

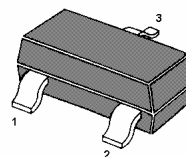
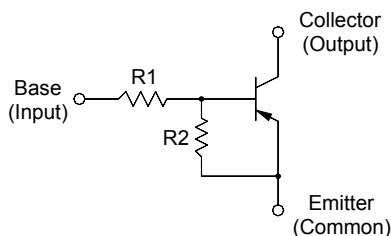
MMBTRA116SS...MMBTRA122SS

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



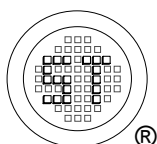
1. Base 2. Emitter 3. Collector
SOT-23 Plastic Package

Resistor Values

| Type | R1 (K Ω) | R2 (K Ω) |
|-------------|------------------|------------------|
| MMBTRA116SS | 1 | 10 |
| MMBTRA117SS | 2.2 | 2.2 |
| MMBTRA118SS | 2.2 | 10 |
| MMBTRA119SS | 4.7 | 10 |
| MMBTRA120SS | 10 | 4.7 |
| MMBTRA121SS | 47 | 10 |
| MMBTRA122SS | 100 | 100 |

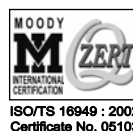
Absolute Maximum Ratings ($T_a = 25\text{ }^\circ\text{C}$)

| Parameter | Symbol | Value | Unit |
|---------------------------|-----------|---------------|------------------|
| Output Voltage | $-V_o$ | 50 | V |
| Input Voltage | V_i | MMBTRA116SS | - 10, 5 |
| | | 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 | $^\circ\text{C}$ |



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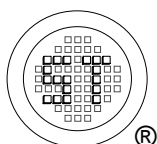
Dated : 29/10/2007

MMBTRA116SS...MMBTRA122SS

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.



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ISO/TS 16949 : 2002
Certificate No. 05103



ISO 14001:2004
Certificate No. 7116



ISO 9001:2000
Certificate No. 0506098

Dated : 29/10/2007