

PRODUCT SUMMARY

CX74059: Rx ASIC for CDMA, PCS, and AMPS Applications

APPLICATIONS

- Tri-mode CDMA handsets

FEATURES

- Battery cell operation ($2.7\text{ V} < VCC < 3.3\text{ V}$)
- Two-step gain control PCS LNA
- Three-step gain control cellular LNA
- External pot resistor to adjust LNA bias current
- Independent cellular and PCS mixers
- Single LO input signal for cellular and PCS mixer
- Frequency divide-by-2 to switch mixer LO from PCS to cell frequency range
- Buffered LO signal for Tx upconverter
- Single external UHF VCO is only required
- 90 dB dynamic range variable gain amplifier
- I/Q demodulator
- 200 to 600 MHz VHF oscillator
- VCO on/off control for standby current optimization
- 6 mm x 6 mm RFLGA™ package with downset paddle

DESCRIPTION

The CX74059 Application-Specific Integrated Circuit (ASIC) is a single Intermediate Frequency (IF), multi-mode, dual-band receiver designed for use in Code Division Multiple Access (CDMA) portable phones implementing both cellular and Personal Communications System (PCS), as well as Advanced Mobile Phone System (AMPS) modes.

This highly integrated, super-heterodyne receiver comprises all the critical components to implement the receiver chain: starting from the Low-Noise Amplifier (LNA) to the In-Phase and Quadrature (I/Q) demodulator stage, excluding the external Surface Acoustic Wave (SAW) filters, bypass, and external matching components. Two LNAs are in the front-end of the receiver. The cellular LNA has three gain stages (bypass, mid, and high), and the PCS LNA has two gain stages (bypass and high).

After RF signal amplification and SAW filtering from the antenna, the signal is mixed down from RF to the IF by the mixer – one independent mixer for each individual band. The CDMA cellular and PCS mixer outputs are shared in a differential output to accommodate a single IF frequency plan, while the AMPS mixer differential output is matched to a differential input SAW filter, and SAW filter output is matched single-ended into a Variable Gain Amplifier (VGA). After external IF filtering, the signal is amplified by a VGA and fed to an I/Q demodulator, which outputs baseband I/Q signals. The VGA has a minimum dynamic range of 90 dB with a control voltage range from 0.3 to 2.5 V, and it is common to all modes. A VHF oscillator with external tank circuitry provides the Local Oscillator (LO) frequency for the I/Q demodulator.

With different frequency bands input to the mixer, the mixer LO is tuned to have the same IF frequency output. Since IF frequency is the same for all bands, it usually refers to a single IF frequency plan at 183.6 MHz. One LO port for the AMPS, CDMA, and PCS mixer is designed on the device. A divide-by-2 is used to switch the mixer LO frequency from PCS to the cellular band. In addition, the LO oscillator signal is coupled out and further amplified, providing an RF signal for the transmitter upconverter LO port (LO_OUT).

The noise figure, gain, and third order Input Intercept Point (IIP3) of each stage in the receiver are optimized to meet the system requirements for AMPS and CDMA modes per TIA/EIA-98-C. The CX74059 uses BiCMOS technology and is designed for low cost, high performance, and a high level of integration.

A block diagram of the CX74059 is shown in Figure 1.

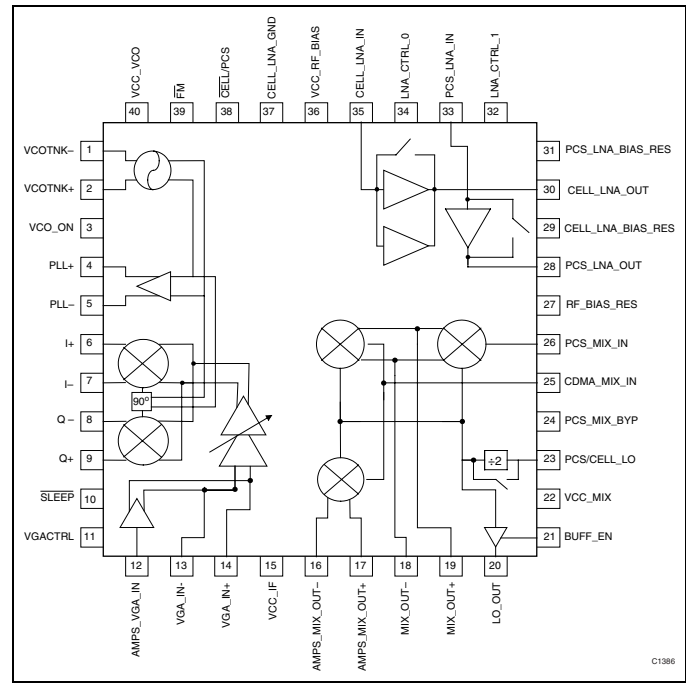


Figure 2. CX74059 RX ASIC Block Diagram

Ordering Information

Model Name	Manufacturing Part Number	Product Revision
Receiver ASIC	CX74059-12	

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