STD123S TRANSISTOR (NPN)

1.BASE

2.COLLECTOR

3.EMITTER

SOT-23-3

FEATURES

- Low saturation medium current application
- Extremely low collector saturation voltage
- Suitable for low voltage large current drivers
- High DC current gain and large current capability
- Low on resistance : R_{ON}=0.6Ω(Max.) (I_B=1mA)

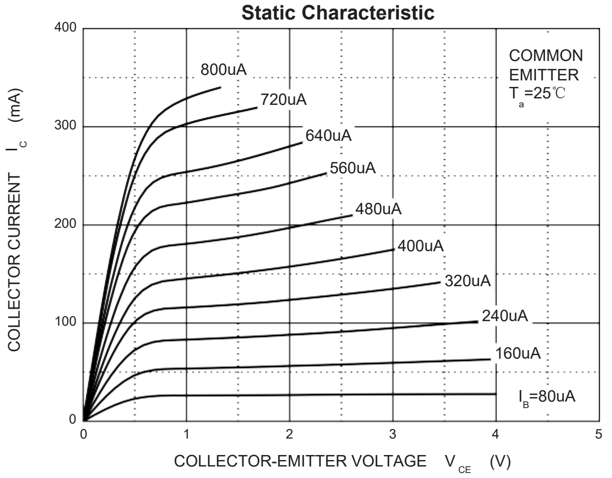
Marking:123

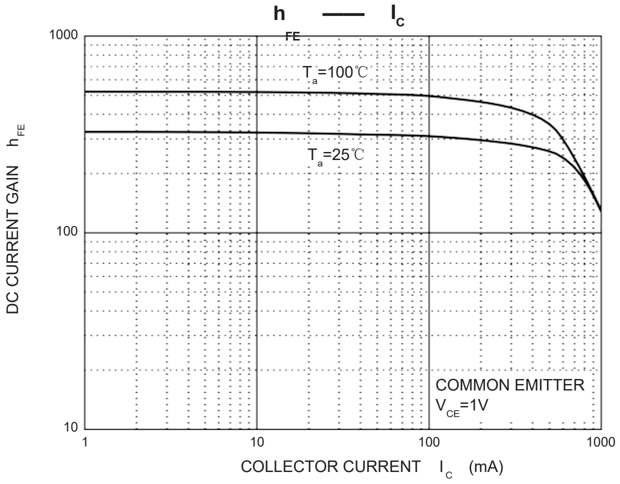
MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

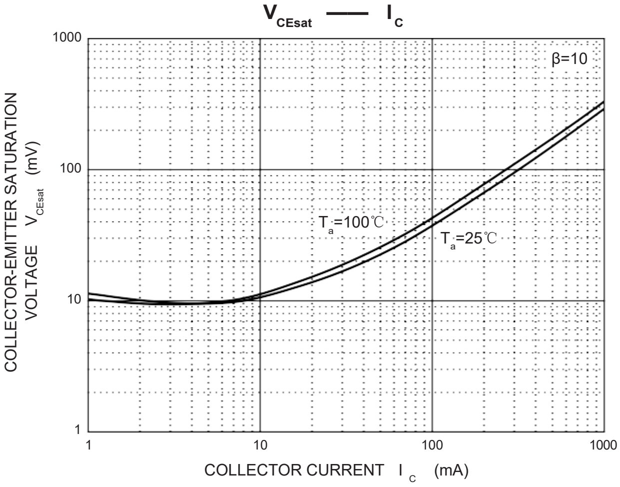
Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	20	V
V_{CEO}	Collector-Emitter Voltage	15	V
V_{EBO}	Emitter-Base Voltage	6.5	V
I_C	Collector Current	1	A
P_C	Collector Power Dissipation	350	mW
$R_{\Theta JA}$	Thermal Resistance From Junction To Ambient	357	℃/W
T_J,T_{stg}	Operation Junction and Storage Temperature Range	-55～+150	℃

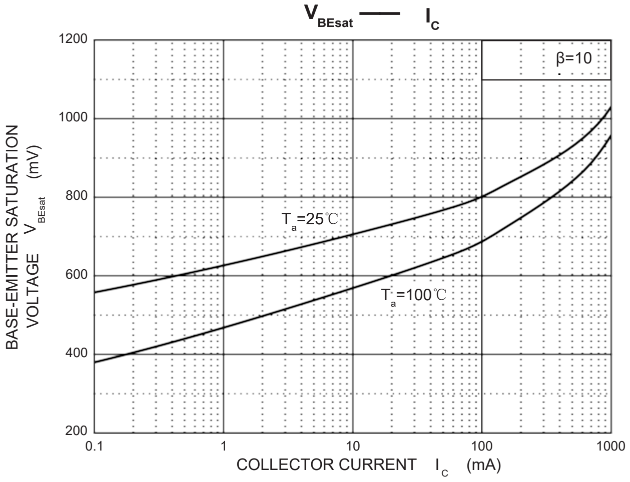
ELECTRICAL CHARACTERISTICS (T_a=25℃ unless otherwise specified)

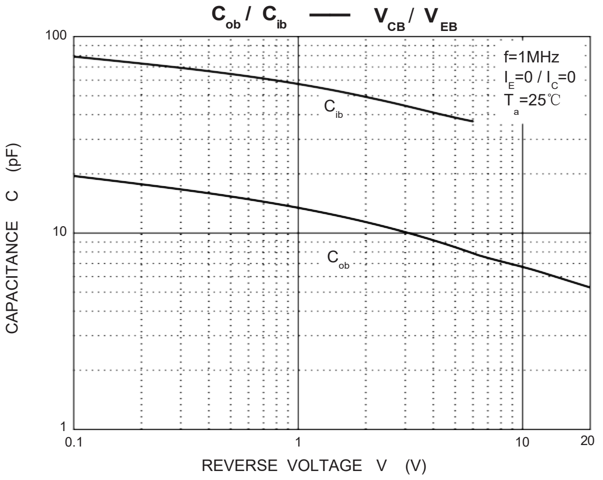
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=50μA, I_E=0	20			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C =1mA, I_B=0	15			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E= 50μA, I_C=0	6.5			V
Collector cut-off current	I_{CBO}	V_{CB}= 20 V, I_E=0			0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB}= 6V, I_C=0			0.1	μA
DC current gain	h_{FE}	V_{CE}=1V, I_C= 100mA	150			
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C=500mA, I_B= 50mA			0.3	V
Transition frequency	f_T	V_{CE}=5V, I_C=50mA		260		MHz
Collector output capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=1MHz		5		pF
On resistance	R_{ON}	f=1KHz,I_B=1mA, V_{IN}=0.3V		0.6		Ω

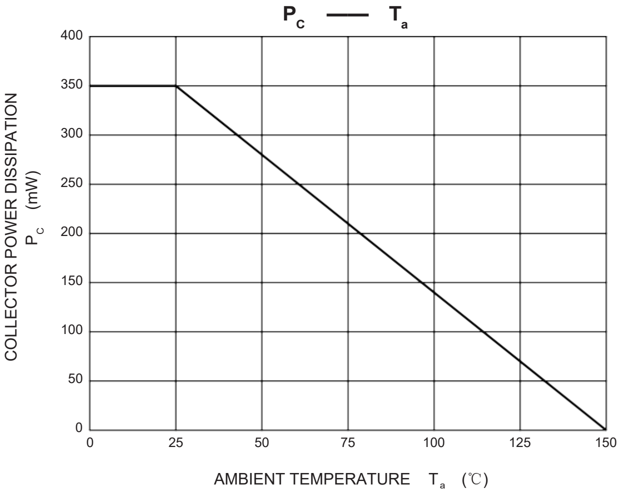

Static Characteristic
COMMON EMITTER
Ta=25℃
800uA
720uA
640uA
560uA
480uA
400uA
320uA
240uA
160uA
IB=80uA
COLLECTOR CURRENT IC (mA)
400
300
200
100
0
0
1
2
3
4
5
COLLECTOR-EMITTER VOLTAGE VCE (V)


hFE —— IC
Ta=100℃
Ta=25℃
COMMON EMITTER
VCE=1V
DC CURRENT GAIN hFE
1000
100
10
1
10
100
1000
COLLECTOR CURRENT IC (mA)


VCEsat —— IC
β=10
Ta=100℃
Ta=25℃
COLLECTOR-EMITTER SATURATION VOLTAGE VCEsat (mV)
1000
100
10
1
1
10
100
1000
COLLECTOR CURRENT IC (mA)


VBEsat —— IC
β=10
Ta=25℃
Ta=100℃
BASE-EMITTER SATURATION VOLTAGE VBEsat (mV)
1200
1000
800
600
400
200
0.1
1
10
100
1000
COLLECTOR CURRENT IC (mA)


Cob / Cib —— VCB / VEB
f=1MHz
IE=0 / IC=0
Ta=25℃
Cib
Cob
CAPACITANCE C (pF)
100
10
1
0.1
1
10
20
REVERSE VOLTAGE V (V)


PC —— Ta
COLLECTOR POWER DISSIPATION PC (mW)
400
350
300
250
200
150
100
50
0
0
25
50
75
100
125
150
AMBIENT TEMPERATURE Ta (℃)