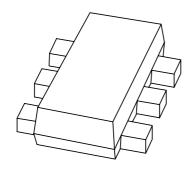
DISCRETE SEMICONDUCTORS

DATA SHEET



PBSS2515VS15 V low V_{CEsat} NPN double transistor

Product specification Supersedes data of 2001 Sep 13

2001 Nov 07





15 V low V_{CEsat} NPN double transistor

PBSS2515VS

FEATURES

- 300 mW total power dissipation
- Very small 1.6 x 1.2 mm ultra thin package
- · Excellent coplanarity due to straight leads
- · Low collector-emitter saturation voltage
- · High current capability
- Improved thermal behaviour due to flat lead
- Replaces two SC-75/SC-89 packaged low V_{CEsat} transistors on same PCB area
- · Reduces required PCB area
- · Reduced pick and place costs.

APPLICATIONS

- · General purpose switching and muting
- Low frequency driver circuits
- · LCD backlighting
- · Audio frequency general purpose amplifier applications
- Battery driven equipment (mobile phones, video cameras and hand-held devices).

DESCRIPTION

NPN low V_{CEsat} double transistor in a SOT666 plastic package.

PNP complement: PBSS3515VS.

MARKING

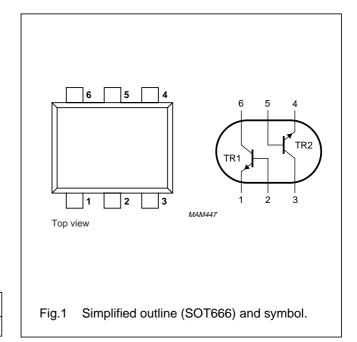
TYPE NUMBER	MARKING CODE
PBSS2515VS	N9

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	15	V
I _{CM}	peak collector current	1	Α
R _{CEsat}	equivalent on-resistance	<500	mΩ

PINNING

PIN	DESCRIPTION			
1, 4	emitter	TR1; TR2		
2, 5	base	TR1; TR2		
6, 3	collector	TR1; TR2		



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LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT		
Per transis	Per transistor unless otherwise specified						
V _{CBO}	collector-base voltage	open emitter	_	15	V		
V _{CEO}	collector-emitter voltage	open base	_	15	V		
V _{EBO}	emitter-base voltage	open collector	_	6	٧		
Ic	collector current (DC)		_	500	mA		
I _{CM}	peak collector current		_	1	А		
I _{BM}	peak base current		_	100	mA		
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C; note 1	_	200	mW		
T _{stg}	storage temperature		-65	+150	°C		
Tj	junction temperature		-	150	°C		
T _{amb}	operating ambient temperature		65	+150	°C		
Per device	Per device						
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C; note 1	_	300	mW		

Note

1. Transistor mounted on an FR4 printed-circuit board.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th j-a}	thermal resistance from junction to ambient	notes 1 and 2	416	K/W

Notes

- 1. Transistor mounted on an FR4 printed-circuit board.
- 2. The only recommended soldering method is reflow soldering.

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CHARACTERISTICS

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

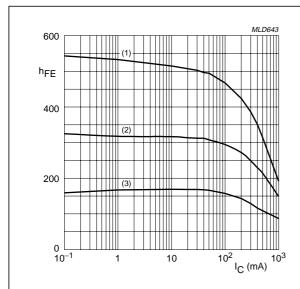
SYMBOL	PARAMETER	PARAMETER CONDITIONS		TYP.	MAX.	UNIT	
Per transis	Per transistor unless otherwise specified						
I _{CBO}	collector-base cut-off current	V _{CB} = 15 V; I _E = 0	_	_	100	nA	
		V _{CB} = 15 V; I _E = 0; T _j = 150 °C	_	_	50	μΑ	
I _{EBO}	emitter-base cut-off current	$V_{EB} = 5 \text{ V}; I_{C} = 0$	_	_	100	nA	
h _{FE}	DC current gain	V _{CE} = 2 V; I _C = 10 mA	200	_	_		
		V _{CE} = 2 V; I _C = 100 mA; note 1	150	_	_		
		V _{CE} = 2 V; I _C = 500 mA; note 1	90	_	_		
V _{CEsat}	collector-emitter saturation	I _C = 10 mA; I _B = 0.5 mA	_	_	25	mV	
	voltage	I _C = 200 mA; I _B = 10 mA	_	_	150	mV	
		I _C = 500 mA; I _B = 50 mA; note 1	_	_	250	mV	
R _{CEsat}	equivalent on-resistance	$I_C = 500 \text{ mA}$; $I_B = 50 \text{ mA}$; note 1	_	300	<500	mΩ	
V _{BEsat}	base-emitter saturation voltage	$I_C = 500 \text{ mA}$; $I_B = 50 \text{ mA}$; note 1	_	_	1.1	V	
V _{BE}	base-emitter turn-on voltage	V _{CE} = 2 V; I _C = 100 mA; note 1	_	_	0.9	V	
f _T	transition frequency	I _C = 100 mA; V _{CE} = 5 V; f = 100 MHz	250	420	_	MHz	
C _c	collector capacitance	$V_{CB} = 10 \text{ V}; I_E = I_e = 0; f = 1MHz$	_	4.4	6	pF	

Note

1. Pulse test: $t_p \le 300~\mu s;~\delta \le 0.02.$

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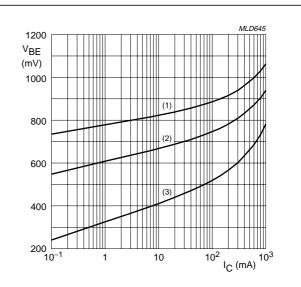
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V_{CE} = 2 V.

- (1) $T_{amb} = 150 \, ^{\circ}C$.
- (2) T_{amb} = 25 °C.
- (3) $T_{amb} = -55$ °C.

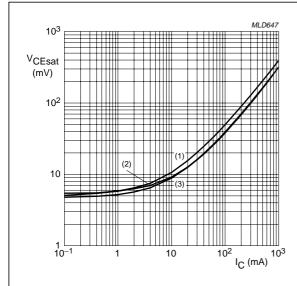
Fig.2 DC current gain as a function of collector current; typical values.



 $V_{CE} = 2 V$.

- (1) $T_{amb} = -55 \, ^{\circ}C$.
- (2) T_{amb} = 25 °C.
- (3) $T_{amb} = 150 \, ^{\circ}C$.

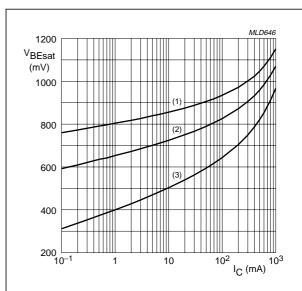
Fig.3 Base-emitter voltage as a function of collector current; typical values.



 $I_{\rm C}/I_{\rm B} = 20.$

- (1) $T_{amb} = 150 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

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



 $I_{\rm C}/I_{\rm B} = 20.$

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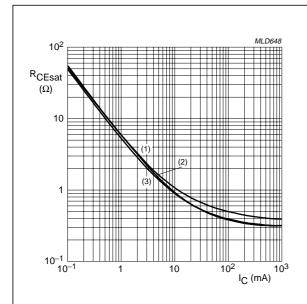
- (1) $T_{amb} = 150 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \,^{\circ}C$.

Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.

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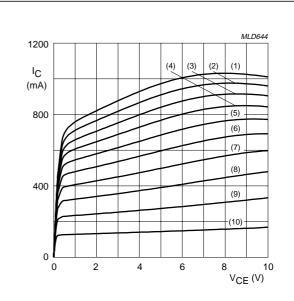
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 $I_{\rm C}/I_{\rm B}=20.$

- (1) $T_{amb} = 150 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

Fig.6 Equivalent on-resistance as a function of collector current; typical values.



 $T_{amb} = 25 \, ^{\circ}C.$

- (1) $I_B = 4.6 \text{ mA}.$
- (6) $I_B = 2.3 \text{ mA}.$
- (2) $I_B = 4.14 \text{ mA}.$
- (7) $I_B = 1.84 \text{ mA}.$
- (3) $I_B = 3.68 \text{ mA}.$
- (8) $I_B = 1.38 \text{ mA}.$
- (4) $I_B = 3.22 \text{ mA}.$
- (9) $I_B = 0.92 \text{ mA}.$
- (5) $I_B = 2.76 \text{ mA}.$
- (10) $I_B = 0.46 \text{ mA}$.

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

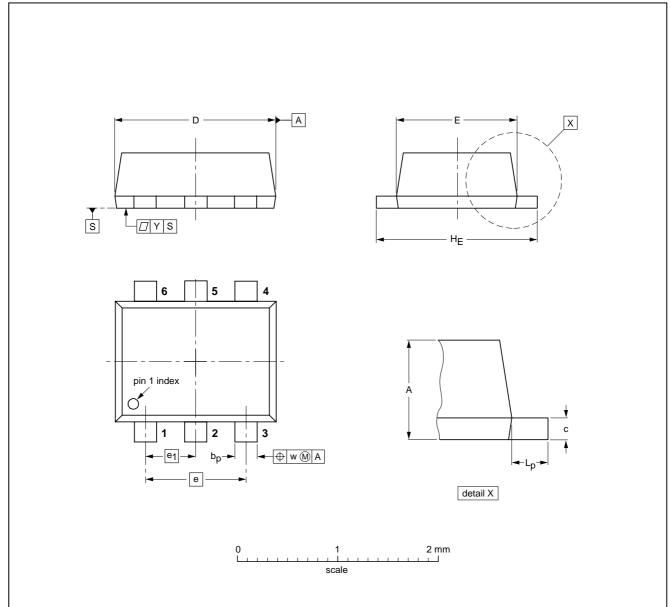
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PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT666



DIMENSIONS (mm are the original dimensions)

UNIT	A	bp	С	D	E	e	e ₁	HE	L _p	w	у
mm	0.6 0.5	0.27 0.17	0.18 0.08	1.7 1.5	1.3 1.1	1.0	0.5	1.7 1.5	0.3 0.1	0.1	0.1

OUTLINE	REFERENCES				EUROPEAN	ISSUE DATE	
VERSION	IEC	JEDEC	EIAJ		PROJECTION	ISSUE DATE	
SOT666						-01-01-04 01-08-27	

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DATA SHEET STATUS

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NOTES

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