NPN Type Bipolar Transistor

Features

- Low profile package
- Power Dissipation of 350mW
- Ideal for automated placement
- Complementary to MMBTA93 (PNP)
- High Stability and High Reliability
- RoHS Compliant

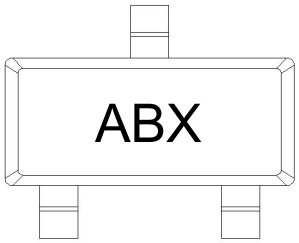
RoHS
COMPLIANT

Marking: ABX

SOT - 23

Applications

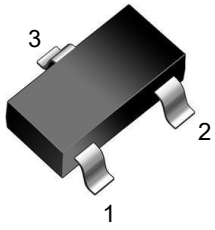
- Amplifying signal
- Electronic switch
- Oscillating circuit
- Variable resistance



Pin definition

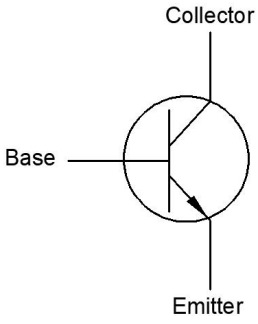
Mechanical Characteristics

- Package: SOT-23
- Lead Finish:Matte Tin
- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020



1：Base
2：Emitter
3：Collector

Epuivalent circuit



Absolute Maximum Ratings (T_A=25℃,unless otherwise noted)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	200	V
Collector-Emitter Voltage	V_{CEO}	200	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current - Continuous	I_C	500	mA
Collector Power Dissipation	P_C	350	mW
Thermal Resistance From Junction to Ambient	$R_{\theta JA}$	357	℃/W
Junction Temperature	T_J	-55 to +150	℃
Junction and Storage Temperature	T_{STG}	-55 to +150	℃

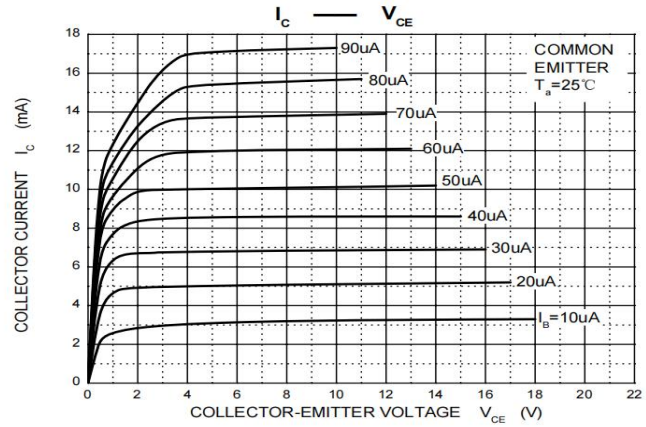
Electrical Specifications(T_A=25℃,unless otherwise noted)

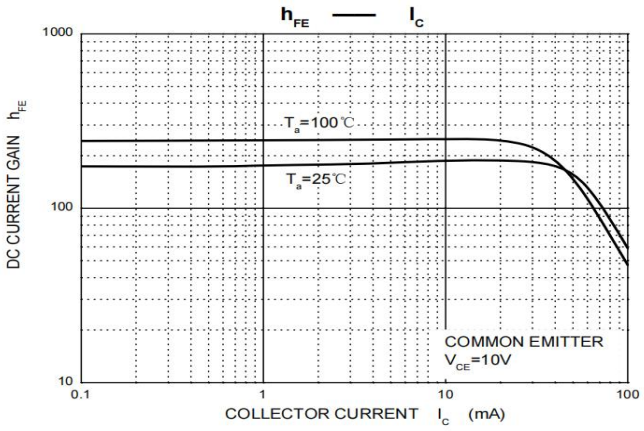
Parameter	Symbol	Test Conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=100uA, I_E=0	200		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=1mA, I_B=0	200		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=100uA, I_C=0	5		V
Collector cut-off current	I_{CBO}	V_{CB}=100V, I_E=0		250	nA
Emitter cut-off current	I_{EBO}	V_{EB}=5V, I_C=0		100	nA
DC current gain	hFE(1)	V_{CE}=10V, I_C=10mA	40		
	hFE(2)	V_{CE}=10V, I_C=1mA	40		
	hFE(3)	V_{CE}=10V, I_C=30mA	40		
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=20mA, I_B=2mA		0.5	V
Base -emitter saturation voltage	$V_{BE(sat)}$	I_C=20mA, I_B=2mA		0.9	V
Transition frequency	f_T	V_{CE}=20V, I_C=10mA,f=100MHz	50		MHz
Collector output capacitance	C_{ob}	V_{CB}=20V, I_E=0, f=1MHz		4	pF

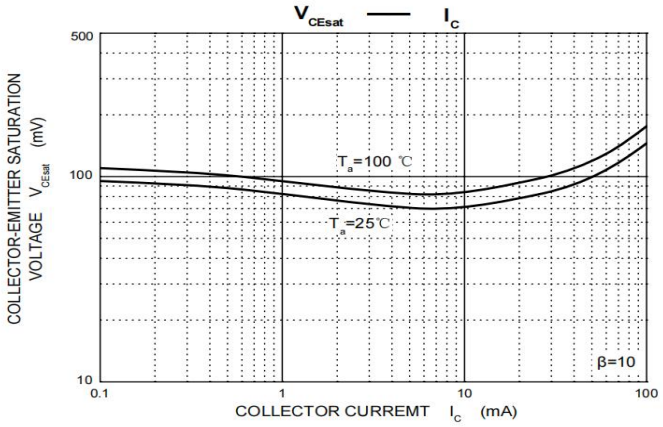
* Pulse test: pulse width ≤300μs, duty cycle≤ 2.0%.

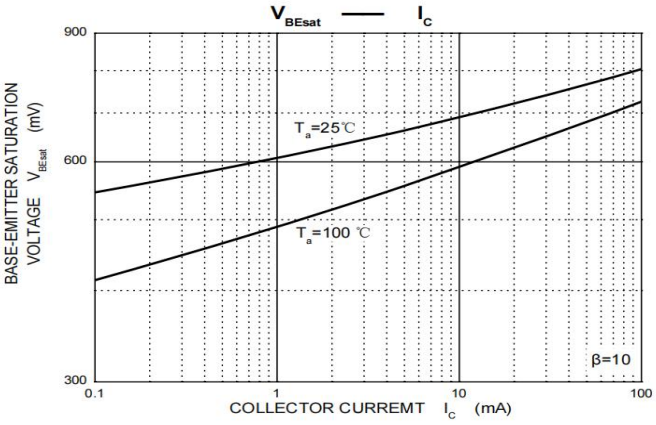
Ratings and Characteristics Curves

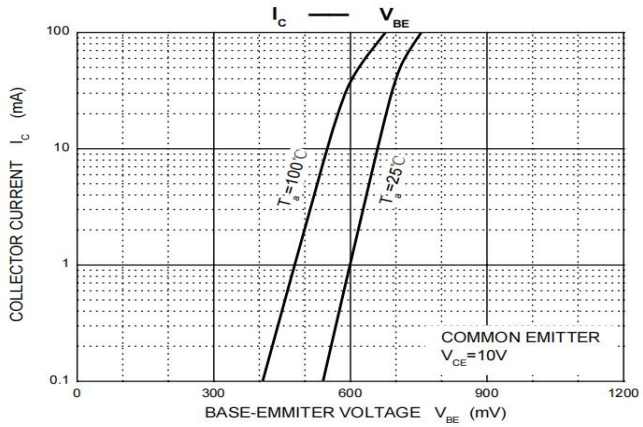
(TA = 25℃ unless otherwise noted)

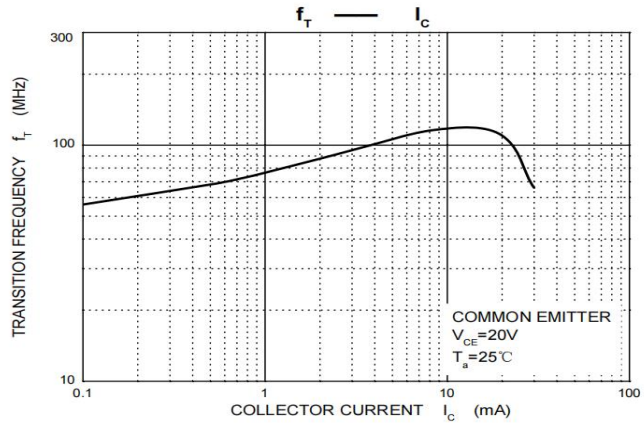


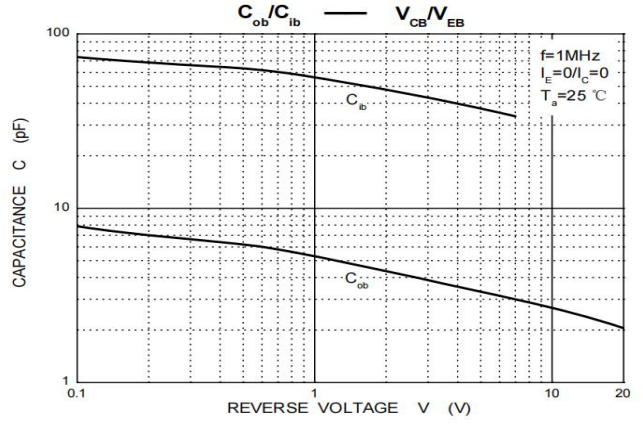


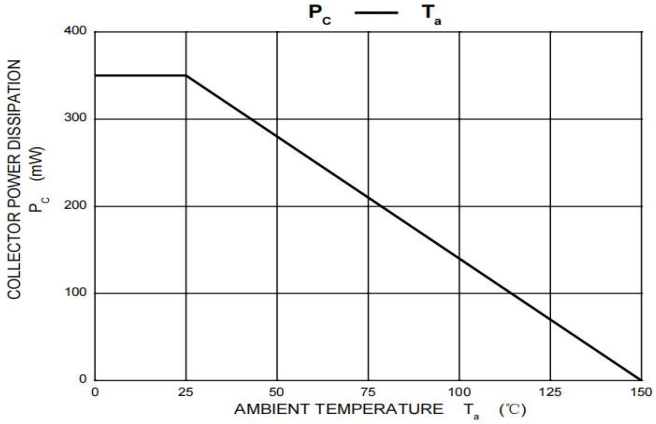






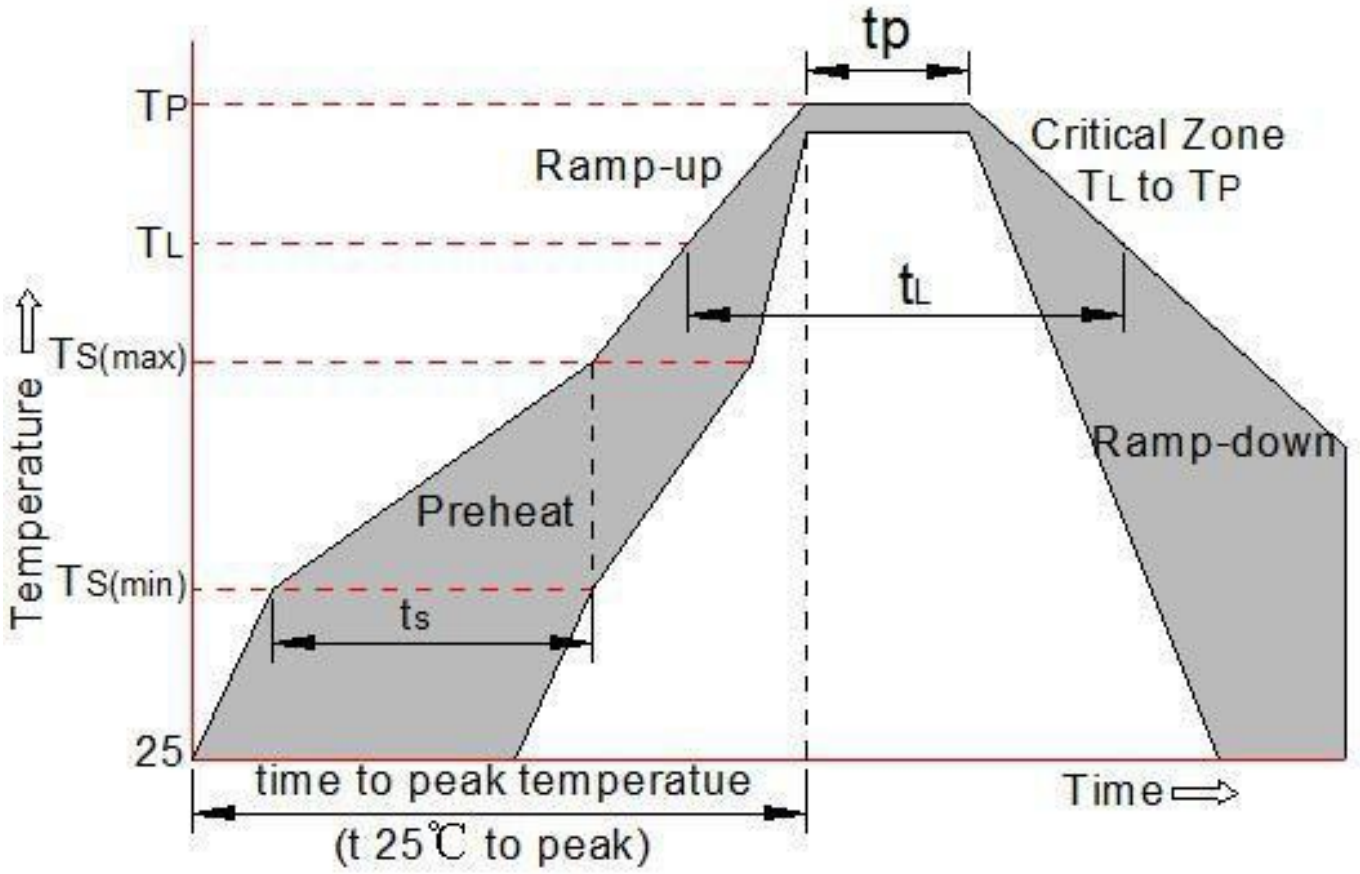






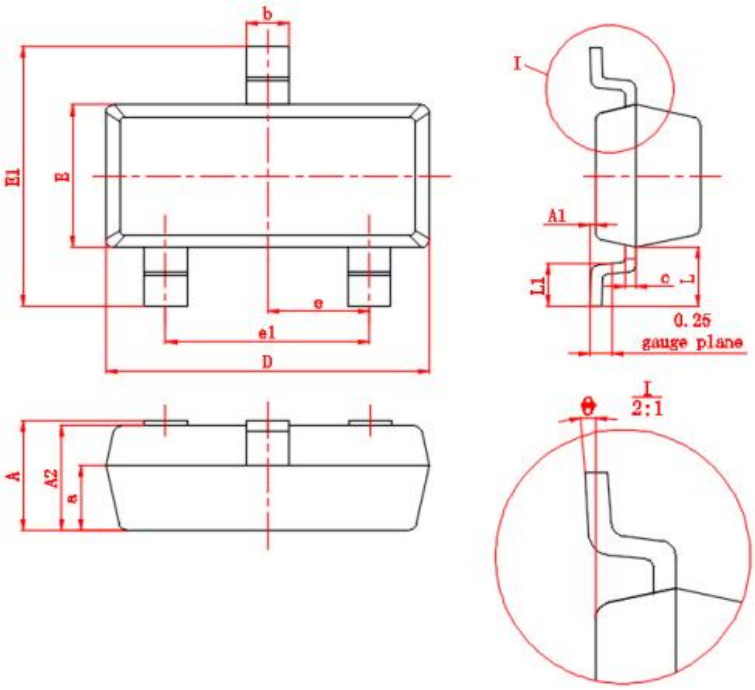
Soldering Parameters

Reflow Condition		Pb -Free assembly (see as bellow)
Pre Heat	-Temperature Min (T s(min))	+150 ℃
	-Temperature Max(T s(max))	+200 ℃
	-Time (Min to Max) (ts)	60 -180 secs.
Average ramp up rate (Liquid us Temp (T L) to peak)		3 ℃ /sec. Max
T s(max)tp T L- Ramp -up Rate		3 ℃ /sec. Max
Reflow	-Temperature(T L) (Liquid us)	+217 ℃
	-Temperature(t L)	60 -150 secs.
Peak Temp (T p)		+260(+0/ -5) ℃
Time within 5 ℃ of actual Peak Temp (t p)		30 secs. Max
Ramp -down Rate		6 ℃ /sec. Max
Time 25 ℃ to Peak Temp (T P)		8 min. Max
Do not exceed		+260 ℃



Package Outline Dimensions

millimeters



Symbol	Dimensional	
	Millimeters	
	min	max
A	0.9	1.15
A1	0	0.1
A2	0.9	1.05
a	(0.6)	
D	2.8	3.0
E	1.2	1.4
E1	2.25	2.55
e	(0.95)	
e1	1.8	2.0
b	0.3	0.5
c	0.08	0.15
L	(0.55)	
L1	0.3	0.5
θ	0°	8°

Revision History

Document Version	Date of release	Description of changes
Rev.A	2022.05.10	First issue

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