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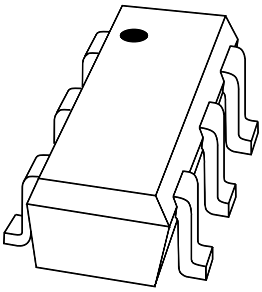
Team Nexperia

DATA SHEET



PBSS2515YPN

15 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	V
I_{CM}	peak collector current	1	A
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

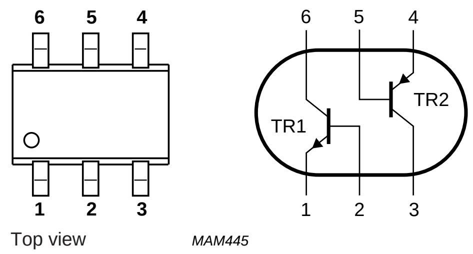


Fig.1 Simplified outline SC-88 (SOT363) and symbol.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PBSS2515YPN	SC-88	plastic surface mounted package; 6 leads	SOT363

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
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	A
I_{BM}	peak base current		–	100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	–	200	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C
Per device					
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °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	note 1	416	K/W

Note

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

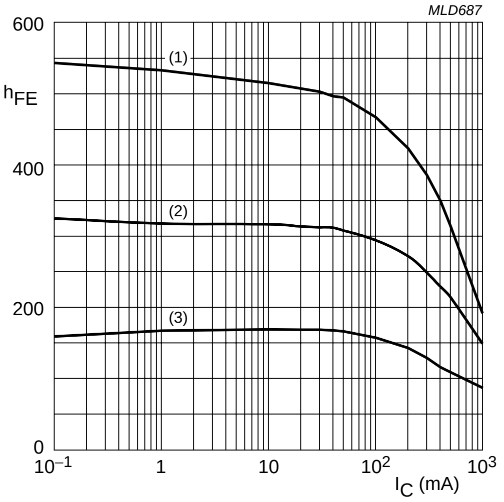
CHARACTERISTICS

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	μA
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 voltage	I_C = 10 mA; I_B = 0.5 mA	–	–	25	mV
		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 mA; I_B = 50 mA; note 1	–	300	<500	mΩ
V_{BEsat}	base-emitter saturation voltage	I_C = 500 mA; I_B = 50 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 transistor						
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 V; I_E = I_e = 0 A; f = 1 MHz	–	4.4	6	pF
PNP transistor						
f_T	transition frequency	I_C = –100 mA; V_{CE} = –5 V; f = 100 MHz	100	280	–	MHz
C_c	collector capacitance	V_{CB} = –10 V; I_E = I_e = 0 A; f = 1 MHz	–	–	10	pF

Note

1. Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.02$.



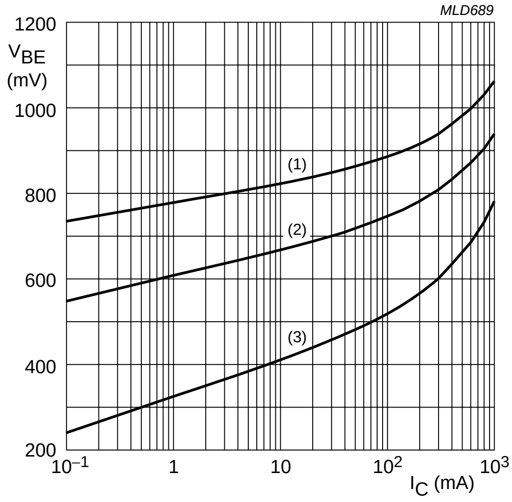
TR1 (NPN) V_{CE} = 2 V.

(1) T_{amb} = 150 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = –55 °C.

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



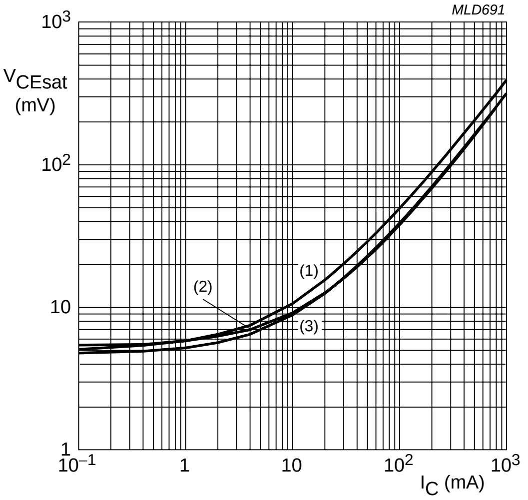
TR1 (NPN) V_{CE} = 2 V.

(1) T_{amb} = –55 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = 150 °C.

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



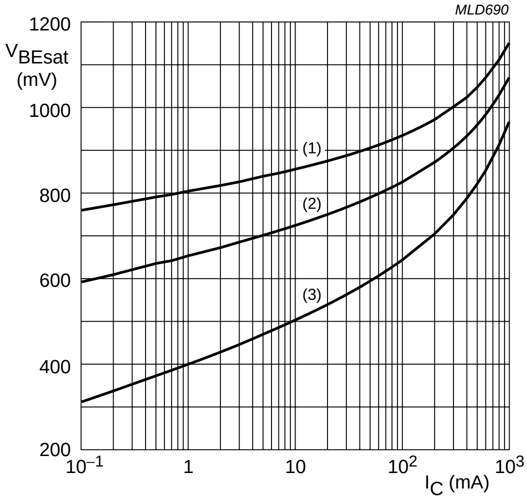
TR1 (NPN) I_C/I_B = 20.

(1) T_{amb} = 150 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = –55 °C.

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



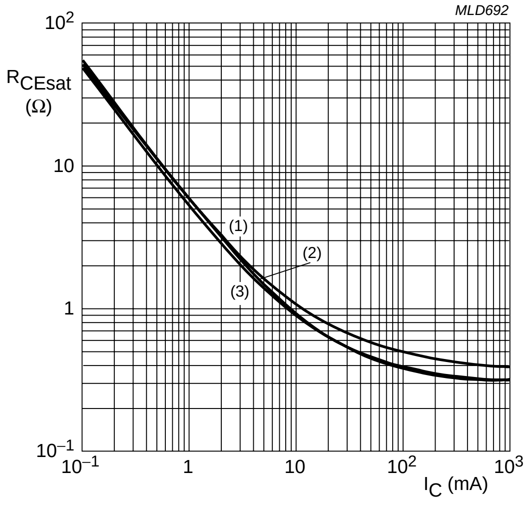
TR1 (NPN) I_C/I_B = 20.

(1) T_{amb} = 150 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = –55 °C.

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



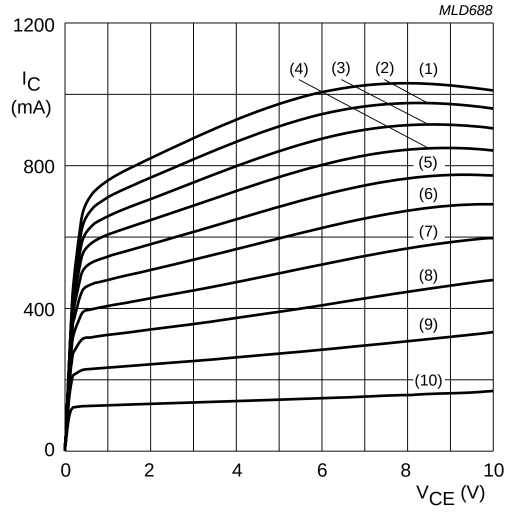
TR1 (NPN) $I_C/I_B = 20$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

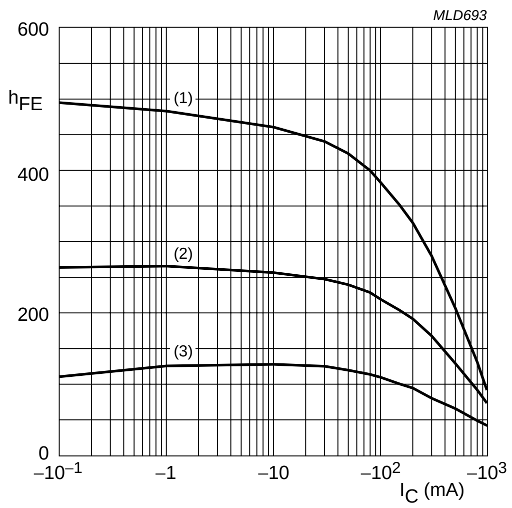
Fig.6 Equivalent on-resistance as a function of collector current; typical values.



TR1 (NPN) $T_{amb} = 25$ °C.

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

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



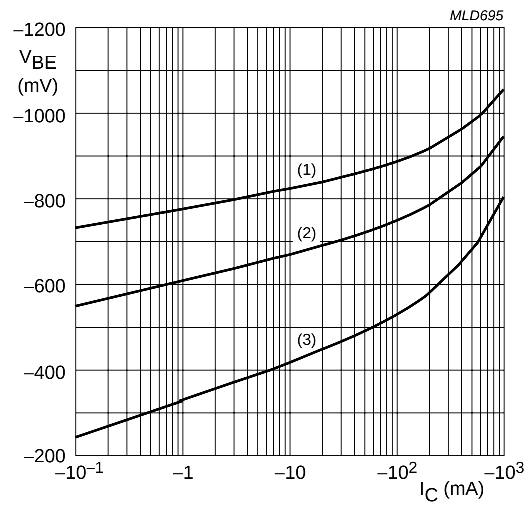
TR2 (PNP) $V_{CE} = -2$ V.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

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



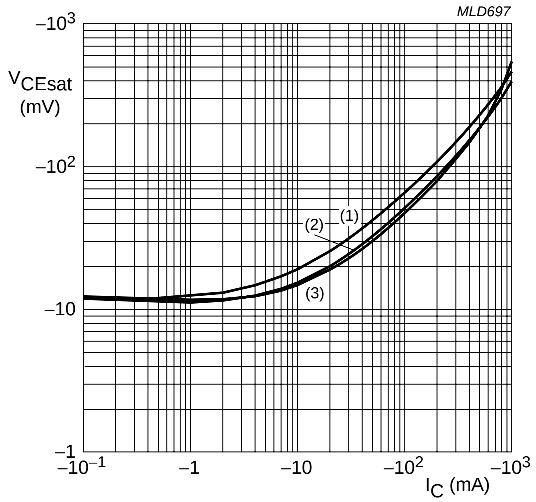
TR2 (PNP) $V_{CE} = -2$ V.

(1) $T_{amb} = -55$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = 150$ °C.

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



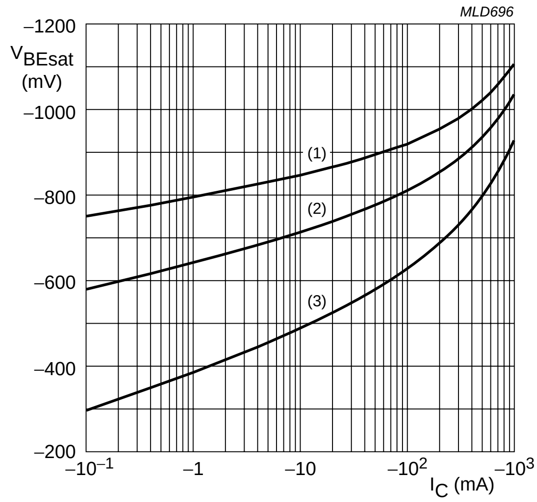
TR2 (PNP) $I_C/I_B = 20$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

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



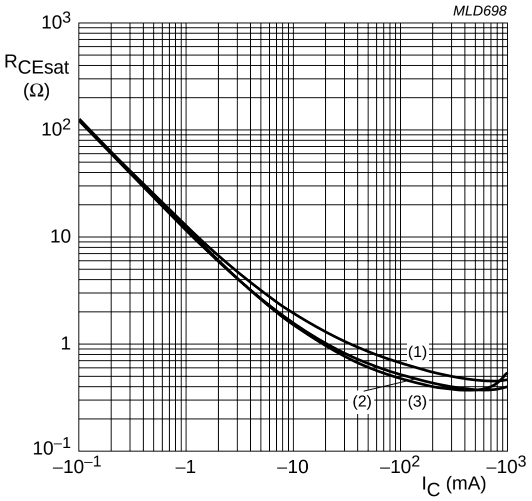
TR2 (PNP) $I_C/I_B = 20$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

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



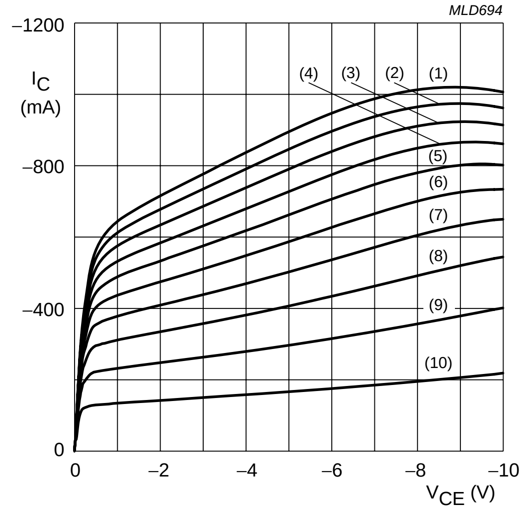
TR2 (PNP) $I_C/I_B = 20$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

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



TR2 (PNP) $T_{amb} = 25$ °C.

(1) $I_B = -7$ mA.

(2) $I_B = -6.3$ mA.

(3) $I_B = -5.6$ mA.

(4) $I_B = -4.9$ mA.

(5) $I_B = -4.2$ mA.

(6) $I_B = -3.5$ mA.

(7) $I_B = -2.8$ mA.

(8) $I_B = -2.1$ mA.

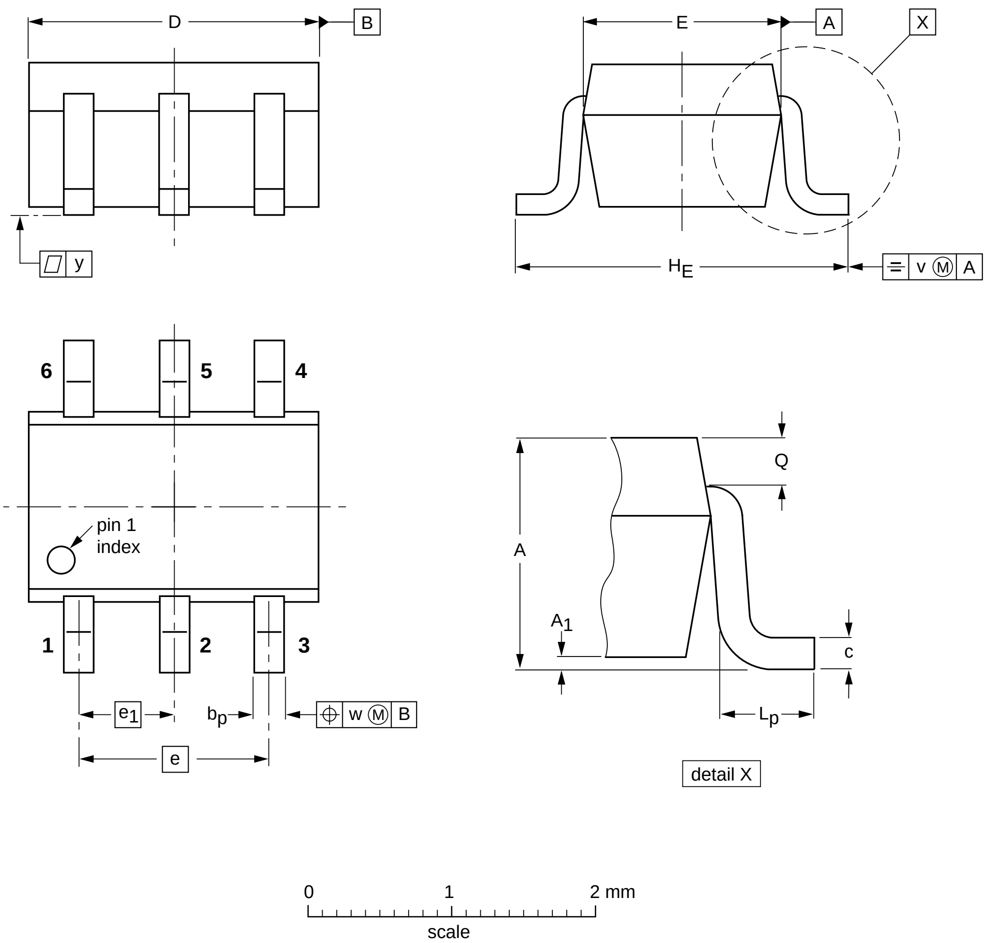
(9) $I_B = -1.4$ mA.

(10) $I_B = -0.7$ mA.

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

PACKAGE OUTLINE

Plastic surface-mounted package; 6 leads **SOT363**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

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

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.

Contact information

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