



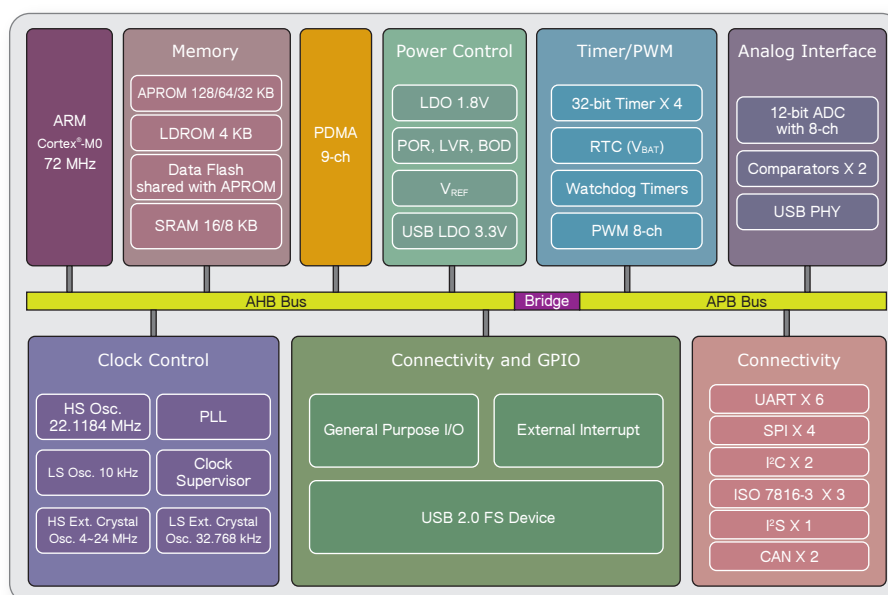
Nuvoton NuMicro™ Family

NuMicro™ NUC230/240 Series

Dual CAN 2.0B Support - NUC230/240 Series

Applications

- ◆ Car Network Control
- ◆ Vehicle Electronic Diagnostic
- ◆ Embedded Network Application
- ◆ Elevator Network Control System
- ◆ Industrial and Auto-control



Selection Guide

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer (32-bit)	Connectivity						I ² S	PWM (16-bit)	ADC (12-bit)	Comp.	RTC	PDMA	ISO- 7816-3*	CRC	RTC (V _{BAT})	ICP ISP IAP	IRC 22 MHz	Package	Operating Temp. Range(°C)
							UART	SPI	I ² C	USB	LIN	CAN													
NuMicro™ NUC230 CAN Series																									
NUC230LC2AE	32	8	4	8	35	4	3+2	1	2	-	3	2	1	4	7	1	✓	9	2	✓	✓	✓	✓	LQFP48	-40 to +105
NUC230LD2AE	64	8	4	8	35	4	3+2	1	2	-	3	2	1	4	7	1	✓	9	2	✓	✓	✓	✓	LQFP48	-40 to +105
NUC230LE3AE	128	16	Configurable	8	35	4	3+2	1	2	-	3	2	1	4	7	1	✓	9	2	✓	✓	✓	✓	LQFP48	-40 to +105
NUC230SC2AE	32	8	4	8	49	4	3+2	2	2	-	3	2	1	6	7	2	✓	9	2	✓	✓	✓	✓	LQFP64*	-40 to +105
NUC230SD2AE	64	8	4	8	49	4	3+2	2	2	-	3	2	1	6	7	2	✓	9	2	✓	✓	✓	✓	LQFP64*	-40 to +105
NUC230SE3AE	128	16	Configurable	8	49	4	3+2	2	2	-	3	2	1	6	7	2	✓	9	2	✓	✓	✓	✓	LQFP64*	-40 to +105
NUC230VE3AE	128	16	Configurable	8	83	4	3+3	4	2	-	3	2	1	8	8	2	✓	9	3	✓	✓	✓	✓	LQFP100	-40 to +105
NuMicro™ NUC240 Connectivity Series																									
NUC240LC2AE	32	8	4	8	31	4	2+2	1	2	1	2	2	1	4	7	1	✓	9	2	✓	✓	✓	✓	LQFP48	-40 to +105
NUC240LD2AE	64	8	4	8	31	4	2+2	1	2	1	2	2	1	4	7	1	✓	9	2	✓	✓	✓	✓	LQFP48	-40 to +105
NUC240LE3AE	128	16	Configurable	8	31	4	2+2	1	2	1	2	2	1	4	7	1	✓	9	2	✓	✓	✓	✓	LQFP48	-40 to +105
NUC240SC2AE	32	8	4	8	45	4	3+2	2	2	1	3	2	1	4	7	2	✓	9	2	✓	✓	✓	✓	LQFP64*	-40 to +105
NUC240SD2AE	64	8	4	8	45	4	3+2	2	2	1	3	2	1	4	7	2	✓	9	2	✓	✓	✓	✓	LQFP64*	-40 to +105
NUC240SE3AE	128	16	Configurable	8	45	4	3+2	2	2	1	3	2	1	4	7	2	✓	9	2	✓	✓	✓	✓	LQFP64*	-40 to +105
NUC240VE3AE	128	16	Configurable	8	79	4	3+3	4	2	1	3	2	1	8	8	2	✓	9	3	✓	✓	✓	✓	LQFP100	-40 to +105

*Marked in the table (3+1) means 3 UART+ 1 ISO-7816 UART
*ISO-7816 UART supports full duplex mode

LQFP64*: 7x7mm

Contact us: NuMicro@nuvoton.com

❖ Features of NuMicro™ NUC230/240 Series

◆ ARM® Cortex®-M0 Core

- Runs up to 72 MHz
- 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

- 32/64/128 KB Flash for program memory (APROM)
- 8 KB Flash for ISP loader (LDROM)
- Supports In-System-Program (ISP) and In-Application-Program (IAP) application code update
- Supports 2-wired ICP update through SWD/ICE interface
- Supports fast parallel programming mode by external programmer

◆ SRAM

- 8/16 KB bytes SRAM
- Supports PDMA mode

◆ PDMA (Peripheral DMA)

- Supports 9 channels PDMA for automatic data transfer between SRAM and peripherals
- Supports CRC calculation with four common polynomials, CRC-CCITT, CRC-8, CRC-16 and CRC-32

◆ 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 $V_{DD} = 2.5\text{ V} \sim 5.5\text{ V}$
- Supports one PLL, up to 72 MHz, for high performance system operation
- External 4~24 MHz high speed crystal input for USB and precise timing operation
- External 32.768 kHz low speed crystal input for RTC function and low power system operation

◆ Timer

- Supports 4 sets of 32-bit timers with 24-bit up-timer and one 8-bit prescale counter
- Independent clock source for each timer
- Provides one-shot, periodic, toggle and continuous counting operation modes
- Supports event counting function
- Supports input capture function

◆ WDT

- Multiple clock sources
 - System clock (HCLK)
 - External 32 kHz crystal (LXT)
 - 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

◆ RTC

- Supports software compensation by setting frequency compensate register (FCR)
- Supports RTC counter (second, minute, hour) and calendar counter (day, month, year)
- Supports battery power pin (V_{BAT})
- Supports wake-up function

◆ PWM/Capture

- Up to four built-in 16-bit PWM generators providing eight PWM outputs or four complementary paired PWM outputs
- Supports PWM trigger ADC to conversion in Center-aligned type
- Supports Capture interrupt

◆ UART

- Up to six UART controllers (three UART controllers are shared with ISO-7816-3 UART mode)
- UART ports with flow control (TXD, RXD, nCTS and nRTS)
- Supports IrDA (SIR) and LIN function
- Supports RS-485 9-bit mode and direction control
- Programmable baud-rate generator up to 1/16 system clock
- Supports PDMA mode

◆ ISO-7816-3 (Smart Card Host, SC)

- Supports up to three ISO-7816-3 ports
 - Compliant to ISO-7816-3 T=0, T=1
- Supports up to three UART ports
 - Full duplex, asynchronous communications
 - Supports receiving / transmitting 4-bytes FIFO

◆ SPI

- Up to four sets of SPI controllers
- Supports SPI Master/Slave mode

◆ I²C

- Up to two sets of I²C devices
- Master/Slave mode

◆ CAN 2.0

- Support two sets of CAN devices
- Supports CAN protocol version 2.0 part A and B
- Bit rates up to 1 Mbps
- 32 Message Objects
- Each Message Object has its own identifier mask
- Programmable FIFO mode (concatenation of Message Object)
- Maskable interrupt
- Disabled Automatic Re-transmission mode for Time Triggered CAN applications
- Supports power down wake-up function

◆ USB 2.0 Full-Speed Device (NUC240 series only)

- One set of USB 2.0 FS Device (12 Mbps)
- On-chip USB Transceiver

◆ ADC

- 12-bit SAR ADC with 800 kSPS
- Up to 8-ch single-end input or 4-ch differential input
- Supports PDMA mode

◆ 96-bit unique ID (UID)

◆ One built-in temperature sensor with 1°C resolution

◆ Brown-out Detector and Low Voltage Reset

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

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

◆ Packages

- All Green package (RoHS)
- LQFP 100-pin / 64-pin / 48-pin