



U 664 B · U 664 BS

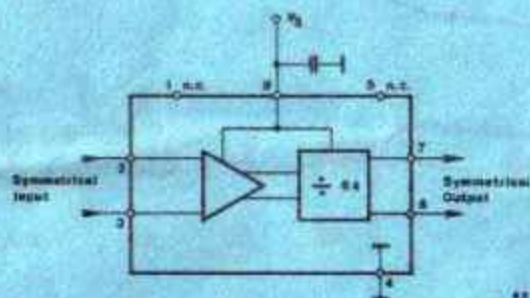
Monolithic Integrated Circuit

Application: 1 GHz frequency divider + 64 for frequency synthesizers in TV-tuners

Features:

- U 664 B without self oscillation
- U 664 BS with self oscillation
- High input sensitivity
- Large operation frequency range
- Large signal compatibility
- High dynamic stability
- Low power dissipation
- Few external components
- Scaling factor 64

Preliminary specifications



- 1 + 5 n.c.
- 2 + 3 Differential inputs with internal bias voltage
- 4 Earth, reference point
- 6 + 7 Differential outputs
- 8 V_g

Fig. 1 Block diagram and pin connections

Notes:

In order to avoid damage prescalers must be handled as MOS devices.

U 664 B: Without input signal the IC oscillates in the upper frequency range.

U 664 BS: The characteristic of the integrated preamplifier prevents an output signal when no input signal is apparent.

This behavior allows the monitoring of the control loop of a frequency synthesis systems.

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Absolute maximum ratings

Reference point 4

| | | | | |
|------------------------------|----------|-----------|------------|------------------|
| Supply voltage | Pin 8 | V_S | 6 | V |
| Input voltage range | Pin 2, 3 | V_i | 0... V_S | V |
| Power dissipation | | P_{tot} | 400 | mW |
| $T_{amb} = 85^\circ\text{C}$ | | | | |
| Junction temperature | | T_j | 125 | $^\circ\text{C}$ |
| Ambient temperature range | | T_{amb} | -25...+ 85 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | -40...+125 | $^\circ\text{C}$ |

Thermal resistance

| | Min. | Typ. | Max. | |
|------------------|------|------|------|------------|
| Junction ambient | | | 100 | K/W |
| | | | | R_{thJA} |

Electrical characteristics

$V_S = 5\text{ V}$, $T_{amb} = 25^\circ\text{C}$, reference point Pin 4

| | | | | | | |
|-------------------------------------------------------|-------|------------|------|-----|-----|-----|
| Supply voltage range | Pin 8 | V_S | 4.5 | 5.0 | 5.5 | V |
| Supply current | Pin 8 | | | | | |
| $V_S = 5\text{ V}$ | | I_S | 40 | 50 | 60 | mA |
| Input sensitivity | | | | | | |
| $R_G = 50\ \Omega$, $f = 80\text{...}900\text{ MHz}$ | Pin 2 | $V_i^1)$ | | 5 | 10 | mV |
| Large signal compatibility | | | | | | |
| $R_G = 50\ \Omega$ | Pin 2 | $V_i^1)$ | 300 | 600 | | mV |
| Frequency range | | f_{imin} | | | 30 | MHz |
| | | f_{imax} | 1000 | | | MHz |
| Differential output voltage | | | | | | |
| measured with $R \leq 10\text{k}\Omega$ | | V_{od} | 1.24 | 1.5 | 1.7 | V |

¹⁾ RMS-voltage, which is calculated from the measured available power

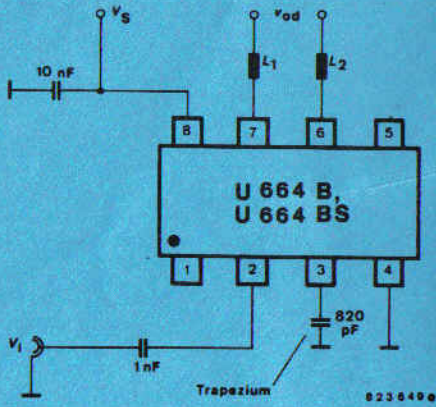
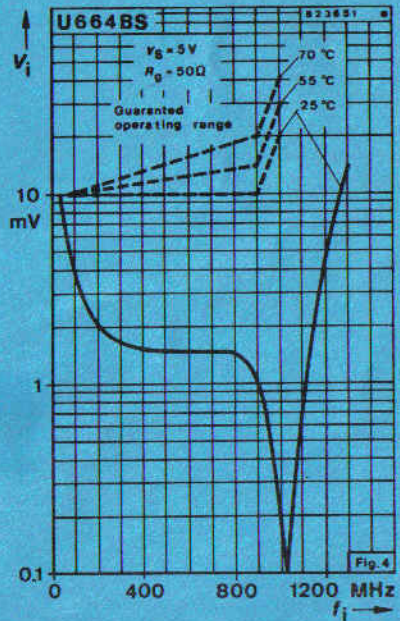
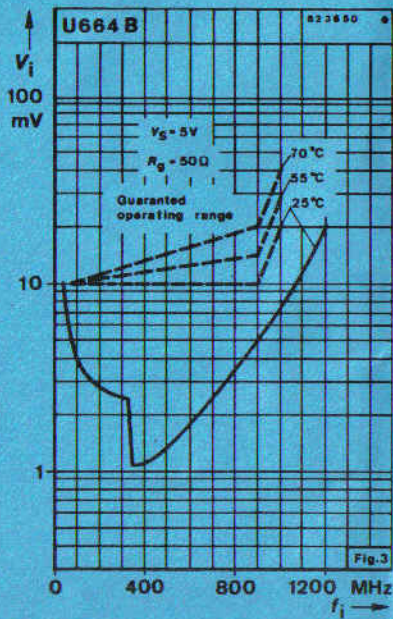


Fig 2 Test circuit

$L_1 = L_2 \approx 150 \text{ nH} - 6 \text{ Wdg } \varnothing 0.45 \text{ CuL on } \varnothing 4$



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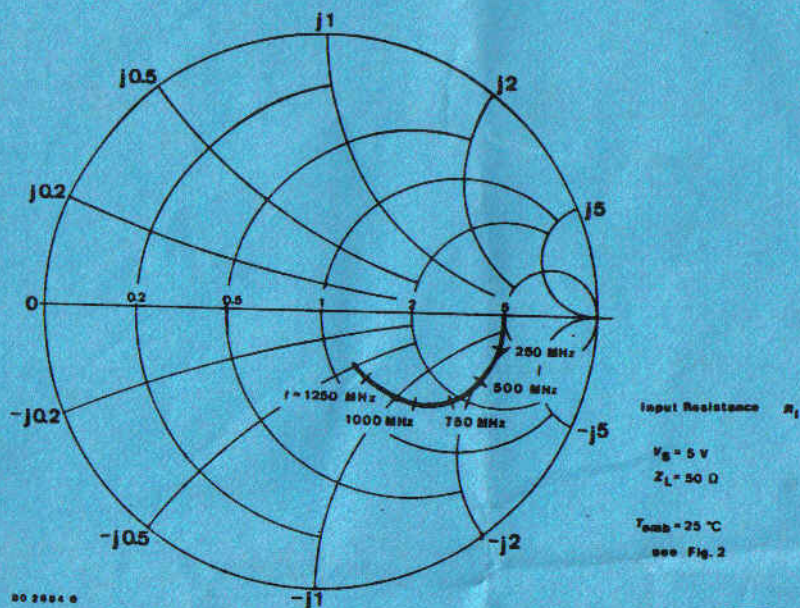
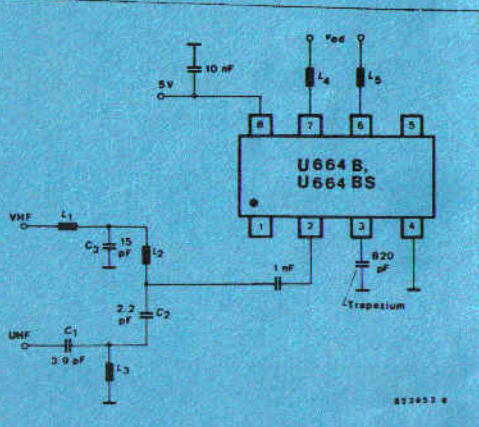


Fig. 6

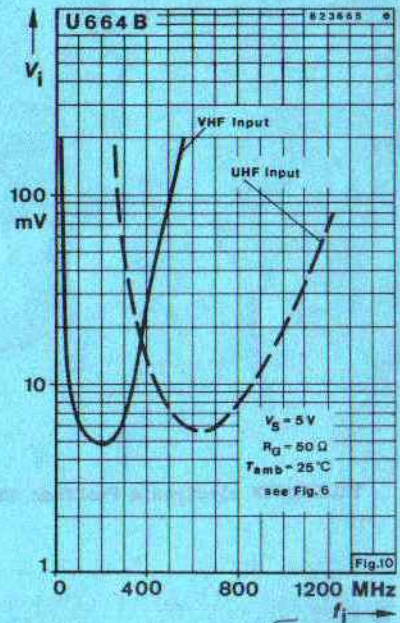
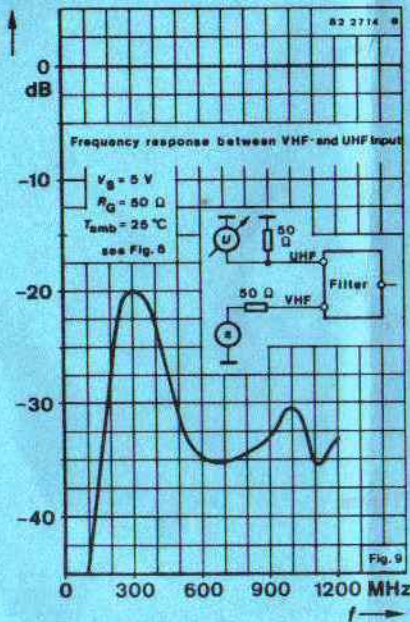
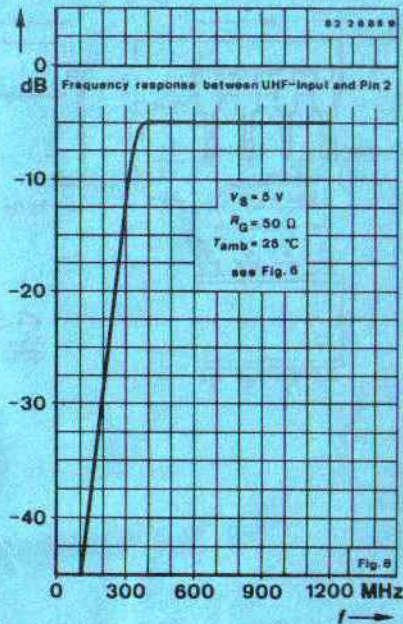
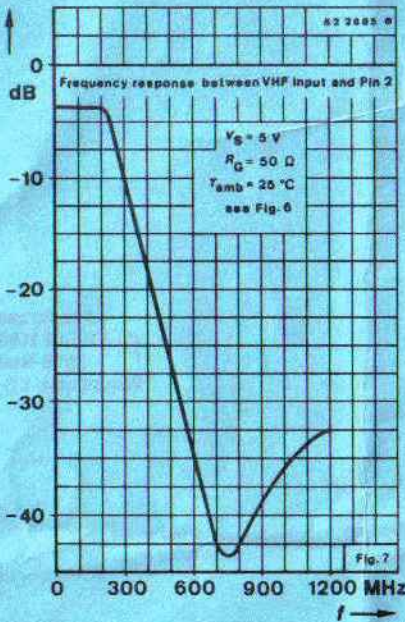
Application note:

In front of the divider IC a VHF/UHF frequency selecting filter is used. Compared to separated coupling at Pin 2 and 3, this arrangement avoids coupling caused by case, and gives a better decoupling between UHF and VHF at high frequencies.



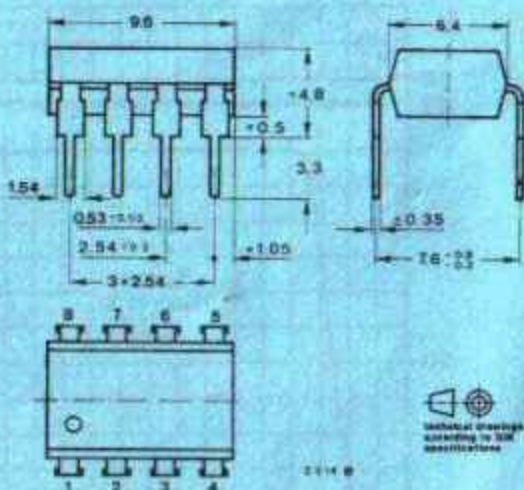
- $L_1 = L_3$ 20 nH -3 Wdg \varnothing 0.45 CuL on \varnothing 2.5
- L_2 40 nH -5 Wdg \varnothing 0.45 CuL on \varnothing 2.5
- $L_4 = L_5$ 150 nH -6 Wdg \varnothing 0.45 CuL on \varnothing 4

Fig. 6 Input divider for frequency synthesizer in FS-tuners



U 664 B · U 664 BS

Dimensions in mm



Plastic case
20 A B DIN 41866
DIP 8-leads
Weight max. 0.8 g

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