

Is Field Programmable Gate Array (FPGA) Technology Poised for Disruption?

The demand for increased flexibility and lower cost helped fuel the adoption of FPGA technology in place of the more expensive Application Specific Integrated Circuits (ASIC). "However, the existing FPGA technology is quite old. The basic architecture was developed 20 years ago," said Doug Pihl, CEO and chairman of the board for MathStar, developers of Field Programmable Object Arrays (FPOAs).



Today, the rapid growth and advancement in digital and video technology is outpacing FPGA speed capability. "This growth is impacting many applications including broadcast video, medical imaging, testing equipment and military applications," Pihl added.

In broadcast video, for example, High Definition video is driving processing and bandwidth requirements across the board. Satellite and cable providers are in a heated race to deliver new HD content to the millions of already deployed 1080p60 HDTV sets. This trend, combined with the move from established compression standards like MPEG-2 to newer approaches like MPEG4/H.264, is also driving an exponential increase in both processing capability and the need for flexibility.



"The use of Object Arrays in a programmable system is a powerful and useful core value. There are many ASIC type products with embedded object arrays doing specific functions. However, they are costly to design and often made obsolete by changes in standards or application," according to Chris Baumann, strategic business advisor with Core Capital Group's Electronic and Semiconductor Group. "The other end of the spectrum is the FPGA where complete flexibility in logic is achievable but it is difficult to do complex designs fast or with high performance due to the interconnect and timing limitations fundamental to FPGAs."

The field programmable object array (FPOA) concept provides a third option to system designers between the extremes by providing very high function performance, deterministic timing and shorter

(See page 2, col. 1)

Cracks Showing in Credit Freeze

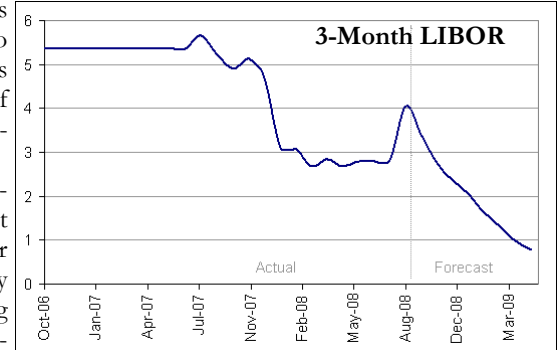
Investors are beginning to shift money into corporate and federal agency debt in a sign that the credit crisis may be at its peak.

"Although we will be digesting the global credit crunch for a while (2-3 quarters), I believe we have seen the worst," according to Loren Lancaster, managing director of Core Capital Group's Electronics and Semiconductor Group.

On October 27, the current 3-month LIBOR rate was 3.520%, more than 100 basis points off its peak at 4.81875% on October 10. The 6-month rate has also dropped to 3.7% from its recent peak of 4.4% in mid-October.

"LIBOR is perhaps the best measure for global liquidity and it is showing signs of thawing," Lancaster added.

(See page 2, col. 2)



Source: The Financial Forecast Center, update on Oct. 9, 2008

From the Trenches

By Loren Lancaster for M&A Review

To say that we are in uncharted territory would be an understatement. Over the past two months, Core Capital Group's Electronics and Semiconductor Group has been raising capital for several deals. In the process, I have made some interesting observations.

- At the same time credit sources have vaporized, we have been seeing a backlog of investment opportunities and real competition for dollars since the crisis began.

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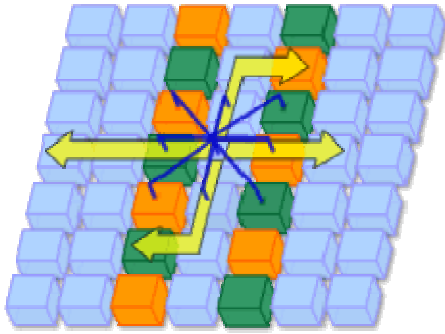


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FPOA *(From page 1, col. 1)*

design time than an ASIC or FPGA solution. The FPOA concept of reconfigurability of the device to adapt the system function to a new application without changing hardware is unique to the application space. The significant benefit to system designers is they can now do system partitioning of functions and data manipulation in ways they could not with FPGAs or ASICs. This is a paradigm shift in systems design and allows for more flexibility in how system problems are approached and solved. The very high performance of the FPOA is also a distinct advantage over FPGAs and some ASICs in that it allows, with proper system design, for the FPOA to be a hardware or data



accelerator running at clock multiples of the remaining design of the system. This allows for more real-time computing of applications while not burdening the system controllers excessively.

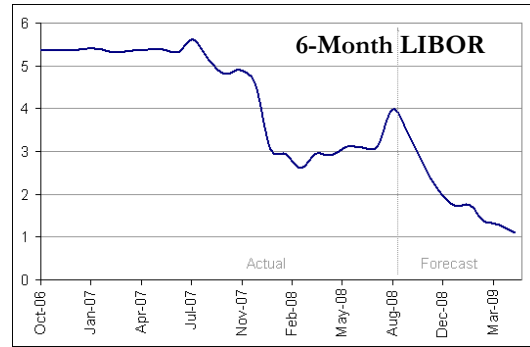
“We found that people would rather not build applications from a detailed gate level up. Programming at the object level is a way to speed the development process because you are designing with hundreds of objects vs. millions of gates,” Pihl commented.

In the Broadcast Video example mentioned earlier, faster design cycles and the need to support multiple video standards such as MPEG-2 and MPEG4/H.264 are leading more designers towards programmable logic and away from custom silicon or ASICs. However, increasing performance requirements make DSPs and FPGAs untenable in many of these high-performance applications. The Field Programmable Object Array was designed to overcome these performance challenges. The Arrix FPOA provides up to four times the performance of an FPGA while retaining the flexibility of a programmable device. MathStar's 1 GHz FPOA is ideally suited for video processing applications such as: MPEG-2 4:2:2 Profile, MPEG-4/H.264, High/High 10/High 4:2:2 profiles, and high sample rate JPEG2000. The FPOA can be programmed in real time for 1080i/720p High Definition or multi-stream Standard Definition applications.



Given the restrictions in real performance gains that FPGAs can continue to achieve and the increased performance offered by FPOAs as well as the more efficient design time, it appears that the market is poised for disruption.

Cracks *(From page 1, col. 2)*



Source: The Financial Forecast Center, update on Oct. 9, 2008

The recent TED spread is also indicating we might see the credit market begin to unfreeze. The TED spread was at 2.67 percentage points in late October compared with 3.15 percentage

points at the end of September. A TED spread of 1.00 percentage point or lower is considered within the normal range.

The TED spread is calculated by taking the difference between the 3 month US T-bill rate and the 3 month LIBOR rate. This is an important indicator because the difference of the two isolates counterparty or default risk in the market at any point in time.

A continued retraction in LIBOR and the beginning of normalizing the TED spread are good signs indicating that we have reached bottom, and that Spring may some day return to the credit markets when the economy can enjoy the big thaw and subsequent growth.

Trenches *(From page 1, col. 2)*

- M&A activity is at a higher level than it has ever been stemming, in part, from a mutual recognition by integrated circuits and packaging companies that they must pool resources to compete more effectively globally.
- Mature companies are showing more wisdom about using existing resources. Rather than shuttering fabs and going fabless, companies are now looking at mature fabs for exploring such technologies as mixed-signal devices, MEMS, and 3-D stacked die techniques.
- The competition for dollars to fund the deal backlog has meant getting creative and digging in to find capital. We are advising our clients to line up back-up financing as a precaution.
- We are also looking deep into the market to uncover solid investment capital sources. We have found our extensive network to be a tremendous value particularly for international deals.

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Our website contains additional information about Core Capital Group's Electronic and Semiconductor Group and the investment banking services we provide. Please take a moment to visit us on the web! You can also sign up to receive this newsletter by writing to info@esgibank.com.