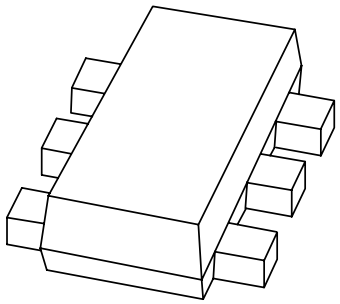
DATA SHEET



PEMZ7
NPN/PNP general purpose transistors

Product specification
Supersedes data of 2001 Sep 25

2001 Nov 07

Philips
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NPN/PNP general purpose transistors PEMZ7

FEATURES

- 300 mW total power dissipation
- Very small 1.6 × 1.2 mm ultra thin package
- Self alignment during soldering due to straight leads
- Low collector capacitance
- Low V_{CEsat}
- High current capabilities
- Improved thermal behaviour due to flat leads
- Reduced required PCB area
- Reduced pick and place costs.

APPLICATIONS

- Heavy duty battery powered equipment (automotive, telecom and audio-video) such as motor and lamp drivers
- V_{CEsat} critical applications such as latest low supply voltage IC applications
- All battery driven equipment, to save battery power.

DESCRIPTION

NPN/PNP low V_{CEsat} transistor pair in a SOT666 plastic package.

MARKING

TYPE NUMBER	MARKING CODE
PEMZ7	Z7

PINNING

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

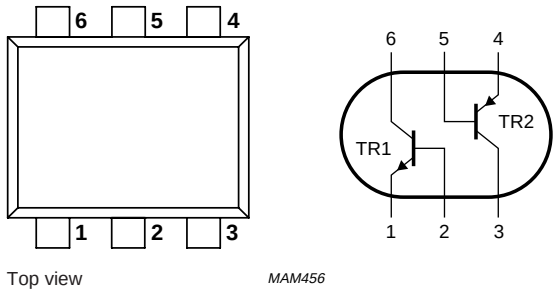


Fig.1 Simplified outline (SOT666) and symbol.

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	–	12	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; note 1	–	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
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	notes 1 and 2	416	K/W

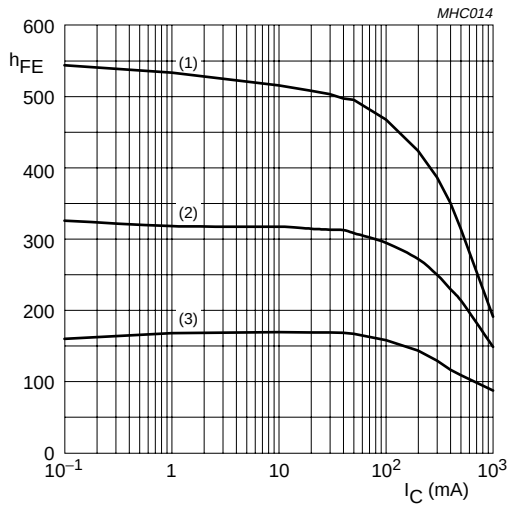
Notes

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

CHARACTERISTICS

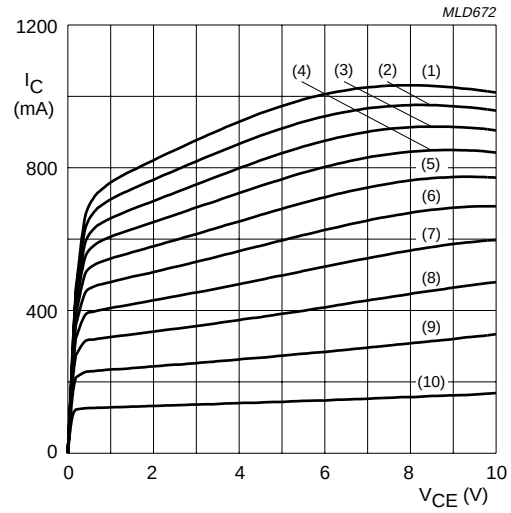
T_{amb} = 25 °C; unless otherwise specified.

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	–	–	100	nA
		V_{CB} = 15 V; I_E = 0; T_j = 150 °C	–	–	50	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0	–	–	100	nA
h_{FE}	DC current gain	V_{CE} = 2 V; I_C = 10 mA	200	–	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = 200 mA; I_B = 10 mA	–	–	220	mV
f_T	transition frequency	I_C = 100 mA; V_{CE} = 5 V; f = 100 MHz				
	TR1 (NPN)		250	420	–	MHz
	TR2 (PNP)		100	280	–	MHz
C_c	collector capacitance	V_{CB} = 10 V; I_E = I_e = 0; f = 1 MHz				
	TR1 (NPN)		–	4.4	6	pF
	TR2 (PNP)		–	–	10	pF



TR1 (NPN); V_{CE} = 2 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

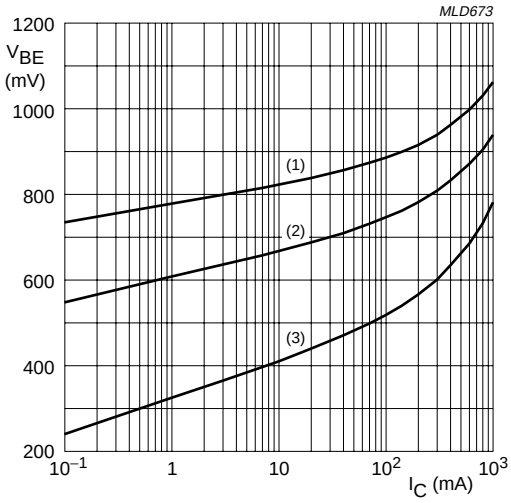
Fig.2 DC current gain as a function of collector current; typical values.



TR1 (NPN); T_{amb} = 25 °C.

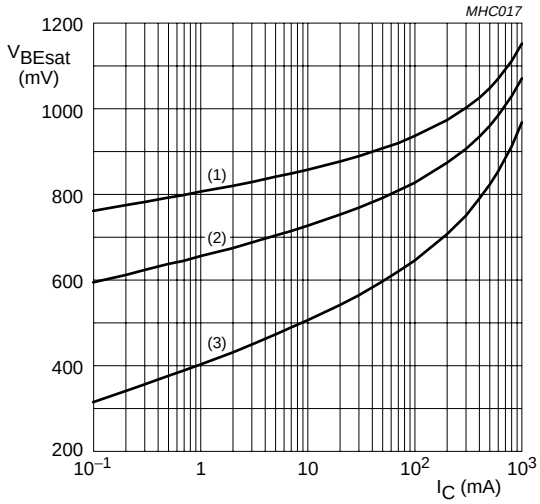
(1) I_B = 4.60 mA
(2) I_B = 4.14 mA
(3) I_B = 3.68 mA
(4) I_B = 3.22 mA
(5) I_B = 2.76 mA
(6) I_B = 2.30 mA
(7) I_B = 1.84 mA
(8) I_B = 1.38 mA
(9) I_B = 0.92 mA
(10) I_B = 0.46 mA

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



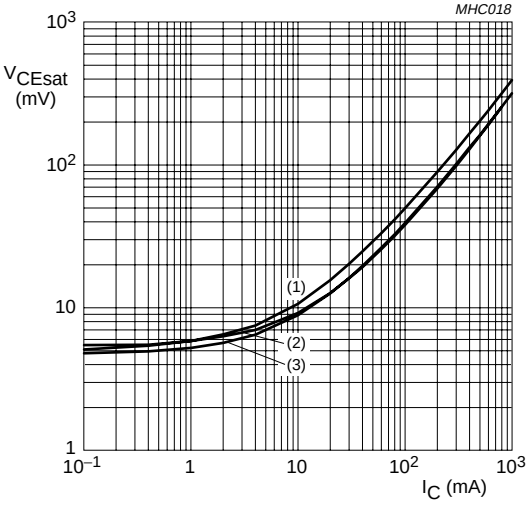
TR1 (NPN); V_{CE} = 2 V.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

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



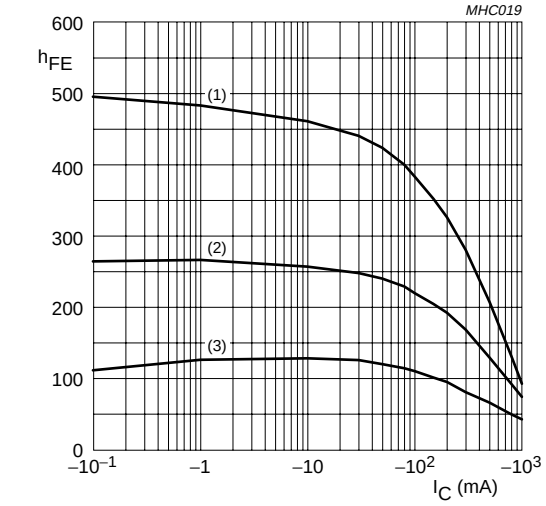
TR1 (NPN); I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

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



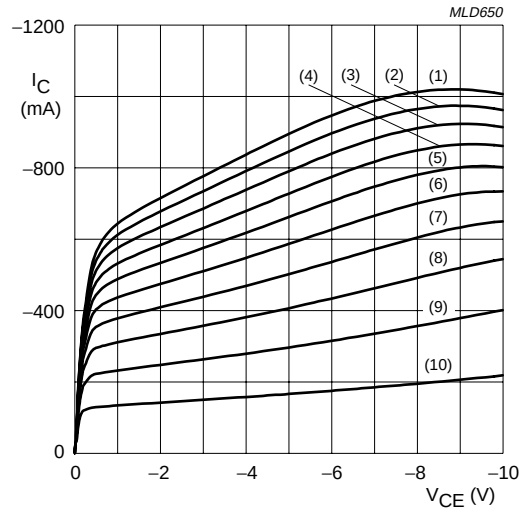
TR1 (NPN); I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

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



TR2 (PNP); V_{CE} = –2 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

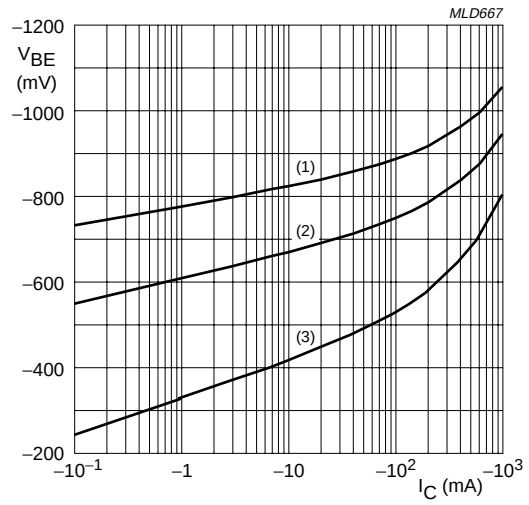
Fig.7 DC current gain as a function of collector current; typical values.



TR2 (PNP); T_{amb} = 25 °C.

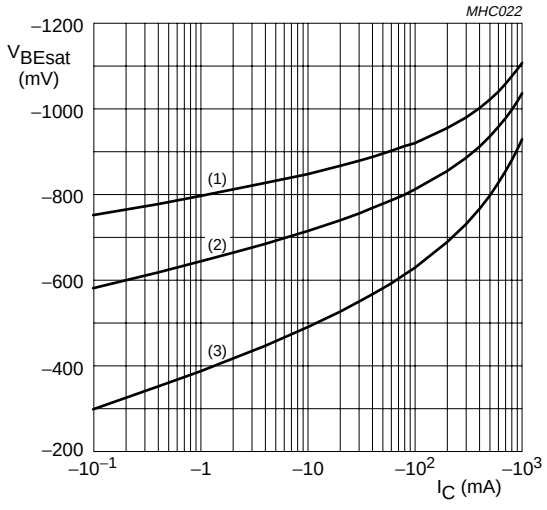
(1) I_B = 7.0 mA
(2) I_B = 6.3 mA
(3) I_B = 5.6 mA
(4) I_B = 4.9 mA
(5) I_B = 4.2 mA
(6) I_B = 3.5 mA
(7) I_B = 2.8 mA
(8) I_B = 2.1 mA
(9) I_B = 1.4 mA
(10) I_B = 0.7 mA

Fig.8 Collector current as a function of collector-emitter voltage; typical values.



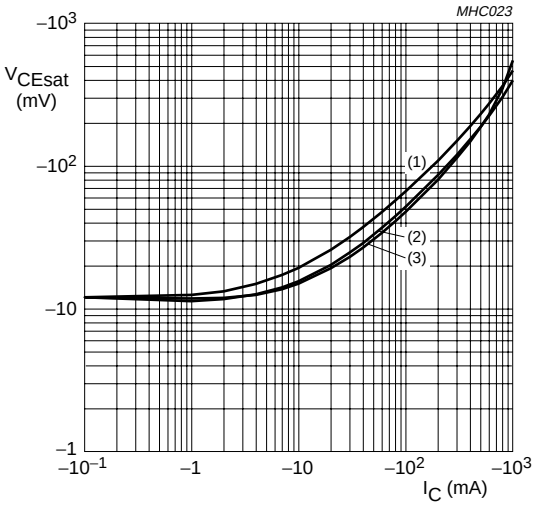
TR2 (PNP); V_{CE} = −2 V.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

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

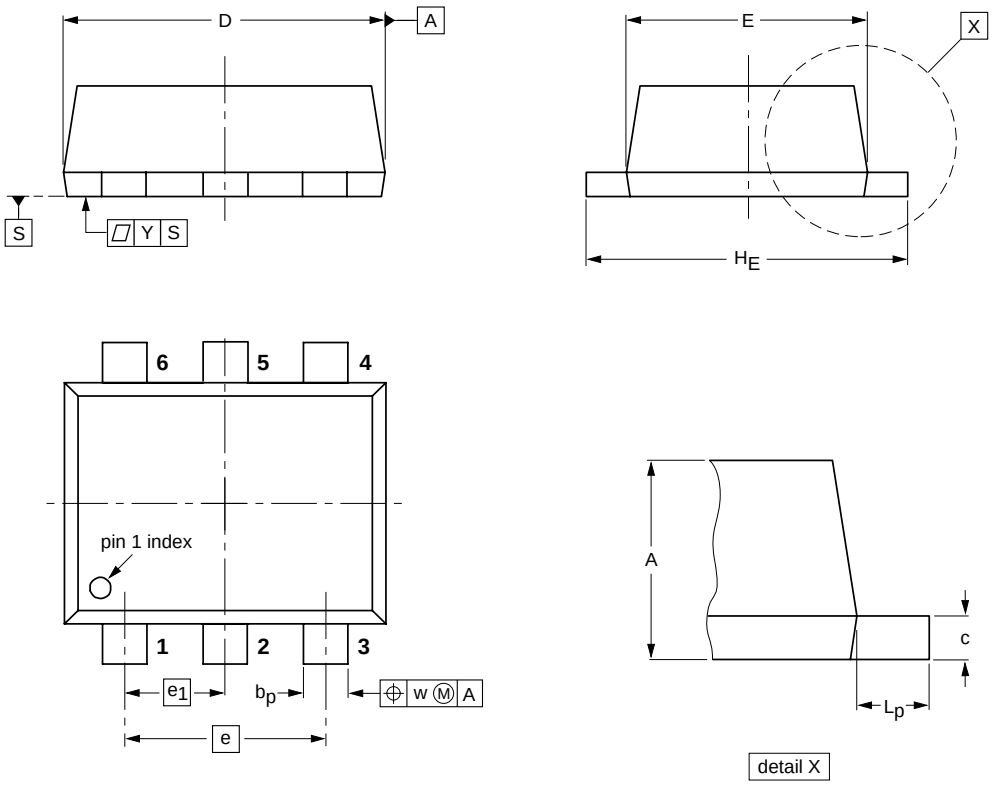


TR2 (PNP); I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

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

PACKAGE OUTLINE

Plastic surface mounted package; 6 leads **SOT666**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b_p	c	D	E	e	e_1	H_E	L_p	w	y
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 VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT666						~~01-01-04~~ 01-08-27

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DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
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