

SOT-23 Plastic-Encapsulate Transistor (NPN)

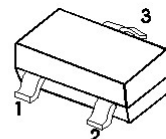
Feature

- Complementary to MMBT2907
- Power Dissipation of 250mW
- High Stability and High Reliability

Mechanical Data

- SOT-23 Small Outline Plastic
- Package Epoxy UL: 94V-0
- Mounting Position: Any

SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

Marking: M1B

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

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	75	V
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter -Base Voltage	V_{EBO}	6	V
Collector Current-Continuous	I_C	600	mA
Collector Power Dissipation	P_C	250	mW
Junction Temperature	T_j	150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-55-+150	$^{\circ}\text{C}$
Thermal resistance From junction to ambient	$R_{\theta JA}$	500	$^{\circ}\text{C/W}$

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Limit		Unit
			Min	Max	
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\mu\text{A}, I_E=0$	75		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=10\text{mA}, I_B=0$	30		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu\text{A}, I_C=0$	6		V
Collector cut-off current	I_{CEX}	$V_{CE}=30\text{V}, V_{EB}(\text{off})=3\text{V}$		10	nA
Collector cut-off current	I_{CBO}	$V_{CB}=60\text{V}, I_E=0$		10	nA
Emitter cut-off current	I_{EBO}	$V_{EB}=3\text{V}, I_C=0$		100	nA
DC current gain	$h_{FE(1)*}$	$V_{CE}=10\text{V}, I_C=150\text{mA}$	100	300	
	$h_{FE(2)*}$	$V_{CE}=10\text{V}, I_C=0.1\text{mA}$	40		
	$h_{FE(3)*}$	$V_{CE}=10\text{V}, I_C=500\text{mA}$	42		
Collector-emitter saturation voltage	$V_{CE(sat)1*}$	$I_C=500\text{mA}, I_B=50\text{mA}$		1.00	V
Collector-emitter saturation voltage	$V_{CE(sat)2*}$	$I_C=150\text{mA}, I_B=15\text{mA}$		0.30	V
Base -emitter saturation voltage	$V_{BE(sat)*}$	$I_C=500\text{mA}, I_B=50\text{mA}$		1.20	V
Transition frequency	f_T	$V_{CE}=20\text{V}, I_C=20\text{mA}, f=100\text{MHz}$	300		MHz
Delay time	t_d	$V_{CC}=30\text{V}, V_{BE}(\text{off})=-0.5\text{V}, I_C=150\text{mA}, I_{B1}=15\text{mA}$		10	nS
Rise time	t_r			25	nS
Storage time	t_s			225	nS
Fall time	t_f	$V_{CC}=30\text{V}, I_C=150\text{mA}, I_{B1}=I_{B2}=15\text{mA}$		60	nS

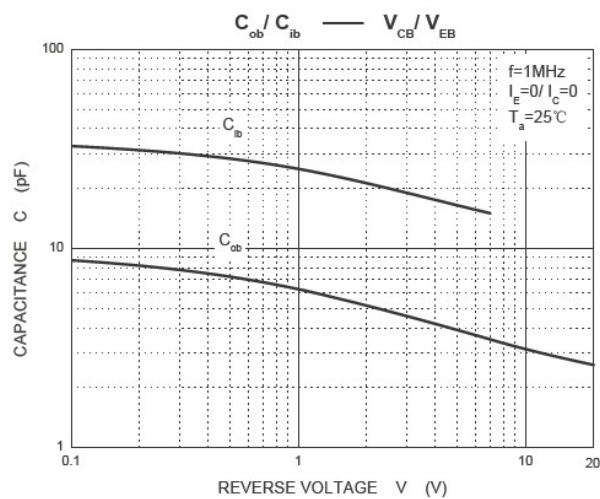
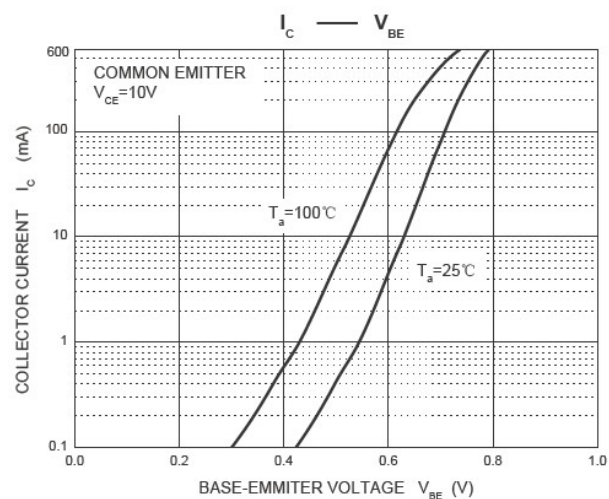
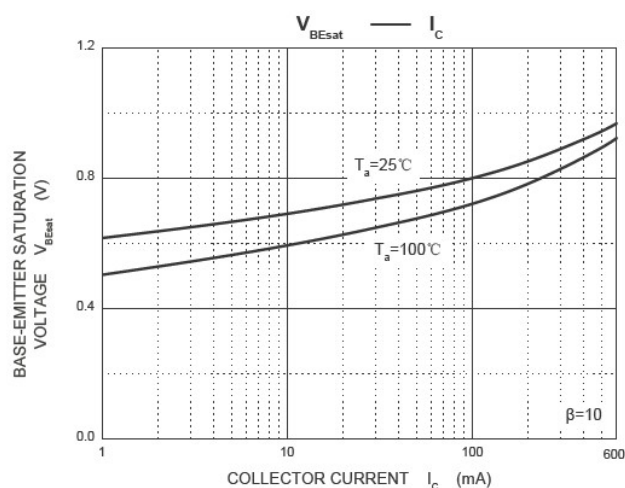
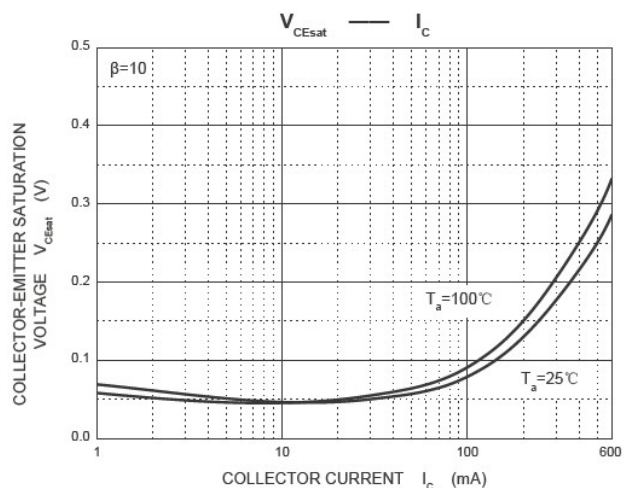
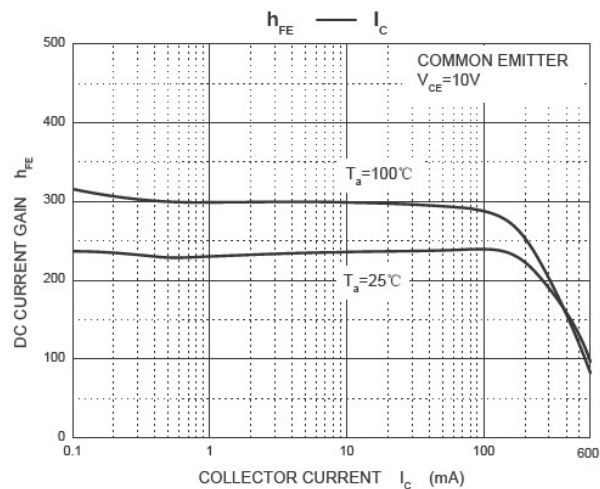
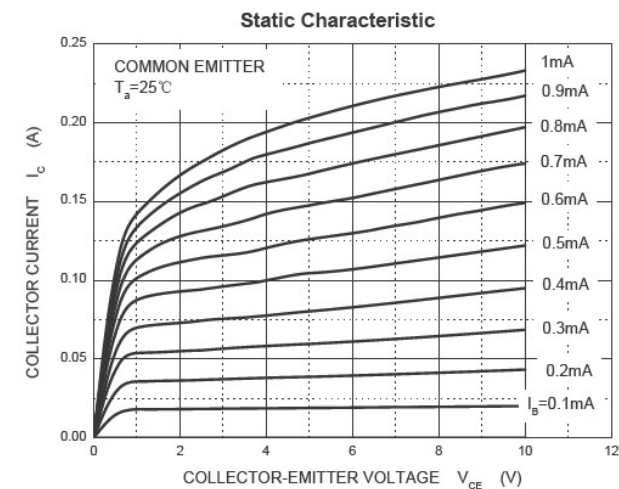
*Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2.0\%$.

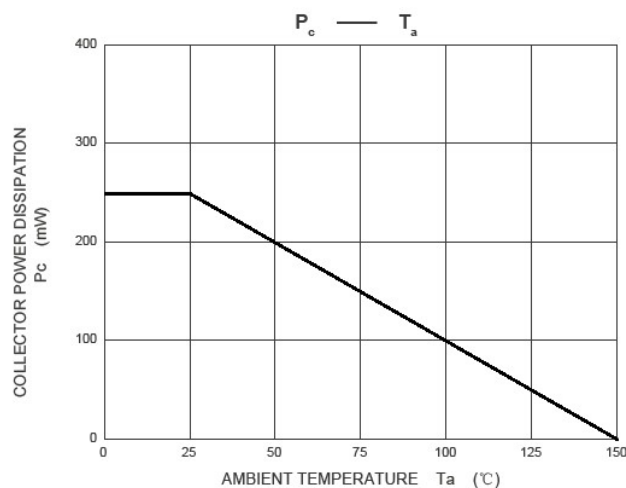
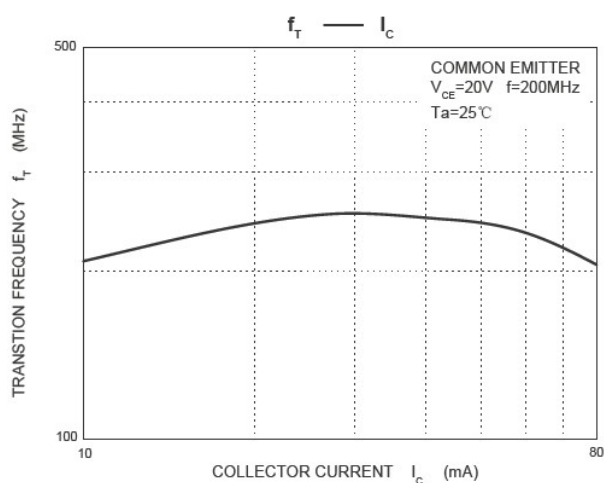
Classification of h_{FE}

h_{FE}	100~300	
Rank	L	H
Range	100~200	200~300

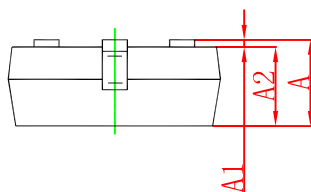
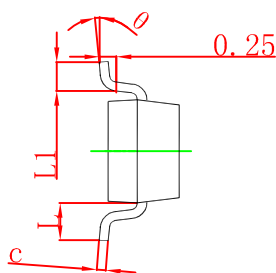
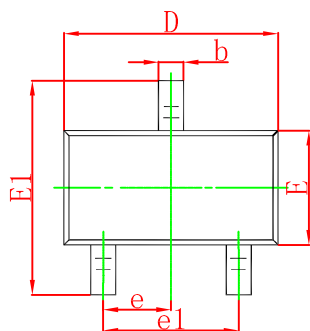


Typical Characteristics



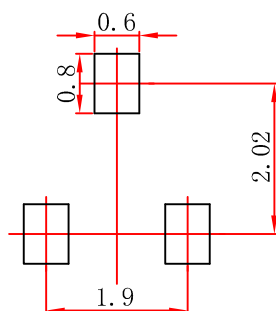


SOT-23 Package Dimension



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



Notes:

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