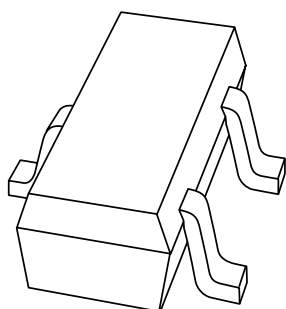


DATA SHEET



PDTTC114YE NPN resistor-equipped transistor

Product specification
Supersedes data of 1998 May 19

1999 May 18

NPN resistor-equipped transistor

PDTC114YE

FEATURES

- Built-in bias resistors R1 and R2 (typ. 10 kΩ and 47 kΩ respectively)
- 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

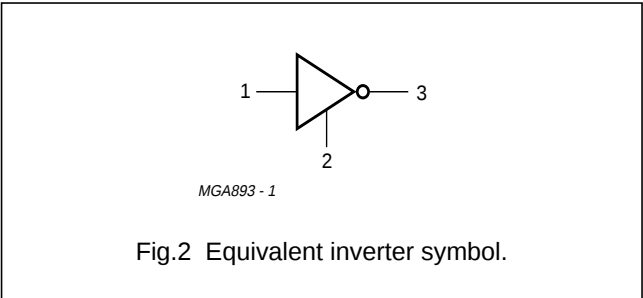
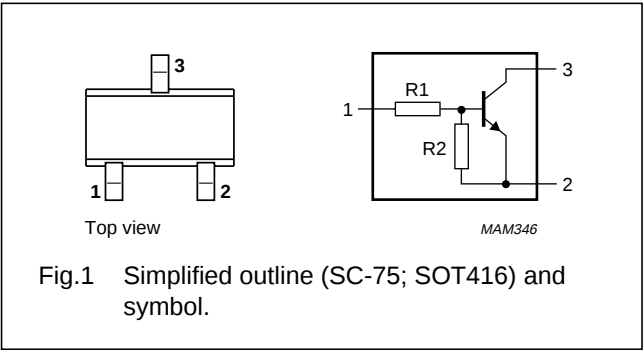
NPN resistor-equipped transistor in a SC-75 (SOT416) plastic package.

MARKING

TYPE NUMBER	MARKING CODE
PDTC114YE	33

PINNING

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



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		–	–6	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	–	150	mW
T _{stg}	storage temperature		–65	+150	°C
T _j	junction temperature		–	150	°C
T _{amb}	operating ambient temperature		–65	+150	°C

Note

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

NPN resistor-equipped transistor

PDTC114YE

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	833	K/W

Note

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

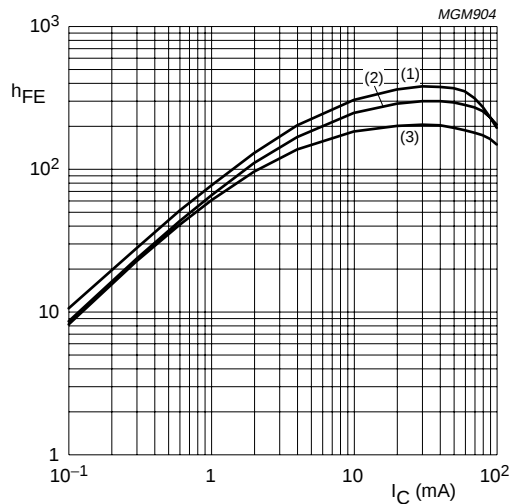
CHARACTERISTICS

$T_{amb} = 25\text{ °C}$ 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	μA
		$I_B = 0$; $V_{CE} = 30\text{ V}$; $T_j = 150\text{ °C}$	–	–	50	μA
I_{EBO}	emitter cut-off current	$I_C = 0$; $V_{EB} = 5\text{ V}$	–	–	150	μA
h_{FE}	DC current gain	$I_C = 5\text{ mA}$; $V_{CE} = 5\text{ V}$	100	–	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 5\text{ mA}$; $I_B = 0.25\text{ mA}$	–	–	100	mV
$V_{i(off)}$	input-off voltage	$I_C = 100\text{ }\mu\text{A}$; $V_{CE} = 5\text{ V}$	–	0.7	0.5	V
$V_{i(on)}$	input-on voltage	$I_C = 1\text{ mA}$; $V_{CE} = 0.3\text{ V}$	1.4	0.8	–	V
$R1$	input resistor		7	10	13	$k\Omega$
$\frac{R2}{R1}$	resistor ratio		3.7	4.7	5.7	
C_c	collector capacitance	$I_E = I_e = 0$; $V_{CB} = 10\text{ V}$; $f = 1\text{ MHz}$	–	–	2.5	pF

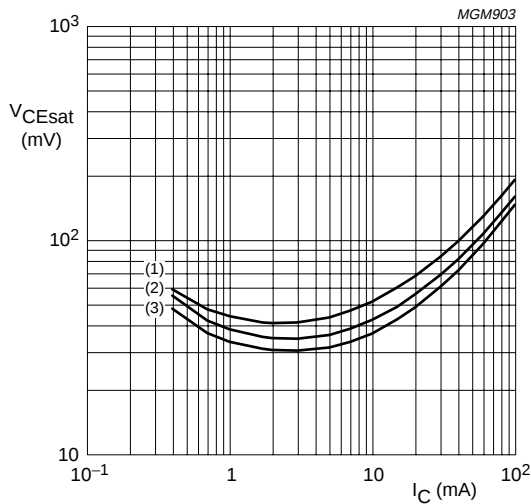
NPN resistor-equipped transistor

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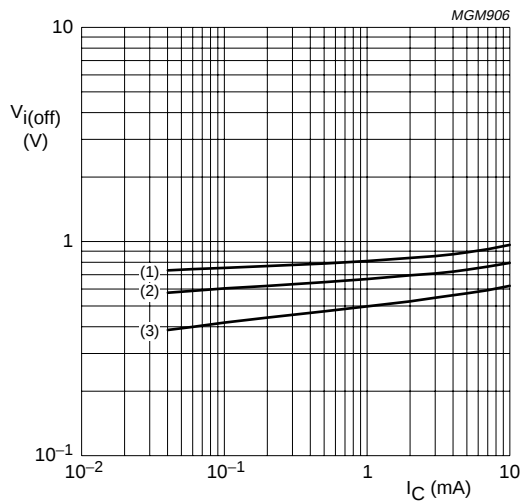
$V_{CE} = 5\text{ V.}$
(1) $T_{amb} = 150^\circ\text{C.}$
(2) $T_{amb} = 25^\circ\text{C.}$
(3) $T_{amb} = -40^\circ\text{C.}$

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



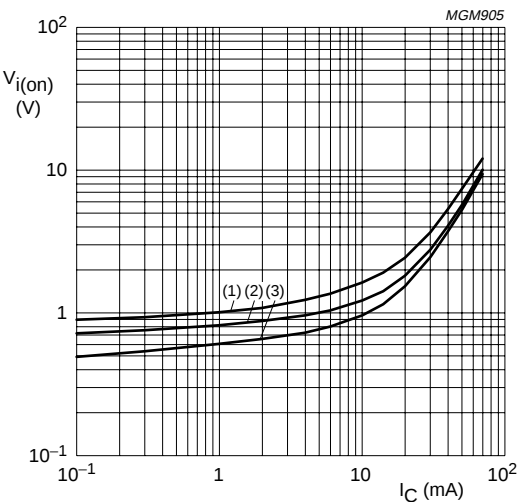
$I_C/I_B = 20.$
(1) $T_{amb} = 100^\circ\text{C.}$
(2) $T_{amb} = 25^\circ\text{C.}$
(3) $T_{amb} = -40^\circ\text{C.}$

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



$V_{CE} = 5\text{ V.}$
(1) $T_{amb} = -40^\circ\text{C.}$
(2) $T_{amb} = 25^\circ\text{C.}$
(3) $T_{amb} = 100^\circ\text{C.}$

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



$V_{CE} = 0.3\text{ V.}$
(1) $T_{amb} = -40^\circ\text{C.}$
(2) $T_{amb} = 25^\circ\text{C.}$
(3) $T_{amb} = 100^\circ\text{C.}$

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

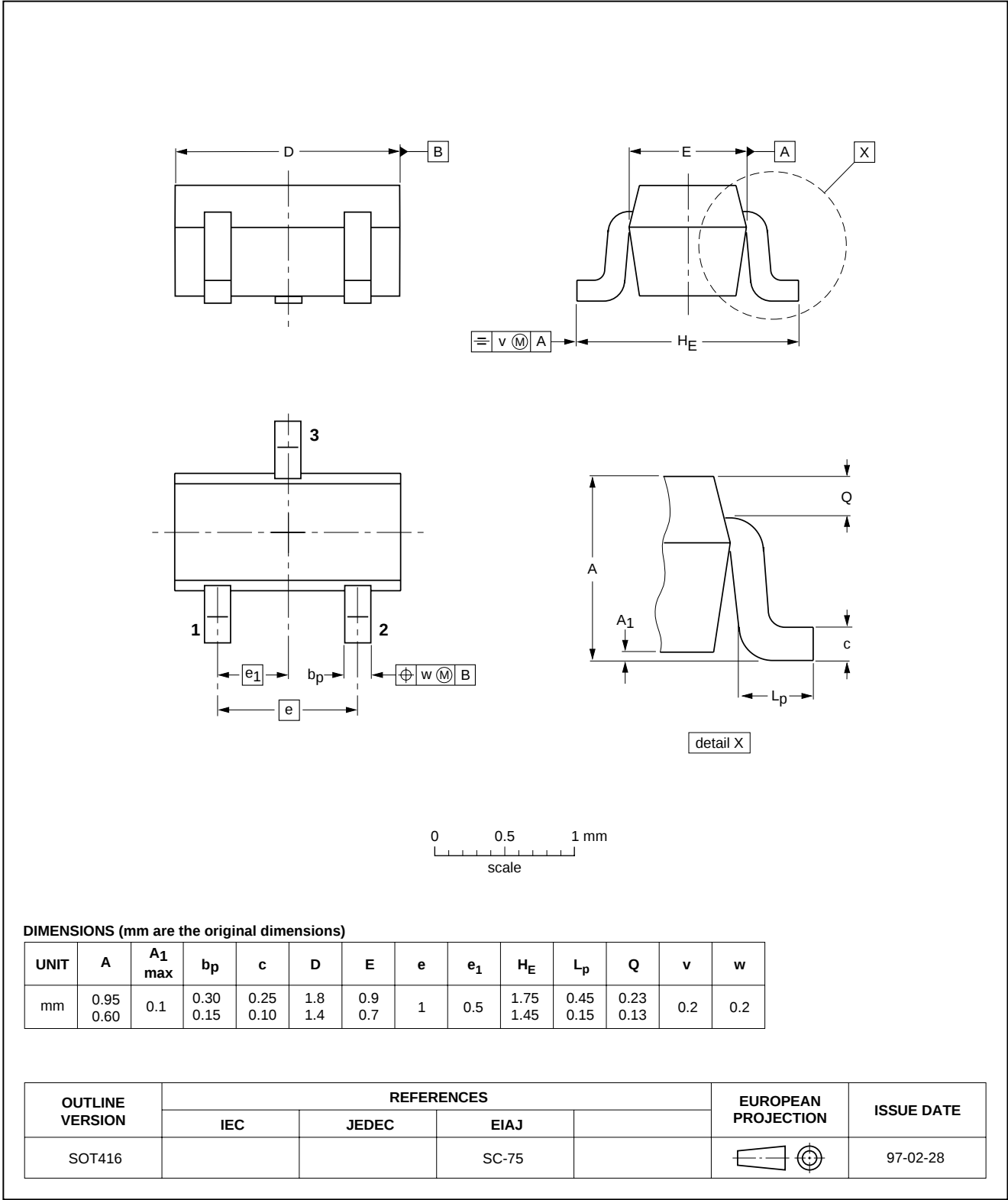
NPN resistor-equipped transistor

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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT416



NPN resistor-equipped transistor

PDTC114YE

DEFINITIONS

Data Sheet Status	
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.
Limiting values	
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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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NPN resistor-equipped transistor

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