

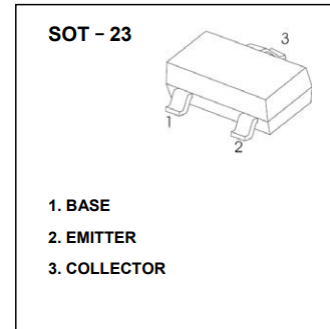


## AD-MMBT3906 series Plastic-Encapsulated Transistor

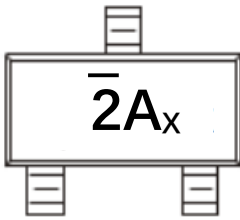
### AD-MMBT3906 series Transistor (PNP)

#### FEATURES

- Complementary to AD-MMBT3904 series
- AEC-Q101 qualified



#### MARKING



$\bar{2}A$  = Device code  
X = Date code

**MAXIMUM RATINGS ( $T_j = 25^\circ\text{C}$  unless otherwise specified)**

Parameter	Symbol	Value	Unit
Collector-base voltage	$V_{CB0}$	-40	V
Collector-emitter voltage	$V_{CEO}$	-40	V
Emitter-base voltage	$V_{EBO}$	-5	V
Collector continuous current	$I_C^{1)}$	-200	mA
Collector power dissipation	$P_C^{1)}$	200	mW
Thermal resistance from junction to ambient	$R_{\theta JA}^{2)}$	625	$^\circ\text{C}/\text{W}$
Operating junction and storage temperature range	$T_j, T_{stg}$	-55 ~ 150	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS ( $T_j = 25^\circ\text{C}$  unless otherwise specified)**

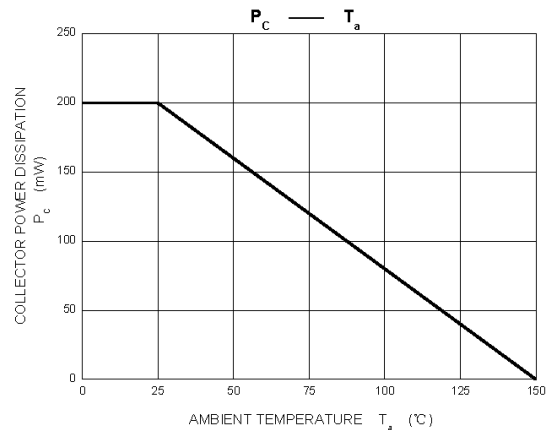
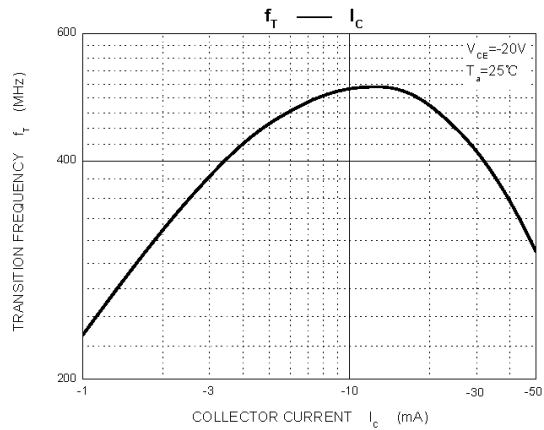
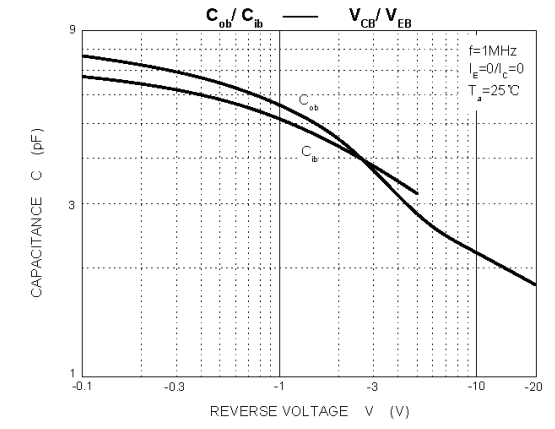
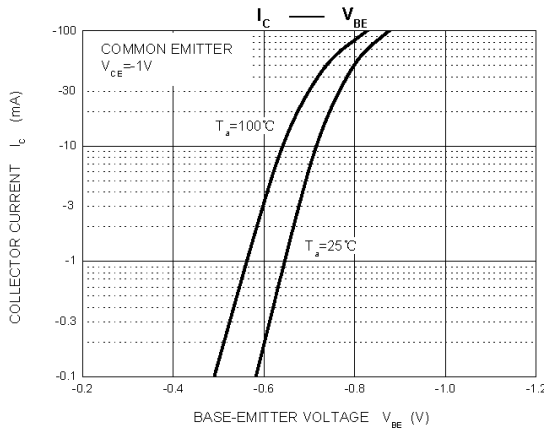
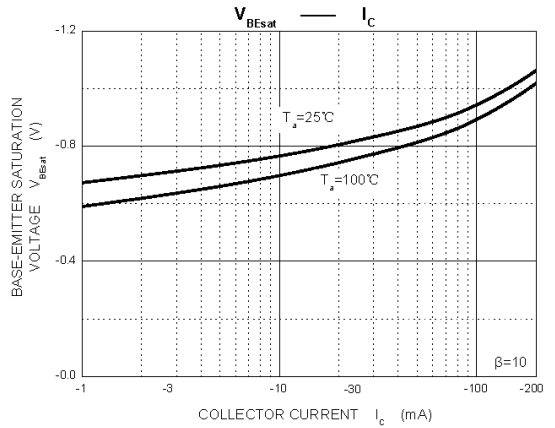
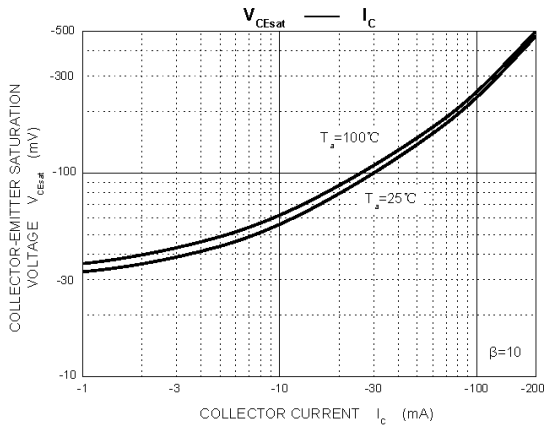
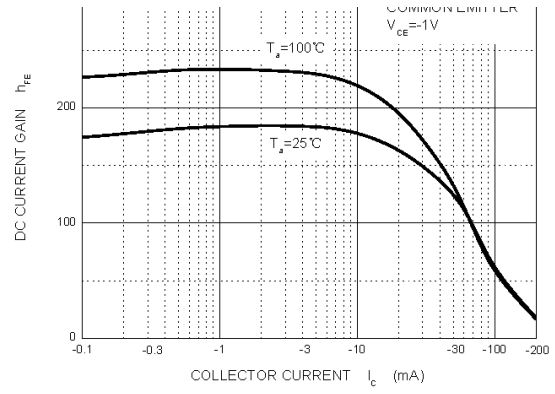
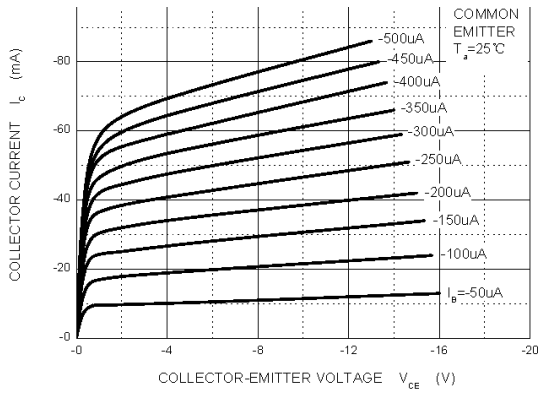
Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CB0}$	$I_C = -10\mu\text{A}, I_E = 0\text{A}$	-40	-	-	V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -1\text{mA}, I_B = 0\text{A}$	-40	-	-	V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -10\mu\text{A}, I_C = 0\text{A}$	-5	-	-	V
Collector-emitter cut-off current	$I_{CEX}$	$V_{CE} = -30\text{V}, V_{BE(off)} = -3\text{V}$	-	-	-50	nA
Collector-base cut-off current	$I_{CBO}$	$V_{CB} = -40\text{V}, I_E = 0\text{A}$	-	-	-100	nA
Emitter-base cut-off current	$I_{EBO}$	$V_{EB} = -5\text{V}, I_C = 0\text{A}$	-	-	-100	nA
DC current gain	$h_{FE(1)}$	$V_{CE} = -1\text{V}, I_C = -10\text{mA}$	100	-	300	-
	$h_{FE(2)}$	$V_{CE} = -1\text{V}, I_C = -50\text{mA}$	60	-	-	
	$h_{FE(3)}$	$V_{CE} = -2\text{V}, I_C = -100\text{mA}$	30	-	-	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -50\text{mA}, I_B = -5\text{mA}$	-	-	-0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = -50\text{mA}, I_B = -5\text{mA}$	-	-	-0.95	V
Transition frequency	$f_T$	$V_{CE} = -20\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$	300	-	-	MHz
Delay time	$t_d$	$V_{CC} = -3\text{V}, V_{BE} = -0.5\text{V}, I_C = -10\text{mA}, I_{B1} = I_{B2} = -1\text{mA}$	-	-	35	ns
Rise time	$t_r$	$V_{CC} = -3\text{V}, V_{BE} = -0.5\text{V}, I_C = -10\text{mA}, I_{B1} = I_{B2} = -1\text{mA}$	-	-	35	ns
Storage time	$t_s$	$V_{CC} = -3\text{V}, I_C = -10\text{mA}, I_{B1} = I_{B2} = -1\text{mA}$	-	-	225	ns
Fall time	$t_f$	$V_{CC} = -3\text{V}, I_C = -10\text{mA}, I_{B1} = I_{B2} = -1\text{mA}$	-	-	75	ns

**CLASSIFICATION OF  $h_{FE(1)}$** 

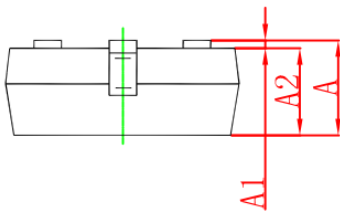
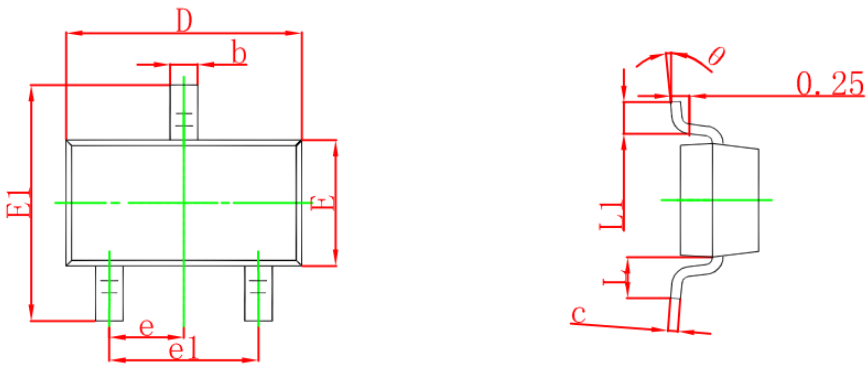
HFE	100 ~ 300	
RANK	AD-MMBT3906-L	AD-MMBT3906-H
RANGE	100 ~ 200	200 ~ 300

1) Maximum allowed temperature  $T_j = 25^\circ\text{C}$ .2) Measured with the device mounted on 1 inch<sup>2</sup> FR-4 board with 1oz. copper, in a still air environment with  $T_a = 25^\circ\text{C}$ .

TYPICAL CHARACTERISTICS

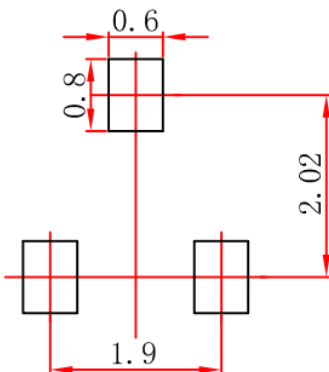


## SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
theta	0°	8°	0°	8°

## SOT-23 SUGGESTED PAD LAYOUT

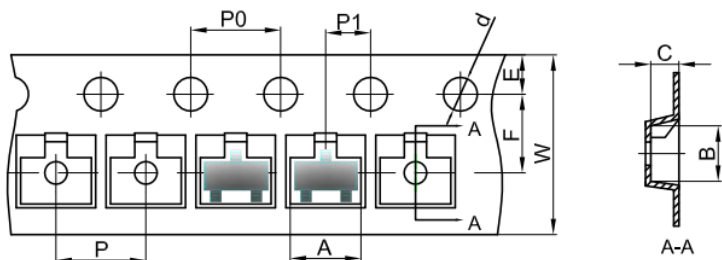


## Note:

1. Controlling dimension in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purpose only.

### SOT-23 TAPE AND REEL

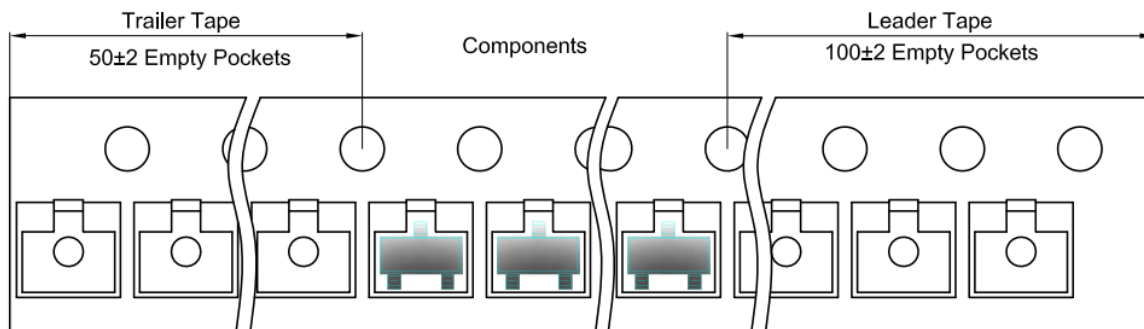
#### SOT-23 Embossed Carrier Tape



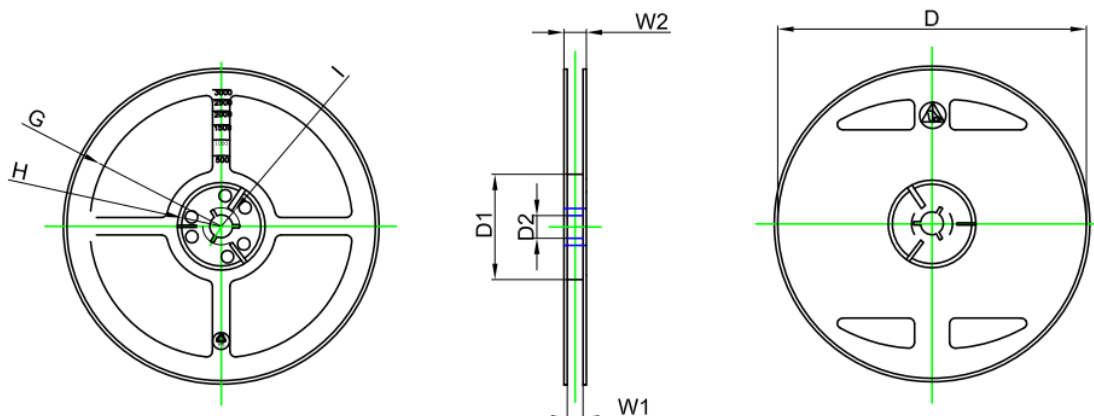
**Packaging Description:**  
 SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

#### SOT-23 Tape Leader and Trailer



#### SOT-23 Reel(S)



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R9.35	9.50	12.00

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	203×203×195	180,000 pcs	438×438×220	

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