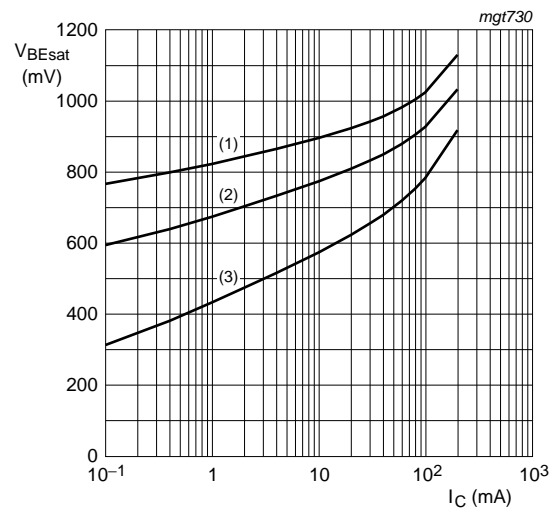
- $V_{CE} = 5\text{ V}$
- (1)  $T_{amb} = -55\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = 150\text{ °C}$

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



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

**Fig 3. BCV63B: Collector-emitter saturation voltage as a function of collector current; typical values**



- $I_C/I_B = 10$
- (1)  $T_{amb} = -55\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = 150\text{ °C}$

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

## 8. Application information

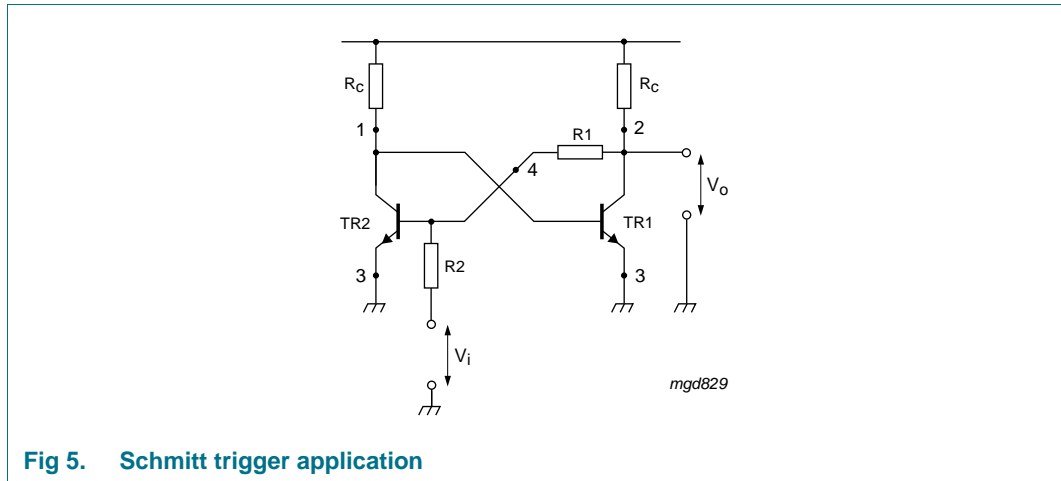


Fig 5. Schmitt trigger application

## 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

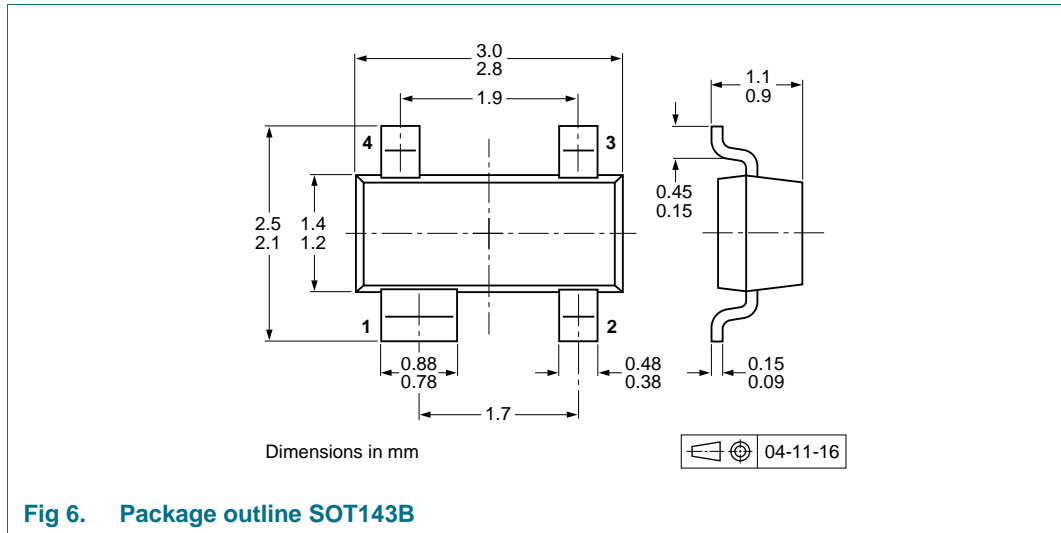


Fig 6. Package outline SOT143B

## 11. Packing information

**Table 9. Packing methods**

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

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](#).





## 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:	<ul style="list-style-type: none"> <li>• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>• Legal texts have been adapted to the new company name where appropriate.</li> <li>• <a href="#">Section 1 "Product profile"</a>: amended</li> <li>• <a href="#">Section 3 "Ordering information"</a>: added</li> <li>• <a href="#">Section 4 "Marking"</a>: updated</li> <li>• <a href="#">Figure 1, 2, 3 and 4</a>: added</li> <li>• <a href="#">Section 8 "Application information"</a>: added</li> <li>• <a href="#">Section 9 "Test information"</a>: added</li> <li>• <a href="#">Figure 6</a>: superseded by minimized package outline drawing</li> <li>• <a href="#">Section 11 "Packing information"</a>: added</li> <li>• <a href="#">Section 12 "Soldering"</a>: added</li> <li>• <a href="#">Section 14 "Legal information"</a>: updated</li> </ul>			
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 <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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".

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