Cogent Computer Systems, Inc.

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"ALWAYS COMPLETE"

CSB1880 - MPC8536E System On a Module (SOM)

The CSB1880, designed, developed and manufactured by Cogent Computer Systems, Inc., is a high performance, network oriented, PowerPC based System on a Module (SOM). The CSB1880 provides a small, powerful and flexible engine for embedded Linux based 10/100/1000 networking applications of all kinds.
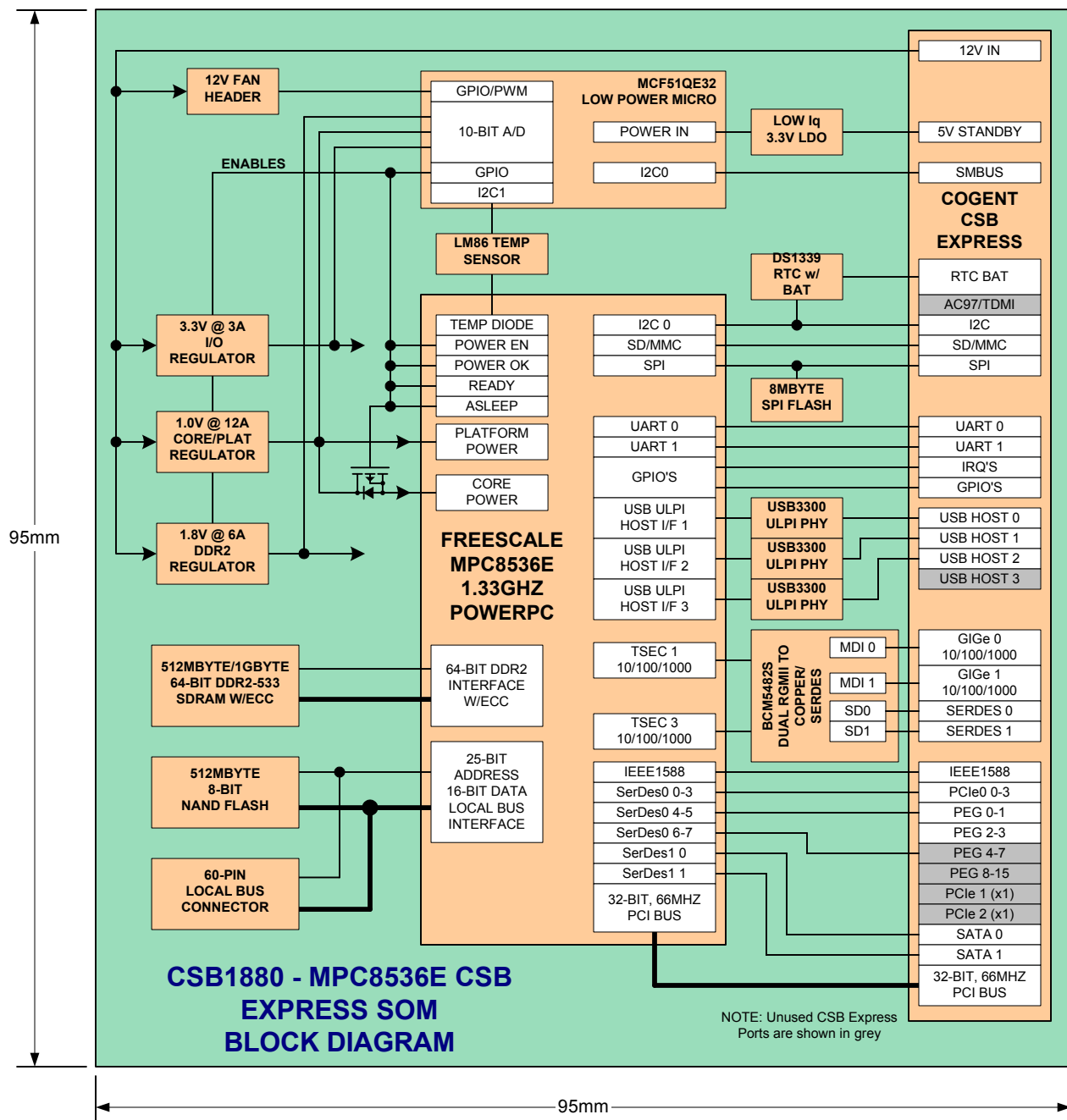
Specifications and Features

- **CPU -** 1.33Ghz e500v2 PowerPC Core
- **CACHE -** 32KByte Instruction and Data Caches, plus On-Chip 512KByte L2 Cache
- **FPU -** IEEE 754 Compliant Floating Point Unit and Vector Coprocessor Unit
- **SDRAM -** 512MByte (1GByte Option) 64-Bit Wide DDR2-533 Memory with ECC
- **BOOT FLASH -** 8Mbyte SPI Serial Flash for Boot Loader
- **NAND FLASH -** On-Board 512MByte NAND and 4-Bit SDIO Port (socket is off board)
- **PCI Express -** One x4 Link and Two x2 Links (may also be configured as one x8, or two x4's)
- **PCI BUS -** 32-Bit, 66Mhz V2.2 with 4 Bus Request/Grant Pairs
- **GIGABIT ETHERNET -** Two Copper or SGMII (Auto selected via PHY) 10/100/1000 Ports
- **SECURITY -** On-Chip Offload Engines Support Various Encryption/Decryption Algorithms including: IPsec/SSL; DES/3DES; MD-5 and SHA1 hashing; Kasumi f8 and f9; and others
- **XOR/RAID -** High Speed XOR DMA Engine for RAID Storage Applications
- **Serial Attached Storage (SATA) -** Dual SATA Gen 2 (1.5Gbit or 3Gbit/sec) Channels
  USB - Three 480Mbit USB 2.0 Host Ports via Low Power ULPI PHY's
- **SERIAL I/O -** Two 4-wire TTL Serial Ports and One I2C Port
- **GPIO -** Eight GPIO lines and Four PCI Interrupts
- **JTAG -** Standard PowerPC 16-Pin JTAG Header
- **POWER MANAGEMENT -** 12V Input via Board Mounting Holes; On-Board 3.3V (I/O), 1.8V (SDRAM), 1.0V (CPU Core); and On-Board MCF51QE32 IPM Micro for Power Sequencing, Boot Configuration, FAN Control and Thermal Monitoring
- **OPERATING TEMPERATURE -** 0C to 70C Operation with Supplied Heatsink
- **OPERATING POWER -** <8W typ., <12W Max and <10mw Power Down (via 3.3V Standby rail)
- **CSB Express Compliant -** Derived from COM Express Type III with Cogent Enhancements
- **Compact Size -** 95mm (3.75") x 95mm (3.75") x 9mm high (Total Height is 32mm with Heatsink)
- **BOOTLOADER/OS -** UBOOT with 2.6.25+ Linux Kernel in Flash

Introduction and Overview

The high-performance Superscalar e500 PowerPC Core, multiple PCI Express links, high speed USB, Dual Serial ATA; Dual 10/100/1000 Ethernet, and highly efficient on-board regulators all combine to make the CSB1880 the ideal engine for size restricted, high performance, Gigabit Ethernet based applications. For the lowest power consumption, the IPM Micro can power the board down completely while remaining on standby power. In this mode the consumption drops to <10milliwatts with IPM bus wakeup events still active. Additionally, the IPM Micro controls power sequencing; thermal, current and voltage monitoring; FAN Control; and boot configuration.

The CSB1880 is constructed using state of the art PCB layout and packaging technology such as: 533Mhz DDR2 balanced tree routing; 3GHZ+ high-speed differential signaling; 15 Amp peak switching regulators; and 8-layer, low EMI, impedance controlled PCB stackup. The CSB1785 gives you access to this technology without the learning curve or the risk. You can integrate the CSB1880 using a simple, low cost 4 or 6-layer PCB, in just weeks, not months! We can even do it for you through our custom design services group.

CSB1880 - MPC8536E CSB EXPRESS SOM BLOCK DIAGRAM

Diagram labels:

95mm (height), 95mm (width)

- 12V FAN HEADER
- GPIO/PWM
- MCF51QE32 LOW POWER MICRO
- 12V IN
- 10-BIT A/D
- POWER IN
- LOW Iq 3.3V LDO
- 5V STANDBY
- ENABLES
- GPIO
- I2C0
- SMBUS
- I2C1
- COGENT CSB EXPRESS
- LM86 TEMP SENSOR
- DS1339 RTC w/ BAT
- RTC BAT
- 3.3V @ 3A I/O REGULATOR
- TEMP DIODE
- I2C 0
- AC97/TDMI
- POWER EN
- SD/MMC
- I2C
- POWER OK
- SPI
- SD/MMC
- READY
- SPI
- ASLEEP
- 8MBYTE SPI FLASH
- 1.0V @ 12A CORE/PLAT REGULATOR
- PLATFORM POWER
- UART 0
- UART 0
- UART 1
- UART 1
- CORE POWER
- GPIO'S
- IRQ'S
- GPIO'S
- FREESCALE MPC8536E 1.33GHZ POWERPC
- 1.8V @ 6A DDR2 REGULATOR
- USB ULPI HOST I/F 1
- USB3300 ULPI PHY
- USB HOST 0
- USB ULPI HOST I/F 2
- USB3300 ULPI PHY
- USB HOST 1
- USB HOST 2
- USB ULPI HOST I/F 3
- USB3300 ULPI PHY
- USB HOST 3
- 512MBYTE/1GBYTE 64-BIT DDR2-533 SDRAM W/ECC
- 64-BIT DDR2 INTERFACE W/ECC
- TSEC 1 10/100/1000
- MDI 0
- GIGe 0 10/100/1000
- BCM5482S DUAL RGMII TO COPPER/ SERDES
- MDI 1
- GIGe 1 10/100/1000
- TSEC 3 10/100/1000
- SD0
- SERDES 0
- SD1
- SERDES 1
- 512MBYTE 8-BIT NAND FLASH
- 25-BIT ADDRESS 16-BIT DATA LOCAL BUS INTERFACE
- IEEE1588
- IEEE1588
- SerDes0 0-3
- PCIe0 0-3
- SerDes0 4-5
- PEG 0-1
- SerDes0 6-7
- PEG 2-3
- SerDes1 0
- PEG 4-7
- SerDes1 1
- PEG 8-15
- 60-PIN LOCAL BUS CONNECTOR
- PCIe 1 (x1)
- PCIe 2 (x1)
- 32-BIT, 66MHZ PCI BUS
- SATA 0
- SATA 1
- 32-BIT, 66MHZ PCI BUS

NOTE: Unused CSB Express Ports are shown in grey

Development Boards and I/O Expansion

The CSB1880 is fully compatible with the CSB1801 Flex-ATX Development Platform. This platform provides a CSB Express Compatible Socket (standard and small sizes) RS-232 COM Port, SDIO Socket, Dual 10/100/1000 Ethernet; XGA (1024 x 768) DVI-I Video; Dual SATA Controller and 2 to 4 USB Host Ports (CPU Specific) to facilitate self-hosted Linux development. This platform also provides One 3.3V PCI Slot, Three PCIe Slots (lanes per socket are CPU specific), and 3 SERDES IO Sites for additional custom or off the shelf high-speed serial expansion. The CSB1801 and CSB1880 are installed in a compact (12.7" x 11" x 5.5"), easy to use (cover removes using only two thumb screws) Micro-ATX Case with 300W Power Supply. Contact Cogent for more detailed information about the CSB1801 and the CSB18xx-DEV Kit.