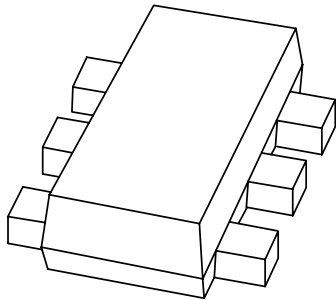


# DATA SHEET



## **PEMF21** 12 V PNP loadswitch

Product specification

2004 Jan 12

# 12 V PNP loadswitch

# PEMF21

### FEATURES

- Low  $V_{CEsat}$  transistor and resistor-equipped transistor in one package
- Very small  $1.6 \times 1.2$  mm ultra thin package
- Reduced component count.

### APPLICATIONS

- Line switches
- Battery charger switches
- Power supply switches
- Drive switches
- General purpose analog switches.

### DESCRIPTION

Low  $V_{CEsat}$  PNP transistor and NPN resistor-equipped transistor in a SOT666 plastic package (see "Ordering information" for package details).

### MARKING

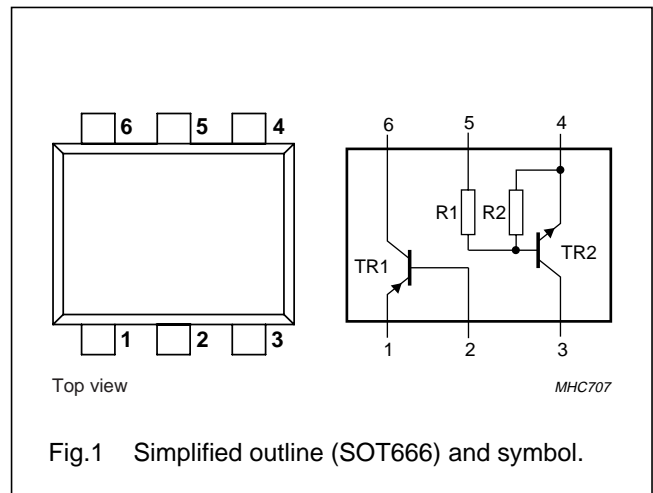
TYPE NUMBER	MARKING CODE
PEMF21	2F

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	TYP.	MAX.	UNIT
<b>TR1; PNP; low <math>V_{CEsat}</math> transistor</b>				
$V_{CEO}$	collector-emitter voltage	–	–12	V
$I_C$	collector current (DC)	–	–500	mA
$R_{CEsat}$	equivalent on-resistance	–	500	m $\Omega$
<b>TR2; NPN; resistor-equipped transistor</b>				
$V_{CEO}$	collector-emitter voltage	–	50	V
$I_O$	output current (DC)	–	100	mA
R1	bias resistor	10	–	k $\Omega$
R2	bias resistor	10	–	k $\Omega$

### PINNING

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



### ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PEMF21	–	plastic surface mounted package; 6 leads	SOT666

## 12 V PNP loadswitch

## PEMF21

**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>Transistor TR1</b>					
V <sub>CBO</sub>	collector-base voltage	open emitter	–	–15	V
V <sub>CEO</sub>	collector-emitter voltage	open base	–	–12	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	–6	V
I <sub>C</sub>	collector current (DC)		–	–500	mA
I <sub>CM</sub>	peak collector current		–	–1	A
I <sub>BM</sub>	peak base current		–	–100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> = 25 °C; note 1	–	200	mW
<b>Transistor TR2</b>					
V <sub>CBO</sub>	collector-base voltage	open emitter	–	50	V
V <sub>CEO</sub>	collector-emitter voltage	open base	–	50	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	10	V
V <sub>i</sub>	input voltage				
	positive		–	+40	V
	negative		–	–10	V
I <sub>O</sub>	output current (DC)		–	100	mA
I <sub>CM</sub>	peak collector current		–	100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> = 25 °C; note 1	–	200	mW
<b>Per device</b>					
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> = 25 °C; note 1	–	300	mW
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	150	°C
T <sub>amb</sub>	operating ambient temperature		–65	+150	°C

**Note**

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

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
<b>Per device</b>				
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	notes 1 and 2	416	K/W

**Notes**

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

## 12 V PNP loadswitch

## PEMF21

**CHARACTERISTICS**

$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

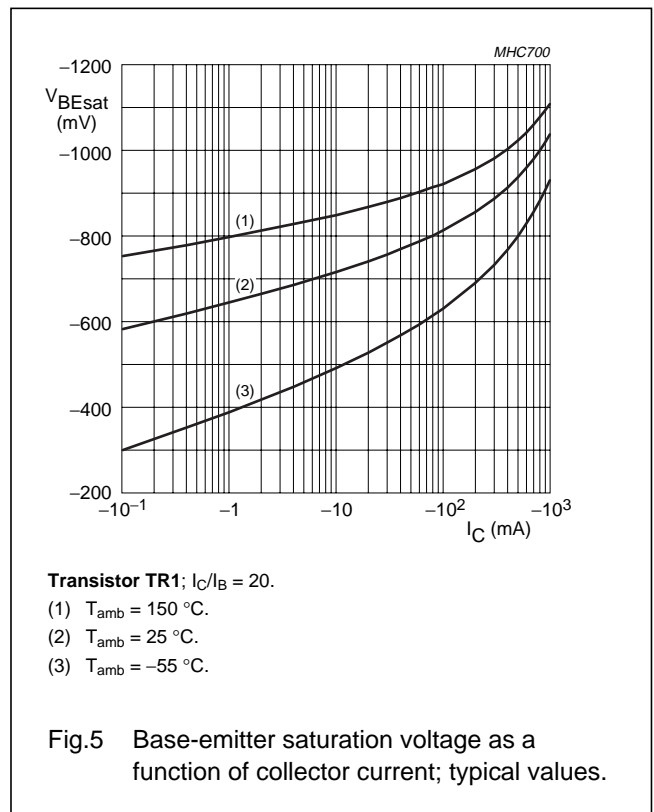
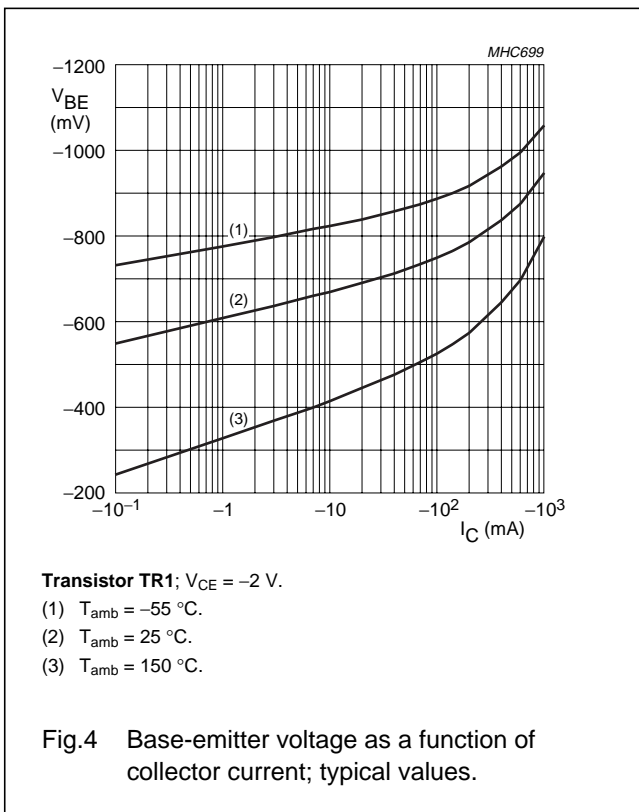
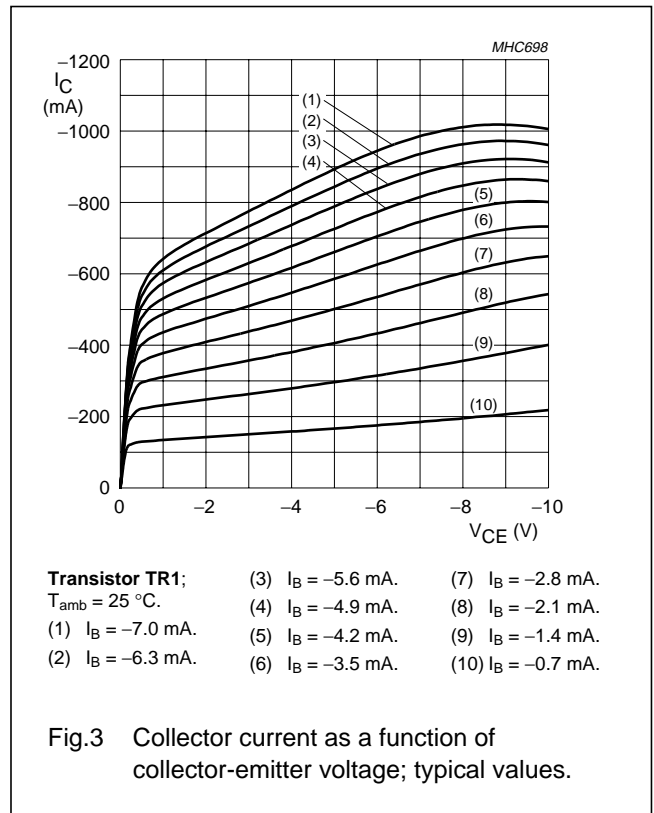
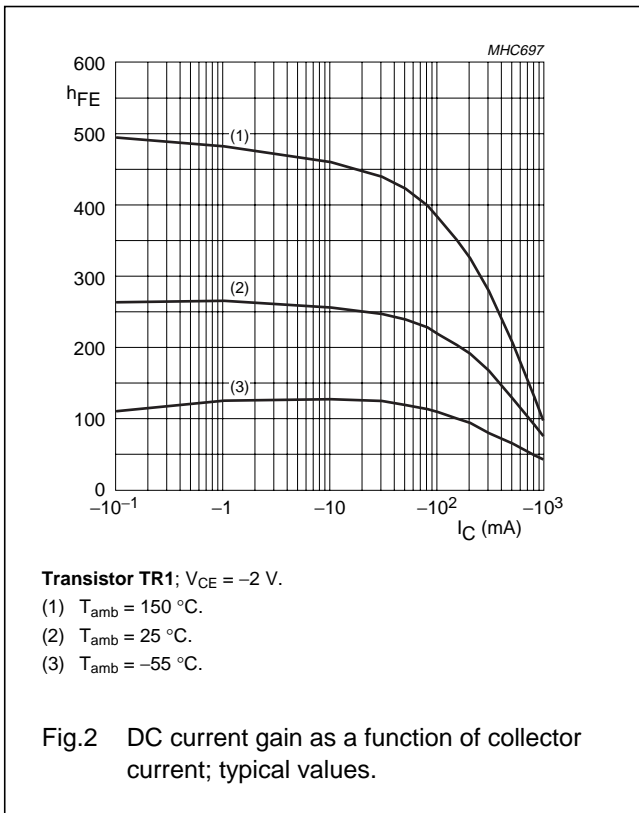
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Transistor TR1</b>						
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -15\text{ V}; I_E = 0$	–	–	–100	nA
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -5\text{ V}; I_C = 0$	–	–	–100	nA
$h_{FE}$	DC current gain	$V_{CE} = -2\text{ V}; I_C = -10\text{ mA}$	200	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -200\text{ mA}; I_B = -10\text{ mA}$	–	–	–250	mV
$R_{CEsat}$	equivalent on-resistance	$I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$	–	300	500	m $\Omega$
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$	–	–	–1.1	V
$V_{BEon}$	base-emitter turn-on voltage	$V_{CE} = -2\text{ V}; I_C = -100\text{ mA}; \text{note 1}$	–	–	–0.9	V
$f_T$	transition frequency	$I_C = -100\text{ mA}; V_{CE} = -5\text{ V}; f = 100\text{ MHz}$	100	280	–	MHz
$C_c$	collector capacitance	$V_{CB} = -10\text{ V}; I_E = i_e = 0; f = 1\text{ MHz}$	–	–	10	pF
<b>Transistor TR2</b>						
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 50\text{ V}; I_E = 0$	–	–	100	nA
$I_{CEO}$	collector-emitter cut-off current	$V_{CE} = 30\text{ V}; I_B = 0$	–	–	1	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	–	–	400	$\mu\text{A}$
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}; I_C = 5\text{ mA}$	30	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$	–	–	300	mV
$V_{i(off)}$	input-off voltage	$V_{CE} = 5\text{ V}; I_C = 100\text{ }\mu\text{A}$	–	–	0.5	V
$V_{i(on)}$	input-on voltage	$V_{CE} = 0.3\text{ V}; I_C = 10\text{ mA}$	3	–	–	V
R1	input resistor		7	10	13	k $\Omega$
$\frac{R2}{R1}$	resistor ratio		0.8	1	1.2	
$C_c$	collector capacitance	$V_{CB} = 10\text{ V}; I_E = i_e = 0; f = 1\text{ MHz}$	–	–	2.5	pF

**Note**

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

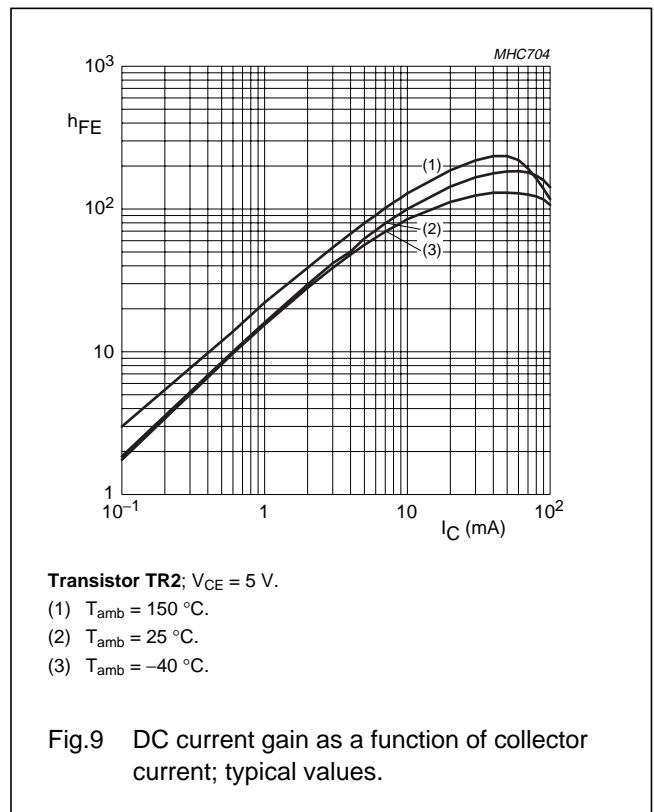
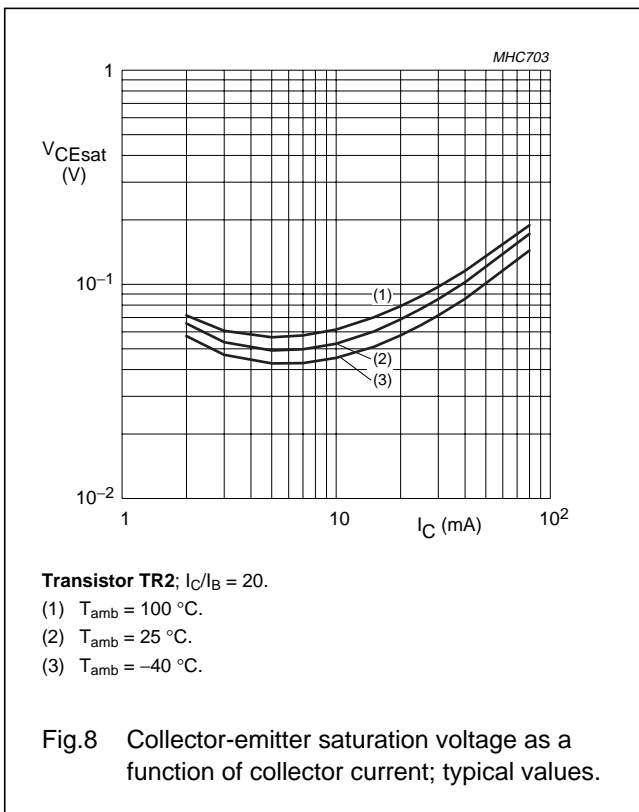
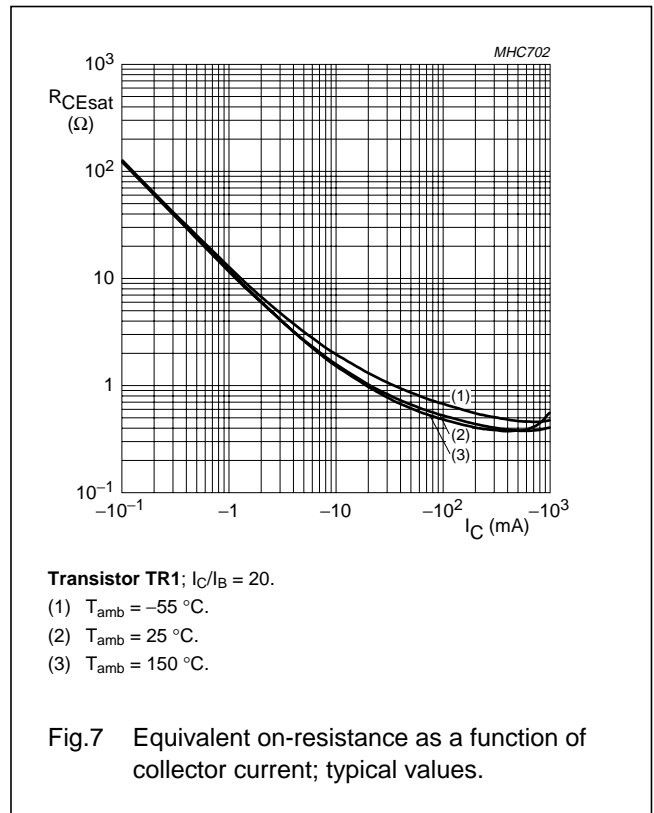
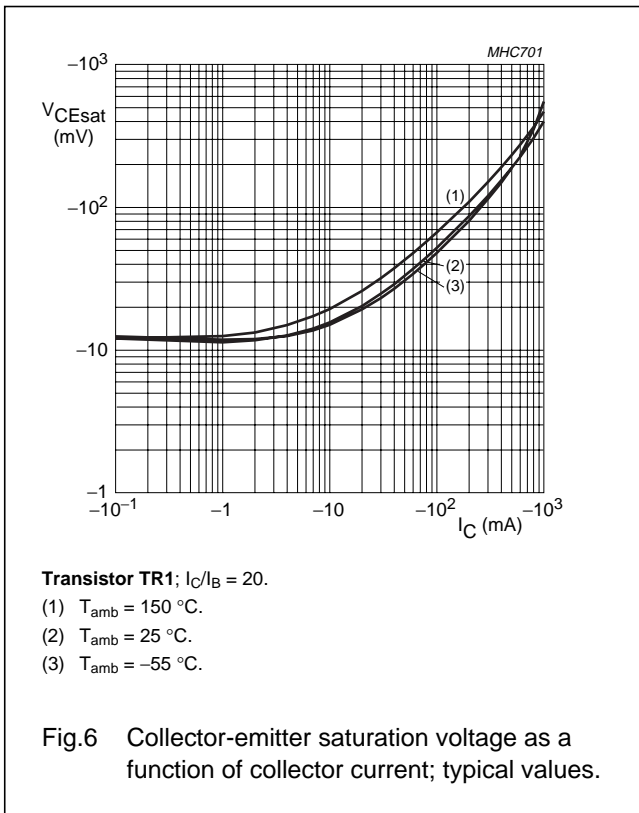
12 V PNP loadswitch

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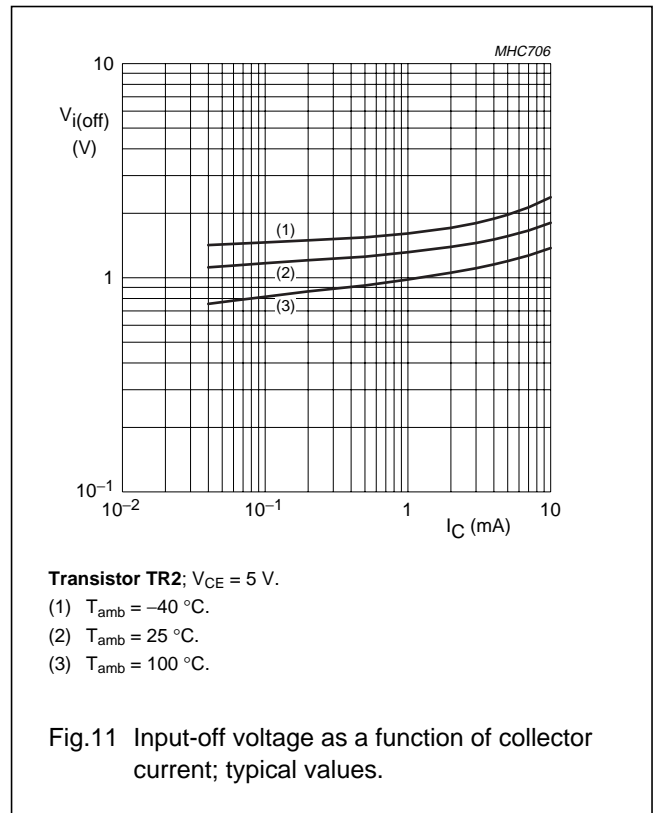
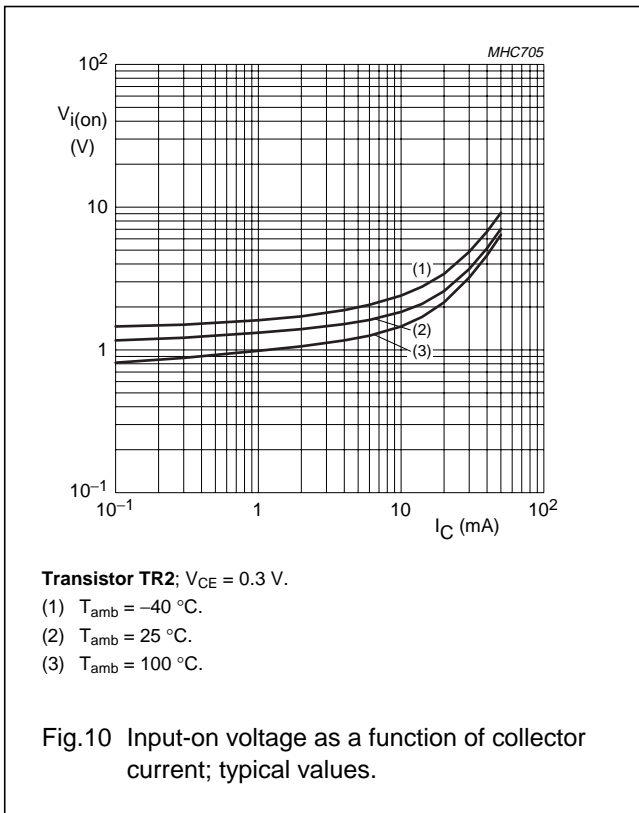
12 V PNP loadswitch

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12 V PNP loadswitch

PEMF21



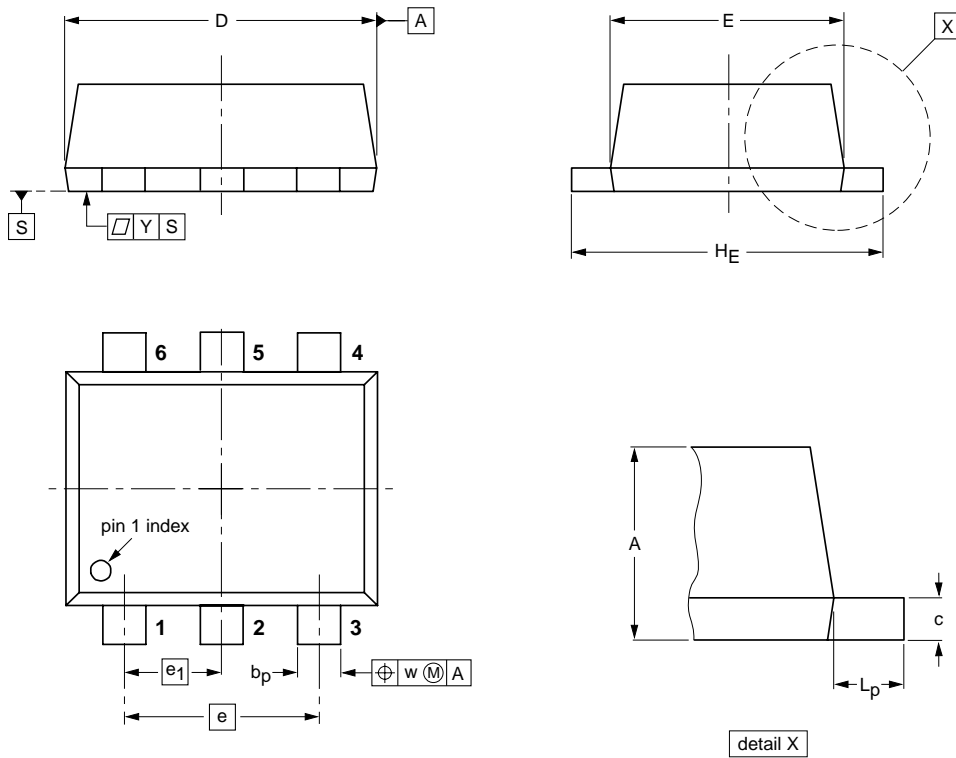
12 V PNP loadswitch

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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



## 12 V PNP loadswitch

## PEMF21

## DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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