



Intel® PXA800F Cellular Processor for GSM/GPRS Mobile Solutions

Product Description

Developed by Intel and manufactured on Intel's industry-leading 0.13 μm flash + logic process technology, the Intel® PXA800F Cellular Processor is a fully integrated cellular and application processor that is at the heart of an advanced total system solution for today's GSM/GPRS mobile phones. This high-performance, power-efficient processor integrates Intel® XScale™ technology with Intel® On-Chip Flash memory and the Intel® Micro Signal Architecture delivering class-leading performance, with industry-leading application headroom for voice and computation-intensive data applications for mainstream mobile phones.

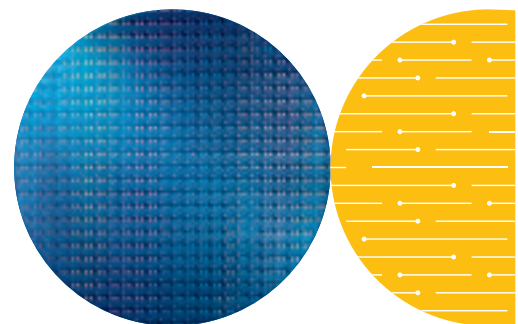
The Intel PXA800F cellular processor is the first product to fully integrate a GSM/GPRS baseband solution with a high-performance application processor and Flash memory on a single chip. This solution features an Intel XScale technology-based processor capable of running at up to 312MHz, in addition to the Intel Micro Signal Architecture, a dual-MAC signal processor core, that can run at 104MHz. Integration of Intel On-Chip Flash memory and SRAM into the processor yields both a significant increase in processing performance and a reduction in power consumption. This design enables the development of powerful, cost-effective wireless devices capable of running rich data applications. This single-chip product is part of a system solution that includes a development platform for a full-featured quad-band voice/data mobile handset that is scalable across multiple product tiers.

Solution Highlights

- Full GSM/GPRS Class 12 solution
- High-performance/Low-power Intel XScale core providing class-leading headroom for rich data applications



- Low-Power Intel Micro Signal Architecture provides a high-performance Dual-MAC signal processor
- Integrated Intel On-Chip Flash and integrated SRAM provides storage for GSM/GPRS Communications Stack, RTOS and applications code for a single-chip mobile solution
- Manufactured on Intel's advanced industry-leading Flash+Logic 0.13 micron process technology
- Supports a rich feature set including Color Displays, Voice Recognition, Voice Memo Pad, Bluetooth*, MP3 and MPEG-4 decode, WAP, SMS, EMS, MMS, Position Location, USB client, SD Card, MMC Card and Sony* Memory Stick* and digital cameras
- Flexible interface to support designs based on one of several available GSM/GPRS RF transceivers



Intel® Personal Internet Client Architecture

The increasing availability of mobile content and the emergence of worldwide wireless data standards are driving the development of a new generation of data-enabled wireless devices for businesses and individuals. To address this need, Intel has defined an architectural framework, the Intel® Personal Internet Client Architecture (Intel® PCA) that promotes the rapid development and deployment of next-generation wireless devices, applications and services. It streamlines the development process by enabling software and hardware developers to design to an open environment for true application scalability. The rapid deployment of wireless products with new and compelling applications will be the key to making cellular data networks successful. By offering integrated, scalable solutions with an open development environment, the Intel PXA800F cellular processor will play a leading role in transitioning the wireless market to an applications focus.

Intel® Development Kit

To speed the development of hardware and software Intel offers the Intel® Wireless Development Kit (DVK) for GSM/GPRS. This Intel® DVK implements a full-featured handset and provides a software/hardware development environment for rapid time-to-market. The kit includes:

- Development platform/reference hardware design
 - Intel PXA800F Cellular Processor for GSM/GPRS
 - Third-party mixed-signal analog baseband IC
 - Third-party direct conversion radio transceiver
 - Third-party power management IC designed to Intel's specification
 - Keypad, LCD (16-bit Color Display), multiple peripheral and debug interfaces
- Mobile handset reference software
- Microsoft* Windows*-based development, calibration and test tools
- Documentation and schematics

Reference Software

The reference software resides entirely in on-chip flash memory. It implements the physical layer and protocol layers 1, 2, and 3 required for full phase 2+ GSM/GPRS Class 12 functionality. Intel provides the physical layer and protocol layer 1; the protocol layers 2 and 3 are available from TTPCom*, a leader in GSM/GPRS software development. Alternatively, developers can opt to utilize their own layer 2/3 solution. Other software available includes a generic MMI, SIM application toolkit, SMS, EMS, MMS, HSCSD, USB client, network-based Position Location, and multiple vocoders (FR, EFR, HR and AMR). Support is also provided for voice recognition, voice record/playback, battery charging, Bluetooth, G3 Fax, WAP, MP3 decoder, MPEG-4 decoder, and dual SIM interface. The software development environment also includes an optimized C/C++ compiler for the Intel XScale core.

Intel® PXA800F Cellular Processor Features Intel® XScale™ Technology

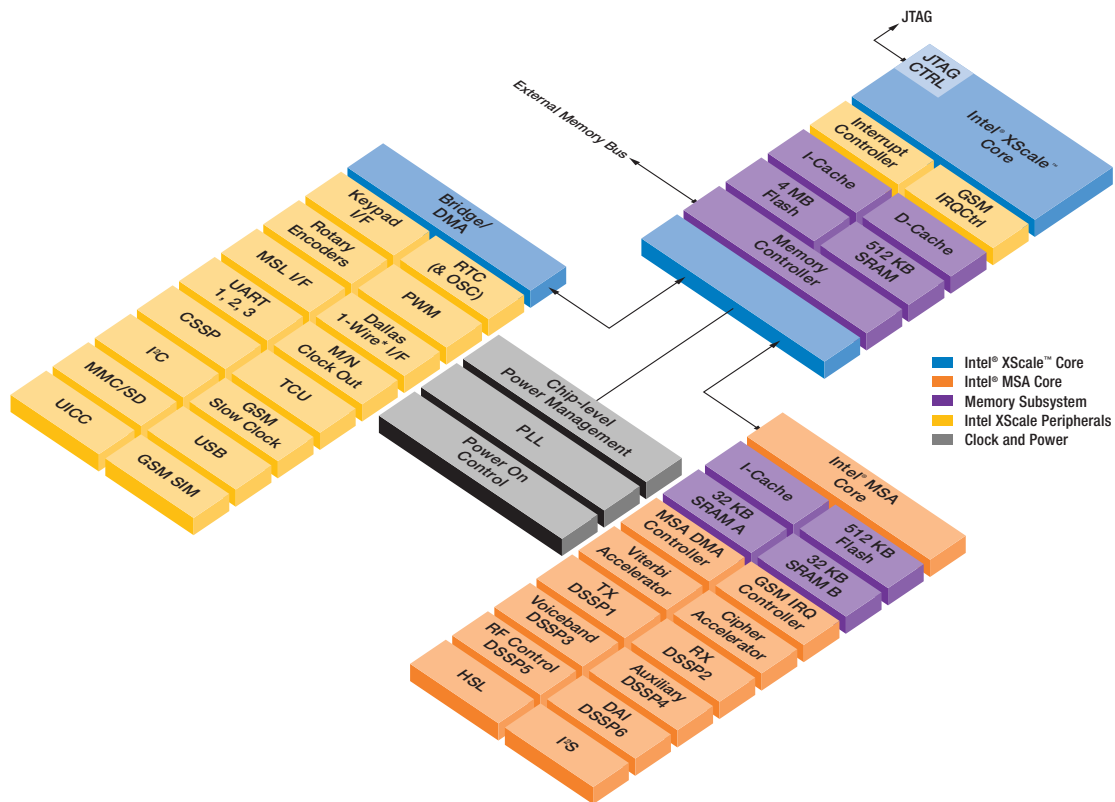
- High-performance, power-efficient processor supports data-intensive applications
- Processor core operates at an adjustable clock frequency up to 312 MHz
- Instruction cache and Data cache memories
- 4 MB integrated Intel On-Chip Flash memory
- 512 KB integrated SRAM
- Memory controller supports synchronous Flash mode, page mode Flash, SRAM, SDRAM, and variable latency
- DMA controller
- Clock units—GSM slow clocking, GSM frame timing, watchdog, RTC
- Supports a wide range of standard interfaces—SIM, UART, USB, I²C*, SPI, SSP, Digital Audio Interface, MultiMediaCard, Secure Digital Card, Sony Memory Stick, Dallas* 1-Wire* Interface, keypad, PWM D/A, JTAG
- Interfaces for Bluetooth, IrDA, GPS and digital camera peripherals
- LCD Controller for up to 120 x 240 display 16-bit color or gray scale

Intel® Micro Signal Architecture

- Performs GSM/GPRS baseband signal processing
- Modified Harvard architecture, dual-MAC, deep pipeline, 104 MHz execution clock
- Instruction cache and 64 KB dual-banked data SRAM
- 512 KB integrated Intel On-Chip Flash for field-upgradable signal processing firmware
- Includes microprocessor instructions such as bit manipulation
- Includes cipher and Viterbi accelerators
- Multiple sleep modes and integrated power management minimize power consumption
- Interface support—digital I/Q, voice codec, auxiliary serial port for mixed-signal analog baseband, I²S audio codec interface, RF synthesizer serial control interface, JTAG

Intel® On-Chip Flash Memory

- Single bit-per-cell NOR Flash stores data and allows code to be executed in place (XIP)
- All the on-chip memory required to run the GSM/GPRS protocol stack
- The entire RTOS and JVM could fit in the on-chip Flash, accelerating performance and reducing power
- Potential to reduce memory latency issues with time-critical applications



Operating Conditions

Core Power Supply
1.2V ± 10%

I/O Power Supply
1.8V ± 10% or 3V ± 10%

Reference Design—Standby Time
250–300 hrs

Operating Temperature -25°C to +85°C

Package

Package body size
12 mm x 12 mm TF BGA

Package height
1.2 mm

Ball pitch
0.65 mm

Number of balls
241

Intel Access

Developer Web Site	developer.intel.com
Intel® PCA Processors Home Page	developer.intel.com/design/pca/applicationsprocessors
Other Intel Support: Intel Literature Center	developer.intel.com/design/litcentr 800 548-4725 7 am–7 pm CST (USA and Canada)
General Information Hotline	800 628-8686 or 916 356-3104 5 am–5 pm PST

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