

Comcerto™ 500 Series VoIP Processors

M825XX

Complete TDM-to-Ethernet VoIP with Host Control and Signaling in One Device

Mindspeed's Comcerto 500 Series, based on fifth-generation voiceband processing technology, delivers breakthrough levels of integration and performance to the carrier access, MTU/MDU, and enterprise Voice-over-IP gateway markets. A single Comcerto 500 device supports up to 128 VoIP media streams, while an integrated host processor simultaneously handles call control, signaling, (SIP/H.248/MEGACO/H.323), and other application-specific functions. Each device in the Comcerto 500 family targets a different level of performance, while sharing a common footprint; So today's 32-port design may be easily transformed into a 24-port or 64-port design tomorrow, providing cost scalability and efficient design reuse.

The Comcerto 500 family is perfectly suited for POTS and ISDN line cards in Ethernet-based IP-DSLAMs/MSANs, since the Comcerto device may be easily collocated on the same line card with SLIC or BRI devices, greatly simplifying system design. Since TDM voiceband traffic is completely processed and converted to VoIP Ethernet streams at the line card level, system complexity is minimized, allowing inexpensive equipment to be built on an Ethernet/LAN-based architecture. Comcerto 500's complete, modular VoIP subsystem allows line card designs in higher density CO/FTTN equipment to be easily applied to FTTC "remote" equipment, or combined with xDSL components for a complete integrated voice/data (IVD) combo solution.

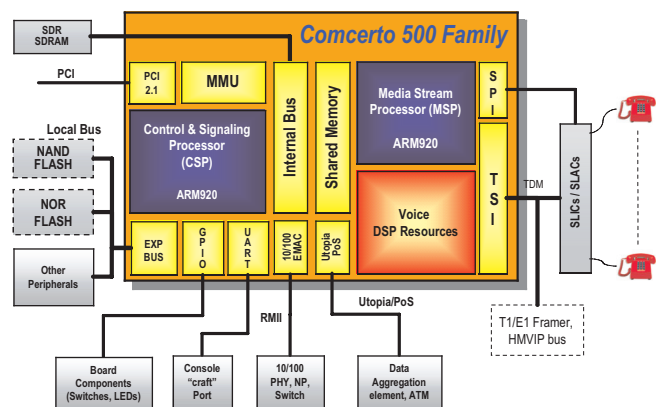
Comcerto's centralized, integrated processing + memory approach makes it easy to benefit from the efficiencies of oversubscription, while allowing customers to mix vocoders of varying complexity based on real-time demand, price, and the QoS demands of different subscribers. This centralized processing approach also efficiently supports announcement serving across all TDM ports, and multi-party/multi-bridge conferencing among all TDM and packet voice streams.

Key Features

- The Industry's most integrated, modular, feature-rich solution for VoIP POTS line cards
- Common footprint across device family allows cost scalability from 4 to 128 VoIP ports with a single design
- Unique dual-processor architecture supports media and signaling separation for software simplicity and efficient memory utilization
- Carrier-class production-quality voice processing software and wireline codec indemnification complete the solution

These advantages are not possible with inferior solutions that physically distribute (and "strand") DSP resources to specific ports.

The Comcerto 500 family's architectural advantage is gained through the use of two separate ARM-based subsystems which are coupled through a shared memory subsystem. The Media Stream Processing (MSP) subsystem couples one ARM to powerful DSP resources and integrated memory, providing real-time, low-latency voice processing. The Control and Signaling Processing (CSP) subsystem handles tasks with less-stringent real-time requirements, such as call control and setup, signaling, and supervisory functions.



Comcerto M825XX Block Diagram



The CSP subsystem is typically built on a Linux or VxWorks kernel, upon which customers may leverage their own software, third-party software, or combinations. This real-time/non-real-time isolation greatly reduces software complexity. In addition, Mindspeed provides royalty-free production level VoIP processing code for the MSP, so customers can focus on developing their value-added CSP-based applications, and accelerate their designs into production.

The Comcerto 500 family supports a variety of memory configurations and system initialization strategies, from low-cost SDRAM-only line card systems which boot from Ethernet, to self-contained systems with non-volatile flash memory. This integration also yields memory efficiency benefits. In contrast to solutions that do not support external memory, with Comcerto there is no need to worry about whether the voice processing software will fit in the limited memory space, since a single bank of SDRAM stores both the CSP (host) software, as well as the MSP voice processing software. This approach allows customers to deploy a rich set of voice processing features and capabilities in a single code image, simplifying deployment and field upgrade strategies.

The Comcerto 500's combination of hardware integration and voice processing software provides the most feature-complete integrated solution available. The voice processing software includes a wide range of gateway functions such as tone genera-

tion and detection, echo-cancellation, silence suppression/comfort-noise generation (with music detection), Caller-ID, conferencing, announcement recording and playback, fax relay, and more with indemnification included for all wireline codecs.

Mindspeed also provides a variety of evaluation and demonstration systems, including the iPOTS*48 line card, which showcases our POTS line card capabilities, including copper loop to Ethernet voice processing, automated line testing, call control, and SIP signaling for 48 copper loops.

Finally, Mindspeed's commitment to voice processing means that new features and capabilities are being developed continuously to meet customer's evolving needs in the dynamic VoIP marketplace.

Media Function	Comcerto 500 Device: M825xx							
	'501	'506	'511	'514	'515	'520	'524	'530
G.711, 10ms/ (20ms)	16	32	64	64	64	96/ (128)	96/ (128)	96/ (128)
G.726 10ms/ (20ms)	4	8	16	24	24/ (32)	32	48	64
G.729a/b	4	8	16	24	32	32	48	64
G.723.1	4	8	16	24	24	32	48	64
T.38	4	8	16	24	32	16	32	32
Hairpinning	32	64	128	128	192	256	256	512

Comcerto 500 Family Full-Featured Channel Densities

Product Features

General

- Compact, 484-ball 19mm² PBGA, (Standard and RoHS), pin-compatible with M828xx, M826xx and M827xx Product Families
- Downloadable Controller Firmware and DSP Code with Network Boot Option
- Complete VoIP Processing from TDM-to-Ethernet
- Unified, Real-Time Diagnostics via Ethernet

Hardware Features

- Dual ARM9 Processors with Memory Management Unit
 - M82501-M82515: 375 Mhz
 - M82520-M82530: 250 Mhz
- 64-bit DSP resource pool
- PC133 SDRAM Controller
 - M82501-M82515: up to 512MB
 - M82520-M82530: up to 128MB
 - NAND Flash support
- 10/100 Ethernet Interface

- M82501-M82515: rMII, MII, s3MII
- M82520-M82530: rMII
- Utopia L2, 8/16 bit
- External Host Support: PCI 2.1, 33 MHz or uP Bus (Intel/Motorola), 8/16/32 bit
- Serial Peripheral Interface (SPI)
 - M82501-M82515: Native
 - M82520-M82530: reference PLD provided
- 4 Software-configurable TDM Interfaces
- 32 bit local expansion bus
- UART(s)
 - M82501-M82515: Dual
 - M82520-M82530: Single
- Up to 32 GPIOs
- 1.2/3.3VDC (+2.5VDC if using 2.5V DRAM)
- Power:
 - Highest performance device (M82530): 1.8W Max / 2.1W Max incl. SDRAM
 - Lowest performance device (M82501): 0.8W Max/ 1.1W Max incl.

SDRAM

Software/Firmware Features

- Packet and Cell (ATM) Processing
 - QoS pre-router
 - VoIP: RTP/UDP/IP/Ethernet
 - RTCP
 - DTMFoRTP (RFC2833)

Narrowband Signal Processing

- G.165/G.168 Echo Cancellation with Echo Path Change Detection, up to 128ms
- Voice Codecs
 - G.711 u/A law, G.726, G.729A/B, G.723.1 and Annex A
 - Others available: AMR, iLBC, SMV, and more
- Patented dynamic jitter buffer with Packet Loss Concealment
- Call Progress Tone Detection/Generation
- DTMF Digit Detection
- Voice Activity Detection / Comfort Noise Generation

- Caller ID Generation / Detection
- T.38 fax relay (v.27ter, V.29, and V.17)
- Fax and Modem passthrough
- TDM Timeslot Interchange (hairpinning)
- Multi-port/Multi-Party Conference Bridging (TDM or Packet side)
- Recorded Announcements

Security

- SRTP
- Authentication*
 - MD5, SHA-1, MMH
- Encryption*
 - 56b DES, 168b Triple DES
 - 128, 192, and 256b AES and RC4

* Subject to possible export restrictions

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