

Keywords: cellular CDMA, cellular AMPS, IF image rejection, IP, IP performance, IIP3, FM mixer, RF, RF VCO, low-noise amplifier, LNA, TDMA, GSM, EDGE, WCDMA

REFERENCE DESIGN 448 INCLUDES: ✓Tested Circuit ✓Schematic ✓BOM ✓Board Available

REP017: Dual-Band Triple-Mode IC Uses 183MHz for both CDMA and AMPS IFs

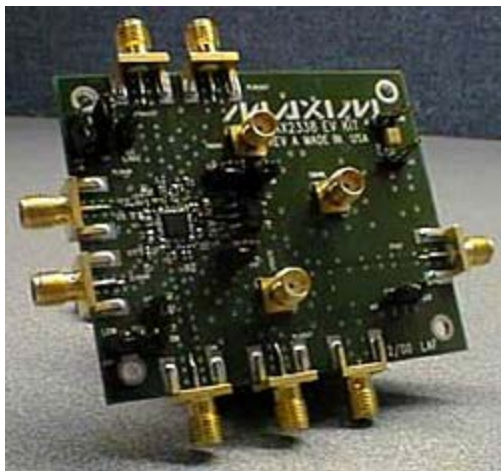
Nov 01, 2000

Abstract: Reference design (RD) is a dual-band, triple-mode CDMA front-end to a receiver whose frequency plan requires digital and AMPS analog IFs to be at 183.6MHz. RD uses the MAX2338, a low-noise amplifier (LNA) with mixer, that is useful for TDMA, GSM, EDGE, and WCDMA applications.

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Rapid Engineering Prototypes are real circuits that Maxim application engineers have built and measured in our labs. They can provide a starting point for new RF designs. They are not available as evaluation kits.



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Objective: To apply the dual-band triple-mode CDMA front-end IC to a receiver whose frequency plan requires both digital and AMPS analog IFs to be at 183.6MHz.

The [MAX2338](#) was made to readily facilitate a single digital IF for the dual band. Both digital mixers' IP2 performance and other related parameters offer a sufficient margin for meeting 1/2 IF and other interferers in a CDMA handset. In addition, the analog FM mixer can be operated readily at 183.6IF, so (by using the internal LO divider) only one RF VCO is required for the transceiver design. In this application, the MAX2338 was tested for and successfully applied to a CDMA plus AMPS handset front-end design that used a 183.6MHz IF filter for CDMA and a narrower-bandwidth 183.6MHz IF filter for AMPS. The data sheet performance objectives were met completely.

The MAX2338 low-noise amplifier (LNA) plus mixer is designed for dual-band CDMA cellular-phone handsets, but it can also be used in dual-band TDMA, GSM, EDGE, or WCDMA applications. The MAX2338 furnishes a divide-by-2 function in the PCS-band LO input path, providing for a single VCO at the PCS band. The buffered LO outputs permit driving the transmit-path upconverter directly without use of an external LO buffer. The MAX2338 differs from its predecessors (the [MAX2320](#) and the [MAX2323](#)) in its lower noise figure and its higher IIP3 for both LNAs and mixers. Also, it comes in a small package (28-QFN).

[Block diagram of a receiver-path application](#)

[Schematic of the MAX2338 evaluation kit \(PDF, 60kB\)](#)

[Bill of materials, part 1](#)

[Bill of materials, part 2](#)

Related Parts

[MAX2338](#)

Triple/Dual-Mode CDMA LNA/Mixers

More Information

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Application Note 448: <http://www.maximintegrated.com/an448>

REFERENCE DESIGN 448, AN448, AN 448, APP448, Appnote448, Appnote 448

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