



# MMBTA42

## SMALL SIGNAL NPN TRANSISTOR

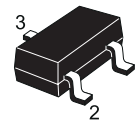
PRELIMINARY DATA

| Type    | Marking |
|---------|---------|
| MMBTA42 | A42     |

- SILICON EPITAXIAL PLANAR NPN HIGH VOLTAGE TRANSISTOR
- MINIATURE SOT-23 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- TAPE AND REEL PACKING
- THE PNP COMPLEMENTARY TYPE IS MMBTA92

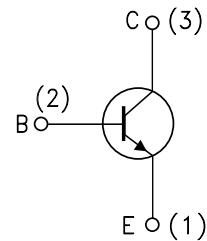
### APPLICATIONS

- VIDEO AMPLIFIER CIRCUITS (RGB CATHODE CURRENT CONTROL)
- TELEPHONE WIRELINE INTERFACE (HOOK SWITCHES, DIALER CIRCUITS)



SOT-23

### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                     | Value      | Unit             |
|-----------|---|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )          | 300        | V                |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )       | 300        | V                |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )            | 6          | V                |
| $I_C$     | Collector Current                             | 0.3        | A                |
| $I_{CM}$  | Collector Peak Current                        | 0.5        | A                |
| $P_{tot}$ | Total Dissipation at $T_C = 25^\circ\text{C}$ | 350        | mW               |
| $T_{stg}$ | Storage Temperature                           | -65 to 150 | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature           | 150        | $^\circ\text{C}$ |

## MMBTA42

### THERMAL DATA

|               |                                     |     |       |                             |
|---------------|-------------------------------------|-----|-------|-----------------------------|
| $R_{thj-amb}$ | Thermal Resistance Junction-Ambient | Max | 357.1 | $^{\circ}\text{C}/\text{W}$ |
|---------------|-------------------------------------|-----|-------|-----------------------------|

• Device mounted on a PCB area of  $1\text{ cm}^2$

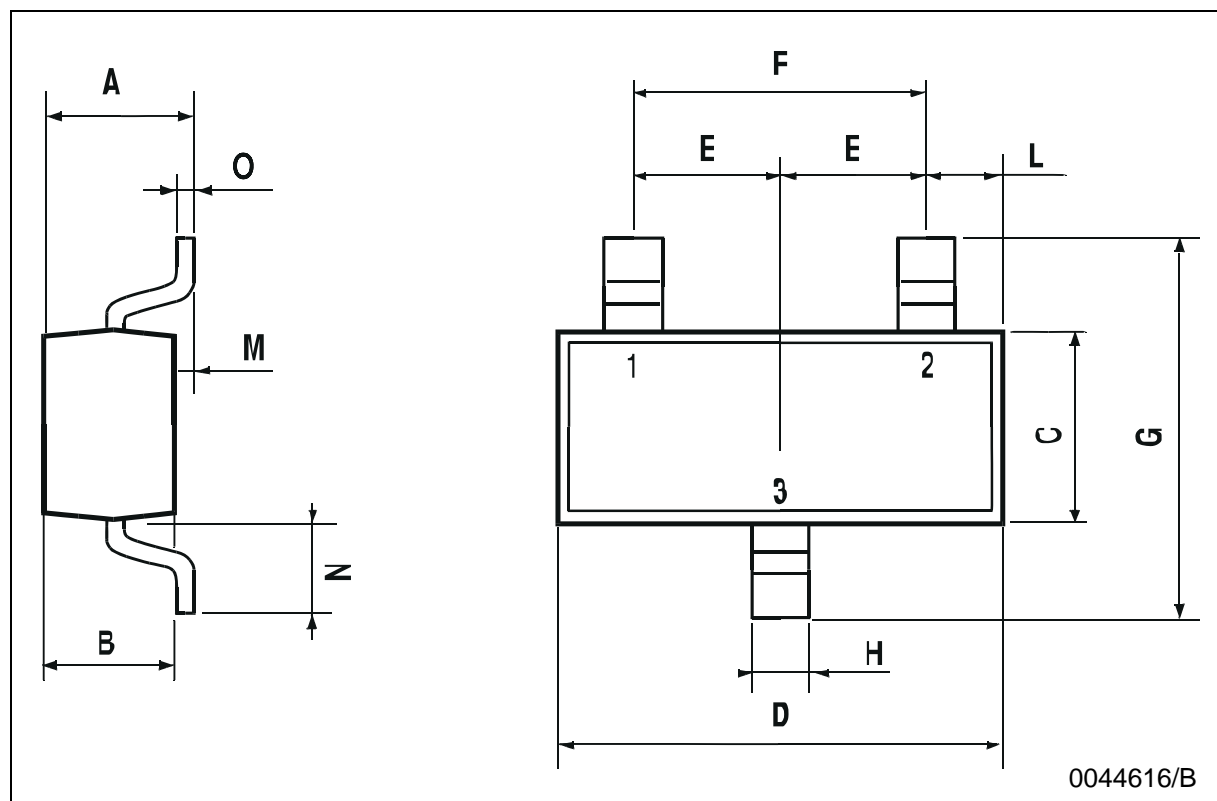
### ELECTRICAL CHARACTERISTICS ( $T_{case} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

| Symbol          | Parameter   | Test Conditions  | Min.           | Typ. | Max. | Unit |
|-----------------|---|--|----------------|------|------|------|
| $I_{CBO}$       | Collector Cut-off Current ( $I_E = 0$ )           | $V_{CB} = 200\text{ V}$  |                |      | 100  | nA   |
| $V_{(BR)CBO}$   | Collector-Base Breakdown Voltage ( $I_E = 0$ )    | $I_C = 100\text{ }\mu\text{A}$   | 300            |      |      | V    |
| $V_{(BR)CEO}^*$ | Collector-Emitter Breakdown Voltage ( $I_B = 0$ ) | $I_C = 1\text{ mA}$  | 300            |      |      | V    |
| $V_{(BR)EBO}$   | Emitter-Base Breakdown Voltage ( $I_C = 0$ )      | $I_E = 100\text{ }\mu\text{A}$   | 6              |      |      | V    |
| $V_{CE(sat)}^*$ | Collector-Emitter Saturation Voltage              | $I_C = 20\text{ mA}$ $I_B = 2\text{ mA}$   |                |      | 0.5  | V    |
| $V_{BE(sat)}^*$ | Base-Emitter Saturation Voltage                   | $I_C = 20\text{ mA}$ $I_B = 2\text{ mA}$   |                |      | 0.9  | V    |
| $h_{FE}^*$      | DC Current Gain                                   | $I_C = 1\text{ mA}$ $V_{CE} = 10\text{ V}$<br>$I_C = 10\text{ mA}$ $V_{CE} = 10\text{ V}$<br>$I_C = 30\text{ mA}$ $V_{CE} = 10\text{ V}$ | 25<br>40<br>40 |      |      |      |
| $f_T$           | Transition Frequency                              | $I_C = 10\text{ mA}$ $V_{CE} = 20\text{ V}$ $f = 20\text{ MHz}$  | 50             |      |      | MHz  |
| $C_{CBO}$       | Collector-Base Capacitance                        | $I_E = 0$ $V_{CB} = 10\text{ V}$ $f = 1\text{ MHz}$  |                | 6    |      | pF   |
| $C_{EBO}$       | Emitter-Base Capacitance                          | $I_C = 0$ $V_{EB} = 2\text{ V}$ $f = 1\text{ MHz}$   |                | 22   |      | pF   |

\* Pulsed: Pulse duration =  $300\text{ }\mu\text{s}$ , duty cycle  $\leq 1.5\%$

## SOT-23 MECHANICAL DATA

| DIM. | mm   |      |      | mils  |      |      |
|------|------|------|------|-------|------|------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP. | MAX. |
| A    | 0.85 |      | 1.1  | 33.4  |      | 43.3 |
| B    | 0.65 |      | 0.95 | 25.6  |      | 37.4 |
| C    | 1.20 |      | 1.4  | 47.2  |      | 55.1 |
| D    | 2.80 |      | 3    | 110.2 |      | 118  |
| E    | 0.95 |      | 1.05 | 37.4  |      | 41.3 |
| F    | 1.9  |      | 2.05 | 74.8  |      | 80.7 |
| G    | 2.1  |      | 2.5  | 82.6  |      | 98.4 |
| H    | 0.38 |      | 0.48 | 14.9  |      | 18.8 |
| L    | 0.3  |      | 0.6  | 11.8  |      | 23.6 |
| M    | 0    |      | 0.1  | 0     |      | 3.9  |
| N    | 0.3  |      | 0.65 | 11.8  |      | 25.6 |
| O    | 0.09 |      | 0.17 | 3.5   |      | 6.7  |



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