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ENTERPRISE IP PHONE CHIP

FEATURES

- **The BCM1113 is the most highly integrated silicon solution targeted for midrange Voice-over IP enterprise phones**
- **The BCM1113 integrates:**
  - 87.5-MHz MIPS32™ CPU (96 DMIPS) with 8K I-cache and 4K D-cache
  - Superscalar 108-MHz ZSP DSP with dual-MAC (216 MIPS), 48K instruction, and 32K data RAM
  - Three-port 10/100BASE-T Ethernet switch with 64K buffer memory
  - Two 10/100BASE-T Ethernet PHYs with in-line power over Ethernet support
  - Three wideband audio ADCs and DACs
  - 9 x 9 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
  - IEEE 1149.1 (JTAG)
- **0.18μ process technology, 1.8/3.3V**
- **1.1W peak, 0.3W – 0.8W standby modes**
- **256-pin PBGA package enables 4-layer PCB designs**
- **Pin and software compatible with the BCM1101, BCM1113R, BCM1115, and BCM1115R ICs**
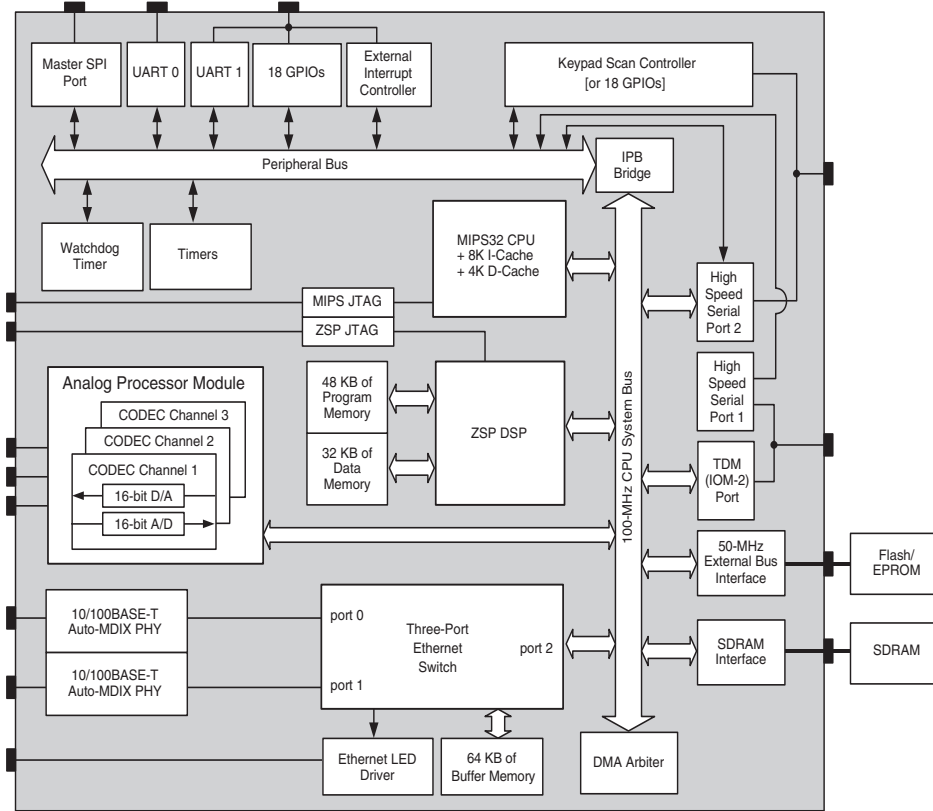
SUMMARY OF BENEFITS

- **10/100BASE-T Ethernet Switch with 802.1p/Q support**
  - 802.1p priority queuing ensures QoS for voice packets and minimizes latency
  - Supports modification of 802.1p priority tags on packets to enforce priority tagging rules
  - 802.1Q VLAN support allows for segmenting physical networks into multiple logical networks
  - MIPS32 CPU not burdened by data packet processing, leaving more cycles for application program
  - Enables wire-speed non-blocking operation
  - Blocks unnecessary traffic by learning local MAC addresses
  - Segments network, preventing any restriction on number of hops
- **87.5-MHz MIPS32 CPU and 108-MHz DSP Support**
  - VxWorks Operating System
  - SIP, H.323, H.248/Megaco, and MGCP
  - G.711, G.726, G.729A/AB/E, G.723.1/A, G.728, G.722.1 and BroadVoice®
  - Full-duplex speakerphone operation
  - Handset echo suppression
  - Two- and three-channel conferencing using complex vocoders
  - Enhanced Packet Loss Concealment
  - Paging (via a G.711 channel)
  - User application software
- **10/100BASE-T Ethernet MACs and PHYs**
  - Integrates support for Cisco 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**
  - Ethernet IP phone reference platform for midrange IP Phones designs

BCM1113 VoIP Ethernet CPE Engine

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

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

MIPS JTAG

ZSP JTAG

High Speed Serial Port 2

High Speed Serial Port 1

Analog Processor Module
CODEC Channel 3
CODEC Channel 2
CODEC Channel 1
16-bit D/A
16-bit A/D

48 KB of Program Memory

32 KB of Data Memory

ZSP DSP

100-MHz CPU System Bus

TDM (IOM-2) Port

50-MHz External Bus Interface

Flash/ EPROM

10/100BASE-T Auto-MDIX PHY

10/100BASE-T Auto-MDIX PHY

port 0

port 1

Three-Port Ethernet Switch

port 2

SDRAM Interface

SDRAM

Ethernet LED Driver

64 KB of Buffer Memory

DMA Arbiter

The Broadcom BCM1113 is a highly integrated IC targeted for the mid-range Enterprise Voice-over IP market.

Key modules integrated in the BCM1113 include:

- MIPS32 87.5-MHz processor with 8K 2-way set associative I-cache and a 4K 2-way associative D-cache. This MCU supports the VoIP protocol stacks, jitter buffer management, and application program. Programming is done in C, on top of Broadcom's object-oriented signal processing API.

- ZSP 108-MHz DSP with 48-KB instruction and 32-KB data RAM. The DSP supports a wide range of vocoders, acoustic echo cancellation for full-duplex speakerphone, fax modems, and a variety of telephony algorithms (e.g., DTMF and Call Progress Tones).

- Analog codecs. Three ADCs and DACs are integrated, eliminating the need for an analog switch to allow the sharing of a codec between multiple interfaces.

- 10/100BASE-T Ethernet switch, media access controllers, and transceivers. The three-port Ethernet switch integrates three full-duplex capable Media Access Controllers (MACs), a serial management port, an address resolution engine, a non-blocking switch controller, 64K of internal switch memory, 802.1p prioritization for voice packets, 802.1Q VLAN support for segmenting physical networks into multiple logical networks, and a set of Management Information Base (MIB) statistics registers. The two transceivers perform all of the functions for 100BASE-T Ethernet in full- or half-duplex mode over Category (CAT) 5 twisted-pair cable and 10BASE-T Ethernet in full- or half-duplex mode over CAT 3, 4, or 5 twisted-pair cable. They support auto-MDI/MDIX detection to allow the use of any cable type in either port. The transceivers also integrate support for in-line powering over Ethernet.

The BCM1113 integrates all the key silicon components of an Ethernet IP Phone into a single device and is pin and software compatible with the BCM1101. The BCM1113 is suited for SOHO Voice-over IP phone products that require mid-range application feature sets (e.g., basic user applications operating on 2-line character displays) while still requiring the same voice quality and reliability of higher end IP phone products.

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