



# MSE1022 Product Brief

High Performance and Integration SoC for  
High-Speed PLC Applications

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## 1. General Description

MSE1022 product is a mixed-signal System on a Chip (SoC) device addressing the high-speed Power Line Communication (PLC) markets, including consumer, industrial and automotive applications. MSE1022 is compliant with the HomePlug® AV standard and the HomePlug® GreenPHY standard. It is qualified for automotive applications at AEC-Q100 grade 2. When used with the companion line driver chip (MSEX25), it can deliver high quality signal for PLC/GreenPHY communication.

The architecture has been designed to meet high throughput/low latency performance requirements with increased coverage compared to the previous generation, while keeping power consumption at a minimum.

This SoC embeds all the necessary functions needed to build high-end PLC applications in a cost-effective package. It integrates a full band HomePlug® AV modem, including the analog front end (DAC/ADC, PGA, filters), a powerful 32-bit processor for all modem management, a packet processor, two specialized DMAs that enable fast HomePlug® frame classification, segmentation and reassembly, an internal memory, a Gigabit Ethernet interface (including 10/100/1000 MAC controller, an RGMII/RMII interface), SPI controllers supporting both master and slave modes, and useful peripherals such as GPIO, PWM and UART.

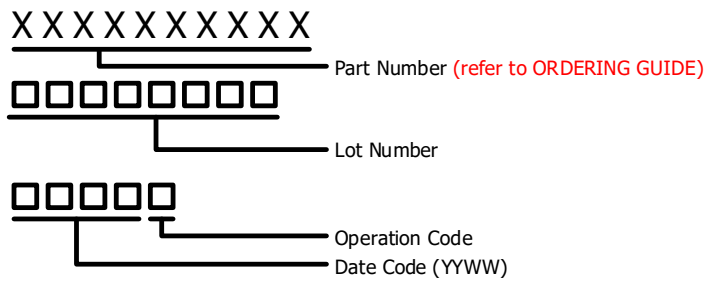
## 2. Features

- 1 • **HomePlug® Specifications**
- 2 • HomePlug® AV/GreenPHY
- 3 compliant MAC & PHY optimized
- 4 for multimedia streaming
- 5 applications
- 6 • Supports 1.8 to 30MHz
- 7 frequencies
- 8 • Supports 4096/1024/256/64/16/8-
- 9 QAM, QPSK, BPSK and ROBO
- 10 modulation schemes
- 11 • Advanced Turbo code FEC
- 12 • Supports HomePlug® AV and
- 13 HomePlug® GreenPHY low power
- 14 modes
- 15 • 128-bit AES Link Encryption with
- 16 easy plug-and-play key
- 17 management
- 18 • Full interoperability with
- 19 HomePlug® AV and HomePlug®
- 20 GreenPHY nodes
- 21 • MAC optimizations for higher end-
- 22 user throughput
- 23
- 24 • **Performance and Flexibility**
- 25 • Advanced signal processing
- 26 architecture for high tolerance of
- 27 noise and interferences
- 28 • Advanced multi-core architecture
- 29 - A powerful 32-bit core
- 30 dedicated to the physical layer
- 31 management
- 32 - A powerful packet processor
- 33 that allows fast and efficient
- 34 bridging and classification
- Interfaces to application processor for external product customization
- **Interfaces**
  - 1 x 10/100/1000 Mbits/s IEEE 802.3 Ethernet MAC interface (RGMII/RMII) for MAC-2-MAC or MAC-2-PHY connection
  - One SPI Master port with clock up to 20MHz
  - One SPI Slave port with input clock up to 7.14MHz
  - 2 UARTs (1 implementing hardware flow control and 1 dedicated to CPU)
  - Up to 15-bit GPIO with HW interrupt function
- **Miscellaneous**
  - Integrated SAR ADC for highly accurate voltage measurement
  - Integrated Zero-Crossing detection mechanism for highly accurate time measurement
  - Integrated PWM generation mechanism
  - Boot mode selection (flash or host)
  - Fast boot up speed (0.9~1.8s)
  - Automotive application (AEC-Q100 grade 2 qualified)

### 3. Ordering and Marking Information

Part Number	Temperature Range	Package Description	Package Option
MSE1022	-40°C to +105°C	EP-LQFP	80-pin
MSE1022-XX	-40°C to +105°C	EP-LQFP	80-pin

Note: XX suffix represents advanced features. Please contact Vertexcom sales representatives ([info@vertexcom.com](mailto:info@vertexcom.com)) for details.



## 4. Block Diagram

