

### General Description

The PMB 2405, 2407 family are single-chip double-conversion heterodyne receivers with LO-phase shifting circuitry for the I/Q-phase demodulation on chip. It also includes a switchable low noise amplifier, the second local oscillator with a VCO output buffer, a programmable gain controlled IF amplifier, two differential operational amplifiers for base band signal filtering and a power-down circuitry.

The receiver family is designed for use in combination with the single chip transmitter family PMB 2240, 2245, 2247 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 2405	PMB 2407	PMB 2407	RX
PMB 2240	PMB 2245	PMB 2247	TX
PMB 2307	PMB 2307	PMB 2307	PLL

The input signal is amplified by the internal LNA and filtered by an external filter. The filtered signal and the first local oscillator signal LO1 are mixed down to an intermediate frequency (IF). The amplification of the IF signal is performed by a digitally programmable gain-controlled amplifier.

The second local oscillator signal LO2 is generated either by an on-chip oscillator or by an external VCO. The internal LO2 signal is fed to a divider (PMB 2405-by 1; 2407-by 1 or 3) and then to a buffered output and also to a divider, which generates orthogonal signals at half the VCO frequency. The filtered IF signal re-enters the chip at the IF input, where it is amplified and converted to the final output frequency with each of the orthogonal signals. The resulting in-phase and in-quadrature signals pass through differential output drivers.

Two differential operational amplifiers can be used as active baseband filters. At both outputs the differential offset is sensed via the sample and hold circuitry. A feedback loop corrects the remaining offset error below the tolerable input value of the GAIM PMB 2905 or any other baseband A/D converter.

Type	Package
PMB 2405-F	P-TQFP-48-1 (SMD)
PMB 2407-F	P-TQFP-48-1 (SMD)

### Applications

- Vector modulated cellular and cordless systems:  
PMB 2405: GSM, PDC, DAMPS,  
PMB 2407: PCN, PCS (DCS1900), WLAN etc.
- Various demodulation schemes, such as PM, PSK, FSK, QAM, QPSK, GMSK
- Space and power saving optimizations of existing discrete demodulator circuits

### Features

- Heterodyne receiver with demodulator
- On-chip, low noise amplifier (LNA),
- Demodulation and generation of I/Q components
- Low mixer noise 9 dB (SSB)
- High input intercept point + 2 dB
- Integrated phase shifter
- IF amplifier with 80 dB programmable gain control (PGC) in steps of 2 dB
- On-chip second LO oscillator with external tuning circuit or possibility to use it as amplifier
- Two differential operational amplifiers for use as base band filter or amplifier
- Low power consumption due to highly flexible power-down capability
- Wide input frequency range up to 2.5 GHz
- Wide IF range from 40 MHz to 300 MHz
- Supply voltage range 2.7 to 4.5 V
- P-TQFP-48 package
- Temperature range – 30 °C to 85 °C



