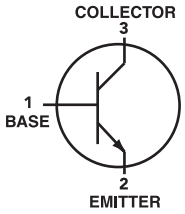
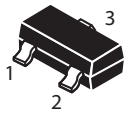
WEITRON

S9013

NPN General Purpose Transistors





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) TA=25°C Derate above 25°C	P_D	225 1.8	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate, (2) TA=25°C Derate above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage, Temperature	$T_{J,Tstg}$	-55 to +150	°C

DEVICE MARKING

S9013=J3

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I_C=0.1mAdc .I_B=0)	$V_{(BR)CEO}$	25	-	Vdc
Collector-Base Breakdown Voltage (I_C=100μAdc.I_E=0)	$V_{(BR)CBO}$	40	-	Vdc
Emitter-Base Breakdown Voltage (I_E=100μAdc.I_C=0)	$V_{(BR)EBO}$	5.0	-	Vdc
Collector Cutoff Current (V_{CE}=20Vdc, I_E= 0)	I_{CEO}	-	0.1	uAdc
Collector Cutoff Current (V_{CB}=40Vdc,I_E=0)	I_{CBO}	-	0.1	uAdc
Emitter Cutoff Current (V_{EB}=5.0Vdc,I_C=0)	I_{EBO}	-	0.1	uAdc

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°C unless otherwise noted) (Countinued)

Characteristics	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain (I_C=50 mAdc, V_{CE}=1.0 Vdc) (I_C=500 mAdc, V_{CE}=1.0 Vdc)	 h_{FE}(1) h_{FE}(2)	 120 40	 350 -	 - -
Collector-Emitter Saturation Voltage (I_C=500 mAdc, I_B=50mAdc)	$V_{CE(sat)}$	-	0.6	Vdc
Base-Emitter Saturation Voltage (I_C=500 mAdc, I_B=50mAdc)	$V_{BE(sat)}$	-	1.2	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain-Bandwidth Product (I_C=20 mAdc, V_{CE}=6.0 Vdc, f=30MHz)	f_T	150	- -	MHz

CLASSIFICATION OF h_{FE}

Rank	L	H
Range	120-200	200-350

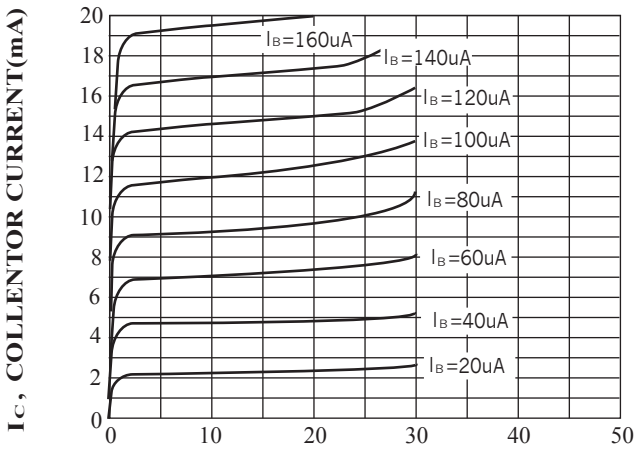


Figure1. Static Characteristic

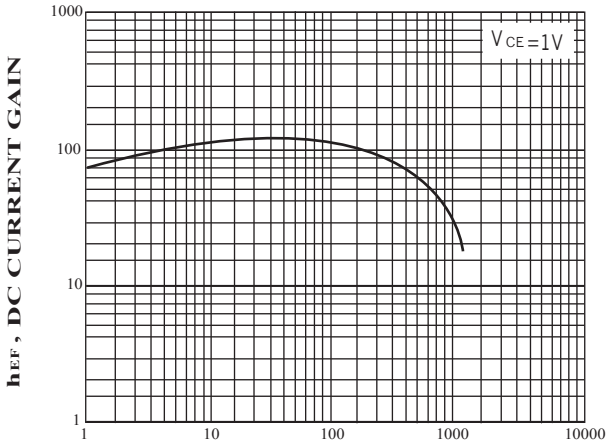


Figure2. DC current Gain

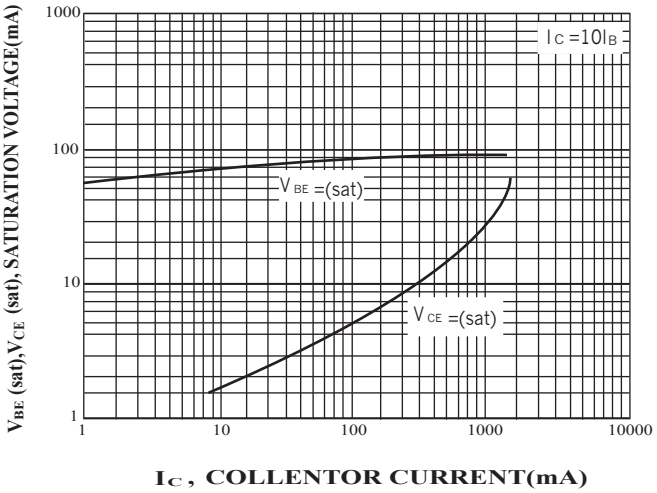


Figure3. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

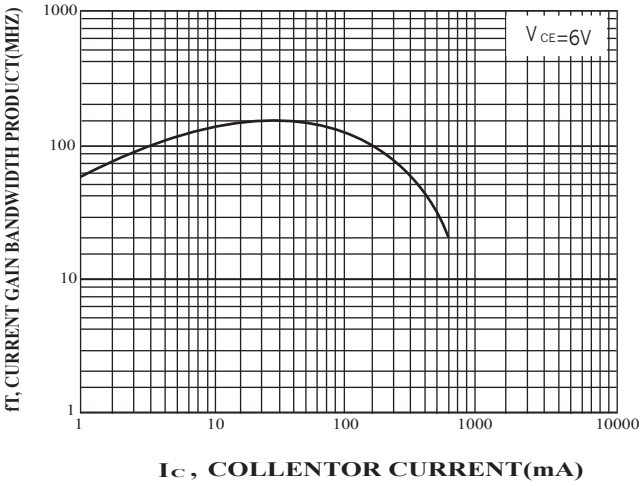


Figure4. Current Gain Bandwidth Product