

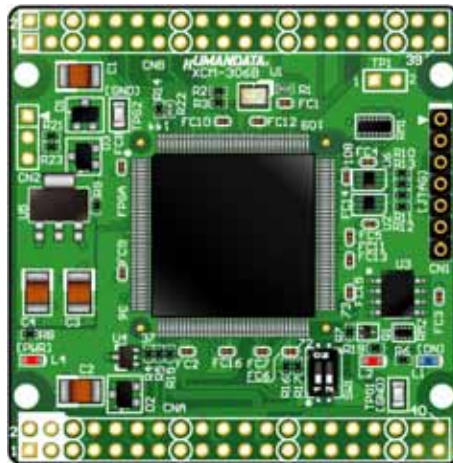
Spartan-6 LX FPGA Board



XCM-306 Series

User's Manual

Ver. 1.0



HuMANDATA LTD.

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Precautions

Do Not

1. This product uses ordinary off-the-shelf electronic components, and is therefore inappropriate for use in applications that require special quality or reliability and are expected to protect human lives or prevent accidents, such as safety mechanisms in fields including space, aeronautics, medicine, and nuclear power.
2. Do not be used underwater or in high-humidity environments.
3. Do not be used in the presence of corrosive gases, combustible gases, or other flammable gases.
4. Do not turn on power when circuit board surface is in contact with other metal.
5. Do not apply voltage higher than rated voltage.

Attention

6. This manual may be revised in the future without notice owing to improvements.
7. All efforts have been made to produce the best manual possible, but if users notice an error or other problem, we ask that they notify us.
8. Item 7 notwithstanding, HuMANDATA cannot be held liable for the consequences arising from use of this product.
9. HuMANDATA cannot be held liable for consequences arising from using this product in a way different from the uses described herein, or from uses not shown herein.
10. This manual, circuit diagrams, sample circuits, and other content may not be copied, reproduced, or distributed without permission.
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9. When repairs or replacements are provided under warranty in Japan, purchaser shall pay shipping charges for shipping to HuMANDATA, and HuMANDATA shall pay shipping charges for shipping to purchaser.
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2. HuMANDATA assumes no liability whatsoever for any direct, indirect, special, incidental, or consequential damages arising from the use of this product, even if HuMANDATA has been advised of the possibility of such damage, whether legal or in tort.
3. At the time this product is purchased, items 1 and 2 above shall be deemed to have been confirmed by purchaser.

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HuMANDATA's Philosophy

1. HuMANDATA endeavors to raise product quality. We continually make detailed improvements and adjustments that are not shown in circuit diagrams.
2. HuMANDATA actively publishes, on the Web and in other ways, information considered useful to customers. Examples would be how to use FPGAs and how to use development tools.
3. HuMANDATA makes efforts for the long-term provision of products and for continuing their long-term support.
4. Instead of concealing small product problems and documentation errors, HuMANDATA makes them public.
5. HuMANDATA abides by Japanese law and its spirit. We make no transactions with purchasers who commit illegal acts.

● Revision History

Date	Revision	Description
Jan. 28, 2013	v1.0	Initial release

● Introduction

Thank you for purchasing our product XCM-306.

This is an evaluation board equipped with a Xilinx FPGA Spartan-6 LX, voltage regulator, configuration reset circuit, oscillator and configuration device.

It can provide you with very convenient and easy-to-use development environment.

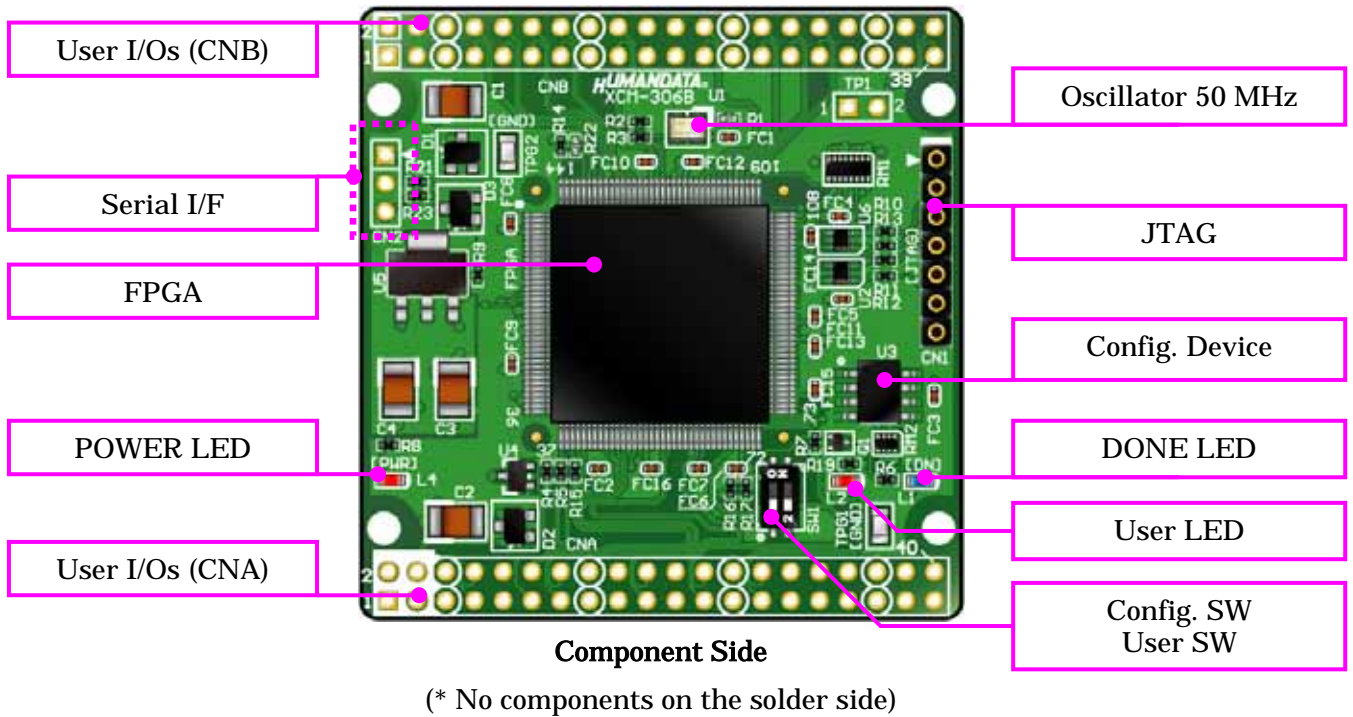
1. Specifications

Model Name	XCM-306-LX4	XCM-306-LX9
FPGA	XC6SLX4-2TQG144C	XC6SLX9-2TQG144C
Config. Device	M25P16-VMN6 (Micron, 16Mbit)	
On-Board Clock	50 [MHz]	
External Clock Input	User I/Os (CNA, CNB)	
Power Input	DC 3.3 [V]	
Dimensions	2.087" x 2.126" (53 x 54 [mm])	
Weight	15 [g] typ.	
User I/Os	56	
User Switch	1 (DIP) x 1bit	
User LED	1	
PCB	6 Layer FR-4 t1.6 [mm] Immersion gold	
Power-On Reset	240 [ms] typ. (Config. reset signal)	
JTAG Connector	SIL 7-pin socket, 2.54 [mm] pitch	
Status LEDs	Power (red) x1, Done (blue) x1	
Accessories	SIL7 long pin header x1	
	DIL 80-pin header (Cutttable) x 2	
RoHS Compliance	YES	

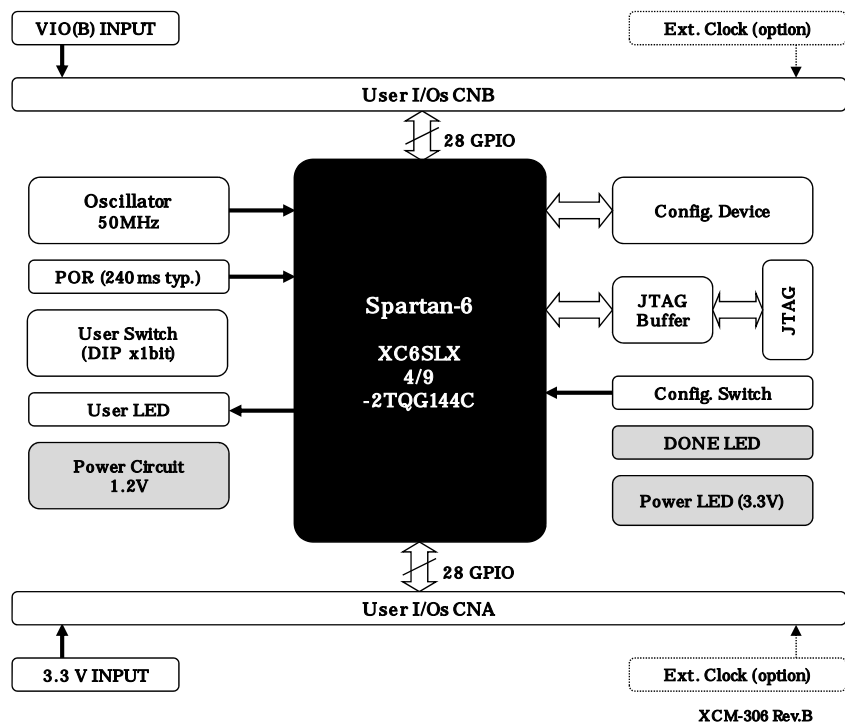
* There may be cases that these parts and specifications are changed.

2. Overview

2.1. Name of Parts



2.2. Block Diagram



2.3. Power Supply

This board operates from single DC 3.3 V (V33A) power supply from CNA. Internally required 1.2 [V] is generated by on-board voltage regulators. The external power supply should be sufficient and stabilized. Please do not apply over 3.3 V voltage.

VIO(B), Vccio of CNB I/Os is not connected to V33A. Please apply voltage suit your design from CNB.

For more details, please refer to circuit schematics and FPGA data sheet.

2.4. Clock

50 MHz (U1) oscillator is equipped as on-board clock. External clock can be input from user I/O connectors.

2.5. JTAG Connector

This connector is used to configure the FPGA and program the configuration device in-system. Pin assignment is as follows. You can use Xilinx download cable.

CN1

Pin No.	Signal Name	Direction
1	GND	I/O
2	TCK	IN
3	TDO	OUT
4	TMS	IN
5	VREF	OUT
6	TDI	IN
7	GND	I/O



Notice

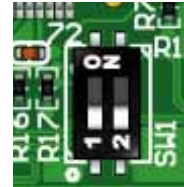
Please pay attention not to attach cables in reverse.

2.6. Configuration Switch (SW1)

The specification of configuration switch is below. “ON” means “Low (Ground)”.
For each pins details, please refer to Spartan-6 configuration user guide.

SW1

	1	2
Net Label	X_M1	ASW2
Function	Configuration Mode	User



Configuration Mode	X_M1
Master Serial / SPI	ON
JTAG	OFF

ON: Low (0), OFF: High (1)

- **X_M1**

Configuration mode select pins. The modes showed above are a part of all.
Generally, users do not need to be attentive to mode setting for JTAG configuration. But for this product, it is recommended to set the mode as shown above.

- **ASW0**

You can use this as user switch.

3. FPGA Configuration

To configure the FPGA via JTAG directly, select FPGA icon detected by Boundary-Scan and assign a bit-stream file.

If configuration is completed successfully, the DONE LED will light up.

4. Configuration Device Programming

To download a an FPGA configuration data to the configuration device via JTAG, a mcs file is required. To generate an mcs file using iMPACT, please refer to the following steps.

4.1. Generating mcs file

Start iMPACT, and double-click [Create PROM File] and set items as shown below.

Storage Target	: SPI Flash – Configure Single FPGA
Storage Device	: 16M (one device)
File Format	: MCS
Others	: any

Select your bit file, and generate MCS file.

4.2. Programming Configuration Device

Assign the mcs file to Flash icon and choose [SPI PROM – M25P16] for device type, then right click and select a command.

Please set FPGA configuration mode to [Master Serial/SPI] mode.

5. Additional Documentation and User Support

The following documents and other supports are available at

<http://www.hdl.co.jp/en/spc/XCM/xcm-306/>

- Circuit Schematic
 - Pin List
 - Dimensional drawing
 - Net List
- ... and more.

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