

# SPA100 Product Brief

## Premium HD Audio Processor

The airlyra SPA100 is a highly integrated system-on-chip with high-definition audio decoder and audio post-processor. It is mainly composed of a 32-bit RISC microprocessor, an 8-bit I/O processor, a DSP-C processor and a DSP-H processor. The DSP-C is designed as a fundamental working audio system, which is able to handle audio interface processing, audio decoders, audio encoders and audio post processing. The DSP-H is dedicated for customer's 3<sup>rd</sup> party algorithm application. Customer just needs to focus on the algorithm itself and can be integrated into the DSP-C's fundamental audio system easily.

The SPA100 is delivering an excellent audio solution in a way that makes its implementation convenient, function complete and cost effective -- provides the fruitful interfaces and tools for system easy to bring-up, features the high performance and powerful processing ability in premium audio functions, and even embeds a lot external parts containing DDR memory for much simplifying the bill of materials on system. Most importantly, SPA100P is born to offer a perfect solution to the developer in producing the best cost-performance Home Audio for the upcoming growth markets.

### FEATURE

#### Kernel Cores

- 32-bit RISC microprocessor, clock up to 320 MHz
- 8-bit I/O processor for system standby control
- 32-bit DSP-C, 800+ MCPS computing power
- DSP-H, 600+ MCPS for customer's 3<sup>rd</sup> party algorithm (only for SPA100P)

#### Memory

- Integrated 128Mb DDR, frequencies up to 1,066 MHz
- 1-/2-/4-bit SPI Flash interface to external 16Mb to 512Mb SPI NOR Flash memory

#### Peripheral Interface

- 24.576MHz crystal in for all clock sources
- UART for connecting to BT, MCU, ISP (In System Programming)
- SDIO for SD memory card or Wi-Fi module
- PWM controller for 3 analog voltage control.
- High-speed USB 2.0 Host/Device for sound tuning, firmware upgrade or music playback
- 10-bit SARADC for multi-key support
- SPI support master mode
- Support IR for remote control (include IR learning)
- I2C Master
- More GPIO

#### Audio Interface

- 8 channels of I2S input for HDMI HBR mode
- 2 channels of I2S input
- 2 channels of ADC for LINE/AUX input
- 4 channels of PDM input for MIC
- 3-to-1 S/PDIF input from Coaxial/Optical/HDMI

- Up to 16 channels of I2S output

#### Audio Processor

- Support Dolby Digital (Plus)/Dolby TrueHD decoder
- Support DTS/DTSHD decoder
- Support MP3/AAC/HEAAC decoders
- Support FLAC/ALAC/WAV/DSD HiRes decoders
- Support DTS Virtual: X post process
- Support MPEG: H(Only for SPA100P)
- Support in-house Audio Post Processor: S+ Spatial Sound/VBass/Matrix/ DRC and Biquad Filters for PEQ/Bass/Treble/Crossover.
- Support DJ/Karaoke sound effects

#### HDMI TX

- HDMI TX with ARC input (except SPA100N)
- HDMI 1.4 compliant and DVI 1.0 compliant transmitter
- Support 480p@60hz, 576p@50hz (only for SPA100H)
- Support HDMI ARC (Audio Return Channel) in, CEC

#### Voice Processor

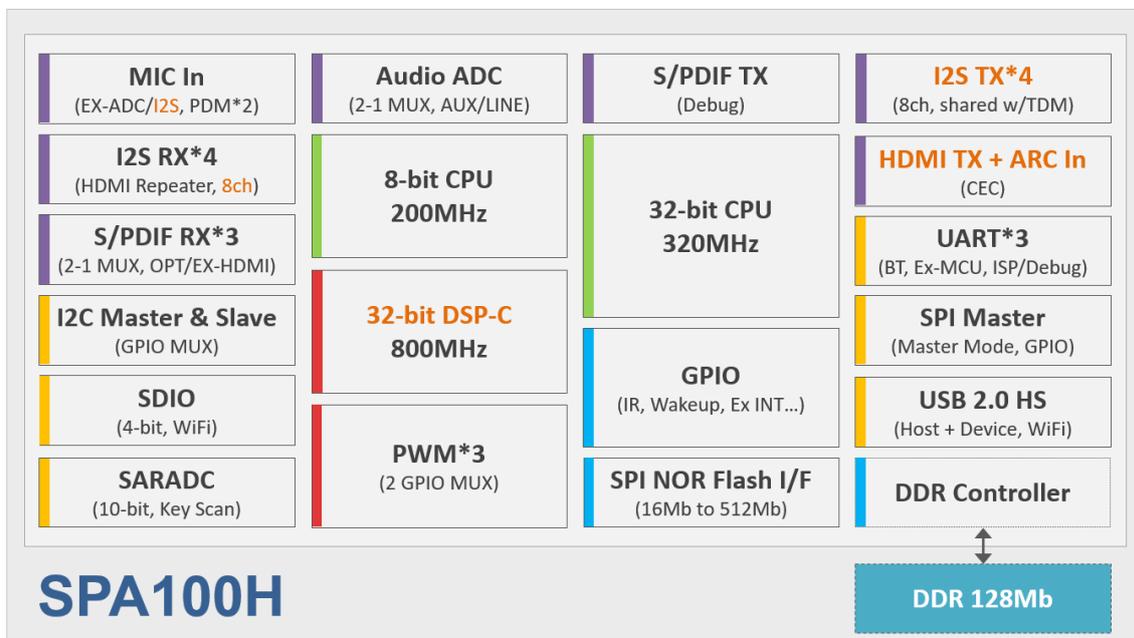
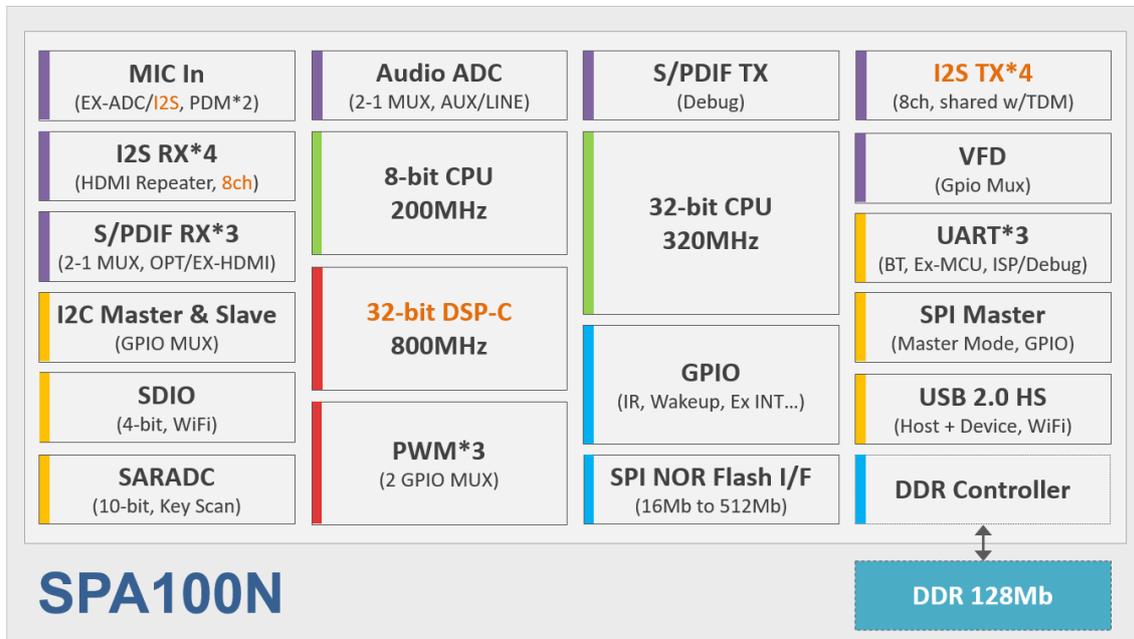
- multiple mics voice processing
- Acoustic echo cancellation with comfort noise generator
- Noise suppressor with stationary and transient noise reduction
- Speech enhancement during conversation

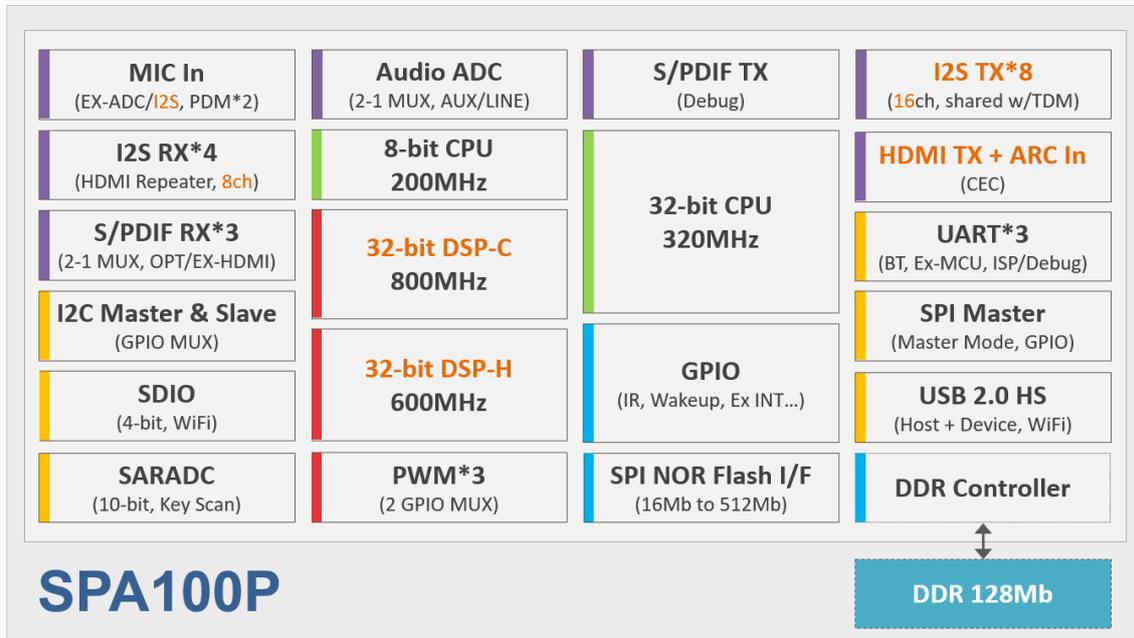
#### Platform

- On-line PC tuning tool
- Customized DSP firmware support
- Best-in-class BOM

#### Package

- LQFP-128, 14mm x 20mm

**BLOCK DIAGRAM**


**BLOCK DIAGRAM**

**APPLICATION**

The SPA100 is applied for Soundbar, Bluetooth Speaker, USB/SD Speaker, A/V Receiver, Conference Speaker etc. various Home Audio appliances.

