ATSAM4CP16B

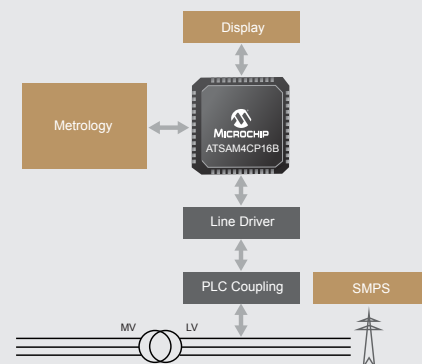## Power Line Communication – PRIME System-on-Chip

Summary

The ATSAM4CP16B is a smart metering platform able to support a complete smart meter implementation. It includes a PRIME-compliant Power Line Communication (PLC) modem. Power Line Intelligent Meter Evolution (PRIME) is a mature, consolidated and worldwide PLC standard for advanced metering, grid control and asset monitoring applications.

The ATSAM4CP16B is based on a high-performance 32-bit, dual-core ARM® Cortex®-M4 RISC processor providing a maximum speed of 120 MHz each, 1 MB of embedded Flash, 128 KB of SRAM and on-chip cache. This device includes an advanced cryptographic engine and embeds a modem for PRIME PLC.

The ATSAM4CP16B PRIME modem supports v1.3 and v1.4 of the PRIME specification, and is able to operate in independently selectable transmission bands up to 472 kHz and to achieve baud rates ranging from 5.4 kbps up to 128 kbps.

The unique dual-core ARM Cortex-M4 architecture of the ATSAM4CP16B supports the implementation of signal processing, application and communications firmware in independent partitions.
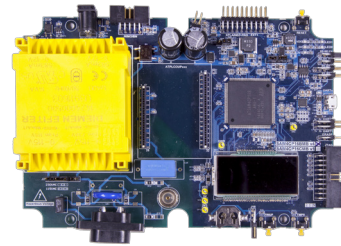
Key Features

- Application/master core
  - ARM Cortex-M4 running at up to 120 MHz
  - Memory Protection Unit (MPU)
  - DSP instruction
- Co-processor
  - ARM Cortex-M4F running at up to 120 MHz
  - IEEE® 754 compliant, single precision Floating Point Unit (FPU)
  - DSP instruction
- Cryptography
  - High-performance AES 128 to 256 with various modes (GCM, CBC, ECB, CFB, CBC-MAC, CTR)
  - TRNG (up to 38 Mbps stream, with tested diehard and FIPS)
  - Classic public key crypto accelerator and associated ROM library for RSA, ECC, DSA, ECDSA
  - Integrity Check Module (ICM) based on secure hash algorithm (SHA1, SHA224, SHA256), DMA assisted
- Safety
  - Physical anti-tamper detection I/O with time stamping and immediate clear of general backup registers
  - Security bit for device protection from JTAG accesses

- PRIME PLC embedded modem
  - Power line carrier modem for 50 Hz and 60 Hz mains
  - PRIME certified
  - DBPSK Robust, DQPSK Robust, DBPSK, DQPSK, D8PSK available
  - Eight selectable channels between 42 kHz to 472 kHz available
  - Baud rate selectable: 5.4 to 128.6 kbps
  - Four dedicated buffers for transmission/reception
  - Up to 124.6 dBµVRMS injected signal against PRIME load
  - Up to 79.6 dB of dynamic range in PRIME networks
  - Class D switching power amplifier control
- Shared system controller
  - Power supply
  - Embedded core and LCD voltage regulator for single-supply operation
  - Power-on-Reset (POR), Brown-Out Detector (BOD) and watchdog timer for safe operation
  - Low-power sleep and backup modes

MICROCHIP

ATSAM4CP16B Evaluation Kit (ATSAM4CP16B-EK)

- Two ATSAM4CP16MB modem boards
- Documentation for PLC hardware design
- PRIME-PLC software and documentation
- Microchip tools for PLC developers: PC applications to evaluate ATSAM4CP16B performance at device and network level (PHY tester, PRIME sniffer, PRIME manager)

Ordering Information

Part Number	MRL	Flash (KB)	Temperature Range	Package Type
ATSAMCP16B-AHU-Y	A	1024	Industrial (–40 to +85°C)	LQFP 176

Evaluation Kit Ordering Information

Part Number	Name
ATSAM4CP16B-EK	ATSAM4CP16B Evaluation Kit

For more information, please email PLC@microchip.com.

www.microchip.com/smartenergy

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