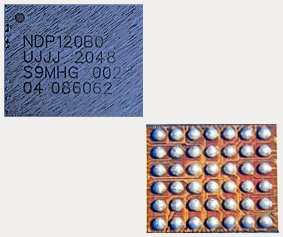
SYNTIANT

NDP120

Neural Decision Processor™

Always-On Speech & Sensor-Fusion Processor



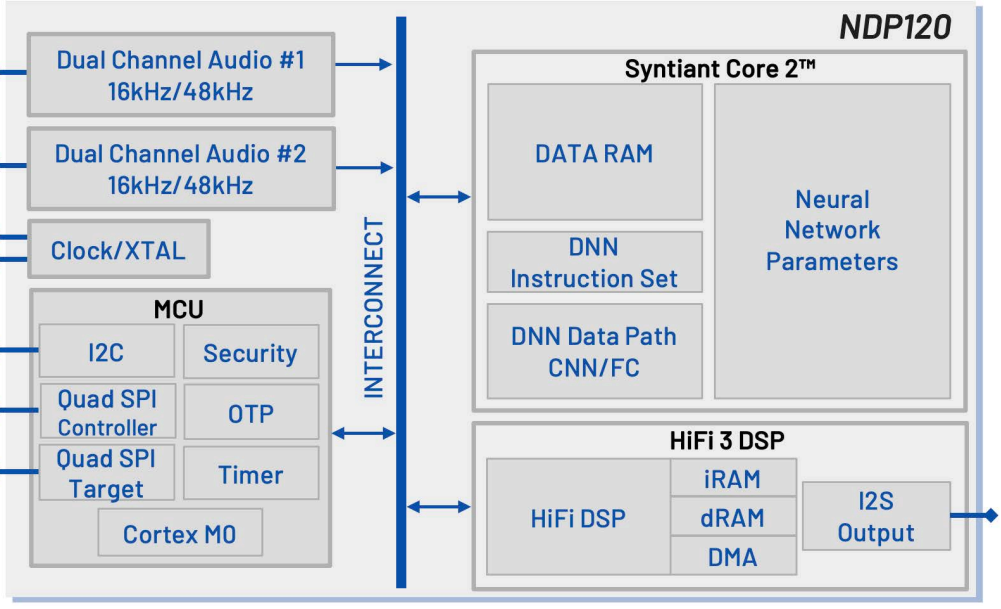
PRODUCT BRIEF

The Syntiant® NDP120™ is a special purpose processor for deep learning and is ideal for always-on applications in battery-powered devices. The NDP120 applies neural processing to run multiple applications simultaneously with minimal power consumption. Built using the Syntiant Core 2™ programmable deep learning architecture, NDP120 is designed to natively run multiple Deep Neural Networks (DNN) on a variety of architectures, such as CNN, RNN and fully connected networks. NDP120 brings a level of ML performance that delivers 25x the tensor throughput than the Syntiant Core 1™ found in the production Syntiant® NDP100™. A programmable Tensilica® HiFi 3 DSP is also added for classical audio processing.

NDP120's programmable Syntiant Core 2 Deep Neural Network supports dozens of application-defined audio sequences for a variety of use cases including:

- + Far-field, near-field and close-talk voice interface
- + Multiple wake words and local commands
- + Acoustic Echo Cancellation (AEC), noise suppression, beamforming
- + Speech enhancement
- + Speaker Identification and verification
- + Acoustic event and scene classification
- + Multi-sensor fusion

BLOCK DIAGRAM



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KEY FEATURES & BENEFITS

+ Syntiant Core 2 Deep Neural Network
+ Neural network layers supported: fully-connected, 2D convolution, depth-wise convolution, recurrent neural network including LSTM and GRU, average and max pooling
+ Support for concurrent neural networks
+ Up to 896k neural parameters in 8-bit mode, 1.6M parameters in 4-bit mode, and 7M+ parameters in 1-bit mode
+ Quad PDM digital microphone interface
+ Dual I2S channels or TDM4 streaming interfaces
+ Support for up to 7 audio streams including I2S/TDM output audio Interface for streaming audio output, Including post-processed audio
+ I2C controller and target for sensor control and integration
+ High speed Quad SPI target & controller interfaces
+ 26 GPIO pins
+ Input holding tank with up to 10 seconds of audio recording and faster than real time SPI extraction
+ Programmable Tensilica 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 use of standard frameworks such as TensorFlow for customer-programmed applications
+ 3.1 mm x 2.5 mm 42-ball WLBGA package (0.4 mm ball pitch)

APPLICATIONS

The NDP120 enables speech and sensor interfaces in the smallest systems and supports entirely new form factors and always-on detection usage models.


MOBILE PHONES


SMART HOME APPLICATIONS


HEARABLES/ WEARABLES


PC


IOT ENDPOINTS

MEDIA STREAMERS


AR/VR

CORPORATE HEADQUARTERS

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