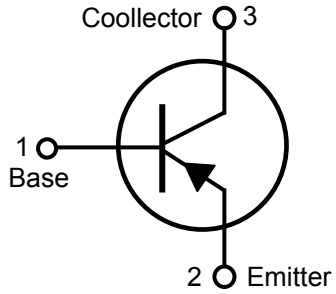
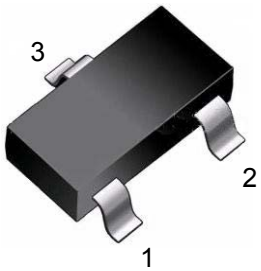
PNP型 小功率 贴片开关三极管 PNP Switching Transistor SMD	HMBT3906 HMBT3906LT1 PNP，BEC General Purpose Transistors 对应其他工业型号 2N3906 MMBT3906 MMBT3906LT1 HMMBT3906LT1
■Excellent hFE linearity ■Low noise ■Complementary to HMBT3904 ■Transistor Polarity: PNP ■Transistor pinout: BEC ■SOT-23 Package ■Marking Code: 2A ■hFE: 100~200, 200~300	

Inner circuit	HMBT3906	元件标识（打印）
	 1. Base 2. Emitter 3. Coollector	
SOT-23 内部结构	SOT-23 管脚排列	DEVICE MARKING

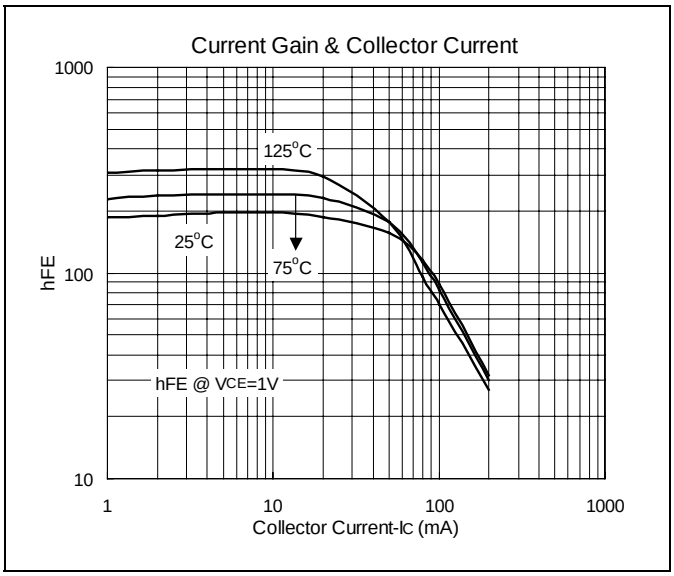
■ DEVICE MARKING 元件标识（打印）对应放大系数

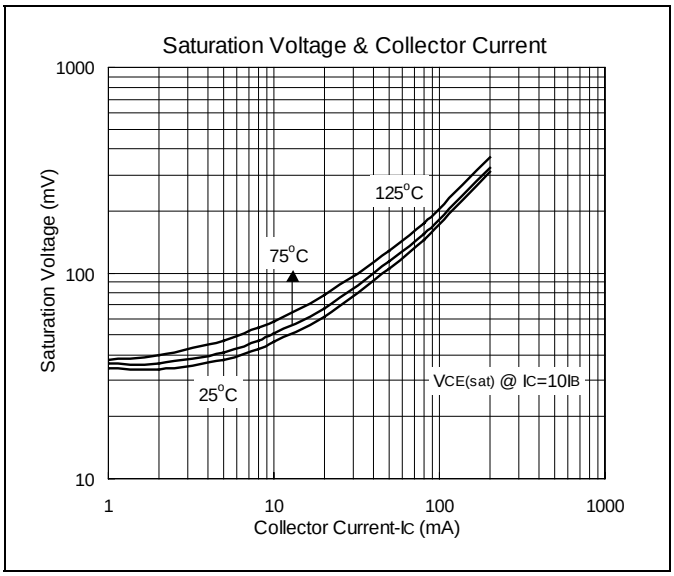
HMBT3906	L	H
MARKING	2A	2A
hFE	100~200	200~300

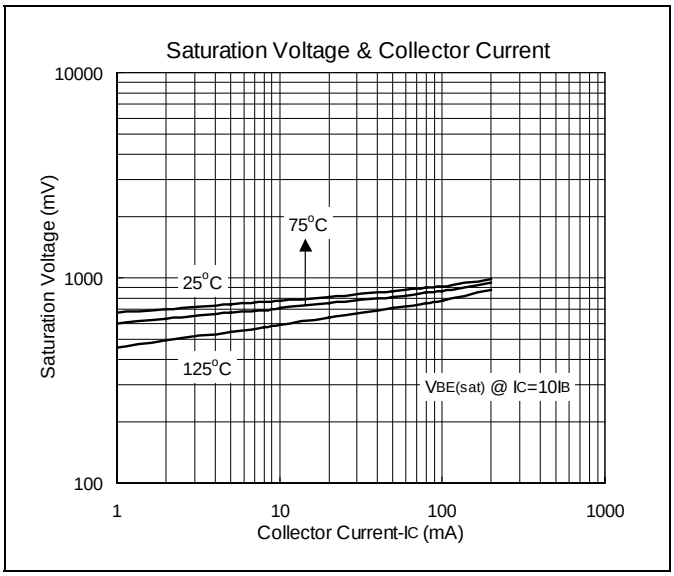
■ MAXIMUM RATINGS 最大额定值

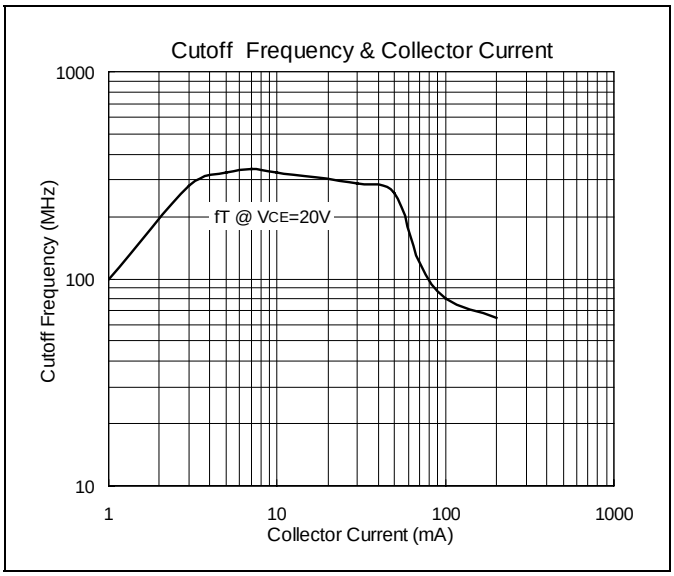
Characteristic 特性参数		Symbol 符号	Rating 额定值	Unit 单位
Collector-Base Voltage 集电极-基极电压		V_{CBO}	-40	V
Collector-Emitter Voltage 集电极-发射极电压		V_{CEO}	-40	
Emitter-Base Voltage 发射极-基极电压		V_{EBO}	-6.0	
Collector Current-Continuous 集电极电流-连续		I_C	-200	mA
Total Device Dissipation 总耗散功率	FR-5 Board (1)	P_D	225	mW
	Derate above25℃ 超过25℃递减		1.8	mW/℃
	Alumina Substrate氧化铝衬底(2) T_A=25℃		300	mW
	Derate above25℃ 超过25℃ 递减		2.4	mW/℃
Thermal Resistance Junction to Ambient 热阻		$R_{\Theta JA}$	417	℃/W
Junction Temperature 结温		T_j	150	℃
Storage Temperature Range 储存温度		T_{stg}	-55~+150	
Solder Temperature/Solder Time 焊接温度/焊接时间		T/t	260/10	℃/S

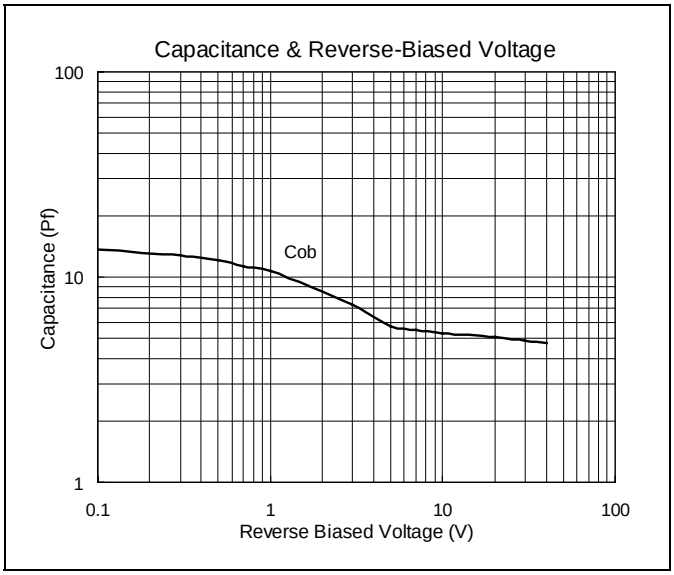
Characteristics Curve

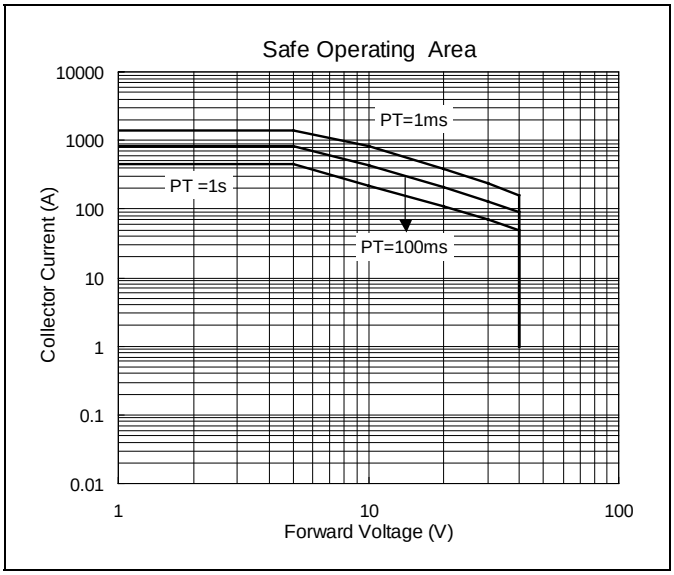












■ ELECTRICAL CHARACTERISTICS 电特性 (T_A=25℃ unless otherwise noted 如无特殊说明，温度为25℃)

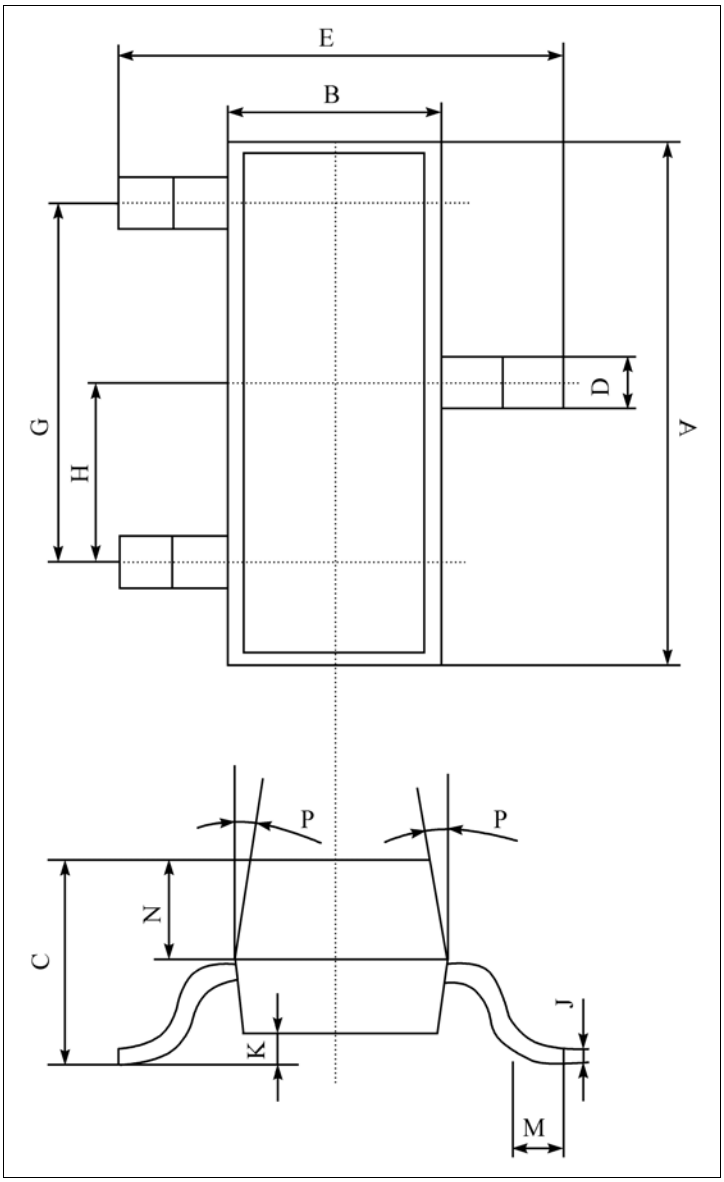
Characteristic 特性参数	Test Condition 测试条件	Symbol 符号	Min 最小值	Typ 典型值	Max 最大值	Unit 单位
Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 (3)	I_B=0, I_C=-1mA	$V_{(BR)CEO}$	-40	--	--	V
Collector-Base Breakdown Voltage 集电极-基极击穿电压	I_E=0, I_C=-10μA	$V_{(BR)CBO}$	-40	--	--	
Emitter-Base Breakdown Votlage 发射极-基极击穿电压	I_C=0, I_E=-10μA	$V_{(BR)EBO}$	-6.0	--	--	
Base Cutoff Current 基极截止电流	V_{CE}=-30V, V_{EB}=-3V	I_{BEX}	--	--	-50	nA
Collector Cutoff Current 集电极截止电流	V_{CE}=-30V, V_{EB}=-3V	I_{CEX}	--	--	-50	
DC Current Gain 直流电流增益	I_C=-0.1mA, V_{CE}=-1V	hFE	40	--	--	
	I_C=-1mA, V_{CE}=-1V		70	--	--	
	I_C=-10mA, V_{CE}=-1V		100	--	300	
	I_C=-50mA, V_{CE}=-1V		60	--	--	
	I_C=-100mA,V_{CE}=-1V		30	--	300	
Collector-Emitter Saturation Voltage 集电极-发射极饱和压降	I_C=-10mA, I_B=-1mA	$V_{CE(sat)}$	--	--	0.25	V
	I_C=-50mA, I_B=-5mA		--	--	0.40	
Base-Emitter Saturation Voltage 基极-发射极饱和压降	I_C=-10mA, I_B=-1mA	$V_{BE(sat)}$	0.65	--	0.85	
	I_C=-50mA, I_B=-5mA		--	--	0.95	
Current-Gain-Bandwidth Product 电流增益-带宽乘积	I_C=-10mA, V_{CE}=-20V f=100MHz	f_T	300	--	--	MHz
Collector Output Capacitance 输出电容	V_{CB}=-5V,I_E=0,f=1MHz	C_{OB}	--	--	4.0	pF
Intput Capacitance 输入电容	V_{EB}=-0.5V,I_C=0,f=1MHz	C_{ibo}	--	--	8.0	
Intput Impedance 输入阻抗	I_C=-1mA,V_{CE}=-10V,f=1kHz	hie	1.0	--	10	KΩ
Voltage Feedback Radio 电压反馈系数	I_C=-1mA,V_{CE}=-10V,f=1kHz	hre	0.5	--	8.0	$\times10^{-4}$
Small-Signal Current Gain 小信号电流增益	I_C=-1mA,V_{CE}=-10V,f=1kHz	hFE	100	--	400	
Output Admittance 输出导纳	I_C=-1mA,V_{CE}=-10V,f=1kHz	hoe	1.0	--	40	μΩ
Noise Figure 噪声系数	I_C=-100uA,V_{CE}=-5V,Rs=1KΩ,f=1kHz	NF	--	--	5.0	db

■ SWITCHING CHARACTERISTICS 開關特性

Characteristic 特性参数		Symbol 符号	Min 最小值	Max 最大值	Unit 单位
Delay Time 延迟时间	V_{CC}=-30V, $V_{BE(off)}$=-0.5V I_C=-10mA, I_B1=-1mA	t_d	--	35	nS
Rise Time 上升时间		t_r	--	35	
Storage Time 储存时间	V_{CC}=-30V, I_C=-10mA I_B1 = I_B2 = -1mA	t_s	--	225	
Fall Time 下降时间		t_f	--	75	

1. FR-5 = 1.0 ×0.75 ×0.062 in.
2. Alumina = 0.4 ×0.3 ×0.024 in.99.5% alumina.
3. Pulse Width ≤300us; Duty Cycle ≤2.0%.
4. Pulse Test: Pulse Width ≤300us; Duty Cycle ≤2.0%.

■ DIMENSION 外形封装尺寸数据



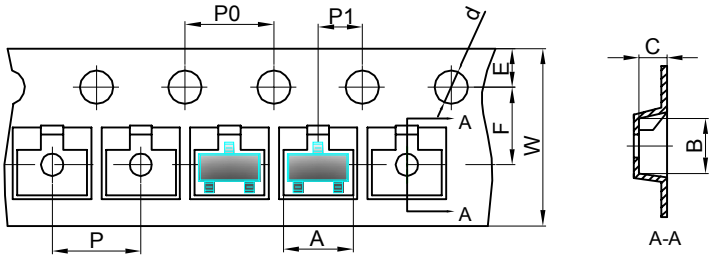
单位（UNIT）：mm

序号	数值及公差
A	2.90±0.10
B	1.30±0.10
C	1.00±0.10
D	0.40±0.10
E	2.40±0.20
G	1.90±0.10
H	0.95±0.05
J	0.13±0.05
K	0.00-0.10
M	≥0.20
N	0.60±0.10
P	7±2°

Packing
SOT-23 包装规格
SMD片式表面贴封装
包装方式: 载带卷盘包装
Tape & Reel, 3Kpcs/Reel
每卷数量3000只（3Kpcs/Reel）
每盒数量45000只（45Kpcs/BOX）
每箱数量180000只（180Kpcs/Cartons）

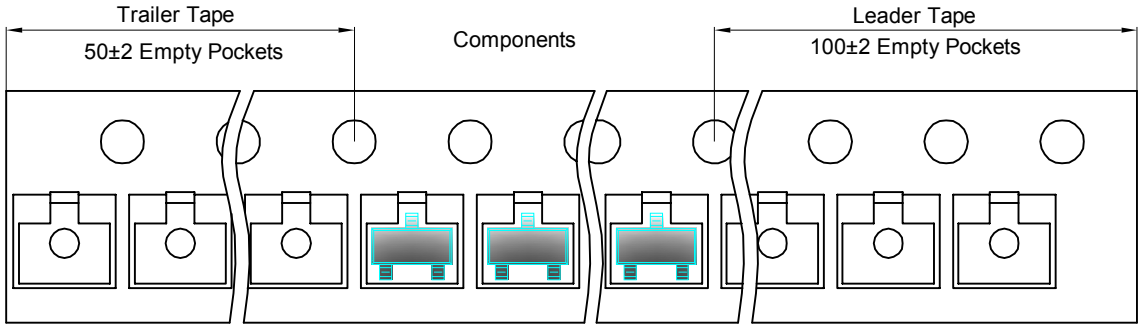
SOT-23 Tape and reel

SOT-23 Embossed Carrier Tape

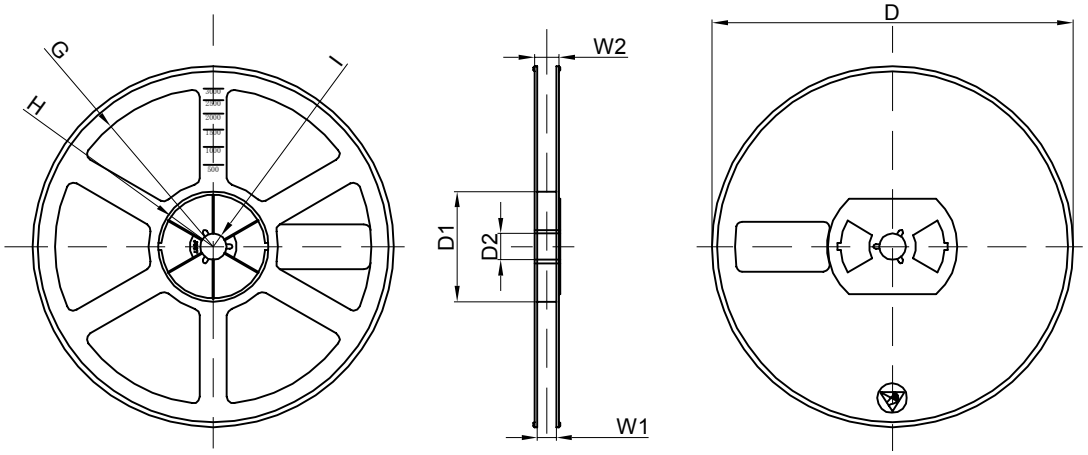


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer



SOT-23 Reel



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	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	