

RIM fields a BlackBerry with consumer appeal

By David Carey

Research in Motion Ltd. has long been a stalwart in the business e-mail terminal market. Whether it invented the category or managed to elevate the concept to mainstream status is up for debate, but its server-based and client software for push e-mail technology almost certainly set the standard, adding “BlackBerry” to the common business vernacular.

As with any company needing to grow, RIM (Waterloo, Ontario) started looking in new directions. Recently, it has dabbled closer to the conventional consumer-oriented phone. Similar to an earlier product (the RIM BlackBerry 7100), the RIM BlackBerry 8100 Pearl brings a slenderizing trend to the company’s traditional slab-format handhelds. With the 8100, RIM has gone further into conventional bar-type cell phones, adding the now nearly ubiquitous camera and a host of media-friendly features. While the usual enterprise e-mail capability is still in place, a 1.3-Mpixel CMOS camera joins with support for ringtones, MP3/MIDI/AAC audio and MPEG-4/H.263 video to bring the BlackBerry squarely into the mainstream. Internal memory of 64 Mbytes with expansion by way of a mini SD card slot provides user storage, and the Bluetooth 2.0 interface can serve up music to a stereo headset.

The interface’s portrait screen is a somewhat unconventional, 240 x 260-pixel TFT display supporting more than 65,000 colors—still highlighting the emphasis on e-mail readability. The 90-gram Pearl’s 107 x 50 x 14-mm dimensions mean the narrow display must also join with something less than the normal QWERTY keyboard. As with the 7100, the design relies on a 5 x 4 array of key-

caps that each host one to three characters. When buckled to predictive text software, it presents a QWERTY layout, albeit in alternative form. I’ve not tested the solution, but the one-key, one-letter tradition of BlackBerries has been tossed aside to accommodate the narrow profile.

On the communications front, the Pearl supports quad-band GSM at 850/900/1,800/1,900 MHz with the same GPRS and Edge network capability found in the previous BlackBerry 7100. While Edge data still falls short of 3G networks on transfer rates, the standard does almost triple data rates vs. GPRS. A removable 900-milliamp-hour lithium-ion cell is said to provide up to 15-day standby time and 3.5 hours’ talk time under favorable network conditions.

The communications engine comes from Freescale in the form of the MMM-6000 transceiver and MMM6027 RF front-end module. The MMM6000 handles all lower-power radio functions and interfaces to the baseband by way of the DigRF industry standard protocol, relying on multichip packaging to bring together three IC devices of distinctly different composition. The first chip in the MMM6000 hosts the more analog and RF elements of the radio (probably

implemented in SiGe process technology) while the second appears to be a far more digital design, almost certainly straight CMOS and probably implementing a DSP within the radio proper along with the DigRF interface. A third small chip provides an in-package low-loss filter.

The MMM6027 is also a multichip affair, combining seven integrated circuits to create the front-end module responsible for RF filtering, RF power amplification, antenna switching and module control. The component implements polar modulation with a selectable linear/saturation mode of operation for Edge and GSM, respectively. These features, combined with other design attributes, are said to reduce external component count/complexity, increase power efficiency and simplify RF tune-up for increased manufacturing throughput.

Multicore processing for the baseband engine joins the radio’s multichip packaging. A single PXA900 312-MHz Hermone cellular processor from Marvell Technology Group Ltd. (previously made by Intel Corp.) supports comms processing for GSM/GPRS and Edge while also tackling OS, interface and multimedia tasks. The combined applications/baseband solution represents one of two distinct vectors in the mobile-handset space. The alternative solution separates communications and applications processing in distinct devices. Covering all bases, Marvell has announced upcoming availability of its PXA3xx Monahans line of applications-centric processors, designed to couple with external communications-related silicon.

The analog subsystems are spread between two primary devices, with the audio subsystem based on the Maxim MAX9853 codec and with system power

management derived from Texas Instruments' TPS65820. Other ICs are part of the power management equation, but the TI part handles most activity there. CSR's BC41B143A BlueCore4 single-chip device serves for the Pearl's Bluetooth v2.0 link.

Pearl's namesake navigation feature is a trackball, replacing the thumbwheel navigation more familiar in RIM products. The translucent trackball's white backlighting can change up for context-sensitive backlighting colors to handle notification, caller ID, etc. Operation comes

from four magnetic spinners engaged by the trackball, each linked to a Hall-effect sensor that relays rotation information.

Sensitivity to manufacturing complexity is evident. Predominantly single-sided surface mount limits placement costs, and the bar phone construction allows final assembly to occur with few reorientations, further shaving factory costs.

Industry-standard component interchanges, multicore processors and multi-chip integration deliver the Pearl as a consumer-slanted continuation of the

popular BlackBerry series. With some keyboard changes and a clever navigation rollerball, RIM apparently hopes to slim the e-mail terminal and bring in a new audience while not forgetting its traditional user.

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