SIC4340 User Manual

By Silicon Craft Technology PLC.

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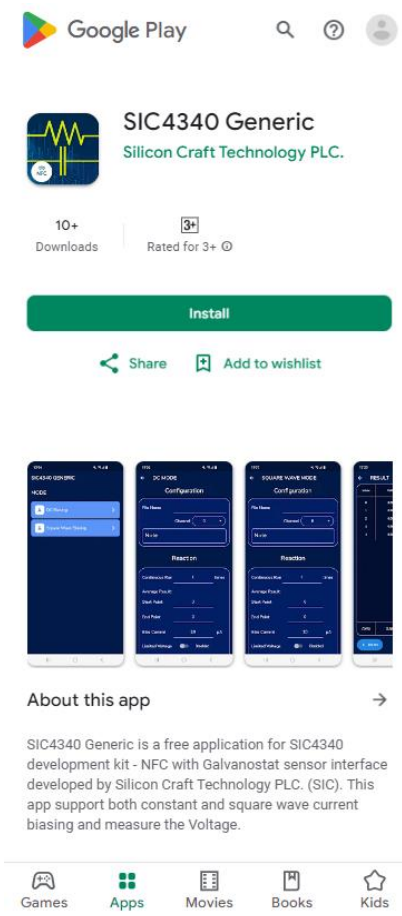
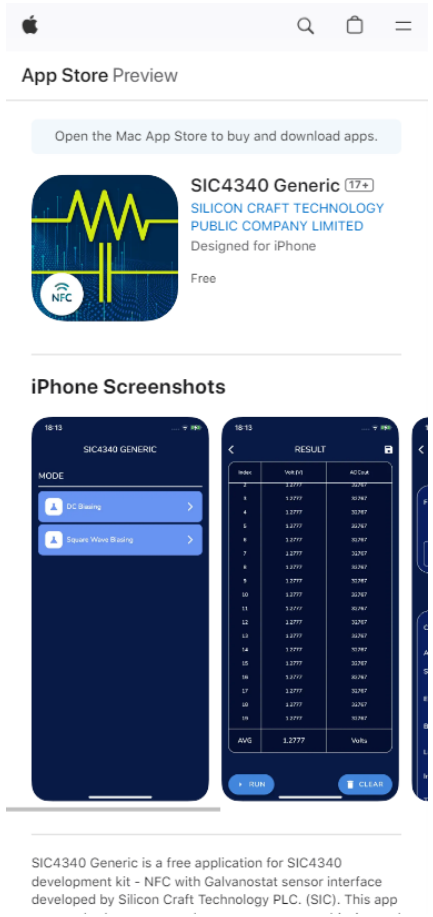
SIC4340 Generic App: Installation

Android



Google Play download link:
https://play.google.com/store/apps/details?id=th.co.sic.sic4340_generic

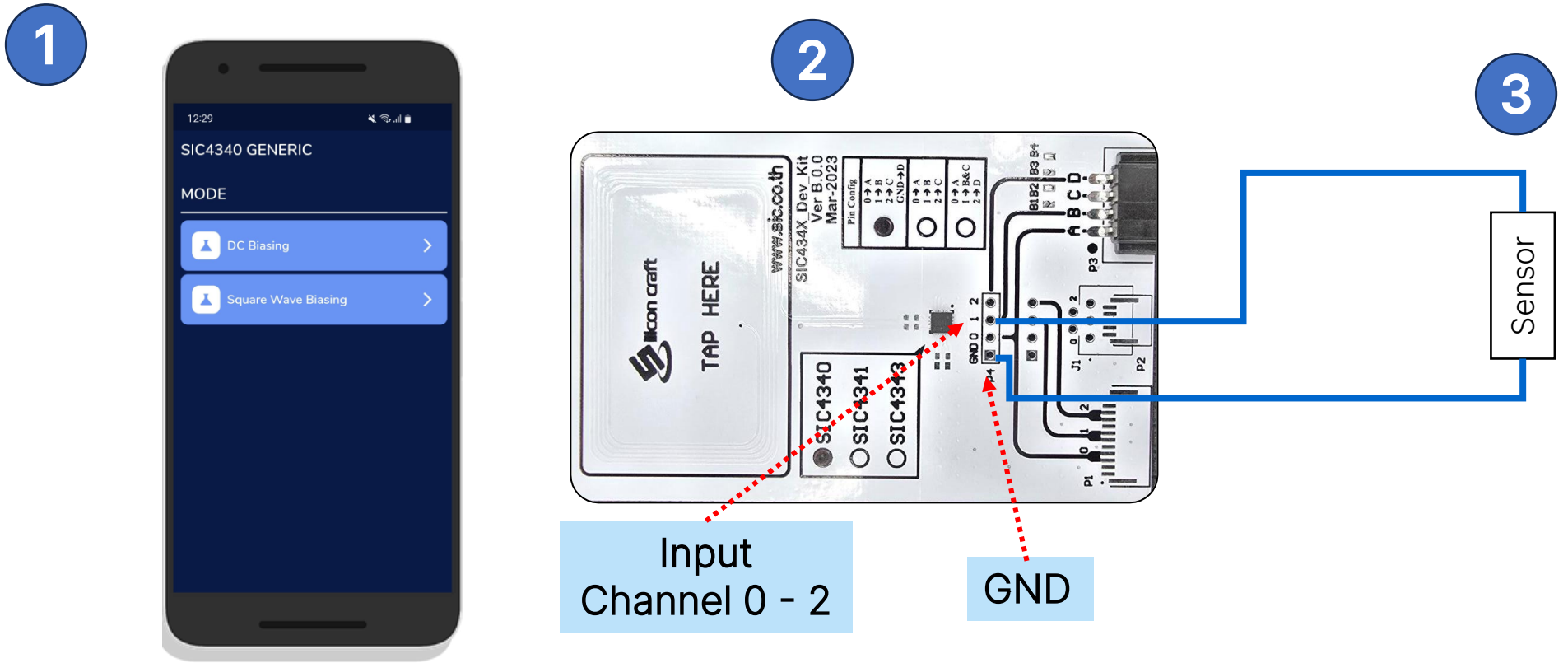
iPhone



App Store download link:
https://apps.apple.com/th/app/sic4340-generic/id6478389759

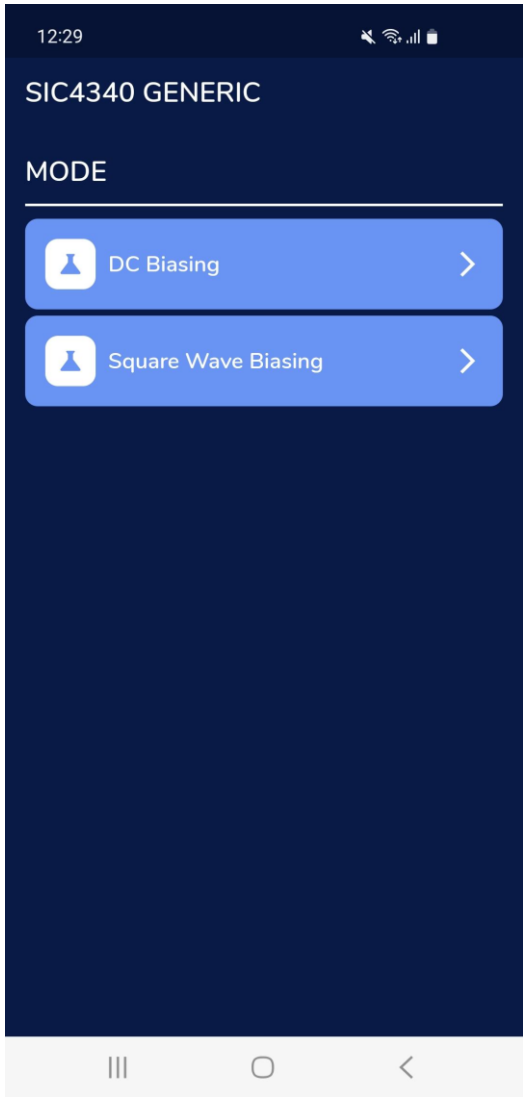
Instruments

1. NFC Smartphone with SIC4343 App
2. SIC4340 Development Kit
3. Sensor



SIC4340
Generic Application

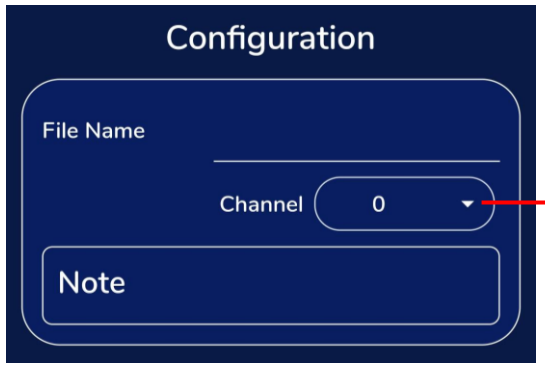
Main Menu



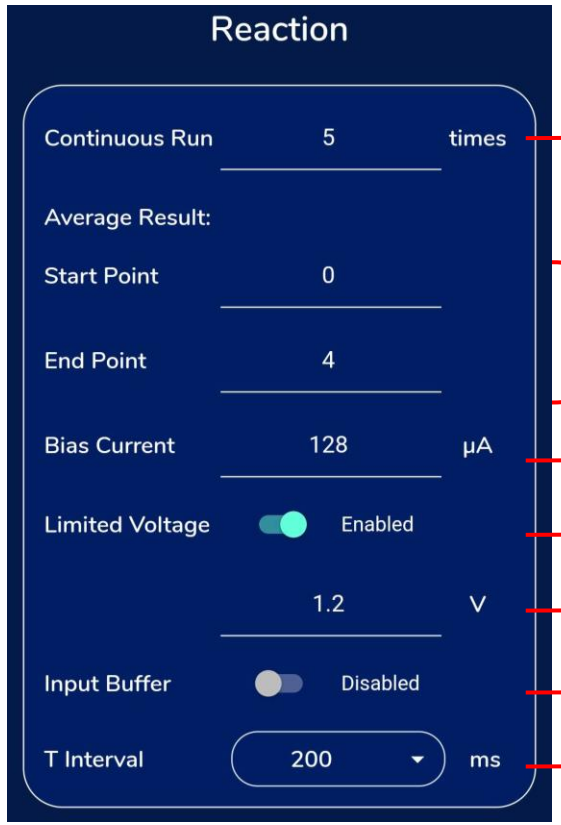
Select the biasing mode

- DC Biasing
- Square Wave Biasing

Setting [DC Biasing]



Set Channel



Set measurement round

Set average result period

Set biasing current

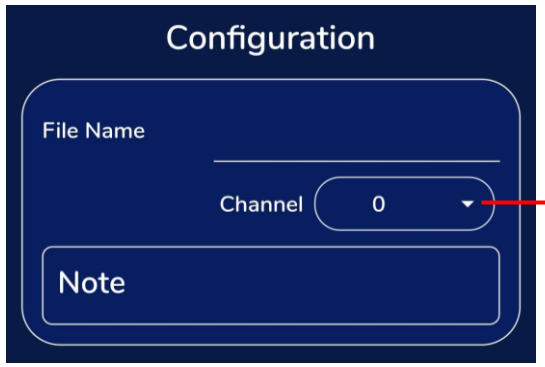
Enable/Disable limited voltage

Set limited voltage value

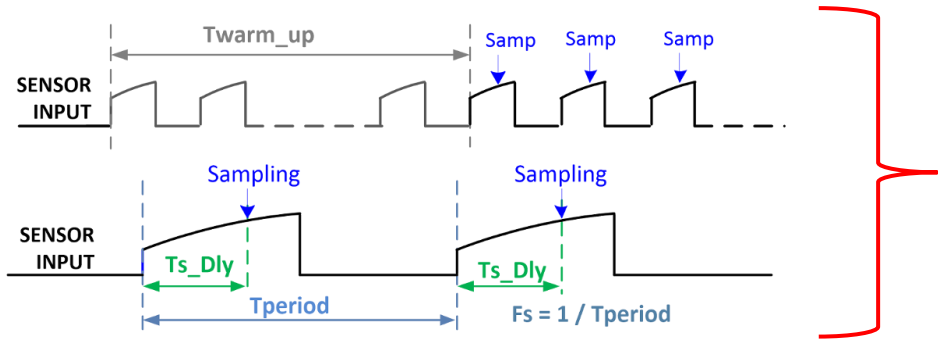
Enable/Disable input buffer

Set interval time

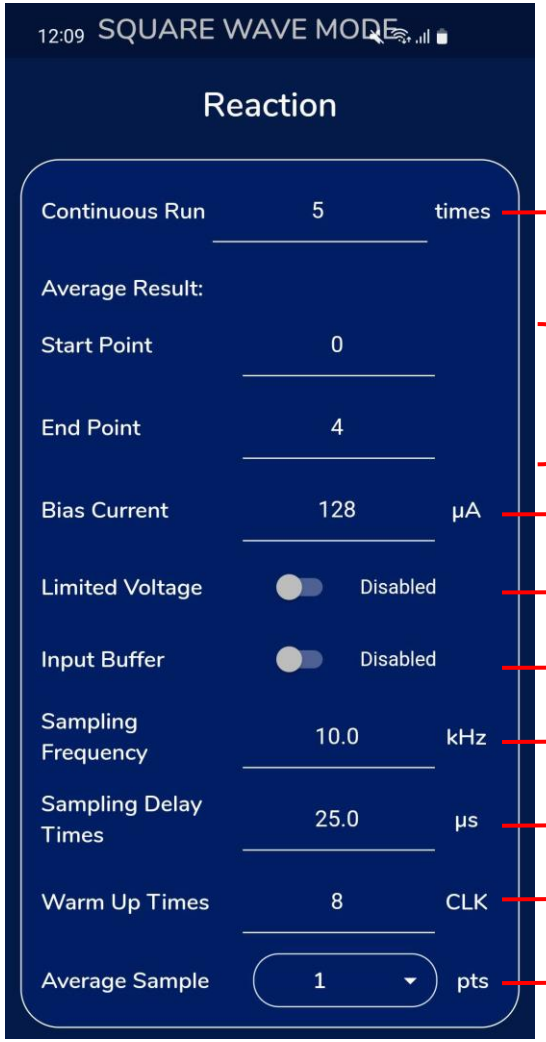
Setting [Square Wave Biasing]



Set Channel



Note: Too long conversion time can cause an error in the app



Set measurement round

Set average result period

Set biasing current

Enable/Disable limited voltage

Enable/Disable input buffer

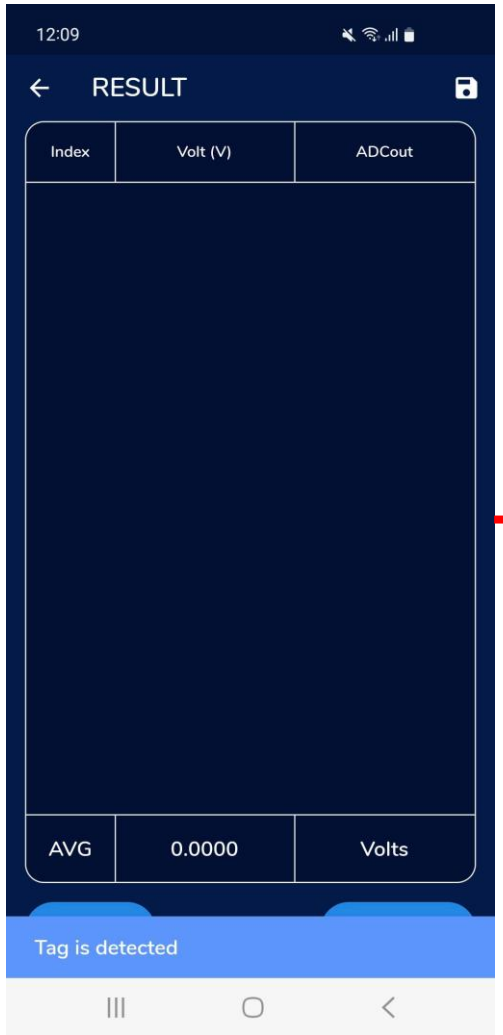
Set sampling frequency (Fs)

Set sampling delay times (Ts_Dly)

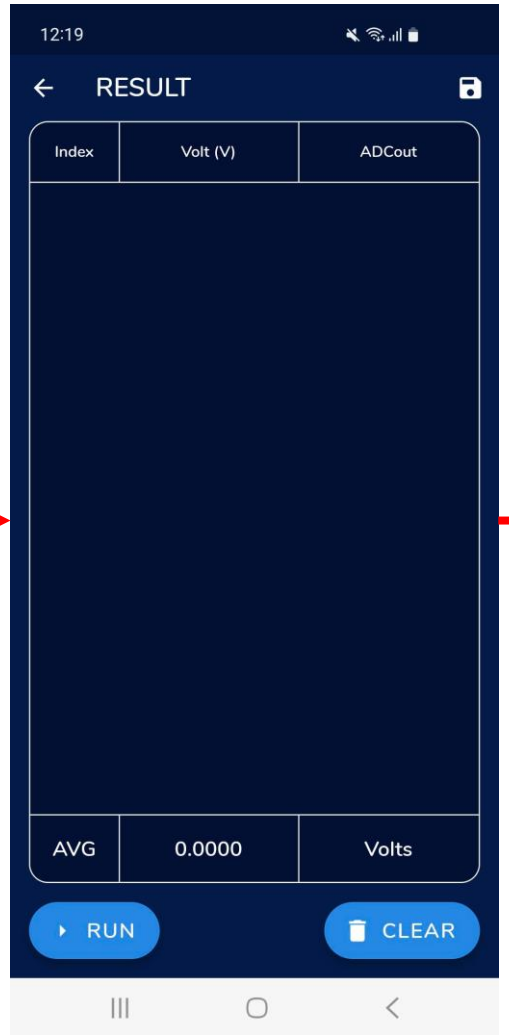
Set warm up times (Twarm_up)

Set number of average points per result

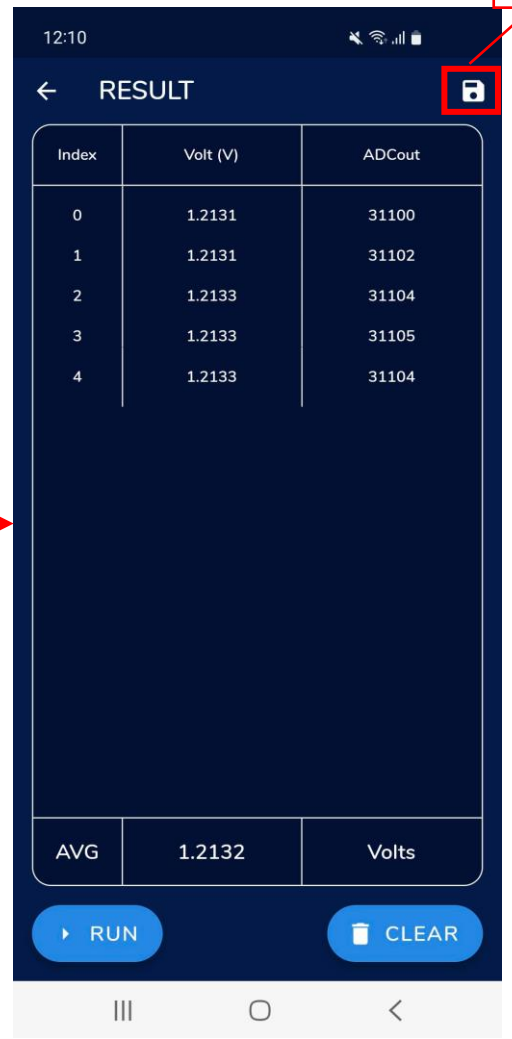
Processing



Connect sensor and Tap mobile on the board



Push ‘RUN’ and wait for measurement

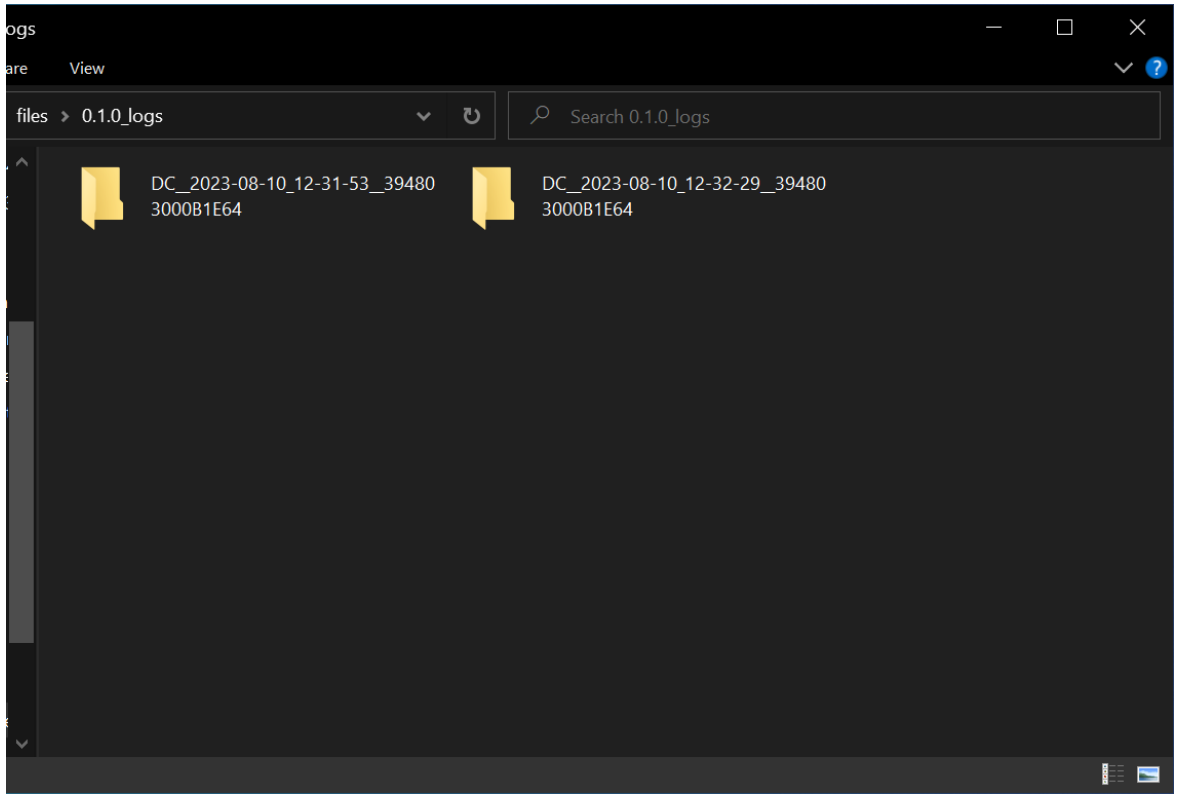


Check the result

Get log files

Connect phone with PC, the log files can be found in

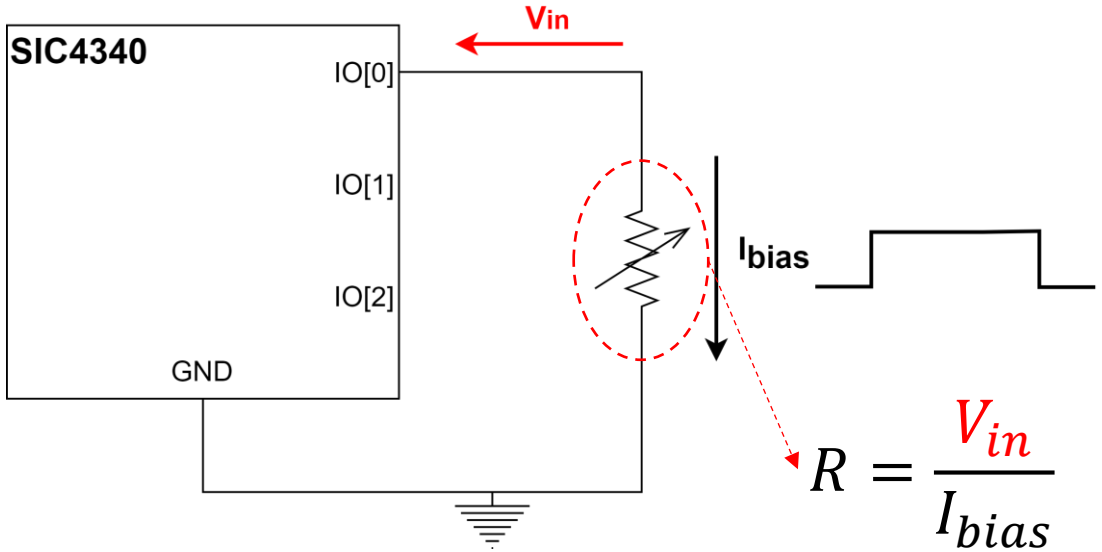
‘\Internal storage\Android\data\th.co.sic.sic4340_generic\files\x.x.x_logs’



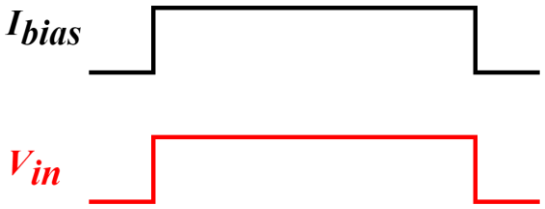
Result Calculation

Resistance Calculation

Resistance can be measured by either ‘DC Biasing’ mode or ‘Square Wave Biasing’ mode



$$R = \frac{V_{in}}{I_{bias}}$$

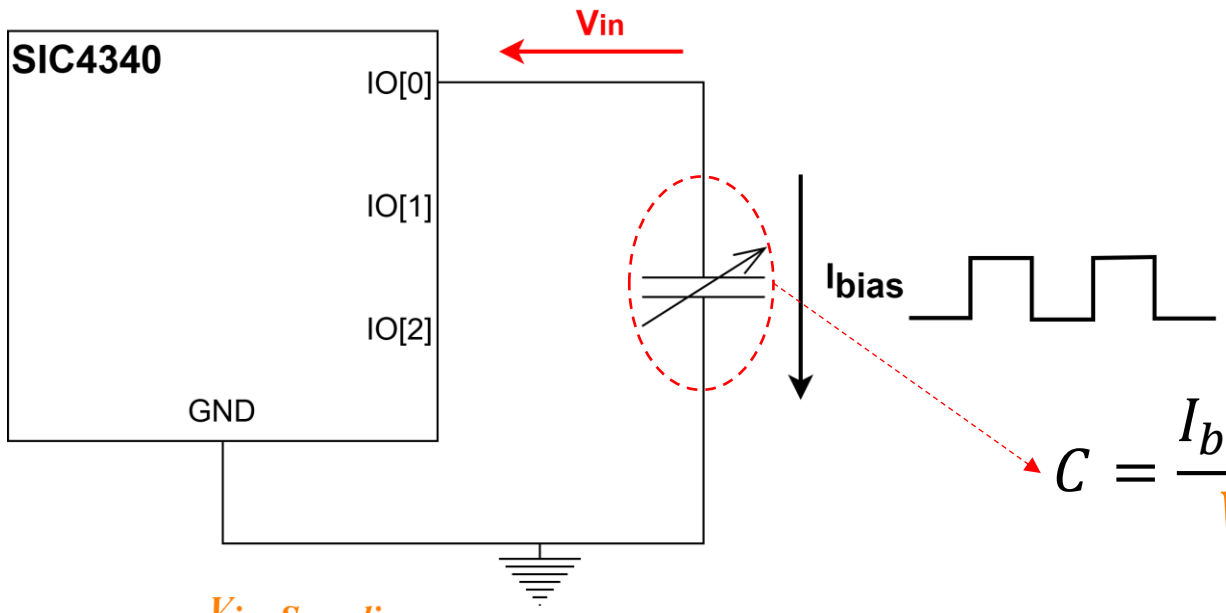


Recommend reliable result when

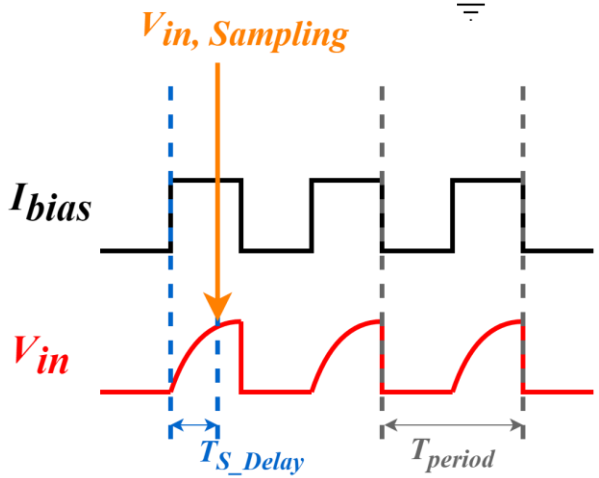
- V_{in}: 0.12V to 1.2V
- I_{bias}: 3μA to 504μA

Capacitance Calculation

Capacitance measurement requires 'Square Wave Biasing' mode



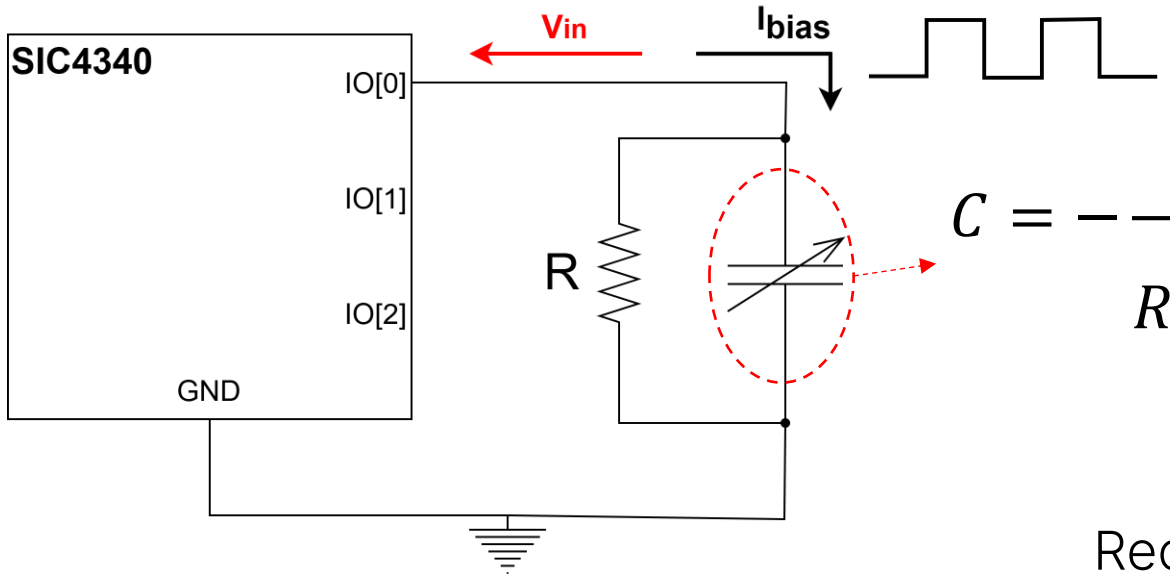
$$C = \frac{I_{bias} \times T_{S\_Delay}}{V_{in,\,Sampling}}$$



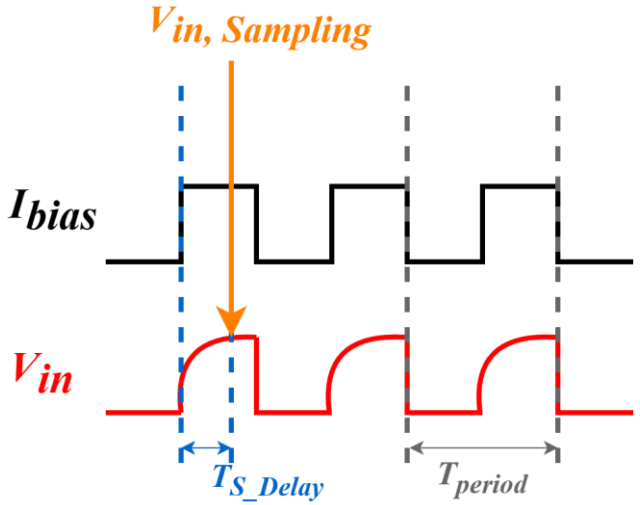
Recommend reliable result when

- $V_{in,Sampling}$: 0.12V to 1.2V
- I_{bias}: 3μA to 504μA
- T_{S_Delay}: >5μs

R//C Calculation



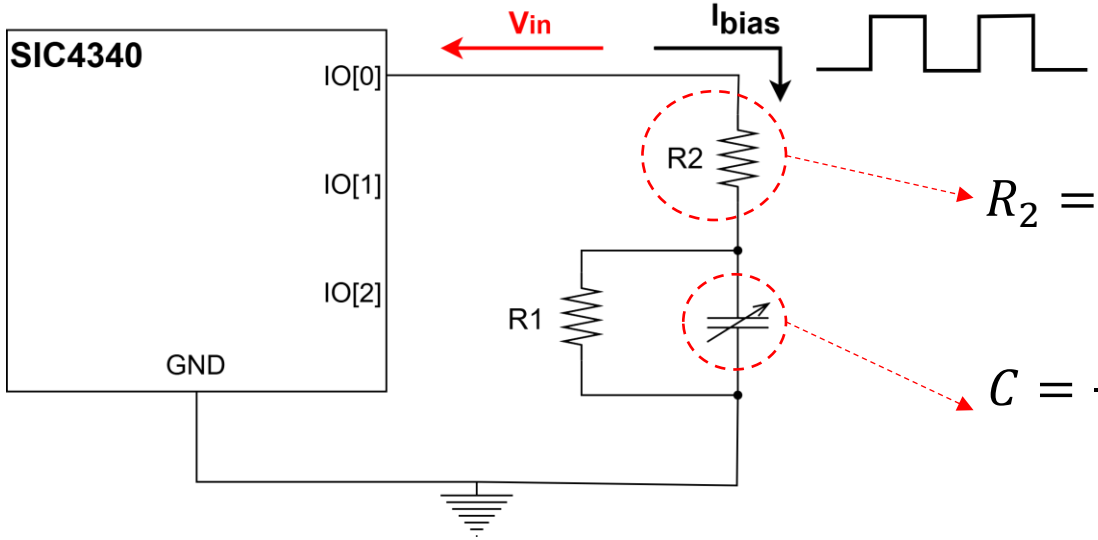
$$C = -\frac{T_{S\_Delay}}{R \cdot \ln\left(1 - \frac{V_{in,Sampling}}{I_{bias} \cdot R}\right)}$$



Recommend reliable result when

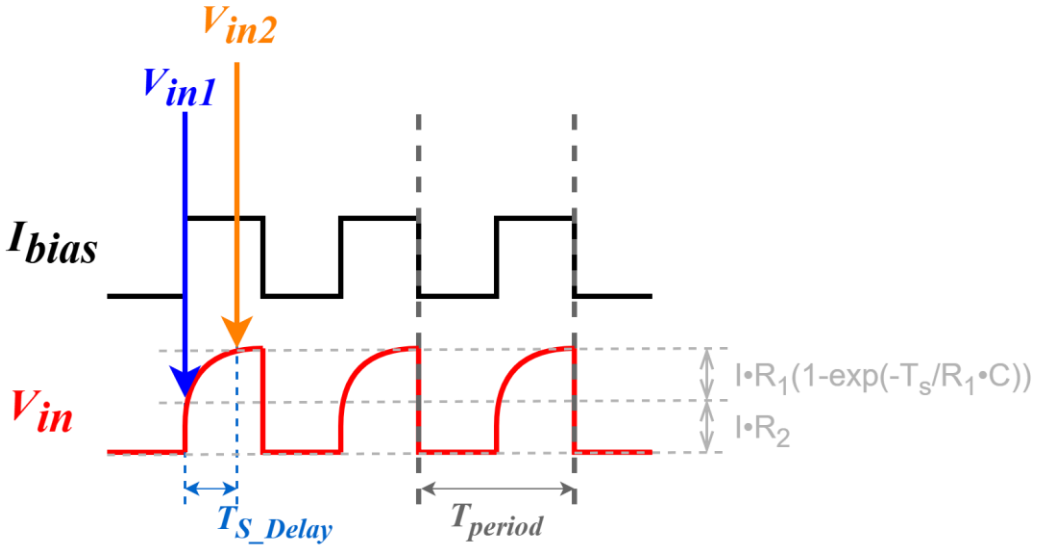
- $V_{in,Sampling}$: 0.12V to 1.2V
- I_{bias}: 3μA to 504μA
- T_{S_Delay}: >5μs

R + R//C Calculation



$$R_2 = \frac{V_{in1}}{I_{bias}} : When\ T_{S\_Delay} = 0\ s$$

$$C = -\frac{T_{S_{Delay}}}{R_1 \cdot \ln\left(1 - \frac{(V_{in2} - V_{in1})}{I_{bias} \cdot R_1}\right)} : When\ T_{S\_Delay} > 5\mu s$$



Recommend reliable result when

- V_{in1}: 0.12V to 1.2V
- V_{in2}: 0.12V to 1.2V
- I_{bias}: 3μA to 504μA

THANK YOU

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