



TRANSISTOR (NPN)

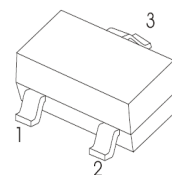
## FEATURES

- High Transition Frequency
- Low Saturation Voltage

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

Symbol	Parameter	Value	Unit
$V_{\text{CBO}}$	Collector-Base Voltage	40	V
$V_{\text{CEO}}$	Collector-Emitter Voltage	15	V
$V_{\text{EBO}}$	Emitter-Base Voltage	5	V
$I_{\text{C}}$	Collector Current	200	mA
$P_{\text{C}}$	Collector Power Dissipation	150	mW
$R_{\theta\text{JA}}$	Thermal Resistance From Junction To Ambient	833	$^{\circ}\text{C}/\text{W}$
$T_{\text{J}}$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{\text{stg}}$	Storage Temperature	-55~+150	$^{\circ}\text{C}$

SOT - 23



1. BASE
2. EMITTER
3. COLLECTOR

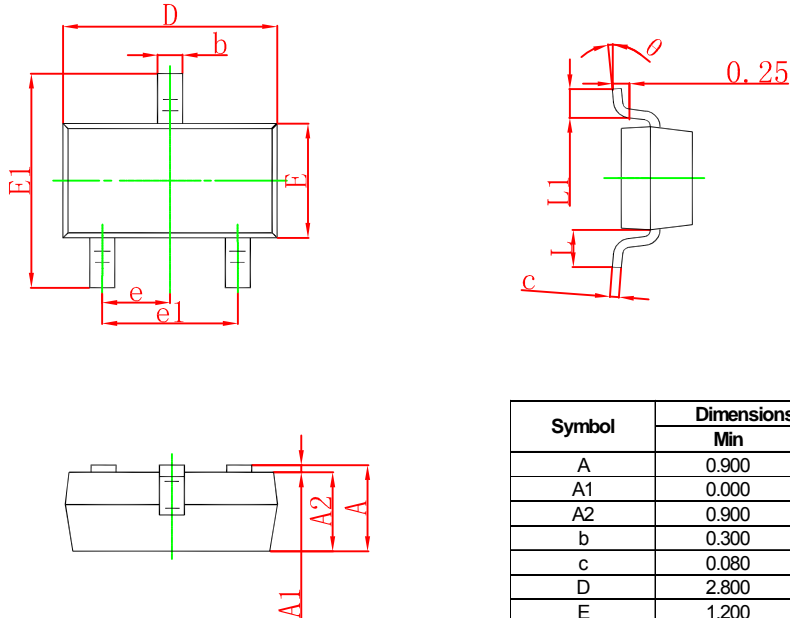
ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}\text{C}$  unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(\text{BR})\text{CBO}}$	$I_{\text{C}}=100\mu\text{A}$ , $I_{\text{E}}=0$	40			V
Collector-emitter breakdown voltage	$V_{(\text{BR})\text{CEO}}$	$I_{\text{C}}=1\text{mA}$ , $I_{\text{B}}=0$	15			V
Emitter-base breakdown voltage	$V_{(\text{BR})\text{EBO}}$	$I_{\text{E}}=100\mu\text{A}$ , $I_{\text{C}}=0$	5			V
Collector cut-off current	$I_{\text{CBO}}$	$V_{\text{CB}}=40\text{V}$ , $I_{\text{E}}=0$			0.1	$\mu\text{A}$
Emitter cut-off current	$I_{\text{EBO}}$	$V_{\text{EB}}=5\text{V}$ , $I_{\text{C}}=0$			0.1	$\mu\text{A}$
DC current gain	$h_{\text{FE}(1)}$	$V_{\text{CE}}=1\text{V}$ , $I_{\text{C}}=10\text{mA}$	40		240	
	$h_{\text{FE}(2)}$	$V_{\text{CE}}=1\text{V}$ , $I_{\text{C}}=100\text{mA}$	20			
Collector-emitter saturation voltage	$V_{\text{CE(sat)}}$	$I_{\text{C}}=20\text{mA}$ , $I_{\text{B}}=1\text{mA}$			0.3	V
Base-emitter saturation voltage	$V_{\text{BE(sat)}}$	$I_{\text{C}}=20\text{mA}$ , $I_{\text{B}}=1\text{mA}$			1	V
Transition frequency	$f_{\text{T}}$	$V_{\text{CE}}=10\text{V}$ , $I_{\text{C}}=10\text{mA}$	200			MHz
Collector output capacitance	$C_{\text{ob}}$	$V_{\text{CB}}=10\text{V}$ , $I_{\text{E}}=0$ , $f=1\text{MHz}$			6	pF

CLASSIFICATION OF  $h_{\text{FE}(1)}$ 

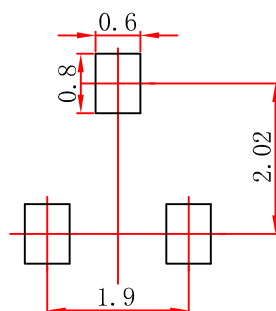
RANK	R	O	Y
RANGE	40 - 80	70 - 140	120 - 240
MARKING	CHR	CHO	CHY

## 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.