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Freescale Plans Compatible 8-, 32-bit Processors for Late This Year

As more customers seek performance headroom.

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AUSTIN, Texas — As more of its customers seek performance headroom, Freescale Semiconductor Inc. plans to offer compatible versions of its high-end 8-bit and 32-bit processors, including software development tools, late this year.

Will Strauss, president of Forward Concepts, said Freescale's move is part of a larger trend among microcontroller and DSP vendors to protect investments in software development by offering compatible chips in the low and high end of the performance range.

The company also plans to introduce a line of low-end 8-bit microcontrollers this spring that are designed to carve out market share in the reduced-cost sector.

The Freescale chips slated to sample by the end of the year will be the company's first step in a long-term strategy to offer a continuum of controllers and tools. Those products will "knit together" the 8-bit and 32-bit product lines, said Paul Grimme, senior vice president and general manager of the transportation and standard products group.

Grimme acknowledged that Freescale's strategy is similar to one pursued by Atmel Corp. (San Jose, Calif.), which has developed compatible AVR microcontrollers across the 8- and 32-bit address lines.

Discussing Freescale's more-immediate plans, Renee Mitchell, manager of the 8-bit controller business, said the company's reduced-cost 8-bit core, the RS08, will be used in a line of 8-bit controllers that will be introduced this spring. The core will be aimed at the 50 cents-and-below market. Freescale now sells 8-bit controllers that are priced from 50 cents to $5 each, with an average selling price of $1.67.

"We haven't made the investments needed to compete with Microchip at the lowest corner of the 8-bit market. But we are now dead serious about the low end," Mitchell said.

While Freescale is concentrating on the low-end 8-bit sector, Microchip Technology Inc. is developing a line of 16-bit MCUs and related DSP capabilities for its PIC24 and dsPIC product lines.

Lost-cost thrust

Tony Massimini, an analyst at Semico Research, said the bulk of the 8-bit MCU market is now below the $1 price point, even if the smart-card market is excluded. "Freescale has had a reputation of throwing everything, including the kitchen sink, into a design. The integration is impressive, but not all 8-bit designs require that. So this RSO8-based line of controllers is a wise move to compete for high-volume applications."

Freescale continues to hold the No. 1 revenue position in both the 8-bit and 32-bit MCU markets. But Strauss of Forward Concepts said that in the sub-$1 microcontroller market, Microchip beat

Freescale to the punch, offering a broad line of microcontrollers that gained Microchip bragging rights as the company that ships the highest unit volumes in the 8-bit market.

The RS08 will use the same bus structure as the more-expensive 8-bit microcontrollers in the 9S08 family, making them compatible with off-chip memories and peripherals. However, they will use a reduced instruction set that supports smaller die sizes. "The functions eliminated are replaced by simpler constructs that will still allow very compact coding of most embedded" apps, said Nicole Urbis, marketing communications manager at Freescale.

Meanwhile, a new version of Freescale's CodeWarrior Development Studio will support software development for both the 8-bit SO8 and the upcoming cost-reduced 32-bit Coldfire core. Also, Freescale is developing a unified hardware development platform that will offer common board and cable interfaces to "give designers a consistent experience across architectures," Grimme said.

Freescale will continue to develop 16-bit controllers for the automotive market, Grimme said, but the industrial and consumer thrust will be on the 8- and 32-bit lines. The Coldfire architecture supports variable-length instructions, bridging the 16-bit and 32-bit address spaces.

The low-end version of the Coldfire 32-bit family that the company plans to introduce by the end of the year will deliver 20 to 50 Mips. The 32-bitter will have the same peripherals and memories as a new high-end 8-bit controller in the RS08 family, which will deliver about 10 Mips. Both chips will be made with the same 0.25-micron process.

A simpler CodeWarrior

In addition to offering products that are compatible, Freescale is developing products that are easier to use. The company launched version 5.0 of its CodeWarrior suite early this year. The new version, said Greg Hemstreet, product manager of the company's CodeWarrior tools, was aimed at customers who "said they didn't need all of the functions in CodeWarrior, which was too complicated for them, with too rich of a user interface."

The forthcoming CodeWarrior suite will continue the trend toward simplification, offering support for the low-end Coldfire, with its 8-bit peripheral set, and support for the high-end 9S08 8-bit processor.

"With optimizations, we believe it's a reasonable design goal to have the code density near parity" for 32-bit code compared with 8-bit code, Hemstreet said. "We want to make the new version of CodeWarrior an easy-to-use tool so that they just recompile 8-bit code to a 32-bit processor."

Strauss of Forward Concepts said the question "that will need to be answered next year, after these parts have been out, is, 'Have you lost anything when you recompile the 8-bit S code to run on the 32-bit Coldfire processor?' "

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