DATA SHEET

PMBTH81
PNP 1 GHz switching transistor

Product specification
File under Discrete Semiconductors, SC14

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Philips
Semiconductors

PHILIPS

PNP 1 GHz switching transistor PMBTH81

FEATURES

- Low cost
- High transition frequency.

DESCRIPTION

The PMBTH81 is a general purpose silicon pnp transistor, encapsulated in a SOT23 plastic envelope. Its complement is the PMBTH10.

PINNING

PIN	DESCRIPTION
Code: V31	
1	base
2	emitter
3	collector

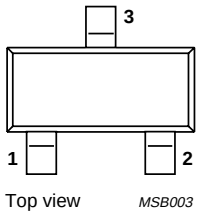


Fig.1 SOT23.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	20	V
V_{CEO}	collector-emitter voltage	open base	–	20	V
P_{tot}	total power dissipation	T_s = 45 °C (note 1)	–	400	mW
C_{ce}	collector-emitter capacitance	V_{CB} = 10 V; I_B = 0; f = 1 MHz	–	0.65	pF
C_{cb}	collector-base capacitance	V_{CB} = 10 V; I_E = 0; f = 1 MHz	–	0.85	pF
f_T	transition frequency	V_{CE} = 10 V; I_C = 5 mA; f = 100 MHz; T_{amb} = 25 °C	600	–	MHz

Note

1. T_s is the temperature at the soldering point of the collector tab.

LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	20	V
V_{CEO}	collector-emitter voltage	open base	–	20	V
V_{EBO}	emitter-base voltage	open collector	–	3	V
I_C	collector current		–	40	mA
P_{tot}	total power dissipation	T_s = 45 °C (note 1)	–	400	mW
T_{stg}	storage temperature		–65	150	°C
T_j	junction temperature		–	150	°C

THERMAL RESISTANCE

SYMBOL	PARAMETER	THERMAL RESISTANCE
$R_{th\ j\text{-}s}$	from junction to soldering point (note 1)	260 K/W

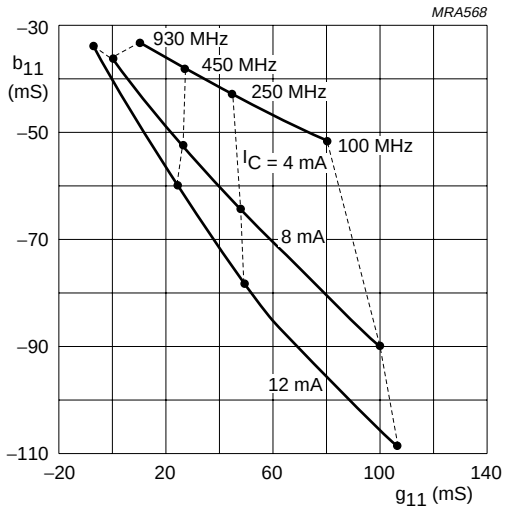
Note

1. T_s is the temperature at the soldering point of the collector tab.

CHARACTERISTICS

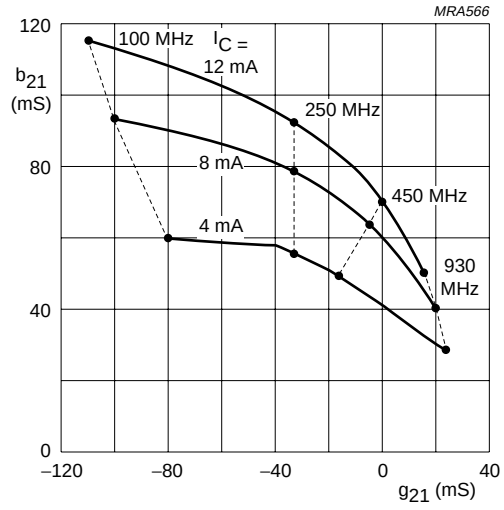
T_j = 25 °C

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; I_C = 10 μA; I_E = 0	20	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; I_C = 1 mA; I_B = 0	20	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; I_E = 10 μA; I_C = 0	3	–	V
$V_{CE\ sat}$	collector-emitter saturation voltage	I_C = 5 mA; I_B = 0.5 mA	–	0.5	V
$V_{BE\ on}$	base-emitter ON voltage	V_{CE} = 10 V; I_C = 5 mA	–	0.9	V
I_{CBO}	collector-base cut-off current	V_{CB} = 10 V; I_E = 0	–	100	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = 2 V; I_C = 0	–	100	nA
h_{FE}	DC current gain	V_{CE} = 10 V; I_C = 5 mA	60	–	
C_{ce}	collector-emitter capacitance	V_{CB} = 10 V; I_B = 0; f = 1 MHz	–	0.65	pF
C_{cb}	collector-base capacitance	V_{CB} = 10 V; I_E = 0; f = 1 MHz	–	0.85	pF
f_T	transition frequency	V_{CE} = 10 V; I_C = 5 mA; f = 100 MHz; T_{amb} = 25 °C	600	–	MHz



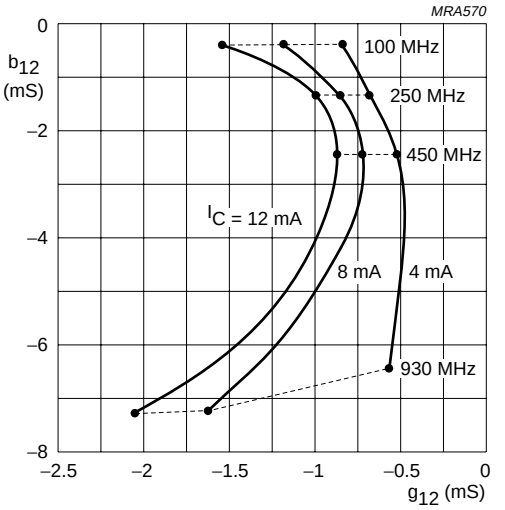
V_{CB} = 10 V; T_{amb} = 25 °C.

Fig.2 Common base input admittance (Y_{11}).



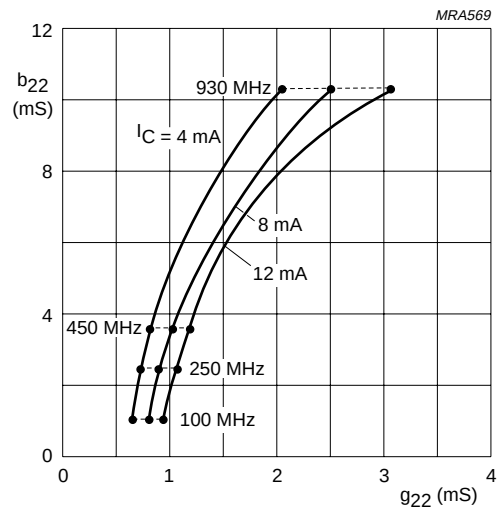
V_{CB} = 10 V; T_{amb} = 25 °C.

Fig.3 Forward transfer admittance (Y_{21}).



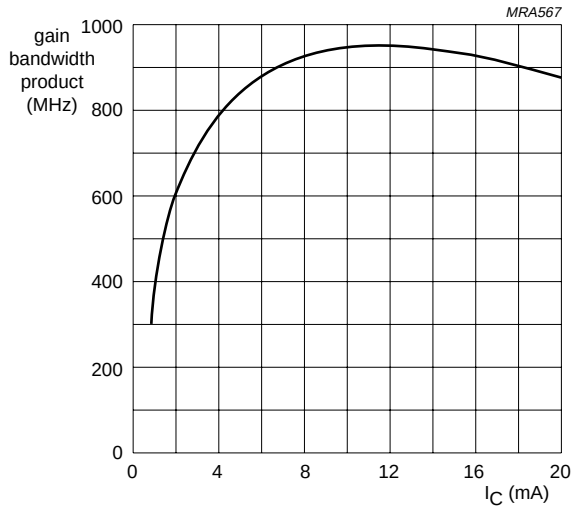
V_{CB} = 10 V; T_{amb} = 25 °C.

Fig.4 Reverse transfer admittance (Y_{12}).



V_{CB} = 10 V; T_{amb} = 25 °C.

Fig.5 Common base output admittance (Y_{22}).

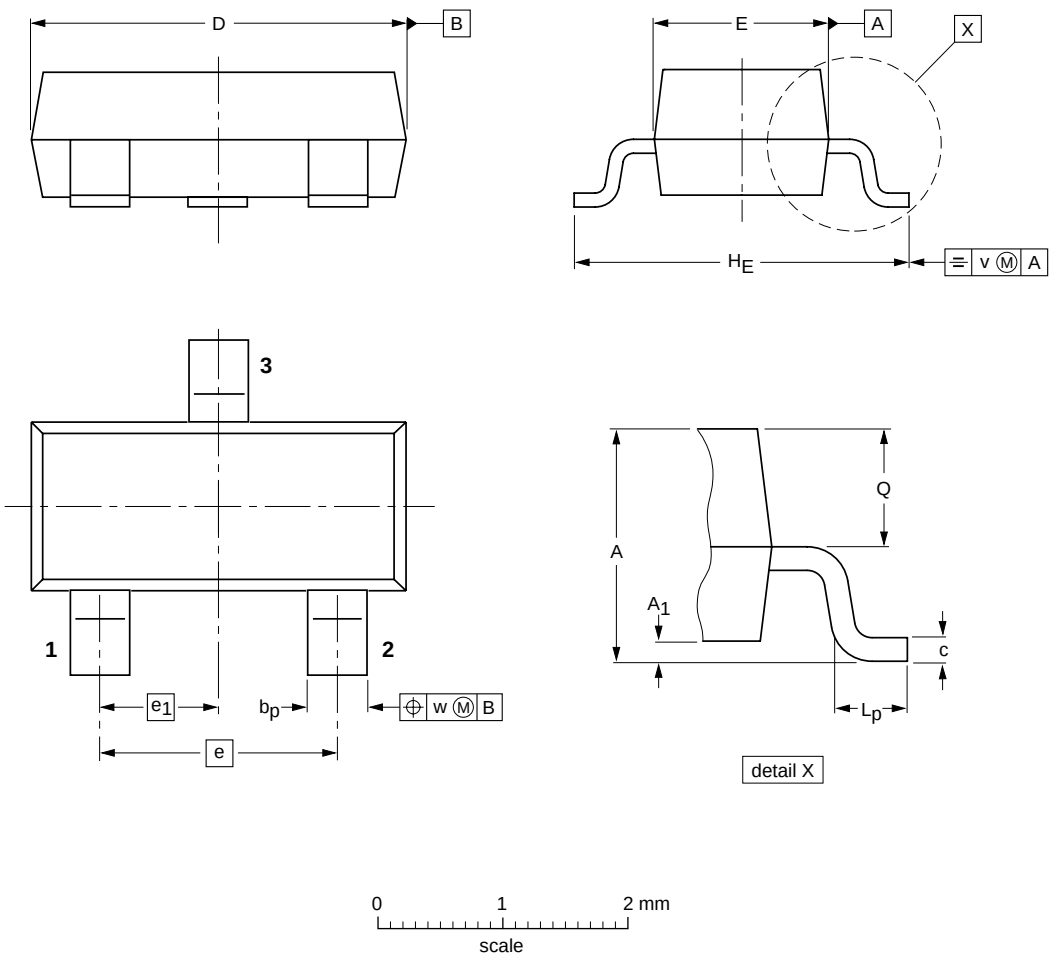


V_{CE} =10 V; f = 100 MHz.

Fig.6 Current gain-bandwidth product as a function of collector current.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT23						97-02-28

DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.