

SUNNYVALE, Calif. DynaChip Corp. has begun shipping its third generation of FPGAs targeting the high end of the market. The family arrives as DynaChip watches competitors such as Xilinx Inc. beginning to encroach on its high-speed niche.

As with DynaChip's earlier devices, the new DY6000 parts are based on an "active-repeater" structure, which buffers signals at each interconnect juncture to speed overall performance. This architecture also makes delays deterministic—a signal's real speed moving through the chip will match the performance calculated on paper.

DynaChip builds its parts entirely for speed, targeting those slices of the FPGA market that push performance, the company said. Data communications and video processing top the list.

The DY6000 family adds to every logic block 32 bits of synchronous, dual-clock, two-port RAM, usable as scratchpad memory or, more notably, as FIFOs for rate matching. This feature was added with data networking in mind, where FIFOs often are needed for shuttling data between two buses of differing speeds.

Other timing improvements come from programmable analog phase-locked loops, designed by DynaChip and different from those used in previous chips. They can be used to fine-tune clock signals "to eke out the last bit of performance," said Don MacLennan, chief executive officer for the company, based here. For example, the PLLs can be set to keep blocks running a few nanoseconds ahead of the actual clock edges.

The DY6000 also can be reconfigured dynamically, changing sections of the circuit while the chip continues to run, a feature that's come in handy with at least one data-encryption scheme. "There aren't many FPGAs out there where you can do that," MacLennan said. "This is the only one that's available to customers."

Fabless DynaChip uses Taiwan Semiconductor Manufacturing Co. as its principal foundry and will have 0.25-micron parts available from TSMC early next year, MacLennan said. That pace keeps DynaChip one process generation behind competitors such as Xilinx, but so far that's not been a

handicap. “We seem to get similar speeds on 0.35 [micron] as they do with 0.25 today,” MacLennan said.

For now, DynaChip chooses to shy away from the cutting-edge processes such as pilot 0.18-micron technologies offered by many foundries. That might change as the competition begins encroaching on the high-speed market, but for now, the company is content with finding “a low-risk way to get the most advanced technology possible,” MacLennan said.

Already in production, the 55,000-gate DY6055 is the first of four planned devices for the DY6000 family. The others, ranging from 9,000 to 35,000 gates, are available in sample quantities.