

2-GHz Mixer

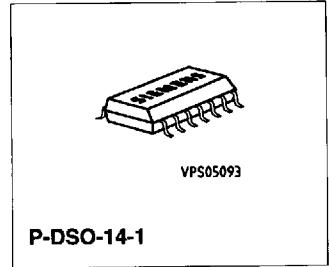
TDA 6130-5X4

Preliminary Data

Bipolar IC

Features

- A wide range of supply voltage
- Few external components
- High conversion transconductance
- Wide range of input signal.



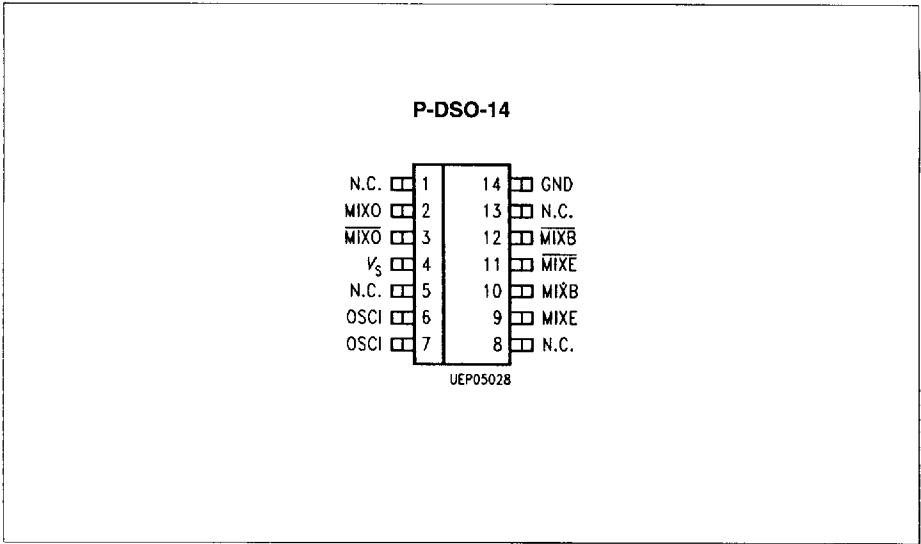
| Type | Ordering Code | Package |
|--------------|---------------|------------|
| TDA 6130-5X4 | Q67000-A5176 | P-DSO-14-1 |

The TDA 6130-5X4 is a symmetrical mixer like the components **S 042 P*** and **TBB 042 G*** but for frequencies up to 2 GHz. It can be driven by an external source or by the build-in oscillator.

* already cancelled

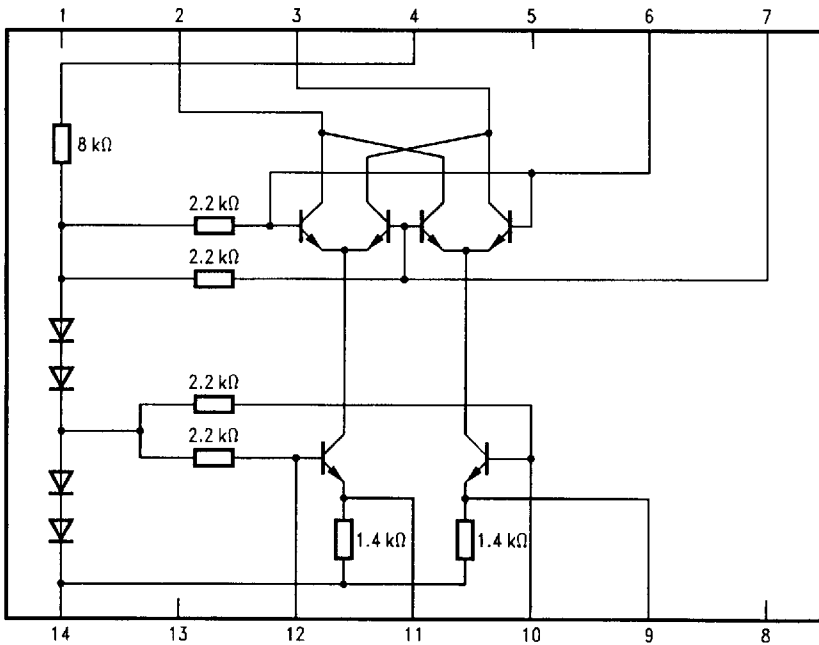
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Pin Configuration (top view)



Pin Definitions and Functions

| Pin No. | Symbol | Function |
|---------|--------|---------------------|
| 1 | N.C. | N.C. |
| 2 | MIXO | Mixer output |
| 3 | MIXO | Mixer output |
| 4 | V_s | Supply voltage |
| 5 | N.C. | N.C. |
| 6 | OSCI | Oscillator input |
| 7 | OSCI | Oscillator input |
| 8 | N.C. | N.C. |
| 9 | MIXE | Mixer input emitter |
| 10 | MIXB | Mixer input base |
| 11 | MIXE | Mixer input emitter |
| 12 | MIXB | Mixer input base |
| 13 | N.C. | N.C. |
| 14 | GND | Ground |



UEB05029

Block Diagram

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Circuit Description

The pins 1, 5, 8, 13 should be connected to pin 14 (ground) to reach optimal HF features. A galvanic connection between pins 6 and 7 and 10 and 12 through coupling windings is recommended.

A resistor of at least $220\ \Omega$ may be connected between pins 9 and 14 (ground) and between 11 and 14 to increase the currents and thus the conversion transconductance.

Pins 9 and 11 may be connected through any impedance. In case of a direct connection between pin 9 and 11, the resistance from this pin to 14 may be at least $100\ \Omega$. Depending on the layout, a capacitor may be required between pins 6 and 7 to prevent oscillations in the UHF band.

Absolute Maximum Ratings $T_A = 0$ to 70 °C

| Parameter | Symbol | Limit Values | | Unit | Test Condition |
|----------------------|-------------|--------------|-------------|------|----------------|
| | | min. | max. | | |
| Supply voltage | V_4 | 0 | 8 | V | |
| Mixer output | $V_{2,3}$ | 1 | 8 | V | Open collector |
| Oscillator input | $V_{6,7}$ | 0 | 2.5 | V | |
| Mixer input emitter | $V_{9,11}$ | 0.8 | 3.5 | | |
| Mixer input base | $V_{10,12}$ | 0 | $V_4 - 1.5$ | V | |
| Junction temperature | T_j | | 125 | °C | |
| Storage temperature | T_{stg} | - 40 | 150 | °C | |
| Thermal resistance | $R_{th SA}$ | | 125 | K/W | |

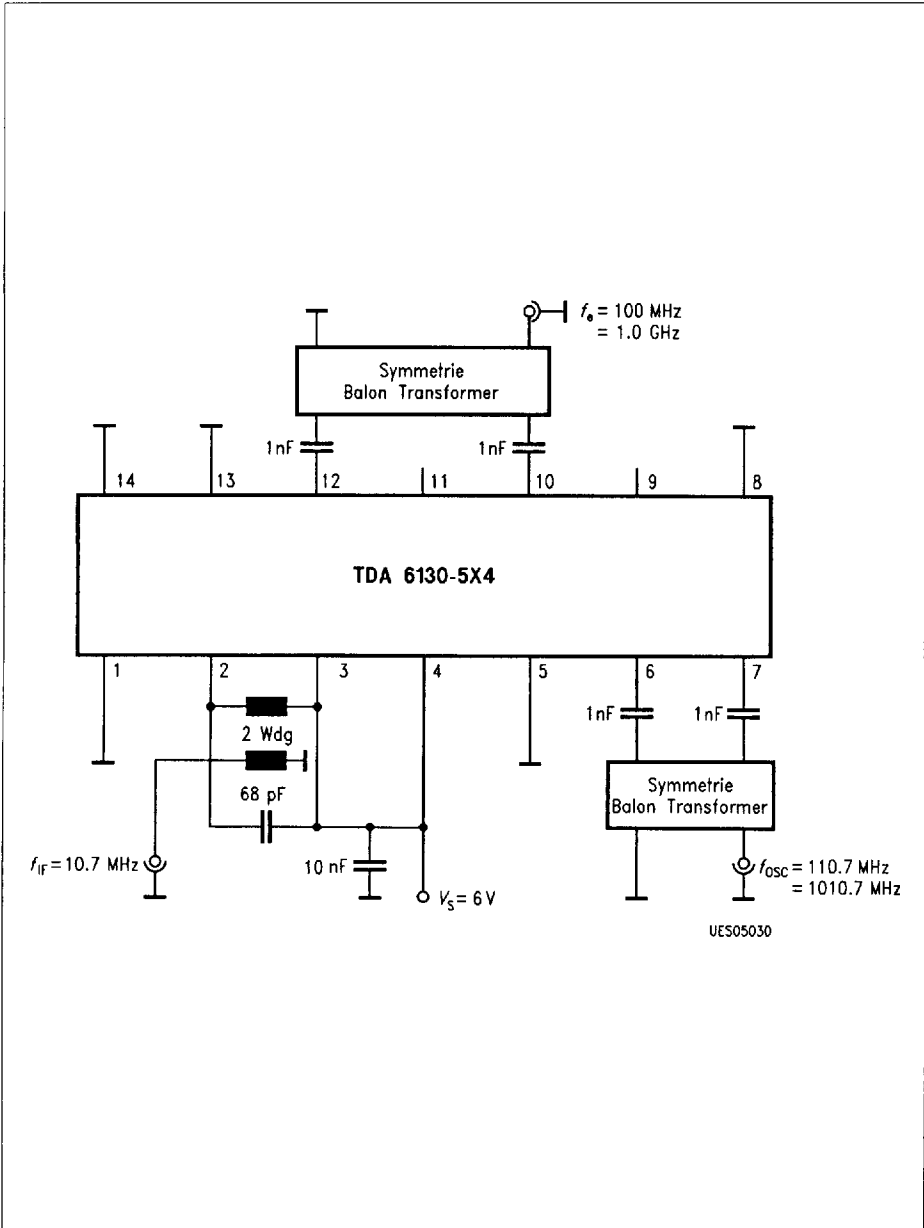
Operating Range

| | | | | | |
|----------------------------------|----------|---|------|-----|--|
| Supply voltage | V_S | 4 | 7 | V | |
| Input frequency range | f_{15} | | 2000 | MHz | |
| Ambient temperature in operation | T_A | 0 | 70 | °C | |

Characteristics

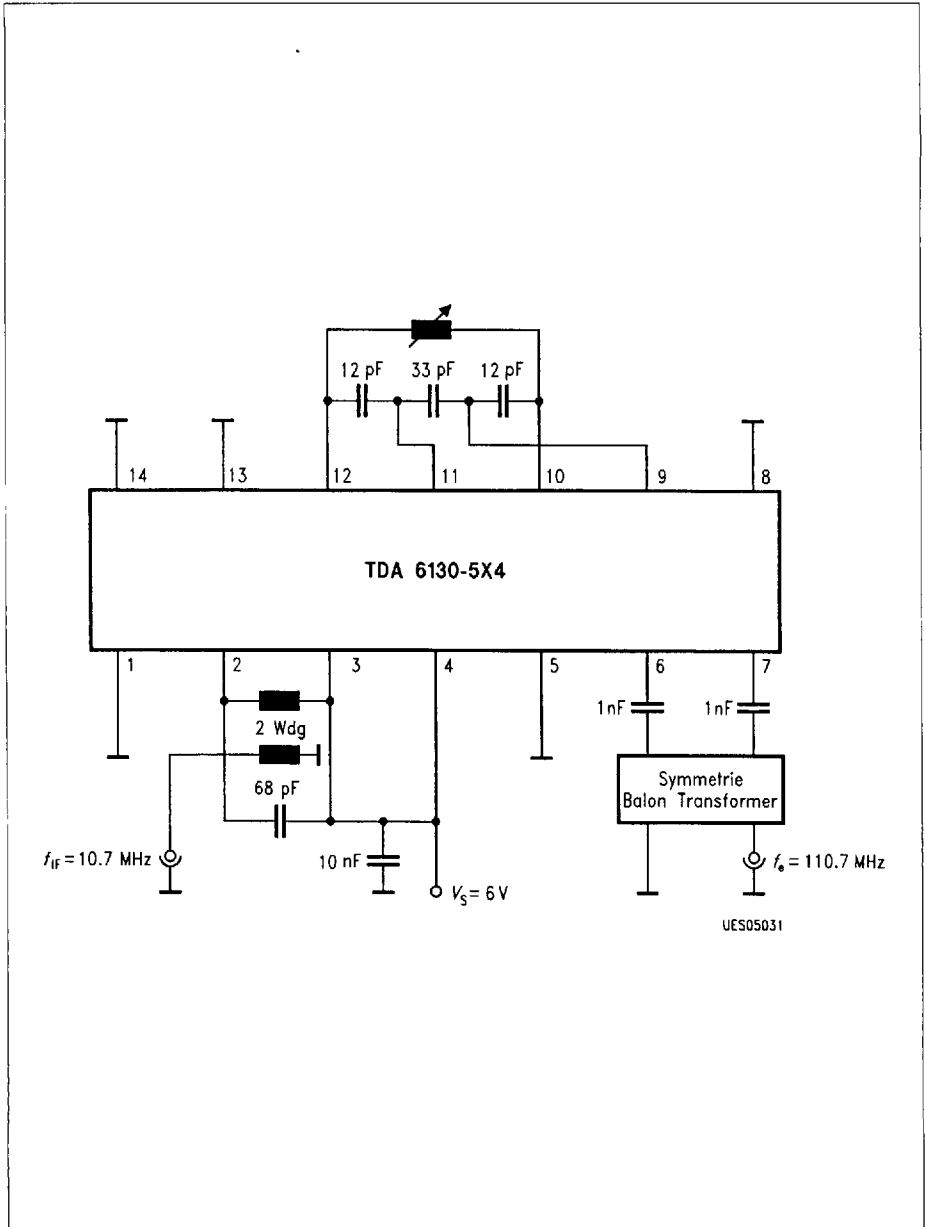
$T_A = 25\text{ °C}$; $V_S = 6\text{ V} \pm 10\%$ (test circuit 1)

| Parameter | Symbol | Limit Values | | | Unit | Test Condition |
|--|-------------------------|--------------|------|------|---------------|----------------------------------|
| | | min. | typ. | max. | | |
| Current consumption | $I_S = I_2 + I_3 + I_4$ | 1.1 | 1.6 | 2.1 | mA | |
| Output-current | $I_2 = I_3$ | 0.35 | 0.54 | 0.75 | mA | |
| Output-current difference | $I_2 - I_3$ | 3 | 10 | 60 | μA | |
| Supply current | I_4 | 0.2 | 0.4 | 0.6 | mA | |
| Power gain | V_P | | | | | |
| $f_e = 100\text{ MHz}$, $f_{\text{OSC}} = 110,7\text{ MHz}$ | | 13 | 16 | 19 | dB | |
| $f_e = 1\text{ GHz}$, $f_{\text{OSC}} = 1,1\text{ GHz}$ | | 13 | 16 | 19 | dB | |
| Break down voltage | $V_{2,3}$ | | 18 | | V | |
| $I_{2,3} = 10\text{ mA}$; $V_{6,7} = 0$ | | | | | | |
| Noise figure | NF | 6 | 7 | 10 | dB | DSB |
| Mixer output impedance | R | | 7.0 | | k Ω | $f_{\text{MO}} = 100\text{ MHz}$ |
| | C | | 0.6 | | k Ω | $f_{\text{MO}} = 1\text{ GHz}$ |
| | | | 1.5 | | pF | |



Test Circuit 1

■ 8235605 0063585 T83 ■



Application Circuit

■ 8235605 0063586 91T ■