



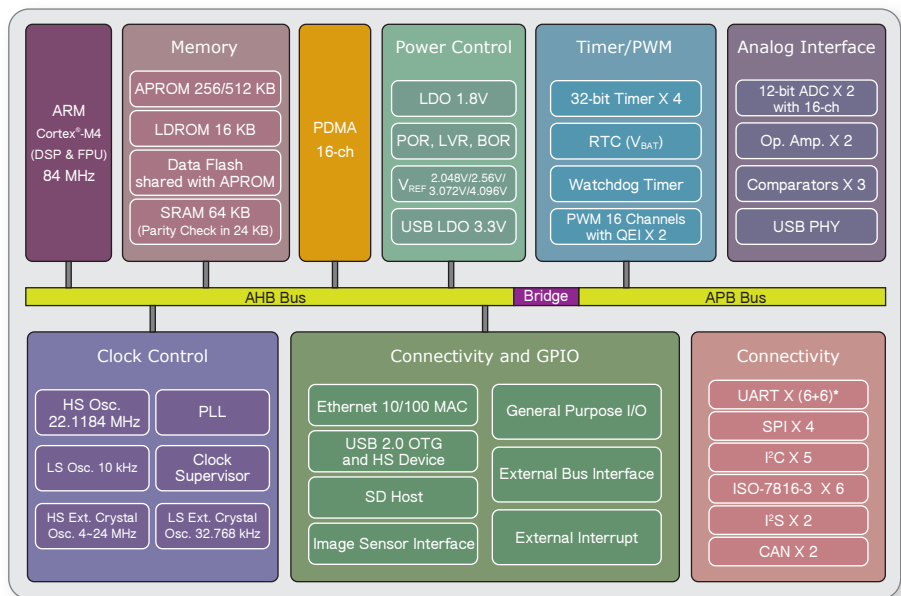
Nuvoton NuMicro™ Family

NuMicro™ NUC472 Series

High Connectivity Cortex®-M4 Ethernet MCU with CAN and USB OTG/HS Device

Applications

- ◆ Industrial Automation
- ◆ Home Automation
- ◆ Home Appliances
- ◆ Security System
- ◆ Motor Control



*Marked in the block diagram (6+6) means 6 UART + 6 ISO-7816 UART

Selection Guide

| Part No. | Flash (Kbytes) | SRAM (Kbytes) | ISP ROM (Kbytes) | PDMA | I/O | Timer (32-bit) | Connectivity | | | | | | EBI | I ² S | Ethernet MAC | USB OTG | USB Device | PWM (16-bit) | QE1 | Analog Comp. | OP Amp. | ADC (12-bit) | RTC (V _{BAT}) | Crypto | ISO- 7816-3* | ICP ISP IAP | Package | Operating Temp. Range(°C) |
|---------------------------------|-------------------|------------------|------------------------|------|-----|-------------------|--------------|-----|------------|------------------|-----|-----|-----|------------------|-----------------|------------|---------------|-----------------|-----|-----------------|------------|-----------------|----------------------------|--------|-----------------|-------------------|---------|---------------------------------|
| | | | | | | | UART* | SPI | SD Host | I ² C | CAN | LIN | | | | | | | | | | | | | | | | |
| NuMicro™ NUC472 Advanced Series | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NUC472VI8AE | 512 | 64 | 16 | 16 | 77 | 4 | 6+5 | 4 | √ | 5 | 2 | 6 | √ | 2 | √ | FS | HS | 16 | 2 | 3 | - | x2, 16-ch | √ | √ | 5 | √ | LQFP100 | -40 to +105 |
| NUC472VG8AE | 256 | 64 | 16 | 16 | 77 | 4 | 6+5 | 4 | √ | 5 | 2 | 6 | √ | 2 | √ | FS | HS | 16 | 2 | 3 | - | x2, 16-ch | √ | √ | 5 | √ | LQFP100 | -40 to +105 |
| NUC472KI8AE | 512 | 64 | 16 | 16 | 101 | 4 | 6+6 | 4 | √ | 5 | 2 | 6 | √ | 2 | √ | FS | HS | 16 | 2 | 3 | 2 | x2, 16-ch | √ | √ | 6 | √ | LQFP128 | -40 to +105 |
| NUC472KG8AE | 256 | 64 | 16 | 16 | 101 | 4 | 6+6 | 4 | √ | 5 | 2 | 6 | √ | 2 | √ | FS | HS | 16 | 2 | 3 | 2 | x2, 16-ch | √ | √ | 6 | √ | LQFP128 | -40 to +105 |
| NUC472JI8AE | 512 | 64 | 16 | 16 | 114 | 4 | 6+6 | 4 | √ | 5 | 2 | 6 | √ | 2 | √ | FS | HS | 16 | 2 | 3 | 2 | x2, 16-ch | √ | √ | 6 | √ | LQFP144 | -40 to +105 |
| NUC472JG8AE | 256 | 64 | 16 | 16 | 114 | 4 | 6+6 | 4 | √ | 5 | 2 | 6 | √ | 2 | √ | FS | HS | 16 | 2 | 3 | 2 | x2, 16-ch | √ | √ | 6 | √ | LQFP144 | -40 to +105 |
| NUC472HI8AE | 512 | 64 | 16 | 16 | 144 | 4 | 6+6 | 4 | √ | 5 | 2 | 6 | √ | 2 | √ | FS | HS | 16 | 2 | 3 | 2 | x2, 16-ch | √ | √ | 6 | √ | LQFP176 | -40 to +105 |
| NUC472HG8AE | 256 | 64 | 16 | 16 | 144 | 4 | 6+6 | 4 | √ | 5 | 2 | 6 | √ | 2 | √ | FS | HS | 16 | 2 | 3 | 2 | x2, 16-ch | √ | √ | 6 | √ | LQFP176 | -40 to +105 |

*Marked in the table (6+5) means 6 UART+ 5 ISO-7816 UART

*ISO-7816 UART supports full duplex mode

LQFP64*: 7x7mm

Contact us: NuMicro@nuvoton.com

❖ Features of NuMicro™ NUC472 Series

◆ Core

- ARM® Cortex®-M4F core running up to 84 MHz
- Supports DSP extensions
- IEEE 754 compliant Floating-point Unit (FPU)
- Supports Memory Protection Unit (MPU)

◆ On-chip LDO for wide operating voltage from 2.5 V to 5.5 V

◆ Flash Memory

- 256/512 Kbytes Flash memory
- 16 Kbytes Flash for loader

◆ SRAM

- 64 Kbytes embedded SRAM
- 24 Kbytes SRAM with hardware parity check

◆ PDMA (Peripheral DMA)

- 16 independent configurable channels for automatic data transfer between memories and peripherals
- Normal and Scatter-Gather Transfer mode

◆ Clock Control

- 22.1184 MHz internal high speed RC oscillator (variation < 2% at -40°C ~ +105°C)
- 10 kHz Internal low speed RC oscillator
- On-chip 4~24 MHz high speed oscillator
- On-chip 32.768 kHz low speed oscillator
- Clock failure detection for system clock

◆ GPIO

- Four I/O modes
- Up to 144 GPIOs

◆ Four Timers

◆ Watchdog Timer

◆ Window Watchdog Timer

◆ RTC

- 96 bytes backup registers
- External power input pin (V_{BAT})
- Supports tamper detection function with up to two input pins

◆ PWM

- Up to two 6 channels PWM outputs with 16-bit resolution
- Dead zone and brake function
- Independent, complementary, synchronized and group PWM output mode
- 12 Capture input channels with 16-bit resolution

◆ EPWM (Enhanced PWM)

- Up to two EPWMs

◆ Quadrature Encoder Interface (QEI)

- Up to two QEI controllers

◆ Enhanced Input Capture Timer

- Up to two Input Capture Timers/Counter Units

◆ UART

- Up to six UART controllers with flow control, IrDA (SIR) and LIN function

◆ Smart Card Interface

- Up to six ISO-7816-3 ports
- UART function

◆ SPI

- Up to four sets of SPI controllers
- Master or Slave mode operation
- 2-bit Dual and Quad I/O Transfer mode
- Master up to 32 MHz, and Slave up to 16 MHz (at 5V)

◆ I²C

- Up to five sets of I²C devices
- Supports speed up to 1 Mbps

◆ I²S

- Up to two I²S interfaces
- Master and Slave mode

◆ CAN 2.0

- Up to two CAN controllers
- CAN protocol version 2.0 part A and B
- Bit rates up to 1M bit/s
- Supports power-down wake-up function

◆ USB 2.0 Controller

- One set of USB 2.0 FS Device/Host/OTG or USB 2.0 HS Device
- On-chip USB Transceiver
- On-chip 5V to 3.3V LDO for USB PHY

◆ EBI

- Supports accessible space up to 256 Mbytes
- 8-/16-bit data width

◆ Image Sensor Interface

- CCIR601 & CCIR656 interfaces
- Resolution up to 3M pixel
- YUV422 and RGB565 color format
- YUV422, RGB565, RGB555 and Y-only color format

◆ ADC

- Up to two 12-bit ADCs
- External V_{REF} pin
- Up to 16 external single-ended analog input channels
- Up to 6 differential analog input pairs
- Up to 1 MSPS conversion rate for each ADC

◆ Two Analog Comparators

◆ Two Operational Amplifiers

◆ Cryptographic Accelerator

- Supports hardware TDES, AES, SHA accelerators

◆ Random Number Generator

◆ Cyclic Redundancy Calculation Unit

◆ Ethernet 10/100 MAC

- Compliant with IEEE 802.3-2002
- MII and RMII interface
- IEEE 1588 v2

◆ SD Host Interface

- SD (Secure Digital) card and SD Host interface
- Compliant with SD Memory Card Specification Version 2.0
- Compliant with SD IO Card Specification Version 2.0
- Supports 1 and 4-bit modes

◆ Supports 96-bit Unique ID and 128-bit Unique Customer ID

◆ Operating Temperature: -40°C ~ +105°C

◆ Packages

- All Green package (RoHS)
- LQFP 176-pin/ 144-pin/ 128-pin/ 100-pin