

## SINGLE-CHIP AGPS SOLUTION

### FEATURES

- Single-chip solution—AGPS baseband and CMOS RF front-end integrated on a single-die—minimizing board space footprint (<math><35\text{ mm}^2</math> PCB area for a complete AGPS solution)
- Up to 2-Hz update rate
- Real-time hardware correlator engine (fast acquisition and high-sensitivity) capable of tracking 24 satellites simultaneously
- Built-in voltage regulators for easy power management
- Multiple mode operation
  - MS-based (calculation of position in mobile handset)
  - MS-assisted (calculation of position in base station)
  - Autonomous (no assistance by network)
  - Enhanced autonomous (position computed at mobile device using multi-day Long Term Orbits (LTO™))

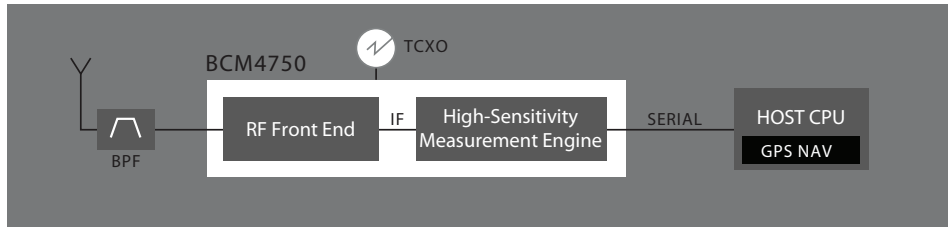
### SUMMARY OF BENEFITS

- Advanced low-power RFCMOS technology and low-power tracking at 13 mW for the longest battery life
- Host communication via two-wire UART, I<sup>2</sup>C-compatible Broadcom Serial Control (BSC), or SPI with baud rates as low as 9.6 Kbps
- High-sensitivity, -157-dBm assisted acquisition sensitivity (with coarse time assistance) and -162-dBm tracking sensitivity, enabling indoor and deep urban operation
- Broadcom software provides protocol layers for control plane (RRLP and RRC) as well as user plane (SUPL)
- Autonomous cold start TTFF 30 s
- Exceeds 3GPP TS 25.171 and 3GPP2 TS C.S0036 performance requirements
- Packages
  - FBGA (6.2 mm × 6.2 mm)
  - FBGA (5 mm × 5 mm)
  - WLBGA (3.6 mm × 3.6 mm)
- Availability
  - Samples available now

### BCM4750 Single-Chip AGPS Solution



## OVERVIEW



### BCM4750 Block Diagram

The BCM4750 is a single-chip, single-die GPS receiver IC fabricated on 90-nm RFCMOS technology. The BCM4750 integrates a high-performance baseband section with a low-noise CMOS radio front end. It is designed to interface with host processors in mobile phones, PDAs, personal navigation devices (PNDs), and MP3 players. The BCM4750 is a host-based GPS IC that delivers the highest positioning performance yet uses the smallest PCB area in the market today.

Broadcom provides a software library that realizes the GPS navigation solution in the host using minimum resources and with no real time requirements. The BCM4750 uses a patent-pending innovative RF design that improves both current consumption and LNA linearity as well as allowing for a minimum number of external components used.

Broadcom has pioneered the concept of host-based GPS, where the functionality is shared between the GPS IC and the host processor, as the best compromise for cost and size while maintaining performance in large volume mobile applications. Host-based GPS uses the GPS IC as a

hardware accelerator that performs all the signal processing functions related to the acquisition and tracking of the GPS signals, relieving the GPS IC of a complete CPU subsystem including ROM, RAM, and other needed peripherals.

Competing System-on-a-Chip (SOC) solutions often have navigation algorithms hardcoded in ROM, resulting in products that are quickly obsolete. Additionally, competing SOCs often use separate flash memory that call for multi-die system-in-package products that are bulkier and cost more than single-die solutions such as the BCM4750. Host-based architectures are ideal for AGPS products where various forms of aiding are used, since the aiding information typically comes from the host CPU.

Requirements on the host CPU are minimum (few MIPS), and no real time requirements are imposed. Communication with the host is done through standard serial I/O protocols at very low bandwidth (down to 9.6 Kbps).

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