DATA SHEET
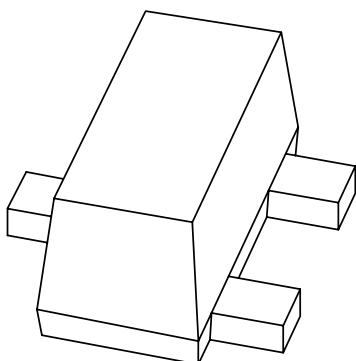

PDTA114YEF

PNP resistor-equipped transistor
R1 = 10 kΩ; R2 = 47 kΩ

Product specification

2002 Mar 15

PNP resistor-equipped transistor
R1 = 10 kΩ; R2 = 47 kΩ

PDTA114YEF

FEATURES

- Built-in bias resistors
- 250 mW total power dissipation
- Very small $1.6 \times 0.85 \times 0.7$ mm thin package
- Flat leads
- Excellent coplanarity
- Improved thermal behaviour
- Reduces number of components and required PCB area.

APPLICATIONS

- General purpose and switching amplification
- Inverter and interface circuits
- Driver circuits.

DESCRIPTION

PNP resistor-equipped transistor in a SOT490 (SC-89) plastic package.

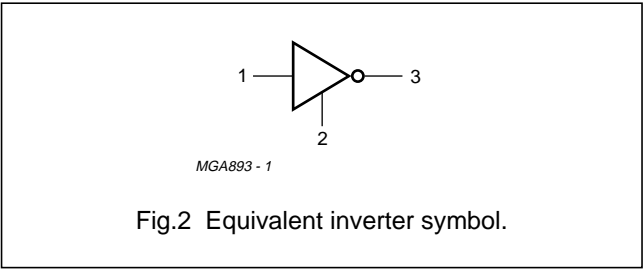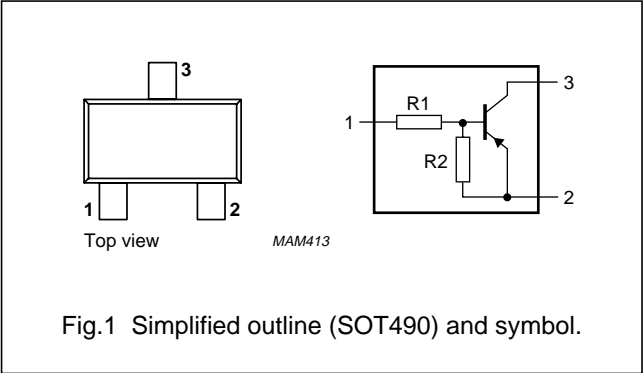## MARKING

TYPE NUMBER	MARKING CODE
PDTA114YEF	37

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	−50	V
I_O	output current (DC)	−100	mA
R1	bias resistor	10	kΩ
R2	bias resistor	47	kΩ

PINNING

PIN	DESCRIPTION
1	base/input
2	emitter/ground (+)
3	collector/output

Fig.1 Simplified outline (SOT490) and symbol.

Fig.2 Equivalent inverter symbol.

PNP resistor-equipped transistor
R1 = 10 kΩ; R2 = 47 kΩ

PDTA114YEF

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
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				
	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	$T_{amb} \leq 25\ °C$; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Note

1. For mounting conditions, see *"Thermal considerations and footprint design for SOT490 in the SC18 Data Handbook"*.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air; note 1	500	K/W

Note

1. For mounting conditions, see *"Thermal considerations and footprint design for SOT490 in the SC18 Data Handbook"*.

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = -50\ V$; $I_E = 0$	–	–	–100	nA
I_{CEO}	collector-emitter cut-off current	$V_{CE} = -30\ V$; $I_B = 0$	–	–	–1	μA
		$V_{CE} = -30\ V$; $I_B = 0$; $T_j = 150\ °C$	–	–	–50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5\ V$; $I_C = 0$	–	–	–150	μA
h_{FE}	DC current gain	$V_{CE} = -5\ V$; $I_C = -5\ mA$	100	–	–	
V_{CEsat}	saturation voltage	$I_C = -5\ mA$; $I_B = -0.25\ mA$	–	–	–100	mV
$V_{i(off)}$	input off voltage	$V_{CE} = -5\ V$; $I_C = -100\ μA$	–	–	–0.5	V
$V_{i(on)}$	input on voltage	$V_{CE} = -0.3\ V$; $I_C = -1\ mA$	–1.4	–	–	V
R_1	input resistor		7	10	13	kΩ
$\dfrac{R2}{R1}$	resistor ratio		3.7	4.7	5.7	
C_c	collector capacitance	$V_{CB} = -10\ V$; $I_E = i_e = 0$; $f = 1\ MHz$	–	–	3	pF

PNP resistor-equipped transistor
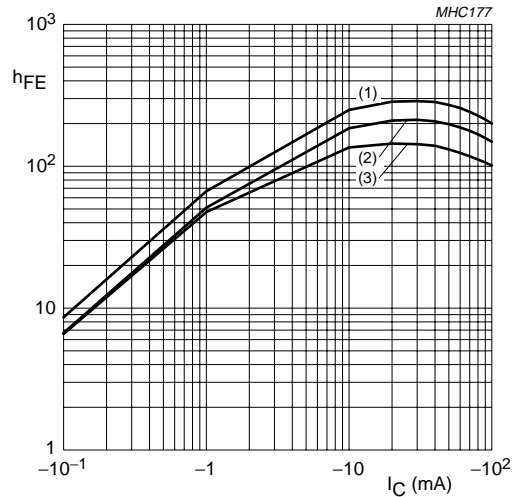R1 = 10 kΩ; R2 = 47 kΩ

PDTA114YEF

V_{CE} = −5 V.
(1) T_{amb} = 100 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −40 °C.

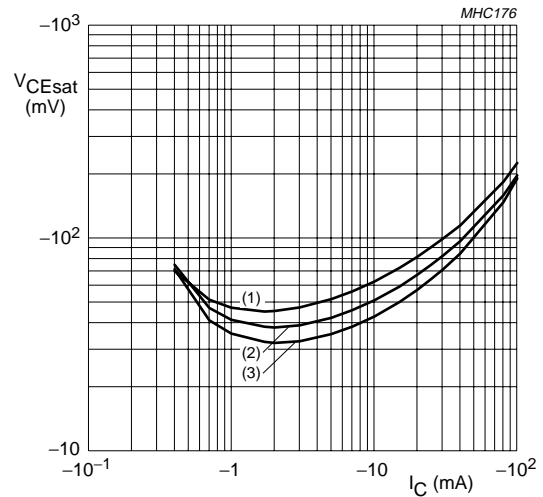Fig.3   DC current gain as a function of collector
current; typical values.

I_C/I_B = 20.
(1) T_{amb} = 100 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −40 °C.

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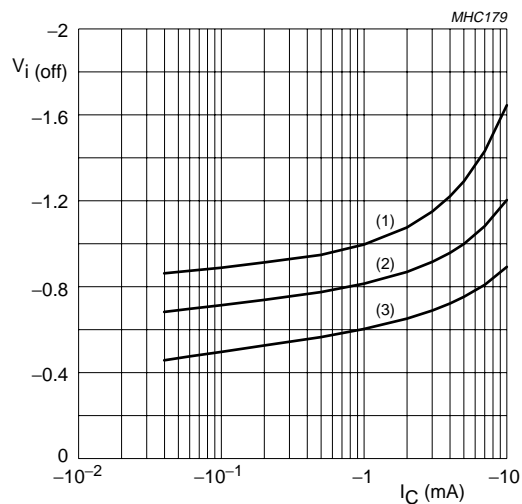function of collector current; typical values.

V_{CE} = −5 V.
(1) T_{amb} = −40 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 100 °C.

Fig.5   Input-off voltage as a function of collector
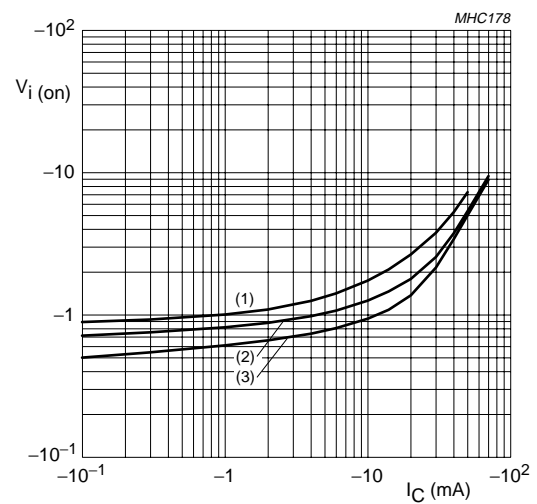current; typical values.

V_{CE} = −0.3 V.
(1) T_{amb} = −40 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 100 °C.

Fig.6   Input-on voltage as a function of collector
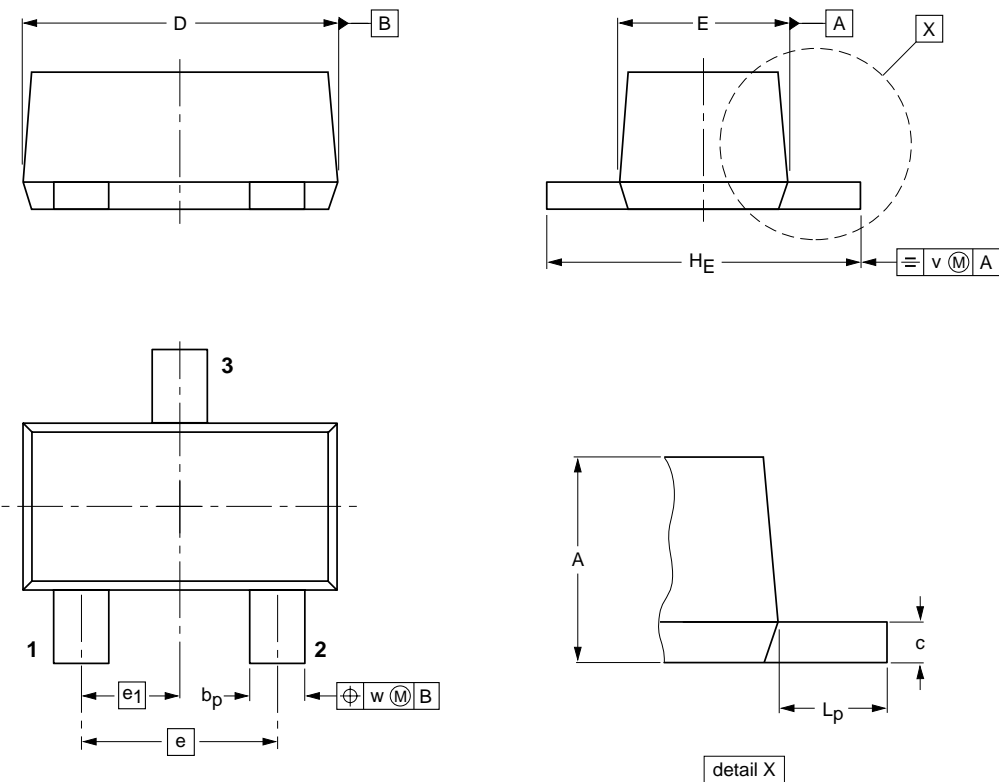current; typical values.

PNP resistor-equipped transistor

R1 = 10 kΩ; R2 = 47 kΩ

PDTA114YEF

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT490

scale

DIMENSIONS (mm are the original dimensions)

UNIT	A	b$_p$	c	D	E	e	e$_1$	H$_E$	L$_p$	v	w
mm	0.8 0.6	0.33 0.23	0.2 0.1	1.7 1.5	0.95 0.75	1.0	0.5	1.7 1.5	0.5 0.3	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT490			SC-89			98-10-23

DATA SHEET STATUS

DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
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.
Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Changes will be communicated according to the Customer Product/Process Change Notification (CPCN) procedure SNW-SQ-650A.

Notes

1. Please consult the most recently issued data sheet before initiating or completing a design.

2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

Application information — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

DISCLAIMERS

Life support applications — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

Right to make changes — Philips Semiconductors reserves the right to make changes, without notice, in the products, including circuits, standard cells, and/or software, described or contained herein in order to improve design and/or performance. Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no licence or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

PNP resistor-equipped transistor
R1 = 10 kΩ; R2 = 47 kΩ

PDTA114YEF

NOTES

Philips Semiconductors – a worldwide company

Contact information

For additional information please visit **http://www.semiconductors.philips.com**.   Fax: **+31 40 27 24825**
For sales offices addresses send e-mail to: **sales.addresses@www.semiconductors.philips.com**.

Printed in The Netherlands   613514/01/pp8   Date of release: 2002 Mar 15   Document order number: 9397 750 09366

Let's make things better.

Philips
Semiconductors

PHILIPS