

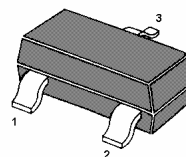
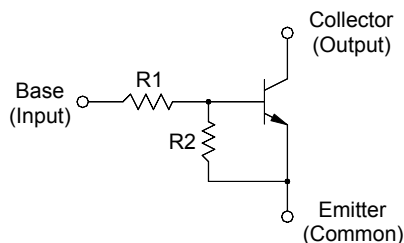
# MMBTRC116SS...MMBTRC122SS

## 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

Type	R1 (KΩ)	R2 (KΩ)
MMBTRC116SS	1	10
MMBTRC117SS	2.2	2.2
MMBTRC118SS	2.2	10
MMBTRC119SS	4.7	10
MMBTRC120SS	10	4.7
MMBTRC121SS	47	10
MMBTRC122SS	100	100

### 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	$^\circ\text{C}$

# MMBTRC116SS...MMBTRC122SS

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	
DC Current Gain at $V_O = 5\text{ V}$ , $I_O = 5\text{ mA}$ at $V_O = 5\text{ V}$ , $I_O = 20\text{ mA}$ at $V_O = 5\text{ V}$ , $I_O = 10\text{ mA}$ at $V_O = 5\text{ V}$ , $I_O = 10\text{ mA}$ at $V_O = 5\text{ V}$ , $I_O = 10\text{ mA}$ at $V_O = 5\text{ V}$ , $I_O = 5\text{ mA}$ at $V_O = 5\text{ V}$ , $I_O = 5\text{ mA}$	MMBTRC116SS MMBTRC117SS MMBTRC118SS MMBTRC119SS MMBTRC120SS MMBTRC121SS MMBTRC122SS	$G_I$	33 20 33 30 24 33 62	- - - - - - -	- - - - - - -	- - - - - - -
Output Cutoff Current at $V_O = 50\text{ V}$		$I_{O(OFF)}$	-	-	500	nA
Input Current at $V_I = 5\text{ V}$	MMBTRC116SS MMBTRC117SS MMBTRC118SS MMBTRC119SS MMBTRC120SS MMBTRC121SS MMBTRC122SS	$I_I$	- - - - - - -	- - - - - - -	7.2 3.8 3.8 1.8 0.88 0.16 0.15	mA
Output Voltage at $I_O = 10\text{ mA}$ , $I_I = 0.5\text{ mA}$ at $I_O = 10\text{ mA}$ , $I_I = 0.5\text{ mA}$ at $I_O = 10\text{ mA}$ , $I_I = 0.5\text{ mA}$ at $I_O = 10\text{ mA}$ , $I_I = 0.5\text{ mA}$ at $I_O = 10\text{ mA}$ , $I_I = 0.5\text{ mA}$ at $I_O = 10\text{ mA}$ , $I_I = 0.5\text{ mA}$ at $I_O = 5\text{ mA}$ , $I_I = 0.25\text{ mA}$	MMBTRC116SS MMBTRC117SS MMBTRC118SS MMBTRC119SS MMBTRC120SS MMBTRC121SS MMBTRC122SS	$V_{O(ON)}$	- - - - - - -	- - - - - - -	0.3 0.3 0.3 0.3 0.3 0.3 0.3	V
Input Voltage (ON) at $V_O = 0.3\text{ V}$ , $I_O = 20\text{ mA}$ at $V_O = 0.3\text{ V}$ , $I_O = 20\text{ mA}$ at $V_O = 0.3\text{ V}$ , $I_O = 20\text{ mA}$ at $V_O = 0.3\text{ V}$ , $I_O = 20\text{ mA}$ at $V_O = 0.3\text{ V}$ , $I_O = 2\text{ mA}$ at $V_O = 0.3\text{ V}$ , $I_O = 2\text{ mA}$ at $V_O = 0.3\text{ V}$ , $I_O = 1\text{ mA}$	MMBTRC116SS MMBTRC117SS MMBTRC118SS MMBTRC119SS MMBTRC120SS MMBTRC121SS MMBTRC122SS	$V_{I(ON)}$	- - - - - - -	- - - - - - -	3 3 3 2.5 3 5 3	V
Input Voltage (OFF) at $V_{CC} = 5\text{ V}$ , $I_O = 100\text{ }\mu\text{A}$	MMBTRC116SS MMBTRC117SS MMBTRC118SS MMBTRC119SS MMBTRC120SS MMBTRC121SS MMBTRC122SS	$V_{I(OFF)}$	0.3 0.5 0.3 0.3 0.8 1 0.5	- - - - - - -	- - - - - - -	V
Transition Frequency at $V_O = 10\text{ V}$ , $I_O = 5\text{ mA}$		$f_T^{1)}$	-	250	-	MHz

<sup>1)</sup> Characteristic of transistor only.