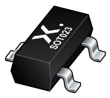


BC856; BC857; BC858

65 V, 100 mA PNP general-purpose transistors

Rev. 7 — 16 April 2018 Product data sheet

1 Product profile

1.1 General description

PNP general-purpose transistors in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

Table 1. Product overview

Type number	Package		NPN complement
	Nexperia	JEDEC	
BC856	SOT23	TO-236AB	BC846
BC856A			BC846A
BC856B			BC846B
BC857			BC847
BC857A			BC847A
BC857B			BC847B
BC857C			BC847C
BC858B			BC848B

1.2 Features and benefits

- Low current (max. 100 mA)
- Low voltage (max. 65 V)
- AEC-Q101 qualified

1.3 Applications

- General-purpose switching and amplification

nexperia

1.4 Quick reference data

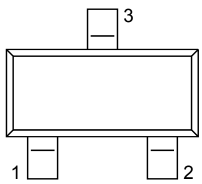
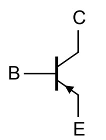
Table 2. Quick reference data

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base					
	BC856			-	-	-65	V
	BC857			-	-	-45	V
	BC858B			-	-	-30	V
I_C	collector current			-	-	-100	mA
I_{CM}	peak collector current			-	-	-200	mA
h_{FE}	DC current gain	V_{CE} = -5 V; I_C = -2 mA					
	BC856			125	-	475	-
	BC857			125	-	800	-
	BC856A; BC857A			125	-	250	-
	BC856; BC857B; BC858B			220	-	475	-
	BC857C			420	-	800	-

2 Pinning information

Table 3. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base		 sym132
2	E	emitter		
3	C	collector		

3 Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
BC856	TO-236AB	Plastic surface-mounted package; 3 leads	SOT23
BC856A			
BC856B			
BC857			
BC857A			
BC857B			
BC857C			
BC858B			

4 Marking

Table 5. Marking codes

Type number		Marking code
BC856	[1]	3D%
BC856A	[1]	3A%
BC856B	[1]	3B%
BC857	[1]	3H%
BC857A	[1]	3E%
BC857B	[1]	3F%
BC857C	[1]	3G%
BC858B	[1]	3K%

[1] % = placeholder for manufacturing site code

5 Limiting values

Table 6. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CBO}	collector-base voltage	open emitter				
	BC856			-	-80	V
	BC857			-	-50	V
	BC858B			-	-30	V
V_{CEO}	collector-emitter voltage	open base				
	BC856			-	-65	V
	BC857			-	-45	V
	BC858B			-	-30	V
V_{EBO}	emitter-base voltage	open collector		-	-5	V
I_C	collector current			-	-100	mA
I_{CM}	peak collector current			-	-200	mA
I_{BM}	peak base current			-	-200	mA
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); single-sided copper; tin-plated and standard footprint.

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; single-sided copper; tin-plated and standard footprint.

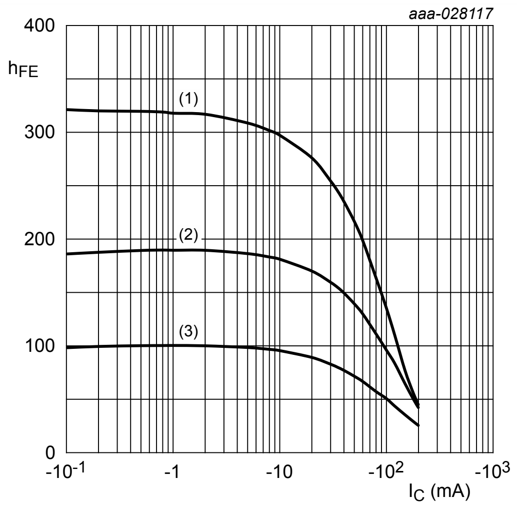
7 Characteristics

Table 8. Characteristics

T_{amb} = 25 °C unless otherwise specified.

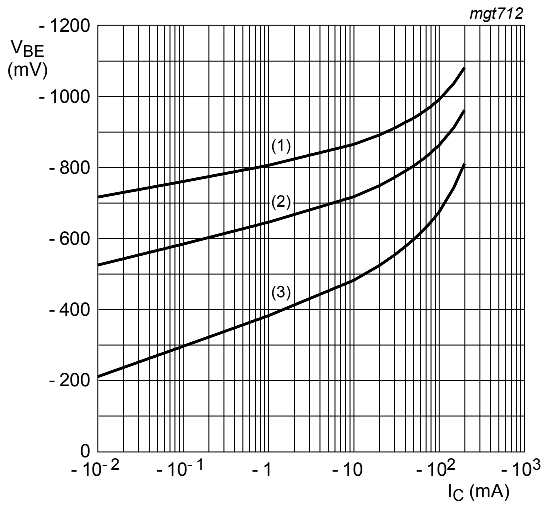
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = -30 V; I_E = 0		-	-1	-15	nA
		V_{CB} = -30 V; I_E = 0; T_j = 150 °C		-	-	-4	μA
I_{EBO}	emitter-base cut-off current	V_{EB} = -5 V; I_C = 0		-	-	-100	nA
h_{FE}	DC current gain						
	BC856	V_{CE} = -5 V; I_C = -2 mA		125	-	475	
	BC857			125	-	800	
	BC856A; BC857A			125	-	250	
	BC856B; BC857B; BC858B			220	-	475	
	BC857C			420	-	800	
V_{CEsat}	collector-emitter saturation voltage	I_C = -10 mA; I_B = -0.5 mA		-	-75	-300	mV
		I_C = -100 mA; I_B = -5 mA	[1]	-	-250	-650	mV
V_{BEsat}	base-emitter saturation voltage	I_C = -10 mA; I_B = -0.5 mA		-	-700	-	mV
		I_C = -100 mA; I_B = -5 mA	[1]	-	-850	-	mV
V_{BE}	base-emitter voltage	V_{CE} = -5 V; I_C = -2 mA		-600	-650	-750	mV
		V_{CE} = -5 V; I_C = -10 mA		-	-	-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		-	4.5	-	pF
F	noise figure	I_C = -200 μA; V_{CE} = -5 V; R_S = 2 kΩ; f = 1 kHz; B = 200Hz		-	2	10	dB

[1] pulsed; t_p ≤ 300 μs; δ ≤ 0.02



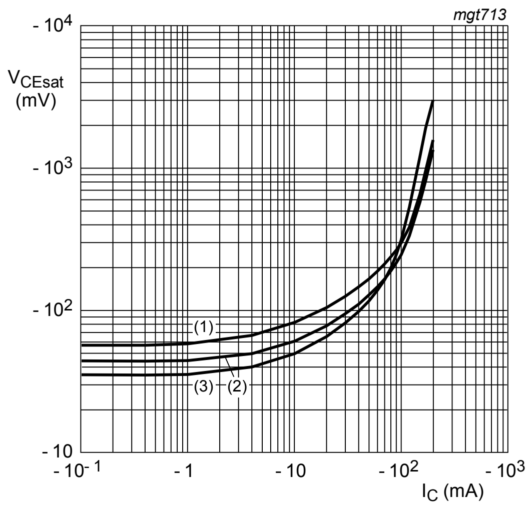
V_{CE} = -5 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Figure 1. BC856A; BC857A: DC current gain as a function of collector current; typical values



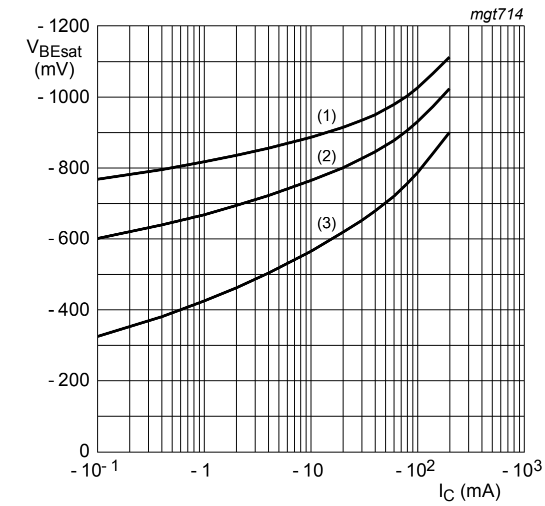
V_{CE} = -5 V
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Figure 2. BC856A; BC857A: Base-emitter voltage as a function of collector current; typical values



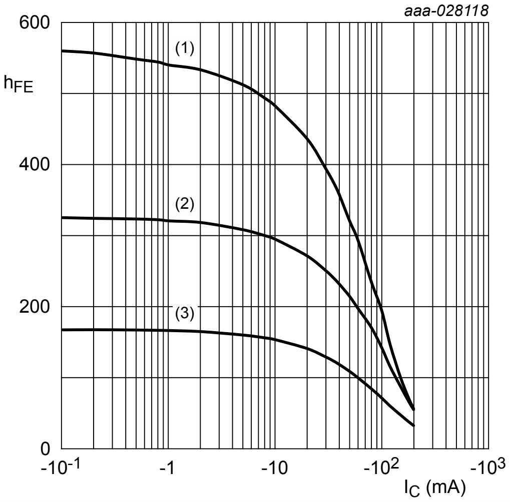
I_C/I_B = 20
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Figure 3. BC856A; BC857A: Collector-emitter saturation voltage as a function of collector current; typical values



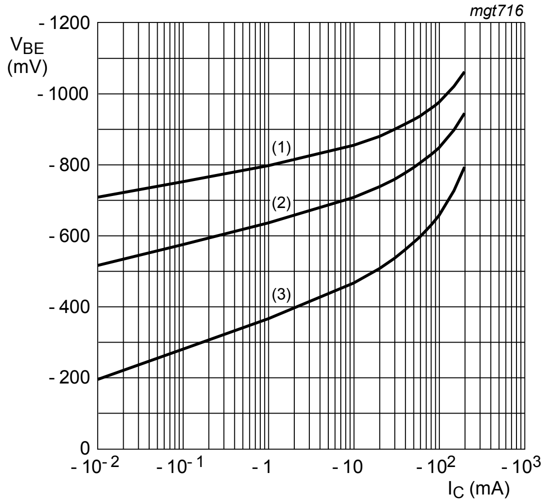
I_C/I_B = 20
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Figure 4. BC856A; BC857A: Base-emitter saturation voltage as a function of collector current; typical values



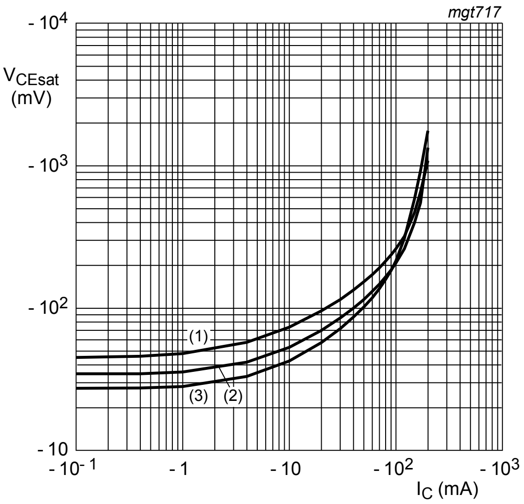
V_{CE} = -5 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Figure 5. BC856B; BC857B; BC858B: DC current gain as a function of collector current; typical values



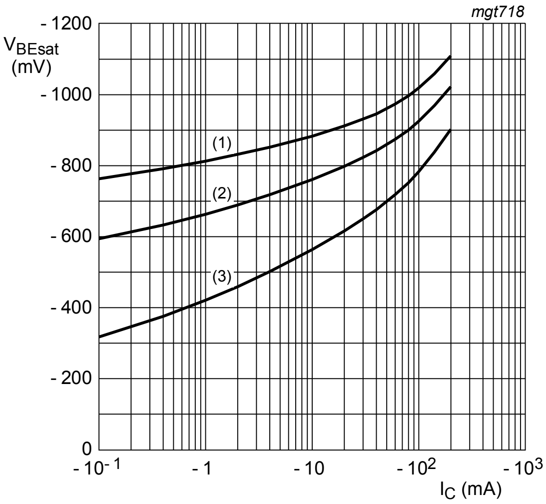
V_{CE} = -5 V
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Figure 6. BC856B; BC857B; BC858B: Base-emitter voltage as a function of collector current; typical values



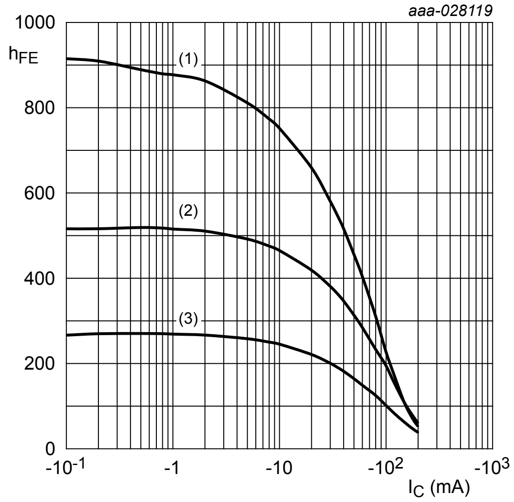
I_C/I_B = 20
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Figure 7. BC856B; BC857B; BC858B: Collector-emitter saturation voltage as a function of collector current; typical values



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

Figure 8. BC856B; BC857B; BC858B: Base-emitter saturation voltage as a function of collector current; typical values



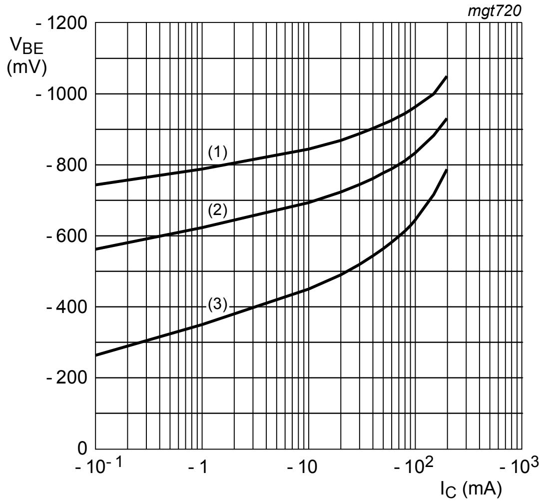
V_{CE} = -5 V

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = -55 °C

Figure 9. BC857C: DC current gain as a function of collector current; typical values



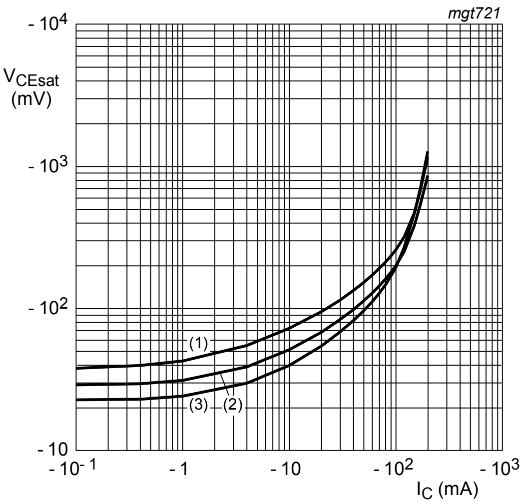
V_{CE} = -5 V

(1) T_{amb} = -55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

Figure 10. BC857C: Base-emitter voltage as a function of collector current; typical values



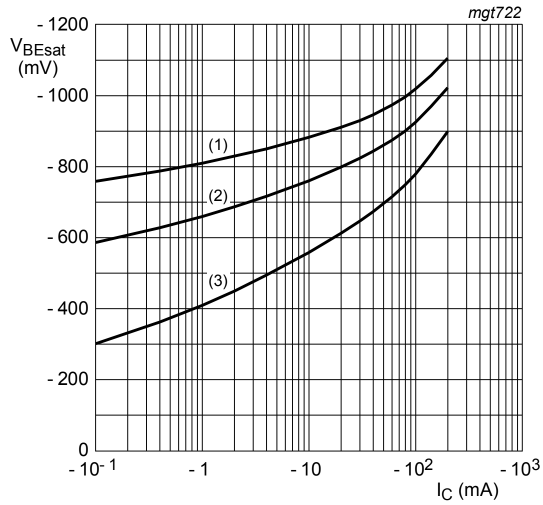
I_C/I_B = 20

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = -55 °C

Figure 11. BC857C: Collector-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 20

(1) T_{amb} = -55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

Figure 12. BC857C: 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

Table 9. Package outline

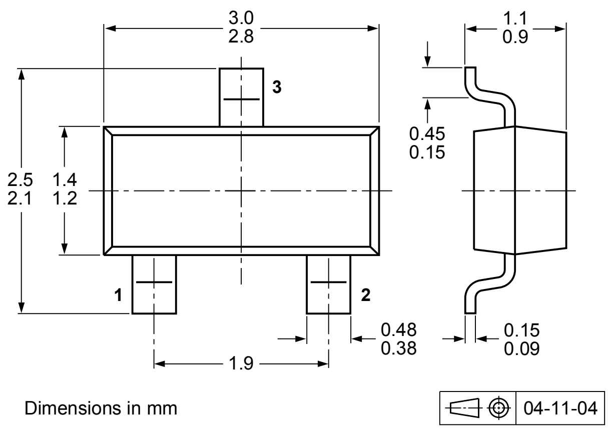


Figure 13. Package outline SOT23 (TO-236AB)

10 Soldering

Table 10. Soldering

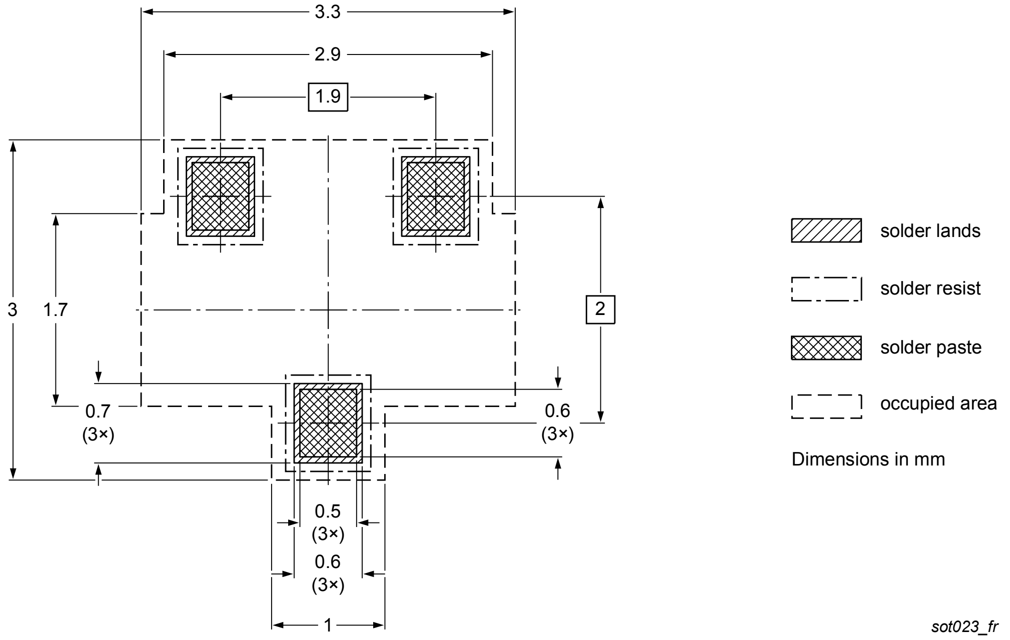


Figure 14. Reflow soldering footprint for SOT23 (TO-236AB)

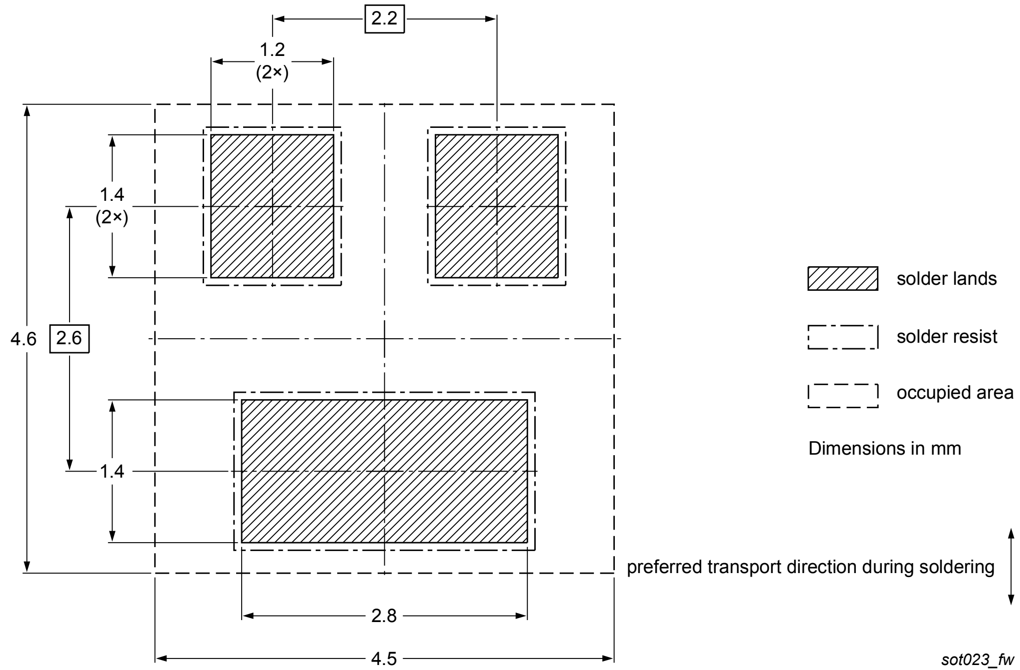


Figure 15. Wave soldering footprint for SOT23 (TO-236AB)

11 Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BC856_BC857_BC858 v.7	20180416	Product data sheet	-	BC856_BC857_BC858 v.6
Modifications:	• The products are AEC-Q101 qualified. • The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • General description, pinning information, ordering information, marking and characteristics are corrected. • Quick reference data added.			
BC856_BC857_BC858 v.6	20040106	Product data sheet	-	BC856_BC857_BC858 v.5

12 Legal information

12.1 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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12.4 Trademarks

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Contents

Date of release: 16 April 2018
Document identifier: BC856_BC857_BC858

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

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