LDM-SYSTEMS

ELECTRONICS MANUFACTURING SERVICES

HIGH-TECH DEVELOPMENT KITS

MULTICLET®

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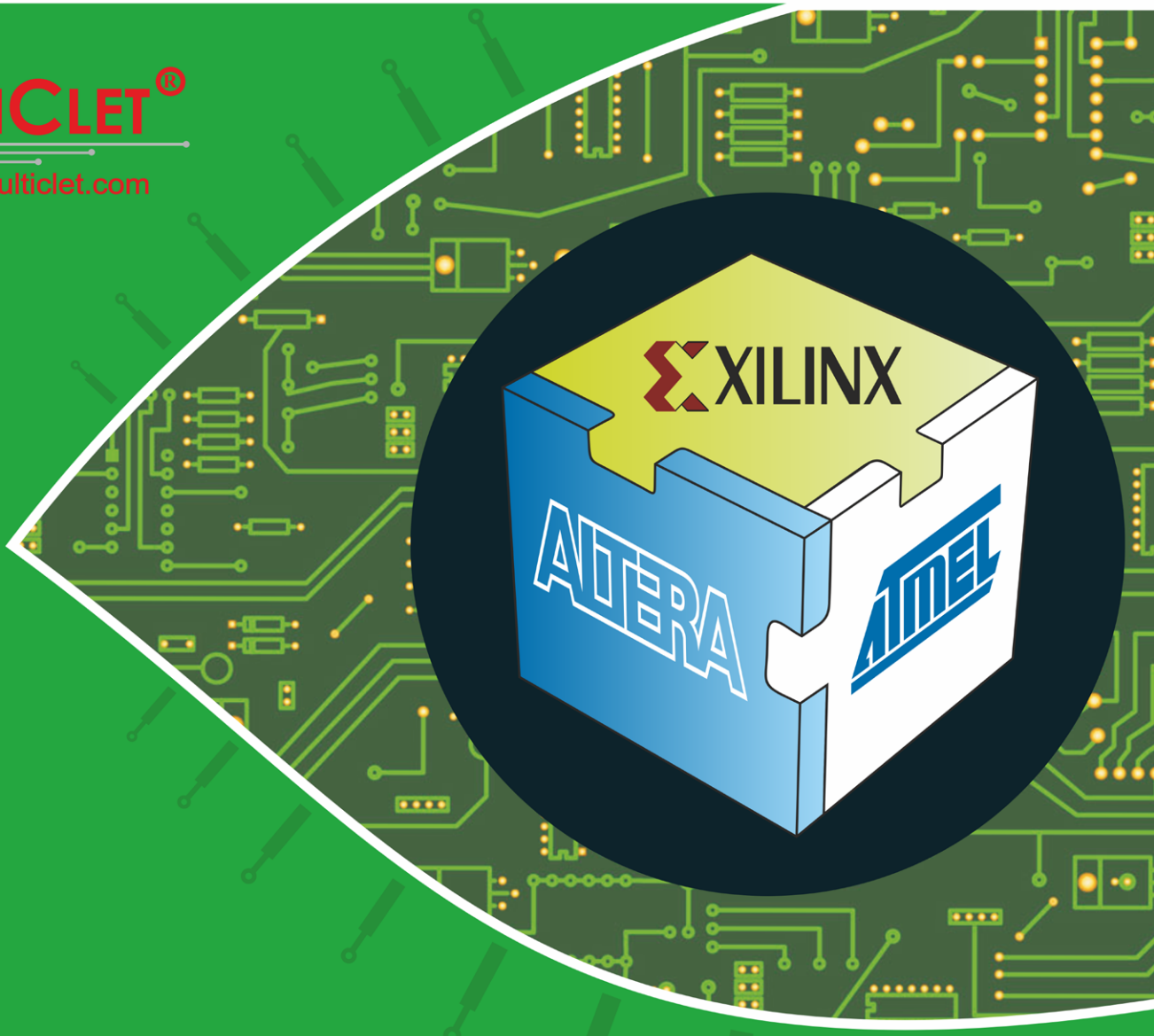
- AVR
- ARM7
- CPLDs
- FPGAs
- MAX II
- MCS-51
- XC9500
- Spartan-6
- Cyclone II
- Cyclone III
- Spartan-3E
- USB-Blaster
- CoolRunner-II
- TQFP-100, 144
- PQFP-100, 208



UNITING THE BEST

MADE IN RUSSIA

info@ldm-systems.com
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007 (495) 500-89-20
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Contents

The multicellular processor is the first processor with a principally new (post-von Neumann) multicellular architecture (MultiClet Ltd production, Russia). It is designed to solve the tasks of controlling and digital processing of signals in the applications which require minimal power consumption as well as superior performance, for instance, audio information.

New processor is a result of realization of new patented multicellular architecture. The main difference with traditional nuclear architecture is that multicellular architecture operates with statements consisting of commands. Realization of all operations within each statement without memory involvement provides processor power increase in 4-5 times and reduction of energy consumption in 10 times.

Multicellular processors can be applied in the following market segments expertly chosen in order to realise the advantages of the multicellular architecture in the best way:

- 3D television,
- mobile and video communications,
- audio-processors (including hearing aids, telephone headsets),
- GLONASS/GPS/Galileo receivers,
- «Antihacker» trust-processors for bank applications,
- desktop supercomputers of teraflop class,
- automotive electronics («intellectual» on-board systems for automobiles),
- special applications for FPGA (special hardware),
- security systems automatically recognizing «friend-or-foe».

More information is here: http://www.multiclet.com/index.php?lang=en

MULTICLET®
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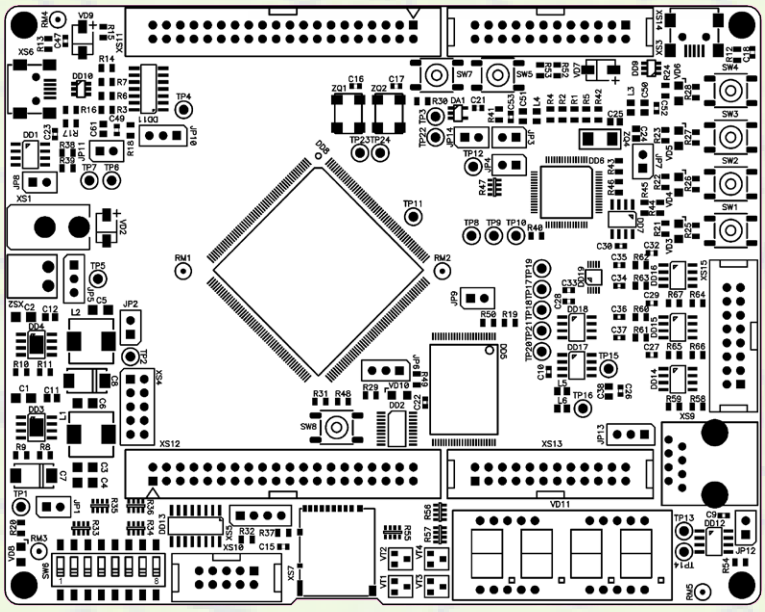
LDM-MCp0411100101-Q208 Evolution (MCp0411100101)

Development Kits is designed for the development, debugging systems, on the basis of MultiCell processor MCp0411100101, production MultiClet Ltd Russia.

Development Kits LDM-MCp0411100101-Q208 Evolution allows the developer to quickly learn the principles of work with MultiCell processor and master the control of peripheral devices. Software includes: Assembler, C preprocessor, C compiler, and math library.



The main technical parameters:

Architecture: ..... MCp04111 Russia 32/64 bits
Cell: 4

Frequency generator: ..... 80 MHz
Dimensions: ..... 140x110x15 мм
Precircuit (step 2.54 mm): ..... No
MC packaging: PQFP-208
I/O lines: 104
Power supply board: ..... +9..12 V
DC/DC converter: ..... 3.3 / 1.8 V
Onboard programm: ..... PicoTAP
ADC: ..... 12 bits, 4 channels
DAC: ..... 12 bits, 2 channels
Program FLASH : ..... 128 KB
SRAM: ..... 128 KB
External NAND FLASH : ..... 64 MB
External EEPROM: ..... 8 KB

Interface: 4 x UART, 2 x I2C, I2S, Ethernet (MAC) 10/100, 4 x SPI, UART-USB, RS485, USB1.1.
User: 4 LEDs, 4 buttons, micro SD, 8 switch, 4-digit seven-segment LED display, 8 power line 0.5A x 50 V.

Development Kits for microcontrollers made by LDM-SYSTEMS represent cost effective basic solutions for the development of digital processing systems of signals. Set of Development Kits is presented in three groups, that is differ by the type of the structure of the microcontroller: AVR, MCS-51, ARM7 (figure 1)

AVR	MCS-51	ARM7
ATmega103	AT89C5130A	AT91SAM7S64
ATmega128	AT89C5131A	AT91SAM7S128
AT90CAN128		AT91SAM7S256
		AT91SAM7X128
		AT91SAM7X256

Figure 1. The classification of Development Kits by groups

Development Kits are made in the form of printed circuit boards, that include: microcontroller, voltage converters, interface drivers, necessary decoupling, crystal resonators and connectors.

Many boards have a large precircuit with step holes at 2.54 mm, suitable for the majority of standard connectors and chips. Precircuit can be used to build a small schemes or socket installation for connection with external devices.

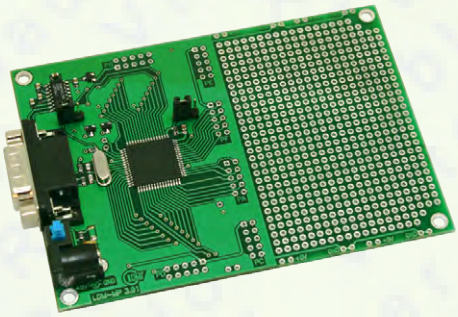
All Development Kits have built-in programmers, that allows to work without additional devices. Depending on the type of Development Kits programming of microcontroller can be made through the serial interfaces: RS232 (COM port), LPT, USB.

All the connectors of microcontrollers are on the mounting platform standard connectors, that allow to use the chip more effectively.

Development Kits of LDM-SYSTEMS safely packed in the original box (figure 2).

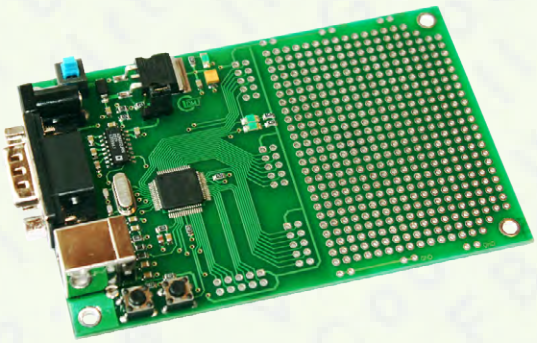
Figure 2. LDM-SYSTEMS brand packaging

LDM-MP 3.01 (ATmega128/ ATmega103/ AT90CAN128)



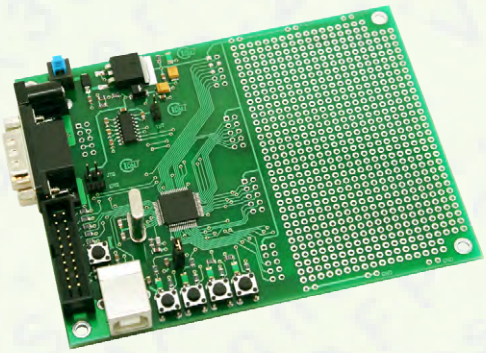
Architecture: ..... AVR, 8 bits
Dimensions: ..... 114x81x15 mm
Precircuit (step 2.54 mm): ..... 53x81 mm
MC packaging: TQFP-64
I/O lines: 53
Crystal resonator: ..... 8 MHz
Onboard programm: ..... COM
ADC: ..... 10 bits, 8 channels
FLASH: ..... 128 Kb
SRAM: ..... 4 Kb
EEPROM: ..... 4 Kb

LDM-AT89C513x (AT89C5130A/ AT89C5131A)



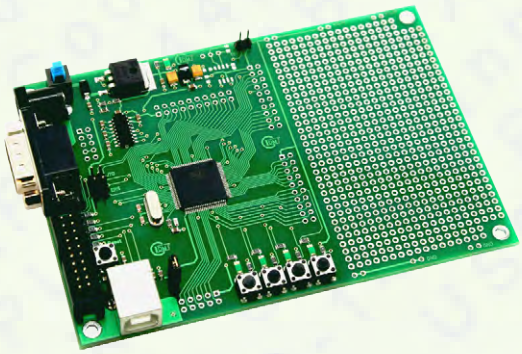
Architecture: ..... MCS-51, 8 bits
Dimensions: ..... 108x71x15 mm
Precircuit (step 2.54 mm): ..... 48x71 mm
MC packaging: VQFP-64
I/O lines: 32
Crystal resonator: ..... 24 MHz
Onboard programm: ..... USB
FLASH: ..... 16 Kb / 32 Kb
SRAM: ..... 0.25 Kb / 0.25 Kb
ERAM: ..... 1 Kb / 1 Kb
EEPROM: ..... 4 Kb / 4 Kb

LDM-SAM7Sxxx (AT91SAM7S64/ 128/ 256)



Architecture: ..... ARM7, 32 bits
Dimensions: ..... 118x91x15 mm
Precircuit (step 2.54 mm): ..... 52x91 mm
MC packaging: LQFN-64
I/O lines: 32
Crystal resonator: ..... 24 MHz
Onboard programm: ..... JTAG, SAM-BA
USB Device: 1
ADC: ..... 10 bits, 8 channels
FLASH: ..... 64 Kb / 128 Kb / 256 Kb
SRAM: ..... 16 Kb / 32 Kb / 64 Kb

LDM-SAM7Xxxx (AT91SAM7X128/ 256)



Architecture: ..... ARM7, 32 bits
Dimensions: ..... 130x91x15 mm
Precircuit (step 2.54 mm): ..... 52x91 mm
MC packaging: LQFN-100
I/O lines: 54
Crystal resonator: ..... 24 MHz
Onboard programm: ..... JTAG, SAM-BA
USB Device: 1
ADC: ..... 10 bits, 8 channels
FLASH: ..... 128 Kb / 256 Kb
SRAM: ..... 32 Kb / 64 Kb

Development Kits of LDM-SYSTEMS on the base of programmable logical integrated circuits (FPGA) Altera represent a printed circuit board with CPLD and FPGA chips (FPGA with external memory programs, CPLD with built-in memory programs). Converters of voltage, socket programming, 4 user LEDs and 4 buttons are installed on the boards. There are large precircuits on each board with hole step 2.54 mm. Programming the FPGA can be carried out by downloading cables: LDM-PB 2.01 (ByteBlasterMV) - LPT-port and LDM USB-Blaster (USB-Blaster) USB port.

Figure 3 and 4 illustrate the classification of Development Kits, divided into groups - CPLD and FPGA.

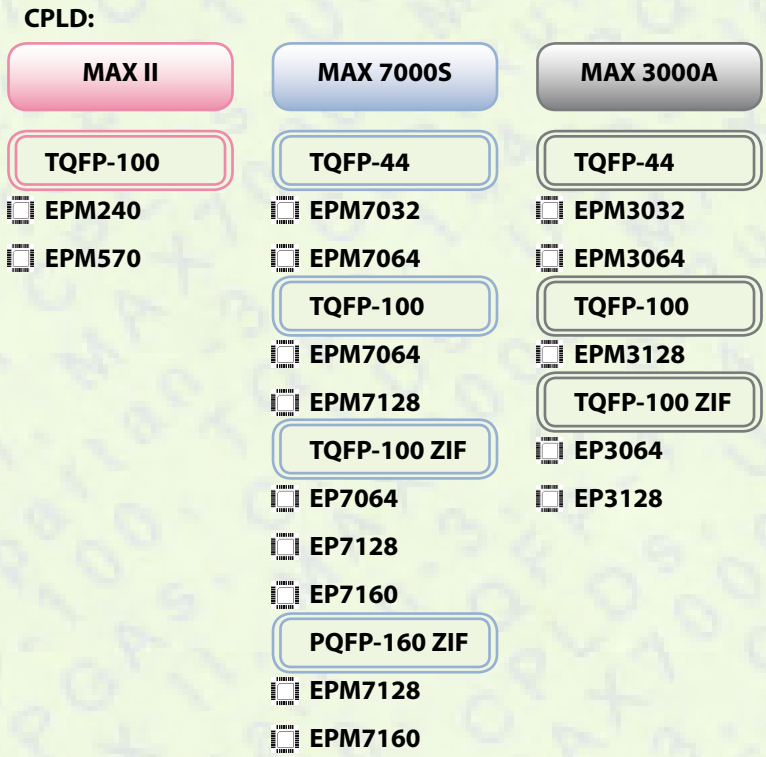


Figure 3. The classification of Development Kits of CPLD group

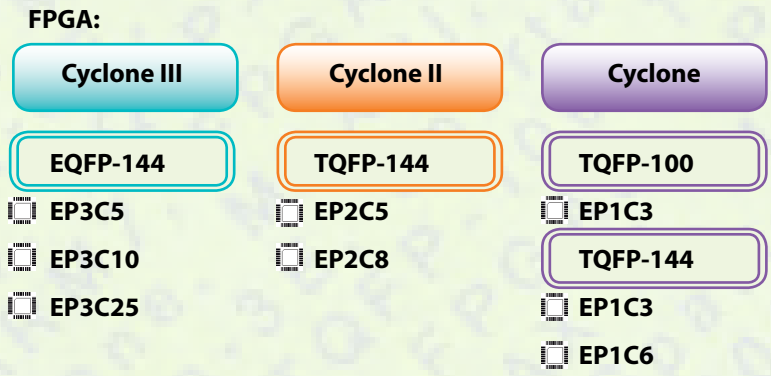
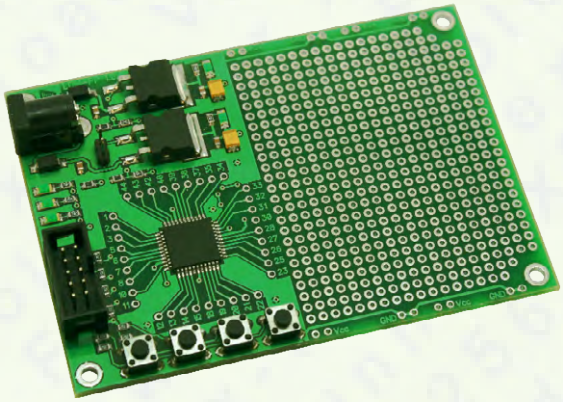


Figure 4. The classification of Development Kits of FPGA group

The set of Development Kits is represented by a board with ZIF connectors (plugs with zero effort) for FPGA packaging: TQFP-100, PQFP-160.

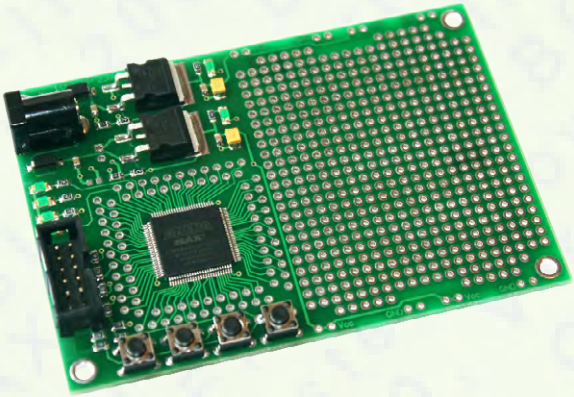
LDM-PP 1.xxxx (EPM3032/ 3064/ 7032/ 7064)



Architecture: ..... CPLD
Family of FPGAs: ..... MAX 3000A / MAX 7000S

Dimensions: ..... 100x71x15 mm
Precircuit (step 2.54 mm): ..... 50x71 mm
FPGAs packaging: TQFP-44
I/O lines: ..... 34 / 34 / 36 / 36
Clock generator: ..... No
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 3.3 / 5 V
Number of macrocells: ..... 32 / 64 / 32 / 64
Maximum frequency: ..... 227 MHz
User LEDs: 4
User buttons: 4

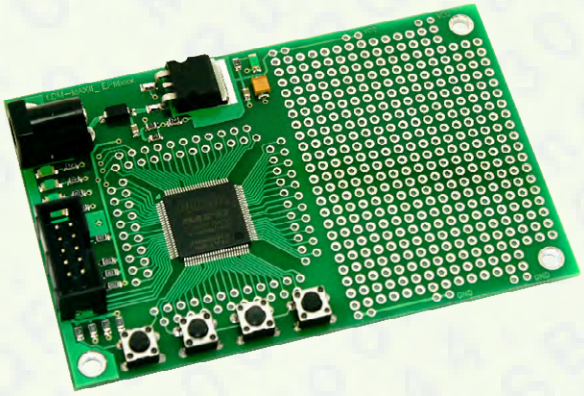
LDM-PP 2.xxxx (EPM3128/ 7064/ 7128)



Architecture: ..... CPLD
Family of FPGAs: ..... MAX 3000A / MAX 7000S

Dimensions: ..... 100x71x15 mm
Precircuit (step 2.54 mm): ..... 50x71 mm
FPGAs packaging: TQFP-100
I/O lines: ..... 80 / 68 / 84
Clock generator: ..... No
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 3.3 / 5 V
Number of macrocells: ..... 128 / 64 / 128
Maximum frequency: ..... 192 MHz
User LEDs: 4
User buttons: 4

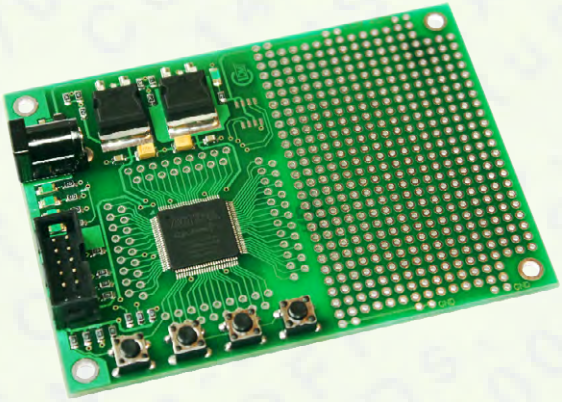
LDM-MAXII EPMxxxT100 (EPM240/ 570)



Architecture: ..... CPLD
Family of FPGAs: ..... MAX II

Dimensions: ..... 97x64x15 mm
Precircuit (step 2.54 mm): ..... 45x64 mm
FPGAs packaging: TQFP-100
I/O lines: ..... 80 / 76
Clock generator: ..... No
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 3.3 V
Number of macrocells: ..... 192 / 440
Maximum frequency: ..... 304 MHz
Total RAM: ..... 8 Kb
User LEDs: 4
User buttons: 4

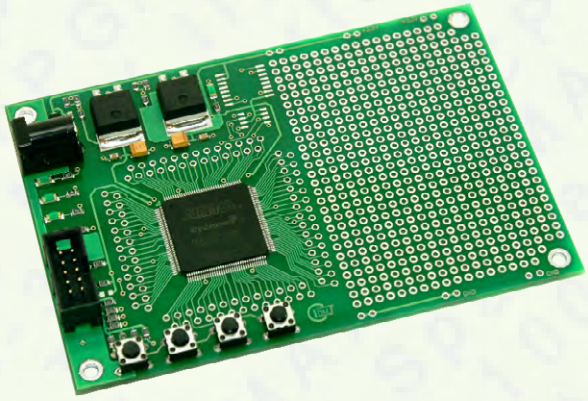
LDM-EP1C3T100 (EP1C3)



Architecture: ..... FPGA
Family of FPGAs: ..... Cyclone

Dimensions: ..... 97x71x15 mm
Precircuit (step 2.54 mm): ..... 45x71 mm
FPGAs packaging: TQFP-100
I/O lines: 65
Clock generator: ..... No
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 1.5 / 3.3 V
Logic Elements: 2910
Maximum frequency: ..... 275 MHz
Total RAM: ..... 58.5 Kb
User LEDs: 4
User buttons: 4

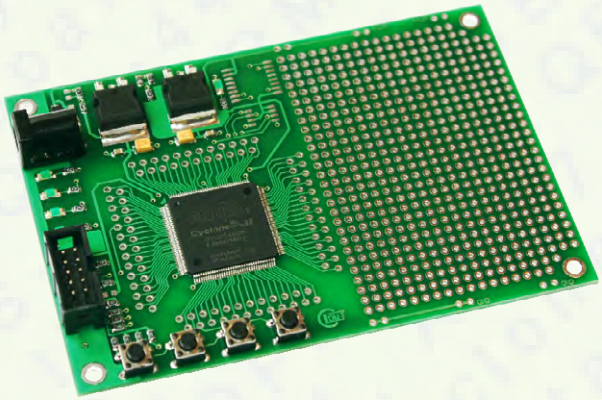
LDM-EP1CxT144 (EP1C3/ 6)



Architecture: ..... FPGA
Family of FPGAs: ..... Cyclone

Dimensions: ..... 114x79x15 mm
Precircuit (step 2.54 mm): ..... 52x79 mm
FPGAs packaging: TQFP-144
I/O lines: ..... 104 / 98
Clock generator: ..... No
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 1.5 / 3.3 V
Logic Elements: ..... 2910 / 5980
Maximum frequency: ..... 275 MHz
Total RAM: ..... 58.5 / 76.5 Kb
User LEDs: 4
User buttons: 4

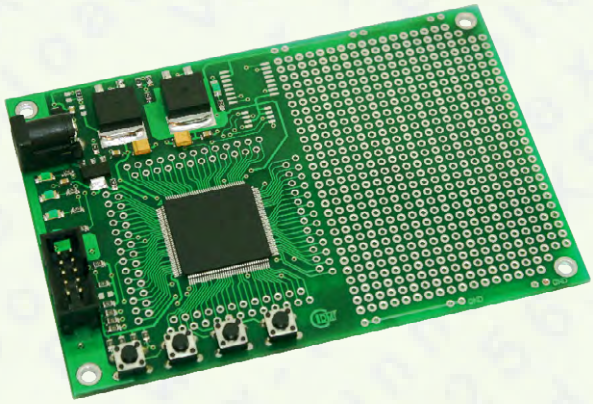
LDM-EP2CxT144 (EP2C5/ 8)



Architecture: ..... FPGA
Family of FPGAs: ..... Cyclone II

Dimensions: ..... 114x79x15 mm
Precircuit (step 2.54 mm): ..... 52x79 mm
FPGAs packaging: TQFP-144
I/O lines: ..... 104 / 98
Clock generator: ..... No
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 1.2 / 3.3 V
Logic Elements: ..... 4608 / 8256
Maximum frequency: ..... 310 MHz
Total RAM: ..... 117 / 162 Kb
User LEDs: 4
User buttons: 4

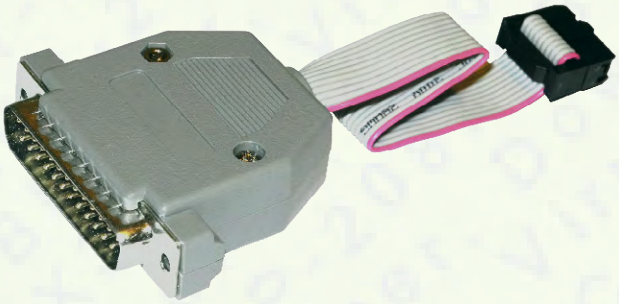
LDM-EP3CxxE144 (EP3C5/ 10/ 25)



Architecture: ..... FPGA
Family of FPGAs: ..... Cyclone III

Dimensions: ..... 114x79x15 mm
Precircuit (step 2.54 mm): ..... 52x79 mm
FPGAs packaging: EQFP-144
I/O lines: ..... 94 / 94 / 82
Clock generator: ..... No
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 1.2 / 2.5 / 3.3 V
Logic Elements: ..... 5 / 10 / 25 K
Maximum frequency: ..... 325 MHz
Total RAM: ..... 368 / 368 / 528 Kb
User LEDs: 4
User buttons: 4

LDM-PB 2.01 (Download cable ByteBlasterMV LPT)



Configuring the FPGA families:
Stratix IV, Stratix III, Stratix II, Stratix GX, Stratix, Cyclone V, Cyclone IV, Cyclone III, Cyclone II, Cyclone, APEX II, ACEX 1K, FLEX 10K, Mercury, Arria GX and Arria II GX.

Programming CPLD families:
MAX V, MAX II, MAX 7000 and MAX 3000.

PROM Programming:
EPC2, EPC4, EPC8, EPC16, EPCS1, EPCS4, EPCS16, EPCS64 and EPCS128.

Connection port: ..... LPT
Software: ..... Quartus II

LDM-USB-Blaster (Download cable USB-Blaster)

Configuring the FPGA families:
Stratix IV, Stratix III, Stratix II, Stratix GX, Stratix, Cyclone V, Cyclone IV, Cyclone III, Cyclone II, Cyclone, APEX II, ACEX 1K, FLEX 10K, Mercury, Arria GX and Arria II GX.

Programming CPLD families:
MAX V, MAX II, MAX 7000 and MAX 3000.

PROM Programming:
EPC2, EPC4, EPC8, EPC16, EPCS1, EPCS4, EPCS16, EPCS64 and EPCS128.

Connection port: ..... USB
Software: ..... Quartus II

Development Kits of LDM-SYSTEMS on the base of programmable logical integrated circuits (FPGA) Xilinx represent a printed circuit board with CPLD and FPGA chips (FPGA with external memory programs, CPLD with built-in memory programs). Converters of voltage, socket programming, 2 adjusted clock frequency generators 25/50/100 MHz, 4 LEDs and 4 buttons are installed on the boards. There are large precircuits on each board with hole step 2.54 mm. Programming the FPGA can be carried out by downloading cable LDM-PCIII 2.01 (Parallel Cable III) - LPT port.

Figure 5 and 6 illustrate the classification of Development Kits, divided into groups - CPLD and FPGA.

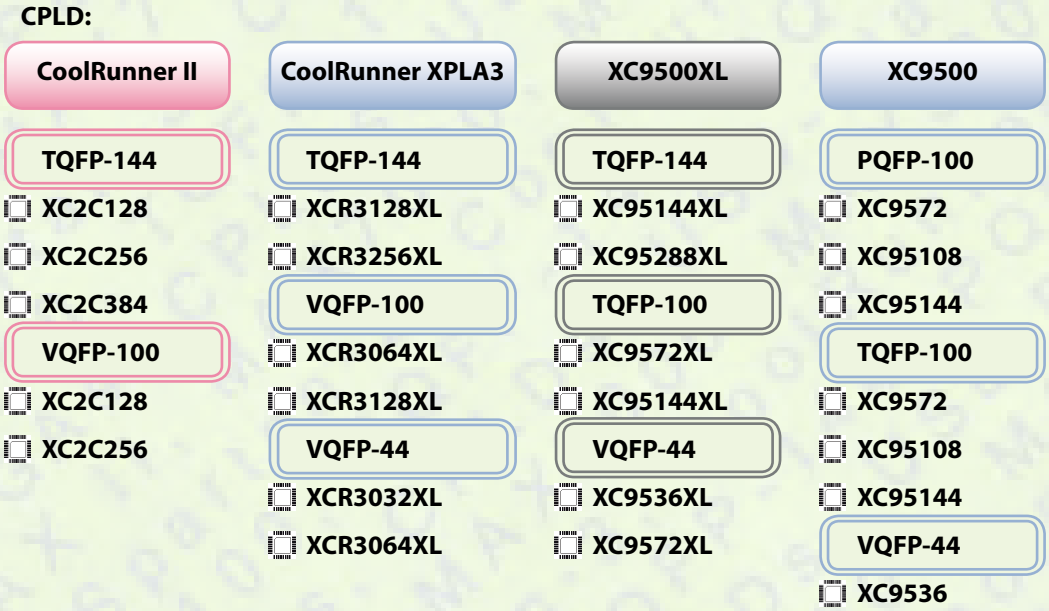
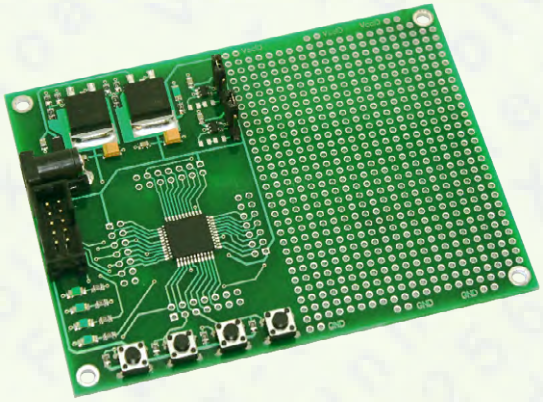


Figure 5. The classification of Development Kits of CPLD group

Figure 6. The classification of Development Kits of FPGA group

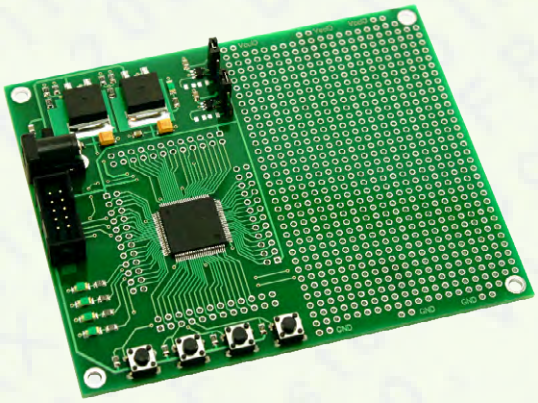
LDM-XC95xxx-VQ44 (XC9536XL/ 9572XL/ 9536)



Architecture: ..... CPLD
Family of FPGAs: ..... XC9500 / XC9500XL

Dimensions: ..... 107x81x15 mm
Precircuit (step 2.54 mm): ..... 55x81 mm
FPGAs packaging: VQFP-44
I/O lines: ..... 34 / 34 / 34
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 3.3 / 5.0 V
Number of macrocells: ..... 36 / 72 / 36
Maximum frequency: ..... 178 MHz
User LEDs: 4
User buttons: 4

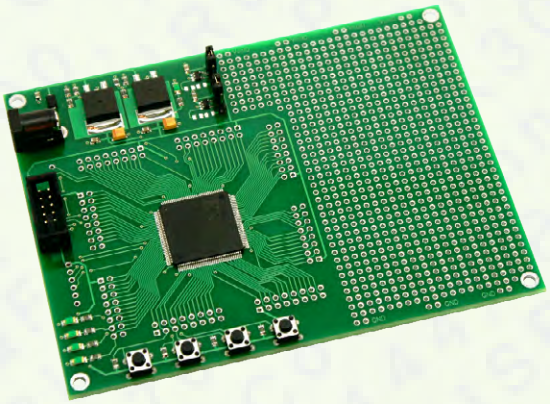
LDM-XC95xxx-TQ100 (9572XL/ 95144XL/ 9572/ 95108/ 95144)



Architecture: ..... CPLD
Family of FPGAs: ..... XC9500 / XC9500XL

Dimensions: ..... 110x92x15 mm
Precircuit (step 2.54 mm): ..... 54x92 mm
FPGAs packaging: TQFP-100
I/O lines: ..... 72 / 81 / 72 / 81 / 81
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 3.3 / 5.0 V
Number of macrocells: ..... 72 / 144 / 72 / 108 / 144
Maximum frequency: ..... 178 MHz
User LEDs: 4
User buttons: 4

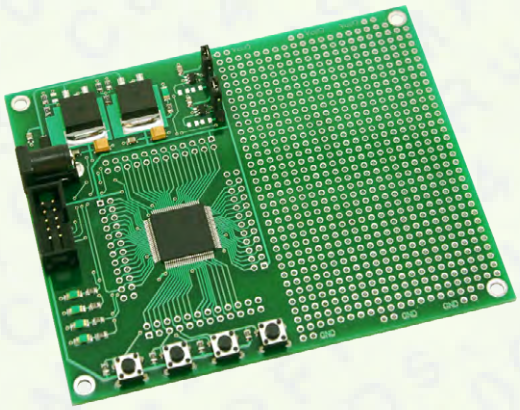
LDM-XC95xxxXL-TQ144 (XC95144XL/ XC95288XL)



Architecture: ..... CPLD
Family of FPGAs: XC9500XL

Dimensions: ..... 133x102x15 mm
Precircuit (step 2.54 mm): ..... 58x102 mm
FPGAs packaging: TQFP-144
I/O lines: ..... 117 / 117
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 3.3 V
Number of macrocells: ..... 144 / 288
Maximum frequency: ..... 178 MHz
User LEDs: 4
User buttons: 4

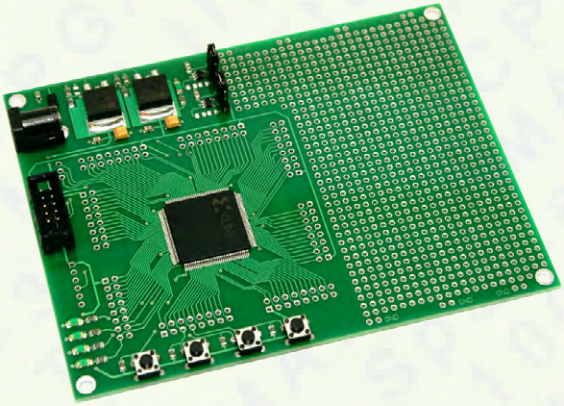
LDM-XC2Cxxx-VQ100 (XC2C128/ 256)



Architecture: ..... CPLD
Family of FPGAs: ..... CoolRunner-II

Dimensions: ..... 110x92x15 mm
Precircuit (step 2.54 mm): ..... 54x92 mm
FPGAs packaging: VQFP-100
I/O lines: ..... 80 / 80
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 1.8 / 3.3 V
Number of macrocells: ..... 128 / 256
Maximum frequency: ..... 256 MHz
User LEDs: 4
User buttons: 4

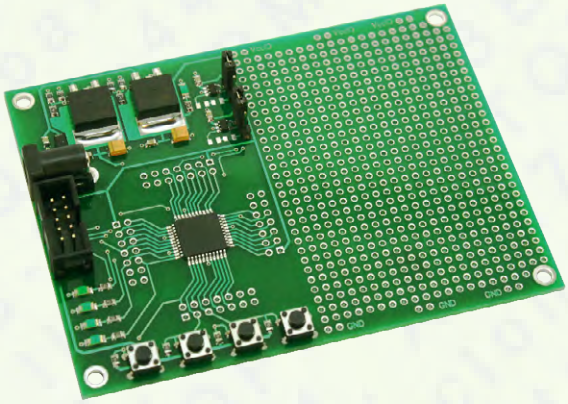
LDM-XC2Cxxx-TQ144 (XC2C128/ 256/ 384)



Architecture: ..... CPLD
Family of FPGAs: ..... CoolRunner-II

Dimensions: ..... 133x102x15 mm
Precircuit (step 2.54 mm): ..... 58x102 mm
FPGAs packaging: TQFP-144
I/O lines: ..... 100 / 118 / 118
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 1.8 / 3.3 V
Number of macrocells: ..... 128 / 256 / 384
Maximum frequency: ..... 256 MHz
User LEDs: 4
User buttons: 4

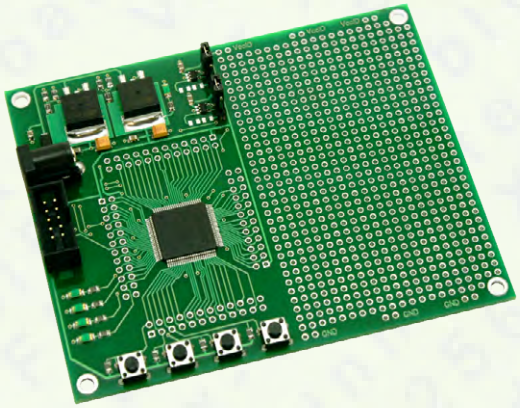
LDM-XCR3xxxXL-VQ44 (XCR3032XL/ 64XL)



Architecture: ..... CPLD
Family of FPGAs: CoolRunner-XPLA3

Dimensions: ..... 107x81x15 mm
Precircuit (step 2.54 mm): ..... 55x81 mm
FPGAs packaging: VQFP-44
I/O lines: ..... 36 / 36
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 3.3 V
Number of macrocells: ..... 32 / 64
Maximum frequency: ..... 213 MHz
User LEDs: 4
User buttons: 4

LDM-XCR3xxxXL-VQ100 (XCR3064XL/ 128XL)



Architecture: ..... CPLD
Family of FPGAs: CoolRunner-XPLA3

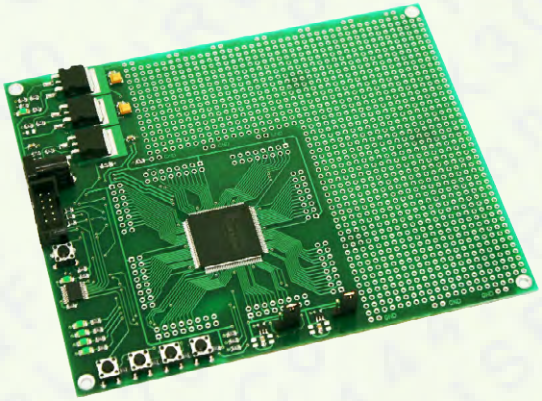
Dimensions: ..... 110x92x15 mm
Precircuit (step 2.54 mm): ..... 54x92 mm
FPGAs packaging: VQFP-100
I/O lines: ..... 68 / 84
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 3.3 V
Number of macrocells: ..... 64 / 128
Maximum frequency: ..... 213 MHz
User LEDs: 4
User buttons: 4

LDM-XCR3xxxXL-TQ144 (XCR3128XL/ 256XL)

Architecture: ..... CPLD
Family of FPGAs: CoolRunner-XPLA3

Dimensions: ..... 133x102x15 mm
Precircuit (step 2.54 mm): ..... 58x102 mm
FPGAs packaging: TQFP-144
I/O lines: ..... 108 / 120
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 3.3 V
Number of macrocells: ..... 128 / 256
Maximum frequency: ..... 213 MHz
User LEDs: 4
User buttons: 4

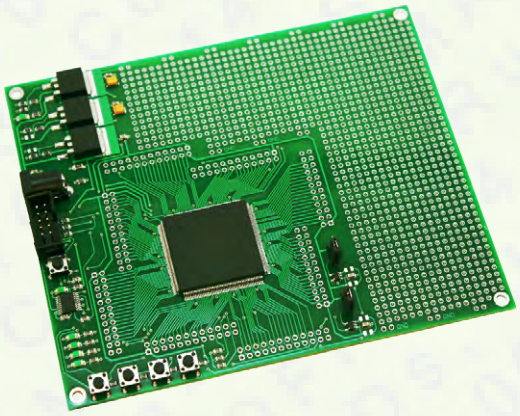
LDM-XC3Sxxx-TQ144 (XC3S50/ 200/ 400)



Architecture: ..... FPGA
Family of FPGAs: ..... Spartan 3

Dimensions: ..... 145x122x15 mm
Precircuit (step 2.54 mm): ..... 70x122 mm
FPGAs packaging: TQFP-144
I/O lines: ..... 97 / 97 / 97
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 1.2 / 2.5 / 3.3 V
Logic Elements: ..... 50 / 200 / 400 K
Maximum frequency: ..... 630 MHz
Total RAM: ..... 84 / 246 / 344 Kb
User LEDs: 4
User buttons: 4

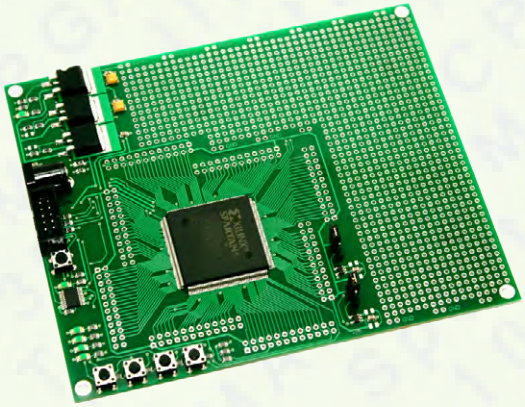
LDM-XC3Sxxx-PQ208 (XC3S50/ 200/ 400)



Architecture: ..... FPGA
Family of FPGAs: ..... Spartan 3

Dimensions: ..... 145x122x15 mm
Precircuit (step 2.54 mm): ..... 70x122 mm
FPGAs packaging: TQFP-144
I/O lines: ..... 124 / 141 / 141
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 1.2 / 2.5 / 3.3 V
Logic Elements: ..... 50 / 200 / 400 K
Maximum frequency: ..... 630 MHz
Total RAM: ..... 84 / 246 / 344 Kb
User LEDs: 4
User buttons: 4

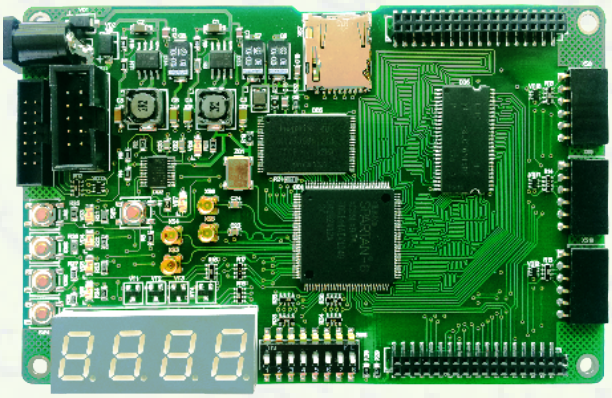
LDM-XC3SxxxE-PQ208 (XC3S250/ 500)



Architecture: ..... FPGA
Family of FPGAs: ..... Spartan 3E

Dimensions: ..... 145x122x15 mm
Precircuit (step 2.54 mm): ..... 70x122 mm
FPGAs packaging: PQFP-208
I/O lines: ..... 158 / 158
Clock generator: ..... 100 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 1.2 / 2.5 / 3.3 V
Logic Elements: ..... 250 / 500 K
Maximum frequency: ..... 572 MHz
Total RAM: ..... 254 / 433 Kb
User LEDs: 4
User buttons: 4

LDM-XC6SLXx-TQG144 Evolution (XC6SLX4/ 9)

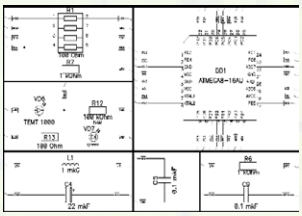


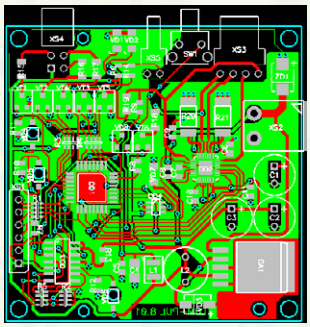
Architecture: ..... FPGA
Family of FPGAs: ..... Spartan 6

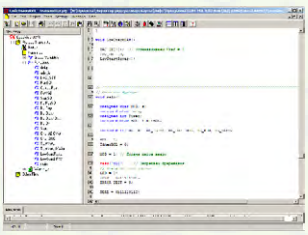
Dimensions: ..... 120x80x15 mm
Precircuit (step 2.54 mm): ..... No
FPGAs packaging: TQFP-144
I/O lines: ..... 102 / 102
Clock generator: ..... 25 MHz
Programming mode: ..... JTAG
Power supply board: ..... +9..12 V
DC/DC converter: ..... 1.2 / 3.3 V
Logic Elements: ..... 3840 / 9152
Maximum frequency: ..... 375 MHz
Total RAM: ..... 75 / 90 Kb
User: 4 LEDs, 4 buttons, NAND FLESH 64 MB, SDRAM 32 MB, micro SD, 8 switch, 4-digit seven-segment LED display, 4 x MMCX high-frequency connectors (2 IN & 2 OUT lines).

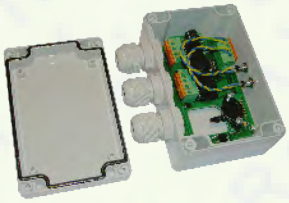
LDM-SYSTEMS is aimed on development of communication, network electronics and designing digital, digital-to-analog signal processing systems.

We develop electronic equipment complexly and perform this on specific areas:









- Requirements specification development;
- Architecture and structure development of the designed device;
- Development and computer modeling of analog electronics;
- Development and computer modeling of digital electronics;
- Software development;
- Complex computer modeling of the designed device;
- Components selection;
- Schematic circuit development;
- PCB wiring;
- 3D modeling of body (AutoCAD, SolidWorks);
- Prototype production;
- Special test equipment development;
- Preparation for serial production;
- Serial production;
- Testing and adjustment of serial devices.

We have experience in developing:

- Digital signal processing in real time;
- Control systems of complex technological equipment;
- Robotic systems control installations;
- Interface controllers to connect specialized peripheral and measuring devices to PC (IR, USB, RS–232, RS–485, Bluetooth, Wi–Fi, Zigbee, GPRS etc.)
- Software (Visual Studio C++, C++ Builder, Visual Basic);
- Client-server application development.

LDM-SYSTEMS possess its own assembly equipment so we can provide our customers with reliable prices, high quality and production time of designed electronics.

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