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Product Brief

Toshiba ApP Lite™ Series: TZ1200 High Performance Platform for IoT

Highlights

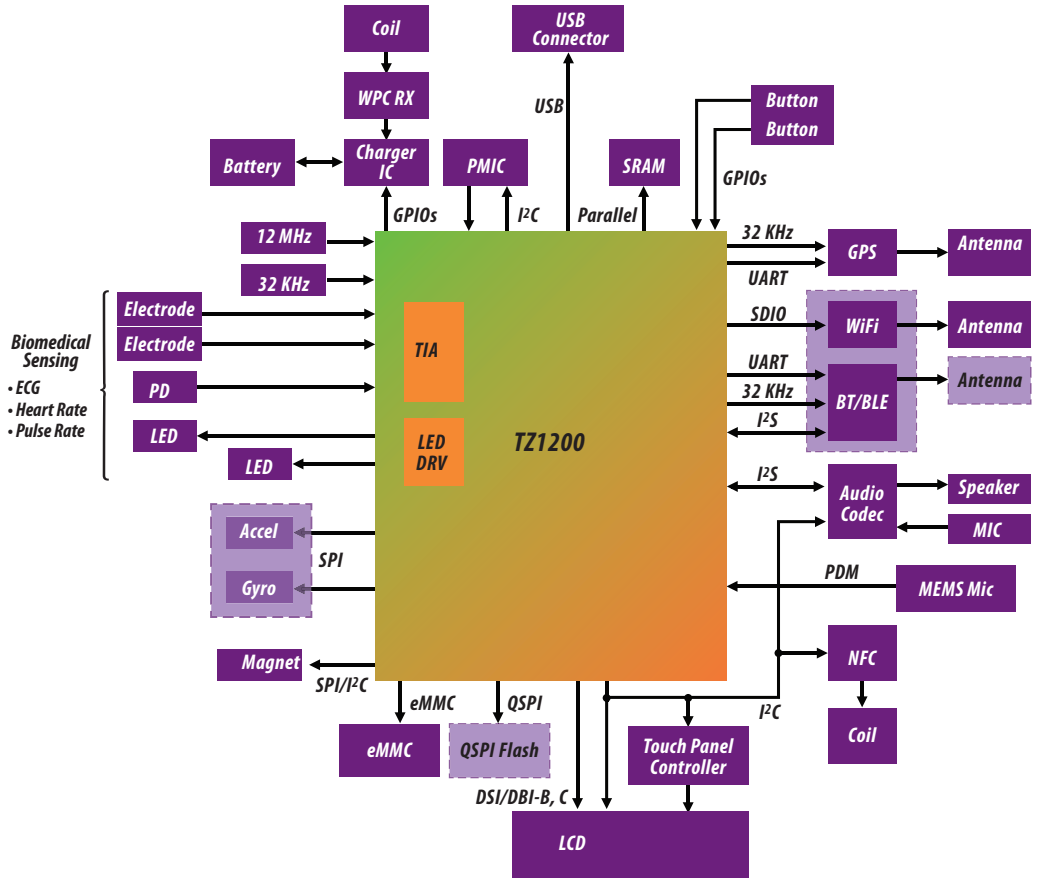
- Incorporates an ultra-low power, high-performance ARM® Cortex® M4F with digital signal processing and a floating point unit. The device has best-in-class1 uA/MHz.
- Sensor fusion software such as AHRS (Attitude and Head Reference System).
- High-performance 2D graphics engine.
- Large memory capacity with embedded 2.2MB SRAM.
- 24-bit Delta-Sigma ADC with op-amp and LED drivers.
- Built-in security engine (AES/SHA2/TRNG).
- Lossless internal compression/decompression engine for sensor data.
- More than 100 free GPIOs to connect with other peripherals.
- Quick Starter Kits are available.

Description

The TZ1200 is a high-performance Cortex M4F processor for next-generation consumer IoT applications such as smart watches, home automation, virtual reality, and more, which not only have extremely low-power requirements, but also need the latest graphics features to drive a high-resolution display, along with occupying a very small footprint. It comes with an integrated high-precision analog front end, which has a 24-bit Delta-Sigma ADC, eliminating the need to have an external ADC. It also has an integrated 2D graphics engine with features such as BitBlt, drawing, rotation and scaling, which eliminates the need to have an external graphics controller and results in reducing the overall system power consumption.

TZ1200 can also act as a sensor hub, processing and sending data from external sensors to the main processor. With Toshiba's highly sophisticated AHRS (Attitude and Head Reference System) sensor fusion software, TZ1200 can be used for head mounted displays and also for precise position tracking in Augmented and Virtual reality applications.

Application Block Diagram
(Intelligent Smartwatch with Biomedical Sensing Applications)



http://toshiba.semicon-storage.com

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Regional Sales Offices

NORTHWEST
San Jose, CA
TEL: (408) 526-2400
FAX: (408) 526-2410

SOUTHWEST
Irvine, CA
TEL: (949) 462-7700
FAX: (949) 462-2200

MIDWEST
Wixom, MI
TEL: (248) 347-2607
FAX: (248) 347-2602
Buffalo Grove, IL
TEL: (847) 484-2400
FAX: (847) 541-7287

NORTHEAST
Marlboro, MA
TEL: (508) 481-0034
FAX: (508) 481-8828
Parsippany, NJ
TEL: (973) 541-4715
FAX: (973) 541-4716

SOUTHEAST
Duluth, GA
TEL: (770) 931-3363
FAX: (770) 931-7602

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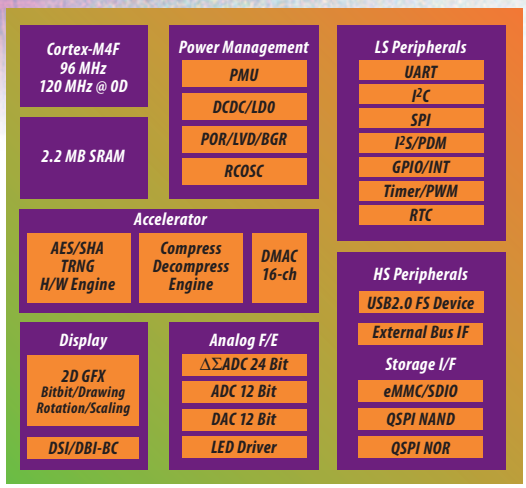
Block Diagram



Applications

- Wearables: Smartwatch
- Healthcare: Sleep diagnosis, ECG, heart rate, pulse rate, etc.
- Home automation: thermostats and smart door locks
- Virtual Reality/Augment Reality: AHRS for head mounted displays

Middleware

Activity Meter

- Walking/running steps, distance in meters
- Walking/running duration (minute)
- Exercise strength (METs)

Sleep Analyzer

- Determines if the user is awake or not using the accelerometer.
- Determines the sleep stage.

Healthcare

- ECG: heart rate (beats per minute), R-R interval (msec)
- Pulse wave: pulse rate (beats per minute), R-R interval (msec)

Other

- AHRS: Quaternion, linear position.

Deliverables

- TZ1200 SoC
  - SoC with system development support of sample CMSIS drivers with RTOS, schematics, and documents (datasheet, SDK manuals for sample drivers and tool chain, and hardware design guides).
  - Middleware: Activity meter, sleep analyzer and additional middleware packages will be provided by Toshiba and certified third parties.
  - Reference Module PKG: Very small footprint reference module with schematics and Garber data for manufacturing. These deliverables enable the user to build their own demo for field testing and mass production.
- Integrated development environment support packages for:
  - ARM Keil™, µVision™
  - IAR Embedded Workbench®
  - Eclipse™

[1]As of 8/2014, based on Toshiba Research

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