

MMBT3906T

MMBT3906T SOT-523 Silicon General Purpose Transistor (PNP)

General description

SOT-523 Silicon General Purpose Transistor (PNP)

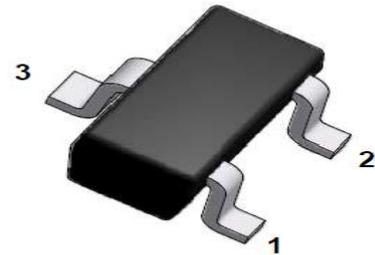
FEATURES

- Simplifies Circuit Design
- RoHS Compliant
- Green EMC
- Matte Tin(Sn) Lead Finish
- Weight: approx. 0.002g

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

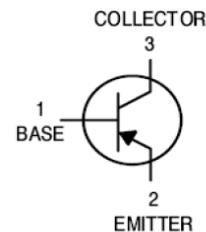
Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	-40	V
V_{CEO}	Collector-Emitter Voltage	-40	V
V_{EBO}	Emitter-Base Voltage	-5	V
I_C	Collector Current	-200	mA
P_D	Power Dissipation (FR-4 Board – minimum pad)	200	mW
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	600	$^\circ\text{C}/\text{W}$
T_J T_{STG}	Junction & Storage Temperature Range	-55 to +150	$^\circ\text{C}$

Green Product



SOT-523 (SC-75A)

Electrical Symbol:



Device Marking :

Device Type	Marking
MMBT3906T	2A or 3N

Off Characteristics

Symbol	Parameter	Test Condition	Limits		Unit
			Min	Max	
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage (Note 1)	$I_C = -1\text{mA}$, $I_B = 0\text{A}$	-40	-	Volts
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -10\mu\text{A}$, $I_E = 0\text{A}$	-40	-	Volts
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10\mu\text{A}$, $I_B = 0\text{A}$	-5	-	Volts
I_{BL}	Base Cutoff Current	$V_{CE} = -30\text{V}$, $V_{EB} = -3\text{V}$	-	-50	nA
I_{CEX}	Collector Cutoff Current	$V_{CE} = -30\text{V}$, $V_{EB} = -3\text{V}$	-	-50	nA

Note 1: Pulse Test. Pulse width <300us, Duty cycle < 2.0%

MMBT3906T

On Characteristics

Symbol	Parameter	Test Condition	Limits		Unit
			Min	Max	
H_{FE}	DC Current Gain	$I_C = -0.1\text{mA}, V_{CE} = -1\text{V}$	60	-	-
		$I_C = -1.0\text{mA}, V_{CE} = -1\text{V}$	80	-	
		$I_C = -10\text{mA}, V_{CE} = -1\text{V}$	100	300	
		$I_C = -50\text{mA}, V_{CE} = -1\text{V}$	60	-	
		$I_C = -100\text{mA}, V_{CE} = -1\text{V}$	30	-	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -10\text{mA}, I_B = -1\text{mA}$	-	0.25	Volts
		$I_C = -50\text{mA}, I_B = -5\text{mA}$	-	0.4	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = -10\text{mA}, I_B = -1\text{mA}$	0.65	0.85	Volts
		$I_C = -50\text{mA}, I_B = -5\text{mA}$	-	0.95	

Small-signal Characteristics

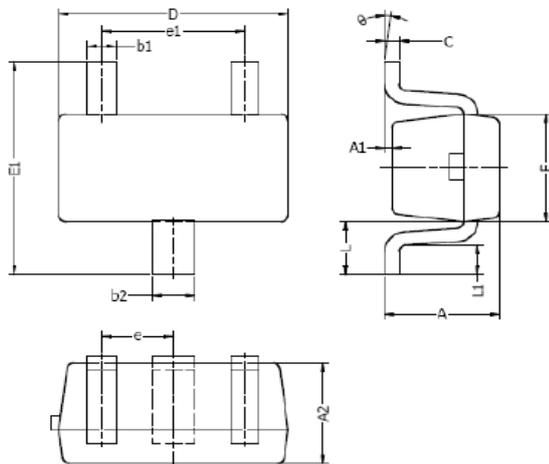
Symbol	Parameter	Test Condition	Limits		Unit
			Min	Max	
f_T	Current-Gain-Bandwidth Product	$I_C = -10\text{mA}, V_{CE} = -20\text{V}, f = 100\text{MHz}$	250	-	MHz
C_{obo}	Output Capacitance	$V_{CB} = -5\text{V}, I_E = 0\text{A}, f = 1.0\text{MHz}$	-	4.5	pF
C_{ibo}	Input Capacitance	$V_{BE} = -0.5\text{V}, I_C = 0\text{A}, f = 1.0\text{MHz}$	-	10	pF
h_{ie}	Input Impedance	$V_{CE} = -10\text{V}, I_C = -1\text{mA}, f = 1.0\text{kHz}$	2	12	pF
h_{re}	Voltage Feedback Ratio	$V_{CE} = -10\text{V}, I_C = -1\text{mA}, f = 1.0\text{kHz}$	0.1	10	$\times 10^{-4}$
h_{fe}	Small-signal Current Gain	$V_{CE} = -10\text{V}, I_C = -1\text{mA}, f = 1.0\text{kHz}$	100	400	-
h_{oe}	Output Admittance	$V_{CE} = -10\text{V}, I_C = -1\text{mA}, f = 1.0\text{kHz}$	3	60	μmhos
NF	Noise Figure	$V_{CE} = -5\text{V}, I_C = -100\mu\text{A}$ $R_s = 1.0\text{k}\Omega, f = 1.0\text{kHz}$		4	dB

Switching Characteristics

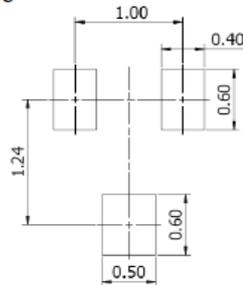
Symbol	Parameter	Test Condition	Limits		Unit
			Min	Max	
t_d	Delay Time	$V_{CC} = -3\text{V}, V_{BE} = -0.5\text{V},$	-	35	nS
t_r	Rise Time	$I_C = -10\text{mA}, I_{B1} = -1\text{mA}$	-	35	
t_s	Storage Time	$V_{CC} = -3\text{V}, I_C = -10\text{mA},$	-	225	nS
t_f	Fall Time	$I_{B1} = I_{B2} = -1\text{mA}$	-	75	

MMBT3906T

SOT-523 PACKAGE OUTLINE



Typical Soldering Pattern:



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.70	0.90	0.028	0.035
A1	0.00	0.10	0.000	0.004
A2	0.70	0.80	0.028	0.031
b1	0.15	0.25	0.006	0.010
b2	0.25	0.35	0.010	0.014
c	0.10	0.20	0.004	0.008
D	1.50	1.70	0.059	0.067
E	0.70	0.90	0.028	0.035
E1	1.45	1.75	0.057	0.069
e	0.50 TYP.		0.020 TYP.	
e1	0.90	1.10	0.035	0.043
L	0.40 REF.		0.016 REF.	
L1	0.10	0.30	0.004	0.012
θ	0°	8°	0°	8°

NOTES:

1. Above package outline conforms to JEITA EAIJ ED-7500A SC-75A.
2. Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.

Important Notice and Disclaimer

DOESHARE has used reasonable care in preparing the information included in this document, but DOESHARE does not warrant that such information is error free. DOESHARE assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.

DOESHARE no warranty, representation or guarantee regarding the documents, circuits and products specification, DOESHARE reservation rights to make changes for any documents, products, circuits and specifications at any time without notice.

Purchasers are solely responsible for the choice, selection and use of the DOESHARE products and services described herein, and DOESHARE assumes no liability whatsoever relating to the choice, selection or use of the products and services described herein.

No license, express or implied, by implication or otherwise under any intellectual property rights of DOESHARE.

Resale of DOESHARE products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by DOESHARE for the DOESHARE product or service described herein and shall not create or extend in any manner whatsoever, any liability of DOESHARE.