onsemi

System Solution Guide - Preview

Medical Wearables

onsemi.com

Table of Contents

Get Latest Version

Full Guide Preview

Get Latest Version

1


2

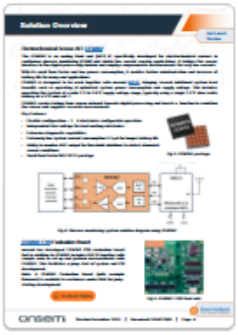

3


4


5


6


7

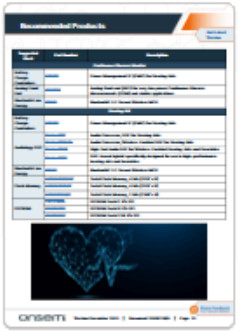

8


9


10


11


12


13


14


15


16

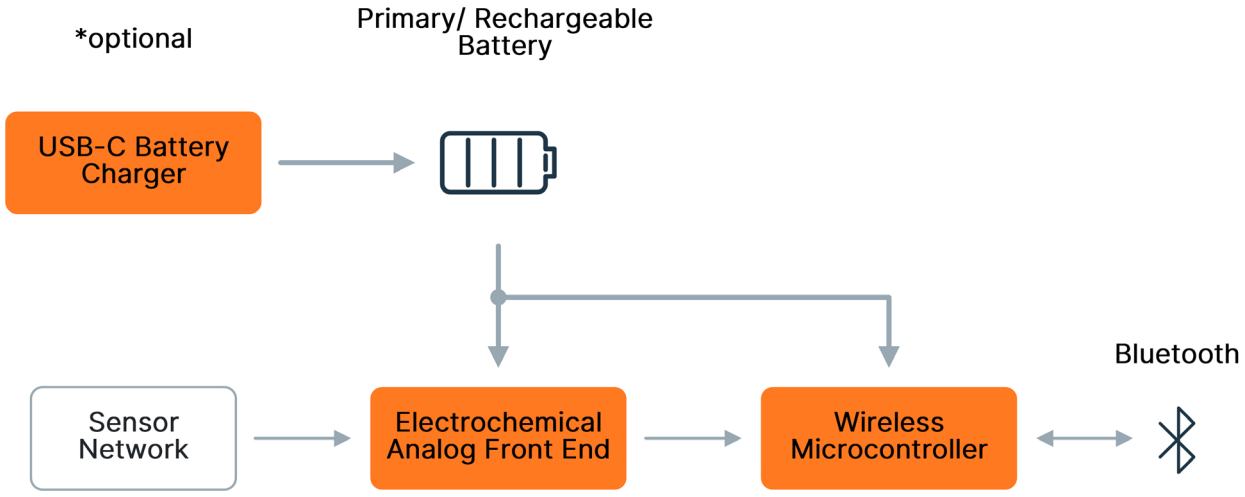
17

Solution Overview

Get Latest Version

Block Diagram – Continuous Glucose Monitor

The block diagram below illustrates a continuous glucose monitor solution featuring recommended products from **onsemi**. The solution requires minimum of the components. The main parts are wireless microcontroller, which communicates via Bluetooth protocol and analog front end which measures the glucose level. If the solution uses primary battery, then no other part is needed. If instead the solution uses rechargeable battery, then battery charge controller needs to be added, which controls the battery charge profile.



Use our Interactive Block Diagrams Tool

Open IBD Tool

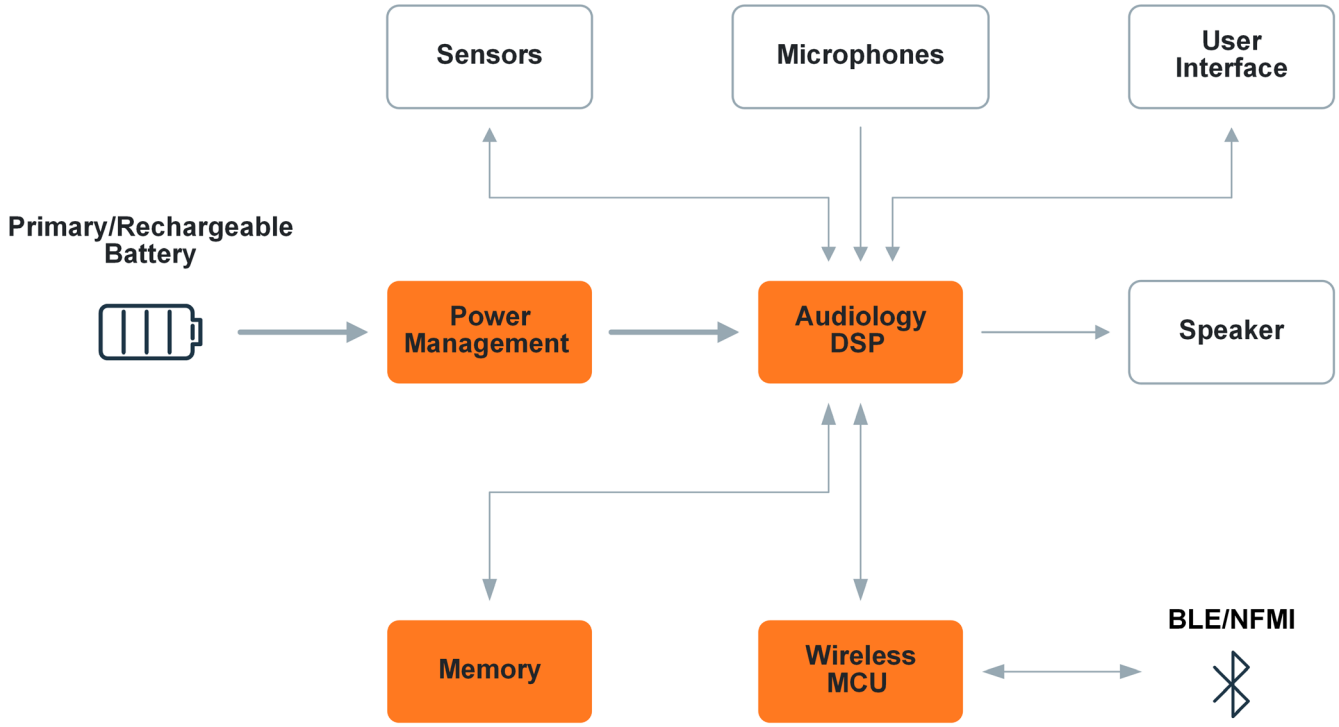
Share Feedback
Your Opinion Matters

Solution Overview

Get Latest Version

Block Diagram – Hearing Aid

The block diagram below illustrates hearing aid solution featuring recommended products from **onsemi**. The heart of the solution is Audiology DSP that processes the audio signal. It also includes a Bluetooth Low Energy microcontroller for wireless connectivity. Other building blocks of the solution available from **onsemi** are battery charge controller and a vast portfolio of memory, including EEPROM and flash memory.



Use our Interactive Block Diagrams Tool

Open IBD Tool

Share Feedback
Your Opinion Matters

Electrochemical Sensor AFE CEM102

The CEM102 is an analog front end (AFE) IC specifically developed for electrochemical sensors in continuous glucose monitoring (CGM) and similar low-current sensing applications. It bridges the sensor interface to the digital processing domain and employs amperometric measurements for very low currents.

With its small form factor and low power consumption, it enables further miniaturization and increase of battery life for many end applications.

CEM102 is designed to be used together with **onsemi** RSL15, bringing several additional system-level benefits such as operating at optimized system power consumption and supply voltage. This includes operating the system at a wide 1.3 to 3.6 V supply voltage range, typically using a single 1.5 V silver oxide battery or a 3 V coin cell. T

CEM102 creates bridge from sensor network towards digital processing and boasts a function to condition the sensor and supports accurate measurement.

Key Features:

- Flexible configuration – 1 - 4 electrodes configurable operation
- Independent bias voltage for dual working electrodes
- Extensive diagnostic capabilities
- Extremely low system current consumption 3.5 μA for longer battery life
- Ability to monitor ADC output for threshold violations to detect abnormal sensor conditions
- Small form factor WLCSP25 package

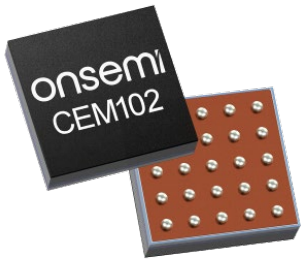


Fig.3: CEM102 package

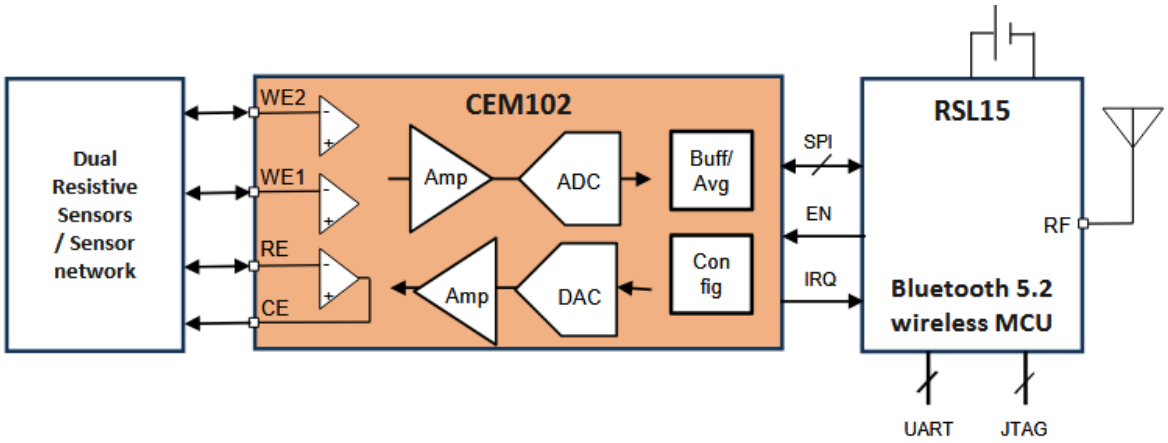


Fig.4: Glucose monitoring system solution diagram using CEM102

CEM102-EVB Evaluation Board

onsemi has developed CEM102-EVB evaluation board that in addition to CEM102 includes RSL15 together with sample code to set up and perform measurements with CEM102. This facilitates a jump start of system and FW development.

Note: A CEM102 Evaluation Board (with example firmware) is available to customers under NDA for jump-starting development.

Contact Sales

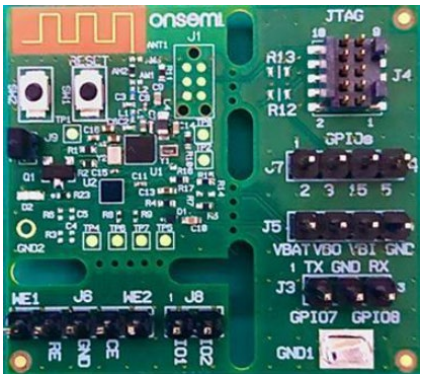


Fig.5: CEM102-EVB front side

Solution Overview

Get Latest Version

Audiology Digital Signal Processor (DSP) Systems

Audiology DSP systems delivers advanced digital signal processing for hearing aids and hearables, transforming sound into clear, personalized experiences. By converting analog audio to digital, DSP applies algorithms for noise reduction, feedback cancellation, and speech enhancement, ensuring optimal clarity in diverse environments. Its low-power architecture supports wireless streaming and real-time adaptation, enabling manufacturers to create smarter, more efficient devices. Audiology DSP is the foundation for next-generation hearing solutions, combining precision, flexibility, and connectivity to improve user comfort and communication.

There is a growing demand for smart, wireless earbuds, which is driving significant innovations in audio DSP technology. These advancements focus on delivering greater processing power and efficiency, high-quality audio for an improved user experience, and ultra-low power consumption to extend battery life. Additionally, designs emphasize compact size for enhanced comfort and portability, along with features such as Active Noise Cancellation and voice command support.

Audiology DSP Systems Ezairo 8300

Advanced audio processor with six programmable or semi-programmable processing cores, providing a high degree of parallelism and flexibility. Excellent choice for high-end wireless-enabled audio applications.

Key Features:

- High fidelity operation at ultra-low power consumption
- Bluetooth® Low Energy support
- The CFX dual−Harvard 24 bits DSP providing support for any type of audio signal processing
- The Arm® Cortex®−M3 processor providing support for general processing and interfacing
- The HEAR configurable accelerator core is optimized for pre−programmed functions that are frequently needed in audio signal processing
- The Neural Network Accelerator allows the processor to perform neural network computations in a highly efficient and flexible way.

Audiology DSP Systems Ezairo 8310

Is an open−programmable DSP−based hybrid module specifically designed for high−performance hearing aids and hearables.

It integrates Ezairo 8300, 16 Mb ultra-low power SPI bus flash memory and passive components in a convenient package, simplifying design and assembly.

Ezairo 8310 uses the same program design tools as Ezairo 8300.

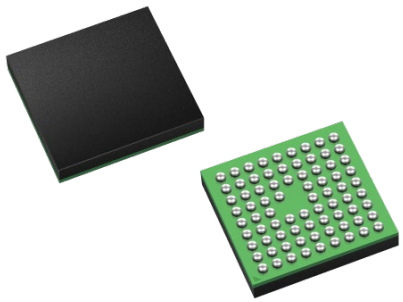


Fig.6: VFBGA78 Ezairo 8300 package

E8300-001-GEVB Evaluation Board

The Open-Programmable Evaluation & Development Kit (EDK) for Ezairo 8300 is available on a subscription basis (with 2, 5 or 10 seat licences) for companies looking to develop custom solutions on the Ezairo platform.

Please contact Sales for more information about the Ezairo product and evaluation board portfolio via the button below.

Contact Sales

Medical Wearables

Get Latest Version

onsemi™

Intelligent Technology. Better Future.

Register now to unlock all System Solution Guides and get additional exclusive benefits!

- Join the conversation on community forum.
- Utilize Elite Power Simulator & other developer tools.
- Watch exclusive webinars and seminars.

Open full System Solution Guide