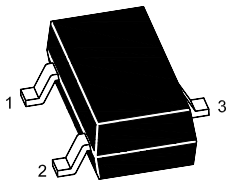
MMBTRC116SS~MMBTRC122SS
NPN Digital Transistor

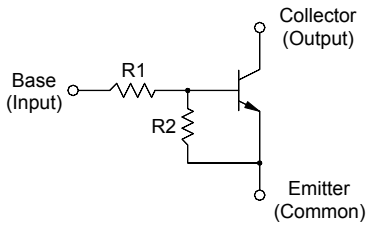
Features

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

SOT-23
(TO-236)



1.Base 2.Emitter 3.Collector



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 ℃)

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_{Stg}	- 55 to + 150	°C

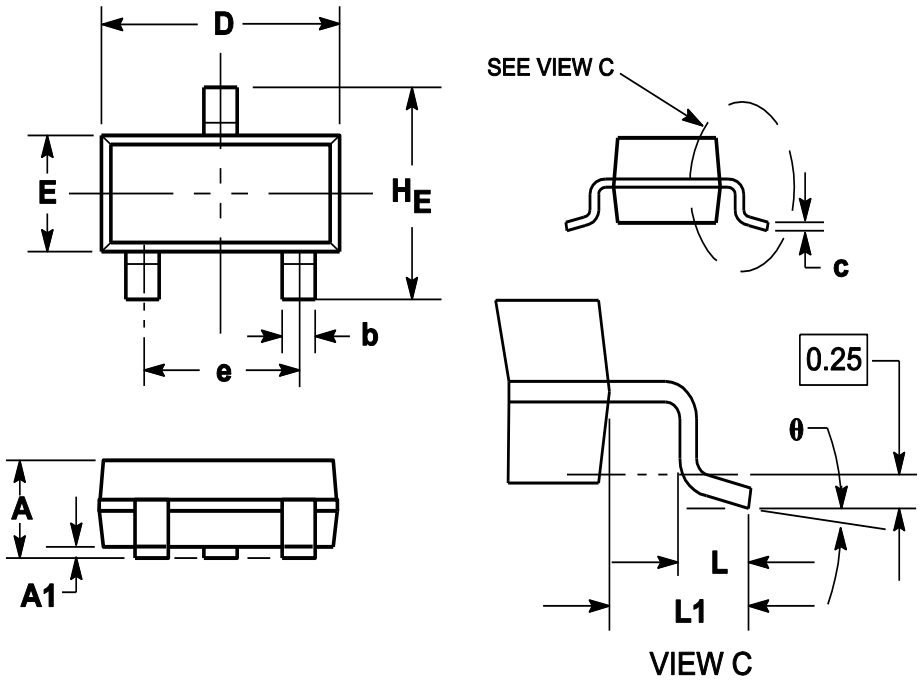
Characteristics at T_a = 25 ℃

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						
at V_O = 50 V		$I_{O(OFF)}$	-	-	500	nA
Input Current						
at V_I = 5 V	MMBTRC116SS	I_I	-	-	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 mA, I_I = 0.5 mA	MMBTRC116SS	$V_{O(ON)}$	-	-	0.3	V
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)						
at V_O = 0.3 V, I_O = 20 mA	MMBTRC116SS	$V_{I(ON)}$	-	-	3	V
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)						
at V_{CC} = 5 V, I_O = 100 μA	MMBTRC116SS	$V_{I(OFF)}$	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 V, I_O = 5 mA		f_T [1)]	-	250	-	MHz

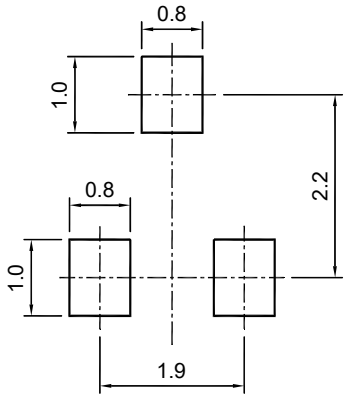
[1)] Characteristic of transistor only.

Package Outline

SOT-23（TO-236)
Dimensions in mm



Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.900	1.025	1.150
A1	0.000	0.050	0.100
b	0.300	0.400	0.500
c	0.080	0.115	0.150
D	2.800	2.900	3.000
E	1.200	1.300	1.400
H_E	2.250	2.400	2.550
e	1.800	1.900	2.000
L1	0.550REF		
L	0.300		0.500
θ	0^o		8^o



SOT-23 (TO-236)

Recommended soldering pad