



**THE DATASHEET OF
XC3S400AN-5FGG400C**





Xilinx Spartan™-3AN FPGAs Non-Volatile Secure FPGAs for Highest System Integration



The System Design Dilemma

- System Designers today face a common challenge—how to benefit from inherent security, board-space savings and ease-of-configuration of non-volatile FPGAs while still taking advantage of the extensive features and high performance available only in leading SRAM-based FPGAs

The Xilinx Spartan-3AN Platform Solution

- The Spartan™-3AN platform offers uncompromised SRAM-based FPGA with leading-edge Flash technology
- Based on the industry's most successful, cost-effective, and production-proven 90nm technology, the platform integrates highly advanced on-chip security features along with the industry's largest user Flash

Spartan-3AN Platform Key Features

Delivering the Best of Both Worlds

The non-volatile Spartan-3AN platform provides the best of both worlds – low cost and extensive features of leading-edge SRAM-based FPGAs with board-space savings and ease-of-configuration of non-volatile FPGAs. With highly advanced on-chip security features, the Spartan-3AN platform provides a robust, cost-effective solution to help prevent reverse-engineering, cloning, and overbuilding. Furthermore, designers can achieve superior system flexibility with up to 11Mb of integrated user Flash which can be used for both device configuration as well as a valuable system resource.

The Complete Low-Cost FPGA Platform

The Spartan-3AN platform is a highly integrated device targeted for the cost-conscious, high-volume market. It is a full-feature platform of five devices with system gates ranging from 50K to 1.4M gates, and I/Os ranging from 108 to 502 I/Os, with density migration, and pin compatible with the Spartan-3A platform.

Spartan-3AN FPGAs support up to 576 Kbits of fast block RAM with byte-write enable, and up to 176 Kbits of distributed RAM. There are built-in multipliers for efficient DSP implementation and Digital Clock Managers (DCMs) for system level clock management functions. Based on production-proven 90nm technology, Spartan-3AN FPGAs provide exceptional performance while still being extremely cost-effective.

Industry's first 90nm FPGA with Electronic Serial Numbering

Each FPGA includes a permanent unique Device DNA serial number and Factory Flash ID. Designers have complete flexibility in implementing highly customized algorithms for both authentication, as well as non-authentication responses such as limited-functionality, time-bomb, and self-destruct. This can significantly deter reverse-engineering, cloning, and overbuilding.

Industry's Largest On-Chip User Flash

The new Spartan-3AN platform boasts the industry's largest on-chip user flash with a capacity of up to 11Mb. It provides simple and secure embedded application storage, while also enabling advanced real-time control with fine-grained protection, lockdown and erase features.

Widest Support for I/O Standards

The Spartan-3AN FPGA is especially suitable for display devices supporting both TMDS and PPDS standards. With support for 26 popular single-ended and differential signaling standards including LVDS, RSDS, SSTL3 Class I & II, full hot-swap compliance, and pre-engineered interface IP solutions such as PCI, PCI Express, USB, Firewire, CAN, SPI, and I2C, the Spartan-3AN platform provides an industry-leading connectivity solution.

| Spartan-3AN FPGA Platform | | | | | |
|---------------------------|----------|-----------|-----------|-----------|------------|
| Device | XC3S50AN | XC3S200AN | XC3S400AN | XC3S700AN | XC3S1400AN |
| System Gates | 50K | 200K | 400K | 700K | 1400K |
| Logic Cells | 1,584 | 4,032 | 8,064 | 13,248 | 25,344 |
| Dedicated Multipliers | 3 | 16 | 20 | 20 | 32 |
| Block RAM Blocks | 3 | 16 | 20 | 20 | 32 |
| Block RAM Bits | 54K | 288K | 360K | 360K | 576K |
| Distributed RAM Bits | 11K | 28K | 56K | 92K | 176K |
| Flash Size Bits | 1M | 4M | 4M | 8M | 16M |
| User Flash Bits | 627K | 2M | 2M | 5M | 11M |
| DCMs | 2 | 4 | 4 | 8 | 8 |
| I/O Standards | 26 | 26 | 26 | 26 | 26 |
| Max Differential I/O | 50 | 90 | 142 | 165 | 227 |
| Max Single Ended I/O | 108 | 195 | 311 | 372 | 502 |
| Package and I/O Offerings | | | | | |
| Device | XC3S50AN | XC3S200AN | XC3S400AN | XC3S700AN | XC3S1400AN |
| TQ144 20 x 20 mm | 108 | | | | |
| FT256 17 x 17 mm | | 195 | | | |
| FG400 21 x 21 mm | | | 311 | | |
| FG484 23 x 23 mm | | | | 372 | |
| FG676 27 x 27 mm | | | | | 502 |

* Spartan-3AN platform is pin compatible with Spartan-3A platform supporting platform migration

Flexible Power-Management Modes

The "Suspend" Mode in Spartan-3AN FPGAs provides a very flexible and effective way to preserve power. In this mode, the total FPGA power is reduced by more than 40%. The configuration data as well as flip-flop and RAM values are also maintained. In addition, it includes a fast wake-up mechanism and system level synchronization across time domains.

Take the Next Step

Visit our website www.xilinx.com/spartan3an or call your local sale office or distributor for more information about Spartan-3AN FPGAs. To start your design immediately, download your free ISE WebPACK™ design tools at www.xilinx.com/ise. To begin evaluating Spartan-3AN FPGAs, order your hardware development board at www.xilinx.com/s3anstarter

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