

## 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 SDRAM, 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.

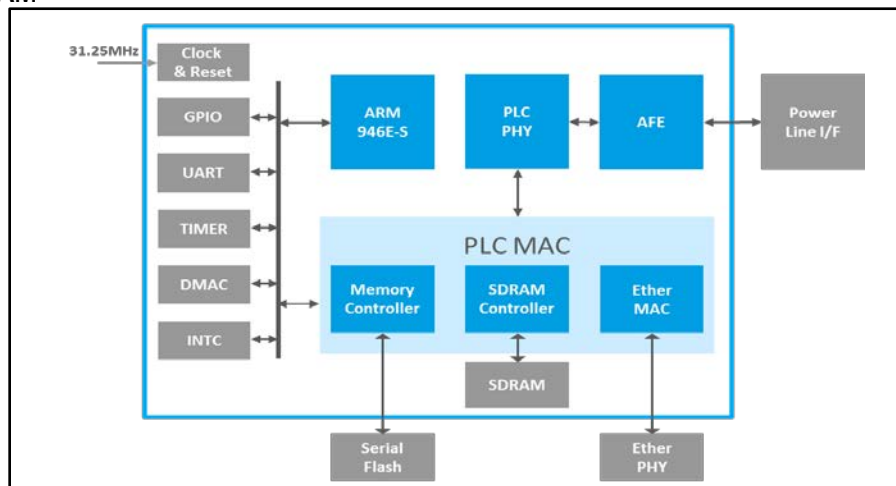
### ■ FEATURES

- 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



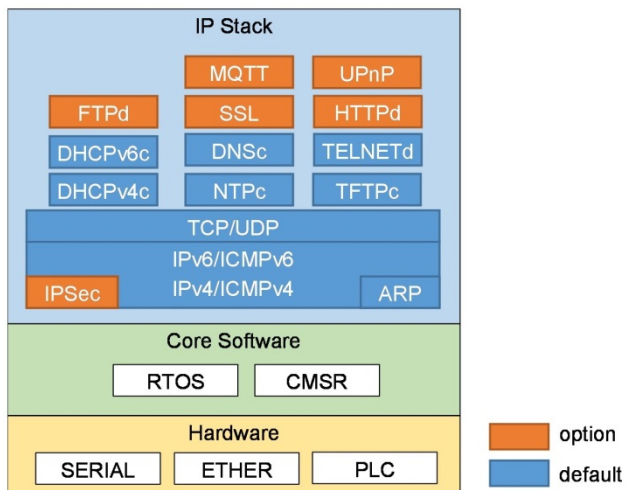
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### KEY SPECIFICATIONS

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	EMC		EN50561-1
System Clock		125MHz	Package		LBGA 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

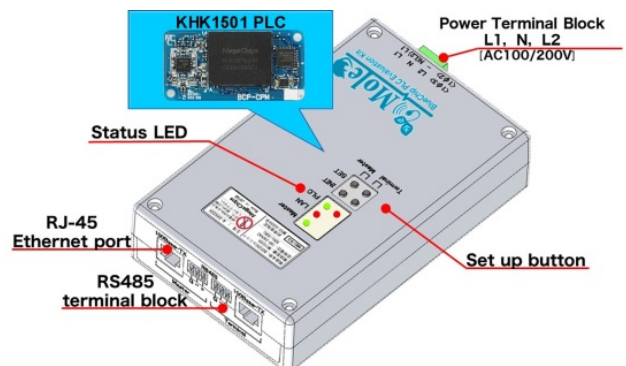
Evaluation tools

- 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.



MegaChips Corporation			MegaChips Technology America Corporation
Corporate Headquarters Shin-Osaka Hankyu Building 1-1-1 Miyahara, Yodogawa-ku Osaka 532-0003, Japan Tel +81-6-6399-2884	Makuhari Office 1-3, Nakase, Mihama-ku, Chiba 261-8501, Japan Tel +81-43-296-7414	Tokyo Office 17-6 Ichibancho, Chiyoda-ku, Tokyo 102-0082, Japan Tel: +81-3-3512-5083	2755 Orchard Pkwy. San Jose, CA 95134, USA Tel: +1 (408) 570-0555 E-mail: <a href="mailto:mca_sales@megachips.com">mca_sales@megachips.com</a>
<a href="http://www.megachips.co.jp">www.megachips.co.jp</a>			<a href="http://www.megachips.com/">http://www.megachips.com/</a>