



# 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

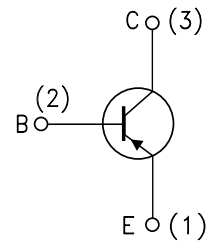
### APPLICATIONS

- 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

$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	357.1	$^{\circ}\text{C}/\text{W}$
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- Device mounted on a PCB area of  $1\text{ cm}^2$

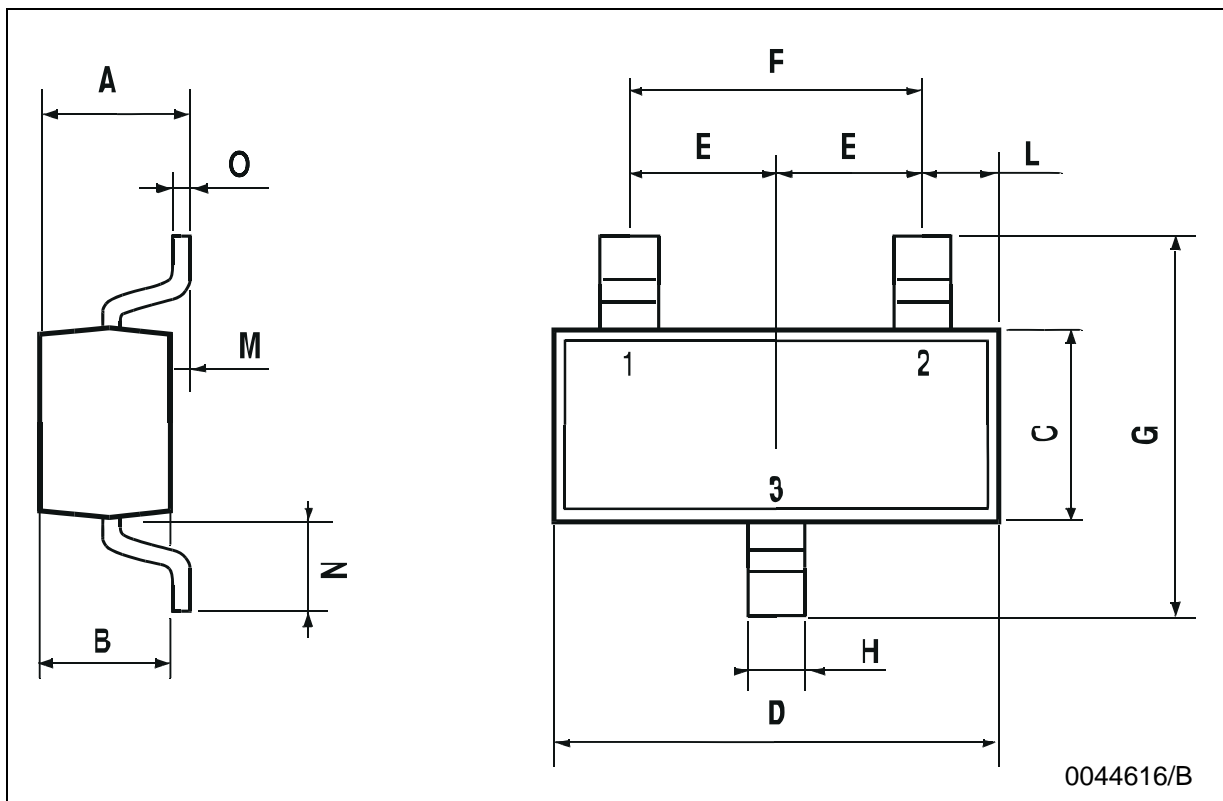
### ELECTRICAL CHARACTERISTICS ( $T_{case} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CEX}$	Collector Cut-off Current ( $V_{BE} = 3\text{ V}$ )	$V_{CE} = -30\text{ V}$			-50	nA
$I_{BEX}$	Collector Cut-off Current ( $V_{BE} = 3\text{ V}$ )	$V_{CE} = -30\text{ V}$			-50	nA
$V_{(BR)CEO}^*$	Collector-Emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = -1\text{ mA}$	-40			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_E = 0$ )	$I_C = -10\text{ }\mu\text{A}$	-60			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_C = 0$ )	$I_E = -10\text{ }\mu\text{A}$	-6			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = -10\text{ mA}$ $I_B = -1\text{ mA}$ $I_C = -50\text{ mA}$ $I_B = -5\text{ mA}$			-0.25 -0.4	V V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = -10\text{ mA}$ $I_B = -1\text{ mA}$ $I_C = -50\text{ mA}$ $I_B = -5\text{ mA}$	-0.65		-0.85 -0.95	V V
$h_{FE}^*$	DC Current Gain	$I_C = -0.1\text{ mA}$ $V_{CE} = -1\text{ V}$ $I_C = -1\text{ mA}$ $V_{CE} = -1\text{ V}$ $I_C = -10\text{ mA}$ $V_{CE} = -1\text{ V}$ $I_C = -50\text{ mA}$ $V_{CE} = -1\text{ V}$ $I_C = -100\text{ mA}$ $V_{CE} = -1\text{ V}$	60 80 100 60 30		300	
$f_T$	Transition Frequency	$I_C = -10\text{ mA}$ $V_{CE} = -20\text{ V}$ $f = 100\text{ MHz}$	250			MHz
NF	Noise Figure	$V_{CE} = -5\text{ V}$ $I_C = -0.1\text{ mA}$ $f = 10\text{ Hz}$ to $15.7\text{ KHz}$ $R_G = 1\text{ K}\Omega$		4		dB
$C_{CBO}$	Collector-Base Capacitance	$I_E = 0$ $V_{CB} = -5\text{ V}$ $f = 100\text{ KHz}$		6		pF
$C_{EBO}$	Emitter-Base Capacitance	$I_C = 0$ $V_{EB} = -0.5\text{ V}$ $f = 100\text{ KHz}$		25		pF
$t_d$	Delay Time	$I_C = -10\text{ mA}$ $I_B = -1\text{ mA}$			35	ns
$t_r$	Rise Time	$V_{CC} = -3\text{ V}$			35	ns
$t_s$	Storage Time	$I_C = -10\text{ mA}$ $I_{B1} = -I_{B2} = -1\text{ mA}$			225	ns
$t_f$	Fall Time	$V_{CC} = -3\text{ V}$			72	ns

\* Pulsed: Pulse duration =  $300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

## 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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