

DATA SHEET

PDTA124X series

PNP resistor-equipped transistors;

R1 = 22 k Ω , R2 = 47 k Ω

Product specification
Supersedes data of 2004 Apr 07

2004 Aug 04

PNP resistor-equipped transistors; R1 = 22 k Ω , R2 = 47 k Ω

PDTA124X series

FEATURES

- Built-in bias resistors
- Simplified circuit design
- Reduction of component count
- Reduced pick and place costs.

APPLICATIONS

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

QUICK REFERENCE DATA

SYMBOL	PARAMETER	TYP.	MAX.	UNIT
V _{CEO}	collector-emitter voltage	–	–50	V
I _O	output current (DC)	–	–100	mA
R1	bias resistor	22	–	k Ω
R2	bias resistor	47	–	k Ω

DESCRIPTION

PNP resistor-equipped transistor (see “Simplified outline, symbol and pinning” for package details).

PRODUCT OVERVIEW

TYPE NUMBER	PACKAGE		MARKING CODE	NPN COMPLEMENT
	PHILIPS	EIAJ		
PDTA124XE	SOT416	SC-75	31	PDTC124XE
PDTA124XEF	SOT490	SC-89	31	PDTC124XEF
PDTA124XK	SOT346	SC-59	44	PDTC124XK
PDTA124XM	SOT883	SC-101	DK	PDTC124XM
PDTA124XS	SOT54 (TO-92)	SC-43	TA124X	PDTC124XS
PDTA124XT	SOT23	–	*47 ⁽¹⁾	PDTC124XT
PDTA124XU	SOT323	SC-70	*44 ⁽¹⁾	PDTC124XU

Note

- * = p: Made in Hong Kong.
* = t: Made in Malaysia.
* = W: Made in China.

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SIMPLIFIED OUTLINE, SYMBOL AND PINNING

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
PDTA124XS		1 2 3	base collector emitter
PDTA124XE PDTA124XEF PDTA124XK PDTA124XT PDTA124XU		1 2 3	base emitter collector
PDTA124XM		1 2 3	base emitter collector

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ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PDTA124XE	–	plastic surface mounted package; 3 leads	SOT416
PDTA124XEF	–	plastic surface mounted package; 3 leads	SOT490
PDTA124XK	–	plastic surface mounted package; 3 leads	SOT346
PDTA124XM	–	leadless ultra small plastic package; 3 solder lands; body 1.0 × 0.6 × 0.5 mm	SOT883
PDTA124XS	–	plastic single-ended leaded (through hole) package; 3 leads	SOT54
PDTA124XT	–	plastic surface mounted package; 3 leads	SOT23
PDTA124XU	–	plastic surface mounted package; 3 leads	SOT323

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{CB0}	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 negative		–	+10	V
			–	–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			
	SOT54	note 1	–	500	mW
	SOT23	note 1	–	250	mW
	SOT346	note 1	–	250	mW
	SOT323	note 1	–	200	mW
	SOT416	note 1	–	150	mW
	SOT490	notes 1 and 2	–	250	mW
SOT883	notes 2 and 3	–	250	mW	
T _{stg}	storage temperature		–65	+150	°C
T _j	junction temperature		–	150	°C
T _{amb}	operating ambient temperature		–65	+150	°C

Notes

1. Refer to standard mounting conditions.
2. Reflow soldering is the only recommended soldering method.
3. Refer to SOT883 standard mounting conditions; FR4 with 60 μ m copper strip line.

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th(j-a)}	thermal resistance from junction to ambient	in free air		
	SOT54	note 1	250	K/W
	SOT23	note 1	500	K/W
	SOT346	note 1	500	K/W
	SOT323	note 1	625	K/W
	SOT416	note 1	833	K/W
	SOT490	notes 1 and 2	500	K/W
SOT883	notes 2 and 3	500	K/W	

Notes

1. Refer to standard mounting conditions.
2. Reflow soldering is the only recommended soldering method.
3. Refer to SOT883 standard mounting conditions; FR4 with 60 μ m copper strip line.

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 A	-	-	-100	nA
I _{CEO}	collector-emitter cut-off current	V _{CE} = -30 V; I _B = 0 A	-	-	-1	μ A
		V _{CE} = -30 V; I _B = 0; T _j = 150 °C	-	-	-50	μ A
I _{EBO}	emitter-base cut-off current	V _{EB} = -5 V; I _C = 0 A	-	-	-120	μ A
h _{FE}	DC current gain	V _{CE} = -5 V; I _C = -5 mA	80	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = -10 mA; I _B = -0.5 mA	-	-	-150	mV
V _{i(off)}	input-off voltage	I _C = -100 μ A; V _{CE} = -5 V	-	-0.8	-0.5	V
V _{i(on)}	input-on voltage	I _C = -2 mA; V _{CE} = -0.3 V	-2	-1.1	-	V
R1	input resistor		15.4	22	28.6	k Ω
$\frac{R2}{R1}$	resistor ratio		1.7	2.1	2.6	
C _c	collector capacitance	I _E = i _e = 0 A; V _{CB} = -10 V; f = 1 MHz	-	-	3	pF

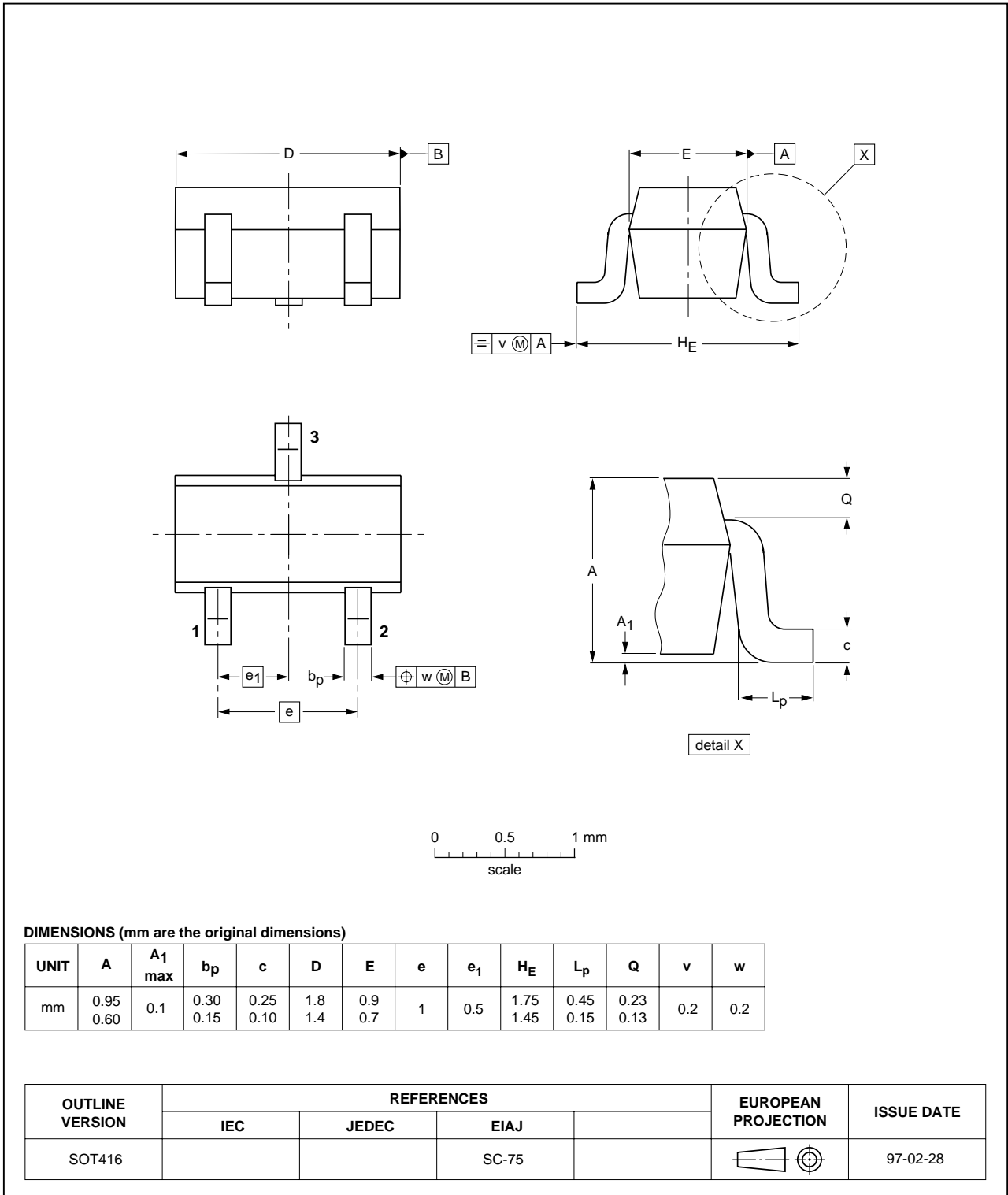
PNP resistor-equipped transistors;
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PDTA124X series

PACKAGE OUTLINES

Plastic surface mounted package; 3 leads

SOT416

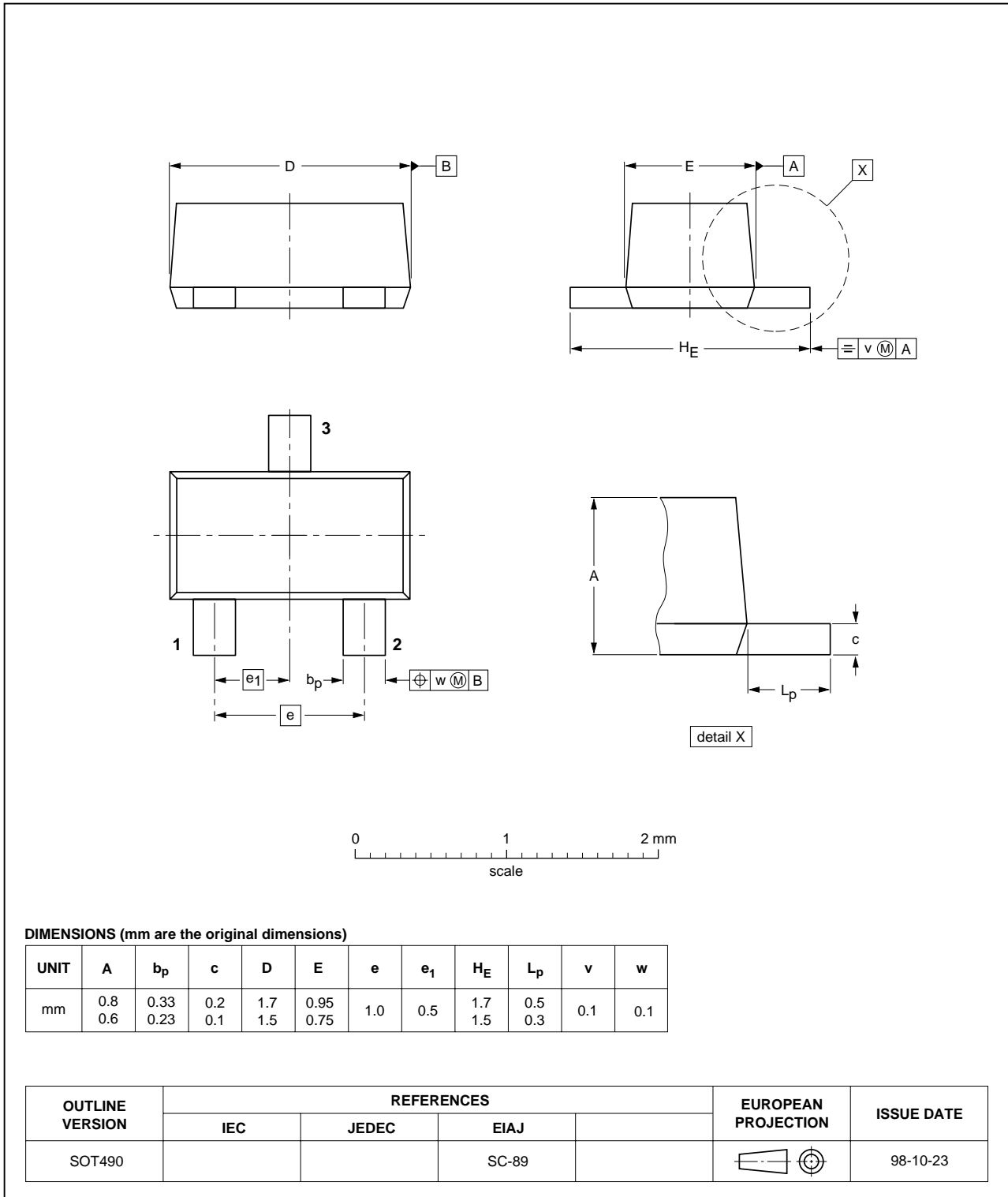


PNP resistor-equipped transistors;
R1 = 22 kΩ, R2 = 47 kΩ

PDTA124X series

Plastic surface mounted package; 3 leads

SOT490

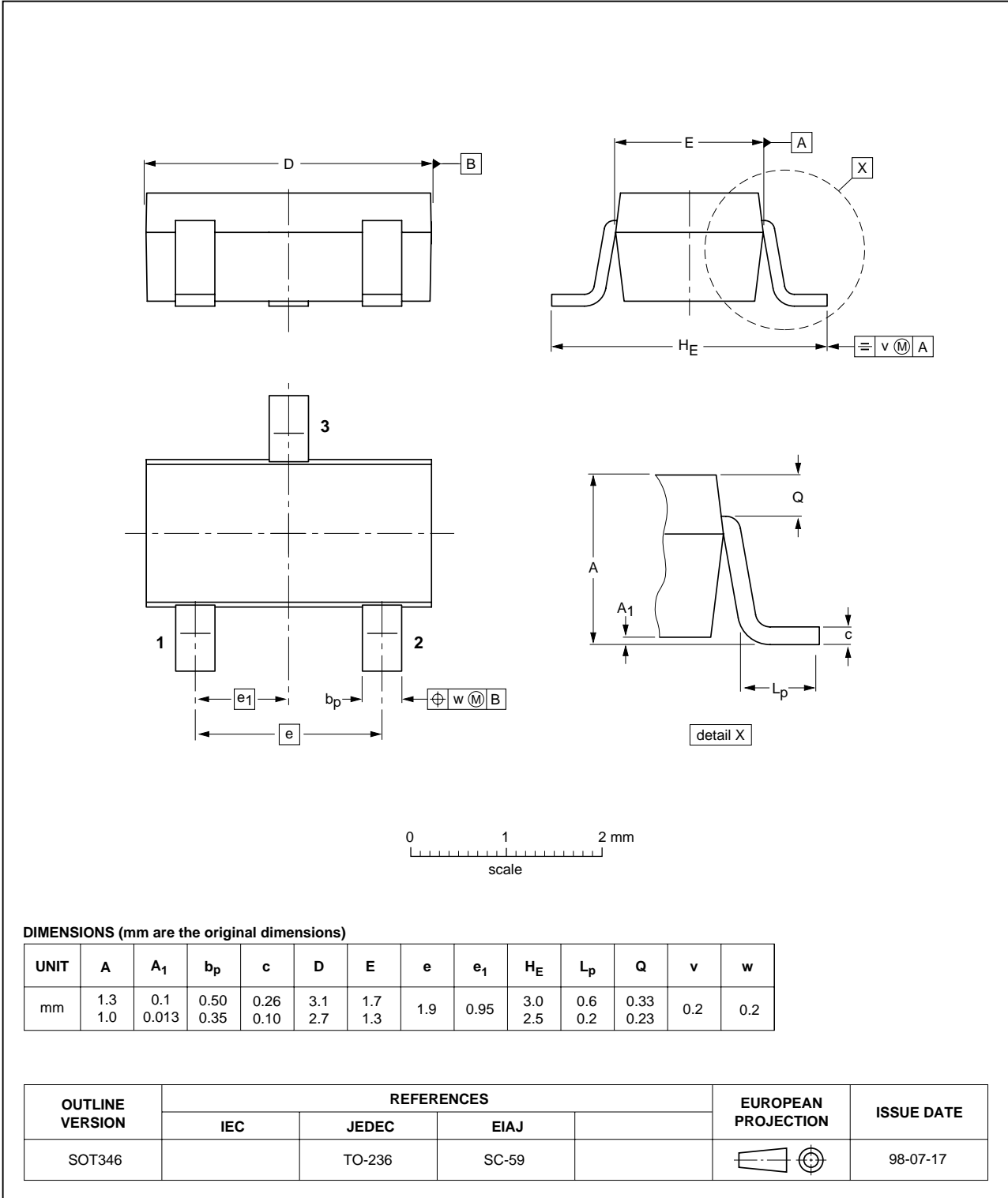


PNP resistor-equipped transistors;
R1 = 22 kΩ, R2 = 47 kΩ

PDTA124X series

Plastic surface mounted package; 3 leads

SOT346

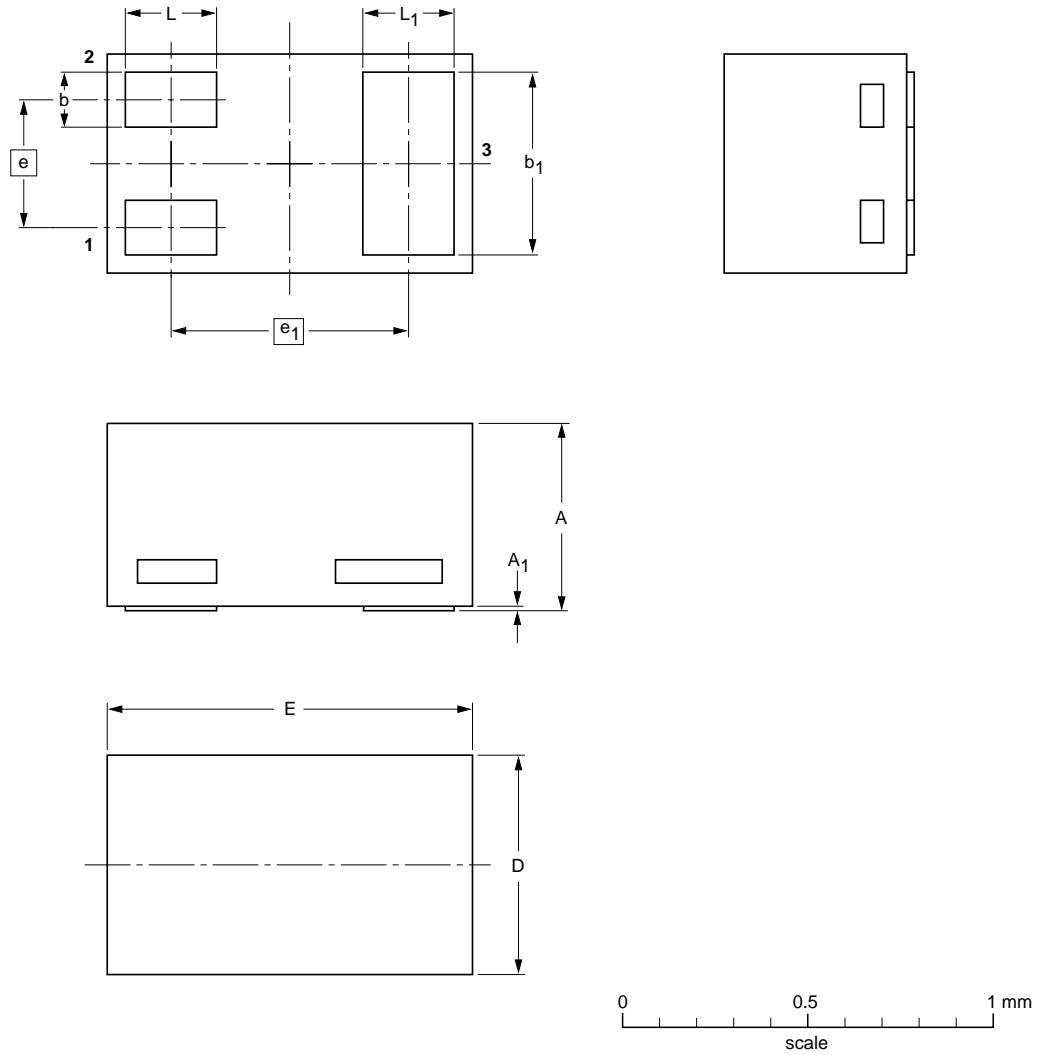


PNP resistor-equipped transistors;
R1 = 22 kΩ, R2 = 47 kΩ

PDTA124X series

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883



DIMENSIONS (mm are the original dimensions)

UNIT	A ⁽¹⁾	A ₁ max.	b	b ₁	D	E	e	e ₁	L	L ₁
mm	0.50 0.46	0.03	0.20 0.12	0.55 0.47	0.62 0.55	1.02 0.95	0.35	0.65	0.30 0.22	0.30 0.22

Note

1. Including plating thickness

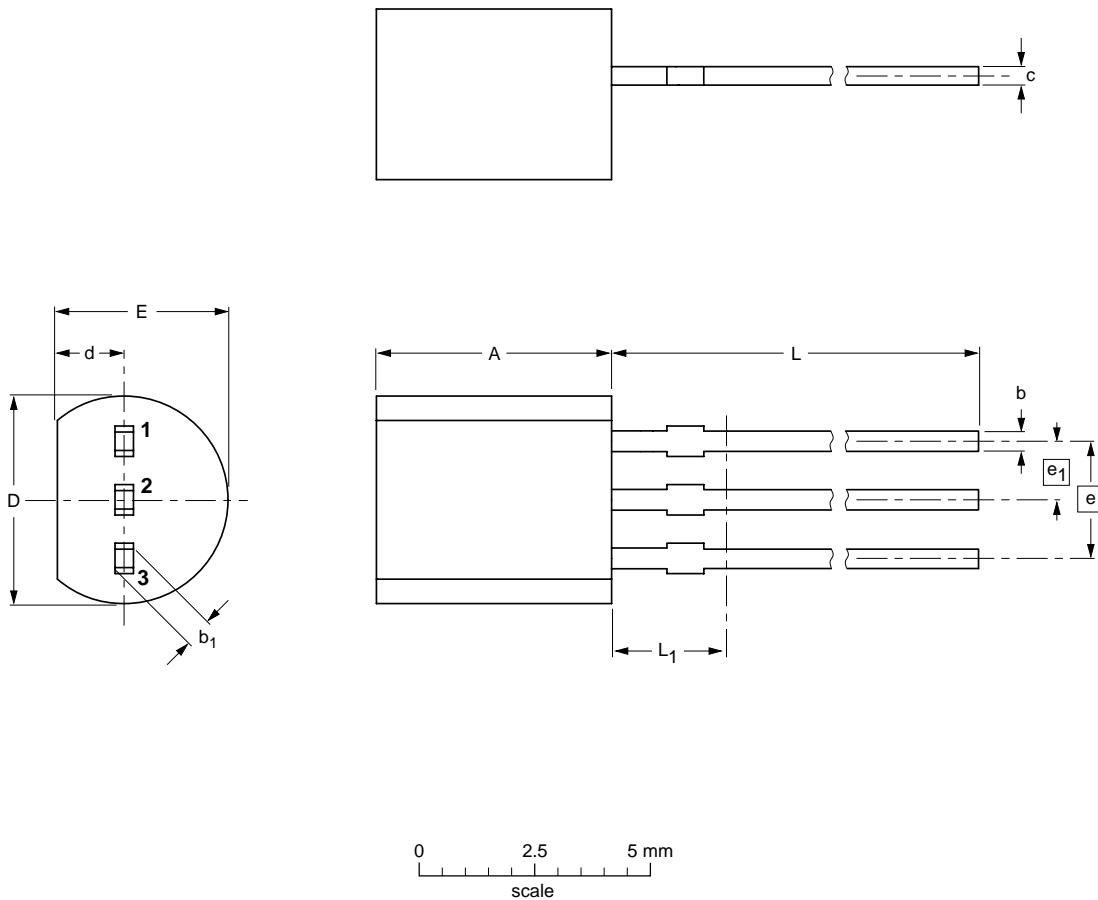
OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT883			SC-101		03-02-05 03-04-03

PNP resistor-equipped transistors;
R1 = 22 kΩ, R2 = 47 kΩ

PDTA124X series

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b ₁	c	D	d	E	e	e ₁	L	L ₁ ⁽¹⁾ max.
mm	5.2 5.0	0.48 0.40	0.66 0.55	0.45 0.38	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

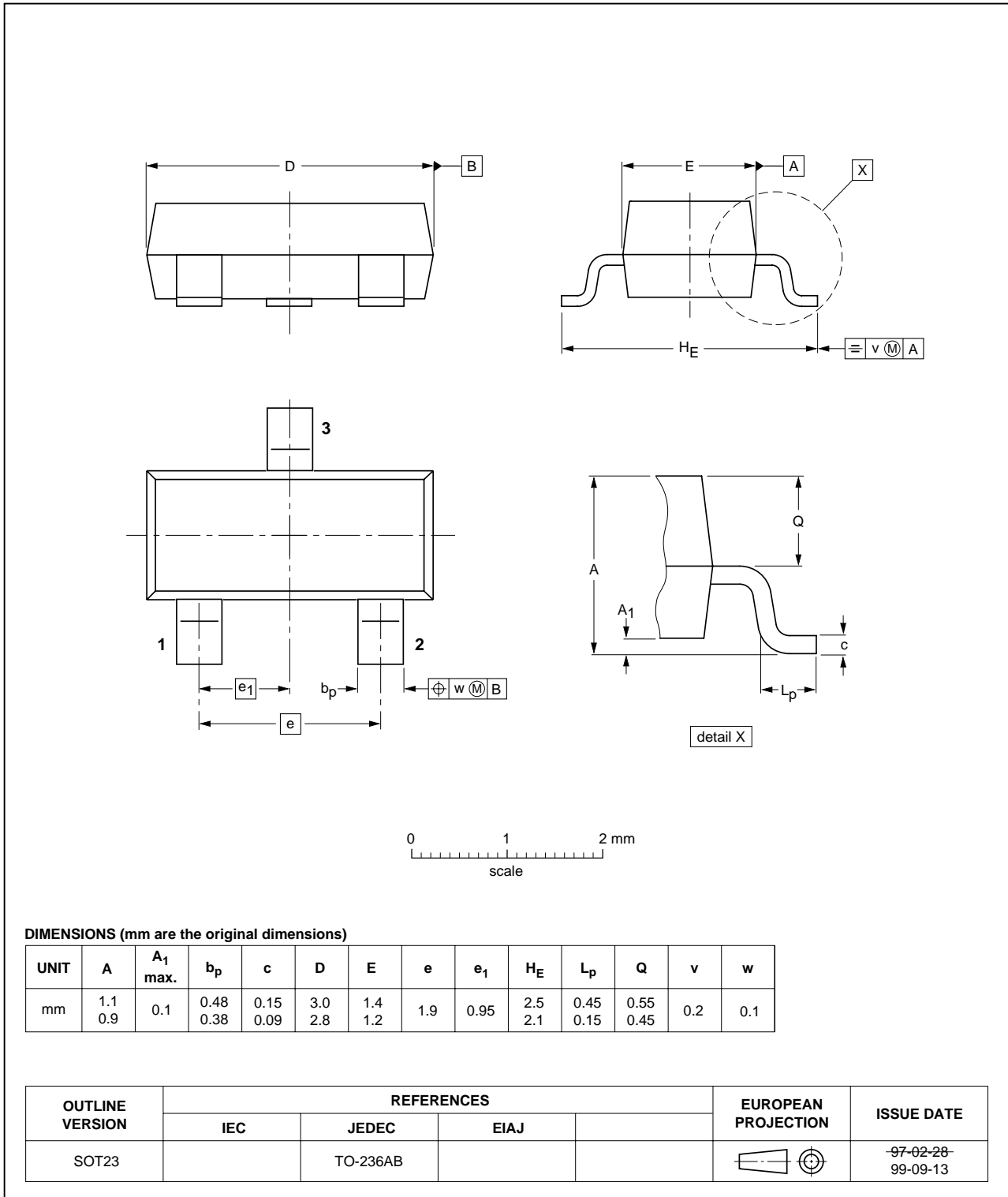
OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT54		TO-92	SC-43A		-97-02-28 04-06-28

PNP resistor-equipped transistors;
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Plastic surface mounted package; 3 leads

SOT23

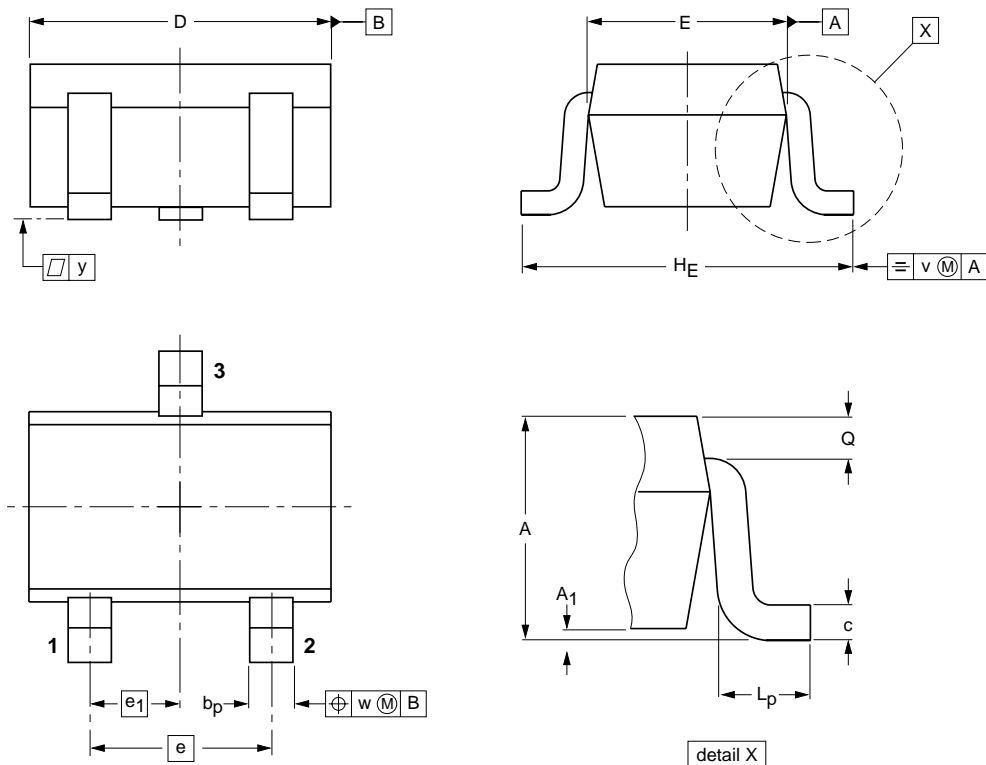


PNP resistor-equipped transistors;
R1 = 22 kΩ, R2 = 47 kΩ

PDTA124X series

Plastic surface mounted package; 3 leads

SOT323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT323			SC-70			97-02-28

PNP resistor-equipped transistors;
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DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	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.
II	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.
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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>.
3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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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.

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Printed in The Netherlands

R75/06/pp14

Date of release: 2004 Aug 04

Document order number: 9397 750 13654

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