PCIE-8130

High-Density PCIe Audio Transcoding Accelerator

BENEFITS

- Modular solution allowing you to scale with additional PCIe accelerators as the subscriber base grows
- Deployable as a centralized cloud solution or in central offices at the edge of the network
- Easy to use packet-based API reducing development time and allowing faster time to revenue
- PCIe formfactor allows the accelerator to be deployed in almost any server platform
- SR-IOV Virtualization

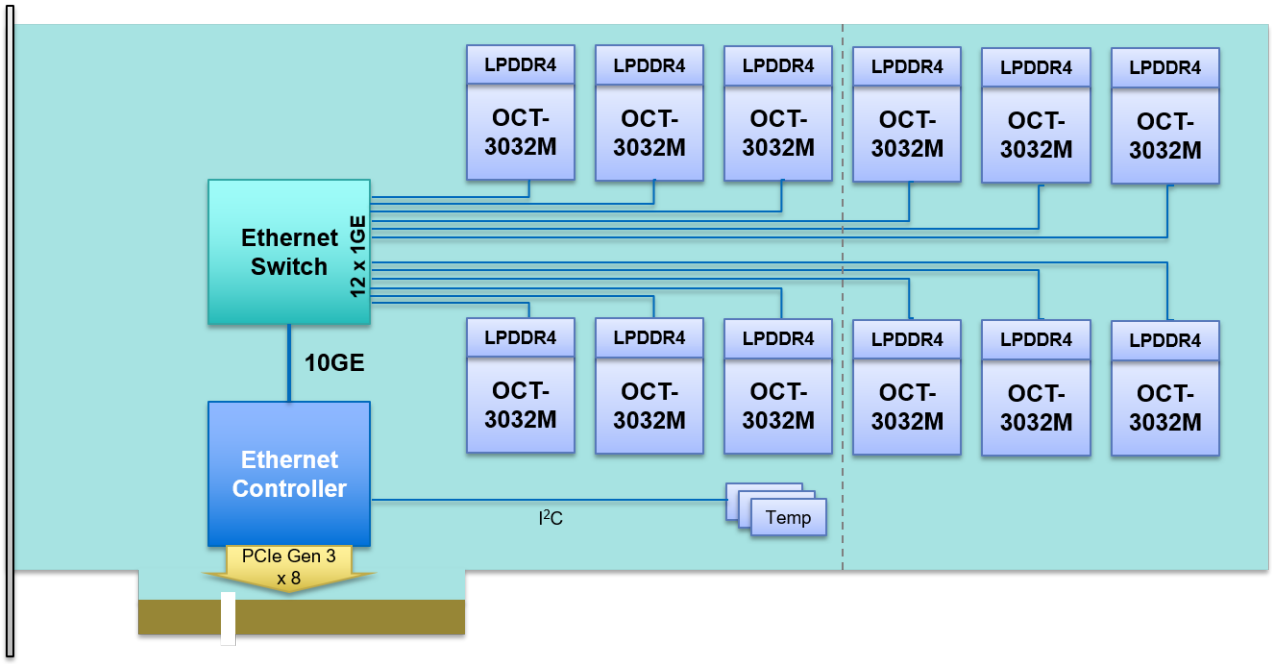
With the deployment of VoLTE and Vo5G, the SMART Embedded Technology PCIE-8130 can accelerate audio transcoding in a standard PCIe slot reducing both CapEx and OpEx by limiting the number of servers that need to be deployed. The PCIE-8130 features up to 12 Octasic OCT3032 DSPs with Vocallo firmware with a rich set of CODEC transcoding functions.

HIGH PERFORMANCE AUDIO TRANSCODING ACCELERATOR CARD

- Configurations with 4, 6 or 12 Octasic OCT3032 DSPs
- Full- or half-length by full-height versions
- Octasic Vocallo firmware
  - Broad CODEC support
  - Field proven in carrier networks
  - Echo cancellation and voice quality enhancement
  - Packet-based API

SMART™ Embedded Computing

PCIE-8130 Block Diagram



Hardware & Firmware

PCIE INTERFACE

- PCIe Gen 3 x 4

PHYSICAL & ENVIRONMENTAL

- Full- or half-length by full-height PCIe card form factor
- Normal operation 0 °C to 35 °C

POWER REQUIREMENTS

- 4-DSP HLFH PCIe Card: Est. 60W
- 6-DSP HLFH PCIe Card: Est. 70W
- 12-DSP FLFH PCIe Card: Est. 118W (Auxiliary power connector provided on-card)

TRANSPORT AND ENDPOINT SUPPORT

- Voice and video over IP endpoints
  - RTP/UDP/IP endpoint
  - IPv4 with DHCP & IPv6
  - Supports secure RTP
  - Adaptive jitter buffer
  - Supports RTCP
- Line echo cancellation and voice quality enhancements
  - G.168 (2004) compliant line echo cancellation, up to 128ms tail, with HLC and music protection
  - Manual and automatic level control (G.169)
  - Acoustic Echo Control (AEC)
  - Adaptive Noise Reduction (ANR)
  - Natural Level Enhancement (NLE)
- Endpoint statistics
  - RTP/UDP/IP per channel and per port packets and errors
  - Per channel/port states, terminations used, media stream events

HARDWARE ACCELERATED CODEC SUPPORT

- G.711, G.723.1, G.726, G.729ab, G.722, G.722.1
- Opus, SILK, iLBC
- EVRC –A/-B/-D/-E
- AMR, AMR-WB, GSM-FR, EFR, EVS
- T.38

IMPORTANT NOTICE - STANDARDS ESSENTIAL PATENTS AND THE USE OF CODECS

The SMART EC End User License Agreement covering software related to the PCIe-8130 does not represent or warrant that the codec software is free of infringement of any third party patents, copyrights, or trade secrets. Many codecs and other recognized standards may require licensing arrangements involving the execution of license agreements or payment of fees to an intellectual property rights (IPR) holder or an IPR agent acting on behalf of the IPR holder.

It is the user's responsibility to determine, for any codecs or other standards they intend to use, whether any additional IPR licenses are required, including the payment of royalties or license fees. The availability of implementations including codecs packaged in products acquired from SMART EC does not imply the right to practice these standards nor does SMART EC grant a license or the right to use or practice some or all of these standards. Depending on the country involved, the end user may be legally obliged to contact an IPR holder or agent and conform to their patents licensing requirements.

STANDARDS ESSENTIAL PATENTS

Standards Essential Patents (SEPs) are an unavoidable consequence of complex standards developed by consortia. Patents are essential when the technology covered by the patent must be practiced in order to comply with the Standard. A patent is typically defined as essential if a standard cannot be practiced without infringing the patent. The contributor of the IP is usually a company involved in the standards process and almost always retains ownership. Companies that own SEPs that are often members of standards setting organizations (such as ETSI or IEEE) and may be required to declare that they will license their patents on Reasonable And Non-Discriminatory (RAND) terms. Most standards organizations do not review patents alleged to be essential to determine that they in fact are essential. This is a determination that may not occur until decided in a contested legal matter.

COVERAGE FOR STANDARDS-ESSENTIAL PATENTS (See Table 1)

SMART EC does not generally provide indemnification against infringement of SEPs related to codecs, but there are some exceptions where SMART EC does offer limited indemnification. Table 1 summarizes SMART EC's understanding of licensing requirements with respect to selected codecs. Except where specifically stated that SMART EC does offer indemnification, it should be understood that SMART EC does not offer indemnification.

COVERAGE FOR NON-ESSENTIAL PATENTS

Non-Essential patents are by definition patents that are not necessarily infringed in order to practice the standard implemented by a codec. As part of a custom license, SMART EC may offer indemnification against infringement of non-essential patents with respect to the codecs embedded in the PCIe-8130 software. Contact your SMART EC sales representative for further details.

A NOTE ON WIRELESS VOICE CODECS

Although the patent situation for wireless voice codecs is very complex, it is not standard industry practice for embedded board-level product manufacturers like SMART EC to offer IPR licensing cover for AMR and EVRC codecs because they are not well placed in the IPR value chain. Therefore, SMART EC does not typically offer indemnification for AMR and EVRC codecs. The IPR holders usually approach end-product manufacturers because many end-products include additional standards compliant technologies that may infringe patents. Many IPR holders prefer to offer portfolio licenses that cover much more than just the codecs. Additionally, a starting point for licensing is based on the number of channels used in a product, and the end-product manufacturer is much better placed to quantify and control usage than the embedded technology provider. SMART EC strongly recommends that customers undertake a full product mapping exercise to determine the feature sets that need to be covered by patent portfolios.

Table 1

CODEC FAMILIES AND STANDARDS ESSENTIAL PATENTS

Class	CODEC Family	Standards Essential Patent Situation
Wireline Voice	G.711 PCM	SMART EC believes that these codecs are currently unencumbered by standards essential patents.
	G.722 Wideband	
	G.726 ADPCM	
	G.723.1	Indemnification for infringement of SEPs for these codecs is included within the SMART EC custom license described here.
	G.729AB	
	G.722.1	G.722.1 (also known as "Siren") is licensed royalty free by Polycom provided that the end-product manufacturer executes the license at http://www.polycom.com/company/about-us/technology/siren.html. Customers interested in this codec should contact Polycom directly.
	iLBC	iLBC is an open source royalty-free codec available directly to Customers under the “revised BSD” license. The full text of the Revised BSD License can be found at: http://opensource.org/licenses/BSD-3-Clause.
Wireless Voice	GSM FR	GSM and GSM AMR codecs may incorporate SEPs held by Ericsson, Voiceage, Nokia, NTT, and France Telecom. Please see "A NOTE ON WIRELESS VOICE CODECS".
	GSM AMR	
	GSM AMR WB	
	EVRC-A	EVRC codecs may incorporate SEPs held by Qualcomm, Ericsson, NTT, France Telecom and others. Please see " A NOTE ON WIRELESS VOICE CODECS".
	EVRC-B	
Internet Voice	SILK	SILK can be used royalty free under a patent license at http://developer.skype.com/silk/license. Customers interested in SILK should contact Skype directly.
	SPEEX	Speex is an open source royalty-free codec available directly to Customers under the “revised BSD” license (see iLBC above for reference).
	Opus	Opus is an open source royalty-free codec available directly to Customers under the “revised BSD” license (see iLBC above for reference).

Ordering Information

Part Number	Description
PCIE-8130-HL-4	OCTASIC PCIE MODULE HALF LENGTH WITH 4 DSPS
PCIE-8130-HL-6	OCTASIC PCIE MODULE HALF LENGTH WITH 6 DSPS
PCIE-8130-FL-12	OCTASIC PCIE MODULE FULL LENGTH WITH 12 DSPS

SOLUTION SERVICES

SMART Embedded Computing provides a portfolio of solution services optimized to meet your needs throughout the product lifecycle. Design services help speed time-to-market. Deployment services include worldwide technical support. Renewal services enable product longevity and technology refresh.

CONTACT DETAILS

+1 602-438-5720
Info@smartembedded.com
www.smartembedded.com/ec/contact

SMART™ Embedded Computing