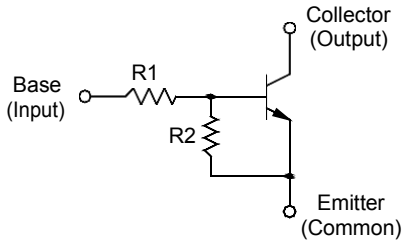
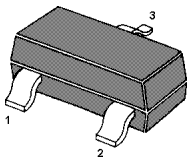
NPN Silicon Epitaxial Planar Transistor

for switching, interface circuit and drive circuit applications





1. Base 2.Emitter 3.Collector
SOT-23 Plastic Package

Features

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

Resistor Values

Type	R1 (KΩ)	R2 (KΩ)	MARKING
MMBTRC116SS	1	10	16BR
MMBTRC117SS	2.2	2.2	17BR
MMBTRC118SS	2.2	10	18BR
MMBTRC119SS	4.7	10	19BR
MMBTRC120SS	10	4.7	20BR
MMBTRC121SS	47	10	21BR
MMBTRC122SS	100	100	22BR

Absolute Maximum Ratings (T_a = 25 °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
Total Power Dissipation		P_{tot}	200	mW
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_S	- 55 to + 150	°C

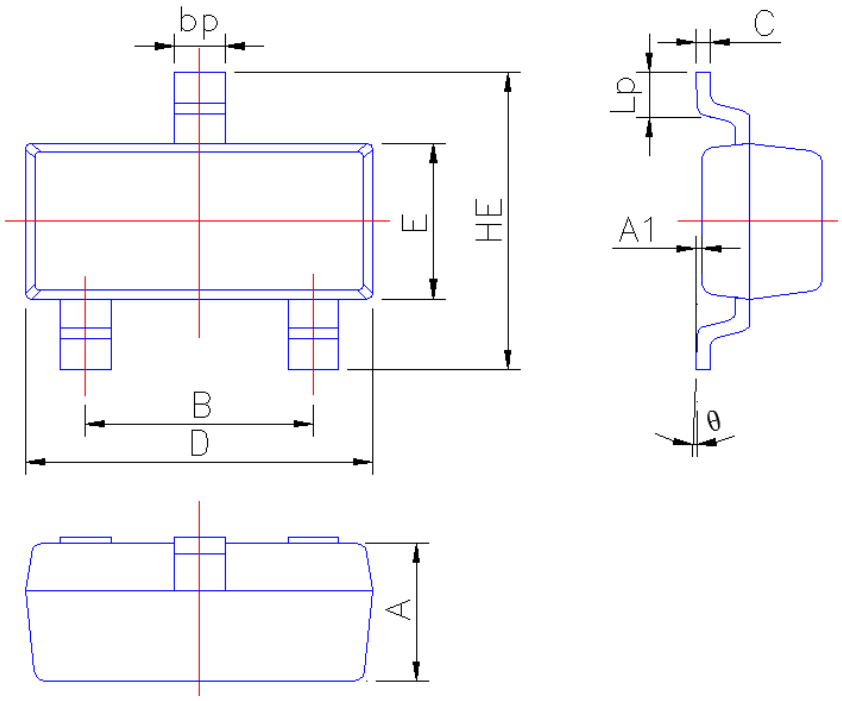
Characteristics at T_a = 25 °C

Parameter		Symbol	Min.	Typ.	Max.	Unit
DC Current Gain						
at V_O = 5 V, I_O = 5 mA	MMBTRC116SS	G_I	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		$I_{O(OFF)}$	-	-	500	nA
at V_O = 50 V						
Input Current		I_I				mA
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		$V_{O(ON)}$				V
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC116SS		-	-	0.3	
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC117SS		-	-	0.3	
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC118SS		-	-	0.3	
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC119SS		-	-	0.3	
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC120SS		-	-	0.3	
at I_O = 10 mA, I_I = 0.5 mA	MMBTRC121SS		-	-	0.3	
at I_O = 5 mA, I_I = 0.25 mA	MMBTRC122SS		-	-	0.3	
Input Voltage (ON)		$V_{I(ON)}$				V
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)		$V_{I(OFF)}$				V
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		f_T [1)]	-	250	-	MHz
at V_O = 10 V, I_O = 5 mA						

1) Characteristic of transistor only.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT-23**



Symbol	Dimension in Millimeters	
	Min	Max
A	0.90	1.10
A1	0.013	0.100
B	1.80	2.00
bp	0.35	0.50
C	0.09	0.150
D	2.80	3.00
E	1.20	1.40
HE	2.20	2.80
Lp	0.20	0.50
θ	0°	5°