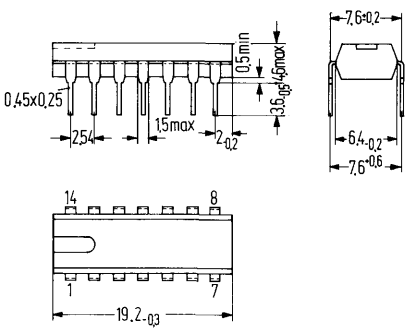
The S 042 is an universally applicable symmetrical mixer for frequencies up to 200 MHz. It can be driven from an external source or from the built-in oscillator. The input signals are suppressed at the outputs. In addition to the usual mixer applications in receivers, converters and demodulators for AM and FM, the S 042 can be used as an electrical polarity switch, multiplier etc.

- Wide range of supply voltage
- Numerous application possibilities
- Few external components
- High conversion transconductance
- Low noise figure

Type	Ordering codes
S 042 P	Q67000-A335
S 042 E	Q67000-A627

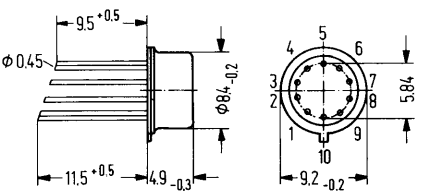
Package outlines

S 042 P



Plastic plug-in package
20 A 14 DIN 41866
14 pins, dual-in-line
Weight approx. 1.1 g

S 042 E



Package 5 J 10 DIN 41873
(similar to TO 100)
10 pins
Weight approx. 1.1 g

Dimensions in mm

Absolute maximum ratings

		S 042 P S 042 E	
Supply voltage	V_{cc}	15	V
Storage temperature	T_s	−40 to +125	°C
Junction temperature	T_j	150	°C
Thermal resistance S 042 P:	R_{thsa}	110	K/W
S 042 E:	R_{thsa}	190	K/W

Range of operation

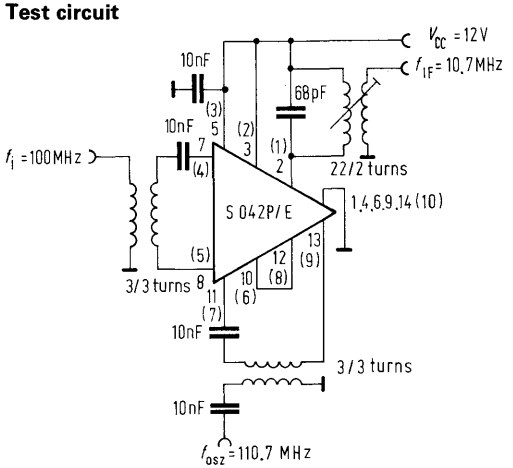
Supply voltage	V_{cc}	4 to 15	V
Ambient temperature in operation	T_{amb}	−15 to +70	°C

Electrical characteristics (V_{cc} = 12 V, T_{amb} = 25 °C)

		min	typ	max	
Total current consumption	$I_{cc}=I_2+I_3+I_5$	1.4	2.15	2.9	mA
Output current	$I_2=I_3$	.36	.52	.68	mA
Output current difference	I_3-I_2	−60		+60	mA
Current	I_5	.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 capacity	C_{2-M}, C_{3-M}		6		pF
Conversion transconductance	$S=\frac{I_2}{V_7-V_8}=\frac{I_3}{V_7-V_8}$		5		mS
Noise figure	F		7		dB

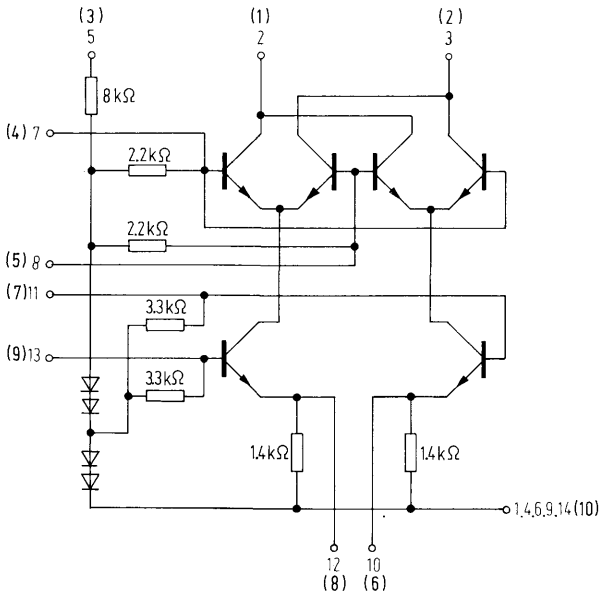
All connections mentioned in the index are referring to S 042 P (e.g. I_2)

Test circuit



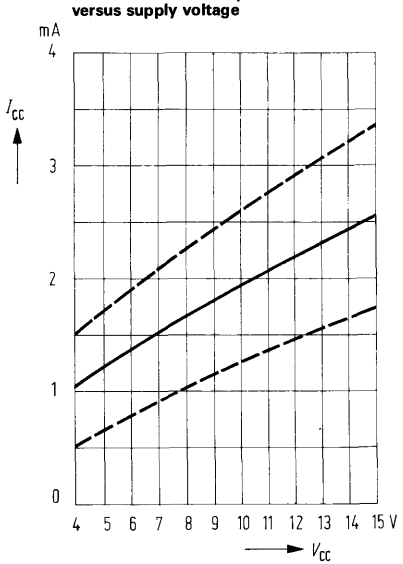
pin connections in brackets are S 042 E

Circuit diagram

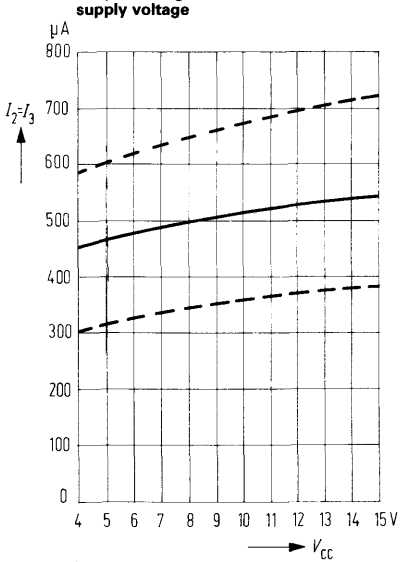


A galvanic connection between pins 7 and 8 and pins 11 and 13 through coupling windings is recommended.
Between pins 10 and 14 (ground) and between pins 12 and 14, a resistance of at least 200 Ω may be connected to increase the currents and therefore the conversion transconductance. Pins 10 and 12 may be connected through any impedance. In case of a direct connection between pins 10 and 12, the resistance from this pins to 14 must be at least 100 Ω. Depending on the layout, a capacitor (10 to 50 pF) may be required between pins 7 and 8 to prevent oscillations in the VHF band.

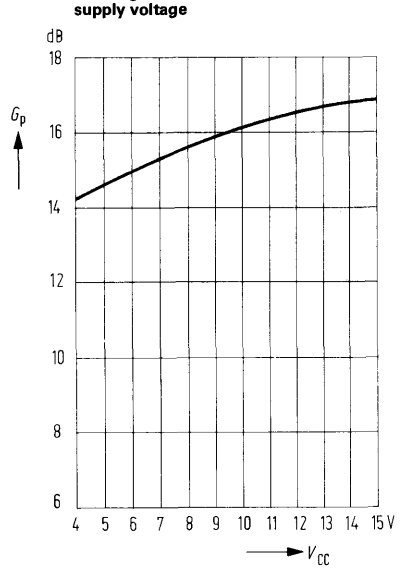
Total current consumption versus supply voltage



Output voltages versus supply voltage

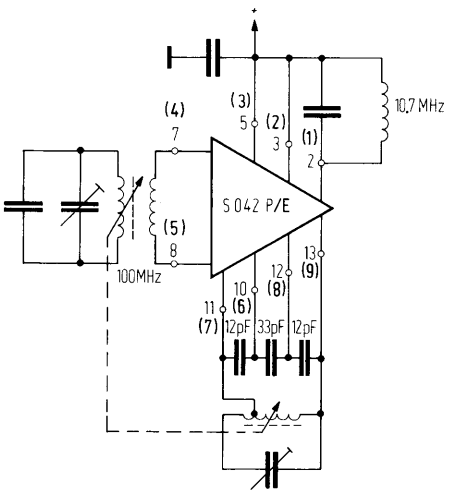


Power gain versus supply voltage



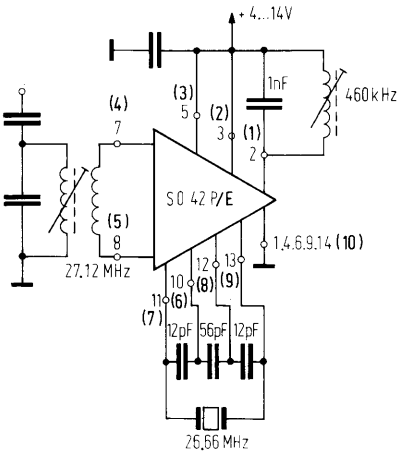
Application circuits

VHF mixer with inductive tuning



pin connections in brackets refer to S 042 E

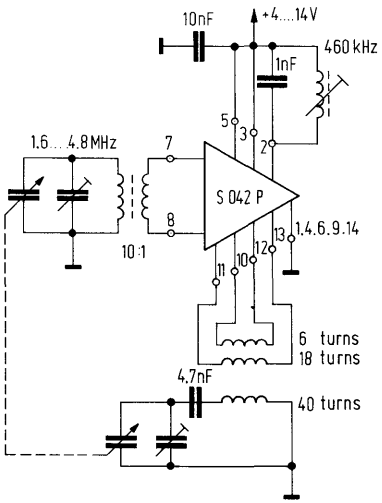
Mixer for remote-control receivers, without oscillator



pin connections in brackets refer to S 042 E

For overtone crystals is recommended an adequate indictivity between pins 10 and 12 to avoid oscillations to the fundamental tone.

Mixer for short wave application in self-oscillating operation



all pin connections refer to S 042 P

Differential amplifier with internal neutralisation, also suited for limiting, for frequencies up to 50 MHz, at higher currents up to 100 MHz