

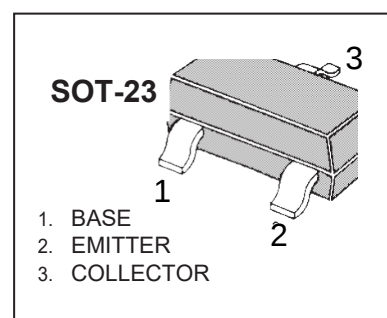
# SOT-23 Plastic-Encapsulate Transistors

## MMBTA42 TRANSISTOR (NPN)

### FEATURES

- High breakdown voltage
- Low collector-emitter saturation voltage
- Complementary to MMBTA92 (PNP)

Marking: 1D



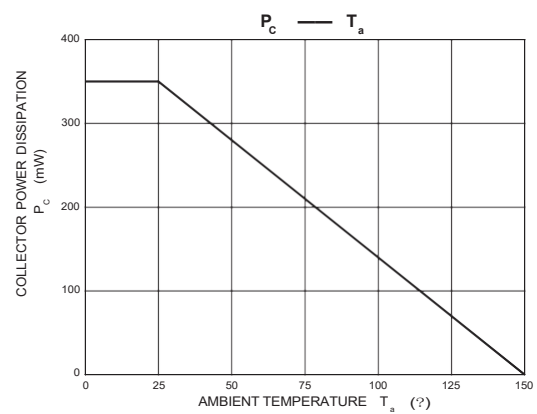
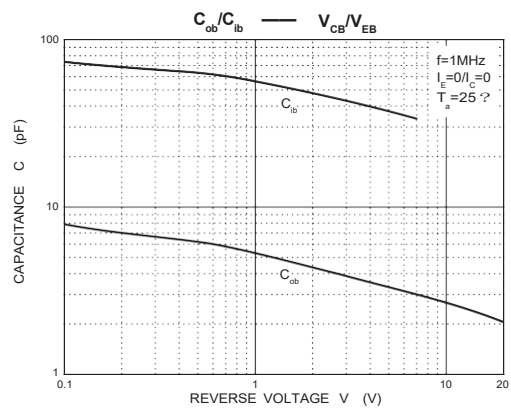
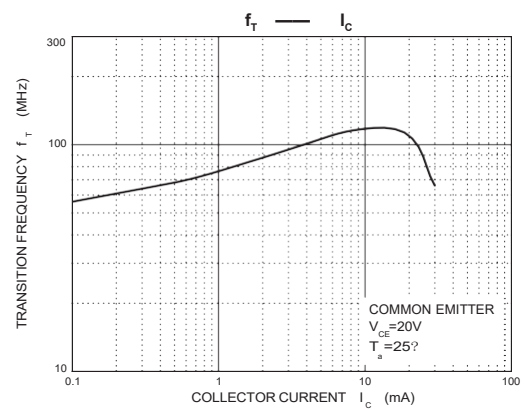
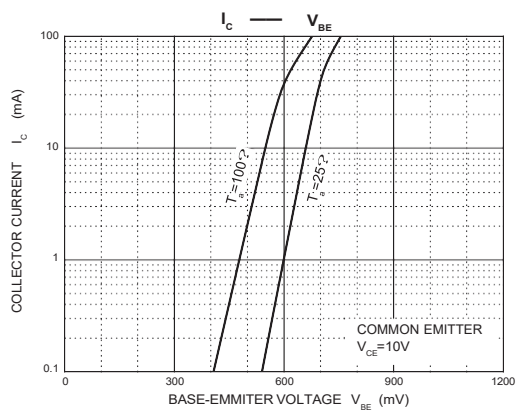
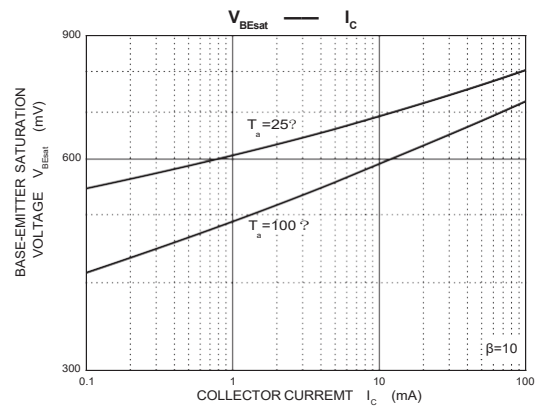
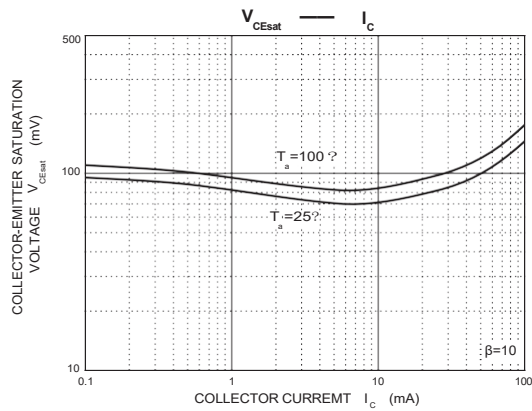
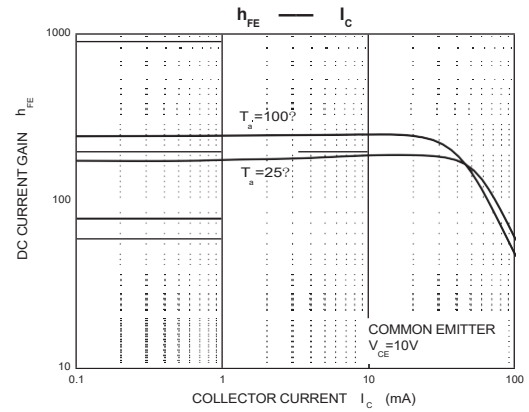
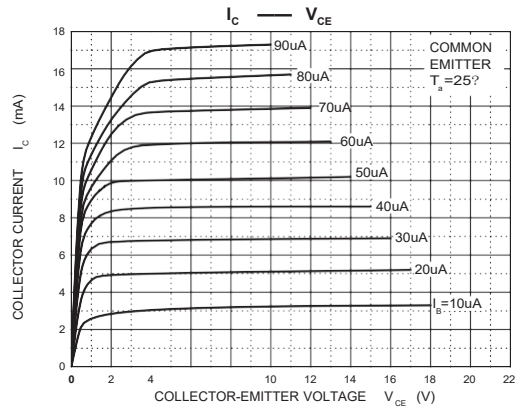
### MAXIMUM RATINGS ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

| Symbol          | Parameter                               | Value    | Unit                        |
|-----------------|-----------------------------------------|----------|-----------------------------|
| $V_{CBO}$       | Collector-Base Voltage                  | 300      | V                           |
| $V_{CEO}$       | Collector-Emitter Voltage               | 300      | V                           |
| $V_{EBO}$       | Emitter-Base Voltage                    | 5        | V                           |
| $I_C$           | Collector Current -Continuous           | 0.3      | A                           |
| $I_{CM}$        | Collector Current-Peak                  | 0.5      | A                           |
| $P_C$           | Collector Power dissipation             | 0.35     | W                           |
| $R_{\theta JA}$ | Thermal Resistance, junction to Ambient | 357      | $^{\circ}\text{C}/\text{W}$ |
| $T_J$           | Junction Temperature                    | 150      | $^{\circ}\text{C}$          |
| $T_{stg}$       | Storage Temperature                     | -55~+150 | $^{\circ}\text{C}$          |

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

| Parameter                            | Symbol        | Test conditions                                      | Min | Max  | Unit          |
|--------------------------------------|---------------|------------------------------------------------------|-----|------|---------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C=100\mu\text{A}, I_E=0$                          | 300 |      | V             |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C=1\text{mA}, I_B=0$                              | 300 |      | V             |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E=100\mu\text{A}, I_C=0$                          | 5   |      | V             |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB}=200\text{V}, I_E=0$                          |     | 0.25 | $\mu\text{A}$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB}=5\text{V}, I_C=0$                            |     | 0.1  | $\mu\text{A}$ |
| DC current gain                      | $h_{FE(1)}$   | $V_{CE}=10\text{V}, I_C=1\text{mA}$                  | 60  |      |               |
|                                      | $h_{FE(2)}$   | $V_{CE}=10\text{V}, I_C=10\text{mA}$                 | 100 | 200  |               |
|                                      | $h_{FE(3)}$   | $V_{CE}=10\text{V}, I_C=30\text{mA}$                 | 60  |      |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=20\text{mA}, I_B=2\text{mA}$                    |     | 0.2  | V             |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C=20\text{mA}, I_B=2\text{mA}$                    |     | 0.9  | V             |
| Transition frequency                 | $f_T$         | $V_{CE}=20\text{V}, I_C=10\text{mA}, f=30\text{MHz}$ | 50  |      | MHz           |

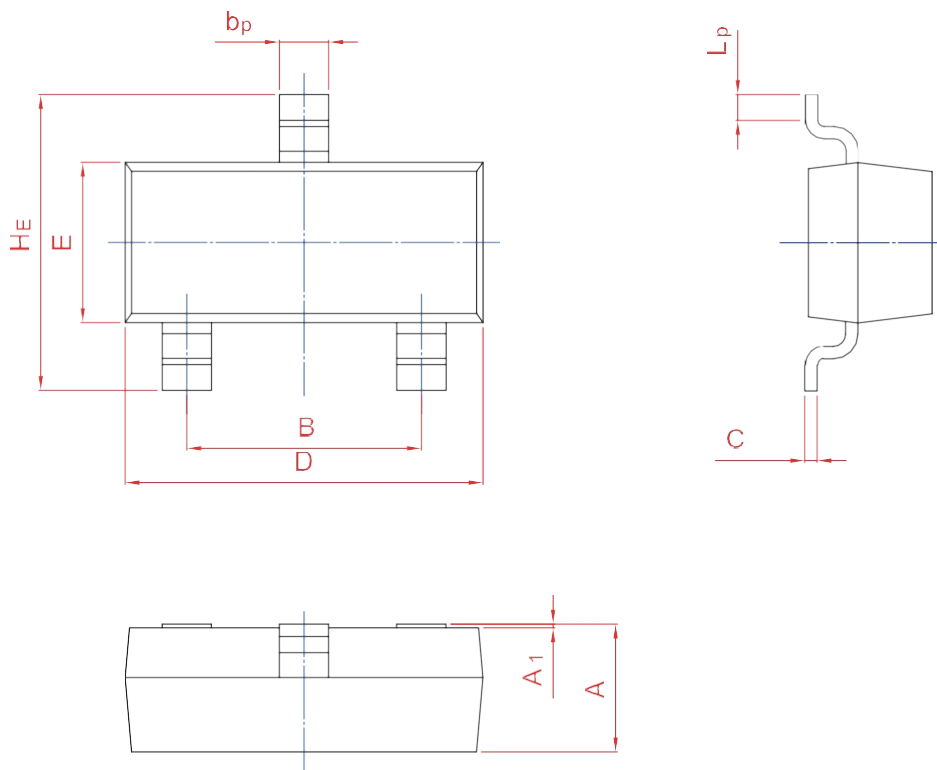
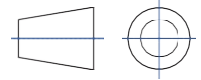
## Typical Characteristics



## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



| UNIT | A            | B            | b <sub>p</sub> | C            | D            | E            | H <sub>E</sub> | A <sub>1</sub> | L <sub>p</sub> |
|------|--------------|--------------|----------------|--------------|--------------|--------------|----------------|----------------|----------------|
| mm   | 1.40<br>0.95 | 2.04<br>1.78 | 0.50<br>0.35   | 0.19<br>0.08 | 3.10<br>2.70 | 1.65<br>1.20 | 3.00<br>2.20   | 0.100<br>0.013 | 0.50<br>0.20   |