

# DATA SHEET



**PBSS5240T**

40 V, 2 A

PNP low  $V_{CEsat}$  (BISS) transistor

Product specification  
Supersedes data of 2001 Oct 31

2004 Jan 15

**40 V, 2 A**  
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**PBSS5240T**

**FEATURES**

- Low collector-emitter saturation voltage
- High current capability
- Improved device reliability due to reduced heat generation
- Replacement for SOT89/SOT223 standard packaged transistor.

**APPLICATIONS**

- Supply line switching circuits
- Battery management applications
- DC/DC converter applications
- Strobe flash units
- Heavy duty battery powered equipment (motor and lamp drivers).

**DESCRIPTION**

PNP low  $V_{CEsat}$  transistor in a SOT23 plastic package.  
 NPN complement: PBSS4240T.

**MARKING**

TYPE NUMBER	MARKING CODE <sup>(1)</sup>
PBSS5240T	ZF*

**Note**

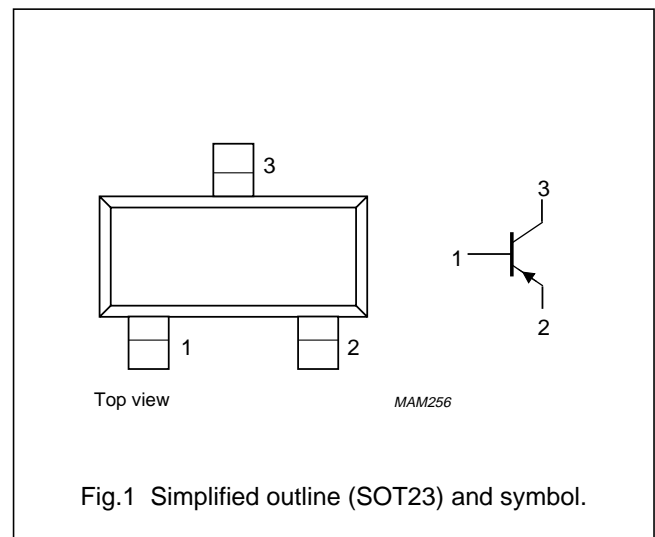
- \* = p: Made in Hong Kong.  
 \* = t: Made in Malaysia.  
 \* = W: Made in China.

**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	MAX.	UNIT
$V_{CEO}$	collector-emitter voltage	-40	V
$I_C$	collector current (DC)	-2	A
$I_{CM}$	peak collector current	-3	A
$R_{CEsat}$	equivalent on-resistance	<220	m $\Omega$

**PINNING**

PIN	DESCRIPTION
1	base
2	emitter
3	collector



**ORDERING INFORMATION**

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PBSS5240T	-	plastic surface mounted package; 3 leads	SOT23

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**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	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)		–	–2	A
$I_{CM}$	peak collector current		–	–3	A
$I_{BM}$	peak base current		–	–300	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$ ; note 1	–	300	mW
		$T_{amb} \leq 25\text{ °C}$ ; note 2	–	480	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

**Notes**

1. Device mounted on a printed-circuit board, single sided copper, tin plated, standard footprint.
2. Device mounted on a printed-circuit board, single sided copper, tin plated, mounting pad for collector 1 cm<sup>2</sup>.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air; note 1	417	K/W
		in free air; note 2	260	K/W

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2. Device mounted on a printed-circuit board, single sided copper, tin plated, mounting pad for collector 1 cm<sup>2</sup>.

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

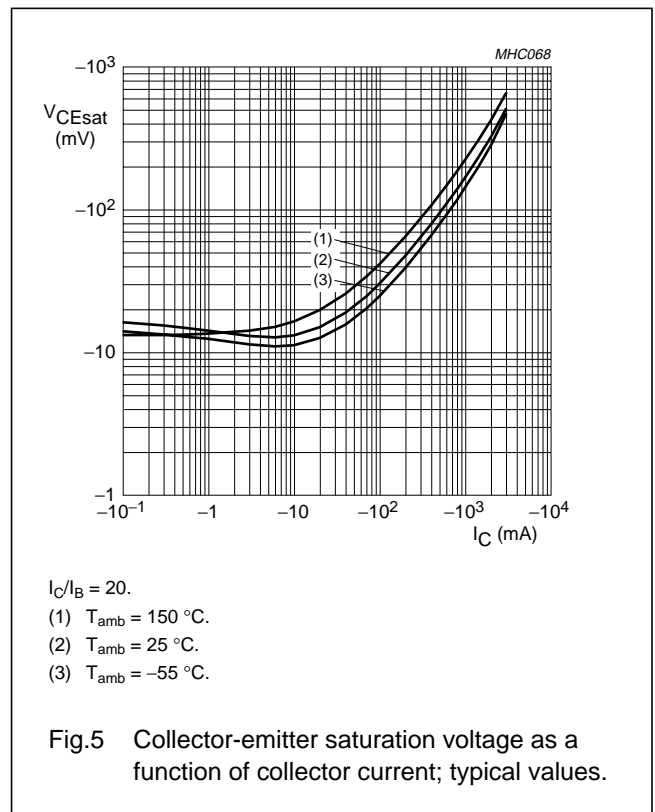
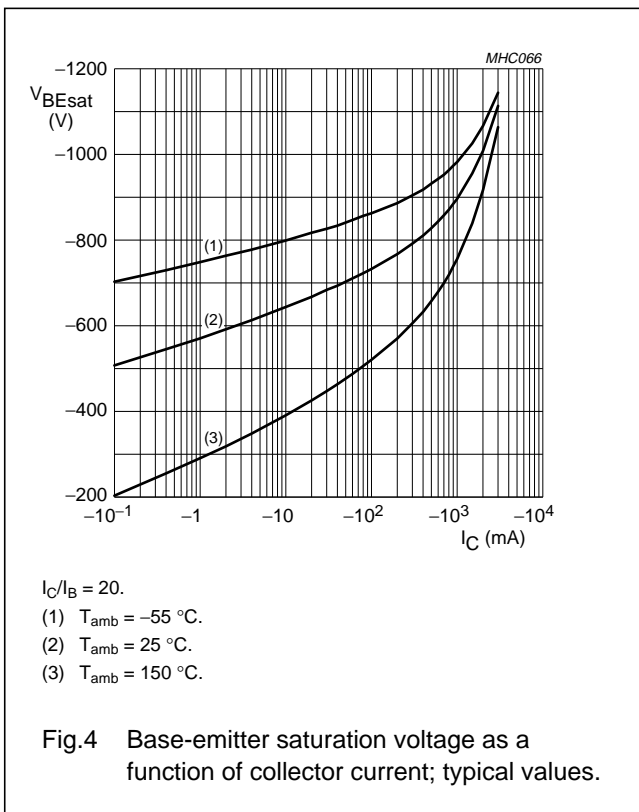
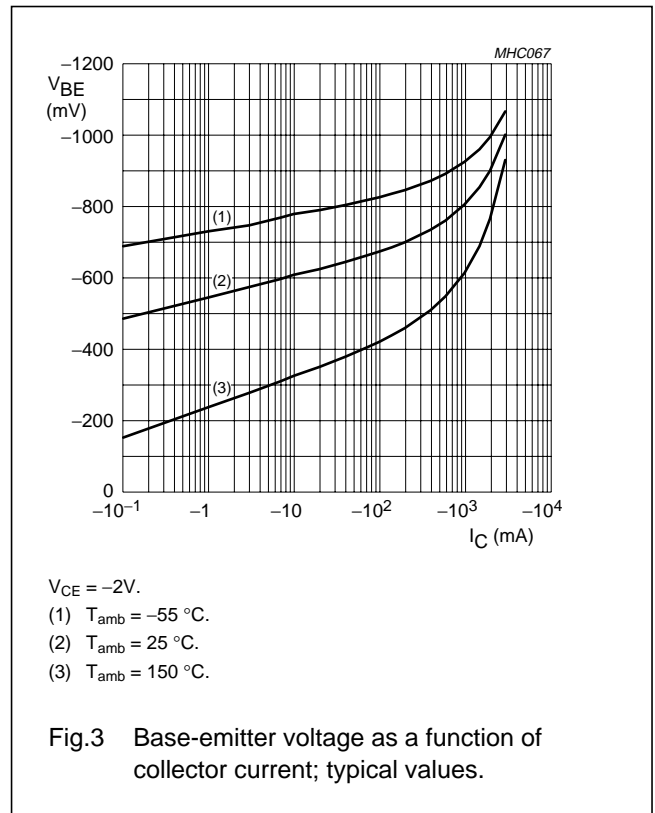
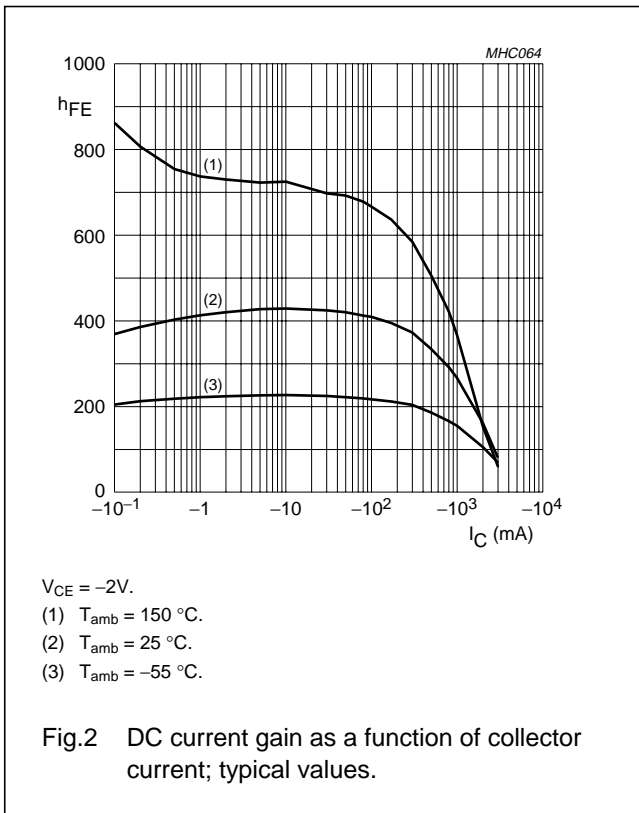
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -30\text{ V}; I_E = 0$	–	–	–100	nA
		$V_{CB} = -30\text{ V}; I_E = 0; T_j = 150\text{ °C}$	–	–	–50	$\mu\text{A}$
$I_{BEO}$	emitter-base cut-off current	$V_{EB} = -4\text{ V}; I_C = 0$	–	–	–100	nA
$h_{FE}$	DC current gain	$V_{CE} = -2\text{ V}$ $I_C = -100\text{ mA}$ $I_C = -500\text{ mA}$ $I_C = -1\text{ A}$ $I_C = -2\text{ A}$	300 260 210 100	450 350 290 180	– – – –	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -100\text{ mA}; I_B = -1\text{ mA}$	–	–55	–100	mV
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}$	–	–70	–110	mV
		$I_C = -750\text{ mA}; I_B = -15\text{ mA}$	–	–140	–225	mV
		$I_C = -1\text{ A}; I_B = -50\text{ mA}$	–	–140	–225	mV
		$I_C = -2\text{ A}; I_B = -200\text{ mA}$	–	–240	–350	mV
$R_{CEsat}$	equivalent on-resistance	$I_C = -500\text{ mA}; I_B = -50\text{ mA};$ note 1	–	160	<220	$\text{m}\Omega$
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -2\text{ A}; I_B = -200\text{ mA}$	–	–	–1.1	V
$V_{BE(on)}$	base-emitter turn-on voltage	$V_{CE} = -2\text{ V}; I_C = -100\text{ mA}$	–	–	–0.75	V
$f_T$	transition frequency	$I_C = -100\text{ mA}; V_{CE} = -10\text{ V};$ $f = 100\text{ MHz}$	100	200	–	MHz
$C_c$	collector capacitance	$V_{CB} = -10\text{ V}; I_E = I_e = 0;$ $f = 1\text{ MHz}$	–	23	28	pF

**Note**

1. Device mounted on a printed-circuit board, single sided copper, tin plated, standard footprint.

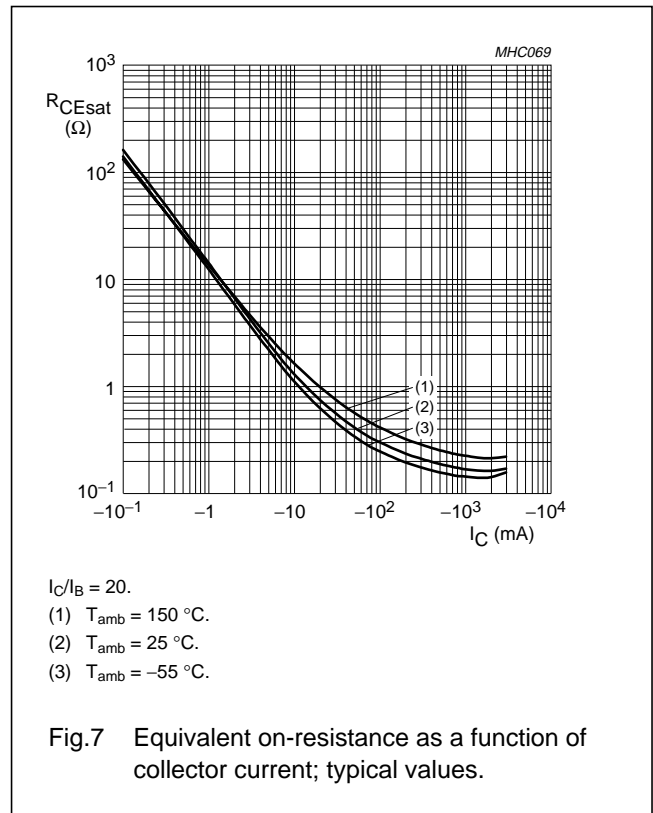
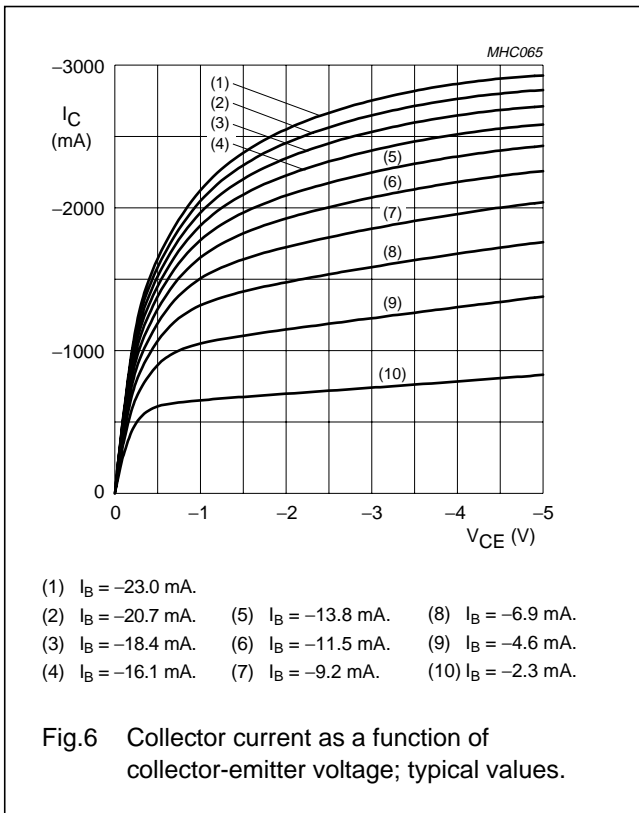
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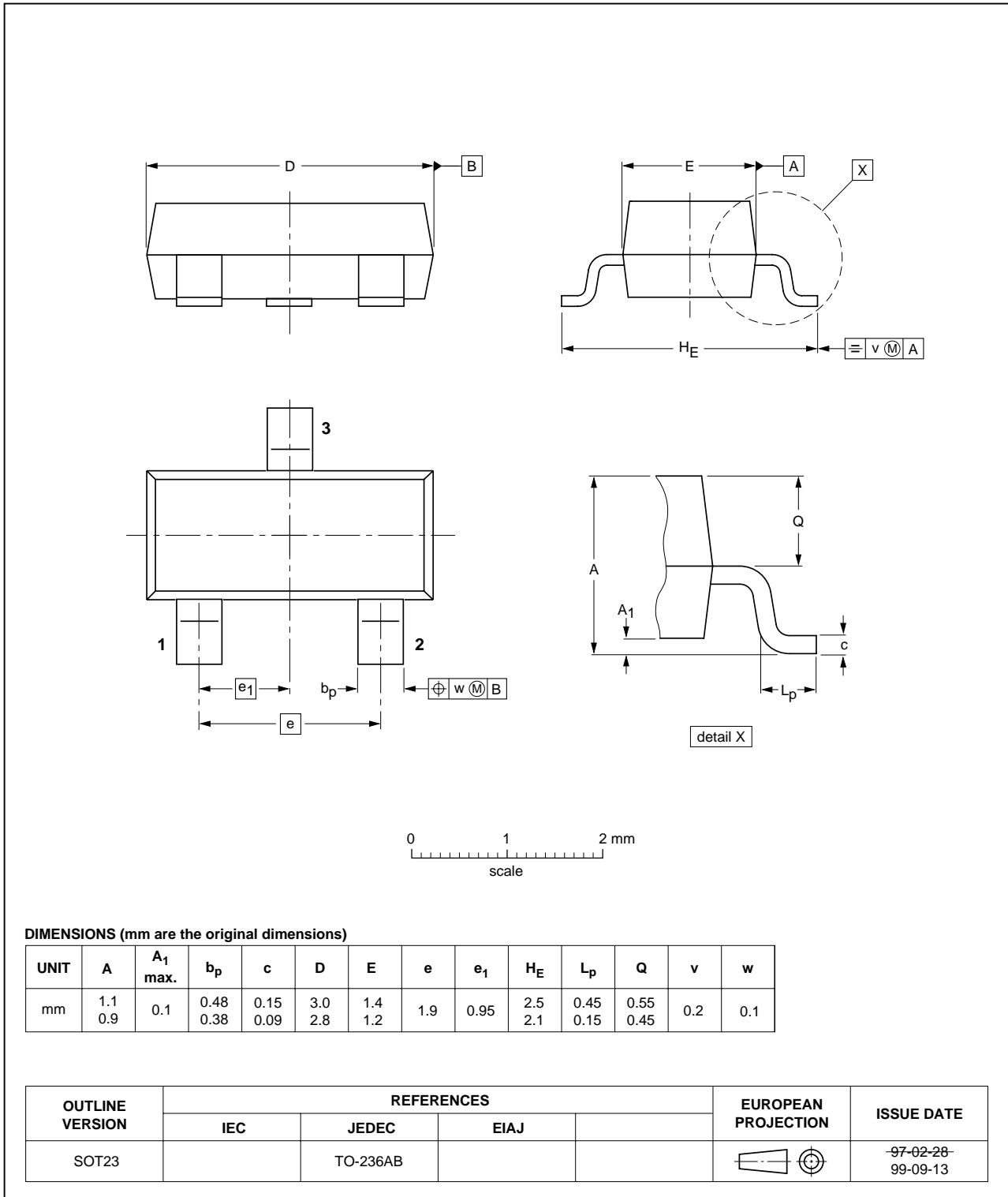
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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



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**DATA SHEET STATUS**

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	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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Printed in The Netherlands

R75/02/pp9

Date of release: 2004 Jan 15

Document order number: 9397 750 12439

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