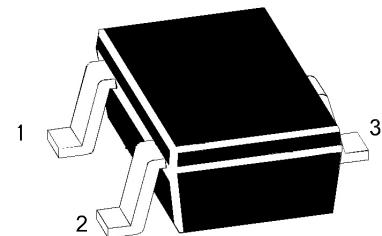


NPN Silicon Epitaxial Planar Transistor

for switching and amplifier applications



1.Base 2.Emitter 3.Collector
SOT-523 Plastic Package

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

| Parameter | | Symbol | Value | Unit |
|---------------------------|-------------------------|-----------|---------------|------|
| Collector Base Voltage | MMBT2222T MMBT2222AT | V_{CBO} | 60 75 | V |
| Collector Emitter Voltage | MMBT2222T MMBT2222AT | V_{CEO} | 30 40 | V |
| Emitter Base Voltage | MMBT2222T MMBT2222AT | V_{EBO} | 5 6 | V |
| Collector Current | | I_C | 600 | mA |
| Power Dissipation | | P_{tot} | 150 | mW |
| Junction Temperature | | T_j | 150 | °C |
| Storage Temperature Range | | T_{stg} | - 55 to + 150 | °C |

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

| Parameter | Symbol | Min. | Max. | Unit |
|---|------------|---------------|------|------|
| DC Current Gain at $V_{CE} = 10 \text{ V}$, $I_C = 0.1 \text{ mA}$ at $V_{CE} = 10 \text{ V}$, $I_C = 1 \text{ mA}$ at $V_{CE} = 10 \text{ V}$, $I_C = 10 \text{ mA}$ at $V_{CE} = 1 \text{ V}$, $I_C = 150 \text{ mA}$ at $V_{CE} = 10 \text{ V}$, $I_C = 150 \text{ mA}$ at $V_{CE} = 10 \text{ V}$, $I_C = 500 \text{ mA}$ | h_{FE} | 35 | - | - |
| | h_{FE} | 50 | - | - |
| | h_{FE} | 75 | - | - |
| | h_{FE} | 50 | - | - |
| | h_{FE} | 100 | 300 | - |
| | h_{FE} | 30 | - | - |
| | h_{FE} | 40 | - | - |
| | | | | |
| Collector Base Cutoff Current at $V_{CB} = 50 \text{ V}$ at $V_{CB} = 60 \text{ V}$ | MMBT2222T | I_{CBO} | - | 100 |
| | MMBT2222AT | | - | 100 |
| Emitter Base Cutoff Current at $V_{EB} = 3 \text{ V}$ | | I_{EBO} | - | 100 |
| | | | | nA |
| Collector Base Breakdown Voltage at $I_C = 10 \mu\text{A}$ | MMBT2222T | $V_{(BR)CBO}$ | 60 | - |
| | MMBT2222AT | | 75 | - |
| Collector Emitter Breakdown Voltage at $I_C = 10 \text{ mA}$ | MMBT2222T | $V_{(BR)CEO}$ | 30 | - |
| | MMBT2222AT | | 40 | - |
| Emitter Base Breakdown Voltage at $I_E = 10 \mu\text{A}$ | MMBT2222T | $V_{(BR)EBO}$ | 5 | - |
| | MMBT2222AT | | 6 | - |
| Collector Emitter Saturation Voltage at $I_C = 150 \text{ mA}$, $I_B = 15 \text{ mA}$ at $I_C = 500 \text{ mA}$, $I_B = 50 \text{ mA}$ | MMBT2222T | $V_{CE(sat)}$ | - | 0.4 |
| | MMBT2222AT | | - | 0.3 |
| | MMBT2222T | | - | 1.6 |
| | MMBT2222AT | | - | 1 |
| Base Emitter Saturation Voltage at $I_C = 150 \text{ mA}$, $I_B = 15 \text{ mA}$ at $I_C = 500 \text{ mA}$, $I_B = 50 \text{ mA}$ | MMBT2222T | $V_{BE(sat)}$ | - | 1.3 |
| | MMBT2222AT | | 0.6 | 1.2 |
| | MMBT2222T | | - | 2.6 |
| | MMBT2222AT | | - | 2 |
| Transition Frequency at $V_{CE} = 20 \text{ V}$, $-I_E = 20 \text{ mA}$, $f = 100 \text{ MHz}$ | | f_T | 300 | - |
| | | | | MHz |
| Collector Output Capacitance at $V_{CB} = 10 \text{ V}$, $f = 100 \text{ KHz}$ | | C_{ob} | - | 8 |
| | | | | pF |
| Delay Time at $V_{CC} = 30 \text{ V}$, $V_{BE(OFF)} = 0.5 \text{ V}$, $I_C = 150 \text{ mA}$, $I_{B1} = 15 \text{ mA}$ | | t_d | - | 10 |
| | | | | ns |
| Rise Time at $V_{CC} = 30 \text{ V}$, $V_{BE(OFF)} = 0.5 \text{ V}$, $I_C = 150 \text{ mA}$, $I_{B1} = 15 \text{ mA}$ | | t_r | - | 25 |
| | | | | ns |
| Storage Time at $V_{CC} = 30 \text{ V}$, $I_C = 150 \text{ mA}$, $I_{B1} = -I_{B2} = 15 \text{ mA}$ | | t_{stg} | - | 225 |
| | | | | ns |
| Fall Time at $V_{CC} = 30 \text{ V}$, $I_C = 150 \text{ mA}$, $I_{B1} = -I_{B2} = 15 \text{ mA}$ | | t_f | - | 60 |
| | | | | ns |

MMBT2222T / MMBT2222AT

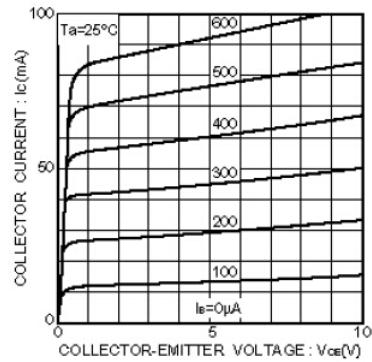


Fig.1 Grounded emitter output characteristics

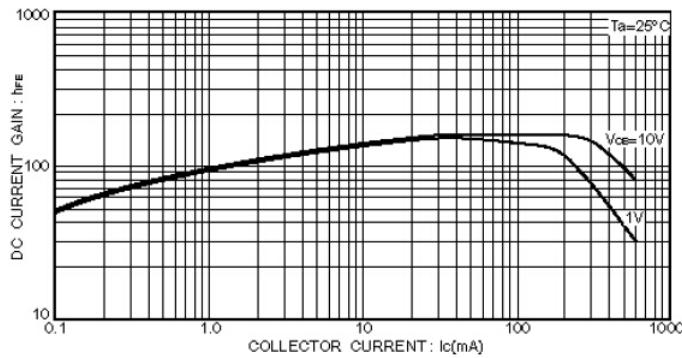


Fig.3 DC current gain vs. collector current(I)

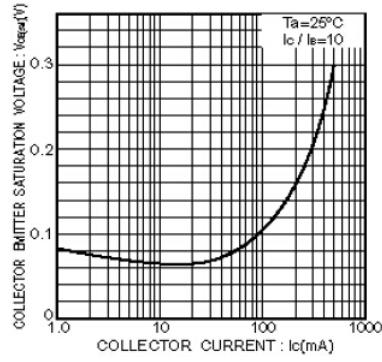


Fig.2 Collector-emitter saturation voltage vs. collector current

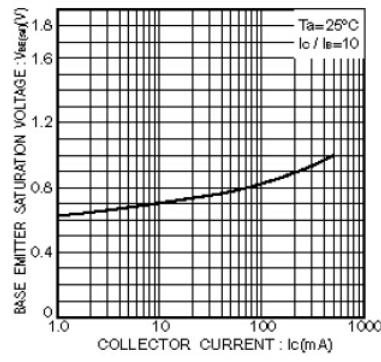


Fig.6 Base-emitter saturation voltage vs. collector current

