# xPC56xLADPT144S MINIMODULE

# USER MANUAL

**Cod. ASD433A**

| *Rev.* | *Auth.* | *Date* |
|---|---|---|
| *01.00* | *Eng. Alfonso FORGIONE* | *28.08.2009* |

ADVANCED SYSTEMS DEVELOPMENT

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# *1 - OVERVIEW*

The xPC56xLADPT144S Minimodule is an evaluation system supporting for FSL MPC5643L microprocessor or STMicroelectronics SPC56EL microprocessor.
The minimodule may be used as a stand-alone unit, which allows access to the CPU, but no access to the I/O pins or any motherboards peripherals.

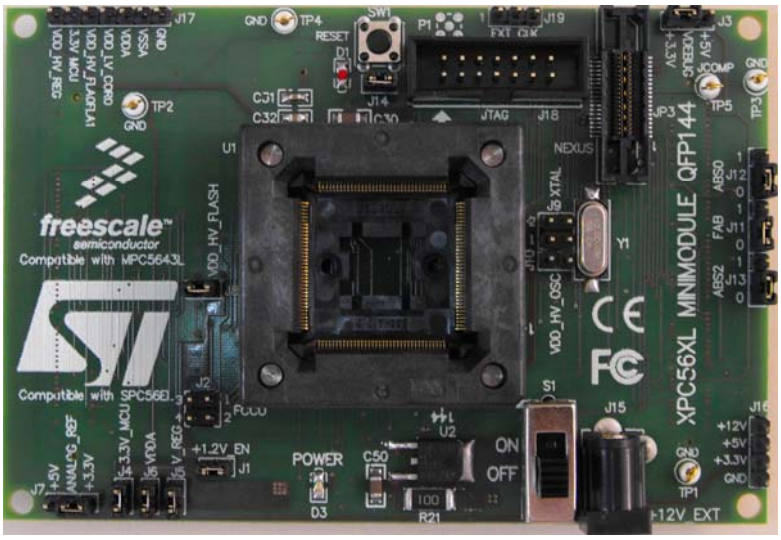


Fig.1 – Overview of the xPC56xLADPT144S Minimodule (ASD433A)

## *1.1 - Package Contents*

An ASD433A minimodule includes the following item:

- One xPC56xLADPT144S Minimodule (ASD433A);
- ASD Warranty and Registration card.

## *1.2 - Supported Devices*

The ASD433A minimodule supports the following devices:

- FSL MPC5643L microprocessor (LQFP144);
- STMicroelectronics SPC56EL microprocessor (LQFP144).

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### *1.3 - Handling precautions*

Please take care to handle the package contents in a manner such as to prevent electrostatic discharge.

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## *2 - HARDWARE FEATURES*

An 38-pin Mictor Nexus port and a 14-pin JTAG port are provided on the Minimodule to allow usage of an external PowerPC Nexus interface.

### 2.1 - ASD433A - xPC56xLADPT144S Minimodule board features

- Can be used as a stand-alone board by providing external 12V power supply input;
- ON/OFF Power Switch w/ LED indicator;
- Reset button with filter and LED indicator;
- ASD433A has socket for xPC56xL device in 144LQFP footprint;
- Debug ports: 38-pin Mictor Nexus port and/or 14-pin JTAG port;
- Direct clock input through SMA connector (footprint only);
- Jumpers for boot configuration;
- 40MHz crystal with jumpers to optionally disconnect it.

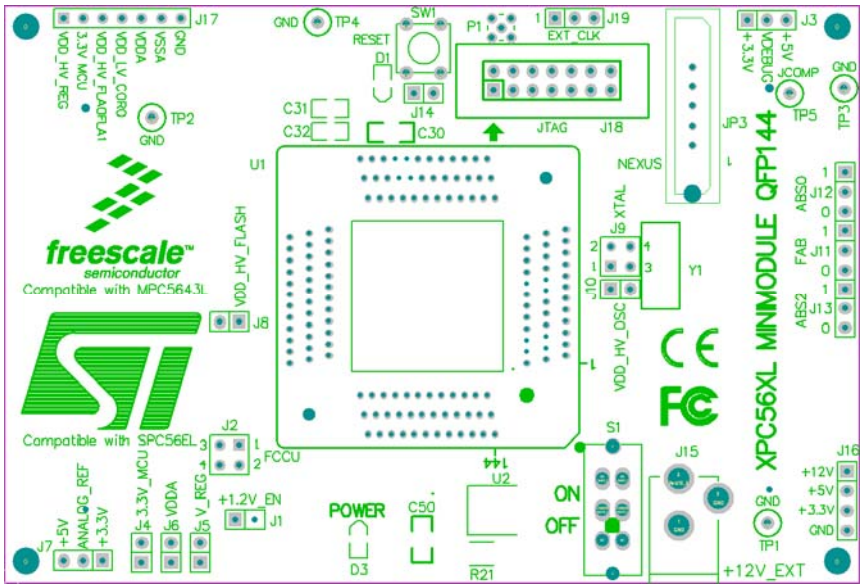


Fig.2 - xPC56xLADPT144S Top component placement

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### 2.2 - Pin numbering for jumpers

Jumpers for the Minimodules have a rectangular pad to indicate the position of pin 1. See examples below for the numbering convention used in this manual for jumper settings.


Fig.3 – Pin numbering

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# 3 - HARDWARE & JUMPER SETTINGS

## 3.1 - Power Supplies

When the Minimodule is plugged into the motherboard, power is supplied directly by the motherboard. In this setup, the external power supply input available on the Minimodule should NOT be used.

When the xPC56xLADPT144S Mini-Module is used as a stand-alone board, an external +12V power supply must be used. The minimodule obtains its power from the 12VDC Center Positive input barrel connector.

The following jumpers are used to configure the power supply:

- J1 – VDD_LV_COR0 Enable;
- J3 – Debug Port Voltage configuration (V_DEBUG), select from +3.3V and +5V;
- J4 – MCU voltage Enable;
- J5 – VDD_HV_REG Enable;
- J6 – ADC Analog supply voltage Enable;
- J7 – Select Analog supply voltage from +3.3V and +5V;
- J9 – VDD_HV_FLA0FLA1 Enable;
- J10 – VDD_HV_OSC Enable.

## 3.2 - Boot configuration

The following jumpers affect the operation of the processor as it initially comes out of the reset state:

- J11 – FAB configuration, controls whether the processor boots from internal FLASH or from a serial interface (CAN, SCI);
- J12 – ABS0 configuration, this jumper configures the ABS[0] pin;
- J13 – ABS2 configuration, this jumper configures ABS[2] pin.

## 3.3 - System CLOCK configuration

The minimodule support the usage of crystal clock sources as well as external clock sources:

- J9 – 40MHz crystal clock source Enable;
- J10 – External clock source Enable.

### 3.4 - Reset circuit

A RESET push button “SW1” on the minimodule can be used to RESET the processor. The J14 jumper Enable the reset circuit.

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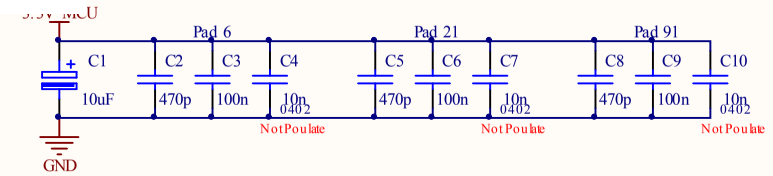
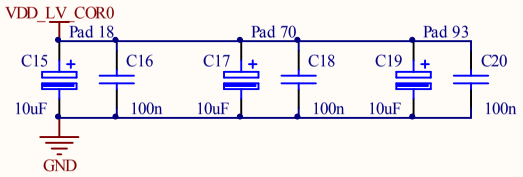
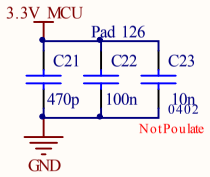
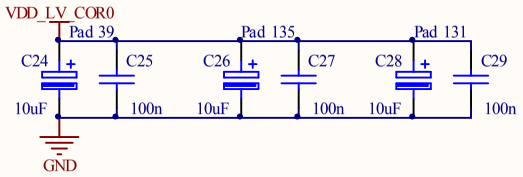
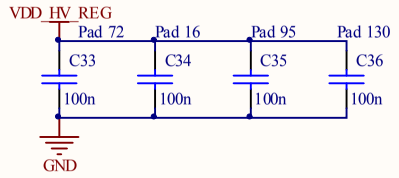
# 4 – SCHEMATIC AND BOM

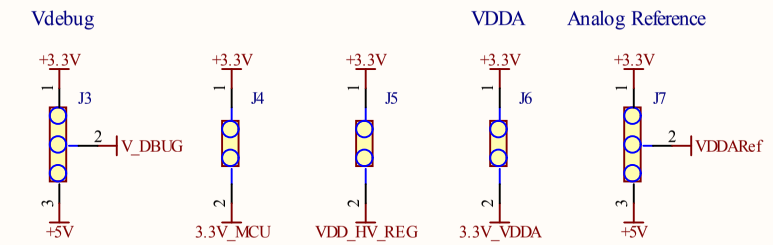


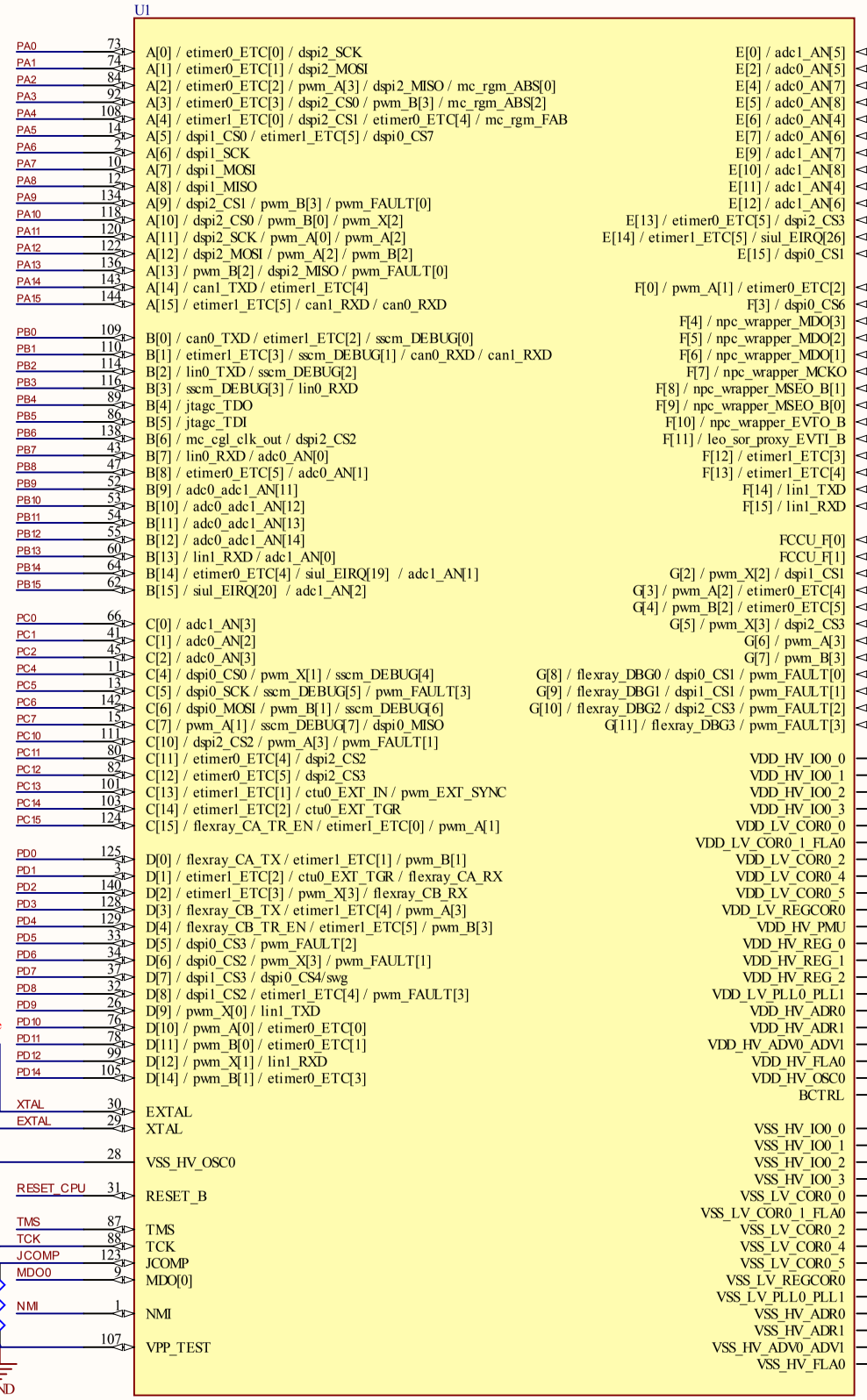



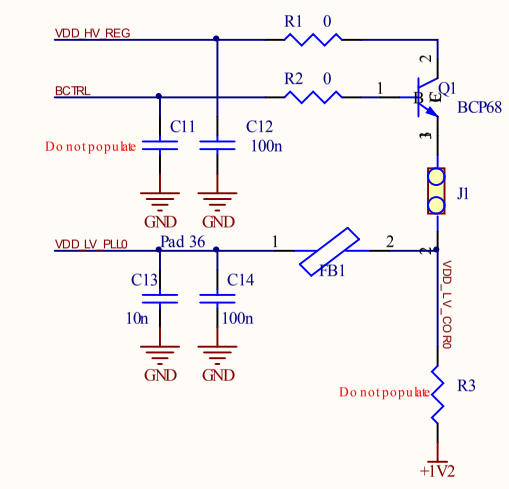



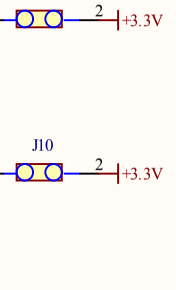



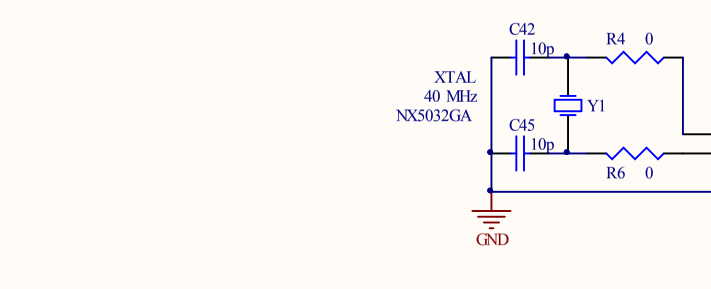



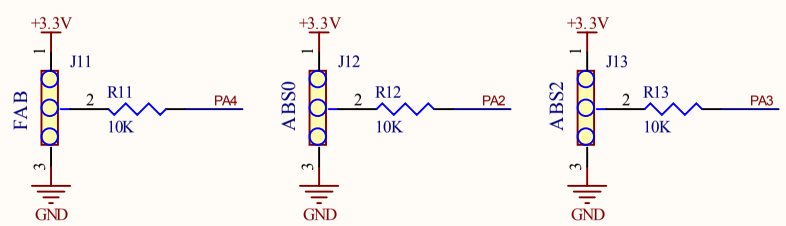


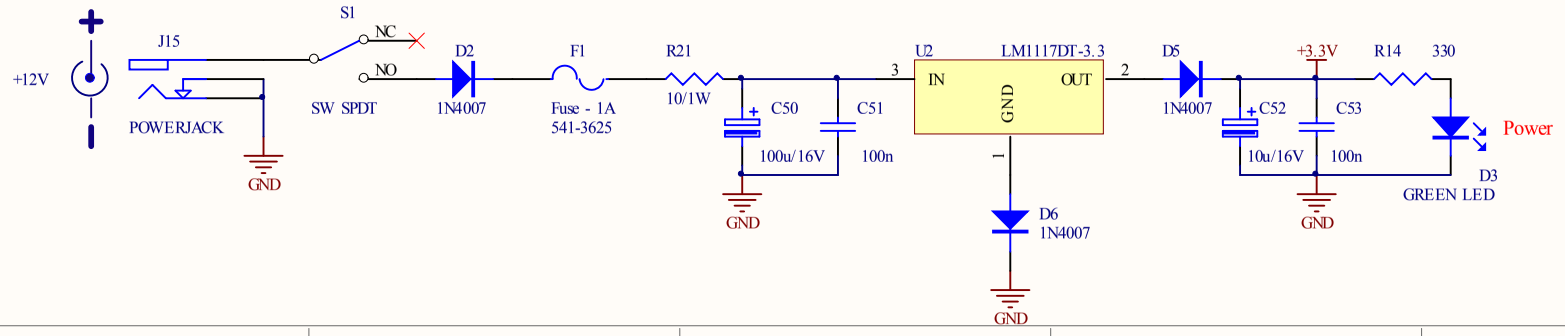


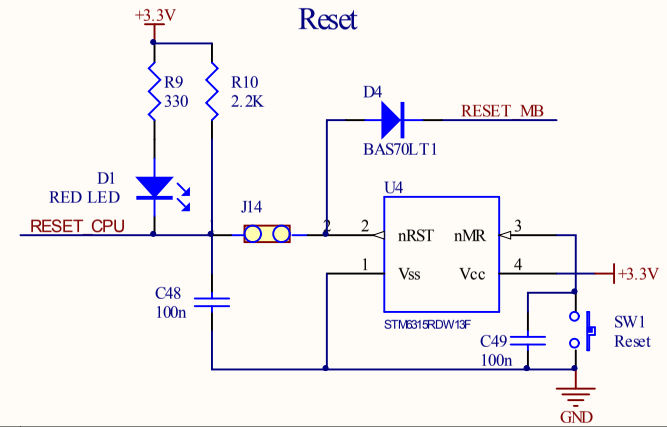
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| Size | Number | | Revision |
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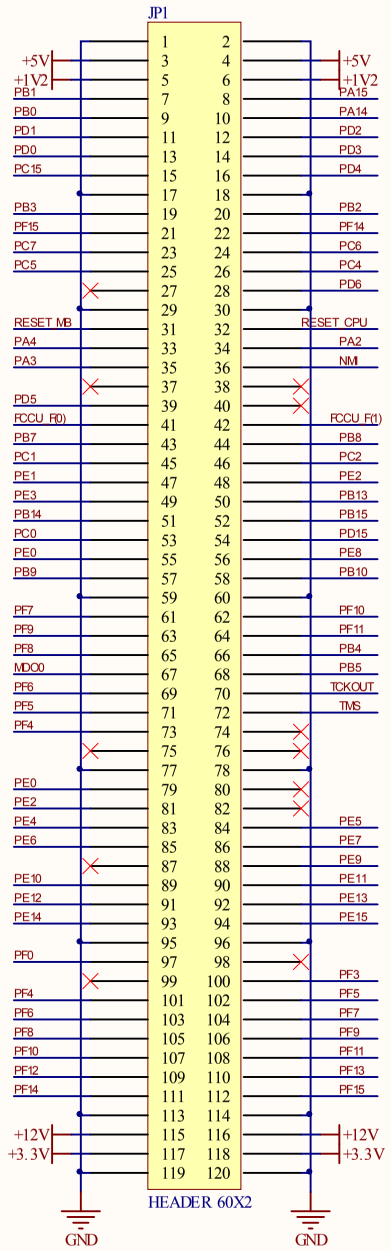
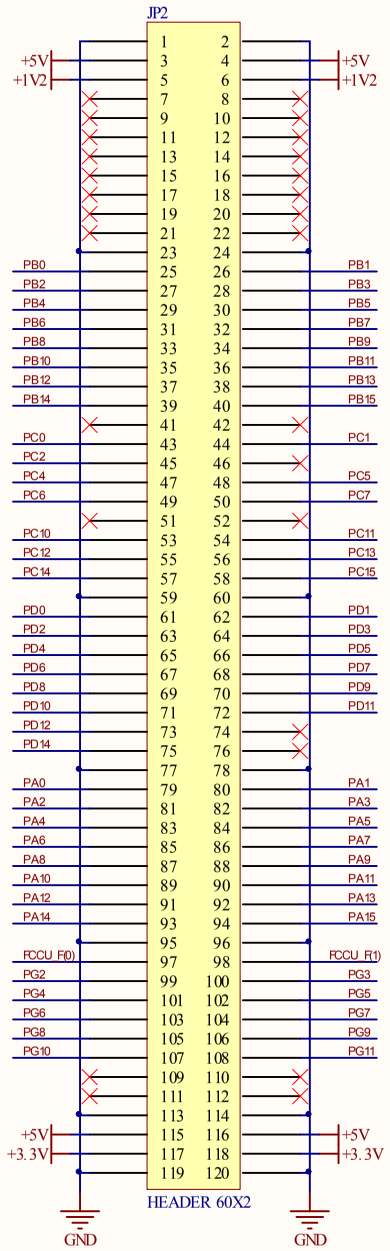
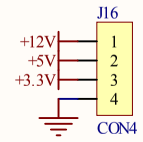
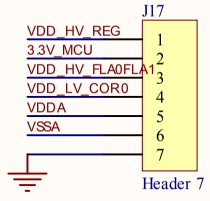
| Date: | 11/09/2009 | Sheet 1 of 2 | |
| File: | C:\SERVER\..\Sheet1.SchDoc | Drawn By: | |

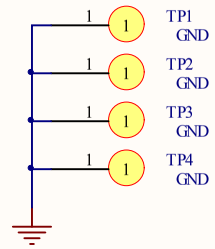


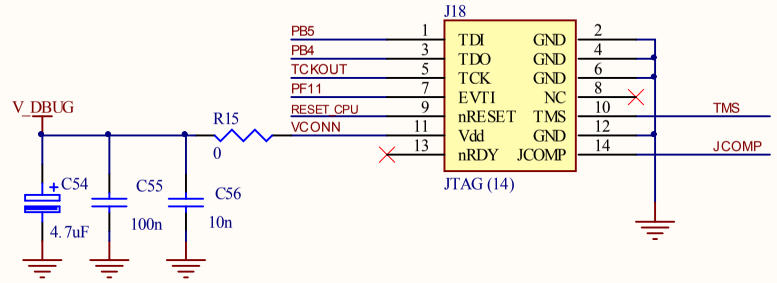




## TEST POINTS







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| Date: 11/09/2009 | | Sheet 2 of 2 |
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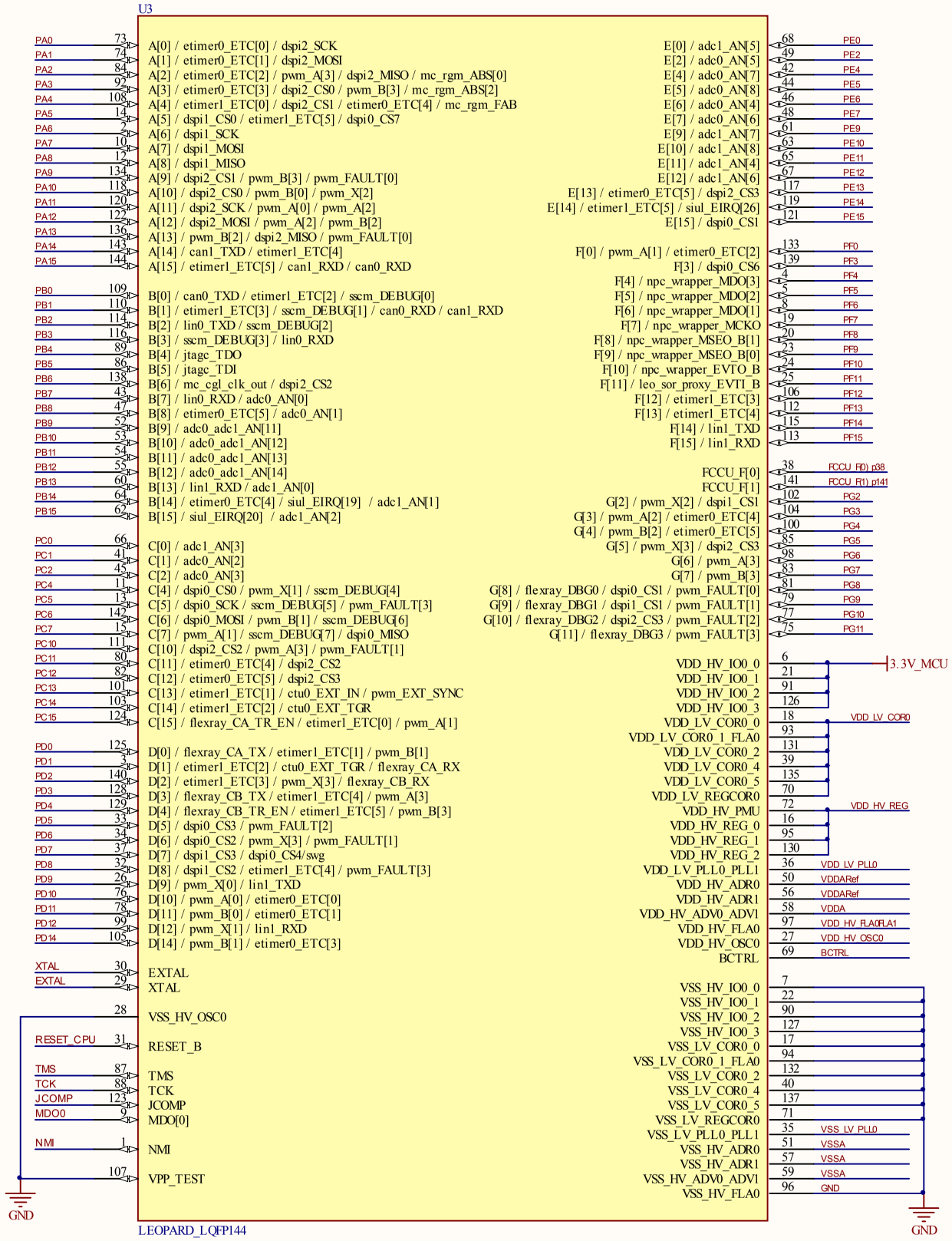


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| Size: A3 | Number: ASD433A | Revision: 1.0 |
| Date: 11/09/2009 | Sheet 1 of 2 | |
| File: C:\SERVER\..\Sheet3.SchDoc | Drawn By: | |

# Bill of Materials

**Source Data From:** ASD433A Leopard Board.PrjPCB
**Project:** ASD433A Leopard Board.PrjPCB
**Variant:** None

Creation Date: 11/09/2009 13.56.23
Print Date:

| Footprint | Comment | LibRef | Designator | Description | Quantity |
|---|---|---|---|---|---|
| 1206 | 10uF | COND EL | C1, C15, C17, C19, C24, C26, C28 | Condensatore Elettrolitico | 7 |
| 0603 | 470p | CAP | C2, C5, C8, C21 | Condensatore | 4 |
| 0603 | 100n | CAP | C3, C6, C9, C12, C14, C16, C18, C20, C22, C25, C27, C29, C33, C34, C35, C36, C44, C47, C48, C49, C51, C53, C55 | Condensatore | 23 |
| 0402 | 10n | CAP | C4, C7, C10, C23 | Condensatore | 4 |
| 0603 | Do not populate | CAP, RES1 | C11, R3, R5, R18 | Condensatore, Resistenza | 4 |
| 0603 | 10n | CAP | C13, C43, C46, C56 | Condensatore | 4 |
| 1206 | 1uF | COND EL | C30, C37 | Condensatore Elettrolitico | 2 |
| 0805 | 47n | CAP | C31, C38, C40 | Condensatore | 3 |
| 0805 | 10n | CAP | C32, C39, C41 | Condensatore | 3 |
| 0603 | 10p | CAP | C42, C45 | Condensatore | 2 |
| 1206 | 100u/16V | COND EL | C50 | Condensatore Elettrolitico | 1 |
| 1206 | 10u/16V | COND EL | C52 | Condensatore Elettrolitico | 1 |
| 1206 | 4.7uF | COND EL | C54 | Condensatore Elettrolitico | 1 |
| 0805 LED | RED LED | LED | D1 | Diodo LED | 1 |
| DO-214AA | 1N4007 | 1N4148 | D2, D5, D6 | Diodo | 3 |
| 0805 LED | GREEN LED | LED | D3 | Diodo LED | 1 |
| SOT-23 | BAS70LT1 | BAS70LT1 | D4 | Schottky Barrie Diodes | 1 |
| FUSE 452/454 SERIES | Fuse - 1A | Fuse 2 | F1 | Fuse | 1 |
| 0805 | FB_0 | FB_0 | FB1, FB2, FB3 | | 3 |
| SIP2 | JUMPER_2 | JUMPER_2 | J1, J4, J5, J8, J10, J14 | | 6 |
| HDR2X2 | Header 2X2H | Header 2X2H | J2, J9 | Header, 2-Pin, Dual row, Right Angle | 2 |
| SIP3 | Vdebug | JUMPER | J3 | | 1 |
| SIP2 | VDDA | JUMPER_2 | J6 | | 1 |
| SIP3 | Analog Reference | JUMPER | J7 | | 1 |
| SIP3 | FAB | JUMPER | J11 | | 1 |
| SIP3 | ABS0 | JUMPER | J12 | | 1 |
| SIP3 | ABS2 | JUMPER | J13 | | 1 |
| CON DC10A | POWERJACK | POWERJACK | J15 | connettore per tensione esterna | 1 |
| SIP4 | CON4 | CON4 | J16 | | 1 |
| HDR1X7 | Header 7 | Header 7 | J17 | Header, 7-Pin | 1 |
| IDC14 | JTAG (14) | JTAG (14) | J18 | | 1 |
| SIP3 | ExtClock | JUMPER | J19 | | 1 |
| 5177984-5 | HEADER 60X2 | HEADER 60X2 | JP1, JP2 | | 2 |
| PROBE AGILENT E5346A-38 | 38-pin MICRTOR | NEXUS-38 | JP3 | Connettore MICTOR | 1 |
| MMCX2.54-V5 | COAX-M | COAX-M | P1 | RF Coaxial PCB Connector, MMCX; Thru-Hole, Vertical Mount Plug, 50 Ohm | 1 |
| SOT223 | BCP68 | STN715 | Q1 | | 1 |
| 0603 | 0 | RES1 | R1, R2, R4, R6, R7, R15, R16, R17 | Resistenza | 8 |
| 0805 | 10K | RES1 | R8, R11, R12, R13, R19, R20 | Resistenza | 6 |
| 0805 | 330 | RES1 | R9, R14 | Resistenza | 2 |
| 0805 | 2.2K | RES1 | R10 | Resistenza | 1 |
| 6332[2512] | 10/1W | RES1 | R21 | Resistenza | 1 |
| MFP201N | SW SPDT | SW SPDT | S1 | | 1 |
| PULSANTE1 | Reset | PULSANTE | SW1 | Pulsante generico | 1 |
| TEST POINT | GND | PIN TEST | TP1, TP2, TP3, TP4 | Test Point | 4 |
| TEST POINT | JCOMP TEST | PIN TEST | TP5 | Test Point | 1 |
| 680HA144011X-001 | LEOPARD_LQFP144 | LEOPARD_LQFP144 | U1, U3 | | 2 |
| TO-252 (DPAK) | LM1117DT-3.3 | LD1117DT33 | U2 | Regolatore bassa caduta 3.3V | 1 |
| SOT-143 | STM6315RDW13F | STM811 | U4 | | 1 |
| HC49/4H SMX | XTAL | XTAL | Y1 | Crystal Oscillator | 1 |
| | | | | | 123 |

| Approved | Notes | |
|---|---|---|
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