KL5BPLC200WMP

HD-PLC Data Processing IC

Databrief

Rev. 0.7.2

1 Product overview

1.1 Function Overview

The KL5BPLC200WMP is an HD-PLC LSI designed to connect a wide range of home network devices in a flexible manner using existing residential electrical wiring. Its capabilities include transmission of high-definition video and other broadband content. HD-PLC is the name of a high definition power line communication system put forth by Panasonic.

Thanks to compatibility with the ubiquitous Ethernet standard, the KL5BPLC200WMP can be easily connected to network-enabled products such as broadband networks, televisions, and computers anywhere there is an electrical outlet simply by supporting the Internet protocol (IP), which already enjoys widespread use.

The KL5BPLC200WMP incorporates a 32-bit RISC processor and provides a single-chip implementation of high-performance wavelet conversion OFDM functionality, MAC processing functionality with high-quality QoS support, and HD-PLC/Ethernet bridge functionality.

QoS functionality can be used to guarantee a fixed communication speed for a variety of communications ranging from data transmission and reception to video streaming and IP telephony.

The KL5BPLC200WMP also has highly integrated analog front-end chip so that no other analog front-end IC for PLC is necessary. An on-chip PLL multiplier and synthesizer provide all the required clock signals from a single crystal or clock source.

Following are the features of KL5BPLC200WMP.

- Single chip solution for HD-PLC application.
- Network construction and optimization, advanced network diagnostics and management.
- HD-PLC network bridge function compatible with Ethernet address system.
- Ensuring the security and easy connectivity by data encryption using AES.
- High-speed communications up to 432 carriers within 2-28MHz band(Maximum PHY Rate: 240Mbps without notch)
- Determine the optimal rate according to the power line channel characteristics with the multilevel modulation for each sub-carrier.
- Optional sub-carriers masking function to be adapted to individual country's regulations.
- Level-up function to achieve maximum speed under individual country's regulations.
- Error correction and selective transmission retry to achieve efficient frame transfer.
- Backward compatible with existing 1st, 2nd HD-PLC systems.
- IEEE1901 compliant(Wavelet MAC/PHY, ISP)

1.2 Block Diagram

Figure- 1 shows a block diagram of the KL5BPLC200WMP.

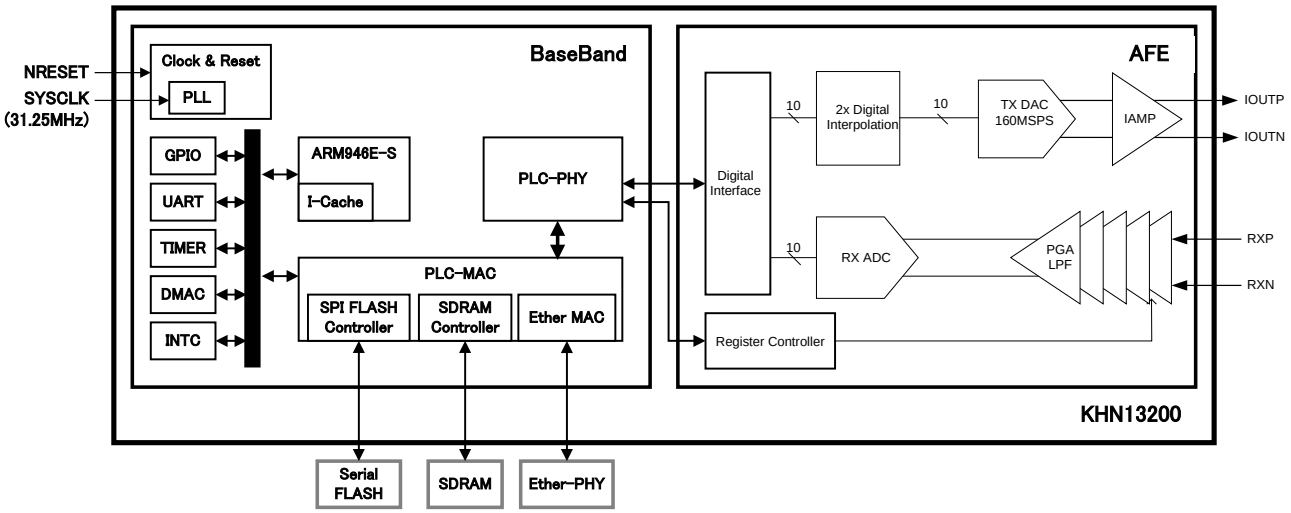

Figure- 1 KL5BPLC200WMP Block Diagram

2 Pins

2.1 Pin Assignments

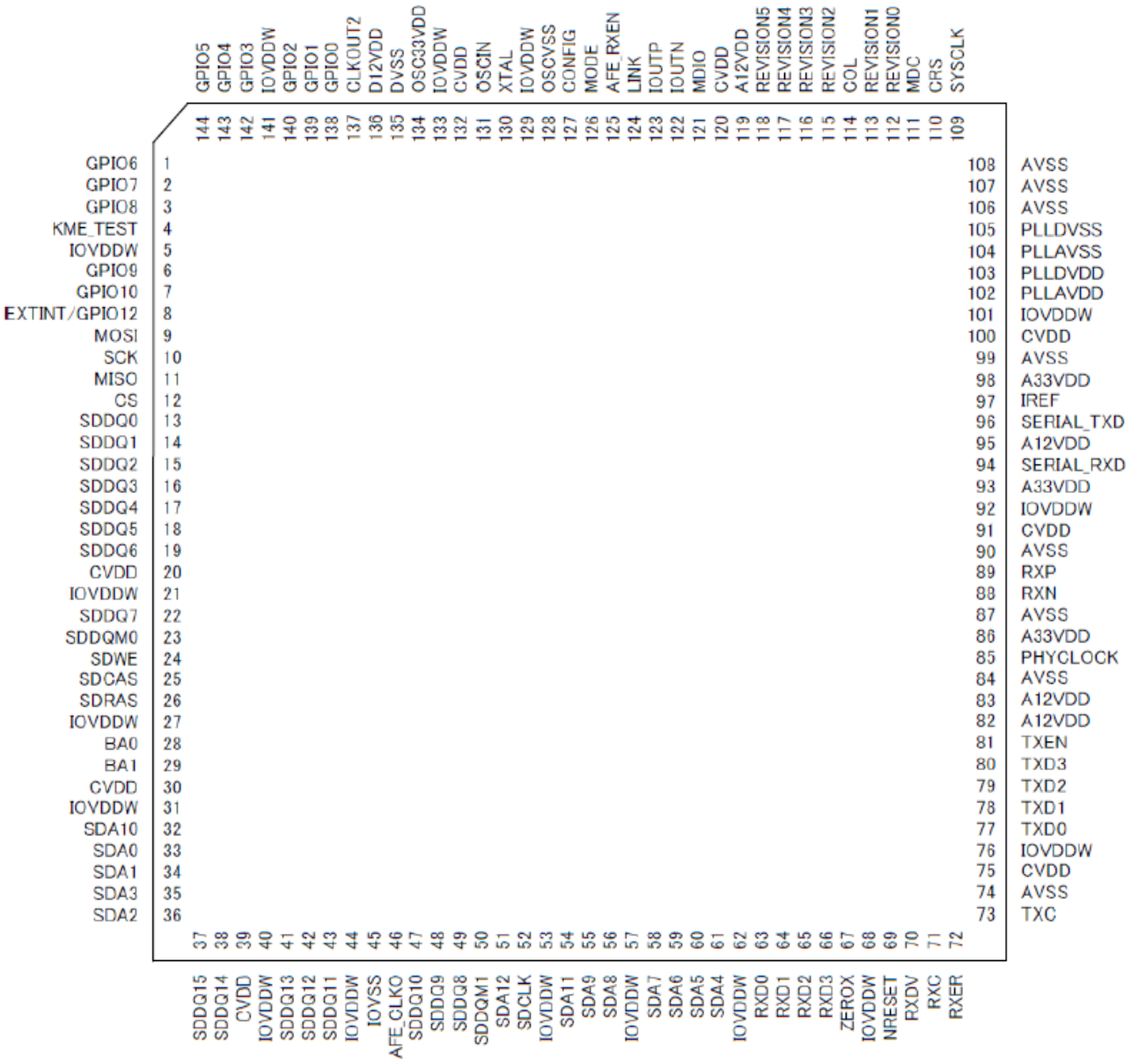

Figure- 2 Pin Assignment

3 Operating Conditions

3.1 Absolute Maximum Ratings

Table- 1 shows absolute maximum ratings.

Table- 1 Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
External supply IO voltage	V_{IOVDDW}	-0.3 to 4.0	V
External supply Analog voltage	V_{A33VDD}	-0.3 to 4.0	V
External supply Analog voltage	$V_{OSC33VDD}$	-0.3 to 4.0	V
Internal supply voltage for BaseBand	V_{CVDD}	-0.3 to 1.32	V
Internal supply voltage for AFE (Analog Part)	V_{A12VDD}	-0.3 to 1.6	V
Internal supply voltage for AFE (Digital Part)	V_{D12VDD}	-0.3 to 1.6	V
Input pin voltage	V_I	-0.3 to V_{IOVDDW} +0.3	V
Analog Input/Output Voltage RXP,RXN,IREF IOUTP, IOUTN OSCIN, XTAL	 V_{A1} V_{A2} V_{A3}	 -0.3 to V_{A33VDD} +0.3 -0.3 to 6.0 -0.3 to $V_{OSC33VDD}$ +0.3	 V V V
Output current (2mA)	I_O	-5.2/+15.9	mA
Output current (4mA)	I_O	-10.6/+31.7	mA
Output current (8mA)	I_O	-21.2/+63.4	mA
Power dissipation	P_D	700	mW
Storage temperature	T_{stg}	-55 to 125	°C

Note:

- *The absolute maximum ratings are the limit values beyond which the IC may be damaged. Operation is not guaranteed under these conditions.*
- *Directly connect all VDD pins to external power supplies and ground all VSS pins.*
- *Ensure that the junction temperature (Tj) is 125°C or less during use.*

3.2 Recommended Operating Conditions

Table- 2 shows recommended operating conditions.

Table- 2 Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
External supply voltage	V_{IOVDDW} V_{A33VDD} $V_{OSC33VDD}$	---	3.1	3.3	3.5	V
Internal supply voltage	V_{CVDD} V_{A12VDD} V_{D12VDD}	---	1.1	1.2	1.3	V
Operating package surface temperature	T_C	Tj = 125°C	-40	---	85	°C

4 Package

Figure- 3 shows the package outline of KL5BPLC200WMP (Exposed TQFP-144 pins).

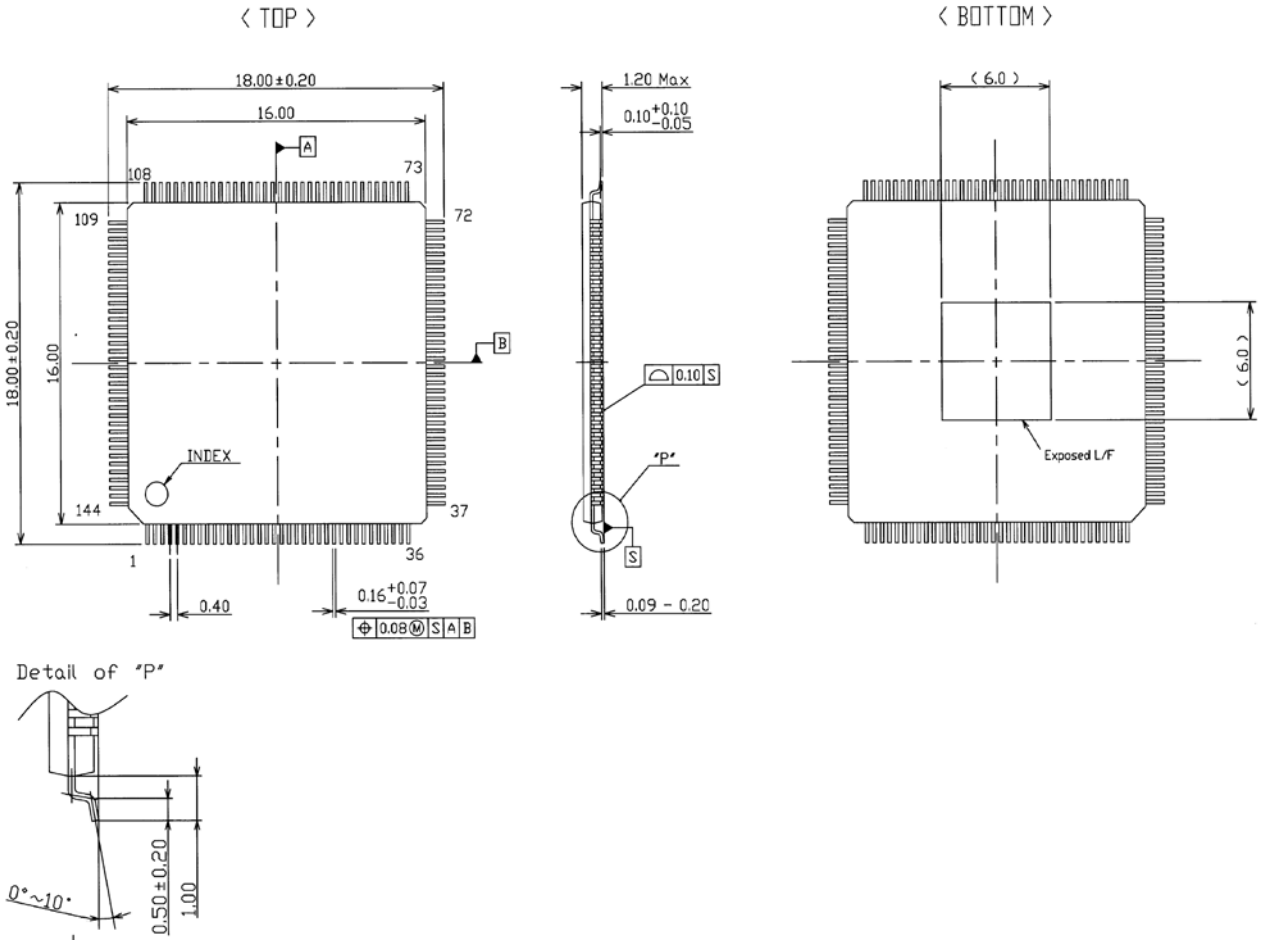

Figure- 3 KL5BPLC200WMP package outline (Exposed TQFP-144 pins)

5 Ordering Information

Part Number: KL5BPLC200WMP

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