W65C134SXB
Single Board Computer
Datasheet

DOCUMENT REVISION HISTORY

Version	Date	Author	Description
0.1	30-June-2014	David Gray	Initial Document Entry
1.0	05-Sept-2014	David Gray	Updated Diagrams, board photos. Minor text edits.
1.1	31-Oct-2014	David Gray	Updated J6 of board diagram and block diagram.
1.2	03-Jun-2020	David Gray	Updated title page/footer, updated Quick Reference Guide section for signal errors, fixed typo in Memory Map section, updated J4 connector description and added mechanical drawing.

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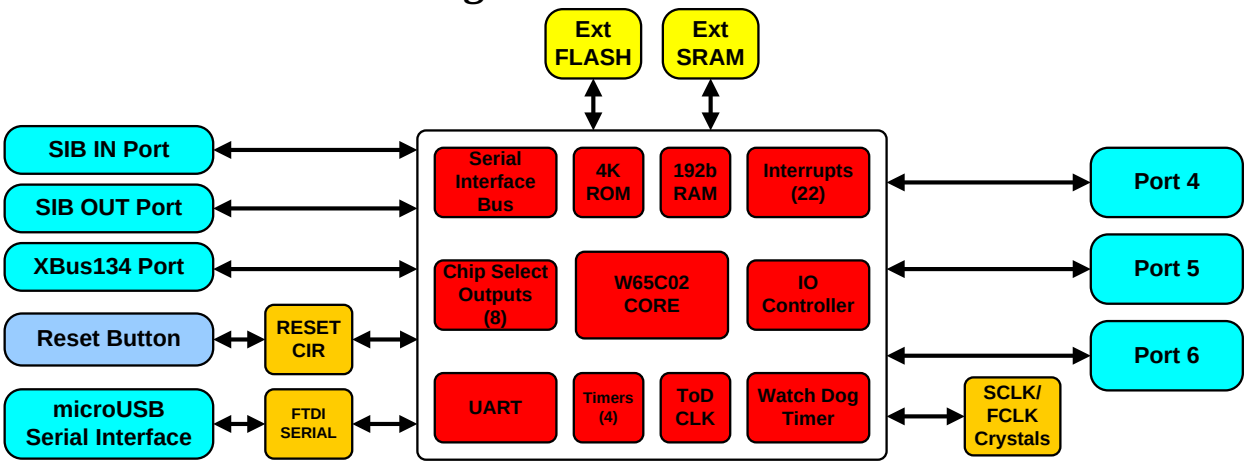
1 Introduction and Features

The W65C134SXB is based around the W65C134S which is a feature rich 8-bit microcomputer based on the W65C02 microprocessor. With proven functionality for applications in production that require in-system diagnostics, the SXB is a perfect solution, featuring internal system monitor ROM. If you need robust math for applications in sensing, such as pressure, temperature, revolutions per minute, flow monitoring and control, variable climate control or other systems for scientific, automotive, communications, home appliance/automation, then you'll benefit from our ANSI Standard C compiler.

1.1 Feature List

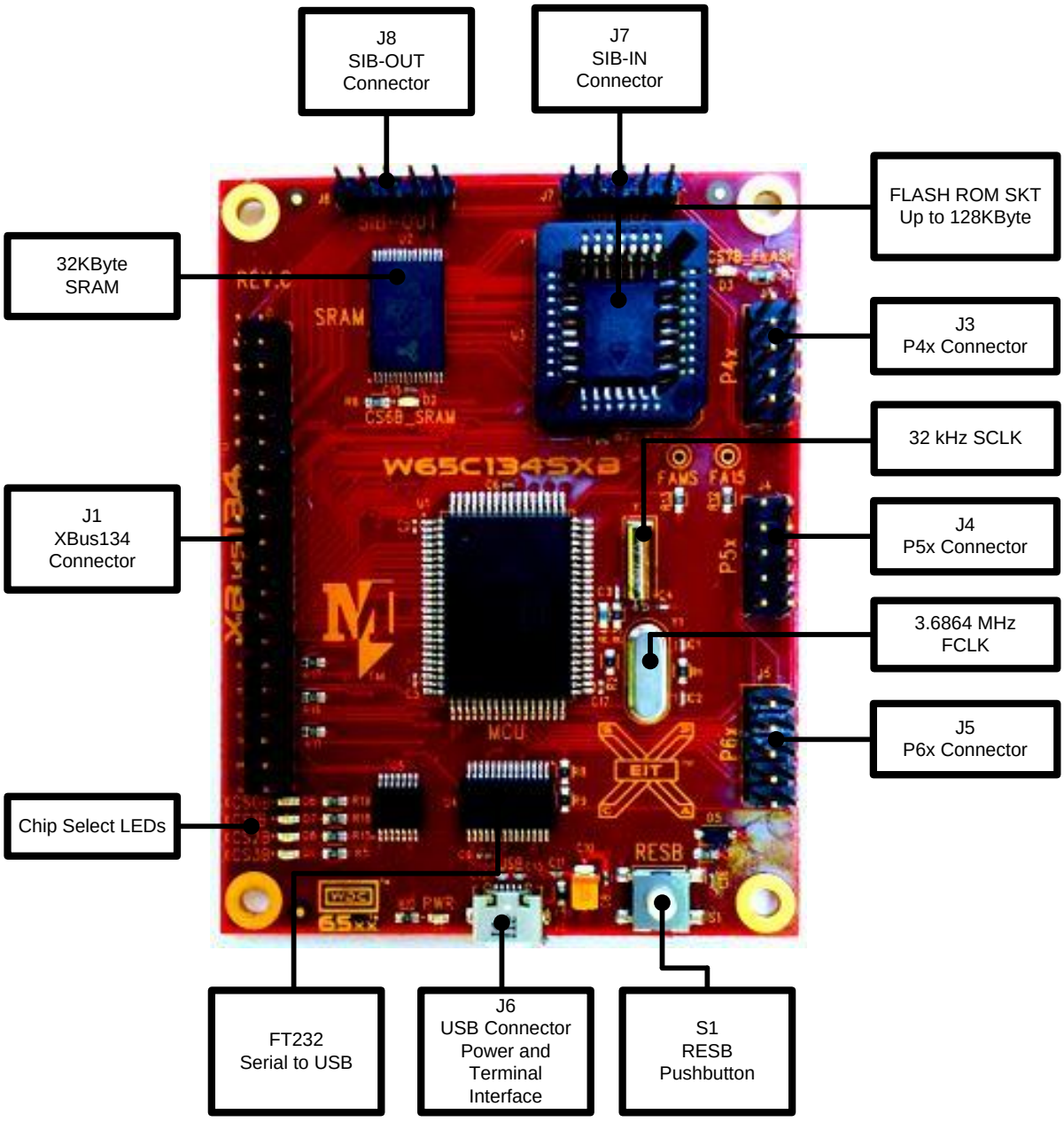
- W65C134S MCU operating at 3.6864 MHz
- 1 x 32Kbytes SRAM
- 1 x 128Kbytes FLASH ROM (32PLCC Socket) mapped as upper 32KB of Memory Map with overlays off of 2 IO pins from the W65C134S (P34 = FA15; P35 = FAMS).
- 1 x XBus134 Connector (40 Pin) with full Data, Address and Control lines for system expansion
- Serial Interface Bus (SIB) connector for SIB-IN and SIB-OUT for token passing local area network for 8 W65C134SXBs with no external components, just cables.
- 3 x 10 IO Connectors (Ports 4/5/6). Each connector has VSS/VDD and 8 I/O.
- TIDE Programming Interface – FTDI232 UART Interfaced to the Serial Port (P60=RXD/P61=TXD/P62=DTRB Output/P47=DSRB Input) of the W65C134S using the MASK Serial Monitor.
- 5V Powered by Micro USB Connector

1.2 Functional Block Diagram



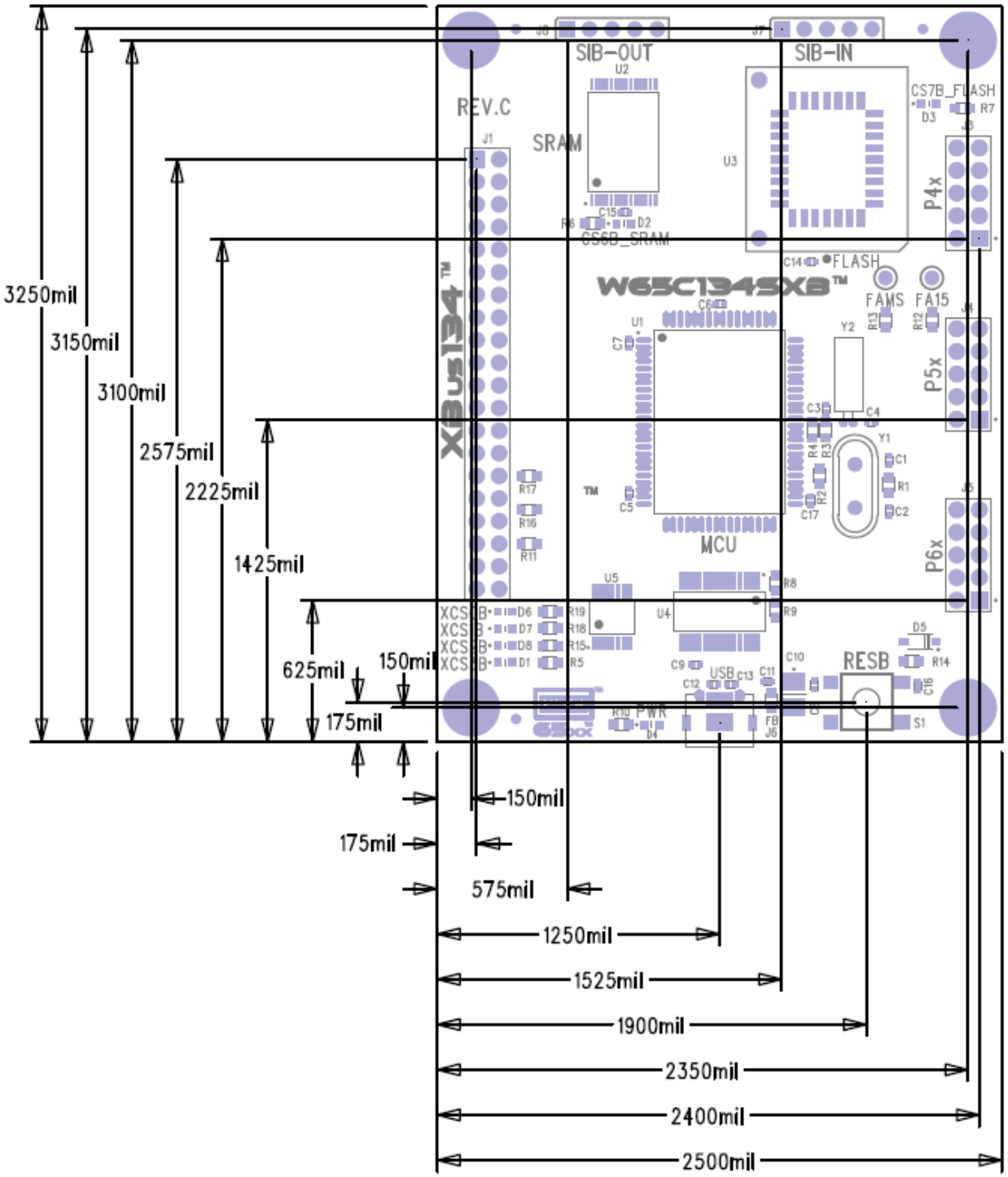
W65C134S Microcomputer

1.3 Board Diagram



2.5" x 3.25" PCB

1.4 Mechanical Drawing



1.5 Quick Reference Guide – Memory Map

W65C134SXB Memory Map				
Start	***End***	***Size***	***Chip Select***	***Description***
FFD0	FFFF	48B	CS7B BCR7=1	Vector Table: Chip Select (CS7B) when Internal ROM disabled by BCR7=1
F000	FFCF	4KB	CS7B BCR7=1	On-Chip Mask ROM Chip Select (CS7B) when Internal ROM disabled by BCR7=1
8000	EFFF	32KB	CS7B	32K block (28672 available)
0100	7FFF	32KB	CS6B	Chip Select (CS6B) 32K block (32512 available) (Note 1)
4000	5FFF	8KB	CS5B	Chip Select (CS5B) 8K block
2000	3FFF	8KB	CS4B	Chip Select (CS4B) 8K block
0100	1FFF	8KB	CS3B	Chip Select (CS3B) 8K block (7836 available) (Note 1)
0140	01FF	32256	STACK	On-Chip Stack RAM (same as 0040-00FF) when PCS33=0 and PCS36=0 (On-Chip Stack)
0120	013F	32B	CS2B	Chip Select (CS2B) 32 Bytes
0100	011F	32B	CS1B	Chip Select (CS1B) 32 Bytes
0040	00FF	192B	RAM	On-Chip RAM
0030	003F	16B	CS0B	Chip Select (CS0B) 16 Bytes
0000	002F	48B		On-Chip I/O (See I/O Memory Map Table 1-4 of W65C134S Datasheet)

Note 1 - When PCS31=1 and/or PCS32=1 then CS1B and/or CS2B are active. CS3B's and CS6B's memory spaces are reduced by CS1B and/or CS2B memory space in order to prevent external bus conflicts.

1.6 Quick Reference Guide – Expansion Connectors

J1 – XBus134 Connector			
Pin	Signal Name	Pin	Signal Name
1	VDD	2	VSS
3	D0	4	D1
5	D2	6	D3
7	D4	8	D5
9	D6	10	D7
11	A0	12	A1
13	A2	14	A3
15	A4	16	A5
17	A6	18	A7
19	A8	20	A9
21	A10	22	A11
23	A12	24	A13
25	A14	26	A15
27	P30_XCS0B	28	P31_XCS1B
29	P32_XCS2B	30	P41 / IRQB
31	P40 / NMIB	32	RESB
33	CLKOB	34	FLCKOB
35	RUN	36	BE
37	RWB	38	PHI2
39	VSS	40	VDD

J3 – P4x Connector			
Pin	Signal Name	Pin	Signal Name
1	VDD	2	VSS
3	P40 / NMIB	4	P41 / IRQB
5	P42	6	P43
7	P44	8	P45
9	P46	10	P47 / DSRB

J4 – P5x Connector			
Pin	Signal Name	Pin	Signal Name
1	VDD	2	VSS
3	P50	4	P51
5	P52	6	P53
7	P54	8	P55
9	P56	10	P57

J5 – P6x Connector			
Pin	Signal Name	Pin	Signal Name
1	VDD	2	VSS
3	P60 / RXD	4	P61 / TXD
5	P62 / DTRB	6	P63
7	P64 / SCLK	8	P65 / SDAT
9	P66 / CHIN	10	P67 / CHOUT

J7 – SIB-IN Connector			
Pin	Signal Name	Pin	Signal Name
1	VDD	2	P66 / CHIN
3	P64 / SCLK	4	P65 / SDAT
5	VSS		

J8 – SIB-OUT Connector			
Pin	Signal Name	Pin	Signal Name
1	VDD	2	P67 / CHOUT
3	P64 / SCLK	4	P65 / SDAT
5	VSS		

2. Connector Descriptions

Following are descriptions of main board connectors. For Port pins coming from the W65C134S chip, careful review of the W65C134S Datasheet is recommended.

2.1 XBus Port (J1)

The "XBus134" is a 40-pin male connector with the following signals:

- 8 Data Bus lines (D0-D7)
- 16 Address Bus lines (A0-A15; 64 Kbyte space)
- 3 External Chip Select Lines for expansion (XCS0B-XCS2B)
- 9 Control lines (PHI2, RWB, BE, CLKOB, FCLKOB, RUN, RESB, NMIB, IRQB)
- 4 Power and Ground - 2x VSS (Pins 2 and 49) and 2x VDD (Pins 1 and 50)

2.2 P4x Port (J3)

The P4x Port Connector is an expansion connector that has VDD, VSS and each of the I/O pins from Port 4 on the W65C134S. This is a multipurpose port in that P40 can be an I/O line as well NMIB. P41 can be an I/O line as well as IRQB. P42-P47 are I/O lines in addition to edge interrupt inputs. P47 is used by the mask rom monitor as the DSRB input for the UART.

2.3 P5x Port (J4)

The P5x Port Connector is an expansion connector that has VDD, VSS and each of the I/O pins from Port 5 on the W65C134S. This is again a multipurpose port in that P50-57 can be an I/O lines as well as edge interrupt inputs.

2.4 P6x Port (J5)

The P6x Port Connector is an expansion connector that has VDD, VSS and each of the I/O pins from Port 6 on the W65C134S. This is again a multipurpose port in that P60-67 can be an I/O lines, the Serial Interface Bus, and the UART signals (P60=RXD/P61=TXD/P62=DTRB Output).

2.5 Micro USB TIDE Port (J6)

The Micro USB connector is dual purpose. It is the power connector that powers the board. The FTDI chip that interfaces to the connector has been pre-programmed so that when the board is power from a USB power on a computer, the chip will request 500mA of current from the host machine. The board can also be powered by any USB port that supplies 5V DC. Note that the board does not have a voltage regulator. 5V DC must be supplied.
In addition to the power, the USB port serves as an interface to WDC's tool suite for debugging and loading programs into the onboard SRAM. An onboard FTDI Serial to USB device interfaces to the W65C134S chip (P60=RXD/P61=TXD/P62=DTRB Output/P47=DSRB Input).

2.6 SIB IN/OUT Ports (J7/J8)

The Serial Interface Bus (SIB) is configured as a token passing Local Area Network, and is intended for inter-chip communications in parallel processing applications. The Serial Interface Bus has four pins associated with its use: CHIN CHOUT, SDAT, and SCLK. J7 and J8 connectors each have SDAT, SCLK, VSS, and VDD. J7 (SIB IN) has CHIN and J8 (SIB OUT) has CHOUT. Refer to the Quick Reference Guide (Section 1.5 of this document) for J7/J8 pin outs. The SIB has seven (7) registers associated with its use: STATE, SR0, SR1, SR2, SR3, SCSR, and BAR.
Refer to the W65C134S Datasheet (Section 2.19) for detailed operation information.

3 Notices and Ordering Information

3.1 FCC Compliance

The Western Design Center, Inc. (WDC) provides the enclosed product under the following conditions: This board is intended for use for Engineering Development or Evaluation Purposes ONLY and is not considered by WDC to be a finished consumer product. This board should be handled with caution using good electronics handling practices. This board is compliant per RoHS/Green directives. It does not fall within the scope of directives such as FCC, CE, and UL. It generates uses and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules.

3.2 Ordering Information

The W65C134SXB is available from WDC Direct and distributors. For information please visit: http://www.wdc65xx.com/where-to-buy/