



# SIC4340

236-Byte ISO14443A RFID/NFC Tag IC  
with built in ADC for Galvanostat sensor interface  
REV 1.5

## Features Summary

### Sensor Interface

- **Galvanostat sensor interface circuit**
  - Voltage is measured by applying current source
  - Effective voltage range: 0.12 to 1.2V
    - Resistance sensing range: 250  $\Omega$  - 400 k  $\Omega$
    - Capacitance sensing range: 25 pF to 7.5  $\mu$ F
- **Programmable current source**
  - 2 ranges
    - 8 - 504  $\mu$ A @ 8 $\mu$ A/Step  $\pm$  4  $\mu$ A
    - 1 - 63 $\mu$ A @ 1 $\mu$ A/Step  $\pm$  0.5  $\mu$ A
- **Built-in ADC**
  - 10-Bit accuracy
  - Selectable post processing average
  - Adjustable conversion starting point to avoid uplink to ensure power stability.
  - Configurable built-in voltage buffer for high-impedance sensor
  - 1.28V temperature compensate voltage reference
  - Conversion rate from 8 ms to 205 ms
- **Adjustable voltage limiter** for preventing sensor burning or overvoltage
  - 1.28 V
- **Adjustable sensor biasing frequency** for supporting wide capacitance-range sensor
  - 300 Hz - 50 kHz
- **Adjustable sampling point** for supporting various settling time
  - 10 - 1,808  $\mu$ s
- **Adjustable warm up clock** for pre-biasing sensor
  - 8 - 491,528 clocks/  $f_{adc}$

### RF Interface

- Compliant with ISO14443A - 106 kbps
- NFC Forum tag type 2

### Memory

- 236 bytes addressable EEPROM
- 192 bytes user memory EEPROM
- EEPROM organization enabling NDEF format
- EEPROM zone for initializing register – automatically reload after power up
- Up to 100,000 erase/write cycles
- Up to 10 years memory retention at 70°C

### Operating Conditions

- Operating temperature: 0°C to 55°C
- Storage temperature: -40°C to 85°C

### Package Information

- QFN 3x3 – 16 leads
- Au-bumped 12-inch die on wafer ring
- Pad size: 80  $\mu$ m x 80  $\mu$ m

## Applications

- Chemical sensor NFC tag
- Light/ humidity sensing NFC tag

## Ordering Information

Part No.	Description	Package	Marking	Product Status
P40CDC60DU0UT4010R6	SIC4340-10, Galvanostat sensor interface with NFC type 2 DOWTB, UV sheet, Wafer ring, Dice	DOWTB	N.A.	Released
P40CVQK4P20UT4010C2	SIC4340-10, Galvanostat sensor interface with NFC type 2 QFN 0.85 mm, Canister, IC	QFN	4340C	Released

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## Die and Package

### Die Information

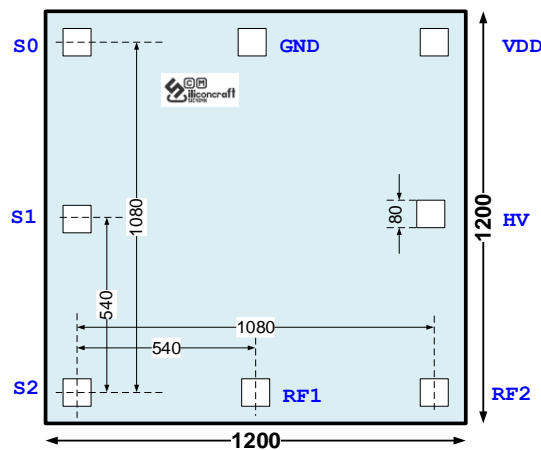


Figure 1: Die Information (Dimension in μm)

Table 1: Pad description

Pad	Symbol	Type	Description
1	S0	Analog	Sensor connection pad 0
2	S1	Analog	Sensor connection pad 1
3	S2	Analog	Sensor connection pad 2
4	RF1	Power	RF-Coil connection pad 1
5	RF2	Power	RF-Coil connection pad 2
6	HV	Power	Unregulated power supply to connect with external decoupling cap
7	VDD	Power	ADC power supply to connect with external decoupling cap
8	GND	Power	Ground ( Power Ground and signal ground )

## Pin configuration

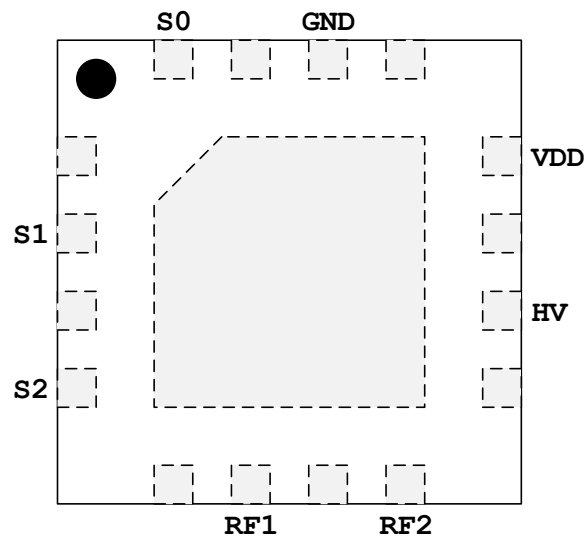


Figure 2: QFN 3x3 Pin arrangement (Top view)

Table 2: Pin description

Pin No.	Symbol	Type	Description
2	S1	Analog	Sensor connection pin 1
4	S2	Analog	Sensor connection pin 2
6	RF1	Power	RF-Coil Connection pin 1
8	RF2	Power	RF-Coil Connection pin 2
10	HV	Power	Unregulated power supply to connect with external decoupling cap
12	VDD	Power	ADC power supply to connect with external decoupling cap
14	GND	Power	Ground ( power ground and signal ground )
16	S0	Analog	Sensor connection pin 0