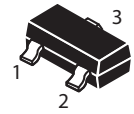
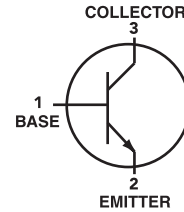


NPN General Purpose Transistors

 Lead(Pb)-Free



SOT-23

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	25	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector Current-Continuous	I_C	500	mAdc

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (1) $T_A=25^{\circ}\text{C}$ Derate above 25°C	P_D	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^{\circ}\text{C/W}$
Total Device Dissipation Alumina Substrate, (2) $T_A=25^{\circ}\text{C}$ Derate above 25°C	P_D	300	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^{\circ}\text{C/W}$
Junction and Storage, Temperature	T_J, T_{stg}	-55 to +150	$^{\circ}\text{C}$

DEVICE MARKING

S9013LT1=J3

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C=0.1\text{mAdc}, I_B=0$)	$V_{(BR)CEO}$	25	-	Vdc
Collector-Base Breakdown Voltage ($I_C=100\mu\text{Adc}, I_E=0$)	$V_{(BR)CBO}$	40	-	Vdc
Emitter-Base Breakdown Voltage ($I_E=100\mu\text{Adc}, I_C=0$)	$V_{(BR)EBO}$	5.0	-	Vdc
Collector Cutoff Current ($V_{CE}=20\text{Vdc}, I_E=0$)	I_{CEO}	-	0.1	μAdc
Collector Cutoff Current ($V_{CB}=40\text{Vdc}, I_E=0$)	I_{CBO}	-	0.1	μAdc
Emitter Cutoff Current ($V_{EB}=5.0\text{Vdc}, I_C=0$)	I_{EBO}	-	0.1	μAdc

1.FR-5=1.0 x 0.75 x 0.062 in

2.Alumina=0.4 x 0.3 x 0.024 in. 99.5% alumina

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristics	Symbol	Min	Max	Unit
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ON CHARACTERISTICS

DC Current Gain ($I_C=50\text{ mAdc}, V_{CE}=1.0\text{ Vdc}$) ($I_C=500\text{ mAdc}, V_{CE}=1.0\text{ Vdc}$)	$h_{FE}^{(1)}$	120	350	-
	$h_{FE}^{(2)}$	40	-	-
Collector-Emitter Saturation Voltage ($I_C=500\text{ mAdc}, I_B=50\text{ mAdc}$)	$V_{CE(sat)}$	-	0.6	Vdc
Base-Emitter Saturation Voltage ($I_C=500\text{ mAdc}, I_B=50\text{ mAdc}$)	$V_{BE(sat)}$	-	1.2	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain-Bandwidth Product ($I_C=20\text{ mAdc}, V_{CE}=6.0\text{ Vdc}, f=30\text{ MHz}$)	f_T	150	-	MHz
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CLASSIFICATION OF h_{FE}

Rank	L	H
Range	120-200	200-350

