NXP Semiconductors

NXP Semiconductors - A Partner with 30 Years of Growing Together

NXP Semiconductors (NXP), the world leader in secure connectivity solutions for embedded applications, draws on its over 60 years of experience and technology to drive technological innovation in the secure connected vehicle, end-to-end security & privacy protection, and smart connected solutions markets.

■ NXP Company Overview

■ Headquarters
Official name : NXP Semiconductors N.V.
Head office : Eindhoven (Netherlands)
Established : August 1, 2006
Number of employees : Approximately 30,000 (in more than 30 countries worldwide)
Business areas : Automotive, industrial & IoT, telecom infrastructure, mobile devices
Net sales : $9.41B (CY2018)
Overseas hubs : Netherlands, China, USA, Singapore, etc.
URL : https://www.nxp.com/

■ Japanese subsidiary
Company name : NXP Japan Ltd.
Head office : Tokyo
Established : August 1, 2006
Business office : Nagoya, Osaka
President : Hiroaki Harashima
URL: https://www.nxp.jp/

■ NXP's History
August 2006　Philips Semiconductors sold its semiconductor division to a consortium of investors
May 2010　Company name was changed to current NXP Semiconductors N.V.
December 2015　Became current NXP Semiconductors after merging with Freescale Semiconductor, Inc.

■ NXP sales composition ratio (CY2018 sales, $9.41B)

- 48% Automotive
- 19% Industrial & IoT
- 19% Telecom infrastructure & other
- 12% Mobile devices
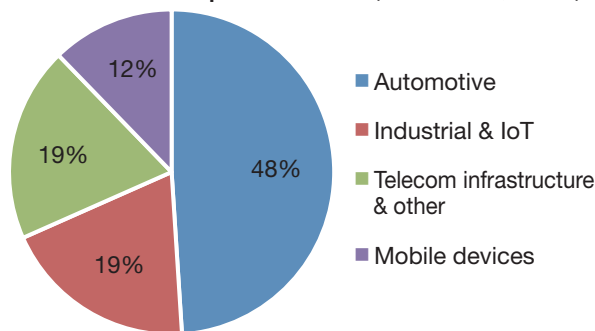
■ NXP and NEXTY Electronics, a long history of working closely together

NEXTY Electronics has been working with NXP for over 30 years, dating back to the time when it was still a part of Philips Semiconductors.

NEXTY offers a wide range of services that include not only our engineering support tailored for product groups in NXP's focus markets, but also third-party solutions, module development, software development assistance and quality support. By using our latest e-NEXTY portal site, designed especially for engineers, our customers have access to higher quality support that helps drive their projects forward.

e-NEXTY

URL: https://www.e-nexty.com

NXP × NEXTY Electronics

NXP Focus Markets & Product Groups

Automotive　　　Industrial & IoT　　　Telecom infrastructure　　　Mobile devices

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Automotive

NXP Semiconductors
Microcontrollers for Automotive Applications: The S32x Automotive Processing Platform

As the newest platform for automotive processing, the S32x series provides a common architecture compatible with a variety of MCUs and MPUs.

S32x architecture is available in MCUs and MPUs based on ARM processor cores that offer reliability, functional safety and security—specifically, "ARM Cortex-M" for low power consumption, "ARM Cortex-R" for real-time processing, and "ARM Cortex-A" for high performance. All products also meet the ASIL D safety standard, and optional memory is available from 4 to 62MB to achieve zero-downtime in OTA (over-the-air).

A Common Hardware & Architecture Platform

Compatibility with a wide variety of automotive devices and applications maximizes hardware/software reuse rates.

■ Features
- Helps to reduce load by maximizing hardware/software reuse rates, thereby allowing software to be reused
- 10x the processing performance provides flexibility in adding or expanding features
- Four Independent HW security engine to meet ASIL D
- Ready for OTA, with a broad-ranging family under development for various applications
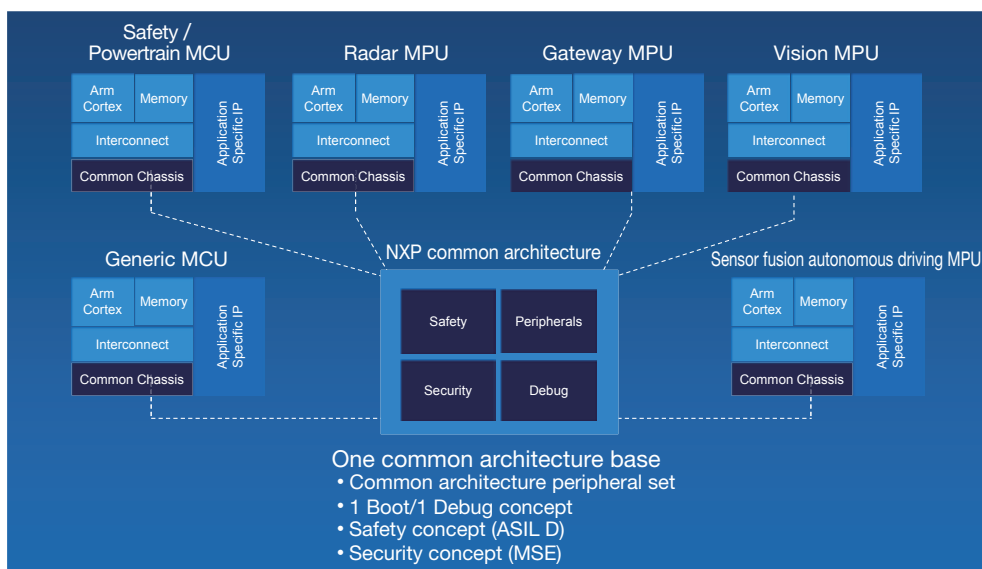
Target Areas

Connectivity	Driver Replacement	Powertrain & Vehicle Dynamics	Body & Comfort
C&S (Connectivity & Security)	ADAS (Advanced Driver Assistance Systems)	VDS (Vehicle Dynamics & Safety)	GPIS (General Purpose & Integrated Solutions)
Gateway/Security for domain controller/OTA support	Designed for RADAR, LIDAR, and Vision. Especially suited for RADAR with the best performance in the market.	Specialized for engine-related apps including powertrain, BMS, and transmission, as well as drivability aspects such as standard motor control, braking, steering, and more.	Specialized for body elements such as lighting and HVAC, as well as standard motor control such as power window motors, pumps, and sensor interfaces.

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Industrial & IoT

NXP Semiconductors
i.MX 8M Mini Series: High-performance, Low-cost Application Processors

The i.MX 8M Mini Series are NXP's flagship processors for consumer equipment, industrial equipment and embedded control devices. They are also ideal for electronic billboards, surveillance cameras, audio equipment, control devices for FA, and smart home appliances with voice control.

i.MX 8M Mini

Announced in March 2018, the i.MX 8M Mini is an embedded multi-core heterogeneous application processor that uses advanced 14LPC FinFET process technology. This product is now in mass production.

Combining high-performance computing, high-power efficiency and embedded security, the i.MX 8M Mini is the driving force behind the spread of fast-growing edge node computing, streaming multimedia, and machine learning applications. At the heart is a scalable core complex of up to four Arm®Cortex®-A53 cores running up to 2 GHz plus Cortex-M4 based real-time processing domain at 400+MHz. With integrated 1080p video acceleration hardware, they are capable of interactive video applications as well as 2D/3D graphics, providing a rich visual HMI experience.

i.MX 8M Mini

■ Features
- Quad-core Arm Cortex-A53 operating at up to 2 GHz
- Arm Cortex-M4 core operating at 400+MHz
- 1080p Video encode/decode
- 2D/3D Graphics
- Display/Camera Interface
- Multi-Channel Audio/Digital Microphone Input
- Wide range of connectivity options for Wi-Fi/BT, Ethernet, USB, and media storage
- Lower power and standard DDR memory support
- Single, dual, or quad CPU cores can be selected
  (all are S/W and PKG compatible, making chip swapping during development hassle-free)
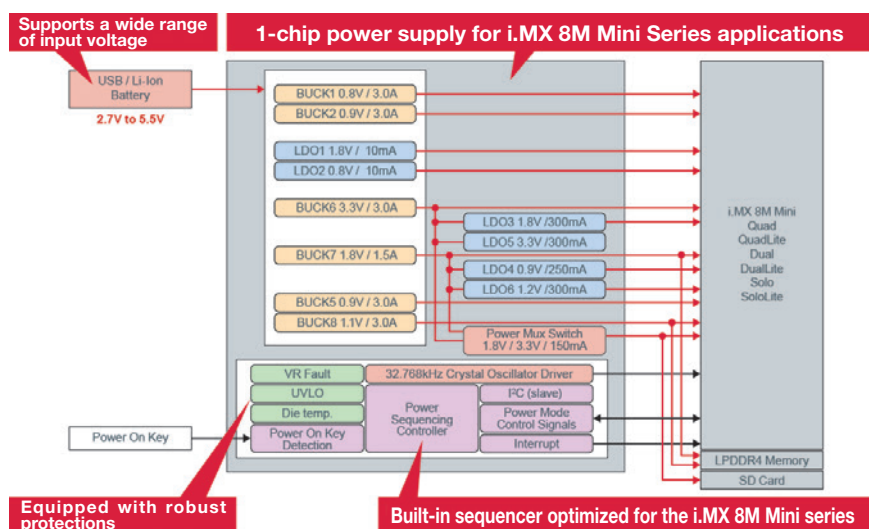
About the PMIC

For the Power Management Integrated Circuit (PMIC) of the i.MX 8M Mini, we recommend ROHM's BD71847AMWV, which is included in the evaluation kit (EVK). The BD71847AMWV provides the power and protection features required by the i.MX 8M Mini Series in a single chip, alongside a built-in on/off sequencer for optimal power management, making it ideal for achieving compact size and effortless application design. These features can help to significantly shorten development time.

i.MX 8M Mini EVK

■ BD71847AMWV Features
- Input voltage range 2.7–5.5V
- Buck DC/DC converter
  (Buck Converter)×6ch, LDO×6ch
- Power multiplexer for SD cards
- Built-in 32.768kHz crystal‐oscillator circuit
- Extensive protection functions
  (i.e. soft-start, power-rail error detection, overvoltage/overcurrent protection, etc.)
- I²C interface support (Max 1MHz)
- Interrupt function (with mask function)

■ Optimized for all power rails of the i.MX 8M Mini series

Supports a wide range of input voltage

1-chip power supply for i.MX 8M Mini Series applications

USB / Li-Ion Battery
2.7V to 5.5V

BUCK1 0.8V / 3.0A
BUCK2 0.9V / 3.0A
LDO1 1.8V / 10mA
LDO2 0.8V / 10mA
BUCK6 3.3V / 3.0A
LDO3 1.8V /300mA
LDO5 3.3V /300mA
BUCK7 1.8V / 1.5A
LDO4 0.9V /250mA
LDO6 1.2V /300mA
BUCK5 0.9V / 3.0A
BUCK8 1.1V / 3.0A
Power Mux Switch 1.8V / 3.3V / 150mA

i.MX 8M Mini
Quad
QuadLite
Dual
DualLite
Solo
SoloLite

VR Fault
UVLO
Die temp.
Power On Key Detection
32.768kHz Crystal Oscillator Driver
I²C (slave)
Power Sequencing Controller
Power Mode Control Signals
Interrupt

Power On Key

LPDDR4 Memory
SD Card

Equipped with robust protections

Built-in sequencer optimized for the i.MX 8M Mini series

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Industrial & IoT

NXP Semiconductors
LPC Series, Kinetis Series & i.MX RT Microcontrollers: A Comprehensive Lineup of Arm Microcontrollers

NXP offers ARM core microcontrollers in a wide range of performance and peripheral features.
By providing Cortex M0, M0+, M3, M4F, M33, and M7 equipped MCUs, with their individual advantages, we make it possible to develop a broad range of system solutions in a variety of approaches to meet customer needs.

### ▌i.MX RT is the recommended choice for building high-performance, feature-rich systems

With its combination of high-performance and real-time operation, the i.MX RT crossover processor series balances 'advanced integration and security' with 'MCU-level usability' at an appropriate price to support the next generation of IoT applications.

■Features
- Cortex-M7 Core, 3015 CoreMark/1284 DMIPS@600MHz
- 2D graphics acceleration engine
- Parallel camera sensor interface
- LCD display controller (up to WXGA 1366x768)
- I2S for high performance multichannel audio
- NAND, eMMC, QuadSPI NOR Flash, Parallel NOR Flash
- Economical, single power supply, 4-layer board mounting

■Target applications
- Audio subsystem
- Smart home appliances, cameras, LCD
- Home/building automation
- Industrial computing
- Motor control/power conversion
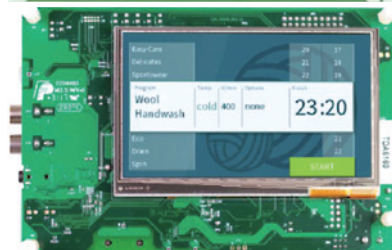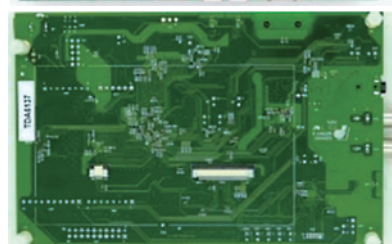
i.MX RT

▌K32 Series Cortex-M4 core microcontrollers offer the lowest power consumption with advanced security

In March 2019, we announced the K32 series to advance the energy efficiency of real-time embedded applications and enable advanced security with physical tamper protection.

＊Energy efficiency for low duty cycle applications with wide operating voltage range, ultra-low leakage power modes that support full SRAM retention and fast wake-up
＊Purpose-built high-performance mixed-signal (HPMS) with architectural improvements for power optimization
＊Advanced embedded security for device authentication, confidentiality, and physical tamper detection/resistance

■Features
72 MHZ Arm(R) Cortex(R)-M4 based MCU with an optional Cortex-M0+.
The device offers up to 1.25MB flash and 384KB SRAM with numerous serial communication interfaces, 12-bit 1MSPS ADC, 10-bit DAC and comparator, 32-bit PWM timer modules, and an external memory controller for flexible expansion.
The complete K32 L3 family is planned to support flash sizes from 512KB to 1.28MB.

K32 L Series

NEXTY Electronics

NEXTY Electronics introduces and supplies third-party products that encompass a wide variety of development environments, operating systems, and drivers.
Please also contact us for support or training in installing an ARM development environment.

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NXP Semiconductors

NFC-compliant NTAGI2C Plus (NT3H21xx) and Various RFID Tag ICs

Industrial & IoT

NXP offers a full product lineup focused on Near Field Communication (NFC), which is growing increasingly popular especially among smartphones. We can introduce NFC/RFID Tag ICs that can easily add NFC and RFID capabilities to your designed applications.

About NFC

NFC (Near Field Communication) is an international standard for near field communication that performs short-range data communication.
NFC is the method recommended in ISO/IEC 18092 in 2002, and is a communication standard established based on FeliCa (Sony) and Mifare (NXP Semiconductors). It enables 100 to 400kBps bidirectional communication at very short distances up to about 10 cm by "swiping" or bringing devices near each other.
In the case of IC cards, no battery or power is required due to their unique feature which allows the cards to communicate and rewrite data using only the power generated via electromagnetic induction when the antenna receives the radio wave.
NFC is commonly used in contactless smart cards such as e-money cards etc., as well as mobile phones, smartphones and such.
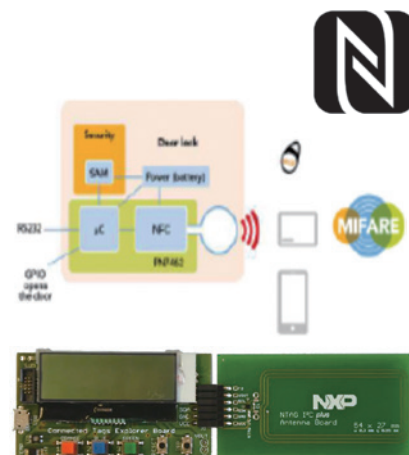
■ NFC Features
- Twenty times faster Cable/WIFI pairing
- Instant device recognition
- Prevents misconnection of accessories

■ Target Products for NFC
- Access control for companies, universities, event spaces, etc.
- Smart lock systems for homes and hotels
- Specialized equipment with control features
- Machines used by multiple users, such as printers

■ NFC compatible NXP products
- NFC R/W IC
- R/W ICs compliant with ISO15693/ISO14443 multi-protocol
- NFC TAG/NTAG I2C (NFC tag with I2C port)
- Various HF-band, UHF-band TAG ICs

NFC-equipped Products
(Annual versus Cumulative Shipments)
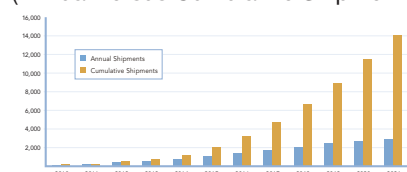
Reference: NXP's document

■ Example Applications
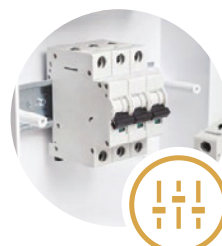

| Pair with Bluetooth devices quickly and smoothly | Create a private concert hall and share the sound source | Order genuine replacements and consumables with a single tap, using authenticated redirection | Combat counterfeits by authenticating accessories and attachments | Let a fully sealed, battery-free sensor unit interact with the meter housing |

※Mifare is a registered trademark of NXP Semiconductors.
※IcodeSLI is a registered trademark of NXP Semiconductors.
※FeliCa is a registered trademark of Sony Corporation

NEXTY Electronics

To meet customers' individual requirements, NEXTY Electronics provides custom development, outsourced software development, and solution proposals. Please feel free to contact us for more information.

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NXP Semiconductors
RFID Modules

These modules solve a variety of problems, e.g. "to embed RFID effortlessly," "small lot development of reader/writer is difficult," "getting certified is too much hassle." The R/W modules we sell, manufactured by ART Finex, are available in UHF-band and HF-band products, making it easy to implement RFID integration needs nowadays.

■ Corporate Profile

Company name：ART Finex Co.,Ltd.
Head office：Sabae City, Fukui/Tokyo Branch: Uchikanda, Chiyoda-ku
Business activities：Development and sale of RFID products, development of computer systems, and transport equipment related business
URL：https://artfinex.co.jp/

■ Products handled
- HF-band(13.56MHz) R/W, supporting multi-mode　(ISO15693, ISO14443A/B,ISO18092)
- Instant HF-band R/W, supporting NFC
- UHF-band (920Mhz) R/W, and various antenna products
  A wide range of products are available, from specific low power models exempted from licensing requirements, to high-end models for long distance communication
- A wide variety of RFID/dynamic tag

■ Features
- Provides a variety of R/W solutions for RFID featuring high-quality Japanese design and production
- Covers both HF and UHF band solutions
- Proposes R/W tags to suit your specific application

HF-band products

UHF-band products

■ Example Applications

Individual item/ confidentiality control

Use cases include managing the location of items that become hard to find among many other items, including valuables or powerful drugs. Also used for IC cards.

Individual item/ confidentiality control

Use cases include RFID tagging of moving items at factories, warehouses (e.g. stock, labels etc.)

Access control

Use cases include controlling entry/exit of persons and vehicles, and authentication of credentials via IC card or RFID tag

For medical and nursing care

Use cases include applying RFID to medical equipment to manage operating hours and location, as well as for monitoring caregivers or reporting emergencies

■ List of RFID systems

Item / Method	Electromagnetic induction type		Radio wave type	
	LF band	HF band	UHF band	Microwave band
Center frequency	120-135KHz	(13.56 MHz)	860-960MHz	2.45GHz
Communication distance	Up to 10s of cm	Up to 70cm	Up to several meters	Up to 1.5m
Anti-collision	Possible	Possible	Possible	Possible
Directivity	Wide	Medium	Medium	Narrow
Communication speed	Slow ◄┈┈┈► Fast			
Effects of metals	Generally affected. Pre-testing is required			
Effects of moisture	Small		Medium	Large
Features	Less likely to be affected by a wide-directional use environment	Most widely used, by various media and equipment Less likely to be affected by use environments	More likely to be affected by a high communication speed use environment Radio Law was amended in July 2012	Easier to achieve size reduction Strong directivity factor

NEXTY Electronics

NEXTY Electronics provides consultation on RFID standards, methods, and multi-country compatibility. Please feel free to contact us for support on any customization or introduction matters. We also have a variety of demos available to showcase the "easy connection" capabilities.

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