

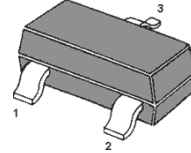
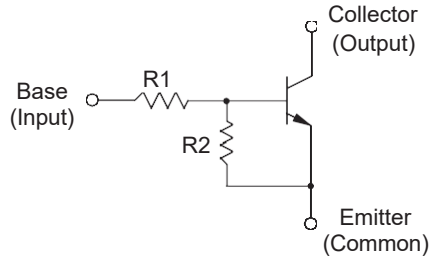
MMBTRC101SS...MMBTRC106SS

NPN Silicon Epitaxial Planar Transistor

for switching and 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 Code |
|-------------|---------|---------|--------------|
| MMBTRC101SS | 4.7 | 4.7 | HP |
| MMBTRC102SS | 10 | 10 | HN |
| MMBTRC103SS | 22 | 22 | HR |
| MMBTRC104SS | 47 | 47 | HX |
| MMBTRC105SS | 2.2 | 47 | HY |
| MMBTRC106SS | 4.7 | 47 | HZ |

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

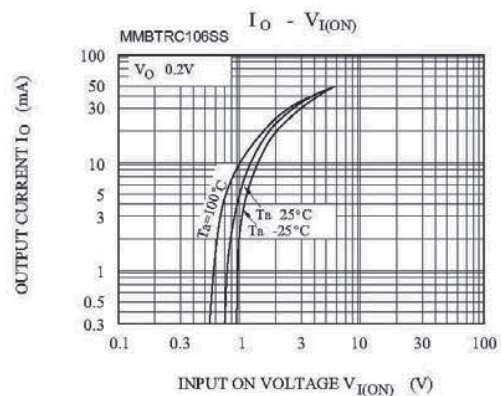
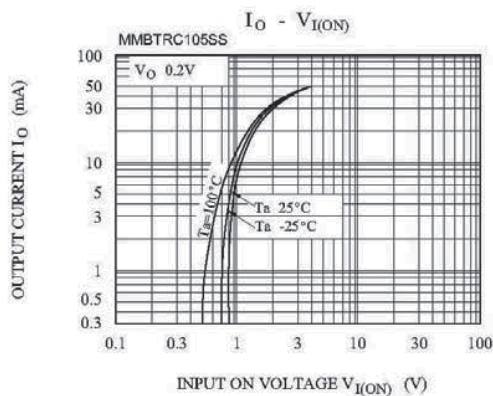
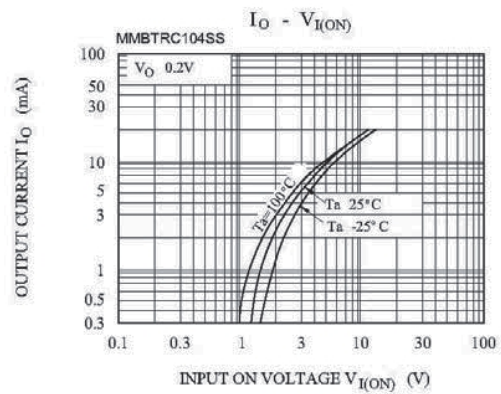
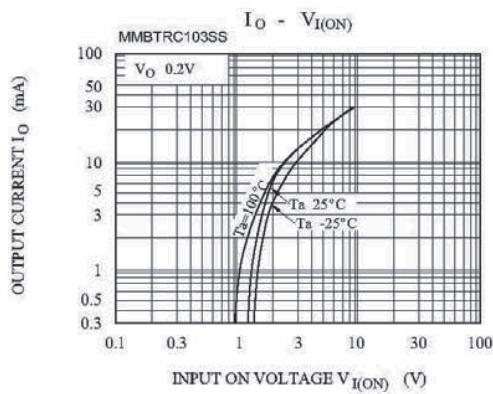
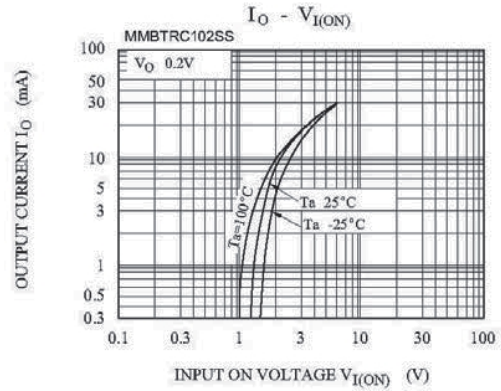
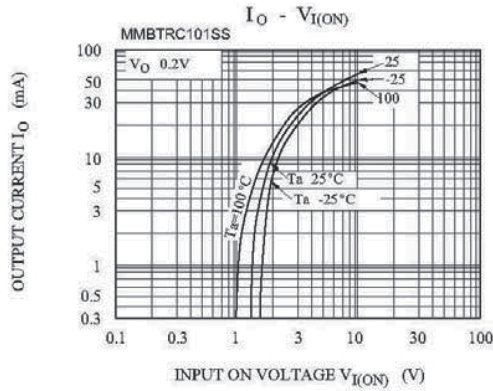
| Parameter | | Symbol | Value | Unit |
|---------------------------|-------------|-----------|---------------|------------------|
| Output Voltage | | V_o | 50 | V |
| Input Voltage | MMBTRC101SS | V_i | 20, -10 | V |
| | MMBTRC102SS | | 30, -10 | |
| | MMBTRC103SS | | 40, -10 | |
| | MMBTRC104SS | | 40, -10 | |
| | MMBTRC105SS | | 12, -5 | |
| | MMBTRC106SS | | 20, -5 | |
| 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_{stg} | - 55 to + 150 | $^\circ\text{C}$ |

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

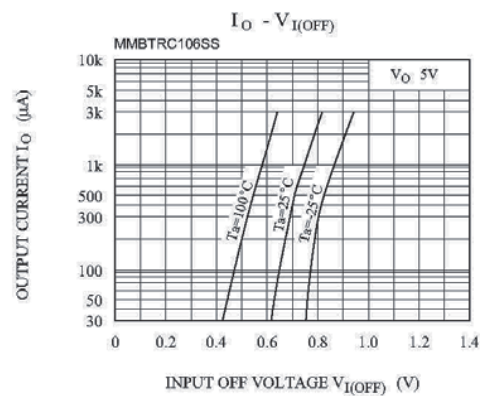
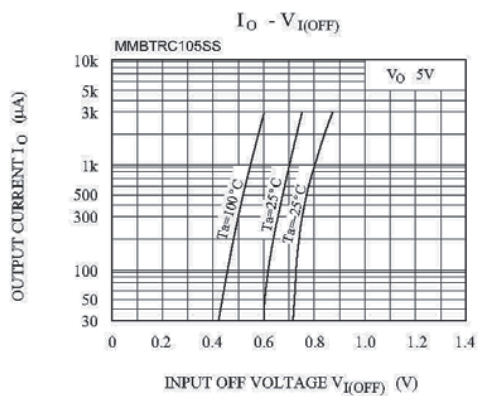
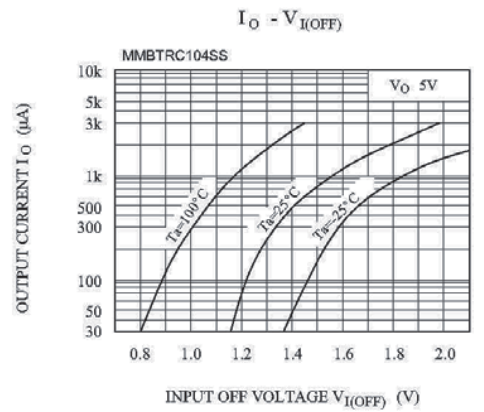
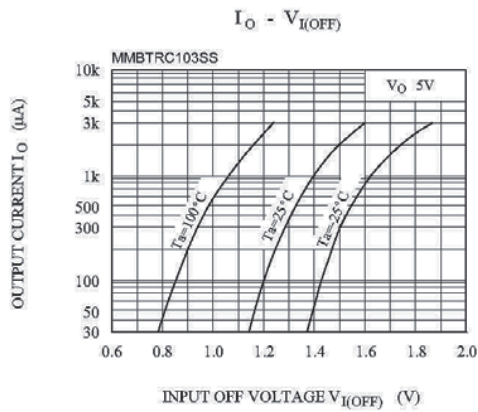
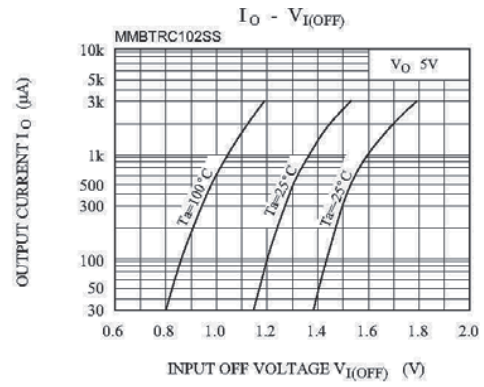
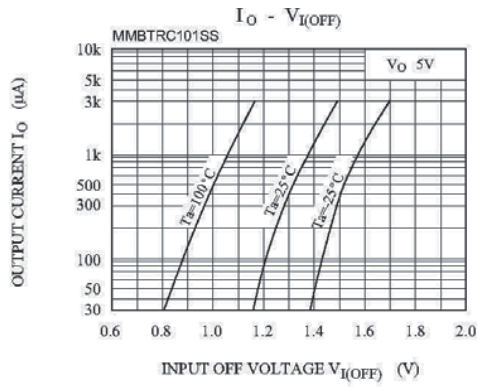
| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|--|--|--------------|----------------------------------|----------------------------|---|
| DC Current Gain at $V_o = 5\text{ V}$, $I_o = 10\text{ mA}$ | MMBTRC101SS MMBTRC102SS MMBTRC103SS MMBTRC104SS MMBTRC105SS MMBTRC106SS | G_I | 30 50 70 80 80 80 | - - - - - - | - - - - - - |
| Output Cutoff Current at $V_o = 50\text{ V}$ | | $I_{O(OFF)}$ | - | - | 500 nA |
| Input Current at $V_i = 5\text{ V}$ | MMBTRC101SS MMBTRC102SS MMBTRC103SS MMBTRC104SS MMBTRC105SS MMBTRC106SS | I_i | - - - - - - | - - - - - - | 1.8 0.88 0.36 0.18 3.6 1.8 mA |
| Output Voltage at $I_o = 10\text{ mA}$, $I_i = 0.5\text{ mA}$ | | $V_{O(ON)}$ | - | - | 0.3 V |
| Input Voltage (ON) at $V_o = 0.2\text{ V}$, $I_o = 5\text{ mA}$ | MMBTRC101SS MMBTRC102SS MMBTRC103SS MMBTRC104SS MMBTRC105SS MMBTRC106SS | $V_{i(ON)}$ | - - - - - - | - - - - - - | 2 2.4 3 5 1.1 1.3 V |
| Input Voltage (OFF) at $V_o = 5\text{ V}$, $I_o = 0.1\text{ mA}$ | MMBTRC101SS~104SS MMBTRC105SS~106SS | $V_{i(OFF)}$ | 1 0.5 | - - | - - V |
| Transition Frequency at $V_o = 10\text{ V}$, $I_o = 5\text{ mA}$ | | $f_T^{1)}$ | - | 200 | - MHz |

1) Characteristic of transistor only.

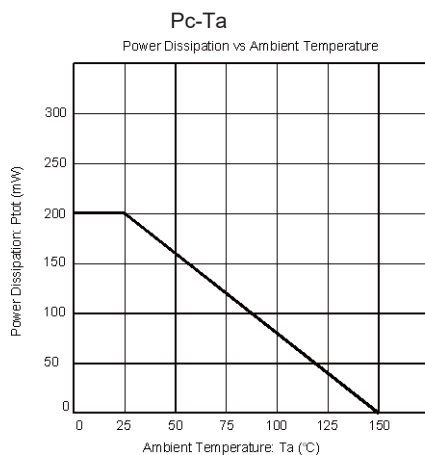
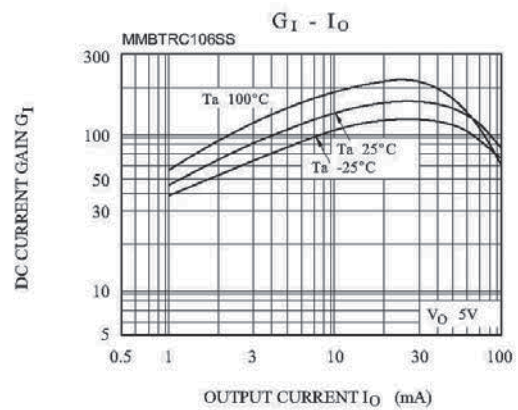
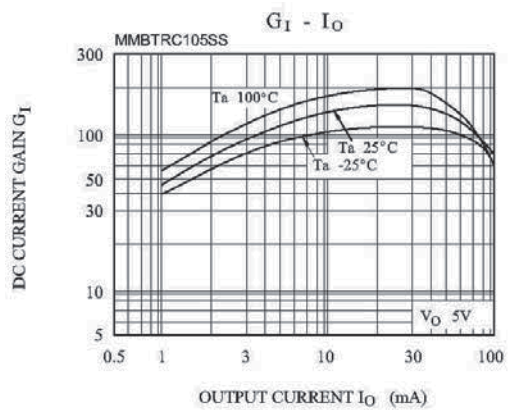
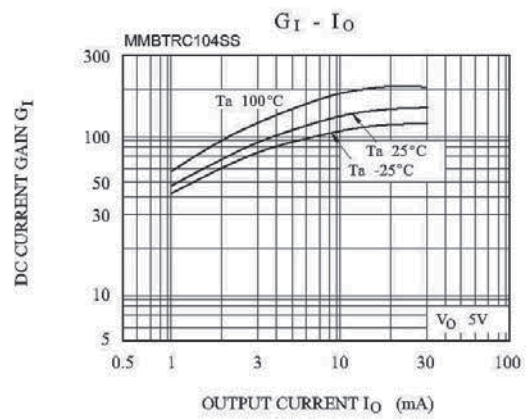
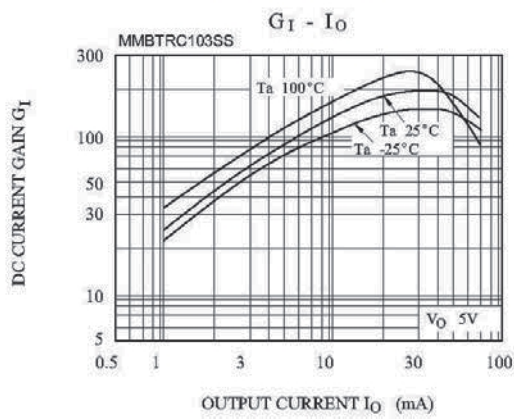
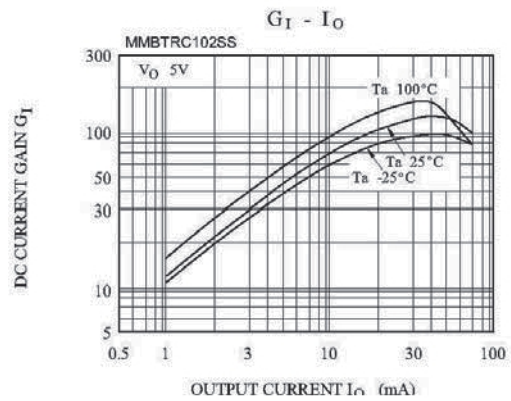
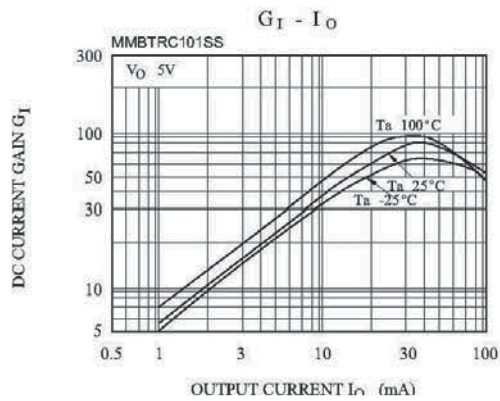
Typical Characteristics



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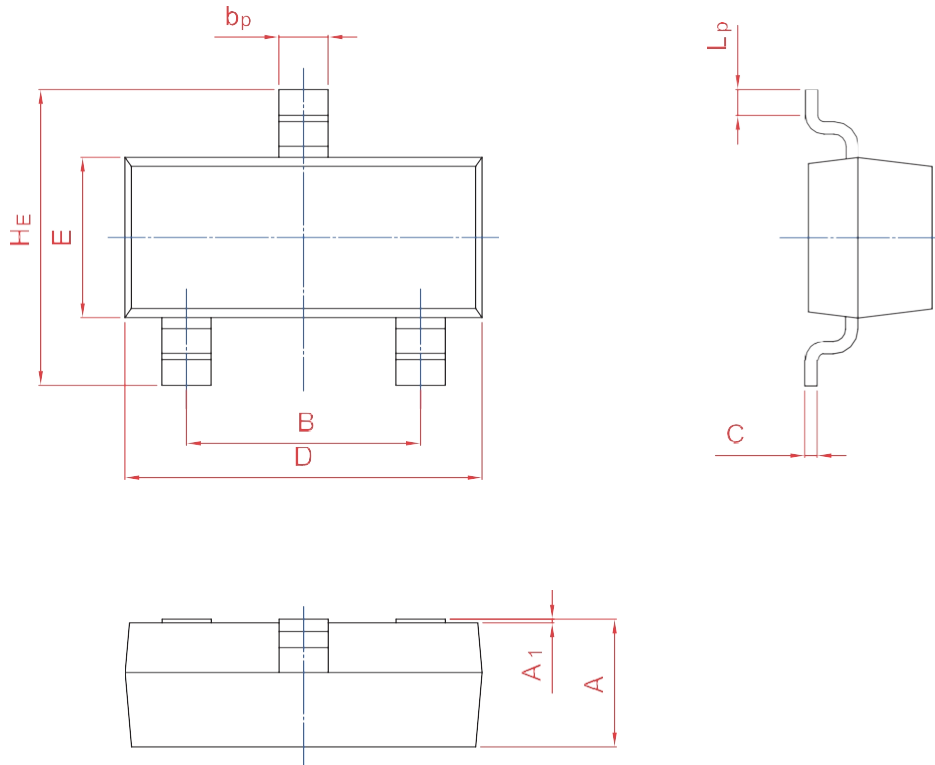
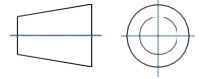
Typical Characteristics



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



| UNIT | A | B | b _p | C | D | E | H _E | A ₁ | L _p |
|------|------|------|----------------|------|------|------|----------------|----------------|----------------|
| mm | 1.40 | 2.04 | 0.50 | 0.19 | 3.10 | 1.65 | 3.00 | 0.100 | 0.50 |
| | 0.95 | 1.78 | 0.35 | 0.08 | 2.70 | 1.20 | 2.20 | 0.013 | 0.20 |