



Nuvoton NuMicro™ Family

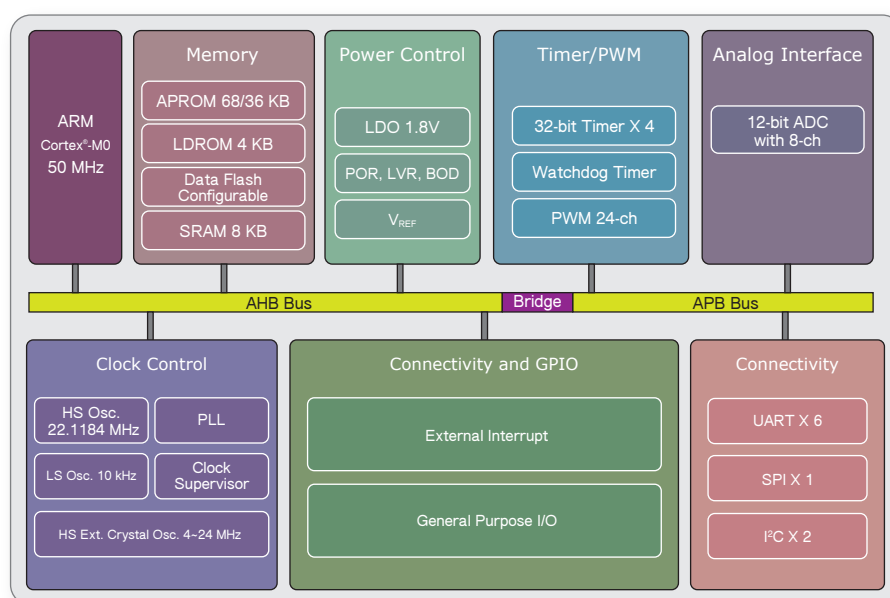
## NuMicro™ M0518 Series



Powerful Cortex®-M0 MCU  
with 6 UARTs and 24 PWMs

### Applications

- ◆ Dimming Control
- ◆ Multi-Communication System
- ◆ Industrial and Auto-control
- ◆ Motor Control



### Selection Guide

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash	ISP ROM (Kbytes)	I/O	Timer (32-bit)	Connectivity				PWM (16-bit)	ADC (12-bit)	ICP ISP IAP	IRC 22 MHz	Package	Operating Temp. Range(°C)
							UART	SPI	I²C	LIN						
NuMicro™ M0518 Series																
M0518LC2AE	36	8	Configurable	4	42	4	6	1	2	3	24	8	√	√	LQFP48	-40 to +105
M0518LD2AE	68	8	Configurable	4	42	4	6	1	2	3	24	8	√	√	LQFP48	-40 to +105
M0518SC2AE	36	8	Configurable	4	56	4	6	1	2	3	24	8	√	√	LQFP64*	-40 to +105
M0518SD2AE	68	8	Configurable	4	56	4	6	1	2	3	24	8	√	√	LQFP64*	-40 to +105

LQFP64\*: 7x7mm

Contact us: NuMicro@nuvoton.com

## ❖ Features of NuMicro™ M0518 Series

### ◆ ARM® Cortex®-M0 Core

- Runs up to 50 MHz
- One 24-bit system timer
- Single-cycle 32-bit hardware multiplier
- NVIC for the 32 interrupt inputs, each with 4-levels of priority
- Serial Wire Debug supports with 2 watchpoints/4 breakpoints

### ◆ Operating Voltage: 2.5 V ~ 5.5 V

### ◆ Memory

- 36/68 Kbytes Flash for program memory (APROM)
- 4 Kbytes Flash for ISP loader (LDRM)
- In-System-Program (ISP) and In-Application-Program (IAP) application code update
- 2-wired ICP update through SWD/ICE interface
- Supports fast parallel programming mode by external programmer

### ◆ SRAM

- 8 Kbytes SRAM

### ◆ Clock Control

- Built-in 22.1184 MHz high speed oscillator for system operation
  - Trimmed to  $\pm 1\%$  at  $+25^{\circ}\text{C}$  and  $V_{DD} = 5\text{ V}$
  - Trimmed to  $\pm 3\%$  at  $-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$  and  $V_{DD} = 2.5\text{ V} \sim 5.5\text{ V}$
- Built-in 10 kHz low speed oscillator for Watchdog Timer and Wake-up operation
- Supports one PLL, up to 50 MHz, for high performance system operation
- External 4~24 MHz high speed crystal input

### ◆ GPIO

- Four I/O modes:
  - Quasi-bidirectional
  - Push-pull output
  - Open-drain output
  - Input only with high impedance
- TTL/Schmitt trigger input selectable
- I/O pin configured as interrupt source with edge/level setting

### ◆ Timer

- Four sets of 32-bit timers with 24-bit up-timer and one 8-bit prescale counter
- Independent clock source for each timer
- One-shot, Periodic, Toggle and Continuous Counting operation modes
- Event counting function and input capture function

### ◆ WDT

- Multiple clock sources:
  - System clock (HCLK)
  - Internal 10 kHz oscillator (LIRC)
- 8 selectable time-out period from 1.6 ms ~ 26.0 sec (depending on clock source)
- Wake-up from Power-down or Idle mode
- Interrupt or reset selectable on watchdog time-out

### ◆ WWDT

- 6-bit down counter with 11-bit prescale for wide range window time selection

### ◆ PWM/Capture

- Supports clock frequency up to 100 MHz
- Up to two PWM modules, each providing three 16-bit timers and six output channels
- Independent mode for PWM output/Capture input channels
- Complementary mode for three complementary paired PWM output channel:
  - Dead-time insertion with 12-bit resolution
  - Two compared values during one period
- 12-bit pre-scalar from 1 to 4096
- 16-bit resolution PWM counter
  - Up, down and up/down counter operation type
- Mask function and tri-state enable for each PWM pin
- Supports brake function:
  - Brake source from pin and system safety events (clock failed, Brown-out detection and CPU lockup)
  - Noise filter for brake source from pin
  - Edge detect brake source to control brake state until brake interrupt cleared
  - Level detect brake source to auto recover function after brake condition removed
- Supports interrupt on the following events:
  - PWM counter matches zero, period value or compared value
  - Brake condition happened
- Supports trigger ADC on the following events:
  - PWM counter match zero, period value or compared value
- Up to 12 capture input channels with 16-bit resolution
- Rising edges, falling edges or both edges capture condition
- Input rising edges, falling edges or both edges capture interrupt
- Rising edges, falling edges or both edges capture with counter reload option

### ◆ UART

- Up to six UART controllers
- UART0 and UART1 ports with flow control (TXD, RXD, nCTS and nRTS)
- Auto baud-rate generator

### ◆ SPI

- One set of SPI controller
- SPI Master/Slave mode

### ◆ I<sup>2</sup>C

- Up to two sets of I<sup>2</sup>C devices
- Master/Slave mode

### ◆ ADC

- 12-bit SAR ADC with 1 MSPS
- Up to 8 channels single-end input or 4 channels differential input

### ◆ 96-bit unique ID (UID)

### ◆ Brown-out Detector and Low Voltage Reset

- With 4 levels: 4.4 V/3.7 V/2.7 V/2.2 V
- Brown-out Interrupt and Reset option
- Threshold voltage level: 2.0 V

### ◆ Operating Temperature: $-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$

### ◆ Packages

- All Green package (RoHS)
- LQFP 64-pin / 48-pin