Our Medical ASIC Platform regrouping NFC/RFID and a set of in-vitro diagnostic environmental sensors front-end

Key design blocks can be packed into a single silicon circuit to feature RFID connectivity, extremely low-power analog sensor acquisition and calibration, and unmatched security for personal/patient data.

Fully wireless ASIC with potentiostat

On top of its NFC and RFID capabilities, and the embedded and versatile potentiostat frontends, this IP Platform can facilitate highly compact systems for electrochemical measurements, targeting Healthcare, Industrial and Instrumentation applications.

Programmable potentiostat IP block

The programmable analog sequencer performs multiple voltammetry and amperometry potentiostat measurements:

- Normal Pulse Voltammetry (NPV)
- Linear Sweep Voltammetry (LSV)
- Cyclic Voltammetry (CV)
- Square Wave Voltammetry (SWV)
- Differential Pulse Voltammetry (DPV)
- Chronoamperometry (CA)

Accelerate your time-to-market

Are you about to start with a portable potentiostat measurement system?

Compared with others, the Hugin platform enables a small, low-cost and low-power system integrated on a single chip.

Thanks to this platform it’s easier, faster and more effective to make your prototype; it can be tailored through firmware to your specific needs.

APPLICATIONS

Hugin can be used to design a broad range of application domains including the highly-demanding Industrial and Medical markets. It performs complex data sampling sequences, validation and data logging in battery operated systems. It offers wireless powering as well for battery-less operation and secure data upload through NFC readers and generates a simple link to cloud data storage.

INDUSTRIAL

Production Automation
- Electrochemical measurements
- Temperature monitoring

Logistics and Transport
- Temperature control
- Air quality and gas sensing

MEDICAL

Production Infrastructure
- Used inside closed containers
- Reduce the risk of cross-contamination

Diagnostic and patient monitoring
- In vitro diagnostics
- Suitable for in-situ tests
- Biological and chemical sensing
- Detect the presence of disease, virus or infection
- Help cure, treat, or prevent diseases
- Encryption of sample data (AES-128)

Safety, Wireless Communication
- Biologically isolated units
- Pathogens and toxins
- Ensures the safety of the user
Hugin

Technical description

Hugin embeds a multiprotocol (ISO 14443A/NFC Forum Type 2 and ISO 15693/NFC Forum Type 5) transponder chip (PICC) that can perform diagnostics measurements and store results with a configurable time interval (0.1 s to 10 h).

Measurements can originate from two potentiostat frontends. The potentiostat measurement sequence is highly configurable by on-chip algorithms. An on-chip high precision temperature sensor and a conductivity sensor frontend is available for initiating and validating the potentiostat measurements.

Measurements can be supplemented by an external differential analog signal or originate from the SPI master interface. The logging capacity is up to 28 kB.

Data transfer rate is up to 848 kB/s and the UID is configurable up to 10 bytes.

Assembled with a credit card size antenna, operation up to 10 cm from reader is possible. For autonomous logging the device can be mounted with a 3.6V (2.0V for Chrono only) to 5.5 V battery.

Standby current consumption is below 1 μA. When an RF field is applied, the internal power supply switches to power extracted from the RF field.

The embedded EEPROM memory size is 32 kB and can hold measurement results, default drivers, and custom SW applications.

Key features

• ISO 14443A and ISO 15693 compliant
• openMSP430 CPU with debug interface
• Customed ULP MSP430
• Voltammetry potentiostat measurement support for ±100µA signal for applied ±850mV
• Chrono amperemetry potentiostat measurement support for ±20µA signal for applied -450mV to +650mV
• Temperature accuracy after factory calibration: ±1.5°C (abs), ±0.1°C (relative)
• Temperature range -20°C to +85ºC
• 16 bits linear low-offset instrumentation ΣΔ ADC
• Up to 24 kB logging storage capacity
• SPI master interface for auxiliary slave
• Can be operated with and without battery power
• Firmware upgradable
• Ultra-low power tag storage mode (< 0.1 μA)
• AES encryption hardware support
• Random Number Generator

Privacy protection

Root of trust applicable from manufacturing to use-case due to secured EAL6 CC manufacturing concept, on chip AES encryption, and data privacy secured access.

Benefit from the experience of a fully integrated ASIC solution provider Presto Engineering can manage the entire ASIC procurement process from initial design to final delivery.

Reduce risk Get to market faster

Minimize costs Optimize design and production processes

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