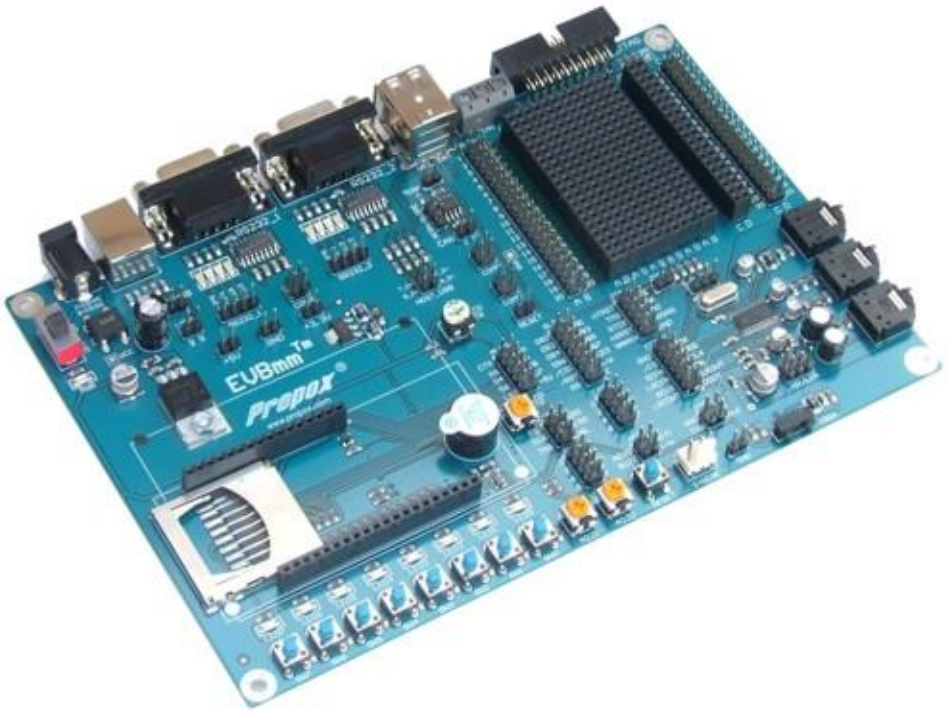


EVBmm^{Tm}

Evaluation system for
microcontrollers ARM
and minimodules PROPOX.

User
Manual

REV 1.1

Propox®
Many ideas one solution

Contents

1

Introduction

System evaluation ***EVBmm^{Tm}*** (Evaluation Board for Mini Modules Team) is tool to designed to building electronic systems based on 32-bit microcontroller ARM and Propox minimodules. This flexible base will allow You to create and verify projects and "shark ideas" quick and easily.

Our remedy idea "many ideas one solution" was implemented in this project. That is the reason why we've created Evaluation System, able to handle most of Propox minimodules **which to fit dimensions into *mm^{Tm}* socket**. Additionally, working on this System, we have took into consideration our future minimodules based on ARM microcontrollers.

The board houses also such peripherals as: LEDs, push-buttons, potentiometers, a LCD display, a RS232 interfaces, **CAN** interface, buzzer, SD/MMC slot card, **codec audio**, 1-Wire connector and **IRDA** transceiver.

Optionally board can be equipped in Alphanumeric LCD Display or Graphic LCD Display (128 x 64 pix resolution) with KS0108 controller.

All these elements are accessible through pin connectors, permitting their connection with any processor port.

This approach supported *Flexibility* technology, and allowed to connect any pin of microcontrollers or Propox minimodule.

The board contains also a power supply which relieves the user from the need to provide a regulated supply voltage.

Together with the board, we deliver development tools as well as demonstration software. The ***EVBmm^{Tm}*** along with the minimodule can be also used in didactic laboratories of informatics colleges and universities. It can be also used to build circuits realizing thesis projects.

We wish great success and full satisfaction while designing and constructing applications bases *EVBmm^{Tm}*.

1.1 Features *EVBmm*^{Tm}

List of main features of ***EVBmm***^{Tm} are as follow:

- Connector with all terminals of the minimodule
- Connectors of all peripherals accessible on board
- JTAG connector for in system programming and debugging
- Voltage regulators (+5V & +3,3V)
- Possibility supply with USB port
- Power switch
- 8 switches and 8 LED diodes
- Buzzer
- 2 potentiometers
- **IRDA port**
- USB Device & USB Host ports
- Two ports RS232 with LEDs
- **Codec Audio**
- **CAN Interface**
- 1-WIRE connector
- SD/MMC card slot
- Alphanumeric LCD connector
- Graphic LCD connector (for 128x64 display)

1.2 Minimodules supported by *EVBmm*^{Tm}

Evaluation system **EVBmm**^{Tm} supported *Flexibility* technology, and allow You to create and verify projects based on minimodules, which can be fitted to ***mm***^{Tm} connector.

List supported *Propox* minimodules:

- MMstr912
- MMstr75xFR
- MMstr71xF
- MMstm32F103R
- MMsam7s
- MMsam7x
- MMlpc213x
- MMnet105
- MMmega02
- MMmega00/01
- MMfpga12
- MMfpga02
- ADPcpld01

Construction of system evaluation **EVBmm**^{Tm}, allowed to implementation ***FPGA*** minimodules based on *Xilinx Spartan3 (MMfpga02, MMfpga12)* devices, and selective minimodules *MMnet* series. W projekcie systemu In project ***EVBmm***^{Tm} board, we have took into consideration support our future minimodules. List of currently supported minimodules is available on site www.propox.com

2

Getting started

Board ***EVBmm***^{Tm}, along with minimodules and accessories make a complete designing system and starting set for a wide range of modules. The system was optimized to cooperate with family minimodules by Propox.

2.1 Component layout

EVBmm^{Tm} system based on ***mm***^{Tm} socket, was designed for clear access to pins of ***mm***^{Tm} socket and peripheral devices. All connections with peripherals are connected using peripheral cables (available in Propox shop named *kab-EVBxxx*).

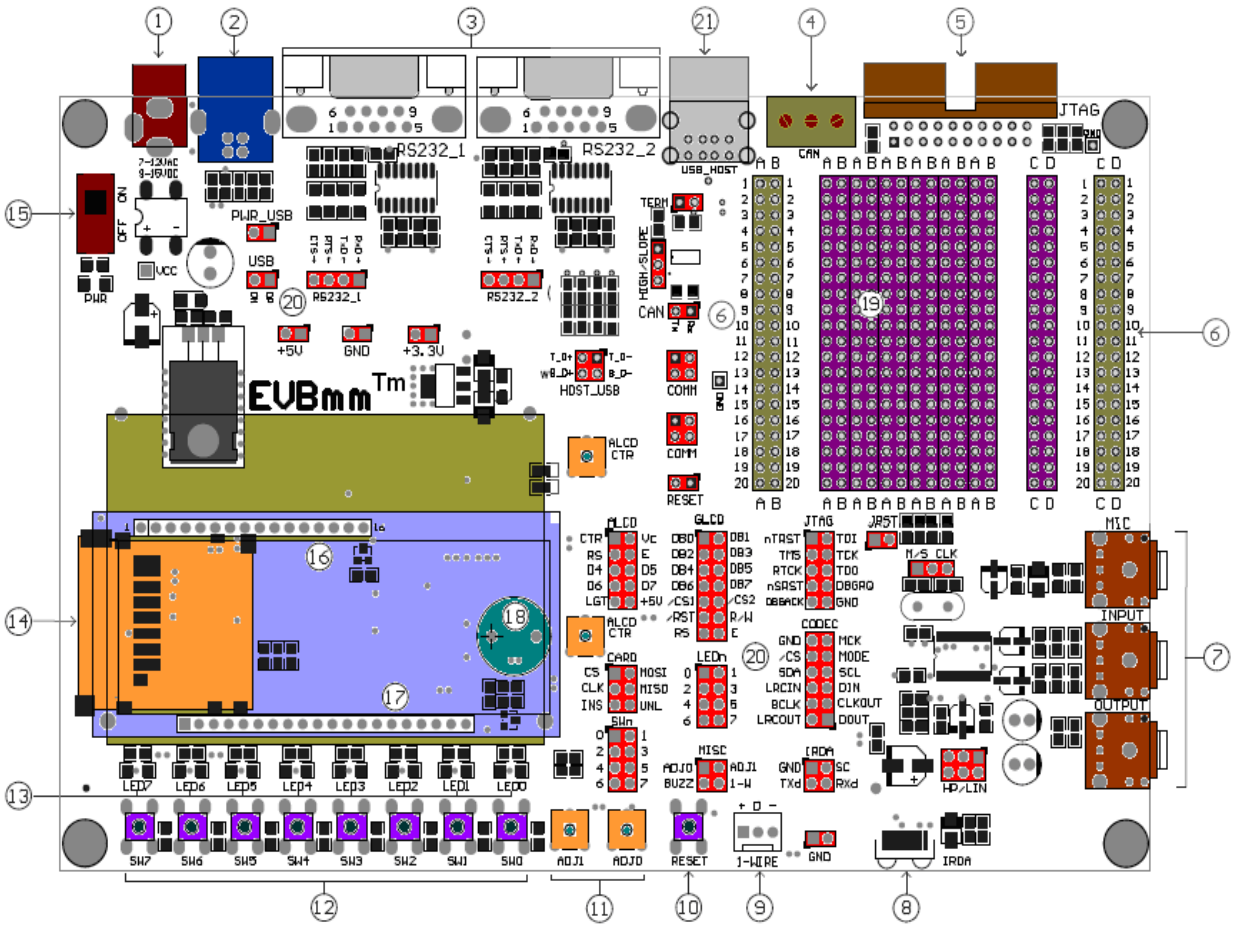


Figure 1 Component layout on the EVBmm^{Tm}

***EVBmm^{Tm}* Components:**

1. Supply connector;
2. USB-B Device connector
3. RS232C connectors;
4. CAN interface;
5. Jtag connector for in system debbuging / programing ARM microcontrollers
6. External ***mm^{Tm}*** connector (to connecting peripheries and jtag connector
7. Input-output analog audio codec connectors
8. IRDA transceiver;
9. 1-Wire connector;
10. RESET switch;
11. Potentiometers;
12. Switches;
13. LEDs;
14. SD/MMC slot card;
15. Power switch;
16. Alphanumeric LCD 2x16 connector;
17. Graphic LCD 128x64pix connect;
18. Buzzer;
19. Internal part ***mm^{Tm}*** sockets (for minimodules);
20. Peripheries devices ***EVBmm^{Tm}***;
21. USB Host connector

Construction of Evaluation System **EVBmm^{Tm}** is allowing to implement ***FPGA*** minimodules based on ***XILINX Spartan3*** *(MMfpga02* and *MMfpga12*) devices, and selective series of ***MMnet*** minimodules. Working on this System, we have took into consideration our future minimodules.

3

Hardware description

3.1 Power supply

The ***EVBmm^{Tm}*** board can be supplied in two ways:

- From an external power supply with an output of 7-12 V AC or 9-15 V DC, having a standard plug with a bolt diameter of 2.1 mm, connected to supply socket J3. In case of a DC supply voltage its polarity is irrelevant.
- From USB connector. In this case JP1 jumper should be closed. Board houses also USB power switch, which allows drawing up to 500mA from USB bus.

Warning!!! Both supply methods should not be used simultaneously !

Fixed voltage +5V and +3.3V, is obtained from LM7805 and SPX2920M3-3,3 standard IC regulator. Can be used to supply microcontroller or minimodules and peripheries such as character ALCD and graphic GLCD. Maximum output current is 400mA for +3,3V voltage and 600mA for 5V voltage. Voltage outputs are available on the headers J1 (+5V) and J15 (+3.3V) . Ground is available on J14 and J38 headers marked as GND.

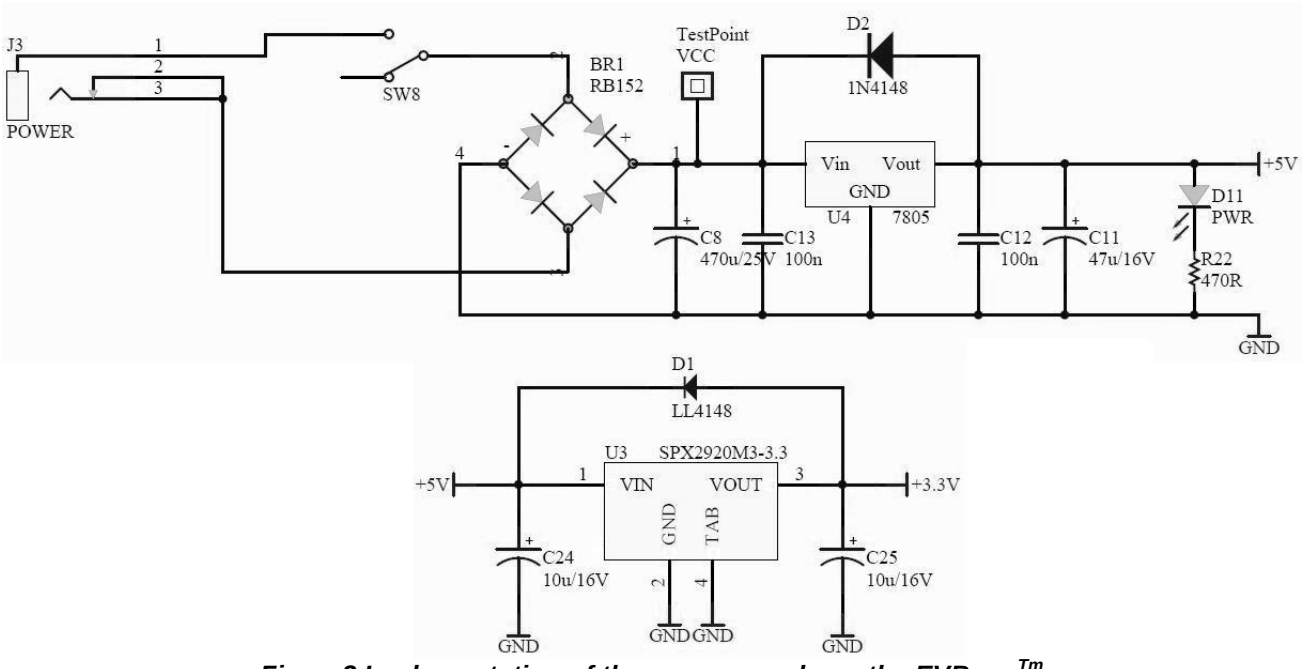


Figure2 Implementation of the power supply on the EVBmm^{Tm}

Solution with USB_5V jumper allows drawing up to 100mA from USB bus. To draw higher current (up to 500mA), accordingly to USB 1.1 or 2.0 specifications, power switch should be used. Software should turn on this power switch after successful enumeration. Example of power switch is shown below (it is not implemented on the board).

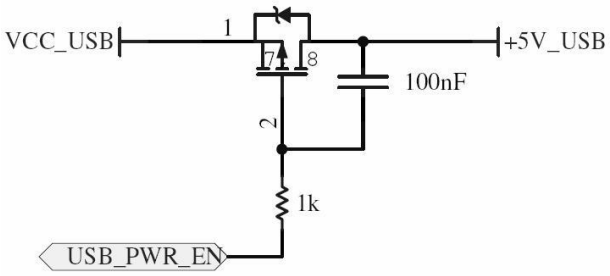


Figure 3 Optional *USB power switch*

3.2 *mm*^{Tm} socket for minimodules

Evaluation board ***EVBmm***^{Tm} was equipped with sockets field allows insert minimodule, and connect peripheries. It solution was named ***mm***^{Tm} ***connector*** .Field ***mm***^{Tm} was divided into two parts. On the right side, is placed two rows 40-pins socket, with the marked rows as C and D. Corresponded them header (goldpin) placed on the right side (Figure 4), too marked as C and D.

On the left side, is placed 12 rows 40-pins socket, with the marked rows as “ABABABABABAB”. Corresponded them header (goldpin) placed on the left side (Figure 4), marked as A and B.

Socket ***mm***^{Tm} is kind of connection matrix, where pin 1A on the ***mm***^{Tm} socket, corresponded 1A pin on the header (goldpin). Analogue, 1B on the ***mm***^{Tm}, corresponded 1B on header, 5C-5C, 2D-2D etc.

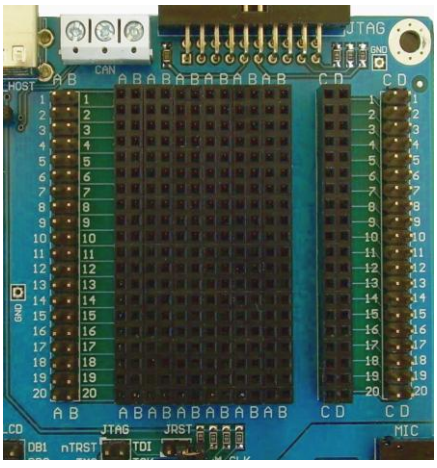


Figure 4 Minimodules sockets

Minimodule installed in ***mm***^{Tm} socket, to beware, so that goldpin connector placed close to right edge of minimodule, insert into socket marked as CD. Other goldpin connector (right side of minimodule) fit into (dependent of width minimodule) socket marked as AB or BA. Access to pins, is possible trough headers placed close ***mm***^{Tm} socket (Figure 5).

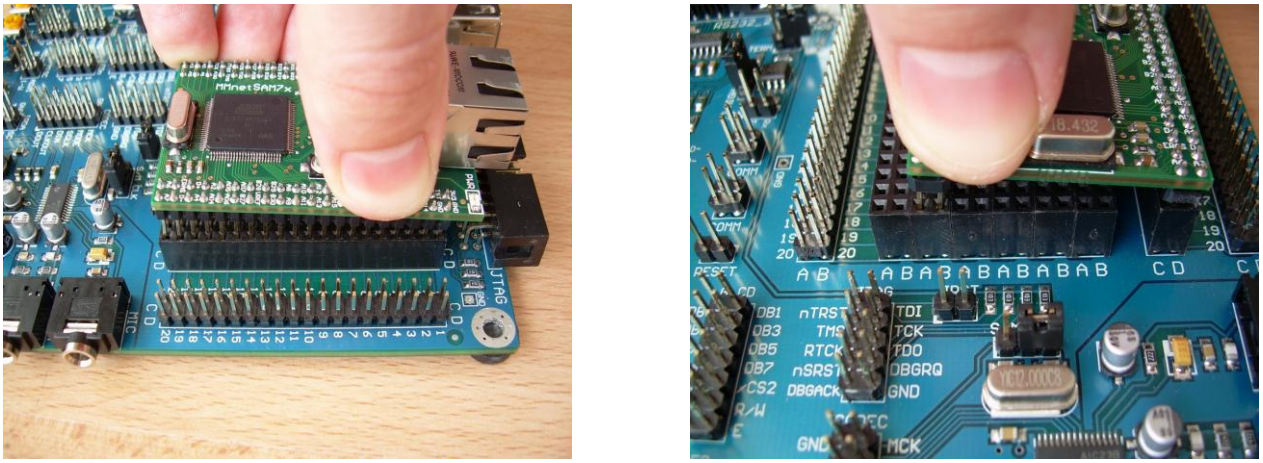


Figure 5. Minimodules process installation

On the bottom side board, close goldpins of ***mm^{Tm}*** sockets, are placed solder pads-jumpers allowed to connect GND of board direct to minimodule. By means of the solder pads, we can direct connect A20,D1 and D1 pins of ***mm^{Tm}*** socket to GND of board.

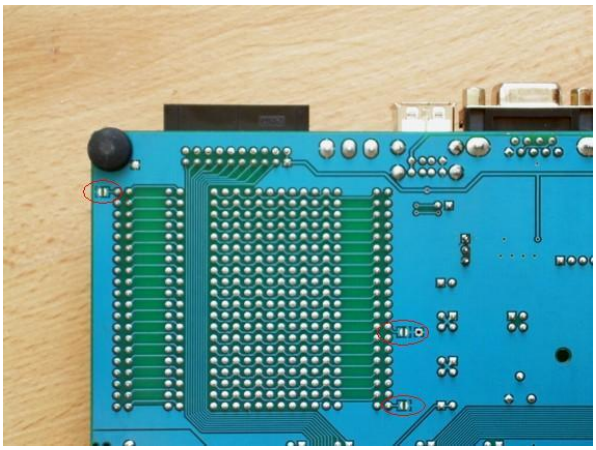


Figure 6. Pads – jumpers of GND

Depending on version of installed minimodule, we short only one in three solder pads-jumpers (Figure 6). This solution allowed to shorten ground path.

WARNING!!! Make sure that power supply of minimodules is connected correctly. Reverse of polarisation, or overvoltage (5V instead 3,3V) can cause damage of minimodule !!!

3.3 LED diodes

The ***EVBmm***^{Tm} has 8 LED diodes which play the role of the simplest interface between the system and the user. The board is constructed in such a way that it allows any connection between the diodes and minimodules leads. A diode lights up when a low signal level is applied to appropriate leads. The LED current flowing into the microcontroller pin is about 3,5 mA.

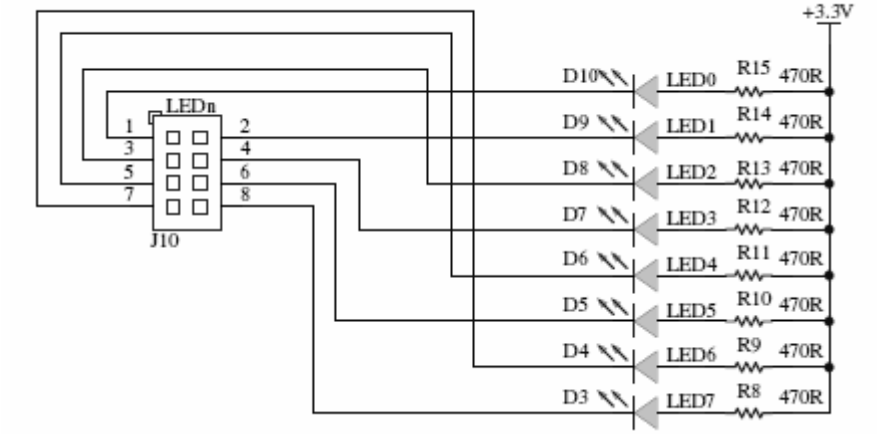


Figure 7. Implementation of LED diodes

3.4 Switches

The ***EVBmm***^{Tm} is equipped with eight microswitches. Pushing a switch causes the corresponding SWx to be pulled low, while releasing it will result in 3,3V on the appropriate switch header connector.

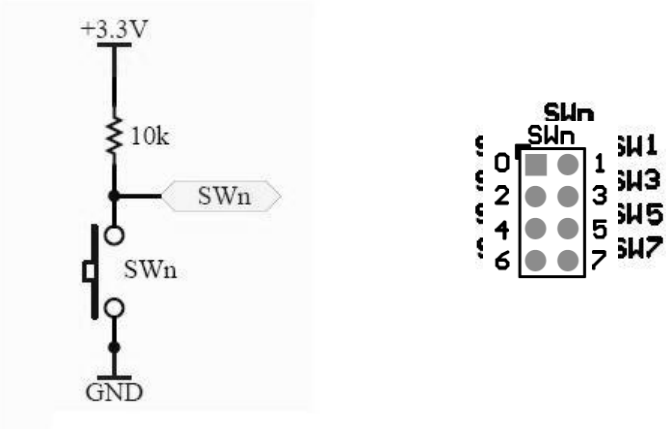


Figure 8. Implementation of switches

3.5 Buzzer

The board ***EVBmm***^{Tm} has a built-in acoustic signaler, controlled by a logic low state through a transistor. The base of the transistor is connected to connector MISC as BUZZ.

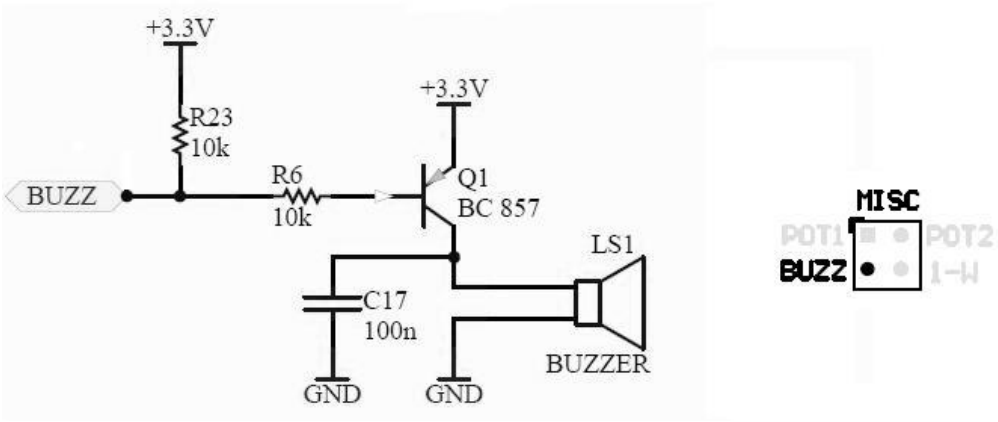


Figure 9. Implementation of buzzer

3.6 Potentiometers

Board ***EVBmm***^{Tm} has two potentiometers, POT0 and POT1. The potentiometers can be used to simulate the outputs of analog circuits. The voltage across POTx terminals can be adjusted in the 0....+3,3V range. The leads of potentiometers are available on MISC connector.

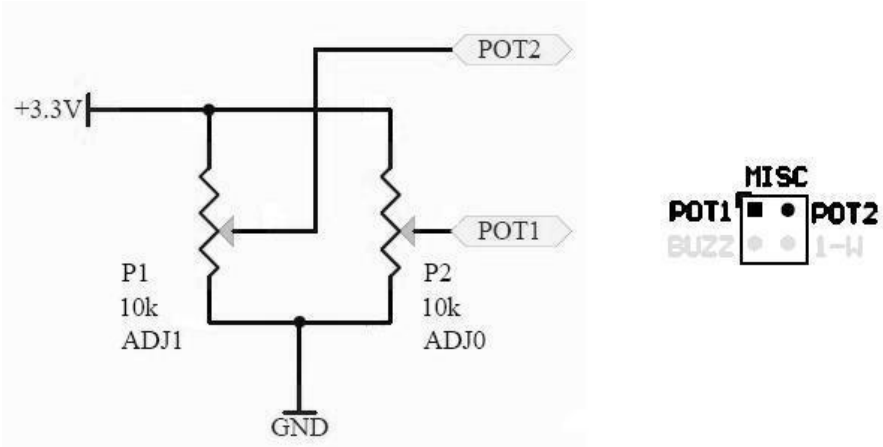


Figure 10. Implementation of potentiometers

3.7 1-WIRE Interface

The ***EVBmm***^{Tm} board has a 1-Wire bus connector. This connector can be used to connect e.g. a digital DS1820 thermometer or Dallas/Maxim iButton reader from. The data signal has been applied to the MISC connector and designated as 1-W. It can be connected to any microcontroller lead-out by means of the attached cable.

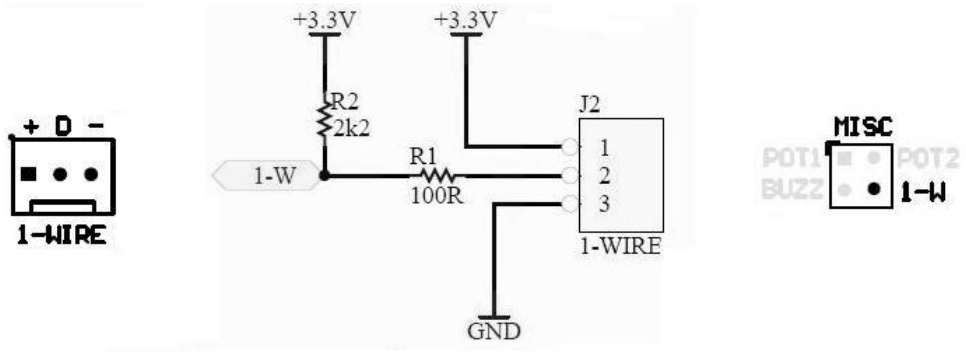


Figure 11. Implementation of 1-Wire

3.8 RESET button

The ***EVBmm***^{Tm} is equipped with an on-board resetting button; by pressing it we force a low state on the RESET connector. Can be used to reset of the ARM minimodule.

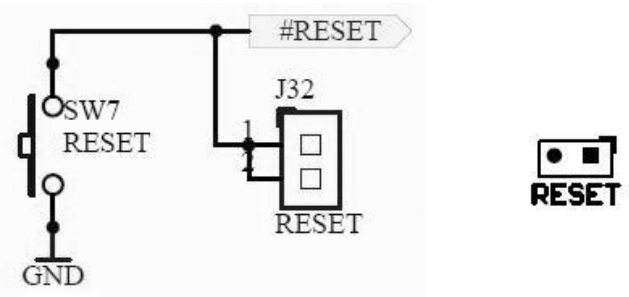


Figure 12. Implementation of RESET button

3.9 USB interface

Board is equipped with USB interface connector. USB allows connection with PC or other USB host and transfer data with up to 1MB/s speed. Along with USB connector there are RC filtering circuits and jumper PWR_USB (JP1) for connecting USB bus power with board +5V voltage.

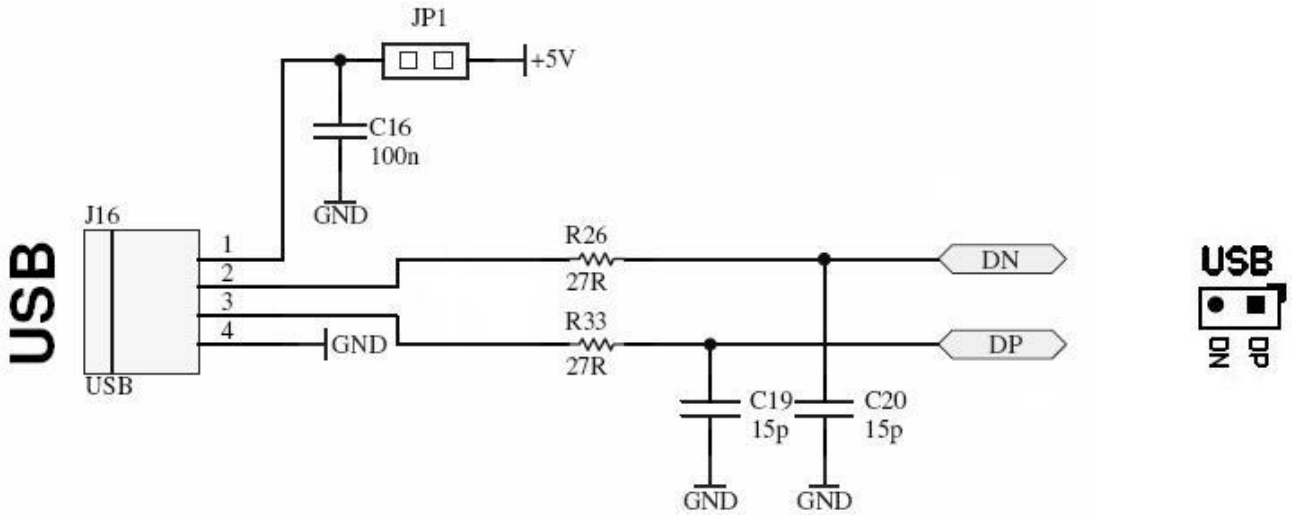


Figure 13. USB connector

Solution with jumper allows drawing up to 100mA from USB bus. To draw higher current (up to 500mA),accordingly to USB 1.1 or 2.0 specifications, power switch should be used. Software should turn on this power switch after successful enumeration. Example of power switch is shown below (it is not implemented on the board).

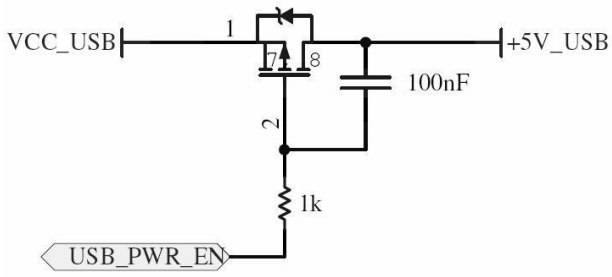


Figure 14. Example of USB power switch – it is necessary for drawing more than 100mA from USB bus

USB host recognize presence of full-speed-device on the bus by sensing pull-up on D+ line. Example pull-up circuit (not implemented on board), shown on drawing bellow.

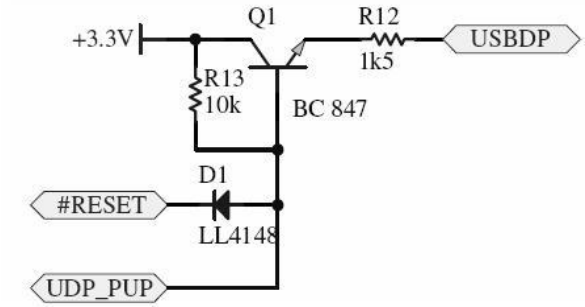


Figure 15. USB D+ pull-up circuit implementation

Pull-up is by default turned off by R13 resistor. Active reset signal or low level on UDP_PUP line turns on pull-up, what is interpreted by USB host as connection of USB device.

3.9 USB Host Interface

Board ***EVBmm***^{Tm} has a double USB-Host connector, which allows connection external USB devices, to microcontroller equipped in Host Controller.

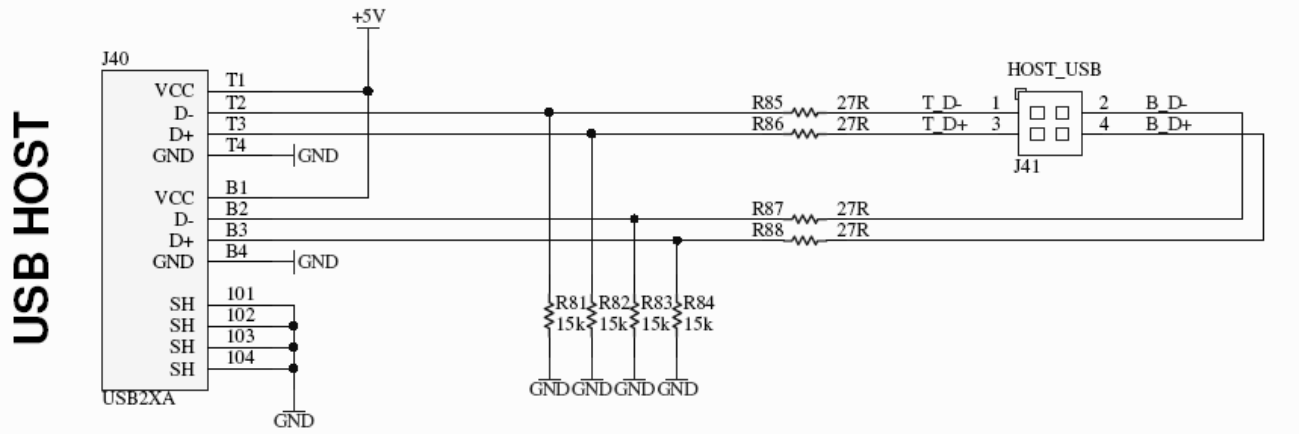


Figure 16. Implementation of USB Host connector

Signals T_D+ , T_D- (for upper connector), and B_D+ i B_D- (for lower connector) are led to goldpin connector marked as HOST_USB.

3.10 RS-232 interfaces

The ***EVBmm***^{Tm} has two RS232 ports with DB-9 connector. TxD, RxD, RTS and CTS lines are led to goldpin connector (RS232_x) through ST3232B transceiver. Signal DSR and DTR are shorted.

RS232 signals can also be connected to any microcontroller's pins with use of wires. Drawing below shows implementation of RS232 ports. LEDs indicated data transfer.

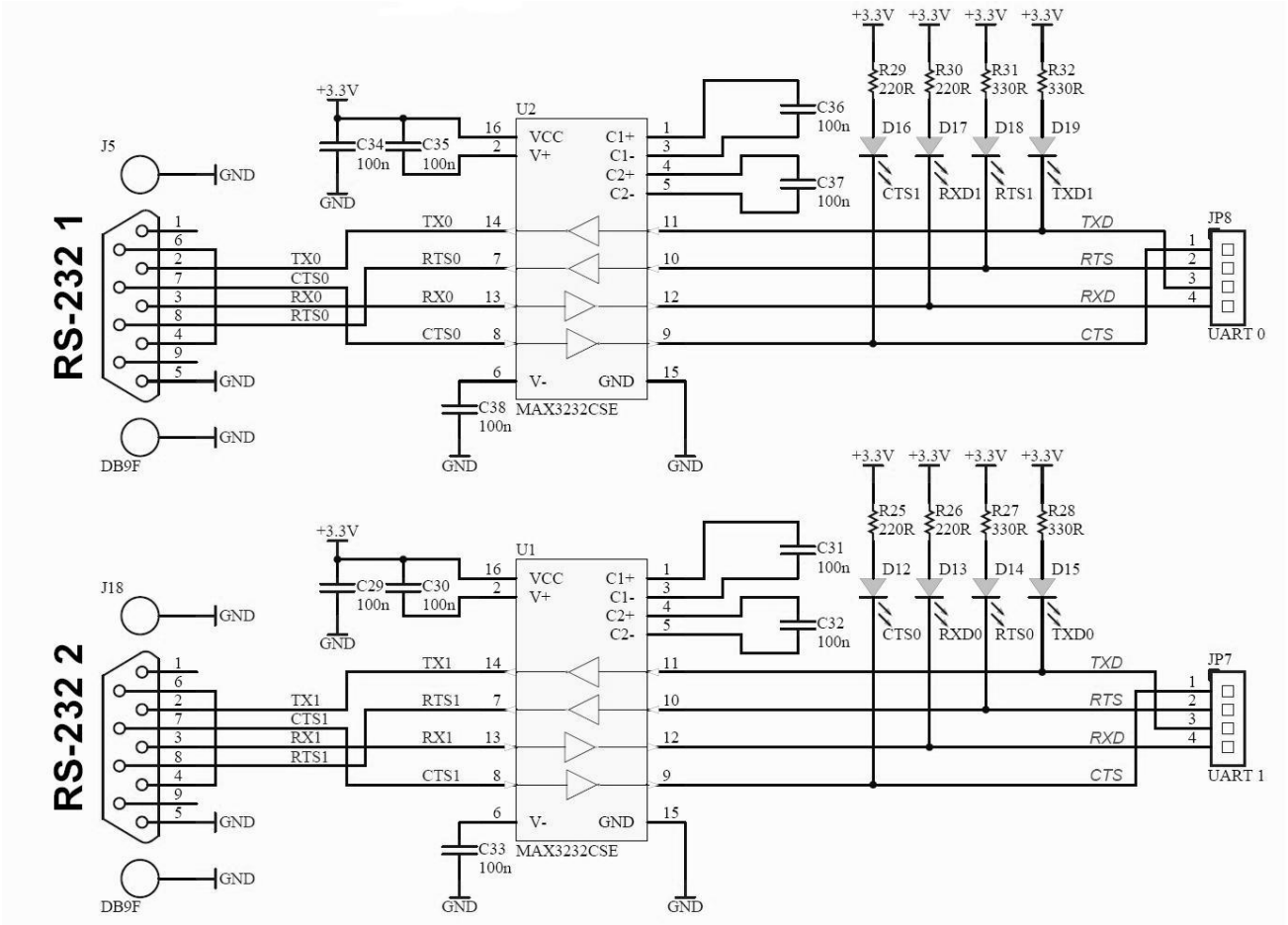


Figure 17. Implementation of RS232 interfaces

3.11 MMC/SD slot card

The board ***EVBmm***^{Tm} has built-in SD/MMC card connector. Its signal are led to J18 connector, marked as “CARD”. Used are only those lines needed to SPI mode.

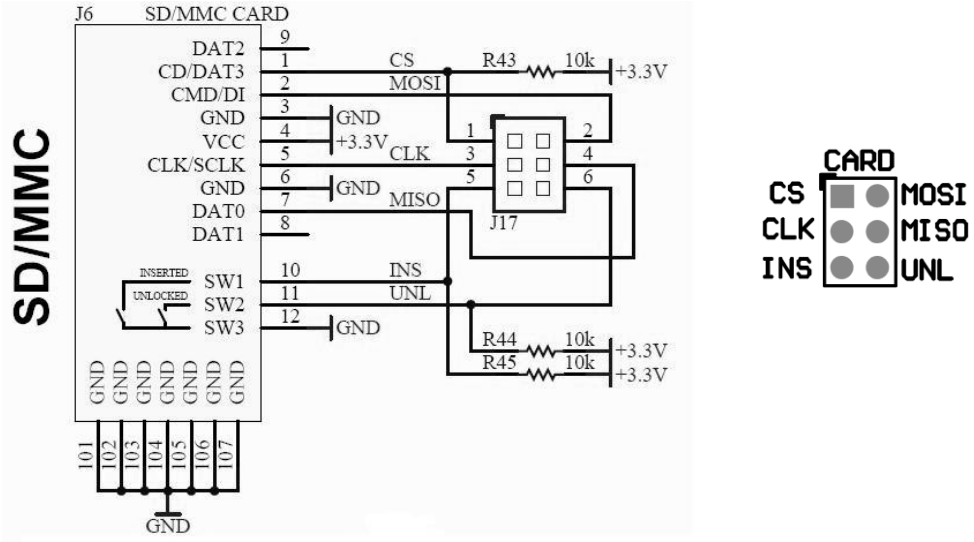


Figure 18. Implementation of SD/MMC slot card

Additionally, card connector has switches informing about card status, which also are connected to *Card* connector. The contacts of switches are pull-up by 10k resistors to +3,3V supply. Active contact shorted line to ground. Meaning of these switches is explained in table:

INS	UNL	Status card
1	1	No card
1	0	-
0	1	Inserted, locked
0	0	Inserted, unlocked

WARNING! SD/MMC card can operated only with **3,3V logic levels**.
Card not tolerant voltage levels above 3,3V. Make sure that power supply microcontroller is 3,3V !!!

3.12 JTAG Connector

Programming/debugging of module can be done through JTAG interface. JTAG is a four-lead interface permitting the takeover of control over the processor’s core. The possibilities offered by this interface are, among others: step operation, full-speed operation, hardware and software breakpoints, inspection and modification of contents of registers and data memories.

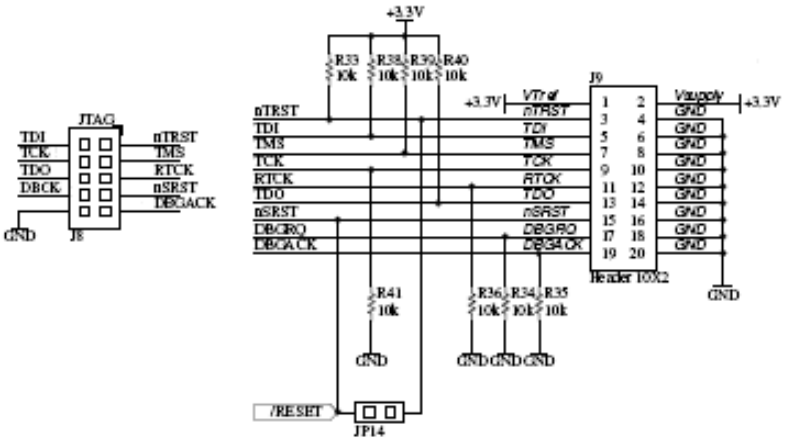
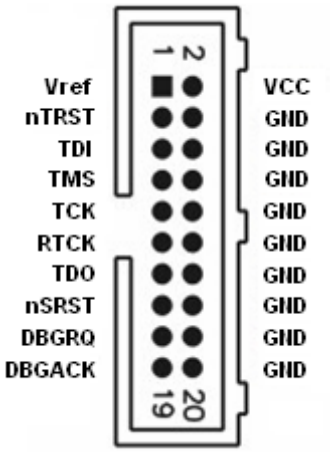


Figure 19. Implementation of JTAG interface

***EVBmm**Tm* board has standard, 20-pin connector J9 (*Wiggler* standard), allowing operation with all JTAG debuggers. Its signal are led to JP8 goldpin connector, marked as "JTAG"



GND – Ground

PIN DESRIPTION

VCC – Supply voltage to the emulator
Vref – Target voltage sense
TRST – Tap RESET, RESET signal for JTAG chain
TDI – Test Data Input,
TMS – Test Mode Select,
TCK – Test Clock
TDO – Test Data Output,
SRST – Target RESET
DBGRQ – Debug Request
DBGACK – Debug Acknow

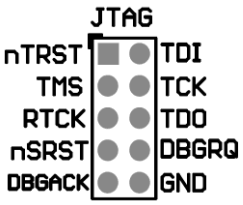


Figure 20. JTAG Interface

3.13 Alphanumeric LCD display

The board ***EVBmm***^{Tm} has place for standard 2x16 characters LCD display with HD44780 compatible controller. Display terminals D4-D7, RS, E, contrast and backlight are led to LCD connector J11(ALCD). LCD connector is designed in this way, that it is possible to connect contrast signal to onboard potentiometer (ALCD CTR) with use of jumpers, or with use of wire to any microcontroller pin, that can generate PWM (through RC low pass filter, which can be built on prototype area).

Similarly, LCD backlight can be permanently turned on by closing jumper, or can be controlled by any microcontroller pin. Because LCD connector contains only higher part of display bus, it has to work 4-bit mode. Also, RW line is permanently connected to ground, what allows only read operation, but it is sufficient to proper operation. Such approach minimizes required microcontroller port pins to six.

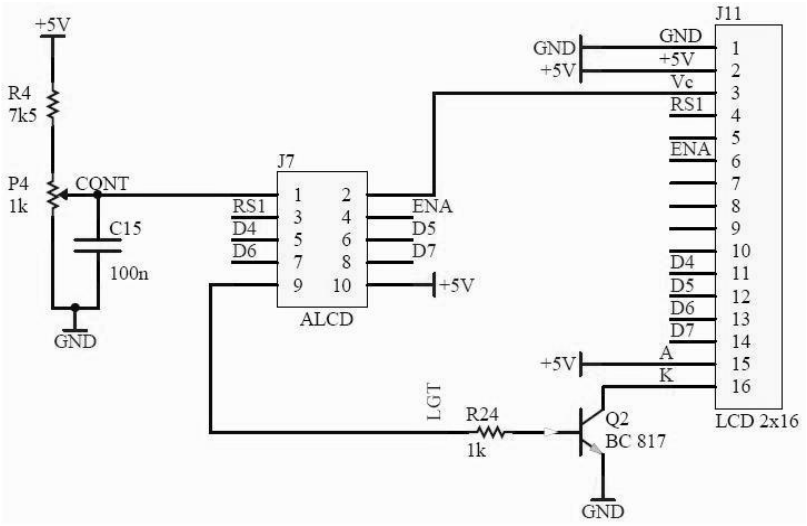


Figure 21. Connection of ALCD display on the board

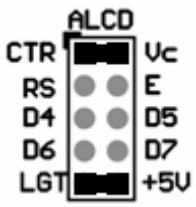


Figure 22. Default ALCD configuration – backlight permanently turned on, contrast regulated with* ALCD CTR *potentiometer

3.14 Graphic display GLCD

The board ***EVBmm^{Tm}*** has place for LCD graphic display LCD-AG-128064H-YIY Y/G (other indication LCD-AG-128064H-BHW W/B-E6 or LCD-A-128064D1-A201 Y/G) with KS0108 compatible controller and 128x64 pix resolution. All lines are available at the pin header GLCD:

- /CS1, /CS2 (Chip Select) – memory bank select, for left/right screen part;
- /RST – reset line;
- R/W – read/write data line (if R/W=1 data can be read with memory display by microcontroller, if R/W=0 data can be write to display by microcontroller);
- RS – data/instruction select line ;
- E – display enable line (strobe line);
- DB0-DB7 – 8-bits data line.

LCD backlight can be permanently turned on by closing jumper (LGT and GND on ALCD connector), or can be controlled by any microcontroller pin. The adjustment of contrast may be done by GLCD CTR potentiometer.

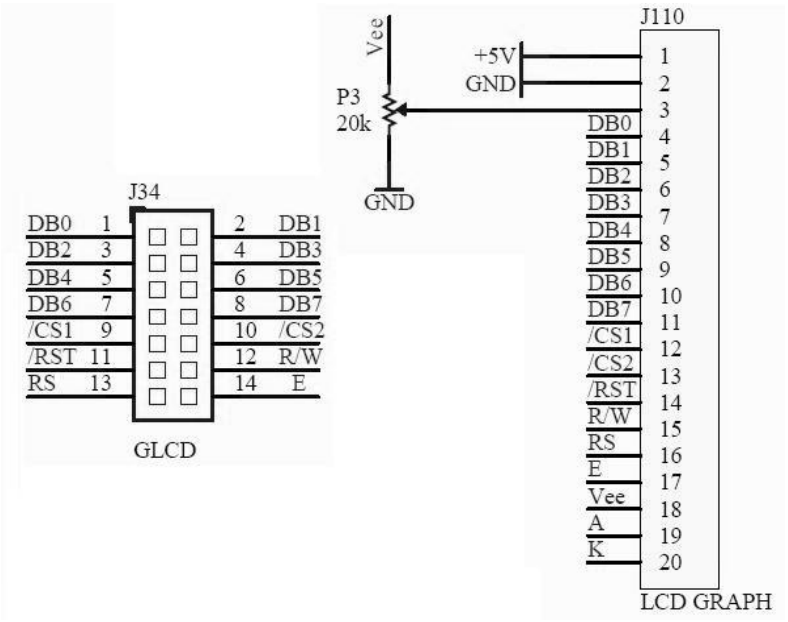


Figure 23 Implementation of graphic LCD

3.15 CAN interface

Evaluation board ***EVBmm^{Tm}*** has CAN interface based on the 3.3V CAN transceiver SN65HVD230 from Texas Instruments, with terminalblock.

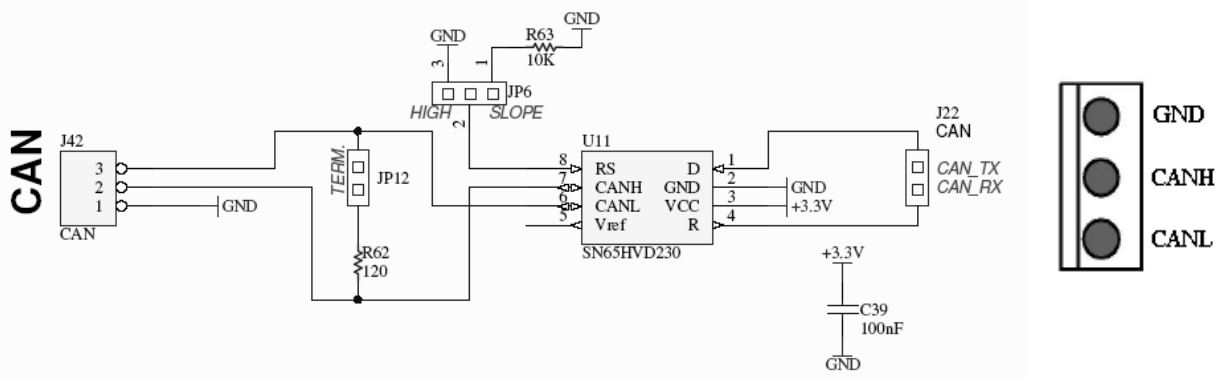


Figure 24 Implementation of CAN interface

Both high-speed mode and slope-control mode are available and can be selected by setting HIGH/SLOPE jumper. CAN terminal resistor (120Ω) is enabled when JP12 jumper marked as TERM, is closed. Signal line of CAN are available on J22 header marked as *CAN*.

3.16 IRDA

On the ***EVBmm^{Tm}*** board , placed infrared transceiver TFDU4100 compliant to the *IRDA 1.2* standard for serial infrared (SIR) data communication , supporting IRDA speeds up to 115.2 kbit/s. Signal line of transceiver are available on J33 header marked as *IRDA*.

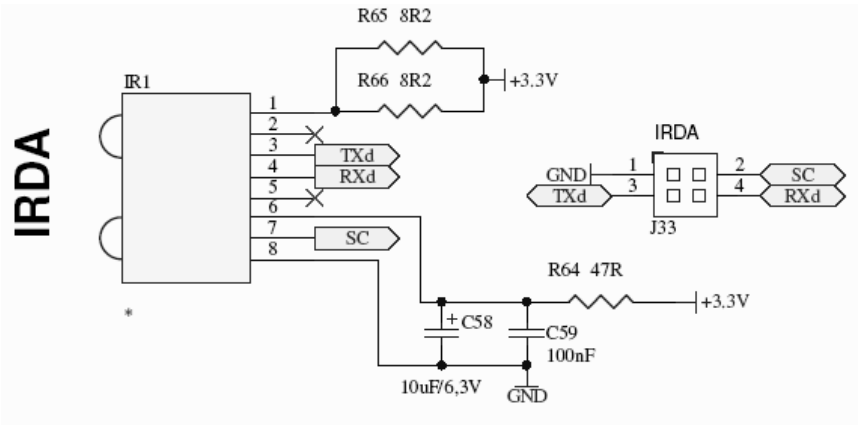


Figure 25 Implementation of IRDA transceiver

The Sensitivity Control pin (SC) allows the minimum detection irradiance threshold of the transceiver to be lowered, when set to a logic HIGH.

3.17 Codec Audio

The board ***EVBmm***^{Tm} has audio codec TLV320AIC23 Texas Instruments. The TLV320AIC23 is a high-performance stereo audio codec with highly integrated analog functionality. The analog-to-digital converters (ADCs) and digital-to-analog converters (DACs) within the TLV320AIC23 use multi-bit sigma-delta technology with integrated oversampling digital interpolation filters. Data-transfer word lengths of 16, 20, 24, and 32 bits, with sample rates from 8 kHz to 96 kHz, are supported.

The TLV320AIC23 has an integrated analog features consist of stereo-line inputs with an analog bypass path, a stereo headphone amplifier, with analog volume control and mute, and a complete electret-microphone-capsule biasing and buffering solution. Configuration devices is possible trough I2C or SPI interface (SCL, SDA, MODE, /CS pins).

Digital Audio stream in I2S standard (thus Left Justified, Right Justified, or DSP) is available on LRCIN, DIN, BCLK, LRCOUT, DOUT, CLKOUT pins on CODEC header.

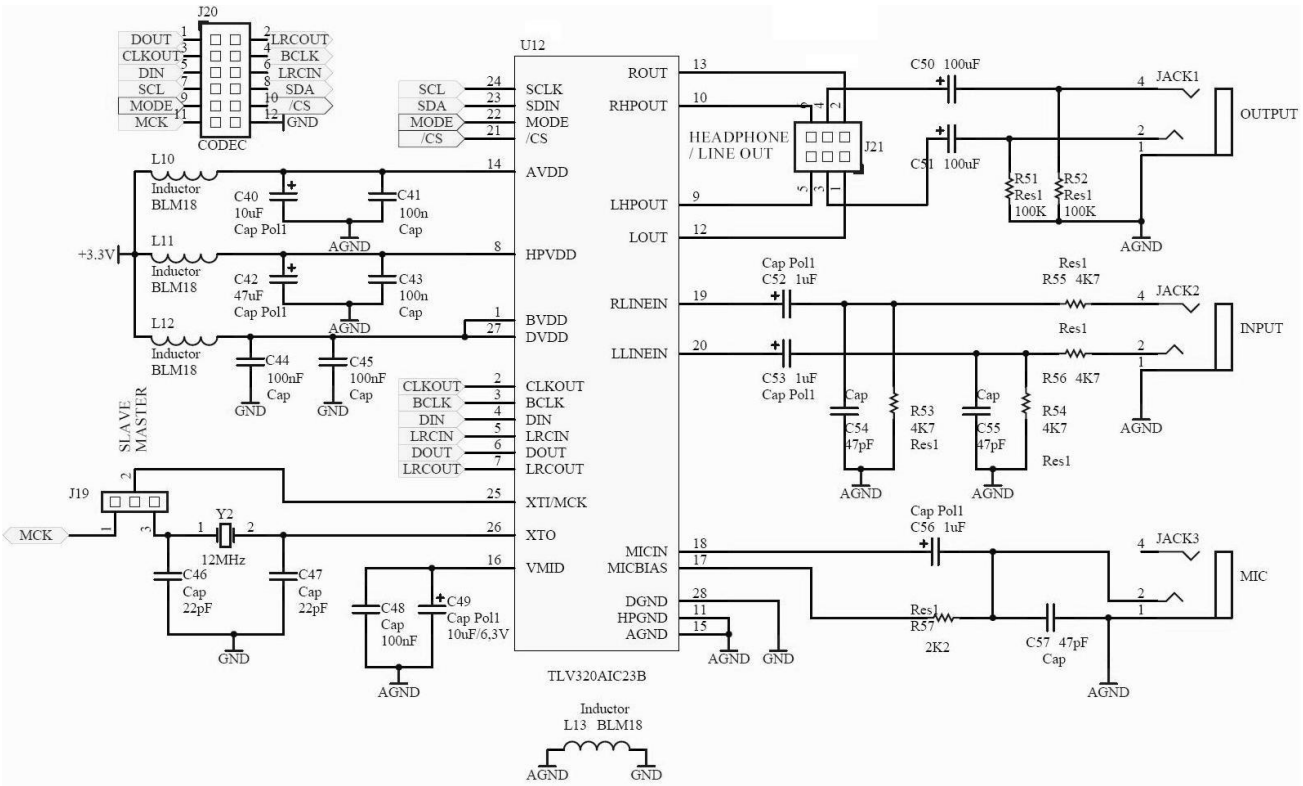


Figure 26 Implementation of audio codec

On board placed three stereo audio *Jack* connectors. OUTPUT connector allows connect headphones (jumpers set HP), or stereo audio amplifier (jumper set LIN). INPUT connector is line inputs for left and right audio channels. MICIN is a high-impedance, low-capacitance input that is compatible with a wide range of microphones. It has a programmable volume control and a mute function.

The TLV320AIC23 can operate in master or slave clock mode. In the master mode (jumper *S/M CLK* is set M position), the TLV320AIC23 clock and sampling rates are derived from a 12-MHz crystal MCLK signal. In Slave mode (jumper *S/M CLK* is set S position), MCK signal is derived from external source (i.e. from microcontrollers) and fitted on MCK

pin. Default CODEC jumpers are set for Master mode and Headphones Output as shown *Figure 26.*

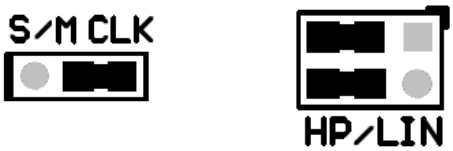


Figure 27. Default CODEC jumpers

For more information about the configuration and function Audio Codec, can be found in TLV320AIC23 datasheet.

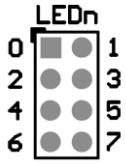
WARNING!!! CODEC can operated only with **3,3V logic levels**.
CODEC not tolerant voltage levels above 3,3V !!!

4

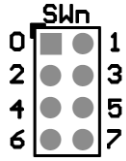
Header and connectors

4.1 Connectors

LED's & Switches Header

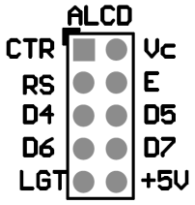


LED0...7 – LEDs



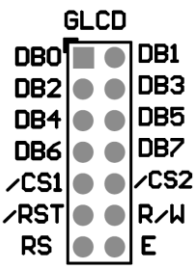
SW0...7 – Switches

ALCD Character Display Header



CTR – LCD contrast line
VC – contrast potentiometer output voltage
RS – control line LCD data/command
E – strobe line LCD
DB4,DB5,DB6,DB7 – data line
LGT – Backlight Display pin control for ALCD and GLCD
+5V – voltage out +5V

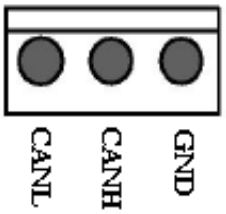
GLCD Character Display Header



DB0-DB7 – data line
/CS1, /CS2 –memory bank select, for left/right screen part
/RST – reset line GLCD
R/W – read/write data line
RS – data/instruction select line
E – display enable line (strobe line)

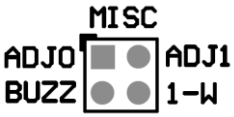
CAN Header

Tx – data input
Rx – data output



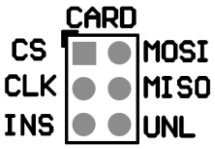
CANL – "L " sigal for CAN
CANH – "H " sigal for CAN
GND – masa

ISC Header



ADJ0 – ADJ0 potentiometer output
ADJ1 – ADJ1 potentiometer output
BUZZ – buzzer control pin
1-W – 1-Wire output pin

SD/MMC Data Flash header

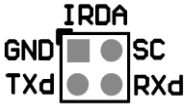


CS – strobe line
MOSI – Master Output Slave Input
CLK – Clock Line
MISO – Master Input Slave Output
INS – Insert Card signalization
UNL – Lock Write signalization

USB device header

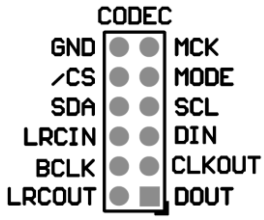
DP – USB D+
DN – USB D -

IRDA header



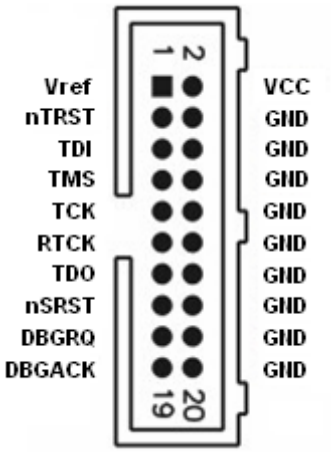
GND – ground
SC – Sensitive Control
TXd – data input
RXd – data output

AUDIO CODEC header

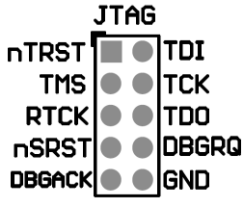


GND – Ground
MCK –External Master Clock Input
/CS – SPI Chip select
MODE – SPI/ 2Wire selection
SDIN – Data line input (for SPI and TWI)
SCLK – Clock line inut (for SPI and TWI)
LRCIN – Left-Right Clock Input
DIN – Digital Input for audio data
BCLK – Bit Clock for audio data
CLKOUT– Clock Out for audio data
LRCOUT – Left-Right Clock Output for audio data
DOUT – Digital Out for audio data

JTAG connectors



VCC – emulator supply
Vref – target voltage sense
nTRST – Tap RESET, reset for JTAG chain
TDI JTAG – Test data input
TMS JTAG – Test Mode select
TCK JTAG – Test Clock
TDO JTAG – Test Data Output
nSRST – RESET signal
GND – Ground
RTCK – Return Clock
DBGRQ – Debugger request
DBGACK – Debugger Acknowledge



4.2 Jumpers

Jumper	Function
PWR_USB	Board +5V power supply from USB bus. Default setting: Not fitted
HI/SLOPE	In HI position CAN interface operated in *High Speed* mode. In SLOPE position CAN interface operated in *Slope Control* mode. Default setting: HI
TERM	CAN terminal resistor (120R) is enabled when jumper TERM is fitted. Default setting: Not fitted
S/M CLK	Master/Slave clock Audio Codec. When jumper is set M position, codec is clocked external clock source passed on MCK pin. In set S position codec clocked with 12MHz crystal oscillator. Default setting: M
HP/LIN	In HP position allowed to connect headphones to OUTPUT Jack. In LINE position allowed to connect audio amplifier to OUTPUT Jack. Default setting: HP
JRST	Connecting system RESET with JTAG Reset. Default setting: Not fitted

4.3 LEDs & switches

Name	Function
POWER led	The RED Led is directly connected to the +5V supply. The power led is always lit when power is applied to GrandEVBavr
RESET	The RESET push button caused low level on RESET header.

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Troubleshooting Guide

Tabela 2 Problem

Problem	Reason	Solution
The red power LED is not on	Supply cable not connect.	Connect supply power cable to the DC jack.
	Wrong supply power.	Check that the power supply is of type 9-15V.
	Power switch off.	Turn on the power switch.
UART serial communication does not work properly	Signals UART RxD and TxD are not connect to minimodules port	Connect signal to ports minimodules
CAN communication does not work properly	Signals CAN RxD and TxD are not connect to minimodules port	Connect signal to ports minimodules
	CAN line end's is not terminated	Set jumpers to TERM header
ALCD does not work properly	Wrong connection of ALCD (GLCD) signals to ports	Check configuration
	Wrong contrast voltage	Check Contrast voltage on display
The JTAG device cannot be programmed	JTAG cable connect wrong.	Check cable.
	Minimodules placed wrong.	Check minimodules.
	Wrong supply power.	Check power supply on minimodules.

6

Technical Data

System unit:

Dimensions board:	without connectors 187mm x 124mm with connectors 190mm x 132mm
Weight:	c.a. 200g

Operating Conditions

VCC supply voltage DC (VDC):	9-15V DC
VCC supply voltage AC (VAC)	7-12V AC
Max. Current POWER (Ivcc):	1.5 A @ VDC 9V or VAC 7V 1A @ VDC 12V or VAC 9V 700mA @ VDC 15V or VAC 12V
Voltage +3,3V :	+3,3V DC
Max. current (+3,3V):	0,4 A but not greater then Ivcc
Voltage +5V	5V DC
Max. current (+5v):	1 A but not greater then Ivcc

Connectors:

Power Connector	5.7mm x 2.1mm
UART Connector RS232	9 (D-SUB) female
USB Device Connector	USB-B female
USB Host Connector	2x USB-A female
CAN Connector	3-screws terminal block
AUDIO connectors	Stereo JACK 3,5mm
JTAG connector	IDC 20

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Technical Assistance

For technical support, please contact support@propox.com. When requesting technical support, please include following information:

- Version number of **EVBmm**[Tm]
- Complete target device (minimodule) part number
- Programming voltage
- Jumper settings
- A detailed description of the problem

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Example Application

Examples programs are available on www.propox.com site.

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Accessories

Below is a list of the available categories of accessories for the **EVBmm^{Tm}** board:

- Perypherial cables
- Minimodules with FPGA, AVR and ARM devices
- **ARMcablel** programmer
- 9V/750mA (230VAC) power supply
- 1-WIRE DS1820 thermometer

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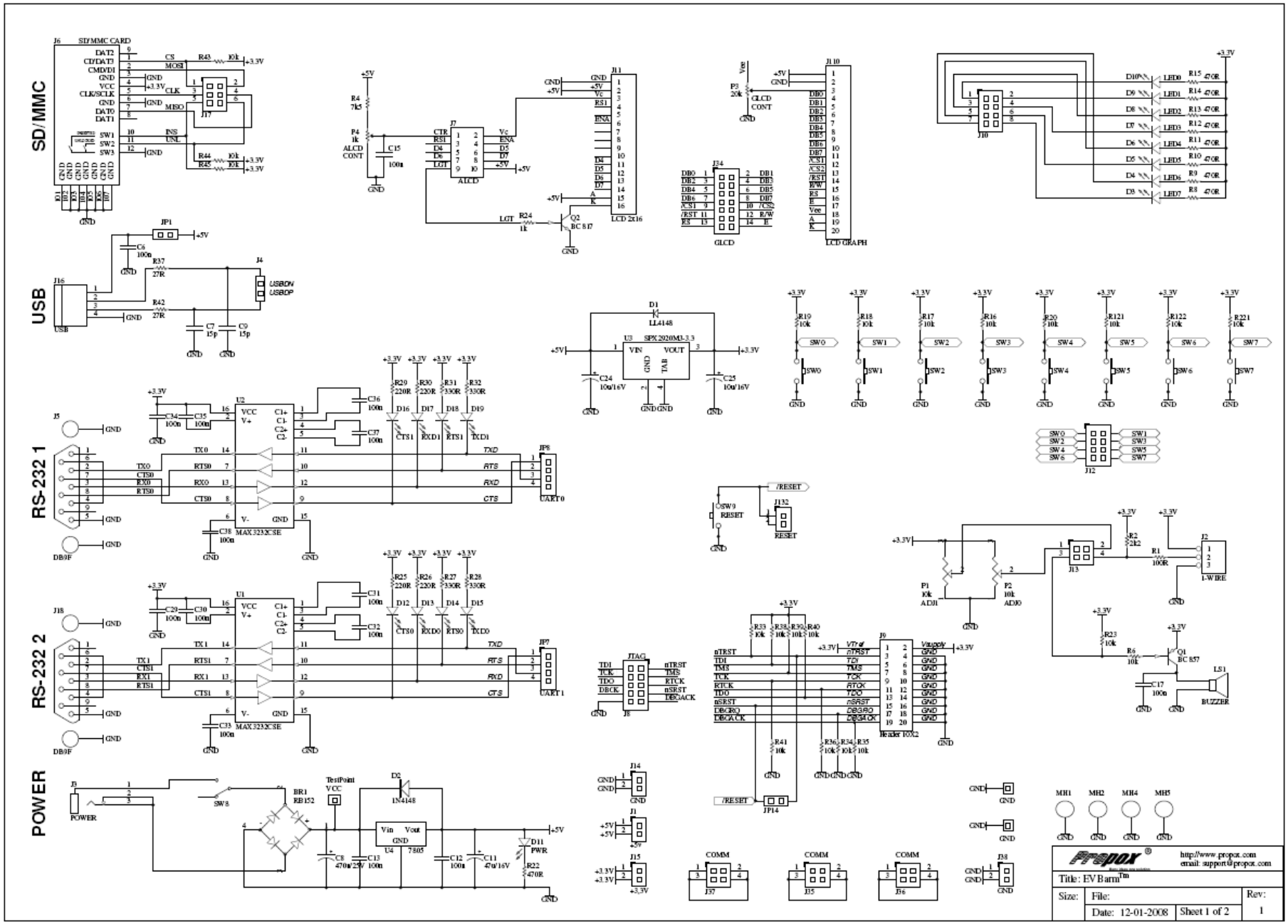
Warranty Statement

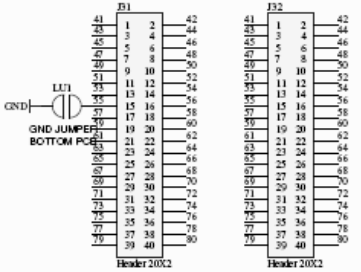
EVBmm^{Tm} warranty is for six month. Repair will be completed at no cost to user if user has not caused failure. User is responsible for shipment charges.

Limitation and Liability

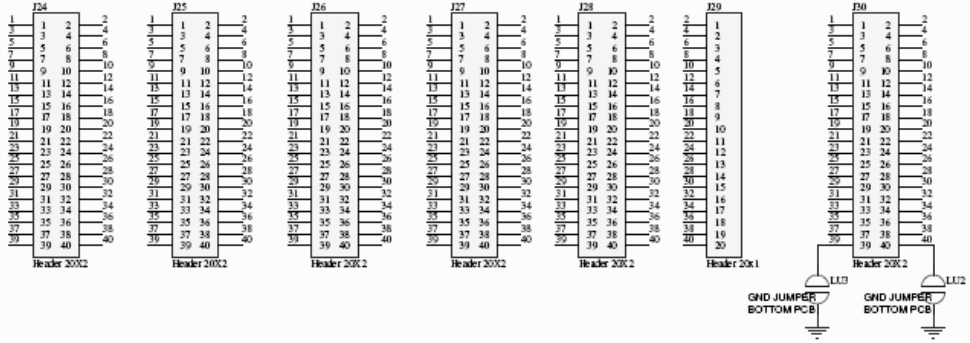
Although all the information contained herein have been carefully verified, Propox assumes no responsibility for errors that might appears in this document, or for damage to things or persons resulting from technical errors, omission and improper use of this guide and of the related software and hardware.


SD/MMC
USB
RS-232 1
RS-232 2
POWER
SD/MMC CARD
LCD 2x16
LCD GRAPH
GLCD
MAX3232CSE
SPX2920M3-3.3
LL4148
JTAG
Header 10X2
BUZZER
1-WIRE
POWER
Prepox
http://www.propox.com
email: support@propox.com
Title: EV Barm
Size:
File:
Date: 12-01-2008
Sheet 1 of 2
Rev:
1

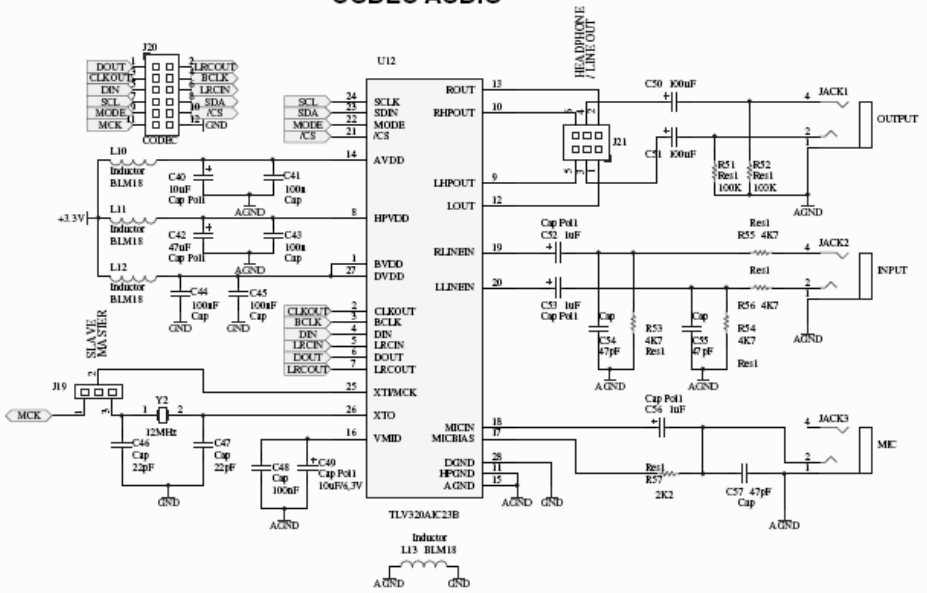
mm^Tm Socket (AB)



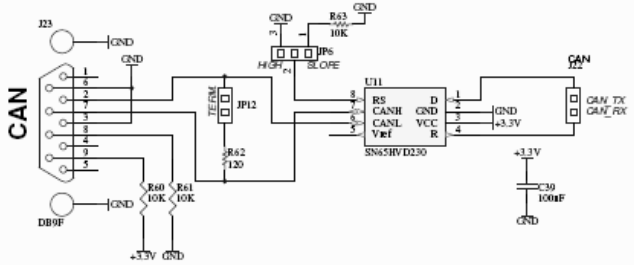
mm^Tm Socket (CD)



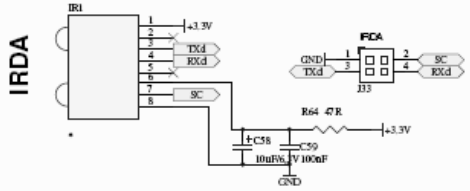
CODEC AUDIO



CAN



IRDA



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Title: EV Barm^Tm		
Size:	File:	Rev: 1
	Date: 12-01-2008 Sheet 2 of 2	