



U 664 B · U 664 BS

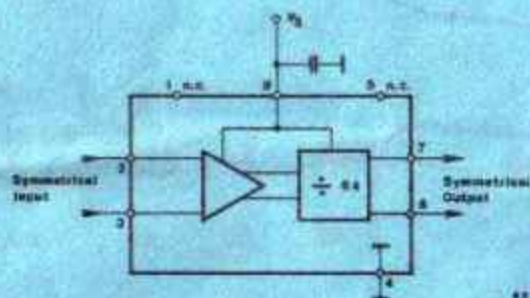
Monolithic Integrated Circuit

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.

U 664 B · U 664 BS

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					
$T_{amb} = 85^\circ\text{C}$		P_{tot}	400		mW
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		R_{thJA}			100	K/W

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

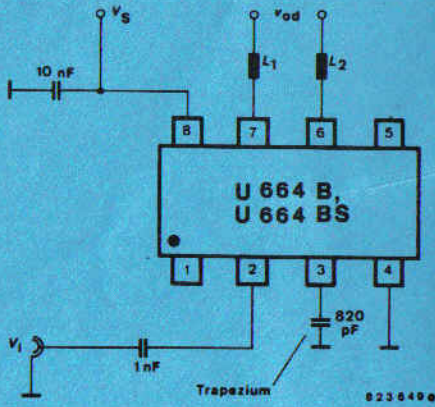
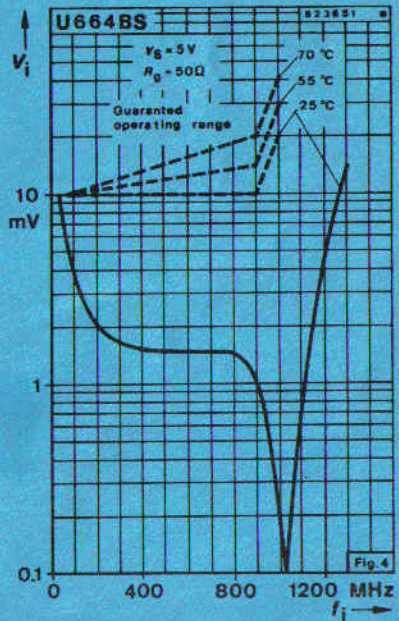
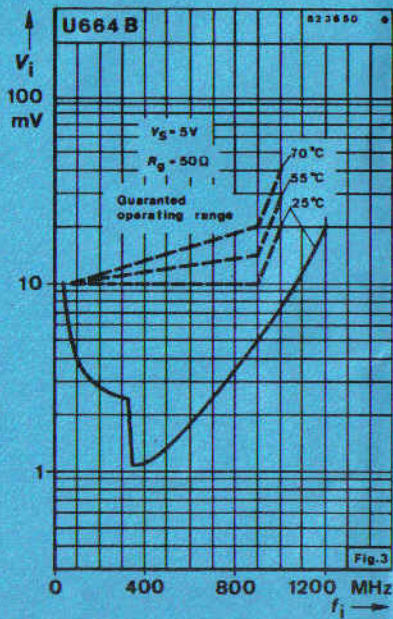


Fig 2 Test circuit

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



U 664 B · U 664 BS

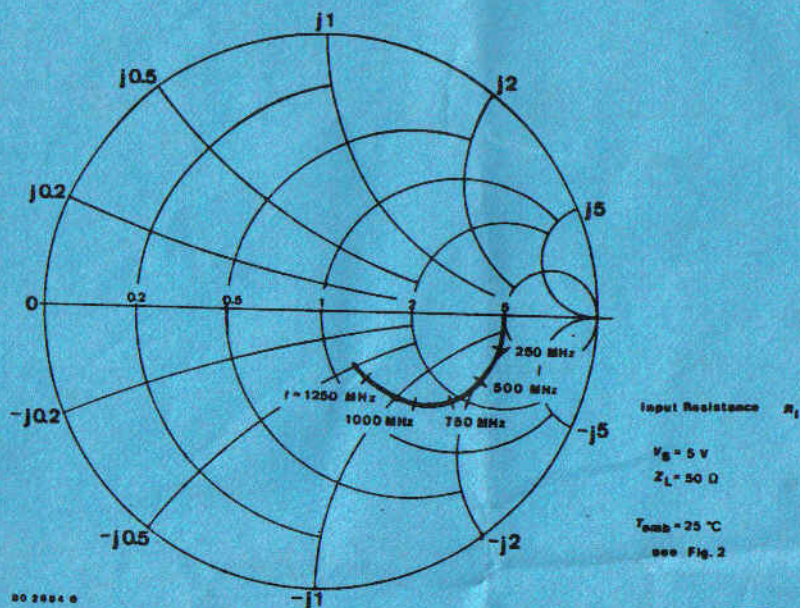
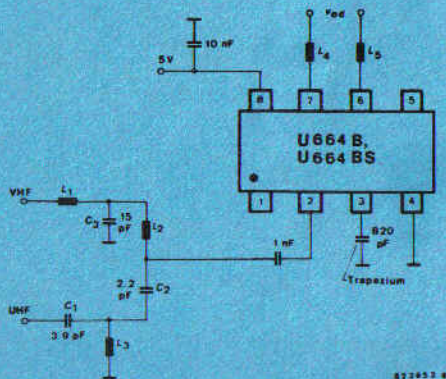


Fig. 6

Application note:

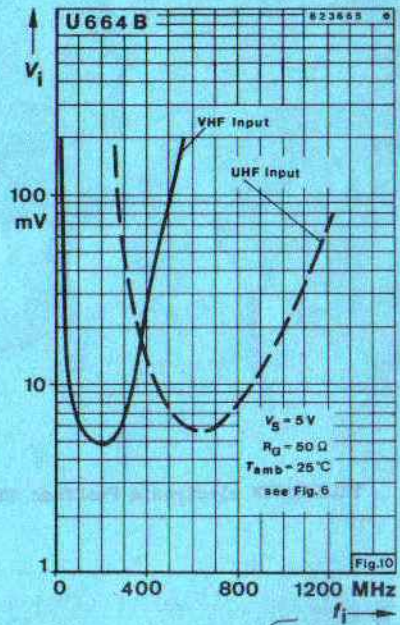
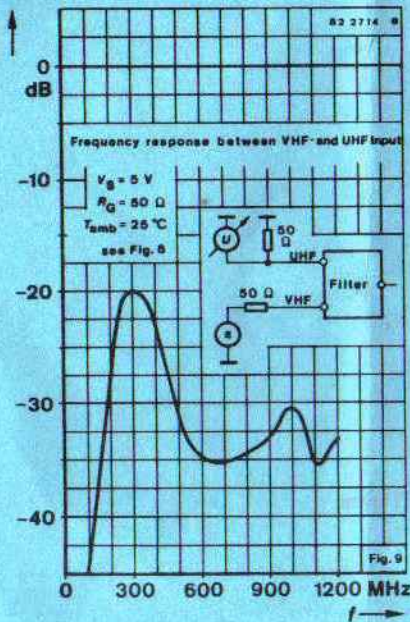
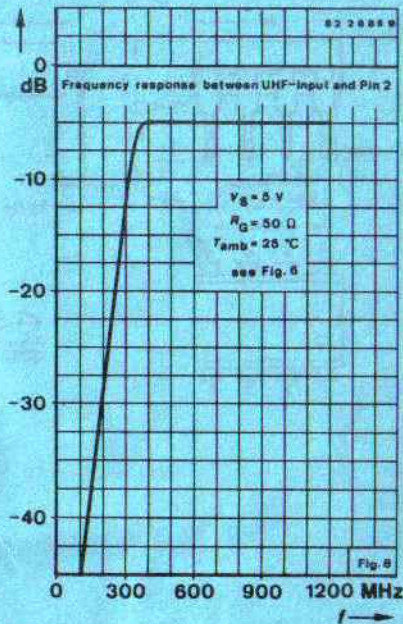
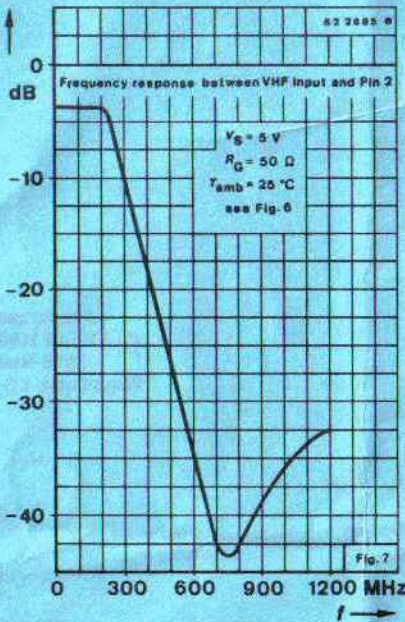
In front of the divider IC a VHF/UHF frequency selecting filter is used. Compared to separated coupling at Pin 2 and 3, this arrangement avoids coupling caused by case, and gives a better decoupling between UHF and VHF at high frequencies.



- $L_1 = L_3$ 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

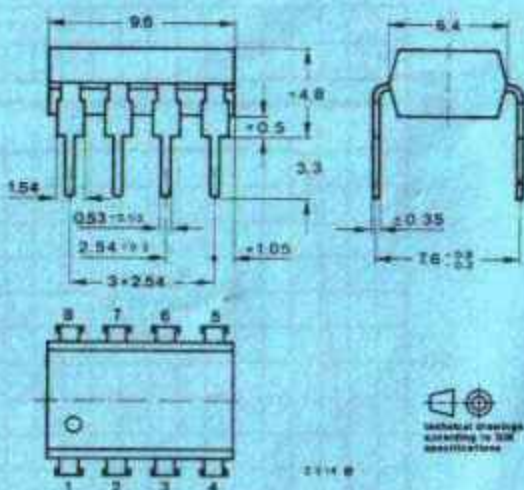
Fig. 6 Input divider for frequency synthesizer in FS-tuners

U 664 B · U 664 BS



U 664 B · U 664 BS

Dimensions in mm



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

TELEFUNKEN electronic Postfach 1105 7100 Heilbronn