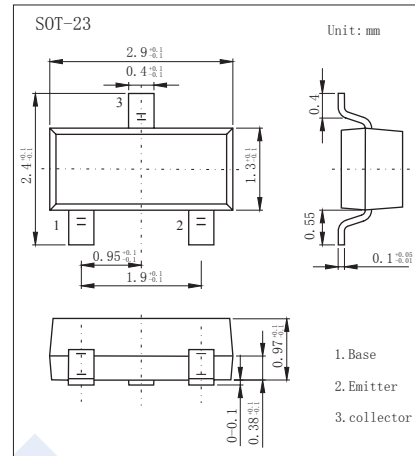


## PNP Transistors

## 2SA1411

## ■ Features

- Very high DC current gain:  $h_{FE}=500$  to  $1600$ .
- High  $V_{EBO}$  Voltage:  $V_{EBO}=-10V$

■ Absolute Maximum Ratings  $T_a = 25^\circ C$ 

Parameter	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	-25	V
Collector-emitter voltage	$V_{CEO}$	-25	V
Emitter-base voltage	$V_{EBO}$	-10	V
Collector current	$I_c$	-150	mA
Total power dissipation at $25^\circ C$ ambient temperature	$P_T$	200	mW
Junction temperature	$T_j$	150	$^\circ C$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ C$

■ Electrical Characteristics  $T_a = 25^\circ C$ 

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	$V_{CBO}$	$I_c = -100 \mu A, I_E = 0$	-25			V
Collector- emitter breakdown voltage	$V_{CEO}$	$I_c = -1 mA, I_B = 0$	-25			
Emitter - base breakdown voltage	$V_{EBO}$	$I_E = -100 \mu A, I_c = 0$	-10			
Collector-base cut-off current	$I_{CBO}$	$V_{CB} = -25 V, I_E = 0$			-0.1	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -7 V, I_c = 0$			-0.1	
Collector-emitter saturation voltage *	$V_{CE(sat)}$	$I_c = -50 mA, I_B = -5 mA$		-0.15	-0.3	V
Base - emitter saturation voltage *	$V_{BE(sat)}$	$I_c = -50 mA, I_B = -5 mA$		-0.8	-1.2	
Base - emitter saturation voltage *	$V_{BE}$	$V_{CE} = -5 V, I_c = -1 mA$		-580		
DC current gain *	$h_{FE}$	$V_{CE} = -5 V, I_c = -1 mA$	500	1000	1600	
		$V_{CE} = -5 V, I_c = -100 mA$	200	400		
Turn-on time	$t_{on}$	$I_c = -50 mA, V_{BE(off)} = 2.7 V, V_{CC} = -10 V, I_{B1} = I_{B2} = -1 mA$		0.12		$\mu s$
Storage time	$t_s$			0.58		
Turn-off time	$t_{off}$				0.75	
Output capacitance	$C_{ob}$	$V_{CB} = -5 V, I_E = 0, f = 1 MHz$		4.6		pF
Transition frequency	$f_T$	$V_{CE} = -5 V, I_E = -10 mA$		200		MHz

\*  $PW \leq 350 \mu s, \text{duty cycle} \leq 2\%$

■ Classification of  $h_{FE}$ 

Type	2SA1411-M15	2SA1411-M16
Range	500-1000	800-1600
Marking	M15	M16