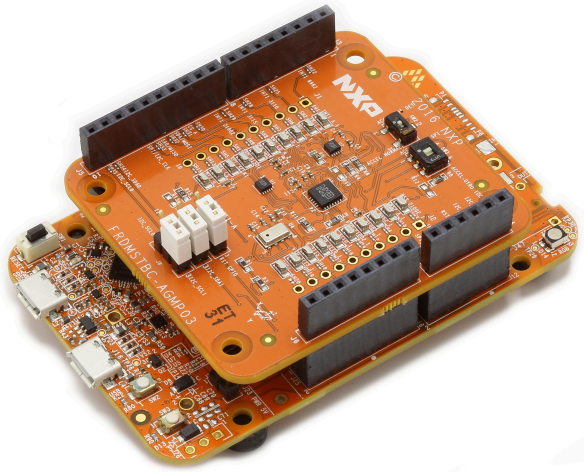
UM11588

Introduction to FRDM-K22F-AGMP03 sensor toolbox development kit

Rev. 1.0 — 24 March 2021 User manual



1 Introduction

2 Finding kit resources and information on the NXP website

NXP Semiconductors provides online resources for this evaluation board and its supported device(s) on the sensors evaluation boards page.

The information page for the FRDM-K22F-AGMP03 sensor toolbox development kit is available at www.nxp.com/FRDM-K22F-AGMP03. The information page provides overview information, documentation, software and tools, ordering information and a Getting Started tab. The Getting Started tab provides quick-reference information applicable to using the FRDM-K22F-AGMP03 development kit, including the downloadable assets referenced in this document.

2.1 Collaborate in the NXP Sensors Community

The NXP Sensors Community is for sharing ideas and tips, asking and answering technical questions, and receiving input on just about any topics related to NXP sensors.

NXP Sensors Community is at https://community.nxp.com/t5/Sensors/bd-p/sensors

3 Getting started

3.1 Kit contents

The **FRDM-K22F-AGMP03** sensor toolbox development kit include:

- FRDM-STBC-AGMP03: multi-sensor shield board
- FRDM-K22F: MCU board
- USB cable
- Quick Start Guide

3.2 Developer resources

In addition to the kit, the following developer resources are recommended to jump-start your evaluation or development using FRDM-K22F-AGMP03 board:

- Get Started with IoT Sensing SDK
- Get Started with STB-CE
- Get Started with FreeMASTER-Sensor-Tool

4 Getting to know the hardware

4.1 General description

The FRDM-K22F-AGMP03 is combination of a multi-sensor add-on/companion shield board (FRDM-STBC-AGMP03) with accelerometer, magnetometer, gyroscope and pressure-sensing capabilities and a FRDM MCU (FRDM-K22F) board.

The multi-sensor shield board include the following sensor parts:

- FXLS8962AF: 3-axis digital accelerometer
- MPL3115: digital pressure/altimeter sensor
- FXAS21002C: 3-axis digital angular rate gyroscope (no longer manufactured)
- MAG3110: 3-axis digital magnetometer (no longer manufactured)

The FRDM-K22F-AGMP03 board enables quick customer evaluation of FXLS896xAF using sensor toolbox enablement SW and tools.

Refer to section 2.3 of the *FRDM-K22F-AGMP03 Getting Started* document to get more details on board components.

4.2 Features

- Sensor toolbox development kit with a variety of sensors and compatible software tools for NXP's 10-axis sensor solution
- Sensor evaluation and development kit for FXLS896xAF
- Enables quick sensor evaluation and helps accelerate quick prototyping and development using NXP sensors
- Compatible with Arduino® and most NXP Freedom development boards
- Allows evaluation of current consumption and pin voltage characteristics
- Supports I2C and SPI communication interface with host MCU
- Supports hardware configurability to switch between accelerometer mode (normal vs. motion detect) and I2C/SPI interface mode
- Has multiple test points on the board

4.3 Board functions

The combination of a multi-sensor shield development board and a freedom development MCU board enables a complete solution for quick sensor evaluation, prototyping and development using a sensor toolbox development ecosystem.

The FRDM-STBC-AGMP03 has been designed to be fully Arduino I/O header compatible and optimized for the operating conditions. The FRDM-STBC-AGMP03 sensor shield board gets powered up by a FRDM-K22F MCU board by stacking the shield board on top of the MCU board using the Arduino I/O headers. See Figure 1. The FRDM-K22F-AGMP03 gets power by connecting the Sensor Demonstration Kit to the PC via the USB cable. Plug the cable in the OpenSDA USB port on the board and the USB connector on the PC.

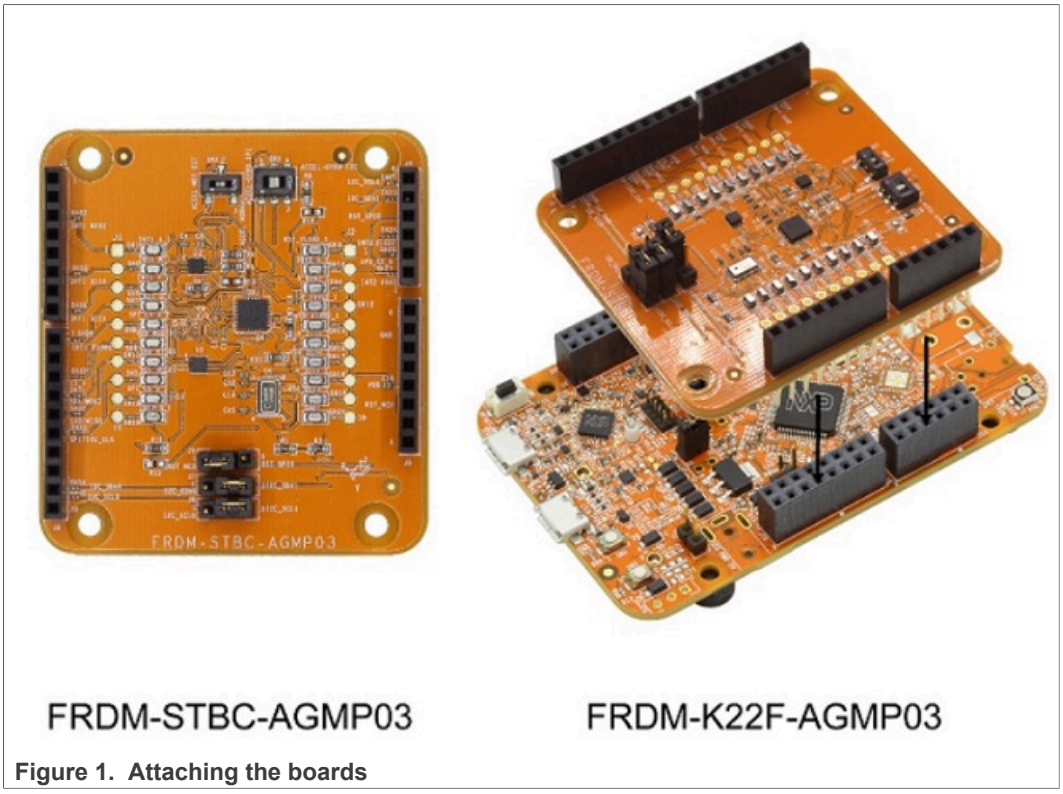


Figure 1. Attaching the boards

The FRDM-STBC-AGMP03 helps accelerate sensor evaluation by using the STB-CE and FreeMASTER-Sensor-Tool software tools. This combination of hardware and software enables end users to move through each phase of product development quickly and increase ease-of-use.

4.4 Featured components

The FRDM-K22F-AGMP03 sensor toolbox development kit features the following components:

- FXLS8962AF: 3-axis digital accelerometer
- MPL3115: digital pressure/altimeter sensor
- FXAS21002C: 3-axis digital angular rate gyroscope (no longer manufactured)
- MAG3110: 3-axis digital magnetometer (no longer manufactured)

4.5 Schematics

The design files for the FRDM-STBC-AGMP03 sensor shield board are available at the FRDM-K22F-AGMP03 boards page in the Design Resources section. A snapshot of the schematic is provided in Figure 2:

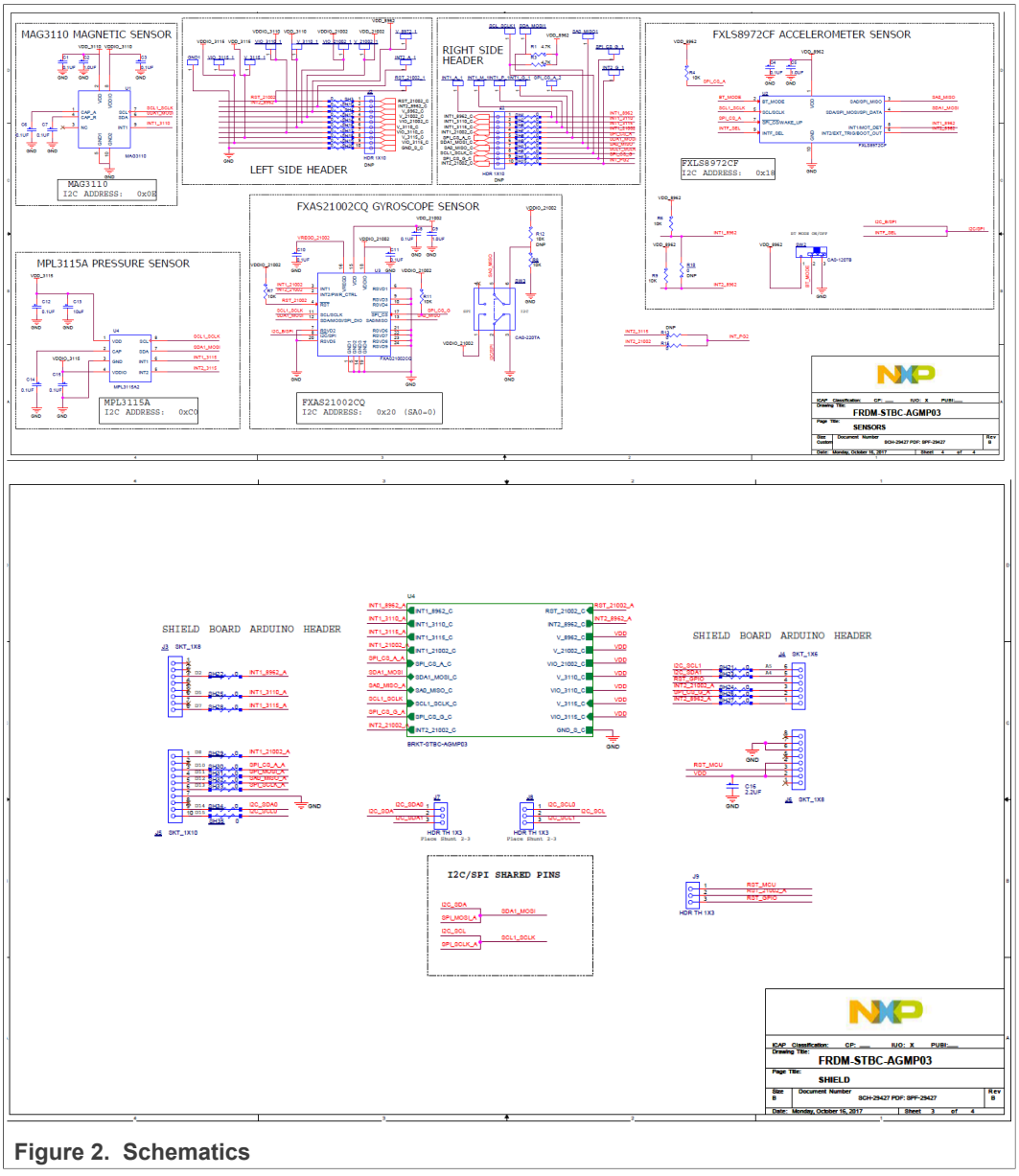


Figure 2. Schematics

5 References

[1]	**Sensor Evaluation Boards**	Sensor Toolbox Development Kits	https://www.nxp.com/design/sensor-developer-resources/sensor-toolbox-sensor-development-ecosystem/evaluation-boards:SNSTOOLBOX
[2]	**IoT Sensing SDK: framework enabling embedded development using sensors**	ISSDK	https://www.nxp.com/design/software/development-software/sensor-toolbox-sensor-development-ecosystem/iot-sensing-software-development-kit-issdk-embedded-software-framework:IOT-SENSING-SDK
[3]	**FreeMASTER-Sensor-Tool**	Sensor evaluation and application development software	https://www.nxp.com/design/software/development-software/sensor-toolbox-sensor-development-ecosystem/freemaster-sensor-tool-for-iot-industrial-medical-sensors:FREEMASTER-SENSOR-TOOL
[4]	**STB-CE**	Sensors visualization and evaluation software	https://www.nxp.com/design/sensor-developer-resources/sensor-toolbox-sensor-development-ecosystem/evaluation-boards:SNSTOOLBOX

Revision history

Rev	Date	Description
1.0	20210324	Initial version

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