Important notice

Dear Customer,

On 7 February 2017 the former NXP Standard Product business became a new company with the tradename **Nexperia**. Nexperia is an industry leading supplier of Discrete, Logic and PowerMOS semiconductors with its focus on the automotive, industrial, computing, consumer and wearable application markets

In data sheets and application notes which still contain NXP or Philips Semiconductors references, use the references to Nexperia, as shown below.

Instead of http://www.nxp.com, http://www.philips.com/ or http://www.semiconductors.philips.com/, use **http://www.nexperia.com**

Instead of sales.addresses@www.nxp.com or sales.addresses@www.semiconductors.philips.com, use **salesaddresses@nexperia.com** (email)

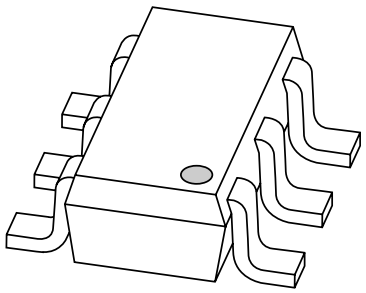
Replace the copyright notice at the bottom of each page or elsewhere in the document, depending on the version, as shown below:
- © NXP N.V. (year). All rights reserved or © Koninklijke Philips Electronics N.V. (year). All rights reserved
Should be replaced with:
- **© Nexperia B.V. (year). All rights reserved**.

If you have any questions related to the data sheet, please contact our nearest sales office via e-mail or telephone (details via **salesaddresses@nexperia.com**). Thank you for your cooperation and understanding,

Kind regards,

Team Nexperia

DATA SHEET



PBSS4240DPN

40 V low V_{CEsat} NPN/PNP transistor

Product data sheet

2003 Feb 20

founded by Philips

40 V low V_{CEsat} NPN/PNP transistor PBSS4240DPN

FEATURES

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability I_C and I_{CM}
- High collector current gain h_{FE} at high I_C
- High efficiency leading to reduced heat generation
- Reduced printed-circuit board area requirements.

APPLICATIONS

- Power management:
  - Complementary MOSFET driver
  - Dual supply line switching.
- Peripheral driver:
  - Half and full bridge motor drivers
  - Multi-phase stepper motor driver.

DESCRIPTION

NPN/PNP low V_{CEsat} transistor pair in a SOT457 (SC-74) plastic package.

MARKING

TYPE NUMBER	MARKING CODE
PBSS4240DPN	M3

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.		UNIT
		NPN	PNP	
V_{CEO}	emitter-collector voltage	40	−40	V
I_C	collector current (DC)	1.35	−1.1	A
I_{CRP}	repetitive peak collector current	2	−2	A
I_{CM}	peak collector current	3	−3	A
R_{CEsat}	equivalent on-resistance	200	260	mΩ

PINNING

PIN	DESCRIPTION	
1, 4	emitter	TR1; TR2
2, 5	base	TR1; TR2
6, 3	collector	TR1; TR2

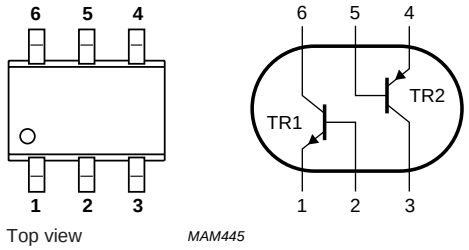


Fig.1 Simplified outline SOT457 (SC-74) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per transistor unless otherwise specified; for the PNP transistor with negative polarity					
V_{CBO}	collector-base voltage	open emitter	–	40	V
V_{CEO}	collector-emitter voltage	open base	–	40	V
V_{EBO}	emitter-base voltage	open collector	–	5	V
I_C	collector current (DC)		–		
	NPN		–	1.35	A
	PNP		–	−1.1	A
I_{CRP}	repetitive peak collector current	note 1	–	2	A
I_{CM}	peak collector current	single peak	–	3	A
I_B	base current (DC)		–	300	mA
I_{BM}	peak base current		–	1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 2	–	370	mW
		$T_{amb} \leq 25$ °C; note 3	–	310	mW
		$T_{amb} \leq 25$ °C; note 1	–	1.1	W
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	$T_{amb} \leq 25$ °C; note 2	–	600	mW

Notes

1. Operated under pulsed conditions: duty cycle $\delta \leq 20\%$; pulse width tp $\leq$ 10 ms; mounting pad for collector standard footprint.
2. Device mounted on a printed-circuit board; single-sided copper; tinplated; mounting pad for collector 1 cm^2.
3. Device mounted on a printed-circuit board; single-sided copper; tinplated; standard footprint.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
Per transistor				
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	in free air; note 1	340	K/W
		in free air; note 2	110	K/W

Notes

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm^2.
2. Operated under pulsed conditions: pulse width $t_p \leq 10$ ms; duty cycle $\delta \leq 0.20$; mounting pad for collector standard footprint.

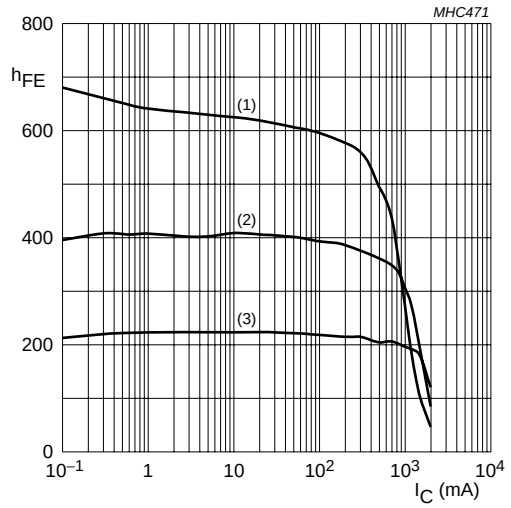
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per transistor unless otherwise specified; for the PNP transistor with negative polarity						
I_{CBO}	collector-base cut-off current	V_{CB} = 40 V; I_E = 0	–	–	100	nA
		V_{CB} = 40 V; I_E = 0; T_j = 150 °C	–	–	50	μA
I_{CEO}	collector-emitter cut-off current	V_{CE} = 30 V; I_B = 0	–	–	100	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0	–	–	100	nA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 1 mA	300	–	–	
f_T	transition frequency	I_C = 50 mA; V_{CE} = 10 V; f = 100 MHz	150	–	–	MHz
C_c	collector capacitance	V_{CB} = 10 V; I_E = I_e = 0; f = 1 MHz	–	–	12	pF
TR1 (NPN)						
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 500 mA	300	–	900	
		V_{CE} = 5 V; I_C = 1 A	200	–	–	
		V_{CE} = 5 V; I_C = 2 A; note 1	75	–	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = 100 mA; I_B = 1 mA	–	60	75	mV
		I_C = 500 mA; I_B = 50 mA	–	80	100	mV
		I_C = 1 A; I_B = 100 mA	–	150	200	mV
		I_C = 2 A; I_B = 200 mA; note 1	–	300	400	mV
V_{BEsat}	base-emitter saturation voltage	I_C = 1 A; I_B = 100 mA	–	–	1.2	V
V_{BEon}	base-emitter turn-on voltage	V_{CE} = 5 V; I_C = 1 A	–	–	1.1	V
R_{CEsat}	equivalent on-resistance	I_C = 1 A; I_B = 100 mA	–	–	200	mΩ
TR2 (PNP)						
h_{FE}	DC current gain	V_{CE} = –5 V; I_C = –100 mA	300	–	800	
		V_{CE} = –5 V; I_C = –500 mA	250	–	–	
		V_{CE} = –5 V; I_C = –1 A	160	–	–	
		V_{CE} = –5 V; I_C = –2 A; note 1	50	–	–	
V_{CEsat}	saturation voltage	I_C = –100 mA; I_B = –1 mA	–	–90	–120	mV
		I_C = –500 mA; I_B = –50 mA	–	–100	–145	mV
		I_C = –1 A; I_B = –100 mA	–	–180	–260	mV
		I_C = –2 A; I_B = –200 mA; note 1	–	–400	–530	mV
V_{BEsat}	saturation voltage	I_C = –1 A; I_B = –50 mA	–	–	–1.1	V
V_{BEon}	base-emitter turn-on voltage	V_{CE} = –5 V; I_C = –1 A	–	–	–1	V
R_{CEsat}	equivalent on-resistance	I_C = –1 A; I_B = –100 mA; note 1	–	–	260	mΩ

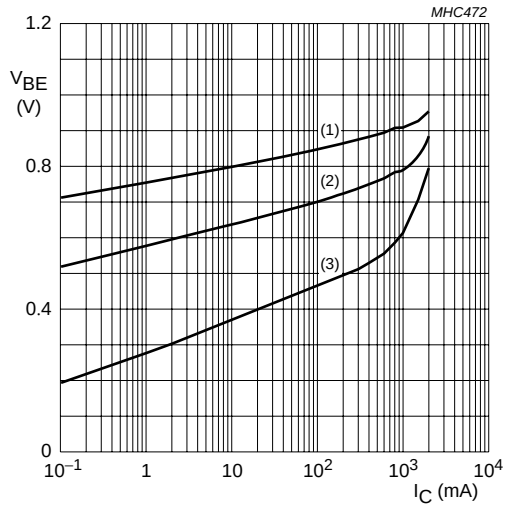
Note

1. Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.02$.



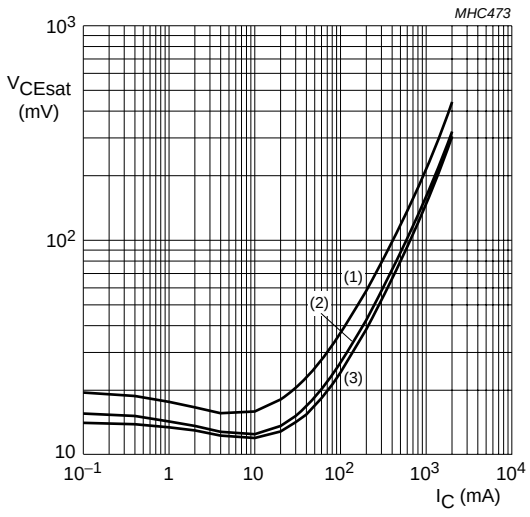
TR1 (NPN); V_{CE} = 5 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.2 DC current gain as a function of collector current; typical values.



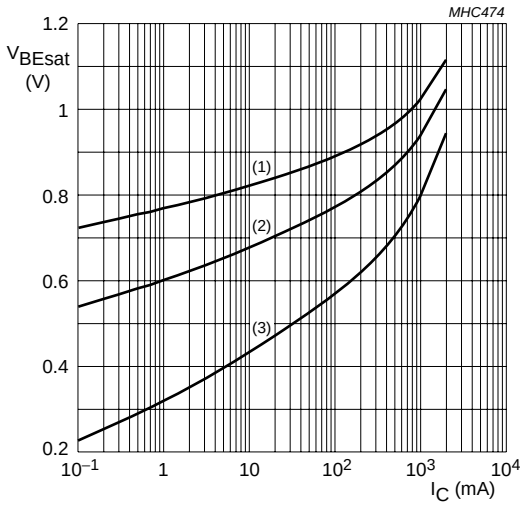
TR1 (NPN); V_{CE} = 5 V.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.3 Base-emitter voltage as a function of collector current; typical values.



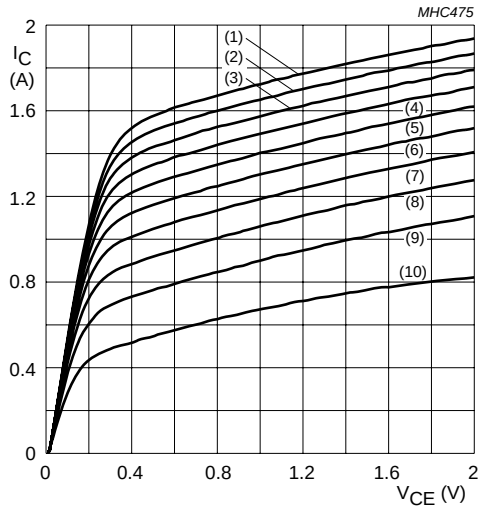
TR1 (NPN); I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

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



TR1 (NPN); I_C/I_B = 20.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

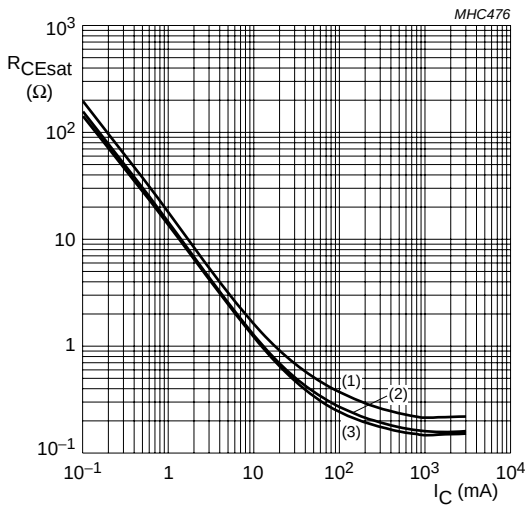
Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.



TR1 (NPN); T_{amb} = 25 °C.

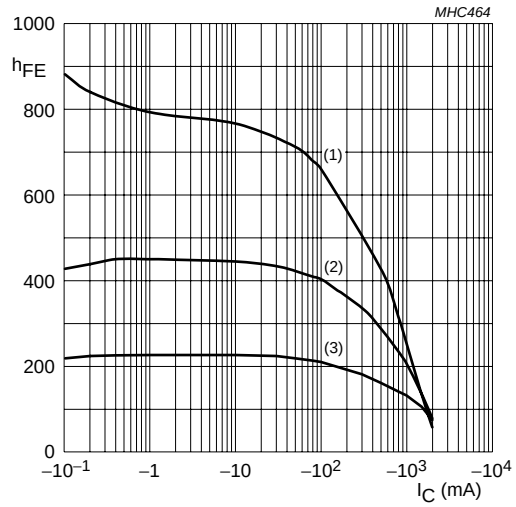
(1) I_B = 30 mA.
(2) I_B = 27 mA.
(3) I_B = 24 mA.
(4) I_B = 21 mA.
(5) I_B = 18 mA.
(6) I_B = 15 mA.
(7) I_B = 12 mA.
(8) I_B = 9 mA.
(9) I_B = 6 mA.
(10) I_B = 3 mA.

Fig.6 Collector current as a function of collector-emitter voltage; typical values.



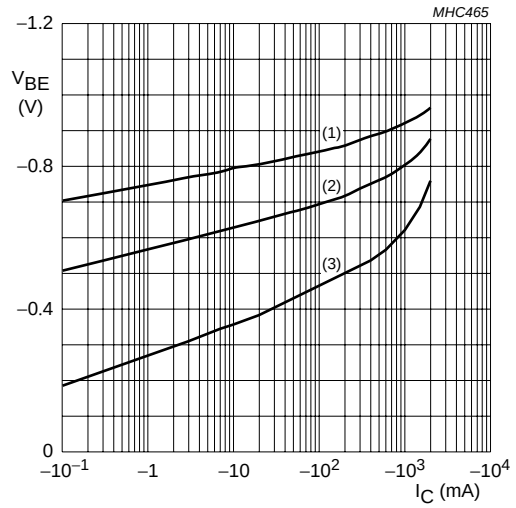
TR1 (NPN); I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.7 Collector-emitter equivalent on-resistance as a function of collector current; typical values.



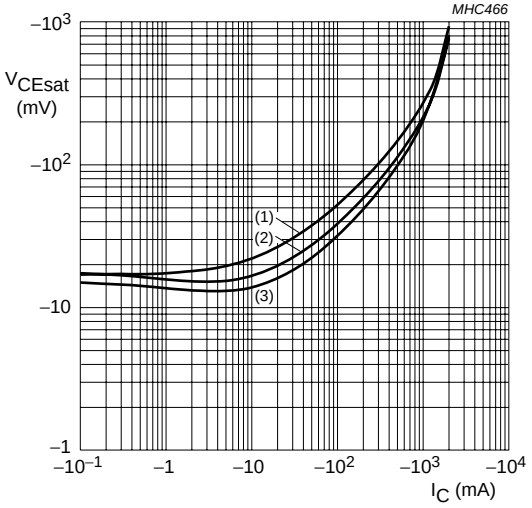
TR2 (PNP); V_{CE} = −5 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.8 DC current gain as a function of collector current; typical values.



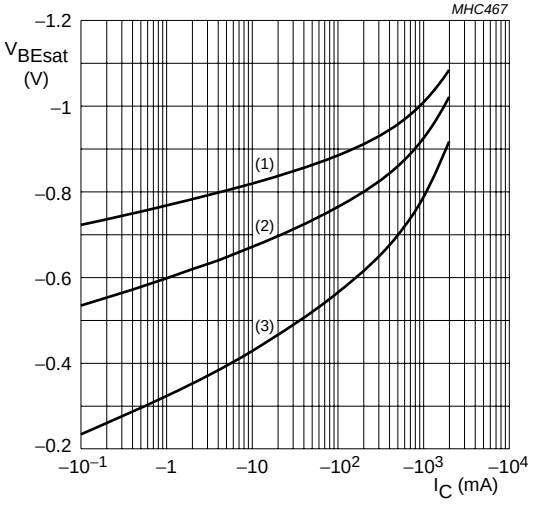
TR2 (PNP); V_{CE} = −5 V.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.9 Base-emitter voltage as a function of collector current; typical values.



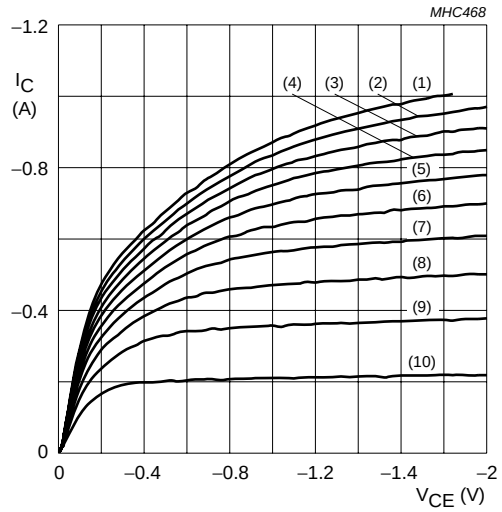
TR2 (PNP); I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.10 Collector-emitter saturation voltage as a function of collector current; typical values.



TR2 (PNP); I_C/I_B = 20.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

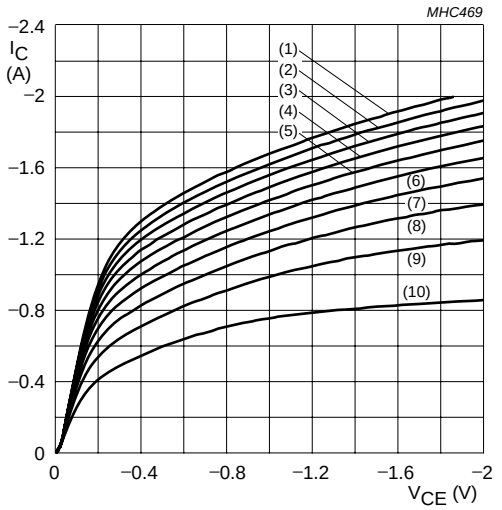
Fig.11 Base-emitter saturation voltage as a function of collector current; typical values.



TR2 (PNP); T_{amb} = 25 °C.

(1) I_B = −7 mA.
(2) I_B = −6.3 mA.
(3) I_B = −5.6 mA.
(4) I_B = −4.9 mA.
(5) I_B = −4.2 mA.
(6) I_B = −3.5 mA.
(7) I_B = −2.8 mA.
(8) I_B = −2.1 mA.
(9) I_B = −1.4 mA.
(10) I_B = −0.7 mA.

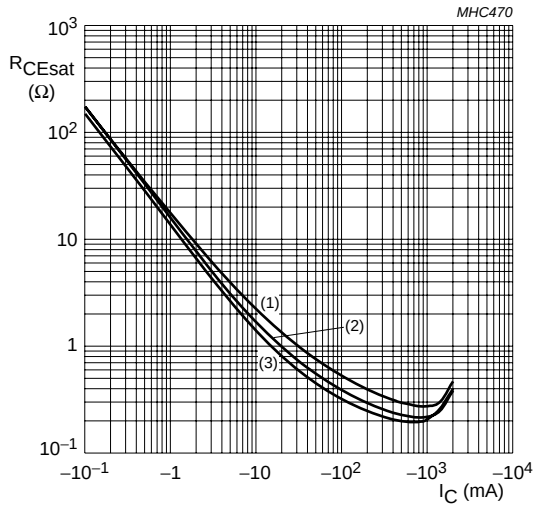
Fig.12 Collector current as a function of collector-emitter voltage; typical values.



TR2 (PNP); T_{amb} = 25 °C.

(1) I_B = −50 mA.
(2) I_B = −45 mA.
(3) I_B = −40 mA.
(4) I_B = −35 mA.
(5) I_B = −30 mA.
(6) I_B = −25 mA.
(7) I_B = −20 mA.
(8) I_B = −15 mA.
(9) I_B = −10 mA.
(10) I_B = −5 mA.

Fig.13 Collector current as a function of collector-emitter voltage; typical values.

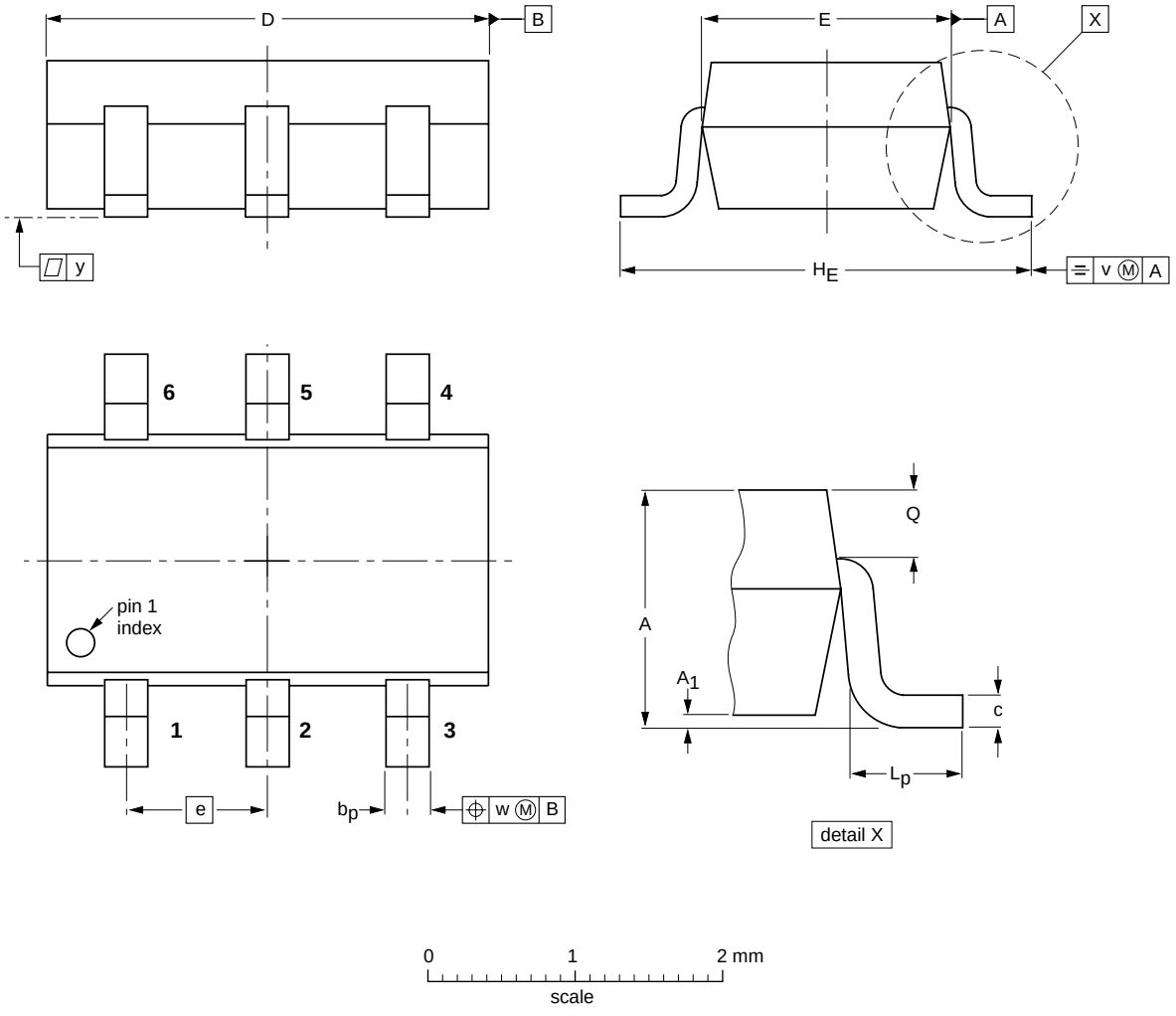


TR2 (PNP); I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.14 Collector-emitter equivalent on-resistance as a function of collector current; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; 6 leads **SOT457**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b_p	c	D	E	e	H_E	L_p	Q	v	w	y
mm	1.1 0.9	0.1 0.013	0.40 0.25	0.26 0.10	3.1 2.7	1.7 1.3	0.95	3.0 2.5	0.6 0.2	0.33 0.23	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT457			SC-74			~~97-02-28~~ 01-05-04

DATA SHEET STATUS

DOCUMENT STATUS[1]	PRODUCT STATUS[2]	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

Notes

1. Please consult the most recently issued document before initiating or completing a design.
2. The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

DISCLAIMERS

General — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

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

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

Terms and conditions of sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nxp.com/profile/terms, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by NXP Semiconductors. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from national authorities.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

NXP Semiconductors

Customer notification

This data sheet was changed to reflect the new company name NXP Semiconductors. No changes were made to the content, except for the legal definitions and disclaimers.

Contact information

For additional information please visit: **http://www.nxp.com**
For sales offices addresses send e-mail to: **salesaddresses@nxp.com**

Printed in The Netherlands 613514/01/pp12 Date of release: 2003 Feb 20 Document order number: 9397 750 10783

单击下面可查看定价，库存，交付和生命周期等信息

>>Nexperia(安世)