

Sidekiq™ Stretch

The Sidekiq family of products represents the state-of-the-art in small form-factor software defined radio (SDR) transceiver solutions. The Sidekiq Stretch is a tiny, highly-integrated and highly compatible RF powerhouse in this product family, packing the hardware that would traditionally require three separate cards into a single, small form factor radio module. The embeddable card uses Analog Devices' AD9361 RFIC for high performance and flexibility and adds both a GPS disciplined oscillator (GPSDO) for excellent long-term positioning accuracy and tunable Rx pre-select filtering for optimum interference protection. These and other integrated features such as on-card programmable logic and a PCIe interface create a complete, high performance, low latency, wideband SDR transceiver in a tiny M.2 2280 card. In this form factor, Sidekiq Stretch can be used in millions of host devices where a PCIe-based NVMe® solid state drive (SSD) is supported. Sidekiq Stretch's small size, high compatibility, and high level of performance radically simplifies product development and makes it an ideal choice for use in field applications where low size, weight, and power (SWaP) are critical.

The Sidekiq Stretch is offered in two form factors:

- **Standard Sidekiq Stretch (22mm x 80mm) card.** This card is ready for integration into a host computing device with a compatible M.2 2280 slot.
- **Thunderbolt 3 (TB3) Platform.** A standard Sidekiq Stretch card integrated into a TB3 carrier with a small enclosure that provides SMA ports for RF, and a TB3 compatible USB-C connector for both power and connectivity to the host.



Actual Size



Sidekiq Stretch shown in Thunderbolt™ 3 housing

Using Sidekiq Stretch is facilitated with the Sidekiq Platform Development Kit (PDK).^{*} Customers have access to both a software API for interfacing to the card, as well as the source code for the FPGA reference design for customization. The software API provides an easy-to-use interface for configuring the RF transceivers and streaming data between the host and Sidekiq Stretch over the PCIe interface. Advanced users can add their own processing blocks to the FPGA to significantly increase the signal processing capabilities of the system.

KEY FEATURES

- » RF tuning range: 70 MHz to 6 GHz
- » Up to 50 MHz RF bandwidth per channel
- » Sub-octave Rx pre-select filtering for interference protection from 150 MHz to 6 GHz
- » Supports 1Tx + 1Rx
- » Integrated FPGA for custom signal processing
- » Integrated GPSDO receiver with PPS for high accuracy
- » M.2 2280 key B+M form factor
- » PCIe Gen2 x1 (5 Gbps) interface to host
- » Typical power consumption: 2.5W

^{*} Platform Development Kit (PDK) required for initial purchase

RF SPECIFICATION

RF INTERFACE

Antenna Port 1: U.FL coaxial connector supporting Rx

Antenna Port 2: U.FL coaxial connector supporting either Tx or Rx

RF TUNING RANGE

70 MHz to 6 GHz

RF CHANNEL BANDWIDTH

Up to 50 MHz

TYPICAL RX NOISE FIGURE

< 8 dB

TYPICAL RX IIP3

-10 dBm

RX AND TX SAMPLE RATES RANGE

233 Ksamples/sec to 61.44 Msamples/sec

A/D AND D/A CONVERTER SAMPLE WIDTH

12-bits

RX GAIN RANGE

0-76 dB, 1 dB steps

TX GAIN RANGE

0-89 dB, 0.5 dB steps

TYPICAL TX OUTPUT POWER

+10 dBm (+13 dBm < 2 GHz)

GPS

NMEA sentences, PPS output, and frequency-disciplining

Multi-channel GPS and GLONASS/BEIDOU, SBAS, QZSS overlay systems receiver

U.FL antenna input, 3.3V bias for active GPS antenna

EXTERNAL CLOCK REFERENCE

W.FL coaxial input, configurable for 10 MHz or 40 MHz input clock

W.FL coaxial output, 40 MHz signal suitable to drive another Sidekiq module

EXTERNAL PPS

W.FL coaxial input

DIGITAL SPECIFICATION

FPGA

Xilinx Artix 7 XC7A50T FPGA with x1 Gen2 PCIe interface to host

FPGA REPROGRAMMING

Over PCIe (supports partial reconfiguration as well as reprogramming of FPGA boot flash)

GPIO

Available at M.2 edge connector; one GPIO available on a W.FL connector

COMPONENT TEMPERATURE RANGE

-40 deg C to +85 deg C

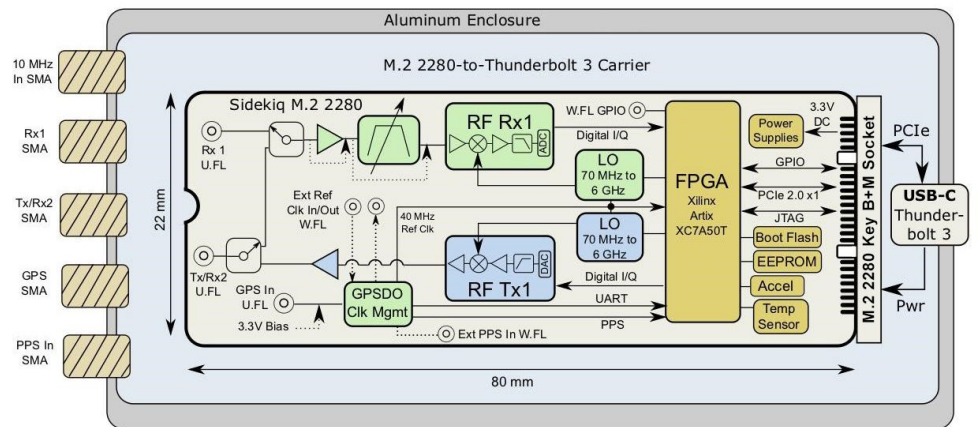
TEMPERATURE SENSOR

-55 deg C to +125 deg C (+/- 2 deg C)

MOTION TRACKING

6-axis, combining a 3-axis gyroscope and 3-axis accelerometer

BLOCK DIAGRAM



Note: Not to scale

RX PRE-SELECT FILTERING SPECIFICATION

Allows for variable bandpass covering 150 MHz to 6 GHz

PHYSICAL SPECIFICATION

FORM FACTOR

M.2 2280 key B+M form factor, commonly used for NVMe SSD drives

DIMENSIONS

22mm x 80mm x 4.5mm

WEIGHT

9.07g

TYPICAL POWER CONSUMPTION

2.5W

THUNDERBOLT 3 PLATFORM SPECIFICATION

DIMENSIONS

63.5mm x 136.2mm x 12.7mm

WEIGHT

180g

POWER CONSUMPTION

3W

RF INTERFACE

SMA RF connectors for TX/RX, RX, CLK Reference, PPS, GPS

INTERFACE TO HOST

Thunderbolt 3 over locking USB-C connector (provides both power and data transport)

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