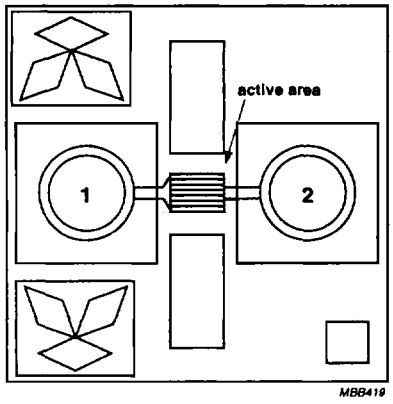
# NPN 9 GHz wideband transistor crystal

# X3A-BFR505

## DESCRIPTION

NPN crystal used in BFR505 (SOT23), BFG505 (SOT143) and BFP505 (SOT173). Crystals are supplied as whole wafer, fully tested but unsawn.

## ELEMENT LAYOUT




Active area: 10 µm around metallization pattern.

Fig.1 X3A-BFR505 crystal.

## MECHANICAL DATA

| | |
|---|---|
| **Crystal** | |
| Top metallization | Au 1.15 µm |
| Back metallization | AuAs 0.35 µm |
| Passivation | $Si_3N_4$ 0.5 µm |
| Base bond pad 1 | dia. 55 µm |
| Emitter bond pad 2 | dia. 55 µm |
| Collector contact | on underside of crystal |
| **Wafer** | |
| Diameter | 76.1 mm (3 inches) |
| Crystal pitch | 290 x 290 µm |
| Separation lane | 60 µm |
| Sawing lane | 50 µm |
| Slice thickness | 200 ±15 µm |
| Average number of good elements per wafer | 30 000 |
| Faulty devices | inked out |
| Visual inspection | to URV-3-5-52/733 |

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

| SYMBOL | PARAMETER | CONDITIONS | MAX. | UNIT |
|---|---|---|---|---|
| $V_{CBO}$ | collector-base voltage | open emitter | 15 | V |
| $V_{CES}$ | collector-emitter voltage | | 15 | V |
| $V_{EBO}$ | emitter-base voltage | open collector | 2.5 | V |
| $I_C$ | DC collector current | | 18 | mA |
| $T_j$ | junction temperature | | 150 | °C |

## CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | collector cut-off current | $I_E = 0$; $V_{CB} = 6$ V | – | – | 50 | nA |
| $h_{FE}$ | DC current gain | $I_C = 5$ mA; $V_{CE} = 6$ V | 60 | 120 | – | |
| $f_T$ | transition frequency | $I_C = 5$ mA; $V_{CE} = 6$ V; f = 1 GHz | – | 9 | – | GHz |
| F | noise figure | $I_C = 1.25$ mA; $V_{CE} = 6$ V; f = 900 MHz | – | 1.1 | – | dB |