Motorola Adds Midrange Network Chips

New PowerPC 850 Variations Extend PowerQUICC Line

by Jim Turley

Not taking any chances with its lucrative line of intelligent network controllers, Motorola has added four more chips to its PowerQUICC line of networking and telecommunications chips. The new chips fill a space in the company's product line between the high-end MPC860 chips and the two existing MPC850 devices. At $28–$34 in volume, these chips should be popular among makers of low-end network routers for small-office environments. Network heavyweights Bay Networks, Cabletron, and 3Com are all developing products that use the new devices.

The move further solidifies Motorola's position as the preeminent supplier of intelligent controllers for the networking market. Ever since the release of the 68302 in 1989, Motorola has doggedly pursued this market and currently offers no fewer than 20 different but related parts.

New Four Add Ethernet, ATM Capability

Motorola's latest barrage includes four chips, dubbed the MPC850DC, 'DE, 'DH, and 'SAR. These four closely follow the design of the existing 850 and 850SE (see MPR 6/23/97, p. 4), which have been in production for nearly a year. All six chips share the same PowerPC processor core and microcoded communications engine, as Figure 1 shows. Where the chips differ is in the microcoded capabilities of their various serial ports, as Table 1 shows. Some handle Ethernet, others USB, multichannel HDLC, or ATM. The MPC801 is nominally part of the same family, but with nothing more than a pair of UARTs on board, it's really a junior member.

The four new chips enhance the abilities of the 850 line by adding a second SCC (serial communications controller) channel and a bigger internal SRAM area for buffering and for communication between the CPU and the communications engine. The 'DH handles multichannel HDLC, while the 'SAR adds ATM support to Motorola's 850 line for the first time.

The goal of the upgrades is to permit running one or more Ethernet channels, possibly in addition to HDLC and ATM. The new combinations permit simpler designs for an ISDN/Ethernet router, or, in the case of the 850SAR, an ADSL adapter (with some other significant circuitry).

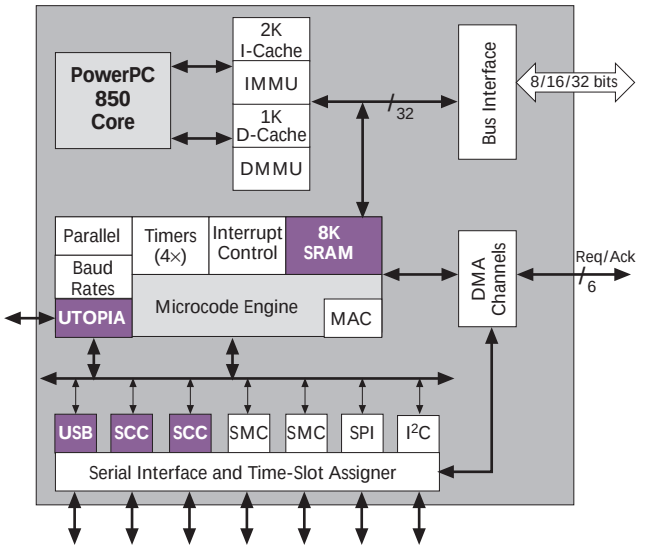

Figure 1. The purple areas indicate the new serial communication channels (SCC), USB interface, and bigger dual-port SRAM found in the four new MPC850 controllers.

Peripheral Mix Is Secret Recipe

Like Motorola's other specialized communications controllers (*www.mot.com/SPS/RISC/netcomm*), the value is in the integration, not the processor. In the case of the MPC850 devices, the PowerPC core plays almost no part in the actual protocol processing. It instead acts as a host for application code. As the speed of the host increases, OEMs are able to add more application code and support more exotic forms of data management.

In a market this vital, it's inevitable that other vendors with other CPU architectures will try to encroach on Motorola's territory. Any instruction-set architecture is suitable, but those with good code density or support for unaligned transfers have an advantage. Intel's i960 initially did well here; integrated x86 chips could also be successful. The key is the breadth of peripheral logic. Vendors with established lines of communications silicon, such as Lucent, LSI Logic, or AMD, are in the best position to assault Motorola's position. For the near term, however, the MPC850 and its siblings give Motorola a solid lead. M

	MPC850	850SE	850DC	850DE	850DH	850SAR
Min freq	33 MHz	33 MHz	33 MHz	33 MHz	33 MHz	33 MHz
Max freq	66 MHz	66 MHz	66 MHz	66 MHz	66 MHz	66 MHz
SCCs	1	1	2	2	2	2
Ethernet	1	1	1	2	2	2
HDLC?	no	no	no	no	yes	yes
ATM?	no	no	no	no	no	yes
USB?	yes	no	yes	yes	yes	yes
Avail.	now	now	3Q98	3Q98	3Q98	3Q98
Price	$26	$24	$28	$31	$34	$34

Table 1. In addition to eight MPC860 devices, Motorola now offers six variations of the lower-cost MPC850 comm controller.