

SOT-23 Plastic-Encapsulate Transistors

FEATURES

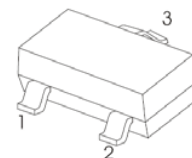
- As complementary type, the NPN transistor TKMMBT3904 is Recommended
- Epitaxial planar die construction

MARKING: 2A

MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
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 -Continuous	-0.2	A
P_C	Collector Dissipation	0.2	W
$R_{\theta JA}$	Thermal resistance junction to ambient	625	$^{\circ}\text{C}/\text{W}$
T_J	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55~+150	$^{\circ}\text{C}$

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1. BASE
2. EMITTER
3. COLLECTOR

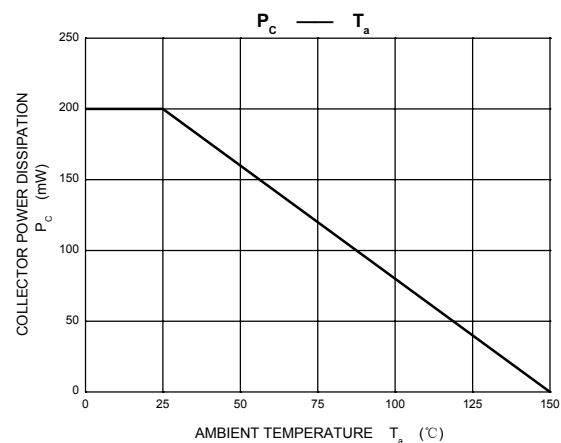
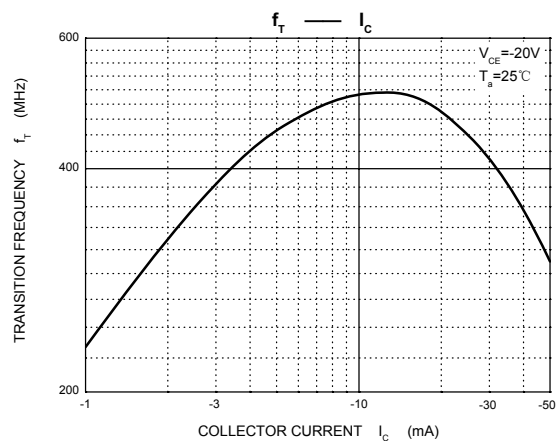
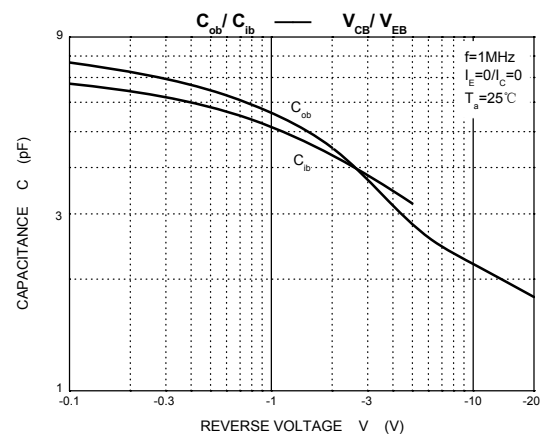
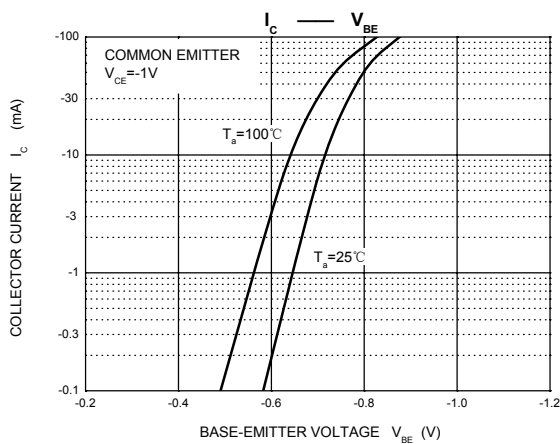
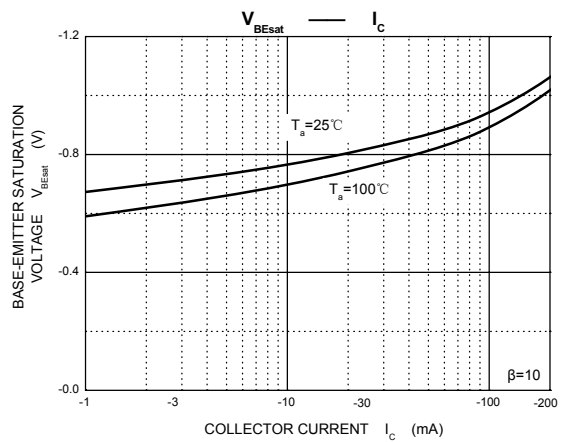
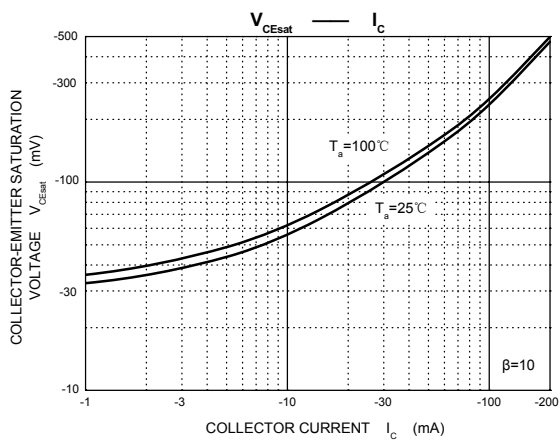
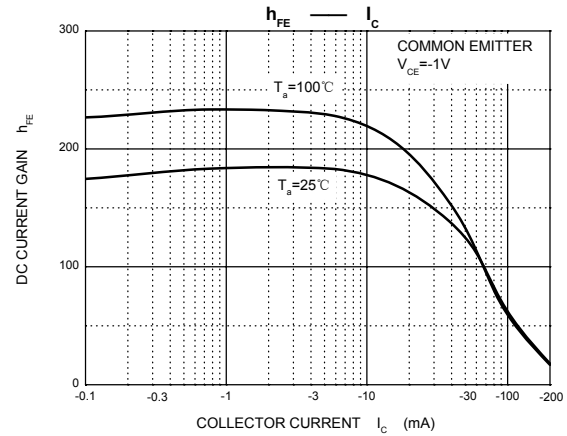
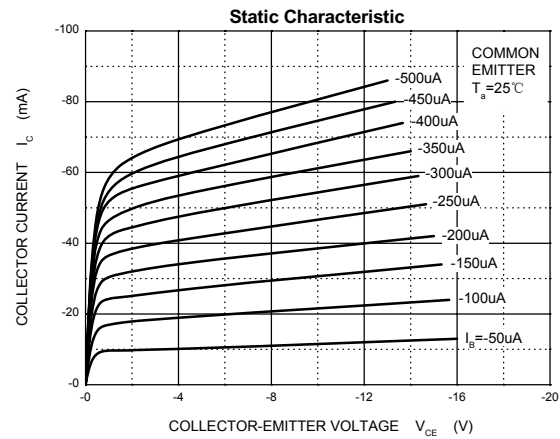
ELECTRICAL CHARACTERISTICS ($T_{amb}=25^{\circ}\text{C}$ unless otherwise specified)

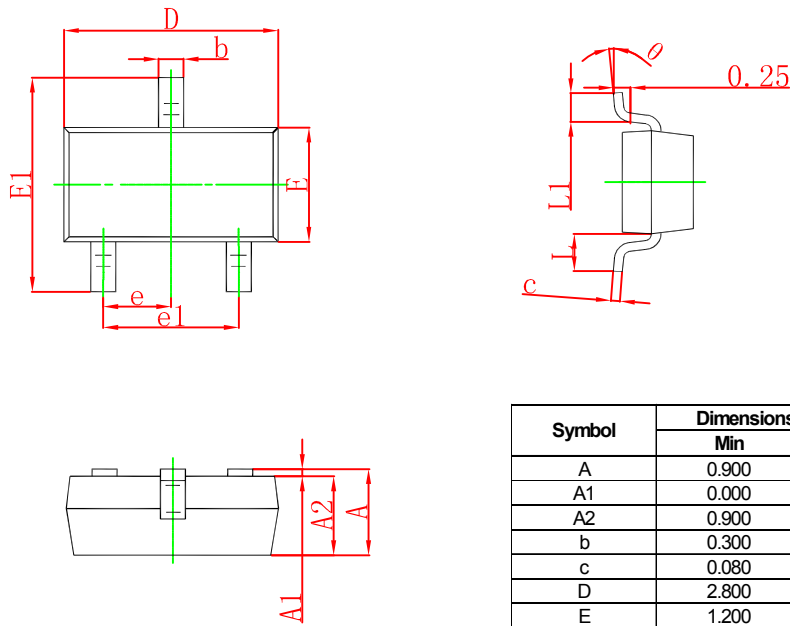
Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}$, $I_E=0$	-40		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=-1\text{mA}$, $I_B=0$	-40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}$, $I_C=0$	-5		V
Collector cut-off current	I_{CBO}	$V_{CB}=-40\text{V}$, $I_E=0$		-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
DC current gain	h_{FE1}	$V_{CE}=-1\text{V}$, $I_C=-10\text{mA}$	100	300	
	h_{FE2}	$V_{CE}=-1\text{V}$, $I_C=-50\text{mA}$	60		
	h_{FE3}	$V_{CE}=-2\text{V}$, $I_C=-100\text{mA}$	30		
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C=-50\text{mA}$, $I_B=-5\text{mA}$		-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			35	nS
Storage Time	t_s	$V_{CC}=-3\text{V}$, $I_C=-10\text{mA}$		225	nS
Fall Time	t_f	$I_{B1}=I_{B2}=-1\text{mA}$		75	nS

CLASSIFICATION OF $h_{FE(1)}$

HFE	100-300
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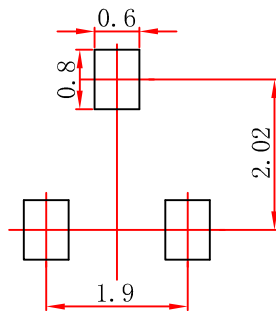
Typical Characteristics





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
θ	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 purposes only.