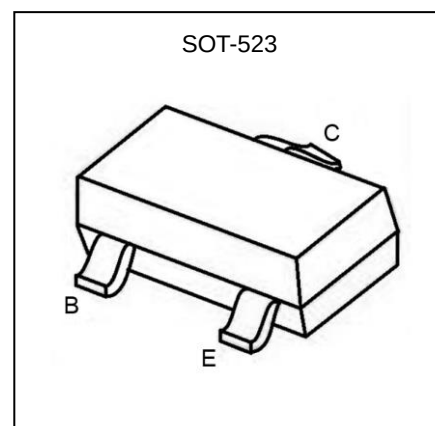


**MMBT2222AT Transistor(NPN)**
**Features**

- Epitaxial planar die construction

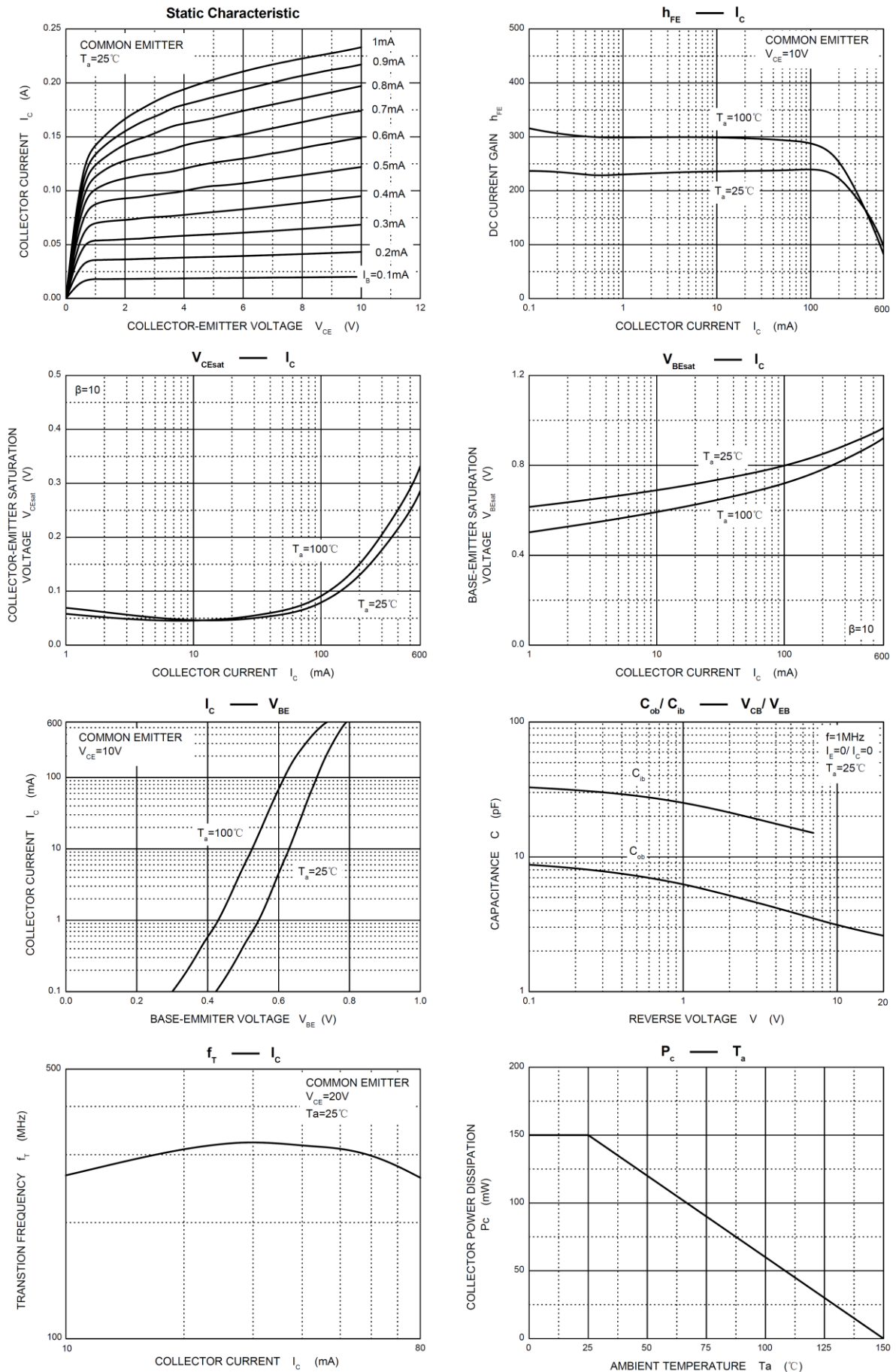
**Marking: 1P**
**MAXIMUM RATINGS ( $T_a=25^{\circ}\text{C}$  unless otherwise noted)**

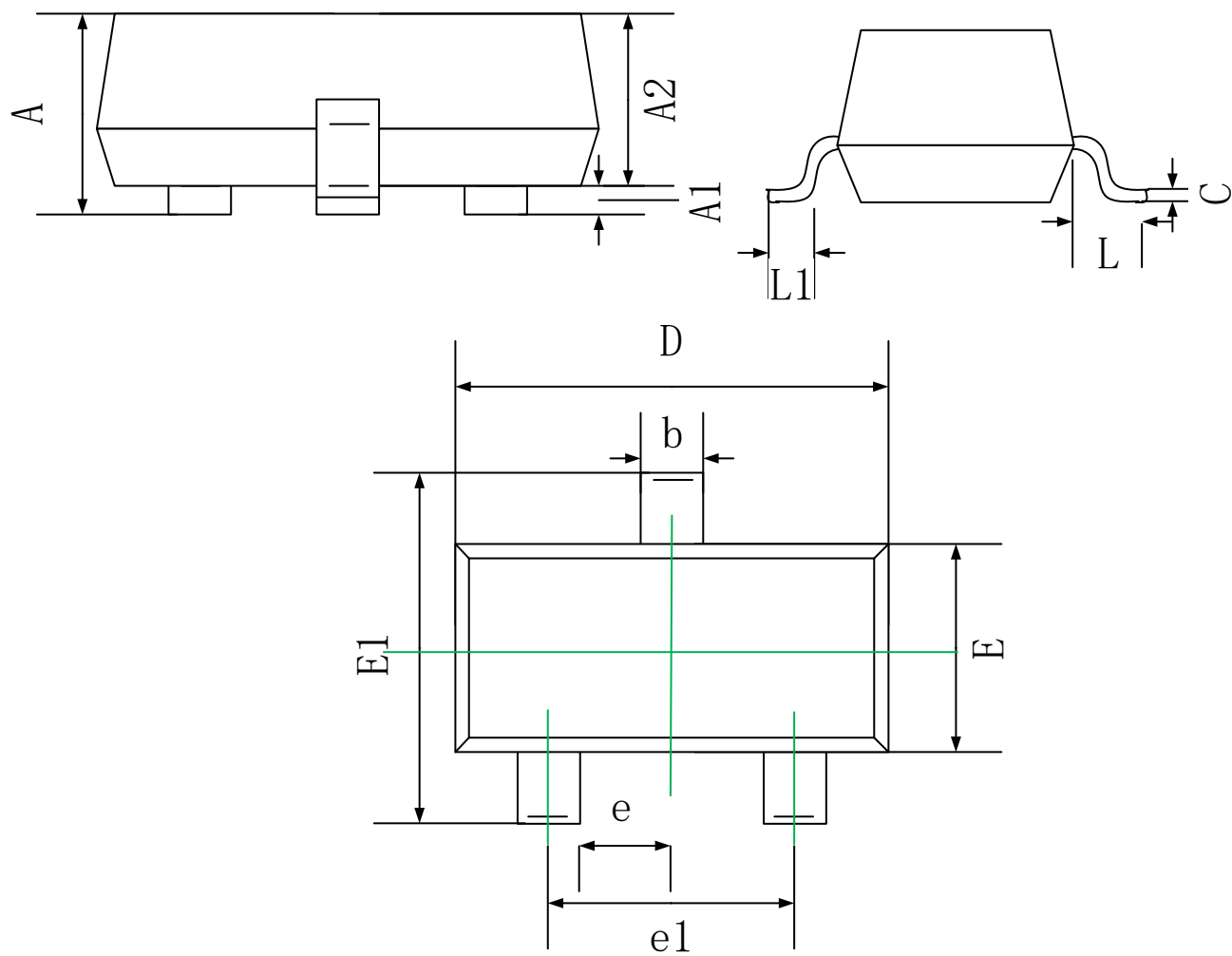
| Parameter                     | Symbol    | Value     | Unit               |
|-------------------------------|-----------|-----------|--------------------|
| Collector-Base Voltage        | $V_{CBO}$ | 75        | V                  |
| Collector-Emitter Voltage     | $V_{CEO}$ | 40        | V                  |
| Emitter-Base Voltage          | $V_{EBO}$ | 6         | V                  |
| Collector Current -Continuous | $I_C$     | 0.5       | A                  |
| Power Dissipation             | $P_d$     | 0.15      | W                  |
| Junction Temperature          | $T_J$     | 150       | $^{\circ}\text{C}$ |
| Storage Temperature           | $T_{STG}$ | -55~ +150 | $^{\circ}\text{C}$ |


**ELECTRICAL CHARACTERISTICS( $T_a=25^{\circ}\text{C}$  unless otherwise noted)**

| Parameter                            | Symbol        | Test Condition                                                                      | Min | Max | Unit |
|--------------------------------------|---------------|-------------------------------------------------------------------------------------|-----|-----|------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C=10\mu\text{A}, I_E=0$                                                          | 75  |     | V    |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C=10\text{mA}, I_B=0$                                                            | 40  |     | V    |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E=10\mu\text{A}, I_C=0$                                                          | 6   |     | V    |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB}=60\text{V}, I_E=0$                                                          |     | 10  | nA   |
| Collector cut-off current            | $I_{CEX}$     | $V_{CE}=60\text{V}, V_{EB(off)}=3\text{V}$                                          |     | 10  | nA   |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB}=3\text{V}, I_C=0$                                                           |     | 10  | nA   |
| DC current gain                      | $h_{FE1}$     | $V_{CE}=10\text{V}, I_C=0.1\text{mA}$                                               | 40  |     |      |
|                                      | $h_{FE2}$     | $V_{CE}=10\text{V}, I_C=150\text{mA}$                                               | 100 | 300 |      |
|                                      | $h_{FE3}$     | $V_{CE}=10\text{V}, I_C=500\text{mA}$                                               | 42  |     |      |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=150\text{mA}, I_B=15\text{mA}$                                                 |     | 0.3 | V    |
|                                      |               | $I_C=500\text{mA}, I_B=50\text{mA}$                                                 |     | 1   | V    |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C=150\text{mA}, I_B=15\text{mA}$                                                 |     | 1.2 | V    |
|                                      |               | $I_C=500\text{mA}, I_B=50\text{mA}$                                                 |     | 2   | V    |
| Transition frequency                 | $f_T$         | $V_{CE}=20\text{V}, I_C=20\text{mA}, f=100\text{MHz}$                               | 300 |     | MHZ  |
| Delay Time                           | $t_d$         | $V_{CC}=30\text{V}, I_C=150\text{mA}, V_{BE(off)}=-0.5\text{V}, I_{B1}=15\text{mA}$ |     | 10  | ns   |
| Rise Time                            | $t_r$         |                                                                                     |     | 25  | ns   |
| Storage Time                         | $t_s$         | $V_{CC}=30\text{V}, I_C=150\text{mA}, I_{B1}=I_{B2}=15\text{mA}$                    |     | 225 | ns   |
| Fall Time                            | $t_f$         |                                                                                     |     | 60  | ns   |

## Typical Characteristics



**SOT-523 Package Information**


| Symbol | Dimensions In Millimeters |       |
|--------|---------------------------|-------|
|        | Min                       | Max   |
| A      | 0.700                     | 0.900 |
| A1     | 0.000                     | 0.100 |
| A2     | 0.700                     | 0.800 |
| b      | 0.250                     | 0.350 |
| c      | 0.100                     | 0.200 |
| D      | 1.500                     | 1.700 |
| E      | 0.700                     | 0.900 |
| E1     | 1.450                     | 1.750 |
| e      | 0.500 TYP                 |       |
| e1     | 0.900                     | 1.100 |
| L      | 0.55 REF                  |       |
| θ      | 0°                        | 8°    |