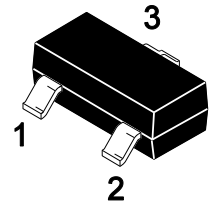


Features

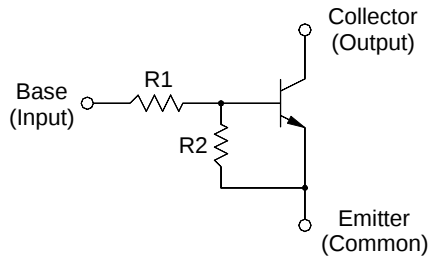
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process

SOT-23



1.Base 2.Emitter 3.Collector

Equivalent Circuit



Resistor Values/Marking Code

Type	R1 (KΩ)			R2 (KΩ)			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

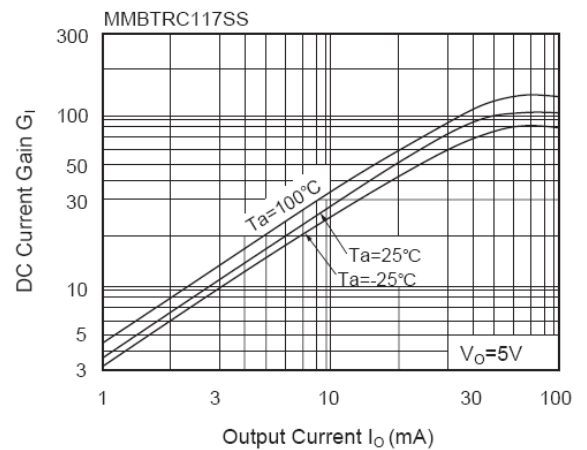
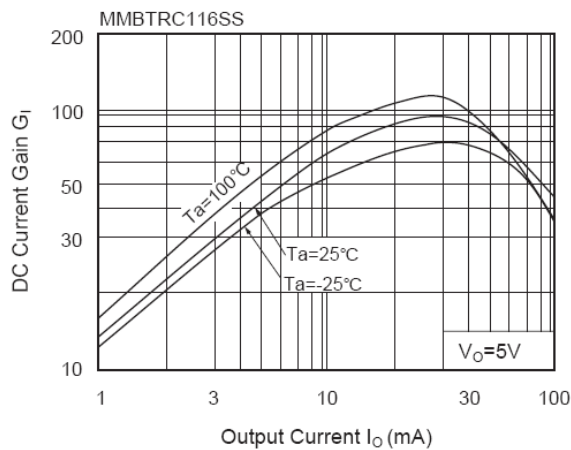
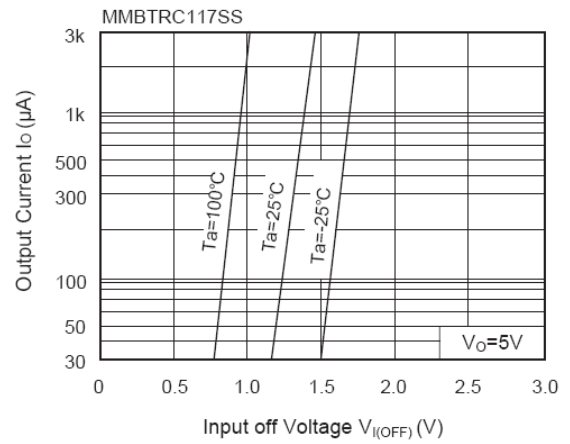
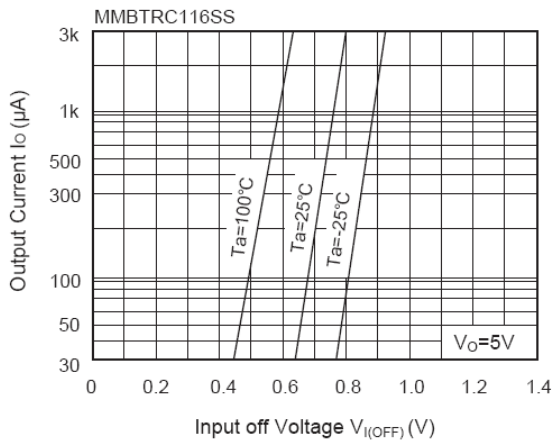
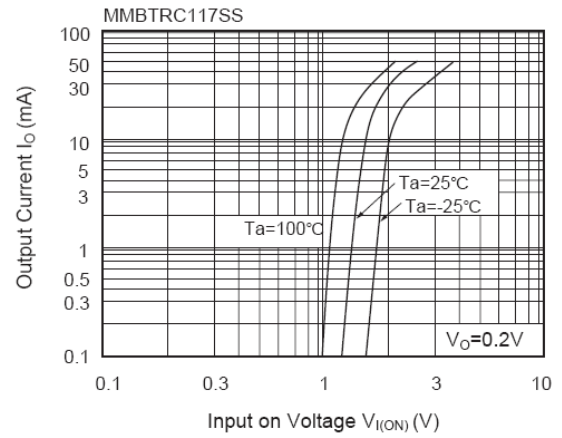
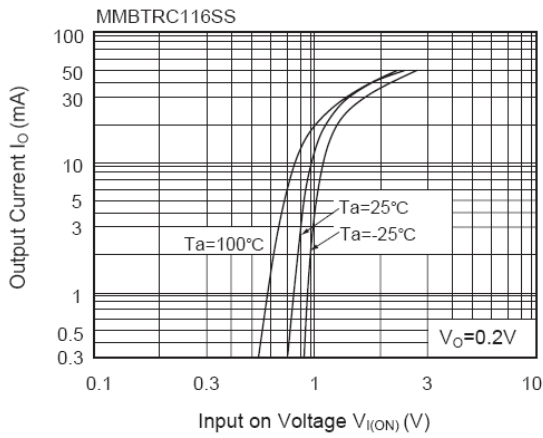
Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$)

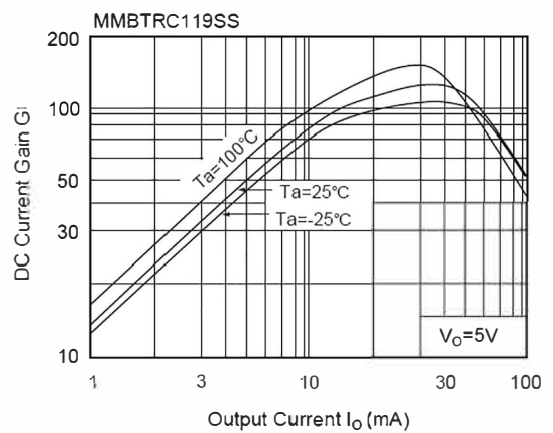
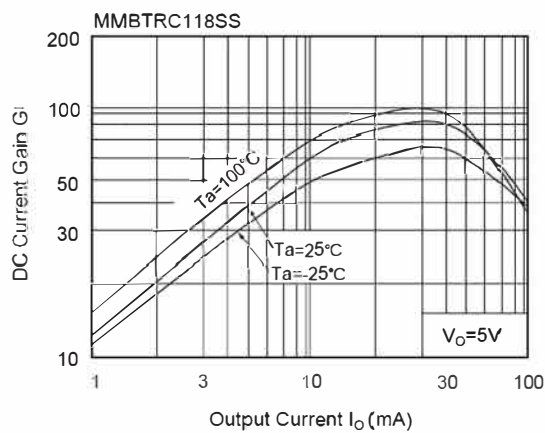
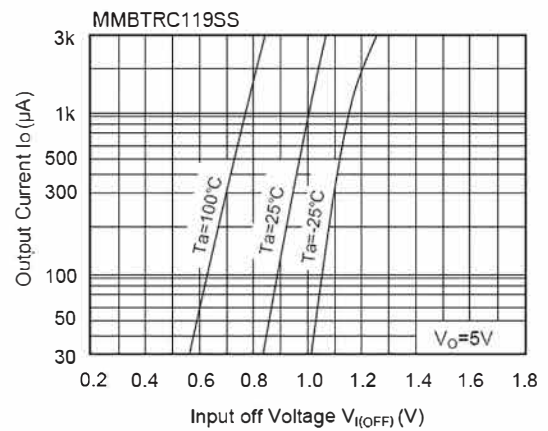
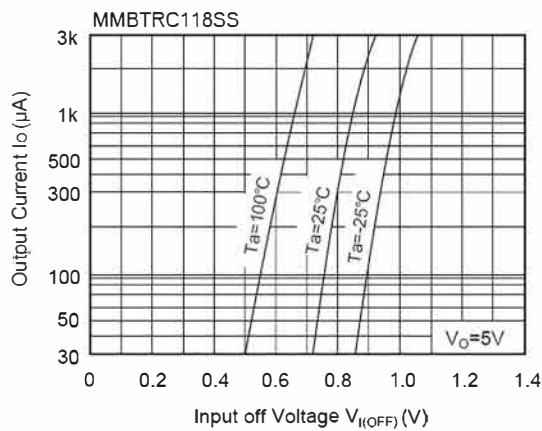
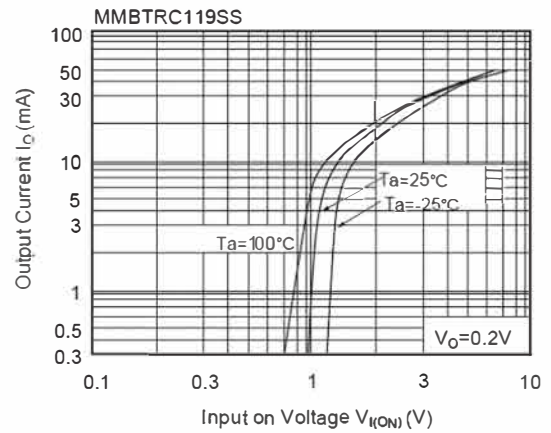
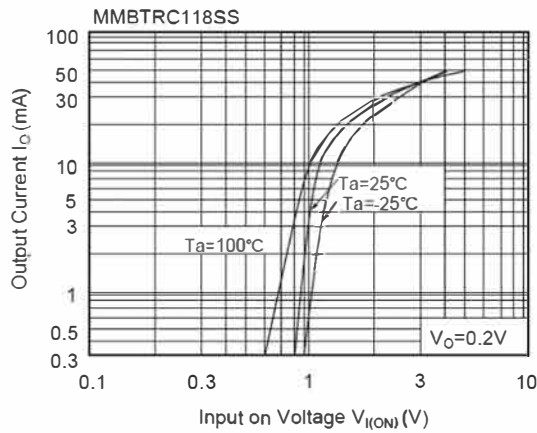
Parameter		Symbol	Value	Unit
Output Voltage		V_O	50	V
Input Voltage	MMBTRC116SS	V_I	10,-5	V
	MMBTRC117SS		12,-10	
	MMBTRC118SS		12,-5	
	MMBTRC119SS		20,-7	
	MMBTRC120SS		30,-10	
	MMBTRC121SS		40,-15	
	MMBTRC122SS		40,-10	
Output Current		I_O	100	mA
Maximum Power Dissipation		P_D	200	mW
Junction Temperature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

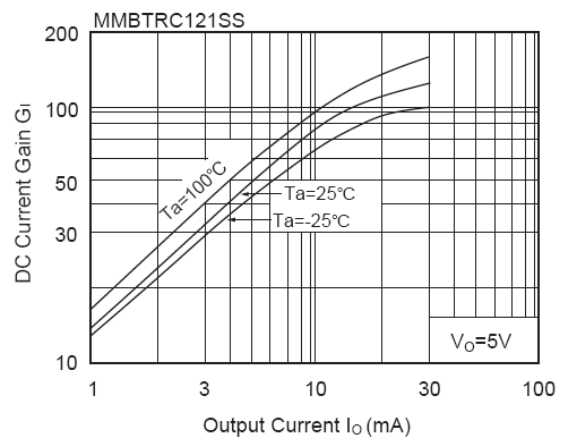
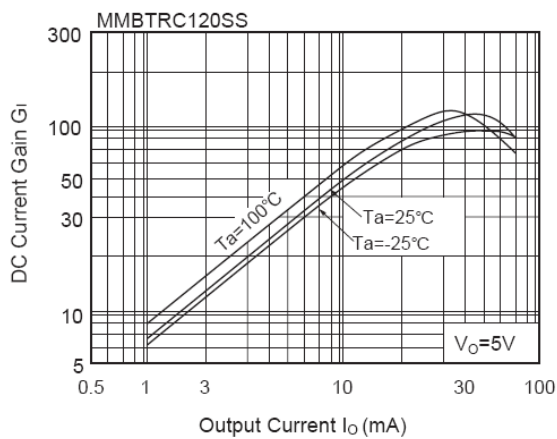
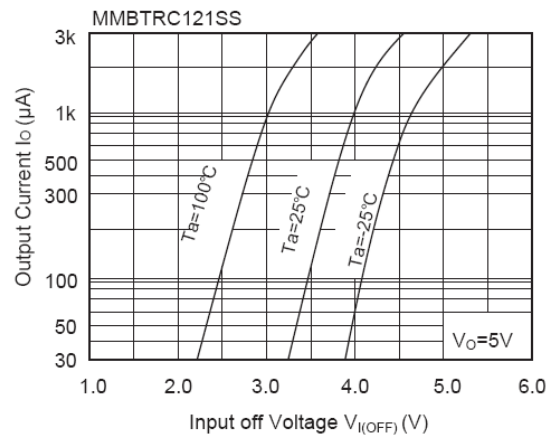
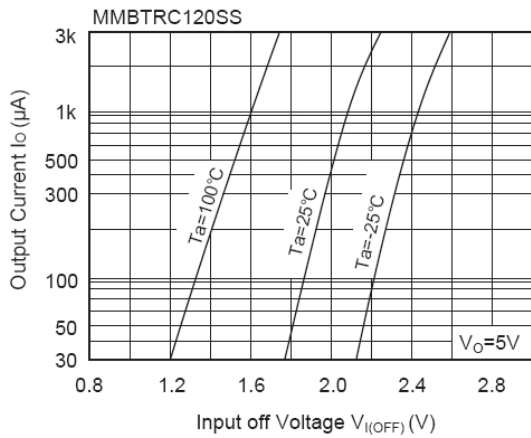
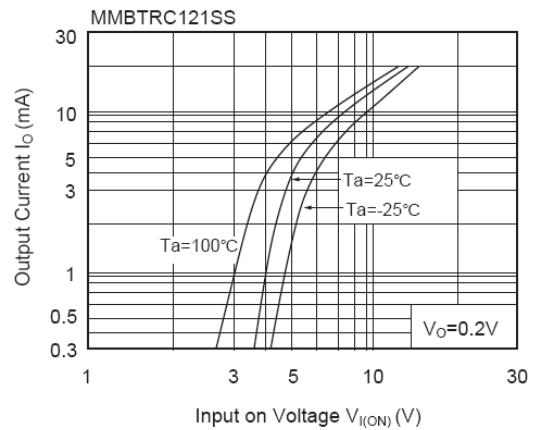
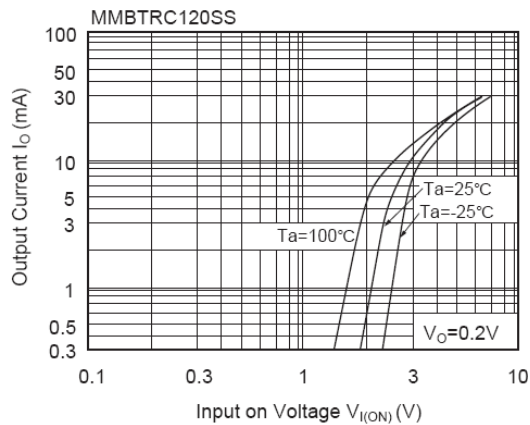
Electrical Characteristics (T_A=25°C)

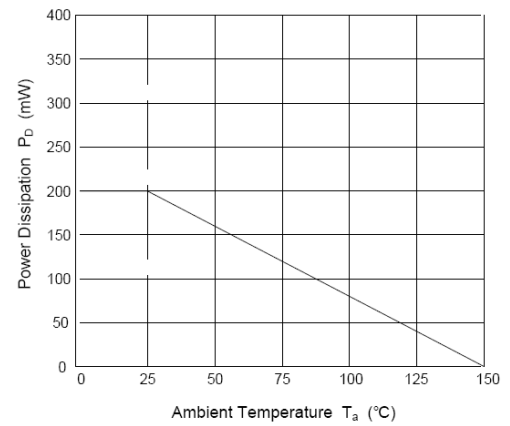
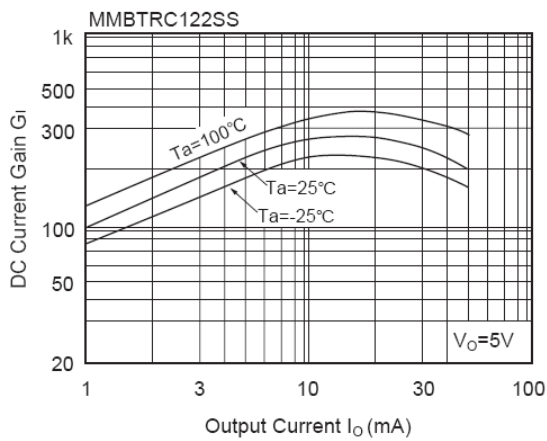
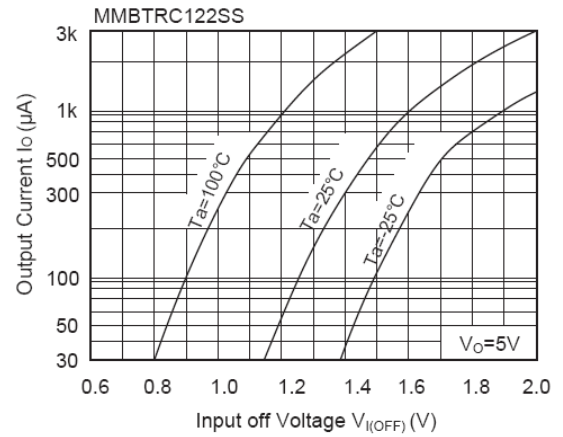
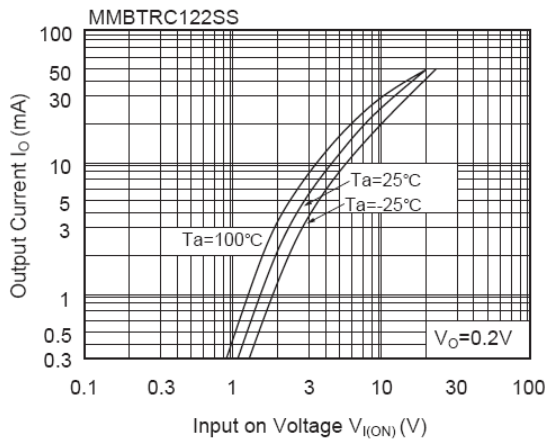
Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain					
at V _O = 5 V, I _O = 5 mA	MMBTRC116SS	33	--	--	
at V _O = 5 V, I _O = 20 mA	MMBTRC117SS	20	--	--	
at V _O = 5 V, I _O = 10 mA	MMBTRC118SS	33	--	--	
at V _O = 5 V, I _O = 10 mA	MMBTRC119SS	30	--	--	
at V _O = 5 V, I _O = 10 mA	MMBTRC120SS	24	--	--	
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	
	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	
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	--	--	
	MMBTRC120SS	0.8	--	--	
	MMBTRC121SS	1	--	--	
	MMBTRC122SS	0.5	--	--	
Transition Frequency at V _O = 10 V, I _O = 5 mA	f _T	--	250	--	MHz

Typical Characteristic Curves





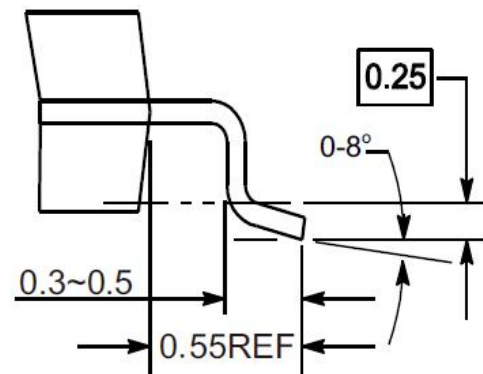
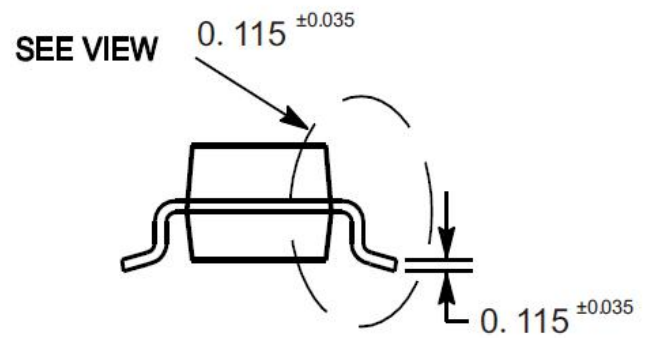
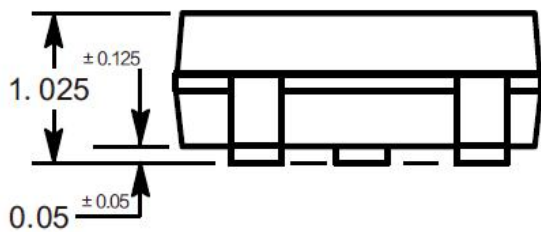
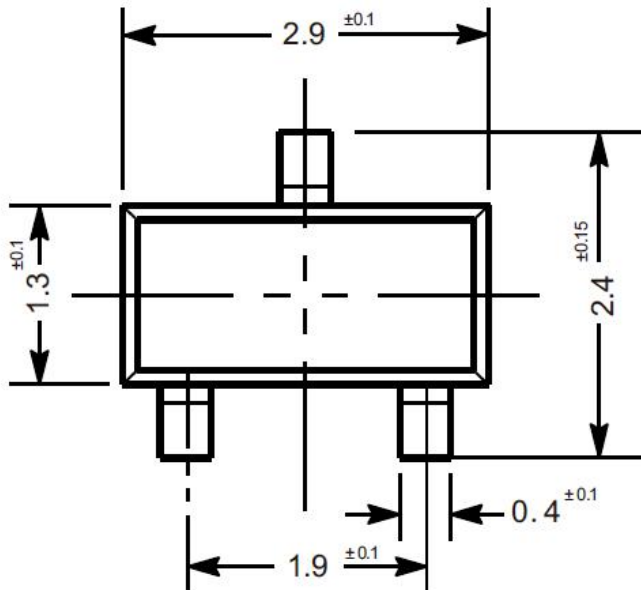




Package Outline

SOT-23

Dimensions in mm



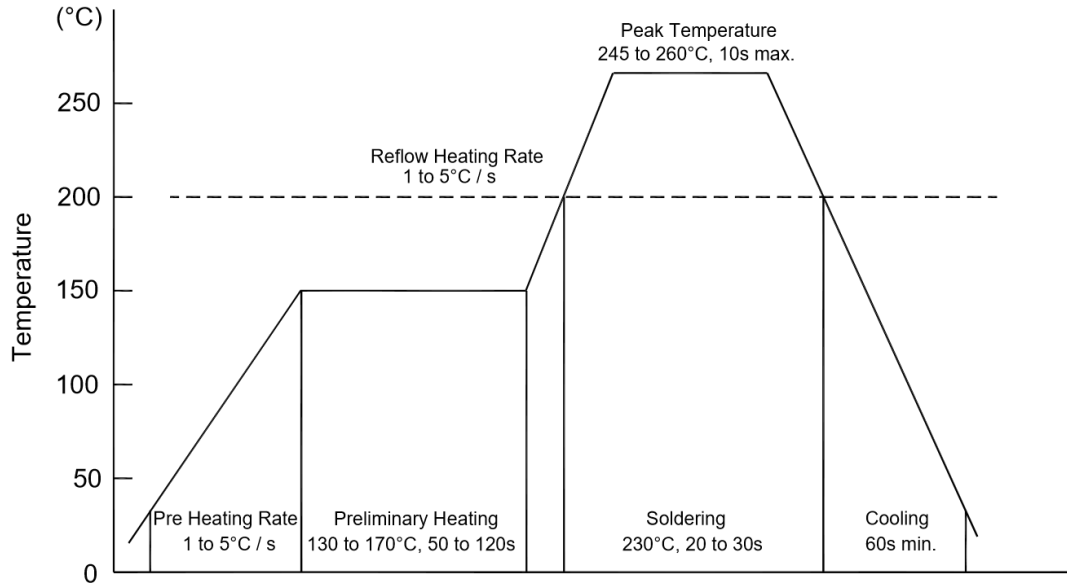
VIEW C

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

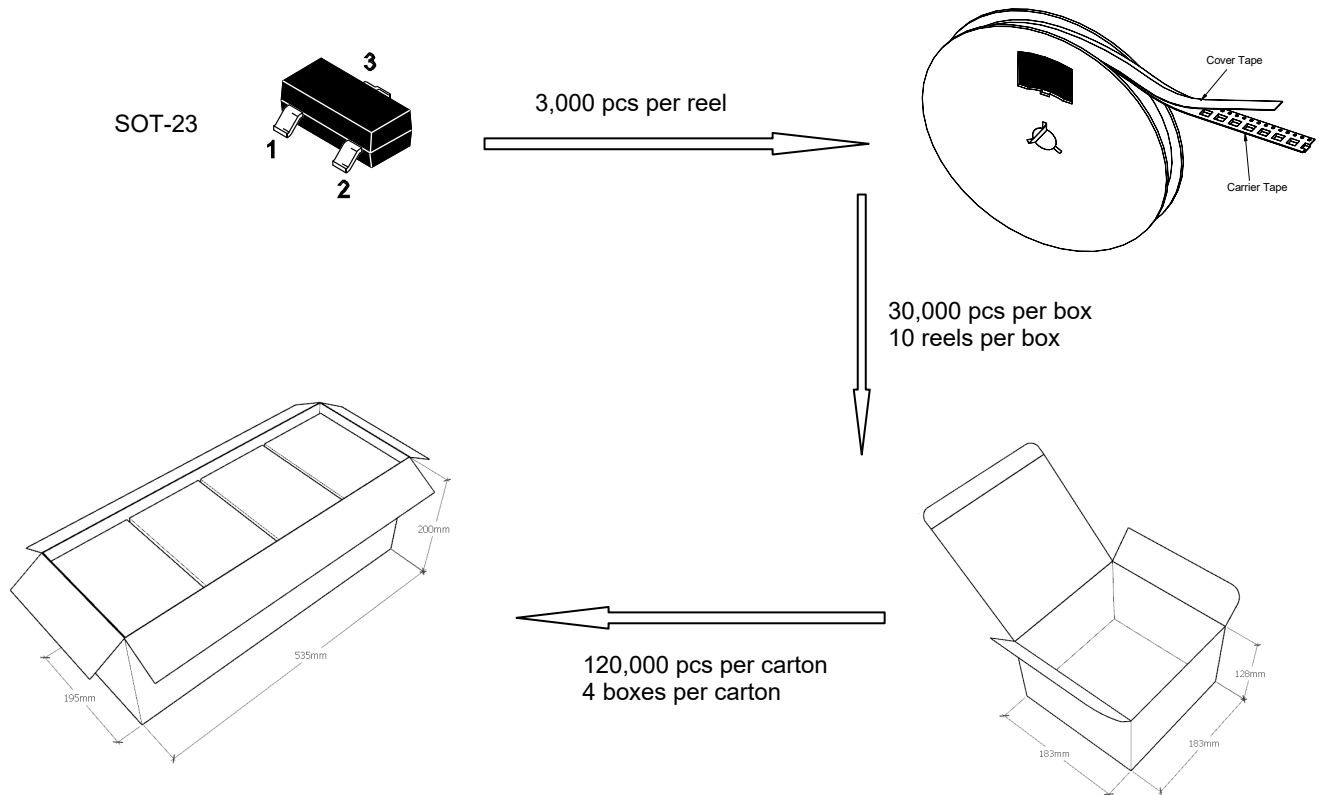
- Temperature: 370 °C
- Time: 3s max.
- Times: one time

◆ Storage conditions

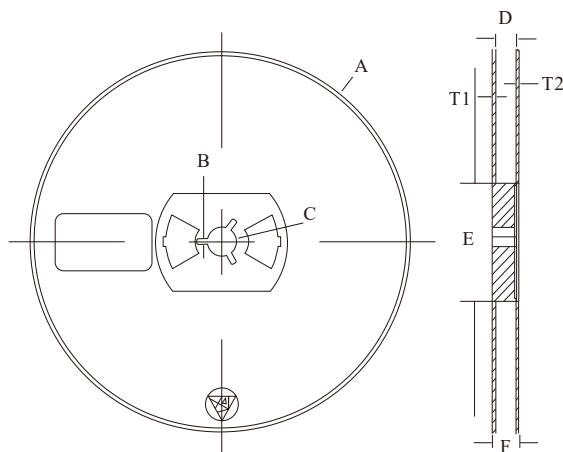
- **Temperature**
5 to 40 °C
- **Humidity**
30 to 80% RH
- **Recommended period**
One year after manufacturing

Package Specifications

- The method of packaging

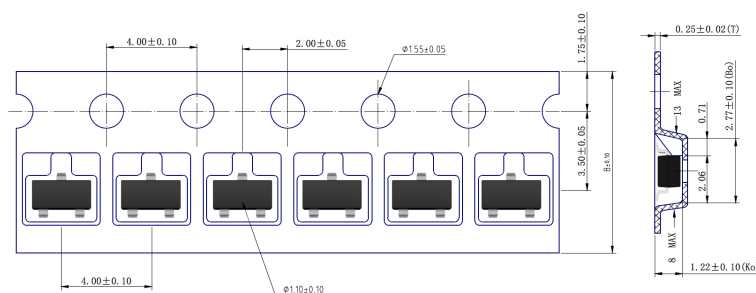


◆ Embossed tape and reel data



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")



Contact Information

TANI website: <http://www.tanisemi.com> Email: tani@tanisemi.com

For additional information, please contact your local Sales Representative.

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Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

TANI reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with TANI to ensure that the product specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult TANI in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. TANI shall assume no responsibility for any consequences resulting from such usage.

Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third-party legal rights. TANI shall assume no responsibility for any disputes or controversies arising from the above-mentioned issues in any form.