H9013

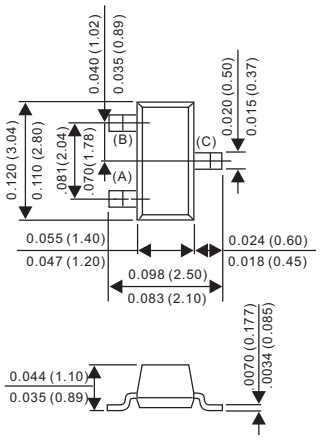
General Purpose Transistors
NPN Silicon

Features

- High collector current. (500mA)
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free part, ex. H9013P-H.

Package outline

SOT-23



Dimensions in inches and (millimeters)

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Maximum ratings (AT T_A=25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector–emitter voltage	V_{CEO}	20	V
Collector–base voltage	V_{CBO}	40	V
Emitter–base voltage	V_{EBO}	5	V
Collector current — continuous	I_C	500	mA

Thermal characteristics

PARAMETER		Symbol	MIN.	TYP.	MAX.	UNIT
Total device dissipation FR-5 board (1)	T_A= 25°C	P_D			225	mW
	Derate above 25°C				1.8	mW/°C
Thermal resistance	Junction to ambient	$R_{\theta JA}$			556	°C/W
Total device dissipation alumina substrate(2)	T_A= 25°C	P_D			300	mW
	Derate above 25°C				2.4	mW/°C
Thermal resistance	Junction to ambient	$R_{\theta JA}$			417	°C/W
Operating junction temperature range		T_J	-55		+150	°C
Storage temperature range		T_{STG}	-55		+150	°C

1. FR-5 = 1.0 X 0.75 X0.062 in.
2. Alumina = 0.4 X 0.3 X 0.024 in. 99.5% alumina.

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Electrical characteristics (AT T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Off characteristics						
Collector-emitter breakdown voltage	I_C=1mA	$V_{(BR)CEO}$	20			V
Emitter-base breakdown voltage	I_E=100uA	$V_{(BR)EBO}$	5			V
Collector-base breakdown voltage	I_C=100uA	$V_{(BR)CBO}$	40			V
Collector cutoff current	V_{CB}=35V	I_{CBO}			150	nA
Emitter cutoff current	V_{EB}=4V	I_{EBO}			150	nA
On characteristics						
Collector-emitter saturation voltage	I_C=500mA I_B= 50mA	$V_{CE(sat)}$			0.6	V
DC current gain *	I_C=50mA V_{CE}= 1V	h_{FE}	100		600	-

h_{FE} values are classified as follows:

*	P	Q	R	S
h_{FE}	100~200	150~300	200~400	300~600

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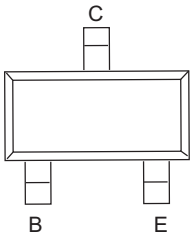
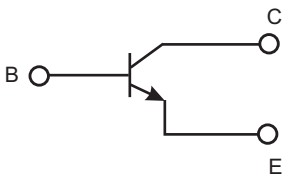
Pinning information

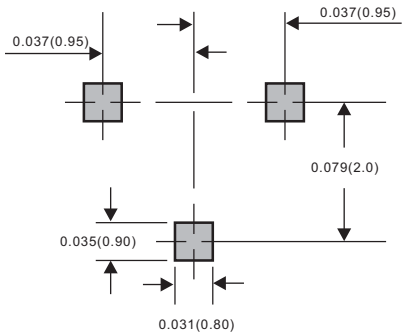
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
H9013	J3

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)