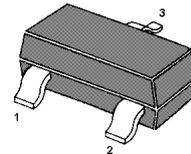
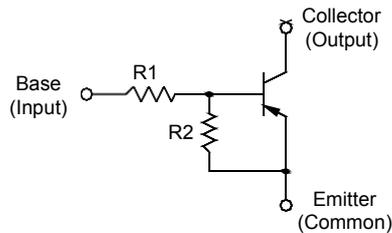


PNP Silicon Epitaxial Planar Transistor

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)	Marking
MMBTRA116SS	1	10	16BT
MMBTRA117SS	2.2	2.2	17BT
MMBTRA118SS	2.2	10	18BT
MMBTRA119SS	4.7	10	19BT
MMBTRA120SS	10	4.7	20BT
MMBTRA121SS	47	10	21BT
MMBTRA122SS	100	100	22BT

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

Parameter		Symbol	Value	Unit
Output Voltage		$-V_o$	50	V
Input Voltage	MMBTRA116SS	V_i	- 10, 5	V
	MMBTRA117SS		- 12, 10	
	MMBTRA118SS		- 12, 5	
	MMBTRA119SS		- 20, 7	
	MMBTRA120SS		- 30, 10	
	MMBTRA121SS		- 40, 15	
	MMBTRA122SS		- 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 $-V_o = 5\text{ V}$, $-I_o = 5\text{ mA}$	MMBTRA116SS	33	-	-	-
at $-V_o = 5\text{ V}$, $-I_o = 20\text{ mA}$	MMBTRA117SS	20	-	-	-
at $-V_o = 5\text{ V}$, $-I_o = 10\text{ mA}$	MMBTRA118SS	33	-	-	-
at $-V_o = 5\text{ V}$, $-I_o = 10\text{ mA}$	MMBTRA119SS	30	-	-	-
at $-V_o = 5\text{ V}$, $-I_o = 10\text{ mA}$	MMBTRA120SS	24	-	-	-
at $-V_o = 5\text{ V}$, $-I_o = 5\text{ mA}$	MMBTRA121SS	33	-	-	-
at $-V_o = 5\text{ V}$, $-I_o = 5\text{ mA}$	MMBTRA122SS	62	-	-	-
Output Cutoff Current at $-V_o = 50\text{ V}$	$-I_{O(OFF)}$	-	-	500	nA
Input Current at $-V_i = 5\text{ V}$					
	MMBTRA116SS	-	-	7.2	mA
	MMBTRA117SS	-	-	3.8	
	MMBTRA118SS	-	-	3.8	
	MMBTRA119SS	-	-	1.8	
	MMBTRA120SS	-	-	0.88	
	MMBTRA121SS	-	-	0.16	
	MMBTRA122SS	-	-	0.15	
Output Voltage					
at $-I_o = 10\text{ mA}$, $-I_i = 0.5\text{ mA}$	MMBTRA116SS	-	-	0.3	V
at $-I_o = 10\text{ mA}$, $-I_i = 0.5\text{ mA}$	MMBTRA117SS	-	-	0.3	
at $-I_o = 10\text{ mA}$, $-I_i = 0.5\text{ mA}$	MMBTRA118SS	-	-	0.3	
at $-I_o = 10\text{ mA}$, $-I_i = 0.5\text{ mA}$	MMBTRA119SS	-	-	0.3	
at $-I_o = 10\text{ mA}$, $-I_i = 0.5\text{ mA}$	MMBTRA120SS	-	-	0.3	
at $-I_o = 10\text{ mA}$, $-I_i = 0.5\text{ mA}$	MMBTRA121SS	-	-	0.3	
at $-I_o = 5\text{ mA}$, $-I_i = 0.25\text{ mA}$	MMBTRA122SS	-	-	0.3	
Input Voltage (ON)					
at $-V_o = 0.3\text{ V}$, $-I_o = 20\text{ mA}$	MMBTRA116SS	-	-	3	V
at $-V_o = 0.3\text{ V}$, $-I_o = 20\text{ mA}$	MMBTRA117SS	-	-	3	
at $-V_o = 0.3\text{ V}$, $-I_o = 20\text{ mA}$	MMBTRA118SS	-	-	3	
at $-V_o = 0.3\text{ V}$, $-I_o = 20\text{ mA}$	MMBTRA119SS	-	-	2.5	
at $-V_o = 0.3\text{ V}$, $-I_o = 2\text{ mA}$	MMBTRA120SS	-	-	3	
at $-V_o = 0.3\text{ V}$, $-I_o = 2\text{ mA}$	MMBTRA121SS	-	-	5	
at $-V_o = 0.3\text{ V}$, $-I_o = 1\text{ mA}$	MMBTRA122SS	-	-	3	
Input Voltage (OFF)					
at $-V_{CC} = 5\text{ V}$, $-I_o = 100\text{ }\mu\text{A}$	MMBTRA116SS	0.3	-	-	V
	MMBTRA117SS	0.5	-	-	
	MMBTRA118SS	0.3	-	-	
	MMBTRA119SS	0.3	-	-	
	MMBTRA120SS	0.8	-	-	
	MMBTRA121SS	1	-	-	
	MMBTRA122SS	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.