



Micro Commercial Components



Micro Commercial Components  
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**S9013-G**  
**S9013-H**  
**S9013-I**

**NPN Silicon  
Transistors**

## Features

- TO-92 Plastic-Encapsulate Transistors
- Capable of 0.625Watts( $T_{amb}=25^{\circ}C$ ) of Power Dissipation.
- Collector-current 0.5A
- Collector-base Voltage 40V
- Operating and storage junction temperature range:  $-55^{\circ}C$  to  $+150^{\circ}C$
- Marking Code: S9013
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Halogen free available upon request by adding suffix "-HF"

## Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
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### OFF CHARACTERISTICS

$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_c=100\mu A_{dc}$ , $I_b=0$ )	40	---	Vdc
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ( $I_c=0.1mA_{dc}$ , $I_b=0$ )	25	---	Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_e=100\mu A_{dc}$ , $I_c=0$ )	5.0	---	Vdc
$I_{cBO}$	Collector Cutoff Current ( $V_{CB}=40V_{dc}$ , $I_e=0$ )	---	0.1	$\mu A_{dc}$
$I_{cEO}$	Collector Cutoff Current ( $V_{CE}=20V_{dc}$ , $I_b=0$ )	---	0.1	$\mu A_{dc}$
$I_{eBO}$	Emitter Cutoff Current ( $V_{EB}=5.0V_{dc}$ , $I_c=0$ )	---	0.1	$\mu A_{dc}$

### ON CHARACTERISTICS

$h_{FE(1)}$	DC Current Gain ( $I_c=50mA_{dc}$ , $V_{CE}=1.0V_{dc}$ )	64	400	---
$h_{FE(2)}$	DC Current Gain ( $I_c=500mA_{dc}$ , $V_{CE}=1.0V_{dc}$ )	40	---	---
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ( $I_c=500mA_{dc}$ , $I_b=50mA_{dc}$ )	---	0.6	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ( $I_c=500mA_{dc}$ , $I_b=50mA_{dc}$ )	---	1.2	Vdc
$V_{EB}$	Base- Emitter Voltage ( $I_e=100mA_{dc}$ )	---	1.4	Vdc

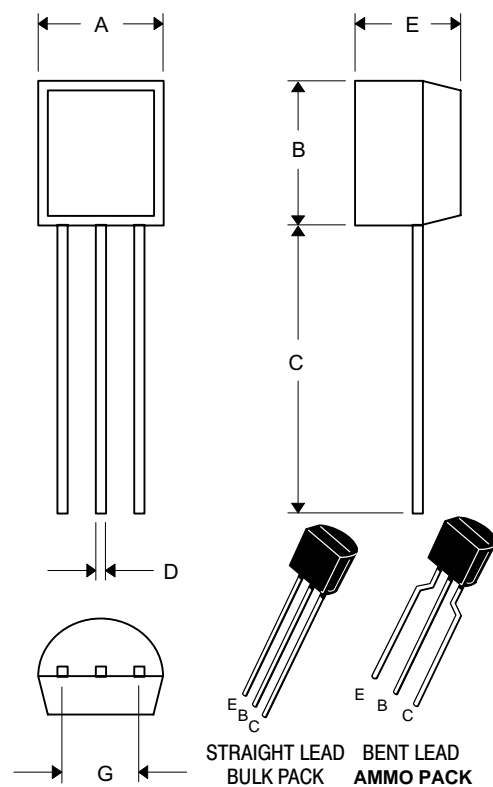
### SMALL-SIGNAL CHARACTERISTICS

$f_T$	Transistor Frequency ( $I_c=20mA_{dc}$ , $V_{CE}=6.0V_{dc}$ , $f=30MHz$ )	150	---	MHz
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### CLASSIFICATION OF $h_{FE(1)}$

Rank	G	H	I
Range	112-166	144-202	190-300

## TO-92



### DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.175	.185	4.45	4.70	
B	.175	.185	4.45	4.70	
C	.500	---	12.70	---	
D	.016	.020	0.41	0.63	
E	.135	.145	3.43	3.68	
G	.095	.105	2.42	2.67	Straight Lead
	.173	.220	4.40	5.60	Bent Lead

\* For ammo packing detailed specification, click here to visit our website of product packaging for details.



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### Ordering Information :

Device	Packing
Part Number-AP	Ammo Packing: 20Kpcs/Carton
Part Number-BP	Bulk: 100Kpcs/Carton

Note : Adding "-HF" suffix for halogen free, eg. Part Number-AP-HF

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