

## CX24430/1/2/3

|                    |                                 |
|--------------------|---------------------------------|
| <b>Description</b> | Interactive Cable TV Decoder IC |
|--------------------|---------------------------------|

The CX24430/1 and CX24432/3 cable modem sub-systems include a complete upstream/downstream physical layer, and an Ethernet MAC in addition to the cable modem MAC and host processor. The set-top box decoder functionality includes an MPEG-2 video decoder, digital audio decoder, three multi-standard transport streamdemultiplexers, an advanced 2D graphics processor, TV encoder, multi-plane compositing engine, a 256 QAM demodulator/FEC block and a high performance 32-bit ARM920 RISC processor with integrated peripheral I/O ports. This makes for an architecture that delivers a rich, high quality navigation/ user interface for advanced electronic program guides and other interactive TV applications.

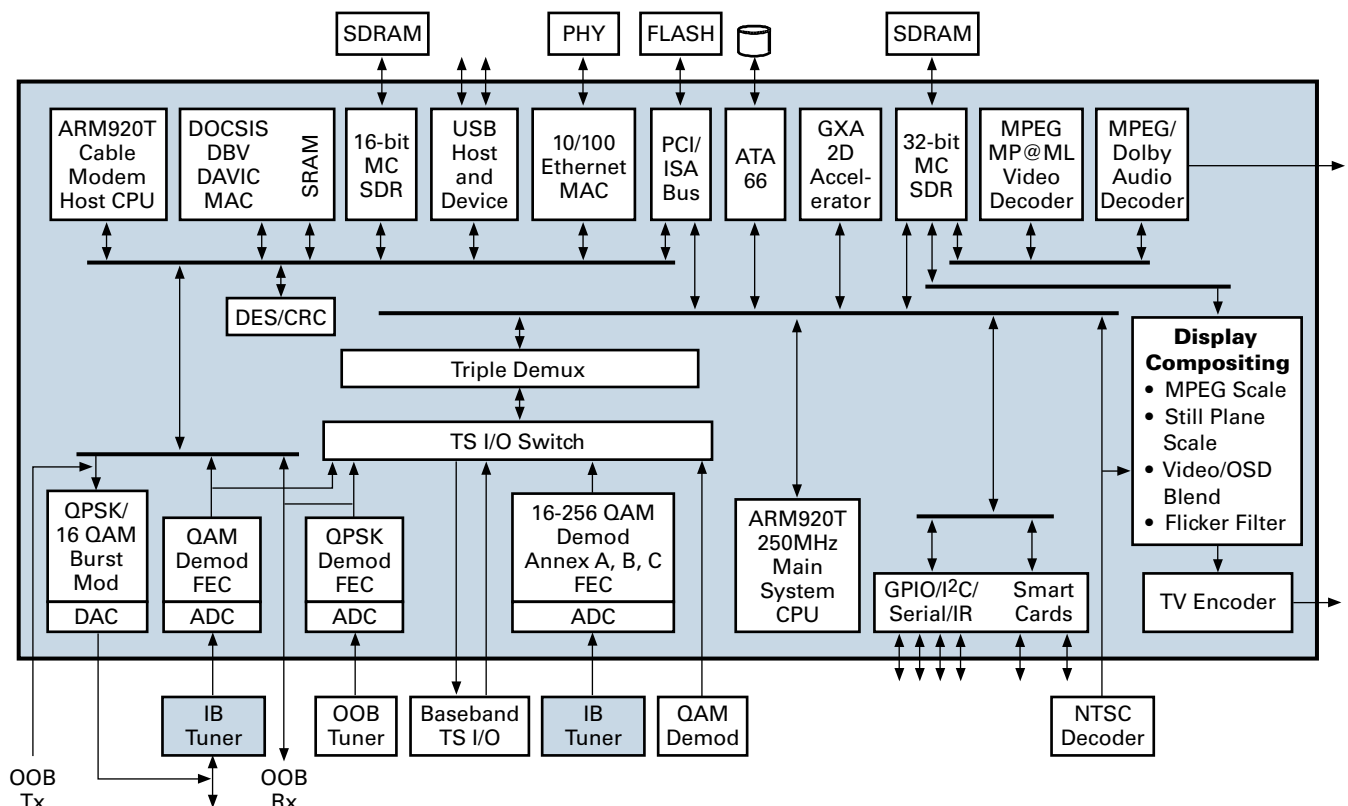
The dual CPU system architecture provides 500+ aggregate MIPS for hosting the operating system, interactive middleware, DOCSIS stack and interactive TV applications, while delivering industry-leading cable modem packet performance. The CX24430/1 and CX24432/3 ICs fully support Data Over Cable Service Interface Specification (DOCSIS®) and EuroDOCSIS™ version 1.1 standards.

The CX24430 and CX24431 set-top box sub-systems also enable advanced Personal Video Recorder (PVR) functionality. Users are able to record two different programs simultaneously with DES copy

protection while playing back a third. The CX24430 and CX24431 incorporate a built-in high-speed hard disk drive controller interface for fast data transfers in PVR applications like pause, instant replay, fast forward and rewind.

Analog video support is provided by four high quality CVBS/ S-video/RGB output signals for all worldwide NTSC/PAL/SECAM broadcast standards. The IC also provides an input port for digitized analog signals based on the CCIR 656 format to support analog TV display and compositing with program guide graphics.

The CX24430/1 and CX24432/3 ICs integrate dual, high performance SDRAM memory controllers. A 32-bit 143MHz memory controller supports all of the set-top box back-end requirements in a unified memory architecture. This back-end SDRAM memory system is used to support the requirements of the main system CPU, MPEG-2 Audio Video (A/V) decoder, transport demultiplexer, graphics, frame buffer and the still plane picture buffers. A second, dedicated 16-bit 143MHz SDRAM controller services the needs of the cable modem system, including the code store for the RTOS executing on the cable modem CPU as well as packet buffers for bridging to Ethernet and USB.



**CX24430/1 IC Block Diagram**

Fully integrated set-top box middleware and Real Time Operating System (RTOS) support includes hardware abstraction layer solutions for Liberate, OpenTV, Nucleus+, pSOS and VxWorks. The CX24430/1 and CX24432/3 IC solutions are also complemented by Conexant's DOCSIS communications protocol stack which is available for license by set-top box manufacturers.

A complete set of low-level software drivers and the associated API are also available to support the OpenCable Advanced Host requirements, including the legacy OOB mode (DVS 167 or DVS

178 signalling with a POD module) and the DSG mode (OOB signaling through an embedded DOCSIS cable modem). These drivers and API also support the OOB signaling through an embedded DAVIC cable modem.

Conexant's system-level approach with the CX24430/1 reduces cost and time-to-market for OEM set-top box vendors as well as allowing them an opportunity to offer their customers a complete interactive set-top box design for the same price as a broadcast service-only product.

Table 1. CX24430/1 and CX24432/3 Feature Differences

| Part Number | TS Demuxes | Ultra DMA 66MHz Controller | IDE HDD Interface (ATAPI Port) | Copy Protection & DES Ciphering | Dual Tuner PVR Support |
|-------------|------------|----------------------------|--------------------------------|---------------------------------|------------------------|
| CX24430/1   | 3          | Yes                        | Yes                            | Yes                             | Yes                    |
| CX24432/3   | 2          | No                         | No                             | No                              | No                     |

Table 2. CX24430/1/2/3 Part/Dash Number Matrix  
n=functional/performance configuration; X=die revision

|                | CX24430/2-nX |    |    |    |    |    |    |    | CX24431/3-nX |    |    |    |    |    |    |    |
|----------------|--------------|----|----|----|----|----|----|----|--------------|----|----|----|----|----|----|----|
|                | 1X           | 2X | 3X | 4X | 5X | 6X | 7X | 8X | 1X           | 2X | 3X | 4X | 5X | 6X | 7X | 8X |
| NDS ICAM       |              |    |    |    |    |    |    |    | •            | •  | •  | •  | •  | •  | •  | •  |
| Macrovision 7x |              |    |    |    | •  | •  | •  | •  |              |    |    |    | •  | •  | •  | •  |
| Dolby Digital  |              | •  |    | •  |    | •  |    | •  |              | •  |    | •  |    | •  |    | •  |
| 250MHz ARM920  | •            | •  |    |    | •  | •  |    |    | •            | •  |    |    | •  | •  |    |    |
| 200MHz ARM920  |              |    | •  | •  |    |    | •  | •  |              |    | •  | •  |    |    | •  | •  |

- MPEG-2 MP@ML Video Decoder
- MPEG-1, MPEG-2 Audio Decoder
- Dolby Digital Decoder
- 32-bit ARM920T Main System CPU
- TV Encoder
- Multi-standard, Multi-stream Transport Demultiplexing
- Multi-Plane Video/Graphics Display Controller
- Advanced 2D Graphics Accelerator
- PCM Audio I/O

- OpenCable POD Interface
- Peripheral I/O Interfaces
- 32-bit ARM940T Cable Modem Host CPU
- Cable Modem MAC
- Ethernet MAC
- Cable Modem Downstream PHY
- Cable Modem Upstream PHY
- DVS 178 Downstream PHY

