



CDMA

# MOBILE STATION MODEM



CDMA Technologies  
Enabling the Future of Communications.™

## MSM3300™

QUALCOMM CDMA TECHNOLOGIES

MSM3300™

### OVERVIEW

The mobile phone - using Code Division Multiple Access and Advanced Mobile Phone System (CDMA/PCS/AMPS) cellular technology that relies heavily upon digital signal processing - is increasingly becoming an important entertainment and information tool. To facilitate faster design times and reduce production costs, QUALCOMM has developed a Mobile Station Modem (MSM™) chipset and system software solution. The heart of the chipset solution is QUALCOMM's MSM3300 single-chip baseband processor modem that interfaces directly

with the IFR3300™ or IFR3500™, RFR3100™ or RFR3300™, RFT3100™ and PA3100™ or PA3300™ chips, and the PM1000™ power management chip. The MSM3300 chipset and system software will enable the design of a new generation of CDMA handsets and data devices with rich feature sets and industry-leading performance. The MSM3300 solution is feature- and pin-compatible with the MSM3100™ device and includes advanced technologies such as position location and Bluetooth™, as well as multimedia features

such as Qtunes™ MP3 player software and Compact Media Extension (CMX™) MIDI-based multimedia software. Along with an optimized software solution for the CDMA modem, QUALCOMM offers system development software, verification, test, debug, calibration, manufacturing and field test support using the CDMA Designer™ development tools, which reduce time-to-market for a complete CDMA handset.

The MSM3300 device integrates both digital and analog functions on a single

chip. The low-power, low-cost MSM3300 solution includes proprietary CDMA building blocks, an ARM7TDMI™ RISC microprocessor and QUALCOMM's powerful QDSP2000™ digital signal processor core, which enables a host of advanced multimedia features.

Pin compatible with the MSM3100 solution, the MSM3300 solution will be available in the same 208-ball Fine-Pitch Ball Grid Array (FBGA) production package.

### MSM3300 SYSTEM SOLUTION

The MSM3300 device is the centerpiece of the chipset made up of the MSM3300 modem, the RFT3100 analog-baseband-to-RF upconverter, the IFR3300 or RFR3300 IF-to-baseband downconverter, the RFR3100 RF-to-IF downconverter, the PA3100 or PA3300 Power Amplifier and the PM1000 power management chip. The MSM3300 device performs baseband digital signal processing and executes the subscriber unit system

software. It is the central interface device in the subscriber unit, connecting RF and baseband circuits as well as memory and user interface features.

The user interface of a subscriber unit typically includes the keypad, LCD display, ringer, microphone and earpiece. The MSM3300 device also contains complete digital modulation and demodulation systems for both CDMA and AMPS cellular

standards as specified in IS-95A and IS-95B. The subscriber unit system software controls most of the functionality and activates the features of the subscriber unit. System software is executed by an embedded ARM7TDMI microprocessor within the MSM3300 device.

QUALCOMM also supplies system software and development tools to minimize the development time of a subscriber unit. With the release

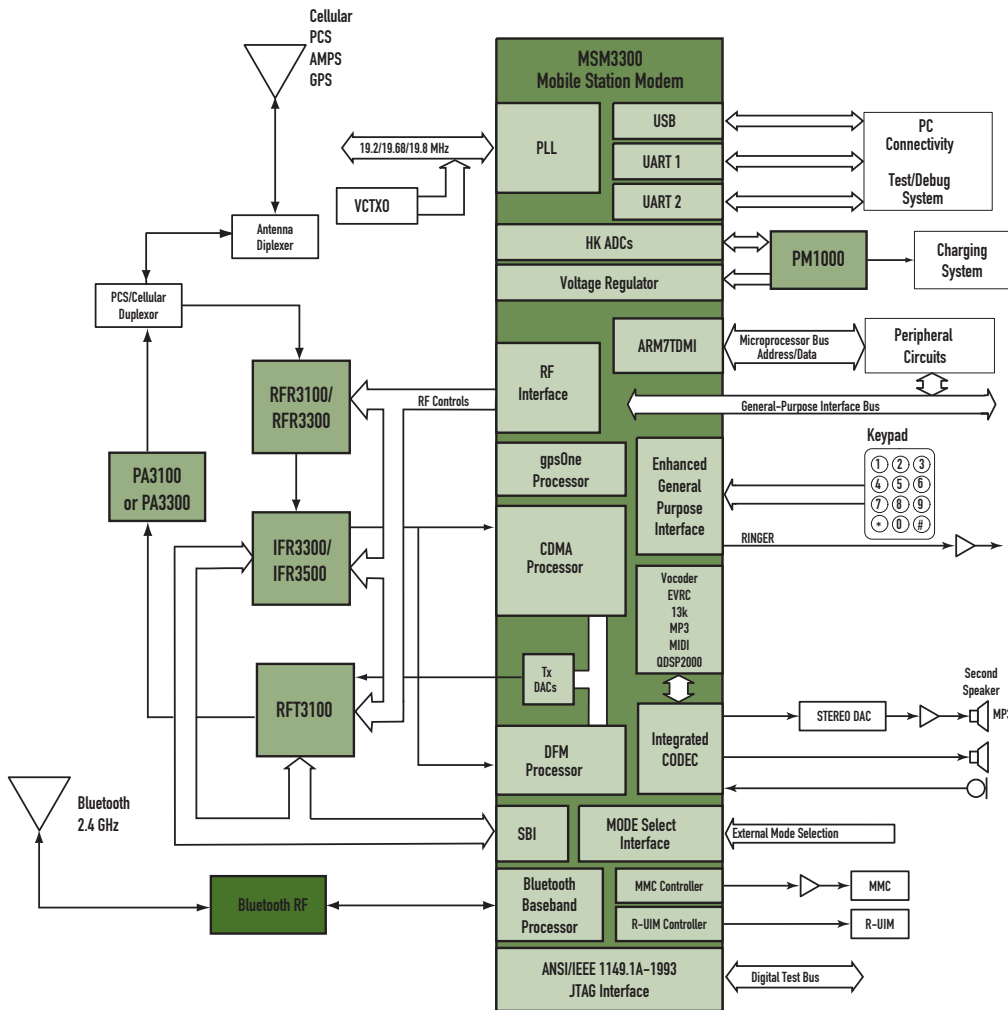
of the MSM3300 solution, an optimized version of Dual-Mode Subscriber Software (DMSS) will be available, with device driver support for the new functionality of the MSM3300 chipset. Additionally, the Subscriber Unit Reference design for MSM3300 chipset (SURF3300™ board) will be available, offering a baseline hardware platform for additional software development.

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Figure 1. MSM3300 Device Functional Block Diagram



### MSM3300 FEATURES

Key features of the MSM3300 chip include:

- Feature compatible and pin compatible with the MSM3100 chipset
- Position location processor based on gpsOne™ technology
- Embedded Bluetooth baseband processor
- Compliant with Bluetooth 1.0 standard
- IS-95B compliant to support High Speed Packet Data (HSPD)
- Audio enhancement technology support (Qtunes and CMX software)
- Integrated mass-storage device (MMC) controller
- Integrated Removable User Interface Module (R-UIM) controller
- 2.3 V to 3.0 V I/O
- 208-ball Fine-Pitch Ball Grid Array (FBGA) package

MSM3300™

## gpsOne™ TECHNOLOGY ON THE MSM3300 CHIPSET

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QUALCOMM is introducing its breakthrough gpsOne position location technology in the MSM3300 solution. The new gpsOne technology merges Global Positioning System (GPS) satellite and network information to provide a high-availability

solution that offers industry-leading accuracy and performance. This solution not only meets the FCC E-911 mandate under the most challenging conditions, but also provides a ubiquitous platform for location-based applications.

The mobile station (MS) collects measurements from the GPS constellation and the cellular/PCS network, then sends the information to the Position Determination Entity which optimizes the position location calculation based on existing

information. gpsOne technology will enable consumer-priced, position-capable CDMA handsets. Figure 1 illustrates the baseline architecture for the MSM3300 and CDMA/GPS receiver devices.

## MSM3300 BLUETOOTH™ SOLUTION

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Bluetooth is a Global Specification for Wireless Connectivity. Bluetooth technology allows replacement of the various proprietary cables that connect one device to another with one universal short-range radio link. For example, Bluetooth radio technology built into both a cellular telephone and a laptop would replace the cumbersome cable used today to connect a laptop to a cellular telephone. Printers, PDAs,

desktops, fax machines, keyboards, joysticks and virtually any other digital device can be part of the Bluetooth system. In addition to untethering devices by replacing the cables, Bluetooth radio technology provides a universal bridge to existing data networks, a peripheral interface, and a mechanism to form small, private ad hoc groupings of connected devices away from fixed network infrastructures.

The Bluetooth air interface is a frequency-hopping Guassian Frequency Shift Keying (GFSK) modulation in the unlicensed 2.4 GHz ISM band. The modulation rate is 1Mbps, and its architecture offers a low-cost, simple radio solution. The Bluetooth baseband functionality is incorporated into the MSM3300 solution. The Bluetooth RF device is contained in the physically separate RF device that can reside on the

same circuit card as the MSM3300. In addition to pursuing an optimal design to minimize cost, size, power dissipation, etc., QUALCOMM is designing Bluetooth baseband processing to be operational at the same time as the CDMA baseband processing to facilitate dial-up networking. Figure 1 illustrates the baseline architecture for the MSM3300 and Bluetooth RF device.

## MULTIMEDIA FEATURES ON THE MSM3300 CHIPSET

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As mobile phones become more popular, they are also becoming more of an entertainment tool. The MSM3300 solution will support optional software from QUALCOMM, enabling

advanced features such as MP3 music and MIDI-based multimedia applications. MP3 (MPEG1 Layer3) is a standard audio file format for compressing a sound sequence into about one-twelfth the size

of the original file with very little loss in sound quality. The MSM3300 solution integrates a mass storage device controller, such as an MMC (Multimedia card) interface, which provides

an effective interconnection to much larger memory space to store CD-quality music data or mapping data from a geographical navigation service.

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