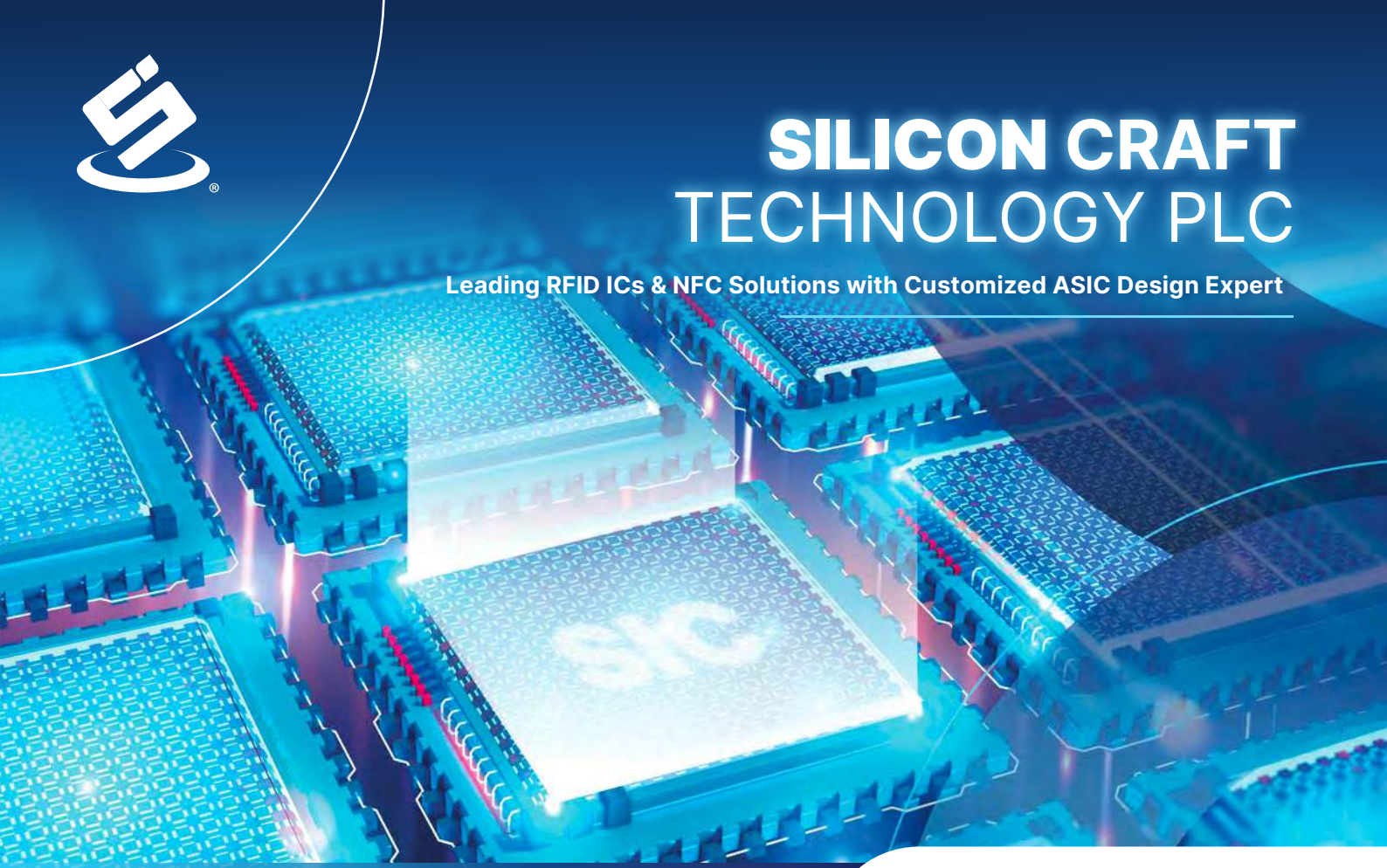
SILICON CRAFT TECHNOLOGY PLC

Leading RFID ICs & NFC Solutions with Customized ASIC Design Expert



SHAPE THE WORLD OF SECURED AND CONNECTED DEVICES WITH

INNOVATION & INTELLIGENCE

Silicon Craft, Thailand's first and only privately held semiconductor design company, is renowned for its expertise in designing and delivering linear and mixed-signal integrated circuits.

With extensive experience and partnerships with top-tier foundries and semiconductor manufacturers, we are a prominent global provider of RFID chips.

Established in 2002, we offer innovative, custom, and standard-designed microchips for RFID applications, delivering products with high value-added features and superior overall system performance.

- Leading company in NFC anti-counterfeiting application
- Forefront in NFC-sensor interfaces for smart healthcare and environmental chemical sensing
- Expert in low-power, mixed-signal ASICs design
- Proven expertise in cryptographic RF communication technology

PRODUCTS & SERVICES

RFID/NFC Integrated Circuit for :

- Industrial IoT
- Advanced NFC
- Animal ID
- Immobilizer

ASICs

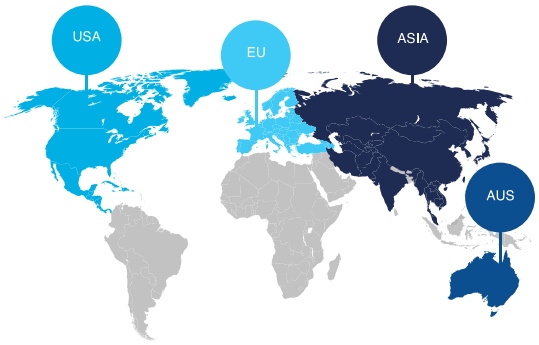
Custom Design to Target a Wide Range of Applications and Use Cases

APPLICATIONS

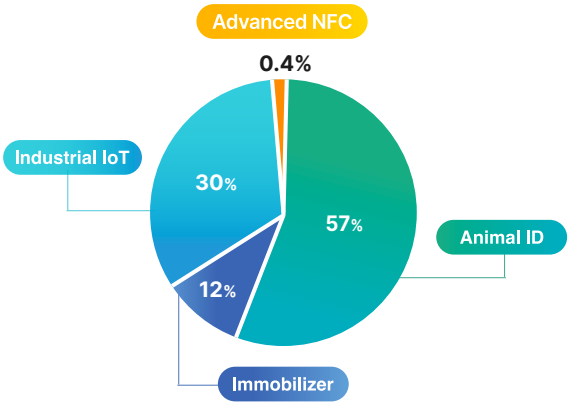
- Anti-Counterfeiting & Brand Protection
- Smart Home & Building
- Medical Devices & Healthcares
- Toys & Games
- Automotive
- Livestock

Market Coverage

Our target strategic growth countries:
EU, USA, Japan, Korea, Australia, China, India



Revenue Contribution



RFID PRODUCT LINES

Industrial IoT

- **Multipage HDX Transponder for Industrial Application**
  SIC73F1
  - LF HDX transponder with EEPROM 1,360 bits in 17 pages read/write memory
- **LF HDX Transponder for Industrial Application**
  SIC73WR
  - LF HDX transponder with 80 bits programmable code
- **LF HDX-B Transponder & IC**
  SIC379
  - HDX tag IC with tunable capacitor
  - A new-generation, value-engineered LF HDX RFID delivering best-in-class reading performance
- **LF FDX-B Transponder IC**
  SIC7150/SIC7151/SIC7152
  - Superior read range performance
  - Support mainstream FDX command
  - Seamless migration
- **ISO/IEC 15693 Tag IC for Industrial Application**
  SIC56NL
  - Industrial tag IC compatible with NFC type 5 tag, featuring a reprogrammable digital signature
- **Multi-Protocol HF Reader IC**
  RE31/RE41
  - Support ISO/IEC 14443 A/B and ISO/IEC 15693
  - Additional support JIS-X-6319-4 (RE41)
  - Support transmitter supply up to 7 V
- **Multi-Protocol HF Reader IC with Low Power Card Detection Mode**
  RA12
  - Support ISO/IEC 14443 A/B and ISO/IEC 15693
  - Consumes only 4.7 µA in card detection mode

Advanced NFC

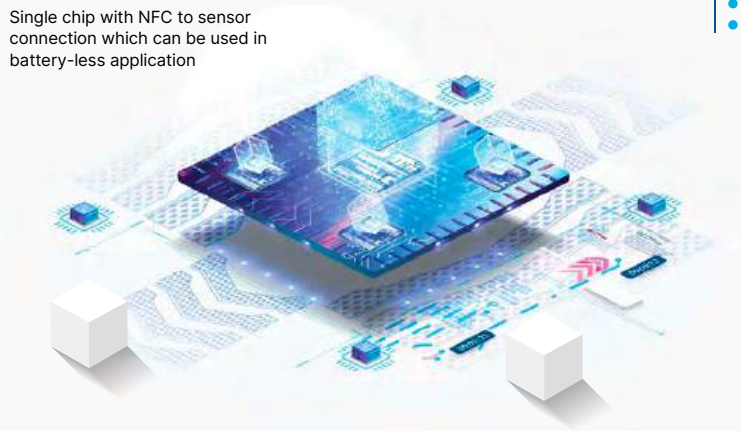
- **NFC Forum Type 2 Tag IC for Connectivity with UART Interface**
  SIC4310
  - NFC-UART data transferring and energy harvesting
- **NFC Forum Type 2 Tag IC for Authentication with On-Chip Encryption Engine**
  SIC43NT/SIC43S1
  - NFC tag IC with dynamic NDEF for web-based authentication
- **NFC Forum Type 5 Tag IC with Anti-Collision and Reprogrammable Digital Signature**
  SIC56NL
  - Industrial tag IC compatible with NFC type 5 tag featuring a reprogrammable digital signature
- **NFC Forum Type 2 Tag IC for Sensor Interface with On-Chip Sensor Biasing and 12-bit ADC**
  SIC4340/SIC4341/SIC4343
  - Single chip with NFC to sensor connection which can be used in battery-less application

Animal ID

- **LF HDX-B Transponder & IC**
  SIC379
  - HDX tag IC in with tunable capacitor
  - A new-generation, value-engineered LF HDX RFID delivering best-in-class reading performance
- **LF FDX-B Transponder IC**
  SIC7150/SIC7151/SIC7152
  - Superior read range performance
  - Support mainstream FDX command
  - Seamless migration
- **LF FDX-A/FDX-B Transponder IC**
  SIC278
  - Outstanding read range performance with tunable capacitor
  - Multiple FDX protocol support

Immobilizer

- **Universal Immobilizer Transponder**
  SIC61AU
  - Supports 4 families of LF communication protocol including N, T, S, and A families which support 14 classical transponder types
- **N-Family Immobilizer Transponder**
  SIC6146/SIC6146B/SIC6146E/ SIC6147/SIC6149/SIC614A
  - 48 bits, 96 bits, and 128 bits encryption with HT algorithm
  - LF FDX technology
- **T-Family Immobilizer Transponder**
  SIC614C/SIC614D/SIC614E/SIC618A
  - 40 bits, 80 bits, and 128 bits encryption with D algorithm
  - LF HDX technology
- **S-Family Immobilizer Transponder**
  SIC6148/SIC6188/SIC61T5
  - 96 bits and 128 bits encryption with M algorithm
  - LF HDX technology
- **A-Family Immobilizer Transponder**
  SIC618C
  - 128 bits encryption with T algorithm
  - LF HDX technology



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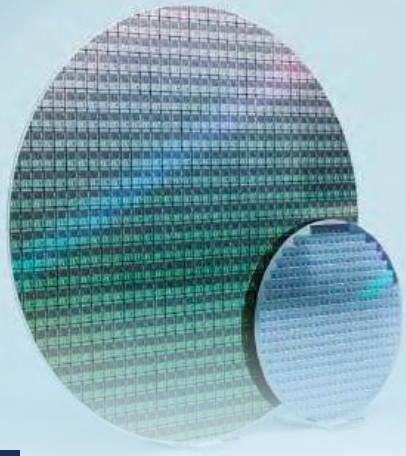
SCAN ME



CUSTOMIZED

ASIC
DESIGN SERVICE

ASIC, or Application Specific Integrated Circuit, is a semiconductor solution designed for a particular application, unlike Field Programmable Gate Arrays (FPGAs), which can be programmed multiple times to perform different functions. ASIC offers advantages in terms of economy of scale. In mass production, the price per unit is significantly lower compared to FPGAs.

Develop your product with unique and smart features, gaining a competitive edge with viable time-to-market and economy of scale benefits, achievable only through your own ASIC device. Silicon Craft provides a full turnkey ASIC design and manufacturing, encompassing everything from requirement generation to mass production, for the entire lifecycle of your product.

SILICON CRAFT'S ODM SERVICE

ASIC

- Analog Design
- Digital Design
- Test Development
- Package Design
- Evaluation

PACKAGE CUSTOMIZATION

- Wafer Test
- Package Test
- Package Customization
- Memory Personalization
- Quality Control

DIFFERENTIATED TECHNOLOGIES
ARE OUR FOUNDATION

- Over 2 decades of specialization and experience in designing and developing RFID ICs.
- We are the technology and IP owners; all ICs are designed, developed, and crafted in-house.
- Designing and customizing ICs based on customers' requirements.
- Flexible customization and adjustment of features for use in a wide range of applications.

ASIC ADVANTAGES

- **Deliver products in desired form and function:**
  ASIC allows you to reduce PCB real estate and opens opportunities to overcome electrical and mechanical constraints in production.
- **Stay ahead of your competitors:**
  Your competitors cannot purchase your ASIC on the market, preventing them from reproducing the same product performance using off-the-shelf devices.
- **Extend battery life:**
  ASIC is custom-designed, eliminating redundant circuits or functions found in off-the-shelf products, which optimizes power consumption to stay within the power budget.
- **Reduce product cost at high volume production:**
  ASIC integrates all your requirements into a silicon chip, resulting in cost optimization through economies of scale in high-volume production.

Silicon Craft's Full Turnkey **ASIC DESIGN SERVICE**

ASIC IC DESIGN SERVICE

ODM IC SERVICE

Specify Product Requirements

Collaborate with customer to define product use-case, circuit and system architecture, manufacturing process and testing methodology.

Product Development & Verification

Our engineering team starts circuit design and simulation for tape out in parallel with test software development.

Our RFID IP blocks have years of track record for high performance and reliability so we are committed to delivering high quality product within timeframe for a successful customer product launch.

Product Qualification

Actual silicon in prototype package is validated against product requirement in various conditions.

The prototyped silicon is used for PCBA-level validation in real-world applications

Product Manufacturing

Based on qualified prototype and customer product plan, We starts pilot run to optimize testing cost and improve production yield.

Product Supply

We provides full manufacturing services including supply chain coordination, quality control, yield improvement as well as inventory management.

Customer can off-load these complex activities that involve many subcontractors to Silicon Craft as a single point of contact.

OUR PRODUCTS & KEY IP BLOCKS

SIC56NL — NFC Forum Type 5 Tag IC

SIC56NL is a vicinity tag IC compatible with ISO/IEC 15693 and NFC Forum type 5 tag with reprogrammable digital signature.

KEY IP BLOCKS

- Long distance ISO15693 Analog and Digital Frontend
- Support Electronic Article Surveillance (EAS)

SIC43S1 — NFC Forum Type 2 Tag IC with AES-128 Based Security

SIC43S1 is an NFC Forum Type 2 tag that offers AES-128 encryption for security applications.The tag support authentication on both dynamic NDEF for web application as well as mutual authentication for higher security or offline verification.

KEY IP BLOCKS

- ISO14443A Analog and Digital Frontend
- AES-128 encryption module
- Multi-location Dynamic NDEF mirror module

SIC4341 — NFC with Sensor Interface AFE

SIC4341 is the world first NFC with a sensor interface analog front-end (AFE). NFC sensing device, e.g. Point-of-care testing (POCT) device or environmental monitoring device, can be made easily by connecting the silicon chip to a 13.56 MHz antenna and sensor substrate terminals

KEY IP BLOCKS

- ISO14443A Analog and Digital Frontend
- 8-bit DACs
- Potentiostat Analog Frontend

RE41 — High Performance 13.56-MHz Multi-Standard RFID Reader IC

RE41 is a single-chip high performance HF reader supporting a variety of 13.56-MHz contactless standard protocols including ISO14443A/B, ISO15693, and JIS-X-6319-4. We also offers RA12, a low power HF reader IC inductive card detection and LDO as well.

KEY IP BLOCKS

- 13.56 MHz RFID reader/writer analog frontend
- ISO1443A/B, ISO15693, JIS-X-6319-4 Tx/Rx CODEC
- SPI interface
- 3.3V LDO

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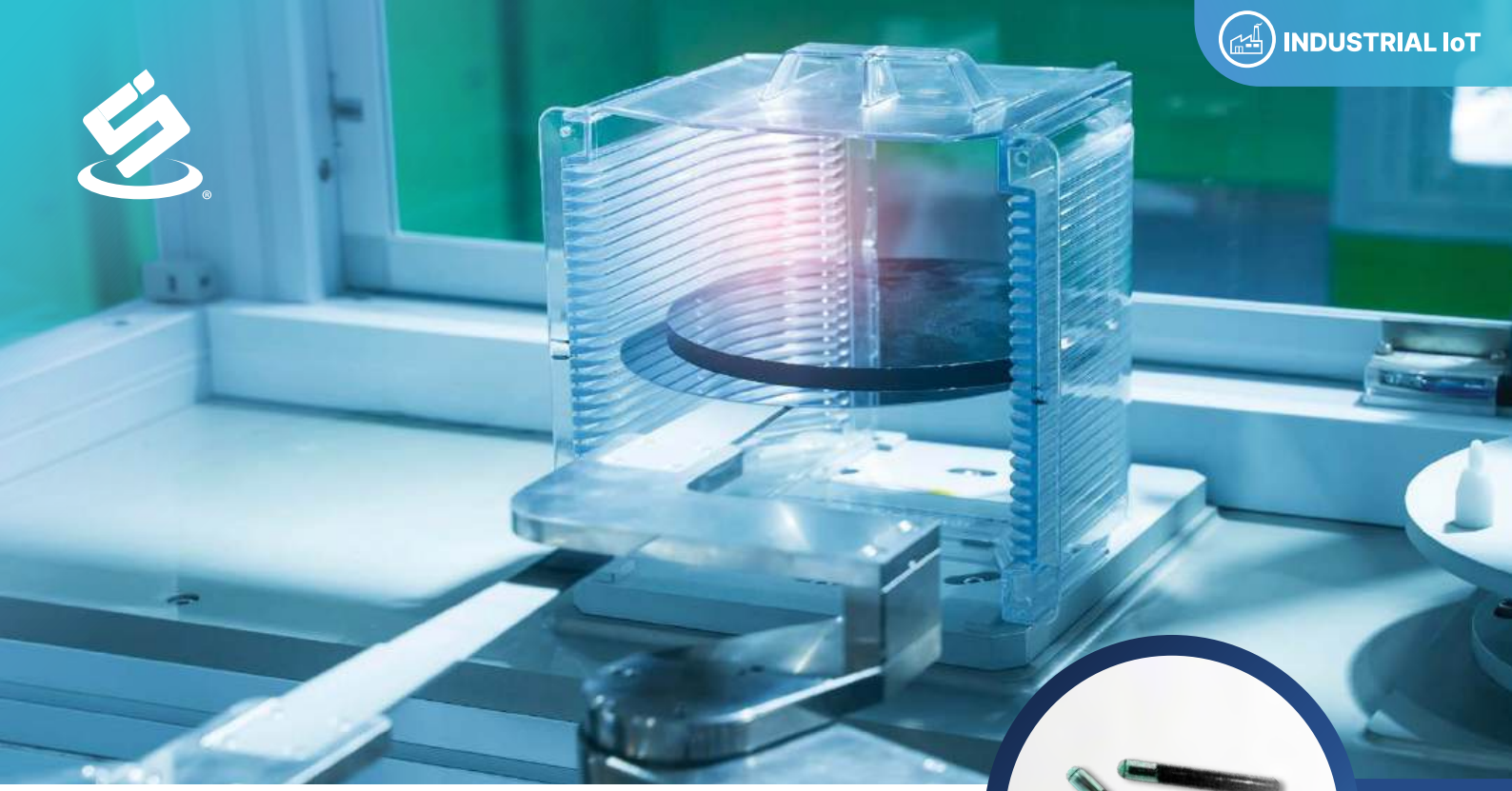

INDUSTRIAL IoT

SIC73F1

LF HDX MULTIPAGE TRANSPONDER

SIC73F1 is a 32mm RFID glass transponder with 1,360-bit multipage read/write memory, operating at 134.2 kHz via a half-duplex protocol. The transponder is robust and well-suited for various industrial tracking applications.

HIGHLIGHT FEATURES

- Half-Duplex Contactless Read/Write Data Transmission
- Multipage Transponder (MPT)
- Drop-in Replacement of RFID Tag for Wafer Carrier
- Robust and High Quality Build

INTERFACE

- Compliant with ISO 11784/11785 HDX Animal Tag ID Data
- Support to SEMI E144-0312
- Uplink Modulation: FSK (Frequency Shift Keying)

MEMORY

- 1,360 bits EEPROM
- 17 Pages Read/Write Memory
- 100,000 Erase/Write Cycles
- 10 Years Non-Volatile Data Retention

APPLICATIONS

- Wafer Carrier Tracking
- Industrial Management
- Access Control System

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INDUSTRIAL IoT

Low-Frequency Half-Duplex RFID Tag

SIC73WR

80-bit programmable code

SIC73WR is a low-frequency half-duplex (HDX) RFID transponder with an 80-bit programmable code for industrial applications.
It employs the same read/write command as other HDX transponders, thereby facilitating system expansion or product replacement.

Form Factor

- IC
- Wedge
- Glass tag 23 mm
- Glass tag 32 mm

Highlight Features

- LF HDX RFID tag operates at 134.2 kHz frequency band.
- 80-bits Programmable ID memory allows assigning unique identifier to each tag using only typical HDX reader/writer in the market.
- Industrial applications have been proven to work successfully in harsh environments and demanding conditions.

Applications

- Access Control
- Vehicle Identification
- Container Tracking
- Asset Management
- Waste Management
- Industrial Automation

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ilicon craft

INDUSTRIAL IoT

SIC379
SIC73WR
SIC73F1

LF HDX RFID TRANSPONDERS & ICs FOR INDUSTRIAL APPLICATIONS

SIC379, SIC73WR, and SIC73F1 offer a broad range of compatible industrial transponders & ICs. These low-frequency (LF) RFID transponders & ICs operate at 134.2 kHz, utilizing half-duplex (HDX) technology with an 80-bit programmable code, ideal for use with existing HDX RFID infrastructure.

Our LF HDX RFID transponders & ICs are highly robust and well-suited for various industrial environments. They provide reliable identification and tracking even in harsh conditions, and are less susceptible to electromagnetic interference or noise (metals, liquids, etc.).

With extended memory, these transponders & ICs store and manage large amounts of data across multiple pages, ensuring that information remains accessible and up-to-date even in dynamic environments.

HIGHLIGHT FEATURES

- Compliant with ISO 11784/11785 HDX
- HDX Contactless Read/Write Data Transmission at 134.2 kHz
- Multipage Transponder (MPT)*
- Tunable Resonant Frequency**
- 80-bit Programmable ID Memory
- Best-in-Class Read and Write Sensitivity
- Robust and High-Quality Build

APPLICATIONS

- Industrial Automation
- Access Control
- Asset Management
- Vehicle Identification
- Container Tracking
- Waste Bin Tag (BDE)
- Food Industry
- Cleanroom Manufacturing
- Wafer Carrier Tracking*

(*) SIC73F1 (**) SIC379

LF HDX TRANSPONDERS & ICs
FOR INDUSTRIAL APPLICATIONS

SIC379
LF HDX RFID transponder & IC with 192-bit R/W memory

SIC73WR
LF HDX RFID transponder & IC with 720-bit R/W memory

SIC73F1
LF HDX RFID transponder & IC with 1,360-bit R/W memory

COMPARISON SPECIFICATION TABLE

SPECIFICATION	SIC379	SIC73WR	SIC73F1
Communication Protocol			
ID Reading	ISO 11784/11785 (HDX)	ISO 11784/11785 (HDX)	ISO 11784/11785 (HDX) & SEMI E144-0312
ID Programming	SIC Proprietary	HDX De Facto Standard	HDX De Facto Standard
Read/Write Extended Memory	SIC Proprietary	SIC Proprietary	SEMI E144-0312
Memory			
Programmable ID Memory [bits]	80		
Extended User Memory Size [bits]	192	720	1360 (Multipage - MPT)
Data Retention [years]	10	20	10
Write Cycles [times]	100k	100k	100k
Security	32-bit Password Authorization	N/A	N/A
Operating Conditions			
Operating Frequency [kHz]	134.2		
Operating Temperature [°C]	−40 to +85	−40 to +85	−25 to +85
Resonant Capacitor			
Integrated Resonant Capacitor [pF]	330	380	N/A
On-Chip Tunable Resonant Capacitor	Yes	N/A	N/A
Tunable Resonant Capacitance Range [%]	±10%	N/A	N/A
Tunable Resonant Capacitance Data [steps]	128	N/A	N/A
Others			
Form Factors	• Wedge • Glass Transponder: 23, 32 mm • VDFN	• Wedge • Glass Transponder: 23, 32 mm • VDFN	Glass Transponder: 32 mm (Bio-Glass with Black Epoxy)

SUPPORT MATERIALS

- Silicon Craft Universal LF Reader
- PC Software for Tuning On-Chip Resonant Capacitance

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SIC279

12mm RFID
GLASS TRANSPONDER

Silicon Craft's passive mini-RFID glass transponder, measuring 12mm x 2.12mm, operates through a 134.2 kHz half-duplex protocol powered by SIC279

Utilizing low-frequency (LF) technology, our industrial transponders are perfect for asset tagging in various use case-such as item security check, product identification or key identification.

Our products, designed with state-of-the-art techniques, incorporate exclusive intellectual property (IP) to deliver the best performance. Our transponders significantly enhance readability, setting a new standard in the industry.

HIGHLIGHT FEATURES

- ISO 11784/11785 80-bit Industrial ID
- Long read range R/W RFID transponder
- High resistance against noise for reliable performance in challenging environments
- Operating frequency 134.2kHz
- Half-duplex communication read/write data

MEMORY

- 192 bits EEPROM
- 100,000 Erase/Write Cycles
- 10 Years Non-Volatile Data Retention

APPLICATIONS

- Asset Tagging
- Key Cabinet Identification
- Industrial Automation
- Animal Identification

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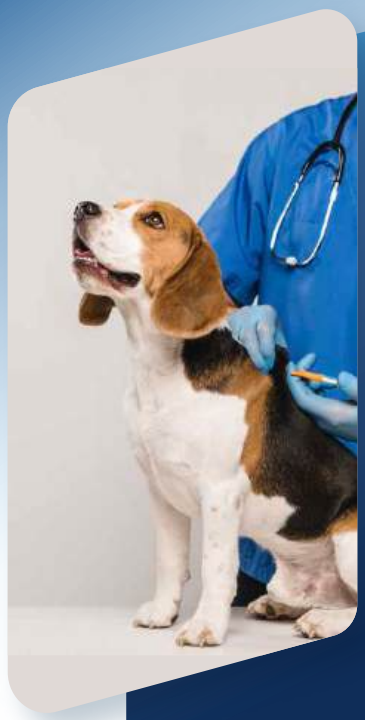

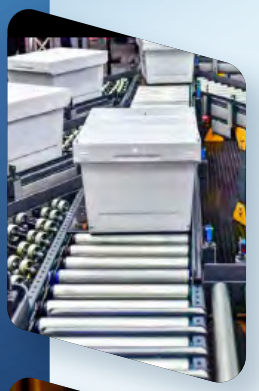

SIC7150
SIC7151
SIC7152

LF RFID TRANSPONDER ICs

FOR INDUSTRIAL & ANIMAL IDENTIFICATION

SIC7150, SIC7151, and SIC7152 are low frequency RFID transponder ICs with full-duplex protocol designed for various applications, operating at both 125 kHz for industrial use and 134.2 kHz for animal identification.

Each transponder IC features a unique on-chip resonant capacitor that optimizes performance across various antenna configurations, ensuring superior functionality in diverse applications.

Powered by Silicon Craft Technology's IPs, the SIC7150 integrates a tunable resonant capacitor, enhancing communication capabilities and delivering best-in-class performance.

ON-CHIP RESONANT CAPACITORS

SIC7150	SIC7151	SIC7152
330 pF	210 pF	250 pF

HIGHLIGHT FEATURES

- Frequency Range 100-150 kHz
- On-chip Tunable Resonant Capacitor ±5% of Resonance Capacitor *
- Long Reading Range
- Support for Reader Talk First

*Only available for SIC7150

SUPPORTED PROTOCOL

- Compliance with ISO 11784/11785 FDX-B
- Command Compatibility with Mainstream FDX Products on the Market
- Support Bi-phase and Manchester Modulation

MEMORY

- 320 bits in User Memory Area
- 100,000 Erase/Write Cycles
- 10 Years Non-Volatile Data Retention
- Secure Memory Lock Functionality

APPLICATIONS

- Animal Identification
- Asset Tagging
- Industrial Automation
- Access Control System

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INDUSTRIAL IoT

SIC278
SIC7150
SIC7151
SIC7152
SIC72A1

LF RFID TRANSPONDER ICs

FOR ACCESS CONTROL

SIC278, SIC7150, SIC7151, SIC7152, and SIC72A1 are low-frequency (LF) RFID transponder ICs designed for a broad range of access control applications. They operate at 125 kHz or 134.2 kHz RFID, fully compliant with ISO 11784 and ISO 11785.

As LF proximity card-based access control systems have been widely installed around the world, our robust LF transponder ICs are well-suited for the demand of seamless integration with both existing and newly installed systems.

Silicon Craft's specialized chip design integrates on-chip resonant capacitance tuning feature, which optimizes transponder communication capabilities and greatly enhances operational efficiency.

HIGHLIGHT FEATURES

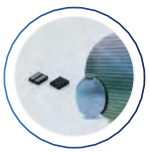
- Support 32-bit and 64-bit ID Manchester, Access Control
- ISO 11784/11785
- On-Chip Tunable Resonant Capacitor*
- Frequency Range 100-150 kHz
- Full-Duplex Communication
- Reader-Talk-First Mode Configurable

*SIC278, SIC7150

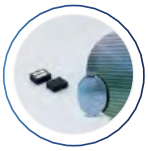
APPLICATIONS

- Building Access Card
- Apartment Key Fob
- Resident Access Card
- Employee ID Card

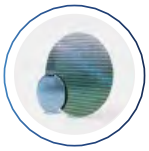
LF RFID TRANSPONDER ICs
FOR ACCESS CONTROL



SIC278



SIC7150
SIC7151
SIC7152



SIC72A1

SPECIFICATION	SIC278	SIC7150	SIC7151	SIC7152	SIC72A1
Communication					
Protocol	Manchester 32/64-bit ID ISO 11784/11785 (FDX-B) FSK FECAVA (FDX-A)	Manchester 32/64-bit ID ISO 11784/11785 (FDX-B)			Manchester 32/64-bit ID ISO 11784/11785 (FDX-B) FSK FECAVA (FDX-A) RF/8 to RF/128 PSKs, FSK, NRZ
Tag Talk First [TTF]	Yes				
Reader Talk First [RTF]	Yes				
Memory					
User Memory Size [bits]	1,184	320			330
Data Retention [years]	10				
Write Cycles [times]	100,000				
Access Protection	Read and Write 32-bit Password Authorization				
One Time Programmable Support	Yes	No	No	No	Yes
Resonant Capacitor					
On-Chip Resonant Capacitor [pF]	230	330	210	250	325
On-Chip Tunable Resonant Capacitor	Yes	Yes	No		
Tunable Resonant Capacitance Range [%]	±5%	±5%	-		
Tunable Resonant Capacitance Data [steps]	32	32	-		
Others					
Packages	Sawn Wafer, WDFN	Sawn Wafer, UDFN			Sawn Wafer
Megapad for Direct Connection of Coil on Die	Yes				

SUPPORT MATERIALS

- Silicon Craft Universal LF Reader
- PC Software for programming memory

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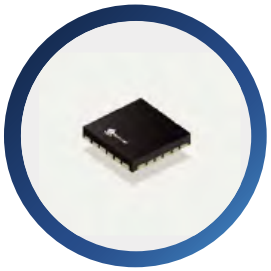
INDUSTRIAL IoT

RA12
RE31
RE41



HF RFID READER ICs

Silicon Craft's 13.56MHz RFID reader/writer ICs are single-chip ASICs designed. Our products adhere to major global standards, including ISO/IEC 14443A/B, ISO/IEC 15693, and JIS-X-6319-4, ensuring compatibility and reliability across diverse applications.

Harnessing the power of contactless communication through HF RFID technology, our ICs enable wireless identification regardless of external lighting conditions and without the need for line-of-sight. This allows effective detection across various mechanical constraints or vision-blocking obstacles, both indoors and outdoors. This robust technology is ideal for operation in dirty and harsh industrial settings, making it perfect for identifying and monitoring products, carriers, or machine conditions on the production line. It enhances operational efficiency, accuracy, safety, and traceability, while reducing downtime and maintenance costs.

HIGHLIGHT FEATURES

- Support Standard HF RFID Protocols
  - ISO/IEC 14443A
  - ISO/IEC 14443B
  - ISO/IEC 15693
  - JIS-X-6319-4
- SPI Interface
- Power-Down Mode Consumption:
  - 0.6 µA (RA12)
  - 1.0 µA (RE31, RE41)
- Low-Power Card Detection Mode Consumption:
  - 4.7 µA (RA12)

APPLICATIONS

- Production Line Automation
- Supply Chain Management
- Asset Tracking
- Tool and Equipment Tracking
- Quality Control
- Predictive Maintenance & Monitoring

HF READER ICs FAMILY

RE31
ISO/IEC 14443A
ISO/IEC 14443B
ISO/IEC 15693
Support 7V TVDD

RE41
ISO/IEC 14443A
ISO/IEC 14443B
ISO/IEC 15693
JIS-X-6319-4
Support 7V TVDD

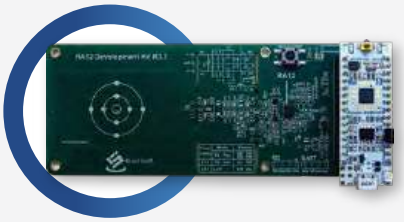
RA12
ISO/IEC 14443A
ISO/IEC 14443B
ISO/IEC 15693
with Low-Power
Card Detection

SPECIFICATION TABLE

SPECIFICATION	RE31	RE41	RA12
Ordering Part Number	**PI5AVQO7P20UT3101E1**	**PI5AVQO7P20UT3201E1**	**PI6BVQL5P60UT1201T1**
Protocol			
ISO/IEC 14443A, up to 848 kbps (NFC Type 1,2,4A Tag)	●	●	●
ISO/IEC 14443B, up to 848 kbps (NFC Type 4B Tag)	●	●	●
ISO/IEC 15693, 1 and 2 Subcarrier (NFC Type 5 Tag)	●	●	●
JIS-X-6319-4 (NFC Type 3 Tag)	Unsecured Memory Only (Need MCU to Decoder)	Unsecured Memory Only (On-Chip HW Decoder)	Unsecured Memory Only (Need MCU to Decoder)
Operating Condition			
Receiver Voltage	2.7 – 3.6 V		
Transmitter Voltage	2.7-7.0 V	2.7-7.0 V	2.7-5.5 V
Operating Temperature	-40 - 85 °C		
Maximum Driving Current	300 mA @ 5 V TVDD 400 mA @ 7 V TVDD	300 mA @ 5 V TVDD 400 mA @ 7 V TVDD	250 mA @ 5 V TVDD
Other Features			
Interface	SPI		
EEPROM	256 bytes	256 bytes	-
IRQ Pin	●	●	●
Low-Power Card Detection Mode	-	-	●
Low-Power Consumption on Power-Down Mode	1 µA	1 µA	0.6 µA
Packages	QFN32 (5×5)	QFN32 (5×5)	QFN24 (4×4)

DEVELOPMENT KITS

- RA12 Development Kit
- RE31 Development Kit
- RE41 Development Kit



SUPPORT MATERIALS

- Firmware Source Code with Command-Line Instruction via UART
- Demo PC Software (Windows Based)
- Reference PCB Design and Schematic Diagram
- Reference Antenna and Antenna Design Tool

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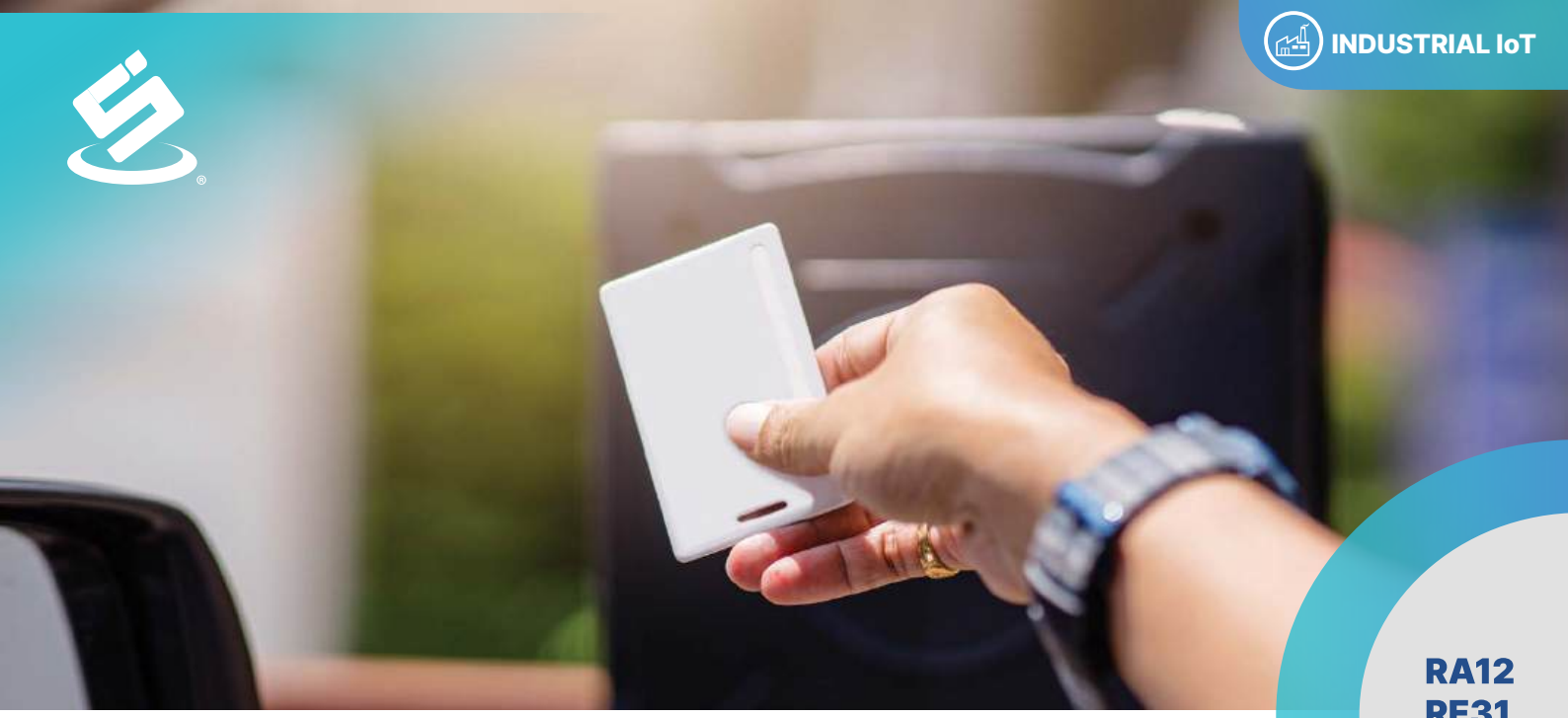
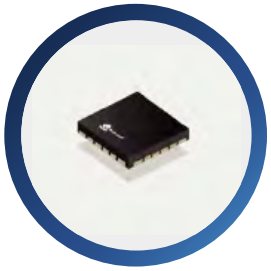
INDUSTRIAL IoT



RA12
RE31
RE41



13.56 MHZ
RFID/NFC READER ICs

Silicon Craft's 13.56MHz RFID reader/writer ICs are single-chip ASICs designed. Our products adhere to major global standards, including ISO/IEC 14443 A/B, ISO/IEC 15693, and JIS-X-6319-4, ensuring compatibility and reliability across diverse applications.

The communication speed can reach up to 848 kbps. Our RFID/NFC reader/writer ICs deliver the best performance while consuming very low power, down to 0.6μA* in power-down mode.

*RA12 only

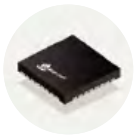
HIGHLIGHT FEATURES

- Support Standard HF RFID Protocols
  - ISO/IEC 14443 A
  - ISO/IEC 14443 B
  - ISO/IEC 15693
  - JIS-X-6319-4
- SPI Interface
- Power-Down Mode Consumption:
  - 0.6 μA (RA12)
  - 1.0 μA (RE31, RE41)
- Low-Power Card Detection Mode Consumption:
  - 4.7 μA (RA12)

APPLICATIONS

- Secure Access Control
- Digital Door Lock
- Handheld or Desktop RFID Reader
- Smart Toys
- Electricity / Gas Metering

HF READER ICs FAMILY



RE31

ISO/IEC 14443 A
ISO/IEC 14443 B
ISO/IEC 15693
Support 7V TVDD

RE41

ISO/IEC 14443 A
ISO/IEC 14443 B
ISO/IEC 15693
JIS-X-6319-4
Support 7V TVDD

RA12

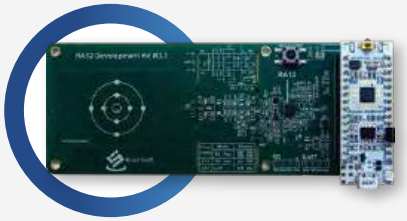
ISO/IEC 14443 A
ISO/IEC 14443 B
ISO/IEC 15693
with Low-Power
Card Detection

SPECIFICATION TABLE

SPECIFICATION	RE31	RE41	RA12
Ordering Part Number	PI5AVQO7P20UT3101E1	PI5AVQO7P20UT3201E1	PI6BVQL5P60UT1201T1
Communication Protocols			
ISO/IEC 14443 A, up to 848 kbps (NFC Type 1,2,4 A Tag)	●	●	●
ISO/IEC 14443 B, up to 848 kbps (NFC Type 4 B Tag)	●	●	●
ISO/IEC 15693, 1 and 2 Subcarrier (NFC Type 5 Tag)	●	●	●
JIS-X-6319-4 (NFC Type 3 Tag)	Unsecured Memory Only (Need MCU to Decoder)	● (Unsecured Memory Only)	Unsecured Memory Only (Need MCU to Decoder)
Operating Conditions			
Receiver Voltage	2.7 – 3.3 V		2.7 – 3.6 V
Transmitter Voltage	2.7 - 7.0 V		2.7 - 5.5 V
Operating Temperature [°C]	-40 to +85		
Maximum Driving Current	300 mA @ 5 V TVDD 400 mA @ 7 V TVDD	300 mA @ 5 V TVDD 400 mA @ 7 V TVDD	250 mA @ 5 V TVDD
Other Features			
Interface	SPI		
EEPROM [Bytes]	256	256	-
IRQ Pin	●	●	●
Low-Power Card Detection Mode	-	-	●
Low-Power Consumption on Power-Down Mode [µA]	6.0	6.0	0.6
Packages	QFN32 (5×5), TSSOP 28-pin	QFN32 (5×5)	QFN24 (4×4)

DEVELOPMENT KITS

- RA12 Development Kit
- RE31 Development Kit
- RE41 Development Kit



SUPPORT MATERIALS

- Firmware Source Code with Command-Line Instruction via UART
- Demo PC Software (Windows Based)
- Reference PCB Design and Schematic Diagram
- Reference Antenna and Antenna Design Tool

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ADVANCED NFC

SIC4310

NFC FORUM TYPE 2 TAG IC

WITH UART INTERFACE & ENERGY HARVESTING FUNCTION

SIC4310 is NFC Forum Type 2 Tag IC with a UART interface that bridges data transfer between NFC devices and UART-connected devices such as MCUs.

In addition, **SIC4310** can harvest energy for peripheral circuits up to 10mA from desktop RFID readers or up to 7mA from typical NFC phones. This energy harvesting capability enables 'battery-less' applications that instantly operate when an NFC device is tapped, even without a battery inside.

Energy Harvesting

UART & GPIOs Interface

HIGHLIGHT FEATURES

- NFC Forum Type 2 Tag with Additional Commands
- Direct Data Transfer Between NFC and UART, or Vice Versa
- Utilizes NFC Energy Harvesting for Self-Operation or External Power Sourcing
- 3.3V On-Chip Regulator for Energy-Harvesting Output
- NFC Energy Harvesting: Up to 10mA Capability to Power External Circuits (Depending on the NFC Device's Output Power)
- 196 Bytes of User Memory

APPLICATIONS

- Shared Facility (e.g. Washing Machine, Coffee Maker, or Printer) Personalization and Controlling via NFC
- NFC Energy Harvesting Module
- Zero-Energy Emergency Data Transfer Channel for Electricity, Water or Gas Metering
- NFC Bridge for Medical Devices
- Interactive Packaging

NFC FORUM TYPE 2 TAG IC
FOR CONNECTIVITY AND ENERGY-HARVESTING

SIC4310
NFC Forum Type 2 Tag with UART Interface and 8 GPIOs

COMPARISON TABLE

SPECIFICATION	SIC4310
Communication	
Standard	NFC Forum Type 2 Tag ISO/IEC 14443 A
Data Rate [kbps]	106
Interface	UART
Buffer Size [bytes]	64
Memory	
Memory Size [bytes]	196
Data Retention [years]	10
Write Cycle [times]	100,000
Operating Condition	
Operating Temperature [°C]	-40 to +85
Maximum Standby Current	80 µA (use XVDD pin)
External Input Supply Voltage	2.7 V to 3.6 V (use XVDD pin)
Maximum Harvesting Current	
Harvest from Mobile Phone	7.82 mA @3 V
Harvest from Desktop Reader	10.2 mA @2.87 V
Pinouts and Peripherals	
GPIO pins	8
On-chip Capacitor [pF]	30.3
Packages	QFN3×3 -16 pins

DEVELOPMENT KITS

- SIC4310-HV Development Kit : P10CK081PB0S110D0CB

- SIC4310-FU Development Kit : P10CSECR000SN10D1CB

SUPPORT MATERIALS

- Firmware Source Code (SIC4310-FU)
- Demonstration Software : iOS, Android and Windows
- Reference PCB Design and Schematic Diagram
- Reference Antenna Design

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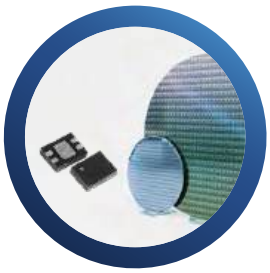
ADVANCED NFC

SIC43NT
SIC43S1



NFC FORUM TYPE 2 TAG ICs
FOR ITEM-LEVEL AUTHENTICATION

SIC43NT and SIC43S1 are passive NFC Forum Type 2 Tag ICs, fully compliant with ISO/IEC 14443 A standard. The user memory of both chips supports NDEF updating with a unique value for each tap, enabling app-less NFC authentication.

For enhanced security, the SIC43S1 contains an AES-128 encryption engine designed for use with mutual authentication and encrypted communication schemes.

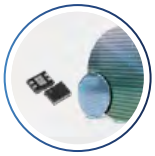
HIGHLIGHT FEATURES

- NFC Forum Type 2 Tag
- Dynamic NDEF Message Containing UID and a Secured Authentication Code (SAC) or Rolling Code for Authentication
- ISO/IEC 14443 A, 106kbps
- 50pF Input Capacitance
- Secured Tamper Detection and Verification via SAC or Rolling Code
- Pin Configuration for RF Field Detection or Tamper Detection (SIC43NT)
- Operating Temperature: -40°C to 85°C

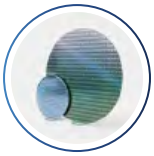
APPLICATIONS

- Item-Level NFC Label or Sticker with Authentication Function
- Smart Packaging
- Vouchers and Coupons
- Access Control Card with Authentication Function

NFC TAG ICs
FOR ITEM-LEVEL AUTHENTICATION



SIC43NT
NFC Forum Type 2 Tag
with Secured Rolling-Code



SIC43S1
NFC Forum Type 2 Tag
with AES-128 Encryption

COMPARISON TABLE

SPECIFICATION	SIC43NT	SIC43S1
Standard	NFC Forum Type 2 Tag ISO/IEC 14443 A	
Memory		
User Memory Size [bytes]	144	816
Data Retention [years]	10	
Write Cycle [times]	500k	100k
Memory Protection	32-bit Password Protection	AES-128 Mutual Authentication
Dynamic NDEF		
UID	14 bytes (ASCII)	
Tamper Status	2 bytes (ASCII)	-
Timestamp	8 bytes (ASCII)	
RLC/SAC	8 bytes (ASCII)	32 bytes (ASCII)
Security		
Mutual Authentication	No	Yes, AES-128
Encrypted Communication	No	Yes, AES-128
I/O Function		
RF Detection	Yes	No
Tampering Detection	Yes	No
Others		
On-Chip Capacitor [pF]	50	
Packages	Sawn Wafer with Bump, DFN	Sawn Wafer with Bump

DEVELOPMENT KITS &
SUPPORT MATERIALS

- Demonstration Software : iOS, Android and Windows
- Reference PCB Design and Schematic Diagram
- Reference Antenna Design

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INDUSTRIAL IoT

SIC56NL

NFC FORUM TYPE 5 TAG IC

WITH ANTI-COLLISION AND REPROGRAMMABLE DIGITAL SIGNATURE

SIC56NL is a vicinity tag IC compatible with ISO/IEC 15693 and NFC Forum Type 5 Tag, with a reprogrammable digital signature.

This chip brings an easy-to-discover NFC experience for consumers, and supports multiple-tag reading based on anti-collision standard from ISO/IEC 15693 and includes an Electronic Article Surveillance (EAS) feature to help deter shoplifting.

SIC56NL supports the de facto standard for the read signature command, with 32-byte digital signature that allowing item-level verification for consumers without internet access.

HIGHLIGHT FEATURES

- NFC Forum Type 5 Tag Compatible
- RF Interface Based on ISO/IEC 15693
- 320 Bytes of User Memory with 50 years Data Retention
- Multiple Tag Reading with Fast Inventory Read
- On-Chip Capacitance 23.5 pF
- Electronic Article Surveillance (EAS)
- Reprogrammable 32 Bytes Digital Signature

APPLICATIONS

- Asset and Document Tagging
- Library Management
- Laundry Tag
- Pharmaceutical Supply Chain Management
- Toys
- Smart Packaging
- Product Authentication

NFC FORUM TYPE 5 TAG IC
FOR ASSET TAGGING

SPECIFICATION	SIC56NL
Standard	NFC Forum Type 5 Tag ISO/IEC 15693 with AFI and DSFID Support ISO/IEC 18000-3 Mode 1
Memory	
User Memory Size [bytes]	320 (Last 4 Bytes Reserved for Counter Feature)
Data Retention [years]	50
Write Cycle [times]	100,000
Access Protection	32-bit or 64-bit Password Protection
Security	
Digital Signature	Reprogrammable
Digital Signature Size [bytes]	32
Digital Signature Technology	Elliptic Curve Digital Signature Algorithm (ECDSA)
Others	
On-Chip Capacitor [pF]	23.5
Packages	Sawn Wafer with Bump, DFN

SUPPORT MATERIALS

- Demonstration Software: iOS, Android and Windows
- Reference Antenna Design

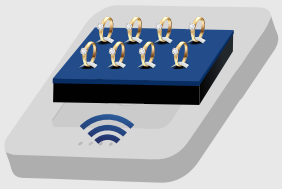
SIC56NL
CONCEPT

Asset & Document Tagging

Long Read Range

Library

Multi-Tag Reading



Fast Anti-Collision

Jewelry Shop

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ENHANCING LEARNING THROUGH HANDS-ON EXPERIENCE

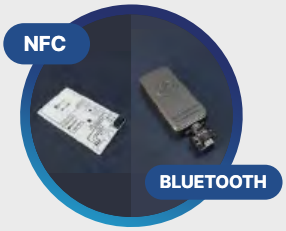
ELECTROCHEMISTRY EDUCATIONAL KITS

ELECTROCHEMISTRY EDUCATIONAL KITS

Electrochemistry educational kits are alternatives to the insufficient of electrochemical analysis equipment in schools and universities.

With over two decades experiences in wireless communication, we successfully developed NFC with sensor interface chip enabling low-cost and portable electrochemical analysis device for individual learning experience anytime anywhere.

THE KITS CONSIST OF

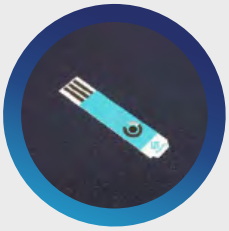


1 WIRELESS POTENTIOSTAT & GALVANOSTAT KIT

NFC / Bluetooth

2 MOBILE APPLICATION

Android/ iOS



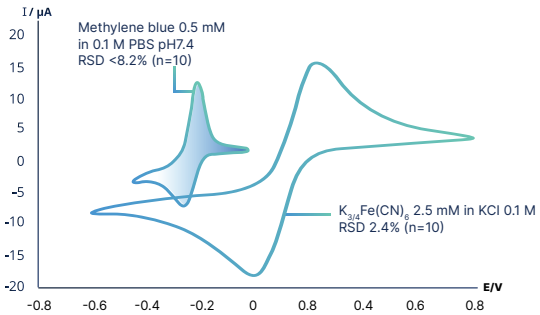
3 SCREEN PRINTED ELECTRODES (SPEs)

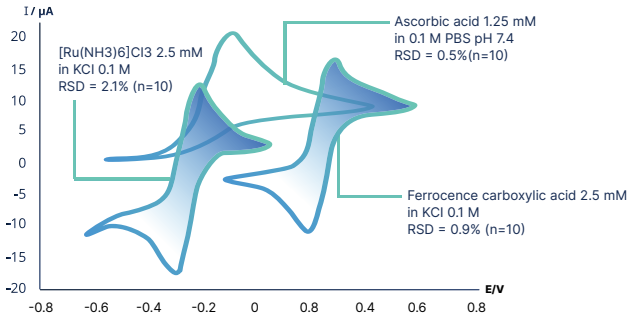
Carbon-Gr

ADVANTAGES

- **Increase accessibility to electrochemistry lab:**
  A budget-friendly portable galvanostat and potentiostat kit provides a hands-on learning experience for all students.
- **Gain more understanding in input-output signal in electrochemical analysis:**
  Students can easily understand the input and output signal of their measurement configuration through real-time graph.
- **Capability to achieve higher technology readiness level:**
  Students can easily understand the input and output signal of their measurement configuration through real-time graph.
- **Improved teaching efficiency:**
  Engage and motivate students by utilizing easy-to-use innovative galvanostat and potentiostat kit.
- **Multidiscipline skills:**
  Students can practice both analytical chemistry and NFC wireless technology using their own smartphones.

Cyclic Voltammograms of Various Electrochemical Substances using Silicon Craft's SPEs





SENSOR PRODUCT SUMMARY





	SIC4340	SIC4341	SIC824B	SIC4343 Single-Ended Mode	SIC4343 Differential Mode
RFID Features					
Working Principle	Chip excites sensor with current, then measures the changes in sensor through voltage.	Chip excites sensor with potential and induce electrochemical reaction to occur, then measures the changes in sensor through current.		Chip measures voltage with respect to GND.	Chip measures voltage between 2 pins.
Communication Interface	NFC Type 2 Tag ISO/IEC 14443 A		Bluetooth® 5.2 BLE	NFC Type 2 Tag ISO/IEC 14443 A	
Power Management	RF On-chip regulator 1.9 V		Lithium rechargable battery 3.7 V 320 mAh	RF On-chip regulator 1.9 V	
Number of Channels	3 I/O 3 channels - configurable	3 I/O Configurable WE, RE, CE	3 I/O Fixed position WE, RE, CE	3 I/O 2 channels - configurable Voltage source = 2 pins ADC input = 1 pin	3 I/O 1 channel - configurable Voltage source = 1 pin ADC differential input = 2 pins
Voltage Source					
Bias Wave Form	-	DC			
Bias Voltage Range, Resolution	-	V(WE-RE) -0.8 V to +0.8 V, 5mV/step	V(WE-RE) **SIC824B16: 1.6 Dynamic voltage range, 5 mV/step** -1.6V to 0V -0.8V to +0.8V 0V to +1.6V **SIC824B32: 3.2 Dynamic voltage range, 10 mV/step** -1.6V to +1.6V	0.2 V to 1.2 V	
Bias Voltage Accuracy	-	± 6 mV	SIC824B16 : 1.6 Dynamic voltage range, ± 6 mV SIC824B32 : 3.2 Dynamic voltage range , ± 12 mV	± 6 mV	
Compliance Voltage	-	-1.3V to +1.4V	± 2.2 V to ± 3.0 V	-	
Current Source					
Bias Wave Form	1) DC 2) Square wave at selectable frequency 300Hz – 50kHz	-	-	-	-
Bias Current Range	Range 0: 1 - 63 µA Range 1: 8 - 504 µA	-	-	-	-
Bias Current Resolution	Range 0: 1 µA /Step Range 1: 8 µA /Step	-	-	-	-
Bias Current Accuracy	Range 0: ± 0.5 µA /Step Range 1: ± 4 µA /Step	-	-	-	-
Analog Input					
Input Impedance	Input buffer is enabled: > 10 MΩ Input buffer is disabled: 18 - 42 kΩ	-	-	Input buffer is enabled: > 10 MΩ Input buffer is disabled: 18 - 42 kΩ	Input buffer is enabled: > 10 MΩ Input buffer is disabled: 18 - 42 kΩ
Measured Current Range	-	Selectable ± 2.5 uA ± 20 uA	Fixed by hardware 50, 100, 150, 200, 250, 350, 400, 500 uA	-	-
Measured Voltage Range	Input buffer is enabled: 0.2 V to +1.2 V Input buffer is disabled: 0 V to +1.2 V	-	-	Input buffer is enabled: 0.2 V to 1.2 V Input buffer is disabled: 0 V to 1.2 V	Input buffer is enabled: -1 V to +1 V Input buffer is disabled: -1.2 V to +1.2 V
Measured Accuracy	± 2.5 mV	± 5 nA for ± 2.5 uA ± 20 nA for ± 20 uA	0.1% of current range	± 2.5 mV	
Data Conversion Rate	10 sps		50 sps	10 sps	
Memory					
User Memory	144 bytes		376 kbytes	144 bytes	
Erase/Write Cycles	100,000		10,000	100,000	
Data Retention	10 years at 70°C		15 years at 85°C	10 years at 70°C	
Compatible Analysis Techniques					
	Electrical condutivity (EC)	Amperometry Voltammetry	Amperometry Voltammetry Open Circuit Potential (OCP)	Open Circuit Potential (OCP) Single-Ended Voltage Measurement	Differential Voltage Measurement (resistive divider, wheatstone bridge)
Form Factor					
Leadless	QFN16L 3×3		-	QFN16L 3×3	
PCB	Dev Kit 85.6 mm x 54.1 mm		with Housing 90 mm x 40 mm	Dev Kit 85.6 mm x 54.1 mm	

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ANIMAL ID

SIC7150
SIC7151
SIC7152
SIC278
SIC379

LF RFID TRANSPONDER & ICs
FOR ANIMAL IDENTIFICATION

SIC7150, SIC7151, SIC7152, SIC278, and SIC379 are low-frequency (LF) RFID transponder & ICs designed for a broad range of applications in animal identification. They operate at 134.2 kHz RFID, fully compliant with ISO 11784 and ISO 11785.

Low-frequency (LF) transponder & ICs streamline animal handling, elevating the standard of livestock management while mitigating the risk of disease transmission. These transponder & ICs also play a crucial role in the identification of pets and laboratory animals.

Silicon Craft's specialized chip design, integrated with proprietary intellectual properties (IPs), provides best-in-class read range performance. It also includes on-chip resonant capacitance tuning, which optimizes transponder communication capabilities and greatly enhances operational efficiency.

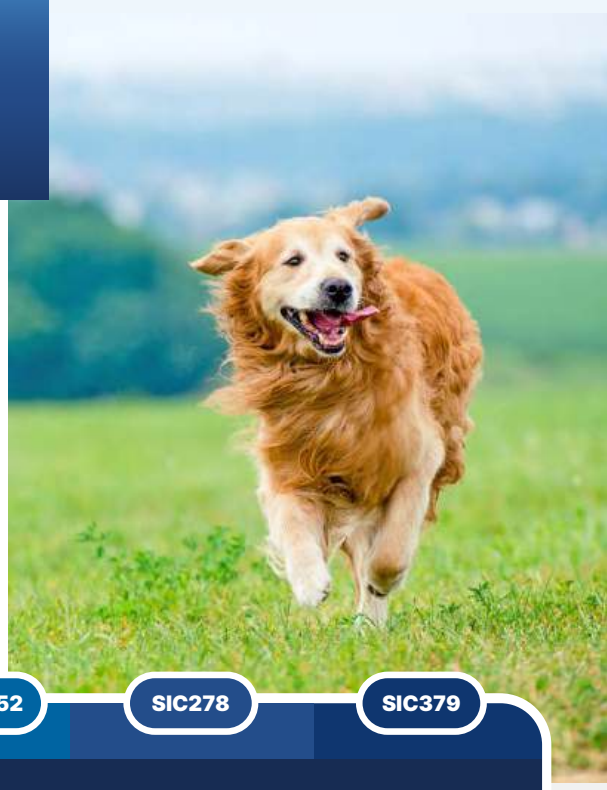
HIGHLIGHT FEATURES

- Meets ISO 11784/11785 and ICAR Standard for Animal Identification
- Support LF Transponders Used in Industrial Applications
- On-Chip Tunable Resonant Capacitor (SIC7150, SIC278 and SIC379)
- Best-in-Class Communication Distance

APPLICATIONS

- Livestock Identification
- Pet Identification
- Fish Identification
- Pigeon Identification
- Laboratory Animal Identification

LF TRANSPONDER & ICs
FOR ANIMAL IDENTIFICATION APPLICATIONS



SIC7150 / SIC7151 / SIC7152
Transponder ICs with Full-Duplex (FDX-B)

SIC278
Transponder IC with Full-Duplex (FDX-A/FDX-B)

SIC379
Transponder & IC with Half-Duplex (HDX R/O)

SPECIFICATION	SIC7150	SIC7151	SIC7152	SIC278	SIC379
Communication					
Protocol	ISO 11784/11785 (FDX-B)			ISO 11784/11785 (FDX-B), FSK FECAVA (FDX-A)	ISO 11784/11785 (HDX R/O)
Reader Talk First [RTF]	Yes			Yes	N/A
Memory					
User Memory Size [bits]	320			1,184	192
Data Retention [years]	10			10	10
Write Cycles [times]	100,000				
Security	Read and Write 32-bit Password Authorization				
Resonant Capacitor					
On-Chip Resonant Capacitor [pF]	330	210	250	230	330
On-Chip Tunable Resonant Capacitor	Yes	No		Yes	
Tunable Resonant Capacitance Range [%]	±5%	-		±5%	±10%
Tunable Resonant Capacitance Data [steps]	32	-		32	128
Others					
Form Factors	Sawn Wafer, UDFN			Sawn Wafer, WDFN	VDFN, Glass Transponder
Megapad for Direct Connection of Coil on Die	Yes			Yes	No

SUPPORT MATERIALS

- Silicon Craft Universal LF Reader
- PC Software for Tuning On-Chip Resonant Capacitance

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ANIMAL ID

SIC279

12mm RFID
GLASS TRANSPONDER

Silicon Craft's passive mini-RFID glass transponder, measuring 12mm x 2.12mm, operates through a 134.2 kHz half-duplex protocol powered by SIC279.

Utilizing low-frequency (LF) technology, our animal identification transponders are perfect for tracking animals in various habitats—such as saltwater, cold-water, and high-noise-level environments—ensuring effective monitoring and management.

Our products, designed with state-of-the-art techniques, incorporate exclusive intellectual property (IP) to deliver the best performance. Our transponders significantly enhance readability, setting a new benchmark in the industry.

HIGHLIGHT FEATURES

- ISO 11784/11785 Animal ID, ICAR compliant RFID
- Long read range R/W RFID transponder
- High resistance against noise for reliable performance in challenging environments
- Operating frequency 134.2kHz
- Half-duplex communication for read/write data

MEMORY

- 192 bits EEPROM
- 100,000 Erase/Write Cycles
- 10 Years Non-volatile Data Retention

APPLICATIONS

- Fish Tracking (PIT)
- Pet Identification
- Lab Animal Identification
- Zoo Animal Identification
- Industrial Automation
- Asset Tagging

Silicon Craft Technology PLC
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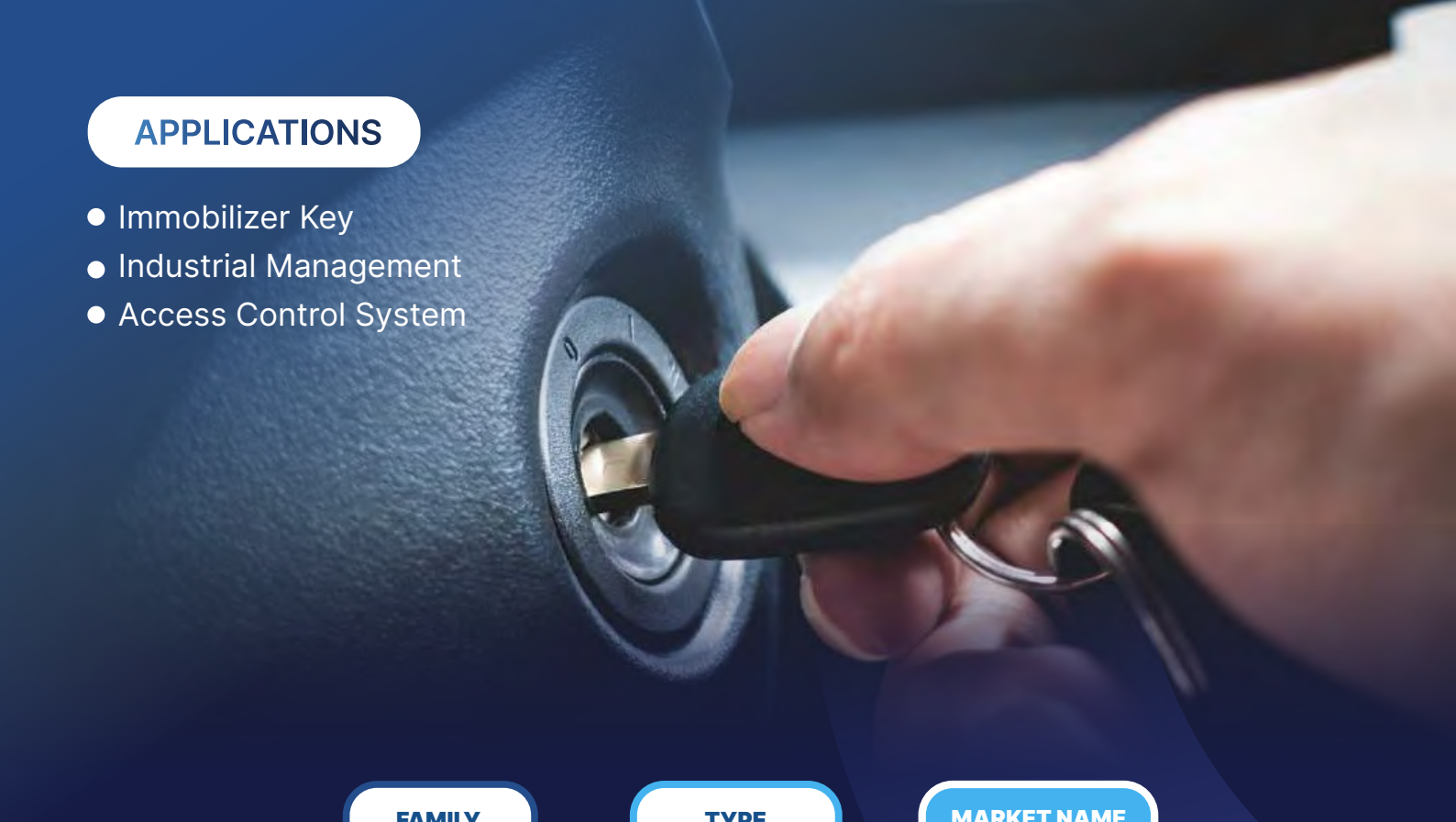
SIC61AU

UNIVERSAL IMMOBILIZER KEY

SIC61AU is a universal immobilizer transponder for automotive keys, operating within the low-frequency (LF) range.
It supports four families of LF communication protocols:
A, N, S, and T, with 14 classical transponder types supported.

HIGHLIGHT FEATURES

- Universally support transponders in the market both HDX and FDX
- Best-in-class reading performance
- Compatible with 4 families and 14 types of conventional immobilizer transponder
- Simple step to transform transponder to each type
- High-Quality and robust transponder package
- Simplify transponders inventory management to handle fluctuating demand in car service center or locksmiths shop



APPLICATIONS

- Immobilizer Key
- Industrial Management
- Access Control System

SUPPORT PRODUCT FAMILY

FAMILY	TYPE	MARKET NAME
N	Full Duplex 125 kHz	ID46
		ID46 +EE
		ID46 Ext.
		ID47
		ID4A
		ID49
T	Half Duplex 134.2 kHz	ID4C
		ID4E
		ID4D
		ID8A
S	Full Duplex 125 kHz	T5
		ID48
A		ID88
		ID8C

ORDERING **INFORMATION**

Part No : PAUDW503EP0SUAU30C3

Description : SIC61AU-30 Universal immobilizer LF FDX & HDX with multiple encryption wedge 134.2/125kHz,Canister, RFID Tag

Package : Wedge (6.0 mm H x 3.0 mm W x 12.0 mm L, Standard size with OEM)

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AUTOMOTIVE TRANSPONDER

Silicon Craft presents a broad range of compatible automotive transponders with superior performance and reliability, extensively supporting a wide variety of automotive applications. Experience uninterrupted use with our transponders manufactured **AEC-Q100 certified** product line.

Fully Compatible with OEM

Superior Read Range

High-Reliability Circuit and Packaging

AUTOMOTIVE TRANSPONDER PORTFOLIO

SIC6146-6H/BN/EN, SIC6147, SIC614A, SIC6149

SPECIFICATION	SIC6146-6H	SIC6146-BN	SIC6146-EN	SIC6147	SIC614A	SIC6149
Compatibility	ID46	ID46+EE*1	ID46 Ext*1	ID49-1C, ID47	ID4A	ID49*1
Security Algorithm	48-bit / H2 32-bit Password	48-bit / H2		96-bit / H3	128-bit / H-AES	128-bit / H-Pro
Technology	FDX					
Frequency	125 kHz					
Downlink Protocol	ASK					
Uplink Protocol	ASK Manchester and Bi-Phase with RF/32 Data Rate					
EEPROM Memory Size	256-bit	4,096-bit				
Unique ID	32-bit					
User Memory	128-bit	128-bit / Ext. 3,840-bit	128-bit / Ext. 3,584-bit	96-bit / Ext. 3,584-bit	64-bit / Ext. 3,584-bit	
Form Factor	Wedge					
Car Brand *2	Honda, BMW, Nissan, Hyundai , Chevrolet, Kia, Citroen, Peugeot	Honda, BMW, Nissan, Hyundai , Chevrolet, Citroen, Kia, Peugeot	Chevrolet, Opel, GMC	Honda, Hyundai,Fiat, Mitsubishi, Suzuki, Acura, Jeep,Renault	Nissan, Honda, Infiniti, Jeep, Kia, Hyundai	BMW, Chevrolet, Mini Cooper, Ford, Toyota

SIC614C/D/E, SIC618A, SIC61T5, SIC6148, SIC6188, SIC618C

SPECIFICATION	SIC614C	SIC614D	SIC614E	SIC618A	SIC61T5	SIC6148	SIC6188	SIC618C
Compatibility	ID4C*1	ID4D	ID4E, ID64	ID7A, ID8A	T5	ID48	ID88, MQB48*1	ID8C,TEMIC
Security Algorithm	Fixed Code	40-bit / D40 80-bit / D80	40-bit / D40	128-bit / D-AES	Fixed Code	96-bit / M2	128-bit / M-AES 96-bit / M2	128-bit / AUT64
Technology	HDX				FDX			
Frequency	134.2 kHz				125 kHz			
Downlink Protocol	ASK							
Uplink Protocol	FSK Uplink at 134 kHz / 123 kHz with RF/16 Data Rate				ASK Manchester and Bi-Phase with RF/32, RF/40, RF/64 Data Rate	ASK Manchester and Bi-Phase with RF/32 Data Rate		ASK Manchester and Bi-Phase with RF/32, RF/64 Data Rate
EEPROM Memory Size	80-bit	552-bit	88-bit	3,072-bit	160-bit	256-bit	2,048-bit	320-bit
Unique ID	80-bit Programmable ID	24-bit Serial Number 8-bit Manufacturer Code			64-bit/128-bit Programmable ID	32-bit	32-bit Unique ID 1 32-bit Unique ID 2	64-bit/128-bit Programmable ID
User Memory	80-bit	336-bit	8-bit	112-bit / Ext. 1,024-bit	128-bit	94-bit	94-bit / Ext. 1,024-bit	128-bit
Form Factor	Wedge					Glass Tag	Wedge	
Car Brand *2	Ford, Lexus,Mitsubishi, Toyota, Hyundai	Ford, Toyota, Kia Hyundai	Chrysler	Toyota, Subaru, Scion Citroen, Peugeot	Fiat, Audi, Honda	Volkswagen, Audi	Audi, Seat, Skoda, Volkswagen	Mazda, Proton

INFORMATION

*1 Please contact our support team for further product information.
*2 Silicon Craft Technology PLC does not hold intellectual property rights or licenses for the vehicle brands, transponders, or commercial names mentioned in this document. These brands and names are used solely for product communication purposes.

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