SILICON EPITAXIAL TRANSISTOR

P-N-P transistor in a microminiature (SMD) plastic package 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 (d.c.)	$-I_C$	max.	200 mA
Total power dissipation up to T_{amb} = 25 °C	P_{tot}	max.	250 mW
D.C. 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

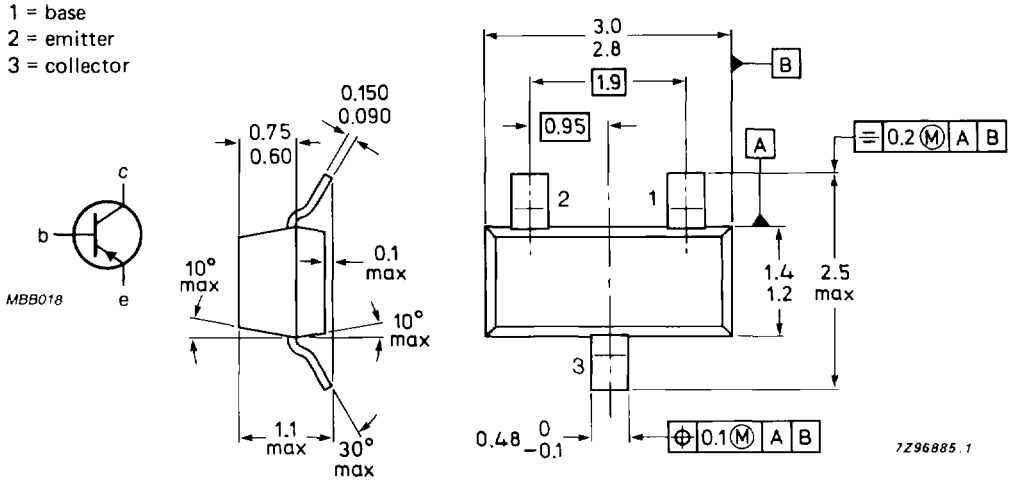
Fig. 1 SOT-23.

Marking code

PMBT3906 : p2A

Pinning:

1 = base
2 = emitter
3 = collector



TOP VIEW

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 (d.c.)	$-I_C$	max.	200	mA
Total power dissipation* up to T_{amb} = 25 °C	P_{tot}	max.	250	mW
Storage temperature	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	$R_{th\ j\text{-}a}$	=	500	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 an FR4 printed-circuit board 8 mm x 10 mm x 0.7 mm.

▲ Pulse test conditions: t_p = 300 μs; duty cycle ≤ 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
Switching times				
Turn-on time when $-V_{CC}$ = 3 V; $-V_{BE}$ = 0,5 V				
$-I_C$ = 10 mA; $-I_{Bon}$ = 1 mA				
Delay time	t_d	max.	35	ns
Rise time	t_r	max.	35	ns
Turn-off time when $-V_{CC}$ = 3 V; $-I_C$ = 10 mA				
$-I_{Bon} = -I_{Boff}$ = 1 mA				
Storage time	t_s	max.	225	ns
Fall time	t_f	max.	75	ns