NS610 — Entry-Level SOHO Switch SoC Product Overview

Overview

The NS610 is a chip in an LQFP-128 package featuring 5+2 port 10/100/1000M Ethernet switching capabilities. It integrates five low-power Gigabit PHYs, supporting 1000Base-T / 100Base-TX / 10Base-T. It also provides two RGMII/MII interfaces for connecting external PHYs or a CPU. An internal high-performance RISC-V SoC management core handles switch control and various protocol processing. It operates from a 25MHz crystal oscillator clock source and supports configuration management via EEPROM/FLASH or I2C/SPI/MDC-MDIO interfaces.

Key Features

Basic Specifications

- Package: LQFP-128, Operating Temperature 0°C to 70°C (Commercial grade)
- Clock Source: 25MHz crystal oscillator or external oscillator input
- Switching Capacity: ⩾ 10 Gbps, non-blocking wire-speed forwarding

Ports and Interfaces

- Integrated 5 low-power Gigabit PHYs, 1000Base-T / 100Base-TX / 10Base-T, auto-negotiation and crossover detection support
- 2 GMAC interfaces, connectable to external PHY or CPU
- 2 sets of RGMII / MII / RMII interfaces, flexible connection to external MAC, PHY, or microcontroller

Switching and Network Features

- MAC Address Table: 2K entries, dynamic learning and static configuration support
- Jumbo Frame: 9KB / 10KB support
- VLAN: 802.1Q VLAN (up to 16 active VLANs), Port-based VLAN support
- QoS: 4 priority queues, SP/WRR scheduling, Port/802.1p/DSCP based classification
- ACL: MAC and IP Access Control Lists (up to 64 rules)
- Multicast: IGMP Snooping v1/v2/v3
- Spanning Tree: STP (802.1D) and RSTP (802.1w)
- Loop Detection: Hardware detection with port block/shutdown protection

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- Port Mirroring: 1:1 or N:1 mirroring
- Link Aggregation: Static port aggregation (up to 2 groups)

Security and Management

- 802.1X port authentication, MAC address filtering
- Broadcast/Unknown Unicast/Multicast storm control
- Management Interfaces: MDC/MDIO, I2C, SPI slave interface
- Configuration Methods: External EEPROM/FLASH or management interfaces

Power Saving and Reliability

- IEEE 802.3az EEE (Energy-Efficient Ethernet)
- Green Ethernet: Auto-adjusts power consumption based on cable length detection
- Low-power idle mode support

Target Applications

SOHO Switch

Home Router/Gateway

Small Enterprise Network Equipment

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