Based on the award-winning TriMedia DSP technology, the PNX1005 from Trident Microsystems, Inc. supports programmable signal processing for high-definition video compression, decompression, analysis and improvement. It supports multiple video compression standards, such as H.264, MPEG-4, MJPEG and many others. The PNX1005 handles full 1080p/60 on input and output for HD 1080p picture processing.

**Key features**
- High performance video DSP media processor
- Supports all popular digital video and audio compression standards
- H.264/MPEG/MJPEG/720p/30fps, dual channel D1/30fps or 8 channel D1/7fps encoding or decoding
- MP3, AAC, Dolby AC-3, etc.
- Designed for HD video processing
- Latest advanced 32-bit 400 MHz TriMedia TM3282 CPU
- Powerful multimedia instructions for entropy coding, motion estimation and others
- Fixed and floating point instructions
- On-chip, independent, DMA units perform I/O, co-processing, scaling, advanced de-interlacing, color space conversion, Bayer pattern conversion, etc.
- Powerful AV inputs and outputs
  1) Video input supports up to 1080p/60p or 8 channels SD or bitstreams up to 24bit@157MHz
  2) Video output supports 1080p/60 or dual SD
  3) 16 channels audio in and out
- Key benefits
  - Powerful core
  - Right peripherals
  - Easy-to-use and mature software environment
  - Extensive software library (codecs, drivers, etc.)
  - Easy to integrate into a system via the PCI or USB Interface

**Applications**
- Security and surveillance (CCTV)
- Audio and video conferencing
- Professional video processing
- High-end consumer application

The PNX1005 leverages a powerful programmable TriMedia TM3282 CPU for high performance media processing. The CPU core delivers top performance through an elegant implementation of fine-grain, parallel, very-long instruction word (VLIW) architecture. Eight issue slots enable up to eight simultaneous operations to be scheduled into only one VLIW instruction.
These operations can simultaneously target any eight of the CPU’s 31 pipelined functional units within one clock cycle. TM3282 supports special instructions for multiple 8-bit operands, filters, pixel interpolation and other complex DSP operations. An integrated bit coprocessor offloads the TM3282 core for intensive bit operations such as CABAC. The PNX1005 also contains a range of independent, on-chip, bus mastering DMA units that capture and format data stream I/O and accelerate processing of multimedia algorithms. A sophisticated data bus infrastructure manages internal I/O and streamlines access to external memory.

Right peripherals
The video input unit captures and processes digital video for use by on-chip units. It accepts ITU656-like streams up to 1080p/60, and also supports 8 SD streams, time multiplexed over two video inputs. The capture unit also supports Bayer pattern RGB from CMOS sensors. The video output streams the video in a variety of formats up to 1080p/60, including CCIR656, YUV, or RGB, while at the same time performing video enhancement algorithms, such as gamma correction, dithering, sharpening, and others. Both the input and output are flexible and support many standard pixel formats. The PNX1005 also supports 16 channel audio input and output. The PCI 66MHz bus supports master, slave and host mode. The PNX1005 also contains a USB2.0 Hi-Speed OTG port.

Easy-to-use software
The PNX1005 can easily be programmed with the Nexperia Development Kit (NDK), provided by Trident. The NDK consists of a complete toolset integrated into the Eclipse development environment to develop media processing software on PNX1005, including compilers, schedulers, linkers, debuggers, etc. The PNX1005 is programmable in standard C/C++ and the NDK compilers and schedulers automate the complete optimization process on the platform. The tools also contain a cycle accurate simulator and powerful real-time analysis tools. Trident also provides an extensive library of software modules.

Specification summary
- DSP TriMedia tm3282 400 MHz 64kB instruction, 128kB data cache
- Memory DDR1 or DDR2 JEDEC-compliant interface up to 266 MHz (DDR2-533)
- Up to 16 bit NOR and NAND glue less Flash interface
- Up to 1080p (60 Hz or 157 MHz pixel rate) video input and output
- Support for CCIR656, YUV, or RGB input and output
- Support for 8 D1 time multiplexed in ITU656-like format