The Sidekiq Stretch is a highly-integrated and highly compatible RF powerhouse in the Sidekiq product family. Packing the hardware that would traditionally require three separate cards into a single, small form factor radio module, the embeddable Stretch 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 create a complete, high performance, low latency, wideband transceiver in an 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. Its small size, high compatibility, and high level of performance radically simplifies product development and makes Sidekiq Stretch an ideal choice for use anywhere 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.

Use Sidekiq Stretch with the Sidekiq Platform Development Kit (PDK).* PDK users can access 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.

* Platform Development Kit (PDK) required for initial purchase.
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 IP3
-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 (1/- 2 deg C)
MOTION TRACKING
6-axis, combining a 3-axis gyroscope and 3-axis accelerometer

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)