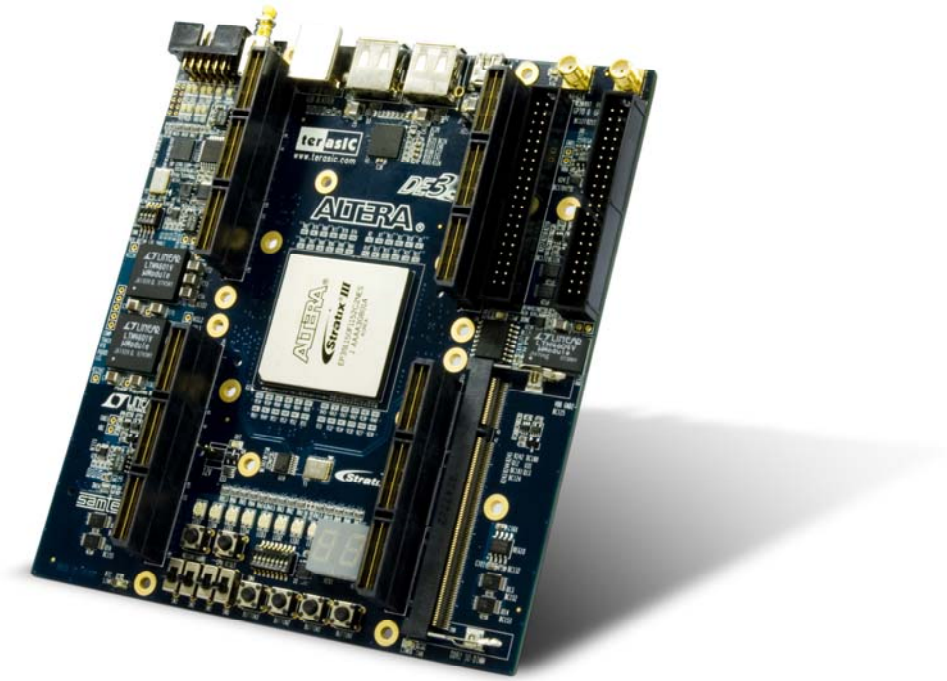


DE3

Stratix III FPGA

- EP3SL340
  - 338,000 logic elements (LEs)
  - 18,381K Total Memory Kbits
  - 526 18x18-bit Multipliers blocks
  - 12 phase-locked-loops (PLLs)
- EP3SE260
  - 254,400 logic elements (LEs)
  - 16,282K Total Memory Kbits
  - 768 18x18-bit Multipliers blocks
  - 12 phase-locked-loops (PLLs)
- EP3SL150
  - 142,000 logic elements (LEs)
  - 6,390K Total Memory Kbits
  - 384 18x18-bit Multipliers blocks
  - 8 phase-locked-loops (PLLs)

Serial Configuration device and USB Blaster circuit

- Altera’s EPCS128/EPCS64 Serial Configuration device
- On-board USB Blaster for programming and user API control
- Support JTAG mode

DDR2 SO-DIMM socket

- Up to 4GB capacity
- Share the same I/O bus with HSTC connector B

SD card socket
- Provides SPI and 1-bit SD mode for SD Card access

Push-button switches
- 6 push-button switches
  - 1 CPU Reset
  - 1 FPGA Reconfigure
  - 4 user-defined inputs
- Debounced by a Schmitt trigger circuit
- Normally high; generates one active-low pulse when the switch is pressed

Slide switches
- 4 slide switches for user-defined inputs
- When a switch is set to the DOWN or UP position (i.e., close to or away from the edge of the DE3 board), it causes logic 0 or 1, respectively.

Clock inputs
- 50MHz oscillator
- 1 SMA connector for PLL clock output
- 1 SMA connector for external clock input

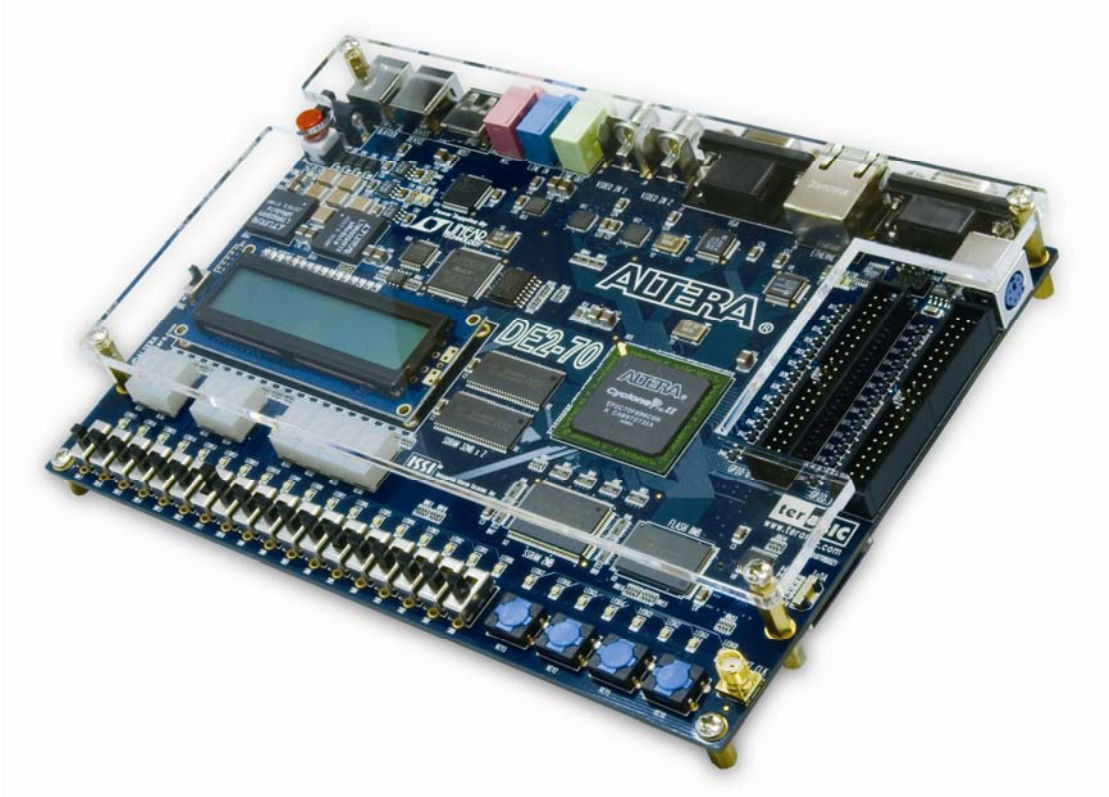
USB Host/Slave controller
- Complies fully with Universal Serial Bus Specification Rev. 2.0
- Support data transfer at high-speed, full-speed, and low-speed
- Support both USB host and device
- Three USB ports (one type mini-AB for host/device and two type A for host)
- Support Nios II with the Terasic driver
- Support Programmed I/O (PIO) and Direct Memory Access (DMA)

Eight 180-pin High Speed Terasic Connectors (HSTC) expansion headers
- 4 male and 4 female connectors are on the top and the bottom of DE3 board, respectively.
- 240 LVDS pairs of user-defined IO pins
- Configurable I/O voltage for 3.3V, 2.5V, 1.8V, and 1.5V

Two 40-pin expansion headers
- 72 FPGA I/O pins, as well as 8 power and ground lines, are brought out to two

40-pin
expansion connectors

- 40-pin header is designed to accept a standard 40-pin ribbon cable used for IDE hard drives
- Share the same I/O pins with HSTC connector A

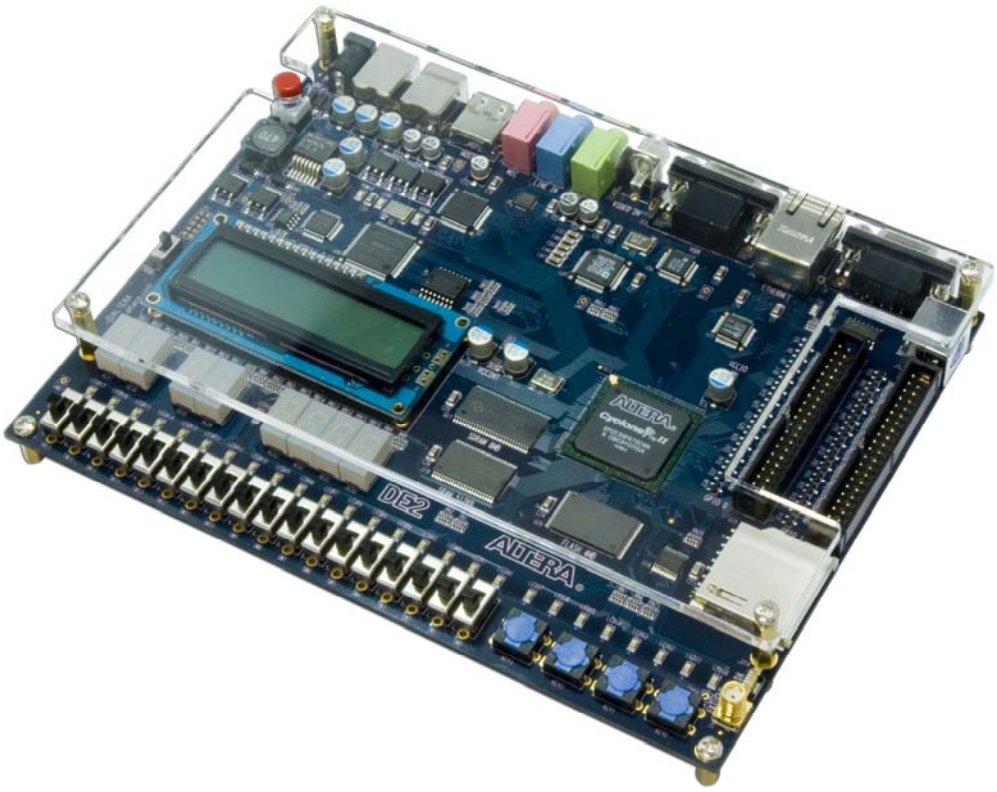


DE2 – 70

The DE2-70 board has many features that allow the user to implement a wide range of designed circuits, from simple circuits to various multimedia projects.

- USB Blaster (on board) for programming and user API control;
  both JTAG and Active Serial (AS) programming modes are supported
- 2-Mbyte SSRAM
- Two 32-Mbyte SDRAM
- 8-Mbyte Flash memory
- SD Card socket
- 4 pushbutton switches
- 18 toggle switches
- 18 red user LEDs
- 9 green user LEDs
- 50-Mhz oscillator and 28.63-Mhz oscillator for clock sources
- 24-bit CD-quality audio CODEC with line-in, line-out, and microphone-in jacks
- VGA DAC (10-bit high-speed triple DACs) with VGA-out connector
- 2 TV Decoder (NTSC/PAL) and TV-in connector
- 10/100 Ethernet Controller with a connector
- USB Host/Slave Controller with USB type A and type B connectors
- RS-232 transceiver and 9-pin connector
- PS/2 mouse/keyboard connector

- IrDA transceiver
- 1 SMA connector
- Two 40-pin Expansion Headers with diode protection
- Size：153*203 mm

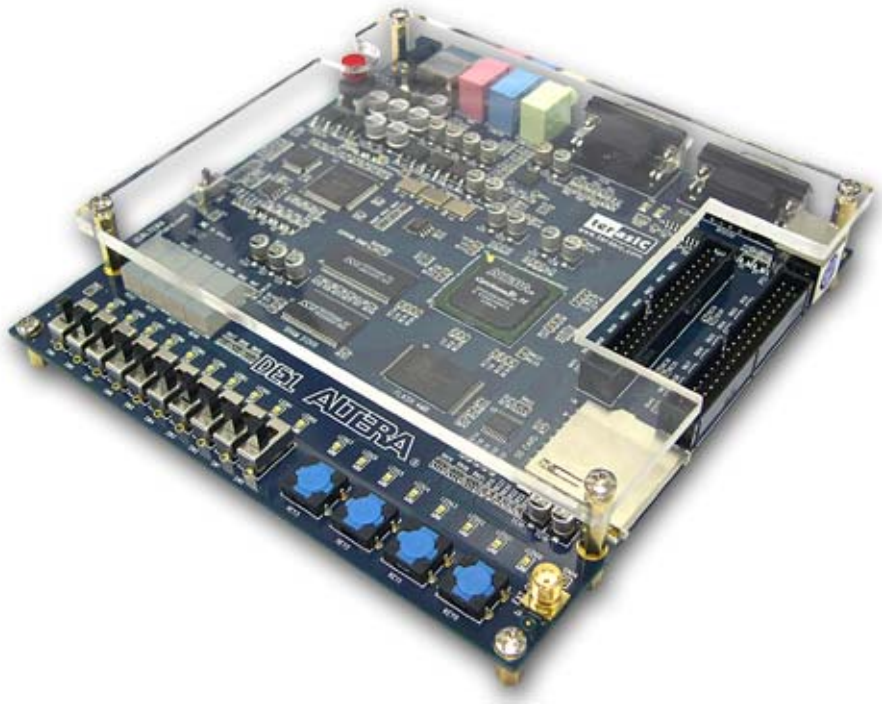


DE2

DE2 board provides users many features to enable various multimedia project development.
Component selection was made according to the most popular design in volume production multimedia products such as DVD, VCD, and MP3 players.
The DE2 platform allows users to quickly understand all the insight tricks to design real multimedia projects for industry.

- Altera Cyclone II 2C35 FPGA with 35000 LEs
- Altera Serial Configuration deivices (EPCS16) for Cyclone II 2C35
- USB Blaster built in on board for programming and user API controlling
- JTAG Mode and AS Mode are supported
- 8Mbyte (1M x 4 x 16) SDRAM
- 512K byte(256K X16) SRAM
- 4Mbyte Flash Memory (upgradeable to 4Mbyte)
- SD Card Socket
- 4 Push-button switches
- 18 DPDT switches
- 9 Green User LEDs
- 18 Red User LEDs

- 16 x 2 LCD Module
- 50MHz Oscillator and 27MHz Oscillator for external clock sources
- 24-bit CD-Quality Audio CODEC with line-in, line-out, and microphone-in jacks
- VGA DAC (10-bit high-speed triple DACs) with VGA out connector
- TV Decoder (NTSC/PAL) and TV in connector
- 10/100 Ethernet Controller with socket.
- USB Host/Slave Controller with USB type A and type B connectors.
- RS-232 Transceiver and 9-pin connector
- PS/2 mouse/keyboard connector
- IrDA transceiver
- Two 40-pin Expansion Headers with diode protection
- DE2 Lab CD-ROM which contains many examples with source code to exercise the boards, including: SDRAM and Flash Controller, CD-Quality Music Player, VGA and TV Labs, SD Card reader, RS-232/PS-2 Communication Labs, NIOSII, and Control Panel API
- Size：153*203 mm



DE1

DE1 board provides users many features to enable various multimedia project development. Component selection was made according to the most popular design in volume production multimedia products. The DE1 platform allows users to quickly understand all the insight tricks to design projects for industry.

- Altera Cyclone II 2C20 FPGA with 20000 LEs
- Altera Serial Configuration deivices (EPCS4) for Cyclone II 2C20
- USB Blaster built in on board for programming and user API controlling
- JTAG Mode and AS Mode are supported
- 8Mbyte (1M x 4 x 16) SDRAM
- 4Mbyte Flash Memory
- 512Kbyte(256Kx16) SRAM
- SD Card Socket
- 4 Push-button switches
- 10 DPDT switches
- 8 Green User LEDs
- 10 Red User LEDs
- 4 Seven-segment LED displays
- 50MHz oscillator ,24MHz oscillator ,27MHz oscillator and external clock sources
- 24-bit CD-Quality Audio CODEC with line-in, line-out, and microphone-in jacks
- VGA DAC (4-bit R-2R per channel) with VGA out connector
- RS-232 Transceiver and 9-pin connector

- PS/2 mouse/keyboard connector
- Two 40-pin Expansion Headers
- DE1 Lab CD-ROM which contains many examples with source code
- Size：153*153 mm

MMK

The following hardware is provided on the MAX II Micro board:

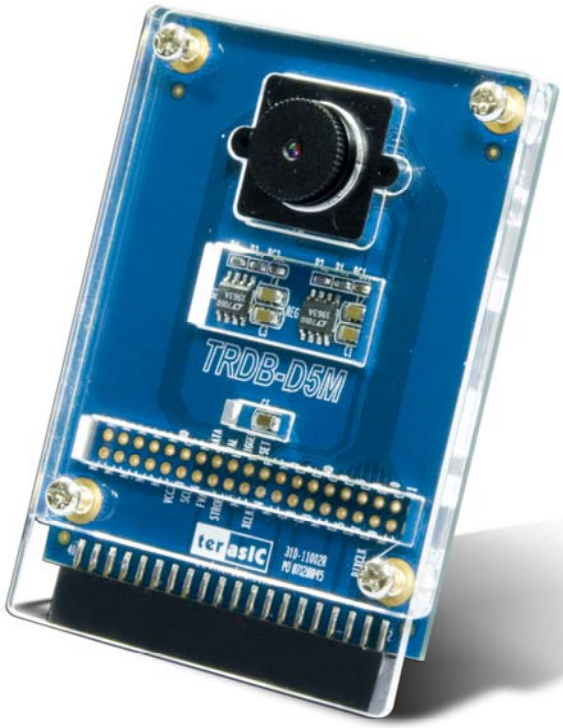
- Altera MAX® II EPM2210F324 FPGA device
- USB Blaster (on board) for programming; MAX II Micro can be used as a USB Blaster, and programming mode supported depends on the configuration device of Altera board connected to MAX II Micro. Only JTAG programming mode is supported to configure MAX II Micro.
- 4 pushbutton switches
- 1 DIP switch
- 2 red user LEDs
- 2 yellow user LEDs
- 2 green user LEDs
- 2 blue user LEDs
- 50-MHz oscillator for clock sources
- Powered by a USB cable (Type-A-Male to Type-A-Female)

LTM

The feature set of the LTM is listed below:

1. Equipped with Toppoly TD043MTEA1 active matrix color TFT LCD module.
2. Support 24-bit parallel RGB interface.
3. 3-wire register control for display and function selection.
4. Built-in contrast, brightness, and gamma modulation.
5. Converting the X/Y coordination of the touch point to its corresponding digital data via the Analog Devices AD7843 AD converter.
6. The general specifications of the LTM are listed below:

Item	Description	Unit
Display Size (Diagonal)	4.3	Inch
Aspect ratio	15:9	-
Display Type	Transmissive	-
Active Area (HxV)	93.6 x 56.16	mm
Number of Dots (HxV)	800 x RGB x480	dot
Dot Pitch (HxV)	0.039 x 0.117	mm
Color Arrangement	Stripe	-
Color Numbers	16Million	-



D5M

1. Complete reference design with source code in Verilog
2. A User Manual with Live Demo examples
3. Support exposure time controlling - users can adjust the exposure according to the light of the surrounding area
4. Support motion capture mode
5. Software allows users to upload the picture captured into PC and save the picture into bitmap format or Joint
6. Photographic Experts Group for viewing.
7. Equipped with Micron 5 Mega Pixel CMOS sensor
   - Support 2,592H x 1,944V active pixels
   - Output data in RGB Bayer Pattern format
   - Full resolution frame rate up to 15 frame per second(FPS)
8. Provide users entire reference design
   (Frame Grabber, high-performance multi-port SDRAM frame buffer, image processing IPs)
9. Support Altera DE3/ DE2_70/ DE2/ DE1 and Cyclone II Starter boards
10. Size：78*59.5 mm