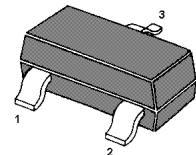
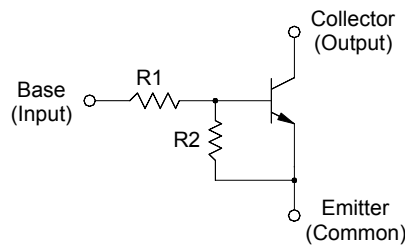


MMBTRC116SS...MMBTRC122SS NPN Silicon Epitaxial Planar Transistor

for switching, interface circuit and drive circuit applications

Features

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



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

Resistor Values And Mark

Type	R1 (KΩ)	R2 (KΩ)	Marking Code
MMBTRC116SS	1	10	YN
MMBTRC117SS	2.2	2.2	YP
MMBTRC118SS	2.2	10	YR
MMBTRC119SS	4.7	10	YX
MMBTRC120SS	10	4.7	YY
MMBTRC121SS	47	10	YZ
MMBTRC122SS	100	100	ZA

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 $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain					
at $V_o = 5\text{ V}$, $I_o = 5\text{ mA}$	MMBTRC116SS	33	-	-	-
at $V_o = 5\text{ V}$, $I_o = 20\text{ mA}$	MMBTRC117SS	20	-	-	-
at $V_o = 5\text{ V}$, $I_o = 10\text{ mA}$	MMBTRC118SS	33	-	-	-
at $V_o = 5\text{ V}$, $I_o = 10\text{ mA}$	MMBTRC119SS	30	-	-	-
at $V_o = 5\text{ V}$, $I_o = 10\text{ mA}$	MMBTRC120SS	24	-	-	-
at $V_o = 5\text{ V}$, $I_o = 5\text{ mA}$	MMBTRC121SS	33	-	-	-
at $V_o = 5\text{ V}$, $I_o = 5\text{ mA}$	MMBTRC122SS	62	-	-	-
Output Cutoff Current at $V_o = 50\text{ V}$	$I_{O(OFF)}$	-	-	500	nA
Input Current at $V_i = 5\text{ V}$					
	MMBTRC116SS	-	-	7.2	mA
	MMBTRC117SS	-	-	3.8	
	MMBTRC118SS	-	-	3.8	
	MMBTRC119SS	-	-	1.8	
	MMBTRC120SS	-	-	0.88	
	MMBTRC121SS	-	-	0.16	
	MMBTRC122SS	-	-	0.15	
Output Voltage					
at $I_o = 10\text{ mA}$, $I_i = 0.5\text{ mA}$	MMBTRC116SS	-	-	0.3	V
at $I_o = 10\text{ mA}$, $I_i = 0.5\text{ mA}$	MMBTRC117SS	-	-	0.3	
at $I_o = 10\text{ mA}$, $I_i = 0.5\text{ mA}$	MMBTRC118SS	-	-	0.3	
at $I_o = 10\text{ mA}$, $I_i = 0.5\text{ mA}$	MMBTRC119SS	-	-	0.3	
at $I_o = 10\text{ mA}$, $I_i = 0.5\text{ mA}$	MMBTRC120SS	-	-	0.3	
at $I_o = 10\text{ mA}$, $I_i = 0.5\text{ mA}$	MMBTRC121SS	-	-	0.3	
at $I_o = 5\text{ mA}$, $I_i = 0.25\text{ mA}$	MMBTRC122SS	-	-	0.3	
Input Voltage (ON)					
at $V_o = 0.3\text{ V}$, $I_o = 20\text{ mA}$	MMBTRC116SS	-	-	3	V
at $V_o = 0.3\text{ V}$, $I_o = 20\text{ mA}$	MMBTRC117SS	-	-	3	
at $V_o = 0.3\text{ V}$, $I_o = 20\text{ mA}$	MMBTRC118SS	-	-	3	
at $V_o = 0.3\text{ V}$, $I_o = 20\text{ mA}$	MMBTRC119SS	-	-	2.5	
at $V_o = 0.3\text{ V}$, $I_o = 2\text{ mA}$	MMBTRC120SS	-	-	3	
at $V_o = 0.3\text{ V}$, $I_o = 2\text{ mA}$	MMBTRC121SS	-	-	5	
at $V_o = 0.3\text{ V}$, $I_o = 1\text{ mA}$	MMBTRC122SS	-	-	3	
Input Voltage (OFF)					
at $V_{CC} = 5\text{ V}$, $I_o = 100\text{ }\mu\text{A}$	MMBTRC116SS	0.3	-	-	V
	MMBTRC117SS	0.5	-	-	
	MMBTRC118SS	0.3	-	-	
	MMBTRC119SS	0.3	-	-	
	MMBTRC120SS	0.8	-	-	
	MMBTRC121SS	1	-	-	
	MMBTRC122SS	0.5	-	-	

Characteristics at $T_a = 25\text{ }^\circ\text{C}$

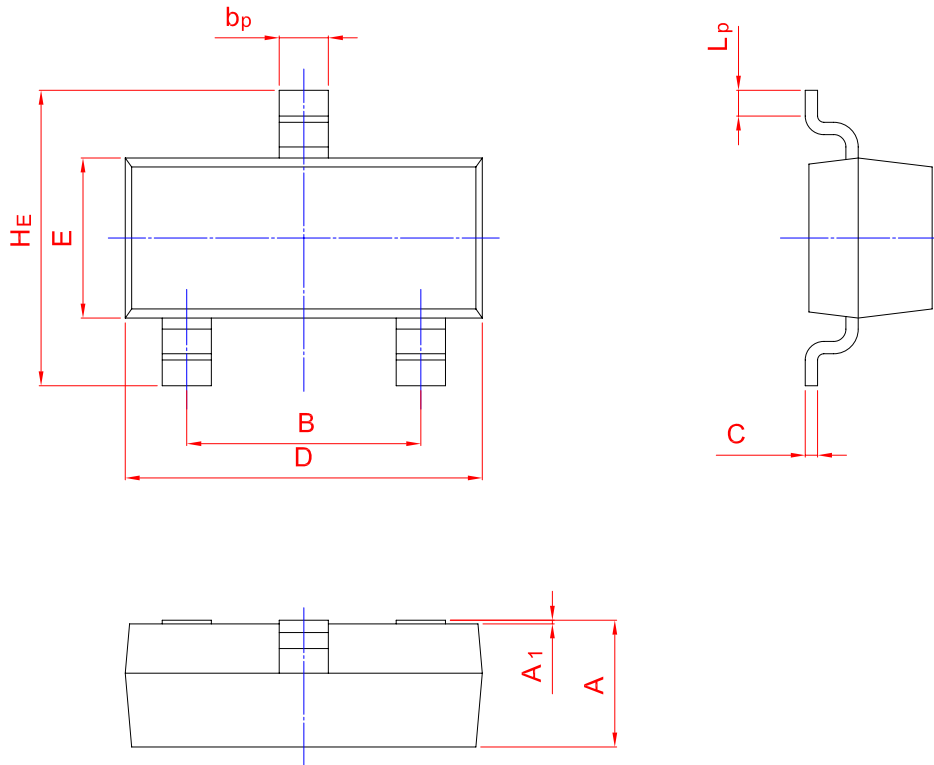
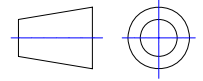
Parameter	Symbol	Min.	Typ.	Max.	Unit
Input Resistance	R1	0.7	1	1.3	k Ω
		1.54	2.2	2.86	
		1.54	2.2	2.86	
		3.29	4.7	6.11	
		7	10	13	
		32.9	47	61.1	
		70	100	130	
Resistance ratio	R2/R1	8	10	12	
		0.8	1	1.2	
		3.6	4.5	5.5	
		1.7	2.1	2.6	
		0.37	0.47	0.57	
		0.17	0.21	0.26	
		0.8	1.0	1.2	
Transition Frequency at $V_o = 10\text{ V}$, $I_o = 5\text{ mA}$	f_T ¹⁾	-	250	-	MHz

1) Characteristic of transistor only.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	bp	C	D	E	Hε	A1	Lp
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20