NDP200
Neural Decision Processor
Always-On Vision Sensor & Speech Processor

SYNTIANT
NDP200AOQF
USAA 2015
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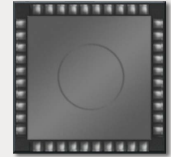
PRODUCT BRIEF

The Syntiant® NDP200 Neural Decision Processor™ is a special-purpose chip for image and sensor processing for always-on applications in battery powered devices and other power constrained systems. The NDP200 applies neural processing to run multiple applications simultaneously with minimal battery power consumption. Built using the Syntiant Core 2™ programmable deep learning architecture, NDP200 is designed to natively run deep multiple neural networks (DNN) on a variety of architectures, such as CNN, RNN and fully connected networks, and it performs vision processing with highly accurate inference at under 1mW. NDP200 brings a level of ML performance that delivers 25x the tensor throughput than the Syntiant Core 1™ embedded in Syntiant's NDP100 and NDP101 devices. A programmable Hifi3 DSP is available for feature extraction and signal processing.

The NDP200 supports dozens of application-defined imaging, speech, and sensor sequences for a variety of use cases including:

+ Person presence detection
+ Object classification
+ Wake words and local commands

+ Motion tracking
+ Acoustic event and scene classification
+ Multi-sensor fusion

BLOCK DIAGRAM
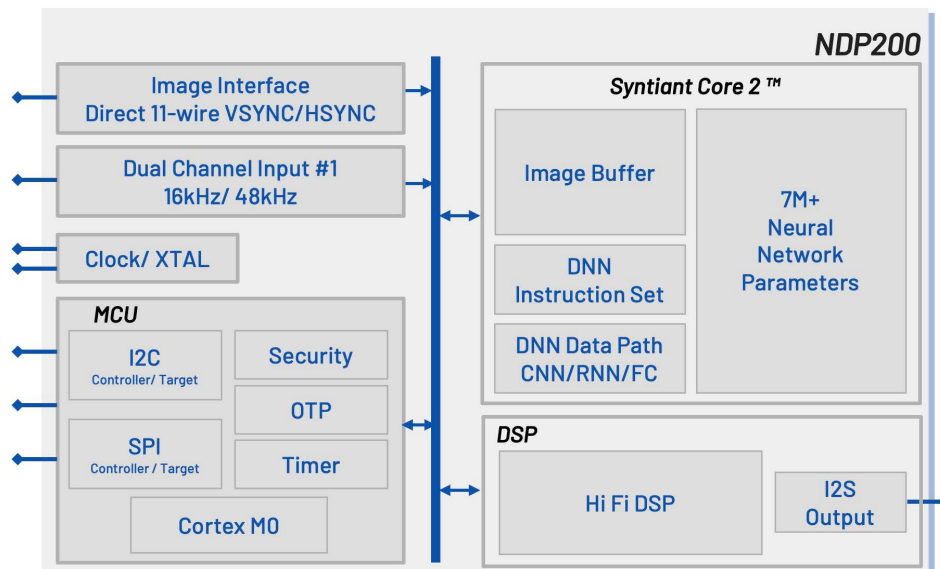
KEY FEATURES & BENEFITS

+ Neural network supported concurrently: fully- connected, 1D & 2D convolution, depth wise convolution, recurrent neural network including LSTM and GRU, average and max pooling

+ Up to 896k neural parameters in 8-bit mode, 1.8M parameters in 4-bit mode, and more than 7M parameters in1-bit mode

+ 11-wire direct image interface

+ Dual PDM digital microphone interface

+ I2S serial interface with PCM

+ SPI and I2C controller and target for multi- modal sensor fusion

+ 26 GPIO pins

+ Programmable HiFi 3 DSP

+ Up to 100MHz internal operating frequency

+ Embedded Arm Cortex-M0 for device management with 48KB SRAM, dual timers and UART functionality

+ Low power PLL for flexible clock input

+ Onboard firmware security and authentication

+ Software Development Kit (SDK) integrates in any software environment

+ Training Development Kit (TDK) to enable the user of standard frameworks such as TensorFlow for customer-programmed applications

+ 5mm x 5mm 40-pin QFN package (0.4mm pitch)

APPLICATIONS

The NDP200 enables ultra-low power vision, sensor and speech interfaces in the battery powered systems and supporting always-on person presence detection and object classification use cases:

MOBILE PHONES

SMART HOME APPLICATIONS

SECURITY CAMERAS

VIDEO DOORBELLS

SMART DISPLAYS

CORPORATE HEADQUARTERS

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