

## MLKHN1501

## Single-Chip HD-PLC w/Multi-hop

### ■ GENERAL DESCRIPTION

MLKHN1501 is the world's first fully compliant IEEE 1901 HD-PLC Power line Communications (PLC) solution with "multi-hop". It delivers bi-directional, IP based, high-speed communication over AC/DC power lines, COAX and twisted pair wiring where wider bandwidths, robustness, long-range, support for larger number of nodes, and highly secure network is required.

The MLKHN1501 combines the Physical (PHY), Media-Access-Control (MAC), 128Mb/256Mb RAM, and a fully integrated Analog-Front-End (AFE) with high precision A/D, D/A data converters and programmable gain amplifiers (PGA) in a single compact package. The modem is based on an Orthogonal Frequency Division Multiplexing (OFDM), using advanced Forward-Error-Correction (FEC) techniques to allow the most robust high-speed data communication over channels with high implosive noise such as the harsh AC power lines.

The MLKHN1501 uses ITU-T G.9905, Centralized Matrix based Source Routing (CMSR) mechanism designed specifically to provide improved robustness, extended range, and wider coverage, while putting minimum load on the network. In addition, it uses a 128-bit AES encryption engine for the highest security at every node meeting today's Internet-of-Things (IoT) requirements.

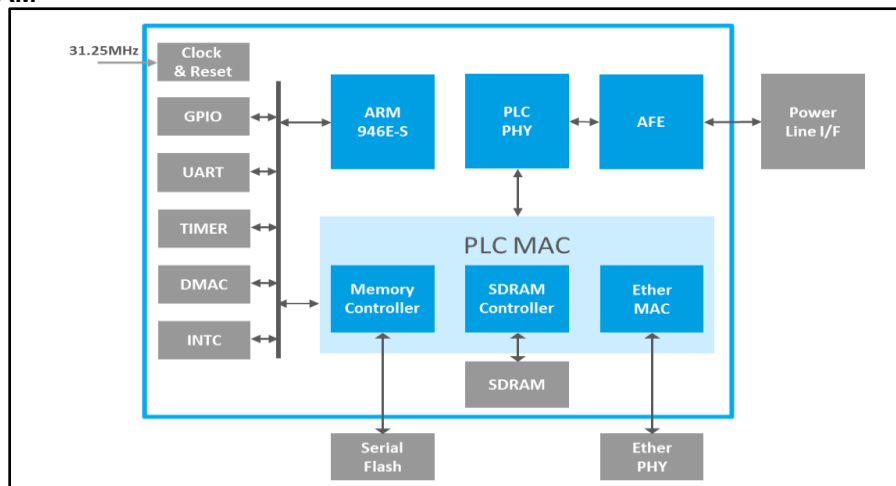
### ■ FEATURES

- Support up to 1024 nodes
- Range up to 10Km @10 hops
- Data rate up to 10Mbps (UDP/10 hops)
- Channel Access: CSMA/CA
- HD-PLC/Ethernet/RS485 bridge
  - Ethernet↔PLC↔Ethernet
  - RS485↔PLC↔RS485
- High noise immunity (0dB)
- Supports IPv4/IPv6
- Low power: 0.57W (typ)
- Meets EN50561-1 EMC requirements
- Free Topology
- Plug-and-Play
- Operating Temp: -40°C to +85°C

### ■ APPLICATIONS

- Smart Grid/AMI
- Smart Buildings/Homes
- Video Entry Systems
- Security/Surveillance
- Outdoor Lighting
- HVAC
- Industrial Automation
- Solar Power

### ■ BLOCK DIAGRAM



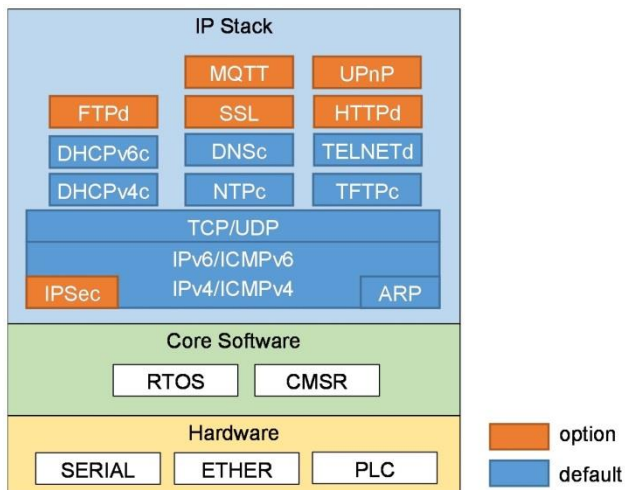
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### KEY SPECIFICATIONS

|                |                  |                         |                      |              |                      |
|----------------|------------------|-------------------------|----------------------|--------------|----------------------|
| PLC Method     | Frequency band   | 2-28MHz                 | Peripheral I/F       |              | GPIO,UART, MII/RMII  |
|                | Modulation       | Wavelet OFDM            | Power Consumption    | Full access  | 0.57W(Typ)           |
|                | PHY/MAC          | IEEE1901 full compliant |                      | Standby mode | 0.12W(Typ)           |
|                | PHY Rate         | 240Mbps                 | Supply Voltage       |              | 1.2, 3.3V            |
|                | Error correction | Reed-Solomon, LDPC-CC   | Operating Temp Range |              | -40°C to 85°C        |
| CPU            |                  | ARM w/16 Kb Cache       | Encryption           |              | AES 128bit           |
| Memory (SDRAM) |                  | 128Mb/256Mb             | EMC                  |              | EN50561-1            |
| System Clock   |                  | 125MHz                  | Package              |              | LPGA 238pin, 18x15mm |

### SOFTWARE DEVELOPMENT KIT



MegaChips offer various reference designs to qualified customers including schematics, layout, BoM and technical support.

Contents:

Master ROM tools

- Sample firmware
- External command sample program

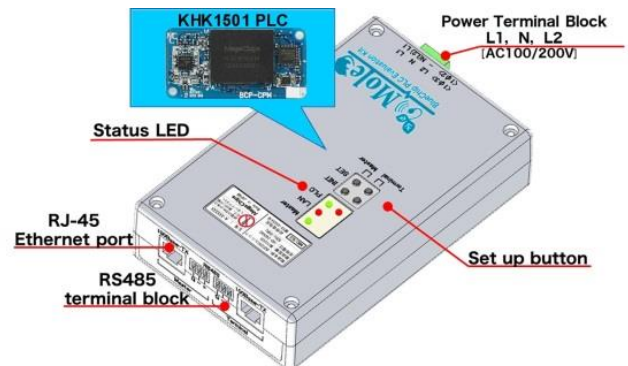
Evaluation tools

- Tool Manager
  - (1) Power Control tool
  - (2) Channel Monitor tool
- Net test tool

### EVALUATION KIT

MegaChips offers a comprehensive set of tools to help customers shorten their design time.

Our evaluation kit includes all the hardware, software, and documentation to easily set-up and evaluate the performance of the system under various conditions and configurations. The included BlueChip PLC Network Manager helps customers to configure, monitor and manage complex networks.



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|--|---|
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