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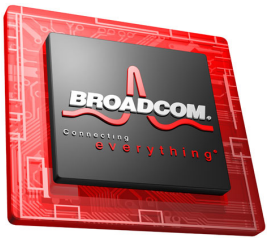
BCM4760 PRODUCT Brief



PERSONAL NAVIGATION SYSTEM-ON-CHIP

FEATURES

- **Processor Core**
  - 500 MHz ARM1136JF-S™
  - 500 MHz Vector Floating Point Unit
  - L1 cache: 32 KB/32 KB (D/I)
  - Scratch RAM: 64 KB
- **Memory Subsystem**
  - Supports up to 166 MHz mobile SDR and mobile DDR (16- or 32-bit)
- **Storage**
  - SLC/MLC NAND memory controller
  - Direct secure boot from managed NAND flash and UART interfaces
  - SDHC / SD / SD 2.0 / MMC 4.3 (×3)
- **2D/3D Graphics Processing Unit**
  - Up to 1 million triangles per second
  - Up to 100 Mpixels per second fill rate
  - 4×/16× full scene anti-aliasing (FSAA)
  - OpenGL® ES 1.1, OpenVG 1.0, and EGL 1.3 compliant
- **Hardware Security Engine**
  - Encryption/decryption (AES, 3DES, RC4, SHA)
  - Public key acceleration (RSA, DSA, DH, ECC)
  - Random number generator
  - OTP ROM (for key and unique ID storage)
  - Authentication (HMAC-SHA1/SHA256)
- **GPS Subsystem**
  - GPS baseband and tuner with integrated LNA
  - Supports space-based augmentation systems (WAAS, EGNOS, MSAS)
  - GPS sensitivity:
    - Autonomous acquisition threshold to –148 dBm
    - Navigation/Tracking threshold to –162 dBm
- **Peripheral Connectivity**
  - 24-bit, RGB-style LCD interface for support of up to 1024 ´ 768 STN and TFT color displays
  - SPI (×2), I^2C (×2), and I^2S interfaces
  - GPIO
  - High-speed UARTs (×3)
  - On-chip 4-/5-wire resistive touch controller
  - USB 2.0 OTG high-speed controller with integrated transceiver (up to 480 mbps)

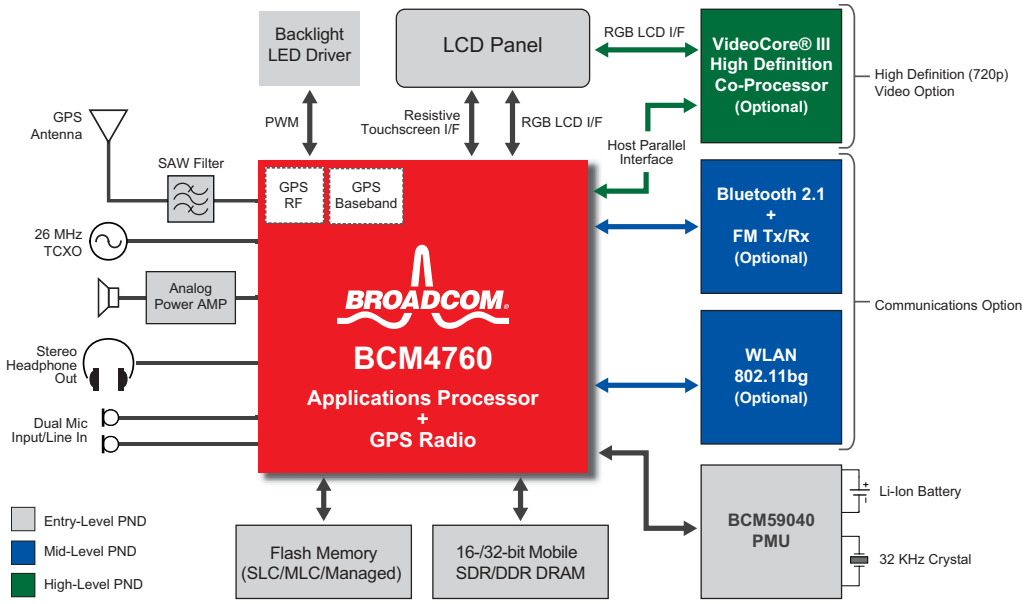
SUMMARY OF BENEFITS

- **First System-on-Chip solution to feature a fully integrated, high performance GPS RF and baseband solution.**
- **Supports Embedded Linux™, Android, and Microsoft® WinCE™ operating systems.**
- **A host interface to the VideoCore multimedia coprocessor provides support for premium video and graphics capabilities.**
- **A high-speed USB 2.0 On-the-Go (OTG) controller with a fully integrated transceiver provides a high-speed serial interface that complies with the OTG supplement to the USB 2.0 Specification (Revision 1.0a) and supports high-speed (480 Mbps), full-speed (12 Mbps), and low-speed (1.5 Mbps) connections.**
- **The secure processing unit for mobile DRM applications (SPU-M) and public key accelerator (PKA) accelerate specific functions that would otherwise consume a large number of CPU processing cycles.**
- **A complete audio subsystem, including DACs, a mixer, stereo headphone amplifier, ADCs, and programmable gain amplifier allows playback into stereo headphones or line-out and eliminates the need for an external codec.**
- **A 4-channel, 10-bit ADC takes voltage measurements from dead reckoning devices and other sensors and can also be used to measure battery charge levels for battery management functions.**
- **A flexible 24-bit LCD controller supports many types of LCD panels of various sizes, resolution, bus width, and timing, providing programmable resolution support of up to 1024 × 768 pixels and has a programmable timing interface.**

APPLICATIONS

- **Portable navigation devices (GPS)**
- **Digital satellite radio receivers**
- **Portable media players**
- **Mobile Internet devices**

OVERVIEW



BCM4760 System Diagram

The BCM4760 System-on-a-Chip (SoC) combines a high-performance GPS receiver and baseband, an ARM11™ 500 MHz processor and companion vector floating point unit, an OpenGL ES 1.1/OpenVG 1.0 compliant graphics processor unit, and advanced analog technology to deliver the most highly integrated applications processor ever created for the personal navigation market.

The BCM4760's high level of integration allows designers to reduce the cost and complexity of PCB design by eliminating external components such as audio codecs, touchscreen controllers, and LNAs. Captured in a small 13 × 13 mm package and manufactured using Broadcom's low-power 65 nm process, the BCM4760 was expressly designed for personal navigation devices (PNDs) and other low-power consumer electronics products.

The BCM4760 enables system manufacturers to create a platform that meets the needs of the entry-, mid-, and high-level GPS PND segments. For the entry market, where low system cost is a primary focus, the BCM4760 provides the functionality needed to create optimized solutions. A USB2.0 OTG high-speed controller with integrated transceiver, 4- or 5-wire touch controller, and audio mixer/DAC simplify the design and help shrink the PCB footprint while keeping the total bill-of-material cost to a minimum.

For midlevel PNDs, the BCM4760 has ample processing power for rapid display of the 3D city maps and 3D landmarks. With the high performance 3-processor architecture (ARM11, FPU, and GPU), multiple high-speed serial interfaces, dual Microphone ADC with PGA, and a 4-channel general-purpose ADC to connect to dead reckoning sensors, the BCM4760 can easily support a wide range of midlevel features. Connectivity technologies such as Broadcom's Bluetooth® and WLAN chipsets can be supported by connecting them directly to the BCM4760 platform. Other features such as hands-free speakerphone, photo viewing, and music playback are also supported.

For the high-level PND, the BCM4760 supports a direct connection to Broadcom's VideoCore® family of coprocessors. Adding the VideoCore III coprocessor enables high definition video playback or recording, graphics acceleration, image signal processing (ISP), and more.

The BCM4760 is the first SoC solution to feature a fully integrated, high-performance GPS RF and baseband solution. The low-noise GPS RF section features an on-chip LNA, a highly linear mixer/IF gain section, and 4-bit ADC. The 24-channel GPS baseband features Broadcom's patented massive parallel correlation architecture that delivers high sensitivity and fast time-to-first-fix (TTFF) performance.

Application developers can take advantage of the hardware-based graphics processing unit to create engaging 2D/3D applications while including the latest nuances in 3D mapping. Anti-aliasing hardware and transparency overlaying enrich the look and feel of vector graphics and also improve overall display performance.

The BCM4760's advanced power management techniques such as voltage and frequency scaling, power islands, and optimized power domains, the BCM4760 puts "portable" back into personal navigation. In addition, Broadcom offers a companion power management unit that performs battery and power supply management functions. Using the two devices together can help achieve greater system power savings.

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