

NPN 1 GHz general purpose switching transistor

PMBTH10

FEATURES

- Low cost
- High power gain.

DESCRIPTION

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

PINNING

PIN	DESCRIPTION
Code: V30	
1	base
2	emitter
3	collector

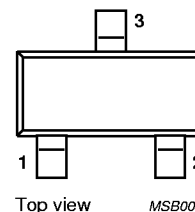


Fig.1 SOT23.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	—	30	V
V_{CEO}	collector-emitter voltage	open base	—	25	V
V_{EBO}	emitter-base voltage	open collector	—	3	V
P_{tot}	total power dissipation	$T_s = 45\text{ °C}$ (note 1)	—	400	mW
h_{FE}	DC current gain	$V_{CE} = 10\text{ V}$; $I_C = 4\text{ mA}$	60	—	
C_{re}	collector-emitter feedback capacitance	$V_{CB} = 10\text{ V}$; $I_E = 0$; $f = 1\text{ MHz}$	—	0.7	pF
C_{rb}	collector-base feedback capacitance	$V_{CB} = 10\text{ V}$; $I_E = 0$; $f = 1\text{ MHz}$	0.35	0.65	pF
f_T	transition frequency	$V_{CE} = 10\text{ V}$; $I_C = 4\text{ mA}$; $f = 100\text{ MHz}$; $T_{amb} = 25\text{ °C}$	650	—	MHz
$r_b C_c$	collector-base time constant	$V_{CE} = 10\text{ V}$; $I_C = 4\text{ mA}$; $f = 100\text{ MHz}$; $T_{amb} = 25\text{ °C}$	—	9	ps

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	—	30	V
V_{CEO}	collector-emitter voltage	open base	—	25	V
V_{EBO}	emitter-base voltage	open collector	—	3	V
I_C	DC collector current		—	40	mA
P_{tot}	total power dissipation	$T_s = 45\text{ °C}$ (note 1)	—	400	mW
T_{stg}	storage temperature		−65	150	°C
T_j	junction temperature		—	150	°C

Note

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

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THERMAL RESISTANCE

SYMBOL	PARAMETER	THERMAL RESISTANCE
$R_{th\ j-s}$	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.

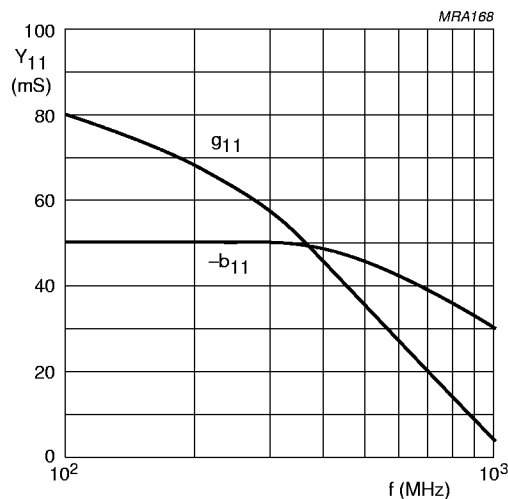
CHARACTERISTICS

$T_j = 25\ ^\circ\text{C}$.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; $I_C = 100\ \mu\text{A}$; $I_E = 0$	30	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; $I_C = 1\ \text{mA}$; $I_B = 0$	25	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; $I_E = 10\ \mu\text{A}$; $I_C = 0$	3	–	V
$V_{CE\ sat}$	collector-emitter saturation voltage	$I_C = 4\ \text{mA}$; $I_B = 0.4\ \text{mA}$	–	0.5	V
$V_{BE\ on}$	base-emitter ON voltage	$V_{CE} = 10\ \text{V}$; $I_C = 4\ \text{mA}$	–	0.95	V
I_{CBO}	collector-base cut-off current	$V_{CB} = 25\ \text{V}$; $I_E = 0$	–	100	nA
I_{EBO}	emitter-base cut-off current	$V_{CB} = 25\ \text{V}$; $I_C = 0$	–	100	nA
h_{FE}	DC current gain	$V_{CE} = 10\ \text{V}$; $I_C = 4\ \text{mA}$	60	–	
C_{re}	collector-emitter feedback capacitance	$V_{CB} = 10\ \text{V}$; $I_E = i_e = 0$; $f = 1\ \text{MHz}$	–	0.7	pF
C_{rb}	collector-base feedback capacitance	$V_{CB} = 10\ \text{V}$; $I_C = i_c = 0$; $f = 1\ \text{MHz}$	0.35	0.65	pF
f_T	transition frequency	$V_{CE} = 10\ \text{V}$; $I_C = 4\ \text{mA}$; $f = 100\ \text{MHz}$; $T_{amb} = 25\ ^\circ\text{C}$	650	–	MHz
$r_b C_c$	collector-base time constant	$V_{CB} = 10\ \text{V}$; $I_C = 4\ \text{mA}$; $f = 100\ \text{MHz}$; $T_{amb} = 25\ ^\circ\text{C}$	–	9	ps

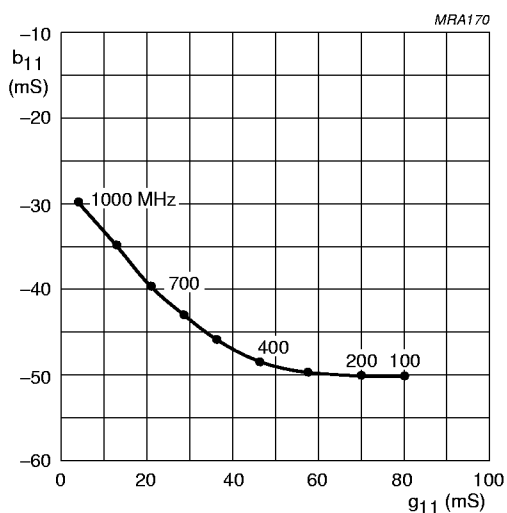
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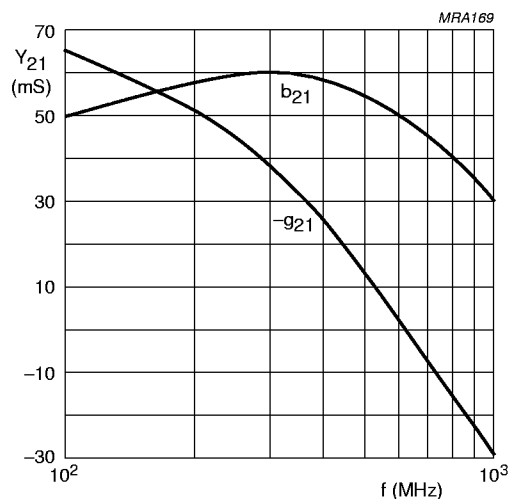
$V_{CB} = 10\text{ V}; I_C = 4\text{ mA}.$

Fig.2 Common base input admittance (Y_{11}) as a function of frequency.



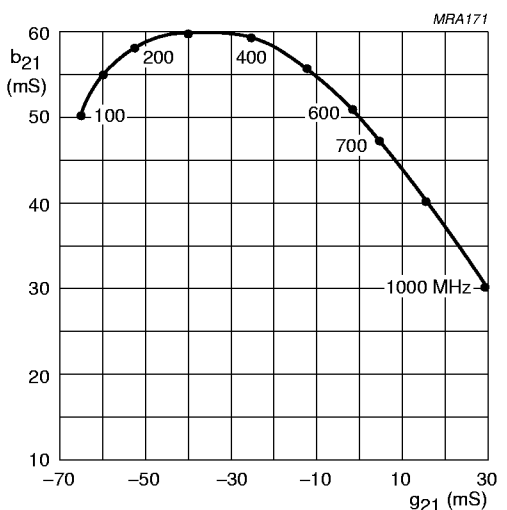
$V_{CB} = 10\text{ V}; I_C = 4\text{ mA}.$

Fig.3 Common base input admittance (Y_{11}).



$V_{CB} = 10\text{ V}; I_C = 4\text{ mA}.$

Fig.4 Common base forward transfer admittance (Y_{21}) as a function of frequency.

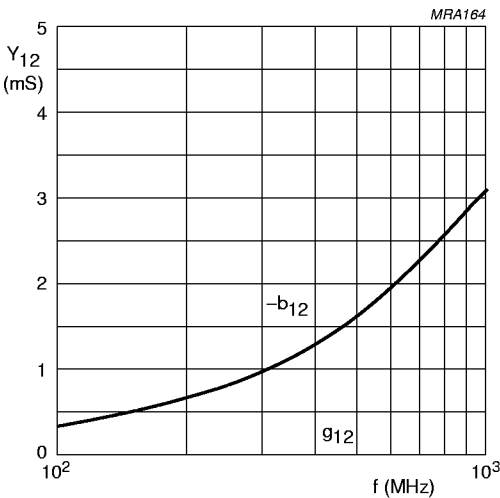


$V_{CB} = 10\text{ V}; I_C = 4\text{ mA}.$

Fig.5 Common base forward transfer admittance (Y_{21}).

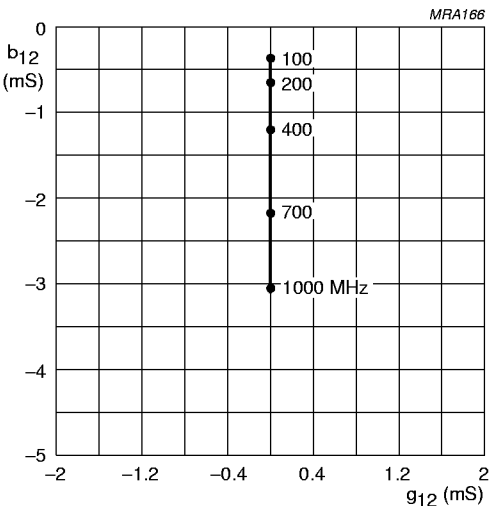
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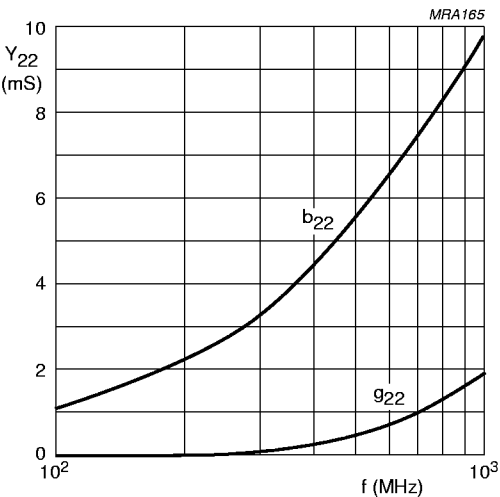
$V_{CB} = 10\text{ V}; I_C = 4\text{ mA}$.

Fig.6 Common base reverse transfer admittance (Y_{12}) as a function of frequency.



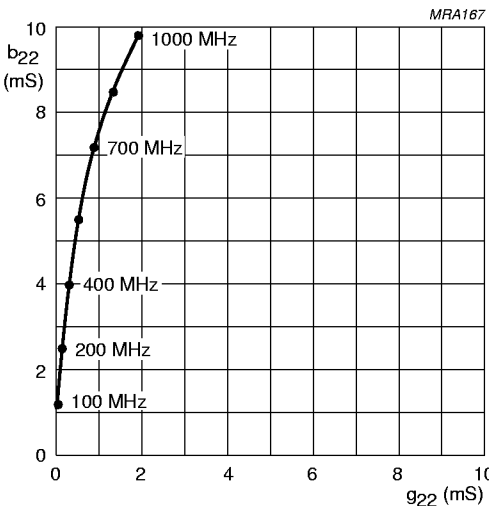
$V_{CB} = 10\text{ V}; I_C = 4\text{ mA}$.

Fig.7 Common base reverse transfer admittance (Y_{12}).



$V_{CB} = 10\text{ V}; I_C = 4\text{ mA}$.

Fig.8 Common base reverse admittance (Y_{22}) as a function of frequency.



$V_{CB} = 10\text{ V}; I_C = 4\text{ mA}$.

Fig.9 Common base reverse admittance (Y_{22}).

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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23

