Low-Power Ultraminiature Multi-Band GSM Transceiver IC

CXA3200ER
CXA3200AR

The GSM digital portable phone system was first placed in service in 1992 in Europe, but its use has now grown to the point where it is the world standard for digital portable phones.
With this flourishing demand as background, new GSM frequency bands are about to be placed in service in many countries worldwide.
To respond to this market demand, Sony has promoted IC design for the GSM system at its design center in England. One of the results of this effort is the development of the CXA3200ER/AR described here.

- **Transmission: Sum loop**
- **Reception: Single conversion + demodulator**
- **Support for a wide range of baseband chips**
- **Ultraminiature package**
- **Low power consumption**
  Reception: 48 mA
  Transmission: 68 mA
- **All functions can be controlled over a 3-wire bus**

Leading Edge Architecture

The CXA3200ER/AR adopts an advanced architecture. It can efficiently implement not only single band and dual band receivers, but even triple band receivers for the 900, 1800, and 1900 MHz bands in the GSM standard. The transmitter system takes full advantage of sum loop technology to produce a high-purity transmitter output signal, and thus allows the high-cost large insertion loss duplexer normally required to be replaced with a low-cost low-loss antenna switch. The receiver system allows an optimal IF frequency to be selected, and thus can support all the GSM reception bands with a single IF SAW filter. It also includes on-chip both a bias control circuit provided for an external low-noise LNA, and an IF local signal oscillator circuit that is shared by the transmission and reception systems. Transmission, reception, and power saving modes (mode control) can be controlled with great precision over the 3-wire bus. The reception mode gain can also be controlled over that bus.

Ultraminiature Package and Support for a Wide Range of Baseband Chips

Sony provides two version of this product, the CXA3200ER and the CXA3200AR, for interface with a wide range of baseband chips. To achieve even further miniaturization in GSM phones, the CXA3200ER is provided in a newly-developed VQFN leadless package. (See figures 2 and 3.)

Sony Total RF Solutions

By adopting a leading-edge bipolar process, Sony was able to achieve low power, especially in reception mode, where current consumption is 48 mA (when V_{CC} is 2.8 V). This allows the GSM phone operating time to be increased. Also, in conjunction with Sony's MMIC products, this device allows the creation of high-sensitivity low loss transceivers. Furthermore, GPRS* and other high-speed data communication systems can be implemented by using this product in conjunction with a commercial general-purpose high-performance PLL IC.

* GPRS: General Packet Radio Service

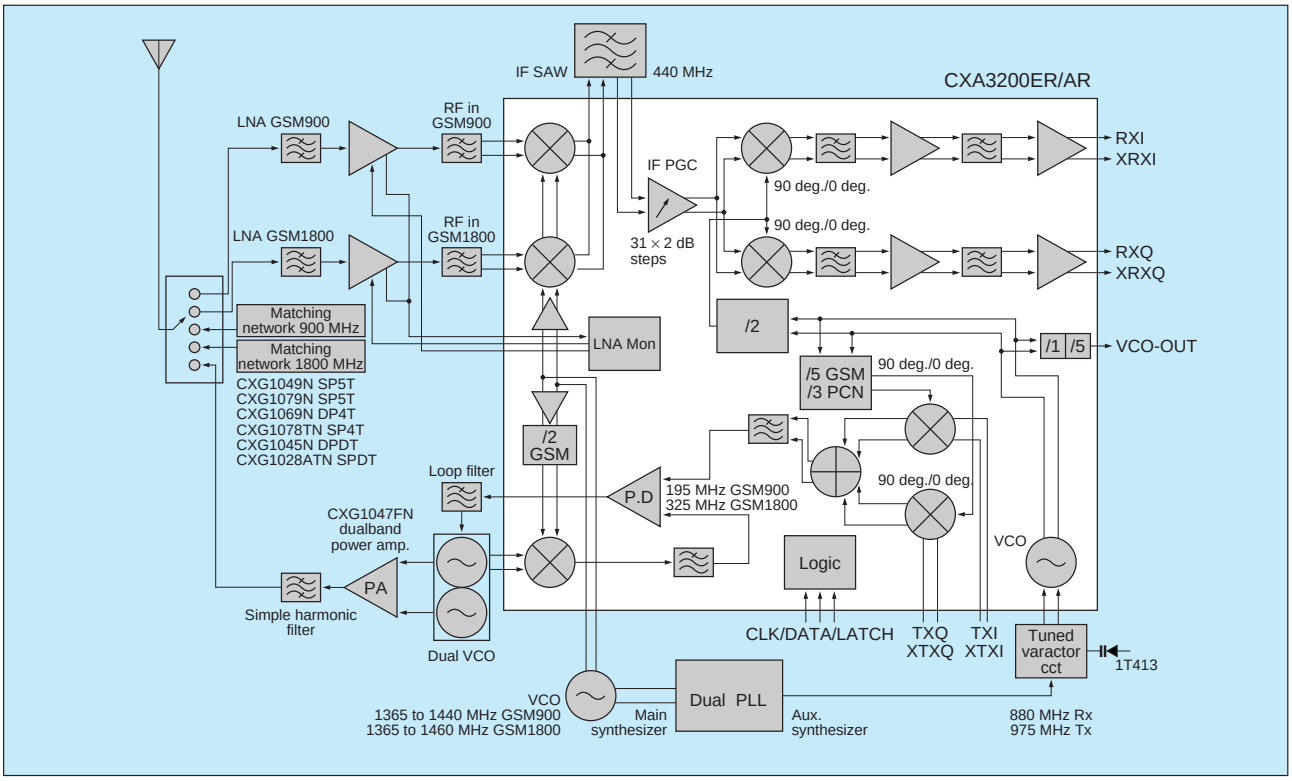
Sony Semiconductor Europe

Sony is now actively improving its communication semiconductor design and customer support system, not only in Japan, but also through Sony Semiconductor Europe in the UK under a powerful support system based in Japan. The CXA3200ER/AR was created under this global system, and is optimal for implementing GSM portable phone transceivers.

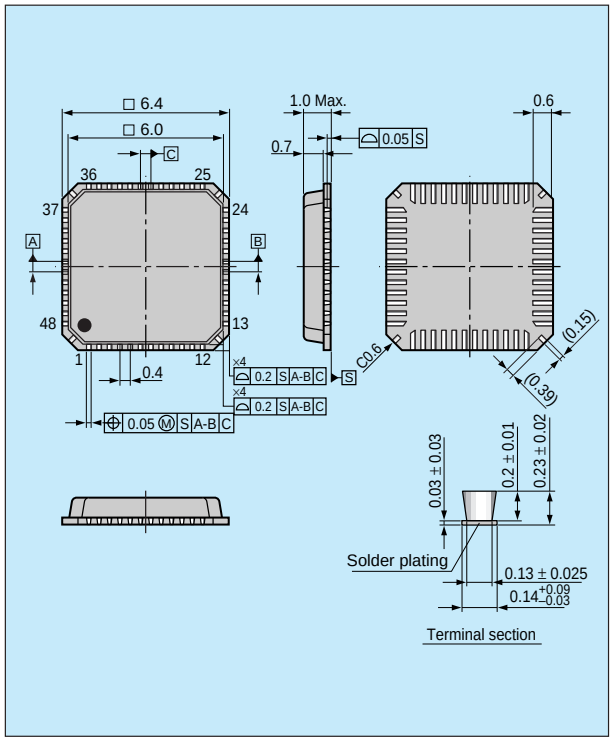
V O I C E

When I started working on developing this IC, I made a point of keeping in mind Sony's image of producing the world's smallest and lightest products. To achieve this in the world of GSM portable phones, we made it our goal to integrate the functions for two transceivers, one for the 900 MHz band and one for the 1800 MHz band, on a single chip. I believe that this makes it possible to provide GSM subscribers with GSM portable phones that are smaller and lighter than conventional cell phones, and that can be used in any country, whichever standard it adopts.

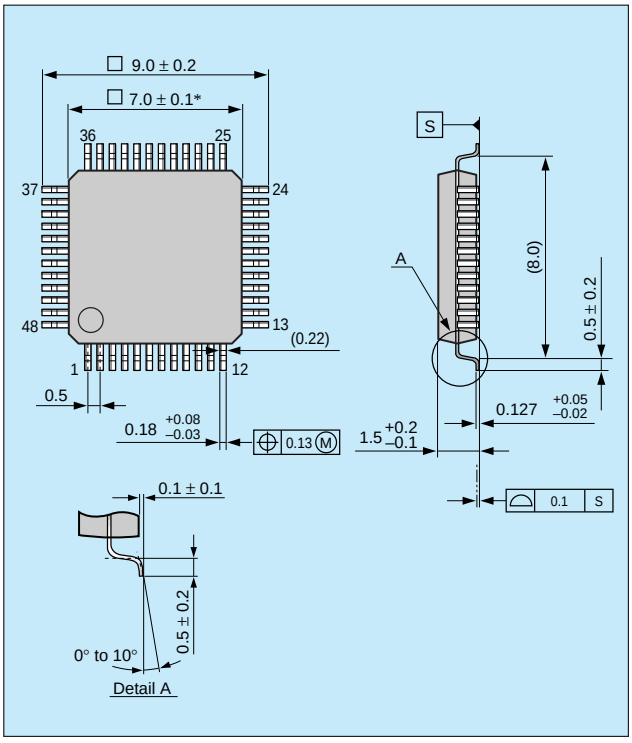
New Products



■ **Figure 1 CXA3200ER/AR Block Diagram**



■ **Figure 2 CXA3200ER 48-Pin VQFN (plastic)**



■ **Figure 3 CXA3200AR 48-Pin LQFP (plastic)**