



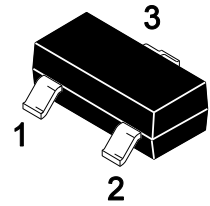
MMBTRA116SS~MMBTRA122SS

PNP Digital Transistor

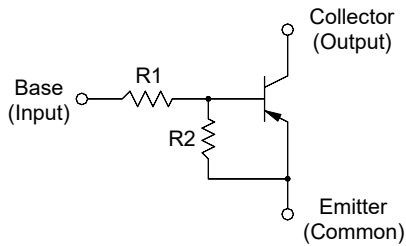
Features

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

SOT-23



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.	
MMBTRA116SS	0.7	1	1.3	7	10	13	16BT
MMBTRA117SS	1.54	2.2	2.86	1.54	2.2	2.86	17BT
MMBTRA118SS	1.54	2.2	2.86	7	10	13	18BT
MMBTRA119SS	3.29	4.7	6.11	7	10	13	19BT
MMBTRA120SS	7	10	13	3.29	4.7	6.11	20BT
MMBTRA121SS	32.9	47	61.1	7	10	13	21BT
MMBTRA122SS	70	100	130	70	100	130	22BT



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

Parameter		Symbol	Value	Unit
Output Voltage		$-V_O$	50	V
Input Voltage	MMBTRA116SS	$-V_I$	10,-5	V
	MMBTRA117SS		12,-10	
	MMBTRA118SS		12,-5	
	MMBTRA119SS		20,-7	
	MMBTRA120SS		30,-10	
	MMBTRA121SS		40,-15	
	MMBTRA122SS		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	$^{\circ}\text{C}$



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PNP Digital Transistor

Electrical Characteristics (T_A=25°C)

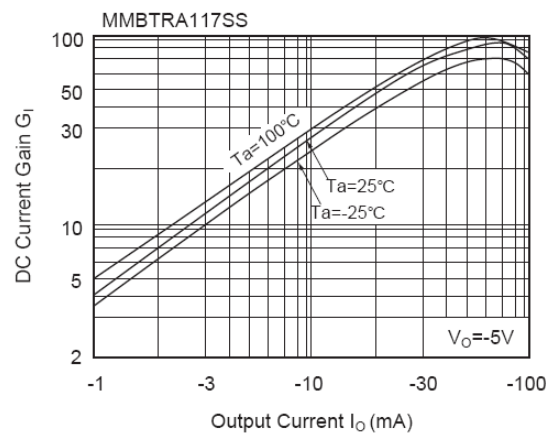
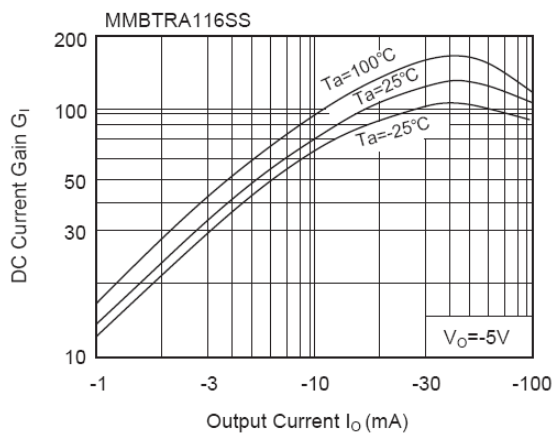
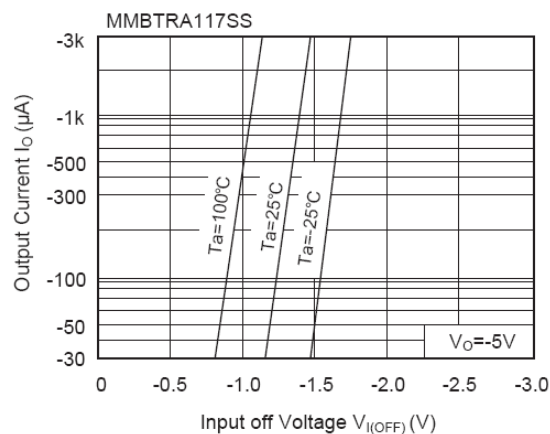
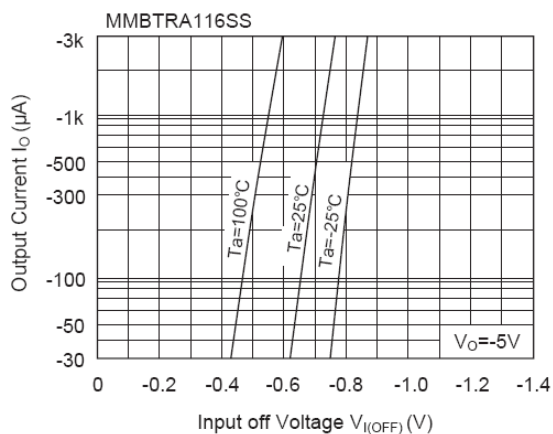
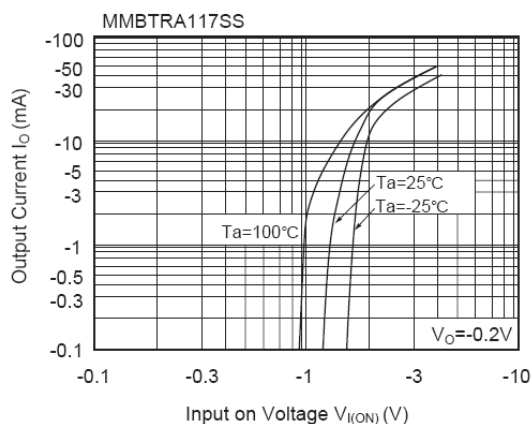
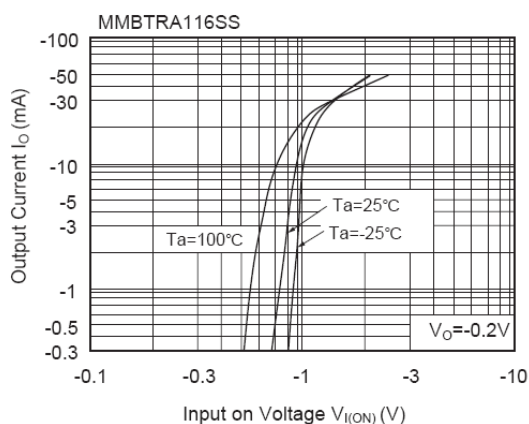
Parameter		Symbol	Min.	Typ.	Max.	Unit
DC Current Gain						
at V _O = -5 V, I _O = -5 mA	MMBTRA116SS	G _I	33	--	--	--
at V _O = -5 V, I _O = -20 mA	MMBTRA117SS		20	--	--	
at V _O = -5 V, I _O = -10 mA	MMBTRA118SS		33	--	--	
at V _O = -5 V, I _O = -10 mA	MMBTRA119SS		30	--	--	
at V _O = -5 V, I _O = -10 mA	MMBTRA120SS		24	--	--	
at V _O = -5 V, I _O = -5 mA	MMBTRA121SS		33	--	--	
at V _O = -5 V, I _O = -5 mA	MMBTRA122SS		62	--	--	
Output Cutoff Current at V _O = -50 V		-I _{O(} OFF)	--	--	500	nA
Input Current at V _I = -5 V		-I _I				mA
	MMBTRA116SS		--	--	7.2	
	MMBTRA117SS		--	--	3.8	
	MMBTRA118SS		--	--	3.8	
	MMBTRA119SS		--	--	1.8	
	MMBTRA120SS		--	--	0.88	
	MMBTRA121SS		--	--	0.16	
	MMBTRA122SS				0.15	
Output Voltage (ON) at I _O = -10 mA, I _I = -0.5 mA		-V _{O(} ON)	--	--	0.3	V
	MMBTRA116SS~121SS					
at I _O = -5 mA, I _I = -0.25 mA			--	--	0.3	
MMBTRA122SS						
Input Voltage (ON)		-V _{I(} ON)				V
at V _O = -0.3 V, I _O = -20 mA	MMBTRA116SS		--	--	3	
at V _O = -0.3 V, I _O = -20 mA	MMBTRA117SS		--	--	3	
at V _O = -0.3 V, I _O = -20 mA	MMBTRA118SS		--	--	3	
at V _O = -0.3 V, I _O = -20 mA	MMBTRA119SS		--	--	2.5	
at V _O = -0.3 V, I _O = -2 mA	MMBTRA120SS		--	--	3	
at V _O = -0.3 V, I _O = -2 mA	MMBTRA121SS		--	--	5	
at V _O = -0.3 V, I _O = -1 mA			--	--	3	
MMBTRA122SS						
Input Voltage (OFF) at V _{CC} = -5 V, I _O = -100 μA		-V _{I(} OFF)	0.3	--	--	V
	MMBTRA116SS					
	MMBTRA117SS		0.5	--	--	
	MMBTRA118SS		0.3	--	--	
	MMBTRA119SS		0.3	--	--	
	MMBTRA120SS		0.8	--	--	
	MMBTRA121SS		1	--	--	
MMBTRA122SS		0.5	--	--		
Transition Frequency at V _O = -10 V, I _O = -5 mA		f _T	--	250	--	MHz



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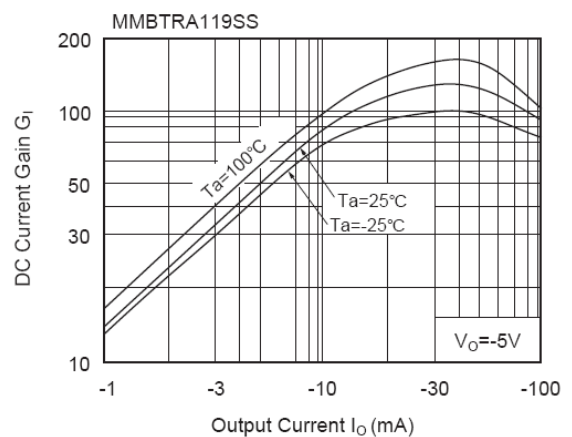
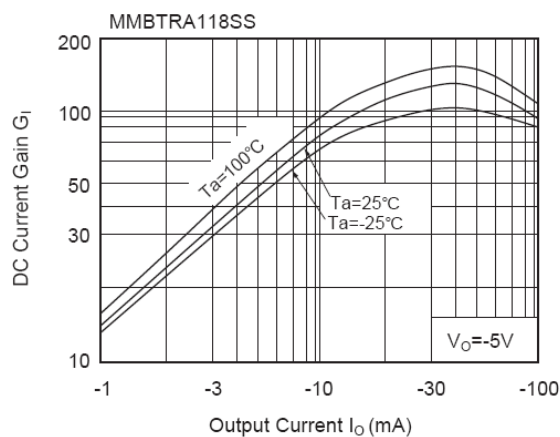
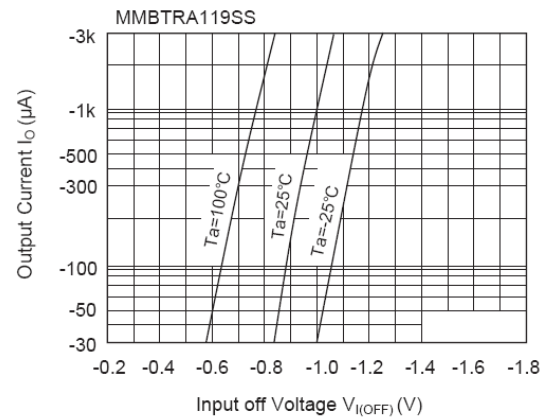
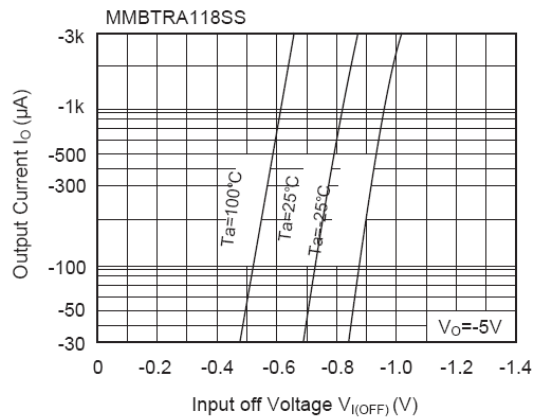
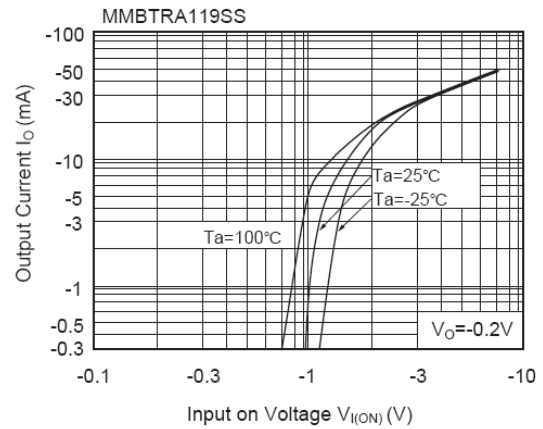
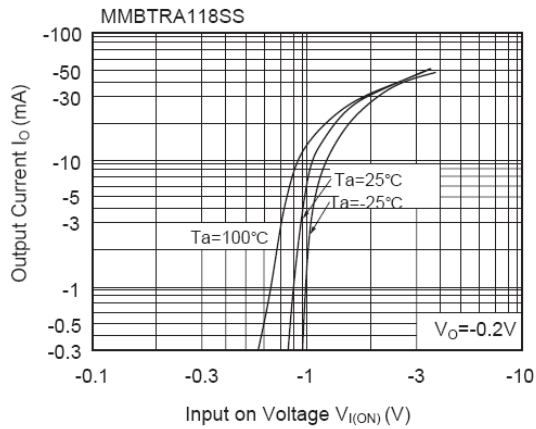
Typical Characteristic Curves





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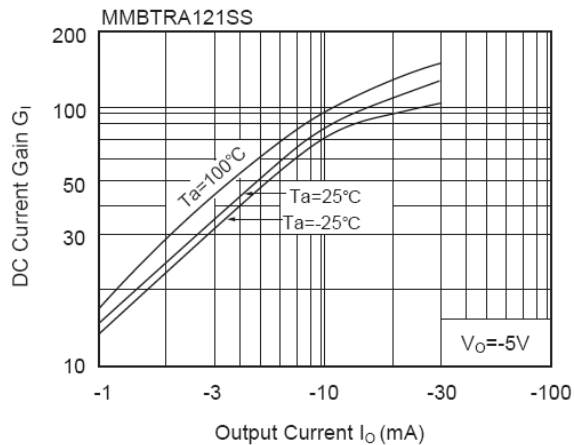
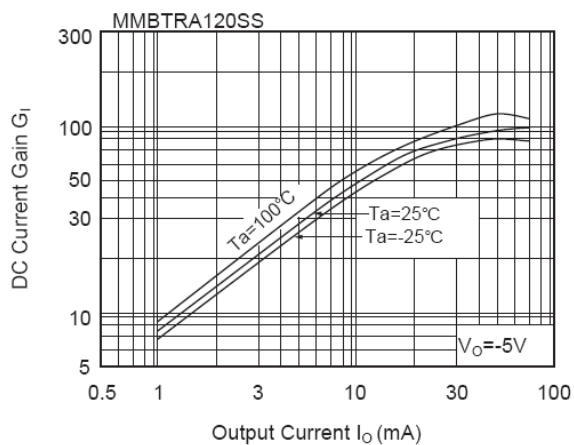
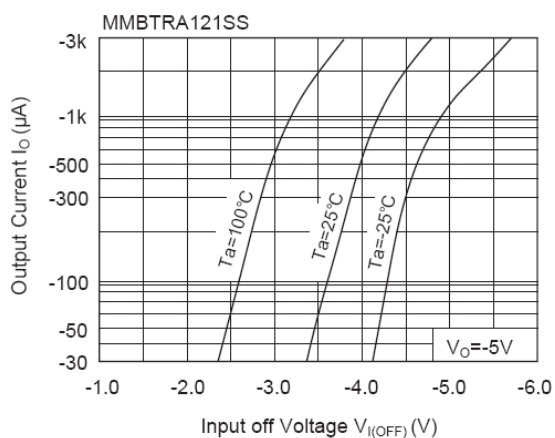
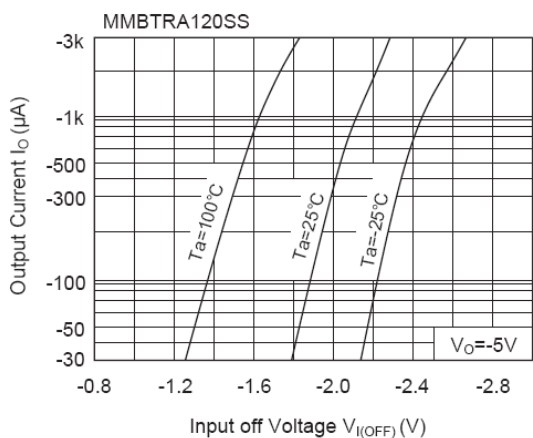
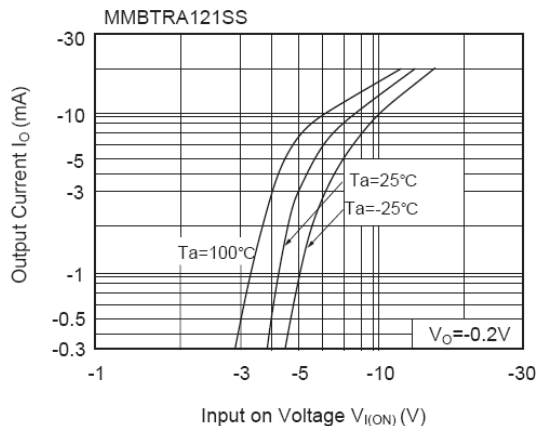
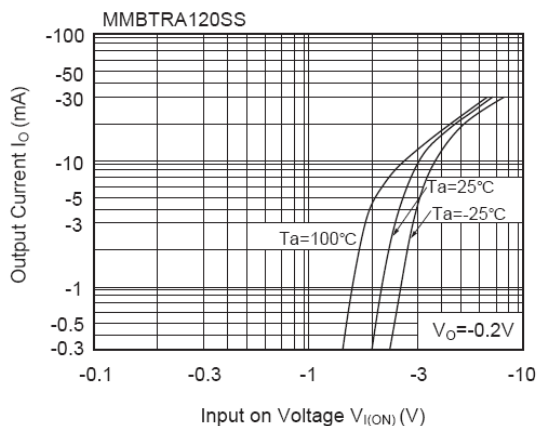
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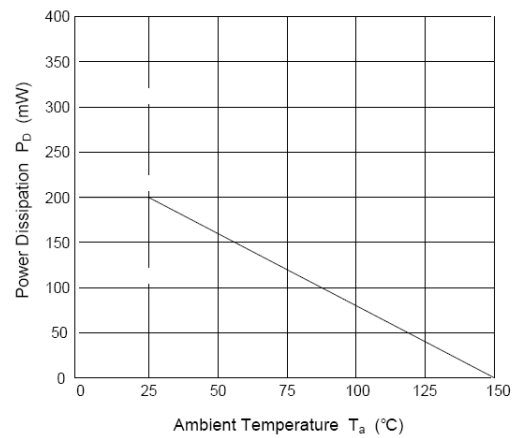
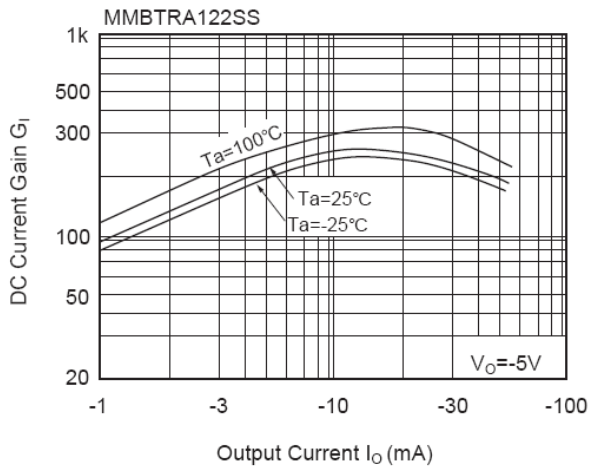
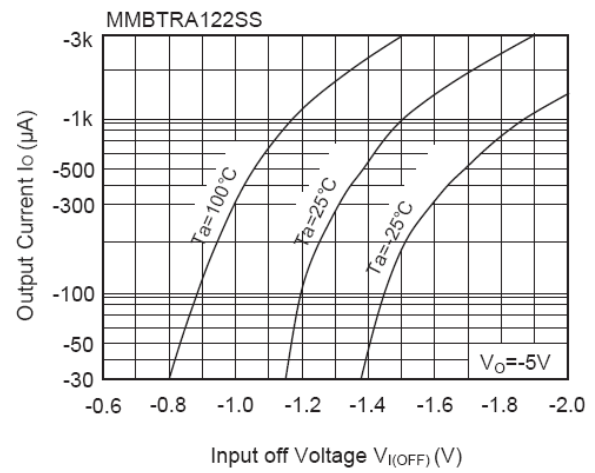
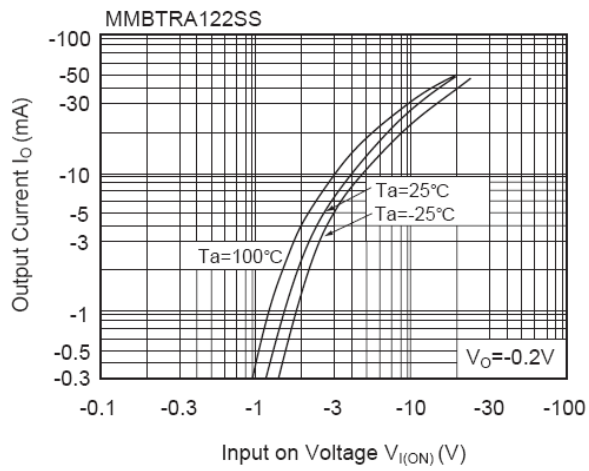
PNP Digital Transistor





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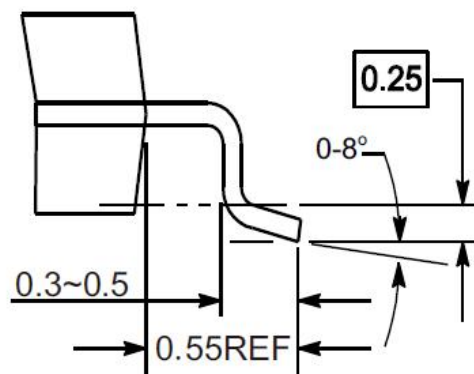
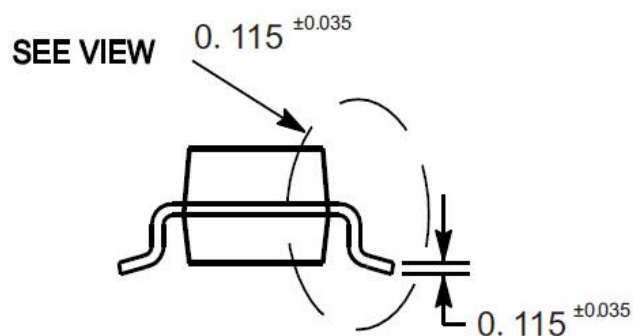
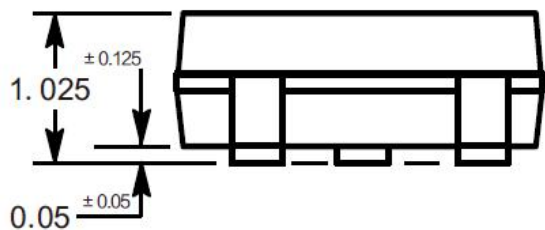
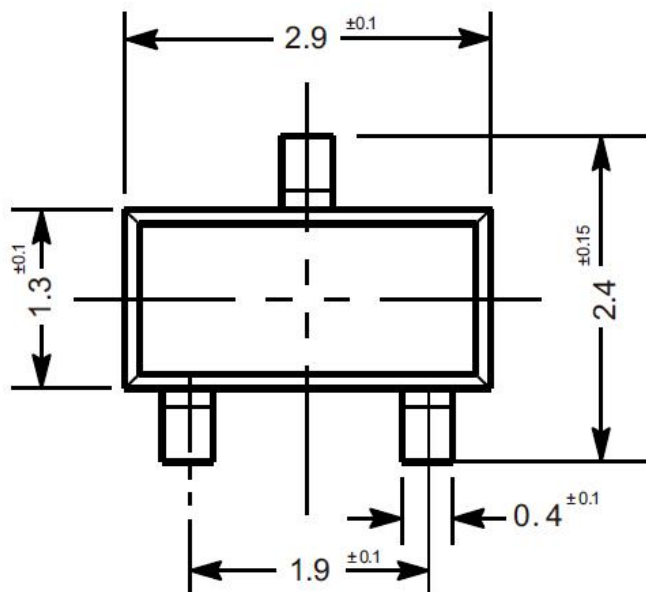
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PNP Digital Transistor

Package Outline

SOT-23

Dimensions in mm



VIEW C

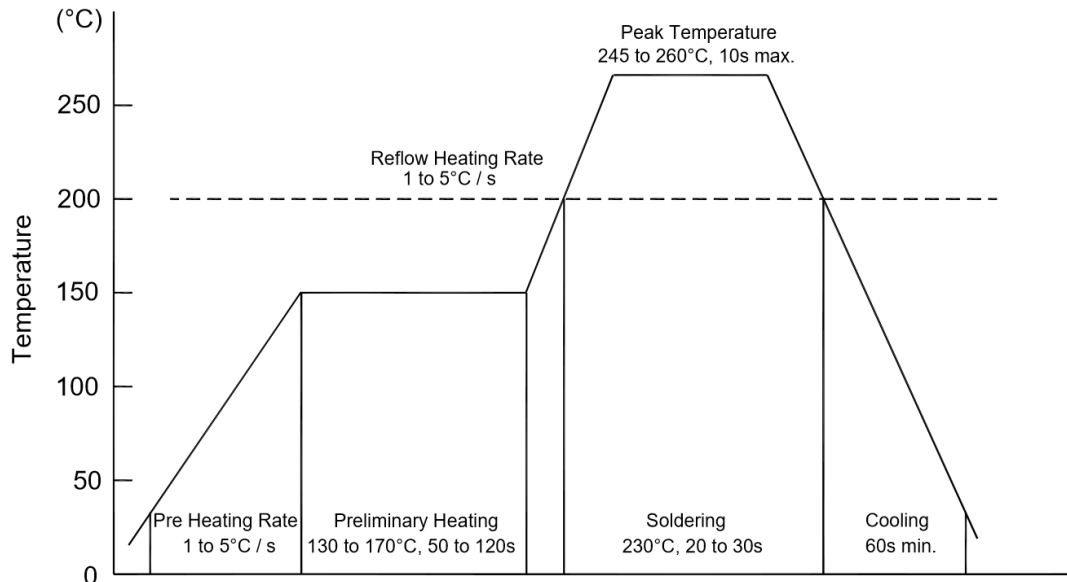
Ordering Information

Device	Package	Shipping
MMBTRA116SS~MMBTRA122SS	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

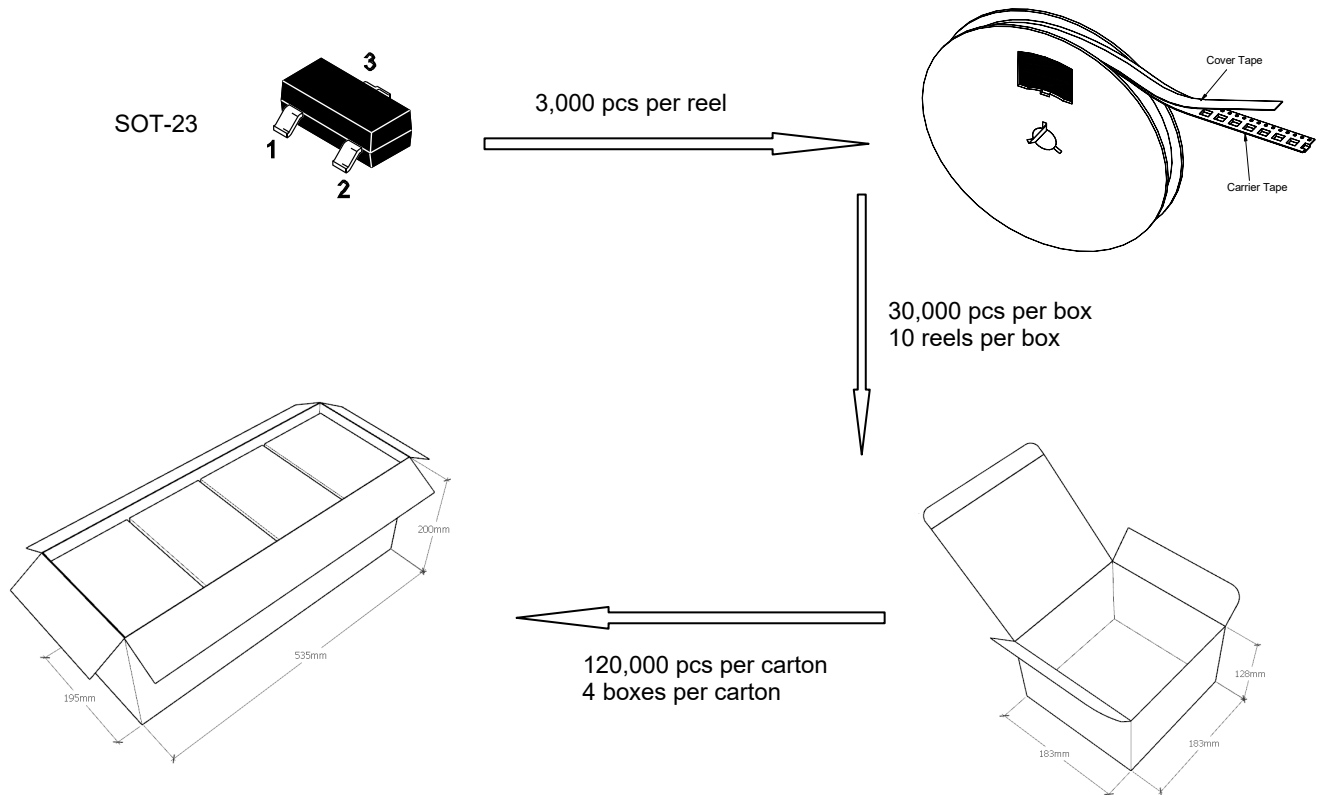
- Temperature: 370 °C
- Time: 3s max.
- Times: one time

◆ Storage conditions

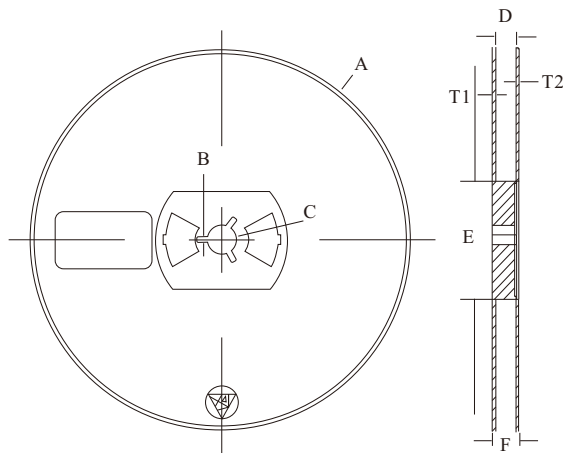
- **Temperature**
5 to 40 °C
- **Humidity**
30 to 80% RH
- **Recommended period**
One year after manufacturing

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")

