



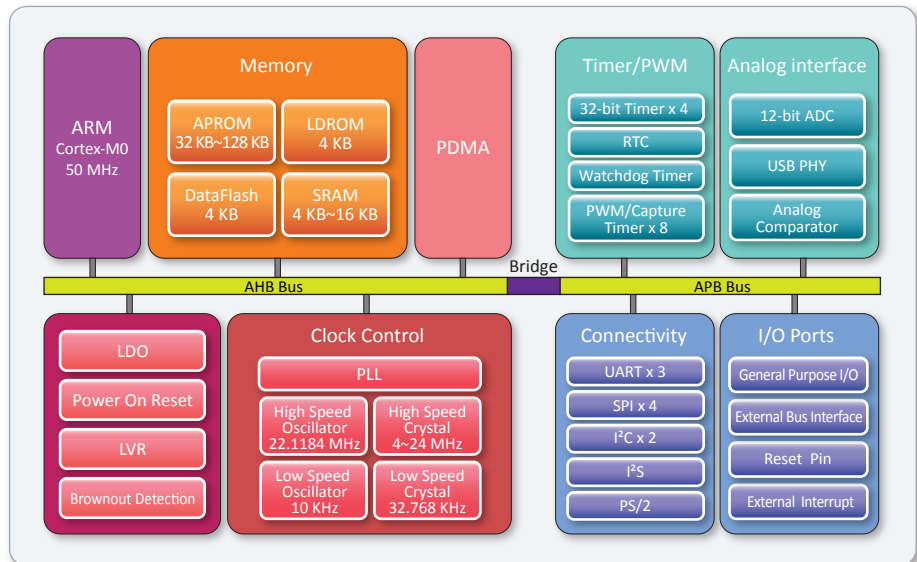
Nuvoton NuMicro™ Family

NuMicro™ NUC120 Series

Multi-connectivity Cortex™-M0 USB device MCU

» Applications

- ◆ Security Alarm System
- ◆ Industrial Control
- ◆ Communication System
- ◆ USB Device Application
- ◆ General Purpose Control



» Selection Guide

Part No.	Flash	SRAM	Data Flash	ISP Loader ROM	I/O	Timer	Connectivity						I ² S	Comp.	PWM	ADC	RTC	EBI	ISP ICP	IRC 22MHz	PDMA	Package
							UART	SPI	I ² C	USB	LIN	CAN										
Low Density																						
NUC120LC1BN	32K	4K	4K	4K	up to 31	4x32-bit	2	1	2	1	-	-	1	1	4	8x12-bit	v	-	v	v	1	LQFP48
NUC120LD1BN	64K	4K	4K	4K	up to 31	4x32-bit	2	1	2	1	-	-	1	1	4	8x12-bit	v	-	v	v	1	LQFP48
NUC120LD2BN	64K	8K	4K	4K	up to 31	4x32-bit	2	1	2	1	-	-	1	1	4	8x12-bit	v	-	v	v	1	LQFP48
NUC120RC1BN	32K	4K	4K	4K	up to 45	4x32-bit	2	2	2	1	-	-	1	2	4	8x12-bit	v	v	v	v	1	LQFP64
NUC120RD1BN	64K	4K	4K	4K	up to 45	4x32-bit	2	2	2	1	-	-	1	2	4	8x12-bit	v	v	v	v	1	LQFP64
NUC120RD2BN	64K	8K	4K	4K	up to 45	4x32-bit	2	2	2	1	-	-	1	2	4	8x12-bit	v	v	v	v	1	LQFP64
Medium Density																						
NUC120D3AN	64K	16K	4K	4K	up to 31	4x32-bit	2	1	2	1	-	-	1	1	4	8x12-bit	v	-	v	v	9	LQFP48
NUC120LE3AN	128K	16K	Configurable	4K	up to 31	4x32-bit	2	1	2	1	-	-	1	1	4	8x12-bit	v	-	v	v	9	LQFP48
NUC120RD3AN	64K	16K	4K	4K	up to 45	4x32-bit	2	2	2	1	-	-	1	2	6	8x12-bit	v	-	v	v	9	LQFP64
NUC120RE3AN	128K	16K	Configurable	4K	up to 45	4x32-bit	2	2	2	1	-	-	1	2	6	8x12-bit	v	-	v	v	9	LQFP64
NUC120VD2AN	64K	8K	4K	4K	up to 76	4x32-bit	3	4	2	1	-	-	1	2	8	8x12-bit	v	-	v	v	9	LQFP100
NUC120VD3AN	64K	16K	4K	4K	up to 76	4x32-bit	3	4	2	1	-	-	1	2	8	8x12-bit	v	-	v	v	9	LQFP100
NUC120VE3AN	128K	16K	Configurable	4K	up to 76	4x32-bit	3	4	2	1	-	-	1	2	8	8x12-bit	v	-	v	v	9	LQFP100

Contact us: NuMicro@nuvoton.com

» Features of NUC120 series

◆ Core

- ARM® Cortex™-M0 core runs up to 50 MHz
- One 24-bit system timer
- Support low power sleep mode
- Single-cycle 32-bit hardware multiplier
- NVIC for the 32 interrupt inputs, each with 4-levels of priority
- Support Serial Wire Debug (SWD) interface and 2 watchpoints/4 breakpoints

◆ Memory

- 32K/64K/128K bytes flash memory for program memory (APROM) (128K bytes supports NUC100 Medium Density only)
- 4K bytes flash memory for loader memory (LDROM)
- Configurable data flash address and size for 128K bytes system, fixed 4K bytes data flash (DataFlash) for the 32K bytes and 64K bytes system
- 4K/8K/16K bytes embedded SRAM (16K bytes supports NUC120 Medium Density only)
- Support PDMA mode

◆ Clock Control

- Flexible selection from different clock sources
- Build-in 22.1184 MHz high speed oscillator (trimmed to 1%) for system operation, and low power 10 KHz low speed oscillator for Watchdog timer and Wake-up operation
- Support one PLL, up to 50 MHz, for high performance system operation
- External 4 ~ 24 MHz high speed crystal input for precise timing operation
- External 32.768 KHz low speed crystal input for RTC function and low power system operation

◆ Timers

- Support 4 sets of 32-bit timers with 24-bit up-timer and one 8-bit pre-scale counter
- Independent clock source for each timer
- Provide one-shot, periodic, toggle and continuous counting operation modes (NUC120 Medium Density supports one-shot and periodic mode only)
- Support event counting function (NUC120 Low Density only)

◆ PWM

- Built-in up to four 16-bit PWM generators provide eight PWM outputs or four complementary paired PWM outputs
- Each PWM generator equipped with one clock source selector, one clock divider, one 8-bit pre-scale and one Dead-Zone generator for complementary paired PWM
- Up to eight 16-bit digital capture timers (shared with PWM timers) provide eight rising/falling capture inputs
- Support capture interrupt

◆ ADC

- 12-bit SAR ADC with 600K SPS
- Up to 8-ch single-end input or 4-ch differential input
- Single scan/single cycle scan/continuous scan
- Each channel with individual result register
- Scan on enabled channels
- Threshold voltage detection
- Conversion start by software programming or external input
- Support PDMA mode

◆ Communication Interface

- Maximum 3 UARTs, up to 1 Mbit/s with flow control
- Maximum 4 SPIs, up to 16 MHz (Master@5V), 10 MHz (Slave)
- 2 I²Cs

- Support IrDA (SIR) function
- Support RS485

◆ I²S

- Interface with external audio CODEC
- Operate as either master or slave mode
- Capable of handling 8-, 16-, 24- and 32-bit word sizes
- Support mono and stereo audio data

◆ USB 2.0 Full-Speed Device

- One set of USB 2.0 FS Device 12 Mbps
- On-chip USB Transceiver
- Provide 1 interrupt source with 4 interrupt events
- Support Control, Bulk In/Out, Interrupt and Isochronous transfers
- Provide 6 programmable endpoints
- 512 bytes internal SRAM as USB buffer included
- Provide remote wake-up capability

◆ Analog Comparator

- Up to two analog comparators
- External input or internal bandgap voltage selectable at negative node
- Interrupt when compare result change

◆ RTC

- Support software compensation by setting frequency compensate register (FCR)
- Support RTC counter (second, minute, hour) and calendar counter (day, month, year)
- Support alarm registers (second, minute, hour, day, month, year)

◆ EBI Bus

(External bus interface supports NUC120 Low Density 64-pin package only)

- Accessible space: 64K bytes in 8-bit mode or 128K bytes in 16-bit mode
- Support 8-/16-bit data width
- Support byte write in 16-bit data width mode

◆ Brownout Detector

- With 4 levels: 4.5V / 3.8V / 2.7V / 2.2V
- Support brownout interrupt and reset option

◆ GPIOs

- Up to 80 general-purpose I/O (GPIO) pins
- Four I/O modes:
 - Quasi bi-direction
 - Push-Pull output
 - Open-Drain output
 - Input only with high impedance
- TTL/Schmitt trigger input selectable
- All GPIO pins can be configured as interrupt source with edge/level setting

◆ Built-in LDO for Wide Operating Voltage Range

- 2.5V to 5.5V

◆ Operating Temperature

- -40°C ~ 85°C

◆ Packages (RoHS)

- LQFP48 (7x7mm)
- LQFP64 (10x10mm)
- LQFP100 (14x14mm)