Frequency Synthesizer for TV Tuner

Description

The U6359B is a single chip PLL frequency synthesizer with 3-wire bus control. This IC contains an integrated preamplifier, a high frequency prescaler, a reference frequency divider, a crystal oscillator, a phase/frequency detector together with a charge pump, a tuning voltage amplifier and 4 output ports.

Features

- Integrated prescaler ÷ 8 with preamplifier
- Input frequency maximum 1024 MHz
- Tuning frequency steps 62.5 kHz
- 14-bit programmable counter
- Reference oscillator with 4 MHz crystal and ÷ 512 counter
- Phase detector (reference frequency 7.8125 kHz)
- 4 programmable port driver
- Lock output
- Microcomputer controlled via 3-wire bus
- SO20 package

Block Diagram

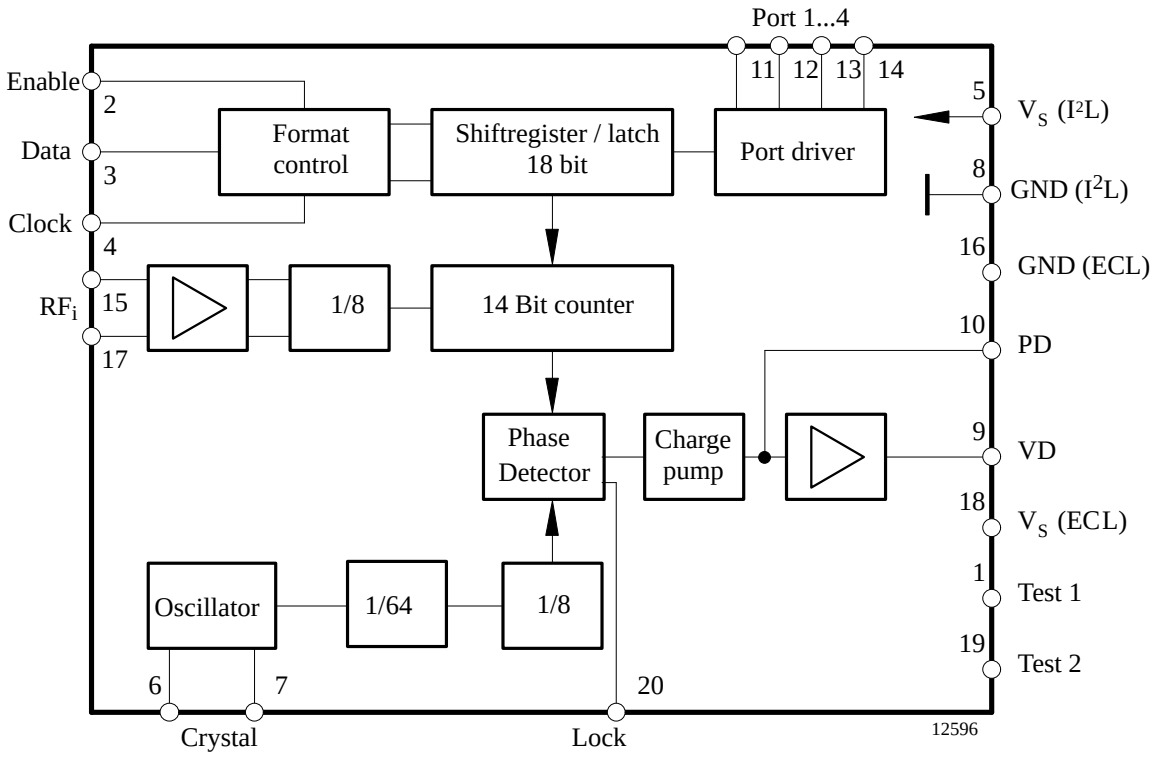


Figure 1. Block diagram

Ordering Information

Extended Type Number	Package	Remarks
U6359B-BFLG3	SO20 plastic package	Taped and reeled

Absolute Maximum Ratings

Reference point Pin 8, 16

Parameters		Symbol	Value	Unit
Supply voltage	Pins 5 and 18	V_S	6	V
Input voltage range	Pins 15 and 17	V_{RFi}	0 to V_S	V
Junction temperature		T_j	125	°C
Ambient temperature range		T_{amb}	–10 to + 65	°C
Storage temperature range		T_{stg}	–40 to +125	°C

Pin Configuration

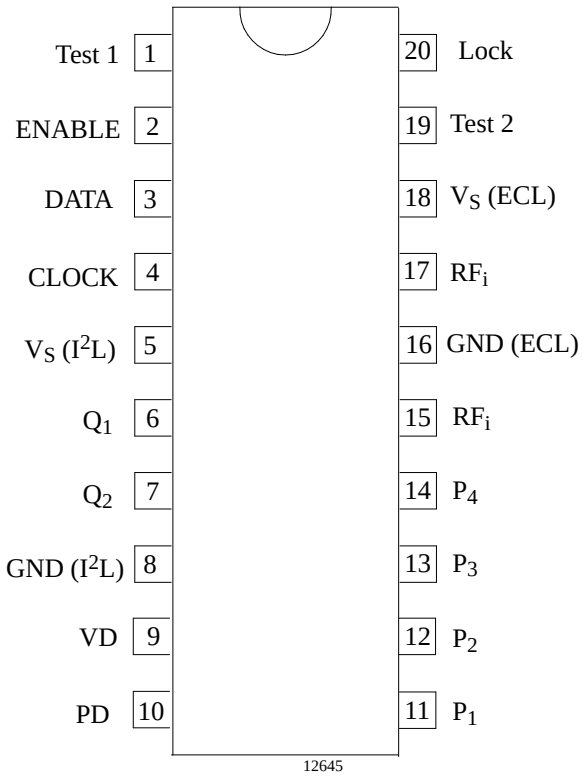


Figure 2. Pinning

Pin	Symbol	Function
1	Test 1	Test 1 input
2	ENABLE	Enable input
3	DATA	Data input
4	CLOCK	Clock input
5	V_S (I^2L)	Supply voltage (I^2L)
6	Q_1	Crystal
7	Q_2	Crystal
8	GND (I^2L)	Ground (I^2L)
9	VD	Active filter output
10	PD	Charge pump output
11	P_1	Port output (open collector)
12	P_2	Port output (open collector)
13	P_3	Port output (open collector)
14	P_4	Port output (open collector)
15	RF_i	RF input
16	GND (ECL)	Ground (ECL)
17	RF_i	RF input
18	V_S (ECL)	Supply voltage (ECL)
19	Test 2	Test 2 input
20	Lock	Lock output

Electrical Characteristics

V_S = 5 V, T_{amb} = 25°C, reference point pin 8, 16, unless otherwise specified

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
Supply voltage ECL	Pin 18	V_{S1}	4.5	5	5.5	V
I^2L	Pin 5	V_{S2}	4.5	5	5.5	V
Supply current ECL	Pin 18	I_{S1}	26	36	46	mA
I^2L	Pin 5	I_{S2}	7	11	16	mA
Input sensitivity	Pin 15	V_i		10		mV
Large signal compatibility	Pin 15	V_i	300			mV
Program scaling factor		T	1024		16383	
Maximum voltage band switch outputs	Pins 11, 12, 13 and 14	V_{max}	12			V
Input level Data, Clock, Enable, Test 1, Test 2		V_{IH}	3.0			V
		V_{IL}			0.8	V
Output level (Test mode) Data, Clock		V_{OH}	3.8			V
		V_{OL}			0.5	V

Calculation of the Oscillator Frequency

f_{OSC} = $f_{ref} \times 8 \times T$
f_{OSC} : Locked oscillator frequency
f_{ref} : Reference frequency 4 MHz/ 512 = 7.8125 kHz
T : Programmable scaling factor

Bus Data Format

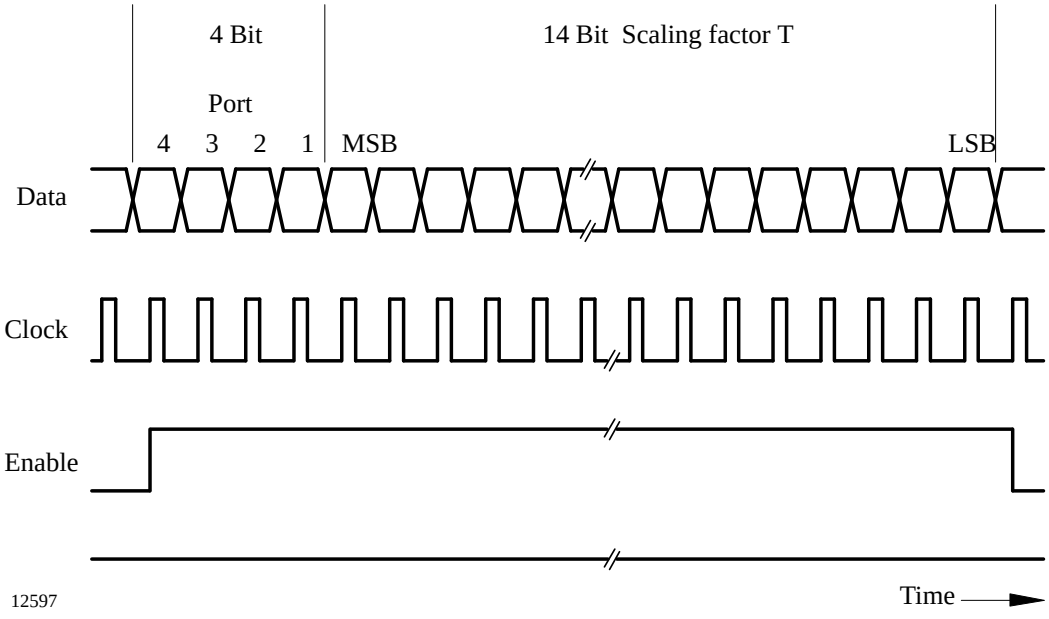


Figure 3.

Bus Timing

Parameters	Symbol	Min.	Typ.	Max.
Set up time	t_s	2		µs
Enable, hold time	t_{SL}	2		µs
Clock 'H'-pulse width	t_C	2		µs
Enable set up time	t_L	10		µs
Data hold time	t_H	2		µs

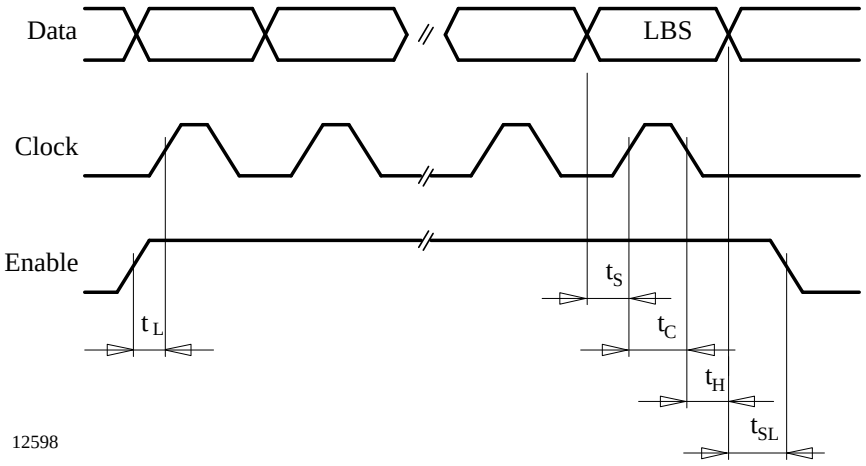


Figure 4.

Application Circuit

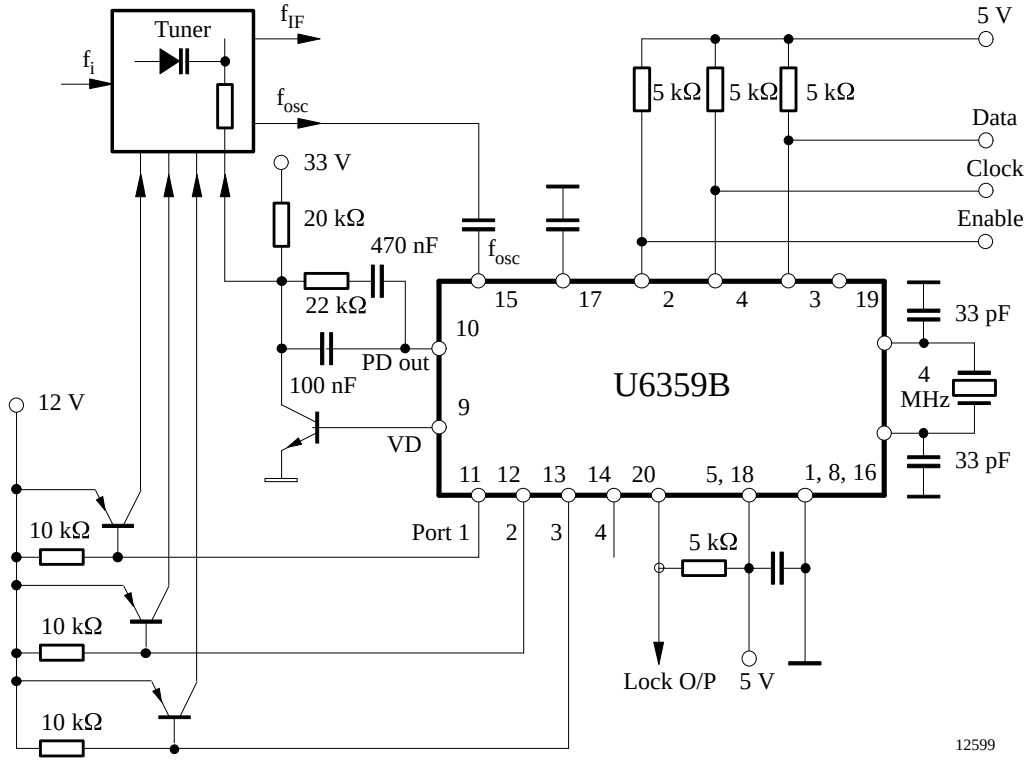
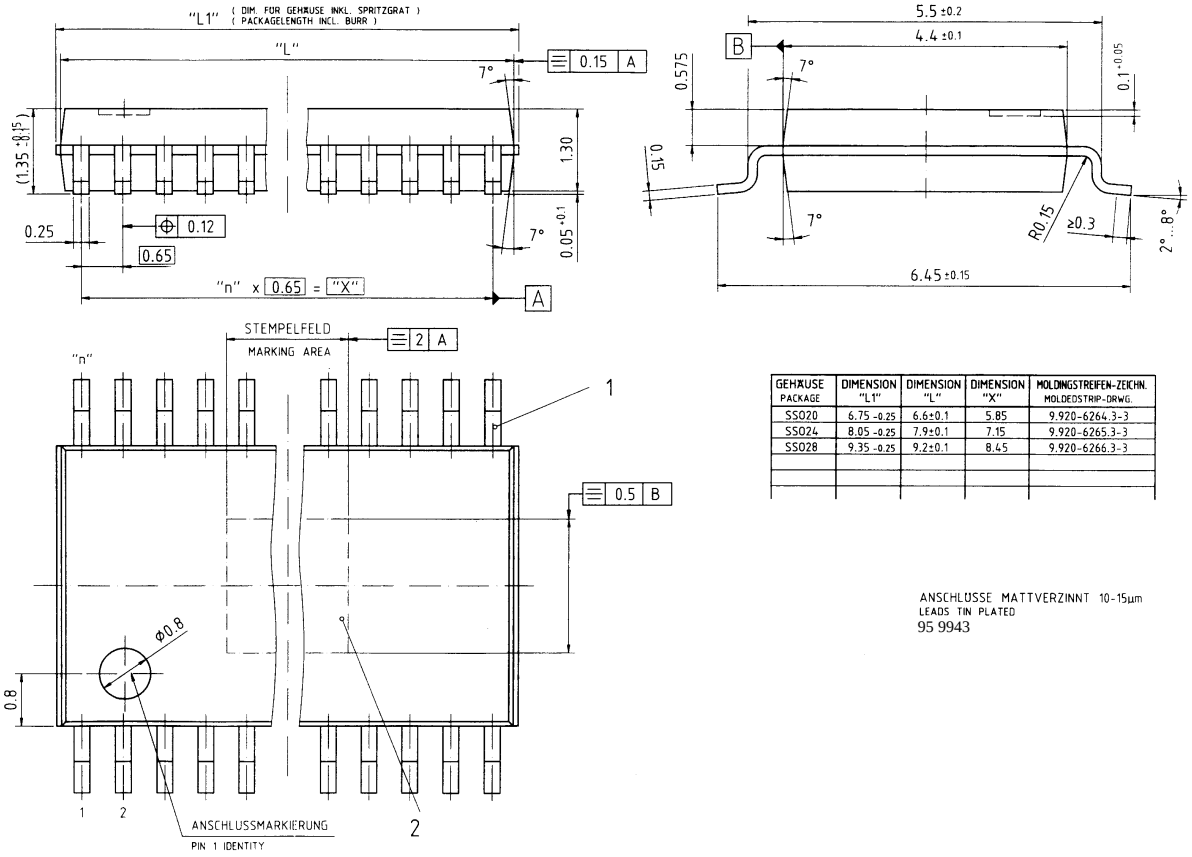


Figure 5. Application circuit

Package Dimensions

Small outline plastic package, 20 pin SO20
Dimensions in mm



GEHÄUSE PACKAGE	DIMENSION "L1"	DIMENSION "L"	DIMENSION "X"	MOLDINGSTREIFEN-ZEICHN. MOLDEDSTRIP-DRWG.
SSO20	6.75 -0.25	6.6±0.1	5.85	9.920-6264.3-3
SSO24	8.05 -0.25	7.9±0.1	7.15	9.920-6265.3-3
SSO28	9.35 -0.25	9.2±0.1	8.45	9.920-6266.3-3

ANSCHLÜSSE MATTVERZINNT 10-15µm
LEADS TIN PLATED
95 9943

Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements.

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

TEMIC can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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