

MPL3E

System on FPGA module

Based on a Xilinx Spartan-3E1200 or 3E1600 the MPL3E is ideal for building embedded systems with exactly the functions and interfaces needed.



Morphologic

Embedded FPGA Solutions
www.morphologic.dk

Product brief

Product key features:

The MPL3E module is a general purpose FPGA module intended for system-on-FPGA designs. The module contains the basic on-board components normally needed for embedded systems, such as high-speed DDR SDRAM, FLASH, watch-dog and a power supply. The integration of the FPGA with the standard components on a module, significantly simplifies the design and multilayer PCB layout effort required to build a system on FPGA.

The programmable nature of the FPGA makes it possible to choose to implement the functions needed in the system, including custom designed interfaces commonly found in embedded systems. It also allows the systems to be upgraded should new requirements arise during the product life. Building and integrating all the system functions onto a single module, simplifies the hardware design and makes it more robust.

Measuring only 49x61 mm (1.93x2.40") the module connects to a base PCB using two quality 120-pin 0.8 mm pitch connectors, carrying the power and IO signals.

Module components:

- Xilinx Spartan 3E FPGA (2 sizes available: 1200 and 1600 kgates).
- 16 bit wide DDR SDRAM chip with up to 128 Mbytes capacity. 600 Mbyte/s burst bandwidth.
- 16 bit wide NOR FLASH with up to 128 MB capacity.
- 16 bit wide low-power SRAM with battery backup capability, allowing machine states to be stored and resumed during a power-faliure.
- Supervisor chip for voltage supervision, backup voltage switching, reset generation and watch-dog function.
- Dual autoboot system: System will boot from backup FPGA image if the main image has been corrupted.
- 1.2 and 2.5V power supply circuitry with 3.3V input voltage. These voltages are available on the connector and can drive additional circuitry.
- Two 120-pin 0.8 mm pitch board-to-board connectors with 143 IO/I pins available from the FPGA as well as JTAG, power and 8-bit shared databus.
- On-board 50 MHz oscillator.
- On-board LED indicators for: boot image selection, configuration status / user defined.

Typical FPGA functions:

- **Xilinx Microblaze processor:**
 - 32-bit harward architecture CPU running at frequencies up to 100 Mhz.
 - Instruction and data cache using internal block-rams.
 - MMU option.
 - Floating point unit option.
 - Interrupt and exception capabilities
 - Efficient fast serial link interface for coprocessor functions etc.
 - Hardware shifter and multiplier.
- **Xilinx MPMC DDR SDRAM controller allowing high bandwidth DMA transfers.**
- **10/100 Mb/s Ethernet mac**
- **Display controller.**
- **Keyboard interfaces**
- **General purpose IOs**
- **Timer/counters**

- **Serial ports**
- **DMA controllers**
- **Storage media interfaces (IDE / CF / SDI interface)**
- **Custom logic:**
 - Specialty device interfacing
 - DSP processing
 - Coprocessor host interfacing
 - Telecom line interfacing
 - Motor controller (stepper, brushless etc)
 - Image analysis (neural networks and other vision algorithms)
 - Hardware implemented control loops
- **Example applications**
 - Man Machine Interfaces.
 - Image analysis (neural networks and other vision algorithms)
 - Networking devices – media routers/ bridges.
 - Thin Clients
 - Industrial Controllers
 - Display controllers
 - Measuring instruments
 - Data acquisition and supervision units
 - Voice over IP units
 - DVB data processing
 - Motor controller (stepper, brushless etc)
- **Supported operating systems (based on microblaze CPU):**
 - Linux
 - eCOS
 - AT NucleusPLUS
 - Micrium μ C/OS-II
 - QNX Neutrino
 - Wind River VXWorks
 - Express Logic ThreadX
 - MontaVista LSP
 - Xilinx RTOS

Block Diagram:

