Mixer

TBB 042 G

Bipolar IC

Type	Ordering Code	Package
⑤ TBB 042 G	Q67000–A8059	P-DSO-14 (SMD)

The TBB 042 G is a balanced mixer applicable for frequencies up to 200 MHz. It can be driven either by an external source or by a built-in oscillator.

Common applications are in receivers, converters and demodulators for AM and FM signals.

Features

- Wide range of supply voltage
- Few external components
- High conversion transconductance
- High pulse strength
- Low noise

Absolute Maximum Ratings

Parameter	Symbol	Values	Unit
Supply voltage	V_S	15	V
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−40 to 125	°C
Thermale resistance system – air	$R_{th\,SA}$	125	K/W

Operating Range

Parameter	Symbol	Values	Unit
Supply voltage	V_S	4 to 15	V
Ambient temperature	T_A	−15 to 70	°C

Characteristics

$V_S = 12$ V, $T_A = +25\,°C$

| Parameter	Symbol	Values min.	typ.	max.	Unit
Current consumption	$I_S = I_2 + I_3 + I_4$	1.4	2.15	2.9	mA
Output current	$I_2 = I_3$	0.36	0.52	0.68	mA
Output current difference	$I_3 - I_2$	−60		60	µA
Supply voltage	I_4	0.7	1.1	1.6	mA
Power gain ($f_i = 100$ MHz, $f_{OSC} = 110.7$ MHz)	G_p	14	16.5		dB
Breakdown voltage ($I_{2,3} = 10$ mA; $V_{7,8} = 0$ V)	V_2, V_3	25			V
Output capacitance	$C_{2\text{-}M}, C_{3\text{-}M}$		6		pF
Conversion transconductance ($f = 455$ kHz)	$S = \dfrac{I_2}{V_6 - V_7} = \dfrac{I_3}{V_6 - V_7}$		5		mS
Noise figure	F		7		dB
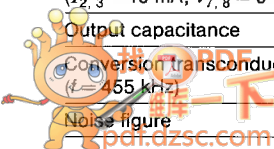
Application Circuits
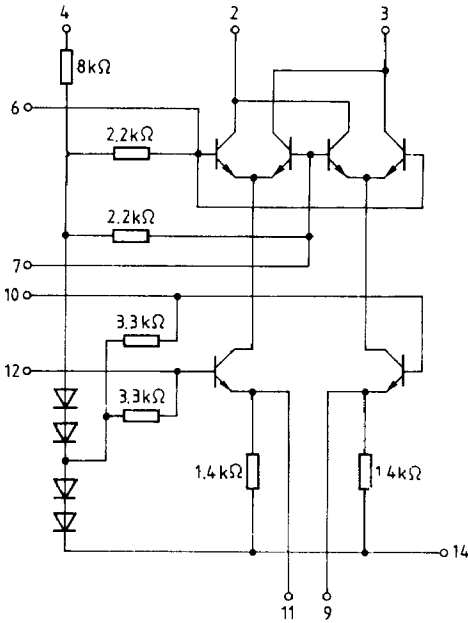
VHF mixer with Inductive Tuning
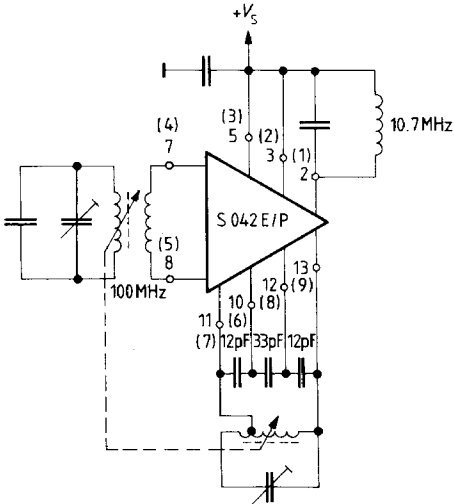
Connections in Parentheses Apply to S 042 E

VHF mixer with Crystal Oscillator
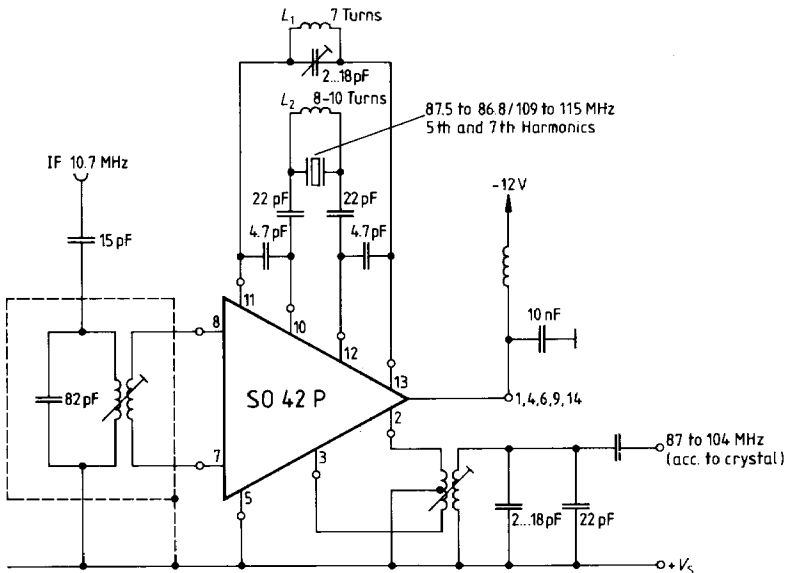
For harmonic crystals an inductance is recommended between pins 10 and 12 which will

Circuit Diagram

Pins 1, 5, 8, and 13 should be connected to pin 14 (GND) to obtain optimum RF features.

It is recommendable to establish an electrical connection between pins 6 and 7 and pins 10 and 12 through coupling windings.

A resistor of at least 220 Ω may be connected between pins 9 and 14 (GND) and pins 11 and 14 to increase the currents and thus the conversion transconductance. Pins 9 and 11 may be connected via any impedance. In case of a direct connection between pins 9 and 11 the resistance from this connection to pin 14 may be at least 100 Ω. Depending on the layout, a capacitor (10 to 50 pF) may be required between pins 6 and 7 to prevent oscillations in the VHF band.

**Total Current Consumption
versus Supply Voltage**
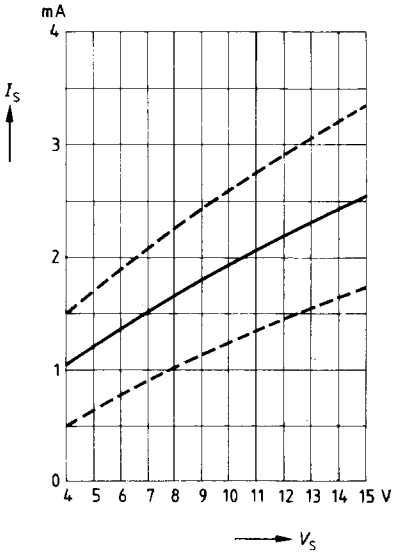
**Output Current
versus Supply Voltage**
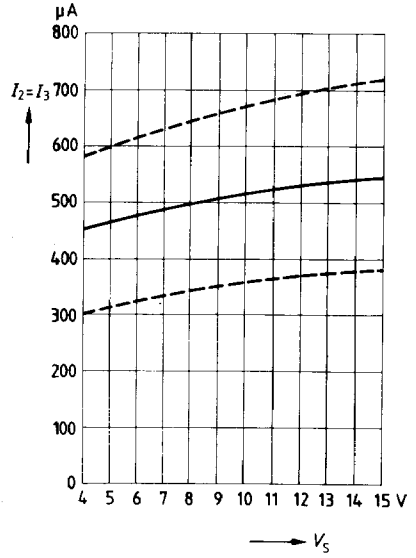
**Power Gain
versus Supply Voltage**