



**THE DATASHEET OF  
XC3S50AN-4TQG144I**





## 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](http://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](http://www.xilinx.com/ise). To begin evaluating Spartan-3AN FPGAs, order your hardware development board at [www.xilinx.com/s3anstarter](http://www.xilinx.com/s3anstarter)

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