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Turnkey PLC chipset for smart-energy infrastructure

Multi-standard, programmable and ultra-low power powerline communication solution

The smart grid networks of the future have to be multi-layered and multi-dimensional in order to cope with the complexity of smart energy systems with bidirectional communication and power exchange between suppliers and consumers, connecting large-scale time-varying renewable sources to national power grids and markets.
With more than 20 years of know-how in powerline communication and multi-million installations on field, ST leads the evolution of the technology and attempts to future-proof smart grids with the new fully programmable powerline communication platform, the highest performing, lowest power, enabling multi-standard/multi-band powerline solutions.

KEY FEATURES AND BENEFITS

- Fully programmable real-time 400 MHz DSP and 200 MHz ARM® 32-bit Cortex®-M4F core, to meet today's and future smart grid requirements
- Ultra-low power-supply consumption <100 mW in Receive mode for the highest energy efficiency operations
- Embedded AES cryptography engine, supporting up to 256-bit security key and multi-security modes to satisfy the most stringent requirements in terms of data security
- Full 500kHz bandwidth support for the best exploitation of worlwide bandwidth (CENELEC, ARIB, FCC)
- Operative temperature range up 105°C suitable for critical applications
- Small footprint QFN package for compact and cost-effective applications

IDEAL FOR

- Smart metering and smart grid applications such as:
  - Smart meters and concentrators
  - Gateways and smart home energy systems
  - Street lighting and smart city solutions
  - Smart solar panels and inverters

SIMPLY THE BEST

ST's new powerline communication (PLC) platform consists of the ST8500 system-on-chip that includes a powerline modem, higher layer communication stack, PLC analog front end and other peripherals and the STLD1 companion chip that provides the line driver (power amplifier) function.

The ST8500 SoC embeds a programmable high performing DSP engine, able to run up to 400MHz, with dedicated code and data SRMA memories, capable of supporting today's and tomorrow's real-time constraints for Powerline Communication protocols. A standard SRAM ARM® 32-bit Cortex®-M4F core with dedicated SRAM memories for code and data is embedded for the protocol upper layer stack, peripherals and system management. The integrated differential Analog Front End guarantees exceptional performance in the receiving path and drives the external line driver companion chip STLD1, suitable for differential and single-ended configurations.

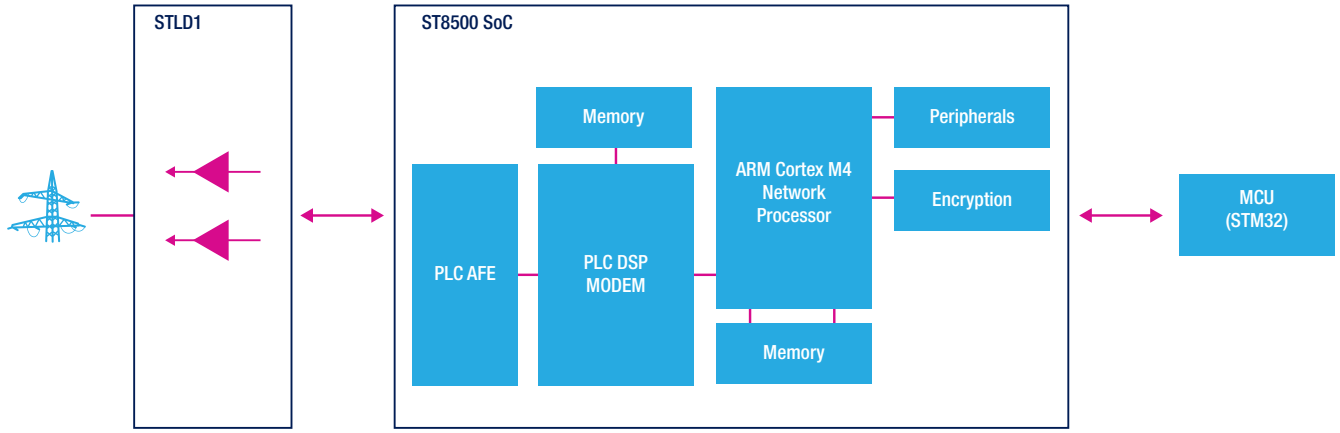
The ST8500 SoC is complete with a dedicated set of peripherals, specifically designed to address smart grid applications, including an AES cryptography engine, supporting up to 256-bit security keys and multi-security modes to satisfy the most stringent requirements in terms of data security and protection. Moreover, the SoC's power consumption of less than 100 mW in receive mode guarantees ultra-low-power performance.

Its full programmability allows customers to address with the same design multiple product variants and comply with different PLC standards (such as G3-PLC ITU G.9903, PRIME ITU-T G. 9904, and others) to target different market or application scenarios. Since tested, the inter-operable, certified and field proven libraries provided by ST with ST8500/STLDA, the time to market is dramatically reduced.

The STLD1's very high linearity, an output range up to 18 V in single-ended or 36 V in differential mode and up to 1.5 A max current guarantee EMC compliance and outstanding communication performance even in noisy and low impedance networks.

Compact packages allow small footprint and cost-effective application boards and communication modules implementation, while operating temperature range extension up 105°C makes them suitable even for most critical environmental applications.

APPLICATION MAIN BLOCKS



PRODUCT TABLE

Part number	Description	Package	Certified PLC protocols	Regulation compliance
ST8500	System-on-chip including powerline modem, higher layer communication stack, PLC analog front end and other peripherals	QFN56 (7 x 7 mm)	G3-PLC ITU G.9903, PRIME ITU-T G. 9904	CENELEC, FCC and ARIB
STLD1	Line Driver, ST8500 companion chip	QFN24 (4 x 4 mm)		