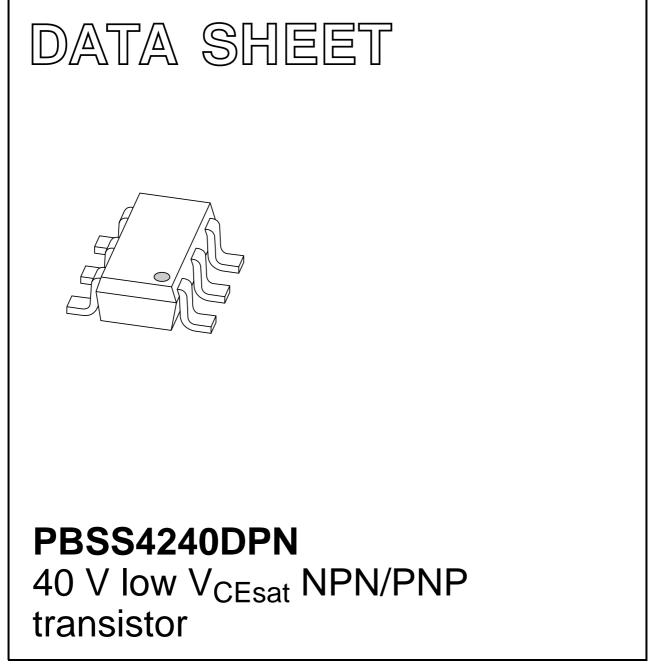
DISCRETE SEMICONDUCTORS



Product data sheet

2003 Feb 20



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	
STNIBUL	FARAMETER	NPN	PNP	UNIT	
V _{CEO}	emitter-collector voltage	40	-40	V	
I _C	collector current (DC)	1.35	-1.1	А	
I _{CRP}	repetitive peak collector current	2	-2	A	
I _{CM}	peak collector current	3	-3	А	
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	

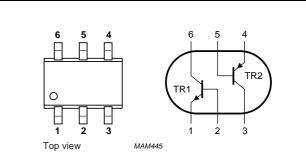


Fig.1 Simplified outline SOT457 (SC-74) and symbol.

PBSS4240DPN

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per transis	stor unless otherwise specified; fo	or the PNP transistor with nega	ative 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	А
	PNP		_	-1.1	А
I _{CRP}	repetitive peak collector current	note 1	_	2	А
I _{CM}	peak collector current	single peak	-	3	А
I _B	base current (DC)		_	300	mA
I _{BM}	peak base current		-	1	А
P _{tot} total power dissi	total power dissipation	$T_{amb} \le 25 \ ^{\circ}C; \text{ note } 2$	-	370	mW
		$T_{amb} \le 25 \ ^{\circ}C$; note 3	-	310	mW
		$T_{amb} \le 25 \ ^{\circ}C$; note 1	-	1.1	W
T _{stg}	storage temperature		-65	+150	°C
Tj	junction temperature		-	150	°C
T _{amb}	operating ambient temperature		-65	+150	°C
Per device	9		•		•
P _{tot}	total power dissipation	$T_{amb} \le 25 \ ^{\circ}C$; note 2	_	600	mW

Notes

1. Operated under pulsed conditions: duty cycle $\delta \le$ 20%; pulse width tp \le 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 cm².
- 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-a}	thermal resistance from junction to	in free air; note 1	340	K/W	
ambient	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 cm².
- 2. Operated under pulsed conditions: pulse width t_p \leq 10 ms; duty cycle $\delta \leq$ 0.20; mounting pad for collector standard footprint.

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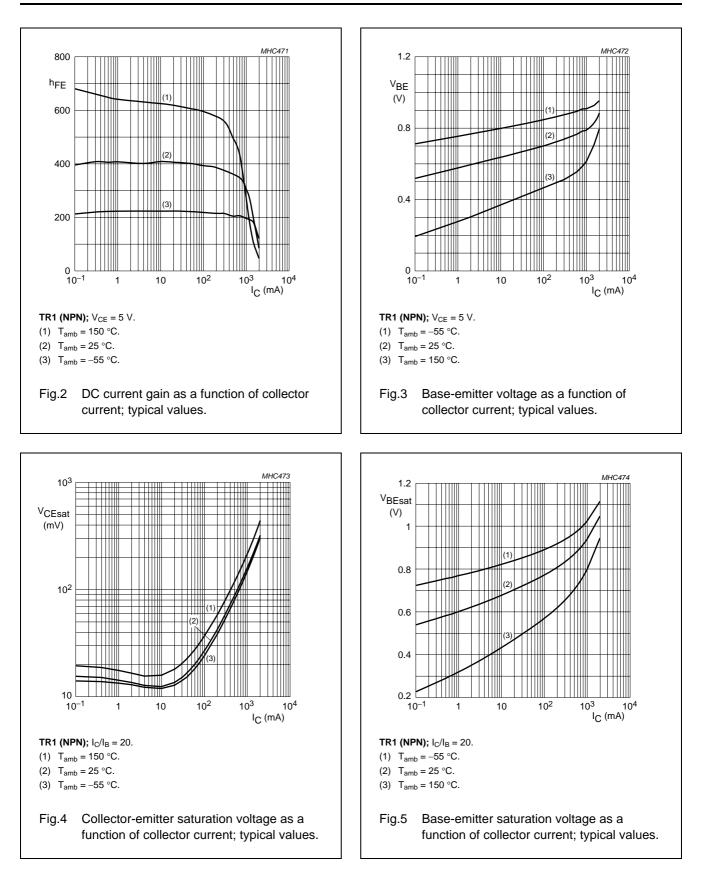
CHARACTERISTICS

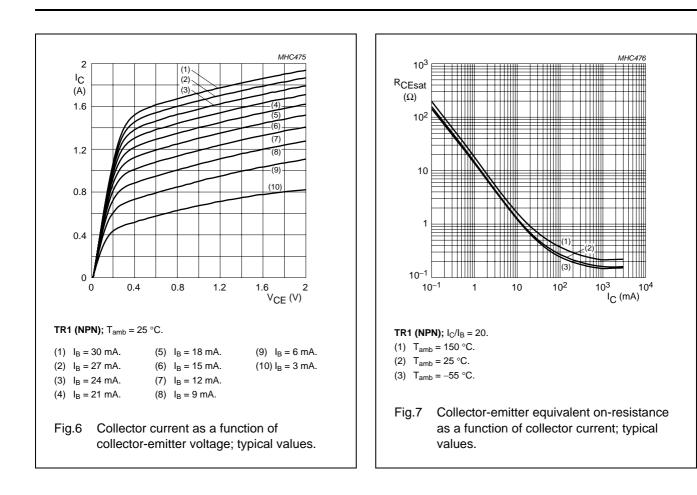
 T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per transi	stor unless otherwise specified; for	the PNP transistor with negative	e polarity	y		
I _{CBO}	collector-base cut-off current	$V_{CB} = 40 \text{ V}; I_E = 0$	-	-	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	$V_{EB} = 5 \text{ V}; I_{C} = 0$	_	-	100	nA
h _{FE}	DC current gain	$V_{CE} = 5 \text{ V}; I_{C} = 1 \text{ mA}$	300	-	-	
f _T	transition frequency	$I_{C} = 50 \text{ mA}; V_{CE} = 10 \text{ V};$ f = 100 MHz	150	-	-	MHz
C _c	collector capacitance	$V_{CB} = 10 \text{ V}; I_E = I_e = 0;$ f = 1 MHz	-	_	12	pF
TR1 (NPN)		•			
h _{FE}	DC current gain	$V_{CE} = 5 \text{ V}; I_{C} = 500 \text{ mA}$	300	-	900	
		$V_{CE} = 5 \text{ V}; \text{ I}_{C} = 1 \text{ A}$	200	_	-	
		$V_{CE} = 5 \text{ V}; I_{C} = 2 \text{ A}; \text{ note } 1$	75	_	_	
V _{CEsat} co	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
		$I_{C} = 2 \text{ A}; I_{B} = 200 \text{ mA}; \text{ note } 1$	_	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	$V_{CE} = 5 \text{ V}; \text{ I}_{C} = 1 \text{ A}$	_	_	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	$V_{CE} = -5 \text{ V}; I_{C} = -100 \text{ mA}$	300	_	800	
		$V_{CE} = -5 \text{ V}; \text{ I}_{C} = -500 \text{ mA}$	250	-	-	
		$V_{CE} = -5 \text{ V}; \text{ I}_{C} = -1 \text{ A}$	160	_	-	
		$V_{CE} = -5$ V; $I_C = -2$ A; note 1	50	_	_	
V _{CEsat}	saturation voltage	$I_{C} = -100 \text{ mA}; I_{B} = -1 \text{ mA}$	_	-90	-120	mV
		$I_{C} = -500 \text{ mA}; I_{B} = -50 \text{ mA}$	_	-100	-145	mV
		$I_{C} = -1 \text{ A}; I_{B} = -100 \text{ mA}$	_	-180	-260	mV
		$I_{C} = -2 \text{ A}; I_{B} = -200 \text{ mA}; \text{ note } 1$		-400	-530	mV
V _{BEsat}	saturation voltage	$I_{\rm C} = -1 \text{ A}; I_{\rm B} = -50 \text{ mA}$	-	-	-1.1	V
V _{BEon}	base-emitter turn-on voltage	$V_{CE} = -5 \text{ V}; \text{ I}_{C} = -1 \text{ A}$	-	-	-1	V
R _{CEsat}	equivalent on-resistance	$I_{C} = -1 \text{ A}; I_{B} = -100 \text{ mA}; \text{ note } 1$	-	-	260	mΩ

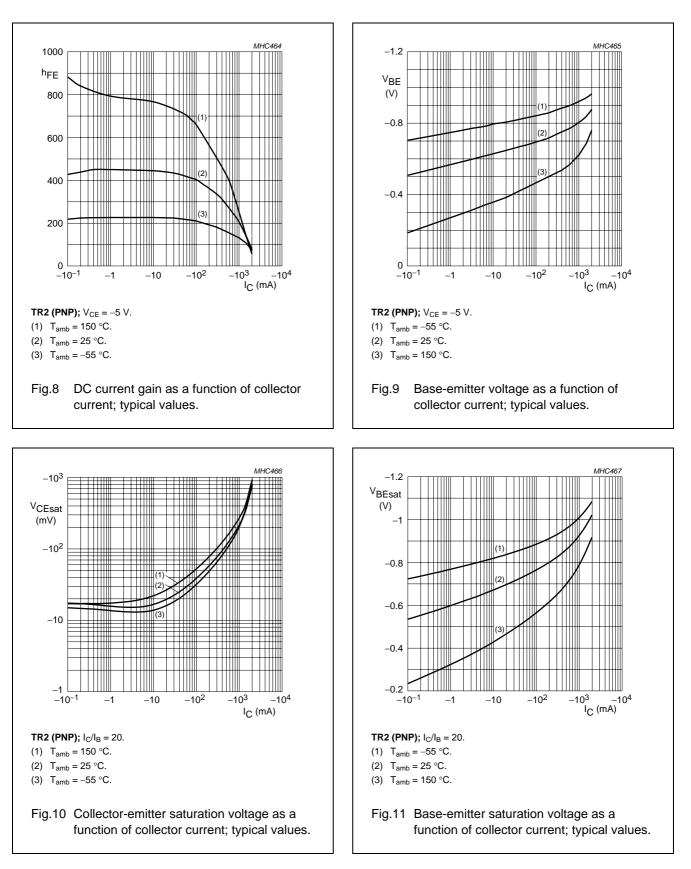
Note

1. Pulse test: $t_p \leq 300~\mu s;~\delta \leq 0.02.$

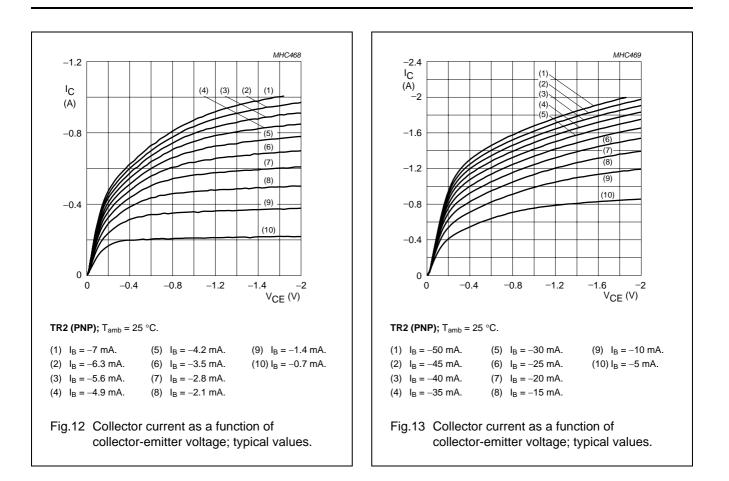


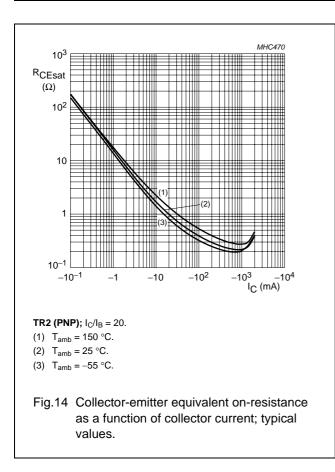


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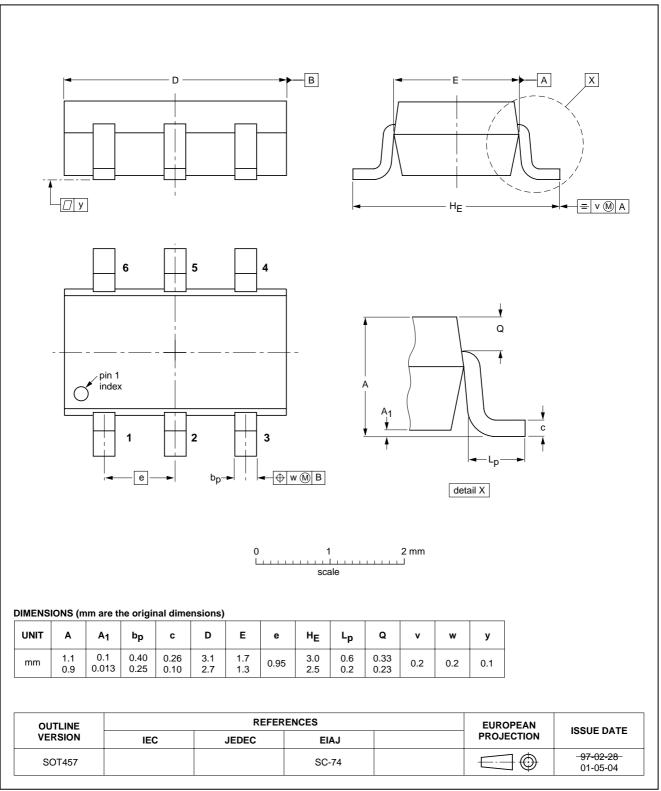


PBSS4240DPN

40 V low V_{CEsat} NPN/PNP transistor

PACKAGE OUTLINE

Plastic surface mounted package; 6 leads



SOT457

PBSS4240DPN

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.

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