

RZ/N-1S REAL-TIME INDUSTRIAL ETHERNET (LOW-END VERSION) EU013

08-2019

1V02

RZ/N1S Real-Time Industrial Ethernet (Low-end version)

Overview

Customers in the industrial arena often require **Realtime Ethernet Solutions**, also called **Industrial Ethernet**.

Common standards in these industries are Ethercat, Powerlink, Sercos III, ProfiNet, Modbus TCP and others.

For Low Cost Industrial Ethernet switch or similar setup with less calculation power requirements the **RZ/N1S** is a perfect fit because of its high integration, calculation power, rich interfaces and integrated 6MB RAM. Also the integrated Cortex[®] M3 based **R-In engine** offloads the Cortex[®] A7 main core by working as a dedicated Gigabit Ethernet hardware RTOS / accelerator. External Flash memory can be attached by using a dedicated, second QSPI interface.

A typical setup for such Low Cost Industrial Ethernet Switch, besides RZ/N1S requires basically only up to five Ethernet PHYs and the power supply.

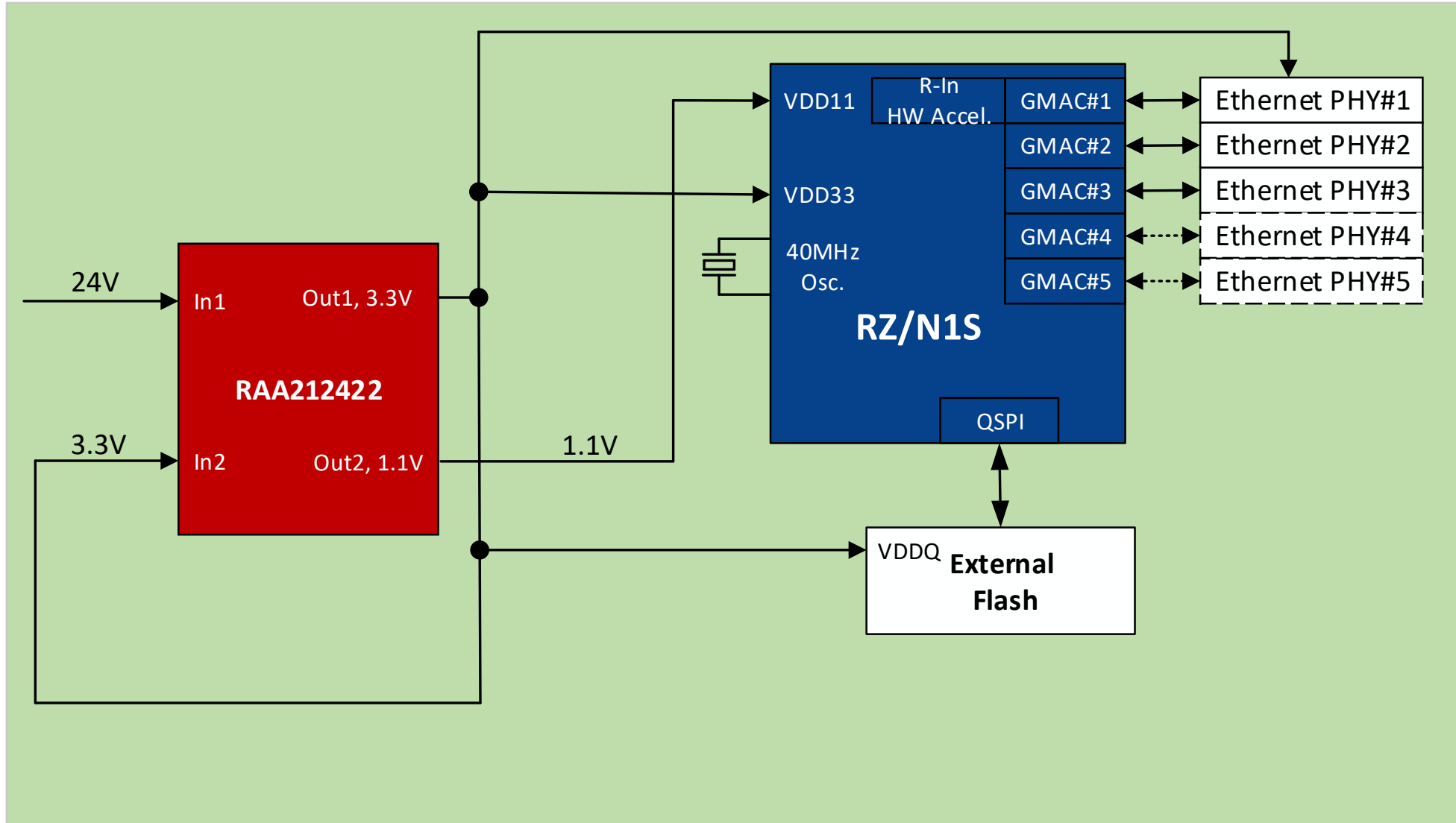
To power this setup, two precise power rails are required. These can easily be achieved by using our highly integrated, **RAA212422** as a perfect fit, as it provides both power levels in one chip, and the complete solution has a small PCB footprint by its integrated MOSFETs. So finally, only this one power-supply chips is needed in total.

Key Features:

- Highly integrated low cost Industrial Ethernet (switch) solution with R-In offload engine / HW accelerator
- Easy to use, high efficiency dual in/out DCDC converter, providing all required voltages
- Low BOM count and small PCB space

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Power Supply



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Summary

Device Category	P/N	Key Features
MCU	RZ/N1S	Industrial Ethernet MPU Cortex® A7 + Cortex® M3 with large integrated RAM (6MB) and QSPI for external Flash
Power	RAA212422	Dual channel 40V / 1.1A and 5.5V / 1.5A synchronous buck regulators

Block Diagram #EU013
September, 2019

RZ/N1S Industrial Ethernet MPU

Cortex® A7 + Cortex® M3

500 MHz Cortex®-A7 + R-IN Engine 125 MHz Cortex®-M3

- Proven R-IN engine as HW accelerator for Industrial Ethernet communication
- Internal oscillator for 40MHz crystal, i.e. no external clock required

6MB SRAM integrated

- Additional RAM can be attached by QSPI, but in many cases not needed

Integrated up to 5 port Ethernet Switch

External Storage interface

- 2x QSPI, 2x SDIO/eMMC
- Several storage devices can be chosen based on application requests

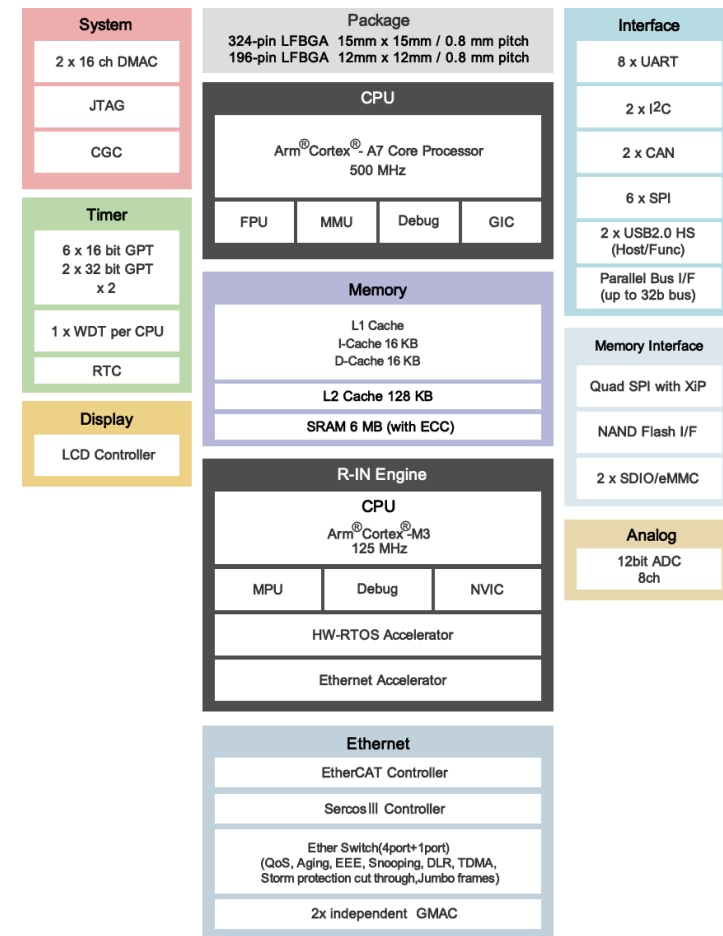
LCD controller, Multiple Timers, RTC

Rich interfaces:

- up to 2x USB2.0, 2x CAN, 8x UART, 6x SPI etc.

Temperature range -40..+110°C

Name	P/N	Package	PRP IEC62439-3
RZ/N1D	R9A06G033VGBA	196BGA	--
	R9A06G033NGBG	324BGA	PRP compliant



RAA212422

Dual channel 40V 1.1A and 5.5V 1.5A synchronous buck regulators

Dual Channel Buck Regulator

- Offers design flexibility
- Allows the usage of 12V and 24V ACDCs

High Integration, Internal high-/ and low-side MOSFETs

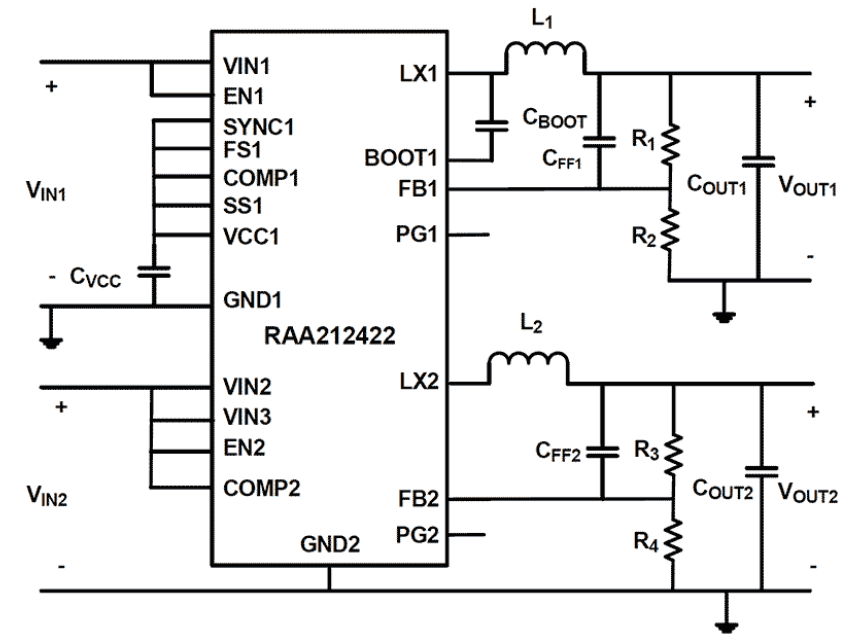
- Small solution size

Switching Frequency up to 2 MHz

- Smaller passive components, thus solution size
- Better transient response

Internal/External compensation

- Design simplicity and flexibility



Part #	VIN	IOUT	Package
RAA2124224GN	3V to 40V 2.7V to 5.5V	1.1A 1.5A	3 x 6mm, QFN22

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