



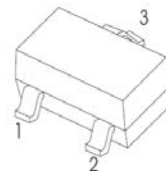
SOT-23 Plastic-Encapsulate Transistors (NPN)

Feature

- Low Noise and High Gain
- High Power Gain

SOT-23

1. BASE
2. EMITTER
3. COLLECTOR



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

Symbol	Parameter	Value	Unit
V_{CB0}	Collector-Base Voltage	20	V
V_{CE0}	Collector-Emitter Voltage	12	V
V_{EB0}	Emitter-Base Voltage	3	V
I_C	Collector Current	100	mA
P_C	Collector Power Dissipation	200	mW
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	625	$^{\circ}\text{C/W}$
T_j, T_{stg}	Operation Junction and Storage Temperature Range	$-55 \sim +150$	$^{\circ}\text{C}$

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

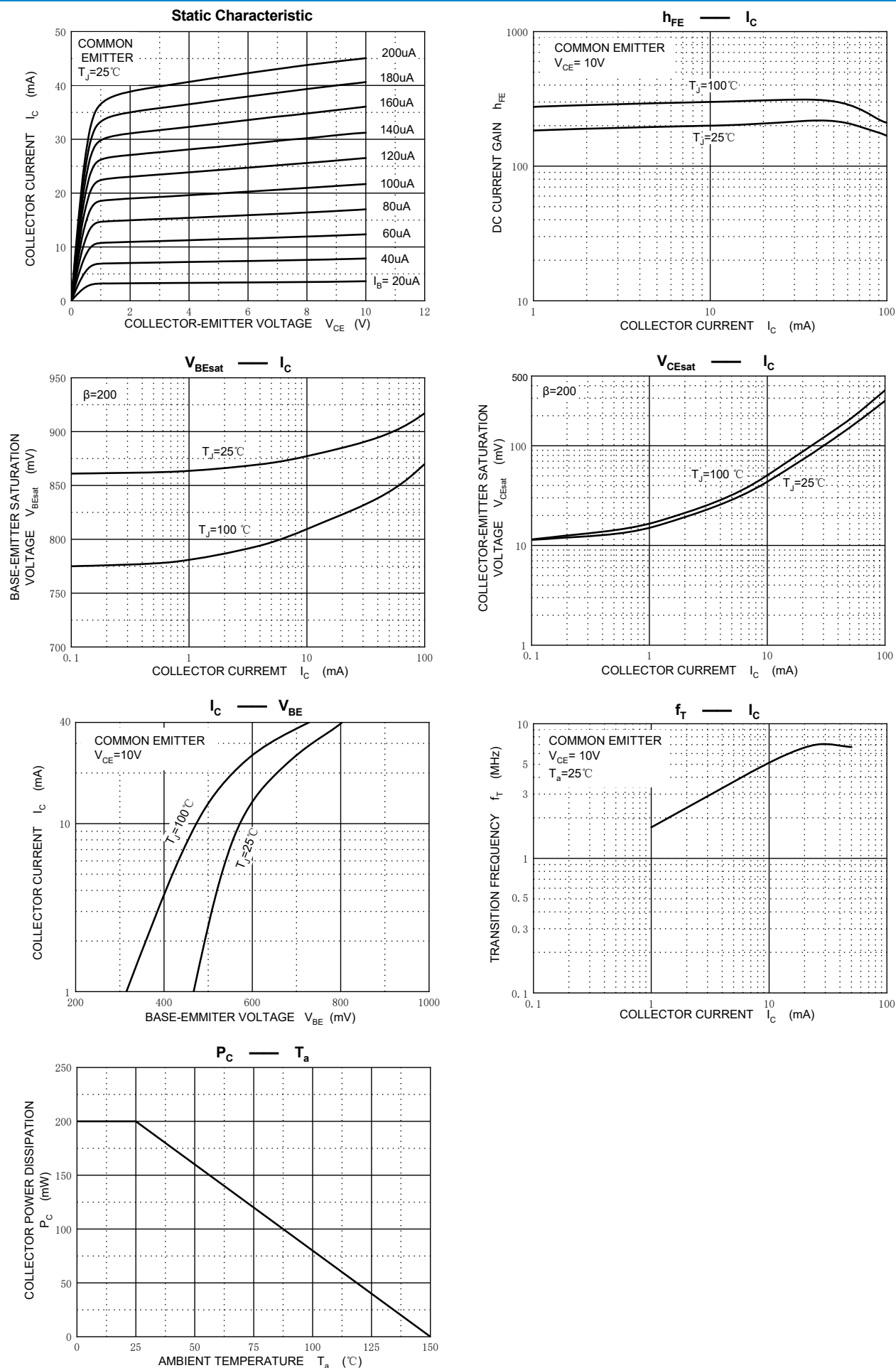
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu\text{A}, I_E=0$	20			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1\text{mA}, I_B=0$	12			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu\text{A}, I_C=0$	3			V
Collector cut-off current	I_{CBO}	$V_{CB}=10\text{V}, I_E=0$			1	μA
Emitter cut-off current	I_{EBO}	$V_{EB}=1\text{V}, I_C=0$			1	μA
DC current gain	$h_{FE(1)}$	$V_{CE}=10\text{V}, I_C=20\text{mA}$	50		250	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=50\text{mA}, I_B=5\text{mA}$			0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=50\text{mA}, I_B=5\text{mA}$			1.15	V
Transition frequency	f_T	$V_{CE}=10\text{V}, I_C=20\text{mA}$		7		GHz
Collector output capacitance	C_{ob}	$V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$		0.8	1	pF
Noise Figure	N_F	$V_{CB}=10\text{V}, I_C=7\text{mA}, f=1\text{GHz}$		1.65	2	dB

Classification of $h_{FE(1)}$

Range	50 - 100	80 - 160	125 - 250
Marking	R23	R24	R25

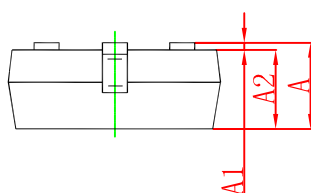
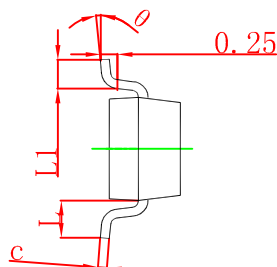
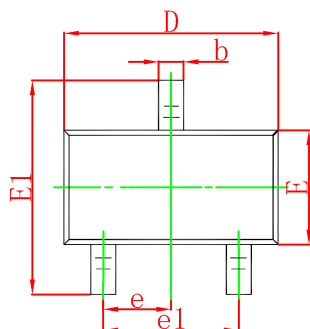


Typical Characteristics



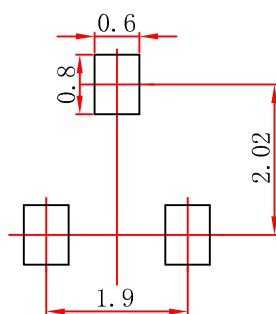


SOT-23 Package Outline Dimensions



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
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.