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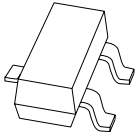Should be replaced with:
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Kind regards,

Team Nexperia

PMBTA44

400 V, 0.3 A NPN high-voltage low V_{CEsat} (BISS) transistor

Rev. 01 — 22 February 2008   **Product data sheet**

1. Product profile

1.1 General description

NPN high-voltage low V_{CEsat} Breakthrough In Small Signal (BISS) transistor in a SOT23 (TO-236AB) small Surface-Mounted Device (SMD) plastic package.

1.2 Features

- Low current (max. 300 mA)
- High voltage (max. 400 V)
- AEC-Q101 qualified

1.3 Applications

- LED driver for LED chain module
- LCD backlighting
- High Intensity Discharge (HID) front lighting
- Automotive motor management
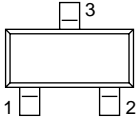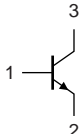- Hook switch for wired telecom
- Switch mode power supply

1.4 Quick reference data

Table 1.   Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base	-	-	400	V
I_C	collector current		-	-	300	mA
h_{FE}	DC current gain	V_{CE} = 10 V; I_C = 10 mA	50	-	200	

2. Pinning information

Table 2.   Pinning

Pin	Description	Simplified outline	Symbol
1	base		
2	emitter		
3	collector		

sym021

3. Ordering information

Table 3.   Ordering information

Type number	Package		Version
	Name	Description	
PMBTA44	-	plastic surface-mounted package; 3 leads	SOT23

4. Marking

Table 4.   Marking codes

Type number	Marking code[1]
PMBTA44	W3*

[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
V$_{CBO}$	collector-base voltage	open emitter	-	500	V
V$_{CEO}$	collector-emitter voltage	open base	-	400	V
V$_{EBO}$	emitter-base voltage	open collector	-	6	V
I$_C$	collector current		-	300	mA
I$_{CM}$	peak collector current	single pulse; t$_p$ ≤ 1 ms	-	300	mA
I$_{BM}$	peak base current	single pulse; t$_p$ ≤ 1 ms	-	100	mA
P$_{tot}$	total power dissipation	T$_{amb}$ ≤ 25 °C [1]	-	250	mW
T$_j$	junction temperature		-	150	°C
T$_{amb}$	ambient temperature		−55	+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.
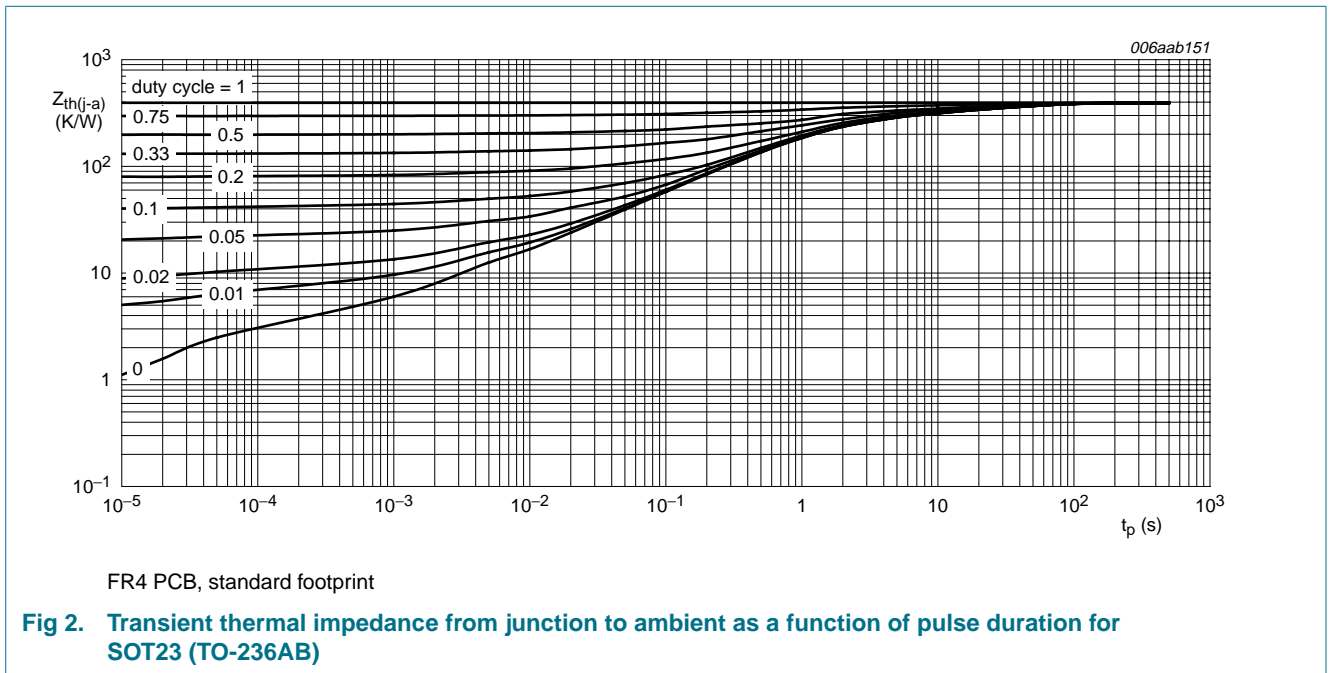

FR4 PCB, standard footprint

Fig 1.   Power derating curve SOT23 (TO-236AB)
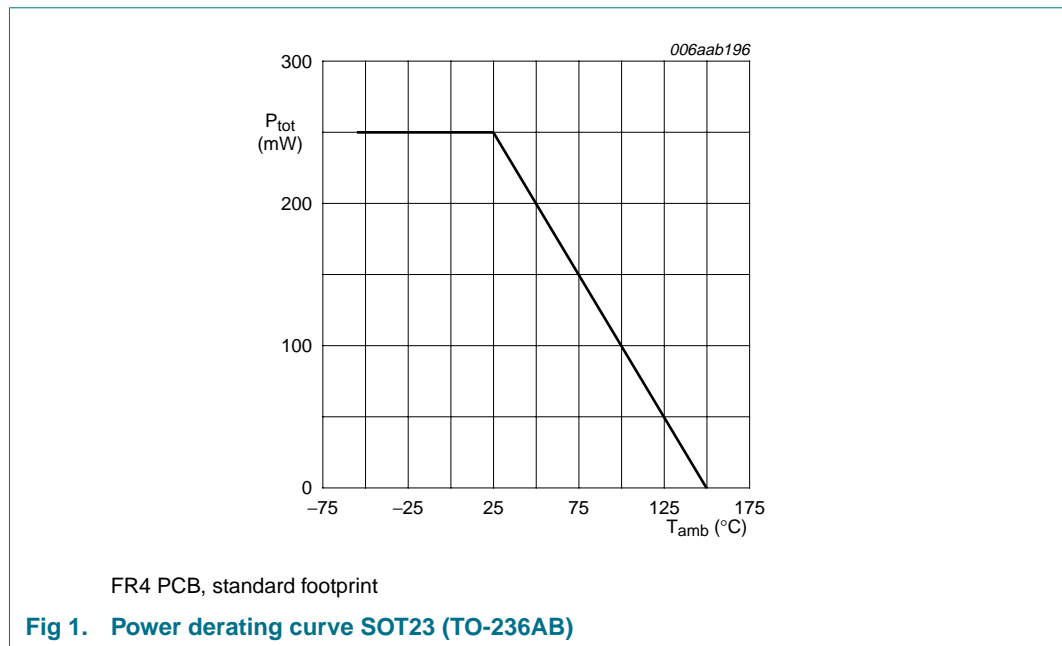
6. Thermal characteristics

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 PCB, single-sided copper, tin-plated and standard footprint.

FR4 PCB, standard footprint

Fig 2. **Transient thermal impedance from junction to ambient as a function of pulse duration for SOT23 (TO-236AB)**

7. Characteristics

Table 7.   Characteristics

T$_{amb}$ = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I$_{CBO}$	collector-base cut-off current	V$_{CB}$ = 320 V; I$_E$ = 0 A		-	-	100	nA
		V$_{CB}$ = 320 V; I$_E$ = 0 A; T$_j$ = 150 °C		-	-	10	μA
I$_{EBO}$	emitter-base cut-off current	V$_{EB}$ = 4 V; I$_C$ = 0 A		-	-	100	nA
h$_{FE}$	DC current gain	V$_{CE}$ = 10 V					
		I$_C$ = 10 mA		50	-	200	
		I$_C$ = 50 mA	[1]	45	-	-	
		I$_C$ = 100 mA	[1]	40	-	-	
V$_{CEsat}$	collector-emitter saturation voltage	I$_C$ = 1 mA; I$_B$ = 0.1 mA		-	-	400	mV
		I$_C$ = 10 mA; I$_B$ = 1 mA		-	-	500	mV
		I$_C$ = 50 mA; I$_B$ = 5 mA	[1]	-	-	750	mV
V$_{BEsat}$	base-emitter saturation voltage	I$_C$ = 10 mA; I$_B$ = 1 mA	[1]	-	-	850	mV
f$_T$	transition frequency	V$_{CE}$ = 10 V; I$_E$ = 10 mA; f = 100 MHz		20	-	-	MHz
C$_c$	collector capacitance	V$_{CB}$ = 20 V; I$_E$ = i$_e$ = 0 A; f = 1 MHz		-	-	7	pF
C$_e$	emitter capacitance	V$_{EB}$ = 0.5 V; I$_C$ = i$_c$ = 0 A; f = 1 MHz		-	-	180	pF

[1]   Pulse test: t$_p$ ≤ 300 μs; δ ≤ 0.02.
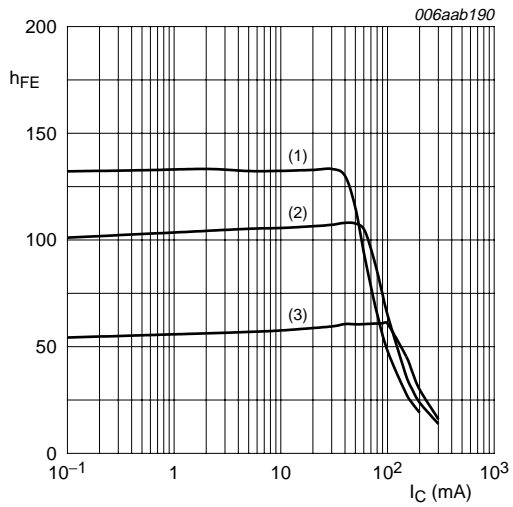
V_{CE} = 10 V

(1) T_{amb} = 100 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

Fig 3.   DC current gain as a function of collector current; typical values
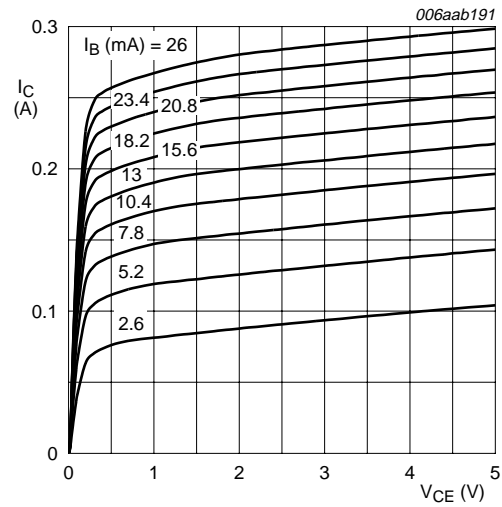
T_{amb} = 25 °C

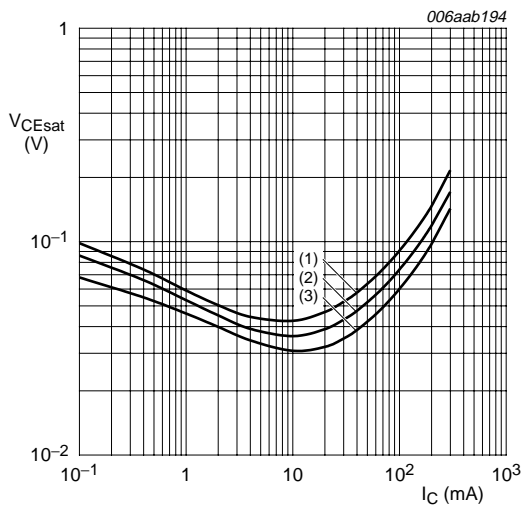**Fig 4.   Collector current as a function of collector-emitter voltage; typical values**
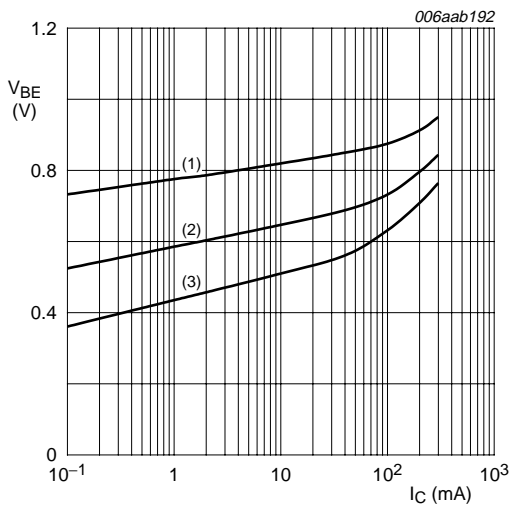
V_{CE} = 10 V

(1) T_{amb} = −55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 100 °C

Fig 5.   Base-emitter voltage as a function of collector current; typical values
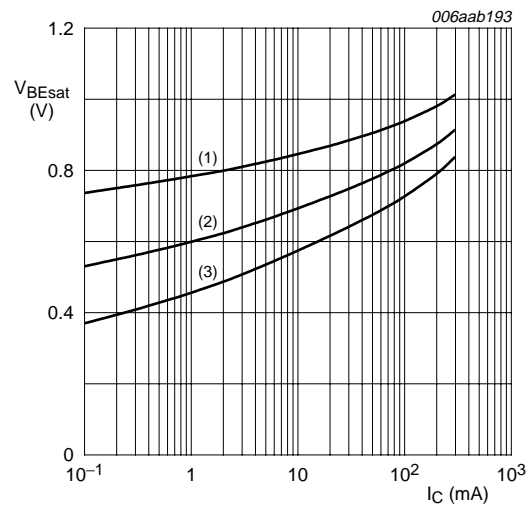
I_C/I_B = 5

(1) T_{amb} = −55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 100 °C

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

006aab194

$I_C/I_B = 5$

(1) $T_{amb} = 100\ °C$

(2) $T_{amb} = 25\ °C$

(3) $T_{amb} = -55\ °C$

Fig 7. Collector-emitter saturation voltage as a function of collector current; typical values

006aab195
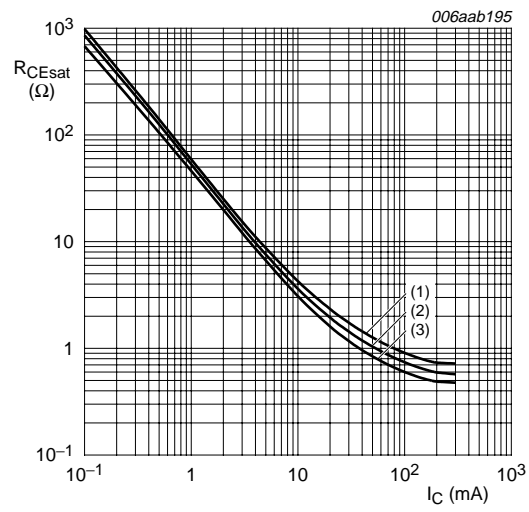
$I_C/I_B = 5$

(1) $T_{amb} = 100\ °C$

(2) $T_{amb} = 25\ °C$

(3) $T_{amb} = -55\ °C$

**Fig 8.** Collector-emitter saturation resistance 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

Fig 9.   Package outline SOT23 (TO-236AB)
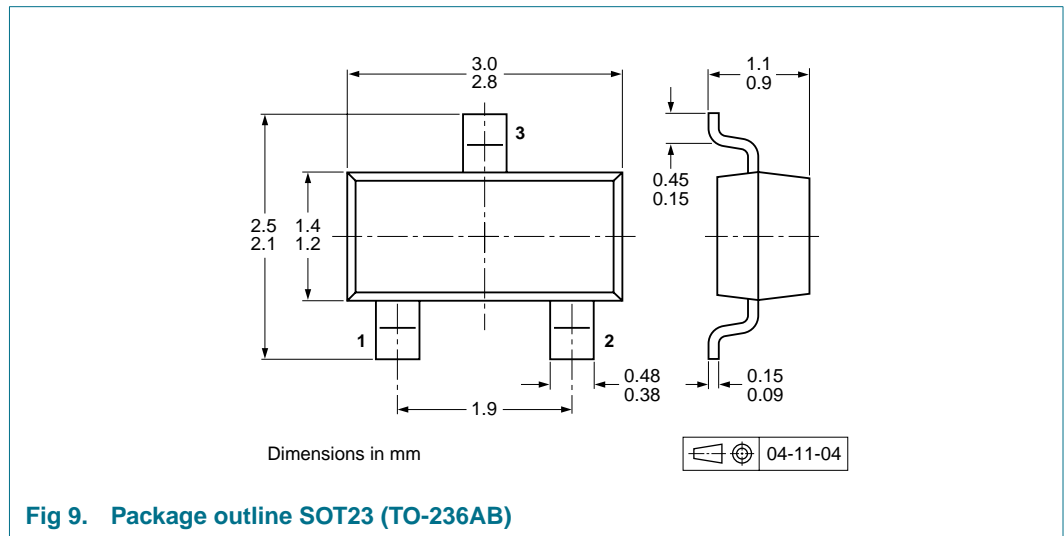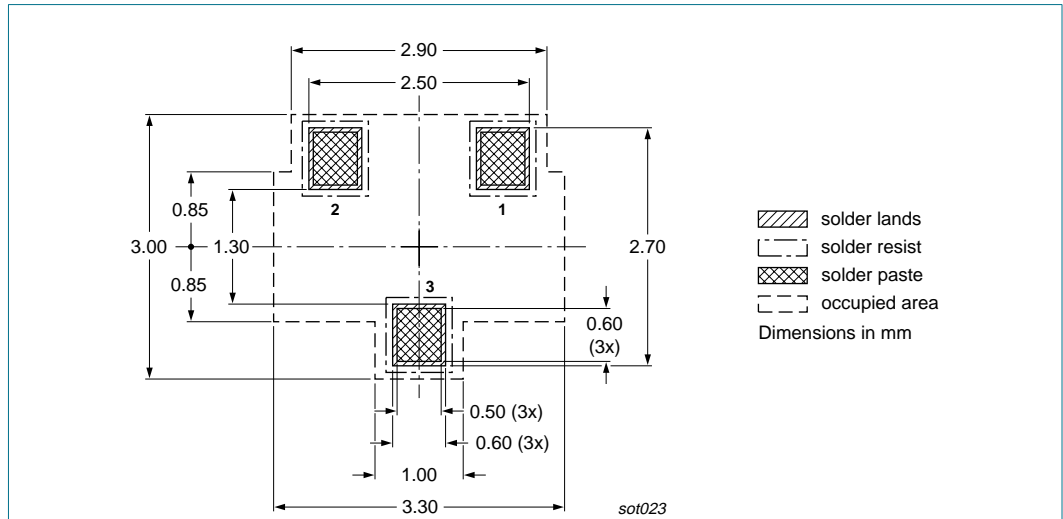
10. Packing information

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

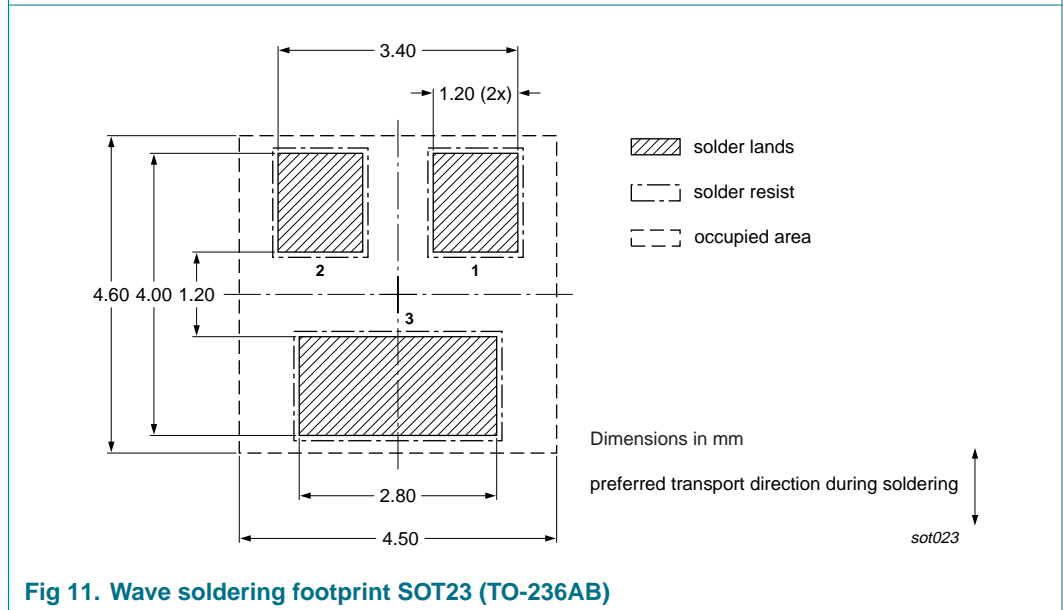| Type number	Package	Description	Packing quantity	
			3000	**10000**
PMBTA44	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235

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

11. Soldering

Fig 10. Reflow soldering footprint SOT23 (TO-236AB)

Fig 11. Wave soldering footprint SOT23 (TO-236AB)

12. Revision history

Table 9. **Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMBTA44_1	20080222	Product data sheet	-	-

13. Legal information

13.1 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.nxp.com.

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