

## SILICON EPITAXIAL TRANSISTORS

P-N-P transistors in a microminiature (SMD) plastic envelope intended for surface mounted applications. They are primarily intended for use in telephony and professional communication equipment.

### QUICK REFERENCE DATA

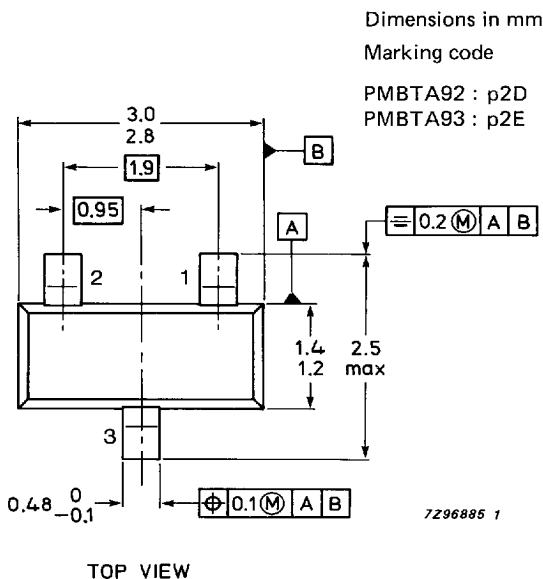
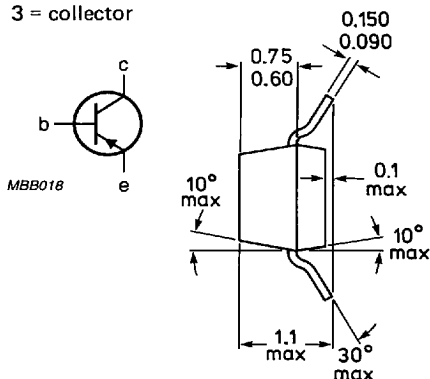
|                                                            |            |      | PMBTA92 | PMBTA93 |
|------------------------------------------------------------|------------|------|---------|---------|
| Collector-base voltage (open emitter)                      | $-V_{CBO}$ | max. | 300     | 200 V   |
| Collector-emitter voltage (open base)                      | $-V_{CEO}$ | max. | 300     | 200 V   |
| Emitter-base voltage (open collector)                      | $-V_{EBO}$ | max. | 5       | V       |
| Collector current (d.c.)                                   | $-I_C$     | max. | 500     | mA      |
| Total power dissipation up to $T_{amb} = 25^\circ\text{C}$ | $P_{tot}$  | max. | 250     | mW      |
| D.C. current gain                                          |            |      |         |         |
| $-I_C = 10\text{ mA}; -V_{CE} = 10\text{ V}$               | $h_{FE}$   | min. | 40      |         |
| Transition frequency at $f = 100\text{ MHz}$               |            |      |         |         |
| $-I_C = 10\text{ mA}; -V_{CE} = 20\text{ V}$               | $f_T$      | min. | 50      | MHz     |
| Collector-base capacitance at $f = 1\text{ MHz}$           |            |      |         |         |
| $I_E = 0; -V_{CB} = 20\text{ V}$                           | $C_{cb}$   | max. | 6       | 8 pF    |

### MECHANICAL DATA

Fig. 1 SOT-23.

#### Pinning:

- 1 = base
- 2 = emitter
- 3 = collector



See also Soldering recommendations.

## RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

|                                                                 |            |      | PMBTA92     | PMBTA93          |
|-----------------------------------------------------------------|------------|------|-------------|------------------|
| Collector-base voltage (open emitter)                           | $-V_{CBO}$ | max. | 300         | 200 V            |
| Collector-emitter voltage (open base)                           | $-V_{CEO}$ | max. | 300         | 200 V            |
| Emitter-base voltage (open collector)                           | $-V_{EBO}$ | max. | 5           | V                |
| Collector current (d.c.)                                        | $-I_C$     | max. | 500         | mA               |
| Total power dissipation *<br>up to $T_{amb} = 25^\circ\text{C}$ | $P_{tot}$  | max. | 250         | mW               |
| Storage temperature                                             | $T_{stg}$  |      | -65 to +150 | $^\circ\text{C}$ |
| Junction temperature                                            | $T_j$      | max. | 150         | $^\circ\text{C}$ |

## THERMAL CHARACTERISTICS \*\*

$$T_j = P (R_{th j-t} + R_{th t-s} + R_{th s-a}) + T_{amb}$$

Thermal resistance

from junction to ambient\*

$$R_{th j-a} = 500 \text{ K/W}$$

## CHARACTERISTICS

 $T_{amb} = 25^\circ\text{C}$  unless otherwise specified

|                                                                                                                                                                          |                                  |                      | PMBTA92        | PMBTA93                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------|----------------|---------------------------------------|
| Collector-emitter breakdown voltage<br>$-I_C = 1 \text{ mA}; I_B = 0$                                                                                                    | $-V_{(BR)CEO}$                   | min.                 | 300            | 200 V                                 |
| Collector-base breakdown voltage<br>$-I_C = 100 \mu\text{A}; I_E = 0$                                                                                                    | $-V_{(BR)CBO}$                   | min.                 | 300            | 200 V                                 |
| Collector cut-off current<br>$-V_{CB} = 200 \text{ V}; I_E = 0$<br>$-V_{CB} = 160 \text{ V}; I_E = 0$                                                                    | $-I_{CBO}$                       | max.<br>max.         | 0,25<br>—      | — $\mu\text{A}$<br>0,25 $\mu\text{A}$ |
| Emitter-base breakdown voltage<br>$-I_E = 100 \mu\text{A}; I_C = 0$                                                                                                      | $-V_{(BR)EBO}$                   | min.                 | 5              | V                                     |
| Emitter cut-off current<br>$I_C = 0; -V_{BE} = 3 \text{ V}$                                                                                                              | $-I_{EBO}$                       | max.                 | 0,1            | $\mu\text{A}$                         |
| Collector-base capacitance<br>at $f = 1 \text{ MHz};$<br>$I_E = 0; -V_{CB} = 20 \text{ V}$                                                                               | $C_{cb}$                         | max.                 | 6              | 8 pF                                  |
| Saturation voltages<br>$-I_C = 20 \text{ mA}; -I_B = 2 \text{ mA}$<br>$-I_C = 20 \text{ mA}; -I_B = 2 \text{ mA}$                                                        | $-V_{CEsat}$<br>$-V_{BEsat}$     | max.<br>max.         | 0,5<br>0,9     | V<br>V                                |
| D.C. current gain ▲<br>$-I_C = 1 \text{ mA}; -V_{CE} = 10 \text{ V}$<br>$-I_C = 10 \text{ mA}; -V_{CE} = 10 \text{ V}$<br>$-I_C = 30 \text{ mA}; -V_{CE} = 10 \text{ V}$ | $h_{FE}$<br>$h_{FE}$<br>$h_{FE}$ | min.<br>min.<br>min. | 25<br>40<br>25 |                                       |

\* Mounted on a ceramic substrate: area = 10 x 8 mm; thickness = 0,7 mm.

\*\* See Thermal characteristics.

▲ Pulse test conditions:  $t_p = 300 \mu\text{s}$ ; duty cycle  $\leq 2\%$ .