SIEMENS

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.

P-DSO-14-1

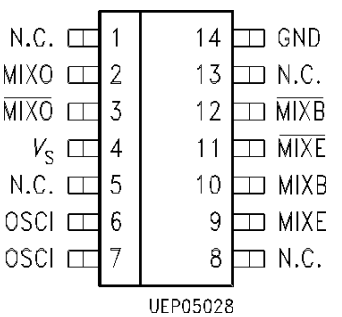
Type	Ordering Code	Package
TDA 6130-5X4	Q67000-A5176	P-DSO-14-1

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

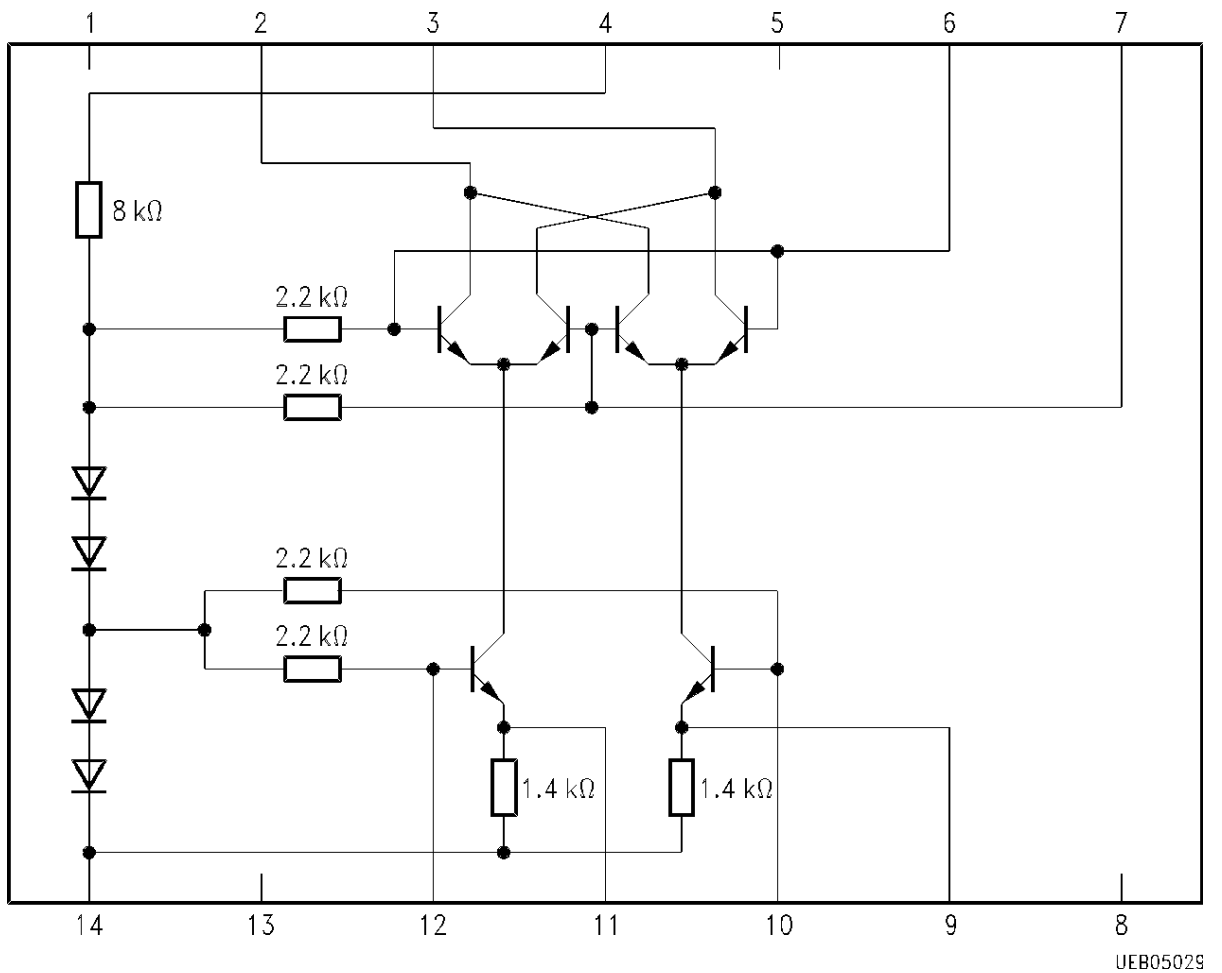
Pin Configuration
(top view)

P-DSO-14



Pin Definitions and Functions

Pin No.	Symbol	Function
1	N.C.	N.C.
2	MIXO	Mixer output
3	$\overline{\text{MIXO}}$	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	$\overline{\text{MIXE}}$	Mixer input emitter
12	$\overline{\text{MIXB}}$	Mixer input base
13	N.C.	N.C.
14	GND	Ground



Block Diagram

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 Ω 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 Ω. 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	

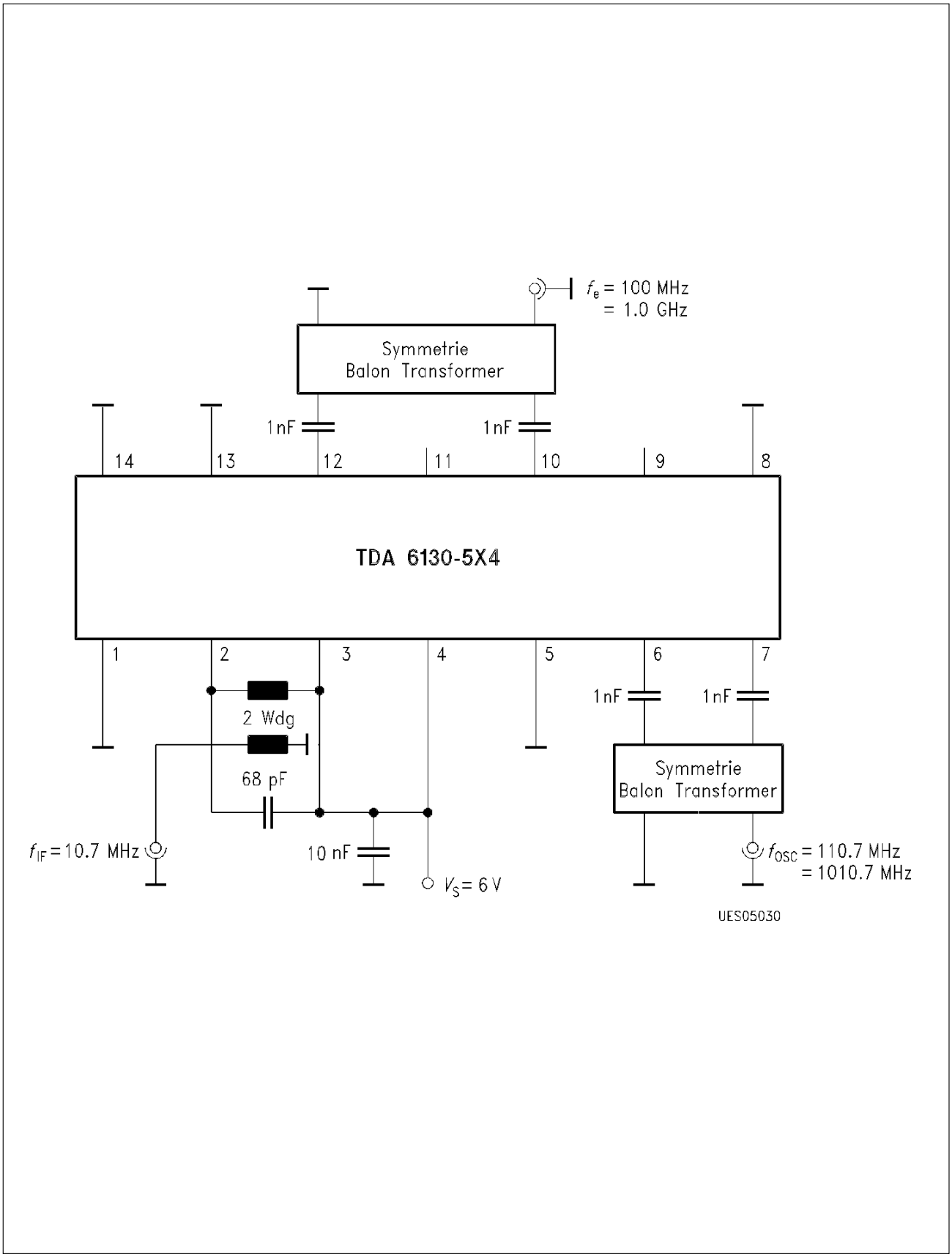
Operating Range

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

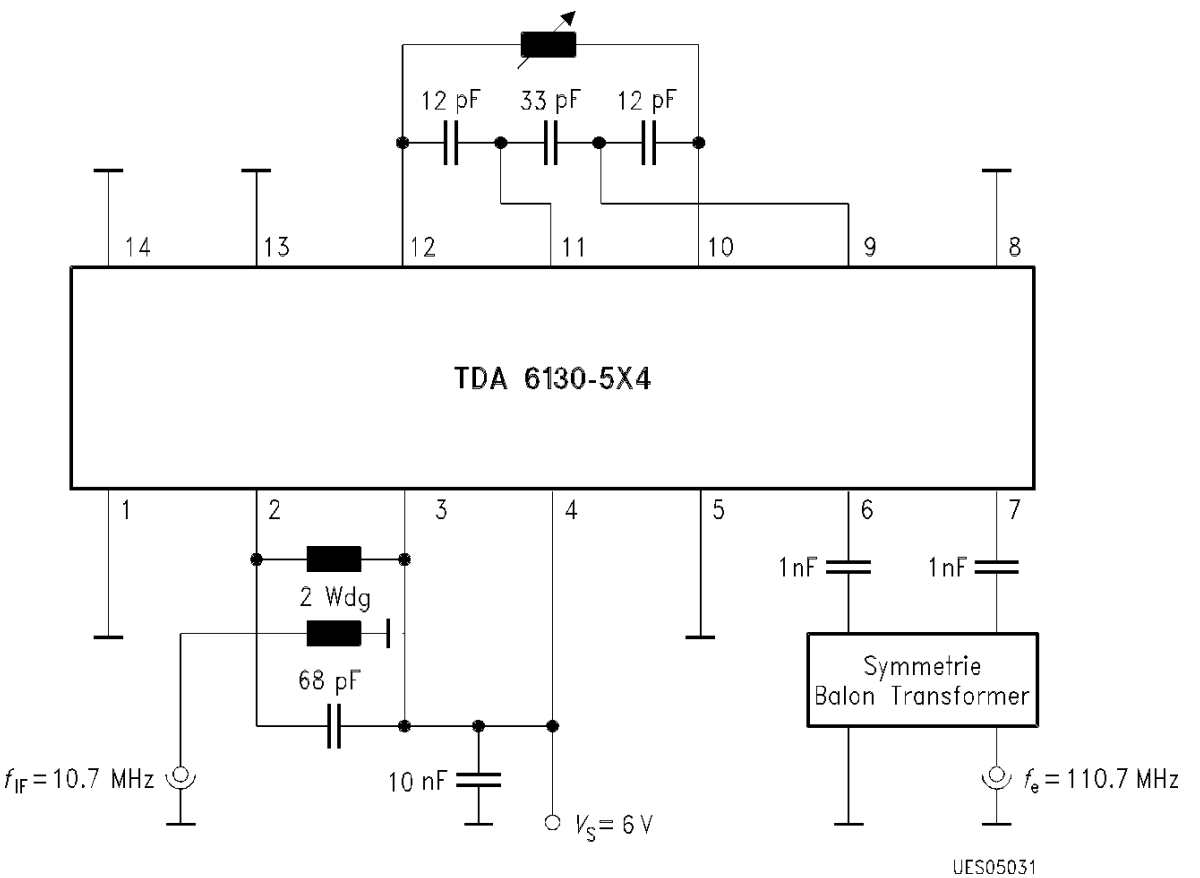
Characteristics

T_A = 25 °C; V_S = 6 V ± 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 f_e = 100 MHz, f_{OSC} = 110,7 MHz f_e = 1 GHz, f_{OSC} = 1,1 GHz	V_P	 13 13	 16 16	 19 19	 dB dB	
Break down voltage $I_{2,3}$ = 10 mA; $V_{6,7}$ = 0	$V_{2,3}$		18		V	
Noise figure	NF	6	7	10	dB	DSB
Mixer output impedance	R C		7.0 0.6 1.5		kΩ kΩ pF	f_{MO} = 100 MHz f_{MO} = 1 GHz



Test Circuit 1



Application Circuit