

General Description

The PMB 2240, 2245, 2247 family are single-chip transmitters which include a prescaler for the RF-oscillator signal and a fixed PLL for the IF-oscillator signal. The transmitter family is designed for use in combination with the single-chip receiver family PMB 2405, 2407 and the PLL PMB 2307 for mobile telephones according to the GSM, PCN and PCS standards and other vector modulated digital systems. It is fabricated using Siemens B6HF silicon process:

| GSM Chipset | PCN Chipset | PCS Chipset | |
|-------------|-------------|-------------|-----|
| PMB 2240 | PMB 2245 | PMB 2247 | TX |
| PMB 2405 | PMB 2407 | PMB 2407 | RX |
| PMB 2307 | PMB 2307 | PMB 2307 | PLL |

The PMB 2240/45/47 transmitters include the active structures for the main oscillator circuit. Alternatively the oscillator signal can be supplied from an external source. The oscillator signal is buffered for off-chip use.

There is a prescaler by 64/65 for the RF-oscillator signal on chip, which can be used to implement the PMB 2307 PLL circuit.

The on-chip FIX-PLL consists of the system clock divider, the IF-oscillator signal divider, the phase detector and the charge pump. The IF-oscillator signal divider is driven by the oscillator on the PMB 2405/07 or by an external discrete VCO. The IF-oscillator signal divider ratio of PMB 2240 and PMB 2245 is fixed. It can be selected either divided by 1 or by 3 using PMB 2247 and PMB 2407 to drive the FIX-PLL with two IF frequencies (450 MHz or 150 MHz) to avoid spurious problems for PCS application.

The two oscillator signals (IF and RF) are combined in the transmit mixer, and the image sideband and other mixing products are to be suppressed by an external interstage filter. The filtered signal reenters the chip at the modulator inputs. The modulator generates two orthogonal carriers which are mixed with the I- and Q modulation signals by two multipliers. The phase between the two carriers can be fine-adjusted to 90° (orthogonality) by two external resistors for maximum SSB suppression. The outputs of the multipliers are added and amplified by a linear output stage.

| Type | Package |
|------------|-------------------|
| PMB 2240-F | P-TQFP-48-1 (SMD) |
| PMB 2245-F | P-TQFP-48-1 (SMD) |
| PMB 2247-F | P-TQFP-48-1 (SMD) |

Application

- Vector modulated cellular and cordless systems:
- PMB 2240: GSM, PDC, DAMPS
- PMB 2245: PCN, PCS, PHS
- PMB 2247: PCN, PCS, etc.
- Various modulation schemes, such as PM, PSK, FSK, QAM, QPSK, GMSK etc.
- Analog systems with FM- and AM modulation
- Space and power saving optimizations of existing discrete transmitter circuits

Features

- Transmitter with I/Q modulator
- Direct I/Q modulation
- Generation of orthogonal carriers with possibility of phase adjust with external resistors
- 30-dB carrier rejection, 40-dB SSB rejection
- 48-dB rejection of third order products with 500-mVpp I/Q-drive level
- High output power with appropriate power matching network at 500-mVpp I/Q-drive level
 PMB 2240: – 3 dBm, PMB 2245: – 6 dBm
 PMB 2247: – 8 dBm
- Integrated active part of RF oscillator
- Possibility to use external RF-oscillator signal
- The RF-oscillator signal is buffered for off-chip use, especially for receiver PMB 2405/07
- Prescaler for the RF-oscillator signal
- Possibility to use the IF oscillator integrated on the PMB 2405/07
- Possibility to use external IF-oscillator signal
- Fixed IF frequency PLL (FIX-PLL) for IF-VCO (PMB 2240, 2245), switchable IF PLL working at 450-MHz or 150-MHz IF frequency (PMB 2247)
- Supply voltage range 2.7 to 5.5 V
- P-TQFP-48 package
- Temperature range – 30 °C to 85 °C

GSM Transmitter
 PCN Transmitter
 PCS Transmitter

PMB 2240 B6HF
 PMB 2245 B6HF
 PMB 2247 B6HF

