nuvoTon
Joy of innovation

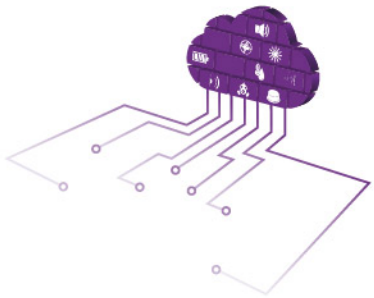
2019 Product Selection Guide

Microcontroller Application

- Cortex®-M23
- Cortex®-M4
- Cortex®-M0
- Arm9™
- 8051

Cloud & Computing

- TPM
- BMC/ EC/ Super IO
- Power Management
  - Power Switch
  - LDO/DDR Regulator
  - Fan, Motor Driver, and PWM Controller



Audio Product

- Audio MCU
- CODEC
- ISD Chip Coder
- Speech

Manufacturing

- HV Foundry Service
- Flat Cell Process
- Embedded Memory, Mixed signal Process

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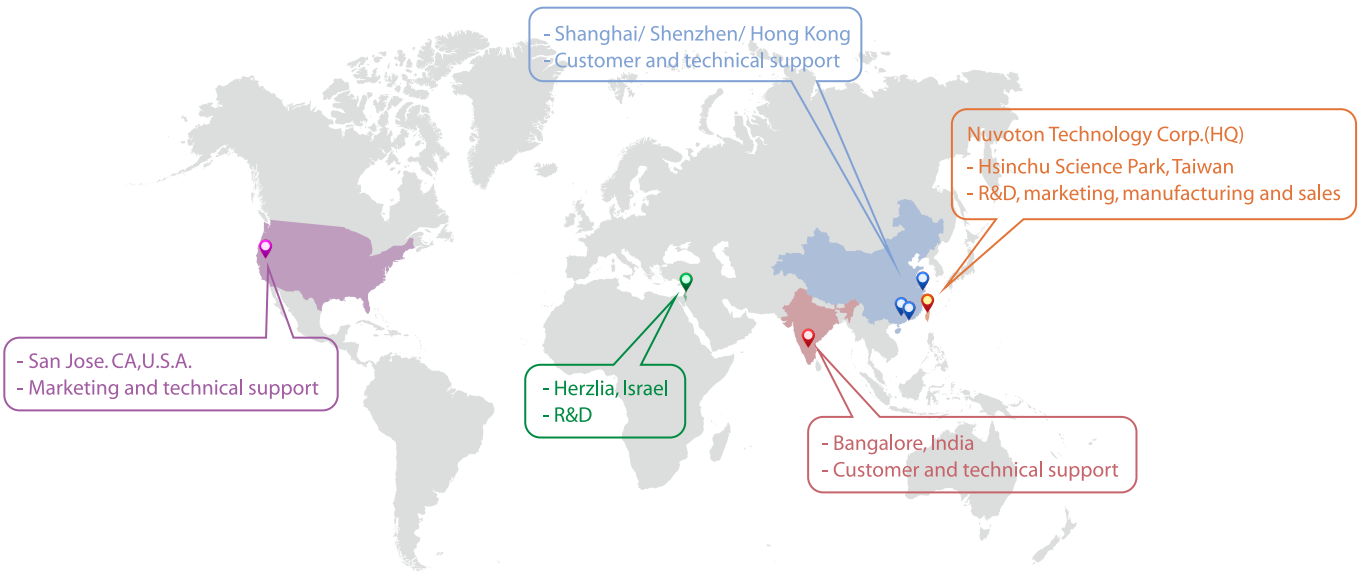
Nuvoton Technology Corporation (NTC) was founded to bring innovative semiconductor solutions to the market. NTC was spun-off as a Winbond Electronics affiliate in July 2008 and went public in September 2010 on the Taiwan Stock Exchange (TSE). Nuvoton Technology focuses on development of microcontroller, analog/mixed signal, cloud and computing products and has strong market share in Industrial, Consumer and Computer markets. Nuvoton owns a wafer fab, featuring customized processes for MCU, analog and power products. Besides in-house IC products, the wafer fab also provides part of its capacity for foundry services. Nuvoton Technology provides products with a high performance/cost ratio for its customers by leveraging flexible technology, advanced design capability and integration of digital and analog technologies. Nuvoton values long term relationships with its partners and customers and is dedicated to continuous innovation of its products, processes and services. The company has established subsidiaries in the USA, China, Israel, and India to strengthen regional customer support and global management. For more information, please visit http://www.nuvoton.com



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Foundry Service	77

Nuvoton Technology Corporation certifies that semiconductor products designated by Nuvoton are compliant with the requirements of the European Union's Restriction on Use of Hazardous Substances ("RoHS") Directive, 2011/65/EU & Commission Delegated Directive (EU) 2015/863.

Microcontrollers

NuMicro® MCU Ecosystem

NuMicro® Family Arm® Cortex®-M23 MCUs

- M2351 Series NEW

NuMicro® Family Arm® Cortex®-M0 MCUs

- Mini51 Series
- M051 Series
- NUC029 Series
- M031 Series NEW
- NUC121 Series
- NUC130 Series
- Nano100 Series
- M251/M252 Series NEW

NuMicro® Family Arm® Cortex®-M4 MCUs

- M451 Series
- M480 Series NEW
- NUC505 Series

NuMicro® Family Arm9 MPUs

- NUC970/NUC980 Series NEW
- N9H Series
- N329 Series

NuMicro® Family 8051 MCUs

- N76E/N79E Series
- MS51 Series NEW
- ML51 Series NEW
- Standard 8051

The NuMicro® Family Ecosystem

• Package Dimension for Arm® Cortex® M0/M4/M23 MCUs

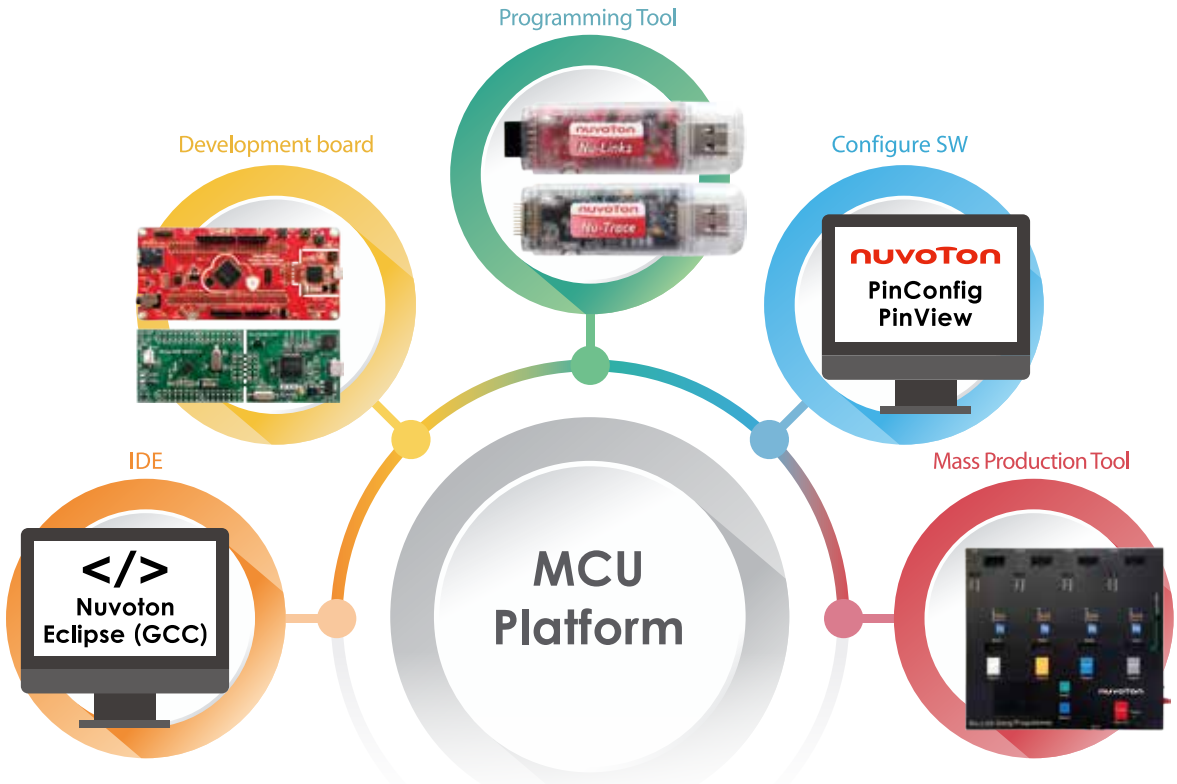
Package Code	Package	Dimension (mm)
F	TSSOP20	4.4x6.5
E	TSSOP28	4.4x9.7
T	QFN33*	4x4
Z	QFN33	5x5
N	QFN48	7x7
L	LQFP48	7x7
S	LQFP64*	7x7
R	LQFP64	10x10
V	LQFP100	14x14
K	LQFP128	14x14
J	LQFP144	20x20
H	LQFP176	24x24

Contact us: SalesSupport@nuvoton.com

nuvoTon Microcontrollers

Nuvoton has been committed to build a customer-oriented MCU ecosystem with rich platform products, evaluation boards, device drivers, BSP, own-developed debugging tools, software development tools, integrated development tools, mass production supporting tools, and operating system software to meet customers' needs from product selection, development, to mass production stages.

Nuvoton provides various development boards, Nu-Link debugger, and ETM-supported Nu-Trace run-time tracing tools to speed up the development time. Software tools include PinConfig for GPIO multi-function pin setting; ClockConfig for clock setting, and PinView for real-time pin status display. For the compiler and integrated development environment, the Nuvoton MCU platform supports Nuvoton Eclipse (GCC), Keil MDK, and IAR Embedded Workbench based on the Windows and Linux to facilitate end products development and debugging. Meanwhile, for mass production, Nuvoton provides Nu-Link-Gang programmer, which can program four target chips with different part numbers to greatly enhance production efficiency and flexibility. The Nuvoton MCU ecosystem includes diverse integrated development environments, development boards, debuggers, visualized graphics development software, and mass production tools. The eco-system brings the best user experience to customers.



NuMicro® Family MCU Platform

Nuvoton's NuMicro® Family MCU platform comprises five product lines: 32-bit Arm® Cortex®-M23, Arm® Cortex®-M0, and Arm® Cortex®-M4 MCUs; Arm9™ MPUs; 8-bit 8051 MCUs, providing a rich portfolio of products to serve various application fields including security system, industrial control, IoT applications, etc.

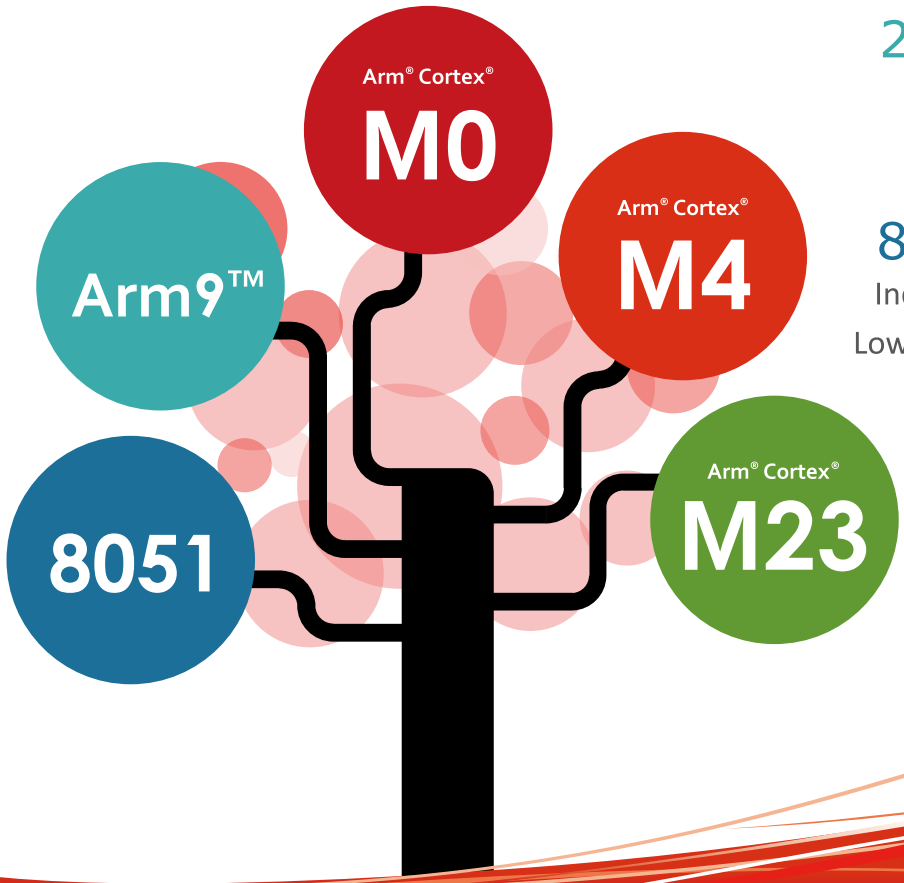
Cortex® M23 — 2016
IoT Security

2012 — **Cortex® M4**
High Performance
Low Power
Security

Cortex® M0 — 2009
High Performance
Low Power

2000 — **Arm 9™**
Industrial
HMI

8051 — 1992
Industrial
Low Power

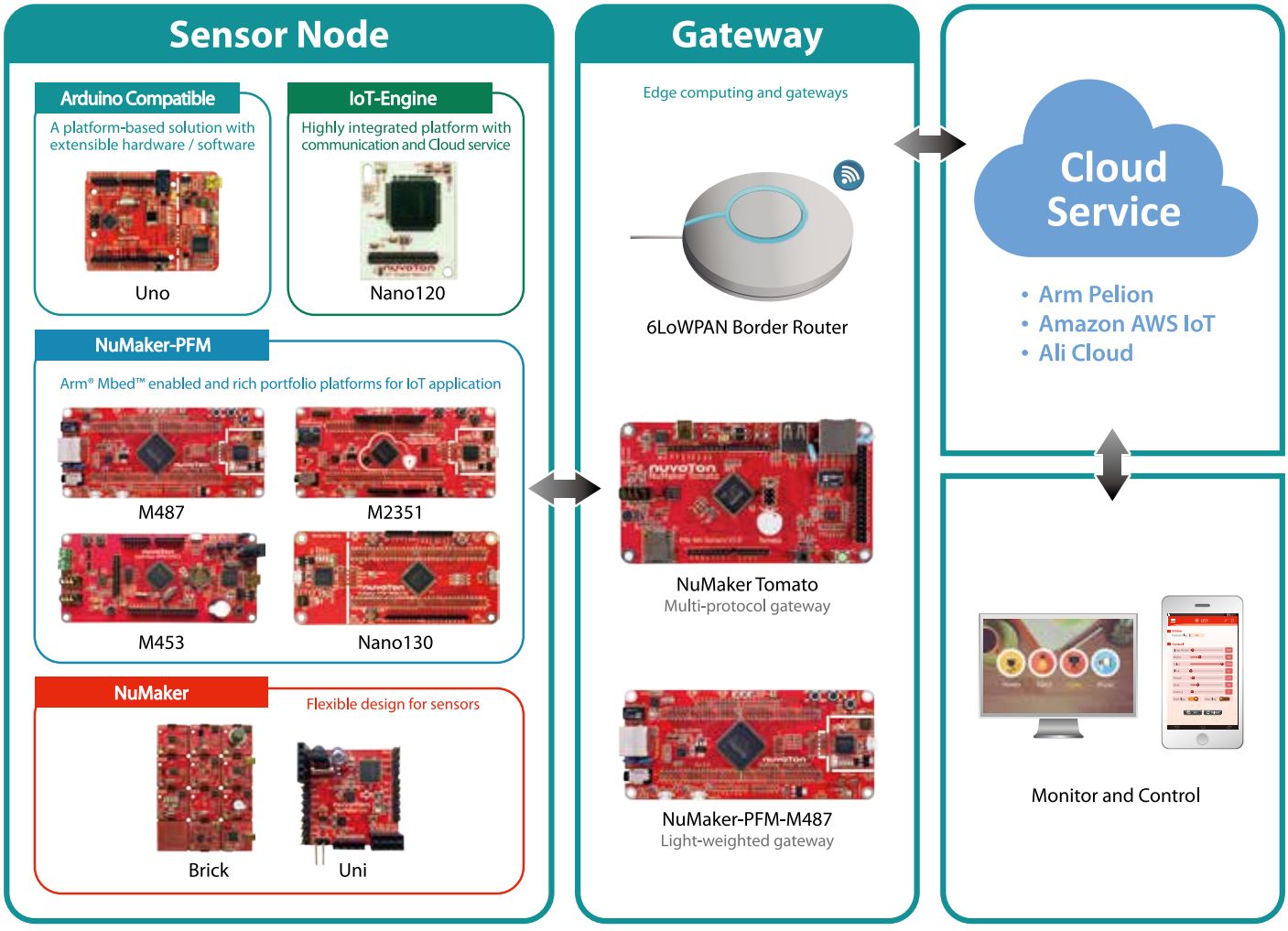


NuMicro® IoT Platform

With the rising of IoT applications, Nuvoton provides complete IoT development platforms with IoT NuMaker evaluation boards supporting IoT operating systems and software library to deploy them to the sensor devices and gateways. At the same time, the real-time control and Human Machine Interface are getting popular. In order to ease the development of HMI, Nuvoton works with Segger to launch the emWin graphics development platform which can build smooth HMI with high quality easily.

The NuMicro® IoT Platform integrates essential hardware components and software for developers to create innovative IoT devices and applications. The platform can either be used as stand-alone devices or freely combined with other platforms for faster IoT solution creation and deployment.

The highly expandable designs such as Arduino Uno, mikroBUS, and NuMaker interfaces on the boards are useful for IoT developer to use additional components in an easy way. The platform supports well-known Arm® Mbed™ OS, FreeRTOS, AliOS Things, and Linux, depending on the choice of microcontrollers or microprocessors for simple or complex smart devices as well as aggregator or gateway. The platform also supports major cloud services including Arm® Pelion Device Management, Amazon AWS IoT, Ali Cloud, etc. (Copyright notice is required.)



NuMicro® emWin Platform

The NuMicro® emWin platform offers an easy-to-use development environment to help designers create powerful and outstanding graphical user interface (GUI). Through dragging-and-dropping graphic widgets in GUIBuilder, the GUI design can be completed within seconds. The NuMicro® emWin platform also integrates a TFT-LCD panel for displaying and debugging the art work during development. For all kinds of applications with graphical user interfaces, like HMI or Industrial IoT gateway, the NuMicro® emWin platform provides friendly development packages for designers, including GUI templates, development boards, software tools, libraries, and APIs.

LCD Resolution	LCD Interface	Platform	Development Boards	Remark
320 x 240 ~ 1024 x 768	RGB / i80 / SPI	N9H Series	NK-N9H30 NK-N9H26 NK-N9H20	Core Speed: up to 300 MHz • Hardware MJPEG Codec • Hardware Graphics Accelerator
< 320 x 240	i80/SPI	M480 Series	NK-BEDM487D	Core Speed: up to 192 MHz
< 320 x 240	SPI	NUC126 Series	NK-NUC126D	Core Speed: up to 72 MHz

NK-N9H30 Board

More information: http://www.nuvoton.com/emWin

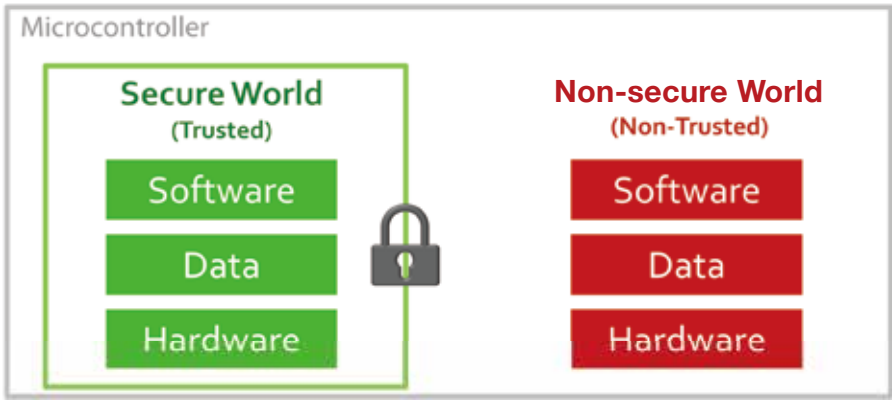
NuMicro® Family Arm® Cortex®-M23 MCUs

– the TrustZone® empowered and Cortex®-M23 based secure microcontrollers focusing on IoT security.

Cortex®-M23 CPU Core Based with TrustZone® for Armv8-M

The NuMicro® M23 Family is based on the Arm® Cortex®-M23 core and is empowered by the Arm® TrustZone® for Armv8-M architecture. The NuMicro® M2351 series is the first series in the Family to realize robust IoT security applications.

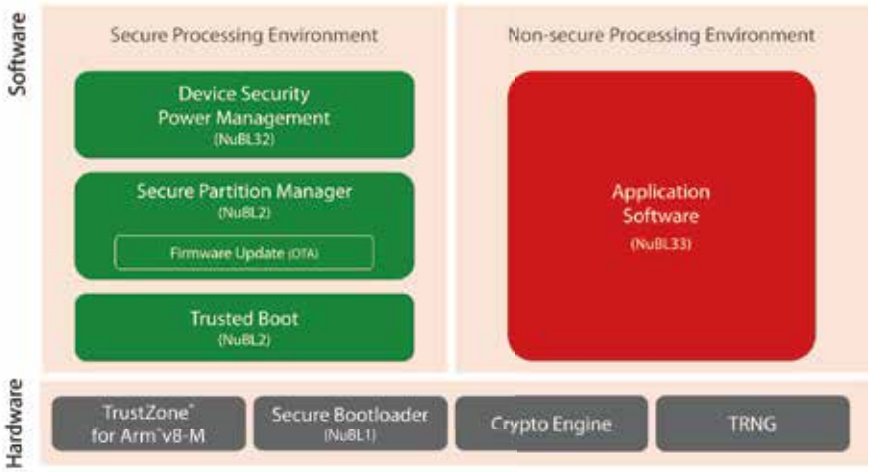
With TrustZone® implemented, memory and peripherals could be divided into secure and non-secure worlds to achieve data integrity, firmware update and operation security. In addition, TrustZone® for Armv8-M provides the key benefit of context switching between secure and non-secure worlds by hardware for faster transitions and greater power efficiency.



Arm® Platform Security Architecture (PSA) Support

The Platform Security Architecture (PSA) is a holistic set of threat models, security analyses, hardware and firmware architecture specifications, and an open source firmware reference implementation. PSA is a contribution from Arm to the entire IoT security ecosystem, offering common ground rules and a more economical approach to building more secure devices, which ideally works with the TrustZone technology for Armv8-M.

To support Arm® PSA for better implementation of IoT security technology, Nuvoton has developed the Nuvoton Secure Microcontroller Platform (NuSMP). The NuSMP is a mixture of hardware and software technology to help users meet up with the vast security requirements of general purpose and secure IoT microcontrollers. With the NuSMP, developers can easily achieve the secure services with M2351 Series microcontroller in coverage of: Trusted Boot (Root of Trust), Secure OTA (Over-The-Air) firmware update (including secure software download), Power management APIs for non-secure world and PC side crypto related development software tool. Nuvoton offers application note, sample code and training videos for each technology for developers' access and reference.



M2351 Series

The rise of the internet of things era has increased awareness for the integration of the physical world into digital systems. While the digitization of our everyday lives led to efficiency improvements and economic benefits, it has also caused pressure on systems designers who are now required to come up with innovative IoT products capable of performing secure connection and data exchange while maintaining low power consumption. Since security and power consumption are both key requirements in IoT application, Nuvoton has developed the NuMicro® M2351 Series, which excels in supporting the proliferation of intelligent connected devices.

The NuMicro® M2351 microcontroller series is powered by Arm® Cortex®-M23 core with TrustZone® for Armv8-M architecture, which elevates the traditional firmware security to a new level of robust software security.

The low-power M2351 series microcontroller operates at up to 64 MHz frequency, with up to 512 Kbytes embedded Flash memory in dual bank mode, supporting secure OTA (Over-The-Air) firmware update and up to 96 Kbytes embedded SRAM. Furthermore, the M2351 series also provides high-performance connectivity peripheral interfaces such as UART, SPI, I²C, GPIOs, USB and ISO 7816-3 for smart card reader. Its secure and efficient power management features strengthen the innovation of IoT security.

*For more information, please visit https://m2351.nuvoton.com

Operating Frequency: 64 MHz
Operating Voltage: 1.8V to 3.6V, all GPIOs support 5V tolerance
Operating Temperature: -40°C to 105°C

Potential Applications: Smart Meter, Gaming Software IP Protection, Smart City, Smart Wearable, Medical Device, IoT Devices with Secure Connection, Collaborative Secure Software Development Model…etc.

Key Features: TrustZone® for Armv8-M Technology, 8 regions MPU_NS (for non-secure world) and 8 regions MPU_S (for secure world), Hardware Crypto Accelerators, CRC calculation unit, Up to 6 tamper detection pins, Arm® Platform Security Architecture (PSA) and Trusted Base System Architecture-M (TBSA-M) supported, Multiple power modes.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency (MHz)	ISP ROM (Kbytes)	I/O	Crypto				Connectivity											Timer (32-bit)	Basic PWM (16-bit)	Enhanced PWM (16-bit)	EBI	USB OTG	ECAP	Analog Comp.	ADC(12-bit)	DAC(12-bit)	Tamper	QEI	RTC (V_{bat})	ETM	Package[3]	Mass Production
						TRNG	DES/ 3-DES/ AES	ECC	SHA	LPUART	ISO-7816-3[1]	SPI	Quad SPI	SPI/I²S	I²S	I²C	USCI[2]	CAN	LIN	SD Host															
M2351ZIAAE	512	96	64	4	25	√	√	√	√	6	3	1	3	1	3	2	1	2	1	4	12	12	-	FS	-	2	10	2	-	1	√	-	QFN33[3]	√
M2351CIAAE	512	96	64	4	41	√	√	√	√	6	3	1	3	1	3	2	1	2	1	4	12	12	√	FS	1	2	12	2	-	2	√	-	WLCSP49[4]	√
M2351SIAAE	512	96	64	4	51	√	√	√	√	6	3	1	4	1	3	2	1	2	1	4	12	12	√	FS	1	2	16	2	1	2	√	-	LQFP64	√
M2351KIAAE	512	96	64	4	107	√	√	√	√	6	3	1	4	1	3	2	1	2	1	4	12	12	√	FS	2	2	16	2	6	2	√	√	LQFP128	√

1. ISO-7816 supports full duplex UART mode.
2. USCI supports UART, SPI and I²C mode.
3. QFN33 (5x5 mm)
4. M2351CIAAE with the package WLCSP49 is upon request

Development Tools: NK-BEDM2351

Mass Production Programmer: NLG-32Z (QFN33)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

NuMicro® Family Arm® Cortex®-M0/M23 MCUs

As one of the leading Microcontroller (MCU) companies in the world, Nuvoton provides the state-of-the–art NuMicro® 32-bit MCU family powered by the Arm® Cortex®-M0/M23 core. The Cortex®-M0/M23 MCUs provide wide operating voltage (1.8V~3.6V, 2.1V~5.5V, 2.5V-5.5V, 1.8V~5.5V), industrial temperature (-40°C-105°C), high accuracy oscillator and high immunity (8KV ESD, 4KV EFT).

The Cortex®-M0/M23 MCU family includes Industrial control 1.8V M031 series, 5V NUC029 series, NUC121/123/125/126 series with USB 2.0 FS device, NUC130/131/140/230/240 series with Controller Area Network (CAN) bus, Mini51 and M051 series for value solutions and ultra-low power solution Nano100 series(1.8V-3.6V), M251/2 series(1.8V-5.5V), targeting at battery powered applications. They are ideal solutions for industrial control systems, industrial automation, consumer products, embedded network control, energy, power systems and motor control.

Mini51 Series

The NuMicro® Mini51 series embedded with the Arm® Cortex®-M0 core runs up to 50 MHz with 4~32 Kbytes Flash program memory, 2/4 Kbytes SRAM. The Mini51 series is equipped with a plenty of ADC & PWM for different industrial application, supporting Low Voltage Reset, Brown-out Detected Reset, 96-bit Unique ID and 128-bit Unique Customer ID.

Potential Applications: Wireless Charger, Home Appliances, Security/Alarm, Temperature Sensor, Motor, Industrial Control,etc.

• Mini51 Series

Operating Frequency: 24 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Configurable Data Flash, 2 Kbytes ISP loader

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity			PWM(16-bit)	ADC(10-bit)	Comparator	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
							UART	SPI	I²C							
MINI51FDE	4	2	Configurable	2	17	2	1	1	1	3	4	-	√	√	TSSOP20	√
MINI51TDE	4	2	Configurable	2	29	2	1	1	1	6	8	2	√	√	QFN33*	√
MINI51ZDE	4	2	Configurable	2	29	2	1	1	1	6	8	2	√	√	QFN33	√
MINI51LDE	4	2	Configurable	2	30	2	1	1	1	6	8	2	√	√	LQFP48	√
MINI52FDE	8	2	Configurable	2	17	2	1	1	1	3	4	-	√	√	TSSOP20	√
MINI52TDE	8	2	Configurable	2	29	2	1	1	1	6	8	2	√	√	QFN33*	√
MINI52ZDE	8	2	Configurable	2	29	2	1	1	1	6	8	2	√	√	QFN33	√
MINI52LDE	8	2	Configurable	2	30	2	1	1	1	6	8	2	√	√	LQFP48	√
MINI54FDE	16	2	Configurable	2	17	2	1	1	1	3	4	-	√	√	TSSOP20	√
MINI54TDE	16	2	Configurable	2	29	2	1	1	1	6	8	2	√	√	QFN33*	√
MINI54ZDE	16	2	Configurable	2	29	2	1	1	1	6	8	2	√	√	QFN33	√
MINI54LDE	16	2	Configurable	2	30	2	1	1	1	6	8	2	√	√	LQFP48	√

Development Tools: NT-Mini51F (Mini51, Mini52, Mini54)/ NT-Mini51L (Mini51, Mini52, Mini54)

QFN33*: 4x4mm

Mass Production Programmer: NLG-Mini51n; n should be replaced by Package Code

• Mini55 Series

Operating Frequency: 48 MHz
Operating Voltage: 2.1V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Supports Hardware Divider

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity				PWM(16-bit)	ADC(10-bit)	Comparator	ICP IAP ISP	IRC 10 kHz 48 MHz	Package	Mass Production
							USCI*	UART	SPI	I²C							
MINI55TDE	17.5	2	Configurable	2	29	2	-	2	1	1	6	12	2	√	√	QFN33*	√
MINI55LDE	17.5	2	Configurable	2	33	2	-	2	1	1	6	12	2	√	√	LQFP48	√

*USCI can be set to UART, SPI or I²C

QFN33*: 4x4mm

Development Tools: NT-Mini55L

Mass Production Programmer: NLG-Mini55n; n should be replaced by Package Code

• Mini57 Series

Operating Frequency: 48 MHz
Operating Voltage: 2.1V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: 2 Sample and Hold ADC, Programmable Gain Amplifier

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity				PWM(16-bit)	ADC(12-bit)*	PGA*	Comparator	ICP IAP ISP	IRC 10 kHz 48 MHz	Package	Mass Production
							USCI*	UART	SPI	I²C								
MINI57FDE	29.5	4	Configurable	2.5	18	2	2	-	-	-	8	8	√	2	√	√	TSSOP20	√
MINI57EDE	29.5	4	Configurable	2.5	22	2	2	-	-	-	8	8	√	2	√	√	TSSOP28	√
MINI57TDE	29.5	4	Configurable	2.5	22	2	2	-	-	-	8	8	√	2	√	√	QFN33*	√

*USCI can be set to UART, SPI or I²C
*PGA (Programmable Gain Amplifier)

QFN33*: 4x4mm

Development Tools: NT-Mini57E
Mass Production Programmer: NLG-Mini57n; n should be replaced by Package Code

• Mini58 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Configurable Data Flash

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity			PWM(16-bit)	ADC(10-bit)	Comparator	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
							UART	SPI	I²C							
MINI58FDE	32	4	Configurable	2.5	17	2	2	1	2	6	4	-	√	√	TSSOP20	√
MINI58TDE	32	4	Configurable	2.5	29	2	2	1	2	6	8	2	√	√	QFN33*	√
MINI58ZDE	32	4	Configurable	2.5	29	2	2	1	2	6	8	2	√	√	QFN33	√
MINI58LDE	32	4	Configurable	2.5	30	2	2	1	2	6	8	2	√	√	LQFP48	√

QFN33*: 4x4mm

Development Tools: NT-Mini58L (Mini58L)
Mass Production Programmer: NLG-Mini51n; n should be replaced by Package Code

M051 Series

The NuMicro® M051 series embedded with the Arm® Cortex®-M0 core, equipped with a plenty resource and variety of peripherals, such as 8~256 Kbytes Flash, 4~20 Kbytes SRAM, and 4/8 Kbytes Flash loader memory for In-System Programming (ISP), up to 20 ch ADC and 14 ch PWM. It support Low Voltage Reset, Brown-out Detected Reset, 96-bit Unique ID and 128-bit Unique Customer ID.

Potential Applications: Industrial Control, Security/Alarm, Temperature Sensor, Motor, etc.

• M051 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: 4 KB Data Flash, Hardware Divider, 4x comparators

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity			PWM(16-bit)	ADC(12-bit)	Comparator	EBI	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
							UART	SPI	I²C								
M052ZDE	8	4	4	4	24	4	2	1	2	5	5	3	-	√	√	QFN33	√
M052LDE	8	4	4	4	40	4	2	2	2	8	8	4	√	√	√	LQFP48	√
M054ZDE	16	4	4	4	24	4	2	1	2	5	5	3	-	√	√	QFN33	√
M054LDE	16	4	4	4	40	4	2	2	2	8	8	4	√	√	√	LQFP48	√
M058ZDE	32	4	4	4	24	4	2	1	2	5	5	3	-	√	√	QFN33	√
M058LDE	32	4	4	4	40	4	2	2	2	8	8	4	√	√	√	LQFP48	√
M0516ZDE	64	4	4	4	24	4	2	1	2	5	5	3	-	√	√	QFN33	√
M0516LDE	64	4	4	4	40	4	2	2	2	8	8	4	√	√	√	LQFP48	√

Development Tools: NT-M051L (M052, M054, M058, M0516)
Mass Production Programmer: NLG-M051n; n should be replaced by Package Code

• M0518 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Configurable Data Flash, 24-ch 100 MHz PWM output, 6x UART

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity				PWM(16-bit)	ADC(12-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
							UART	SPI	I²C	LIN						
M0518LC2AE	36	8	Configurable	4	42	4	6	1	2	3	24	8	√	√	LQFP48	√
M0518SC2AE	36	8	Configurable	4	56	4	6	1	2	3	24	8	√	√	LQFP64*	√
M0518LD2AE	68	8	Configurable	4	42	4	6	1	2	3	24	8	√	√	LQFP48	√
M0518SD2AE	68	8	Configurable	4	56	4	6	1	2	3	24	8	√	√	LQFP64*	√

Development Tools: NT-M0518S

LQFP64*: 7x7mm

Mass Production Programmer: NLG-M0518n; n should be replaced by Package Code

• M0519 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Hardware Divider, Dual ADC, 2x OPAs, 3x Comparators

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity				PWM(16-bit)	ADC(12-bit)	Comparator	OPA	Capture	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
							UART*	SPI	I²C	LIN									
M0519LD3AE	64	16	4	8	38	4	3+2	1	1	2	6	8+8	2	2	-	√	√	LQFP48	√
M0519SD3AE	64	16	4	8	51	4	3+2	2	1	2	10	8+8	2	2	-	√	√	LQFP64*	√
M0519LE3AE	128	16	Configurable	8	38	4	3+2	1	1	2	6	8+8	2	2	-	√	√	LQFP48	√
M0519SE3AE	128	16	Configurable	8	51	4	3+2	2	1	2	10	8+8	2	2	-	√	√	LQFP64*	√
M0519VE3AE	128	16	Configurable	8	82	4	3+2	3	1	2	14	8+8	3	2	6	√	√	LQFP100	√

*Marked in the table (3+2) means 3 UART + 2 ISO-7816 UART

LQFP64*: 7x7mm

Development Tools: NT-M0519V

Mass Production Programmer: NLG-M0519n; n should be replaced by Package Code

• M0564 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Configurable Data Flash, Hardware Divider, Up to 8x UARTs, 144 MHz PWM output, 800 kSPS ADC

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	SPROM (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	PWM	Connectivity					ADC(12-bit)	ACMP	PDMA	RTC(V_{BAT})	V_{DDIO} (1.8V-5.5V)	EBI	ICP IAP ISP	IRC 10 kHz 22 MHz 48 MHz	Package	Mass Production
									USCI*	UART*	ISO-7816-3*	SPI/I²S	I²C										
M0564LE4AE	128	20	Configurable	2	4	41	4	12	3	3+2	2	2	2	10	2	5	-	√	√	√	√	LQFP48	√
M0564SE4AE	128	20	Configurable	2	4	53	4	12	3	3+2	2	2	2	15	2	5	√	√	√	√	√	LQFP64*	√
M0564LG4AE	256	20	Configurable	2	4	41	4	12	3	3+2	2	2	2	10	2	5	-	√	√	√	√	LQFP48	√
M0564SG4AE	256	20	Configurable	2	4	53	4	12	3	3+2	2	2	2	15	2	5	√	√	√	√	√	LQFP64*	√
M0564VG4AE	256	20	Configurable	2	4	85	4	12	3	3+2	2	2	2	20	2	5	√	√	√	√	√	LQFP100	√

*USCI can be set to UART, SPI or I²C
*Marked in the table (3+2) means 3 UART+ 2ISO-7816 UART
*ISO-7816-3 UART supports full duplex mode

LQFP64*: 7x7mm

Development Tools: NT-M0564V

Mass Production Programmer: NLG-M0564n; n should be replaced by Package Code

NUC029 Series

The NuMicro® NUC029 series is designed for Industrial Applications supported by its robust noise immunity EFT features. Embedded with the Arm® Cortex®-M0 core. 5V operating voltage. NUC029 series provides 16~256Kbytes Flash, 2~20K bytes SRAM, equipped with high performance peripherals such as 12-bit ADC, UART, PWM, SPI, I²C…etc. Specific parts support hardware divider, comparator, USB 2.0 full-speed device by crystal-less.

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 85°C/105°C

Potential Applications: Industrial Control, High Precision Meter, HMI, Motor Control, Communication System, etc.

• NUC029 Series

Key Features: 5V industrial control, Robust noise immunity EFT 4.4KV and strong ESD up to HBM 7KV.

Part Number	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency (MHz)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer (32-bit)	Connectivity								PWM (16-bit)	PDMA	EBI	CRC	PLL	LXT	RTC	ACMP	Divider	ADC(12-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	V_{DDIO} (1.8V-5.5V)	Package	Operating Temp. Range (°C)	Mass Production
								USCI*	UART*	SPI	I²C	I²S	ISO-7816-3*	LIN	USB*																
NUC029FAE	16	2	24	Configurable	2	17	2	-	1	1	1	-	-	-	-	3	-	-	-	-	√	-	2	-	4 (10-bit)	√	√	-	TSSOP20	-40 to +105	√
NUC029TAN	32	4	50	4	4	24	4	-	2	1	2	-	-	-	-	5	-	-	-	√	-	-	3	√	5	√	√	-	QFN33*	-40 to +85	√
NUC029ZAN	64	4	50	4	4	24	4	-	2	1	2	-	-	-	-	5	-	-	-	√	-	-	3	√	5	√	√	-	QFN33	-40 to +85	√
NUC029NAN	64	4	50	4	4	40	4	-	2	2	2	-	-	-	-	8	-	√	-	√	-	-	4	√	8	√	√	-	QFN48	-40 to +85	√
NUC029LAN	64	4	50	4	4	40	4	-	2	2	2	-	-	-	-	8	-	√	-	√	-	-	4	√	8	√	√	-	LQFP48	-40 to +85	√
NUC029LDE	68	8	50	Configurable	4	42	4	-	4	1	2	-	-	3	-	12	-	-	-	√	-	-	-	-	8	√	√	-	LQFP48	-40 to +105	√
NUC029SDE	68	8	50	Configurable	4	56	4	-	4	1	2	-	-	3	-	12	-	-	-	√	-	-	-	-	8	√	√	-	LQFP64*	-40 to +105	√
NUC029LEE	128	16	72	Configurable	8	31	4	-	2	1	2	-	-	2	1	4	9	-	√	√	√	√	-	-	10	√	√	-	LQFP48	-40 to +105	√
NUC029SEE	128	16	72	Configurable	8	45	4	-	3	2	2	-	-	3	1	6	9	√	√	√	√	√	-	-	12	√	√	-	LQFP64*	-40 to +105	√
NUC029LGE	256	20	72	Configurable	4	35	4	3	3	2	2	2	-	-	1	10	5	√	√	√	√	√	2	-	9	√	√	√	LQFP48	-40 to +105	√
NUC029SGE	256	20	72	Configurable	4	49	4	3	3	2	2	2	-	-	1	12	5	√	√	√	√	√	2	-	15	√	√	√	LQFP64*	-40 to +105	√
NUC029KGE	256	20	72	Configurable	4	86	4	3	3+2	2	2	2	2	-	1	12	5	√	√	√	√	√	2	-	20	√	√	√	LQFP128	-40 to +105	√

*USCI can be set to UART, SPI or I²C
*Marked in the table (3+2) means 3 UART + 2 ISO-7816 UART
*USB support FS Device mode crystal-less
*ISO-7816-3 UART supports full duplex mode

QFN33*: 4x4mm
LQFP64*: 7x7mm

Development Tools: NT-NUC029F/NT-NUC029L/NT-NUC029SD/NT-NUC029SE/NT-NUC029SG/NT-NUC029KG
Mass Production Programmer: NLG-NUC029nA/NLG-NUC029nD/NLG-NUC029nE/NLG-NUC029nG ; n should be replaced by Package Code

M031 Series

The NuMicro® M031 series embedded with the Arm® Cortex®-M0 core, designed for 1.8V~3.6V industrial applications, it equipped high performance and plenty peripherals, such as 2 Msps ADC, up to 144 MHz PWM. It also supports IEC60730 safety specifications and USB crystal-less. Built-in 16~512 Kbytes Flash, 2~96Kbytes SRAM.

Operating Frequency: 48~72 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 105°C

Potential Applications: Industrial Control, High Precision Meter, Wireless Charger, HMI, IoT Node Device, Security System, Motor Control, Communication System, etc.

• M031 Series

Key Features: Configurable up to 10 UARTs, 144 MHz PWM, 2 Msps ADC, 24 MHz SPI, 1-wire UART, OTA, USB-FS Crystal-less, Security program ROM.

Part Number	Flash (Kbytes)	SRAM (Kbytes)	Operating Frequency (MHz)	ISP ROM (Kbytes)	SPROM (Byte)	I/O	Timer (32-bit)	Connectivity						PWM (16-bit)	PDMA	EBI	CRC	PLL	LXT	RTC	ACMP	Divider	ADC(12-bit)	ICP IAP ISP	IRC 38.4 kHz 48 MHz	Package	Mass Production
								USCI*	UART	QSPI	SPI / I²S	I²C	USB*															
M031FB0AE	16	2	48	2	512	15	2	0	3	0	1	2	-	6	0	-	√	-	-	-	-	√	7	√	√	TSSOP20	Q2
M031EB0AE	16	2	48	2	512	23	2	0	3	0	1	2	-	6	0	-	√	-	-	-	-	√	9	√	√	TSSOP28	Q2
M031TB0AE	16	2	48	2	512	27	2	0	3	0	1	2	-	6	0	-	√	-	-	-	-	√	10	√	√	QFN33*	Q2
M031FC1AE	32	4	48	2	512	15	4	0	3	0	1	2	-	6	2	-	√	-	-	-	-	√	7	√	√	TSSOP20	Q1
M031EC1AE	32	4	48	2	512	23	4	0	3	0	1	2	-	6	2	-	√	-	-	-	-	√	9	√	√	TSSOP28	Q1
M031TC1AE	32	4	48	2	512	27	4	0	3	0	1	2	-	6	2	-	√	-	√	-	-	√	10	√	√	QFN33*	Q1
M031LC2AE	32	8	48	2	512	42	4	1	3	0	1	2	-	12	5	-	√	√	√	-	2	√	12	√	√	LQFP48	Q1
M031SC2AE	32	8	48	2	512	55	4	1	3	0	1	2	-	12	5	-	√	√	√	-	2	√	16	√	√	LQFP64*	Q1
M031TD2AE	64	8	48	2	512	27	4	1	3	0	1	2	-	12	5	-	√	√	√	-	2	√	10	√	√	QFN33*	Q1
M031LD2AE	64	8	48	2	512	42	4	1	3	0	1	2	-	12	5	-	√	√	√	-	2	√	12	√	√	LQFP48	Q1
M031SD2AE	64	8	48	2	512	55	4	1	3	0	1	2	-	12	5	-	√	√	√	-	2	√	16	√	√	LQFP64*	Q1
M031LE3AE	128	16	48	8	512	42	4	1	3	0	1	2	-	12	5	√	√	√	√	-	2	√	12	√	√	LQFP48	Q2
M031SE3AE	128	16	48	8	512	55	4	1	3	0	1	2	-	12	5	√	√	√	√	-	2	√	16	√	√	LQFP64*	Q2
M032LE3AE	128	16	48	8	512	38	4	1	3	0	1	2	√	12	5	√	√	√	√	-	2	√	12	√	√	LQFP48	Q2
M032SE3AE	128	16	48	8	512	51	4	1	3	0	1	2	√	12	5	√	√	√	√	-	2	√	16	√	√	LQFP64*	Q2
M031LG6AE	256	32	72	4	2048	42	4	2	6	1	1	2	-	24	7	√	√	√	√	√	2	√	12	√	√	LQFP48	Q4
M031SG6AE	256	32	72	4	2048	55	4	2	6	1	1	2	-	24	7	√	√	√	√	√	2	√	16	√	√	LQFP64*	Q4
M031KG6AE	256	32	72	4	2048	111	4	2	6	1	1	2	-	24	7	√	√	√	√	√	2	√	16	√	√	LQFP128	Q4
M032LG6AE	256	32	72	4	2048	38	4	2	6	1	1	2	√	24	7	√	√	√	√	√	2	√	12	√	√	LQFP48	Q4
M032SG6AE	256	32	72	4	2048	51	4	2	6	1	1	2	√	24	7	√	√	√	√	√	2	√	16	√	√	LQFP64*	Q4
M032KG6AE	256	32	72	4	2048	108	4	2	6	1	1	2	√	24	7	√	√	√	√	√	2	√	16	√	√	LQFP128	Q4
M031LG8AE	256	64	72	4	2048	42	4	2	6	1	1	2	-	24	7	√	√	√	√	√	2	√	12	√	√	LQFP48	Q4
M031SG8AE	256	64	72	4	2048	55	4	2	6	1	1	2	-	24	7	√	√	√	√	√	2	√	16	√	√	LQFP64*	Q4
M031KG8AE	256	64	72	4	2048	111	4	2	6	1	1	2	-	24	7	√	√	√	√	√	2	√	16	√	√	LQFP128	Q4
M032LG8AE	256	64	72	4	2048	38	4	2	6	1	1	2	√	24	7	√	√	√	√	√	2	√	12	√	√	LQFP48	Q4
M032SG8AE	256	64	72	4	2048	51	4	2	6	1	1	2	√	24	7	√	√	√	√	√	2	√	16	√	√	LQFP64*	Q4
M032KG8AE	256	64	72	4	2048	108	4	2	6	1	1	2	√	24	7	√	√	√	√	√	2	√	16	√	√	LQFP128	Q4
M031SIAAE	512	96	72	8	2048	55	4	2	8	1	1	2	-	24	9	√	√	√	√	√	2	√	16	√	√	LQFP64*	Q4
M031KIAAE	512	96	72	8	2048	111	4	2	8	1	1	2	-	24	9	√	√	√	√	√	2	√	16	√	√	LQFP128	Q4
M032SIAAE	512	96	72	8	2048	51	4	2	8	1	1	2	√	24	9	√	√	√	√	√	2	√	16	√	√	LQFP64*	Q4
M032KIAAE	512	96	72	8	2048	108	4	2	8	1	1	2	√	24	9	√	√	√	√	√	2	√	16	√	√	LQFP128	Q4

*USCI can be set to UART, SPI or I²C
*USB supports FS Device mode crystal-less

QFN33*: 4x4mm
LQFP64*: 7x7mm

Development Tools: NK-M031TB/NK-M031TC/NK-M031SD/NK-M031SE/NK-M032SE/NK-M031KG/NK-M032KG/NK-M031KI/NK-M032KI

Mass Production Programmer: NLG-20F/NLG-28E/NLG-32T (QFN33*)/ NLG-48L (LQFP48)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

NUC121 Series

The NuMicro® NUC121 series embedded with the Arm® Cortex®-M0 core with 32~256 Kbytes Flash memory, 8~20 Kbytes SRAM, and 4 Kbytes Flash loader memory for In-System Programming (ISP). This series is a standard USB series which supports crystal-less (except NUC123). 48 MHz high speed RC oscillator supports crystal-less USB transfer and 24-ch PWM/BPWM for external components control. Besides, NUC121 series provides a plenty selections up to 24-ch PWM and 20-ch ADC.

Key Features: Over 4 Kbytes ISP loader. USB 2.0 FS Device Crystal-less (except NUC123). NUC125/126 supports voltage adjustable interface (VAI) with individual I/O (1.8V-5.5V) connecting to the external components to allow more flexbile in designs.
Potential Applications: USB Composite Device, Gaming Mouse/Keyboard/Pad, USB Type-C Earphone, Industrial Automation, IoT device, etc.

• NUC121 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	SPROM (Bytes)	I/O	Timer(32-bit)	Connectivity					PWM (16-bit)	ADC (12-bit)	PDMA	ICP IAP ISP	IRC 10 kHz 48 MHz	Package	Mass Production
							USCI*	UART	SPI/I²S	I²C	USB*							
NUC121ZC2AE	32	8	4.5	512	22	4	1	1	1	2	1	17	4	5	√	√	QFN33	√
NUC121LC2AE	32	8	4.5	512	38	4	1	1	1	2	1	24	4	5	√	√	LQFP48	√
NUC121SC2AE	32	8	4.5	512	52	4	1	1	1	2	1	24	12	5	√	√	LQFP64*	√

*USCI can be set to UART, SPI or I²C
*USB supports FS Device mode crystal-less

LQFP64*: 7x7mm

Development Tools: NT-NUC121S
Mass Production Programmer: NLG-NUC121n; n should be replaced by Package Code

• NUC125 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Voltage Adjustable Interface from 1.8V~5.5V, up to 12-ch ADC

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	SPROM (Bytes)	I/O	Timer(32-bit)	V_{DDIO} (1.8V-5.5V)	Connectivity					PWM (16-bit)	ADC (12-bit)	PDMA	ICP IAP ISP	IRC 10 kHz 48 MHz	Package	Mass Production
								USCI*	UART	SPI/I²S	I²C	USB*							
NUC125ZC2AE	32	8	4.5	512	22	4	√	1	1	1	2	1	17	4	5	√	√	QFN33	√
NUC125LC2AE	32	8	4.5	512	37	4	√	1	1	1	2	1	23	4	5	√	√	LQFP48	√
NUC125SC2AE	32	8	4.5	512	51	4	√	1	1	1	2	1	23	12	5	√	√	LQFP64*	√

*USCI can be set to UART, SPI or I²C
*USB supports FS Device mode crystal-less

LQFP64*: 7x7mm

Development Tools: NT-NUC125S
Mass Production Programmer: NLG-NUC125n; n should be replaced by Package Code

• NUC123 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity						PWM(16-bit)	ADC(10-bit)	PDMA	CRC	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
						UART	SPI	I²C	I²S	USB	PS2								
NUC123ZC2AE1	36	12	4	20	4	1	3	1	1	1	-	3	3	6	√	√	√	QFN33	√
NUC123LC2AE1	36	12	4	36	4	2	3	2	1	1	1	4	8	6	√	√	√	LQFP48	√
NUC123SC2AE1	36	12	4	47	4	2	3	2	1	1	1	4	8	6	√	√	√	LQFP64*	√
NUC123ZD4AE0	68	20	4	20	4	1	3	1	1	1	-	3	3	6	√	√	√	QFN33	√
NUC123LD4AE0	68	20	4	36	4	2	3	2	1	1	1	4	8	6	√	√	√	LQFP48	√
NUC123SD4AE0	68	20	4	47	4	2	3	2	1	1	1	4	8	6	√	√	√	LQFP64*	√

Development Tools: NT-NUC123S

LQFP64*: 7x7mm

Mass Production Programmer: NLG-NUC123n; n should be replaced by Package Code

• NUC126 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Key Features: Up to 12-ch 144 MHz PWM, 800 Ksps 20-ch ADC, Hardware Divider

Part No.	Flash (Kbytes)	SRAM (Kbytes)	SPROM (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	V_{DDIO} (1.8V-5.5V)	Connectivity						PWM (16-bit)	ADC(12-bit)	ACMP	PDMA	RTC (V_{BAT})	EBI	ICP IAP ISP	IRC 10 kHz 22 MHz 48 MHz	Package	Mass Production
								USB*	USCI*	UART*	ISO-7816-3*	SPI/I²S	I²C										
NUC126NE4AE	128	20	2	4	35	4	√	1	3	3+2	2	2	2	10	9	2	5	-	√	√	√	QFN48	√
NUC126LE4AE	128	20	2	4	35	4	√	1	3	3+2	2	2	2	10	9	2	5	-	√	√	√	LQFP48	√
NUC126SE4AE	128	20	2	4	49	4	√	1	3	3+2	2	2	2	12	15	2	5	√	√	√	√	LQFP64	√
NUC126LG4AE	256	20	2	4	35	4	√	1	3	3+2	2	2	2	10	9	2	5	-	√	√	√	LQFP48	√
NUC126SG4AE	256	20	2	4	49	4	√	1	3	3+2	2	2	2	12	9	2	5	√	√	√	√	LQFP64*	√
NUC126VG4AE	256	20	2	4	81	4	√	1	3	3+2	2	2	2	12	20	2	5	√	√	√	√	LQFP100	√

*Marked in the table (3+2) means 3 UART + 2 ISO-7816 UART
*USCI can be set to UART, SPI or I²C
*ISO-7816-3 UART supports full duplex mode

LQFP64*: 7x7mm

Development Tools: NT-NUC126V

Mass Production Programmer: NLG-NUC126n; n should be replaced by Package Code

NUC130 CAN Series

The NuMicro® NUC130/131/140/230/240 series with Controller Area Network (CAN) bus embedded with the Arm® Cortex®-M0 core with 32~128 Kbytes Flash memory, 4~16 Kbytes SRAM, and 4/8 Kbytes Flash loader memory for In-System Programming (ISP). This series is designed for CAN applications, and it also equipped with a variety of peripherals for general connectivity function such as LIN, USB 2.0 FS, UART, I²C, and ADC, Analog Comparator, Low Voltage Reset and Brown-out Detector.

NUC130 CAN Series	USB FS	LIN	CAN
NUC131		V	V
NUC130		V	V
NUC140	V	V	V
NUC230		V	V
NUC240	V	V	V

Key Features: LIN and up to 2-ch CAN Bus Supported, 4 Kbytes Data Flash, and 4/8 Kbytes ISP loader.
Potential Applications: Automotive, Security/ Alarm, Temperature Sensor, Communication System, etc.

• NUC131 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity					PWM(16-bit)	ADC(12-bit)	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
							UART	SPI	I²C	LIN	CAN						
NUC131LC2AE	36	8	Configurable	4	42	4	6	1	2	3	1	24	8	√	√	LQFP48	√
NUC131SC2AE	36	8	Configurable	4	56	4	6	1	2	3	1	24	8	√	√	LQFP64*	√
NUC131LD2AE	68	8	Configurable	4	42	4	6	1	2	3	1	24	8	√	√	LQFP48	√
NUC131SD2AE	68	8	Configurable	4	56	4	6	1	2	3	1	24	8	√	√	LQFP64*	√

LQFP64*: 7x7mm

Development Tools: NT-NUC131S
Mass Production Programmer: NLG-NUC131n; n should be replaced by Package Code

• NUC130 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 85°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity								PWM(16-bit)	ADC(12-bit)	Comparator	RTC	EBI	PDMA	ICP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
							UART	ISO-7816-3	SPI	I²C	I²S	USB	LIN	CAN										
NUC130LC1CN	32	4	4	4	35	4	3	-	1	2	1	-	2	1	4	8	1	√	-	9	√	√	LQFP48	√
NUC130RC1CN	32	4	4	4	49	4	3	-	2	2	1	-	2	1	6	8	2	√	√	9	√	√	LQFP64	√
NUC130LD2CN	64	8	4	4	35	4	3	-	1	2	1	-	2	1	4	8	1	√	-	9	√	√	LQFP48	√
NUC130RD2CN	64	8	4	4	49	4	3	-	2	2	1	-	2	1	6	8	2	√	√	9	√	√	LQFP64	√
NUC130LE3CN	128	16	Configurable	4	35	4	3	-	1	2	1	-	2	1	4	8	1	√	-	9	√	√	LQFP48	√
NUC130RE3CN	128	16	Configurable	4	49	4	3	-	2	2	1	-	2	1	6	8	2	√	√	9	√	√	LQFP64	√
NUC130VE3CN	128	16	Configurable	4	80	4	3	-	4	2	1	-	2	1	8	8	2	√	√	9	√	√	LQFP100	√

Development Tools: NT-NUC140V
Mass Production Programmer: NLG-NUC100n; n should be replaced by Package Code

• NUC140 Series

Operating Frequency: 50 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 85°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM	I/O	Timer(32-bit)	Connectivity								PWM(16-bit)	ADC(12-bit)	Comparator	RTC	EBI	PDMA	ICP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
							UART	ISO-7816-3	SPI	I²C	I²S	USB	LIN	CAN										
NUC140LC1CN	32	4	4	4	31	4	2	-	1	2	1	1	2	1	4	8	1	√	-	9	√	√	LQFP48	√
NUC140RC1CN	32	4	4	4	45	4	3	-	2	2	1	1	2	1	4	8	2	√	√	9	√	√	LQFP64	√
NUC140LD2CN	64	8	4	4	31	4	2	-	1	2	1	1	2	1	4	8	1	√	-	9	√	√	LQFP48	√
NUC140RD2CN	64	8	4	4	45	4	3	-	2	2	1	1	2	1	4	8	2	√	√	9	√	√	LQFP64	√
NUC140LE3CN	128	16	Configurable	4	31	4	2	-	1	2	1	1	2	1	4	8	1	√	-	9	√	√	LQFP48	√
NUC140RE3CN	128	16	Configurable	4	45	4	3	-	2	2	1	1	2	1	4	8	2	√	√	9	√	√	LQFP64	√
NUC140VE3CN	128	16	Configurable	4	76	4	3	-	4	2	1	1	2	1	8	8	2	√	√	9	√	√	LQFP100	√

Development Tools: NT-NUC140V
Mass Production Programmer: NLG-NUC100n; n should be replaced by Package Code

• NUC230 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity								PWM(16-bit)	ADC(12-bit)	Comparator	PDMA	CRC	RTC (V_{BAT})	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
							UART*	ISO-7816-3*	SPI	I²C	I²S	USB	LIN	CAN										
NUC230LC2AE	32	8	4	8	35	4	3+2	2	1	2	1	-	3	2	4	7	1	9	√	√	√	√	LQFP48	√
NUC230SC2AE	32	8	4	8	49	4	3+2	2	2	2	1	-	3	2	6	7	2	9	√	√	√	√	LQFP64*	√
NUC230LD2AE	64	8	4	8	35	4	3+2	2	1	2	1	-	3	2	4	7	1	9	√	√	√	√	LQFP48	√
NUC230SD2AE	64	8	4	8	49	4	3+2	2	2	2	1	-	3	2	6	7	2	9	√	√	√	√	LQFP64*	√
NUC230LE3AE	128	16	Configurable	8	35	4	3+2	2	1	2	1	-	3	2	4	7	1	9	√	√	√	√	LQFP48	√
NUC230SE3AE	128	16	Configurable	8	49	4	3+2	2	2	2	1	-	3	2	6	7	2	9	√	√	√	√	LQFP64*	√
NUC230VE3AE	128	16	Configurable	8	83	4	3+3	3	4	2	1	-	3	2	8	8	2	9	√	√	√	√	LQFP100	√

*Marked in the table (3+3) means 3 UART+ 3 ISO-7816 UART
*ISO-7816-3 UART supports full duplex mode
LQFP64*: 7x7mm

Development Tools: NT-NUC240V
Mass Production Programmer: NLG-NUC200n; n should be replaced by Package Code

• NUC240 Series

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V
Operating Temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity								PWM(16-bit)	ADC(12-bit)	Comparator	PDMA	CRC	RTC (V_{BAT})	ICP IAP ISP	IRC 10 kHz 22 MHz	Package	Mass Production
							UART*	ISO-7816-3*	SPI	I²C	I²S	USB	LIN	CAN										
NUC240LC2AE	32	8	4	8	31	4	2+2	1	1	2	1	1	2	2	4	7	1	9	√	√	√	√	LQFP48	√
NUC240SC2AE	32	8	4	8	45	4	3+2	2	2	2	1	1	3	2	4	7	2	9	√	√	√	√	LQFP64*	√
NUC240LD2AE	64	8	4	8	31	4	2+2	1	1	2	1	1	2	2	4	7	1	9	√	√	√	√	LQFP48	√
NUC240SD2AE	64	8	4	8	45	4	3+2	2	2	2	1	1	3	2	4	7	2	9	√	√	√	√	LQFP64*	√
NUC240LE3AE	128	16	Configurable	8	31	4	2+2	1	1	2	1	1	2	2	4	7	1	9	√	√	√	√	LQFP48	√
NUC240SE3AE	128	16	Configurable	8	45	4	3+2	2	2	2	1	1	3	2	4	7	2	9	√	√	√	√	LQFP64*	√
NUC240VE3AE	128	16	Configurable	8	79	4	3+3	3	4	2	1	1	3	2	8	8	2	9	√	√	√	√	LQFP100	√

*Marked in the table (3+3) means 3 UART+ 3 ISO-7816 UART
*ISO-7816-3 UART supports full duplex mode
LQFP64*: 7x7mm

Development Tools: NT-NUC240V
Mass Production Programmer: NLG-NUC200n; n should be replaced by Package Code

Nano Series

The NuMicro® Nano series supports ultra low power consumption and embedded with the Arm® Cortex®-M0 core with 16~128 Kbytes Flash Memory and 4~16 Kbytes SRAM and 4 Kbytes Flash loader memory for In-System Programming (ISP). The Nano series integrates COM/SEG LCD controller, Real Time Counter (RTC), ADC, DAC, USB 2.0 FS device, ISO-7816-3 and rich peripherals, supports fast wake-up via many interfaces.

Key Features: Ultra-low power and short wake-up time.
Potential Applications: Suitable for limited battery-powered devices such as Smart Wearable, IoT Device, Portable Medical Device, Smart Home Appliance, Security / Alarm, Mobile Payment Smart Card Reader, GPS Data Collector, Wireless Communication (Zigbee, LoRa...etc.) Node Device, Electronic Shelf Label (ESL), RFID, Smart Heat/Water/Gas Meters, etc.

• Nano100 Series

Operating Frequency: 42 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C

Key Features: Ultra-low power: 200 µA/MHz (Normal), 75 µA/MHz (Idle), 2.5 µA (Power Down, RTC On, RAM retention) and 1 µA (Power Down, RAM retention) and less than 3.5 µs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity						PWM(16-bit)	ADC(12-bit)	RTC	EBI	PDMA	LCD	DAC(12-bit)	ICP IAP ISP	IRC 10 kHz 12 MHz	Package	Mass Production
							UART*	ISO-7816-3*	SPI	I²C	I²S	USB											
NANO100NC2BN	32	8	Configurable	4	38	4	2+2	2	3	2	1	-	6	7	√	-	8	-	2	√	√	QFN48	√
NANO100LC2BN	32	8	Configurable	4	38	4	2+2	2	3	2	1	-	6	7	√	-	8	-	2	√	√	LQFP48	√
NANO100SC2BN	32	8	Configurable	4	52	4	2+3	3	3	2	1	-	8	7	√	-	8	-	2	√	√	LQFP64*	√
NANO100ND2BN	64	8	Configurable	4	38	4	2+2	2	3	2	1	-	6	7	√	-	8	-	2	√	√	QFN48	√
NANO100ND3BN	64	16	Configurable	4	38	4	2+2	2	3	2	1	-	6	7	√	-	8	-	2	√	√	QFN48	√
NANO100LD2BN	64	8	Configurable	4	38	4	2+2	2	3	2	1	-	6	7	√	-	8	-	2	√	√	LQFP48	√
NANO100LD3BN	64	16	Configurable	4	38	4	2+2	2	3	2	1	-	6	7	√	-	8	-	2	√	√	LQFP48	√
NANO100SD2BN	64	8	Configurable	4	52	4	2+3	3	3	2	1	-	8	7	√	-	8	-	2	√	√	LQFP64*	√
NANO100SD3BN	64	16	Configurable	4	52	4	2+3	3	3	2	1	-	8	7	√	-	8	-	2	√	√	LQFP64*	√
NANO100KD3BN	64	16	Configurable	4	86	4	2+3	3	3	2	1	-	8	12	√	√	8	-	2	√	√	LQFP128	√
NANO100NE3BN	128	16	Configurable	4	38	4	2+2	2	3	2	1	-	6	7	√	-	8	-	2	√	√	QFN48	√
NANO100LE3BN	128	16	Configurable	4	38	4	2+2	2	3	2	1	-	6	7	√	-	8	-	2	√	√	LQFP48	√
NANO100SE3BN	128	16	Configurable	4	52	4	2+3	3	3	2	1	-	8	7	√	-	8	-	2	√	√	LQFP64*	√
NANO100KE3BN	128	16	Configurable	4	86	4	2+3	3	3	2	1	-	8	12	√	√	8	-	2	√	√	LQFP128	√

*Marked in the table (2+3) means 2 UART+ 3 ISO-7816 UART
*ISO-7816-3 UART supports half duplex mode

LQFP64*:7X7mm

Development Tools: NT-Nano100K (Nano100)/ NT-Nano120K (Nano100)/ NT-Nano130K (Nano100)
Mass Production Programmer: NLG-Nano100n; n should be replaced by Package Code

• Nano102 Series

Operating Frequency: 32 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C

Key Features: Ultra-low power: 150 µA/MHz (Normal), 65 µA/MHz (Idle), 1.5 µA (Power Down, RTC On, RAM retention) and 0.65 µA (Power Down, RAM retention) and less than 3.5 µs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity				Comparator	PWM(16-bit)	ADC(12-bit)	RTC	PDMA	LCD	ICP IAP ISP	IRC 10 kHz 12 MHz 16 MHz	Package	Mass Production
							UART*	ISO-7816-3*	SPI	I²C										
NANO102ZB1AN	16	4	Configurable	4	27	4	2+1	1	2	2	2	4	2	√	4	-	√	√	QFN33	√
NANO102LB1AN	16	4	Configurable	4	40	4	2+2	2	2	2	2	4	7	√	4	-	√	√	LQFP48	√
NANO102ZC2AN	32	8	Configurable	4	27	4	2+1	1	2	2	2	4	2	√	4	-	√	√	QFN33	√
NANO102LC2AN	32	8	Configurable	4	40	4	2+2	2	2	2	2	4	7	√	4	-	√	√	LQFP48	√
NANO102SC2AN	32	8	Configurable	4	58	4	2+2	2	2	2	2	4	7	√	4	-	√	√	LQFP64*	√

*Marked in the table (2+2) means 2 UART + 2 ISO-7816 UART
*ISO-7816 UART supports UART full duplex mode

LQFP64*: 7x7mm

Development Tools: NT-Nano102S (Nano102)/ NT-Nano112V (Nano102)
Mass Production Programmer: NLG-Nano102Z(QFN33)/NLG-Nano112L(LQFP48)/NLG-Nano112S(LQFP64)

• Nano103 Series

Operating Frequency: 36 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 105°C

Key Features: Ultra-low power: 180 µA/MHz (Normal), 75 µA/MHz (Idle), 2 µA (Power Down, RTC On, RAM retention).

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity					PWM	ADC(12-bit)	ACMP	RTC	IRC 10 KHz 4 MHz 12/16MHz 36 MHz	PDMA	ICP IAP ISP	Package	Mass Production
							UART*	ISO-7816-3*	SPI	I²C	I²S									
NANO103ZD3AE	64	16	Configurable	4	26	4	2+2	2	4	2	-	2	6	1	√	√	4	√	QFN33	√
NANO103LD3AE	64	16	Configurable	4	39	4	2+2	2	4	2	-	6	8	1	√	√	4	√	LQFP48	√
NANO103SD3AE	64	16	Configurable	4	53	4	2+2	2	4	2	-	6	8	1	√	√	4	√	LQFP64*	√

*Marked in the table (2+2) means 2 UART + 2 ISO-7816 UART
*ISO-7816-3 UART supports UART full duplex mode

LQFP64*: 7x7mm

Development Tools: NT-Nano103S
Mass Production Programmer: NLG-Nano103n; n should be replaced by Package Code

• Nano110 Series

Operating Frequency: 42 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C

Key Features: Integrates 4x40 & 6x38 COM/SEG LCD controller, ultra-low power: 200 μA/MHz (Normal), 75 μA/MHz (Idle), 2.5 μA (Power Down, RTC On, RAM retention) and 1 μA (Power Down, RAM retention) and less than 3.5 μs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity						PWM(16-bit)	ADC(12-bit)	RTC	EBI	PDMA	LCD	DAC(12-bit)	ICP IAP ISP	IRC 10 kHz 12 MHz	Package	Mass Production
							UART*	ISO-7816-3*	SPI	I²C	I²S	USB											
NANO110SC2BN	32	8	Configurable	4	51	4	2+3	3	3	2	1	-	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64*	√
NANO110RC2BN	32	8	Configurable	4	51	4	2+3	3	3	2	1	-	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64	√
NANO110KC2BN	32	8	Configurable	4	86	4	2+3	3	3	2	1	-	8	12	√	√	8	4x40, 6x38	2	√	√	LQFP128	√
NANO110SD2BN	64	8	Configurable	4	51	4	2+3	3	3	2	1	-	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64*	√
NANO110SD3BN	64	16	Configurable	4	51	4	2+3	3	3	2	1	-	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64*	√
NANO110RD2BN	64	8	Configurable	4	51	4	2+3	3	3	2	1	-	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64	√
NANO110RD3BN	64	16	Configurable	4	51	4	2+3	3	3	2	1	-	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64	√
NANO110KD2BN	64	8	Configurable	4	86	4	2+3	3	3	2	1	-	8	12	√	√	8	4x40, 6x38	2	√	√	LQFP128	√
NANO110KD3BN	64	16	Configurable	4	86	4	2+3	3	3	2	1	-	8	12	√	√	8	4x40, 6x38	2	√	√	LQFP128	√
NANO110SE3BN	128	16	Configurable	4	51	4	2+3	3	3	2	1	-	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64*	√
NANO110RE3BN	128	16	Configurable	4	51	4	2+3	3	3	2	1	-	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64	√
NANO110KE3BN	128	16	Configurable	4	86	4	2+3	3	3	2	1	-	8	12	√	√	8	4x40, 6x38	2	√	√	LQFP128	√

*Marked in the table (2+3) means 2 UART+ 3 ISO-7816 UART
*ISO-7816-3 UART supports half duplex mode

LQFP64*:7X7mm

Development Tools:NT-Nano130K (Nano110)
Mass Production Programmer: NLG-Nano100n; n should be replaced by Package Code

• Nano112 Series

Operating Frequency: 32 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C

Key Features: Integrates 4x36 & 6x34 COM/SEG LCD controller, ultra-low power: 150 μA/MHz (Normal), 65 μA/MHz (Idle), 1.5 μA (Power Down, RTC On, RAM retention) and 0.65 μA (Power Down, RAM retention) and less than 3.5 μs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity				Comparator	PWM(16-bit)	ADC(12-bit)	RTC	PDMA	LCD	ICP IAP ISP	IRC 10 kHz 12 MHz 16 MHz	Package	Mass Production
							UART*	ISO-7816-3*	SPI	I²C										
NANO112LB1AN	16	4	Configurable	4	40	4	2+2	2	2	2	2	4	7	√	4	4x20, 6x18	√	√	LQFP48	√
NANO112SB1AN	16	4	Configurable	4	58	4	2+2	2	2	2	2	4	7	√	4	4x32, 6x30	√	√	LQFP64*	√
NANO112RB1AN	16	4	Configurable	4	58	4	2+2	2	2	2	2	4	7	√	4	4x32, 6x30	√	√	LQFP64	√
NANO112LC2AN	32	8	Configurable	4	40	4	2+2	2	2	2	2	4	7	√	4	4x20, 6x18	√	√	LQFP48	√
NANO112SC2AN	32	8	Configurable	4	58	4	2+2	2	2	2	2	4	7	√	4	4x32, 6x30	√	√	LQFP64*	√
NANO112RC2AN	32	8	Configurable	4	58	4	2+2	2	2	2	2	4	7	√	4	4x32, 6x30	√	√	LQFP64	√
NANO112VC2AN	32	8	Configurable	4	80	4	2+2	2	2	2	2	4	8	√	4	4x36, 6x34	√	√	LQFP100	√

*Marked in the table (2+2) means 2 UART + 2 ISO-7816 UART
*ISO-7816-3 UART supports UART full duplex mode

LQFP64*:7X7mm

Development Tools: NT-Nano112V
Mass Production Programmer: NLG-Nano112n; n should be replaced by Package Code

• Nano120 Series

Operating Frequency: 42 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to 85°C

Key Features: Integrates USB 2.0 FS device interface, ultra-low power: 200 µA/MHz (Normal), 75 µA/MHz (Idle), 2.5 µA (Power Down, RTC On, RAM retention) and 1µA (Power Down, RAM retention) and less than 3.5 µs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity						PWM(16-bit)	ADC(12-bit)	RTC	EBI	PDMA	LCD	DAC(12-bit)	ICP IAP ISP	IRC 10 kHz 12 MHz	Package	Mass Production
							UART*	ISO-7816-3*	SPI	I²C	I²S	USB											
NANO120LC2BN	32	8	Configurable	4	34	4	2+2	2	3	2	1	1	4	7	√	-	8	-	2	√	√	LQFP48	√
NANO120SC2BN	32	8	Configurable	4	48	4	2+3	3	3	2	1	1	8	7	√	-	8	-	2	√	√	LQFP64*	√
NANO120LD2BN	64	8	Configurable	4	34	4	2+2	2	3	2	1	1	4	7	√	-	8	-	2	√	√	LQFP48	√
NANO120LD3BN	64	16	Configurable	4	34	4	2+2	2	3	2	1	1	4	7	√	-	8	-	2	√	√	LQFP48	√
NANO120SD2BN	64	8	Configurable	4	48	4	2+3	3	3	2	1	1	8	7	√	-	8	-	2	√	√	LQFP64*	√
NANO120SD3BN	64	16	Configurable	4	48	4	2+3	3	3	2	1	1	8	7	√	-	8	-	2	√	√	LQFP64*	√
NANO120KD3BN	64	16	Configurable	4	86	4	2+3	3	3	2	1	1	8	8	√	√	8	-	2	√	√	LQFP128	√
NANO120LE3BN	128	16	Configurable	4	34	4	2+2	2	3	2	1	1	4	7	√	-	8	-	2	√	√	LQFP48	√
NANO120SE3BN	128	16	Configurable	4	48	4	2+3	3	3	2	1	1	8	7	√	-	8	-	2	√	√	LQFP64*	√
NANO120KE3BN	128	16	Configurable	4	86	4	2+3	3	3	2	1	1	8	8	√	√	8	-	2	√	√	LQFP128	√

*Marked in the table (2+3) means 2 UART+ 3 ISO-7816 UART
*ISO-7816-3 UART supports half duplex mode

LQFP64*:7X7mm

Development Tools: NT-Nano120K/ NT-Nano130K (Nano120)
Mass Production Programmer: NLG-Nano100n; n should be replaced by Package Code

• Nano130 Series

Operating Frequency: 42 MHz
Operating Voltage: 1.8V to 3.6V
Operating Temperature: -40°C to +85°C

Key Features: Integrates 4x40 & 6x38 COM/SEG LCD controller and USB 2.0 FS device interface,ultra-low power: 200 µA/MHz (Normal), 75 µA/MHz (Idle), 2.5 µA (Power Down, RTC On, RAM retention) and 1 µA (Power Down, RAM retention) and less than 3.5 µs wake-up time.

Part No.	Flash (Kbytes)	SRAM (Kbytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer(32-bit)	Connectivity						PWM(16-bit)	ADC(12-bit)	RTC	EBI	PDMA	LCD	DAC(12-bit)	ICP IAP ISP	IRC 10 kHz 12 MHz	Package
							UART*	ISO-7816-3*	SPI	I²C	I²S	USB										
NANO130SC2BN	32	8	Configurable	4	47	4	2+3	3	3	2	1	1	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64*
NANO130KC2BN	32	8	Configurable	4	86	4	2+3	3	3	2	1	1	8	8	√	√	8	4x40, 6x38	2	√	√	LQFP128
NANO130SD2BN	64	8	Configurable	4	47	4	2+3	3	3	2	1	1	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64*
NANO130SD3BN	64	16	Configurable	4	47	4	2+3	3	3	2	1	1	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64*
NANO130KD2BN	64	8	Configurable	4	86	4	2+3	3	3	2	1	1	8	8	√	√	8	4x40, 6x38	2	√	√	LQFP128
NANO130KD3BN	64	16	Configurable	4	86	4	2+3	3	3	2	1	1	8	8	√	√	8	4x40, 6x38	2	√	√	LQFP128
NANO130SE3BN	128	16	Configurable	4	47	4	2+3	3	3	2	1	1	7	7	√	-	8	4x31, 6x29	2	√	√	LQFP64*
NANO130KE3BN	128	16	Configurable	4	86	4	2+3	3	3	2	1	1	8	8	√	√	8	4x40, 6x38	2	√	√	LQFP128

*Marked in the table (2+3) means 2 UART+ 3 ISO-7816 UART
*ISO-7816-3 UART supports half duplex mode

LQFP64*:7X7mm

Development Tools: NT-Nano130K
Mass Production Programmer: NLG-Nano100n; n should be replaced by Package Code

M251/M252 Series

The NuMicro® M251/M252 is ultra-low power series embedded with the Arm® Cortex®-M23 core for Armv8-M architecture, supports wide operation voltage and built-in 16~256 Kbytes Flash memory, 8~32 Kbytes SRAM and 4 Kbytes Flash loader memory for In-System Programming (ISP). The M251/M252 series integrates PSIO (Programmable Serial I/O) that is capable of emulating various serial communication protocols including: UART, SPI, I²C...etc. In addition Real Time Counter (RTC), ADC, DAC, Analog Comparator, Operational Amplifier, VAI (Voltage Adjustable Interface), USB 2.0 FS device (Crystal-less), ISO-7816-3, and rich peripherals, supports fast wake-up via communication interfaces.

Operating Frequency: 48 MHz
Operating Voltage: 1.8V to 5.5V
Operating Temperature: -40°C to 105°C

Potential Applications: Suitable for limited battery-powered devices, such as Wearable Device, IoT Device, Portable Medical Device, Smart Home Appliance, Security / Alarm Monitoring, Mobile Payment Smart Card Reader, GPS Data Collector, Wireless Communication (Zigbee, LoRa...etc.) Node Device, Electronic Shelf Label (ESL), RFID, Smart Heat/Water/Gas Meters, etc.

• M251 Series

Key Features: Up to 8-ch PSIO that is capable of emulating various serial communication protocols. Ultra-low-power Consumption with 138uA/MHz (Normal), 60uA/MHz (Idle), 2.5 uA (Power Down, RTC on, RAM retention) and 1.5 uA (Power Down, RTC off, RAM retention)

Part Number	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	Timer (32-bit)	PWM(16-bit)	WDT/WWDT	Connectivity							ADC(12-Bit)	ACMP	DAC	OPA	PDMA	Crypto	V_{DDIO} (1.8V-5.5V)	V_{Bat}	Package	Mass Production
								USCI	UART*	QSPI	SPI /I²S	I²C	ISO-7816-3*	PSIO										
M251FB2AE	16	8	4	15	4	9	V	1	2+1	1	-	2	1	-	7	-	-	-	5	-	-	-	TSSOP20	Q2
M251EB2AE	16	8	4	23	4	11	V	1	2+1	1	-	2	1	-	9	-	-	-	5	-	-	-	TSSOP28	Q2
M251ZB2AE	16	8	4	26	4	12	V	1	2+1	1	-	2	1	-	10	-	-	-	5	-	V	-	QFN33	Q2
M251FC2AE	32	8	4	15	4	9	V	1	2+1	1	-	2	1	-	7	-	-	-	5	-	-	-	TSSOP20	Q2
M251EC2AE	32	8	4	23	4	11	V	1	2+1	1	-	2	1	-	9	-	-	-	5	-	-	-	TSSOP28	Q2
M251ZC2AE	32	8	4	26	4	12	V	1	2+1	1	-	2	1	-	10	-	-	-	5	-	V	-	QFN33	Q2
M251LC2AE	32	8	4	41	4	24	V	2	3+1	1	1	2	1	4	12	2	-	-	5	-	V	-	LQFP48	Q2
M251SC2AE	32	8	4	54	4	24	V	2	3+1	1	1	2	1	4	16	2	-	-	5	-	V	-	LQFP64*	Q2
M251ZD2AE	64	12	4	26	4	24	V	2	3+1	1	1	2	1	4	10	2	-	-	5	-	V	-	QFN33	Q2
M251LD2AE	64	12	4	41	4	24	V	2	3+1	1	1	2	1	4	12	2	-	-	5	-	V	-	LQFP48	Q2
M251SD2AE	64	12	4	54	4	24	V	2	3+1	1	1	2	1	4	16	2	-	-	5	-	V	-	LQFP64*	Q2
M251LE3AE	128	16	4	41	4	24	V	3	3+1	1	1	2	1	8	12	2	-	-	8	-	V	-	LQFP48	Q2
M251SE3AE	128	16	4	53	4	24	V	3	3+1	1	1	2	1	8	16	2	-	-	8	-	V	V	LQFP64*	Q2
M251KE3AE	128	16	4	85	4	24	V	3	3+1	1	1	2	1	8	16	2	-	-	8	-	V	V	LQFP128	Q2
M251LG6AE	256	32	4	41	4	24	V	3	3+1	1	1	2	1	8	12	2	1	1	8	V	V	-	LQFP48	Q2
M251SG6AE	256	32	4	53	4	24	V	3	3+1	1	1	2	1	8	16	2	1	1	8	V	V	V	LQFP64*	Q2
M251KG6AE	256	32	4	85	4	24	V	3	3+1	1	1	2	1	8	16	2	1	1	8	V	V	V	LQFP128	Q2

*Marked in the table (2+1) means 2 UART+ 1 ISO-7816-3 UART
* ISO-7816-3 UART supports full duplex mode

LQFP64*:7X7mm

Development Tools: NK-M251KG/NK-M251KE/NK-M251SD/NK-M251ZC
Mass Production Programmer: NLG-20F/NLG-28E/NLG-32Z (QFN33)/ NLG-48L (LQFP48)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

• M252 Series

Key Features: USB 2.0 FS Device Crystal-less and up to 8-ch PSIO that is capable of emulating various serial communication protocols. Ultra-low-power Consumption with 138 µA/MHz (Normal), 60 µA/MHz (Idle), 2.5 µA (Power Down, RTC on, RAM retention) and 1.5 µA (Power Down, RTC off, RAM retention)

Part Number	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	I/O	Timer (32-bit)	PWM(16-bit)	WDT/WWDT	Connectivity								ADC(12-Bit)	ACMP	DAC	OPA	PDMA	Crypto	V_{DDIO} (1.8V-5.5V)	V_{Bat}	Package	Mass Production
								USCI	UART*	QSPI	SPI /I²S	I²C	ISO-7816-3*	USB*	PSIO										
M252FC2AE	32	8	4	11	4	7	V	1	2+1	1	-	2	1	1	-	3	-	-	-	5	-	-	-	TSSOP20	Q2
M252EC2AE	32	8	4	19	4	11	V	1	2+1	1	-	2	1	1	-	9	-	-	-	5	-	-	-	TSSOP28	Q2
M252ZC2AE	32	8	4	22	4	12	V	1	2+1	1	-	2	1	1	-	10	-	-	-	5	-	V	-	QFN33	Q2
M252LC2AE	32	8	4	37	4	24	V	2	3+1	1	1	2	1	1	4	12	2	-	-	5	-	V	-	LQFP48	Q2
M252SC2AE	32	8	4	50	4	24	V	2	3+1	1	1	2	1	1	4	16	2	-	-	5	-	V	-	LQFP64*	Q2
M252ZD2AE	64	12	4	22	4	20	V	2	3+1	1	1	2	1	1	4	10	2	-	-	5	-	V	-	QFN33	Q2
M252LD2AE	64	12	4	37	4	24	V	2	3+1	1	1	2	1	1	4	12	2	-	-	5	-	V	-	LQFP48	Q2
M252SD2AE	64	12	4	50	4	24	V	2	3+1	1	1	2	1	1	4	16	2	-	-	5	-	V	-	LQFP64*	Q2
M252LE3AE	128	16	4	37	4	24	V	3	3+1	1	1	2	1	1	8	12	2	-	-	8	-	V	-	LQFP48	Q2
M252SE3AE	128	16	4	49	4	24	V	3	3+1	1	1	2	1	1	8	16	2	-	-	8	-	V	V	LQFP64*	Q2
M252KE3AE	128	16	4	81	4	24	V	3	3+1	1	1	2	1	1	8	16	2	-	-	8	-	V	V	LQFP128	Q2
M252LG6AE	256	32	4	37	4	24	V	3	3+1	1	1	2	1	1	8	12	2	1	1	8	V	V	-	LQFP48	Q2
M252SG6AE	256	32	4	49	4	24	V	3	3+1	1	1	2	1	1	8	16	2	1	1	8	V	V	V	LQFP64*	Q2
M252KG6AE	256	32	4	81	4	24	V	3	3+1	1	1	2	1	1	8	16	2	1	1	8	V	V	V	LQFP128	Q2

* Marked in the table (2+1) means 2 UART+ 1 ISO-7816-3 UART
* ISO-7816-3 UART supports full duplex mode
* USB support FS Device mode crystal-less

LQFP64*:7X7mm

Development Tools: NK-M252KG/NK-M252KE/NK-M252SD/NK-M252ZC

Mass Production Programmer: NLG-20F/NLG-28E/NLG-32Z (QFN33)/ NLG-48L (LQFP48)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)

NuMicro® Family ARM Cortex®-M4 MCUs

The NuMicro Family Cortex®-M4 based MCUs provide high performance system design with up to 90-240 DMIPS operating at up to 72-192 MHz. When executing from the embedded Flash memory, the power consumption can be lowered to 130 µA/MHz with dynamic power scaling function supported by the M480 series. EBI supports Intel 8080 panel. With emWin graphics library, designer can easily creates the outstanding graphical user interface.

The NuMicro Family Cortex®-M4 based MCUs are composed of the following product series.

M480 Series: 192 MHz CPU, up to 512 KB of dual bank Flash memory, up to 160 KB of SRAM memory, SPI Master interface with XIP (eXecute-In-Place), and 16-bit I80 QVGA LCD

M481 – 192 MHz PWM, dual SDHC, dual 5 MSPS ADC, and dual 1 MSPS DAC.
M482 – USB 2.0 Full Speed device/host/OTG with integrated OTG PHY and 1 KB data buffer, dual 5 MSPS ADC.
M483 – Dual/Triple CAN 2.0B, dual USB supporting High Speed (HS) OTG and Full Speed (FS) OTG.
M484 – USB 2.0 High Speed device/host/OTG with integrated OTG PHY and 4 KB data buffer, USB 2.0 Full Speed device/host/OTG with integrated OTG PHY and 1 KB data buffer.
M485 – Hardware cryptography engine including ECC-256, AES-256, and SHA-512, random number generator, and dual USB 2.0 device/host/OTG.
M487 – 10/100 Mbps Ethernet MAC with RMII/MDC/MDIO interface, hardware cryptography engine, dual CAN 2.0B, and dual USB 2.0 device/host/OTG.

M451 Series: 72 MHz CPU, up to 256 KB of Flash memory, up to 32 KB of SRAM memory, and Quad-SPI interface

M451 – 144 MHz PWM, 1 MSPS ADC, 1 MSPS DAC
M452 – USB 2.0 Full Speed device/host/OTG with integrated OTG PHY
M453 – USB 2.0 Full Speed device/host/OTG with integrated OTG PHY, CAN 2.0B

M451 Series

The high immunity NuMicro® M451 series embedded with Arm® Cortex®-M4F core supports DSP instruction and integrated floating-point unit (FPU).The dynamic power consumption can be down to 430 µA/MHz and the standby current can be down to 1.6 µA.

Operating Frequency: 72 MHz
Operating Voltage: 2.5V to 5.5V, all GPIOs support 5V tolerance
Operating Temperature: -40°C to 105°C

Potential Applications: Industrial Automation, Home Automation, Motor Control, Communication Systems, USB Accessory, etc.

M451 Series	USB FS	CAN
M451		
M452	V	
M453	V	V

Key Features: Configurable data flash, Voltage Adjustable Interface, 16+16 bytes UART FIFO for TX/RX, 1 MSPS ADC, USB full speed device/host/OTG with on-chip PHY, Intel 8080 on EBI, ICP/ISP

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	PDMA	I/O	Timer(32-bit)	PWM[1](16-bit)	Connectivity					Quad SPI	EBI(i80)	USB FS	ADC(12-bit)	DAC(12-bit)	Analog Comp.	VAI	RTC	Package	Mass Production
								UART[2]	ISO-7816-3[3]	SPI/I²S	I²C	CAN										
M451LC3AE	40	16	4	8	39	4	12	4	1	1	2	-	1	√	-	10	1	2	√	√ (V_{BAT})	LQFP48	√
M451MLC3AE	40	16	4	8	42	4	12	4	1	1	2	-	1	√	-	11	1	2	-	-	LQFP48	√
M451RC3AE	40	16	4	8	53	4	12	4	1	1	2	-	1	√	-	16	1	2	√	√ (V_{BAT})	LQFP64	√
M451MSC3AE	40	16	4	8	55	4	12	4	1	1	2	-	1	√	-	13	1	2	-	-	LQFP64[5]	√
M451LD3AE	72	16	4	8	39	4	12	4	1	1	2	-	1	√	-	10	1	2	√	√ (V_{BAT})	LQFP48	√
M451MLD3AE	72	16	4	8	42	4	12	4	1	1	2	-	1	√	-	11	1	2	-	-	LQFP48	√
M451RD3AE	72	16	4	8	53	4	12	4	1	1	2	-	1	√	-	16	1	2	√	√ (V_{BAT})	LQFP64	√
M451MSD3AE	72	16	4	8	55	4	12	4	1	1	2	-	1	√	-	13	1	2	-	-	LQFP64[5]	√
M451LE6AE	128	32	4	12	39	4	12	3	1	2	2	-	1	√	-	8	1	2	√	√ (V_{BAT})	LQFP48	√
M451MLE6AE	128	32	4	12	42	4	12	4	1	2	2	-	1	√	-	9	1	2	-	-	LQFP48	√
M451RE6AE	128	32	4	12	53	4	12	4	1	2	2	-	1	√	-	12	1	2	√	√ (V_{BAT})	LQFP64	√
M451VE6AE	128	32	4	12	85	4	12	4	1	2	2	-	1	√	-	16	1	2	√	√ (V_{BAT})	LQFP100	√
M451LG6AE	256	32	4	12	39	4	12	3	1	2	2	-	1	√	-	8	1	2	√	√ (V_{BAT})	LQFP48	√
M451MLG6AE	256	32	4	12	42	4	12	3	1	2	2	-	1	√	-	9	1	2	-	-	LQFP48	√
M451RG6AE	256	32	4	12	53	4	12	4	1	2	2	-	1	√	-	12	1	2	√	√ (V_{BAT})	LQFP64	√
M451VG6AE	256	32	4	12	85	4	12	4	1	2	2	-	1	√	-	16	1	2	√	√ (V_{BAT})	LQFP100	√
M452LC3AE	40	16	4	8	35	4	10	4	1	1	2	-	1	√	Device	10	1	2	√	√ (V_{BAT})	LQFP48	√
M452LD3AE	72	16	4	8	35	4	10	4	1	1	2	-	1	√	Device	10	1	2	√	√ (V_{BAT})	LQFP48	√
M452RD3AE	72	16	4	8	49	4	12	4	1	1	2	-	1	√	Device	16	1	2	√	√ (V_{BAT})	LQFP64	√
M452LE6AE	128	32	4	12	34	4	10	3	1	1	2	-	1	√	OTG	8	1	2	√	√ (V_{BAT})	LQFP48	√
M4521LE6AE	128	32	4	8	35	4	10	3*	1	1	2	-	1	√	Host/Device[4]	10	-	-	√	√ (V_{BAT})	LQFP48	√
M4521SE6AE	128	32	4	8	49	4	12	4*	1	1	2	-	1	√	Host/Device[4]	16	-	-	√	√ (V_{BAT})	LQFP64[5]	√
M452RE6AE	128	32	4	12	48	4	12	4	1	2	2	-	1	√	OTG	12	1	2	√	√ (V_{BAT})	LQFP64	√
M452VE6AE	128	32	4	12	80	4	12	4	1	2	2	-	1	√	OTG	16	1	2	√	√ (V_{BAT})	LQFP100	√
M452LG6AE	256	32	4	12	34	4	10	3	1	1	2	-	1	√	OTG	8	1	2	√	√ (V_{BAT})	LQFP48	√
M452RG6AE	256	32	4	12	48	4	12	4	1	2	2	-	1	√	OTG	12	1	2	√	√ (V_{BAT})	LQFP64	√
M452VG6AE	256	32	4	12	80	4	12	4	1	2	2	-	1	√	OTG	16	1	2	√	√ (V_{BAT})	LQFP100	√
M453LC3AE	40	16	4	8	35	4	10	4	1	1	2	1	1	√	Device	10	1	2	√	√ (V_{BAT})	LQFP48	√
M453LD3AE	72	16	4	8	35	4	10	4	1	1	2	1	1	√	Device	10	1	2	√	√ (V_{BAT})	LQFP48	√
M453RD3AE	72	16	4	8	49	4	12	4	1	1	2	1	1	√	Device	16	1	2	√	√ (V_{BAT})	LQFP64	√
M453VD3AE	72	16	4	8	72	4	12	4	1	1	2	1	1	√	Device	16	1	2	√	√ (V_{BAT})	LQFP100	√
M453LE6AE	128	32	4	12	34	4	10	3	1	2	2	1	1	√	OTG	8	1	2	√	√ (V_{BAT})	LQFP48	√
M453RE6AE	128	32	4	12	48	4	12	4	1	2	2	1	1	√	OTG	12	1	2	√	√ (V_{BAT})	LQFP64	√
M453VE6AE	128	32	4	12	80	4	12	4	1	2	2	1	1	√	OTG	16	1	2	√	√ (V_{BAT})	LQFP100	√
M453LG6AE	256	32	4	12	34	4	10	3	1	2	2	1	1	√	OTG	8	1	2	√	√ (V_{BAT})	LQFP48	√
M453RG6AE	256	32	4	12	48	4	12	4	1	2	2	1	1	√	OTG	12	1	2	√	√ (V_{BAT})	LQFP64	√
M453VG6AE	256	32	4	12	80	4	12	4	1	2	2	1	1	√	OTG	16	1	2	√	√ (V_{BAT})	LQFP100	√

1. 12-ch PWM from 6x 16-bit timers. (144 MHz)
2. All UARTs support IrDA SIR. UART0/1 support LIN function. *M4521xE6AE doesn't support LIN function.
3. ISO-7816 supports full duplex UART mode with 4+4 bytes FIFO for TX/RX.
4. USB supports crystal-less feature in full speed device mode.
5. LQFP64, 7 mm x 7 mm

Development Tools: NT-M451V (M451, M452, M453, M451M), NT-M4521S (M4521)
Mass Production Programmer: NG-M451n (M451n)/ NG-M451Mn (M451Mn); n should be replaced by Package Code/ NG-M453L (M452L, M453L, M4TKL)/ NG-M453R (M452R, M453R, M4TKR)/ NG-M453V (M453V, M4TKV)

M480 Series

The high performance, low power consumption, secure boot and hardware cryptography NuMicro® M480 series embedded with Arm® Cortex®-M4F core supports DSP instruction and integrated floating-point unit (FPU).The dynamic power consumption can be down to 175 or 130 μA/MHz and the standby current can be down to 1 μA. M480 series supports Secure Boot functionality, which provides a constant digital signature of system software for identification during boot up, to protect the integrity of Flash content from attack.

Operating Frequency: 192 MHz
Operating Voltage: 1.8V to 3.6V, all GPIOs support 5V tolerance
Operating Temperature: -40°C to 105°C

Potential Applications: Industrial Automation, Home Automation, Motor Control, Sensor Hub, IoT/IIoT Gateway, Security System, Ethernet Converter, Gaming Accessory, etc.

M480 Series	USB FS	USB HS	CAN	Crypto	Ethernet
M481					
M482	V				
M483	V	V	V		
M484	V	V			
M485	V	V		V	
M487	V	V	V	V	V

Key Features: Configurable data flash, Voltage Adjustable Interface, 16+16 bytes UART FIFO for TX/RX, Dual 5 MSPS ADC, USB high speed device/host/OTG with on-chip PHY, Hardware ECC (Elliptic Curve Cryptography), 10/100 Mbps Ethernet, Intel 8080 on EBI, ICP/ISP/IAP

Part No.	Flash(Kbytes)	SRAM(Kbytes)	ISP ROM(Kbytes)	SPROM(Kbytes)	XOM	PDMA	I/O	Timer(32-bit)	PWM[1](16-bit)	Connectivity								Quad SPI	SPI Master[5]	EBI(i80)	USB OTG	Ethernet MAC	ADC(12-bit)	DAC(12-bit)	Analog Comp.	OP Amp.	QEI	eCAP	Camera	Crypto Engine	TRNG	VAI	RTC	Package	Mass Production
										LPUART[2]	ISO-7816-3[3]	SPI/I²S	I²S	I²C	USCI[4]	CAN	SD Host																		
M481ZG8AE	256	64	4	-	√	16	26	4	24	8	1	2	1	3	-	-	1	2	-	-	-	-	10	1	2	-	2	-	√	AES	√	√	√ (V_{BAT})	QFN33	Q3
M481LG8AE	256	64	4	-	√	16	41	4	24	8	1	2	1	3	-	-	1	2	-	√	-	-	12	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP48	Q3
M481SG8AE	256	64	4	-	√	16	52	4	24	8	1	3	1	3	-	-	1	2	-	√	-	-	16	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP64	Q3
M481ZGAAE	256	96	4	4	-	16	26	4	24	6	3	3	1	3	2	-	1	1	1	-	-	-	10	2	2	1	1	-	-	-	-	√	√	QFN33	√
M481LGAAE	256	96	4	4	-	16	41	4	24	6	3	3	1	3	2	-	2	1	1	√	-	-	12	2	2	2	2	1	-	-	-	√	√	LQFP48	√
M481SGAAE	256	96	4	4	-	16	52	4	24	6	3	4	1	3	2	-	2	1	1	√	-	-	16	2	2	2	2	1	-	-	-	√	√	LQFP64	√
M481ZGCAE	256	128	4	-	√	16	26	4	24	8	1	2	1	3	-	-	1	2	-	-	-	-	10	1	2	-	2	-	√	AES	√	√	√ (V_{BAT})	QFN33	Q3
M481LGCAE	256	128	4	-	√	16	41	4	24	8	1	2	1	3	-	-	1	2	-	√	-	-	12	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP48	Q3
M481SGCAE	256	128	4	-	√	16	52	4	24	8	1	3	1	3	-	-	1	2	-	√	-	-	16	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP64	Q3
M481ZIDAE	512	160	4	4	-	16	26	4	24	6	3	3	1	3	2	-	1	1	1	-	-	-	10	2	2	1	1	-		-	-	√	√	QFN33	√
M481LIDAE	512	160	4	4	-	16	41	4	24	6	3	3	1	3	2	-	2	1	1	√	-	-	12	2	2	2	2	1		-	-	√	√	LQFP48	√
M481SIDAE	512	160	4	4	-	16	52	4	24	6	3	4	1	3	2	-	2	1	1	√	-	-	16	2	2	2	2	1		-	-	√	√	LQFP64	√
M482ZG8AE	256	64	4	-	√	16	26	4	24	8	1	2	1	3	-	-	1	2	-	√	FS[6]	-	10	1	2	-	2	-	√	AES	√	√	√ (V_{BAT})	QFN33	Q3
M482LG8AE	256	64	4	-	√	16	41	4	24	8	1	2	1	3	-	-	1	2	-	√	FS[6]	-	12	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP48	Q3
M482SG8AE	256	64	4	-	√	16	52	4	24	8	1	3	1	3	-	-	1	2	-	√	FS[6]	-	16	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP64	Q3
M482LGAAE	256	96	4	4	-	16	41	4	24	6	3	3	1	3	2	-	2	1	1	√	FS	-	12	2	2	2	2	1	-	-	-	√	√	LQFP48	√
M482SGAAE	256	96	4	4	-	16	52	4	24	6	3	4	1	3	2	-	2	1	1	√	FS	-	16	2	2	2	2	1	-	-	-	√	√	LQFP64	√
M482KGAAE	256	96	4	4	-	16	100	4	24	6	3	4	1	3	2	-	2	1	1	√	FS	-	16	2	2	3	2	2	-	-	-	√	√	LQFP128	√
M482ZGCAE	256	128	4	-	√	16	26	4	24	8	1	2	1	3	-	-	1	2	-	√	FS[6]	-	10	1	2	-	2	-	√	AES	√	√	√ (V_{BAT})	QFN33	Q3
M482LGCAE	256	128	4	-	√	16	41	4	24	8	1	2	1	3	-	-	1	2	-	√	FS[6]	-	12	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP48	Q3
M482SGCAE	256	128	4	-	√	16	52	4	24	8	1	3	1	3	-	-	1	2	-	√	FS[6]	-	16	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP64	Q3
M482KGCAE	256	128	4	-	√	16	100	4	24	8	1	3	1	3	-	-	1	2	-	√	FS[6]	-	16	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP128	Q3
M482ZIDAE	512	160	4	4	-	16	26	4	24	6	3	3	1	3	2	-	1	1	1	-	FS	-	10	2	2	1	1	-		-	-	√	√	QFN33	√
M482LIDAE	512	160	4	4	-	16	41	4	24	6	3	3	1	3	2	-	2	1	1	√	FS	-	12	2	2	2	2	1		-	-	√	√	LQFP48	√
M482SIDAE	512	160	4	4	-	16	52	4	24	6	3	4	1	3	2	-	2	1	1	√	FS	-	16	2	2	2	2	1		-	-	√	√	LQFP64	√
M482KIDAE	512	160	4	4	-	16	100	4	24	6	3	4	1	3	2	-	2	1	1	√	FS	-	16	2	2	3	2	2		-	-	√	√	LQFP128	√
M483SG8AE	256	64	4	-	√	16	52	4	24	8	1	3	1	3	-	2	1	2	-	√	FS[6]	-	16	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP64	Q3
M483SGAAE	256	96	4	4	-	16	44	4	24	6	3	4	1	3	2	2	2	1	1	√	HS	-	16	2	2	2	2	1	-	-	-	√	√	LQFP64	√
M483SGCAE	256	128	4	-	√	16	52	4	24	8	1	3	1	3	-	2	1	2	-	√	FS[6]	-	16	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP64	Q3
M483KGCAE	256	128	4	-	√	16	100	4	24	8	1	3	1	3	-	3	1	2	-	√	FS[6]	-	16	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP128	Q3
M483SIDAE	512	160	4	4	-	16	44	4	24	6	3	4	1	3	2	2	2	1	1	√	HS	-	16	2	2	2	2	1		-	-	√	√	LQFP64	√
M483KIDAE	512	160	4	4	-	16	100	4	24	6	3	4	1	3	2	2	2	1	1	√	HS+FS	-	16	2	2	3	2	2	-	-	-	√	√	LQFP128	√
M484SGAAE	256	96	4	4	-	16	44	4	24	6	3	4	1	3	2	-	2	1	1	√	HS	-	16	2	2	2	2	1	-	-	-	√	√	LQFP64	√
M484SIDAE	512	160	4	4	-	16	44	4	24	6	3	4	1	3	2	-	2	1	1	√	HS	-	16	2	2	2	2	1	-	-	-	√	√	LQFP64	√
M484KIDAE	512	160	4	4	-	16	100	4	24	6	3	4	1	3	2	-	2	1	1	√	HS+FS	-	16	2	2	3	2	2	-	-	-	√	√	LQFP128	√
M485ZIDAE	512	160	4	4	-	16	26	4	24	6	3	3	1	3	2	-	1	1	1	-	FS	-	10	2	2	1	1	-	-	√	-	√	√	QFN33	√
M485LIDAE	512	160	4	4	-	16	41	4	24	6	3	3	1	3	2	-	2	1	1	√	FS	-	12	2	2	2	2	1	-	√	-	√	√	LQFP48	√
M485SIDAE	512	160	4	4	-	16	44	4	24	6	3	4	1	3	2	-	2	1	1	√	HS	-	16	2	2	2	2	1	-	√	-	√	√	LQFP64	√
M485KIDAE	512	160	4	4	-	16	100	4	24	6	3	4	1	3	2	-	2	1	1	√	HS+FS	-	16	2	2	3	2	2	-	√	-	√	√	LQFP128	√
M487SGAAE	256	96	4	4	-	16	44	4	24	6	3	4	1	3	2	2	2	1	1	√	HS	√	16	2	2	2	2	1	-	√	-	√	√	LQFP64	√
M487SIDAE	512	160	4	4	-	16	44	4	24	6	3	4	1	3	2	2	2	1	1	√	HS	√	16	2	2	2	2	1	-	√	-	√	√	LQFP64	√
M487KIDAE	512	160	4	4	-	16	100	4	24	6	3	4	1	3	2	2	2	1	1	√	HS+FS	√	16	2	2	3	2	2	-	√	-	√	√	LQFP128	√
M487JIDAE	512	160	4	4	-	16	114	4	24	6	3	4	1	3	2	2	2	1	1	√	HS+FS	√	16	2	2	3	2	2	-	√	-	√	√	LQFP144	√
M483SG8AE2A	256	64	4	-	√	16	52	4	24	8	1	3	1	3	-	2	1	2	-	√	FS[6]	-	8+8	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP64	Q3
M483KGCAE2A	256	128	4	-	√	16	100	4	24	8	1	3	1	3	-	3	1	2	-	√	FS[6]	-	16+8	1	2	-	2	2	√	AES	√	√	√ (V_{BAT})	LQFP128	Q3
M484SGAAE2U	256	96	4	4	-	16	44	4	24	6	3	4	1	3	2	-	2	1	1	√	HS+FS	-	16	2	2	2	2	1	-	-	-	√	√	LQFP64	√
M484SIDAE2U	512	160	4	4	-	16	44	4	24	6	3	4	1	3	2	-	2	1	1	√	HS+FS	-	16	2	2	2	2	1	-	-	-	√	√	LQFP64	√

1. 12-ch Enhanced PWM from 6x 16-bit timers + 12-ch Basic PWM from 2x 16-bit timers. (192 MHz)
2. All UARTs support IrDA SIR. UART0/1 support LIN function.
3. ISO-7816 supports full duplex UART mode.
4. USCI supports configurable UART, SPI and I²C mode. UART mode supports 1+2 bytes FIFO for TX/RX.
5. SPI Master is designed for accessing SPI Flash and supports XIP(eXecute-In-Place) with 32 KB cache.
6. USB supports crystal-less feature in full speed device mode.

Development Tools: NK-BEDM487, NK-BEDM487D, NK-BEDM487E

Mass Production Programmer: NLG-32Z (QFN33)/ NLG-48L (LQFP48)/ NLG-64S (LQFP64)/ NLG-128KX (LQFP128)/ NLG-144J (LQFP144)

NUC505 Series

The NuMicro® NUC505 series embedded with Arm® Cortex®-M4F core supports DSP instructions and integrated floating-point unit (FPU). The dynamic power consumption can be down to 479 µA/MHz and the standby current can be down to 7 µA. NUC505 series supports internal Audio PLL and internal stereo 24-bit Sigma-Delta audio CODEC with Mic/Line input and headphone output.

Operating Frequency: 100 MHz
Operating Voltage: 3.3V, all GPIOs support 5V tolerance
Operating temperature: -40°C to 85°C

Potential Applications: Thermal Printer, GPS Tracker, Wireless Microphone, Alarm Speaker, etc.

Key Features: 128-bit Key for Code Protection, 64+64 bytes UART FIFO for TX/RX, Dual USB, Audio PLL, 24-bit audio CODEC

Part No.	Serial Flash (Kbytes)	SRAM (Kbytes)	I/O	Timer(32-bit)	PWM[1](16-bit)	Connectivity							Quad SPI	SPI Master[3]	USB Host	USB Device	ADC(12-bit)	DAC(12-bit)	Digital Mic	Auio CODEC (24-bit)	RTC	Package	Mass Production
						UART[2]	ISO-7816-3	SPI	I²S	I²C	CAN	SD Host											
NUC505DLA	512	128	18	4	-	2	-	1	1	2	-	-	-	1	-	HS	5-ch	-	√	√	-	LQFP48	√
NUC505YLA	512	128	18	4	-	2	-	1	1	2	-	-	-	1	-	HS	5-ch	-	√	√	-	QFN48	√
NUC505YLA2Y	512	128	25	4	4	3	-	2	1	3	-	√	-	1	FS	HS	5-ch	-	√	-	√ (V_{BAT})[5]	QFN48	√
NUC505DSA	512	128	34	4	4	3	-	2	1	2	-	√	-	1	FS	HS	5-ch	-	√	√	-	LQFP64	√
NUC505DL13Y	2048	128	25	4	4	3	-	2	1	2	-	√	-	1	FS	HS	5-ch	-	√	-	√ (V_{BAT})[5]	LQFP48	√
NUC505DS13Y	2048	128	35	4	4	3	-	2	1	2	-	√	-	1	FS	HS	8-ch	-	√	√[4]	√ (V_{BAT})[5]	LQFP64	√
NUC505YO13Y	2048	128	52	4	4	3	-	2	1	2	-	√	-	1	FS	HS	8-ch	-	√	√	√ (V_{BAT})	QFN88	√

1. 4-ch PWM from single 2x 16-bit timers.
2. All UARTs support IrDA SIR. UART0 only supports 16+16 bytes FIFO for TX/RX. UART1/2 support LIN function.
3. SPI Master is designed for accessing SPI Flash and supports XIP(eXecute-In-Place).
4. Only headphone output is supported
5. Not support 32 kHz crystal pin out.

Development Tools: NT-NUC505Y

Mass Production Programmer: NG-NUC505LA (NUC505DLA)/ NG-NUC505L (NUC505DL13Y)/ NG-NUC505NA (NUC505YLA)/ NG-NUC505N (NUC505YLA2Y)/ NG-NUC505SA (NUC505DSA)/ NG-NUC505S (NUC505DS13Y)/ NG-NUC505O (NUC505YO13Y)

NuMicro® Family Arm9 MPUs

NUC970/980 Series

Nuvoton's ARM9 Industrial network series offers LQFP packages stacked with 16 MB~128 MB DDR memory to reduce PCB size and EMI issues. Rich peripherals include 11 sets of UART, dual Ethernet, SDIO/eMMC interface, NAND Flash interface, LCD controller, CAN 2.0B interface and High-Speed USB 2.0 host/device controller to allow more flexibility in designs. The Arm9 Industrial network series also integrates the crypto engine which provides hardware acceleration for AES, ECC, RSA and SHA function.

Operaing Frequency: 300 MHz (ARM926EJ-S)
Operating Voltage: 3.0V to 3.6V, GPIOs support 5V tolerance
Operating temperature: -40°C to 85°C

Boot Source: SPI NOR, SPI NAND, NAND, SD, eMMC
Potential Applications: Industrial Control, HMI, Industrial IoT Gateway, Network Printer, Meter Concentrator and Smart Home Gateway applications.

Series	EBI	LCD	Crypto	Linux
NUC980DF	√	-	AES/ECC/RSA/SHA	√
NUC980DK	√	-	AES/ECC/RSA/SHA	√
NUC980DR	-	-	AES/ECC/RSA/SHA	√
NUC972DF	√	√	AES/ECC/SHA/DES/3DES	√
NUC975DK	-	-	AES/ECC/SHA/DES/3DES	√
NUC976DK	-	√	AES/ECC/SHA/DES/3DES	√
NUC977DK	-	√	AES/ECC/SHA/DES/3DES	√
NUC978DK	-	√	AES/ECC/SHA/DES/3DES	√

Key Features: MCP industrial DDR in LQFP package, Dual USB High Speed Host, Dual 10/100M Ethernet MAC.

Part No.	Stack DDR Size(MB)	Crypto	Q SPI Flash Boot	SPI NAND Boot	NAND Flash Boot	SD Memory Boot	eMMC I/F	SD / SDIO	Ethernet	USB 2.0 HS Host	USB 2.0 HS Device	USB 2.0 FS Host Lite	JPEG Codec	2D Graphics	Parallel RGB LCD Color(bit)	Touch Screen Controller	Real-Time Clock(RTC)	Timer(32-bit)	WatchdogTimer	Window Watchdog Timer	ADC(12bit)	EBI	PWM	CMOS Interface	UART	CAN BUS	I²C	SPI	ISO7816-3	I²S	GPIO(Max)	Package	Mass Production
NUC972DF71YC	128	√	√	-	√	-	√	2	2	2	1	-	√	√	24	√	√	5	√	√	8	√	4	1	11	2	2	2	2	1	146	LQFP216	√
NUC972DF61YC	64	√	√	-	√	-	√	2	2	2	1	-	√	√	24	√	√	5	√	√	8	√	4	1	11	2	2	2	2	1	146	LQFP216	√
NUC972DF61Y	64	√	√	-	√	-	√	2	2	2	1	-	√	√	24	√	√	5	√	√	8	√	4	1	11	-	2	2	2	1	146	LQFP216	√
NUC975DK61Y	64	√	√	-	√	-	√	2	1	2	1	-	√	-	-	-	-	5	√	√	4	-	2	1	10	-	2	2	2	1	87	LQFP128	√
NUC975DK41Y	16	√	√	-	√	-	√	2	1	2	1	-	√	-	-	-	-	5	√	√	4	-	2	1	10	-	2	2	2	1	87	LQFP128	√
NUC976DK61YC	64	√	√	-	-	-	√	2	1	2	1	-	√	√	16	√	√	5	√	√	4	-	4	1	6	1	2	2	2	1	80	LQFP128	√
NUC976DK61Y	64	√	√	-	-	-	√	2	1	2	1	-	√	√	16	√	√	5	√	√	4	-	4	1	6	-	2	2	2	1	80	LQFP128	√
NUC976DK41Y	16	√	√	-	-	-	√	2	1	2	1	-	√	√	16	√	√	5	√	√	4	-	4	1	6	1	2	2	2	1	80	LQFP128	√
NUC977DK61YC	64	√	√	-	√	-	√	2	1	2	1	-	√	√	16	-	√	5	√	√	-	-	4	1	8	1	2	2	2	1	87	LQFP128	√
NUC977DK61Y	64	√	√	-	√	-	√	2	1	2	1	-	√	√	16	-	√	5	√	√	-	-	4	1	8	-	2	2	2	1	87	LQFP128	√
NUC977DK41Y	16	√	√	-	√	-	√	2	1	2	1	-	√	√	16	-	√	5	√	√	-	-	4	1	8	-	2	2	2	1	87	LQFP128	√
NUC978DK61Y	64	√	√	-	√	-	√	2	1	2	1	-	√	√	16	√	√	5	√	√	5	-	4	1	9	-	2	2	2	1	86	LQFP128	√
NUC978DK41Y	16	√	√	-	√	-	√	2	1	2	1	-	√	√	16	√	√	5	√	√	5	-	4	1	9	-	2	2	2	1	86	LQFP128	√
NUC980DF71YC	128	√	√	√	√	√	√	2	2	2	1	6		-	-	-	√	6	√	√	8	√	8	2	10	4	4	3	2	1	104	LQFP216	√
NUC980DF61YC	64	√	√	√	√	√	√	2	2	2	1	6		-	-	-	√	6	√	√	8	√	8	2	10	4	4	3	2	1	104	LQFP216	√
NUC980DK61YC	64	√	√	√	√	√	√	2	2	2	1	6		-	-	-	√	6	√	√	8	√	8	2	10	4	4	3	2	1	92	LQFP128	√
NUC980DK61Y	64	√	√	√	√	√	√	2	2	2	1	-		-	-	-	√	6	√	√	8	√	8	2	10	-	4	3	2	1	92	LQFP128	√
NUC980DK41Y	16	√	√	√	√	√	√	2	2	2	1	-		-	-	-	√	6	√	√	8	√	8	2	10	-	4	3	2	1	92	LQFP128	√
NUC980DR61Y	64	√	-	-	√	√	√	2	1	1	1	-		-	-	-	-	6	√	√	2	-	5	2	8	-	2	2	2	1	40	LQFP64-EP	√
NUC980DR41Y	16	√	-	-	√	√	√	2	1	1	1	-		-	-	-	-	6	√	√	2	-	5	2	8	-	2	2	2	1	40	LQFP64-EP	√

Development Tools: ND-NUC972 (NUC972/ NUC976/ NUC977), NK-NUC980 (NUC980DF/ NUC980DK/ NUC980DR)

N9H Series

The HMI emWin N9H Series is embedded with the ARM926EJ-S core. CPUs operating at up to 200 MHz, 264 MHz and 300 MHz respectively. It uses Multi Chip Package (MCP) with SDRAM stacked, size ranging from 2 MB to 128 MB, which significantly reduces PCB size and electromagnetic interference (EMI) to minimize system design efforts and shorten the product design cycle time.

The N9H series BSP (Board Support Package) comes with licensed industrial leading emWin embedded GUI library, which contains emWin library, samples, tools and documents. Nuvoton licensed it from SEGGER to allow developers to create smooth, professional, high quality.

Operaing Frequency: 200/264/300 MHz (ARM926EJ-S)
Operating Voltage: 3.0V to 3.6V, GPIOs support 5V tolerance
Operating temperature: -40°C to 85°C / -20°C to 85°C

Boot Source: SPI NOR, NAND, SD, eMMC
Potential Applications: HMI (Human Machine Interface) of home automation and industrial

Series	Operating Frequency	LCD	Video Codec	Audio DAC	Ethernet/CAN	Operating Temp	Linux
N9H20	200	16 / 24bit	JPEG	√	-	-20°C to 85°C	√
N9H26	264	24bit	JPEG /H.264	√	-	-20°C to 85°C	√
N9H30	300	16 / 24bit	JPEG	-	√	-40°C to 85°C	√

Key Features: MCP Memory up to 128MB, LCD up to 1024x768 24-bit, Supports SEGGER emWin library

Part No.	Stack DDR Size(MB)	SPI NOR Boot	NAND Flash Boot	SD Card Boot	eMMC I/F	SD / SDIO	Ethernet	USB 2.0 HS Host	USB 2.0 HS Device	USB 2.0 FS Host	2D Graphics	Parallel RGB LCD Color(bit)	Touch Screen Controller	Real-Time Clock(RTC)	Timer(32-bit)	WatchdogTimer	Window Watchdog Timer	ADC	PWM	EBI	UART	CAN BUS	I²C	SPI	I²S	GPIO(Max)	Package	Mass Production
N9H20R11N	2	√	-	√	√	1	-	-	1	1	√	16	-	-	2	√	-	-	4	-	2	-	1	1	-	44	TQFP64-EP	√
N9H20K11N	2	√	√	√	√	3	-	-	1	1	√	24	√	√	2	√	-	10bit x 3CH	4	-	2	-	1	2	1	70	LQFP128	√
N9H20K31N	8	√	√	√	√	3	-	-	1	1	√	24	√	√	2	√	-	10bit x 3CH	4	-	2	-	1	2	1	70	LQFP128	√
N9H20K51N	32	√	√	√	√	3	-	-	1	1	√	24	√	√	2	√	-	10bit x 3CH	4	-	2	-	1	2	1	70	LQFP128	√
N9H26K51N	32	√	√	√	√	3	-	1	1	-	√	24	√	√	4	√	-	10bit x 7CH	4	-	2	-	1	2	1	80	LQFP128	√
N9H30K41I	16	√	√	-	√	2	-	2	1	-	√	16	√	√	5	√	√	12bit x 5CH	4	-	2	-	2	2	1	86	LQFP128	√
N9H30F61IEC	64	√	√	-	√	2	2	2	1	-	√	24	√	√	5	√	√	12bit x 8CH	4	√	11	2	2	2	1	146	LQFP216	√
N9H30F71IEC	128	√	√	-	√	2	2	2	1	-	√	24	√	√	5	√	√	12bit x 8CH	4	√	11	2	2	2	1	146	LQFP216	√

Development Tools: NK-N9H20(N9H20), **NK-N9H26(N9H26)**, **NK-N9H30(N9H30)**

N329 Series

Designed for cost-effective solutions targeting at consumer electronics, the ARM-based SoC are embedded with various H/W accelerators and a number of useful peripherals. All parts even come up with a unique MCP (Multi-Chip Package) in the LQFP footprint, which is ideal in terms of several key design factors: high performance, small dimension, much less EMI, stable production yield, and lower BOM cost.

Operaing Frequency: 200/240 MHz (ARM926EJ-S)
Operating Voltage: 3.0V to 3.6V
Operating temperature: -20°C to 85°C

Boot Source: SPI NOR, NAND, SD, eMMC

Series	Operation Frequency	Video Codec	Linux
N3290xR	200	JPEG	√
N32901R7	200	JPEG	-
N3290xU	200	JPEG	√
N3290xK	200	JPEG	√
N3292xU	240	JPEG /H.264	√

Key Features: H.264 / MJPEG Codec, LQFP MCP Memory up tp 64MB , LCD Display, Bulid in Audio Codec

Part No.	Stacked DDR Size(MB)	SPI NOR Boot	NAND Flash Boot	SD / SDIO	USB FS Host(12 Mbps)	USB HS Host	USB Device(FS / HS)	Video Codec	2D Graphics	Parallel RGB LCD Color(bit)	Max. Resolution[3]	SAR ADC	ADC for MIC Input	Touch Panel(Wire)	Stereo DAC(bits)	JTAG	Ethernet MAC	CMOS Sensor	UART	I²C	SPI	RTC	PWM	I²S	GPIO(Max)	Package	Mass Production
N32901R1DN	2	√	-	2	1	-	HS	MJPEG	-	-	-	1	√	-	16	-	-	1	2	-	1	-	2	√	34	LQFP64	√
N32903R5DN	8	√	-	2	1	-	HS	MJPEG	-	-	-	1	√	-	16	-	-	1	2	-	1	-	2	√	34	TQFP64-EP	√
N32905R3DN	32	√	-	2	1	-	HS	MJPEG	-	-	-	1	√	-	16	-	-	1	2	-	1	-	2	√	34	TQFP64-EP	√
N32901R7DN	2	√	-	1	1	-	HS	MJPEG	√	16	QVGA	-	-	-	-	√	-	-	2	1	1	-	4	-	44	TQFP64-EP	√
N32901U1DN	2	√	√	3	1	-	HS	MJPEG	√	18	QVGA	2	√	4	16	√	-	1	2	1	1	√	4	√	64	LQFP128	√
N32903U5DN	8	√	√	3	1	-	HS	MJPEG	√	18	VGA	2	√	4	16	√	-	1	2	1	1	√	4	√	64	LQFP128	√
N32905U3DN	32	√	√	3	1	-	HS	MJPEG	√	18	VGA	2	√	4	16	√	-	1	2	1	1	√	4	√	64	LQFP128	√
N32901K3DN	2	√	√	3	1	-	HS	MJPEG	√	24	VGA	3	-	4	16	√	-	1	2	1	2	√	4	√	70	LQFP128	√
N32903K5DN	8	√	√	3	1	-	HS	MJPEG	√	24	VGA	3	-	4	16	√	-	1	2	1	2	√	4	√	70	LQFP128	√
N32905K5DN	32	√	√	3	1	-	HS	MJPEG	√	24	VGA	3	-	4	16	√	-	1	2	1	2	√	4	√	70	LQFP128	√
N32926U4DN	64	√	√	3	1	1	HS	MJPEG/H.264	√	24	XGA	7	√	4/5	16	√	1	2	2	1	1	√	4	√	80	LQFP128	√

Development Tools: ND-N32905 (N32901, N32903, N32905)/ ND-N32926 (N32926)

NuMicro® Family 8051 MCUs

As a leading supplier of 8051 microcontrollers (MCUs), Nuvoton offers a variety of products with the best-in-class price/performance critical to the success of consumers and industrial products. The 8-bit MCU comes equipped with rich peripherals to meet various system requirements and is supported by the tool chain from world leading tool makers for rapid product development.

Key Features: N76E N79E series offer high-value features by integrating high resolution of ADC, power management circuit such as LDO, POR and BOD.

N76E Series (1T)

Operaing Frequency: 16 MHz
Operating Voltage:2.4V to 5.5V
Operating temperature: -40°C to 105°C

Potential Applications: Industrial Control, Thermostat, HMI, LED Control, Consumer, etc.

Part No.		SRAM (bytes)	Data Flash (bytes)	ISP ROM	I/O	Timer (16-bit)	Connectivity			PWM	ADC	Package	Mass Production
							UART	SPI	I²C				
N76E003AT20	18	256+768	Configurable	√	up to 18	4	2	1	1	6*16-bit	8*12-bit	TSSOP20	√
N76E003AQ20	18	256+768	Configurable	√	up to 18	4	2	1	1	6*16-bit	8*12-bit	QFN20*	√
N76E003BQ20	18	256+768	Configurable	√	up to 18	4	2	1	1	6*16-bit	8*12-bit	QFN20**	√

*QFN20: 0.4mm Pitch width
**QFN20: 0.5mm Pitch width

Development Tools: NT-N76E003, Nu-Link

Operating Frequency: 25 MHz
Operating Voltage: 2.4V to 5.5V
Operating temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (bytes)	ISP ROM	I/O	Timer (16-bit)	Connectivity			PWM	ADC	Package	Mass Production
							UART	SPI	I²C				
N76E885AT20	18	512	Configurable	√	up to 26	4	2	1	1	8*12-bit	10*10-bit	TSSOP20	√
N76E885AT28	18	512	Configurable	√	up to 26	4	2	1	1	8*12-bit	10*10-bit	TSSOP28	√

Development Tools: NT-NT-N76E885, Nu-Link, Nu-Link2

Operating Frequency: 16 MHz
Operating Voltage: 2.4V to 5.5V
Operating temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (bytes)	ISP ROM	I/O	Timer (16-bit)	Connectivity			LCD Driver	PWM	ADC	Package	Mass Production
							UART	SPI	I²C					
N76E616AL48	18	512	Configurable	√	up to 46	up to 7	2	-	1	4X32 6X30	4*16-bit	8*10 -bit	LQFP48	√
N76E616AF44	18	512	Configurable	√	up to 46	up to 7	2	-	1	4X32 6X30	4*16-bit	8*10 -bit	PQFP44	√
N76E616AM44	18	512	Configurable	√	up to 46	up to 7	2	-	1	4X32 6X30	4*16-bit	8*10 -bit	LQFP44	√

Development Tools: NT-N76E616 Nu-Link, Nu-Link2

N79E Series (4T)

Operaing Frequency: 24 MHz
Operating Voltage: 2.4V to 5.5V
Operating temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (bytes)	ISP ROM	I/O	Timer (16-bit)	Connectivity			PWM	ADC	Package	Mass Production
							UART	SPI	I²C				
N79E715AS28	16	512	Configurable	2	up to 25	3	1	1	1	4	8*10-bit	SOP28	√
N79E715AS20	16	512	Configurable	2	up to 25	3	1	1	1	4	8*10-bit	SOP20	√
N79E715AS16	16	512	Configurable	2	up to 25	3	1	1	1	4	8*10-bit	SOP16	√
N79E715AT28	16	512	Configurable	2	up to 25	3	1	1	1	4	8*10-bit	TSSOP28	√
N79E715AT20	16	512	Configurable	2	up to 25	3	1	1	1	4	8*10-bit	TSSOP20	√

Development Tools: NT-N79E715, ISP-ICP Programmer (NWR-005)

MS51 Series (1T)

Operaing Frequency: 16 MHz/ 24MHz
Operating Voltage: 2.4V to 5.5V
Operating temperature: -40°C to 105°C

Potential Applications: Industrial Control, Battery Pack, Home Appliance, LED Control, Consumer Devices, etc.

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (bytes)	ISP ROM	I/O	Timer (16-bit)	Connectivity			PWM	ADC	Package	Mass Production
							UART	SPI	I²C				
MS51FB9AE	16	256+1K	Configurable	√	up to 18	4	2	1	1	6*16-bit	8*12-bit	TSSOP20	Q1
MS51XB9AE	16	256+1K	Configurable	√	up to 18	4	2	1	1	6*16-bit	8*12-bit	QFN20*	Q1
MS51XB9BE	16	256+1K	Configurable	√	up to 18	4	2	1	1	6*16-bit	8*12-bit	QFN20**	Q1

*QFN20: 0.4mm Pitch width
**QFN20: 0.5mm Pitch width

Development Tools: NT-MS51, Nu-Link

ML51 Series

NuMicro® ML51 series embedded with 1T 8051 core is suitable for low power and high performance applications. The internal voltage reference and analog comparator can support portable devices, where power consumption is critical.

Operaing Frequency: 24 MHz
Operating Voltage: 1.8V to 5.5V
Operating temperature: -40°C to 105°C

Key Features: The operating current can support 100 uA/MHz, power consumption of low power run mode is 15 uA, low power idle mode is 13 uA, Power Down mode is 0.8 uA at 3.3V, and 10 us fast wake-up time, high immunity (8KV ESD, 4KV EFT) and 20 mA large sink current, which makes this series also ideal for industrial applications.
Potential Applications: Industrial Control, Home Appliance, Thermostat, E-lock, HMI, Battery Pack, Medical Devices, etc.

• ML51 series

Part No.	Flash (Kbytes)	SRAM (Kbytes)	ISP ROM (Kbytes)	PDMA	I/O	Timer (16-bit)	PWM	Connectivity				Internal Voltage Reference	Analog Comp.	ADC (12-bit)	ICP IAP ISP	Package	Mass Production
								UART	SPI	ISO-7816-3	I²C						
ML51BB9AE	16	1	4	-	7	4	6	2	1	1	2	-	-	2	√	MSOP10	√
ML51DB9AE	16	1	4	-	11	4	6	2	1	1	2	-	-	3	√	TSSOP14	√
ML51FB9AE	16	1	4	-	16	4	6	2	1	1	2	-	-	6	√	TSSOP20	√
ML51OB9AE	16	1	4	-	17	4	6	2	1	1	2	-	-	6	√	SOP20	√
ML51XB9AE	16	1	4	-	17	4	6	2	1	1	2	-	-	6	√	QFN20	√
ML51EB9AE	16	1	4	-	24	4	6	2	1	1	2	-	-	8	√	TSSOP28	√
ML51UB9AE	16	1	4	-	24	4	6	2	1	1	2	-	-	8	√	SOP28	√
ML51PB9AE	16	1	4	2	28	4	6	2	2	1	2	Y	2	8	√	LQFP32	√
ML51TB9AE	16	1	4	2	28	4	6	2	2	1	2	Y	2	8	√	QFN33	√
ML51EC0AE	32	2	4	2	24	4	6	2	2	1	2	Y	2	8	√	TSSOP28	√
ML51UC0AE	32	2	4	2	24	4	6	2	2	1	2	Y	2	8	√	SOP28	√
ML51PC0AE	32	2	4	2	28	4	6	2	2	1	2	Y	2	8	√	LQFP32	√
ML51TC0AE	32	2	4	2	28	4	6	2	2	1	2	Y	2	8	√	QFN33	√

Development Tools: NT-ML51P, NK-ML51P, Nu-Link, Nu-Link 2

Standard 8051

The Nuvoton standard 8051 series is based on 6/12 cycle core structure, and provides 22.1184 MHz internal oscillator (1% accuracy at 25°C, 5V) , data Flash configurable and high immunity (8KV ESD, 4KV EFT).

Operaing Frequency: 40 MHz
Operating Voltage: 2.5V to 5.5V
Operating temperature: -40°C to 105°C

Potential Applications: Industrial Control, Power Management, etc.
Key Features: Flash size: 16KB~64KB, power energy management circuit such as LDO, POR and BOD.

• N78E Series

Operaing Frequency: 40 MHz
Operating Voltage: 2.5V to 5.5V
Operating temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	Data Flash (Kbytes)	ISP ROM (Kbytes)	I/O	Timer (16-bit)	Connectivity			Comp	PWM (8-bit)	ADC (10-bit)	INT	ISP	Special Function	Package	Mass Production
							UART	SPI	I²C								
N78E055A	16	256+1K	4	2.5	up to 40	3	1	1	-	-	5	-	4	√	6T/12T option, Extra I/O port, 22.1184 MHz internal RC, BOR	PLCC44/PQFP44/LQFP48/ DIP40	√
N78E059A	32	256+1K	4	2.5	up to 40	3	1	1	-	-	5	-	4	√	6T/12T option, Extra I/O port, 22.1184 MHz internal RC, BOR	PLCC44/PQFP44/LQFP48/ DIP40	√
N78E517A	64	256+1K	Configurable	2.5	up to 40	3	1	1	-	-	5	-	4	√	6T/12T option, Extra I/O port, 22.1184 MHz internal RC, BOR	PDIP40/PLCC44/PQFP44/ LQFP48 /TQFP44	√
N78E366A	64	256+1K	-	2.5	up to 40	3	1	1	-	-	5	-	4	√	6T/12T option, Extra I/O port, 22.1184 MHz internal RC, BOR	PLCC44/PQFP44/LQFP48/ DIP40	√

Development Tools: ISP-ICP Programmer (NWR-005)

• W78 Series

Operaing Frequency: 40 MHz
Operating Voltage: 2.5V to 5.5V
Operating temperature: -40°C to 105°C

Part No.	Flash (Kbytes)	SRAM (bytes)	ISP ROM (Kbytes)	I/O	Timer (16-bit)	Connectivity			Comp	PWM (8-bit)	ADC (10-bit)	INT	ISP	Special Function	Package	Mass Production
						UART	SPI	I²C								
W78E052D	8	256	2	up to 36	3	1	-	-	-	-	-	4	√	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48//TQFP44	√
W78E054D	16	256	2	up to 36	3	1	-	-	-	-	-	4	√	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48//TQFP44	√
W78E058D	32	512	4	up to 36	3	1	-	-	-	-	-	4	√	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48	√
W78E516D	64	512	4	up to 36	3	1	-	-	-	-	-	4	√	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48	√

Development Tools: ISP-ICP Programmer (NWR-005)

Integrated Development Environment (IDE)

Nuvoton has been committed to building the customer-oriented MCU eco-System from rich platform products, evaluation boards, device drivers, BSP, own-developed debugging tools, software developing tools, integrated development tools, and mass production supporting tools, and the operating system software to fulfill customers' needs from product selection, development and mass production stages.

IDE	Validated MCUs	License	Debugger	Windows	Linux
NuEclipse (GCC)	NuMicro M0/M4/M23	Free	Nu-Link	√	√
KEIL MDK Nuvoton edition M0/M23	NuMicro M0/M23	Free	Nu-Link / J-Link / U-Link	√	
KEIL MDK Nuvoton edition M4	NuMicro M4	Special offer	Nu-Link / J-Link / U-Link	√	
IAR EWARM	NuMicro M0/M4/M23	IAR	Nu-Link	√	
KEIL C51	NuMicro 8-bit	Keil	4T: Nu-Tiny-51 1T: Nu-Link	√	
IAR EW8051	NuMicro 8-bit 1T MCUs	IAR	Nu-Link	√	

Development Platforms

Nuvoton offers distinctive evaluation boards and a variety of debug tools to shorten the development time. Each evaluation board includes a Nu-Link-Me ICE adaptor, so no additional debug equipments is needed.

• NuMaker PFM

The NuMaker Platform is an Internet of Things (IoT) application focused platform specially developed by Nuvoton. It is a convenient starter kit pin-compatible with Arduino and supported by IAR EWARM, Keil RVMDK, NuEclipse environment as well as ARM mbed OS 5.5. It is ideal for arrays of IoT application development for prototype development designs with sensors and wireless modules. The kit includes examples with source code and the Nu-Link-Me ICE adaptor.

• NuTiny Board

The NuTiny board is a simple, easy to use evaluation/development kit supported by IAR EWARM, Keil RVMDK and NuEclipse environment. Its compact size is applicable for all types of product development. The Nu-Link-Me ICE adaptor is also included.

• Nu-Learning Board

The Nu-Learning board includes rich functional blocks that connects to the embedded microcontroller. With the functional blocks, users can develop and verify applications to emulate the real behavior. It can be used as a real system controller to design users' target systems. The Nu-Link-Me ICE adapter is also included for easy debug.

Debugger and Programmer

• Nu-Link2

Nuvoton's Nu-Link2 Debug Adapter is an USB debugger/programmer and can be applied to the development of NuMicro® Family microcontrollers. It supports all Nu-Link's features plus programmable output V_{DD} and wide target V_{DD} input level. The Nu-Link2 includes an USB 2.0 High-Speed port that can be connected to a computer host, a set of Status LEDs, an off-line programming button, a SWD port which can be adjusted through software as 1.8V, 2.5V, 3.3V, or 5.0V. It supports on-line/off-line ICP based on the SWD signal interface up to 24 Mbps. It has USCI port to support additional functions. Nu-Link2 has one control bus that supports chip firmware update on automatic IC programming system. Nu-Link2 can be used with Keil RVMDK, IAR EWARM and NuEclipse IDE.

• Nu-Trace

The Nu-Trace supports all of Nu-Link2's features plus ETM trace function
(4-bit data). The Nu-Trace can debug and program a target chip through SWD interface, or through SWD with ETM interface up to 96M tracing bit rate. The voltage level of the SWD port can be adjusted through software as 1.8V, 2.5V, 3.3V, or 5.0V. Nu-Trace can be used with Keil RVMDK, IAR EWARM and NuEclipse IDE.

• ISP-ICP Programming Tool

A programmar designed for NuMicro® 8051 Family microcontrollers. It supports online/offline mode ICP and ISP. Under on-line mode, users can plug the programmer into PC's USB port and update the program memory of the 8051 MCU. Owing to the it's built-in non-volatile storage, users can download data into the programmer. Under off-line mode, users can use the programmer with preloaded data to update the program memory of the 8051 MCU without PC's intervention.
Apply to N79E715, N79E81x series, N79E845/844/8432, W78E052/054/058/516, N78E366, and N78E517. For other NuMicro® 8051 Family microcontrollers, Nu-Link2 programmer is recommanded.

• Nu-Link-Me

The Nuvoton ICE adapter Nu-Link-Me is included in all evaluation development boards. It connects the PC's USB port to the target system and allows users to program and debug embedded programs on the target chip. It supports online ICP and there is no need to install additional debug hardware. The Nu-Link-Me V3.0 also supports VCOM function, which gives users more flexibility for debugging. Nu-Link-Me can be used with Keil RVMDK, IAR EWARM and NuEclipse IDE. (Not for retail sale)

Configure Software

• PinConfig

PinConfigure is used to configure GPIO multi-functions of Nuvoton MCU families.

• PinView

NuTool-PinView is a monitoring and visualization tool that can immediately show the current status of I/O pins, and inform users of certain common pin configuration errors.

• ClockConfig

ClockConfigure is used to configure clock settings of Nuvoton MCU families.

• NuConsole

Nu-Console provides non-invasive message-logging mechanism via the SWD.

Please visit: www.nuvoton.com/NuTool

Programmer

• Nu-Link-Gang

The Nu-Link-Gang Programmer is specially designed for mass-production in the customer site. Supports programming all Nuvoton NuMicro® Family and 8051 1T series and packages with flexible programming setting, such as 3 options of programming voltage (1.8V, 3.3V, or 5.0V), 4 different chips with individual firmware image file, and offline programming 4 chips simultaneously or individually. It is suitable for automatic IC programming system.

Audio

Consumer Speech

PowerSpeech® Series
BandDirector® Series
ViewTalk® Series
NuVoice™ Series
Peripheral Series
Consumer Series

Arm® Cortex®-M Audio SoCs

AUI Enabler Series

Audio CODECs

Mono Codec Series
Stereo Codec Series
Ultra Low Power (ULP) Codec Series
Stereo ADC Series
Ultra Low Power (ULP) ADC Series
Stereo DAC Series

Audio Amplifiers

2Vrms Line Driver and Class-AB Series
Class D Series

Audio Enhancement

Audio Converters

Precision ADC Series

ChipCorder® Family

Digital ChipCorder® Series
MLS ChipCorder® Series

Development Tools

Consumer Speech Development Tools
Audio Development Tools

Consumer Speech

PowerSpeech® Series

• W584A 4-bit µC Base, 1-ch Voice + Dual Tone Melody Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC			
W584A011	300	9	7	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A016	460	15	11	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A021	620	20	15	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A031	1020	34	25	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A041	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A052	1580	53	40	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A062	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A017	460	15	11	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A022	620	20	15	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A032	1020	34	25	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A042	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A051	1580	53	40	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A061	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A071	2220	75	56	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A081	2540	86	64	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A025	620	20	15	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A035	1020	35	26	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A045	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin

• W584A 4-bit µC Base, 1-ch Voice + Dual Tone Melody Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC			
W584A065	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A075	2220	75	56	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A085	2540	86	64	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A100	3180	108	81	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A120	3820	129	97	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A151	4460	151	113	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A171	5100	173	130	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A191	5740	195	146	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A300	9100	310	232	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A340	10220	348	261	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584AP017(OTP)	460	15	11	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	-
W584AP045 (OTP)	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	-
W584AP065(OTP)	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	-

• W584B 4-bit µC Base, 1-ch Voice Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC			
W584B010	300	9	7	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B015	460	15	11	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B020	620	20	15	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B030	1020	34	25	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B040	1260	42	32	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B052	1580	53	40	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B062	1900	64	48	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B016	460	15	11	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B021	620	20	15	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B031	1020	34	25	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B041	1260	42	32	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B070	2220	75	56	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B080	2540	86	64	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B100	3180	108	81	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B120	3820	129	97	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B150	4460	151	113	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B170	5100	173	130	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B190	5740	195	146	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin

• W588L 8-bit µC Base, 2 Batteries, 2-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO
		(6 KHz)	(8 KHz)					PWM	DAC		
W588L020	94	23	18	1.8~3.6	1	4, 6	Ring	12-bit	-	96	8 I/O
W588L030	126	32	24	1.8~3.6	1	4, 6	Ring	12-bit	-	96	8 I/O
W588L035	170	44	33	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L040	192	50	37	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L050	224	58	43	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L060	254	66	49	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L070	330	86	65	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L080	382	100	75	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L100	448	118	88	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O

• W588C 8-bit µC Base, 2-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO
		(6 KHz)	(8 KHz)					PWM	DAC		
W588C003	20	5	4	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C006	30	8	6	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C009	50	14	11	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C012	62	18	14	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C015	78	23	17	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C020	98	29	22	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	12 I/O
W588C025	114	35	26	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	12 I/O
W588C030	126	38	29	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	12 I/O

• W588C 8-bit µC Base, 2-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO
		(6 KHz)	(8 KHz)					PWM	DAC		
*W588C036	170	52	39	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
*W588C041	192	59	44	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
*W588C046	205	63	48	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
*W588C051	224	69	52	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
*W588C056	240	74	56	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
*W588C061	254	79	59	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
*W588C071	330	103	77	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
*W588C081	382	119	90	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
*W588C101	448	140	105	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
*W588C121	510	160	120	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
W588C150	640	201	151	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C170	768	242	181	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C210	896	282	212	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C260	1022	322	242	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C300	1180	372	279	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O

*DAC w/o Noise Shaping

• W588D 8-bit µC Base, 3-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Sub-Clock 32KHz	Audio		RAM (Bytes)	GPIO	SIM SPI
		(6 KHz)	(8 KHz)						PWM	DAC			
W588D003	20	5	4	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	192	16 I/O	√
W588D006	30	8	6	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	192	16 I/O	√
W588D009	50	14	11	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D012	62	18	14	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D015	78	23	17	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D020	98	29	22	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D025	114	35	26	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D030	126	38	29	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D035	170	52	39	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D040	192	59	44	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D045	205	63	48	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D050	224	69	52	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D055	240	74	56	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D060	254	79	59	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588DF060 (MTP)	254	79	59	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D070	330	103	77	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D080	382	119	90	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D100	448	140	105	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D120	510	160	120	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D150	640	201	151	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D170	768	242	181	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D210	896	282	212	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D260	1022	322	242	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D300	1180	372	279	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	8I, 24 I/O	√
W588D350	1348	425	319	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	8I, 24 I/O	√
W588D400	1534	484	363	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	8I, 24 I/O	√

• N584L 4-bit µC Base, 1~2 Battery, 1-ch Voice + Dual Tone Melody Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	Booster Output (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO
		(6 KHz)	(8 KHz)						PWM	DAC		
N584L020	620	20	15	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	8 I/O
N584L030	1020	34	25	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	8 I/O
N584L040	1260	42	32	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	8 I/O
N584L080	2540	86	64	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L120	3820	129	97	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L031	1020	34	25	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L041	1260	42	32	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L061	1900	64	48	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L081	2540	86	64	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L121	3820	129	97	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O

• N588L 1.0~3.6V, 8-bit µC base, 2-ch Voice Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (6 MHz)	CH	Fsys (MHz)	OSC	Audio		Vp (V)	RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)					PWM	DAC					
N588L040	126	40	30	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L080	254	80	60	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L120	416	132	99	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L160	528	167	125	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L200	638	202	152	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L240	768	243	182	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L280	896	284	213	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L330	1022	324	243	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP080 (OTP)	254	80	60	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP200 (OTP)	638	202	152	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588LP330 (OTP)	1022	324	243	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair

• N584H High Sound Quality 1-ch Voice

Part No.	ROM (Kbits)	Duration (Sec.) @ 4-bit NM4		V_{DD} (4 MHz)	CH	Fsys (MHz)	OSC	Audio		Cap Sensor	RAM (N)	LVD	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC					
N584H009	300	12	9	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	4 I/O	4-pin
N584H019	620	24	18	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	4 I/O	4-pin
N584H029	940	37	28	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	4 I/O	4-pin
N584H039	1260	49	37	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	4 I/O	4-pin
N584H010	300	12	9	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	8 I/O	8-pin
N584H020	620	24	18	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	8 I/O	8-pin
N584H030	940	37	28	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	8 I/O	8-pin
N584H040	1260	49	37	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	8 I/O	8-pin
N584H060	1740	68	51	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	8 I/O	8-pin
N584H070	1900	74	56	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	8 I/O	8-pin
N584H120	3340	131	98	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	V	16 I/O	8-pin
N584H160	4070	159	119	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit		8-pin	224	V	16 I/O	8-pin
N584H170	4460	175	131	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	V	16 I/O	8-pin
N584H210	5740	225	169	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	V	16 I/O	8-pin
N584H260	7020	275	206	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	V	16 I/O	8-pin
N584H300	7980	312	234	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	V	16 I/O	8-pin
N584HP030 (OTP)	940	37	28	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	8 I/O	8-pin
N584HP070 (OTP)	1900	74	56	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	V	8 I/O	8-pin
N584HP160 (OTP)	4070	159	119	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	V	16 I/O	8-pin
N584HP300 (OTP)	7980	312	234	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	V	16 I/O	8-pin

• N588J 8-bit µC Base, 1-ch Voice Synthesizer w/ PWM Direct Driver

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (6MHz)	CH	Fsys (MHz)	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)				PWM	DAC				
N588J010	30	10	7	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J040	126	40	30	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J060	206	65	49	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J080	254	80	60	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J120	414	131	98	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J170	510	162	121	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J200	704	223	167	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J250	830	263	197	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J340	1020	324	243	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J480	1534	486	364	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J650	2044	648	486	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588JP081 (OTP)	254	80	60	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588JP171 (OTP)	510	162	121	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588JP340 (OTP)	1020	324	243	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588JP480 (OTP)	1534	486	364	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588JP650 (OTP)	2044	648	486	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair

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• N588H 8-bit µC Base, 3-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)					PWM	DAC				
N588H061	206	65	49	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H081	254	80	60	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H120	414	131	98	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H170	510	162	121	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H200	704	223	167	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H250	830	263	197	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H340	1022	324	243	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H480	1534	486	364	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H650	2044	648	486	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588HP081 (OTP)	254	80	60	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588HP171 (OTP)	510	162	121	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588HP340 (OTP)	1022	324	243	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588HP480 (OTP)	1534	486	364	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588HP650 (OTP)	2044	648	486	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair

• N589A, 8-bit µC Base, 2-ch Voice or 8-ch Melody Synthesizer, w/ SPIO, SPIM, ADC, IR wake-up

Part No.	Duration (Sec)	V_{DD} (V)	LVR (V)	Speech/ MIDI CH	ADC	Audio	RAM (Bytes)	GPIO	SPI	PWM I/O	LVD	IR wake up	LRC
	6 KHz					PWM							
N589A080	109	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	√	√	√
N589A150	195	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	√	√	√
N589A200	280	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	√	√	√
N589A280	365	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	√	√	√

• N589B, 8-bit µC Base, 2-ch Voice, w/ SPIO, SPIM, ADC, IR wake-up

Part No.	Duration (Sec)	V_{DD} (V)	LVR (V)	Speech CH	ADC	Audio	RAM (Bytes)	GPIO	SPI	PWM I/O	LVD	IR wake up	LRC
	6 KHz					PWM							
N589B080	131	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	22 I/O	SPIO, SPIM	6 pin	√	√	√
N589B120	173	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	22 I/O	SPIO, SPIM	6 pin	√	√	√
N589B170	216	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	22 I/O	SPIO, SPIM	6 pin	√	√	√
N589B200	301	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	√	√	√
N589B250	387	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	√	√	√
N589B340	472	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	√	√	√

• N589C, 8-bit µC Base, 2-ch Voice, with SPIO, IR wake-up

Part No.	Duration (Sec) 6 KHz	V_{DD} (V)	LVR (V)	Speech CH	ADC	Audio PWM	RAM (Bytes)	GPIO	SPI	PWM I/O	LVD	IR wake up	LRC
N589C080	131	2.0~5.5	1.9	2	NO	13-bit	512	16 I/O	NO	3 pin	√	√	√
N589C120	173	2.0~5.5	1.9	2	NO	13-bit	512	16 I/O	NO	3 pin	√	√	√
N589C170	216	2.0~5.5	1.9	2	NO	13-bit	512	16 I/O	NO	3 pin	√	√	√
N589C200	301	2.0~5.5	1.9	2	NO	13-bit	512	22 I/O	SPIO	6 pin	√	√	√
N589C250	387	2.0~5.5	1.9	2	NO	13-bit	512	22 I/O	SPIO	6 pin	√	√	√
N589C340	472	2.0~5.5	1.9	2	NO	13-bit	512	22 I/O	SPIO	6 pin	√	√	√

• N589D, 8-bit µC Base, 1-ch Voice, with IR wake-up

Part No.	Duration (Sec) 6 KHz @ NSP	V_{DD} (V)	LVR (V)	Speech CH	ADC	Audio PWM	RAM (Bytes)	GPIO	SPI	PWM I/O	LVD	IR wake up	LRC
N589D080	131	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	NO	3 pin	√	√	√
N589D120	173	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	NO	3 pin	√	√	√
N589D170	216	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	NO	3 pin	√	√	√
N589D200	301	2.0~5.5	1.9	1	NO	13-bit	384	22 I/O	NO	6 pin	√	√	√
N589D250	387	2.0~5.5	1.9	1	NO	13-bit	384	22 I/O	NO	6 pin	√	√	√
N589D340	472	2.0~5.5	1.9	1	NO	13-bit	384	22 I/O	NO	6 pin	√	√	√

• N5132,N5162 1-ch Voice Synthesizer w/ CPU I/F

Part No.	V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio PWM	Audio DAC	LVR	GPIO	CPU I/F
N5132 (OTP)	2.2~5.5	1	8	Ring	9-bit	-	√	6 I/O	√
N5162S16(Flash)	2.7~5.5	1	6,8	Ring	12-bit	13-bit	√	12 I/O	√

• N5160S 8-bit µC Base, 1-ch Long Duration Voice Synthesizer

Part No.	Flash (Kbytes)	Duration (Sec.) @ 4-bit NM4 (6 KHz)	Duration (Sec.) @ 4-bit NM4 (8 KHz)	V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio PWM	Audio DAC	LVR	GPIO	SIM SPI	Package
N5160S16 (Flash)	2048	635	476	2.7~5.5	1	6,8	Ring	12-bit	13-bit	√	12 I/O	√	LQFP48
N5160S32 (Flash)	4096	1270	953	2.7~5.5	1	6,8	Ring	12-bit	13-bit	√	12 I/O	√	LQFP48

BandDirector® Series

• W567C 8-bit µC Base, 16-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		Fsys (MHz)	OSC	Sub-Clock 32 KHz	Audio		RAM (Bytes)	GPIO	H/W PWM	SIM SPI	PAN Stereo
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC					
W567C070	336	99	74	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C080	416	124	93	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C100	464	139	104	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C120	508	152	114	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C151	640	193	145	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C171	768	233	174	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C210	896	272	204	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C260	1020	311	233	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C300	1232	376	282	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C340	1376	421	316	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C380	1532	469	352	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C126	508	152	114	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C266	1020	311	233	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C306	1232	376	282	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C346	1376	421	316	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C386	1532	469	352	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567CP260 (OTP)	1020	311	233	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-

• N567G 8-bit µC Base, 4-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO	H/W PWM	SIM SPI
		(6 KHz)	(8 KHz)					PWM	DAC				
N567G030	126	34	26	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567G041	158	44	33	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567G080	286	84	63	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	√
N567G121	416	124	93	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567G161	528	158	119	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567G201	638	192	144	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567G240	768	233	174	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567G280	896	272	204	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567G330	1022	311	233	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√

• N567K 8-bit µC Base, 6-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM	SIM SPI
		(6 KHz)	(8 KHz)					PWM	DAC					
N567K030	126	34	26	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	24 I/O	-	√
N567K041	158	44	33	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	24 I/O	-	√
N567K080	286	84	63	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	√
N567K081	254	80	60	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	√	24 I/O	-	√
N567K121	416	124	93	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	-
N567K161	528	158	119	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	-
N567K201	638	192	144	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	-
N567K240	768	233	174	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	8I, 24 I/O	3-pair	√
N567K280	896	272	204	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	8I, 24 I/O	3-pair	√
N567K330	1022	311	233	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	8I, 24 I/O	3-pair	√

• N567H 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO	H/W PWM	SIM SPI
		(6 KHz)	(8 KHz)					PWM	DAC				
N567H030	126	34	26	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567H041	158	44	33	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567H080	286	84	63	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	√
N567H121	416	124	93	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567H161	528	158	119	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567H201	638	192	144	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567H240	768	233	174	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567H280	896	272	204	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567H330	1022	311	233	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567HP330 (OTP)	1022	311	233	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√

• N567D 8-bit µC Base, 14-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		Fsys (MHz)	OSC	Sub-Clock 32 KHz	Audio		RAM (Bytes)	GPIO	H/W PWM	SIM SPI
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC				
N567D070	224	71	53	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D100	336	106	80	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D120	416	132	99	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D140	464	147	110	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D160	508	161	121	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D200	640	203	152	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D240	768	243	183	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D280	896	284	213	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D320	1020	323	242	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D380	1232	390	293	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D420	1376	436	327	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D470	1532	485	364	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567DP320 (OTP)	1020	323	242	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√

• N567L 1.0~3.6V, 8-bit µC base, 8-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		V_{DD} (6 MHz)	Fsys (MHz)	OSC	Audio		Vp (V)	RAM (Bytes)	LVD	GPIO	H/W PWM
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC					
N567L080	254	80	60	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L120	416	132	99	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L160	528	167	125	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L200	638	202	152	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L240	768	243	182	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L280	896	284	213	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L330	1022	324	243	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567LP330 (OTP)	1022	324	243	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair

• N566G 8-bit µC Base, 4-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	H/W PWM	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC					
N566G120	416	124	93	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G160	528	158	119	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G200	638	192	144	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G240	768	233	174	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G280	896	272	204	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G320	1022	311	233	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√

• N566K 8-bit µC Base, 6-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	SIM	GPIO	H/W PWM	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC						
N566K080	254	74	55	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	√	24 I/O	2-pin	√
N566K120	416	124	93	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K160	528	158	119	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K200	638	192	144	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K240	768	233	174	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K280	896	272	204	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K320	1022	311	233	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√

• N566H 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	SIM	GPIO	H/W PWM	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC						
N566H080	254	74	55	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	√	24 I/O	2-pin	√
N566H120	416	124	93	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H160	528	158	119	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H200	638	192	144	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H240	768	233	174	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H280	896	272	204	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H320	1022	311	233	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566HP080 (OTP)	254	74	55	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	√	24 I/O	2-pin	√
N566HP320 (OTP)	1022	311	233	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√

ViewTalk® Series

• N537A090 8-bit µC Base, 2-ch Voice + Dual Tone Melody Synthesizer w/ B/W 1K-dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
N537A090	283	1K	90	128	12 I/O	9-bit	-	64x16	1/4, 1/5	1/8, 1/16

• N531A170 8-bit µC Base, 2-ch Voice + Dual Tone Melody Synthesizer w/ B/W 1K-dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
N531A170	509	1K	170	128x2	16 I/O	12-bit	-	64x16	1/4, 1/5	1/8, 1/16

• N538T 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer w/ B/W 2K-dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
N538T080	249	1K	60	256x2	24 I/O	9-bit	10-bit	64x32	1/4, 1/5	1/16, 1/32
N538T170	505	1K	120	256x2	24 I/O	9-bit	10-bit	64x32	1/4, 1/5	1/16, 1/32
N538T260	761	1K	180	256x2	24 I/O	9-bit	10-bit	64x32	1/4, 1/5	1/16, 1/32
N538T340	1017	1K	250	256x2	24 I/O	9-bit	10-bit	64x32	1/4, 1/5	1/16, 1/32

• N538A 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer w/ B/W 1K-dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
N538A170	505	1K	120	128x2	24 I/O	9-bit	10-bit	64x16	1/4, 1/5	1/6
N538A260	761	1K	180	128x2	24 I/O	9-bit	10-bit	64x16	1/4, 1/5	1/6
N538A340	1017	1K	250	128x2	24 I/O	9-bit	10-bit	64x16	1/4, 1/5	1/6

• W539A 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer w/ B/W 1K-dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
W539A804	505	1K	120	128x2	24 I/O	12-bit	13-bit	64x16	1/4, 1/5	1/8, 1/16
W539A806	761	1K	180	128x2	24 I/O	12-bit	13-bit	64x16	1/4, 1/5	1/8, 1/16
W539A808	1017	1K	250	128x2	24 I/O	12-bit	13-bit	64x16	1/4, 1/5	1/8, 1/16

• N539T 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer w/ 4-Gray Level,2K-dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	H/W PWM	SIM	Bias	Duty
						PWM	DAC					
N539T171	509	1K	120	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539T261	765	1K	180	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539T341	1021	1K	250	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539TP340 (OTP)	1021	1K	250	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	-	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32

Contact us: ViewTalk@nuvoton.com

NuVoice™ Series

• N569S, 32-bit Cortex-M0 with embedded Flash, long duration solution

Part No.	CPU	APROM	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	GPIO	I/O Interface	PWM I/O	Audio		LDO	ADC	Other	Package
										Mic.	Speaker				
N569S502	Cortex®-M0 49 MHz	64KB Flash	4Mbit	2.4~5.5	500	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48
N569S1K0	Cortex®-M0 49 MHz	64KB Flash	8Mbit	2.4~5.5	1,000	6 KB	18	SPI,UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48
N569S2K0	Cortex®-M0 49 MHz	64KB Flash	16Mbit	2.4~5.5	2,000	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48
N569S4K0	Cortex®-M0 49 MHz	64KB Flash	32Mbit	2.4~5.5	4,000	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48
N569S8K0	Cortex®-M0 49 MHz	64KB Flash	64Mbit	2.4~5.5	8,000	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48
N569SAK2	Cortex®-M0 49 MHz	64KB Flash	128Mbit	2.4~5.5	16,000	6 KB	18	SPI, UART	8	-	DPWM DAC	√	-	3-ch Voice 8-ch MIDI	LQFP48

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• N570F, N570C, 32-bit Cortex-M0 with embedded Flash and 10 bit ADC

Part No.	CPU	APROM	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	GPIO	I/O Interface	PWM I/O	Audio		LDO	ADC	Other	Package
										Mic.	Speaker				
N570F064	Cortex®-M0 49 MHz	64KB Flash	-	1.8~5.5	-	6 KB	22	SPI x 2, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570C064	Cortex®-M0 49 MHz	64KB Flash	-	1.8~5.5	-	6 KB	22	SPI x 2, UART	8	√	DPWM DAC	√	10-bit 4-ch	Voice Recognition	LQFP48

• N570S, N570SC, 32-bit Cortex-M0 with embedded Flash and 10 bit ADC, long duration solution

Part No.	CPU	APROM	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	GPIO	I/O Interface	PWM I/O	Audio		LDO	ADC	Voice Recognition	Package
										Mic.	Speaker				
N570S08A	Cortex®-M0 49 MHz	64KB Flash	8Mbit	2.4~5.5	1,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570S16A	Cortex®-M0 49 MHz	64KB Flash	16Mbit	2.4~5.5	2,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570S32A	Cortex®-M0 49 MHz	64KB Flash	32Mbit	2.4~5.5	4,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570S64A	Cortex®-M0 49 MHz	64KB Flash	64Mbit	2.4~5.5	8,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570S130	Cortex®-M0 49 MHz	64 KB Flash	128Mbit	2.4~5.5	16,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	-	LQFP48
N570SC08	Cortex®-M0 49 MHz	64 KB Flash	8Mbit	2.4~5.5	1,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	√	LQFP48
N570SC16	Cortex®-M0 49 MHz	64 KB Flash	16Mbit	2.4~5.5	2,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	√	LQFP48
N570SC32	Cortex®-M0 49 MHz	64 KB Flash	32Mbit	2.4~5.5	4,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	√	LQFP48
N570SC64	Cortex®-M0 49 MHz	64 KB Flash	64Mbit	2.4~5.5	8,000	6 KB	18	SPI, UART	8	√	DPWM DAC	√	10-bit 4-ch	√	LQFP48

• N570H, 32-bit Cortex-M0 with embedded Flash, 10 bit ADC, Touch wake up

Part No.	CPU	APROM	V_{DD} (V)	SRAM	GPIO	I/O Interface	PWM I/O	Audio		ADC	Touch Wakeup
								Mic.	Speaker		
N570H064	Cortex®-M0 49 MHz	64 KB Flash	1.8~5.5	6 KB	28	SPI x 2, UART	8	√	DPWM DAC	10-bit 5-ch	√

• N570J, 32-bit Cortex-M0 with embedded Flash, 10 bit ADC, Touch wake up, long duration solution

Part No.	CPU	APROM	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	GPIO	I/O Interface	PWM I/O	Audio		ADC	Touch Wakeup	Package
										Mic.	Speaker			
N570J08C	Cortex®-M0 49 MHz	64 KB Flash	8Mbit	2.4~5.5	1,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 4-ch	√	LQFP48
N570J16C	Cortex®-M0 49 MHz	64 KB Flash	16Mbit	2.4~5.5	2,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 4-ch	√	LQFP48
N570J32C	Cortex®-M0 49 MHz	64 KB Flash	32Mbit	2.4~5.5	4,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 4-ch	√	LQFP48

• N571P, 32-bit Cortex M0 with embedded OTP and 10 bit ADC Solution

Part No.	CPU	APROM	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	I/O	I/O Interface	PWM I/O	Audio Mic.	Audio Speaker	LDO	ADC	Other	Package
N571P032	Cortex®-M0 23 MHz	32 KB OTP	-	2.4~5.5	-	4 KB	24	SPI	4	√	Class-AB (400mW)	√	10-bit 3-ch	-	LQFP48

• N572, 32-bit Cortex M0 with embedded OTP/Flash and 12 bit ADC Solution

Part No.	CPU	APROM	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	I/O	I/O Interface	PWM I/O	Audio Mic.	Audio Speaker	LDO	ADC	Other	Package
N572P072	Cortex®-M0 48 MHz	64 KB OTP 8 KB Flash	-	2.4~5.5	-	8 KB	32	SPI x 2	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572F072	Cortex®-M0 48 MHz	72 KB Flash	-	2.4~5.5	-	8 KB	32	SPI x 2	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572C072	Cortex®-M0 48 MHz	72 KB Flash	-	2.4~5.5	-	8 KB	32	SPI x 2	4	√	Class-AB (400mW)	√	12-bit 8-ch	Voice Recognition	LQFP64
N572F065	Cortex®-M0 48 MHz	64 KB Flash	-	2.4~5.5	-	8 KB	32	SPI x 2	4	√	Class-AB (250mW)	√	12-bit 8-ch	USB 2.0 FS Device	LQFP64
N572S08A	Cortex®-M0 48 MHz	64 KB Flash	8Mbit	2.4~5.5	1,000	8 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572S16A	Cortex®-M0 48 MHz	64 KB Flash	16Mbit	2.4~5.5	2,000	8 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572S32A	Cortex®-M0 48 MHz	64 KB Flash	32Mbit	2.4~5.5	4,000	8 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572S64A	Cortex®-M0 48 MHz	64 KB Flash	64Mbit	2.4~5.5	8,000	8 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572U130	Cortex®-M0 48 MHz	64 KB Flash	128Mbit	2.4~5.5	16,000	8 KB	22	SPI	4	√	Class-AB (250mW)	√	12-bit 8-ch	USB 2.0 FS Device	LQFP64

• N573, 32-bit Cortex-M0 with embedded Flash and 16 bit ADC Solution

Part No.	CPU	APROM	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	I/O	I/O Interface	PWM I/O	Audio Mic.	Audio Speaker	LDO	ADC	Other	Package
N573F128	Cortex®-M0 48 MHz	128 KB Flash	-	1.8~5.5	-	12 KB	32	UART, I²C, I²S, SPI	4	√	DPWM (1W)	√	16-bit sigma delta, 12-bit 10-ch SAR ADC	16-ch Touch Key, PDMA, CRC	LQFP64

• N575, 32-bit Cortex-M0 with embedded Flash and 16 bit ADC Solution

Part No.	CPU	APROM	Flash Memory	V_{DD} (V)	Duration(Sec) 8KHz	SRAM	I/O	I/O Interface	PWM I/O	Audio Mic.	Audio Speaker	LDO	ADC	Other	Package
N575F145	Cortex®-M0 48 MHz	145 KB Flash	-	2.4~5.5	-	12 KB	24	UART, I²C, I²S, SPI	2	√	DPWM (1W)	√	16-bit, sigma delta	8-ch Touch Key, Temperature Alarm, PDMA, CRC	LQFP48
N575C145	Cortex®-M0 48 MHz	145 KB Flash	-	2.4~5.5	-	12 KB	24	UART, I²C, I²S, SPI	2	√	DPWM (1W)	√	16-bit, sigma delta	8-ch Touch Key, Temperature Alarm, PDMA, CRC, Voice Recognition	LQFP48
N575S64A	Cortex®-M0 48 MHz	145 KB Flash	64 Mbit	2.4~5.5	8,000	12 KB	20	UART, I²C, I²S, SPI	2	√	DPWM (1W)	√	16-bit, sigma delta	8-ch Touch Key, Temperature Alarm, PDMA, CRC	LQFP64

Peripheral Series

■ Nu-Touch

• N55T10 10 Key Capacitor Sensor Controller

Part No.	Input	Wake Up	V_{DD} (V)	Interface
N55T10	10	√	2.4~5.5	I²C

■ ADC

• N55AD SAR ADC

Part No.	Channel	Resolution	V_{DD} (V)	Conversion Rate
N55AD808	8	8-bit	2.7~5.5	50 KHz

■ I/O Expander

• W55P241 I/O Expander w/ 24 I/O Pins and SPI Interface

Part No.	Interface	GPIO	Wake Up	H/W PWM	Internal OSC
W55P241	SPI	24 I/O	√	8-pin	8 MHz

• N55P242 I/O Expander w/ 24 I/O Pins and SPI Interface

Part No.	Interface	GPIO	Wake Up	H/W PWM	Constant Current	Internal OSC
N55P242	SPI	24 I/O	√	24-pin	24-pin	8 MHz

■ MFID and RF Family

• W55MID 13.56MHz MFID w/ Single-tag/Multi-tag and Reader

Part No.	Category	Frequency (MHz)	ID type	ID No.	Anti-collision	TX power	µC Interface
W55MID15	Single-tag	13.56	Bonding-ID	243	-	-	-
W55MID35	Multi-tag	13.56	Bonding-ID	243	4~6 tags	-	-
W55MID20	Single-tag	13.56	Programmable	> 1K	-	-	-
W55MID50	Reader	13.56	-	-	-	4-level	Serial/Parallel

■ Serial ROM Family

• N551C Serial Mask ROM

Part No.	ROM (bits)	Access Time	V_{DD} (V)	Interface
N551C161	16M	1us	2.4~5.5	SPI
N551C321	32M	1us	2.4~5.5	SPI

■ DC to DC Family

• N55DC DC to DC

Part No.	ROM (bits)	Access Time	V_{DD} (V)	Interface
N55DC01	1.0~3.6V	3.3V, 4.2V	60mA @1.2V	√

Consumer Series

• W541 Low Power 4-bit µC

Part No.	V_{DD} (V)	ROM (bits)	RAM (bits)	GPIO	LCD	System Clock	Fast Working Frequency	Slow Working Frequency	Package
W541L20x	1.2~1.8	2Kx16	128x4	20 I/O	-	Single Crystal/RC	400K~1 MHz	32768 Hz	DIP:18/20/28 SOP:20/28
W541C20x	2.4~5.5	2Kx16	128x4	20 I/O	-	Single Crystal/RC	400K~1 MHz	32768 Hz	DIP:18/20/28 SOP:20/28
W541E20x (MTP)	2.4~5.5	2Kx16	128x4	20 I/O	-	Single Crystal/RC	400K~1 MHz	32768 Hz	DIP:18/20/28 SOP:20/28
W541L23x	1.2~3.6	1Kx16 1.5Kx16 2Kx16	64x4 96x4 128x4	12 I/O	4x16	Single/Dual Crystal/Internal RC	100K~800 KHz	32768 Hz	PLCC-44
W541L240	1.2~1.8	2Kx16	64x4	12 I/O	4x24	Single Crystal/RC	400K~1 MHz	32768 Hz	QFP64
W541C240	2.4~5.5	2Kx16	64x4	12 I/O	4x24	Single Crystal/RC	400K~1 MHz	32768 Hz	QFP64
W541L250	1.2~1.8	2Kx16	128x4	20 I/O	4x24	Single Crystal/RC	400K~1 MHz	32768 Hz	QFP64
W541L261	1.2~3.6	2Kx16	128x4	20 I/O	4x32	Single/Dual Crystal/RC	400K~4 MHz	32768 Hz	QFP80
W541C261	2.4~5.5	2Kx16	128x4	20 I/O	4x32	Single/Dual Crystal/RC	400K~4 MHz	32768 Hz	QFP80
W541E261 (MTP)	2.4~5.5	2Kx16	128x4	20 I/O	4x32	Single/Dual Crystal/RC	400K~4 MHz	32768 Hz	QFP80
W541L480	1.2~3.6	4Kx16	256x4	20 I/O	4x32	Single/Dual Crystal/RC	400K~4 MHz	32768 Hz	QFP80
W541C480	2.4~5.5	4Kx16	256x4	20 I/O	4x32	Single/Dual Crystal/RC	400K~4 MHz	32768 Hz	QFP80
W541E480 (MTP)	2.4~5.5	4Kx16	256x4	20 I/O	4x32	Single/Dual Crystal/RC	400K~4 MHz	32768 Hz	QFP80

Contact us: 4-bit@nuvoton.com

Arm® Cortex®-M Audio SoCs

AUI Enabler Series

Part No.	CPU	APROM	SRAM	I/O	Timer	SPI	PWM	ADC	RTC	Audio		Developemnt Tools	Other	Package
										MIC.	Speaker			
ISD91032	Cortex®-M0 49 MHz	64 KB Flash	6 KB	22	3	1	8	10-bit SAR ADC	√	1	Class-D (0.45W)	ISD-DMK_91032C	13-bit DAC, UART	LQFP48
ISD91032C	Cortex®-M0 49 MHz	64 KB Flash	6 KB	22	3	1	8	10-bit SAR ADC	√	1	Class-D (0.45W)	ISD-DMK_91032C	VR, 13-bit DAC, UART	LQFP48
ISD9130	Cortex®-M0 49 MHz	68 KB Flash	12 KB	24	2	1	2	Sigma-Delta >92 dB	√	1	Class-D (1W)	ISD-DMK_9160	8-ch Touch Key, Temperature Alarm, UART, I²C, I²S, PDMA, CRC	LQFP48 QFN32
ISD9160	Cortex®-M0 49 MHz	145 KB Flash	12 KB	24	2	1	2	Sigma-Delta >92 dB	√	1	Class-D (1W)	ISD-DMK_9160	8-ch Touch Key, Temperature Alarm, UART, I²C, I²S, PDMA, CRC	LQFP48 QFN32
ISD9160C	Cortex®-M0 49 MHz	145 KB Flash	12 KB	24	2	1	2	Sigma-Delta >92 dB	√	1	Class-D (1W)	ISD-DMK_9160	VR, 8-ch Touch Key,Temperature Alarm,UART, I²C, I²S, PDMA, CRC	LQFP48 QFN32
ISD91230	Cortex®-M0 49 MHz	64 KB Flash	12 KB	32	2	2 (Quad /Dual)	4	Sigma-Delta >90 dB	√	1	Class-D (0.45W)	ISD-DMK_91260	16-ch Touch Key,Temperature Alarm,2*UART, I²C, I²S, PDMA, CRC	LQFP64
ISD91260	Cortex®-M0 49 MHz	128 KB Flash	12 KB	32	2	2 (Quad /Dual)	4	Sigma-Delta >90 dB	√	1	Class-D (0.45W)	ISD-DMK_91260	16-ch Touch Key,Temperature Alarm, 2*UART, I²C, I²S, PDMA, CRC	LQFP64
ISD91260C	Cortex®-M0 49 MHz	128 KB Flash	12 KB	32	2	2 (Quad/ Dual)	4	Sigma-Delta >90 dB	√	1	Class-D (0.45W)	ISD-DMK_91260	VR, 16-ch Touch Key, Temperature Alarm, 2*UART, I²C, I²S, PDMA, CRC	LQFP64 QFN32
ISD91230B	Cortex®-M0 49 MHz	64 KB Flash	12 KB	32	2	2 (Quad/ Dual)	4	Bridge Sense ADC, 24-bit	√	-	Class-D (0.45W)	ISD-DMK_91260B	16-ch Touch Key, Temperature Alarm, 2*UART, I²C, I²S, PDMA, CRC	LQFP64
ISD91260B	Cortex®-M0 49 MHz	128 KB Flash	12 KB	32	2	2 (Quad/ Dual)	4	Bridge Sense ADC, 24-bit	√	-	Class-D (0.45W)	ISD-DMK_91260B	16-ch Touch Key, Temperature Alarm, 2*UART, I²C, I²S, PDMA, CRC	LQFP64
ISD91331	Cortex®-M0 98 MHz	68 KB Flash	16 KB	32	2	1 (Quad)	6	Sigma-Delta >90 dB	√	1	Class-D (1W)	ISD-DMK_91300	16-ch Touch Key,Temperature Alarm, UART, I²C, I²S, PDMA, CRC	LQFP64
ISD91361	Cortex®-M0 98 MHz	145 KB Flash	16 KB	32	2	1 (Quad)	6	Sigma-Delta >90 dB	√	1	Class-D (1W)	ISD-DMK_91300	16-ch Touch Key,Temperature Alarm, UART, I²C, I²S, PDMA, CRC	LQFP64
ISD91361C	Cortex®-M0 98 MHz	145 KB Flash	16 KB	32	2	1 (Quad)	6	Sigma-Delta >90 dB	√	1	Class-D (1W)	ISD-DMK_91300	VR, 16-ch Touch Key, Temperature Alarm, UART, I²C, I²S, PDMA, CRC	LQFP64
ISD94124A	Cortex®-M4 200 MHz	512 KB Flash	192 KB	57	4	2 (Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100	USB 2.0 FS VAD	LQFP64, QFN48
ISD94124C	Cortex®-M4 200 MHz	512 KB Flash	192 KB	57	4	2 (Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100	VR, USB 2.0 FS VAD	LQFP64
ISD94124D	Cortex®-M4 200 MHz	512 KB Flash	192 KB	57	4	2 (Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100	BF+NR, USB 2.0 FS VAD	LQFP64
ISD94124P	Cortex®-M4 200 MHz	512 KB Flash	192 KB	57	4	2 (Quad/ Dual)	6	12-bit SAR ADC	√	4x DMIC	DPWM to exteral amp	ISD-DMK_94100	BF+NR+VR, USB 2.0 FS VAD	LQFP64

Audio CODECs

Mono Codec Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	SPKVDD/ Analog/Digital/ Digital I/O (V)	Package (mm)
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8810	Mono Codec with 2-wire interface	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU8810-DEMO	2-Wire	2.50~5.50 2.50~3.60 1.71~3.60 1.71~3.60	QFN20 (4x4)
NAU88C10	Mono Codec with 2-wire interface	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU88C10-DEMO	2-Wire	2.50~5.50 2.50~3.60 1.71~3.60 1.71 ~ 3.60	QFN20 (4x4)
NAU88C14	Mono Audio Codec with Equalizer, speaker driver	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU88C14-DEMO	2-Wire 3-Wire	2.50 to 5.50 2.50 to 3.60 1.71 to 3.60 1.71 to 3.60	QFN24 (4x4)
NAU8812	Mono Codec with speaker driver	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU8812-DEMO	2-Wire 3-Wire 4-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.71 ~ 3.60 1.71 ~ 3.60	QFN32 (5x5) SSOP-28
NAU8814	Mono Audio Codec with Equalizer, speaker driver	1	1	91	93	-79	-84	8~48	I²S PCM (Timeslot)	NAU8814-DEMO	2-Wire 3-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.71 ~ 3.60 1.71 ~ 3.60	QFN24 (4x4)

Stereo Codec Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	SPKVDD/ Analog/Digital/ Digital I/O (V)	Package (mm)
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8822A	Stereo Codec with Speaker Drive	2	2	90	94	-80	-84	8~48	I²S PCM (Timeslot)	NAU8822A-DEMO	2-Wire 3-Wire 4-Wire	2.50 to 5.50 2.50 to 3.60 1.65 to 3.60 1.65 to 3.60	QFN32 (5x5)
NAU88C22	Stereo Codec with Speaker Drive	2	2	89	89	-78	-84	8~192	I²S PCM (Timeslot)	NAU88C22-DEMO	2-Wire 3-Wire 4-Wire	2.50 to 5.50 2.50 to 3.60 1.65 to 3.60 1.65 to 3.60	QFN32 (5x5) QFN32 (4x4)
NAU8820	Stereo Codec	2	2	90	94	-80	-84	8~48	I²S PCM (Timeslot)	NAU8820-DEMO	2-Wire 3-Wire 4-Wire	2.50 to 5.50 2.50 to 3.60 1.65 to 3.60 1.65 to 3.60	QFN32 (5x5)

Ultra Low Power (ULP) Codec Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	SPKVDD/ MICBIAS/Analog/ Digital/Digital I/O (V)	Package (mm)
		ADC	DAC	ADC	DAC	ADC	DAC						
***NAU88L21**	ULP Stereo CODEC With Advanced Headset Detection and Stereo Class D Amp	2	2	98	100	-91	-85	8 to 192	I²S (TDM) PCM (Timeslot)	NAU88L21-DEMO	I²C	NA 2.5 to 3.6 1.6 to 2.0 1.61 to 1.98 1.6 to 3.6	QFN32 (5x5)
NAU88L24	ULP Stereo CODEC With Advanced Headset Detection and Stereo Class D Amp	2	2	100	103	-85	-77	8~96	I²S (TDM) PCM (Timeslot)	NAU88L24I-DEMO	I²C	2.6 ~ 5.0 2.6 ~ 5.0 1.6 ~ 2.0 1.1 ~ 1.98 1.6 ~ 3.6	QFN48 (6x6)
NAU88L25	Ultra-Low Power Audio CODEC With Advanced Headset Features and 124dB Class G Headphone Drive	1	2	101	124	-91	-89	8~192	I²S / PCM	NAU88L25-DEMO	I²C	NA 2.6 ~ 5.0 1.6 ~ 2.0 1.1 ~ 1.98 1.6 ~ 3.6	QFN32 (5x5)

* Under Development
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Stereo ADC Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	Analog/ Digital/Digital I/O (V)	Package (mm)
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8501	Stereo ADC with Input Mixer and Line Output	2	-	90	-	-80	-	8~48	I²S (TDM) PCM (Timeslot)	NAU8501-DEMO	2-Wire 3-Wire 4-Wire	2.50 ~ 3.60 1.65 ~ 3.60 1.65 ~ 3.60	QFN28 (4x4)
NAU8502	Stereo ADC with Integrated LDO	2	-	90	-	-80	-	8~48	I²S (TDM) PCM (Timeslot)	NAU8502-Card	2-Wire 3-Wire 4-Wire	2.70 ~ 3.60 1.71 ~ 3.60 1.71 ~ 3.60	QFN32 (5x5)

Ultra Low Power (ULP) ADC Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	MICBIAS/ Analog/Digital/ Digital I/O (V)	Package (mm)
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU85L20	ULP Stereo Audio ADC with integrated FLL and Microphone Preamplifier	2	-	101	-	-91	-	8 to 96	I²S (TDM)	NAU85L20-DEMO	I²S	1.80 ~ 5.50 1.62 ~ 1.98 1.20 ~ 1.98 1.62 ~ 3.60	QFN28 (4x4)
NAU85L40	ULP Quad Audio ADC with integrated FLL and Microphone Preamplifier	4	-	101	-	-91	-	8 to 96	I²S (TDM)	NAU85L40-DEMO	I²S	2.50 ~ 5.50 1.62 ~ 1.98 1.20 ~ 1.98 1.62 ~ 3.60	QFN28 (4x4)

Stereo DAC Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	CTRL IF	SPKVDD/ Analog/ Digital/Digital I/O (V)	Package (mm)
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8401	Stereo DAC with Speaker Drive and Line Input	-	2	-	94	-	-84	8~48	I²S PCM (Timeslot)	NAU8401-DEMO	2-Wire 3-Wire 4-Wire	2.50 ~ 5.50 2.50 ~ 3.60 1.65 ~ 3.60 1.65 ~ 3.60	QFN32 (5x5)
NAU8402	Stereo DAC with 2Vrms Output	-	2	-	98	-	-82	8~96	I²S	NAU8402-Card	-	NA 3.0 ~ 3.6 1.7 ~ 3.6 1.7 ~ 3.6	TSSOP 16

Audio Amplifiers

2Vrms Line Driver and Class-AB Series

Part No.	Description	SNR (dB)	Output Power		Gain (dB)	Standby Current (uA)	Operating Voltage (V)	Temp (°C)	Development Tools	Package
			Power (W)	THD+N (%)						
NAU8220	2Vrms Line Driver	108	-	0.003	-	-	3.0~3.6	-40~85	NAU8220WG-EVB	SOP14 TSSOP14
ISD8101	1.5W Class-AB Audio Amplifier with Chip Enable, Differential/Single ended inputs, Low pop and Click	100	0.825 (5.0V)	<1	20	<1	2.4~6.8	-40~85	ISD-DEMO8101	8-pin SOP 8-pin PDIP
			1.1 (5.0V)	<10						
			1.5 (6.8V)	<10						
ISD8102	2W Class-AB Audio Amplifier with Head Phone Sense Input	100	2W into 4Ω at 5V	<10	20	<1	2.0~6.8	-40~85	ISD-DEMO8102	8-pin SOP (Thermal ex-pad)
ISD8104	2W Class-AB Audio Amplifier, Differential/Single ended inputs	100	2W into 4Ω at 5V	<10	20	<1	2.0~6.8	-40~85	ISD-DEMO8104	8-pin SOP (Thermal ex-pad)P

Class D Series

Part No.	Description	SNR (dB)	Output Power		Gain (dB)	Standby Current (uA)	Operating Voltage (V)	Temp (°C)	Development Tools	Package
			Power (W)	THD+N (%)						
NAU82011VG	3.1W Mono Class-D Audio Amplifier, variable gain with Differential / Single ended inputs	103	3.1W into 4Ω at 5V	<10	Variable	<1	2.5~5.5	-40~85	NAU82011VG-EVB	9-bump WCSP
NAU8223	3.1W Stereo Filer-Free Class-D Audio Amplifier, 5 gain steps with Differential / Single ended inputs	103	3.1W into 4Ω at 5V	<10	0, 6, 12, 18, 24	<1	2.5~5.5	-40~85	NAU8223-EVB	QFN20
NAU8224	3.1W Stereo Filer-Free Class-D Audio Amplifier, 2 wire interface gain control with Differential / Single ended inputs	101	3.1W into 4Ω at 5V	<10	24 to -62	<1	2.5~5.5	-40~85	NAU8224-EVB	QFN20
***NAU8225**	I²S, 3.1W Stereo Filer-Free Class-D Audio Amplifier, 2 wire interface	-	3.0W into 4Ω at 5V	<10	24 to -62	<2	SPK_VDD: 2.5 - 5.5 A_Vdd: 1.62 - 1.98 IO_Vdd: 1.62 - 3.6	-40 to 85	NAU8225-CEVB	QFN20
***NAU83P20**	Class D power stage 2x20W into 8Ohms (1% THD)	102	10Wx4 20Wx2	<0.18	3BTL / 3SE	<1	7.0~24.0	-40~85	NAU83P20-DEMO	QFN48

* Under Development

Audio Enhancement

Part No.	Description	HW Configuration					Algorithms								
		I²S Stereo Inputs	ADC Stereo Inputs	I²S Output 2 x Stereo	DAC Single Output	Power Output	Bass	Pro. Eq.	3D	Treble	Volume	Level	Dialog	DRC	Package
NPCP215F	MaxxAudio	4	0	3	0	20W (8R)	Y	Y	Y	Y	Y	Y	Y	-	QFN48
NPCA112D	MaxxAudio	4	0	3	0	-	Y	Y	Y	Y	Y	Y	Y	-	QFN32
NPCA110P	MaxxAudio	2	3	3	4	-	Y	Y	Y	Y	Y	Y	Y	-	QFN40
NPCA110T	MaxxAudio	3	0	3	3	-	Y	Y	Y	Y	Y	Y	Y	-	QFN32
NPCA110D	MaxxAudio	3	0	3	0	-	Y	Y	Y	Y	Y	Y	Y	-	QFN32
NPCA110B	MaxxAudio	1	2	1	2	-	Y	Y	-	-	Y	-	-	-	QFN32
***NPCA120D**	DPS	3	0	3	0	-	Y	Y	Y	Y	Y	Y	Y	Y	LQFP64
***NPCP225F**	DPS	3	0	3	0	20W (8R)	Y	Y	Y	Y	Y	Y	Y	Y	QFN48

* Under Development

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Audio Converters

Precision ADC Series

Part No.	Description	Resolution Bits	Sample Rates (max)	Architecture	Gain	# of Input Channels	Development Tools	ENOB (Gain=1, 10SPS)	Package
NAU7802	Dual Channel 24-bit ADC	24	10, 20, 40, 80 & 320 Hz	Sigma-Delta	1x, 2x, 4x, 8x, 16x, 32x, 64x, 128x	2	N/A	23	SOP-16, PDIP-16

Contact us: Audio@nuvoton.com

ChipCorder® Family

Digital ChipCorder® Series

Part No.	Description	Duration	Sample Rate (KHz)	Operating Voltage (V)	Package	Development Tools	Temp (°C)
ISD15102	Multi-message record/playback, Flash memory, I²S digital audio and SPI interfaces	2 min	Up to 48	2.7~3.6	LQFP48	ISD-DMK_15100	Industrial -40~85°C
ISD15104		4 min					
ISD15108		8 min					
ISD15C00	Multi-message record/playback with I²S digital audio and SPI interfaces	Ext. Flash up to 64 min	Up to 48	2.7~3.6	LQFP48	ISD-DMK_15C00	AEC-Q100
ISD15D00	Multi-message playback-only with I²S digital audio and SPI interfaces	Ext. Flash up to 64 min	Up to 48	2.7~5.5	QFN32	ISD-DMK_15D00	AEC-Q100
ISD3900	Multi-message record/playback with I²S digital audio and SPI interfaces	Ext. Flash up to 64 min	Up to 48	2.7~3.6	LQFP48	ISD-DMK_3900	Industrial -40~85°C
ISD3800	Multi-message playback-only with I²S digital audio and SPI interfaces	Ext. Flash up to 64 min	Up to 48	2.7~5.5	LQFP48	ISD-DMK_3800	Industrial -40~85°C
ISD2130	Multi-message playback-only with embedded Flash memory	30 sec	Up to 32	2.7~3.6	QFN20	ISD-DMK_2100	Industrial -40~85°C
ISD2115A		15 sec				ISD-DMK_2100	
ISD2360	Multi-message, 3-channel audio, playback-only with embedded Flash memory	64 sec	Up to 32	2.4~5.5	QFN32 SOP16	ISD-DMK_2360	Industrial -40~85°C

Contact us: ChipCorder@nuvoton.com

MLS ChipCorder® Series

Part No.	Description	Duration	Sample Rate (KHz)	Operating Voltage (V)	Package	Development Tools	Temp (˚C)
ISD14B20	Multi-message record/playback with internal Flash memory	10~128 sec	4~12	2.4~5.5	DIE	ISD-COB18B20	0~50°C
ISD14B40						ISD-COB18B24	
ISD14B80						ISD-COB18B80	
ISD1916	Multi-message record/playback with internal Flash memory	10~128 sec	4~12	2.4~5.5	SOIC 28	ISD-DEMO1964	Industrial
ISD1932							
ISD1964							
ISD1610B	Single-message record/playback with internal Flash memory	6~40 sec	4~12	2.4~5.5	SOIC 16 DIE	I16-COB20	Commercial Industrial
ISD1616B							
ISD1620B							
ISD1730	Multi-message record/playback, internal Flash memory and SPI interface	20~480 sec	4~12	2.4~5.5	SOIC 28 DIE	ISD-COB1730	Commercial Industrial
ISD1760						ISD-COB17160	
ISD17120						ISD-COB17150	
ISD17240						ISD-COB17240	
ISD1806	Single-message record/playback with internal Flash	6~16 sec	4~8	2.7~4.5	DIE	ISD-COB1810	0~50°C
ISD1810							

MLS ChipCorder® Series

Part No.	Description	Duration	Sample Rate (KHz)	Operating Voltage (V)	Package	Development Tools	Temp (˚C)
ISD18A04	Single-message record/playback with internal Flash memory	4~8 sec	4~8	2.4~5.5	DIE	ISD-COB18A04	0~50°C
ISD18B12	Single-message record/playback with internal Flash memory	6~24 sec	4~8	2.4~5.5	DIE	ISD-COB18B24	0~50°C
ISD18B24							
ISD18C10	Single-message record/playback with internal Flash memory	12 sec	4~8	2.7~4.5	DIE	ISD-COB18C10	0~50°C
ISD4002	Multi-message record/playback, internal Flash memory and SPI interface	2~16 min	4,5.3,6.4,8	2.7~3.3	DIP 28 SOIC 28 DIE	IPROG-1	Commercial Industrial
ISD4003							
ISD4004							
ISD5102	Multi-message record/playback, internal Flash memory and I²C interface	2~16 min	4,5.3,6.4,8	2.7~3.3	SOIC 28 DIE	IPROG-1	Industrial
ISD5104							
ISD5108							
ISD5116							

Development Tools

Consumer Speech Development Tools

• Development Tools for PowerSpeech® Family

Ordering No.	Board Name	Content	Description	Picture
Development Kit				
ICE-W588D	WHS-588D-ICE	• WHS-MINI-USB-ICE System V1.1 • WHS-588D-ICE System V3.3 • USB Cable	• W588C/D In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-N588H	NHS-588H-ICE	• WHS-MINI-USB-ICE System V1.1 • NHS-588H-ICE System V1.1 2 layer boards • USB Cable	• N588H/J In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-W584A-FS	WHS-584A-ICE	• WHS-584A-ICE-IL System V1.1 • WHS-584A-ICE System V1.2 • WHS-KEY + Cable • Power Adaptor • USB Cable	• W584A In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-N584H	NHS-584H-ICE	• N584H ICE System	• N584H In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-N566H	NHS-566H-ICE	• WHS-MINI-USB-ICE System V1.1 • WHS-566H-ICE System V1.1 • USB Cable	• N566H In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-Dongle	NHS-ICE CNT	• N589 ICE Dongle Bar	• N589 ICE Dongle bar, use in NuIDE to control N589A340 EVB program operation.	
Evaluation Board				
NV-W588D	WHS-588C/D-16M	• W588C/D series EVB	• W588C/D Series Evaluation Board (EVB) with 16Mbit Flash	
NV-W588DF20B	WHS-W588DF20-H1	• W588DF060(W588DF20) EVB	• W588DF060(W588DF20) Evaluation Board (EVB) with 2Mbit Embedded Flash	
NV-N588H	NHS-588H-16M	• N588H/J Series EVB	• N588H/J Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N588H-L	NHS-588H-08ML	• N588H/J Series EVB for Low Voltage	• N588H/J EVB Series Evaluation Board (EVB) with 8Mbit Low Voltage Flash	
NV-N566H	NHS-566H-16M	• N566H EVB	• N566H Evaluation Board (EVB) with 16M-bit Parallel Flash	
NV-N566HP320	NHS-N566HP320	N566HP EVB	• N566HP320 COB with passive parts	
NV-N5132	NV-513X-16M	N5132	• N513X EVB with 16M-bit Parallel Flash	
NV-N5132-FS	NV-5132-FS	N5132 + USB	• N5132 TOOL SET	
NV-N5160	NHS-W588X006 (NV-N5160)	• N5160 EVB	• N5160 Evaluation Board (EVB) with 32M-bit SPI Flash	

• Development Tools for PowerSpeech® Family

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
NV-N5160S16	NHS-N5160S16	• N5160S16 EVB	• N5160S16 Evaluation Board (EVB)	
NV-N5160S32	NHS-N5160S32	• N5160S32 EVB	• N5160S32 Evaluation Board (EVB)	
NV-N5162S16	NHS-N5162S16	• N5162S16 EVB	• N5162S16 Evaluation Board (EVB)	
NV-N589EVB	NHS-589EVB	• N589 EVB	• N589A/B/C/D ICE and Evaluation Board (EVB)	
NV-N584H	NHS-584H-16M	• N584H Series EVB	• N584H Series Evaluation Board (EVB) with 16Mbit Flash	
NV-W584A-H	WHS-584AH-16M	• W584A/B/C Series EVB	•W584A/B/C Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N584L-3V	NHS-584L-16M-3V	• N584L Series EVB with Vp=3V	• N584L Series Evaluation Board (EVB) with 16Mbit Flash for Vp=3V	
NV-N584L-4V	NHS-584L-16M-4V	• N584L Series EVB with Vp=4V	• N584L Series Evaluation Board (EVB) with 16Mbit Flash for Vp=4V	
NV-N588L	NHS-N588L-16M	• N588L Series EVB	• N588L Series Evaluation Board (EVB) with 16Mbit Flash	

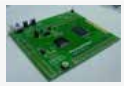
• Development Tools for BandDirector® Family

Ordering No.	Board Name	Content	Description	Picture
Development Kit				
ICE-W567C-FS	WHS-BD567C	• WHS-MINI-USB-ICE System V1.1 • WHS-567C-IC System V1.3 • USB Cable • Power Adaptor	• W567C/J In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
ICE-N567H	WHS-N567H-ICE	• WHS-MINI-USB-ICE System V1.1 • WHS-N567H-ICE System V3.0 • USB Cable	• N567G/H/K In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	

• Development Tools for BandDirector® Family

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
NV-N566H	NHS-566H-16M	• N566H EVB	• N566H Evaluation Board (EVB) with 16M-bit Parallel Flash	
NV-W567C	WHS-567C-16M	• W567C/J series EVB	• W567C/J Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N567H	WHS-N567-H1	• N567G/H/K series EVB	• N567G/H/K Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N567L	NHS-N567L-16M	• N567L Series EVB	• N567L Series Evaluation Board (EVB) with 16Mbit Flash	

• Development Tools for ViewTalk® Family

Ordering No.	Board Name	Content	Description	Picture
Development Kit				
ICE-N539T	NHS-539-ICE	• WHS-MINI-USB-ICE System V1.1 • NHS-539-ICE System V1.2 • USB Cable	• N539 In-Circuit Emulation (ICE) Dev. Kit. Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	
Evaluation Board				
NV-N531-16M	NHS-531-16M	• N531 Series EVB	• N531 Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N539T001	NHS-539001-16M	• N539T001 Series EVB	• N539T001 Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N539T000	NHS-539-16M	• N539T000 Series EVB	• N539T000 Series Evaluation Board (EVB) with 16Mbit Flash	

• Development Tools for OTP Family

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
NV-W584AP20	NHS-584AP20	• W584AP065(W584AP20) OTP EVB	• W584AP065(W584AP20) One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-W584AP05	NHS-584AP05	• W584AP017(W584AP05) OTP EVB	• W584AP017(W584AP05) One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N584HP300	NHS-584HP300	• N584HP300 OTP EVB	• N584HP300 EVB One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-W567CP80	NHS-W567CP80	• W567CP260(W567CP80) OTP EVB	• W567CP260(W567CP80) One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N567HP80	NHS-567HP80	• N567HP330(N567HP80) OTP EVB	• N567HP330(N567HP80) One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N567LP330	NHS-567LP330	• N567LP330 OTP EVB	• N567LP330 EVB One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N588LP330	NHS-588LP330	• N588LP330 OTP EVB	• N588LP330 EVB One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N588HP650	NHS-N588HP650	• N588HP650 OTP EVB	• N588HP650 COB with passive parts	
NV-N588HP340	NHS-588HP340	• N588HP340 OTP EVB	• N588HP340 One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N588HP170	NHS-588HP170	• N588HP170 OTP EVB	• N588HP170 One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N588HP080	NHS-588HP080	• N588HP080 OTP EVB	• N588HP080 One-Time Programmable (OTP) Evaluation Board (EVB)	
Writer				
NW-OTP	Nuvoton OTP Writer	• Nu-Speech / Nu-Voice OTP chip Writer	• Nu-Speech / Nu-Voice OTP chip Writer	
NW-OTP-Gang	Nuvoton OTP Gang Writer	• Nu-Speech / Nu-Voice OTP chip Gang Writer	• Nu-Speech / Nu-Voice OTP chip Gang Writer - support to write 4 chips one time	
NW-N570S64A-F	Flash Gang Writer	• Nu-Voice N569S, N57xS chip Gang Writer	• Nu-Voice N569S, N57xS chip Gang Writer - support to write 8 chips one time	

• Development Tools for NuVoice™

Ordering No.	Board name	Content	Description	Picture
		Evaluation Board		
NU-NUVOICE	NU-LINK	• Nu-Link Debug Adapter • USB Cable	Nu-Link Debug Adapter for Nu-Voice Series, supports online/offline In-Circuit Programming (ICP), development, and debug.	
NV-N569S2K0	NHS-N569S2K0	• NHS-N569S2K0 EVB	N569S (w/ 16Mbit Flash) Evaluation Board (EVB) with I/O Interface	
NV-N569S8K0	NHS-N569S8K0	• NHS-N569S8K0 EVB	N569S (w/ 64Mbit Flash) Evaluation Board (EVB) with I/O Interface	
NV-N570C064	NHS-570C064-EVB	• NHS-570C064 EVB	N570C064 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application	
NV-N570S16A	NHS-N570S16A	• NHS-N570S16A EVB	N570S16A (w/ 16Mbit Flash) Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application	
NV-N570S64A	NHS-N570S64A	• NHS-N570S64A EVB	N570S64A (w/ 64Mbit Flash) Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application	
NV-N572F065	NHS-572F065-EVB	• NHS-572F065 EVB	N572F065 Evaluation Board (EVB) with I/O Interface	
NV-N572F072	NHS-572F072-EVB	• NHS-572F072 EVB	N572F072 Evaluation Board (EVB) with I/O Interface & Microphonefor Voice Recognition Application	
NV-N572C072	NHS-572C072-EVB	• NHS-572C072 EVB	N572C072 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application	
NV-N571P032	NHS-571P032-EVB	• NHS-571P032 EVB	N571P032 One-Time Programmable (OTP) Evaluation Board (EVB) with I/O Interface & Microphone for program verifcation	
ICE-N571P032	NHS-571E000-EVB	• N571P032 ICE Chip EVB	N571P032 In-Circuit Emulation (ICE) Chip with I/O interface & Microphone, Provide in-circuit emulation with program, execute, step through features for design development, verification & debugging	

• Development Tools for NuVoice™

Ordering No.	Board name	Content	Description	Picture
		Evaluation Board		
NV-N575C145	NHS-575C145	•NHS-575C145 EVB	NHS-575C145 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application	
NV-N575F145	NHS-575F145	•NHS-575F145 EVB	NHS-575F145 Evaluation Board (EVB) with I/O Interface & Microphone	
NK-N575CF145	AU9110-DemoKit	•I/O Expansion Daughter Board for N575 EVB	NHS-575C/F145-Daughter Board expands N575 EVB with additional Push Button & Reserved SD Card Socket.	
NT-N575C145	NHS-575C145	•NHS-575C145-EVB + Daughter Board	NHS-575C145 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application with Daughter Board	
NT-N575F145	NHS-575F145	•NHS-575F145-EVB + Daughter Board	NHS-575F145 Evaluation Board (EVB) with I/O Interface & Microphone with Daughter Board	

• Development Tools for Nu-Touch

Ordering No.	Board Name	Content	Description	Picture
		Evaluation Board		
ICE-N55T10	NHS-55T10 (TOUCH SYSTEM)	• N55T10 Evaluation Kit	• N55T10 Evaluation kits, it include NHS-55T-1, NHS-55T-2, NHS- 55T10-COB, WHS-588L-8M	
NV-N55T10	NHS-55T10-COB EVB	• N55T10 EVB	• N55T10 Evaluation Board (EVB)	

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• IO expander Family

Ordering No.	Board Name	Content	Description	Picture
		Evaluation Board		
NV-N55P242	NHS-55P242	• N55P242 EVB	• N55P242 Evaluation Board (EVB)	
		Demo Board		
NV-N55P242-R	N55P242_RING_TYPE_ DEMO_BOARD_V1.0	• N55P242 Demo Board (Circle)	• N55P242 Circle Demo Board	
NV-N55P242-S	N55P242_SINGLE_ STRIP_DEMO_BOARD_ V1.0	• N55P242 Demo Board (Rectangle)	• N55P242 Rectangle Demo Board	

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• Development Tools for MFID Family

Ordering No.	Board Name	Content	Description	Picture
Evaluation Board				
NV-MFID50	WHS-55MID50-002	• W55MID50 EVB	• W55MID50 MFID Evaluation Board (EVB) with PCB Antenna (42mm*34.5mm)	
NV-W55MID15	WHS-55MID15	• W55MID15 MFID Tag EVB	• W55MID15 w/ ANT (20mm*20mm)	
NV-W55MID35	WHS-55MID35	• W55MID35 MFID Tag EVB	• W55MID35 w/ ANT (15mm*15mm)	

• Development Tools for Other

Ordering No.	Board Name	Content	Description	Picture
Accessary				
NK-Keymatrix	WHS-KEY MATRIX	• External Key-Matrick Board	• External Key-Matrick Board	
NW-USB	WHS-USB-Writer	• USB Writer	• PowerSpeech/ViewTalk/BandDirector/ Others USB writer	

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Audio Development Tools

• Development Tools for AUI Enabler Series

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Development Kit					
NM-I94100_AM	**ISD-DMK_94100_AM**	ISD94100	• NL-ISD94124A • NP-I94124_AM • Speaker	• Evaluation, debugging and demo kit for ISD94100 • connect with Analog microphone adaptor	
NM-I94100_DM	**ISD-DMK_94100_DM**	ISD94100	• NL-ISD94124A • NP-I94124_DM • Speaker	• Evaluation, debugging and demo kit for ISD94100 • connect with Digital microphone adaptor	
NM-ISD91260	**ISD-DMK_91260**	ISD91260CRI	• ISD-DEMO91260 • ISD-NU-LINK • Speaker	• Evaluation and demo kit for ISD91260CRI	
NM-ISD91260B	**ISD-DMK_91260B**	ISD91260BRI	• ISD-DEMO91260B • ISD-NU-LINK • Speaker	• Evaluation and demo kit for ISD91260BRI	
NM-ISD91032C	**ISD-DMK_91032C**	ISD91032	• ISD-DEMO91032C • ISD-NU-LINK • Speaker	• Evaluation and demo kit for ISD91032CFI	
NM-ISD9160	**ISD-DMK_9160**	ISD9160	• ISD-DEMO9160 • ISD-NU-LINK • ISD-9160-Touch • ISD-9160-KB • Speaker	• Evaluation, debugging and demo kit for ISD9160 • Keil RV/MDK available on Keil website • Supports ICP (In-Circuit Programming)	
NM-ISD91300	**ISD-DMK_91300**	ISD91300	• ISD-DEMO91300 • ISD-91300-Touch • Speaker	• Evaluation, debugging and demo kit for ISD91300 • Keil RV/MDK available on Keil website • Supports ICP (In-Circuit Programming)	
Programmer/Writer					
NW-ISD9160	**ISD-ES9160__Prog_F**	ISD9160 Series LQFP pakcage	• ISD-ES9160__Prog_F	• ISD9160 LQFP single socket programmer • Connect to PC via ISD NU-LINK for programming and evaluation	
NG-ISD9160	**ISD-9160_GANG_Prog_F**	ISD9160	• ISD-9160_GANG_Prog_F	• ISD9160 LQFP standalone gang programmer	
NW-ISD91300	**ISD-ES91300_PROG_F**	ISD91300	ISD-ES91300_PROG_F	• ISD91300 LQFP single socket programmer for programming and evaluation	
NG-ISD91300	**ISD-91300_GANG_Prog_F**	ISD91300	• ISD-91300_GANG_Prog_F	• ISD91300 LQFP standalone gang programmer	

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• Development Tools for Audio CODECs

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation Board					
NV-NAU88C10	NAU88C10-DEMO	NAU88C10	•NAU88C10-DEMO •GUI Installation CD	•Compact Audio Base Board + NAU88C10 daughter card •Installation CD kit	
NV-NAU8810	NAU8810-DEMO	NAU8810	•NAU8810-DEMO •GUI Installation CD	•Compact Audio Base Board + NAU8810 daughter card •Installation CD kit	
NV-NAU8812	NAU8812-DEMO	NAU8812	•NAU8812-DEMO •GUI Installation CD	•Compact Audio Base Board + NAU8812 daughter card •Installation CD kit	
NV-NAU88C14	NAU88C14-DEMO	NAU88C14	•NAU88C14-DEMO •GUI Installation CD	•Compact Audio Base Board + NAU88C14 daughter card •Installation CD kit	
NV-NAU8814	NAU8814-DEMO	NAU8814	•NAU8814-DEMO •GUI Installation CD	•Compact Audio Base Board + NAU8814 daughter card •Installation CD kit	

• Development Tools for Audio CODECs

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation Board					
NL-NAU88L25	NAU88L25-DEMO	NAU88L25	•NAU88L25-DEMO	•Demo board for NAU88L25YGB	
NU-NAU88L25	NAU-Audio_ Control_USB	NAU88L25 NAU88L24	•NAU-Audio_ Control_USB	•Micro USB Audio control board for connecting both NL-NAU88L25 and NL-NAU88L24I to PC	
NL-NAU88L24I	NAU88L24I-DEMO	NAU88L24	•NAU88L24I-DEMO	•Demo board for NAU88L24IG	
NV-NAU8822A	NAU8822A-DEMO	NAU8822A NAU88U22A	•NAU8822A-DEMO •GUI Installation CD	•Compact Audio Base Board + NAU8822A daughter card •Installation CD kit	
NV-NAU88C22	NAU88C22-DEMO	NAU88C22	•NAU88C22-DEMO •GUI Installation CD	•Compact Audio Base Board + NAU88C22 daughter card •Installation CD kit	
NV-NAU8820	NAU8820-DEMO	NAU8820	•NAU8820-DEMO •GUI Installation CD	•Compact Audio Base Board + NAU8820 daughter card •Installation CD kit	
NV-NAU8401	NAU8401-DEMO	NAU8401	•NAU8401-DEMO •GUI Installation CD	•Compact Audio Base Board + NAU8401 daughter card •Installation CD kit	
NV-NAU8501	NAU8501-DEMO	NAU8501	•NAU8501-DEMO •GUI Installation CD	•Compact Audio Base Board + NAU8501 daughter card •Installation CD kit	
NL-NAU85L40	NAU85L40-DEMO	NAU85L40	NAU85L40-DEMO	Demo board for NAU85L40YG	
NL-NAU85L20	NAU85L20-DEMO	NAU85L20	NAU85L20-DEMO	Demo board for NAU85L20YG	
NT-NAU8402	NAU8402-Card	NAU8402	NAU8402-Card	NAU8402YG Daughter Board	
NT-NAU8502	NAU8502-Card	NAU8502	NAU8502-Card	NAU8502YG Daughter Board	

• Development Tools for Audio Amplifiers

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Power Amplifier					
NV-NAU83P20	NAU83P20-DEMO	NAU83P20	•NAU83P20-DEMO	•Demo board for NAU83P20YG	
NE-NAU82011V	NAU82011V-EVB	NAU82011	•NAU82011V-EVB	•Evaluation Board for NAU82011VG	
NT-ISD8101	ISD-DEMO8101	ISD8101	•ISDI8101-DEMO	•Demo Board for I8101SYI	
NT-ISD8102	ISD-DEMO8102	ISD8102	•ISD8102-DEMO	•Demo Board for I8102SYI	
NT-ISD8104	ISD-DEMO8104	ISD8104	•ISD8104-DEMO	•Demo Board for I8104SYI	

• Development Tools for Audio Amplifiers

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Power Amplifier					
NL-NAU8225	NAU8225-CEVB	NAU8225	• NAU825-CEVB	• Evaluation Board for NAU8225	
NE-NAU8223	NAU8223-EVB	NAU8223	• NAU8223-EVB	• Evaluation Board for NAU8223YG	
NV-NAU8223	NAU8223-DEMO	NAU8223	• NAU8223-DEMO	• Demo Board for NAU8223YG	
NE-NAU8224	NAU8224-EVB	NAU8224	• NAU8224-EVB • GUI Installation CD	• Evaluation Board for NAU8224YG • Installation CD kit	
NU-NAU8224	NAU-ES_MINI_USB	NAU8224	• NAU-ES_MINI_USB	• USB to I²C bus dongle for NAU8224-EVB	
NE-NAU8220	NAU8220WG-EVB	NAU8220	• NAU8220WG-EVB	• Evaluation Board for NAU8220WG	

• Development Tools for ChipCorder® Family

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Development Kit					
NM-ISD15100	ISD-DMK_15100	ISD15102/04/08	• ISD-DEMO15100 • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD15102/4/8	
NM-ISD15C00	ISD-DMK_15C00	ISD15C00	• ISD-DEMO15C00 • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD15C00	
NM-ISD15D00	ISD-DMK_15D00	ISD15D00	• ISD-DEMO15D00 • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD15D00	
NM-ISD2100Q	ISD-DMK_2100	ISD2100YYI	• ISD-DEMO2100_Q • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD2100Y	
NM-ISD2360Q	ISD-DMK_2360_Q	ISD2360YYI	• ISD-DEMO2360_Q • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD2360Y	
NM-ISD2360S	ISD-DMK_2360_S	ISD2360SYI	• ISD-DEMO2360_S • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD2360S	
NM-ISD3800	ISD-DMK_3800	ISD3800	• ISD-DEMO3800 • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD3800	
NM-ISD3900	ISD-DMK_3900	ISD3900	• ISD-DEMO3900 • ISD-ES_MINI_USB • Speaker	• Evaluation and demo kit for ISD3900	
Evaluation/Demo/Development Board					
NC-ISD18B24	ISD-COB18B24	ISD18B12/24	• ISD-COB18B24	• ISD18B24/12 demo board	
NC-ISD18C10	ISD-COB18C10	ISD18C10	• ISD-COB18C10	• ISD18C10/18C06 demo board (SPK/MIC sharing)	
NC-ISD1810	ISD-COB1810	ISD1806/10	• ISD-COB1810	• ISD1810/1806 demo board	

• Development Tools for ChipCorder® Family

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation/Demo/Development Board					
NC-ISD17240	ISD-COB17240	ISD17240/210/180	• ISD-COB17240	• ISD17240/210/180 demo board	
NC-ISD17150	ISD-COB17150	ISD17150/120/90	• ISD-COB17150	• ISD17150/120/090 demo board	
NC-ISD1760	ISD-COB1760	ISD1760/50/40	• ISD-COB1760	• ISD1760/50/40 demo board	
NC-ISD1730	ISD-COB1730	ISD1730	• ISD-COB1730	• ISD1730 demo board	
NC-ISD1620B	I16-COB20	ISD1600 Series	• I16-COB20	• ISD1620/16/12/10 demo board	
Programmer/Writer					
NW-ISD15100	ISD-ES15100_Mini_PROG_F	ISD15102/04/08	• ISD-ES15100_Mini_PROG	• ISD15102/04/08 LQFP single socket programmer • Connect to PC via ISD-ES_Mini_USB for programming and evaluation	
NW-ISD2100Q	ISD-ES2100_Mini_PROG_Q	ISD2100 Series QFN package	• ISD-ES2100_Mini_PROG_Q	• ISD2100 QFN single socket programmer • Connect to PC via ISD-ES_Mini_USB for programming and evaluation	
NW-ISD2100S	ISD-ES2100_Mini_PROG_S	ISD2100 Series SOP package	• ISD-ES2100_Mini_PROG_S	• ISD2100 SOP single socket programmer • Connect to PC via ISD-ES_Mini_USB for programming and evaluation	
NG-ISD2100Q	ISD-2100_GANG_Prog_Q	ISD2100 Series QFN package	• ISD-2100_GANG_Prog_Q	• ISD2100 QFN standalone gang programmer	

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• Development Tools for ChipCorder® Family

Ordering No.P	art No.	Supported Devices	Content	Description	Picture
Programmer/Writer					
NG-ISD2100S	ISD-2100_GANG_Prog_S	ISD2100 Series SOP package	• ISD-2100_GANG_ Prog_S	• ISD2100 SOP standalone gang programmer	
NW-ISD2360Q	ISD-ES2360_MINI_PROG_Q	ISD2360	• ISD-ES2360_ MINI_PROG_Q	• ISD2360 QFN single socket programmer, used with ISD-ES_Mini_USB • Connect to PC via ISD-ES_Mini_USB for programming and evaluation	
NW-ISD2360S	ISD-ES2360_MINI_PROG_S	ISD2360	• ISD-ES2360_ MINI_PROG_S	• ISD2360 SOP single socket programmer • Connect to PC via ISD-ES_Mini_USB for programming and evaluation	
NW-ISDPROG	ISD-PROG	ISD2100 Series ISD15100 Series ISD15D00 Series Winbond SPI Flash	• ISD-PROG •	Stand alone Programmer for Digital ChipCorder	
NG-ISD2360Q	ISD-2360_GANG_PROG_Q	ISD2360 QFN package	• ISD-2360_GANG_ PROG_Q	• ISD2360 QFN standalone gang programmer	
NG-ISD2360S	ISD-2360_GANG_PROG_S	ISD2360 SOP package	• ISD-2360_GANG_ PROG_S	• ISD2360 SOP standalone gang programmer	
NW-ISDIPROG1	ISD-IPROG-1	ISD4000/5000/1700	• ISD-PROG-1	• Single chip programming board support ISD4000/5000/1700 Series	
NE-ISD1700	ISD-ES17XX_USB_PB	ISD1700 Series	• ISD-ES17XX_ USB_PB	• Eval board for 1700 Series	
NE-ISD1900	ISD-ES1900_USB_PROG	ISD1900 Series	• ISD-ES1900_ USB_PROG	• USB evaluation board for ISD1900 Series	
NE-ISD1600	ISD-ES1600_USB_PROG	ISD1600 Series	• ISD-ES1600_ USB_PROG	• USB evaluation board for ISD1600 Series	

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• Development Tools for MaxxAudio® Series

Ordering No.	Part No.	Supported Devices	Content	Description	Picture
Evaluation/Demo/Development Board					
NE-NPCA110XB	NPCA110x evaluation board	NPCA110x device	NPCA110x evaluation board	NPCA110x 1 watt base board	
NT-NPCA110PP	NPCA110P/M Piggy board	NPCA110P	NPCA110P/M evaluation board	NPCA110P Piggy board	
NU-NPUSB2I2C	USB-To-I²C/I²S	NPCA110x & NPCP215x	USB-To-I²C/I²S	USB2I2C board for NPCA110x & NPCP215x	
NE-NPCP215F	NPCP215x evaluation board	NPCP215F	NPCP215x evaluation board	NPCP215F evaluation board	

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Cloud Computing

EC

EC for Portable Applications

Security

Trusted Platform Module (TPM)

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Desktop / Server Series
NB and Networking / Storage Series

Interface Logic

Switches and Multiplexers
Interface Logic Series

I/O

General Purpose I/O Series
Super I/O Series
eSIO Series

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EC

EC for Portable Applications

Nuvoton's highly-integrated embedded controller (EC) device has an embedded 32-bit, high-performance RISC core and integrated advanced functions. It is targeted for a wide range of portable applications and provides best-in-class, complete EC functionality. The EC uses either the Low Pin Count (LPC), the Enhanced Serial Peripheral Interface (eSPI), or I²C Host interface and is designed to best meet the requirements of mobile systems.

Part No.	Core Type	Core Max Frequency	Internal Flash Memory	SRAM	SPI Flash Interface	eSPI	LPC	SMBus /I²C	Peripheral SPI Controller	PECI	ADC	DAC	Host I/F channels	8042 KBC	Host Mailbox	PWM Channels / with HB	Fan TACHs	Keyboard Scan	PS/2	JTAG	Package
NPCE94nx	CR16CPlus	25 MHz	Up to 256 KB	4 KB	Up to 8 MB	x	√	4 Controllers/ 4 Ports	Master/ Slave	3.0 (NPCE94xI)	8-bit / 3 inputs	8-bit / 1 output	4	√	4	6 / 6	6	16 x 8	1	Standard/ Serial	LQFP64 VFBGA64
NPCE9m5x	CR16CPlus	25 MHz	-	100 KB	Up to 16 MB	x	√	4 Controllers/ 6 Ports	Master/ Slave	3.0	Up to 10-bit / Up to 12 inputs	8-bit / 4 outputs	4	√	4	8 / 8	6	18 x 8	3	Standard/ Serial	LQFP128 TFBGA128 TFBGA144
NPCE9m8x	CR16CPlus	25 MHz	128 KB	4 KB	Up to 8 MB	x	√	4 Controllers/ 6 Ports	Master/ Slave	3.0	Up to 10-bit / Up to 12 inputs	8-bit / 4 outputs	4	√	4	8 / 8	6	18 x 8	3	Standard/ Serial	LQFP128 TFBGA128 TFBGA144
NPCE2m5x	CR16CPlus	50 MHz	-	132 KB	Up to 16 MB	x	√	4 Controllers/ 6 Ports	Master/ Slave	3.1	Up to 10-bit / Up to 12 inputs	8-bit / 4 outputs	4	√	4	8 / 8	6	18 x 8	3	Standard/ Serial	LQFP128 TFBGA128 TFBGA144
NPCE2m8x	CR16CPlus	50 MHz	128 KB	4 KB	Up to 16 MB	x	√	4 Controllers/ 6 Ports	Master/ Slave	3.1	Up to 10-bit / Up to 12 inputs	8-bit / 4 outputs	4	√	4	8 / 8	6	18 x 8	3	Standard/ Serial	LQFP128 TFBGA128 TFBGA144
NPCE3m5x	CR16CPlus	50 MHz	-	132 KB	Up to 16 MB	√	√	4 Controllers/ 6 Ports	Master/ Slave	3.1	Up to 10-bit / Up to 10 inputs	8-bit / 4 outputs	4	√	4	8 / 8	6	18 x 8	3	Standard/ Serial	LQFP128 TFBGA128
NPCE3m8x	CR16CPlus	50 MHz	128 KB	4 KB	Up to 16 MB	√	√	4 Controllers/ 6 Ports	Master/ Slave	3.1	Up to 10-bit / Up to 10 inputs	8-bit / 4 outputs	4	√	4	8 / 8	6	18 x 8	3	Standard/ Serial	LQFP128
NPCX5mnG	Arm® Cortex®-M4	50 MHz	-	Up to 256 KB	Up to 64 MB	√	√	4 Controllers/ 5 Ports	Master/ Slave	3.1	Up to 10-bit / Up to 5 inputs	-	4	√	2	10 / 8	4	18 x 8	4	Standard/ SWD	TQFP128 AQFN132 VFBGA128
NPCX796FA	Arm® Cortex®-M4	100 MHz	Up to 1 MB	256 KB	N/A	√	√	8 Controllers/ 10 Ports	Master/ Slave	3.1	Up to 10-bit / Up to 10 inputs	-	4	√	4	10 / 8	4	18 x 8	4	Standard/ SWD	VFBGA144

Hardware Monitors

Desktop / Server Series

Nuvoton's Desktop & Server Hardware Monitoring IC Series is one of Nuvoton's most popular computer product categories. Hardware Monitoring ICs are widely adopted in desktop and server motherboards and in Industrial PC applications. Hardware Monitoring ICs monitor important hardware parameters including voltage, temperature, and fan speed and are able to issue alarms or warning signals to prevent system damage when abnormal events are detected.

Part No.	System Interface	On-chip Thermal Sensor	Remote Thermal Sensor Inputs	Voltage Monitor Inputs	Fan Tachometer Inputs	Fan Speed Control Outputs	Operation Voltage	PECI I/F	Package
NCT7802Y	SMBus/I²C	Y	3(max)	5(max)	3	3	3.3V	3.1	QFN20
NCT7906D	SMBus/I²C	Y	4(max)	16(max)	8	4	3.3V	3.1	TQFP64
NCT7904D	SMBus/I²C	Y	4(max)	17(max)	12(max)	4	3.3V	3.1	LQFP48
W83795ADG	SMBus/I²C	N	6	18(max)	14(max)	2	3.3V	2.0	LQFP48
W83795G	SMBus/I²C	N	6	21(max)	14(max)	8(max)	3.3V	2.0	LQFP64

NB and Networking / Storage Series

Nuvoton Thermal Sensor ICs are widely adopted in the Notebook, Networking/Storage, Graphic card and IA applications. These solutions provide high accuracy for temperature monitoring and independent fault signals to activate system protection.

Part No.	System Interface	On-chip Thermal Sensor	Remote Thermal Sensor Inputs	Voltage Monitor Inputs	Fan Tachometer Inputs	Fan Speed Control Outputs	Operation Voltage	PECI I/F	Package
NCT7511Y	SMBus/I²C	Y	2 (max)	N	1	1	3.3V	N	QFN16
NCT7717U	SMBus/I²C	Y	N	N	N	N	3.3V	N	SOT23-5
NCT7718W	SMBus/I²C	Y	1	N	N	N	3.3V	N	MSOP8
NCT7719W	SMBus/I²C	Y	2	N	N	N	3.3V	N	MSOP10
W83773G	SMBus/I²C	Y	2	N	N	N	3.3V	N	MSOP8

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I/O

General Purpose I/O Series

Nuvoton's General Purpose I/O Expansion IC series allows the easy addition of multiple GPIO capabilities over a standard SMBus interface. These devices include strappable address setting, Input interrupts, and LED and BEEP functions.

Part No.	Supply Voltage	GPIO	Interface	Package
NCT5655W/Y	2.3V ~ 5.5V	16	SMBus	TSSOP24/QFN24
NCT5635W/Y	2.3V ~ 5.5V	16	SMBus	TSSOP24/QFN24
NCT5605Y	3.3V	14	SMBus	QFN20
W83L604G	3.3V	14	SMBus	SSOP20
W83L603G	3.3V	8	SMBus	SOP14
W83601G	5V	15	SMBus	SSOP20

Super I/O Series

Nuvoton's Super I/O series are widely adopted in the motherboard, industrial PC, AIO and workstation applications and support both traditional legacy functions (serial port, parallel port, KBC, and General Purpose I/O) as well as advanced hardware monitoring functions and control features.

Part No.	Interface	KBC	UART	Parallel Port	Hardware Monitor	ACPI	SMBus Master	PECI I/F	SB-TSI I/F	EuP Power Saving	Port 80	Package
NCT5104D	LPC	N	4	N	N	N	N	N	N	N	N	LQFP48
NCT5532D	LPC	Y	1	N	Y	Y	Y	3.1	Y	Y	N	LQFP64
NCT5567D-B	LPC	Y	1	N	Y	Y	Y	3.1	Y	Y	N	LQFP64
NCT5581D	LPC	Y	1	N	Y	Y	Y	3.1	Y	Y	Y	LQFP64
NCT5583D	LPC / eSPI	Y	1	N	Y	Y	Y	3.1	Y	Y	Y	LQFP64
W83627DHG-P	LPC	Y	2	Y	Y	Y	N	3.1	N	N	N	QFP128
NCT6776D	LPC	Y	2	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6779D	LPC	Y	2	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6793D	LPC	Y	2	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6796D	LPC	Y	2	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6796D-E	LPC / eSPI	Y	2	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6106D	LPC	Y	6	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6116D	LPC / eSPI	Y	6	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128

eSIO Series

Nuvoton's family of eSIO devices combines built-in microcontroller and traditional legacy SIO functions in a single device. These devices can perform traditional Super I/O functions and the programmable core allows a rich set of customized features including advanced fan control and flexible power sequence control. The eSIO series is widely adopted in gaming PCs, AIOs, workstations, datacenter and entry-level server applications.

Part No.	Interface	KBC	UART	Parallel Port	Hardware Monitor	ACPI	SMBus Master	SPI I/F	PECI I/F	SB-TSI I/F	EuP Power Saving	Port 80	Built-in uC	Package
NCT6683D-T	LPC	Y	2	Y	Y	Y	Y	Y	3.1	Y	Y	Y	Y	LQFP128
NCT6685D	LPC	Y	2	Y	Y	Y	Y	Y	3.1	Y	Y	Y	Y	LQFP128
NCT6686D	LPC / eSPI	Y	2	Y	Y	Y	Y	Y	3.1	Y	Y	Y	Y	LQFP128

Security

Trusted Platform Module (TPM)

Nuvoton's Trusted Platform Module (TPM) (NPCT75x) is a seventh-generation Nuvoton SafeKeeper™ device that implements the Trusted Platform Module (TPM) 2.0 specifications for PC-Client TPM.

Part No.	Description	TPM Main Specification Version Compliance	TCG PC Client Specific TIS Version	Compliances	Interface	Operation Temperature (°C)	Package Options
NPCT650	SafeKeeper™ Trusted Platform Module (TPM)	Version 1.2 revision 116	TIS v1.3	CC EAL4+ and FIPS 140-2 Level 1	LPC, SPI, I²C (3.3V)	0 ~ 70 or -40 ~ 85	TSSOP28 QFN32
		Version 2.0 revision 01.16	PTP v0.43	CC EAL4+ and FIPS 140-2 Level 2			
NPCT652	SafeKeeper™ Trusted Platform Module (TPM)	Version 1.2 revision 116	TIS v1.3	CC EAL4+ and FIPS 140-2 Level 1	LPC, SPI, I²C (1.8V)	0 ~ 70 or -40 ~ 85	TSSOP28 QFN32
		Version 2.0 revision 01.16	PTP v0.43	CC EAL4+ and FIPS 140-2 Level 2			
NPCT75x	SafeKeeper™ Trusted Platform Module (TPM)	Version 2.0 revision 01.16	PTP v22 Revision 01.03	CC EAL4+ and FIPS 140-2 Level 2	SPI, I²C (1.8V-3.3V)	0 ~ 70 or -40 ~ 85	QFN32 UQFN16
		Version 2.0 revision 01.38	PTP v22 Revision 01.03	CC EAL4+ and FIPS 140-2 Level 2 with Physical security level 3	SPI, I²C (1.8V-3.3V)	0 ~ 70 or -40 ~ 85	QFN32 UQFN16

Interface Logic

Voltage Level Shifter

Nuvoton level shifter series provides the ability to interface a variety of devices with different operating voltages. High ESD protection and speeds are supported. These devices are suitable for all Desktop, Workstation, Industrial PC, Server and Cloud computing applications.

Part No.	Operation Voltage	Interface	Inputs	Outputs	Operation Temperature (°C)	Package
NCT5927W	0.8V-5.5V/ 2.2V-5.5V	SMBus/I²C	1	1	-40~85	MSOP 8
NCT5914W	0.5V-6.0V	GTL to LVTTL	4	4	-40~85	TSSOP14

Switches and Multiplexers

Nuvoton Switches and multiplexers allow the connection of devices that operate at different voltage levels but share the same bus, and isolate devices when not in use to reduce overall system capacitive loading. They are widely used in Workstation, Industrial PC, Server and Cloud computing applications.

Part No.	Frequency	Operation Voltage	Interface	Inputs	Outputs	Operation Temperature (°C)	Package
NCT5945W/Y	1 MHz	2.3-5.5V	SMBus/I²C	1	4	-40~85	TSSOP20/QFN20
NCT5946W/Y	1 MHz	2.3-5.5V	SMBus/I²C	1	4	-40~85	TSSOP16/QFN16
NCT5948W/Y	1 MHz	2.3-5.5V	SMBus/I²C	1	8	-40~85	TSSOP24/QFN24
NCT1901D	380Mbit	0.8-3.6V	NC-SI	2	3	-40~85	LQFP64

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Power Management

Power Switch

Power Switch Series

Voltage Regulators

DDR Bus Termination Series
Fan Driver IC Series
Linear Regulator Series
PWM IC Series

Power Switch

Power Switch Series

Nuvoton's Power Switch Series are solutions of high integration and cost-effectiveness. Our products offer PCB space saving and are ideal for high side over current protection and system power saving applications. Our series feature low RDS (ON), low input voltage and abundant protections such as over current protection, short circuit, over temperature and reverse voltage/current protections.

Part No.	Input Voltage (VIN)	Features	Rdson (typ.)	Output Current (typ.)	Flag indicator	OCP Adjustable	Output Discharge	Package
NCT3521U	2.7V ~ 5.5V	Enable; Adj. Soft-start & Shutdown Output Discharge, UVLO, OCP, RCP, RVP, OTP	80 m-ohm	2.0A	Y	N	Y	SOT23-5 SOT23-6
NCT3521U-2	2.7V ~ 5.5V	Enable; Adj. Soft-start & Shutdown Output Discharge, UVLO, OCP, RCP, RVP, OTP	80 m-ohm	2.0A	Y	N	Y	SOT23-5 SOT23-6
NCT3527U	3.0V ~ 5.5V	Enable; OCP adjustable, UVLO, OCP, RCP, RVP, OTP; Output Latched off when Flag# Alerted	70 m-ohm	2.5A	Y	Y	Y	TSOT23-6
NCT3527U-A	3.0V ~ 5.5V	Enable; OCP adjustable, UVLO, OCP, RCP, RVP, OTP; Output cycle by cycle re-try when Flag# Alerted	70 m-ohm	2.5A	Y	Y	Y	TSOT23-6
NCT3530Y	4.5V ~ 5.5V	Enable; OCP, UVLO, OCP, RCP, RVP, OTP; HDMI/DVI DDC I²C, HPD Level Shifters	0.6 ohm	0.25A	Y	N	Y	DFN10
NCT3532Y	3.0V ~ 5.5V	Enable; OCP, UVLO, OCP, RCP, RVP, OTP; Dual Mode Display Port (DP++) Auxiliary Channels Splitter with HDMI DDC I²C, HPD Voltage Level Translators	0.2 ohm	0.5A	N	N	N	QFN16

Voltage Regulators

DDR Bus Termination Series

Nuvoton's family of DDR bus termination regulators series provides bi-directional (sinking/ sourcing) current outputs for high speed bus termination applications. These devices provide stable termination power (VTT) and fast transient response for DDR, DDR2, DDR3x, and DDR4 VTT bus termination applications, and are intended for high-performance, low cost DDR designs.

Part No.	Input Voltage (VIN)	Features	Control Voltage	Memory Supported	VTT Output offset (max)	Sink/Source Current (max)	Package
NCT3103S	1.0V ~ 5.5V	Sleep S3 & DDR VTT Enable Control Signals, OCP & OTP	3.0V ~ 5.5V	DDRII, DDRIII, DDRIV	-20mV ~ +20mV	2A	SOP8 with Exposed Pad
NCT3105Y	1.0V ~ 3.6V	EN with Suspend to RAM (STR) Functionality, Power Good, OCP & OTP	2.3V ~ 5.5V	DDRII, DDRIII, DDRIV	-20mV ~ +20mV	2A	DFN10
NCT3101S	1.0V ~ 5.5V	OCP & OTP	3.0V ~ 5.5V	DDRI, DDRII, DDRIII, DDRIV	-20mV ~ +20mV	2A	SOP8 with Exposed Pad

Fan Driver IC Series

Nuvoton's Fan Driver devices are highly integrated and cost-effective solutions providing small PCB footprint and reduced BOM cost. These devices can be coupled with Nuvoton's Super IO Series to drive low cost DC or PWM fans and feature over-current protection, short circuit protection and thermal shutdown for enhanced design safety.

Part No.	Input Voltage (VIN)	Output Voltage	Features	V_{SET}	Current Limit Trigger	Output Current (typ.)	Package
NCT3941S	8.0V ~ 17.6V	Follow V_{SET} *4.0 times	OCP, SCP & OTP EN: NCT3941S FON#: NCT3941S-A	1.0 ~ VIN	1.6A (typ.)	0.5A	SOP8 with Exposed Pad
NCT3941S-A	8.0V ~ 17.6V	Follow V_{SET} *4.0 times	OCP, SCP & OTP EN: NCT3941S FON#: NCT3941S-A	1.0 ~ VIN	1.6A (typ.)	0.5A	SOP8 with Exposed Pad
NCT3943S	4.5V ~ 13.2V PWM Duty IN	V_{SET} Adjustable PWM Duty OUT	Auto Fan Type Detection (DC/ PWM Fan); EN/ FON#, OCP, SCP & OTP	0 ~ 4.0V	2.2A ~ 3.2A	1.5A	SOP8 with Exposed Pad

Linear Regulator Series

Nuvoton's Linear Regulator Series provides high performance, low input voltage and low dropout voltage features. Our products provide on/off control (enable pin) for power saving and feature over-current protection, short circuit protection and thermal shutdown for enhanced design safety.

Part No.	Input Voltage (VIN)	Features	Control Voltage	Dropout (typ.)	Output Current (typ.)	Package
NCT3720S	1V ~ 5.5V	EN, PG, UVLO, OCP, SCP & OTP	3V ~ 5.5V	150mV	2A	SOP8 with Exposed Pad
NCT3730S	1V ~ 5.5V	EN, PG, UVLO, OCP, SCP & OTP	3V ~ 5.5V	210mV	3A	SOP8 with Exposed Pad

PWM IC Series

Nuvoton's PWM IC series are solutions of high performance, cost-effectiveness, and are ideal for for DC/DC regulation applications. Our PWM controller is designed to drive high side and low side N-channel MOSFETs in a synchronous rectified buck topology and provides high efficiency and fast transient response.

Part No.	Supply Voltage	Input Voltage (VIN)	Output Voltage	Accuracy	Frequency	Features	Package
NCT3230S	4.5V ~ 13.2V	1.5V ~ 13.2V	0.8V ~ VIN	-2% ~ +2%	300 KHz	Internal Soft start, Programmable OCP, UVP & OVP	SOP8

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Foundry Service

Nuvoton Foundry FAB

Technologies and Applications

Focus on Technology
Available Technologies
Applications
Advanced 0.35um BCD Process:
Increase Product Value

Foundry Service

Multi-Layer Mask (MLM)
Multi-Project Wafer (MPW) Services
Customized Technology
Excellent Cycle Time
Embedded Non-Volatile Memory IP
Complete Design Kits
Product Service Team

Nuvoton Foundry FAB

Nuvoton Foundry Service (previous Winbond FAB2: 6 inch fab) has a capacity of 45,000 wafers per month. As a semiconductor manufacturing foundry, our mission is to deliver excellent foundry capabilities as a manufacturing partner to fabless or fab-lite semiconductor companies.

Nuvoton Foundry FAB offers a variety of technologies including Generic Logic, Mixed Signal (Mixed Mode), High Voltage, HVIC, Ultra High Voltage, Power Management, Mask ROM (Flat Cell), embedded Logic Non-Volatile Memory, and customized processes (e.g. GaN HEMT, MOSFET, Biochip, TVS, Sensor, etc.) based on 0.35um to 1.0um technologies.

In addition to its mature, stable, and customized processes, Nuvoton also provides long-term stable production capacity, high quality, and accurate delivery schedules.

In addition, Nuvoton's foundry has a process development team with more than 20 years of experience in Devices, Integration, Modules, ESD, and SPICE Modeling to meet your customized process needs.

Nuvoton's foundry also has a product service team to provide customers with complete IDM class service. We have an internationally certified laboratory (with ESD, EMMI, OBIRCH, FIB, SEM, and TEM electrical / physical analysis equipment) to ensure product reliability and certification requirements.

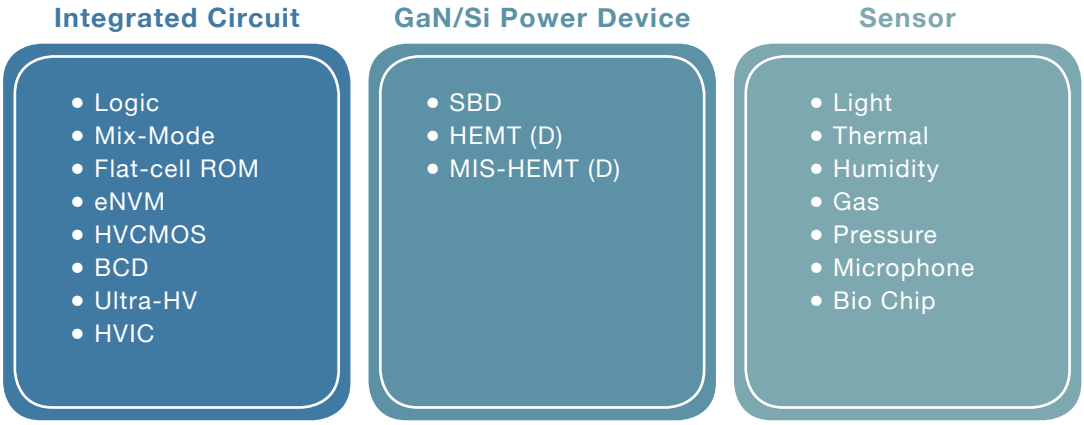
Nuvoton has a wealth of resources and support services, and operates with a More-Than-Foundry thinking process. Nuvoton Foundry Service can meet market capacity demand and enable customers to achieve business goals. Nuvoton Foundry Service is your best foundry choice.

Process Technology: 0.35um ~ 1.0um
Wafer Size: 6"
Capacity: 45,000 pcs/month

Technologies and Applications

Focus on Technology

Nuvoton Foundry's process technology currently offers 0.35um processes, including Integrated-circuit (logic, Mix-mode, Flat-cell ROM, eNVM, HVCMOS, BCD, Ultra-HV, Gate-driver HVIC), GaN on Si Power Device (SBD, Depletion HEMT, Depletion MIS-HEMT), Sensor (Light, Thermal, Humidity, Gas, Pressure, Micropnone, Bio chip) more and more process and customized.



Available Technologies

Process	Technology	Process Feature
Logic / Mixed Mode	0.35um	3.3V/5V Mixed Mode
	0.45um	3.3V/5V Mixed Mode
	0.5um	3.3V/5V Mixed Mode
Embedded Logic NVM	0.35um	3.3V/5V Mixed Mode embedded NVM
Mask ROM	0.35um	3.3V/5V Logic embedded 0.32um Flat Cell
	0.5um	5V Logic embedded 0.37um Flat Cell
High Voltage / Power	0.35um	5V/12V/18V/25V/40V BCD (with NVM)
		5V/60V/80V BCD (with NVM)
		5V/20V/120V/250V/600V HVIC (with NVM)
	0.5um	7V/9V/30V/150~700V UHV
		9V HVCMOS
	0.6um	5V/12V/16V/20V CDMOS (High Vgs)
		5V/25V/40V/60V Dual-Vgs CDMOS
		5V/25V/40V/120V/300~700V UHV
	0.8um	5V/40V HVMOS (N-sub)
	1.0um	5V/40V HVMOS (EPI)

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Applications

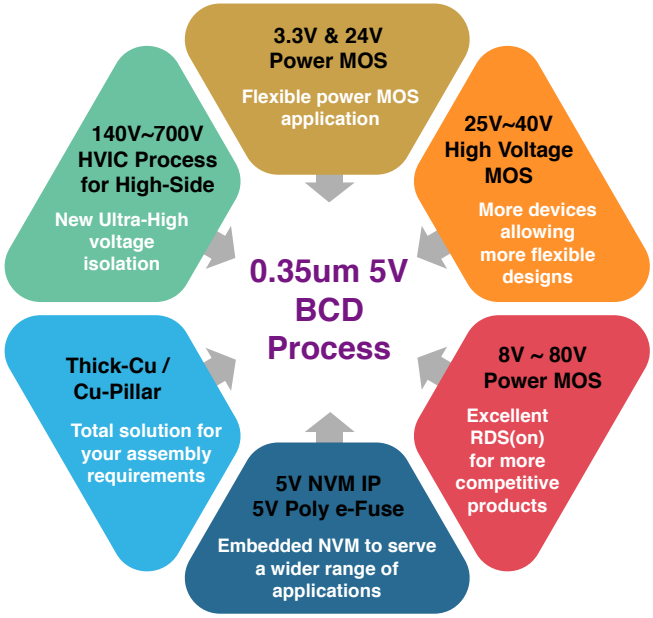
Nuvoton Foundry's process technologies are highly focused on High-Voltage, power management, LED Driver, and logic related fields. Current customers have successfully used our processes to create MCUs, Speech ICs, DC / DC converters, AC / DC SMPS, LDOs, USB Switches, Chargers, LCD drivers, Fan Drivers, Hall Sensors and LED B/L driver products in volumes exceeding several million wafers.

In addition to general IC processes, Nuvoton also provides customized process services to support HV MOSFETs, TVS, Light Sensor, Pressure Sensors, BioChip, GaN HEMT etc. Applications include industrial control, high power conversion systems, mobile devices, sensors, system electrostatic protection, medical care, and more. Nuvoton also has a strong R&D team that can create a variety of customized processes for customer requirements.

- DC/DC Converter & Controller
- AC/DC SMPS (PFC and PWM)
- LDO, USB Switch
- LED Lighting, LED Display
- HVIC, MOSFET, SBD
- Biochip, MCU, Speech
- Motor Driver, Fan Driver,
- Audio Amp, Sensor, TVS
- Car Charger
- Pressure sensor, MEMS Microphone
- Thermal Sensor, Light sensor
- Gas sensor, Humidity Sensor

Advanced 0.35um BCD Process: Increase Product Value

Nuvoton Foundry Services offers a wide range of customizable processes and design tools in order to manufacture optimized semiconductors. Nuvoton's 0.35um BCD process provides multiple device structures integrated into one process using a modular process approach. This approach allows the customer to create products with complex circuits for applications such as AC/DC, DC/DC, Charger, LED products etc. Nuvoton's highly integrated 0.35um BCD process saves development cost and increases competitive advantage.



Foundry Service

Multi-Layer Mask (MLM), and Multi-Project Wafer (MPW) Services

Multi-Layer Mask (MLM) services are available for engineering lots on all processes. The MLM service configures images with multiple design layers using similar mask specifications on a single reticle. This service not only saves development cost, but provides tape-out flexibility allowing customers to tape-out products at any time without being dependent on pre-set prototyping schedules. MPW Service offers platforms that use multi-project wafers for prototyping which enables multiple customers to share mask tooling costs.

Customized Technology and Excellent Cycle Time

Nuvoton's modular platform provides customers customized processes and quick Cycle Time of 0.8 Days/Layer for fast prototyping to help customers' Time to Market in a fast changing world.

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Embedded Non-Volatile Memory IP

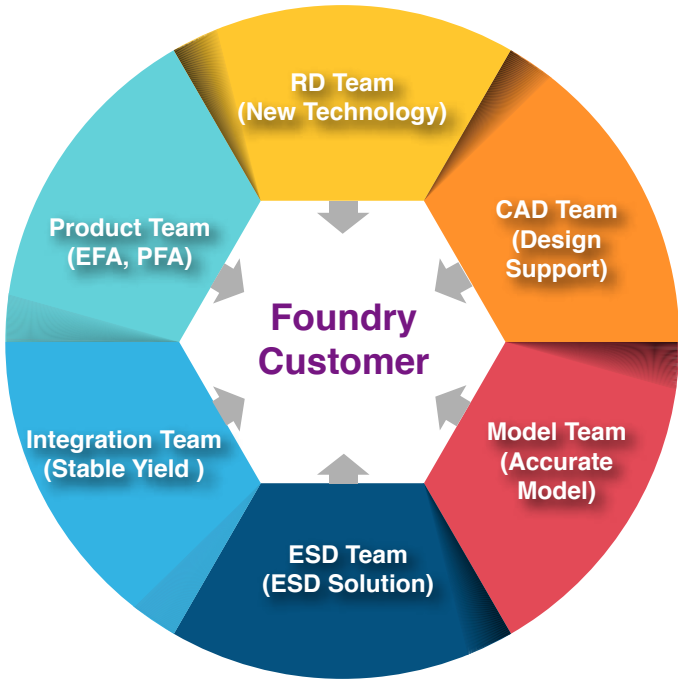
Nuvoton recognizes that memory requirements vary by application. Specifically in a 0.35um process Nuvoton offers three versions of matching logic processes with embedded non-volatile memory (NVM). They are (1) Yield Microelectronics Corporation's (YMC) 3.3V MTP (Multi-Time-Programing) NVM IP; (2) YMC's 5V MTP (Multi-Time-Programing) NVM IP; (3) Nuvoton's proprietary 5V Poly e-Fuse Trimming IP.

Application	Target Product	Function	0.35um Process	NVM IP
Trimming	LCD Driver, LED Driver, Touch Panel, Power IC, STB Control	Fuse Like	5V/40V/UHV or BCD	YMC 5V MTP NTC Poly e-fuse
Parameter Setting	LCD, LED, Battery Pack Protection	Status Parameter	5V/40V HV or BCD	YMC 5V MTP
Encryption	LCD, STB, Smart Card	Security confirm code	5V/40V HV or BCD	YMC 5V MTP
Function Selection	SoC product Function selecter	SoC Function Control	3.3V/5V Logic	YMC 3.3V MTP
Identification Setting	Product ID, TagIC <13.5 MHz	ID Code	3.3V/5V Logic	YMC 3.3V MTP
Code Storage	4/8-bits MCU	Program, Data Storage	3.3V/5V Logic	YMC 3.3V MTP

Complete Design Kits and Product Service Team

We provide the most accurate and complete Design Kits to customers for product design, while providing a full range of customer support services to help customers get to market quickly.

Process	Vender	Tools / Version	
Design Rule & Sample Layout	-	Layout Design Rule	Device sample layout
	-	ESD/Latch-Up Layout Design Rule	ESD sample layout
Schematic Entry	-	Schematic Symbol	
SPICE Model	-	HSPICE	BSIM3V3 (L49) (+ macro)
	-	Spectre SPICE	BSIM3V3 (L49) (+ macro)
DRC	Mentor Graphics	Calibre	
LVS	Mentor Graphics	Calibre	
LPE	Mentor Graphics	Calibre	
IP	Cell Library	Standard Cell Library / IO Cell Library	
	NVM IP	Yield Microelectronics Corp. (YMC) (Third Party) Provides MTP, Flash, EEPROM (Logic Base without extra Mask)	
	SRAM	3.3V SRAM Compiler	
PDK	Cadence	Cadence Virtuoso P-Cells	
	Synopsys	Laker Custom Layout System (with Magic-Cell)	



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