Texas Instruments and STMicroelectronics cdma2000® 1X solution

Product Bulletin

The cdma2000 1X solution from STMicroelectronics and Texas Instruments provides complete hardware and software that reduce cost, speed time to market and promote product customization.

Key Features

- Product provides a complete system solution for cdma2000® 1X wireless handsets

- Flexible, scalable solution addresses midrange and voice-centric markets

- Direct conversion RF architecture reduces component count and cost

- Mature protocol stack facilitates rapid time-to-production; application software using TCS Application Suite promotes customization

- Solution includes still camera, color display, polyphonic ringtones and other popular features

- Complementary technologies include ST's Nomadik™ and TI's OMAP™ application processor, assisted GPS, WLAN, Bluetooth®, camera modules and Flash memories

- In-depth support includes reference design, EVM, development and testing tools

The new product offering from Texas Instruments and STMicroelectronics integrates four devices in a complete hardware and software solution for handsets supporting the dual-band cdma2000 1X standard for wireless communication. This high level of integration simplifies design, saves components and board space, reduces development and manufacturing costs, and speeds the time-to-market in a fast-paced industry. In addition, the scalable solution provides the flexibility that original equipment manufacturers (OEMs) need to differentiate their products in the growing cdma2000 market worldwide.

With the release of the cdma2000 1X offering, two leaders in the wireless industry, ST and TI, have combined their respective areas of expertise to provide a flexible solution based on an open architecture for wireless system designers. Seamless interfaces simplify system design, and leading manufacturing processes reduce power consumption during both active and standby operation.

Complete, flexible solution

The solution includes the following four highly integrated digital and analog devices from TI and ST:

– The TBB5110 digital baseband is the communications and applications engine for the system, performing voice encoding and decoding, with support for data rates up to 153.6 kilobits per second (kbps) (upgradable to 307.2 kbps).

– The STw4200 analog baseband/energy management device integrates all the functions required for power management, battery and charger control and monitoring, as well as voice and radio sigma-delta conversion.

– The TRF4320 RF transmitter directly modulates and up-converts the signal from baseband to dual-band RF.

– The TRF5320 RF receiver directly demodulates and down-converts the signal from dual-band RF to baseband.

Also included is the cdma2000 protocol stack, saving development time and allowing OEMs to concentrate on adding value in program development. Application software using the TCS Application Suite gives developers a head start on customizing their products to win customers in the marketplace.

cdma2000 1X system solution
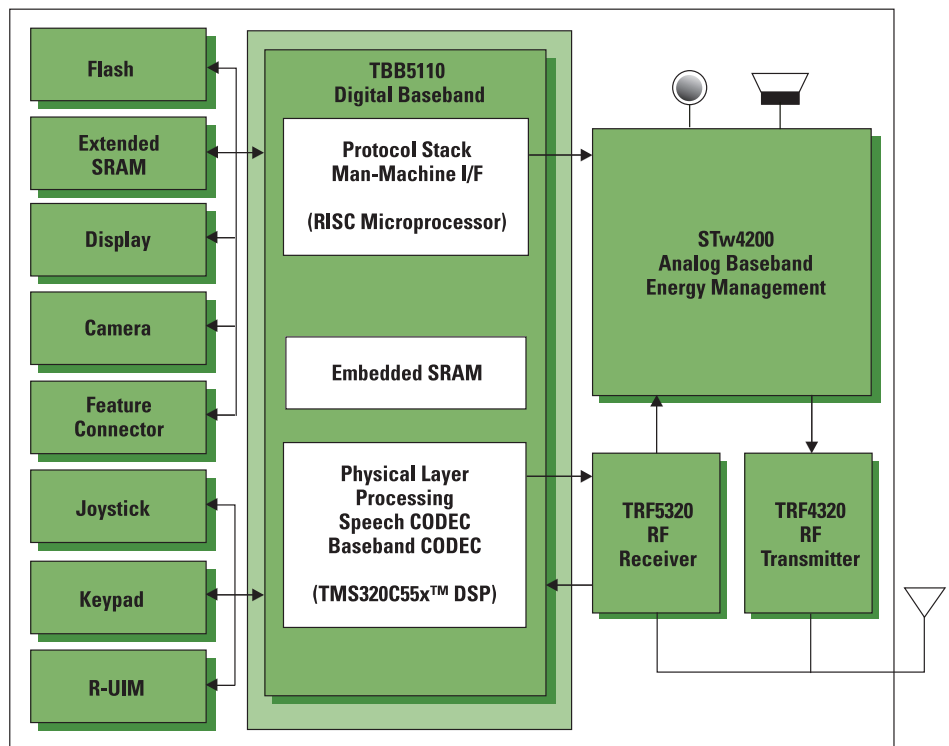
Ease of customization

The inherent flexibility of the cdma2000 1X solution enables OEMs to leverage a single platform to develop both voice-centric and feature-rich midrange handsets. The open software architecture and the TCS Application Suite enable developers to add features easily. Popular add-ons supported include digital still cameras (DSCs), color displays and polyphonic ringtones.

The highly integrated solution is complemented by ST's Nomadik application processor and TI's OMAP processor for high-performance multimedia applications, with support for advanced mobile operating systems such as Symbian OS™, Microsoft® Windows® CE and Linux®. Additional TI and ST technologies supported include concurrent assisted global positioning service (A-GPS), wireless LAN, Bluetooth, camera modules and Flash memories.

These available technologies can be readily implemented in a modular fashion along with the cdma2000 1X solution, enabling OEMs to customize their products for success in the marketplace.

Development support

In-depth support for the cdma2000 1X solution helps OEMs develop and differentiate their products quickly. Support for the cdma2000 1X solution includes a reference design that consists of a complete bill of materials, as well as board design and layout, a proven CDMA protocol stack along with development and testing tools, and a broad set of data and messaging services supported via TI's integrated TCS Application Suite.

Leadership for the future

The solution reflects the depth of technology and manufacturing strength of two leading wireless suppliers. The open, scalable cdma2000 1X solution enables ease of migration toward multiple handset segments. Both ST and TI are committed to using their wireless design expertise and process leadership to achieve higher levels of integration, decreased power consumption and cost reductions in future releases. In addition, the companies plan continued cooperation in creating a robust portfolio of solutions for the growing cdma2000 market.

TBB5110 digital baseband

The TBB5110 digital baseband is a narrow-band cdma2000 1X engine that includes a DSP core performing baseband signal processing, an MCU core executing system software, and custom logic to perform CDMA and FM functions. The DBB is the central interface of the solution, connecting to the analog baseband and RF devices, as well as memory and user interface features. Programmable interfaces can be used to support complimentary technologies such as application processors, IR, Bluetooth and GPS.

Features

- Software supports IS-2000, release 0, with data rates up to 153.6 kbps (upgradable to 307.2 kbps)
- Software-upgradable to IS-2000, rev. A, with support for 307.2 kbps
- 16-bit TMS320C55x™ DSP with 4KB cache
- 16-/32-bit ARM7TDMI® MCU with 4KB cache
- MCU and DSP Program RAM
- General-purpose USART and I/Os, Flash programming, PLLs
- ABB control, keyboard, LDC, test interfaces
- Programmable RF or PLL interface
- 144-lead BGA

TBB5110 Digital Baseband
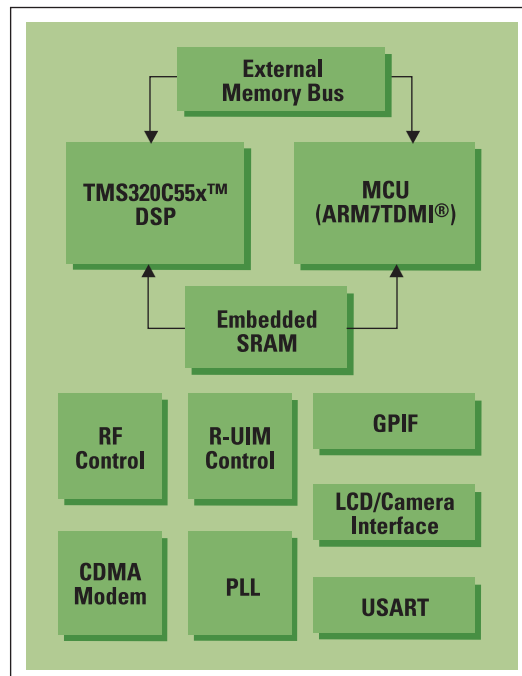
STw4200 analog baseband

The STw4200 analog baseband/energy management device integrates the cdma2000 1X voice and radio sigma-delta converters plus all the functions required for power management, battery and charger control and monitoring. The analog baseband also includes required housekeeping functions and all required interfaces and drivers.

Features

• RF Sigma Delta Converters
• Voice codec converters with programmable attenuation and gain stages.
• Microphone amplifier, earpiece and headset drivers
• Startup oscillator, 32-kHz crystal, RTC logic, R-UIM and serial control interfaces
• Buzzer, vibrator, keyboard, display backlight, LED drivers
• Bandgap and voltage references
• Charger detection, control and monitoring. Charger switch with thermal shutdown; Battery monitoring
• Baseband LDO regulators for analog, logic, Flash, LEDs, DBB core and R-UIM
• RF LDO regulators and charge pump
• 244-lead TFBGA

**STw4200 Analog Baseband/Energy Management**
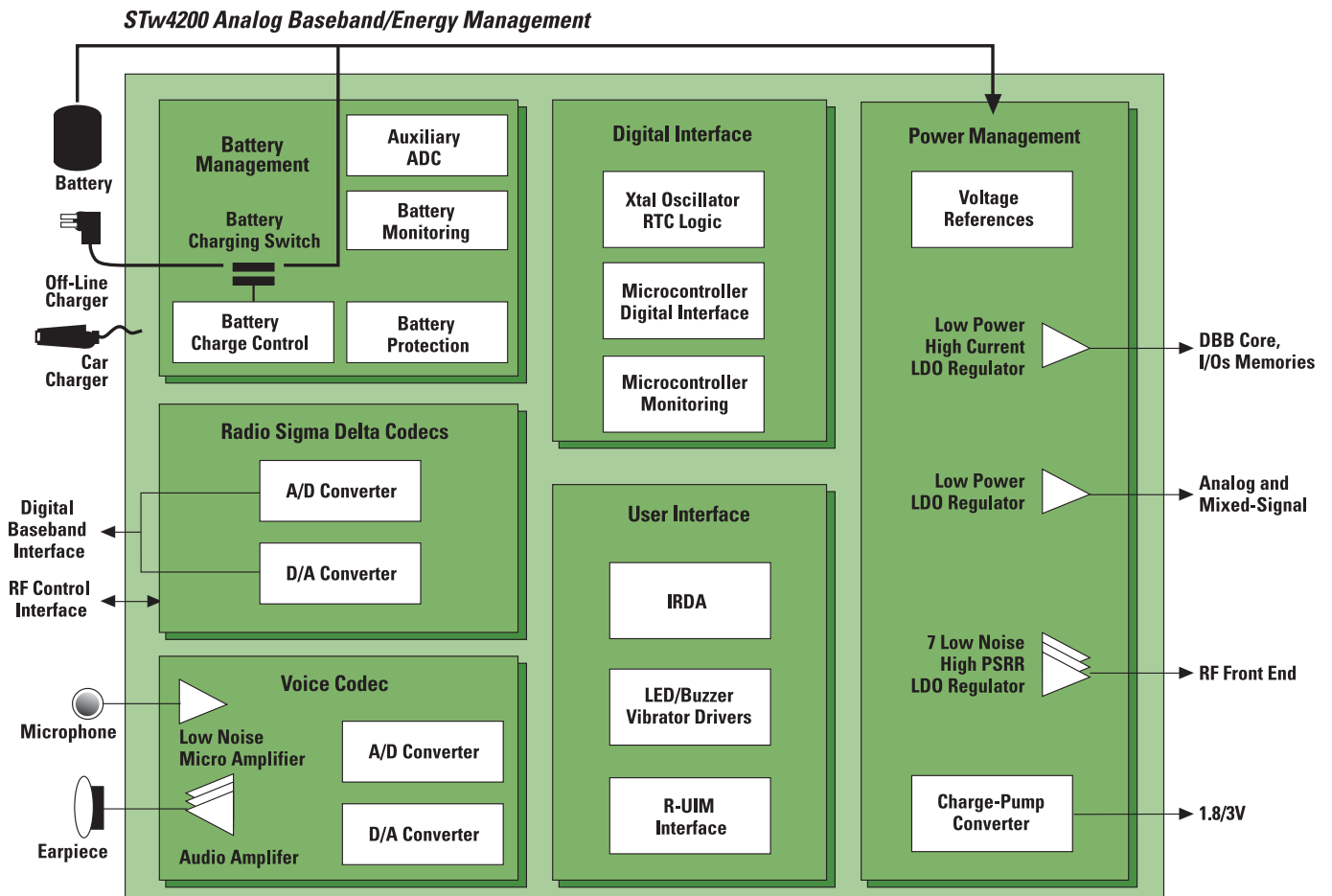
TRF4320 RF Transmitter

The TRF4320 RF Transmitter performs the quadrature modulation and up-conversion to dual-band (800 and 1900 MHz) RF. Direct conversion saves power, circuitry and space.

Features

- Supports voice and voice + data modulation schemes
- Direct transmit modulation from I/Q baseband to cellular and PCS RF bands; variable gain and differential driver amps
- UHF synthesizer with VCO for both bands
- Instrumentation summing amp and reference voltage for RF power detector
- Programmable SIO bus interface
- 40-lead VQFN

TRF4320 RF Transmitter
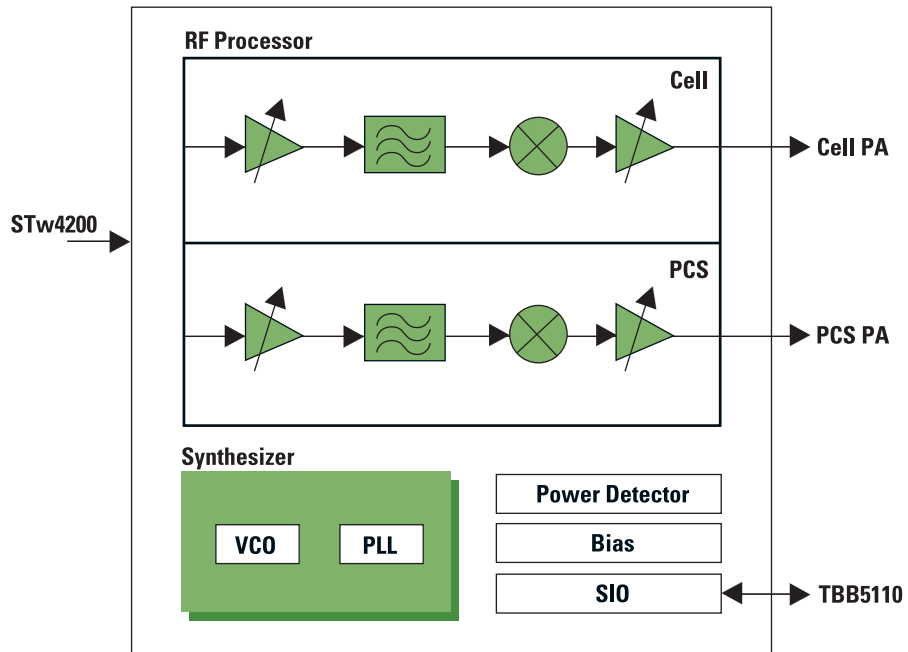
TRF5320 RF Receiver

The TRF5320 RF Receiver performs the quadrature demodulation and down-conversion from dual-band (800 and 1900 MHz) RF to baseband. Direct conversion saves power, circuitry and space.

Features

- Supports voice and voice + data demodulation schemes
- Direct receive demodulation from cellular and PCS RF bands to baseband; imbalance and intermodulation product calibration
- Low-noise, high dynamic range baseband buffer amps
- Baseband low-pass filters, variable gain amps
- Programmable SIO bus interface
- Standby, varied power-down and operation modes
- 84-lead TFBGA

TRF5320 RF Receiver
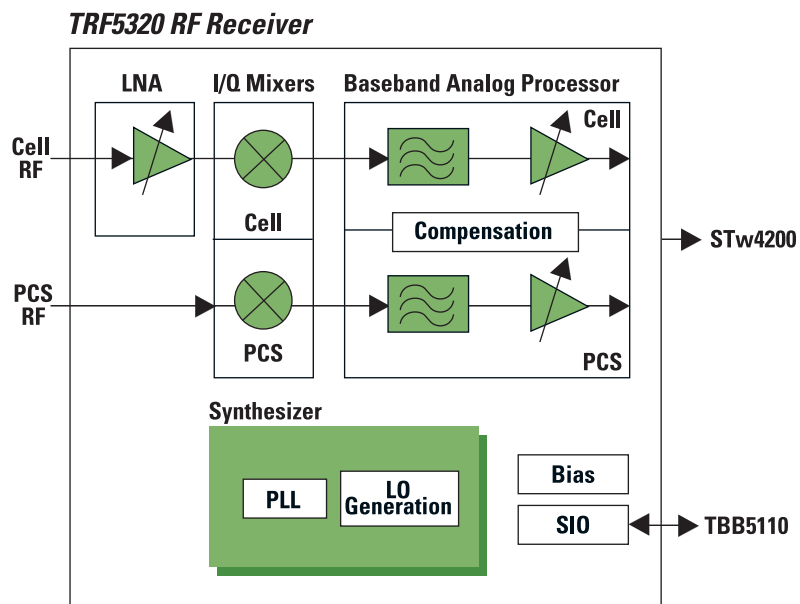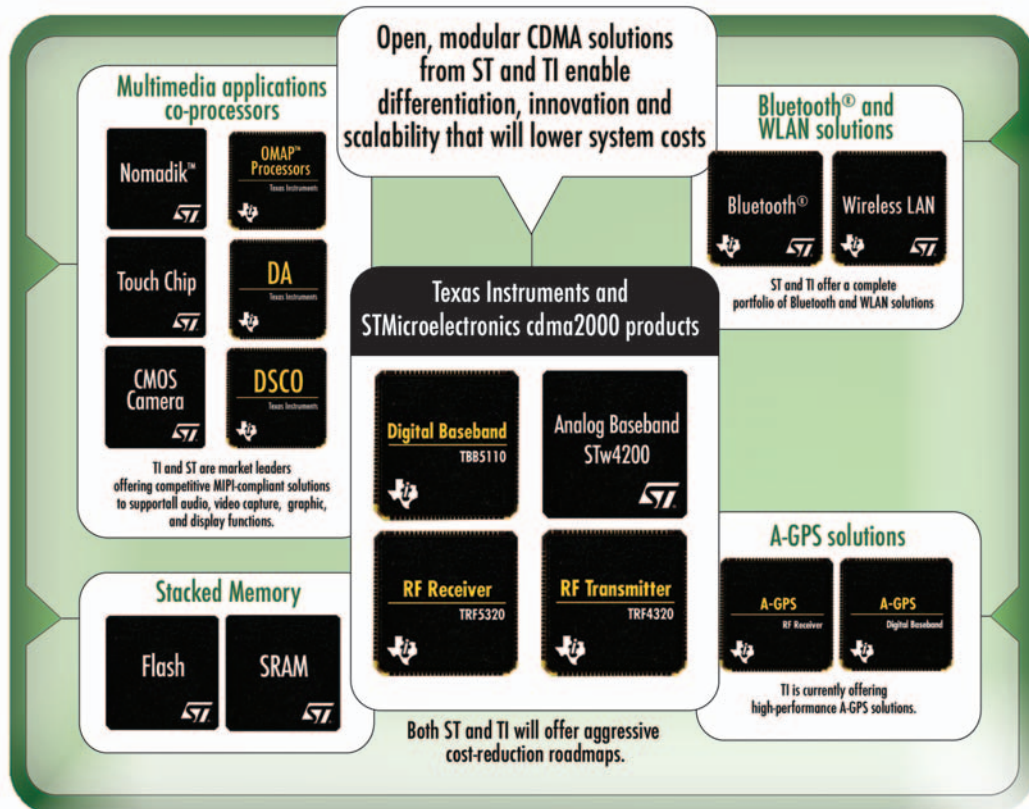
For more information

To learn how ST and TI's flexible cdma2000 1x solution can help you differentiate your next wireless design, visit:

www.ti.com/cdmasolutions
www.st.com/cdma

TEXAS INSTRUMENTS

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