

# CELLULAR SYSTEM SOLUTION 6513

Fully integrated multimedia for 2-Mpixel EDGE phones



September 2009

ST-Ericsson introduces its fourth generation single-core system solution for EDGE camera phones. It has increased processing power and can support all multimedia use cases with EDGE data transfer in the background. The refined power management unit ensures outstanding play and standby time. The embedded multimedia engine offers a 2-Mpixel camera interface and a QCIF encode, QVGA decode video camcorder, as well as an MP3 music player/recorder. Cellular system solution 6513 is cost effective and allows fast time-to-market development.

**KEY FEATURES**

**Telecom**

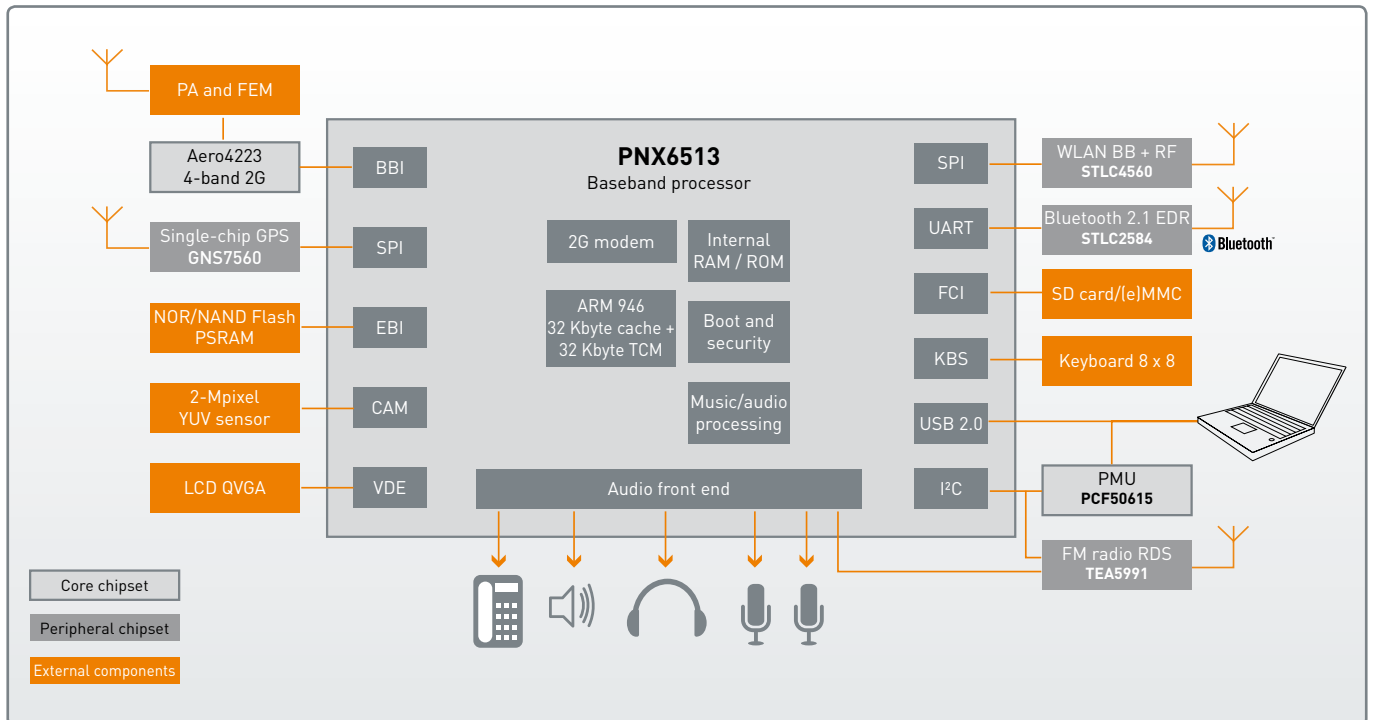
- ARM946 @ 156 MHz, DSP RD16024 @ 143 MHz
- Quad-band 850/900/1800/1900
- Release 99 EDGE class 10
- HR/FR/EFR/AMR
- A5/3, GEA3
- SAIC/MIC
- A-GPS
- File system target-FFS for Flash types: NAND, NOR, FAT32 NAND, FTL NAND, FTL NOR
- Multi TA / 07.10: allows modem application with multi-tasking OS
- LifeVibes™ 1.2 acoustic echo canceller, and VoiceClarity 2.0 from NXP Software
- Low power consumption: 1.6 mA DRX2, 25 mA MP3
- Telecom part compatible with PNX6511/PNX6515

**Multimedia**

- QVGA display interface (full colors and full overlay up to QVGA)
- Preview full screen: QCIF+ 262k or QVGA 64k
- QVGA decoding H.263 or MPEG-4 15 fps/AMR
- QCIF decoding H.263 or MPEG-4 30 fps/AAC
- QCIF encoding MPEG-4 15 fps/AMR
- Stereo audio player
  - MP3, AAC, eACC, eAAC+, WAV, PCM
  - MIDI 64 tones
- Stereo audio recorder
  - WB-AMR 16 kHz
  - MP3 32 kHz, AAC 32 kHz
- Bluetooth SBC encoder in DSP
- DRM2.0, WDRM
- Easy audio tuning and 4-step Tx analog gain

**Connectivity**

- USB 2.0 Full Speed with USB charge
- Up to 7 Mbit/s USB mass storage
- 3<sup>rd</sup>, 4<sup>th</sup> UART interface
- 4-bit SD/(e)MMC interface, high speed



ST-Ericsson cellular system solution 6513 application diagram

## **POWERFUL ARCHITECTURE**

With its increased processing power, memory bandwidth, and additional DSP/hardware acceleration, cellular system solution 6513 is powerful enough to run complex multimedia use cases in parallel with EDGE data transfer without any limitations. For instance, it is possible to listen to FM radio on a stereo Bluetooth headset and record at 32 kHz in MP3, while at the same time having an EDGE data transfer in the background.

## **EFFICIENT POWER MANAGEMENT**

The cellular system solution 6513 platform has been refined at all levels: PMU, transceiver, telecom stack, CPU operating modes and DSP firmware, in order to achieve outstanding play time and standby time.

- Up to 30 hours MP3 play time
- 9 hours talk time
- 500 hours DRX2 standby time

## **2-MPIXEL CAMERA INTERFACE**

The fully qualified ST-Ericsson embedded image subsystem (ISS) has already been widely adopted in volume production as a competitive alternative to an external image/multimedia processor. The cellular system solution 6513 latest-generation imaging and video subsystem introduces:

- 2-Mpixel YUV camera interface
- Camcorder up to QVGA decode (MPEG-4, H.263), QCIF encode (MPEG-4)
- 8/16-bit display interface supporting low cost, 8-bit only, QVGA displays

In addition to feature upgrades, the ISS architecture enhancements include a hardware upscaler, a hardware JPEG encoder/decoder, and improved internal data flow management.

This new 2-Mpixel evolution of the ISS continues to offer an extraordinarily fast picture processing time without compromising on the WYSIWYG architecture: the image shown on the display after a camera shot, even with a 2x zoom, is the real 2-Mpixel image captured and stored in the phone memory. The entire process (including capture, encode, store, decode, resize and display) runs in less than 1 second.

## **INTEGRATED MUSIC PHONE**

Cellular system solution 6513 benefits from the same set of integrated features that have made previous ST-Ericsson solutions successful in a range of high-running music phones:

- Extended play time
- SBC encoder in DSP for efficient stereo Bluetooth headset support
- 32 kHz FM-stereo record in MP3
- USB PC-to-phone download
- PlayForSure™ certified

## **REDUCED MEMORY FOOTPRINT**

New architecture improvements make it possible to support the embedded camera functionality with as little as 128 Mbits of total external RAM for the entire system solution, including the customer application.

### COST-EFFECTIVE, COMPACT SOLUTION

With its core 3-chip footprint totaling only 152 mm<sup>2</sup>, cellular system solution 6513 is one of the most compact solutions able to provide this level of multimedia without the addition of a multimedia processor or an application engine. Furthermore, thanks to the maturity and level of integration of this solution, very few external glue components are needed. Some of the typical external components that are not needed with cellular system solution 6513 are: USB charge IC, additional LDO regulators or DC-DC converters, audio switch, audio amplifier.

### FAST TIME TO MARKET

Cellular system solution 6513 comes with a reference design, development environment, industrialization tools and an industry approved telecom and multimedia stack. It is supported by a worldwide sales and application support organization.

Type name	Function	Package	Package size
<b>Core chipset</b>			
PNX6513	Multimedia baseband processor	LFBGA-296	10 x 10 mm
PCF50615	Power supply and battery management controller	HVQFN-52	6 x 6 mm
Aero4223	Quad band EDGE transceiver	LFBGA-49	4 x 4 mm
<b>Peripheral chipset</b>			
STLC2584	Bluetooth V2.1 + EDR	WLCSP-48	PCB area < 33 mm <sup>2</sup>
TEA5991	Stereo FM RDS receiver	WLCSP-20	PCB area < 10 mm <sup>2</sup>
GNS7560	Single-chip GPS receiver	WLCSP-54	PCB area < 25 mm <sup>2</sup>
STLC4560	Single-chip IEEE 802.11b/g WLAN radio	LFBGA-240	8.5 x 8 mm

### ST-Ericsson cellular system solution 6513 chipset

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