



W65C816SRTL: 8/16-Bit 65xx Microprocessor

The W65C816SRTL Soft Core from The Western Design Center is a general purpose 8/16-bit Microprocessor Core. The core was designed to emulate the available W65C816S GDSII Hard Core. This characteristic makes the soft core ideal in FPGA prototyping systems for ASIC designs that will use the hard core, while remaining flexible for strictly FPGA designs.

Implementation Results

The following are typical performance and utilization results.

LatticeXP	Device LUT-4s	Registers	Slices	External I/Os	Speed (fmax, MHz)
LFXP10C4F-5	5538	688	3312	48	12
LatticeXP2	Device LUT-4s	Registers	Slices	External I/Os	Speed (fmax, MHz)
LFXP2-17E-5QFP208	6112	667	3659	48	16

Features

- 8-bit data bus
- 24-bit Address Bus 16Mbyte Memory and IO Space
- 16-bit ALU, Accumulator, Stack Pointer and Index Registers
- 91 Variable Length Instructions
- 24 Addressing Modes
- 1.8–5V Operating Voltage
- 14MHz Operating Bus Speed
- Valid Data Address (VDA) and Valid Program Address (VPA) for cycle steal DMA implementation
- Abort (ABORTB) input and associated vector for processor repairs of bus error conditions
- Separate program and data bank registers for program segmentation or full 16 MByte linear addressing
- Direct Register and stack relative addressing for reentrant, recursive and re-locatable programming
- Block Move Instructions
- Fully Static for Power and Radiation Management



Development Tools

WDC supports the 65xx brand microprocessor technology with an ANSI Standard C compiler tool suite that includes the Terbium Integrated Development Environment (TIDE). In addition to integration of WDC development tool suite TIDE also provides debugger features with unlimited software breakpoints for in-circuit debug through the TIDE port embedded monitor.

Available Development Tools:

- TIDE
- ISO/ANSI Standard C Compiler
- Assembler
- Linker
- Librarian
- Object Inspector
- Symbol Tool

Microprocessor Programming Model

	8 BITS	8 BITS	8 BITS	
Data Bank Register	DBR	XH	XL	(X) Index Register
Data Bank Register	DBR	YH	YL	(Y) Index Register
	00	SH	SL	(S) Stack
		B	A	(C) Accumulator
Program Bank Register	PBR	PCH	PCL	(PC) Program Counter
	00	DH	DL	(D) Direct Register

Darker Shaded blocks = 6502 registers

Processor Status Register (P) Coding

Darker Shaded blocks = 6502 status register bits

