



# SOT-23 Plastic-Encapsulate Transistors

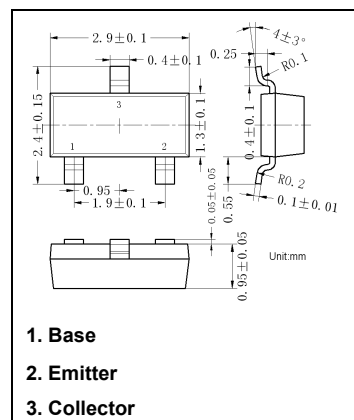
## S9013

NPN Transistors

### Features

- High Collector Current.
- Complementary to S9012.
- Excellent  $h_{FE}$  Linearity.

Marking: J3



### Maximum Ratings ( $T_a=25\text{ }^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
$V_{CEO}$	Collector Emitter Voltage	40	V
$V_{CBO}$	Collector Base Voltage	25	V
$V_{EBO}$	Emitter Base Voltage	5	V
$I_C$	Collector Current Continuous	500	mA
$P_C$	Collector Power Dissipation	300	mW
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	416	$^\circ\text{C/W}$
$T_j$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature	- 55 to +150	$^\circ\text{C}$

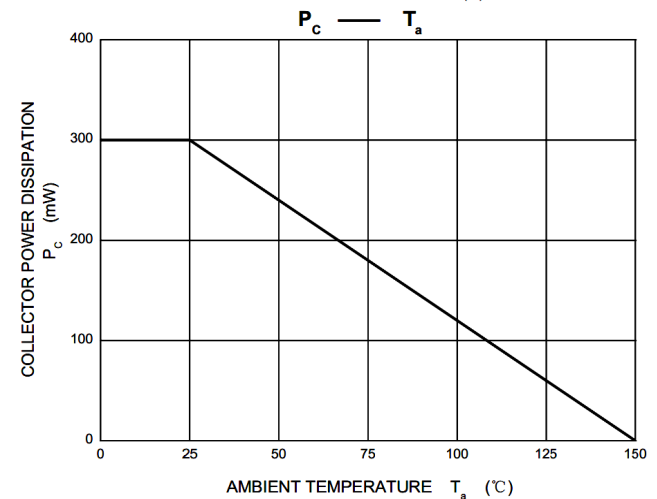
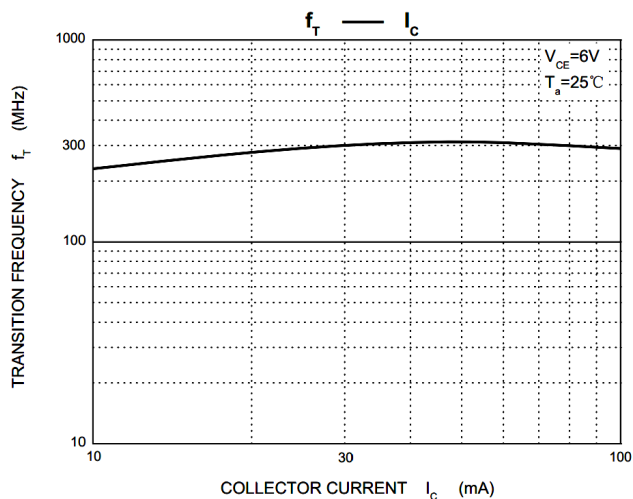
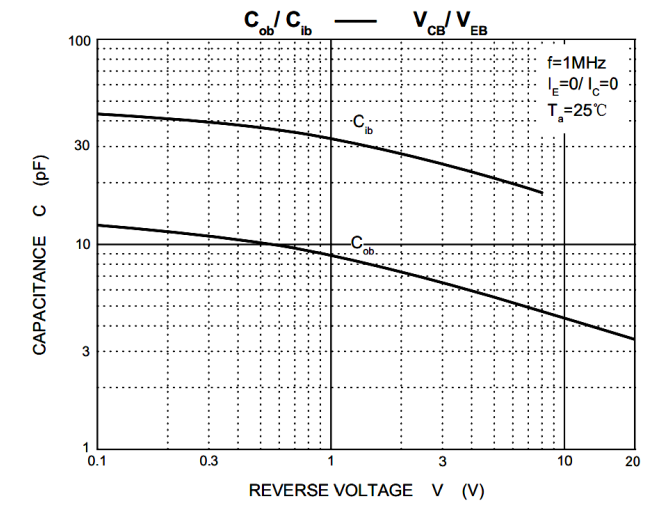
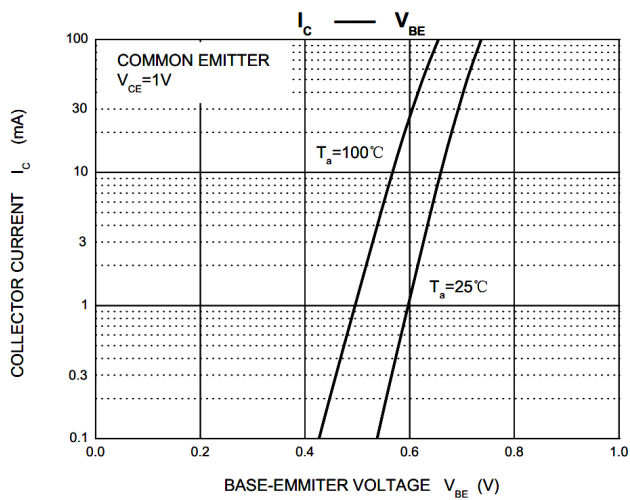
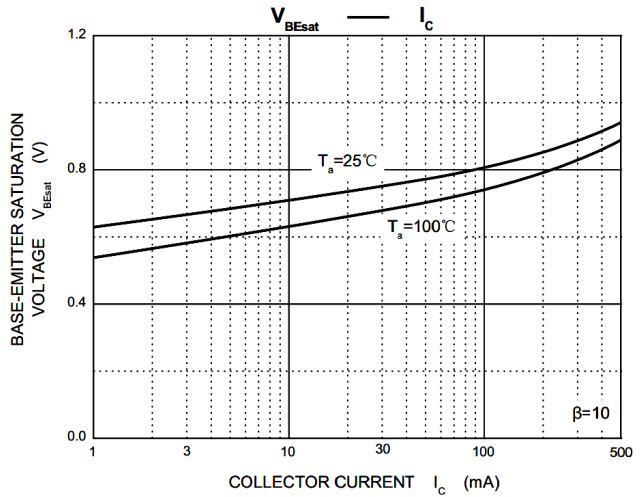
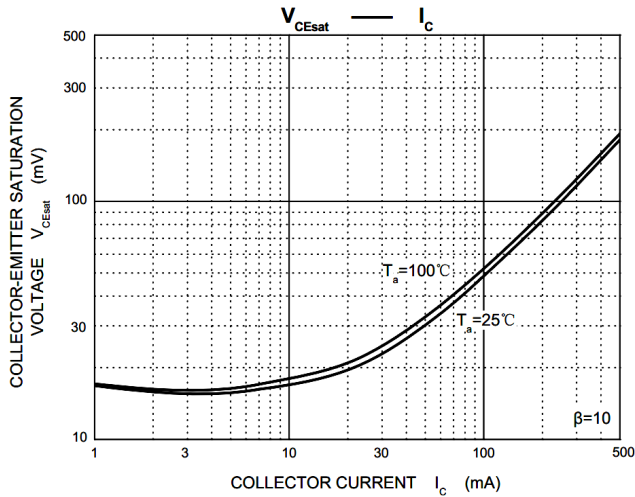
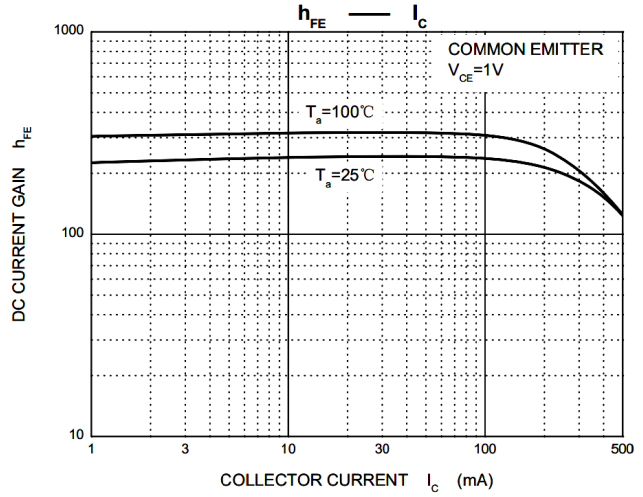
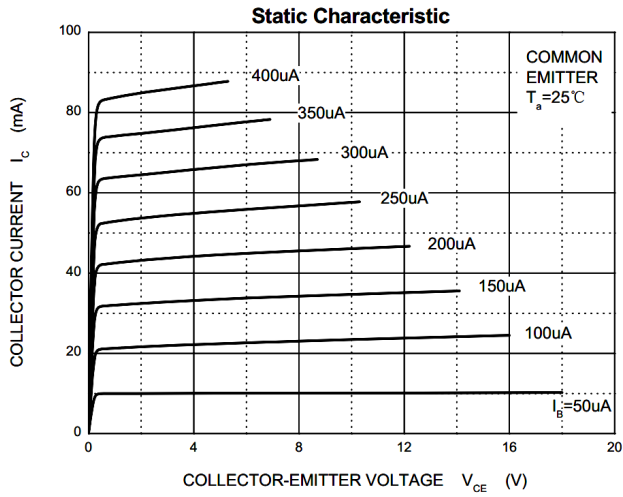
### Electrical Characteristics ( $T_a=25\text{ }^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Max	Unit
$V_{(BR)CEO}$	Collector Emitter Voltage	$I_C = 1\text{mA}, I_B = 0$	25		V
$V_{(BR)CBO}$	Collector Base Voltage	$I_C = 100\mu\text{A}, I_E = 0$	40		V
$V_{(BR)EBO}$	Emitter Base Voltage	$I_E = 100\mu\text{A}, I_C = 0$	7		V
$I_{CBO}$	Collector Cut Off Current	$V_{CB} = 40\text{V}, I_E = 0,$		100	nA
$I_{CEO}$	Collector Cut Off Current	$V_{CE} = 20\text{V}, I_B = 0$		100	nA
$I_{EBO}$	Emitter Cut Off Current	$V_{EB} = 10\text{V}, I_C = 0$		100	nA
$h_{FE(1)}$	DC Current Gain	$V_{CE} = 1\text{V}, I_C = 50\text{mA}$	120	400	
$h_{FE(2)}$		$V_{CE} = 1\text{V}, I_C = 500\text{mA}$	40		
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$I_C = 500\text{mA}, I_B = 50\text{mA}$		0.6	V
$V_{BE(sat)}$	Base Emitter Saturation Voltage	$I_C = 500\text{mA}, I_B = 50\text{mA}$		1.2	V
$V_{BE}$	Base Emitter On Voltage	$V_{CE} = 1\text{V}, I_C = 10\text{mA}$		0.7	V
$f_T$	Current Gain Bandwidth Product	$I_C = 20\text{mA}, V_{CE} = 6\text{V},$ $f = 10\text{MHz}$	150		MHz
$C_{ob}$	Collector output capacitance	$V_{CB} = 6\text{V}, I_E = 0, f = 1\text{MHz}$		8	pF

### Classification Of $h_{FE(1)}$

Rank	L	H	J
Range	120-200	200-350	300-400

# Typical Characteristics



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