

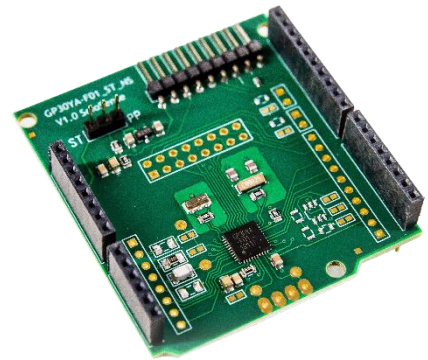
DRAFT



# UFC

## ST Nucleo Shields

### Expansion Boards User Guide



**UFC\_ST\_Nucleo\_Shields**

Revision: C

Release Date: 2021-07-08

## Content Guide

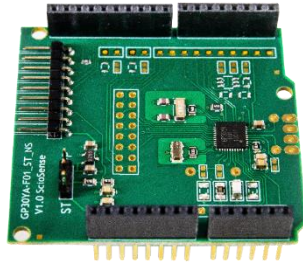


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## 1 Introduction

SciSense 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 SciSense offers a series of ST Nucleo shields. Those boards can easily be combined with both, the ST development kits and the SciSense 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**

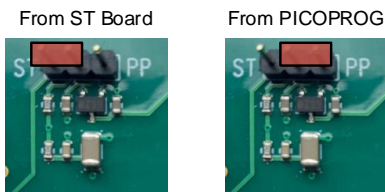
Product	Material number	Image
GP30YA-F01_ST_NS	220260014	
AS6031-QF_ST_NS	221020007	
AS6040-QF_ST_NS	220500002	

## 2 Hardware

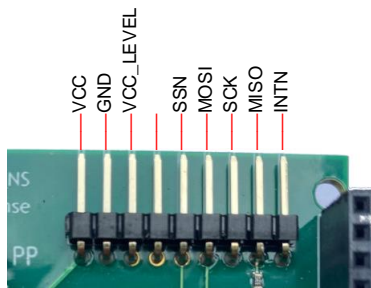
### 2.1 Common Hardware Elements

All shields have some interfaces or connectors in common:

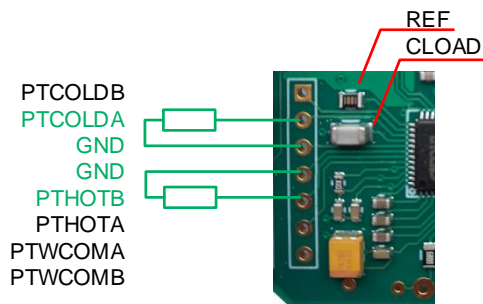
- Power selection. Via jumper the user can select whether the 5V supply comes from the ST motherboard or from the SciSense PICOPROG interface.



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



- Temperature ports

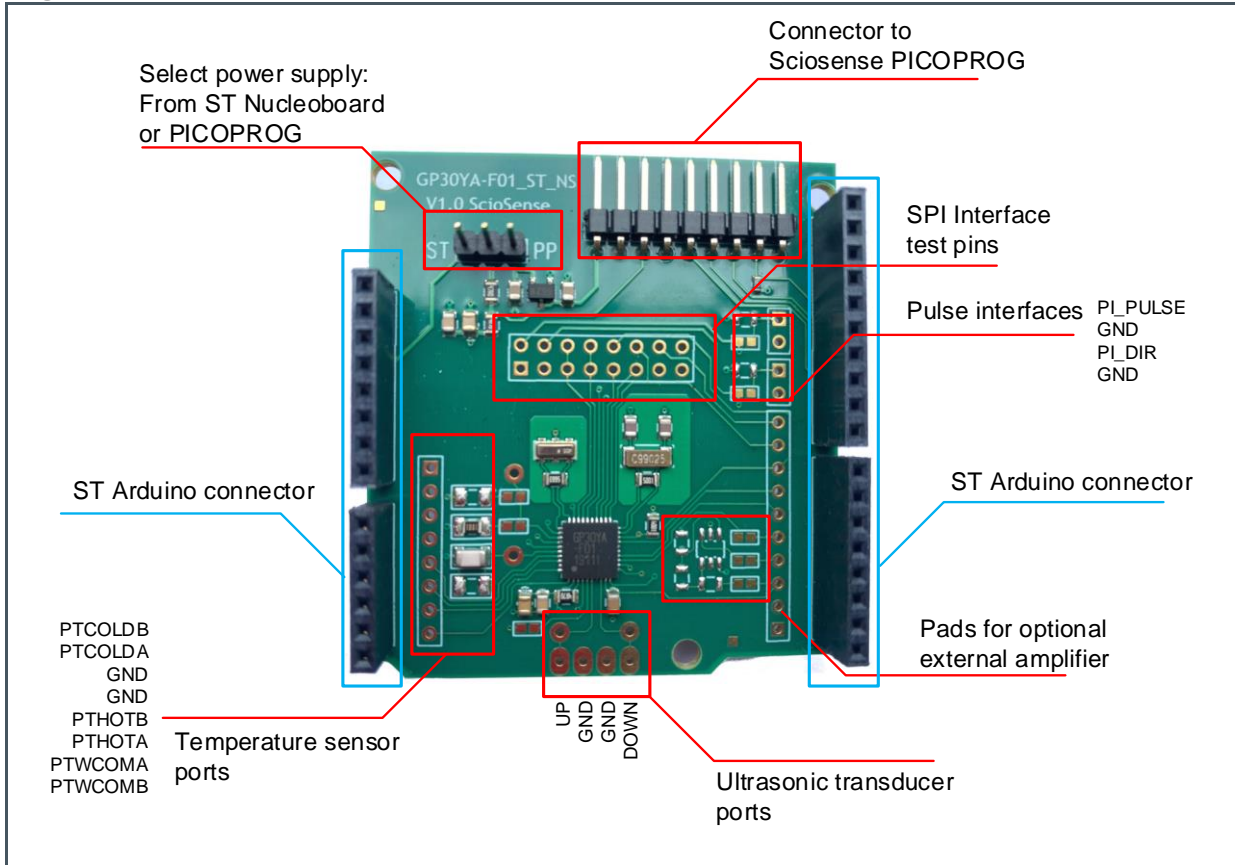


## 2.2 GP30YA-F01 Shield

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

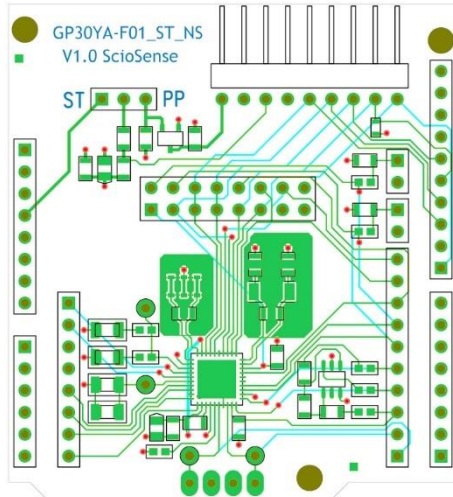
The following figure shows the main interfaces:

**Figure 2: GP30YA-F01 Shield**



### 2.2.1 GP30YA-F01 Layout

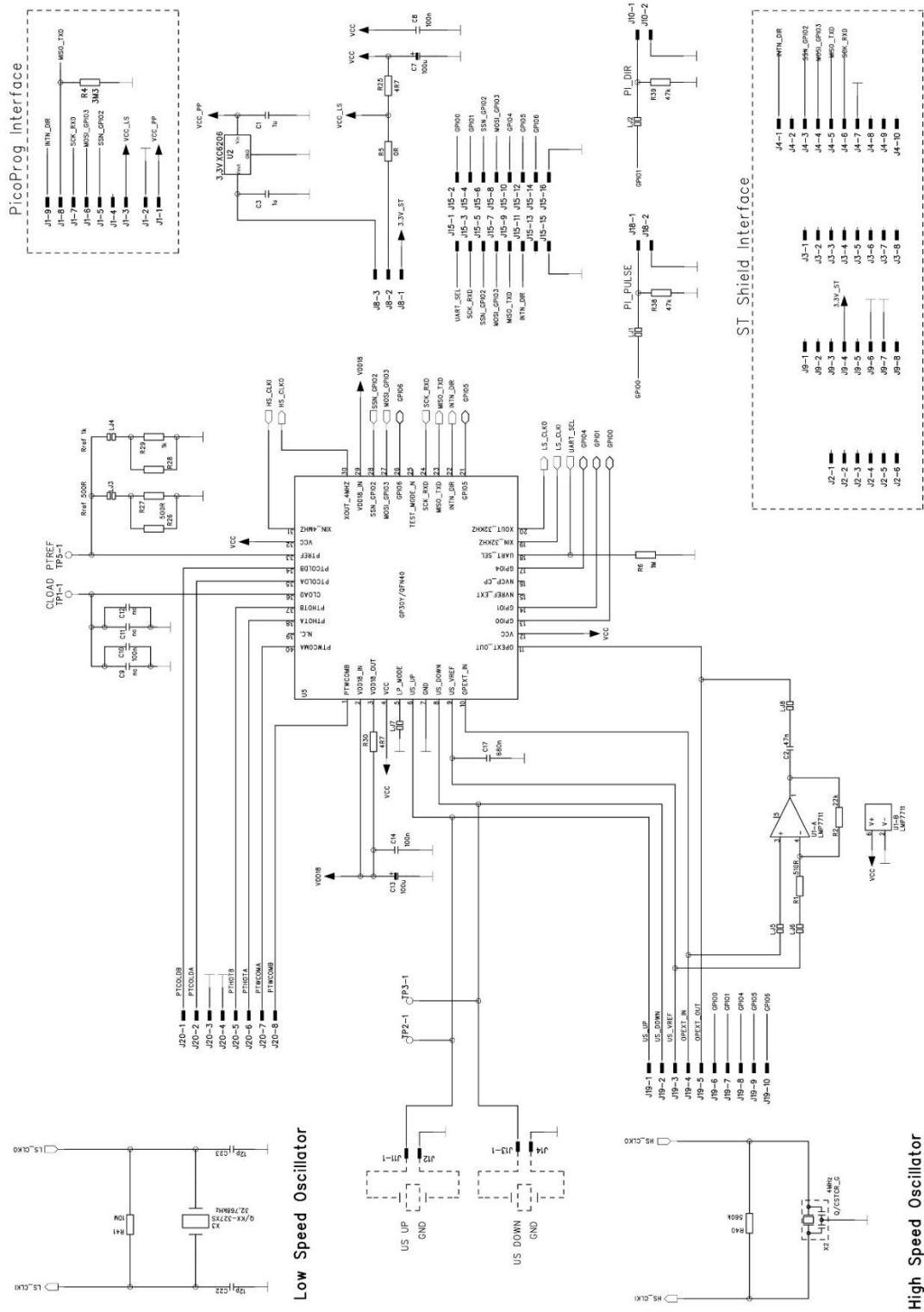
**Figure 3: GP30YA-F01 Shield layout**



## 2.2.2 GP30YA-F01 Schematics

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

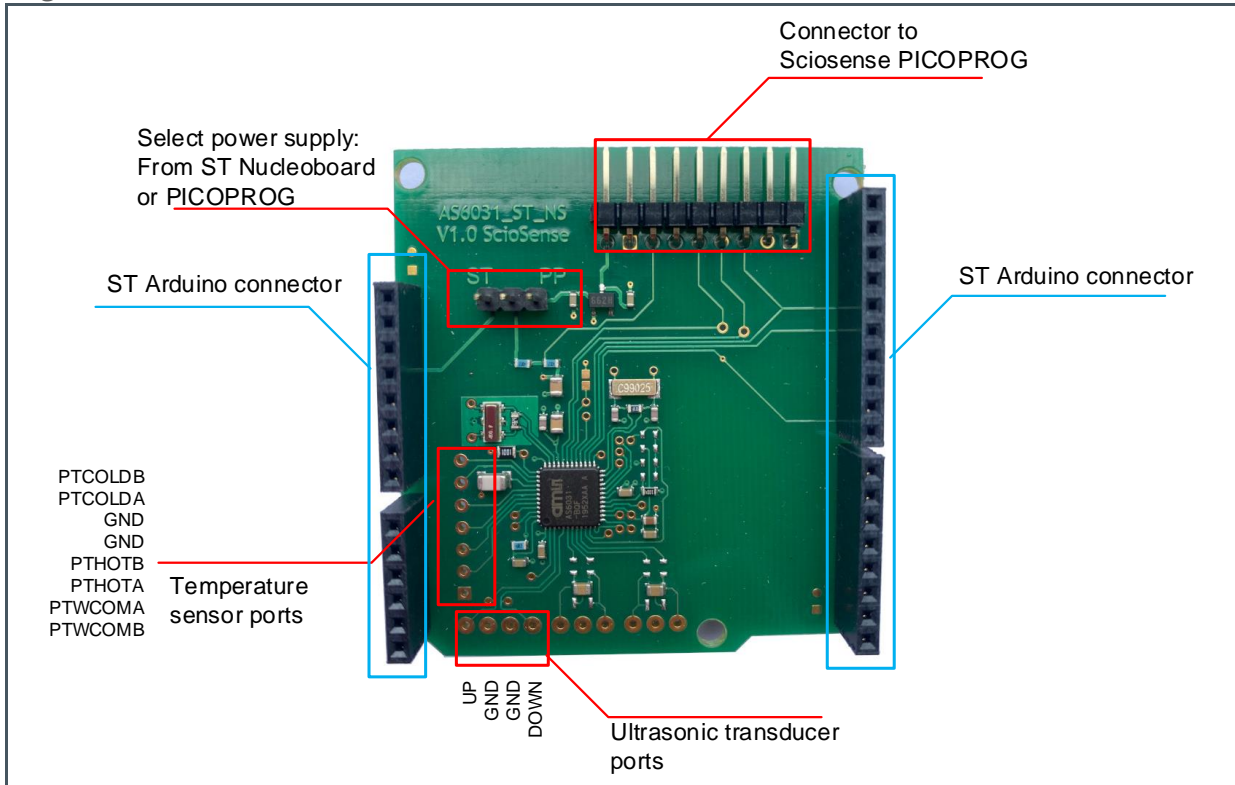
Figure 4: GP30YA-F01 Shield schematics



## 2.3 AS6031 Shield

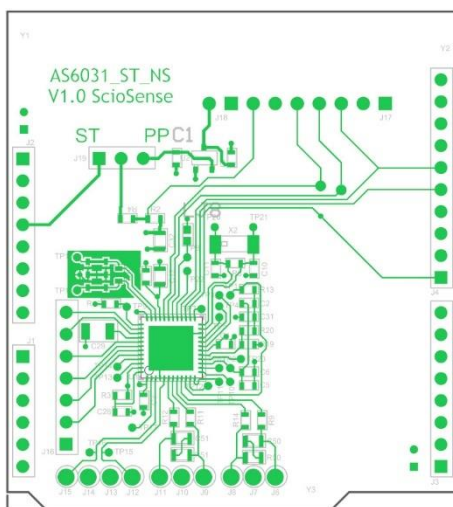
This shield is based on AS6031-QF\_DK\_RB. The following figure shows the main interfaces:

Figure 5: AS6031 Shield



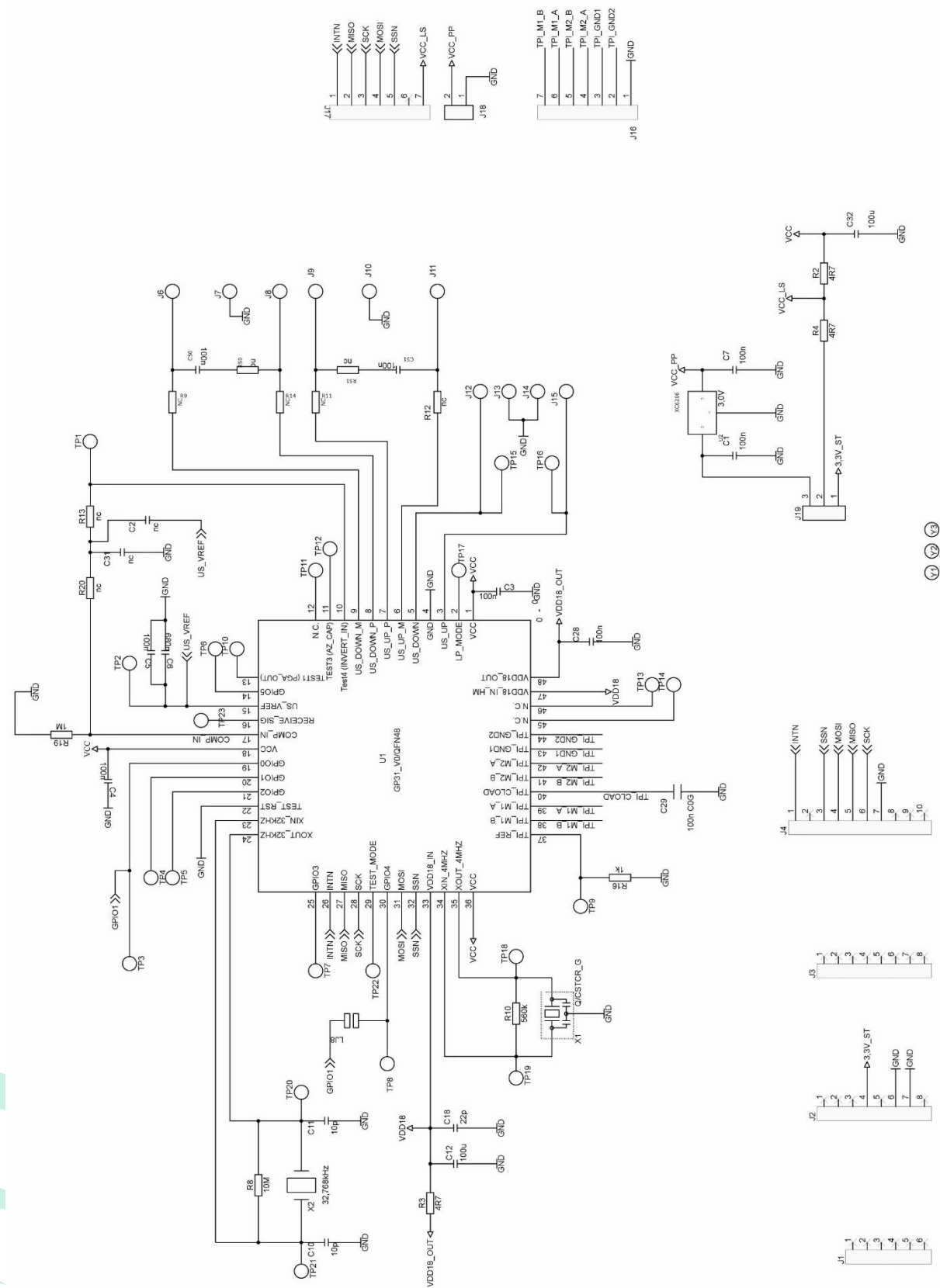
### 2.3.1 AS6031 Layout

Figure 6: AS6031 Shield layout



## 2.3.2 AS6031 Schematics

Figure 7: AS6031 Shield schematics



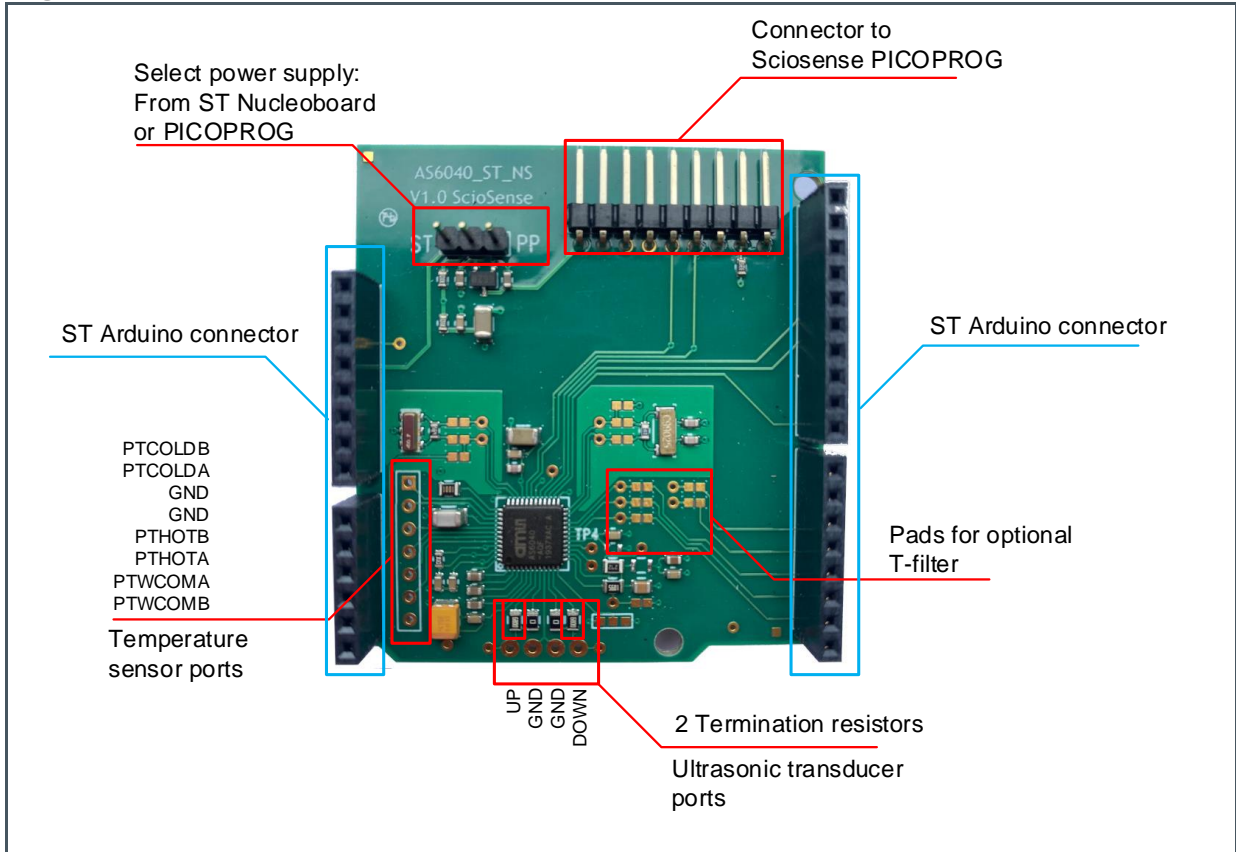


## 2.4 AS6040 Shield

This shield is based on AS6040-QF\_DK\_RB.

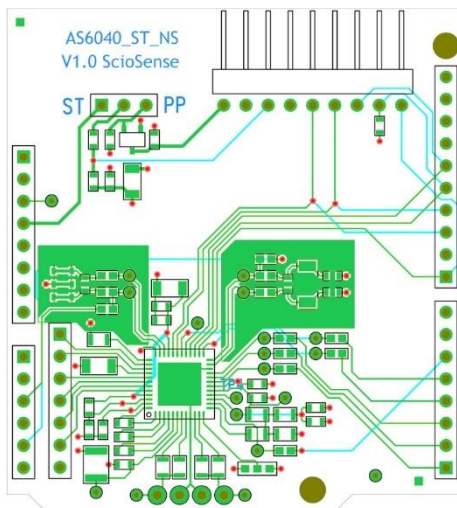
The following figure shows the main interfaces:

**Figure 8: AS6040 Shield**



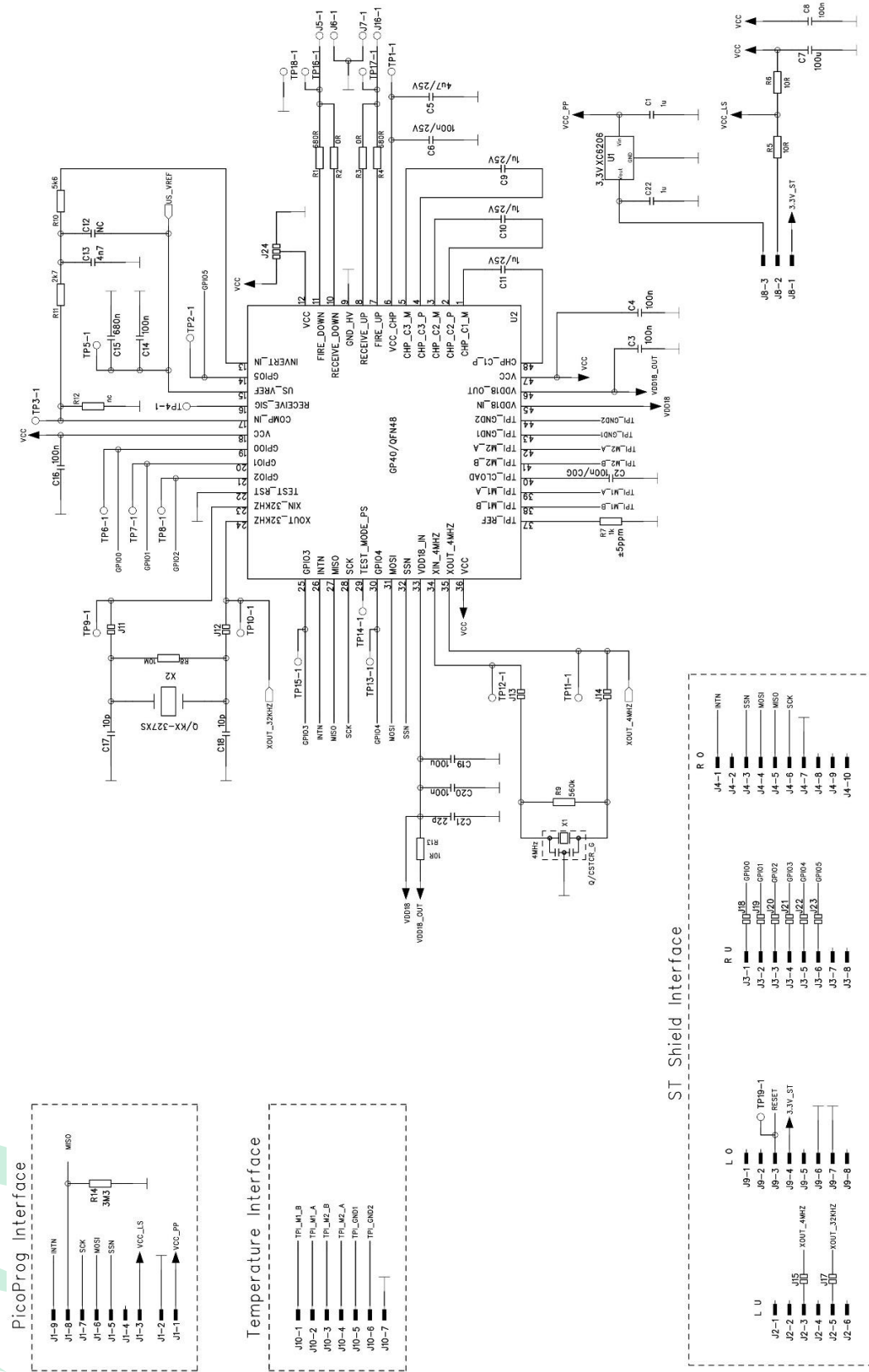
### 2.4.1 AS6040 Layout

**Figure 9: AS6040 Shield layout**



## 2.4.2 AS6040 Schematics








Figure 10: AS6040 Shield layout



## 3 Software

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

### SciSense\_UFC\_ST\_NS package

-  \_cfg
-  \_Src\_Lib
-  Core
-  Debug
-  ST-Link USB driver
-  SciSense\_UFC\_ST\_NS.ioc
-  SciSense\_UFC\_ST\_NS

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

## 4 Copyrights & Disclaimer

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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.