



3U VPX SNAP Card

PRODUCT OVERVIEW

Bascom Hunter’s SNAP Card (Spiking Neuromorphic Advanced Processor) is a high-performance 3U OpenVPX AI/ML processor built for rugged, mission-critical environments.

The card is SOSA-aligned, HOST-compatible, and conduction cooled. It combines a Xilinx UltraScale+ RFSoc FPGA with five BrainChip AKD1000 spiking neuromorphic processors to achieve the best of both signal processing and neuromorphic computing – featuring a total of 6 million neurons and 50 billion synapses across the card.

Unlike traditional machine learning accelerators such as GPUs or TPUs, neuromorphic processors are designed to mimic the biological efficiency of the human brain, allowing the SNAP Card to run multiple ML models in parallel at exceptionally low power — just 1W per model — without sacrificing speed or accuracy while the FPGA enhances input/output operations and performs any desired signal processing tasks.

This combination in a rugged, interoperable, and military-hardened package makes Bascom Hunter’s SNAP Card the ideal solution for the concurrent and parallel processing of real-time, multi-modal, and multi-sensor data on autonomous, unattended, denied, or otherwise battery-constrained military systems.

APPLICATIONS

A single SNAP Card, deployed on an airborne ISR platform, occupying only one 3U VPX slot, could deploy up to five complex machine learning algorithms across each of its onboard processors to perform the following missions simultaneously:

- Automated Target Recognition (ATR) on full motion video feeds and imagery (to include 4k and higher)
- Real-time detection and identification of threat radars and their acquisition/operating modes
- Detection of FISINT (Foreign Instrumentation Signature Intelligence) and/or hacking across the airframe’s 1553 communications bus
- Perform communications analysis to include speech-to-text and foreign language translation of intercepted communications
- Fuse multiple infrared cameras (e.g., SWIR, MWIR, LWIR) to provide a combined infrared operating picture on the ground Multi-user, simultaneous modulation/demodulation

SPIKING NEURAL NETWORK PROCESSORS

- BrainChip AKD1000 (x5)
- 1.2M neurons/10B synapses per AKD1000
- 300x more power efficient than GPU

FPGA PROCESSOR (PRE/POST PROCESSING)

- Zynq US+ Quad Core ARM A53
- Zynq US+ Dual Core ARM R5
- 930,300 FPGA Logic Cells

MEMORY

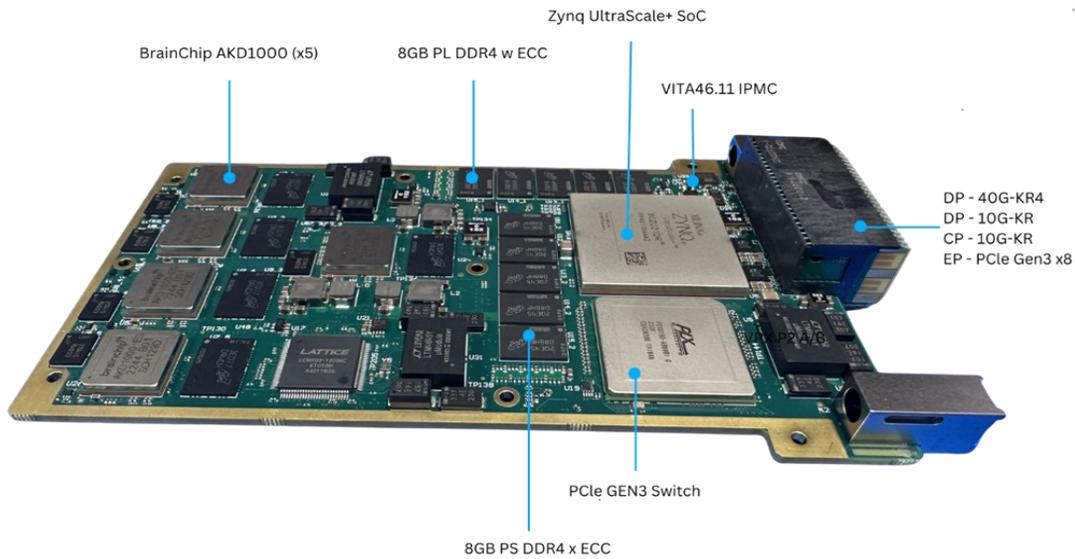
- 8 GB PS DDR4-2400 with ECC
- 8 GB PL DDR4-2400 with ECC
- ~154 Gbps BW per channel

PROCESSING POWER

- TOPS: 1.5 – 7.5 (based on number of SNAP processors used)
- TOPS/W: 0.75 – 3.75 (based on number of SNAP processors used)
- Latency/Energy: 0.045 ms/μJ

VPX FORM FACTOR

- SOSA-Aligned 3U OpenVPX
- Slot Profile
SLT3-PAY-1F1U1S1S1U1U2F1H-14.6.11-n
- Data Plane (DP) - 40G-KR4, 10G-KR
- Control Plane (CP) - 10G-KR
- Expansion Plane (EP) - PCIe Gen3 x8
- Conduction Cooled 1” Pitch



INTEGRATION SPECIFICATIONS

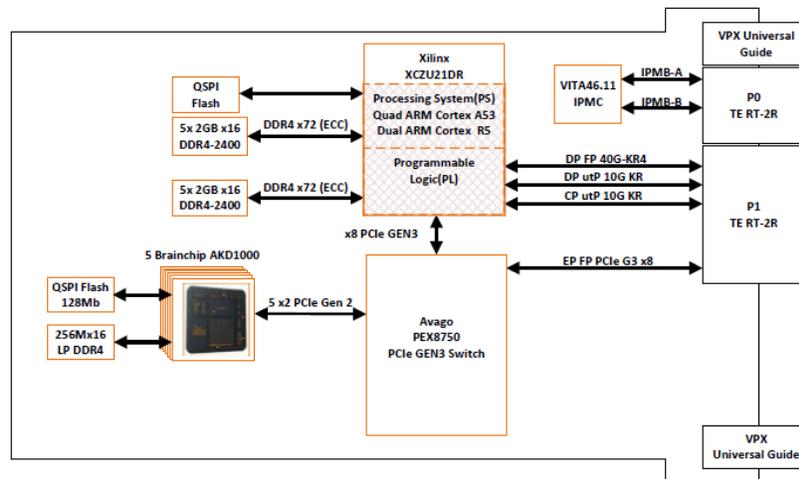
- Weight: 1.01 lb.
- Dimensions: ANSI/VITA 46.0-2019 VPX Baseline Standard (100 mm x 170.60 mm w/ backplane)
- 10—45 W (est over temp)
- -40 °C to 85 °C (Rugged Condition Cooled)

MEZZANINE CARD (PURCHASED SEPARATELY)

- USB-C (x2) (direct access to PS/PL Serial Ports)
- USB 3.0 (keyboard/mouse/etc)
- DisplayPort
- Gigabit Ethernet
- Micro SD Card

SOFTWARE & PLATFORM SUPPORT

- PetaLinux
- REST API (HTTPS/TLS)
- MQ (MQTT, Kafka)
- gRPC
- DIFI
- Bascom Hunter AI Software Environment (BASE)
 - Modern WebUI for accessing, configuring, and deploying connected 3U VPX SNAP Cards
 - Capable of configuring multiple SNAP cards across a network
 - Fully Containerized (Docker) and DOD STIG Compliant
 - Allows developers to easily translate standard TensorFlow models into spiking models
 - Allows for users to easily deploy models to each processor on connected SNAP cards



Bascom Hunter maintains a corporate commitment to quality, with our design and manufacturing operations certified to AS9100D and ISO 9001:2015



Specifications Subject to Change

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