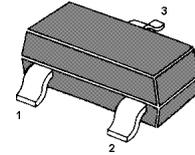
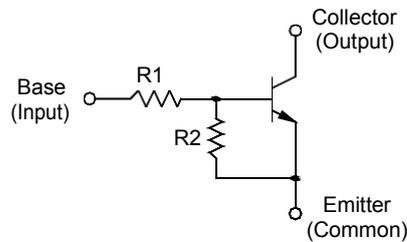


NPN Silicon Epitaxial Planar Transistor

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

Type	R1 (K Ω)	R2 (K Ω)	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 ($T_a = 25\text{ }^\circ\text{C}$)

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
Total Power Dissipation		P_{tot}	200	mW
Junction Temperature		T_j	150	$^\circ\text{C}$
Storage Temperature Range		T_s	- 55 to + 150	$^\circ\text{C}$

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	-	-	
Transition Frequency at $V_O = 10\text{ V}$, $I_O = 5\text{ mA}$	f_T ¹⁾	-	250	-	MHz

1) Characteristic of transistor only.