

brainchip™ AKD1500 M.2 Development Card Product Brief

The **AKD1500 M.2 Development Card** is an Edge AI acceleration development card built on the **Akida™ 1.0 AKD1500 Co-Processor**, utilizing **BrainChip's advanced neuromorphic computing technology**. This digital, event-based architecture mimics the brain's efficiency to accelerate standard neural network models with ultra-low power consumption. A standout feature is its built-in capacity for on-device learning, which allows for secure application personalization without needing a cloud connection or extensive retraining.

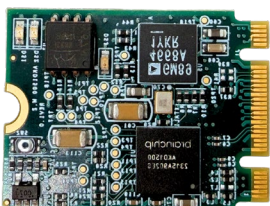
Developers can easily compile and optimize models using the **MetaTF™ software** flow, and the card's standard M.2 form factor ensures seamless pairing with Raspberry Pi, IoT SoC boards, and existing Single Board Computers. This makes it an ideal choice for prototyping and deploying intelligent, portable devices across Industrial, Automotive, Healthcare, and Smart Home applications.

Key Benefits

- * **Designed for Low-Power AI NN Acceleration**
 - Unsurpassed images/second/watt
 - Maximum 800 Effective GOPS at <1mW/GOPS
- * **On-Chip Learning**
 - Personalized Edge AI systems
- * **Industry Standard Development Environment**
 - TensorFlow/Keras and Pytorch APIs
- * **Small Form Factor**
 - M.2 2230 B+M Key
 - 22 nm FD-SOI CMOS digital logic process
 - 7x7 mm MFCTFBGA169 package, 0.5 mm pitch

Applications Areas

- * **Personalized Learning Edge AI Systems**
- * **Edge AI Vision Systems**
 - ADAS/AV
 - Vision Guided Robotics
 - Drones
 - Video Surveillance
- * **Industrial Internet of Things**
 - Environmental monitoring/control
 - Predictive maintenance
- * **Smart Home**
 - Appliances
 - Speakers
 - Voice Control



Specifications

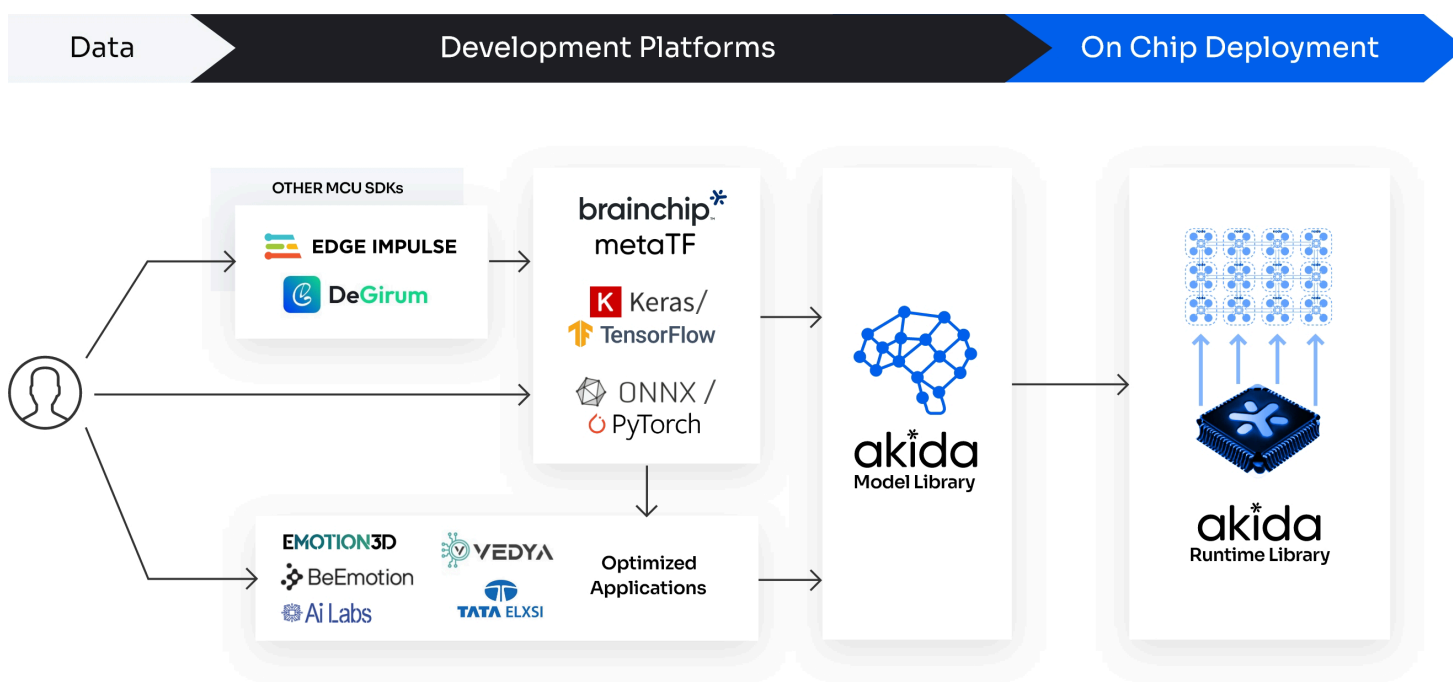
- * Akida Neuron Fabric
- * 32 Neural Processor Units (NPUs)
- * On-Chip Conversion Complex
- * 1MB On-Chip Local memory
- * 100K SRAM Per NPU
- * PCIe Gen2 Endpoint Interface
- * SPI S/D/Q/O Peripheral Interface
- * SPI D/Q/O Memory Expansion Interface
- * Clock frequency range: 5 – 400MHz
- * Typical Power 100mW/SPI, 200mW PCIe

brainchip™ AKD1500 M.2 Development Card

Product Brief

Specifications

Form Factor	M.2 2230 B+M Key
Host Interface	PCIe PHY 2-lane
On-Board Co-Processor	1x Akida AKD1500
Peak INT4 GOPs	800 GOPS
On-Chip Memory	1MB of dual-port memory
Clock Frequency	400 MHz
Operating Temperature	0 - 70° C
Thermal Solution	No fan required
Typical Application Power	250 mW typical at 400 MHz



Model Development Methodology

The Akida Co-Processor offers support for complex neural processing with compelling performance-per-watt at the Edge. **Akida is an event-based neural networks processor**, it is therefore taking advantage of activation sparsity, further reducing power consumption. It supports today's models and networks and leverages the benefits of event-based processing.

Entire neural networks can be placed into the fabric, removing or minimizing the need to swap weights in and out of DRAM, which reduces power and increases throughput.