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BCM1115

PRODUCT
Brief

SINGLE-PORT VOICE OVER IP ETHERNET CPE ENGINE

FEATURES

- **The BCM1115 is the most highly integrated silicon solution for mid-range 1-Ethernet port Voice over IP Enterprise Phone and Ethernet Residential Gateway applications.**

- **The BCM1115 integrates:**
  - 100-MHz MIPS32 CPU (110 DMIPS) with 8 KB of I-cache and 4 KB of D-cache
  - Superscalar 108 MHz ZSP DSP with dual-MAC (216 MIPS), 48 KB of instruction RAM and 32 KB of data RAM
  - One 10/100BASE-T Ethernet PHY with in-line power over Ethernet support
  - Two wideband audio DACs and ADCs
  - 9x9 keyscan controller
  - Ethernet status LED driver
  - TDM IOM-2® port
  - Two UARTs
  - Two high-speed serial ports
  - General purpose I/O
  - Interrupt control unit
  - DMA support unit
  - SDRAM interface
  - External Bus Interface
  - EEE 1149.1 (JTAG)

- **0.18u process technology, 1.8/3.3 V**

- **0.95W peak, 0.3-0.8W standby modes**

- **256-pin PBGA package enables 4-layer PCB designs**

- **Pin and Software compatible with BCM1101, BCM1112, BCM1113, BCM1113R, and BCM1115R ICs**
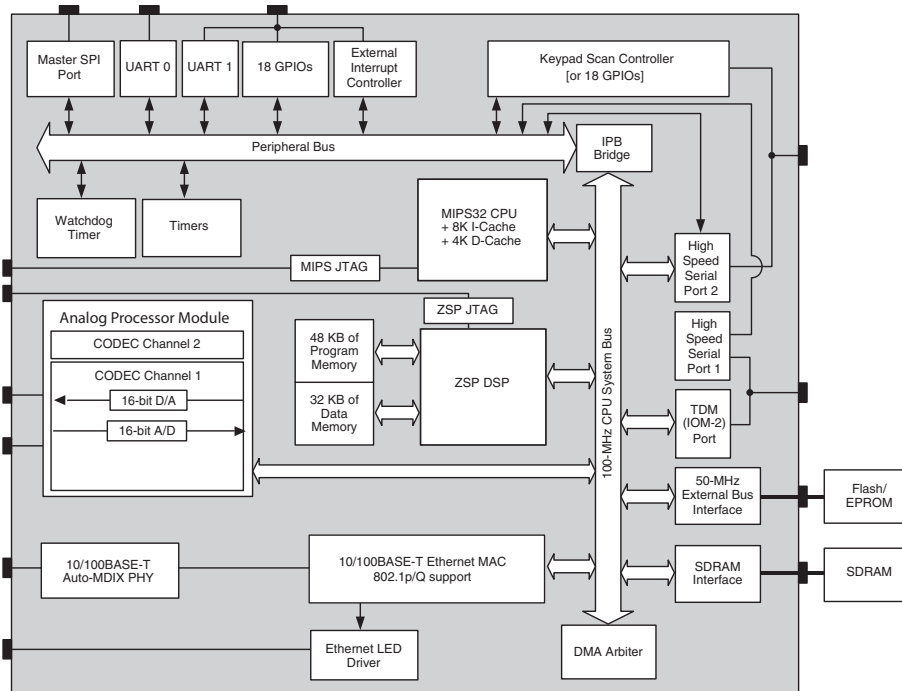
SUMMARY OF BENEFITS

- **87.5 MHz MIPS32 CPU and 108 MHz DSP Support**
  - In IP phone applications
    - VxWorks® Operating System
    - SIP, H.323, H.248/Megaco, and MGCP
    - G.711, G.726, G.729A/AB, G.723.1/A, G.722.1 and BroadVoice®
    - Full-duplex speakerphone operation
    - Handset echo suppression
    - Two- and three-channel conferencing
    - Enhanced Packet Loss Concealment
    - Paging (via a G.711 channel)
    - User application software
  - In VoIP gateway applications
    - VxWorks Operating System
    - SIP, H.323, H.248/Megaco, and MGCP
    - G.711, G.726, G.729A/AB, G.723.1/A, and BroadVoice
    - Line echo cancellation
    - Conferencing support
    - Enhanced Packet Loss Concealment
    - User application software

- **10/100BASE-T Ethernet MAC and PHY**
  - Integrates support for Modified Link Pulse in-line power specification
  - Compliant with 802.3af power over Ethernet standard
  - Provides auto-MDI/MDIX, enabling the use of straight or crossover cables in either port

- **Wideband Audio CODECS**
  - Enables support of emerging wideband vocoding standards

HARDWARE PLATFORMS

- **BCM91101 Reference Platform**
  - Complete Ethernet IP phone reference design in phone plastics

- **BCM91112SMTA Reference Platform**
  - Ethernet Residential Gateway reference design

Master SPI Port | UART 0 | UART 1 | 18 GPIOs | External Interrupt Controller | Keypad Scan Controller [or 18 GPIOs]

Peripheral Bus

IPB Bridge

Watchdog Timer | Timers

MIPS JTAG

MIPS32 CPU + 8K I-Cache + 4K D-Cache

High Speed Serial Port 2

Analog Processor Module
CODEC Channel 2
CODEC Channel 1
16-bit D/A
16-bit A/D

ZSP JTAG

48 KB of Program Memory

32 KB of Data Memory

ZSP DSP

High Speed Serial Port 1

TDM (IOM-2) Port

100-MHz CPU System Bus

50-MHz External Bus Interface — Flash/EPROM

10/100BASE-T Auto-MDIX PHY | 10/100BASE-T Ethernet MAC 802.1p/Q support

SDRAM Interface — SDRAM

Ethernet LED Driver | DMA Arbiter

Broadcom's BCM1115 is designed for use in cost-sensitive, single Ethernet port consumer and Enterprise IP Phone and Gateway products.

Key modules integrated in the BCM1115 include:

- MIPS32™ 100-MHz processor with 8K 2-way set associative I-cache and 4K 2-way associated D-cache. This MCU supports the VoIP protocol stacks, VxWorks operating system, and customer application software. Programming is done in C, on top of Broadcom's object-oriented signal processing API.

- ZSP 87-MHz DSP with 48-KB instruction and 32-KB data RAM. The DSP can support narrowband voice communication using G.711, G.726, G.723.1/A, G.729A/AB, or BroadVoice16™, and wideband communications using G.722 or BroadVoice32™. Full-duplex speakerphone capability is supported in conjunction with any of these voice compression techniques for IP Phone designs. The DSP also supports enhanced Packet Loss Concealment, Jitter Buffer, fax relay and telephony algorithms e.g., DTMF and Call Progress Tones).

- Analog codecs: Two integrated analog CODECs capable of supporting both narrowband 8 Kilohertz (KHz) and wideband 16 KHz sampling, which, in conjunction with wideband voice coders, such as Broadcom's BroadVoice32, will enable IP phone networks to deliver high fidelity voice transmission.

- 10/100BASE-T Media Access Controller and Transceiver. The Media Access Controller (MAC) supports 802.1p prioritization of voice packets and 802.1Q VLAN support for segmenting physical networks into multiple logical networks. The transceiver performs all of the functions for 100BASE-T Ethernet in full- or half-duplex mode over Category (CAT) 5 twisted pair cabling and 10BASE-T Ethernet in full- or half-duplex mode over CAT 3, 4, or 5 twisted-pair cable. The PHY also supports auto-MDI/MDIX detection to allow the use of any cable type. The transceiver integrates support for in-line powering over Ethernet.

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