General Description

The PMB 2308, PMB 2309 are Phase Locked Loop (PLL) synthesizers with programmable frequency dividers for use in mobile communication equipment. It is fabricated using Siemens B6HF silicon bipolar process.

The circuit consists of high speed dual modulus divider, shift register, programmable counter (A-, N- and R-counter), phase detector with charge pump and a control logic block.

Since the high speed dual modulus divider is able to handle frequencies of up to 1.25 (2.5) GHz, there is no need to add a dedicated external prescaler. The switching signals for the dividing ratio 16/17 (32/33) is generated by the A-counter.

The A-counter and the N-down-counter are programmable via the 3-wire bus. They are clocked by the dual modulus divider output signal. The carry output of the N-counter is connected to the frequency input of the phase detector and is controlling the loading of the programmed A-/N-counter start values.

The 11 bit R-counter is also programmable and is serving as reference frequency divider. Its carry output is connected to the reference frequency input of the phase detector and is controlling the loading of the programmed counter start value.

The phase detector is of PFD-type (phase and frequency sensitive). It has a linear output characteristic in the 0˚ phase error region.

The control logic handles phase detector output polarity, charge pump output current and software-generated power-down (all circuit parts except the shift registers and data latches).
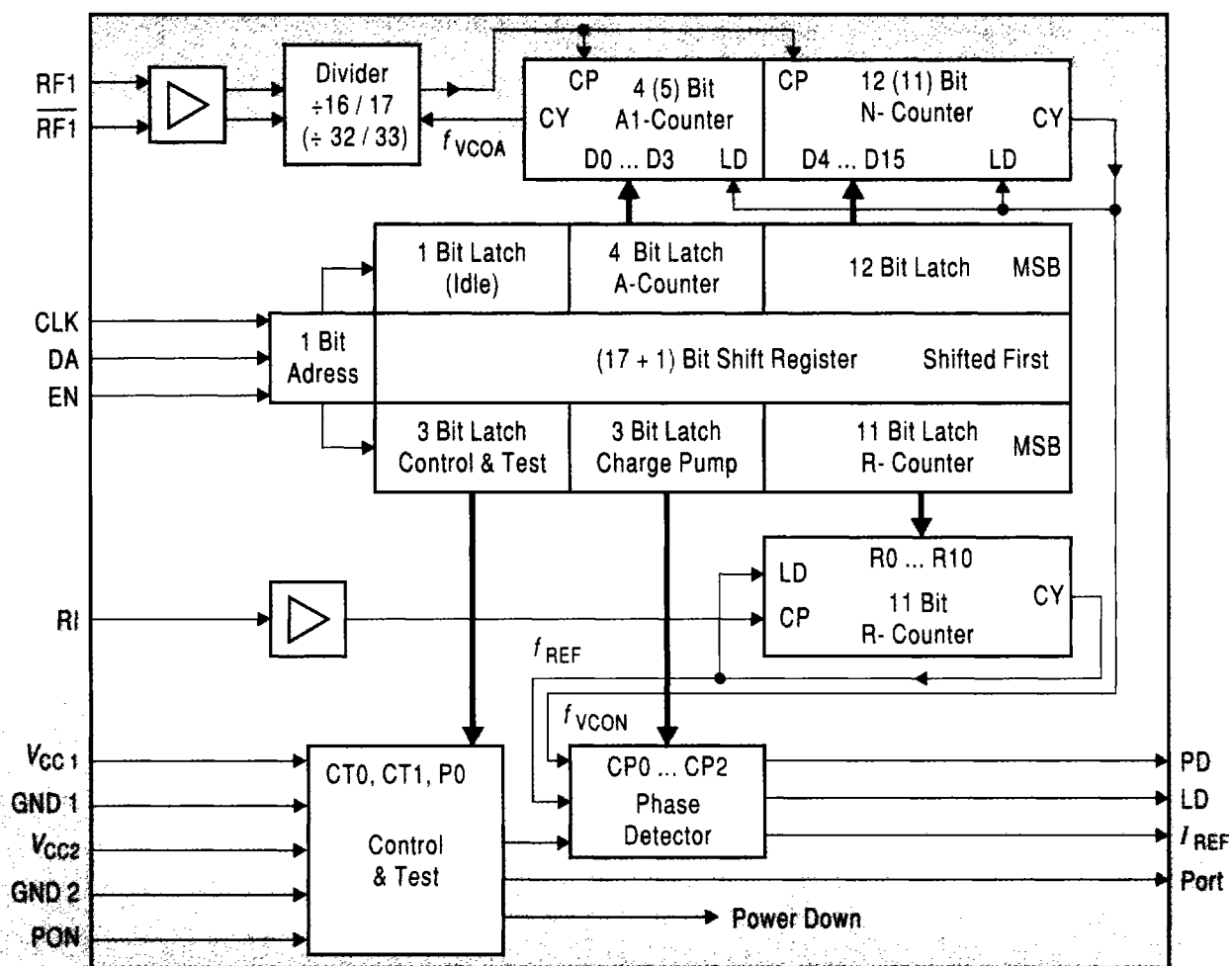
Applications

All mobile communication analog and digital systems as RF- and IF synthesizers

Type	Package
PMB 2308-R	P-TSSOP-16-1 (Shrink, SMD)
PMB 2309-R	P-TSSOP-16-1 (Shrink, SMD)

Features

- Integrated prescaler
- Low operating current
- Different power-down modes
- High input sensitivity, high input frequency
- Fast phase detector without dead zone
- Linearization of the phase detector output by current sources
- Large dividing ratios for small channel spacing

PLL	PMB 2308	PMB 2309
max. freq.	1.25 GHz	2.5 GHz
prescaler:	:16/:17	:32/:33
A-counter	0 to 15	0 to 31
N-counter	16 to 4095	32 to 2047
R-counter	3 to 2047	3 to 2047

- Serial control (3-wire bus: data, clock, enable) for fast programming (f_{max} = 10 MHz)
- Switchable polarity and phase detector current programmable
- 1 port output (TTL push-pull)
- External current setting for phase detector output
- Lock detect output with gated pulse (quasi-digital lock detect)
- Operating voltage 2.7 V to 5.5 V
- P-TSSOP-16 package
- Temperature range – 30 ˚C to 85 ˚C

RF1

$\overline{\text{RF1}}$

Divider
÷16 / 17
(÷ 32 / 33)

f_{VCOA}

CP   4 (5) Bit
CY   A1-Counter
D0 ... D3   LD

CP   12 (11) Bit
N- Counter   CY
D4 ... D15   LD

1 Bit Latch
(Idle)

4 Bit Latch
A-Counter

12 Bit Latch   MSB

CLK

DA

EN

1 Bit
Adress

(17 + 1) Bit Shift Register   Shifted First

3 Bit Latch
Control & Test

3 Bit Latch
Charge Pump

11 Bit Latch   MSB
R- Counter

R0 ... R10

LD

CP

11 Bit
R- Counter

CY

RI

f_{REF}

f_{VCON}

V_{CC1}

GND 1

V_{CC2}

GND 2

PON

CT0, CT1, P0

Control
& Test

CP0 ... CP2
Phase
Detector

PD

LD

I_{REF}

Port

Power Down

ITB08471