

DATA SHEET

PEMD48; PUMD48

**NPN/PNP resistor-equipped
transistors;**

R1 = 47 k Ω , R2 = 47 k Ω

and R1 = 2.2 k Ω , R2 = 47 k Ω

Product specification
Supersedes data of 2004 Jun 02

2004 Jun 24

**NPN/PNP resistor-equipped transistors;
R1 = 47 kΩ, R2 = 47 kΩ and R1 = 2.2 kΩ, R2 = 47 kΩ**

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PUMD48**

FEATURES

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

APPLICATIONS

- Low current peripheral driver
- Replacement of general purpose transistors in digital applications
- Control of IC inputs.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	TYP.	MAX.	UNIT
V _{CEO}	collector-emitter voltage	–	50	V
I _{CM}	peak collector current	–	100	mA
Transistor TR1 (NPN)				
R1	bias resistor	47	–	kΩ
R2	bias resistor	47	–	kΩ
Transistor TR2 (PNP)				
R1	bias resistor	2.2	–	kΩ
R2	bias resistor	47	–	kΩ

DESCRIPTION

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

PRODUCT OVERVIEW

TYPE NUMBER	PACKAGE		MARKING CODE	PNP/PNP COMPLEMENT	NPN/PNP COMPLEMENT
	PHILIPS	EIAJ			
PEMD48	SOT666	–	48	–	–
PUMD48	SOT363	SC-88	4*8 ⁽¹⁾	–	–

Note

1. * = 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
PEMD48	<p>Top view MAM448</p>	1	emitter TR1
		2	base TR1
		3	collector TR2
		4	emitter TR2
		5	base TR2
		6	collector TR1
PUMD48	<p>Top view MAM343</p>	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
PEMD48	–	plastic surface mounted package; 6 leads	SOT666
PUMD48	–	plastic surface mounted package; 6 leads	SOT363

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LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per transistor; for the PNP transistor with negative polarity					
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 TR1		–	+40	V
			–	–10	V
	input voltage TR2		–	+5	V
			–	–12	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	–	200	mW
		notes 1 and 2	–	200	mW
T _{stg}	storage temperature		–65	+150	°C
T _j	junction temperature		–	150	°C
T _{amb}	operating ambient temperature		–65	+150	°C
Per device					
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C			
		note 1	–	300	mW
		notes 1 and 2	–	300	mW

Notes

1. Transistor mounted on an FR4 printed-circuit board, single-sided copper, standard footprint.
2. The only recommended soldering method is reflow soldering.

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
Per transistor				
R _{th(j-a)}	thermal resistance from junction to ambient	T _{amb} ≤ 25 °C		
	SOT363	note 1	625	K/W
	SOT666	notes 1 and 2	625	K/W
Per device				
R _{th(j-a)}	thermal resistance from junction to ambient	T _{amb} ≤ 25 °C		
	SOT363	note 1	416	K/W
	SOT666	notes 1 and 2	416	K/W

Notes

1. Transistor mounted on an FR4 printed-circuit board, single-sided copper, standard footprint.
2. The only recommended soldering method is reflow soldering.

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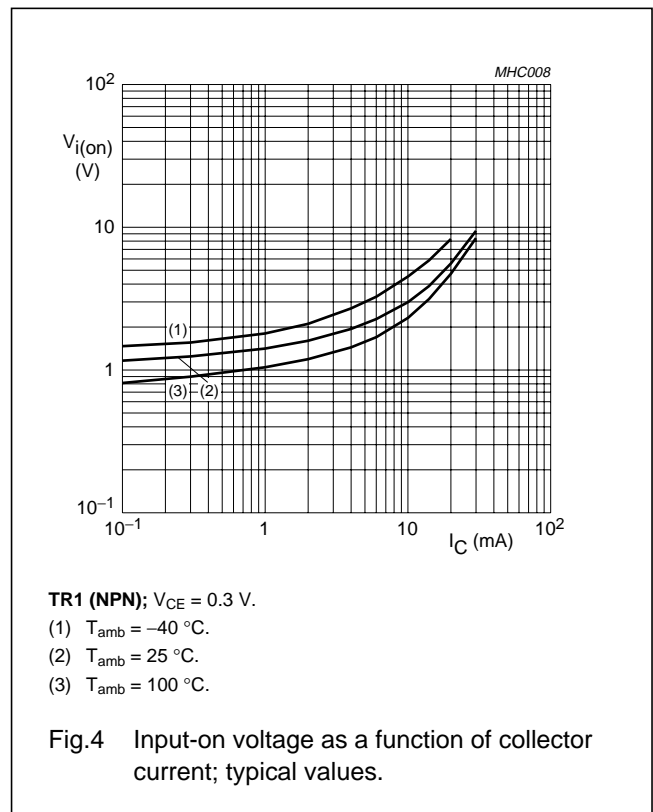
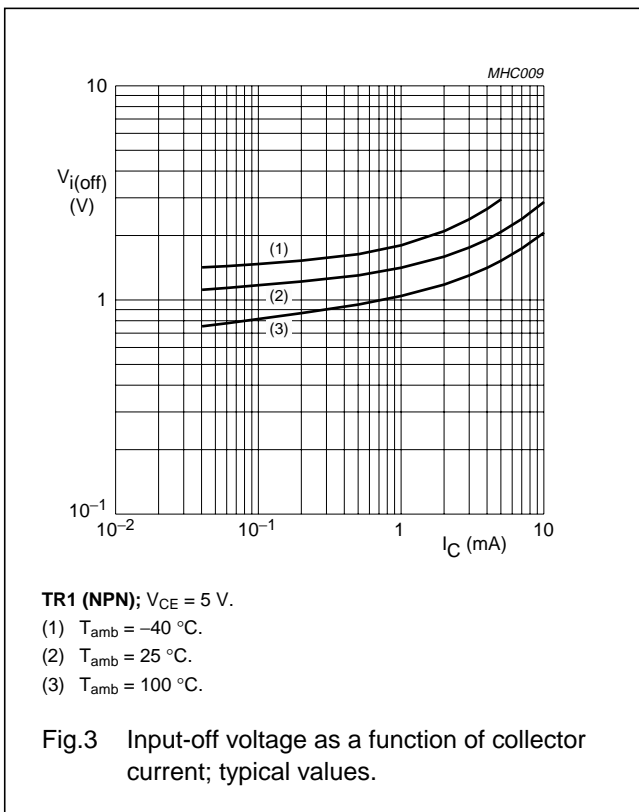
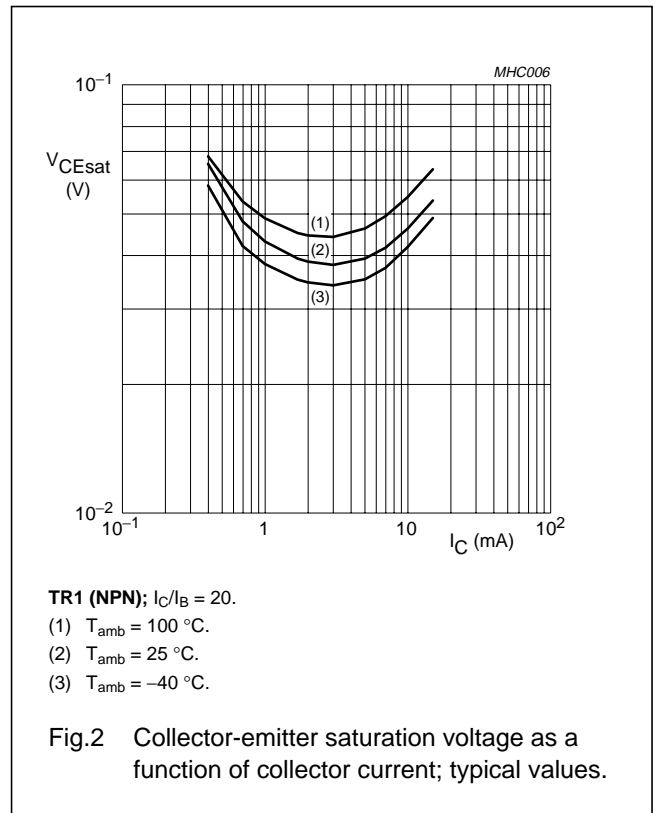
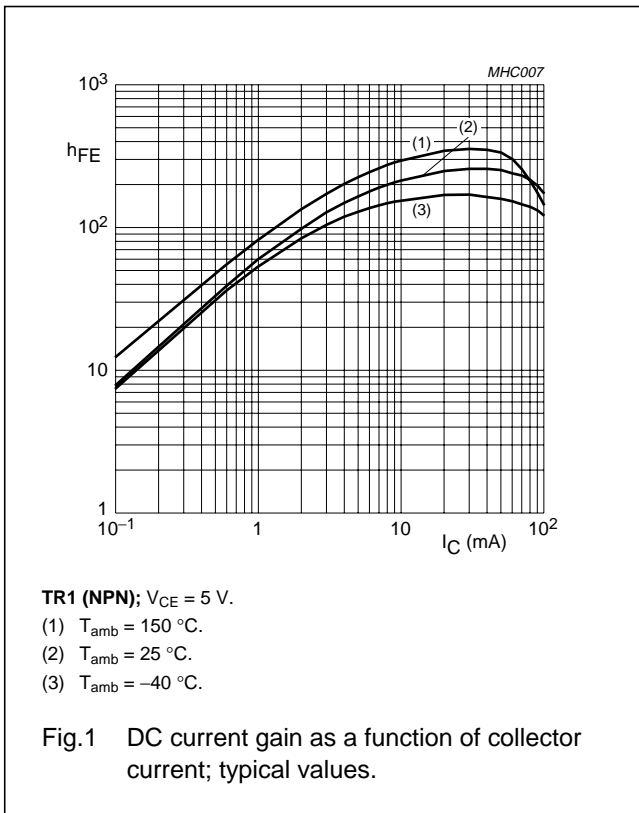
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per transistor; for the PNP transistor with negative polarity						
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 A; T _J = 150 °C	–	–	50	μ A
Transistor TR1 (NPN)						
I _{EBO}	emitter-base cut-off current	V _{EB} = 5 V; I _C = 0 A	–	–	90	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	–	1.2	0.8	V
V _{i(on)}	input-on voltage	I _C = 2 mA; V _{CE} = 0.3 V	3	1.6	–	V
R1	input resistor		33	47	61	k Ω
$\frac{R2}{R1}$	resistor ratio		0.8	1	1.2	
C _c	collector capacitance	I _E = I _e = 0 A; V _{CB} = 10 V; f = 1 MHz	–	–	2.5	pF
Transistor TR2 (PNP)						
I _{EBO}	emitter-base cut-off current	V _{EB} = –5 V; I _C = 0 A	–	–	–180	μ A
h _{FE}	DC current gain	V _{CE} = –5 V; I _C = –10 mA	100	–	–	
V _{CEsat}	collector-emitter saturation voltage	I _C = –5 mA; I _B = –0.25 mA	–	–	–100	mV
V _{i(off)}	input-off voltage	I _C = –100 μ A; V _{CE} = –5 V	–	–0.6	–0.5	V
V _{i(on)}	input-on voltage	I _C = –5 mA; V _{CE} = –0.3 V	–1.1	–0.75	–	V
R1	input resistor		1.54	2.2	2.86	k Ω
$\frac{R2}{R1}$	resistor ratio		17	21	26	
C _c	collector capacitance	I _E = I _e = 0 A; V _{CB} = –10 V; f = 1 MHz	–	–	3	pF

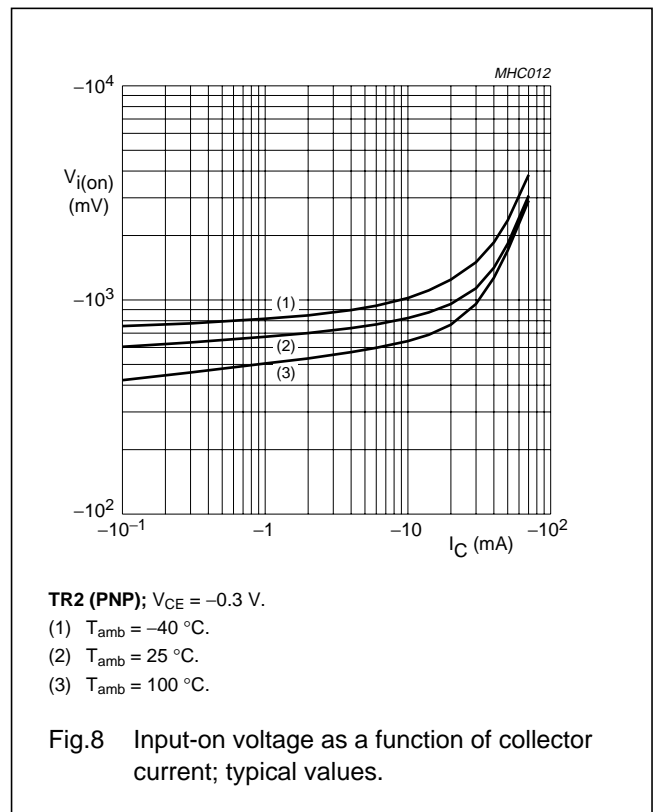
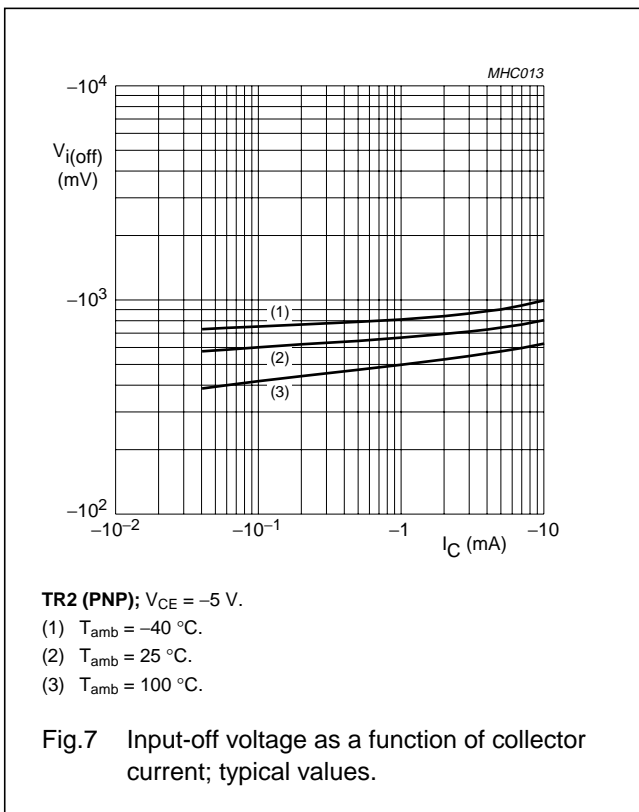
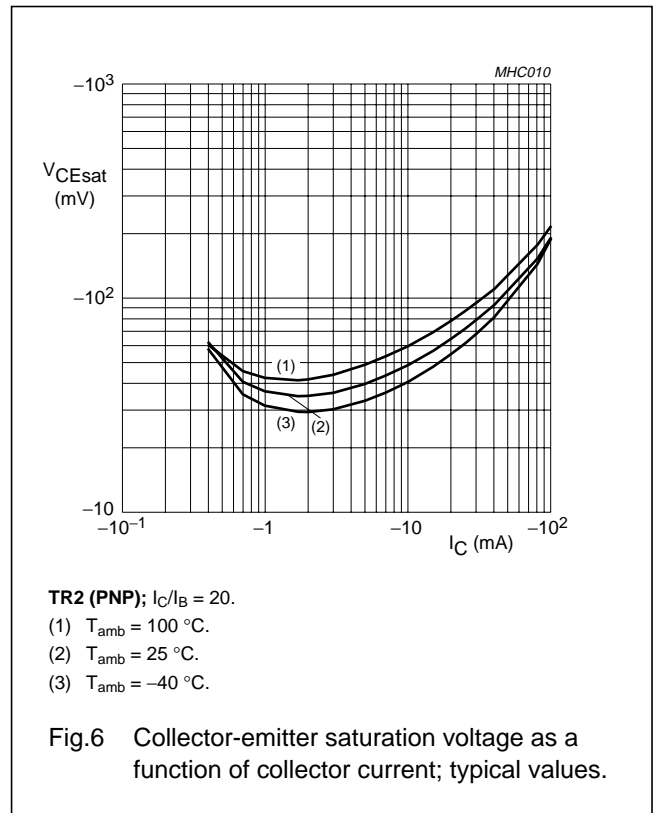
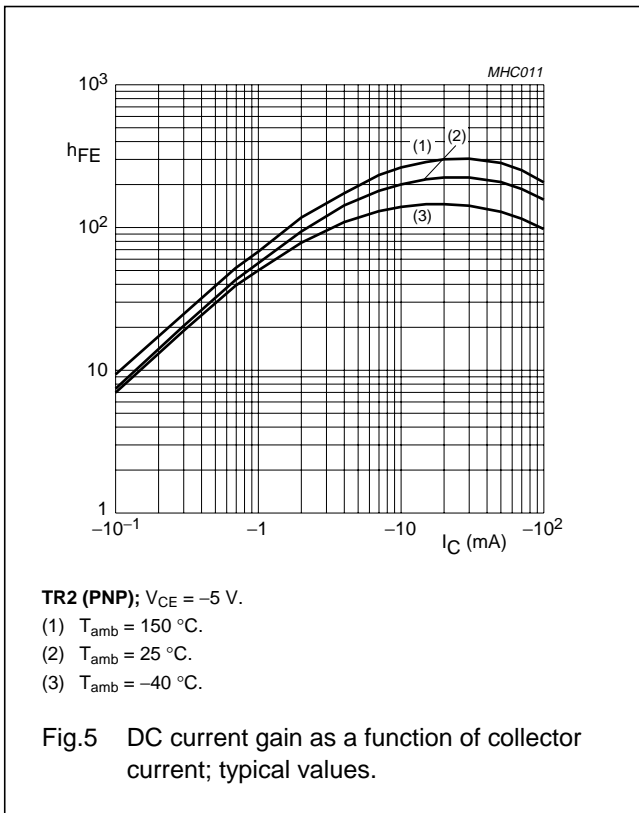
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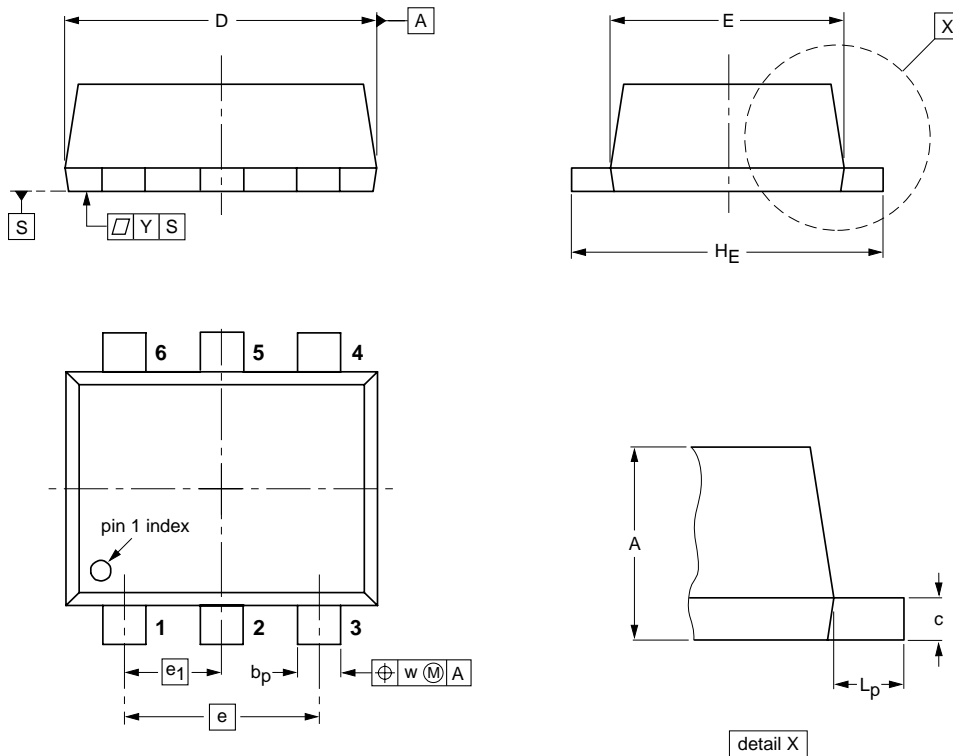
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PACKAGE OUTLINES

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

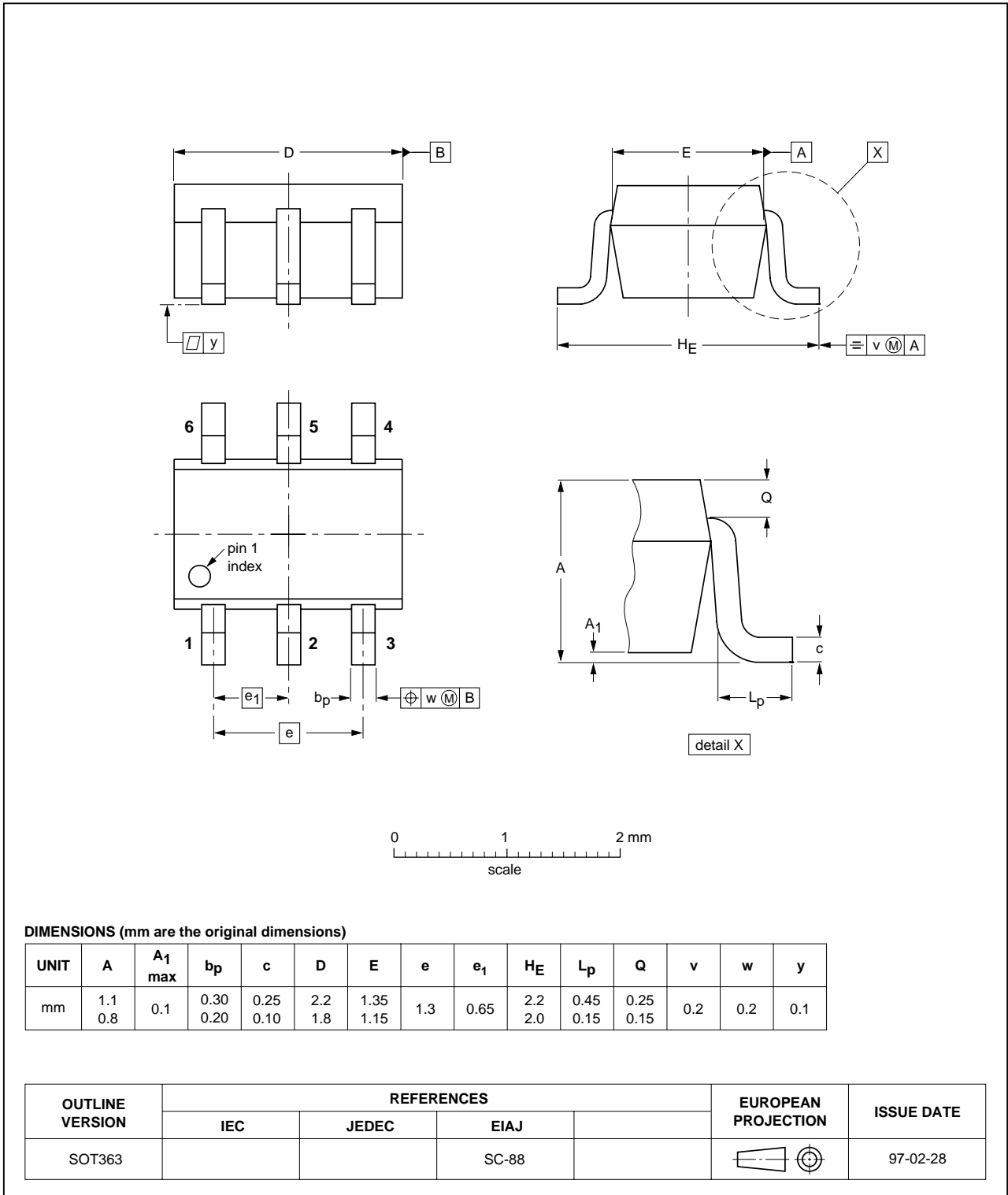
OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT666					01-01-04 01-08-27

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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.
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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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