

spiFlash[®]

Serial Flash Memories




Add a little Flash  to your next FPGA Design.

SpiFlash[®] Memories for Xilinx Spartan-3E FPGAs!

SpiFlash[®] Memories from Winbond feature the popular Serial Peripheral Interface (SPI), densities from 1M to 32M-bit, and performance and packaging tailored for emerging electronic applications. Fully compatible with Xilinx Spartan-3E FPGA's, spiFlash memories offer a pin, space and cost efficient alternative to ordinary configuration PROMs and Parallel Flash. Plus, after Spartan-3E configuration is complete, spiFlash memories have capacity readily available for storing user data or Xilinx MicroBlaze processor code.

SpiFlash memories use a 4-pin (clock, chip select, data in, data out) SPI port. Optional write-protect and hold pins are also provided. Data can read at clock rates of up to 50MHz. Memory is organized in pages of 256 bytes per page with typical page program time of 2ms. SpiFlash devices operate on a single 2.7V to 3.6V supply and feature low-power consumption and microamp standby current. Densities from 1M to 32M-bit are housed in 8-pin SOIC packages that use less than 25% the space of Parallel Flash memories. All spiFlash products meet industrial temperature operation, are available in Green "RoHS" compliant packages and are supported by popular third party PROM programmers. For more information on spiFlash memories please visit www.spiflash.com or www.winbond-usa.com.

Xilinx Spartan-3E and Winbond spiFlash[®] Memory Reference Chart

Xilinx Spartan-3E P/N	Serial Flash Density	SpiFlash 25P P/N	SpiFlash 25X P/N	Package	Clock Freq.	 8-pin SOIC 150mil
XC3S100E	1M-bit	W25P10VSNIG	W25X10VSNIG	8-pin SOIC 150mil	40MHz	 8-pin SOIC 208mil
XC3S250E	2M-bit	W25P20VSNIG	W25X20VSNIG	8-pin SOIC 150mil	40MHz	
XC3S500E	4M-bit	W25P40VSNIG	W25X40VSNIG	8-pin SOIC 150mil	40MHz	
XC3S1200E	4M-bit	W25P40VSNIG	W25X40VSNIG	8-pin SOIC 150mil	40MHz	 16-pin SOIC 300mil
XC3S1600E	8M-bit	W25P80VSSIG	W25X80VSSIG	8-pin SOIC 208mil	50MHz	
XC3S1600E+	16M-bit	W25P16VSSIG	W25X16VSSIG	8-pin SOIC 208mil	50MHz	
	16M-bit	W25P16VSFIG	W25X16VSFIG	16-pin SOIC 300mil	50MHz	
XC3S1600E+	32M-bit		W25X32VSSIG	8-pin SOIC 208mil	50MHz	
	32M-bit		W25X32VSFIG	16-pin SOIC 300mil	50MHz	

Winbond acquired NexFlash Technologies in June 2005. Winbond's "W" prefix SpiFlash memories are fully compatible with NexFlash's "NX" SpiFlash memory specifications. All spiFlash products support 2.7V to 3.6V supply operation and -40° to 85°C temperature. Green (lead free RoHS compliant) packaging. W25P series offers 64Kb sector erase. W25X series offers 64Kb and 4Kb sector erase.

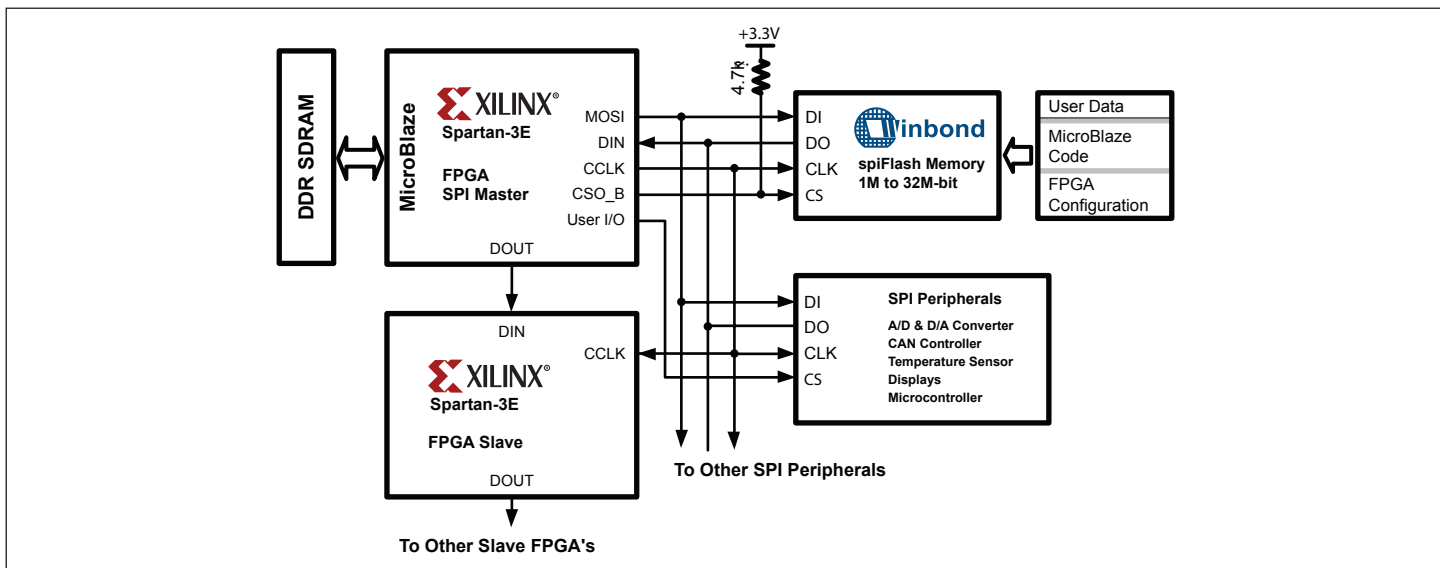


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Xilinx Spartan-3E and Winbond spiFlash® Memory Block Diagram



SpiFlash® memories from Winbond can configure one or more Spartan-3E FPGAs in the master/slave configuration shown above. After configuration is complete, the spiFlash memory can be used for other applications such as storing MicroBlaze processor code and user data (look-up tables, parameters, text, waveforms, images, voice prompts, etc.). Additionally, the same SPI pins can be used to access and control a variety of SPI peripherals.

Xilinx Spartan-3E and Winbond spiFlash® Memory Usage Chart

Xilinx Spartan-3E P/N	System Gates	Number of Configuration Bits	Smallest Density Serial Flash	SpiFlash 25P P/N	SpiFlash 25X P/N	Total Serial Flash Memory (bits)	% of memory available for other use	Extra Bits	Extra Bytes
XC3S100E	100,000	581,344	1M-bit	W25P10VSNIG	W25X10VSNIG	1,048,576	45%	467,232	58,404
XC3S250E	250,000	1,353,728	2M-bit	W25P20VSNIG	W25X20VSNIG	2,097,152	36%	744,960	93,120
XC3S250E + XC3S100E	350,000	1,935,072	2M-bit	W25P20VSNIG	W25X20VSNIG	2,097,152	8%	163,616	20,452
XC3S500E	500,000	2,270,208	4M-bit	W25P40VSNIG	W25X40VSNIG	4,194,304	46%	1,927,168	240,896
XC3S500E + XC3S250E	750,000	3,623,936	4M-bit	W25P40VSNIG	W25X40VSNIG	4,194,304	14%	574,976	71,872
XC3S1200E	1,200,000	3,837,184	4M-bit	W25P40VSNIG	W25X40VSNIG	4,194,304	9%	361,984	45,248
XC3S1600E	1,600,000	5,964,672	8M-bit	W25P80VSSIG	W25X80VSSIG	8,388,608	29%	2,430,848	303,856
XC3S1600E + XC3S500E	2,100,000	8,234,880	8M-bit	W25P80VSSIG	W25X80VSSIG	8,388,608	2%	163,712	20,464
XC3S1600E(x2)	3,200,000	11,929,344	16M-bit	W25P16VSSIG	W25X16VSSIG	16,777,216	29%	4,861,696	607,712
XC3S1600E(x5)	8,000,000	29,823,360	32M-bit		W25X32VSSIG	33,554,432	11%	3,765,632	470,704

After FPGA configuration, a spiFlash memory will have additional capacity available for other purposes. The chart above shows the amount of memory required to configure one or more Spartan-3E FPGA(s) and the spiFlash memory capacity available for use. The chart above assumes no compression.

