

**NPN 1 GHz wideband transistor**

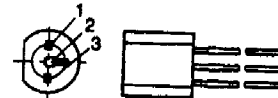
**BF748**

**FEATURES**

- Stable oscillator operation
- High current gain
- Low feedback capacitance
- Good thermal stability.

**PINNING**

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | collector   |
| 2   | emitter     |
| 3   | base        |



**DESCRIPTION**

Low cost NPN transistor in a plastic SOT54 (TO-92 variant) envelope.

It is intended for VHF and UHF TV tuner applications and can be used as a mixer and/or oscillator.

**QUICK REFERENCE DATA**

| SYMBOL    | PARAMETER                 | CONDITIONS   | MIN. | TYP. | MAX. | UNIT |
|-----------|---------------------------|--|------|------|------|------|
| $V_{CB0}$ | collector-base voltage    | open emitter   | -    | -    | 30   | V    |
| $V_{CE0}$ | collector-emitter voltage | open base  | -    | -    | 20   | V    |
| $V_{EB0}$ | emitter-base voltage      | open collector   | -    | -    | 3    | V    |
| $I_{CM}$  | peak collector current    |  | -    | -    | 50   | mA   |
| $P_{tot}$ | total power dissipation   | up to $T_s = 75^\circ\text{C}$ (note 1)                        | -    | -    | 500  | mW   |
| $f_T$     | transition frequency      | $I_C = 15\text{ mA}; V_{CE} = 10\text{ V}; f = 500\text{ MHz}$ | 0.8  | 1.2  | 1.6  | GHz  |

**LIMITING VALUES**

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

| SYMBOL    | PARAMETER                 | CONDITIONS                              | MIN. | MAX. | UNIT             |
|-----------|---------------------------|---|------|------|------------------|
| $V_{CB0}$ | collector-base voltage    | open emitter                            | -    | 30   | V                |
| $V_{CE0}$ | collector-emitter voltage | open base                               | -    | 20   | V                |
| $V_{EB0}$ | emitter-base voltage      | open collector                          | -    | 3    | V                |
| $I_{CM}$  | peak collector current    |   | -    | 50   | mA               |
| $P_{tot}$ | total power dissipation   | up to $T_s = 75^\circ\text{C}$ (note 1) | -    | 500  | mW               |
| $T_{stg}$ | storage temperature       |   | -55  | 150  | $^\circ\text{C}$ |
| $T_j$     | junction temperature      |   | -    | 150  | $^\circ\text{C}$ |

**Note**

1.  $T_s$  is the temperature at the soldering point of the collector lead, 4 mm from the body.



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## THERMAL RESISTANCE

| SYMBOL        | PARAMETER   | CONDITIONS                          | THERMAL RESISTANCE |
|---------------|---|-------------------------------------|--------------------|
| $R_{th, j-s}$ | thermal resistance from junction to soldering point | up to $T_s = 75\text{ °C}$ (note 1) | 150 K/W            |

### Note

- $T_s$  is the temperature at the soldering point of the collector lead, 4 mm from the body.

## CHARACTERISTICS

$T_j = 25\text{ °C}$  unless otherwise specified.

| SYMBOL    | PARAMETER                              | CONDITIONS   | MIN. | TYP. | MAX. | UNIT |
|-----------|--|--|------|------|------|------|
| $I_{CBO}$ | collector cut-off current              | $I_E = 0; V_{CB} = 10\text{ V}$                                | -    | -    | 100  | nA   |
| $h_{FE}$  | DC current gain                        | $I_C = 2\text{ mA}; V_{CE} = 10\text{ V}$                      | 40   | 95   | 250  |      |
| $f_T$     | transition frequency                   | $I_C = 15\text{ mA}; V_{CE} = 10\text{ V}; f = 500\text{ MHz}$ | 0.8  | 1.2  | 1.6  | GHz  |
| $C_{re}$  | feedback capacitance                   | $I_E = I_B = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$        | -    | 0.65 | -    | pF   |
| $G_{UM}$  | maximum unilateral power gain (note 1) | $I_C = 15\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$ | -    | 25   | -    | dB   |

### Note

- $G_{UM}$  is the maximum unilateral power gain, assuming  $S_{12}$  is zero and  $G_{UM} = 10 \log \frac{|S_{21}|^2}{(1 - |S_{11}|^2)(1 - |S_{22}|^2)}$  dB.