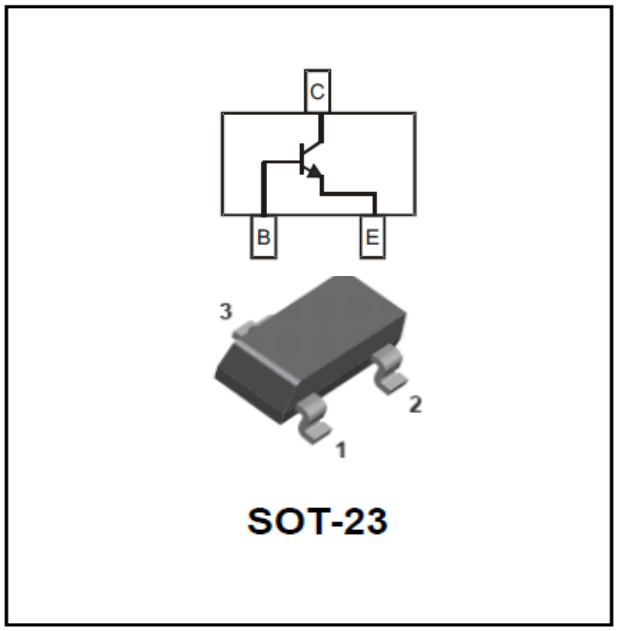
NPN Transistor



Features

- Epoxy meets UL-94 V-0 flammability rating
- Halogen free available upon request by adding suffix ”HF”
- Moisture Sensitivity Level 1
- Marking: J3

■ Maximum Ratings (Ta=25℃ unless otherwise noted)

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

■ Electrical Characteristics (Ta=25℃ unless otherwise noted)

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	V_{CBO}	V	IC=0.1mA,IE=0	40		
Collector-emitter breakdown voltage	V_{CEO*}	V	IC =1mA,IB=0	25		
Emitter-base breakdown voltage	V_{EBO}	V	IE=0.1mA,IC=0	5		
Collector-Base cut-off current	I_{CBO}	uA	VCB=40V,IE=0			0.1
Collector-Emitter cut-off current	I_{CEO}	uA	VCE=20V, IB =0			0.1
Emitter-Base cut-off current	I_{EBO}	uA	VEB=5V, IC =0			0.1
DC current gain	$h_{FE(1)}$	V	VCE=1V,IC=50mA	120		400
	$h_{FE(2)}$	V	VCE=1V,IC=500mA	40		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	IC=500mA,IB=50mA			0.6
Base-emitter saturation voltage	$V_{BE(sat)}$	V	IC=500mA,IB=50mA			1.2
Transition frequency	f_T	MHz	VCE=6V,IC=20mA,f=30MHz	150		

■CLASSIFICATION OF HFE (1)

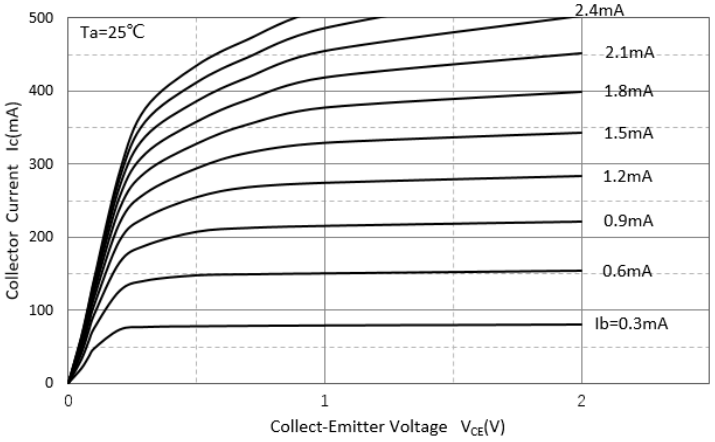
RANK	L	H	J
RANGE	120-200	200-350	300-400

■ Ordering Information (Example)

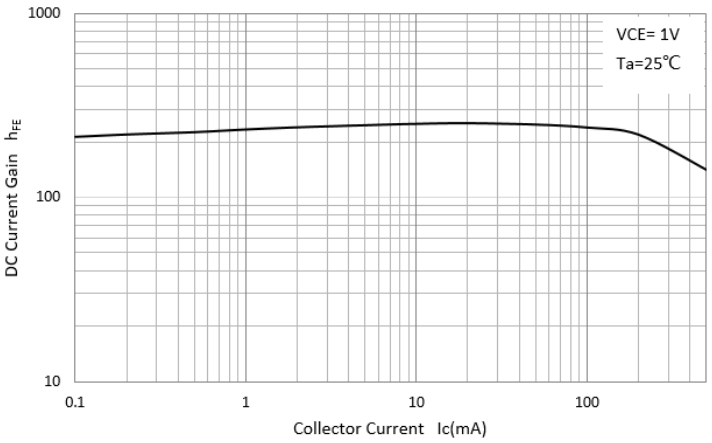
PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
S9013	F2	Approximate 0.008	3000	30000	120000	7” reel

■ Characteristics (Typical)

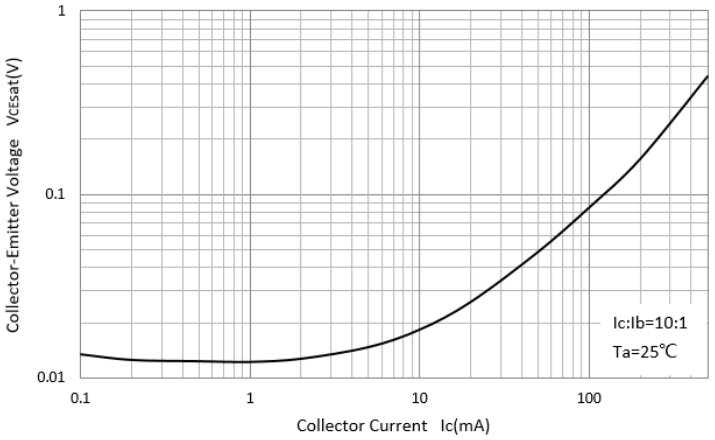
Static Characteristic



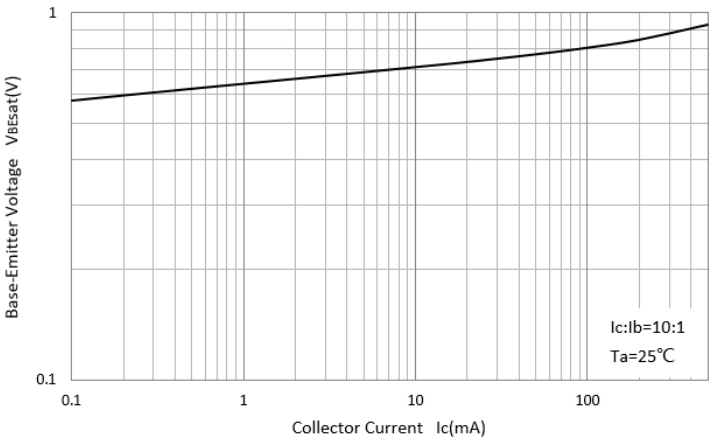
DC Current Gain



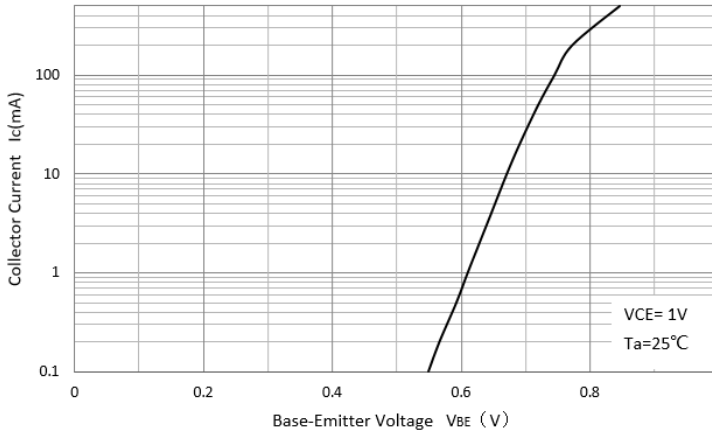
Collector-Emitter Saturation Voltage



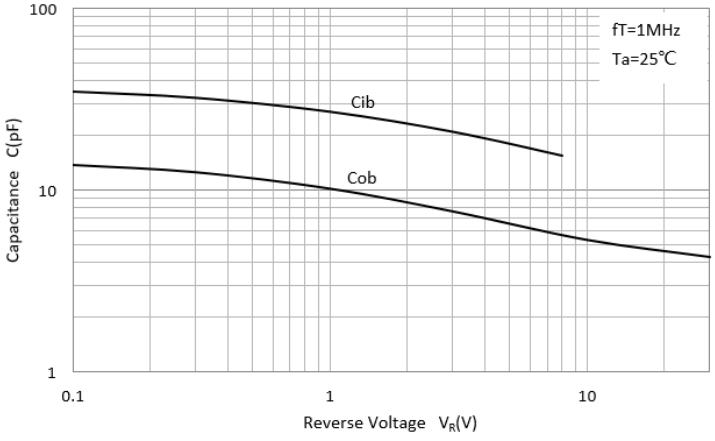
Base-Emitter Saturation Voltage



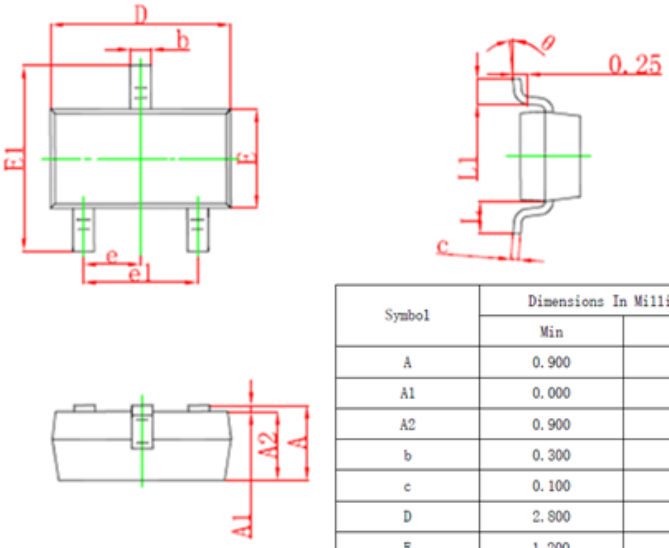
Base-Emitter On Voltage



Cob/Cib-V_{CB}/V_{EB}

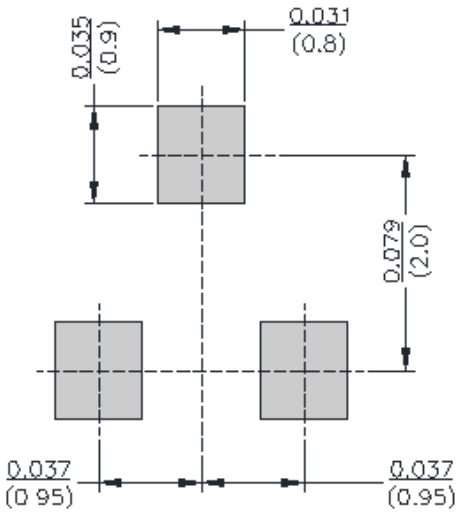


■SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

■SOT-23 Soldering Footprint



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