



# MMBT3906

## SMALL SIGNAL PNP TRANSISTOR

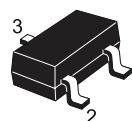
PRELIMINARY DATA

Type	Marking
MMBT3906	36

- SILICON EPITAXIAL PLANAR PNP TRANSISTOR
- MINIATURE SOT-23 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- TAPE AND REEL PACKING
- THE NPN COMPLEMENTARY TYPE IS MMBT3904

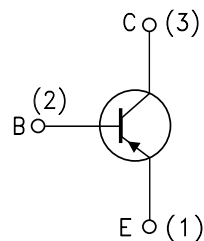
### APPLICATIONS

- WELL SUITABLE FOR PORTABLE EQUIPMENT
- SMALL LOAD SWITCH TRANSISTOR WITH HIGH GAIN AND LOW SATURATION VOLTAGE



SOT-23

### INTERNAL SCHEMATIC DIAGRAM



DS10120

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	-60	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	-40	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	-6	V
$I_C$	Collector Current	-200	mA
$P_{tot}$	Total Dissipation at $T_C = 25\text{ }^{\circ}\text{C}$	350	mW
$T_{stg}$	Storage Temperature	-65 to 150	$^{\circ}\text{C}$
$T_j$	Max. Operating Junction Temperature	150	$^{\circ}\text{C}$

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### THERMAL DATA

R <sub>thj-amb</sub> •	Thermal Resistance Junction-Ambient	Max	357.1	°C/W
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- Device mounted on a PCB area of 1 cm<sup>2</sup>

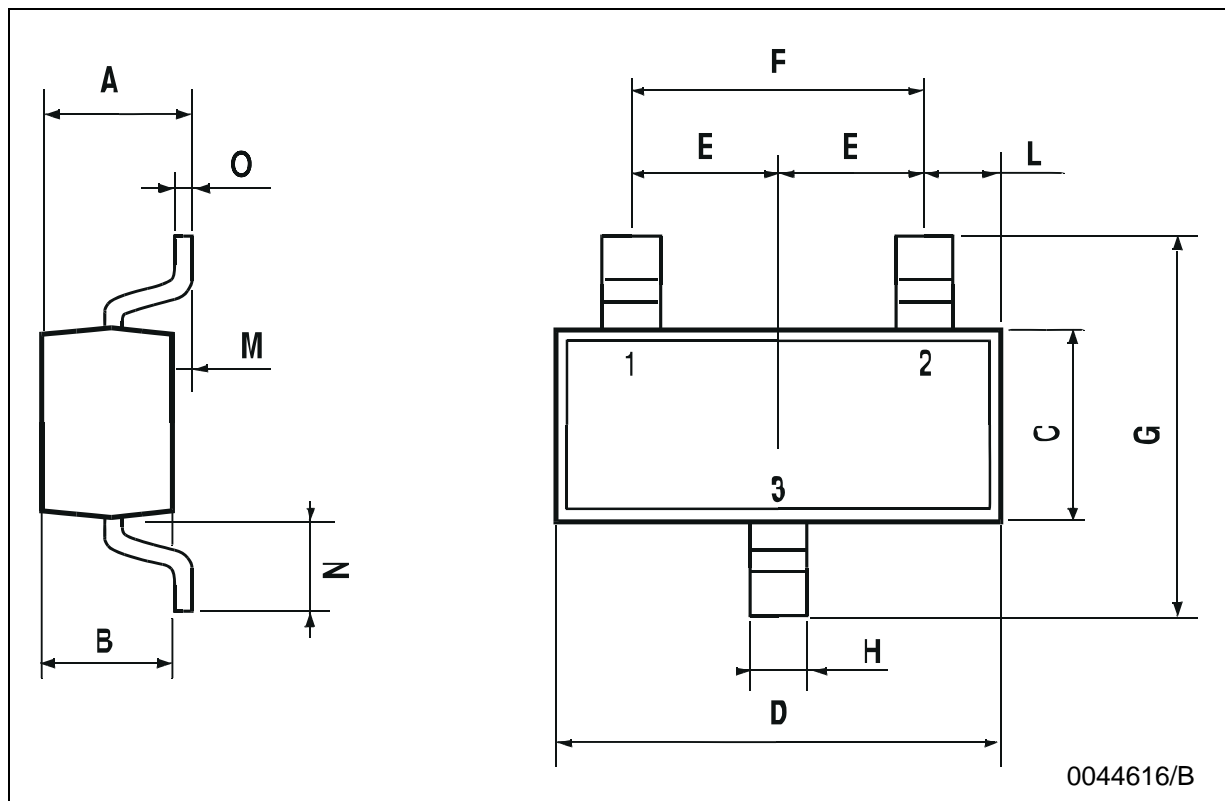
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CEX</sub>	Collector Cut-off Current (V <sub>BE</sub> = 3 V)	V <sub>CE</sub> = -30 V			-50	nA
I <sub>BEX</sub>	Collector Cut-off Current (V <sub>BE</sub> = 3 V)	V <sub>CE</sub> = -30 V			-50	nA
V <sub>(BR)CEO</sub> *	Collector-Emitter Breakdown Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = -1 mA	-40			V
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>E</sub> = 0)	I <sub>C</sub> = -10 µA	-60			V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = -10 µA	-6			V
V <sub>CE(sat)</sub> *	Collector-Emitter Saturation Voltage	I <sub>C</sub> = -10 mA I <sub>B</sub> = -1 mA I <sub>C</sub> = -50 mA I <sub>B</sub> = -5 mA			-0.25 -0.4	V V
V <sub>BE(sat)</sub> *	Base-Emitter Saturation Voltage	I <sub>C</sub> = -10 mA I <sub>B</sub> = -1 mA I <sub>C</sub> = -50 mA I <sub>B</sub> = -5 mA	-0.65		-0.85 -0.95	V V
h <sub>FE</sub> *	DC Current Gain	I <sub>C</sub> = -0.1 mA V <sub>CE</sub> = -1 V I <sub>C</sub> = -1 mA V <sub>CE</sub> = -1 V I <sub>C</sub> = -10 mA V <sub>CE</sub> = -1 V I <sub>C</sub> = -50 mA V <sub>CE</sub> = -1 V I <sub>C</sub> = -100 mA V <sub>CE</sub> = -1 V	60 80 100 60 30		300	
f <sub>T</sub>	Transition Frequency	I <sub>C</sub> = -10mA V <sub>CE</sub> = -20 V f = 100MHz	250			MHz
NF	Noise Figure	V <sub>CE</sub> = -5 V I <sub>C</sub> = -0.1 mA f = 10 Hz to 15.7 KHz R <sub>G</sub> = 1 KΩ		4		dB
C <sub>CBO</sub>	Collector-Base Capacitance	I <sub>E</sub> = 0 V <sub>CB</sub> = -5 V f = 100 KHz		6		pF
C <sub>EBO</sub>	Emitter-Base Capacitance	I <sub>C</sub> = 0 V <sub>EB</sub> = -0.5 V f = 100 KHz		25		pF
t <sub>d</sub>	Delay Time	I <sub>C</sub> = -10 mA I <sub>B</sub> = -1 mA			35	ns
t <sub>r</sub>	Rise Time	V <sub>CC</sub> = -3V			35	ns
t <sub>s</sub>	Storage Time	I <sub>C</sub> = -10 mA I <sub>B1</sub> = -I <sub>B2</sub> = -1 mA			225	ns
t <sub>f</sub>	Fall Time	V <sub>CC</sub> = -3V			72	ns

\* Pulsed: Pulse duration = 300 µs, duty cycle ≤ 2 %

## SOT-23 MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.85		1.1	33.4		43.3
B	0.65		0.95	25.6		37.4
C	1.20		1.4	47.2		55.1
D	2.80		3	110.2		118
E	0.95		1.05	37.4		41.3
F	1.9		2.05	74.8		80.7
G	2.1		2.5	82.6		98.4
H	0.38		0.48	14.9		18.8
L	0.3		0.6	11.8		23.6
M	0		0.1	0		3.9
N	0.3		0.65	11.8		25.6
O	0.09		0.17	3.5		6.7



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