

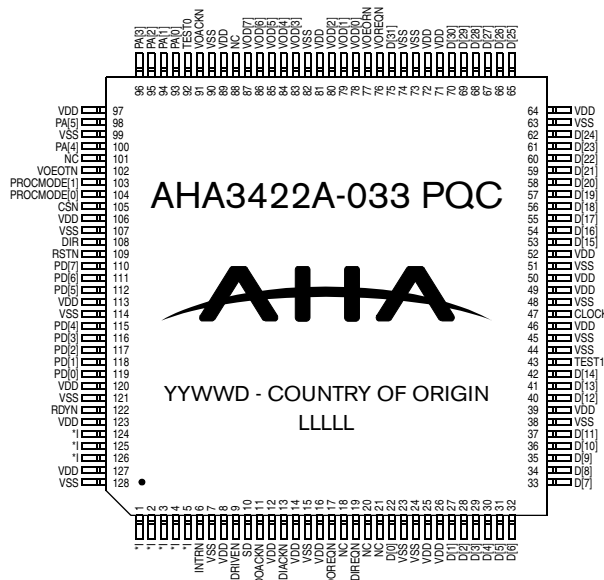
# AHA3422 StarLite

## 16 MBYTES/SEC LOSSLESS DECOMPRESSOR IC

AHA3422 is a high speed lossless decompression coprocessor IC for the hardcopy systems on many standard platforms, including the PCI Bus. The device offers a low cost decompression only solution for under 30 ppm printers or 50 ppm copiers at 1200 dpi.

High speed decompression, flexible interfaces and advanced banding support make this a unique solution for Raster Image Processing (RIP) controller designs. Advanced banding support handles blank, uncompressed and compressed bands. Scan line and record length counters accommodate various print resolutions and band buffer sizes.

Software simulation and an analysis of the algorithm for printer and copier images of various complexity are available for evaluation.



NOTES: NC = No Connect; \*I = Connect to VDD or VSS  
 YYWWWD = DATE CODE; LLLLL = LOT NUMBER

### FEATURES

#### PERFORMANCE:

- 16 MBytes/sec data rate
- 132 MBytes/sec burst data rate over a 32-bit data bus
- 33 MBytes/sec burst rate, 16 MBytes/sec sustained synchronous 8-bit video out port
- Average 15 to 1 compression ratio for 1200 dpi bitmap image data
- Advanced banding support

#### FLEXIBILITY:

- Big Endian or Little Endian; 32 or 16-bit bus width and data bit/byte reordering for duplex printing support
- Programmable Record Length, Record Count and Scan Length Registers may be prearmed
- Scan line length up to 2K bytes
- Interfaces directly with various Motorola 68xxx and Cold FIRE and Intel i960 processors
- Pass-through mode passes raw data through the decompression engine

#### SYSTEM INTERFACE:

- Single chip decompression solution—no external SRAM required
- Four internal 16 × 32-bit FIFOs
- Maskable interrupts
- Tristatable outputs to facilitate board level testing

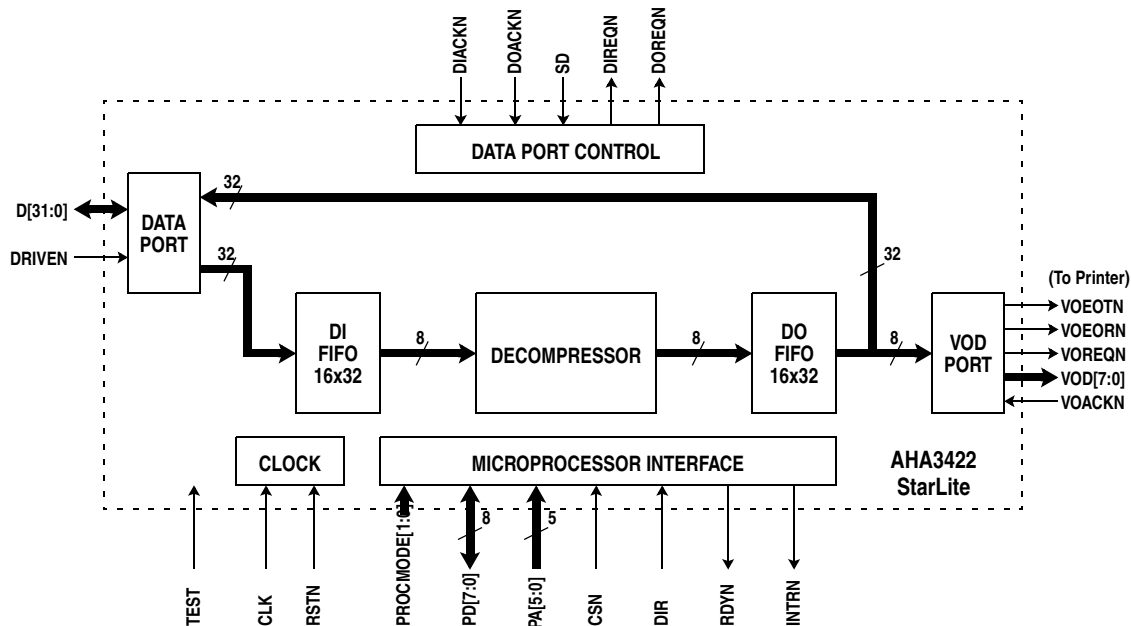
#### OTHERS:

- Low power modes
- Optional counter checks errors in decompression
- Software emulation program available
- 128 pin quad flat package

### APPLICATIONS

- Digital copiers
- Printer controllers
- Multifunction printers and copiers

Figure 1: AHA3422 Block Diagram



## FUNCTIONAL DESCRIPTION

The coprocessor device has two external high speed synchronous data ports each capable of transferring once every 33 MHz clock. These are a 32-bit bidirectional data port and an 8-bit Video Output Data (VOD) port. The data port is capable of transferring up to 132 MBytes/sec. The VOD is capable of up to 33 MBytes/sec.

Decompression data is accepted through the data port, buffered in the Decompression Input FIFO (DI FIFO), and decompressed. The output data is made available on the data port via the Decompression Output FIFO (DO FIFO) or optionally on the 8-bit Video Output port. The decompression engine runs on the 33 MHz clock and is capable of processing an uncompressed byte every other clock, i.e. 16 MBytes/sec.

The two FIFOs are organized as 16×32 each. For data transfers through the two ports, the “effective” FIFO widths differ according to their data bus widths.

Data transfer is synchronous over the data ports functioning as DMA masters. To initiate a transfer into or out of the Video port, the device asserts VOREQN, the external device responds with VOACKN and begins to transfer data over the VOD bus on each succeeding rising edge of the clock until VOREQN is deasserted. The data port relies on the FIFO Threshold settings to determine the transfer.

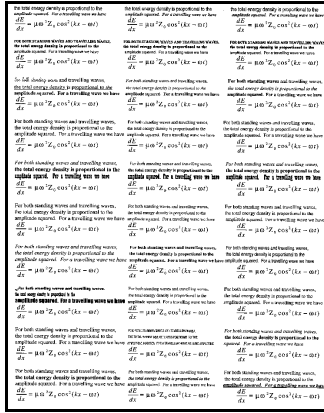
## SYSTEM APPLICATION

The device is intended for memory intensive applications requiring a hardware decompression device, such as high resolution copiers or printers. The part is typically used in systems where StarLite compression is performed either in software or in another StarLite compression device. It may also be used in systems requiring multiple decompressors.

# StarLite IMAGE COMPRESSION RESULTS - 1200 x 1200 DPI

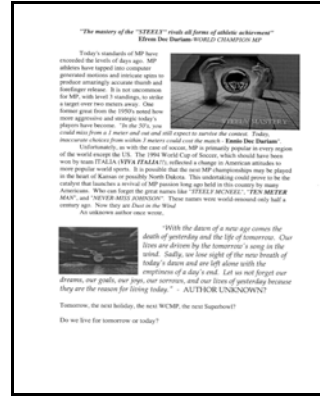
Uncompressed file size = 16 MBytes; Image dimensions = 10200 x 13200 pels

## FONTS - Simple Text



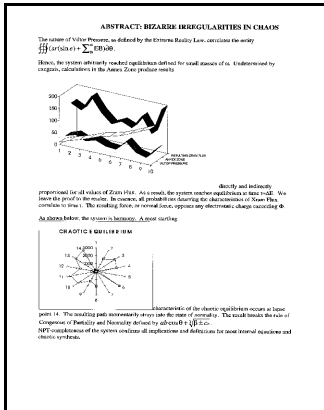
Output File Size = 783,848  
Compression Ratio = 21.5

## MP - Text and Simple Graphics



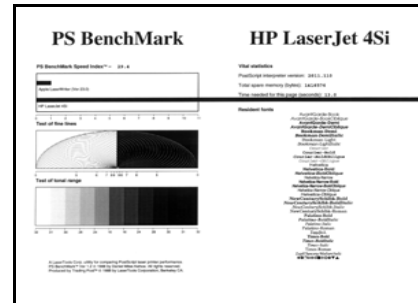
Output File Size = 86,525  
Compression Ratio = 194.5

## MATH - Simple Text and Linear



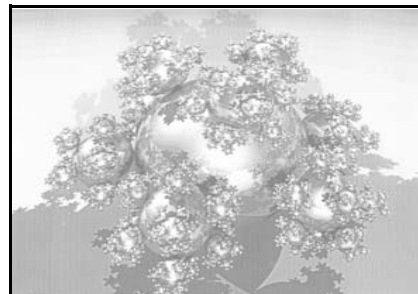
Output File Size = 79,245  
Compression Ratio = 212.4

## BENCH2 - Text and Graphics with Pictorials



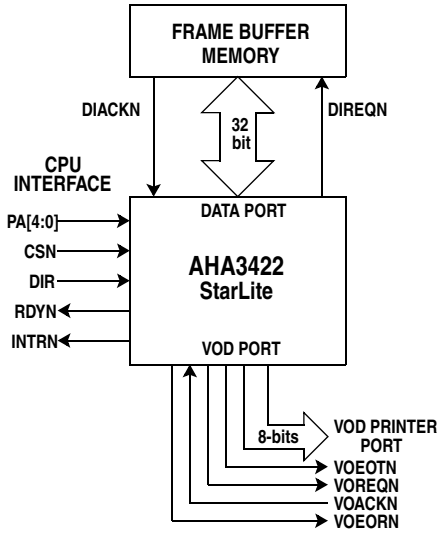
Output File Size = 424,995  
Compression Ratio = 39.6

## BALLS - Complex Graphics with Pictorials



Output File Size = 3,665,167  
Compression Ratio = 4.6

## DECOMPRESSOR FOR MID-RANGE MULTIFUNCTION COPIER/PRINTER APPLICATIONS - AN EXAMPLE



## ABOUT AHA

Comtech AHA Corporation (AHA) develops and markets superior integrated circuits, boards, and intellectual property core technology for communications systems architects worldwide. AHA has been setting the standard in Forward Error Correction and Lossless Data Compression technology for many years and provides flexible, cost-effective solutions for today's growing bandwidth and reliability challenges. Comtech AHA Corporation is a wholly owned subsidiary of Comtech Telecommunications Corp. (NASDAQ: CMTL). For more information, visit [www.aha.com](http://www.aha.com).

## ORDERING INFORMATION

| PART NUMBER      | DESCRIPTION                            |
|------------------|--|
| AHA3422A-033 PQC | 16 MBytes/sec Lossless Decompressor IC |



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