

# Make Intelligence Smarter

Speck™, an all-in-one dynamic vision SoC



## About Speck™

Speck™ is a fully event-driven neuromorphic vision SoC. Speck™ supports large-scale spiking convolutional neural networks (sCNNs) with a fully asynchronous chip computational architecture.

Speck™ is fully configurable with up to a capacity of 320k neurons and integrates a state-of-art dynamic vision sensor (DVS), enabling fully event-driven, real-time, highly integrated solutions for a range of visual applications. For most applications, Speck™ provides intelligent visual processing at milli-Watt power levels, and with a response latency of down to a few ms.



## Features

### Power consumption <5mW

100-1000x lower than GPU solutions

An AA battery can power Speck™ for up to 100 days

Fully-asynchronous, always-on

### Privacy security

On-chip vision processing, no video stream recorded or transmitted

For privacy-sensitive applications

### Application latency <5ms

Real-time human interaction

Low latency / fast reaction use cases

### Ultra-light weight

World's lightest complete smart vision system

Ubiquitous vision processing for any device

# Finger gesture recognition based on Speck™ SoC

an all-in-one dynamic vision SoC



## Finger gesture recognition

Speck™ is a system on chip (SoC) providing a dynamic visual solution that merges sensing and computing into a single platform. With ultra-low power consumption in the milliwatt range and ultra-low latency in the millisecond range, Speck™ can capture, recognize, and analyze target behaviors in real-time. This translates to a more intuitive and seamless interaction experience for end devices, significantly enhancing the user experience. In addition, the integration of sensing and computing improves data security and privacy by eliminating the need for data transfer to the cloud.

SynSense's Speck™ SoC includes a programmable spiking neural network (SNN) accelerator, enabling efficient inference for improved human-machine interaction. One example is the rock-paper-scissors gesture recognition algorithm, which facilitates gesture interaction between people and Speck™ smart gaming devices.

With its dynamic recognition technology, ultra-low power consumption, ultra-low latency, and inherent privacy, SynSense provides a comprehensive solution for partners in the toy and gaming industry.

## Specifications

### Hardware parameters

Circuitry	Asynchronous digital circuit
Resolution	128*128
Neurons	320,000
Integration	19,800/mm <sup>2</sup>

### Application parameters

Illumination range	30lux - 3,000lux
Dynamic range	90dB
Power consumption	<5mW (typical)

## Applications

### Game console

Game pads  
Handheld game consoles

### Smart toy

Interactive toys



## Key benefits

### Ultra low cost

System cost <\$7

### Fast response

Response time <50ms (typical applications)

### Highly integrated

On-chip integration of sensors and processors  
High neuron density

### Ultra-low power consumption

Power consumption <5mW (typical applications)

### Privacy

Pure end-to-end computing of data streams:  
no data transfer to the cloud

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