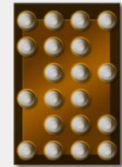
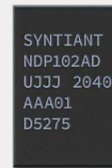


## NDP102 Neural Decision Processor

Always-On Sensor Applications Processor



### PRODUCT BRIEF

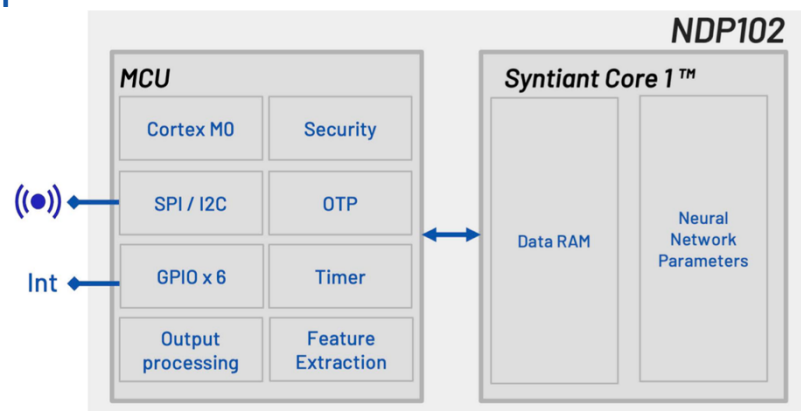
The Syntiant<sup>®</sup> Neural Decision Processor<sup>™</sup> architecture is built from the ground up to run deep learning algorithms. With embedded Syntiant Core 1<sup>™</sup>, the NDP102 is capable of performing sensor processing at under 100uW and can operate as a standalone always-on component of a larger system. It achieves breakthrough performance by highly coupled computation and memory, exploiting the vast inherent parallelism of deep learning and computing at only required numerical precision. The device combines these elements to achieve approximately 100x efficiency improvement over stored program architectures such as CPUs and DSPs.

The native neural network processing capabilities embedded in the Syntiant Core 1<sup>™</sup> eliminate the need for intermediate compilers and, works seamlessly with popular machine learning frameworks such as TensorFlow, which greatly reduces time to market and helps assure expected performance.

**The NDP102 supports dozens of application-defined sensor sequences for a variety of use cases including:**

- + Event detection
- + Pressure sensing
- + Gesture recognition
- + Anomaly detection
- + Sensor fusion

### BLOCK DIAGRAM



## KEY FEATURES & BENEFITS

- + Under 100uW active power consumption in always-on sensor applications
- + 1.71mm x 2.51mm 20-pin eWLB (0.4mm pitch)
- + Syntiant Core 1™ neural processor
- + Hardware feature extraction up to 100Hz frame rate and up to 40 frequency bins per frame
- + Fully connected neural network, supporting up to 589k parameters
- + Deeply embedded ARM cortex-M0 processor with 112KB SRAM
- + Six GPIO pins with programmable direction and drive strength
- + Integrated clock multiplier and dividers support low frequency clock source or external clocking
- + I2C serial interface for sensor applications
- + On-chip programmable clock divider
- + External serial flash boot
- + Integrated clock multiplier and dividers support low-frequency clock source or external clocking
- + On board firmware security and authentication
- + Software Development Kit (SDK) integrates in any software environment
- + Training Development Kit (TDK) to enable the use of standard frameworks such as TensorFlow for customer-programmed application

## APPLICATIONS

The NDP102 enables always-on sensor processing in the smallest systems and serves as a powerful AI interface in a tiny package with near-zero power consumption.



MOBILE PHONES



SMART HOME



REMOTE CONTROLS



SMART WATCHES



IOT ENDPOINTS

### CORPORATE HEADQUARTERS

7555 Irvine Center Drive, Suite 200, Irvine, CA 92618

©2023 Syntiant Corp. All rights reserved. Syntiant is a registered trademark of Syntiant Corp. Disclaimer: The information given in this document is believed to be accurate and reliable. However, Syntiant Corp does not give any representations or warranties as to the completeness or accuracy of such information and shall have no liability for the use of the information contained herein. Syntiant Corp reserves the right to make changes to this document and the information contained herein at any time and without notice.