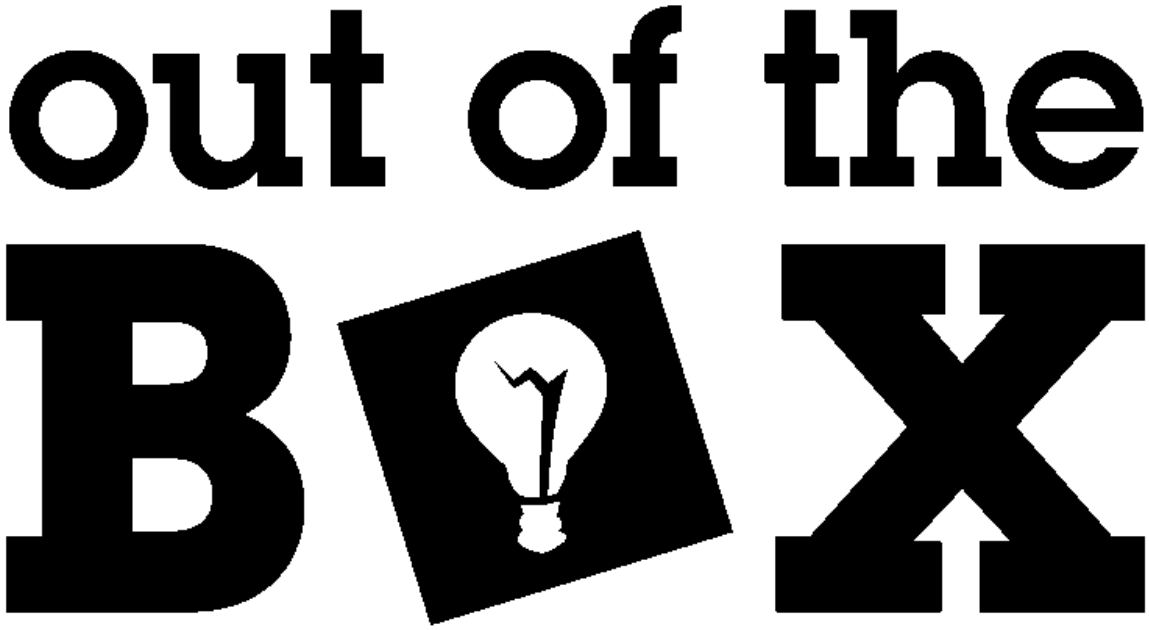
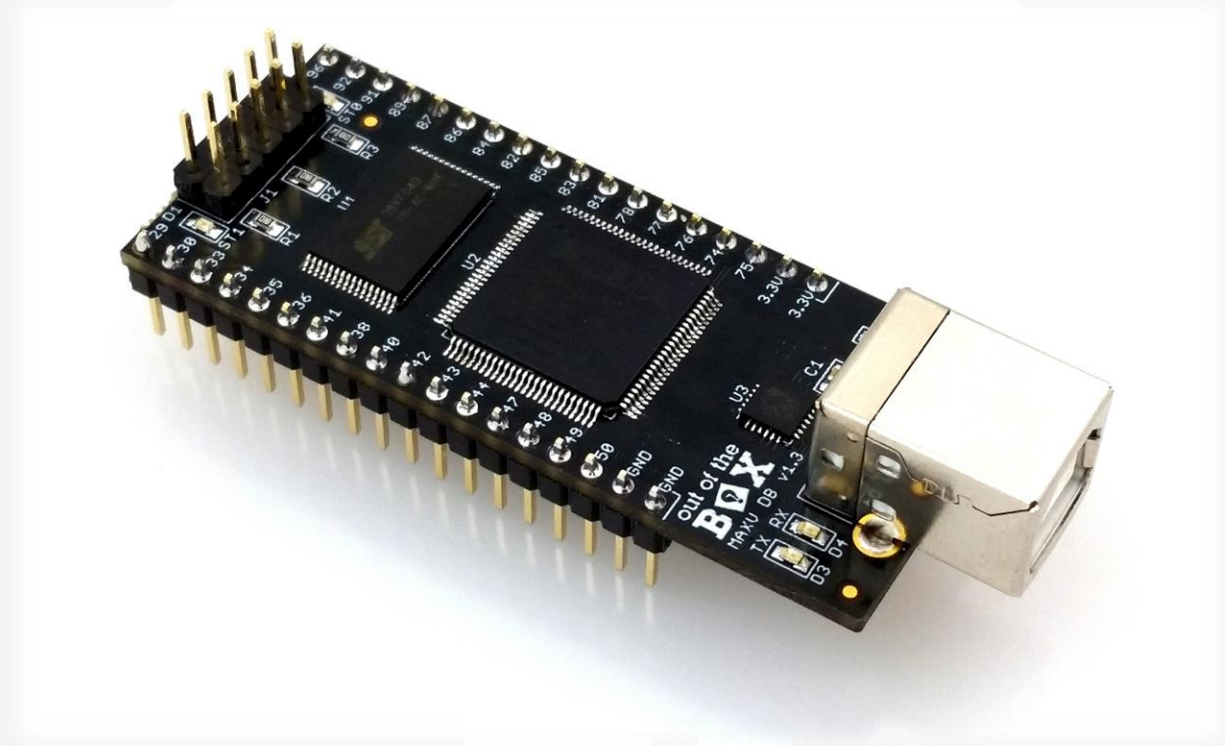


MAX V Development Board Manual

Last Updated August 24, 2016

out of the BOX
Electronics and Robotics LLC
ootbrobotics.com


Out of the
BOX
MAKU DB V1.3
GND
3.3V
RX
TX

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WARNING

The Out of the Box MAX V Development Board is only intended to be powered using a PC via USB. Some USB power products such as external USB battery packs used for charging Cell Phones have been found to provide USB voltages over the maximum voltage input of this device. Use at your own risk. Further the Out of the Box MAX V Development Board utilizes a clock signal from the FTDI USB to FIFO IC. This clock is only available when the device is connected to a computer. When using the on-board Flash ROM the USB connector must be connected to a PC to function properly.

Overview

The Out of the Box MAX V Development Board is a platform designed specifically for learning the basics of digital electronics from the lowest level of logic gates to microprocessors. The board features a USB FIFO bridge, external flash memory and software to program data to the flash memory through the use of a PC. The board form-factor also makes it ideal for interfacing with a solderless breadboard.

Features

MAX V CPLD

The Out of the Box MAX V Development Board features a 570 logic element CPLD. The largest per its footprint. This is sufficient space for a basic microprocessor such as the University of Florida's GPCPU.

I/O and Indicators

The Out of the Box MAX V Development Board has 32 GPIO pins and 4 additional I/O connect to onboard LEDs. Two of these LEDs are generally reserved for RX and TX transmissions to and from the USB to FIFO bridge.

USB Communication

The Out of the Box MAX V Development Board contains a FT-240X USB to FIFO bridge that allows the CPLD to send and receive data from a PC USB connection.

External Flash memory

The Out of the Box MAX V Development Board features a flash ROM that can be read by the MAX V CPLD. This ROM could be used for simple look up tables, processor program memory etc.

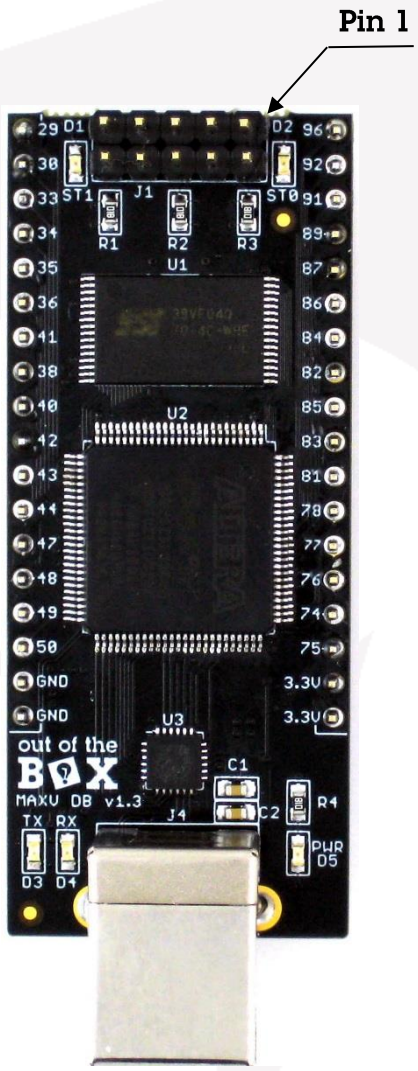
Flash Programmer

The Out of the Box MAX V Development Board comes with software and firmware that in tandem can be used to either upload data to or download data from the flash of the platform in seconds.

Electrical Characteristics

Item	Min	Nominal	Max	Unit
Un-programmed Current draw	< 20			mA
3.3V current output[1]			300	mA
3.3V source accuracy	-3.0		3.0	%
GPIO VIH	1.7		4.0	V
GPIO VIL	-0.5		0.8	V
GPIO VOH	2.4			V
GPIO VOL			0.45	V

1) This includes the current required to power the board itself



Powering the Board

The Out of the Box MAX V Development Board is intended to be powered via a PC's USB port. Once powered the 3.3V and GND signals broken out by the board can be used to power external circuits

Programming the Board

The 10 pin JTAG header (J1 on the board) can be used with an Altera or Terrasic programmer through the use of Altera's Quartus IDE. The board must be powered for programming.