



MSE1021 Product Brief

High Performance and Integration SoC for
High-Speed PLC Applications

Version: 1.2
Release Date: 2022/2/16

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1. General Description

MSE1021 product is a mixed-signal System on a Chip (SoC) device addressing the high-speed Power Line Communication (PLC) markets, including consumer, industrial and other applications. MSE1021 is compliant with the SISO profile of HomePlug® AV 2.1 standard, and the HomePlug® GreenPHY standard. It is capable to deliver high quality signals for PLC/GreenPHY communications.

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

This SoC embeds all the necessary functions needed to build high-end PLC applications in a very cost-effective package. It integrates a full band HomePlug® AV2.1 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 and a Fast Ethernet PHY), an SPI controller and useful peripherals such as GPIO, PWM and UART.

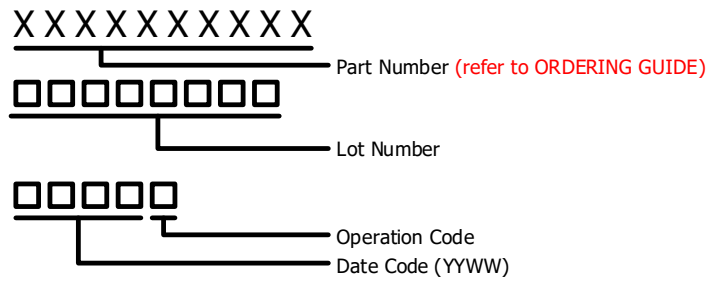
2. Features

- **HomePlug® Specifications**
 - HomePlug® AV 2.1/GreenPHY compliant MAC & PHY optimized for multimedia streaming applications
 - Supports 1.8 to 86MHz frequencies
 - Supports 4096/1024/256/64/16/8-QAM, QPSK, BPSK and ROBO Modulation Schemes
 - Advanced Turbo Code FEC
 - Supports HomePlug® AV 2 and HomePlug® GreenPHY low power modes
 - 128-bit AES Link Encryption with easy plug-and-play key management
 - Full Interoperability with IEEE 1901, HomePlug® AV and HomePlug® GreenPHY nodes
 - Co-exists with HomePlug® 1.0 and IEEE1901 Wavelet OFDM nodes
 - TDMA and CSMA/CA access protocols with ToS, CoS and IP Port Classifiers
 - IGMP managed multicast sessions
 - MAC optimizations for higher end-user throughput
 - Supports IEEE1905.1 and TR069
- **Performance and Flexibility**
 - Advanced multi-core architecture
 - A powerful 32-bit core dedicated to the physical layer management and all real-time requirements
 - A powerful packet processor allows for fast and efficient bridging and classification (allowing QoS support at line speed)
- **Interfaces**
 - 1 x 10/100/1000 Mb/s IEEE 802.3 Ethernet MAC interface (RGMII/RMII) for MAC-2-MAC or MAC-2-PHY connection
 - 1 x 10/100 integrated IEEE 802.3 Ethernet PHY interface for PHY-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
 - Fast boot up speed (1~1.5s)
 - Boot mode selection (flash or host)
 - Qualified for industrial grade applications (-40°C~85°C)

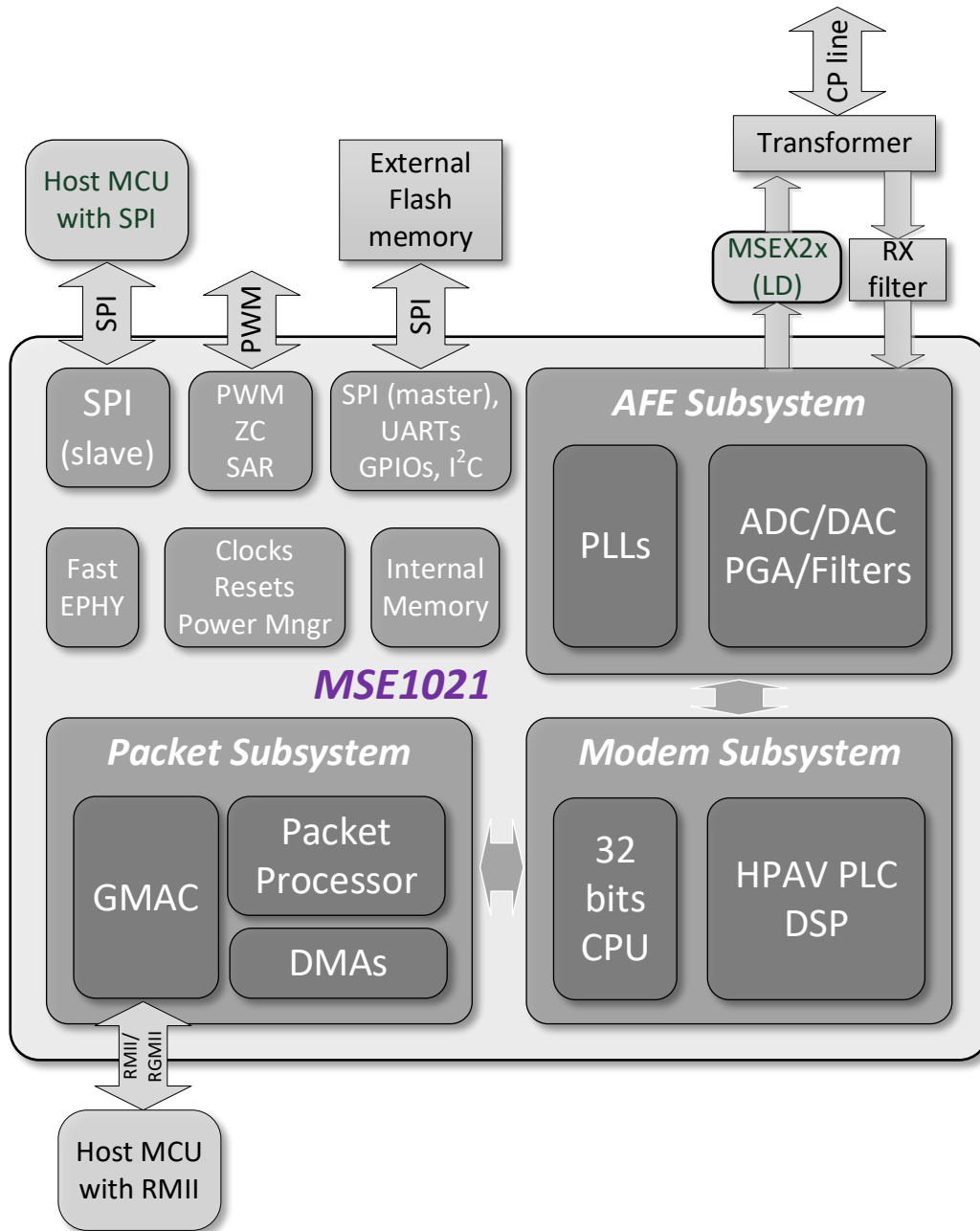
3. Ordering and Marking Information

Part Number	Temperature Range	Package Description	Package Option
MSE1021	-40°C to +85°C	EP-LQFP	80-pin
MSE1021-XX	-40°C to +85°C	EP-LQFP	80-pin

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



1 4. Block Diagram



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