

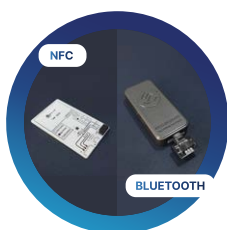


ENHANCING LEARNING THROUGH HANDS-ON EXPERIENCE

ELECTROCHEMISTRY EDUCATIONAL KITS

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THE KITS CONSIST OF



1 WIRELESS POTENTIOSTAT & GALVANOSTAT KIT

NFC, Bluetooth



2 MOBILE APPLICATION

Android/ iOS



SIC4340 Generic



SIC4343



SIC824B



Chemister



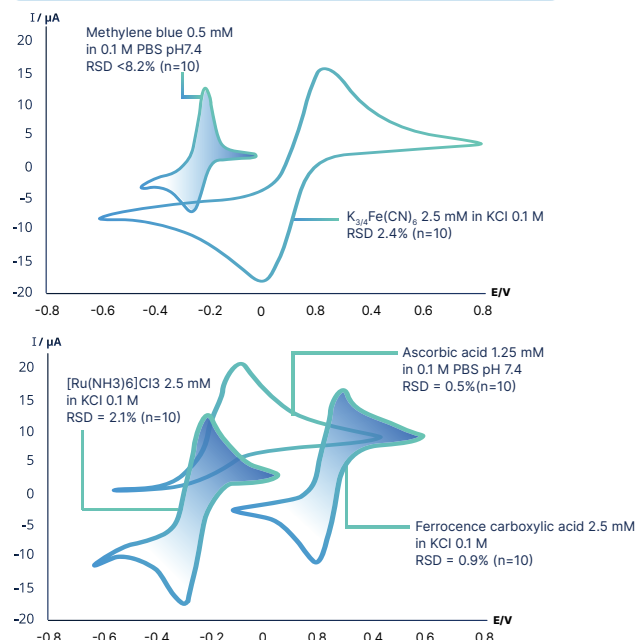
3 SCREEN PRINTED ELECTRODES (SPEs)

Carbon-Gr

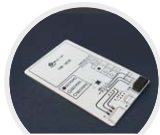
ADVANTAGES

- 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.

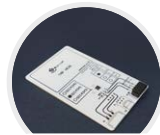
Cyclic Voltammograms of Various Electrochemical Substances using Silicon Craft's SPEs



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 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 ISO14443A	NFC Type 2 Tag ISO14443A	Bluetooth® 5.2 BLE	NFC Type 2 Tag ISO14443A	NFC Type 2 Tag ISO14443A
Power Management	RF On-chip regulator 1.9 V		Lithium rechargeable 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/Resolution	Range 0: 1 - 63 μ A Range 1: 8 - 504 μ A	-	-	-	-
Bias Current Resolution	Range 0: 1 μ A /Step Range 1: 8 μ A /Step	-	-	-	-
Bias Current Accuracy	Range 0: ± 0.5 μ A /Step Range 1: ± 4 μ A /Step	-	-	-	-

Analog Input

Input Impedance	Input buffer is enabled: > 10 M Ω Input buffer is disabled: 18 - 42 k Ω	-	-	Input buffer is enabled: > 10 M Ω Input buffer is disabled: 18 - 42 k Ω	Input buffer is enabled: > 10 M Ω Input buffer is disabled: 18 - 42 k Ω
Measured Current Range	-	Selectable ± 2.5 μ A ± 20 μ A	Fixed by hardware 50, 100, 150, 200, 250, 350, 400, 500 μ A	-	-
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 μ A ± 20 nA for ± 20 μ A	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 conductivity (EC)	Amperometry Voltammetry	Amperometry Voltammetry Open circuit potential (OCP)	Open Circuit Potential (OCP) Single-ended voltage measurement	Differential voltage measurement (resistive divider, wheatstone bridge)
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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