Benefits of Using MAX 9000 & MAX 7000S Devices

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As time-to-market pressures increase, designers look for ways to speed the development of system-level products. The Altera® MAX® 9000 and MAX 7000S families offer in-system programmability (ISP), which helps solve these time-to-market pressures by providing shorter development times, simplified manufacturing and production test flows, and support for system upgrades in the field. In addition to ISP, MAX 9000 and MAX 7000S devices provide advantages in performance, die size, and power consumption.

High Performance

MAX 9000 and MAX 7000S devices provide consistent performance, maintaining the same maximum internal global clock frequency ($\mathbf{f_{CNT}}$) no matter how many logic array blocks (LABs) are used. In contrast, the $\mathbf{f_{CNT}}$ of competing field-programmable gate arrays (FPGAs) degrades significantly as more logic is used. For example, the Xilinx XC95108 device has an $\mathbf{f_{CNT}}$ of 125 MHz if the design uses one function block (FB), but has a maximum system frequency ($\mathbf{f_{SYSTEM}}$) of 83 MHz if the design uses multiple FBs.

In addition, Altera provides the fastest speed grades currently available. Table 1 compares the speed grades available for MAX 7000 and Xilinx XC9500 devices with comparable densities.

Table 1. Speed Grade Comparison

Altera *Note (1)*		**Xilinx** *Note (2)*	
Device	**Speed Grade (ns)**	**Device**	**Speed Grade (ns)**
EPM7032	–6	XC9536	–5
EPM7128S	–7.5	XC95108	–10
EPM7192S	–10	XC95216	–15
EPM7256S	–12	XC95288	Not yet available

Notes:
(1) Source: *MAX 7000 Programmable Logic Device Family Data Sheet.*
(2) Source: Xilinx world-wide web site, March 1997.

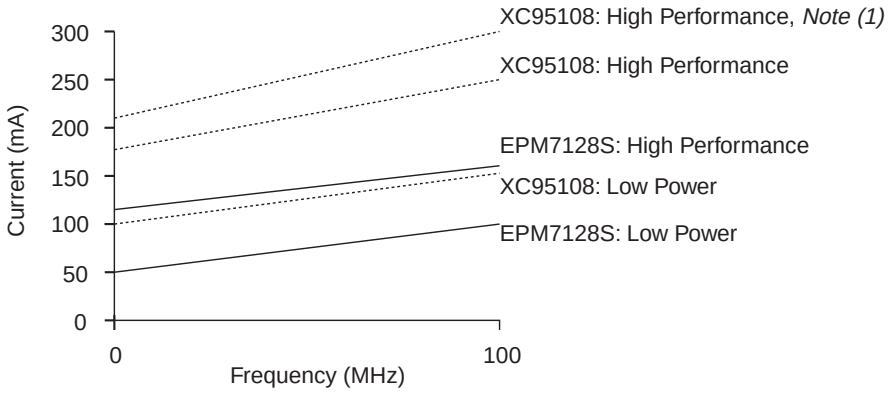
Small Die Size

Because reductions in die size mean faster speeds and lower device costs, Altera continually migrates devices to advanced processes. For example, Altera has migrated EPM7128S devices to a 0.5-micron process. In contrast, the Xilinx XC95108 device is currently fabricated on a 0.6-micron process, which produces a die that is more than 2.5 times larger than the EPM7128S die.

Low Power Consumption

Altera's MAX 9000 and MAX 7000S devices consume less power than comparable devices from competing vendors. Figure 1 compares the power consumption of the Altera MAX 7000S family with the Xilinx XC9500 family in both low-power and high-power modes.

Figure 1. Comparison of MAX 7000S & XC9500 Devices



Note:
(1) Power consumption was measured with an XC95108 device with 128 macrocells.

The documents listed below provide more detailed information. Part numbers are in parentheses.

- *MAX 9000 Programmable Logic Device Family Data Sheet* (*A-DS-M9000-04*)
- *MAX 7000 Programmable Logic Device Family Data Sheet (A-DS-M7000-04)*
- *AB 141: In-System Programmability in MAX 9000 Devices (A-AB-141-01)*
- *AB 145: Designing for In-System Programmability in MAX 7000S Devices (A-AB-145-01)*

You can request these documents from:

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