SILICON EPITAXIAL TRANSISTOR

PNP transistor in a microminiature (SMD) plastic envelope intended for surface mounted applications. The PMBT3906 is primarily intended for use in telephony and professional communication equipment.

QUICK REFERENCE DATA

Collector-base voltage (open emitter)	$-V_{CBO}$	max.	40 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	40 V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.	5 V
Collector current (DC)	$-I_C$	max.	200 mA
Total power dissipation up to T_{amb} = 25 °C	P_{tot}	max.	300 mW
DC current gain $-I_C$ = 10 mA; $-V_{CE}$ = 1 V	h_{FE}		100 to 300
Transition frequency at f = 100 MHz $-I_C$ = 10 mA; $-V_{CE}$ = 20 V	f_T	min.	250 MHz

MECHANICAL DATA

Dimensions in mm

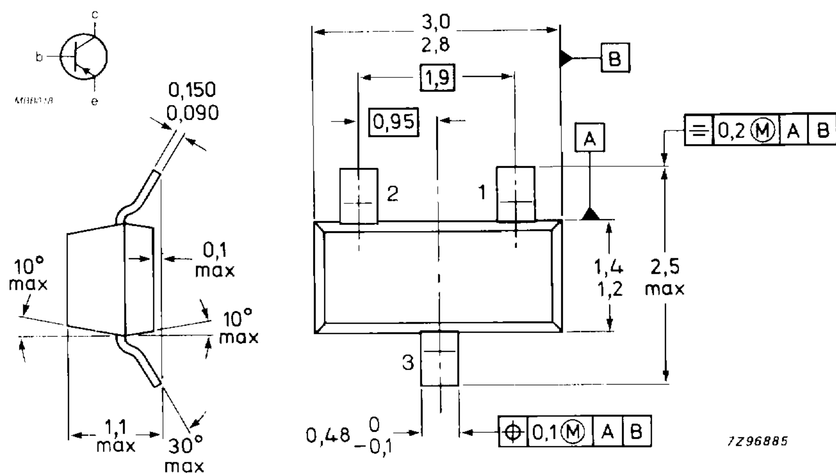
Fig. 1 SOT-23.

Marking code

PMBS3906 : P06

Pinning

1 = base
2 = emitter
3 = collector



RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Collector-base voltage (open emitter)	$-V_{CBO}$	max.	40 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	40 V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.	5 V
Collector current (DC)	$-I_C$	max.	200 mA
Total power dissipation* up to T_{amb} = 25 °C	P_{tot}	max.	300 mW
Storage temperature range	T_{stg}		−65 to +150 °C

THERMAL CHARACTERISTICS**

$T_j = P(R_{th\ j\text{-}t} + R_{th\ t\text{-}s} + R_{th\ s\text{-}a}) + T_{amb}$

Thermal resistance from junction to ambient	$R_{th\ j\text{-}a}$	=	430 K/W

CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified

Collector-emitter breakdown voltage▲ $-I_C$ = 1 mA; I_B = 0	$-V_{(BR)CEO}$	min.	40 V
Collector-base breakdown voltage $-I_C$ = 10 μA; I_E = 0	$-V_{(BR)CBO}$	min.	40 V
Emitter-base breakdown voltage $-I_E$ = 10 μA; I_C = 0	$-V_{(BR)EBO}$	min.	5 V
Collector cut-off current $-V_{CE}$ = 30 V; $-V_{EB}$ = 3 V	$-I_{CE}$	max.	50 nA
Base current with reverse biased emitter junction	$-I_{BEX}$	max.	50 nA
Output capacitance at f = 100 kHz I_E = 0; $-V_{CB}$ = 5 V	C_c	max.	4.5 pF
Input capacitance at f = 100 kHz I_C = 0; $-V_{BE}$ = 0.5 V	C_e	max.	10 pF

* Mounted on a ceramic substrate: area = 10 x 8 mm; thickness = 0.7 mm.

** See Thermal characteristics.

▲ Pulse test conditions: t_p = 300 μs; duty factor ≤ 2%.

Saturation voltages				
$-I_C$ = 10 mA; $-I_B$ = 1 mA	$-V_{CEsat}$	max.	0.25	V
$-I_C$ = 50 mA; $-I_B$ = 5 mA	$-V_{CEsat}$	max. min.	0.4 0.65	V V
$-I_C$ = 10 mA; $-I_B$ = 1 mA	$-V_{BEsat}$	max.	0.85	V
$-I_C$ = 50 mA; $-I_B$ = 5 mA	$-V_{BBsat}$	max.	0.95	V
D.C. current gain				
$-I_C$ = 0.1 mA; $-V_{CE}$ = 1 V	h_{FE}	min.	60	
$-I_C$ = 1 mA; $-V_{CE}$ = 1 V	h_{FE}	min.	80	
$-I_C$ = 10 mA; $-V_{CE}$ = 1 V	h_{FE}	min. max.	100 300	
$-I_C$ = 50 mA; $-V_{CE}$ = 1 V	h_{FE}	min.	60	
$-I_C$ = 100 mA; $-V_{CE}$ = 1 V	h_{FE}	min.	30	
Transition frequency at f = 100 MHz				
$-I_C$ = 10 mA; $-V_{CE}$ = 20 V	f_T	min.	250	MHz
Noise figure at R_S = 1 kΩ				
$-I_C$ = 100 μA; $-V_{CE}$ = 5 V f = 10 Hz to 15,7 kHz	F	max.	4	dB
h-parameters (common emitter)				
$-I_C$ = 1 mA; $-V_{CE}$ = 10 V; f = 1 kHz				
Input impedance	h_{ie}	min. max.	2.0 12	kΩ kΩ
Reverse voltage transfer ratio	h_{re}	min. max.	1.0 10	10^{-4} 10^{-4}
Small signal current gain	h_{fe}	min. max.	100 400	
Output admittance	h_{oe}	min. max.	30 60	μS μS