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ScioSense™

UFC
ST Nucleo Shields
Expansion Boards User Guide
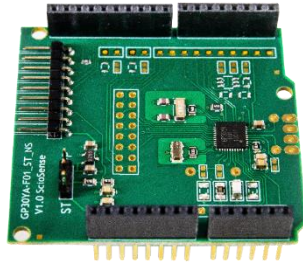
Content Guide

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1   Introduction

ScioSense ultrasonic flow converters are well established in the market as leading solutions as front-ends for time-of-flight ultrasonic flow meters. For those users that design their system based on a ST Microelectronics platform ScioSense offers a series of ST Nucleo shields. Those boards can easily be combined with both, the ST development kits and the ScioSense evaluation kits in combination with the UfcEvaluationSoftware package.

The boards have two rows of connectors that fit into the ST Nucleo boards and additional connector to our PICOPROG interface. Actually, shields are available for TDC-GP30YA-F01 (with flow firmware), AS6031 and AS6040.

Figure 1: Available shields

Product	Material number	Image
GP30YA-F01_ST_NS	220260014	
AS6031-QF_ST_NS	221020007	
AS6040-QF_ST_NS	220500002	

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## 2 Hardware

2.1 Common Hardware Elements
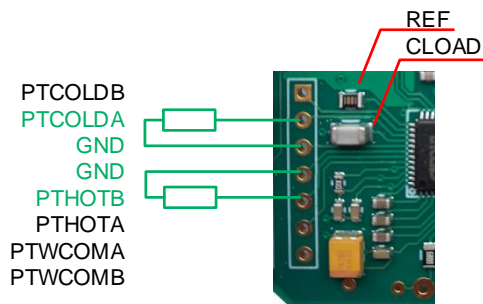
All shields have some interfaces or connectors in common:

- Power selection. Via jumper the user can select whether the 5V supply comes from the ST motherboard or from the ScioSense PICOPROG interface.

From ST Board   From PICOPROG
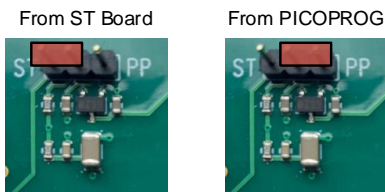
- 9-pin connector to PICOPROG with SPI interface, interrupt, level shifter feedback, power.

- Temperature ports

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PUBLIC INFORMATION
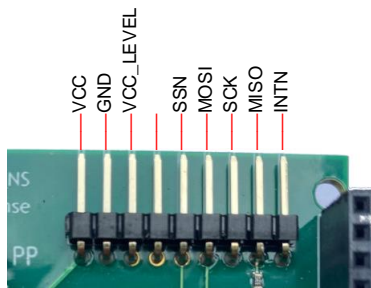
2.2 GP30YA-F01 Shield

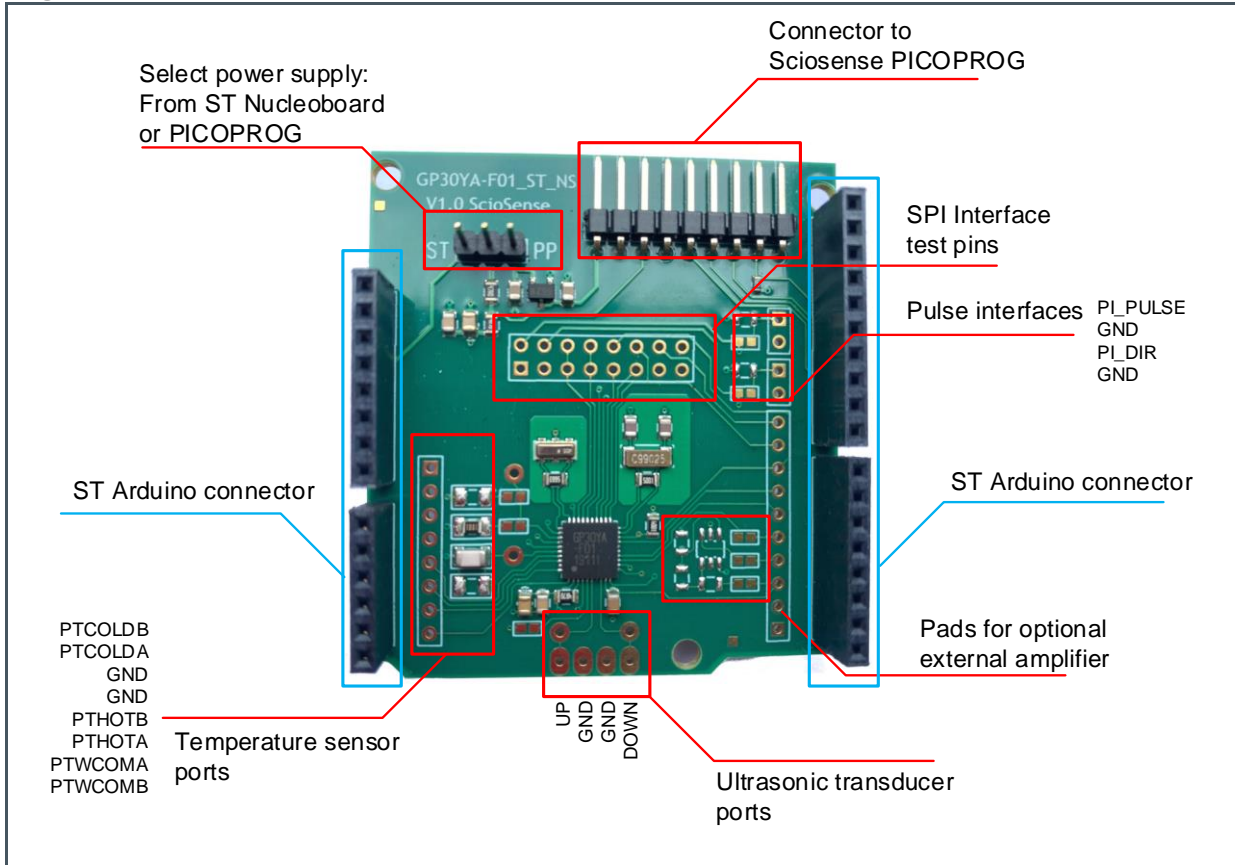This shield is based on TDC-GP30YA-F01 which has a flow firmware on chip.

The following figure shows the main interfaces:

Figure 2: GP30YA-F01 Shield

2.2.1 GP30YA-F01 Layout

Figure 3: GP30YA-F01 Shield layout

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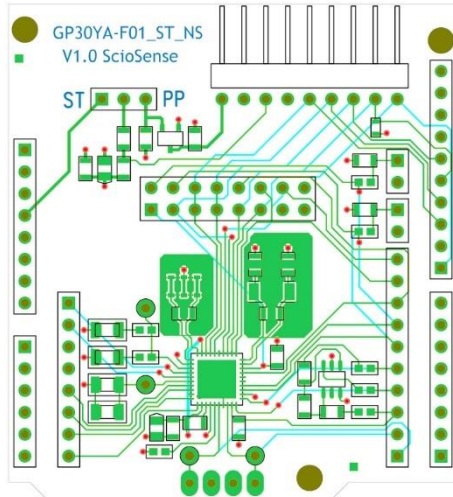
2.2.2 GP30YA-F01 Schematics

The schematic of this boards is mainly a copy of the GP30-DEV reference board.

Figure 4: GP30YA-F01 Shield schematics

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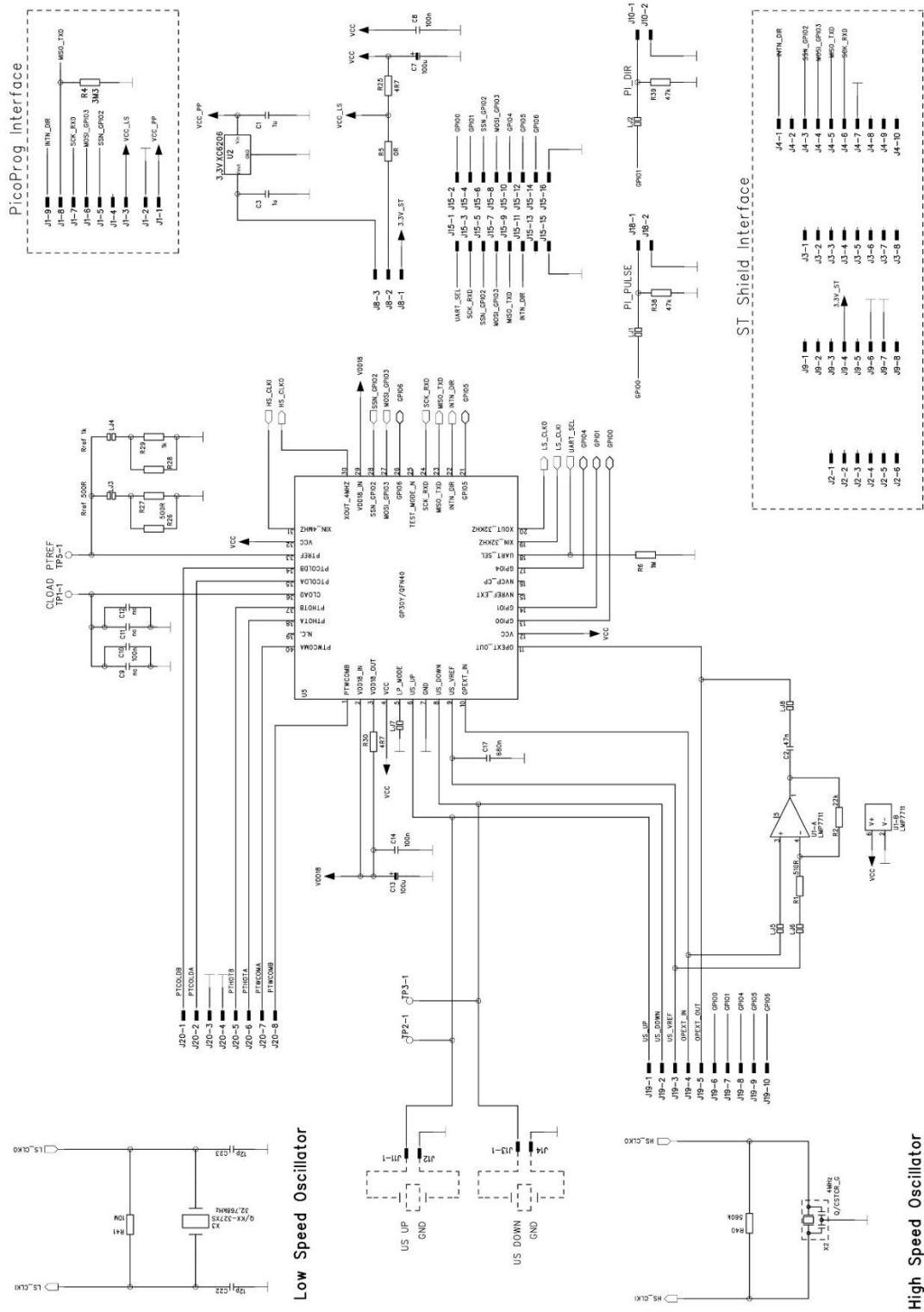
2.3 AS6031 Shield

This shield is based on AS6031-QF_DK_RB. The following figure shows the main interfaces:

Figure 5: AS6031 Shield

2.3.1 AS6031 Layout

Figure 6: AS6031 Shield layout

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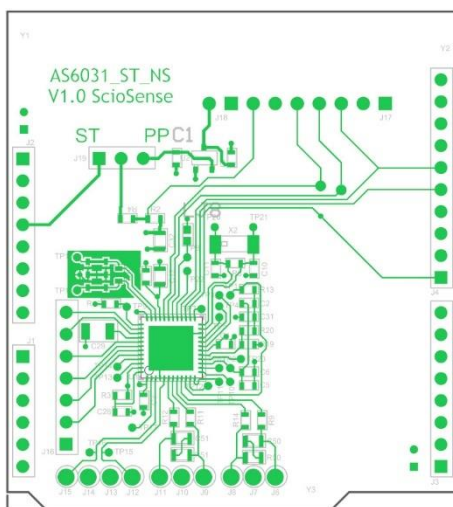
2.3.2 AS6031 Schematics

Figure 7: AS6031 Shield schematics

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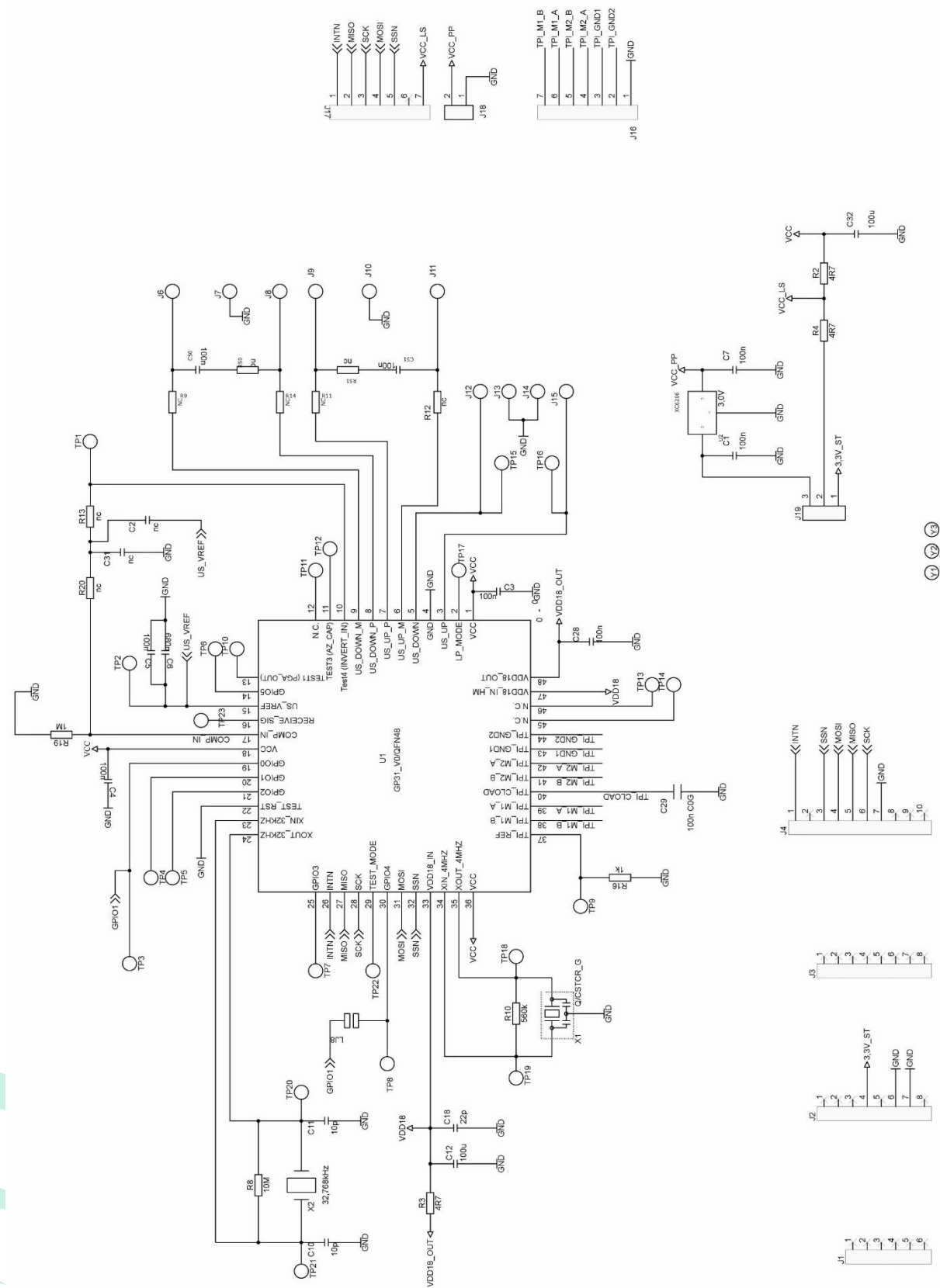
2.4   AS6040 Shield

This shield is based on AS6040-QF_DK_RB.

The following figure shows the main interfaces:

Figure 8: AS6040 Shield

Select power supply:
From ST Nucleoboard
or PICOPROG

Connector to
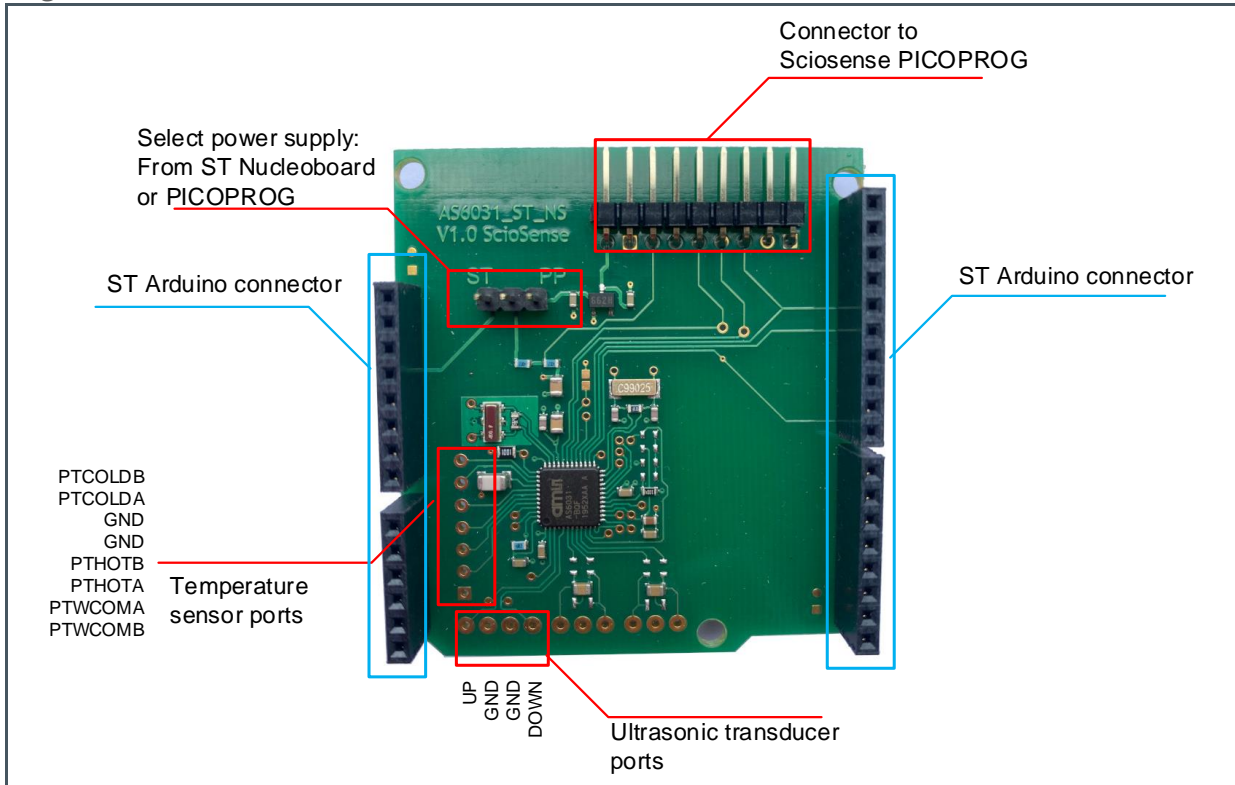Sciosense PICOPROG

ST Arduino connector

ST Arduino connector

PTCOLDB
PTCOLDA
GND
GND
PTHOTB
PTHOTA
PTWCOMA
PTWCOMB

Temperature
sensor ports

Pads for optional
T-filter

UP
GND
GND
DOWN

2 Termination resistors

Ultrasonic transducer
ports
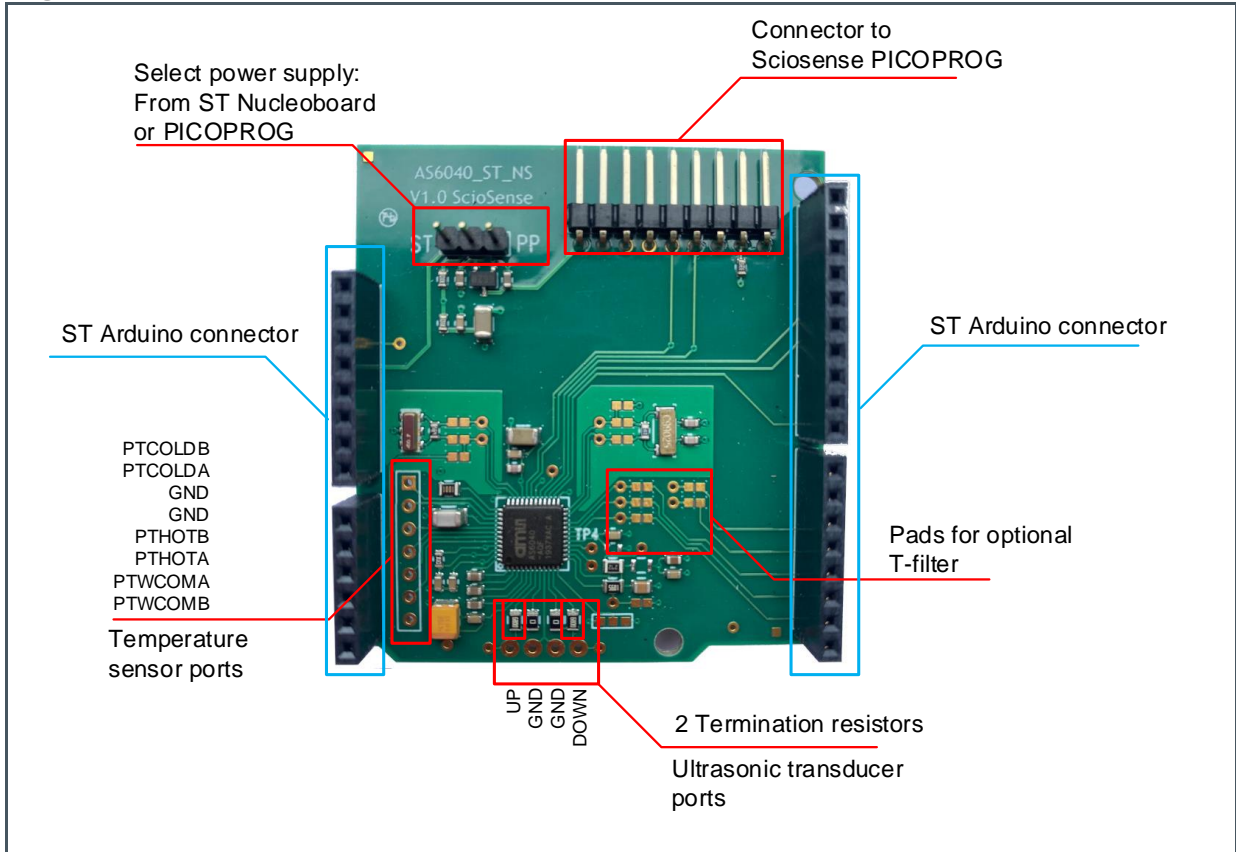
2.4.1   AS6040 Layout

Figure 9: AS6040 Shield layout

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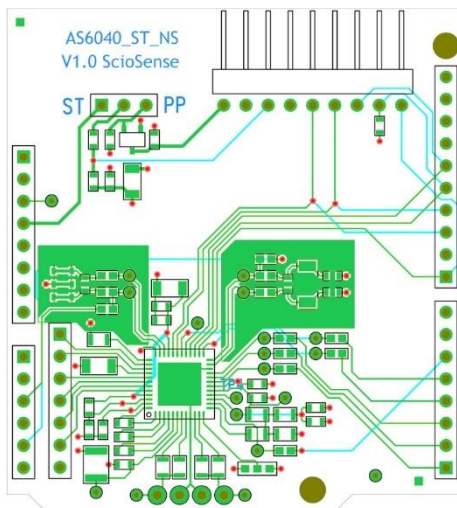
2.4.2   AS6040 Schematics

Figure 10: AS6040 Shield layout

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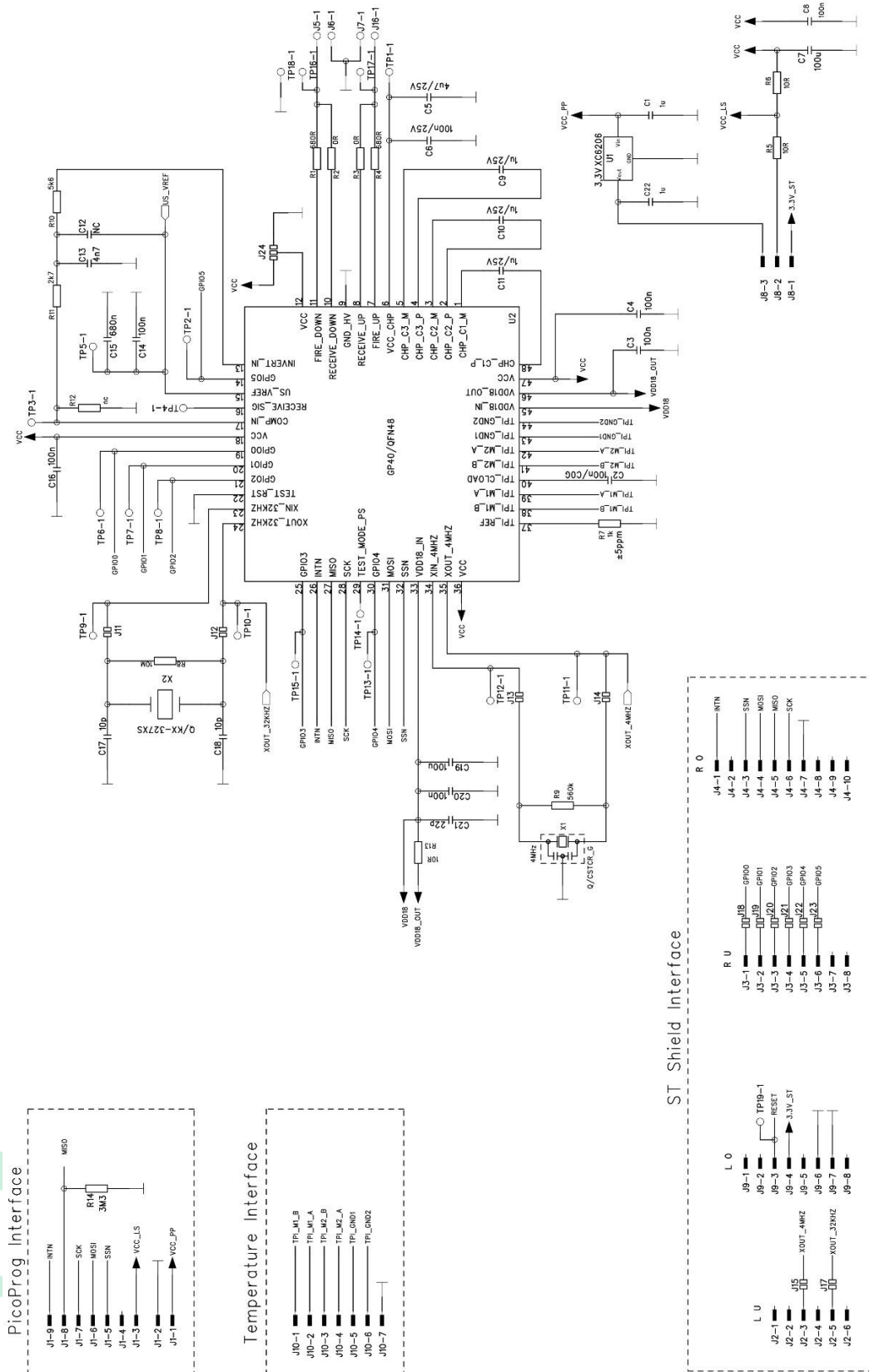
3   Software

ScioSense provides a common sample software package for the three UFC chips.

📁 ScioSense_UFC_ST_NS package
  📁 _cfg
  📁 _Src_Lib
  📁 Core
  📁 Debug
  📁 ST-Link USB driver
  📄 ScioSense_UFC_ST_NS.ioc
  📄 ScioSense_UFC_ST_NS

The main program is found in the \Core\Src folder.

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5   Revision Information

Table 1: Revision History

Revision	Date	Comment	Page
1	July 2021	Initial Version	

Note(s) and/or Footnote(s):

1. Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.

2. Correction of typographical errors is not explicitly mentioned.

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