

RTL8305NB



Single-Chip 5-Port 10/100Mbps Ethernet Switch Controller

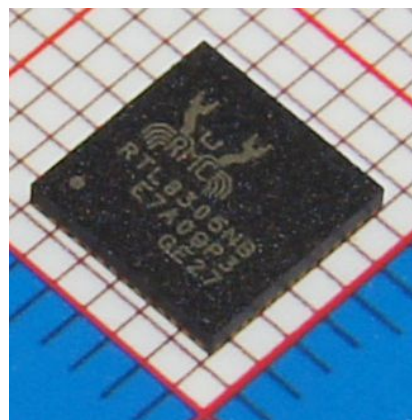
General Description

The RTL8305NB is a 5-port 10/100M Ethernet switch controller that integrates memory, five MACs, and five physical layer transceivers for 10Base-T and 100Base-TX operation into a single chip.

In order to accomplish diagnostics in complex network systems, the RTL8305NB provides a loopback feature in each port.

The RTL8305NB supports several advanced QoS functions with four-level priority queues to improve multimedia or real-time networking applications, including:

- Multi-priority assignment
- Differential queue weight
- Port-based rate limitation
- Queue-based rate limitation



The RTL8305NB supports 16 VLAN groups. These can be configured as port-based VLANs and/or 802.1Q tag-based VLANs. The RTL8305NB also supports VLAN learning, with four Independent VLAN Learning (IVL) filtering databases.

The RTL8305NB contains a 2K-entry address lookup table. A 4-way associative hash algorithm avoids hash collisions and maintains forwarding performance.

Maximum packet length can be 2048 bytes. Three types of independent storm filter are provided to filter packet storms, and an intelligent switch engine prevents Head-of-Line blocking problems.

The RTL8305NB supports Energy-Efficient Ethernet mode (EEE; defined in IEEE 802.3az) to minimize system power consumption. Energy-Efficient Ethernet (EEE) supports Low Power Idle Mode. When Low Power Idle Mode is enabled, systems on both sides of the link can disable portions of the functionality and save power during periods of low link utilization.

To simplify the peripheral power circuit, the RTL8305NB integrates one LDO regulator to generate 1.0V from a 3.3V input power, and needs only one external diode.

Features

Basic Switching Functions

- 5-port switch controller with memory and transceiver for 10Base-T and 100Base-TX
- Non-blocking wire-speed reception and transmission and non-head-of-line-blocking forwarding
- Complies with IEEE 802.3/802.3u auto-negotiation
- Built-in high efficiency SRAM for packet buffer, with 2K-entry lookup table and two 4-way associative hash algorithms
- 2048 byte maximum packet length
- Flow control fully supported
 - Half duplex: Back pressure flow control
 - Full duplex: IEEE 802.3x flow control

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Service Quality

- Supports high performance QoS function on each port
 - Supports 4-level priority queues
 - Weighted round robin service
 - Supports strict priority
 - Input/Output port bandwidth control
 - Queue-based bandwidth control
 - 1Q-based, Port-based, DSCP-based, IP address-based, and other types of priority assignments
- Supports IEEE 802.1p Traffic Remarking

Security and Management

- Supports reserved control frame filtering
- Supports advanced storm filtering
- Built-in high efficiency SRAM for packet buffer, with 2K-entry lookup table and two 4-way associative hash algorithms

VLAN Functions

- Supports up to 16 VLAN groups
- Flexible 802.1Q port/tag-based VLAN
- Supports four IVLs
- Leaky VLAN for unicast/multicast/broadcast/ARP packets

Power Saving Functions

- Supports Energy-Efficient Ethernet (EEE) function (IEEE 802.3az)
- Link Down Power Saving Mode

Diagnostic Functions

- Supports hardware loop detection function with LEDs and buzzer to indicate the existence of a loop
- Supports cable diagnosis (RTCT function)
- Flexible LED indicators
 - RTCT status indication
 - Loop status indication
 - Link Down Power Saving Mode

Other Features

- Optional MDI/MDIX auto crossover for plug-and-play
- Physical layer port Polarity Detection and Correction function
- Robust baseline wander correction for improved 100Base-TX performance
- 25MHz crystal or 3.3V OSC input
- Single 3.3V power input can be transformed by integrating an LDO regulator to generate 1.0V from 3.3V via a low-cost external diode
- Low power, 1.0/3.3V, 55nm CMOS technology
- 48-pin QFN 'Green' package