

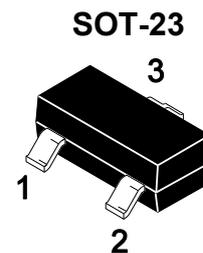


MMBTRC116SS~MMBTRC122SS

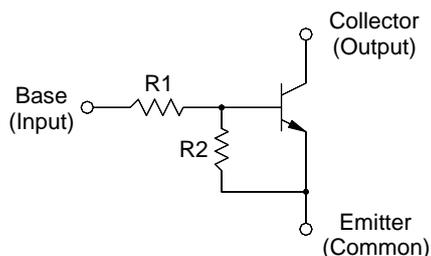
NPN Digital Transistor

Features

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process



Equivalent Circuit



1.Base 2.Emitter 3.Collector

Resistor Values/Marking Code

Type	R1 (K Ω)			R2 (K Ω)			Marking Code
	Min.	Typ.	Max.	Min.	Typ.	Max.	
MMBTRC116SS	0.7	1	1.3	7	10	13	16BR
MMBTRC117SS	1.54	2.2	2.86	1.54	2.2	2.86	17BR
MMBTRC118SS	1.54	2.2	2.86	7	10	13	18BR
MMBTRC119SS	3.29	4.7	6.11	7	10	13	19BR
MMBTRC120SS	7	10	13	3.29	4.7	6.11	20BR
MMBTRC121SS	32.9	47	61.1	7	10	13	21BR
MMBTRC122SS	70	100	130	70	100	130	22BR



MMBTRC116SS~MMBTRC122SS

NPN Digital Transistor

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$)

Parameter		Symbol	Value	Unit
Output Voltage		V_o	50	V
Input Voltage	MMBTRC116SS	V_i	10,-5	V
	MMBTRC117SS		12,-10	
	MMBTRC118SS		12,-5	
	MMBTRC119SS		20,-7	
	MMBTRC120SS		30,-10	
	MMBTRC121SS		40,-15	
	MMBTRC122SS		40,-10	
Output Current		I_o	100	mA
Maximum Power Dissipation		P_D	200	mW
Junction Temperature		T_J	150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55 to +150	$^{\circ}\text{C}$



MMBTRC116SS~MMBTRC122SS

NPN Digital Transistor

Electrical Characteristics (T_A=25°C)

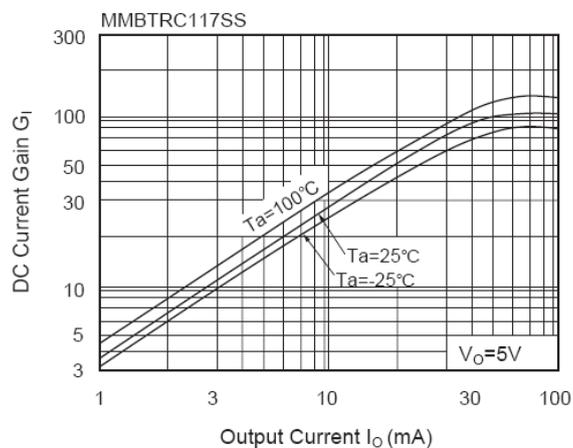
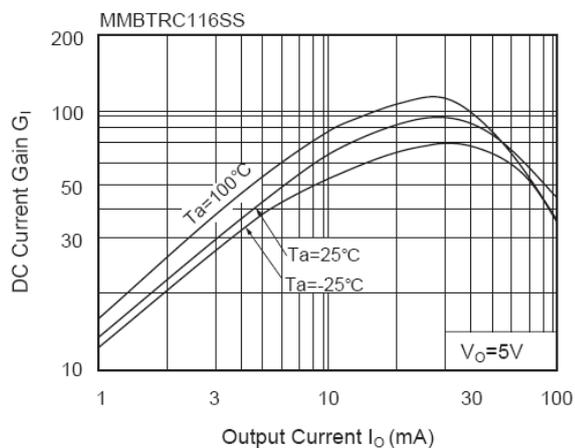
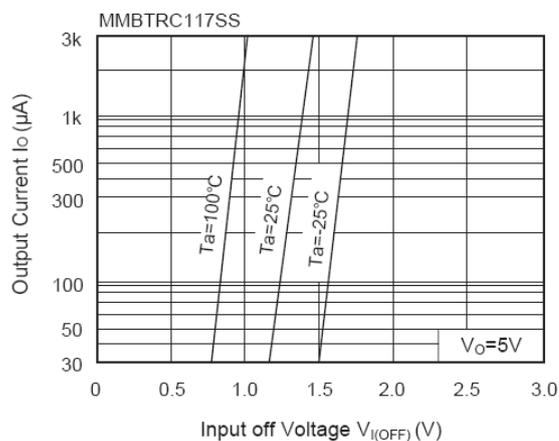
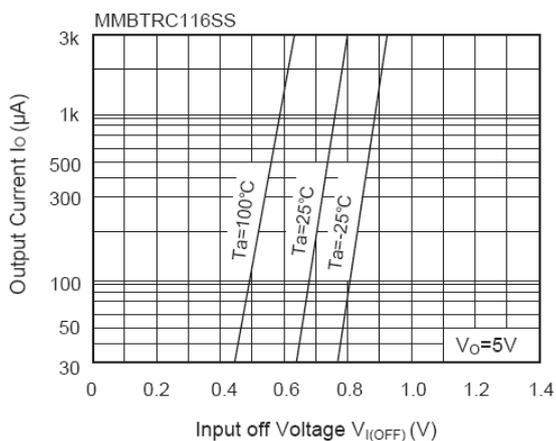
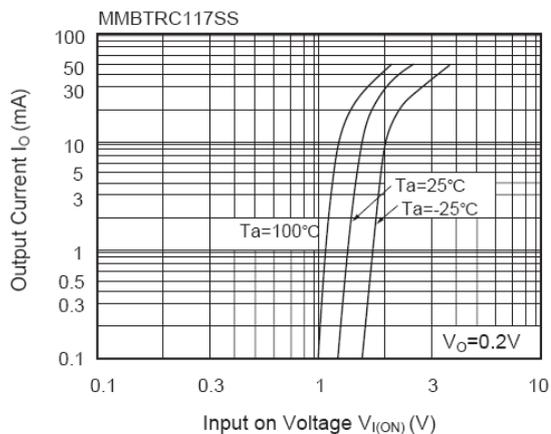
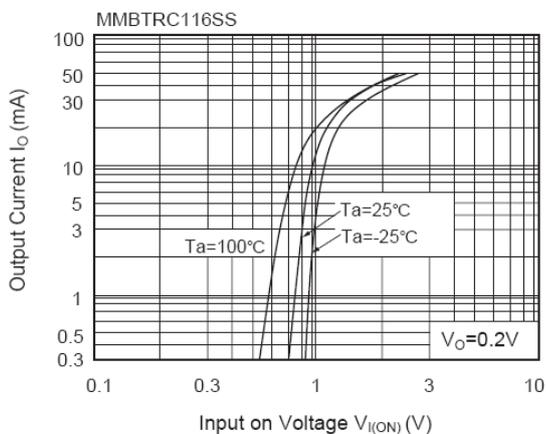
Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain					
at V _O = 5 V, I _O = 5 mA	MMBTRC116SS	33	--	--	
at V _O = 5 V, I _O = 20 mA	MMBTRC117SS	20	--	--	
at V _O = 5 V, I _O = 10 mA	MMBTRC118SS	33	--	--	
at V _O = 5 V, I _O = 10 mA	MMBTRC119SS	30	--	--	--
at V _O = 5 V, I _O = 10 mA	MMBTRC120SS	24	--	--	
at V _O = 5 V, I _O = 5 mA	MMBTRC121SS	33	--	--	
at V _O = 5 V, I _O = 5 mA	MMBTRC122SS	62	--	--	
Output Cutoff Current					
at V _O = 50 V	I _{O(OFF)}	--	--	500	nA
Input Current					
at V _I = 5 V					
	MMBTRC116SS	--	--	7.2	
	MMBTRC117SS	--	--	3.8	
	MMBTRC118SS	--	--	3.8	
	MMBTRC119SS	--	--	1.8	mA
	MMBTRC120SS	--	--	0.88	
	MMBTRC121SS	--	--	0.16	
	MMBTRC122SS	--	--	0.15	
Output Voltage (ON)					
at I _O = 10 mA, I _I = 0.5 mA	MMBTRC116SS~121SS	--	--	0.3	V
at I _O = 5 mA, I _I = 0.25 mA	MMBTRC122SS	--	--	0.3	
Input Voltage (ON)					
at V _O = 0.3 V, I _O = 20 mA	MMBTRC116SS	--	--	3	
at V _O = 0.3 V, I _O = 20 mA	MMBTRC117SS	--	--	3	
at V _O = 0.3 V, I _O = 20 mA	MMBTRC118SS	--	--	3	
at V _O = 0.3 V, I _O = 20 mA	MMBTRC119SS	--	--	2.5	V
at V _O = 0.3 V, I _O = 2 mA	MMBTRC120SS	--	--	3	
at V _O = 0.3 V, I _O = 2 mA	MMBTRC121SS	--	--	5	
at V _O = 0.3 V, I _O = 1 mA	MMBTRC122SS	--	--	3	
Input Voltage (OFF)					
at V _{CC} = 5 V, I _O = 100 μA					
	MMBTRC116SS	0.3	--	--	
	MMBTRC117SS	0.5	--	--	
	MMBTRC118SS	0.3	--	--	
	MMBTRC119SS	0.3	--	--	V
	MMBTRC120SS	0.8	--	--	
	MMBTRC121SS	1	--	--	
	MMBTRC122SS	0.5	--	--	
Transition Frequency					
at V _O = 10 V, I _O = 5 mA	f _T	--	250	--	MHz

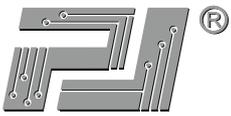


MMBTRC116SS~MMBTRC122SS

NPN Digital Transistor

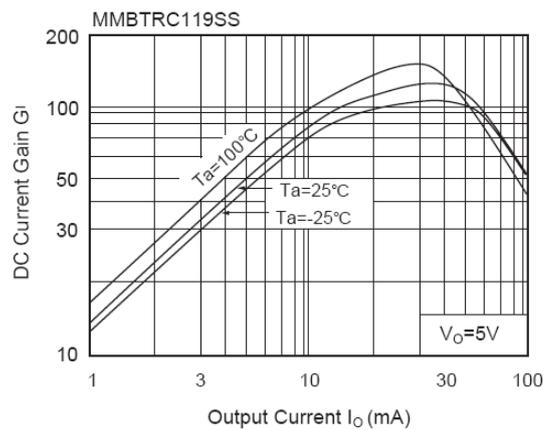
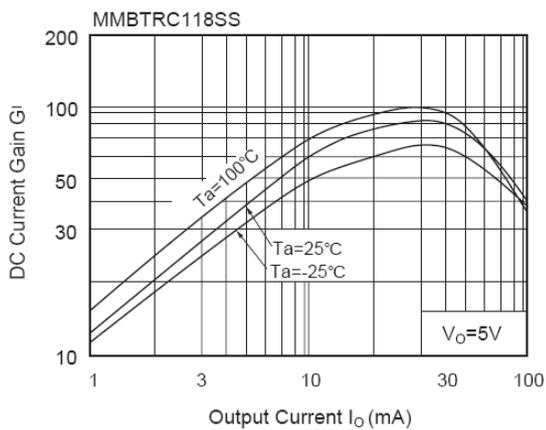
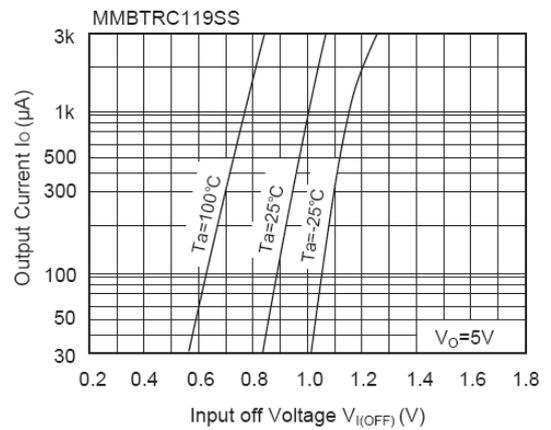
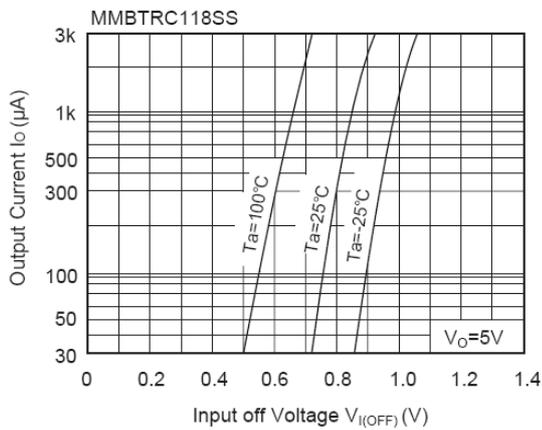
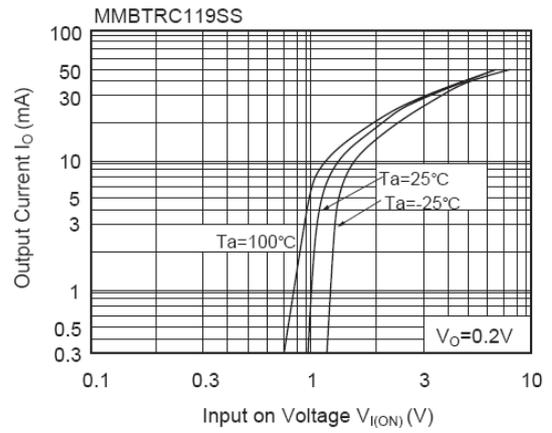
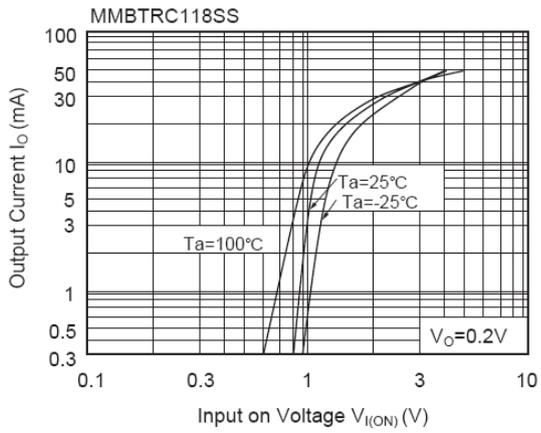
Typical Characteristic Curves

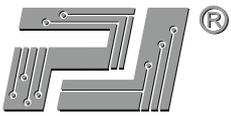




MMBTRC116SS~MMBTRC122SS

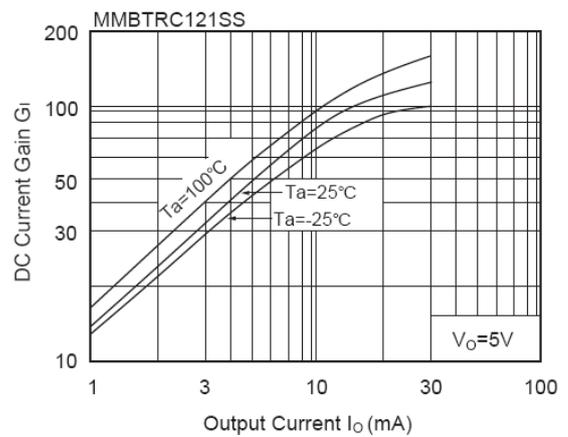
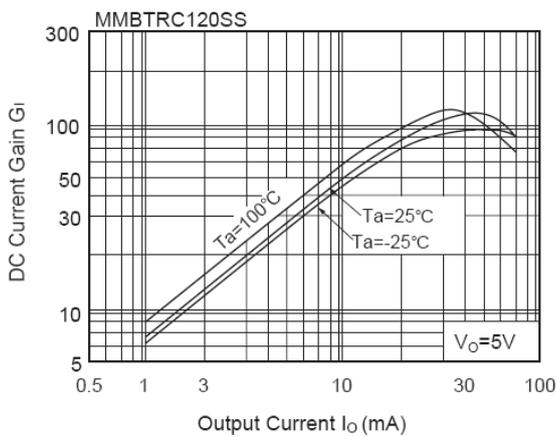
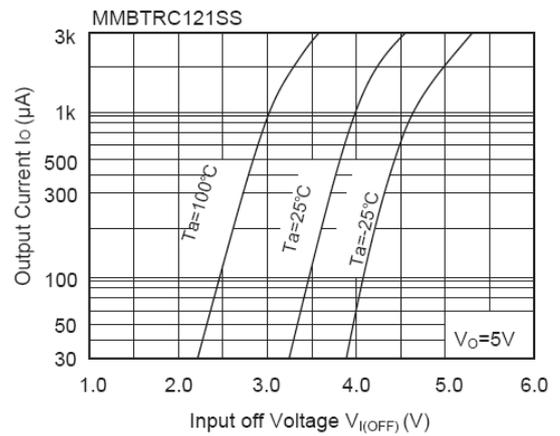
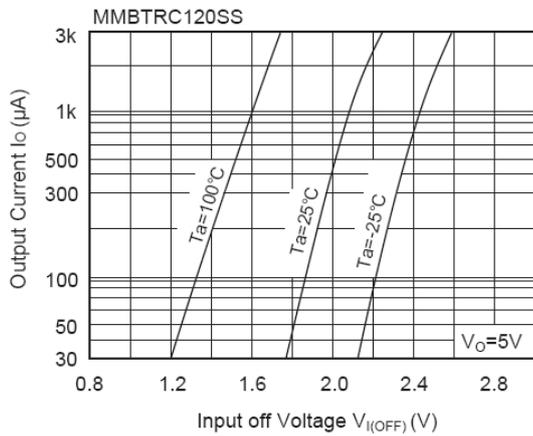
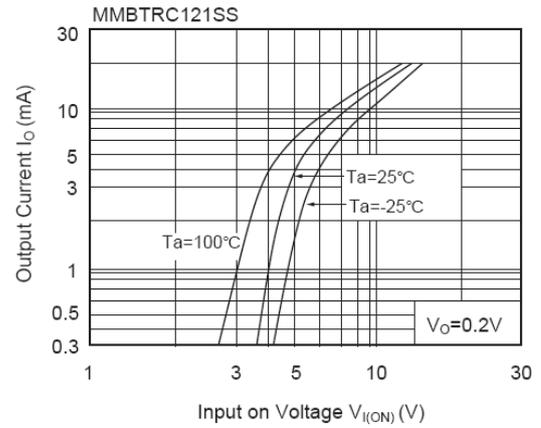
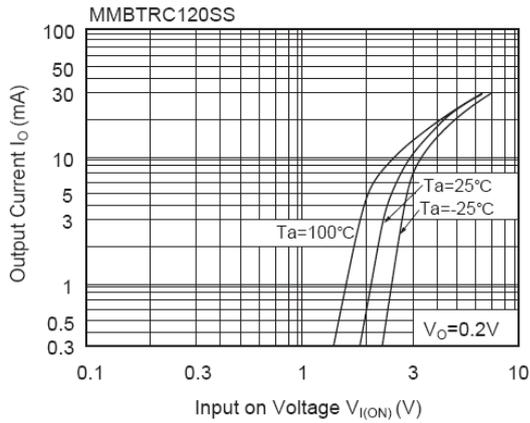
NPN Digital Transistor

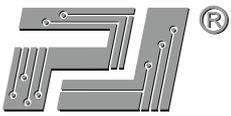




MMBTRC116SS~MMBTRC122SS

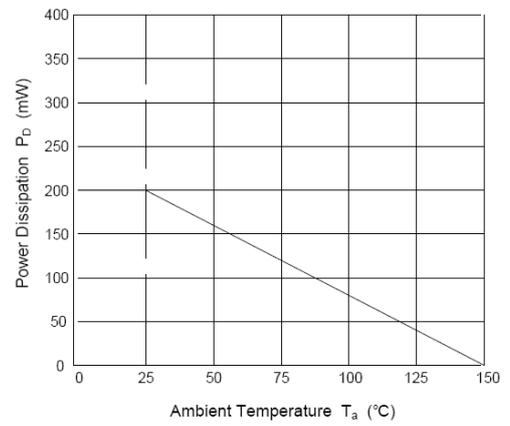
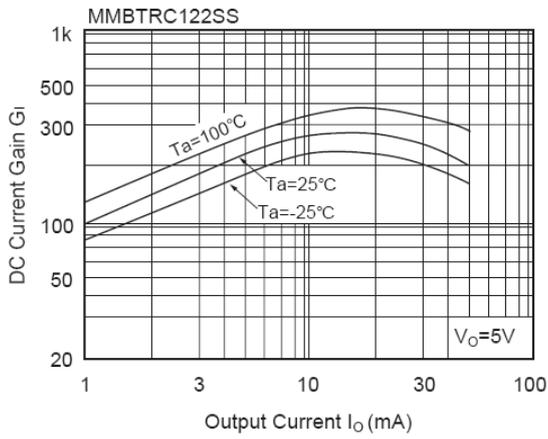
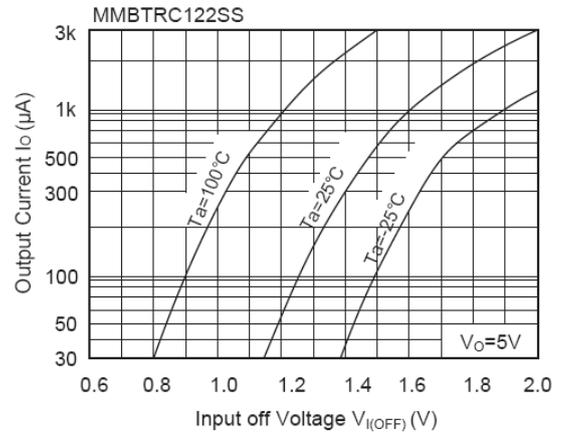
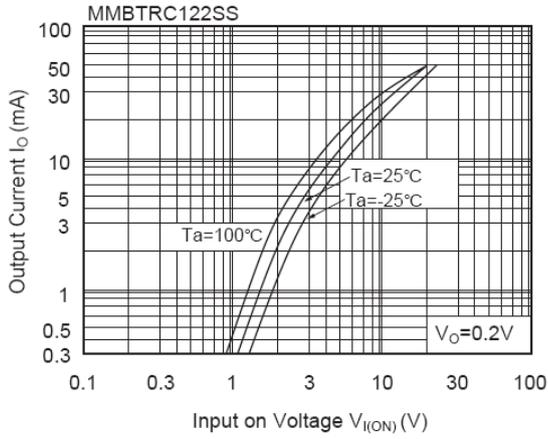
NPN Digital Transistor





MMBTRC116SS~MMBTRC122SS

NPN Digital Transistor





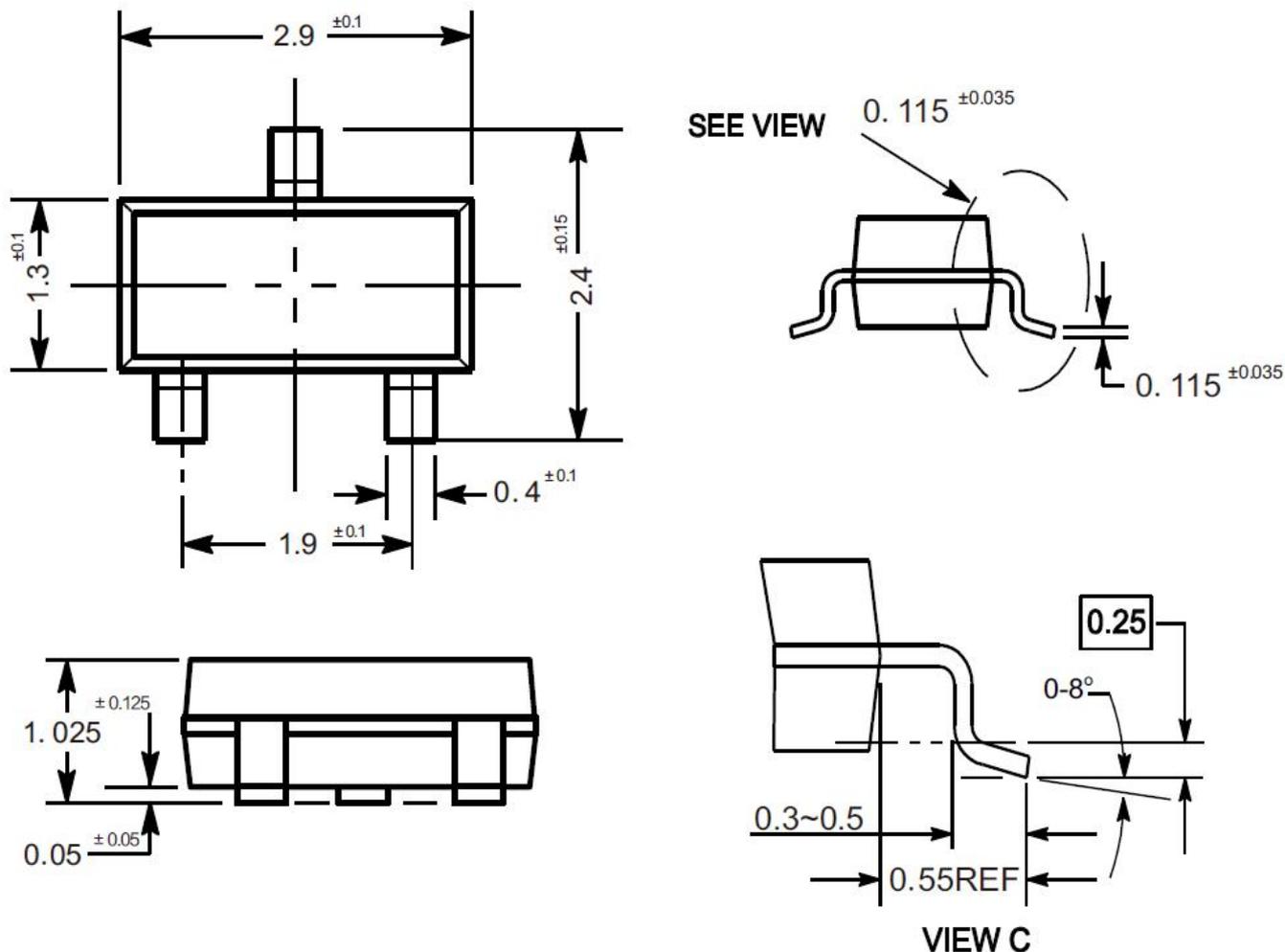
MMBTRC116SS~MMBTRC122SS

NPN Digital Transistor

Package Outline

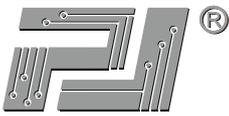
SOT-23

Dimensions in mm



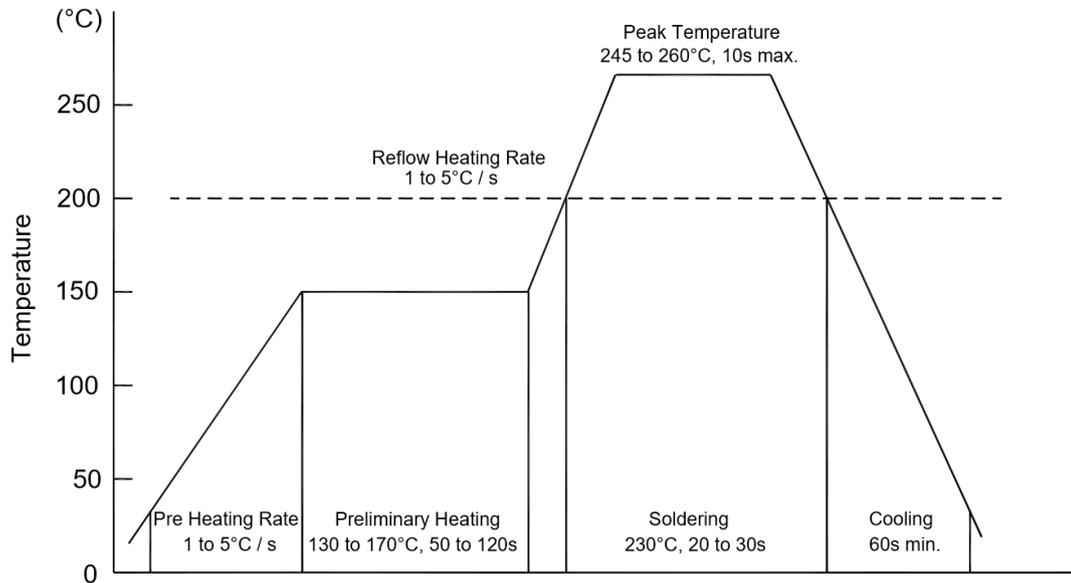
Ordering Information

Device	Package	Shipping
MMBTRC116SS~MMBTRC122SS	SOT-23	3,000PCS/Reel&7inches



Conditions of Soldering and Storage

◆ Recommended condition of reflow soldering



Recommended peak temperature is over 245 °C. If peak temperature is below 245 °C, you may adjust the following parameters:

- Time length of peak temperature (longer)
- Time length of soldering (longer)
- Thickness of solder paste (thicker)

◆ Conditions of hand soldering

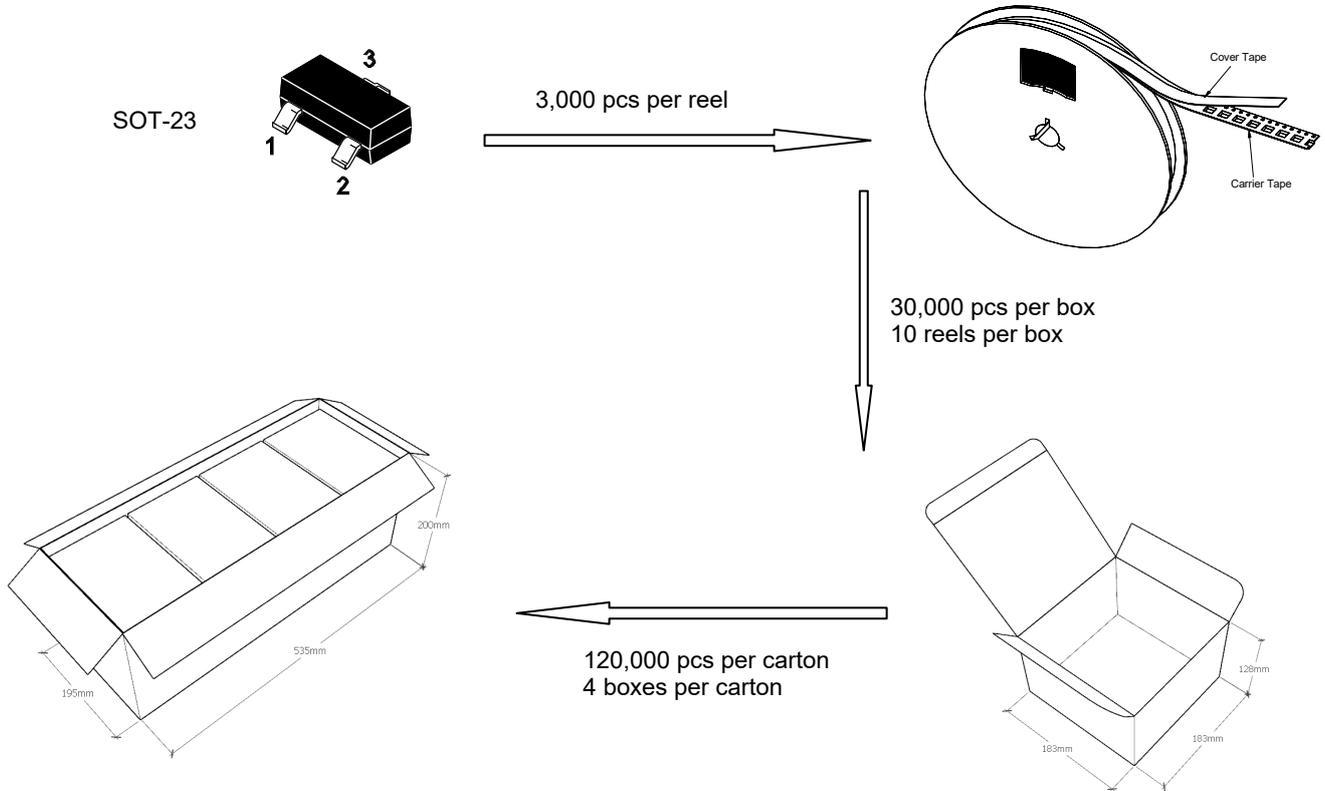
- Temperature: 370 °C
- Time: 3s max.
- Times: one time

◆ Storage conditions

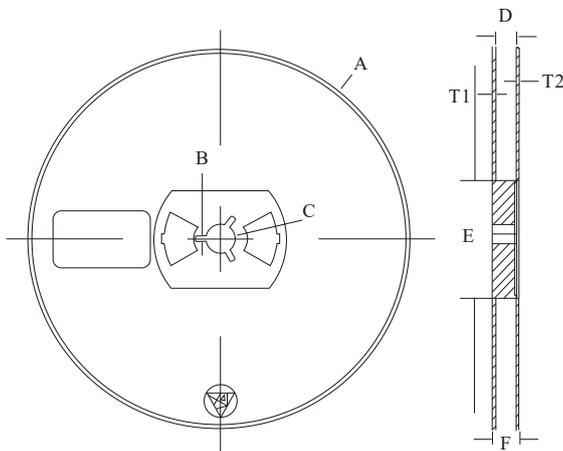
- **Temperature**
5 to 40 °C
- **Humidity**
30 to 80% RH
- **Recommended period**
One year after manufacturing

Package Specifications

- The method of packaging



◆ Embossed tape and reel data



Symbol	Value (unit: mm)
A	Ø 177.8±1
B	2.7±0.2
C	Ø 13.5±0.2
E	Ø 54.5±0.2
F	12.3±0.3
D	9.6+2/-0.3
T1	1.0±0.2
T2	1.2±0.2

Reel (7")

