

# MMBT3906W

## MMBT3906W SOT-323 Silicon General Purpose Transistor (PNP)

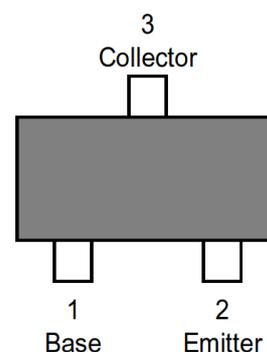
### General description

SOT-323 Silicon General Purpose Transistor (PNP)

### FEATURES

- Simplifies Circuit Design
- RoHS Compliant
- Green EMC
- Matte Tin(Sn) Lead Finish
- Weight: approx. 0.001g

Top View



### Absolute Maximum Ratings (T<sub>A</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector Base Voltage	-V <sub>CBO</sub>	40	V
Collector Emitter Voltage	-V <sub>CEO</sub>	40	V
Emitter Base Voltage	-V <sub>EBO</sub>	5	V
Collector Current	-I <sub>C</sub>	200	mA
Total Power Dissipation	P <sub>tot</sub>	200	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature Range	T <sub>stg</sub>	- 55 to +150	°C

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## Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain at $-V_{CE} = 1\text{ V}$ , $-I_C = 0.1\text{ mA}$ at $-V_{CE} = 1\text{ V}$ , $-I_C = 1\text{ mA}$ at $-V_{CE} = 1\text{ V}$ , $-I_C = 10\text{ mA}$ at - $V_{CE} = 1\text{ V}$ , $-I_C = 50\text{ mA}$ at - $V_{CE} = 1\text{ V}$ , $-I_C = 100\text{ mA}$	$h_{FE}$ $h_{FE}$ $h_{FE}$ $h_{FE}$ $h_{FE}$	60 80 100 60 30	- - 300 - -	- - - - -
Collector Emitter Cutoff Current at $-V_{CE} = 30\text{ V}$	$-I_{CES}$	-	50	nA
Emitter Base Cutoff Current at $-V_{EB} = 3\text{ V}$	$-I_{EBO}$	-	50	nA
Collector Base Breakdown Voltage at $-I_C = 10\text{ }\mu\text{A}$	$-V_{(BR)CBO}$	40	-	V
Collector Emitter Breakdown Voltage at $-I_C = 1\text{ mA}$	$-V_{(BR)CEO}$	40	-	V
Emitter Base Breakdown Voltage at $-I_E = 10\text{ }\mu\text{A}$	$-V_{(BR)EBO}$	5	-	V
Collector Emitter Saturation Voltage at $-I_C = 10\text{ mA}$ , $-I_B = 1\text{ mA}$ at $-I_C = 50$ $\text{mA}$ , $-I_B = 5\text{ mA}$	$-V_{CE(sat)}$	- -	0.25 0.4	V
Base Emitter Saturation Voltage at $-I_C = 10\text{ mA}$ , $-I_B = 1\text{ mA}$ at $-I_C$ $= 50\text{ mA}$ , $-I_B = 5\text{ mA}$	$-V_{BE(sat)}$	0.65 -	0.85 0.95	V
Transition Frequency at $-V_{CE} = 20\text{ V}$ , $I_E = 10\text{ mA}$ , $f = 100\text{ MHz}$	$f_T$	250	-	MHz
Collector Output Capacitance at $-V_{CB} = 10\text{ V}$ , $f = 100\text{ KHz}$	$C_{ob}$	-	4.5	pF
Delay Time at $-V_{CC} = 3\text{ V}$ , $-V_{BE(OFF)} = 0.5\text{ V}$ , $-I_C = 10\text{ mA}$ , $-I_{B1} = 1\text{ mA}$	$t_d$	-	35	ns
Rise Time at $-V_{CC} = 3\text{ V}$ , $-V_{BE(OFF)} = 0.5\text{ V}$ , $-I_C = 10\text{ mA}$ , $-I_{B1} = 1\text{ mA}$	$t_r$	-	35	ns
Storage Time at $-V_{CC} = 3\text{ V}$ , $-I_C = 10\text{ mA}$ , $I_{B1} = -I_{B2} = -1\text{ mA}$	$t_{stg}$	-	225	ns
Fall Time at $-V_{CC} = 3\text{ V}$ , $-I_C = 10\text{ mA}$ , $I_{B1} = -I_{B2} = -1\text{ mA}$	$t_f$	-	75	ns



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## Typical characteristics

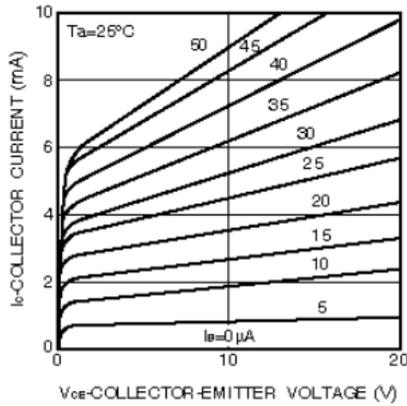


Fig.1 Grounded emitter output characteristics

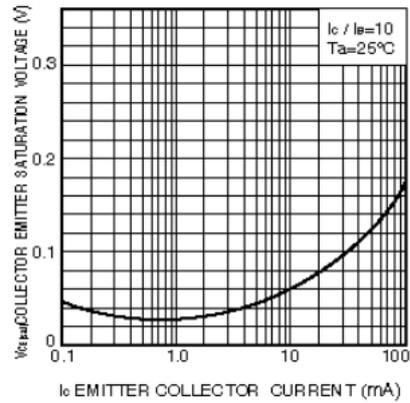


Fig.2 Collector-emitter saturation voltage vs. collector current

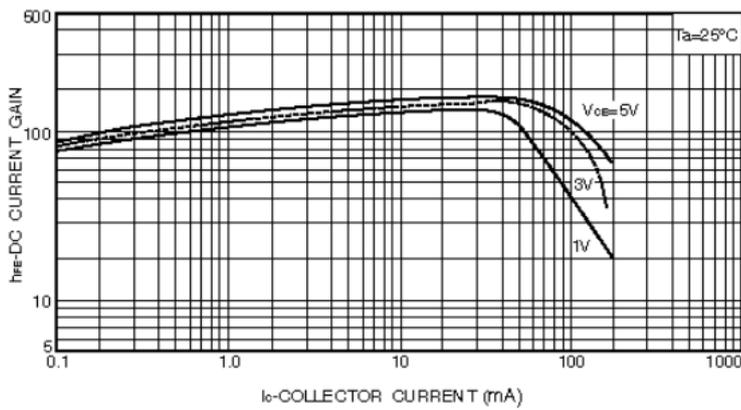


Fig.3 DC current gain vs. collector current (I)

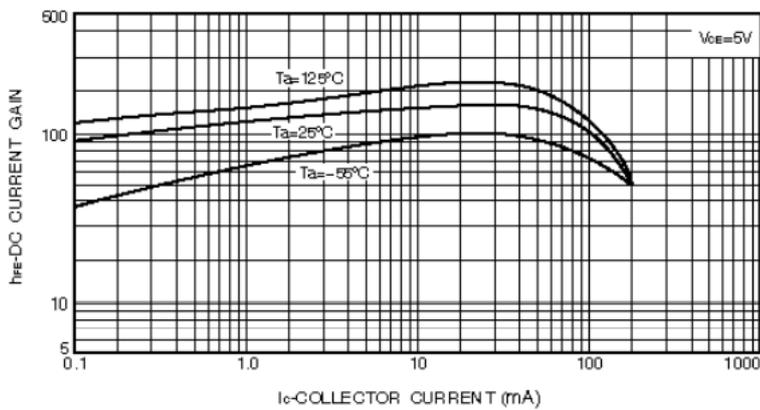


Fig.4 DC current gain vs. collector current (II)

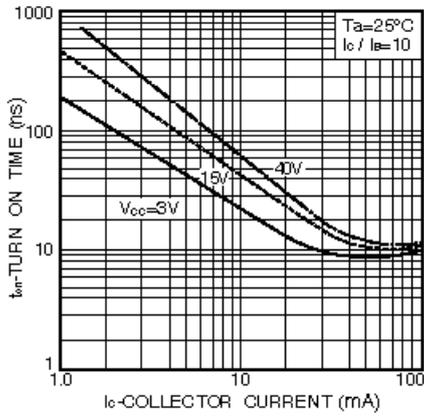


Fig.8 Turn-on time vs. collector current

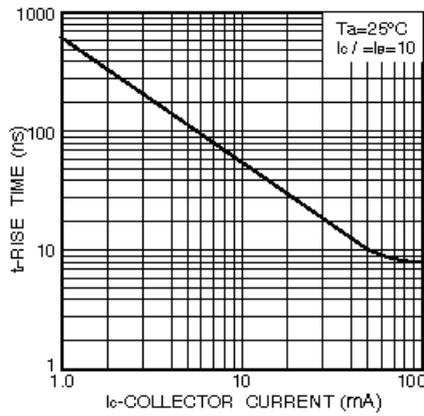


Fig.9 Rise time vs. collector current

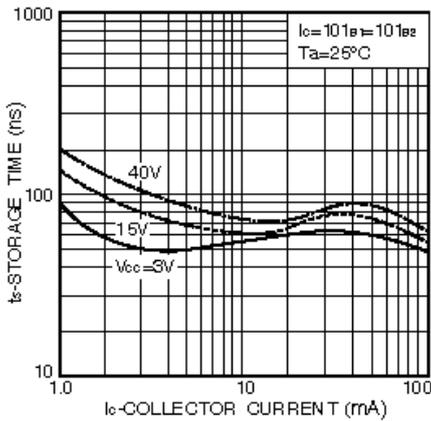


Fig.10 Storage time vs. collector current

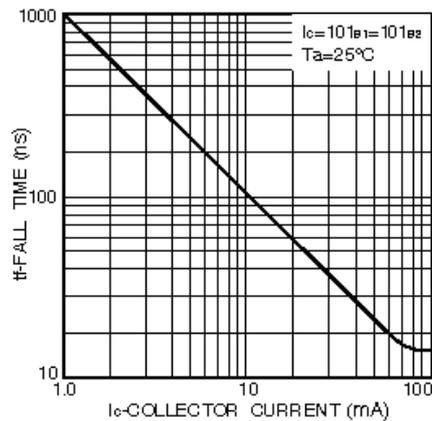


Fig.11 Fall time vs. collector current

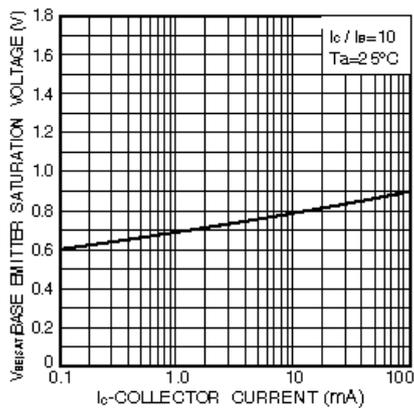


Fig.6 Base-emitter saturation voltage vs. collector current

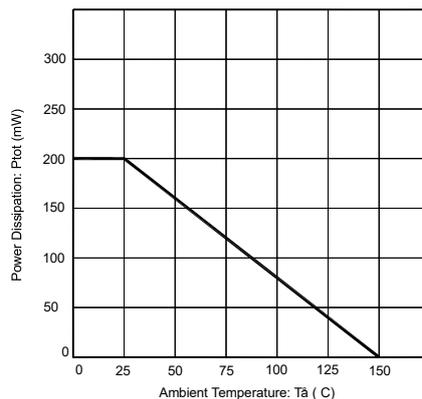
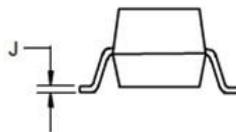
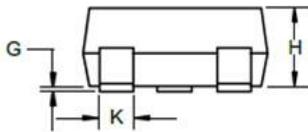
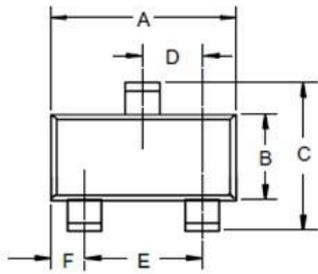


Fig.10 Power Dissipation vs Ambient Temperature



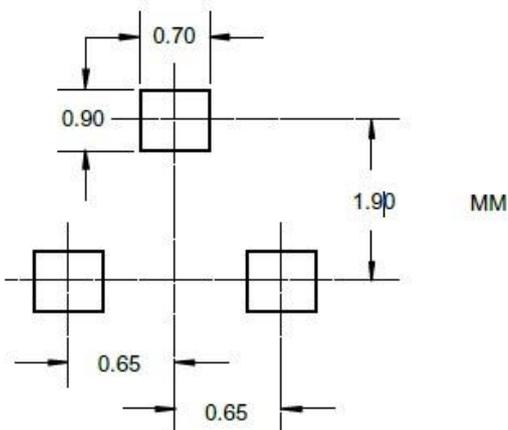
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## SOT-323 Package information



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.071	.087	1.80	2.20	
B	.045	.053	1.15	1.35	
C	.083	.096	2.10	2.45	
D	.026 Nominal		0.65Nominal		
E	.047	.055	1.20	1.40	
F	.012	.016	.30	.40	
G	.000	.004	.000	.100	
H	.035	.039	.90	1.00	
J	.004	.010	.100	.250	
K	.006	.016	.15	.40	

### Suggested Pad Layout



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