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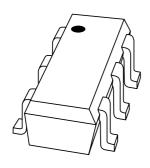
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Kind regards,

Team Nexperia

DISCRETE SEMICONDUCTORS

DATA SHEET



PBSS2515YPN15 V low V_{CE(sat)} NPN/PNP transistor

Product data sheet Supersedes data of 2002 May 08 2005 Jan 11



15 V low V_{CE(sat)} NPN/PNP transistor

PBSS2515YPN

FEATURES

- Low collector-emitter saturation voltage
- · High current capability
- Replaces two SC-70 packaged low V_{CEsat} transistors on same PCB area
- · Reduces required PCB area
- · Reduced pick and place costs.

APPLICATION

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

DESCRIPTION

NPN/PNP low V_{CEsat} transistor pair in a SC-88 plastic package.

MARKING

TYPE NUMBER	MARKING CODE
PBSS2515YPN	N8*

Note

- 1. * = -: made in Hong Kong
 - * = t: made in Malaysia
 - * = W: made in China.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	15	٧
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	

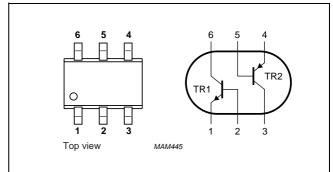


Fig.1 Simplified outline SC-88 (SOT363) and symbol.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE			
TIPE NOWIBER	NAME DESCRIPTION VERSION			
PBSS2515YPN	SC-88	plastic surface mounted package; 6 leads SC		

15 V low $V_{CE(sat)}$ NPN/PNP transistor

PBSS2515YPN

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT	
Per transis	Per transistor; for the PNP transistor with negative polarity					
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	V	
I _C	collector current (DC)		_	500	mA	
I _{CM}	peak collector current		_	1	Α	
I _{BM}	peak base current		-	100	mA	
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	_	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

THERMAL CHARACTERISTICS

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

Note

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

^{1.} Transistor mounted on an FR4 printed-circuit board.

15 V low $V_{\text{CE(sat)}}$ NPN/PNP transistor

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CHARACTERISTICS

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

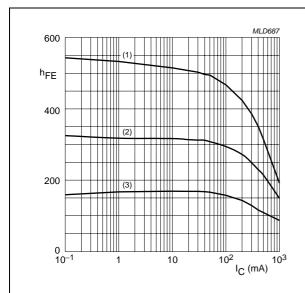
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Per transistor; for the PNP transistor with negative polarity							
I _{CBO}	collector-base cut-off current	V _{CB} = 15 V; I _E = 0 A	_	_	100	nA	
		V _{CB} = 15 V; I _E = 0 A; T _j = 150 °C	-	_	50	μΑ	
I _{EBO}	emitter-base cut-off current	V _{EB} = 5 V; I _C = 0 A	_	_	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_{BEon}	base-emitter turn-on voltage	V _{CE} = 2 V; I _C = 100 mA; note 1	-	_	0.9	V	
NPN trans	istor						
f _T	transition frequency	I _C = 100 mA; V _{CE} = 5 V; f = 100 MHz	250	420	_	MHz	
C _c	collector capacitance	$V_{CB} = 10 \text{ V}; I_E = I_e = 0 \text{ A}; f = 1 \text{ MHz}$	_	4.4	6	pF	
PNP transistor							
f _T	transition frequency	$I_C = -100 \text{ mA}; V_{CE} = -5 \text{ V};$ f = 100 MHz	100	280	-	MHz	
C _c	collector capacitance	$V_{CB} = -10 \text{ V}; I_E = I_e = 0 \text{ A}; f = 1 \text{ MHz}$	-	_	10	pF	

Note

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

15 V low $V_{CE(sat)}$ NPN/PNP transistor

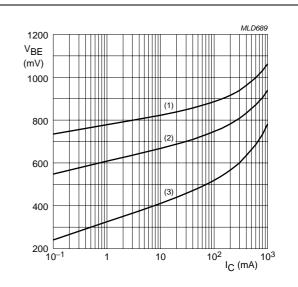
PBSS2515YPN



TR1 (NPN) $V_{CE} = 2 V$.

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

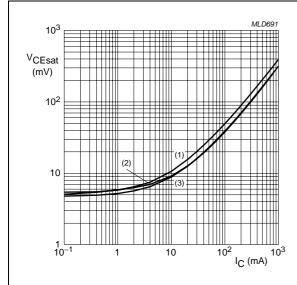
Fig.2 DC current gain as a function of collector current; typical values.



TR1 (NPN) $V_{CE} = 2 V$.

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

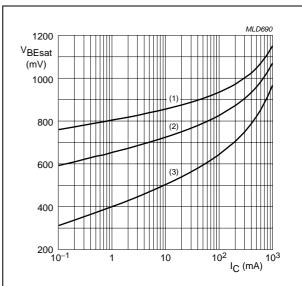
Fig.3 Base-emitter voltage as a function of collector current; typical values.



TR1 (NPN) $I_C/I_B = 20$.

- (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.



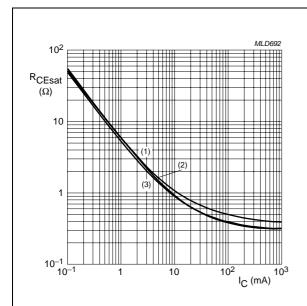
TR1 (NPN) $I_C/I_B = 20$.

- (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.

15 V low $V_{CE(sat)}$ NPN/PNP transistor

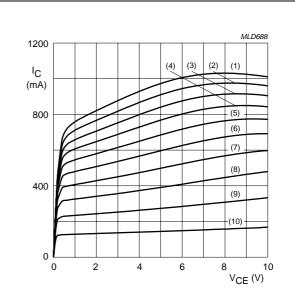
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TR1 (NPN) $I_C/I_B = 20$.

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

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



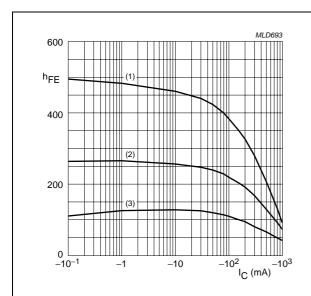
TR1 (NPN) $T_{amb} = 25 \, ^{\circ}C$.

- (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) $I_B = 3.22 \text{ mA}.$
- (6) $I_B = 1.36 \text{ mA}$. (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.

15 V low $V_{CE(sat)}$ NPN/PNP transistor

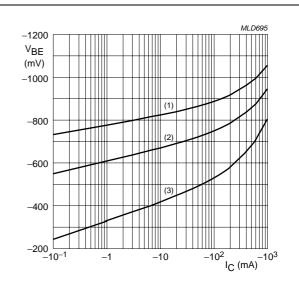
PBSS2515YPN



TR2 (PNP) $V_{CE} = -2 V$.

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

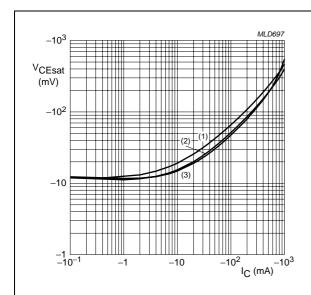
Fig.8 DC current gain as a function of collector current; typical values.



TR2 (PNP) $V_{CE} = -2 V$.

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

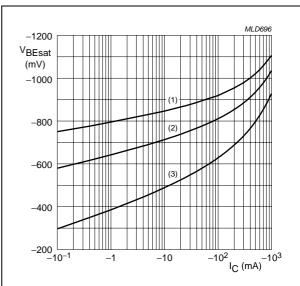
Fig.9 Base-emitter voltage as a function of collector current; typical values.



TR2 (PNP) $I_{\text{C}}/I_{\text{B}} = 20$.

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

Fig.10 Collector-emitter saturation voltage as a function of collector current; typical values.



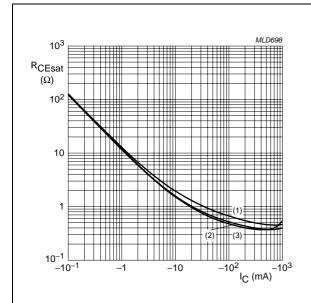
TR2 (PNP) I_C/I_B = 20.

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

Fig.11 Base-emitter saturation voltage as a function of collector current; typical values.

15 V low $V_{CE(sat)}$ NPN/PNP transistor

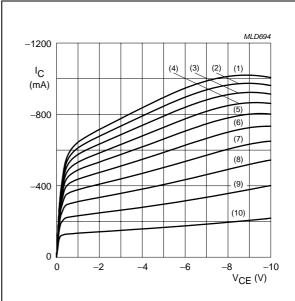
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TR2 (PNP) $I_C/I_B = 20$.

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

Fig.12 Equivalent on-resistance as a function of collector current; typical values.



TR2 (PNP) $T_{amb} = 25 \, ^{\circ}C$.

- (1) $I_B = -7 \text{ mA}$. (6) $I_B = -3.5 \text{ mA}$.
- (2) $I_B = -6.3 \text{ mA}$. (7) $I_B = -2.8 \text{ mA}$.
- (3) $I_B = -5.6 \text{ mA}$. (8) $I_B = -2.1 \text{ mA}$.
- (4) $I_B = -4.9 \text{ mA}$. (9) $I_B = -1.4 \text{ mA}$.
- (5) $I_B = -4.2 \text{ mA}$. (10) $I_B = -0.7 \text{ mA}$.

Fig.13 Collector current as a function of collector-emitter voltage; typical values.

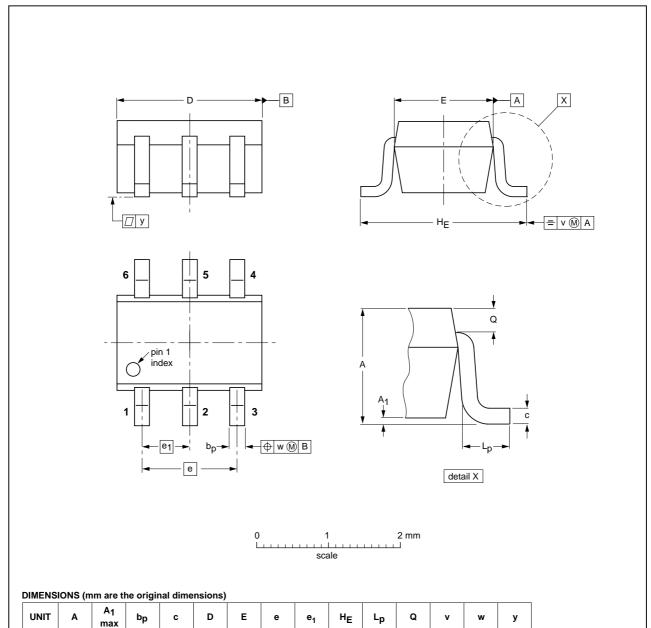
15 V low $V_{CE(sat)}$ NPN/PNP transistor

PBSS2515YPN

PACKAGE OUTLINE

Plastic surface-mounted package; 6 leads

SOT363



OUTLINE	REFERENCES			EUROPEAN	ISSUE DATE	
VERSION	IEC	JEDEC	JEITA		PROJECTION	ISSUE DATE
SOT363			SC-88			04-11-08 06-03-16

0.65

0.45

0.15

0.25

0.2

0.2

0.1

2005 Jan 11 9

0.25

0.10

1.35

1.15

1.3

1.1

0.1

mm

15 V low $V_{CE(sat)}$ NPN/PNP transistor

PBSS2515YPN

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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NXP Semiconductors

Customer notification

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

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