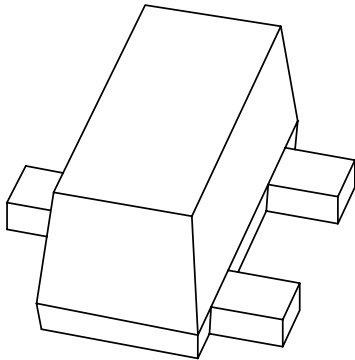


# DATA SHEET



**PPTC114EEF**

**NPN resistor-equipped transistor**

Product specification  
Supersedes data of 1998 Nov 11

1999 May 31

# NPN resistor-equipped transistor

# PDTC114EEF

### FEATURES

- Power dissipation comparable to SOT23
- Built-in bias resistors R1 and R2 (typ. 10 kΩ each)
- Simplification of circuit design
- Reduces number of components and board space.

### APPLICATIONS

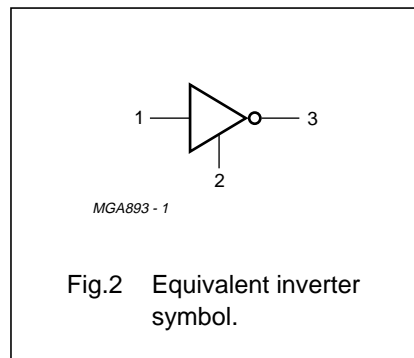
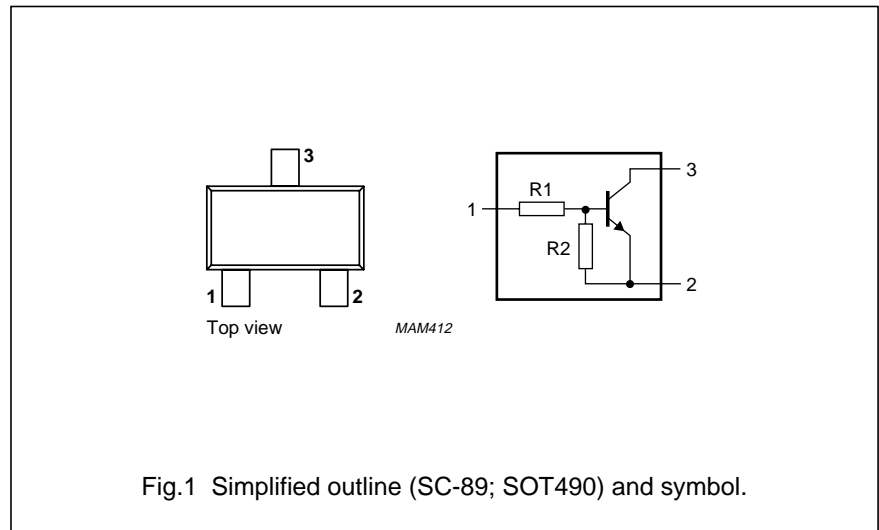
- Especially suitable for space reduction in interface and driver circuits
- Inverter circuit configurations without use of external resistors.

### DESCRIPTION

NPN resistor-equipped transistor encapsulated in an ultra small plastic SMD SC-89 (SOT490) package. PNP complement: PDATA114EEF.

### PINNING

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



### MARKING

TYPE NUMBER	MARKING CODE
PDTC114EEF	09

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{CE0}$	collector-emitter voltage	open base	–	–	50	V
$I_o$	output current (DC)		–	–	100	mA
$I_{CM}$	peak collector current		–	–	100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	–	–	250	mW
$h_{FE}$	DC current gain	$I_C = 5\text{ mA}; V_{CE} = 5\text{ V}$	30	–	–	
R1	input resistor		7	10	13	kΩ
$\frac{R2}{R1}$	resistor ratio		0.8	1	1.2	

## NPN resistor-equipped transistor

## PDTTC114EEF

**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

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		–	+40	V
	negative		–	–10	V
$I_O$	output current (DC)		–	100	mA
$I_{CM}$	peak collector current		–	100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$ ; note 1	–	250	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	250	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

**Note**

1. Refer to SC-89 (SOT490) standard mounting conditions.

**THERMAL CHARACTERISTICS**

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

**Note**

1. Refer to SC-89 (SOT490) standard mounting conditions.

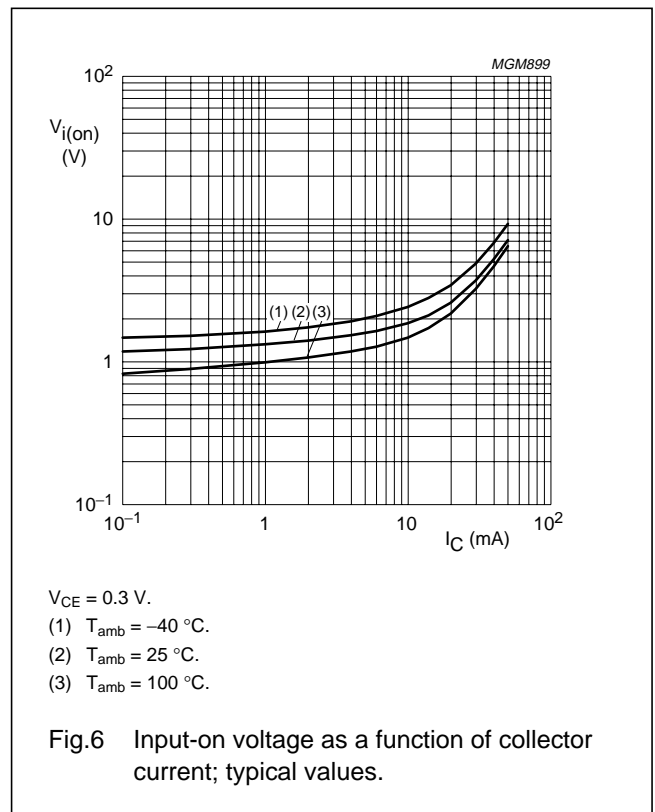
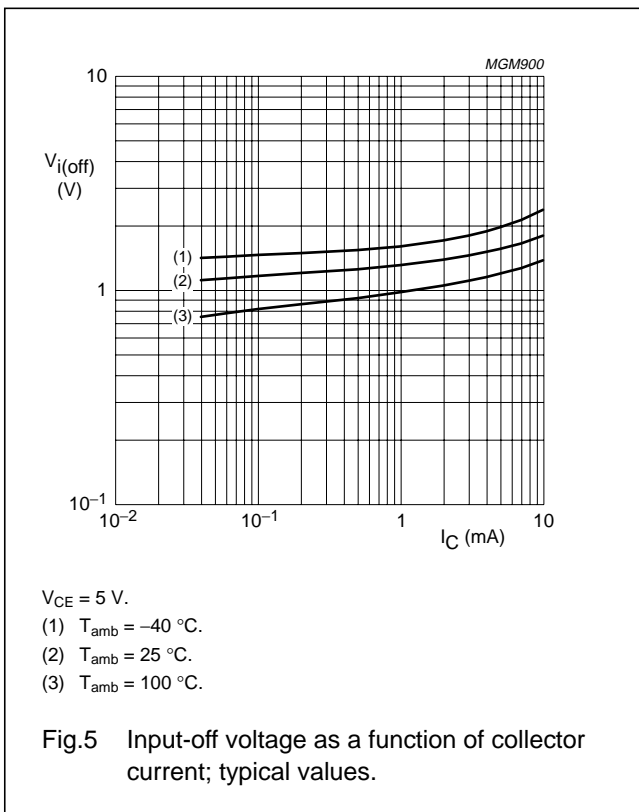
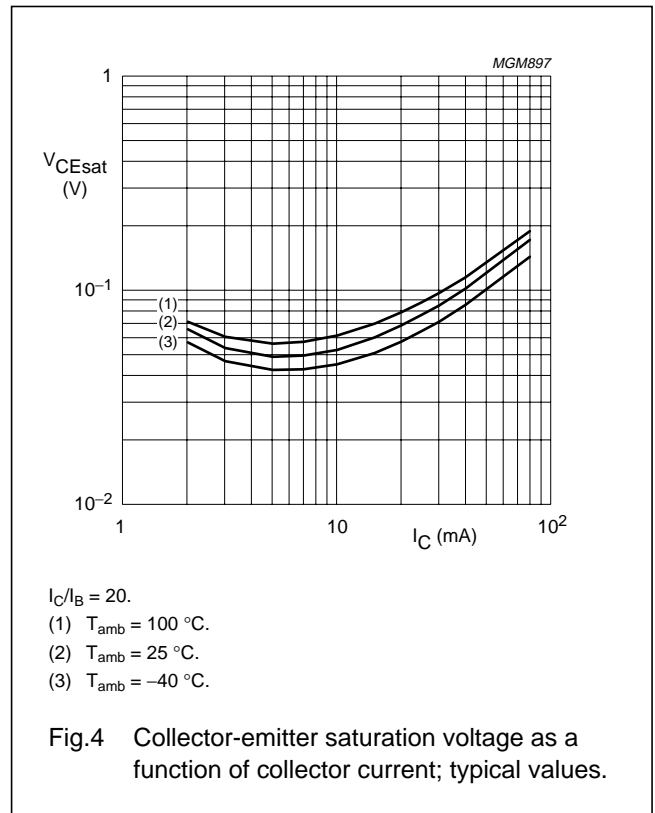
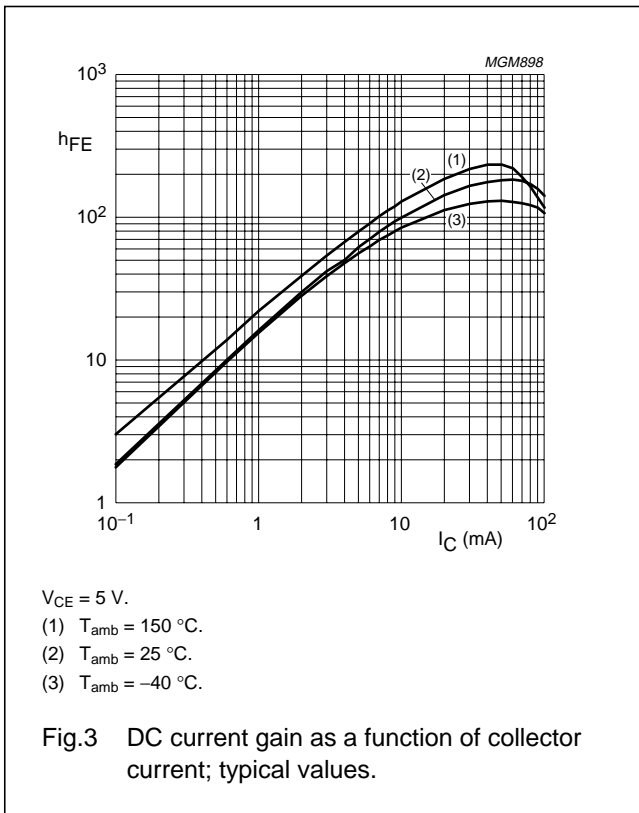
**CHARACTERISTICS**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$I_E = 0$ ; $V_{CB} = 50\text{ V}$	–	–	100	nA
$I_{CEO}$	collector cut-off current	$I_B = 0$ ; $V_{CE} = 30\text{ V}$	–	–	1	$\mu\text{A}$
		$I_B = 0$ ; $V_{CE} = 30\text{ V}$ ; $T_j = 150\text{ °C}$	–	–	50	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$I_C = 0$ ; $V_{EB} = 5\text{ V}$	–	–	400	$\mu\text{A}$
$h_{FE}$	DC current gain	$I_C = 5\text{ mA}$ ; $V_{CE} = 5\text{ V}$	30	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 10\text{ mA}$ ; $I_B = 0.5\text{ mA}$	–	–	150	mV
$V_{i(off)}$	input-off voltage	$I_C = 100\text{ }\mu\text{A}$ ; $V_{CE} = 5\text{ V}$	–	1.1	0.8	V
$V_{i(on)}$	input-on voltage	$I_C = 10\text{ mA}$ ; $V_{CE} = 0.3\text{ V}$	2.5	1.8	–	V
R1	input resistor		7	10	13	k $\Omega$
$\frac{R2}{R1}$	resistor ratio		0.8	1	1.2	
$C_c$	collector capacitance	$I_E = I_e = 0$ ; $V_{CB} = 10\text{ V}$ ; $f = 1\text{ MHz}$	–	–	2.5	pF

NPN resistor-equipped transistor

PDTC114EEF



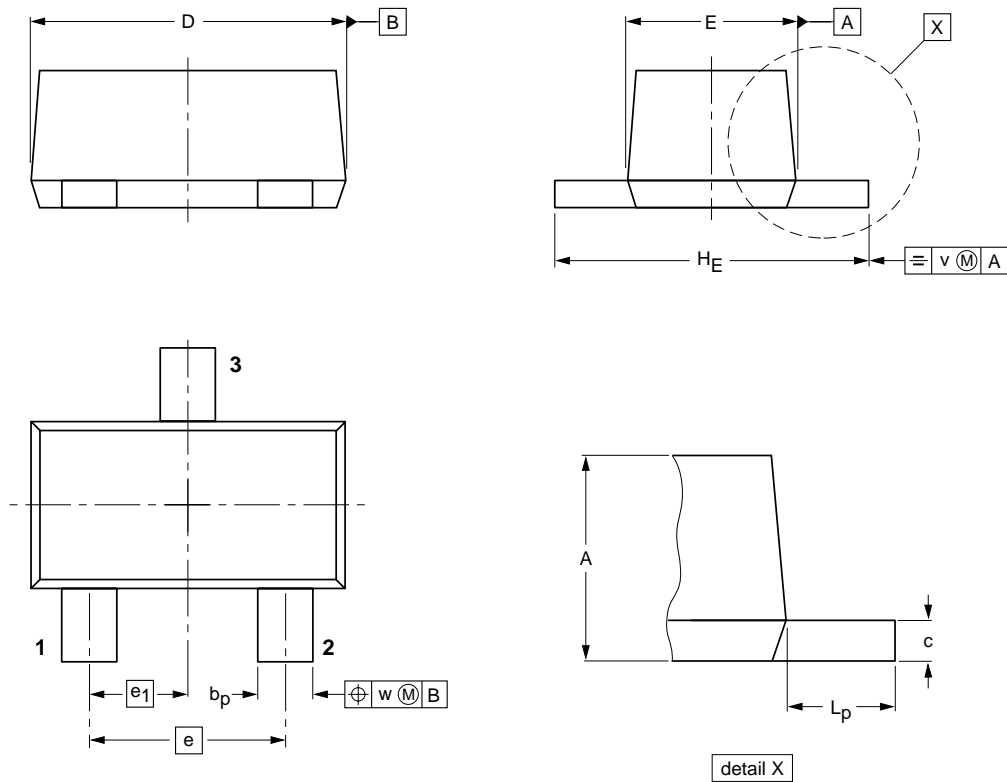
NPN resistor-equipped transistor

PDTC114EEF

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT490



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

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**NPN resistor-equipped transistor****PDTC114EEF**

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**DEFINITIONS**

<b>Data sheet status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
<b>Application information</b>	
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Printed in The Netherlands

115002/02/pp8

Date of release: 1999 May 31

Document order number: 9397 750 06035

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