



BC856S

65 V, 100 mA PNP/PNP general-purpose transistor

1 July 2022

Product data sheet

1. General description

PNP/PNP general-purpose transistor pair in a very small SOT363 (SC-88) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- 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

3. Applications

- General-purpose switching and amplification

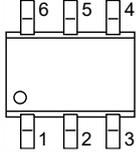
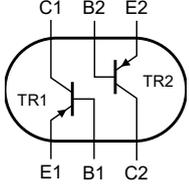
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor						
V_{CEO}	collector-emitter voltage	open base	-	-	-65	V
I_C	collector current		-	-	-100	mA
h_{FE}	DC current gain	$V_{CE} = -5\text{ V}; I_C = -2\text{ mA}; T_{amb} = 25\text{ °C}$	110	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E1	emitter TR1	 <p>TSSOP6 (SOT363)</p>	 <p><i>sym138</i></p>
2	B1	base TR1		
3	C2	collector TR2		
4	E2	emitter TR2		
5	B2	base TR2		
6	C1	collector TR1		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BC856S	TSSOP6	plastic, surface-mounted package; 6 leads; 0.65 mm pitch; 2.1 mm x 1.25 mm x 0.95 mm body	SOT363

7. Marking

Table 4. Marking codes

Type number	Marking code ^[1]
BC856S	5F%

[1] % = placeholder for manufacturing site code

8. Limiting values

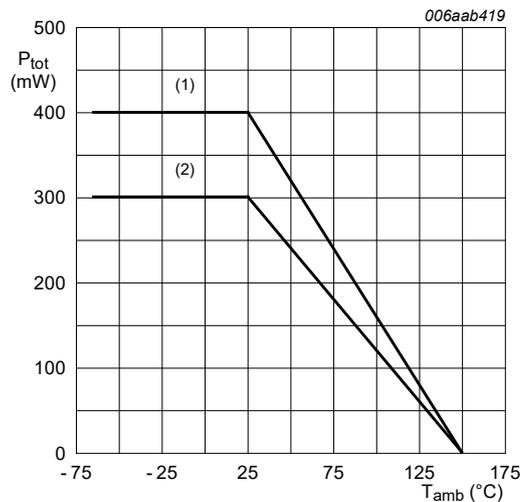
Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per transistor						
V_{CBO}	collector-base voltage	open emitter		-	-80	V
V_{CEO}	collector-emitter voltage	open base		-	-65	V
V_{EBO}	emitter-base voltage	open collector		-	-5	V
I_C	collector current			-	-100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	-	220	mW
			[2]	-	250	mW
Per device						
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	-	300	mW
			[2]	-	400	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 PCB, single-sided, 35 μm copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided, 35 μm copper, tin-plated, mounting pad for collector 1 cm^2 .



- (1) FR4 PCB, single-sided, 35 μm copper, tin-plated, mounting pad for collector 1 cm^2
 (2) FR4 PCB, single-sided, 35 μm copper, tin-plated and standard footprint

Fig. 1. Per device: Power derating curves SOT363 (SC-88)

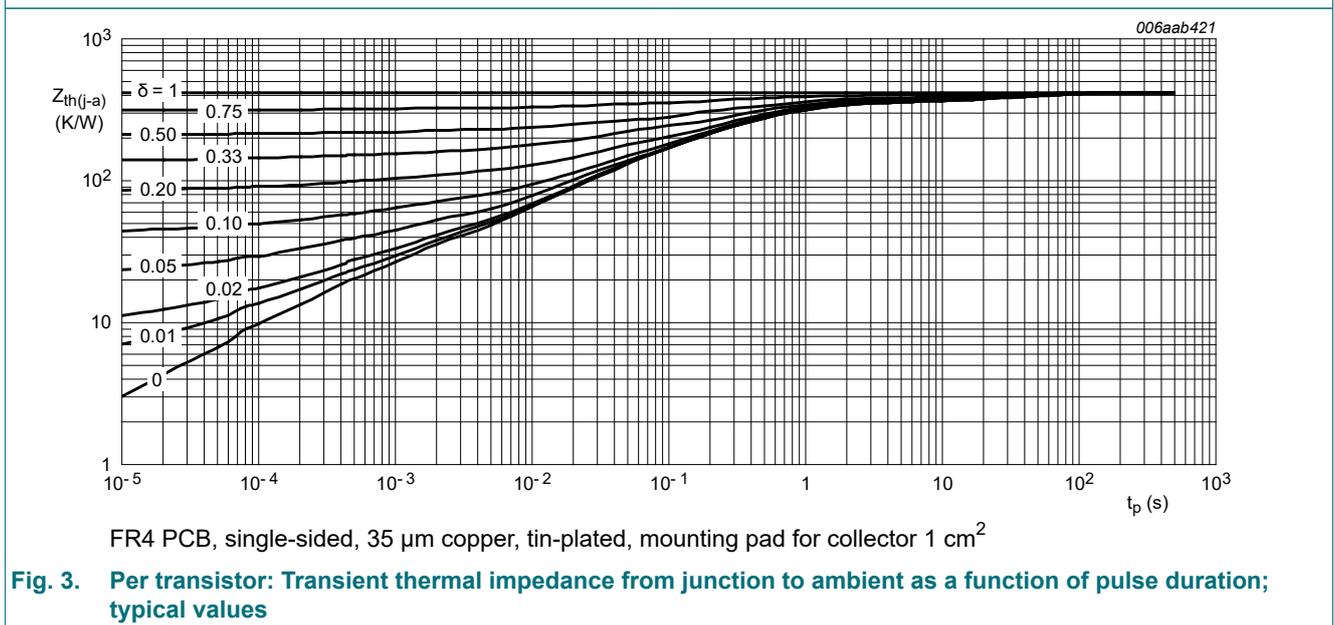
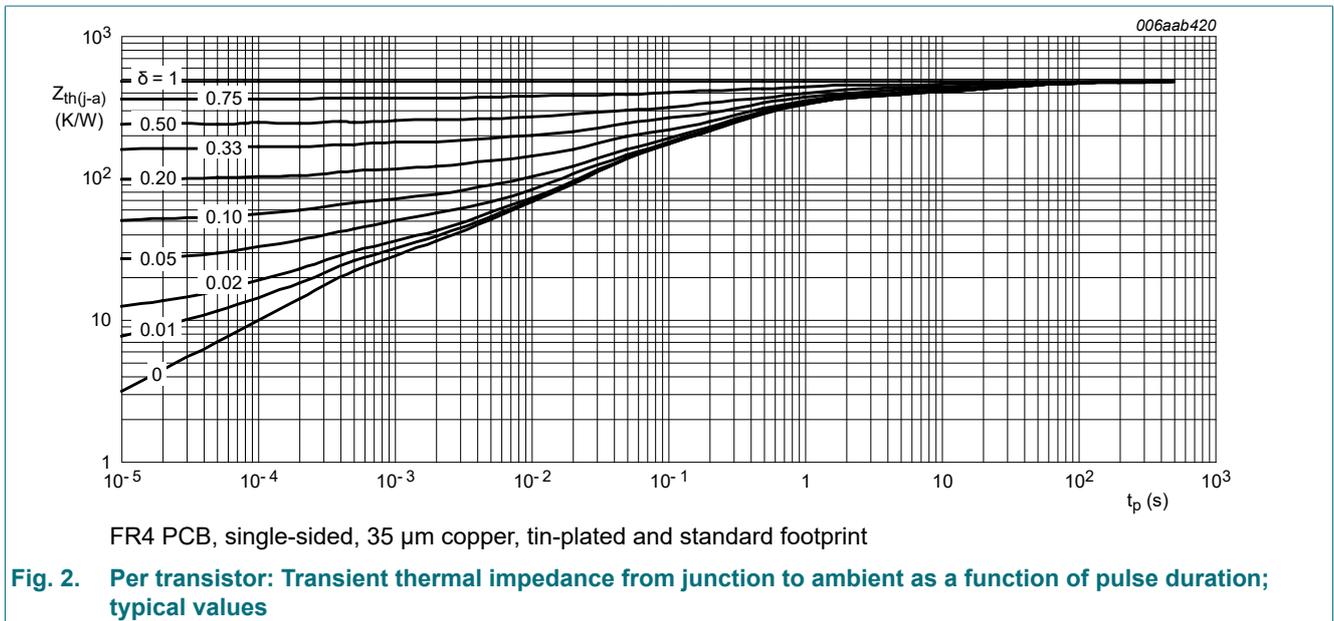
9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
Per transistor							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	568	K/W
			[2]	-	-	500	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		-	-	230	K/W	
Per device							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	416	K/W
			[2]	-	-	313	K/W

[1] Device mounted on an FR4 PCB, single-sided, 35 µm copper, tin-plated and standard footprint.

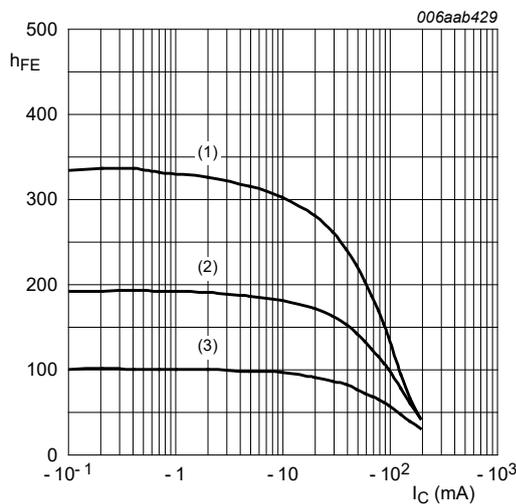
[2] Device mounted on an FR4 PCB, single-sided, 35 µm copper, tin-plated, mounting pad for collector 1 cm².



10. Characteristics

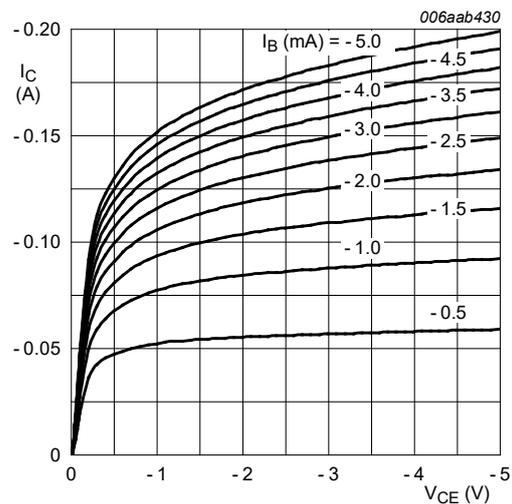
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor						
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = -100 \mu\text{A}$; $I_E = 0 \text{ A}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-80	-	-	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = -2 \text{ mA}$; $I_B = 0 \text{ A}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-65	-	-	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	$I_C = 0 \text{ A}$; $I_E = -100 \mu\text{A}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-5	-	-	V
I_{CBO}	collector-base cut-off current	$V_{CB} = -30 \text{ V}$; $I_E = 0 \text{ A}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	-15	nA
		$V_{CB} = -30 \text{ V}$; $I_E = 0 \text{ A}$; $T_j = 150 \text{ }^\circ\text{C}$	-	-	-5	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5 \text{ V}$; $I_C = 0 \text{ A}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	-100	nA
h_{FE}	DC current gain	$V_{CE} = -5 \text{ V}$; $I_C = -2 \text{ mA}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	110	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10 \text{ mA}$; $I_B = -0.5 \text{ mA}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	-100	mV
		$I_C = -100 \text{ mA}$; $I_B = -5 \text{ mA}$; pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	-300	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = -10 \text{ mA}$; $I_B = -0.5 \text{ mA}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	700	-	mV
V_{BE}	base-emitter voltage	$V_{CE} = -5 \text{ V}$; $I_C = -2 \text{ mA}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-600	-650	-750	mV
		$V_{CE} = -5 \text{ V}$; $I_C = -10 \text{ mA}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	-820	mV
C_c	collector capacitance	$V_{CB} = -10 \text{ V}$; $I_E = 0 \text{ A}$; $i_e = 0 \text{ A}$; $f = 1 \text{ MHz}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	2.5	pF
f_T	transition frequency	$V_{CE} = -5 \text{ V}$; $I_C = -10 \text{ mA}$; $f = 100 \text{ MHz}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	100	-	-	MHz



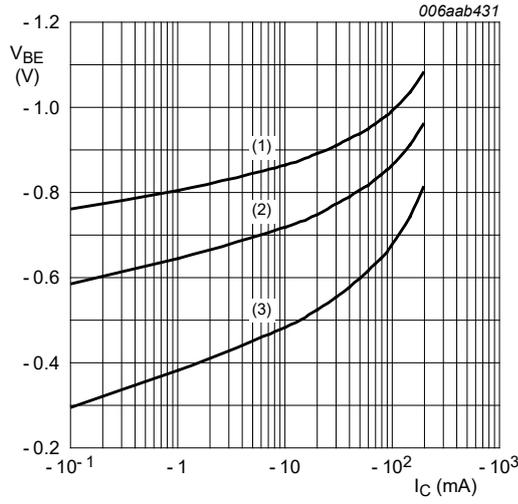
$V_{CE} = -5 \text{ V}$
 (1) $T_{\text{amb}} = 150 \text{ }^\circ\text{C}$
 (2) $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$
 (3) $T_{\text{amb}} = -55 \text{ }^\circ\text{C}$

Fig. 4. Per transistor: DC current gain as a function of collector current; typical values



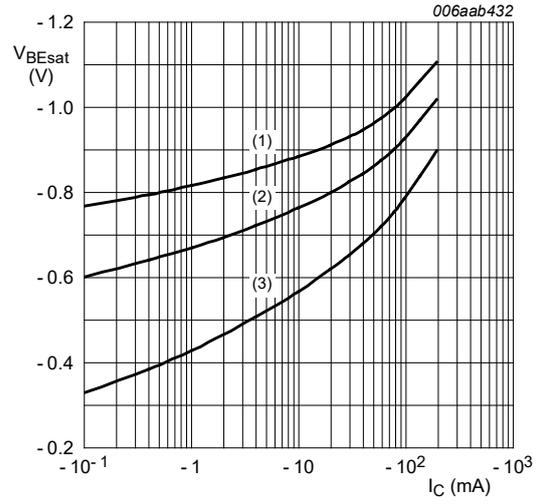
$T_{\text{amb}} = 25 \text{ }^\circ\text{C}$

Fig. 5. Per transistor: Collector current as a function of collector-emitter voltage; typical values



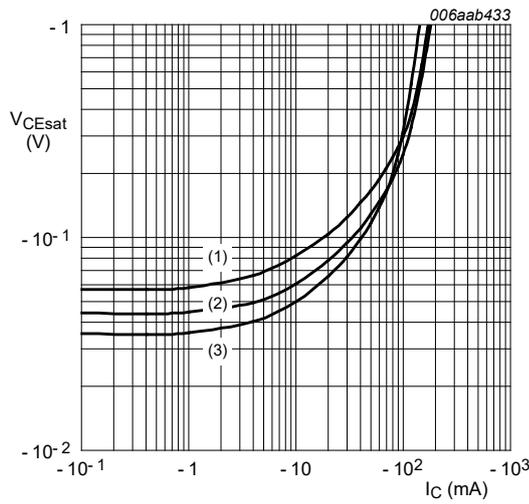
$V_{CE} = -5 \text{ V}$
 (1) $T_{amb} = -55 \text{ }^\circ\text{C}$
 (2) $T_{amb} = 25 \text{ }^\circ\text{C}$
 (3) $T_{amb} = 150 \text{ }^\circ\text{C}$

Fig. 6. Per transistor: Base-emitter voltage as a function of collector current; typical values



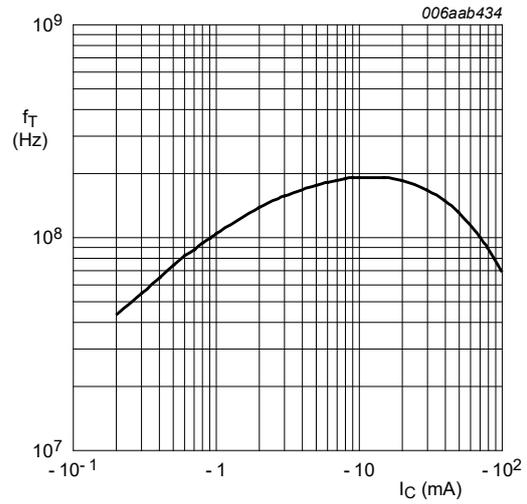
$I_C/I_B = 20$
 (1) $T_{amb} = -55 \text{ }^\circ\text{C}$
 (2) $T_{amb} = 25 \text{ }^\circ\text{C}$
 (3) $T_{amb} = 150 \text{ }^\circ\text{C}$

Fig. 7. Per transistor: Base-emitter saturation 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) $T_{amb} = -55 \text{ }^\circ\text{C}$

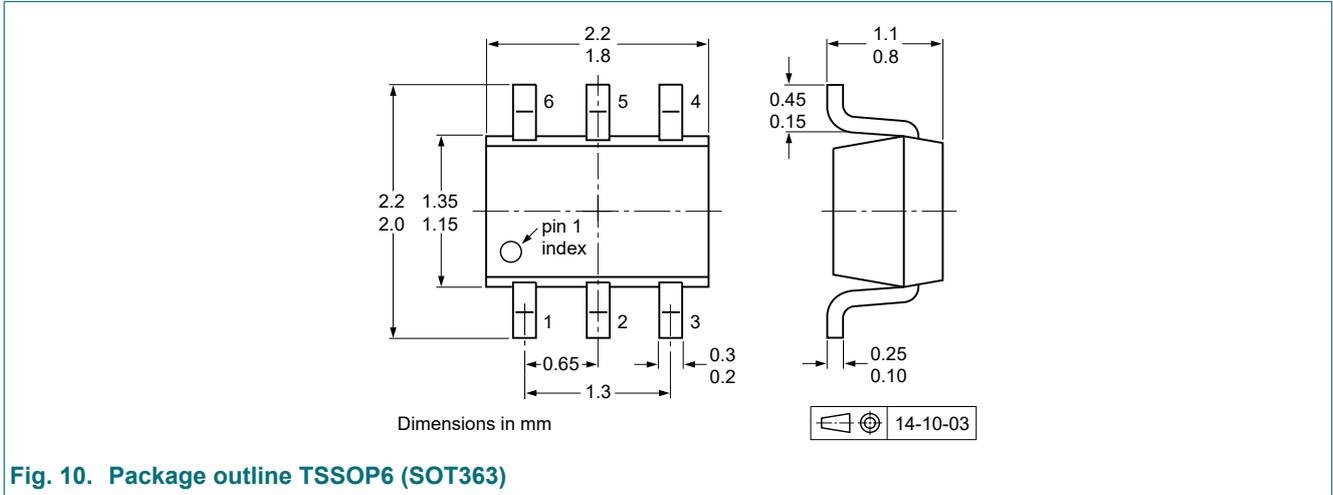
Fig. 8. Per transistor: Collector-emitter saturation voltage as a function of collector current; typical values



$f = 1 \text{ MHz}$
 $T_{amb} = 25 \text{ }^\circ\text{C}$
 $V_{CE} = -5 \text{ V}$

Fig. 9. Per transistor: Transition frequency as a function of collector current; typical values

11. Package outline



13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BC856S v.3	20220701	Product data sheet	-	BC856S_2
Modification:	<ul style="list-style-type: none">Product changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).Packing information removed.			
BC856S_2	20090219	Product data sheet	-	BC856S_1
BC856S_1	19990824	Product specification	-	-

14. Legal information

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".
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Date of release: 1 July 2022
