

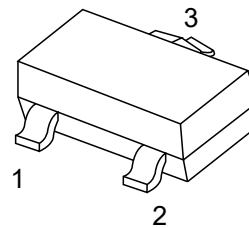
1.Features

- Small Package
- Complementary to MMBT3906T
- MMBT3904 TRANSISTOR (NPN)

2.Pinning Information

Pin	Symbol	Description
1	B	BASE
2	E	EMITTER
3	C	COLLECTOR

SOT-23



3.Absolute Maximum Ratings $T_A = 25^{\circ}\text{C}$

Parameter	Symbol	Value	Units
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current -Continuous	I_C	200	mA
Collector Dissipation	P_C	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	$^{\circ}\text{C}/\text{W}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 to 150	$^{\circ}\text{C}$



4. Electrical Characteristics $T_A = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Collector-base breakdown voltage	V_{CBO}	$I_C=100\mu\text{A}$, $I_E=0$	60			V
Collector-emitter breakdown voltage	V_{CEO}	$I_C=1\text{mA}$, $I_B=0$	40			V
Emitter-base breakdown voltage	V_{EBO}	$I_E=100\mu\text{A}$, $I_C=0$	6			V
Collector-base cut-off current	I_{CBO}	$V_{CB}=60\text{V}$, $I_E=0$			100	nA
Collector cut-off current	I_{CEX}	$V_{CE}=30\text{V}$, $V_{BE(off)}=3\text{V}$			50	nA
Emitter cut-off current	I_{EBO}	$V_{EB}=5\text{V}$, $I_C=0$			100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=10\text{mA}$, $I_B=1\text{mA}$			0.2	V
		$I_C=50\text{mA}$, $I_B=5\text{mA}$			0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=10\text{mA}$, $I_B=1\text{mA}$	0.65		0.85	V
		$I_C=50\text{mA}$, $I_B=5\text{mA}$			0.95	V
DC current gain	$h_{FE(1)}$	$V_{CE}=1.0\text{V}$, $I_C=0.1\text{mA}$	40			
	$h_{FE(2)}$	$V_{CE}=1.0\text{V}$, $I_C=1\text{mA}$	70			
	$h_{FE(3)}$	$V_{CE}=1.0\text{V}$, $I_C=10\text{mA}$	100		300	
	$h_{FE(4)}$	$V_{CE}=1.0\text{V}$, $I_C=50\text{mA}$	60			
Delay time	t_d	$V_{CC}=3\text{V}$, $V_{BE(off)}=-0.5\text{V}$			35	ns
Rise time	t_r	$I_C=10\text{mA}$, $I_{B1}=1\text{mA}$			35	ns
Storage time	t_s	$V_{CC}=3\text{V}$, $I_C=10\text{mA}$			200	ns
Fall time	t_f	$I_{B1}=I_{B2}=1\text{mA}$			50	ns
Collector output capacitance	C_{ob}	$V_{CB}=5\text{V}$, $I_E=0$, $f=1\text{MHz}$			4	pF
Base input capacitance	C_{ib}	$V_{EB}=0.5\text{V}$, $I_C=0$, $f=1\text{MHz}$			8	pF
Transition frequency	f_T	$V_{CE}=20\text{V}$, $I_C=10\text{mA}$, $f=100\text{MHz}$	300			MHz



5. Typical Characteristics

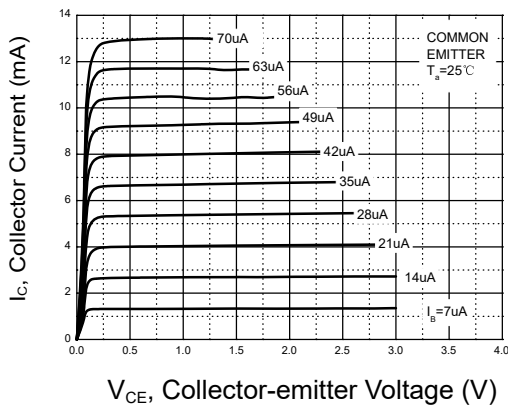
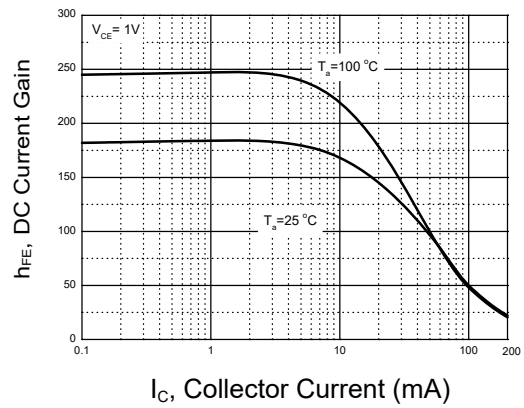
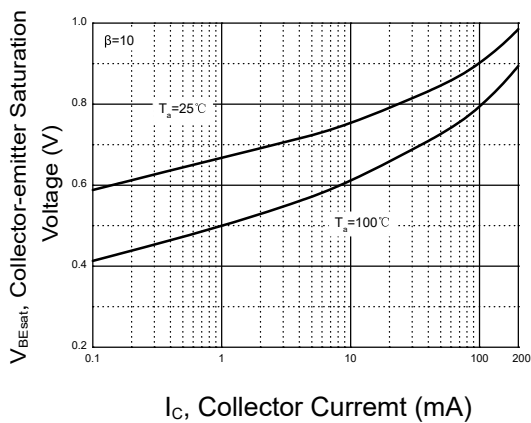
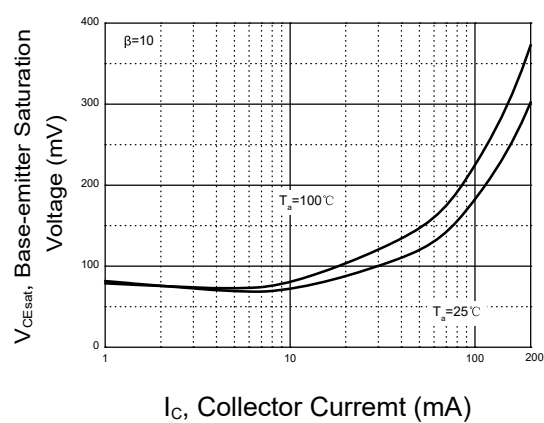
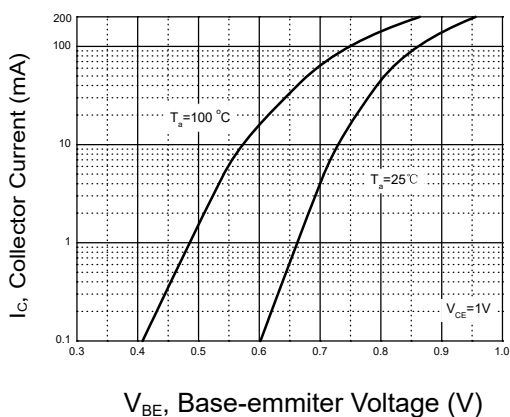
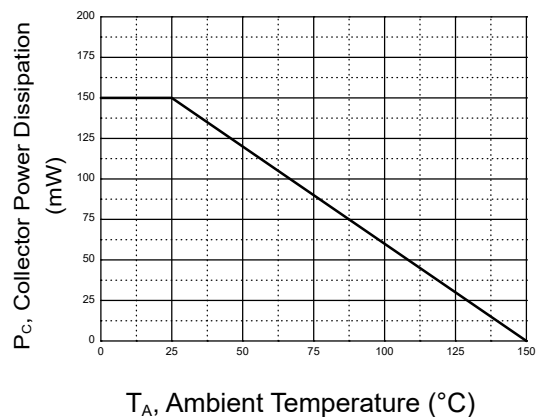
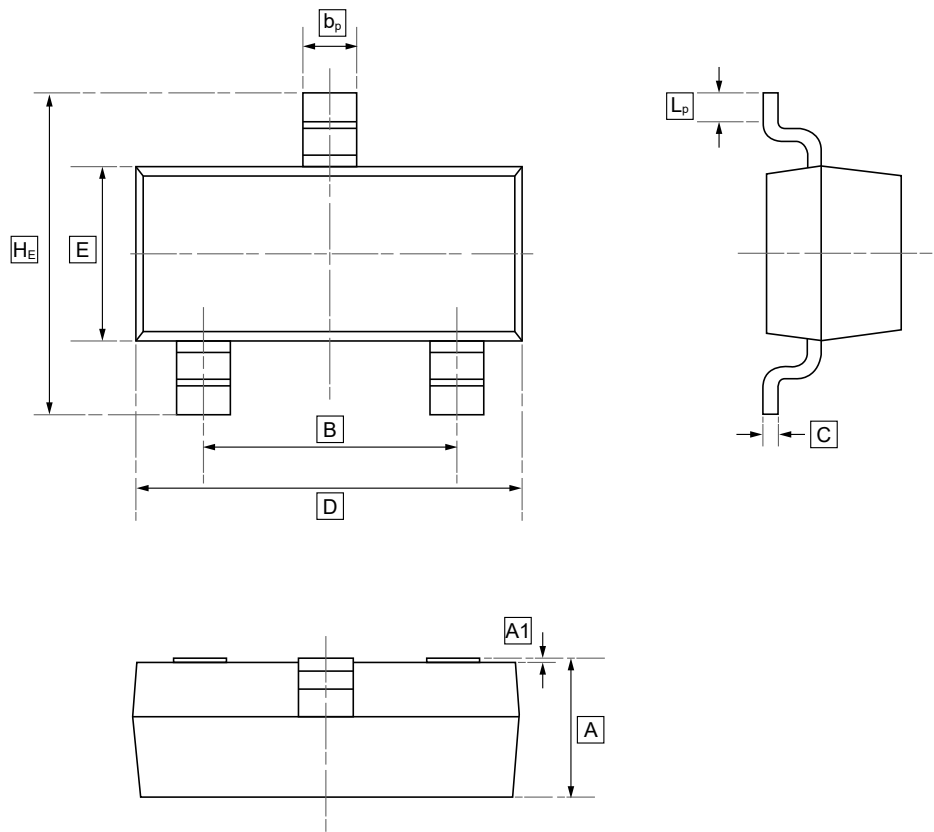


Figure 1: Static Characteristic

Figure 2: h_{FE} — I_C Figure 3: V_{BEsat} — I_C Figure 4: V_{CEsat} — I_C Figure 5: I_C — V_{BE} Figure 6: P_C — T_A



6.SOT-23 Package Outline Dimensions

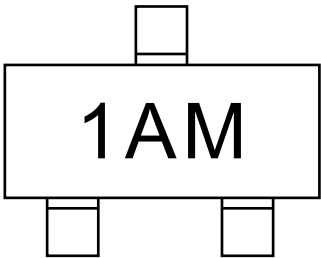


DIMENSIONS (mm are the original dimensions)

Symbol	A	B	b _p	C	D	E	H _E	A1	L _p
Min	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20
Max	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50



7.Ordering information



Order Code	Package	Base QTY	Delivery Mode
UMW MMBT3904	SOT-23	3000	Tape and reel



8.Disclaimer

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