

DATA SHEET



PEMD9

**NPN/PNP resistor-equipped
transistors;**

$R1 = 10 \text{ k}\Omega$, $R2 = 47 \text{ k}\Omega$

Preliminary specification

2001 Oct 22

**NPN/PNP resistor-equipped transistors;
R1 = 10 kΩ, R2 = 47 kΩ**

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FEATURES

- 300 mW total power dissipation
- Very small 1.6 × 1.2 mm ultra thin package
- Self alignment during soldering due to straight leads
- Replaces two SC-75/SC-89 packaged transistors on same PCB area
- Reduces required PCB area
- Reduced pick and place costs.

APPLICATIONS

- General purpose switching and amplification
- Inverter and interface circuits
- Circuit driver.

DESCRIPTION

NPN/PNP resistor-equipped transistors in a SOT666 plastic package.

MARKING

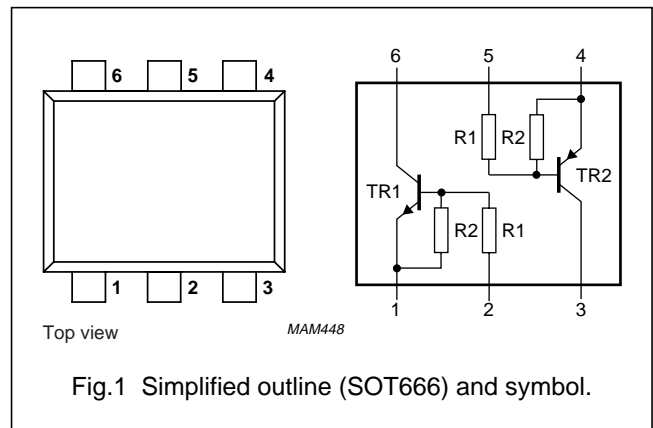
TYPE NUMBER	MARKING CODE
PEMD9	D9

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V _{CEO}	collector-emitter voltage	50	V
I _{CM}	peak collector current	100	mA
TR1	NPN	–	–
TR2	PNP	–	–
R1	bias resistor	10	kΩ
R2	bias resistor	47	kΩ

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 transistor; for the PNP transistor with negative polarity					
V _{CBO}	collector-base voltage	open emitter	–	50	V
V _{CEO}	collector-emitter voltage	open base	–	50	V
V _{EBO}	emitter-base voltage	open collector	–	10	V
V _i	input voltage TR1				
	positive		–	+40	V
	negative		–	–6	V
	input voltage TR2				
	positive		–	+6	V
	negative		–	–40	V
I _O	output current (DC)		–	100	mA
I _{CM}	peak collector current		–	100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 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} ≤ 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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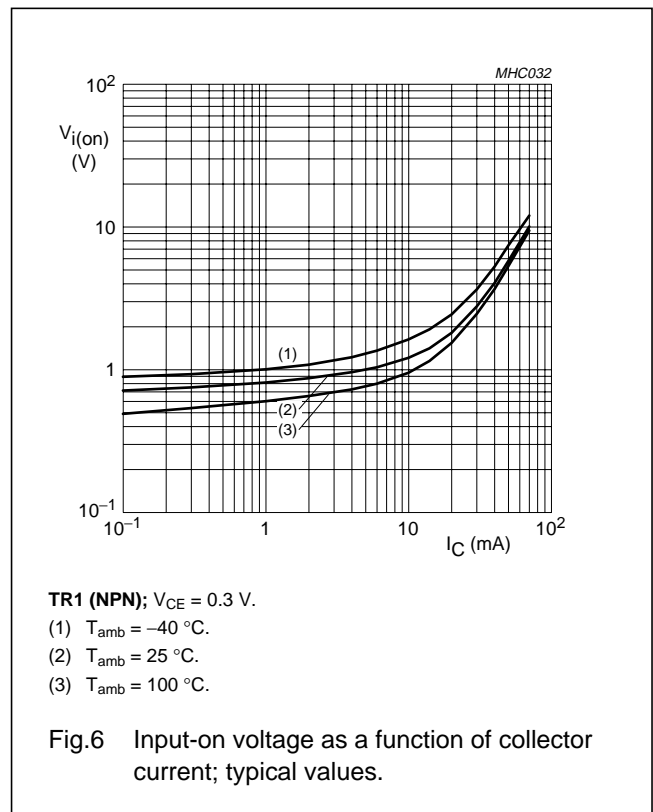
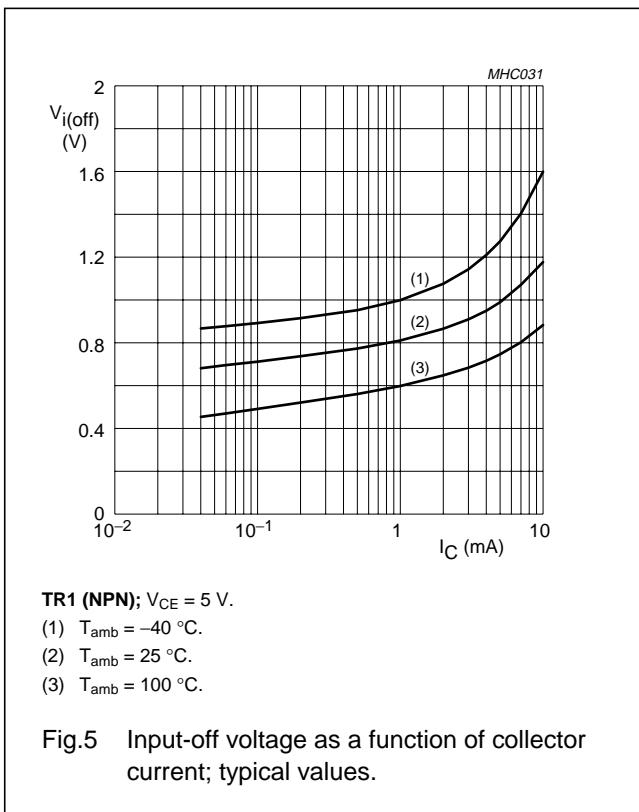
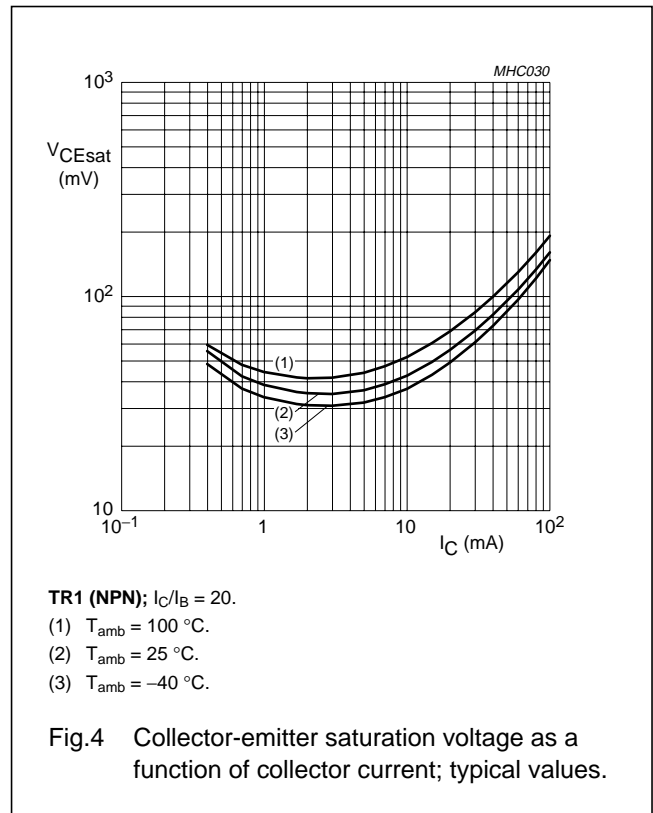
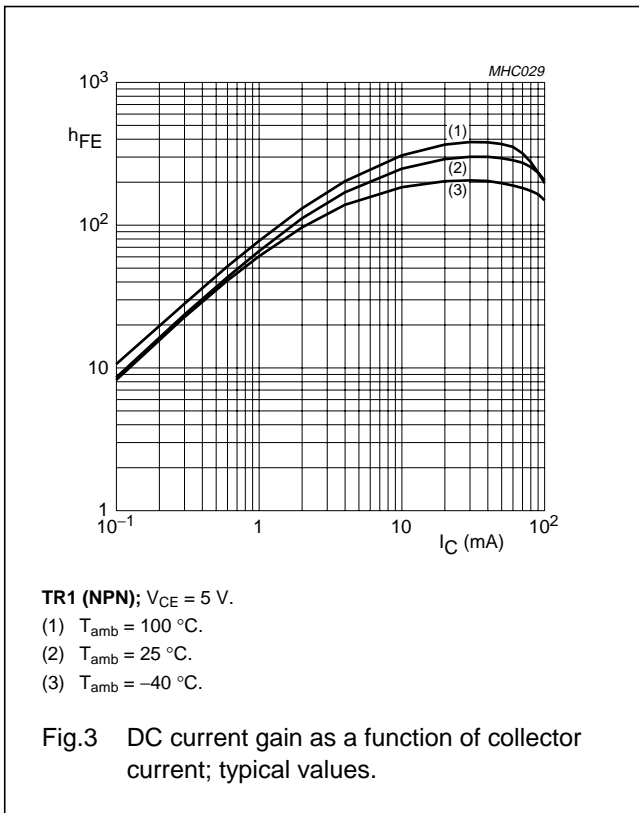
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CHARACTERISTICS $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per transistor; for the PNP transistor with negative polarity						
I_{CBO}	collector-base cut-off current	$V_{\text{CB}} = 50\text{ V}$; $I_{\text{E}} = 0$	–	–	100	nA
I_{CEO}	collector-emitter cut-off current	$V_{\text{CE}} = 50\text{ V}$; $I_{\text{B}} = 0$	–	–	1	μA
		$V_{\text{CE}} = 30\text{ V}$; $I_{\text{B}} = 0$; $T_{\text{j}} = 150\text{ }^{\circ}\text{C}$	–	–	50	μA
I_{EBO}	emitter-base cut-off current	$V_{\text{EB}} = 5\text{ V}$; $I_{\text{C}} = 0$	–	–	150	μA
h_{FE}	DC current gain	$V_{\text{CE}} = 5\text{ V}$; $I_{\text{C}} = 5\text{ mA}$	100	–	–	
V_{CEsat}	collector-emitter saturation voltage	$I_{\text{C}} = 5\text{ mA}$; $I_{\text{B}} = 0.25\text{ mA}$	–	–	100	mV
$V_{\text{i(off)}}$	input off voltage	$V_{\text{CE}} = 5\text{ V}$; $I_{\text{C}} = 100\text{ }\mu\text{A}$	–	0.7	0.5	V
$V_{\text{i(on)}}$	input on voltage	$V_{\text{CE}} = 0.3\text{ V}$; $I_{\text{C}} = 1\text{ mA}$	1.4	0.8	–	V
R1	input resistor		7	10	13	$\text{k}\Omega$
$\frac{R2}{R1}$	resistor ratio		3.7	4.7	5.7	
C_{c}	collector capacitance	$I_{\text{E}} = i_{\text{e}} = 0$; $V_{\text{CB}} = 10\text{ V}$; $f = 1\text{ MHz}$	–	–	2.5	pF
	TR1 (NPN)				3	pF
	TR2 (PNP)					

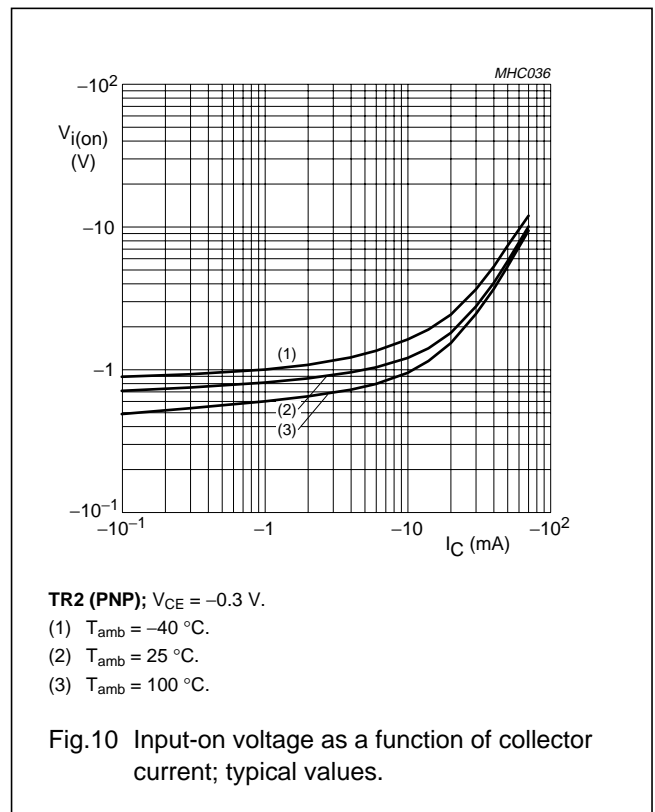
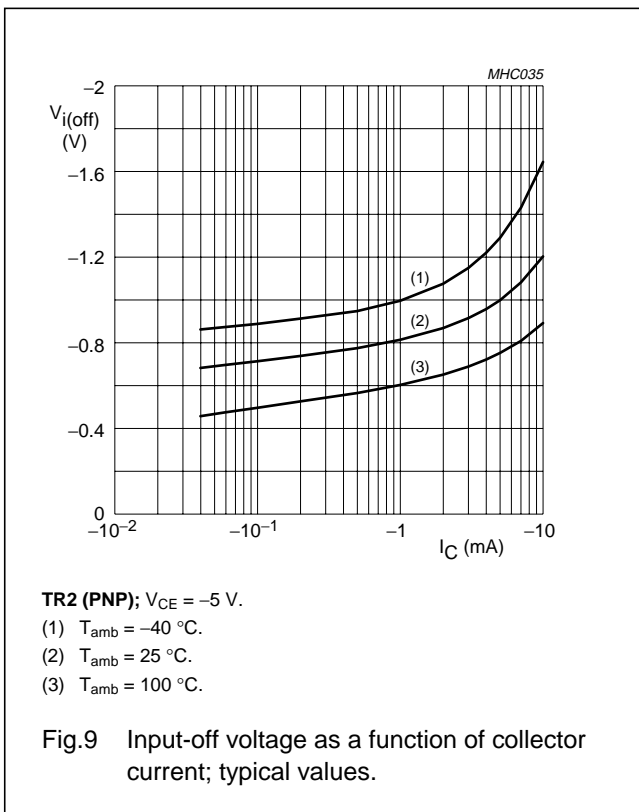
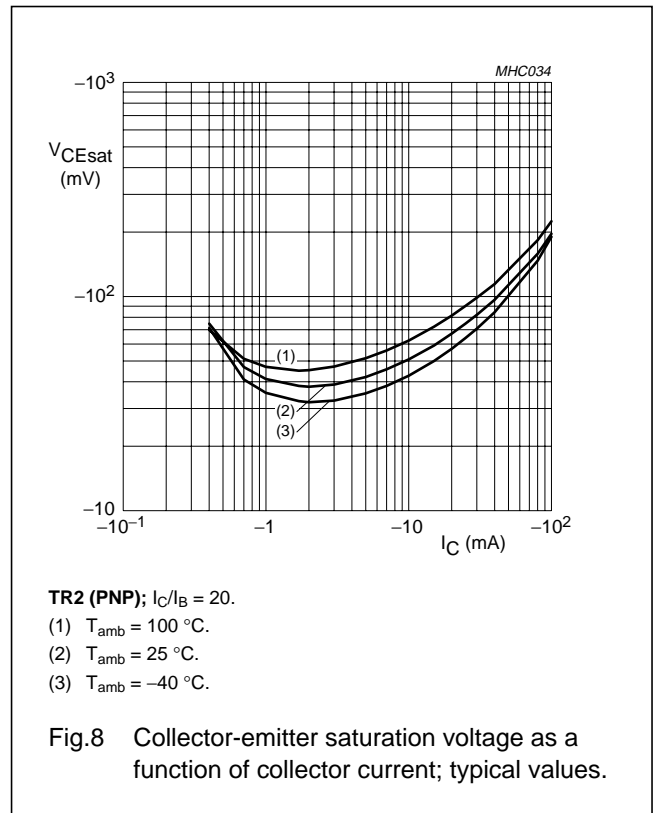
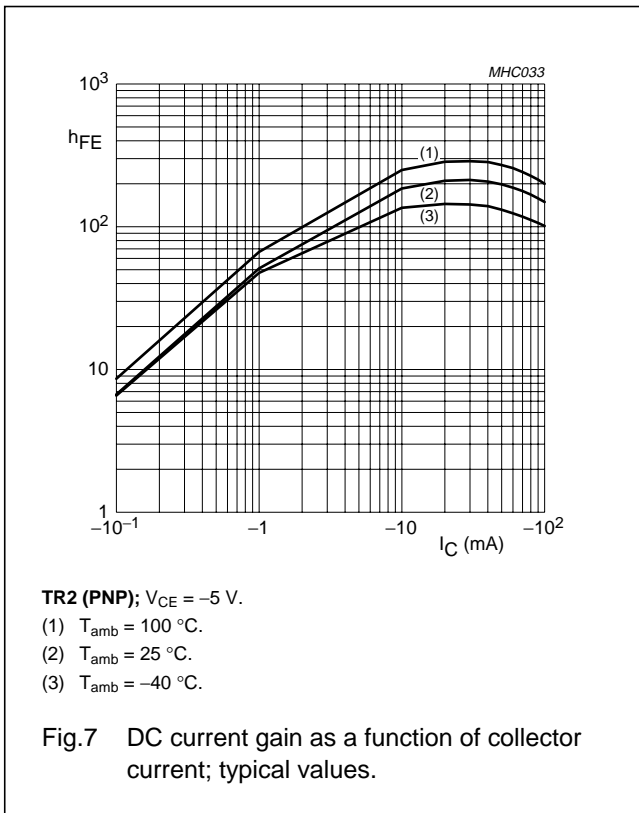
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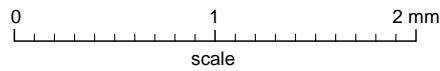
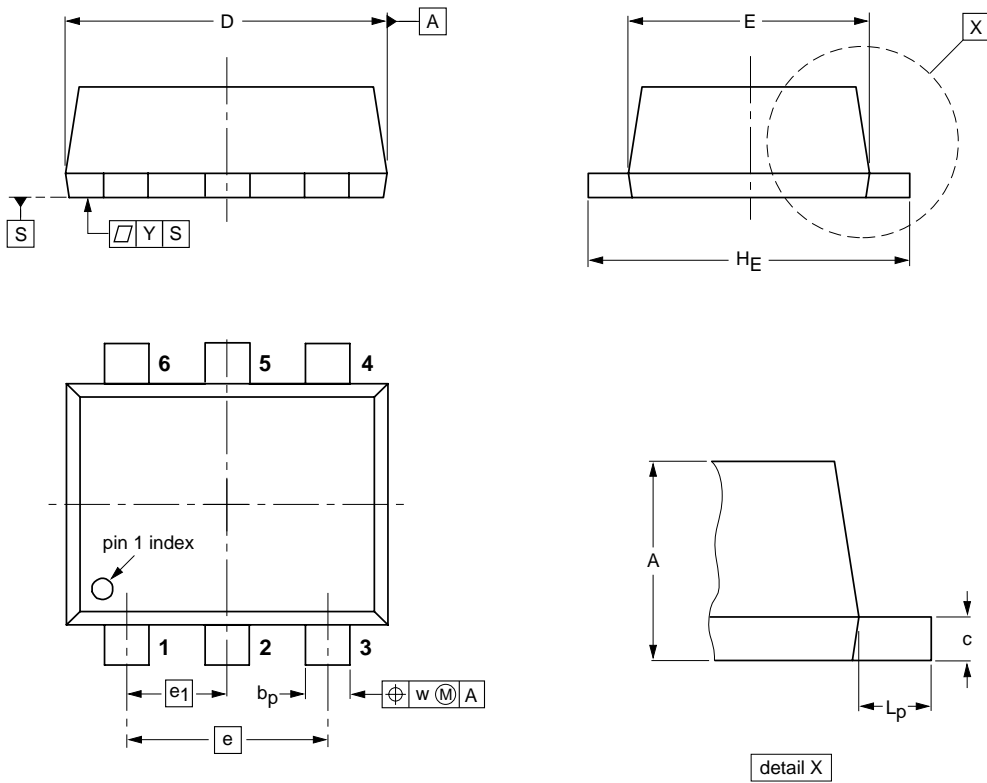
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PACKAGE OUTLINE

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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NOTES

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