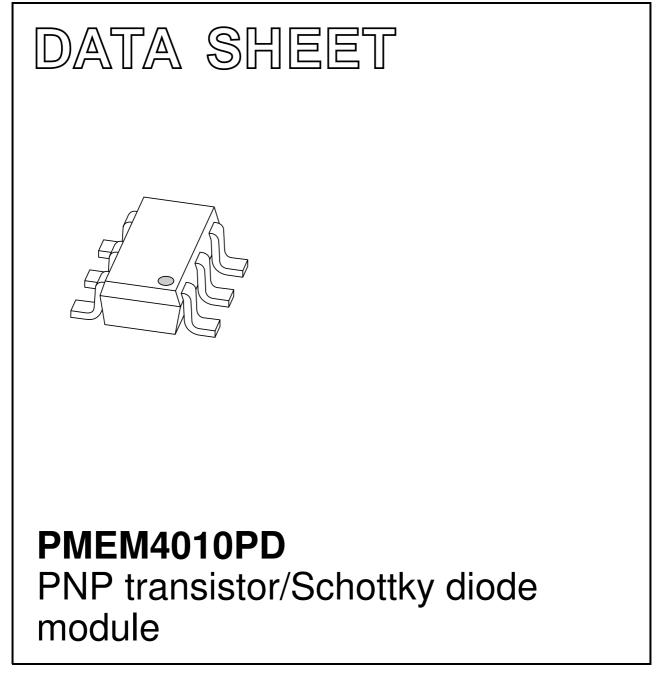
DISCRETE SEMICONDUCTORS



Product data sheet

2002 Oct 28



Product data sheet

PNP transistor/Schottky diode module

FEATURES

- 600 mW total power dissipation
- High current capability
- Reduces required PCB area
- Reduced pick and place costs
- Small plastic SMD package.

Transistor:

• Low collector-emitter saturation voltage.

Diode:

- Ultra high-speed switching
- Very low forward voltage
- Guard ring protected.

APPLICATIONS

- DC/DC convertors
- Inductive load drivers
- General purpose load drivers
- Reverse polarity protection circuits.

DESCRIPTION

Combination of a PNP transistor with low V_{CEsat} and high current capability and a planar Schottky barrier diode with an integrated guard ring for stress protection in a SOT457 (SC-74) small plastic package.

NPN complement: PMEM4010ND.

PINNING

PIN	DESCRIPTION	
1	emitter	
2	not connected	
3	cathode	
4	anode	
5	base	
6	collector	

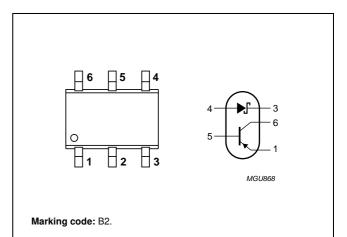


Fig.1 Simplified outline (SOT457) and symbol.

PMEM4010PD

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LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
NPN trans	istor				
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
lc	collector current (DC)		_	-1	А
I _{CM}	peak collector current		-	-2	А
I _{BM}	peak base current		-	-1	А
Tj	junction temperature		-	150	°C
Schottky b	barrier diode				
V _R	continuous reverse voltage		-	20	V
I _F	continuous forward current		-	1	А
I _{FSM}	non repetitive peak forward current	t = 8.3 ms half sinewave; JEDEC method	-	5	A
Tj	junction temperature		-	125	°C
Combined	l device	·	•		•
P _{tot}	total power dissipation	$T_{amb} \le 25 \ ^{\circ}C;$ note 1	-	600	mW
T _{stg}	storage temperature		-65	+150	°C
T _{amb}	operating ambient temperature		-65	+125	°C

Note

1. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm².

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT	
R _{th j-a}	thermal resistance from junction to ambient	in free air; note 1	208	K/W	

Note

1. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm².

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CHARACTERISTICS

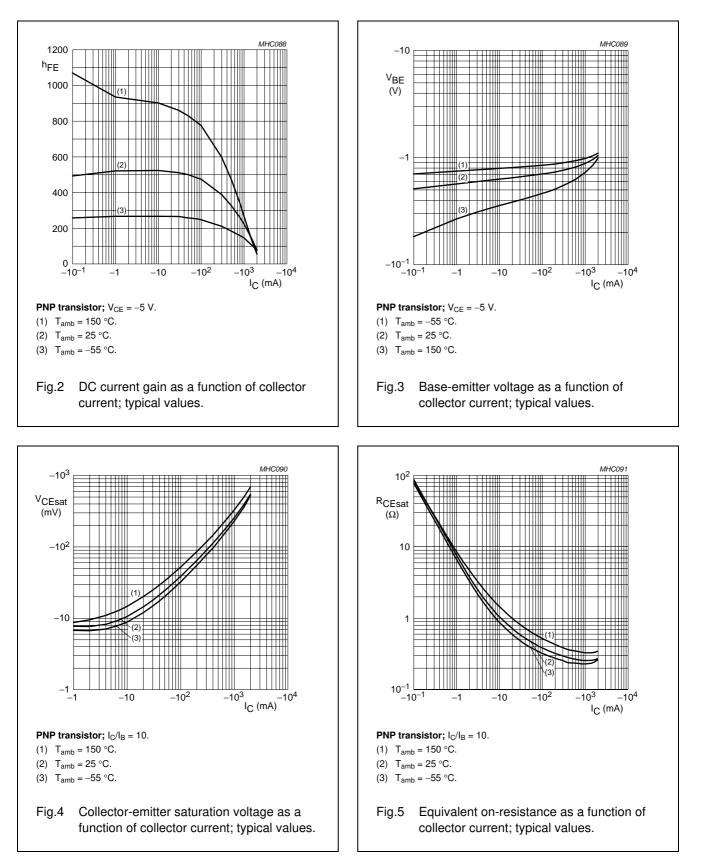
 T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
NPN trans	sistor		•			
I _{CBO}	collector-base cut-off current	$V_{CB} = -40 \text{ V}; I_E = 0$	-	-	-100	nA
		$V_{CB} = -40 \text{ V}; I_E = 0;$ $T_{amb} = 150 \text{ °C}$	-	-	-50	μA
I _{CEO}	collector-emitter cut-off current	$V_{CE} = -30 \text{ V}; \text{ I}_{B} = 0$	_	_	-100	nA
I _{EBO}	emitter-base cut-off current	$V_{EB} = -5 V; I_{C} = 0$	_	_	-100	nA
h _{FE}	DC current gain	$V_{CE} = -5 \text{ V}; \text{ I}_{C} = -1 \text{ mA}$	300	_	-	
		$V_{CE} = -5 \text{ V}; \text{ I}_{C} = -100 \text{ mA}$	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 _{CEsat}	collector-emitter saturation voltage	$I_{\rm C} = -100 \text{ mA}; I_{\rm B} = -1 \text{ mA}$	-	-	-140	mV
		$I_{C} = -500 \text{ mA}; I_{B} = -50 \text{ mA}$	-	_	-170	mV
		$I_{\rm C} = -1$ A; $I_{\rm B} = -100$ mA	-	_	-310	mV
V _{BEsat}	base-emitter saturation voltage	$I_{C} = -1 \text{ A}; I_{B} = -50 \text{ mA}$	-	-	-1.1	V
R _{CEsat}	equivalent on-resistance	$I_{C} = -500 \text{ mA}; I_{B} = -50 \text{ mA};$ note 1	-	300	<340	mΩ
V _{BEon}	base-emitter turn-on voltage	$V_{CE} = -5 \text{ V}; \text{ I}_{C} = -1 \text{ A}$	-	-	-1	V
f _T	transition frequency	$I_{C} = -50 \text{ mA}; V_{CE} = -10 \text{ V};$ f = 100 MHz	150	-	-	MHz
Schottky	barrier diode	·				
V _F	continuous forward voltage	I _F = 10 mA; note 1	-	240	270	mV
		I _F = 100 mA; note 1	-	300	350	mV
		I _F = 1000 mA; see Fig.7; note 1	-	480	550	mV
I _R	reverse current	V _R = 5 V; note 1	_	5	10	μA
		V _R = 8 V; note 1	_	7	20	μA
		V _R = 15 V; see Fig.8; note 1	_	10	50	μA
C _d	diode capacitance	V _R = 5 V; f = 1 MHz; see Fig.9	-	19	25	pF

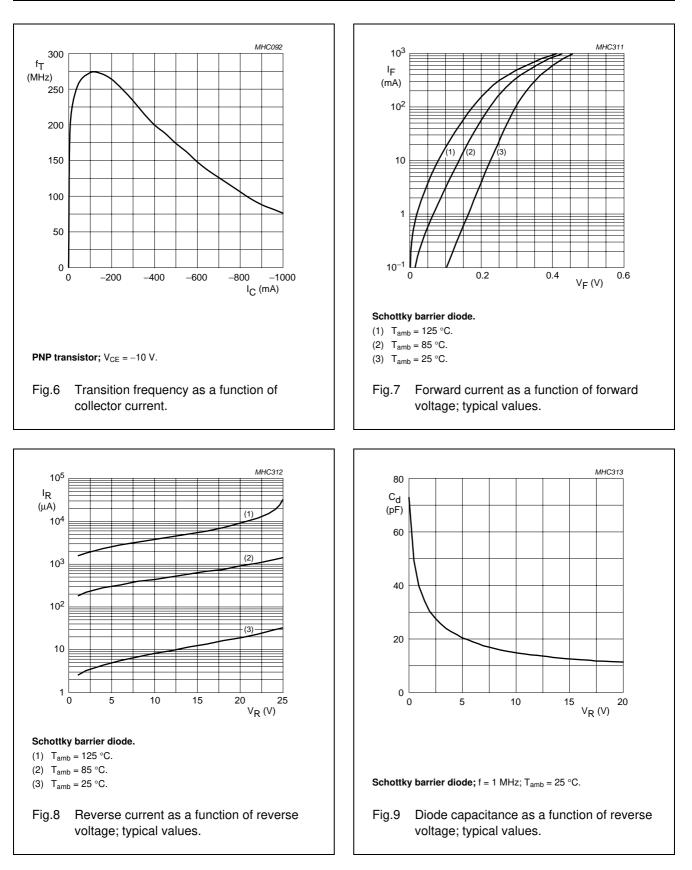
Note

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

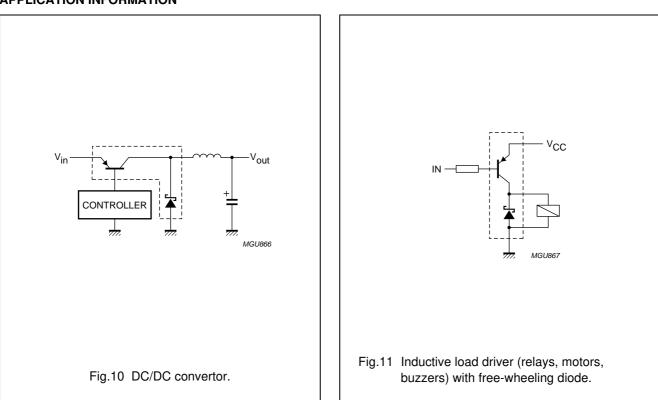
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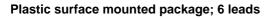


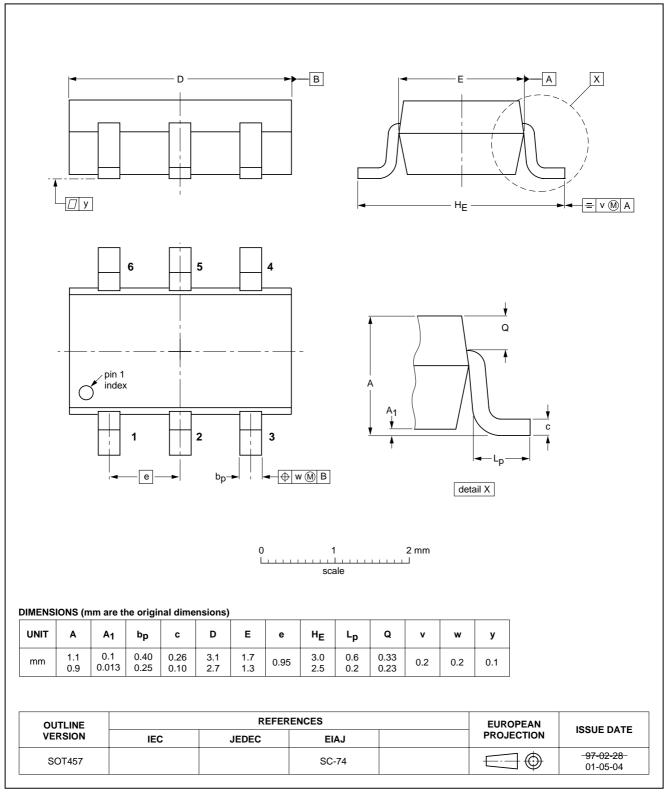
APPLICATION INFORMATION

PMEM4010PD

PNP transistor/Schottky diode module

PACKAGE OUTLINE





SOT457

PMEM4010PD

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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